

INTEGRATED DEVICE FOR KITCHEN GARBAGE ALL-AROUND TREATMENT AND PRODUCT MANUFACTURING METHOD

BACKGROUND

Technical Field

5 The present invention discloses an integrated device for kitchen garbage all-around treatment and a product manufacturing method, and the present invention belongs to the field of comprehensive technologies of household garbage treatment, relates to an integrated device for kitchen garbage resource treatment and a manufacturing method as well as formula and process thereof, and also relates to a large number of technical fields such as microorganism,
10 biochemistry, equipment manufacturing, photoelectricity, ozone application, functional plastics, plastic reverse engineering, clean coal, mineral fuel manufacturing, biomass fuel manufacturing, clean production, air purification and sewage treatment.

Related Art

15 Long-time application of science and technology of resource utilization of waste has proved a truth that, if a resource treatment technology of the waste is a single application, the consequences will bring about greater crisis to human living environments, especially that a serious problem of secondary pollution thus arising is hard to control, so comprehensive treatment of the waste has become a current development trend. The composition of kitchen garbage is extremely complex, including sewage, plastic bags, plastic bottles, waste cloth,
20 putrefactive organic matter, paper, metal bottles, broken glass, broken ceramic chips, animal oil, plant oil, native bacteria and other substances. Current kitchen garbage resource treatment technologies have presented a situation of "a hundred flowers are in bloom" in methods and processes at home and abroad, but the technologies are basically simple single treatment, do not turn to international environmental-protection treatment trend and direction of comprehensive
25 treatment, utilization and disposal from simple treatment, and may result in that necessary attachments in the kitchen garbage are transferred and filled and placed in a mess, leading to water and soil pollution or transfer, which not only blocks city water pipelines, smells foul, but also causes serious secondary pollution. The single treatment process of the kitchen garbage is feasible in consideration of the resource utilization value, but does more harm than good from the

comprehensive perspective of long-term global environment protection, livability of people and atmospheric environment protection.

SUMMARY

With respect to the shortcomings mentioned in the prior art that the kitchen garbage is simple single-phase treatment and may cause secondary pollution, the present invention provides a large highly integrated kitchen garbage comprehensive treatment equipment and applications as well as production process and formula thereof, which are in line with the current international development direction that residue after resource treatment of waste is not transferred for treatment.

The technical solution adopted in the present invention to solve the technical problem thereof is as follows: a kitchen garbage all-around comprehensive treatment system, where the system includes a kitchen garbage bag-breaking apparatus, a kitchen garbage joint screening apparatus, a wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus, a vertical dehydration apparatus, a material crusher and an automatic control apparatus, kitchen garbage is thrown into the kitchen garbage bag-breaking apparatus for bag-breaking treatment and then input to the kitchen garbage joint screening apparatus for joint screening, a screened oil, water and solid mixture is input to the wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus for inactivation treatment, the kitchen garbage that has been inactivated, deodorized, desalted and primarily dehydrated through wet advanced oxidation is sent into the dehydration apparatus by a screw-rod conveying pipeline, a material, after being dehydrated by the dehydration apparatus, is input into the material crusher for crushing, and the automatic control apparatus controls other apparatuses to operate.

A method for manufacturing conversion products by using the kitchen garbage all-around comprehensive treatment system, the method including:

A. collecting kitchen garbage, and throwing the kitchen garbage into the kitchen garbage bag-breaking apparatus for bag-breaking treatment;

B. jointly screening the kitchen garbage after bag-breaking treatment through the kitchen garbage joint screening apparatus, to separate solid plastics and others therefrom;

C. carrying out inactivation treatment on other kitchen garbage from which the solid plastics have been removed through the wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus;

D. carrying out dehydration treatment on the inactivated garbage through the vertical dehydration apparatus; and

E. crushing a dehydrated material through the material crusher.

5 The technical solution adopted in the present invention to solve the technical problem thereof further includes:

The lacerating apparatus includes a horizontal tubular housing, one end of the housing is a discharge port, more than one cutting tool is fixed on an inner wall of the one end of the discharge port of the housing, the other end of the housing is internally provided with a piston capable of sliding along an inner cavity of the housing and is connected with a power tool
10 pushing the piston to move, a cutter groove is opened in a position on the piston corresponding to each cutting tool, and a feeding port is opened in a middle position at the top of the housing.

A pulley is installed at the bottom of the piston, a concave sliding rail is fixedly disposed in a position at the bottom of an inner wall of the housing corresponding to the pulley, and the pulley is capable of sliding back and forth on the concave sliding rail.

15 A collecting tank is installed at the position of the feeding port, an upper portion of the collecting tank is funnel-shaped, a lower portion is in communication with the feeding port on the housing through a blanking pipeline, and the blanking pipeline is provided thereon with a pneumatic slide gate valve.

20 A rolling clapper is installed at the position of the discharge port on the housing, and the motor drives the rolling clapper to rotate.

The rolling clapper is square or polygonal and is provided with an inner cavity.

Each side of the rolling clapper is provided thereon with more than one compressed air injection slot, the rolling clapper is internally provided with a compressed air airway and a gas jet nozzle, the gas jet nozzle is connected onto the compressed air airway, and a jet flow direction of
25 the gas jet nozzle is the same as a discharge direction of the discharge port.

The compressed air injection slots are disposed in parallel.

The blade of a cutting tool is at an angle of 90 degrees with a cross section of the discharge port of the housing or at an angle of 30 degrees with the inner wall of the housing.

30 The kitchen garbage joint screening system includes a shell, the shell is internally provided with a partition plate, the interior of the shell is divided into an air-floating zone and a non-air-floating zone through the partition plate, the partition plate is provided thereon with a

material leakage outlet, the air-floating zone is provided with a feeding port, a lower portion of the air-floating zone is provided with a heavy material discharge outlet, the heavy material discharge outlet is provided with a valve, around the heavy material discharge outlet is more than one air nozzle, an upper portion of the air-floating zone is provided with a rolling rake, the non-air-floating zone is internally provided with a material output device, one end of the material output device is disposed in the shell, the other end is disposed on an outer side of the shell, the material output device is internally provided with an auger, the material output device is provided thereon with a motor and a transmission, and the motor coordinates with the transmission to drive the auger to rotate.

The material leakage outlet is provided with a shutter guide groove, the shutter guide groove is connected to a pneumatic push-pull rod, a pneumatic apparatus drives the push-pull rod to move, and the push-pull rod controls opening and closing of the shutter guide groove.

The number of the rolling rake is two, the two rolling rakes are disposed up and down, half of the lower rolling rake is disposed in a liquid level of the air-floating zone, the upper rolling rake is disposed above the liquid level of the air-floating zone, and the two rolling rakes are in mesh.

The shell is provided thereon with a rolling rake motor, and the rolling rake motor simultaneously drives the two rolling rakes to rotate.

The transmission is installed at the material output device, and the motor drives the auger to rotate through the transmission.

A liquid level automatic control apparatus for controlling a liquid level is installed at the air-floating zone.

The shell is provided thereon with a pipeline for conveying the kitchen garbage into the shell, and the pipeline is connected onto an intake pipeline.

A circulating water inlet of the air-floating zone is connected to a hydraulic booster pump, a water source is provided by a circulating water storage tank, middle and lower portions of the non-air-floating zone are provided with water outlets, and water is input into the circulating water storage tank through a water pump, used for circulating the water in the air-floating zone and the non-air-floating zone and strengthening strong rolling of the water in the air-floating zone.

The oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus of the kitchen garbage includes more than one reactor and a gas, water and material mixer for mixing

ozone, water and a material, the mixer is connected with a waterproof check valve, one end of the waterproof check valve, after being connected to a gas pipe, is connected to an ozone generating device, the mixer is further connected with an outlet of a high viscosity cam rotor pump, an outlet of the mixer extends into one reactor, an inlet of the high viscosity cam rotor pump is connected with another reactor, the reactors are internally provided with more than one granular activated carbon reaction ball, the granular activated carbon reaction balls contain granular activated carbon, and a material outlet is disposed at the bottom of each of the reactors.

The total volume of the granular activated carbon accounts for 15%-98% of the volume of a spherical cavity of the granular activated carbon reaction balls.

An automatic exhaust valve is disposed at the top of each of the reactors, and the automatic exhaust valve is connected with an ozone destroyer.

A semicircular head is disposed at the bottom of each of the reactors, and the material outlet is disposed on the semicircular head.

The most front-end reactor in the reactors is provided thereon with an inclined helical ribbon conveyor, and a rear-end reactor is provided thereon with a water level adjustment pipeline.

The material outlet is connected with a solid-liquid separator.

The solid-liquid separator includes a housing and a tilted reticular barrel, the tilted reticular barrel is disposed in the housing, the motor coordinates with the transmission to drive the tilted reticular barrel to rotate, the front end of the tilted reticular barrel is provided with more than one row of meshes, and the tilted reticular barrel is internally provided with a helical ribbon connected to an inner wall of the reticular barrel, and a water butt is disposed at the bottom of the housing.

The helical ribbon accounts for the overall length of the tilted reticular barrel.

The housing is provided thereon with a window.

Side faces of the reactors are provided with manholes.

The vertical dehydration apparatus includes a housing, a vertical inleakage tower and a helical ribbon push rod, the vertical inleakage tower is disposed inside the housing, the helical ribbon push rod is disposed inside the vertical inleakage tower, side faces of the vertical inleakage tower are opened with more than one leakage hole, a feeding port is disposed at the bottom of the vertical inleakage tower, a discharge port is disposed at the top of the vertical inleakage tower, the bottom of the housing is installed with a power source that drives the helical

ribbon push rod to rotate, inside the housing, corresponding to four side of the bottom of the vertical inleakage tower, are water catchers, and the water catchers are connected with water outlets.

More than one water pipe is disposed inside the housing and around the vertical inleakage tower, and each water pipe is connected with more than one high-pressure water recoil nozzle.

The top of the vertical inleakage tower is installed with an axis-retaining plate of the helical ribbon push rod.

A helical ribbon tail end on the helical ribbon push rod is installed with a seal plate that adjusts a discharging speed.

Spacing of helical ribbons on the helical ribbon push rod is gradually narrowed from a lower portion to the tower top.

Spacing of helical ribbon lower ends on the helical ribbon push rod is 25 CM, and terminal spacing is 10 CM.

The power source includes a motor, a transmission and a steering transform apparatus that turns horizontal axial rotation into vertical axial rotation, the motor drives the transmission to rotate, the transmission drives the steering transform apparatus to rotate, and the steering transform apparatus drives the helical ribbon push rod to rotate.

The housing is internally provided with a stainless steel support sleeve.

Around an outer side of the vertical inleakage tower is more than one stainless steel vertical plate, around the stainless steel vertical plates is more than one reinforced trap, and each reinforced trap is provided thereon with an inclined anti-recoil diversion eave.

The vertical inleakage tower is composed of more than one towers, upper and lower circumferential positions of each tower are provided with reinforced flanges, connections between adjacent towers are abutting joints between upper and lower flanges of the towers, which are fixed with bolts, and an upper flange in a position where flanges of each tower are connected is provided with an inclined anti-recoil diversion eave.

The biochemical fermentation apparatus includes an anaerobic fermentation pool and a primary fermentation apparatus, the primary fermentation apparatus includes two secondary fermenters and more than one primary fermenter, the two secondary fermenters are disposed above the primary fermenters, feeding ports are disposed where the secondary fermenters are connected with the primary fermenters, the primary fermentation apparatus is externally provided

with a material hoist for inputting a material into the secondary fermenters, the secondary fermenters are internally provided with stirring devices, the primary fermenters are internally provided with double-layered helical ribbon stirrers, the anaerobic fermentation pool is connected with the primary fermenters, and the anaerobic fermentation pool throws the material into the primary fermenters through an automatic unloading system.

The double-layered helical ribbon stirrers each include a shaft body, an internal helical ribbon and an external helical ribbon, the internal helical ribbon is disposed inside the external helical ribbon, the internal helical ribbon and the external helical ribbon are helical strips and respectively fixedly installed on the shaft body, spiral directions of the internal helical ribbon and the external helical ribbon are opposite, and a share vane is added around the shaft body of each of the double-layered helical ribbon stirrers.

In the middle of each of the stirring devices is a spindle, and more than one stirring vane is fixedly installed on a central shaft.

An upper side in the anaerobic fermentation pool is provided with a material stirrer that can move automatically.

The automatic unloading multi-stage drying apparatus includes a pre-drying device and a main drying device, the pre-drying device is installed above the main drying device, a housing of the pre-drying device is two-sided, a sandwiched housing cavity of the pre-drying device is formed between two sides, the pre-drying device is internally provided with a material automatic flap, in the middle of the main drying device is a horizontal cylinder body capable of rotating counterclockwise and clockwise at 360 degrees, front and rear ends of the main drying device are respectively fixed heads, the horizontal cylinder body is internally provided with more than one secondary barrel fixedly installed together with the horizontal cylinder body, inside the horizontal cylinder body and the respective secondary barrels are material-guiding helical ribbons, the main drying device is provided thereon with a gas or liquid fuel combustion chamber and a burner, heat produced by the burner is introduced into the main drying device, tail gas of the main drying device is input into the sandwiched housing cavity through a hot air outlet, and a material output port of the pre-drying device is disposed corresponding to the innermost secondary barrel of the main drying device.

The bottom of the pre-drying device is provided with a helical ribbon auger automatic discharging device, and the helical ribbon auger automatic discharging device is tubular and

internally provided with a helical ribbon auger.

The top of the pre-drying device is provided with an air-inducing device.

The respective secondary barrels are nested together, and material inlets of external secondary barrels are longer than material outlets of internal secondary barrels.

5 Outer sidewalls of the respective secondary barrels are fixedly installed with airflow disturbance wings.

The material-guiding helical ribbons inside the horizontal cylinder body and the respective secondary barrels are in opposite directions.

The material selection apparatus includes a base, a metal rolling sieve tube, a material loader,
10 an automatic conveying tool, a chain conveyor and a bypass damper, the metal rolling sieve tube is installed on the base, the material loader is disposed below the metal rolling sieve tube, the automatic conveying tool is disposed below the material loader, the front end of the metal rolling sieve tube is provided with screen holes, the rear end is provided with a helical ribbon, the chain conveyor is disposed below a discharge port of the metal rolling sieve tube, and the bypass
15 damper is disposed at the tail end of the chain conveyor.

The screen holes each have a diameter of 4 mm to 6 mm, and the screen holes are at a distance of 2 mm.

The metal rolling sieve tube is disposed obliquely, and an oblique angle is 1 degree to 20 degrees.

20 The bypass damper is provided with an adjustment apparatus for adjusting the height between the bypass damper and the chain conveyor.

An outer side of the metal rolling sieve tube is installed with a protection cover.

The kitchen garbage joint screening apparatus is provided with a plastic solid output end, and the plastic solid output end of the kitchen garbage joint screening apparatus is connected with
25 a waste plastic reverse engineering apparatus.

The waste plastic reverse engineering apparatus mainly includes a main-body treatment apparatus, the main-body treatment apparatus conveys a material into an air-pressure type automatic feeder through a conveyor belt, the material is conveyed into a cracking catalytic horizontal reaction kettle through the air-pressure type automatic feeder, the reaction kettle can
30 rotate clockwise and counterclockwise at 360 degrees, the reaction kettle internally has an automatic random scrapping apparatus, the reaction kettle is connected with a back-stage vacuum

system, the reaction kettle is connected with an oil-wax separator through a pipeline, the pipeline is provided thereon with a check valve, the oil-wax separator is connected with a first-stage heavy oil separator through the pipeline, the first-stage heavy oil separator is connected with a first-stage condenser through the pipeline, the bottom of the first-stage condenser is connected with an oil container, the rear end of the first-stage condenser is connected with a negative pressure device, the rear end of the negative pressure device is connected with a vertical water-sealed gas safety conveyor, the rear end of the vertical water-sealed gas safety conveyor is connected with a secondary gas compressor, and the secondary gas compressor is connected with a gas repository.

The bottom of the reaction kettle is provided with a cracking furnace, and an outlet pipeline of the cracking furnace is connected with a tail gas environmental-protection equipment system.

The oil container is connected with a decarbonizing pure floating device and a dewaxing and degumming device.

The system further includes a coarse carbon black treatment apparatus, and the coarse carbon black treatment apparatus is connected at a residue outlet of the waste plastic reverse engineering apparatus.

The coarse carbon black treatment apparatus includes a coarse carbon black artificial aging processor, the coarse carbon black artificial aging processor is connected with a physical aging bed, the physical aging bed is connected with a material matching device through an automatic conveying tool, the material matching device is connected with a liquid-solid automatic quantitative charging device, the rear end of the material matching device is provided with a multi-layered push-pull type screw rod, and the rear end of the multi-layered push-pull type screw rod is connected with a low-sulfur high-energy environmentally friendly cleaning coal forming machine.

The system further includes a distillation-free biodiesel production apparatus, the respective apparatuses first carry out oil-water separation on an oil, water and solid mixture through a pipeline, and then the mixture after oil-water separation is sent into the distillation-free biodiesel production apparatus.

The distillation-free biodiesel production system includes a horizontal helical ribbon solid-liquid separation device, an oil-water separating column, an oil storage container, a grease colloid removal device, a bio-oil normal-temperature grease exchange device, a liquid separation

device and a filtering device, an outlet of the horizontal helical ribbon solid-liquid separation device is connected to a middle-lower end of the oil-water separating column through a pipeline, the oil-water separating column is internally provided with a heating pipeline, the heating pipeline extends to the interior of the oil-water separating column from a lower portion of the oil-water separating column and then is output to an outer side of the oil-water separating column from a middle-upper portion of the oil-water separating column, the top of the oil-water separating column is provided with an oil wiper, the oil-water separating column is connected with the oil storage container through an oil outlet pipeline, an inlet of the oil outlet pipeline is disposed corresponding to the oil wiper, the oil storage container is in communication with the grease colloid removal device through a pipeline, a hole impact plate is fixedly disposed inside the grease colloid removal device, corresponding positions on two sides of the impact plate are respectively installed with a propeller-type hydraulic pusher, propeller blades of the propeller-type hydraulic pusher are disposed in the grease colloid removal device, the motor is disposed on an outer side of the grease colloid removal device, the motor drives the propeller blades to rotate, a lower portion of the grease colloid removal device is provided with a grease outlet, the grease outlet is communicated into the bio-oil normal-temperature grease exchange device through a pipeline, the bio-oil normal-temperature grease exchange device is internally provided with more than one ultrasonic generator, the top of the bio-oil normal-temperature grease exchange device is opened with a feeding port, the bottom of the bio-oil normal-temperature grease exchange device is communicated to the liquid separation device through a pipeline, the bottom of the liquid separation device is connected to the filtering device through an oil pipeline, and the filtering device outputs biodiesel.

The horizontal helical ribbon solid-liquid separation device includes a horizontal cylinder housing, the housing is internally provided with a strainer, a conveying helical ribbon is fixedly disposed inside the strainer, the helical ribbon drives the motor to coordinate with the transmission to drive the strainer and the helical ribbon to rotate, and the bottom of the horizontal helical ribbon solid-liquid separation device is provided with an oil-water mixture output pipeline.

The top of the oil-water separating column is provided with an infrared water liquid-level locator.

The periphery of the ultrasonic generator is provided with a casing, internal thread jet holes

are opened around the casing, a locking device is fixedly disposed above the casing, and the ultrasonic generator is installed inside the bio-oil normal-temperature grease exchange device through the locking device.

5 The bio-oil normal-temperature grease exchange device contains a liquid diversion pipe, one end of the liquid diversion pipe is connected to an upper portion of the bio-oil normal-temperature grease exchange device, the other end is connected to the bottom of the bio-oil normal-temperature grease exchange device, and the liquid diversion pipe is connected with a pump.

10 The bottom of the bio-oil normal-temperature grease exchange device is provided with an air-blowing pipe, and one end of the air-blowing pipe is connected with a compressed air engine.

The system further includes a grease colloid removal device, and bio-oil is input from the oil storage container to the grease colloid removal device by a special oil pump and then enters into the grease exchange device.

15 The system further includes an emulsified biodiesel manufacturing apparatus, and the bio-oil from a grease exchange process is output to the emulsified biodiesel manufacturing apparatus.

20 The emulsified biodiesel manufacturing apparatus includes a shell, the shell contains a vertical stirrer, a power source drives the vertical stirrer to rotate, a central shaft of the vertical stirrer is provided thereon with more than one paddle-type flat stirring impeller or paddle-type blade impeller, a lower portion of the central shaft of the vertical stirrer is installed with a turbine or disc curved blade, an upper portion in the shell is provided with an oxygen-enriched water atomization nozzle, the top of the shell is provided with more than one feeding port, each feeding port is connected with a quantitative charging device through a pipeline, and a lower portion of the shell is provided with a finished-product discharge port.

25 The upper portion of the shell is cylindrical, and the lower portion is semicircular.

More than one liquid diversion plate is installed around cylindrical inner walls of the shell.

The bottom of the shell is installed with a support bracket for supporting a rotation shaft of the vertical stirrer.

30 The power source includes a motor and a variable speed device, the variable speed device is installed to the top of the shell, the motor is disposed above the variable speed device, and the motor drives the vertical stirrer to rotate through the variable speed device.

The system further includes a rapid sewage recycling apparatus, and sewage produced by

the apparatuses is connected to the rapid sewage recycling apparatus through pipelines.

The rapid sewage recycling apparatus includes a sewage filtering basin, the sewage filtering basin is internally provided with a sundries barrier, the sundries barrier is internally provided with an anti-fouling recoil device, the sewage filtering basin is connected with a scorching blanket sewage treatment device through an intake pipeline, the scorching blanket sewage treatment device includes an inner cavity and an enclosure, the top of the enclosure is provided with a plurality of atomizing ejection heads in communication with an intake pipe, below the atomizing ejection heads is a scorching blanket, the scorching blanket is internally provided with a heat-conducting oil pipeline, the bottom below the scorching blanket is provided with a micro solid precipitation zone, the bottom of the micro solid precipitation zone is provided with a sewage outlet, above the sewage outlet is an anti-fouling recoil damper, below the scorching blanket is a high-temperature-resistant cushion layer for supporting the scorching blanket, the top of the enclosure is opened with an automatic suction and discharge valve, the enclosure is opened with a hot steam collecting port above the scorching blanket, the hot steam collecting port is connected with a heat exchanger through a pipeline, the rear end of the heat exchanger is connected with a collecting basin, the collecting basin is connected with an advanced oxidation system through a pipe section, the advanced oxidation system has two cavities, i.e., inner and outer cavities, the inner cavity is a gas-water reaction chamber, the outer cavity is a gas-water circular reaction cushion chamber, an end portion of an inlet pipe at a water inlet of the inner cavity is provided with an activated carbon reaction ball, the activated carbon reaction ball contains granular activated carbon, the bottom of the inner cavity is provided with a sewage outlet, the sewage outlet is connected with a sewage outlet of the housing, the sewage outlet of the inner cavity is further installed with an anti-recoil damper, an advanced oxidation reactor is connected with a gas-water mixer through a circulating pipeline, the gas-water mixer is tee joint, two ends are in communication with circulating water, a port in the middle is connected with a waterproof check valve, the other interface of the waterproof check valve is in communication with a gas pipeline of an ozone generator, the advanced oxidation system is connected with a transit pool, the transit pool is connected with an activated carbon filter fixed bed, the activated carbon filter fixed bed is connected with a composite filtering device, the composite filtering device includes more than one filtering tank, the filtering tanks each are provided with more than one vertical filter column, a water outlet hole is opened at a position half the length of each

vertical filter column, the bottom of each of the vertical filter columns is provided with a strainer with 80-140 meshes, the top of each of the filtering tanks has a water inlet and a pressurized pipe, the tank body of each of the filtering tanks is divided into two layers, the tank in each layer is provided with a filter column carrier, orifices matching the diameter of the filter columns are opened on the filter column carrier, the filter columns are inserted into the filter column carrier, one side of an upper portion of the upper tank body is installed with an influent diversion pipeline, the influent diversion pipeline leads to an upper portion of the lower tank body, one side of a lower portion of the upper tank body is installed with an effluent diversion pipeline, the effluent diversion pipeline leads to a lower portion of the lower tank body, one side of the upper and lower layers of the tank body is respectively installed with an exhaust port, water outlets of the filtering tanks are disposed on one side of a bottom head of the composite filtering device, and a central position of the bottom head is provided with a precipitate discharge port.

A surface of the scorching blanket is provided with a plurality of running water shallow grooves.

The top of the inner cavity is installed with an automatic exhaust valve and a liquid level control online monitor for monitoring a liquid level.

An upper portion of the activated carbon reaction ball is impermeable, and a lower portion is a reticular water outlet.

The volume of the granular activated carbon in the activated carbon reaction ball accounts for 15%-95% of the volume of the inner cavity of the reaction ball.

The system further includes a hybrid charged adsorbent production apparatus for treating remaining solid sludge, and sludge produced by various sections is input to the hybrid charged adsorbent production apparatus.

The system further includes a tail gas environmental-protection treatment apparatus carrying out centralized treatment on flue gas, hot flue gas, dust and the like produced in various processes.

The tail gas treatment system includes a preliminary purification apparatus, a water-solid mixer, a twin-tower rotary spray system and a flue gas emission device, the preliminary purification apparatus includes an air buffer and a primary flue gas treatment pipeline, tail gas is introduced into the air buffer, input into the primary flue gas treatment pipeline through the air buffer and discharged into the water-solid mixer through the primary flue gas treatment pipeline,

the outlet of the water-solid mixer leads into the twin-tower rotary spray system, and the tail gas is input into the flue gas emission device after being treated by the twin-tower rotary spray system and then is discharged after being treated by the flue gas emission device.

5 The air buffer includes a cylindrical housing, an upper side in the housing is provided with more than one water curtain jet, and the bottom of the housing is provided with a sewage outlet.

The preliminary purification apparatus further includes a setting pond, and the sewage outlet is connected to the setting pond through a pipe section.

10 A pipe section is connected near the sewage outlet, the pipe section is connected to an upper portion of the setting pond, and the upper portion of the setting pond is connected to the air buffer through a pump and the pipe section.

An upper side inside the air buffer is further installed with an online liquid level monitor for detecting a liquid level inside the air buffer.

15 The primary flue gas treatment pipeline is internally provided with more than one negative ion charged ceramic, and a rear end of each negative ion charged ceramic is correspondingly installed with a high-speed spray nozzle.

A rear end of each high-speed spray nozzle is installed with a diversion plate.

The diversion plate is an obtuse diversion plate.

The anion charged ceramics are installed on left, right and upper surfaces in the primary flue gas treatment pipeline.

20 The tail gas treatment system further includes a cooling tower, and the cooling tower cools hot water in the heat exchanger in the flue gas emission device.

25 The system further includes a plasma photocatalytic negative ion air deodorization and sterilization apparatus that treats air thought to be male ends and air in production areas, and air inlets of the plasma photocatalytic negative ion air deodorization and sterilization apparatus are installed around various kitchen garbage collection pools.

30 The plasma photocatalytic negative ion air deodorization and sterilization apparatus includes an air delivery pipeline, a photocatalytic main processor and an activated carbon air filter, gas is input into the air delivery pipeline, the air delivery pipeline is internally provided with an anion apparatus, the gas is input into the photocatalytic main processor through the air delivery pipeline, the photocatalytic main processor is internally provided with an air channel, the air channel is internally installed with more than one ultraviolet light pipe whose emission wavelength is 253

nm to 258 nm, rear ends of the ultraviolet light pipes are fixedly installed with titanium dioxide photocatalytic touch plates, the tail end of the air channel is in communication with the activated carbon air filter, and the gas is output through the activated carbon air filter.

An air discharge pipeline is connected between the photocatalytic main processor and the activated carbon air filter, the air discharge pipeline is internally provided with an anion apparatus, the tail end of the air channel is in communication with the air discharge pipeline, and the air discharge pipeline is in communication with the activated carbon air filter.

The anion apparatus is an anion corrugated plate, and the anion corrugated plate is installed in a stacked manner.

The anion corrugated plate is provided with two sections, the front section is installed horizontally, and the rear section is installed vertically.

A front end of the air delivery pipeline is provided with an air inlet, and a rear end of the air inlet is installed with an automatic slide gate valve.

Back sides of the ultraviolet light pipes are all provided with smooth reflect plates.

The air channel in the photocatalytic main processor is Z-shaped.

Sizes and shapes of the titanium dioxide photocatalytic touch plates match a cross section of the air channel, which can be just blocked in the air channel.

The titanium dioxide photocatalytic touch plates are honeycomb-like.

The titanium dioxide photocatalytic touch plates have a thickness of 1 cm to 10 cm, and are opened with more than one hole.

The crushed material in step E is biochemically treated by a biochemical treatment apparatus and then dried by an automatic unloading multi-stage drying apparatus, to form mixed feeds after multi-stage drying and material selection.

The biochemical treatment includes:

A. generating a prefermented material under the simultaneous action of an anaerobic fermentation pool and two secondary fermenters;

B. after completion of a prefermentation section, feeding the material in the two secondary fermenters into a primary fermenter through an automatic delivery device disposed at the bottom of the secondary fermenters, and also feeding the material in the anaerobic fermentation pool into the primary fermenter through an automatic unloading system, to carry out secondary fermentation; and

C. after completion of the secondary fermentation, discharging the material.

When the prefermented material is generated in the anaerobic fermentation pool, bean crop straw that accounts for 50%-80% of the total fermentation basic material weight and seasonal straw of gramineae crop that accounts for 20%-50% of the total fermentation basic material weight are crushed into powder whose particle size is 0.5 mm to 1 mm, a composite inoculant that can break down crude fiber is added thereto to biochemically treat the mixed material, the composite inoculant contains not less than two strains, one is *Aspergillus oryzae*, the input amount of the composite inoculant is 1% of a hybrid solid basic material, and chemical compositions of calcium oxide, sodium chloride, dibasic sodium phosphate and urea are added.

When the prefermented material is generated in one of the secondary fermenters, the kitchen garbage artificially inactivated is added to the secondary fermenter as a basic material, bran that accounts for 1%-2% of the weight of the basic material, rice bran that accounts for 1%-3% of the weight of the basic material and white sugar that accounts for 1% of the weight of the basic material are added thereto as a mixture, an appropriate amount of water is added to make the mixture into a paste, the temperature is controlled in a range between 20°C and 30°C, bread yeast that accounts for 2%-4% of the total weight of the mixture is added to the mixture and then is fully stirred with the mixture to strengthen aeration, so as to enhance yeast growth, and the fermentation manner may be old leavening.

When the prefermented material is generated in one of the secondary fermenters, the kitchen garbage artificially inactivated, cleaned and dehydrated is added to the secondary fermenter as a basic material for solid-state fermentation, *Trichoderma viride*, *Candida tropicalis*, water bacteria and *Endomycopsis* yeast are selected to form a four-strain mixed inoculant, a weight ratio of the four strains is 2:2:1:1, the inoculation quantity is 2% of the total weight, urea that accounts for 1%-1.5% of the total weight is added at the same time, the temperature is 25°C-42°C, a stirring device rolls the mixture once every hour, and the fermentation time is 9 h to 10 h.

During the secondary fermentation, the material on which preliminary biochemical treatment has been carried out is input to the primary fermenter, the straw fermentation material accounts for 10%-40% of the total material weight percentage, the bread yeast fermentation material accounts for 20% of the total material weight percentage, the fermentation material in the second secondary fermenter accounts for 40%-70% of the total material weight percentage, when the three materials after prefermentation treatment enter into the primary fermenter, the

double-layered helical ribbon stirrer rotates at 360 degrees in a round-trip direction, to slowly stir the materials at a low speed, the temperature in the primary fermenter starts to ramp up from initial 20°C, an average temperature of the materials in the ramp-up stage is 20°C-28°C, an air valve I87 is closed after a holding time of 4 h, the temperature is raised to 35°C-38°C at the same time, after a holding time of 3 h, a first-stage air-inducing apparatus is opened, to carry out lightweight ventilation, and after completion of the two holding times, the temperature is raised to 82°C, the time is 2 h, and a second-stage air-inducing apparatus is opened to carry out strong ventilation.

Waste plastics produced in step B are reversed into biodiesel through the waste plastic reverse engineering apparatus.

The artificial aging processor of residue and coarse carbon black produced by manufacturing of the biodiesel ages the materials by using ozone, the coarse carbon black after chemical aging enters into a physical aging bed, after artificial aging, the coarse carbon black is input to a material matching device through a special automatic conveying tool, each compatible adjuvant is added by a liquid-solid automatic quantitative charging device, the materials are fully mixed and input to a low-sulfur high-energy environmentally friendly cleaning coal forming machine through a multi-layered push-pull type screw rod, and the coarse carbon black is obtained after the materials are formed.

Sewage produced in step A to step E, after being treated by a rapid sewage recycling apparatus, is discharged or recycled.

Solid sludge produced in step A to step E, after being treated by a hybrid charged adsorbent production apparatus, generates a hybrid charged adsorbent.

Flue gas, hot flue gas, dust and pumping-drainage-port air produced in step A to step E are discharged after being treated by an environmental-protection treatment apparatus.

The gas after treatment is discharged after being treated by a plasma photocatalytic negative ion air deodorization and sterilization apparatus.

An oil-water mixture produced in step A to step E produces biodiesel with a distillation-free biodiesel production method, the method including:

(1) carrying out solid removal treatment on an oil, water and solid mixture produced during production of the kitchen garbage through a horizontal helical ribbon solid-liquid separation device, to obtain an oil-water mixture;

(2) conveying the oil-water mixture to an oil-water separating column for oil-water separation, and inputting separated grease to an oil storage container;

(3) when it is necessary to process biolipid, after the biolipid is sent into a grease colloid removal device through tools such as a delivery pump, starting an propeller-type hydraulic pusher, adding phosphoric acid whose concentration is 85%, a ratio of the phosphoric acid to the biolipid not exceeding 1% of the total amount of the grease, using propeller thrust on two ends of the grease colloid removal device to make the liquids inside the grease colloid removal device generate face-to-face impact, the impact time being 10 min to 15 min, and after the face-to-face impact of the liquids ends, immediately adding dilute brine, a weight ratio of water to salt in the dilute brine being between 95:5 and 90:10, and a weight ratio of the biolipid to the dilute brine being between 90:10 and 80:20;

(4) continuously starting the propeller-type hydraulic pusher, the time being 10 min to 20 min;

(5) retaining a grease mixture in the grease colloid removal device for 60 min to 120 min;

(6) inputting the biolipid from which colloid has been removed into a bio-oil normal-temperature grease exchange device;

(7) when a liquid level of the grease input in the bio-oil normal-temperature grease exchange device reaches a liquid level set in a production process, stopping the inputting, beginning to start an air-blowing pipe at the bottom of the bio-oil normal-temperature grease exchange device, opening a feeding port, adding a solid catalyst and methanol, dosage of the solid catalyst being 1.5%-3.5% of the mass of the biolipid, and dosage of the methanol being 3%-8% of the mass of the biolipid, and adding a cosolvent after adding the methanol;

(8) continuously stirring for 10 min to 15 min by using a stirrer, and adding a solid metal alkali catalyst, the adding quantity being 3%-4.5% of the mass of the biolipid;

(9) after an adjuvant required is added, closing the feeding port, opening a material circulation delivery pump, and opening an ultrasonic generator, where the initial frequency of the ultrasonic generator is 25 KHZ, the time is 1 min, then the initial frequency gradually increases to 30 KHZ, the time is 30 min to 40 min, and the reaction temperature is 25°C-35°C;

(10) after grease exchange of the grease is completed in the bio-oil normal-temperature grease exchange device, inputting the biolipid mixture to a liquid separation device for standing and layering, where the upper layer is a mixed liquid of methanol and glycerol, and the lower

layer is crude biodiesel; and

(11) first disposing and opening the liquid separation device at a lower liquid outlet, conveying the crude biodiesel into a filtering device, obtaining a refined biodiesel after filtering and recycling a solid catalyst.

5 During the oil-water separation, the oil-water mixture in the oil-water separating column is heated to 60°C-85°C, after the biolipid floats up, oil water dissociation is achieved, and the biolipid in the upper layer is scraped by an oil scraper and is sent into the oil storage container through an oil outlet pipeline.

The cosolvent is selected as methanol and ethanol, the adding quantity of the cosolvent is 10 0.5%-2% of the mass of the biolipid, and the cosolvent further includes butanol whose adding quantity is 0.5% of the mass of the biolipid.

The solid anionic metal alkali catalyst is characterized by taking reagent activated carbon and nano particles of cyclic-structure silicate minerals of aluminum, sodium, iron and lithium as a core, externally wrapped with silicon, aluminum, and lithium mesh skeleton mediums and having 15 a hybrid charged carrier with polarity, then the carrier is immersed in a KNO_3 liquid, and becomes a hybrid charged solid anionic metal alkali catalyst with polarity and containing 15%-25% of KNO_3 .

The biodiesel is made into an emulsified biodiesel through a micro-emulsified biodiesel manufacturing apparatus, the method comprising:

20 (1) inputting crude biodiesel into the micro-emulsified biodiesel manufacturing apparatus, starting a stirring system, adding 30%-80% of National III standard diesel, and then stirring the mixture for 5 min;

(2) adding a hydrophilic agent, whose adding quantity is 2-3% of the total weight of pure biodiesel and the National III standard diesel, and stirring the mixture for 1 min to 15 min;

25 (3) adding the butanol as an intermediate, whose adding quantity is 2-4% of the total weight of the pure biodiesel and the National III standard diesel, and continuously stirring the mixture directly for 15 min, where, during the stirring, a vertical stirrer (P175) stirs the mixture at a rotating speed of 100 r/min-130 r/m;

(4) adding isopentane as a spontaneous combustion temperature regulator, whose adding 30 quantity is 1.5-2% of the total weight of the pure biodiesel; and

(5) adding oxygen-enriched water, where the water accounts for 1%-20% of the total weight

of the product, stirring the mixture for 15 min, adjusting the rotating speed as 170 r/min-200 r/m, and adding Octadec-cis-9-enoic acid as an emulsifier, where the adding quantity of the Octadec-cis-9-enoic acid is 70%-90% of the weight of clean water added, the mixture is continuously stirred by the stirring device until the mixture becomes clear, at this time, the rotating speed of the stirrer is adjusted as 280-340 r/min, the mixture generally needs to be continuously stirred for 40-60 min, and after standing for a certain time, a finished product is obtained after the emulsified oil is observed as clean and transparent without layering.

For the hydrophilic agent, a cationic surfactant and non-ionic surfactant associated compound material is selected as a composite surfactant, and the mixing proportion is that the cationic surfactant is 50% and the non-ionic surfactant is 50%.

The surfactant is triethanolamine or hexahydroaniline or cetrimonium bromide and ammonia.

The adding quantity of the oxygen-enriched water is 10%-20% of the total weight.

The acid value of the setting quantity of the Octadec-cis-9-enoic acid is 200.

Beneficial effects of the present invention are as follows: 1. The kitchen garbage all-round treatment integrated equipment and method described in the present invention application are a set of highly integrated, automatic and comprehensive equipment in the same trades of kitchen treatment at home and abroad for the first time being compatible with a method for carrying out resource treatment on necessary attachments of the kitchen garbage, adapt to the tendency of international environmental protection industry, and implement safe treatment and disposal without transferring and digesting the residue after centralized comprehensive treatment of waste and without producing secondary pollution.

2. The present invention application provides a method for treating kitchen garbage and necessary attachments thereof, i.e., waste plastic bags, swill sludge and factory domestic sewage, and industrial sewage and sludge output in the production process, in various large system devices in the same equipment.

3. The present invention application provides names of various high value-added products manufactured after comprehensive resource treatment of the kitchen garbage and a manufacturing method and use thereof.

4. The present invention application provides a comprehensive clean production method and mode of energy-saving production and safe production with no residue transfer treatment, no

emissions at room temperature, no odor emissions, almost no sewage discharge for the industry of kitchen garbage treatment.

5 5. The products output in the present invention are three major strategic energy, i.e., National III mineral diesel, low-sulfur high-calorific-value clean environmental-protection coal and gas, which function to reduce the pressure of social supply and demand. At the same time, the high-nutrition microbial protein feed additives produced can effectively fill the missing gaps in the domestic high protein feed additives.

10 6. The present invention provides a kitchen garbage loader (barrel) and a new waste loader (barrel) production method which is capable of natural sterilization and deodorization and can naturally provide clean air in the periphery outside the barrel body, and is a new environmental protection cleaning utensil with extremely broad applications.

The present invention will be further described below in combination with the accompanying drawings and specific embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

15 The disclosure will become more fully understood from the detailed description given herein below for illustration only, and thus are not limitative of the disclosure, and wherein:

FIG. 1 is a schematic flowchart of a core part of a system according to the present invention;

FIG. 2 is a schematic flowchart of the system according to the present invention;

20 FIG. 3 is a schematic view of a production process of an energy plastic carrying utensil according to the present invention;

FIG. 4 is a schematic structural view of a collection apparatus in the present invention;

FIG. 5 is a schematic three-dimensional structural view of a kitchen garbage bag-breaking apparatus in the present invention;

25 FIG. 6 is a schematic structural view of a section of the kitchen garbage bag-breaking apparatus in the present invention;

FIG. 7 is a schematic structural view of a profile of the kitchen garbage bag-breaking apparatus in the present invention;

FIG. 8 is a schematic structural view of a kitchen garbage joint screening apparatus in the present invention;

30 FIG. 9 is a schematic structural view of a section of the kitchen garbage joint screening apparatus in the present invention;

FIG. 10 is a schematic structural view of a wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus in the present invention;

FIG. 11 is a schematic structural view of a primary solid separator in the present invention;

FIG. 12 is a schematic structural view of a vertical dehydration apparatus in the present invention;

FIG. 13 is a schematic view of an internal structure of the vertical dehydration apparatus in the present invention;

FIG. 14 is a schematic structural view of a main biochemical treatment apparatus in the present invention;

FIG. 15 is a schematic structural view of a main fermentation apparatus in the present invention;

FIG. 16 is a schematic three-dimensional structural view of the main biochemical treatment apparatus in the present invention;

FIG. 17 is a schematic structural view of an automatic unloading multi-stage drying apparatus in the present invention;

FIG. 18 is a schematic structural view of a profile of a pre-drying device in the present invention;

FIG. 19 is a schematic structural view of a main drying device in the present invention;

FIG. 20 is a schematic structural view of a profile of the main drying device in the present invention;

FIG. 21 is a schematic structural view of a selection apparatus in the present invention;

FIG. 22 is a schematic structural view of a mixed feed apparatus in the present invention;

FIG. 23 is a schematic view of a partial structure of a waste plastic reverse engineering apparatus in the present invention;

FIG. 24 is a schematic view of a partial structure of the waste plastic reverse engineering apparatus in the present invention;

FIG. 25 is a schematic view of a partial structure of the waste plastic reverse engineering apparatus in the present invention;

FIG. 26 is a schematic view of a partial structure of the waste plastic reverse engineering apparatus in the present invention;

FIG. 27 is a schematic structural view of a coarse carbon black treatment apparatus in the

present invention;

FIG. 28 is a schematic structural view of a water, oil and solid separation apparatus in the present invention;

FIG. 29 is a schematic structural view of a biodiesel production apparatus in the present invention;

FIG. 30 is a schematic structural view of a section of a bio-oil normal-temperature grease exchange device in the present invention;

FIG. 31 is a schematic structural view of a section of an ultrasonic transducer in the present invention;

FIG. 32 is a schematic structural view of an emulsified biodiesel manufacturing apparatus in the present invention;

FIG. 33 is a schematic view of a partial structure of a rapid sewage recycling apparatus in the present invention;

FIG. 34 is a schematic view of a partial structure of the rapid sewage recycling apparatus in the present invention;

FIG. 35 is a schematic view of a partial structure of the rapid sewage recycling apparatus in the present invention;

FIG. 36 is a schematic view of a partial structure of the rapid sewage recycling apparatus in the present invention;

FIG. 37 is a schematic view of a partial structure of a hybrid charged adsorbent production apparatus in the present invention;

FIG. 38 is a schematic view of a partial structure of the hybrid charged adsorbent production apparatus in the present invention;

FIG. 39 is a schematic view of a partial structure of the hybrid charged adsorbent production apparatus in the present invention;

FIG. 40 is a schematic view of a tail gas treatment system in the present invention;

FIG. 41 is a schematic view of a twin-tower wet gas-solid separator and an internal structure thereof in the present invention;

FIG. 42 is a schematic structural view of a primary flue gas treatment pipeline in the present invention;

FIG. 43 is a schematic view of a flue gas emission system and an internal structure thereof in

the present invention;

FIG. 44 is a schematic structural view of the primary flue gas treatment pipeline in the present invention;

FIG. 45 is a schematic structural view of a plasma photocatalytic negative ion air deodorization and sterilization apparatus in the present invention; and

FIG. 46 is a schematic view of a partial structure of a gas collection and pretreatment apparatus of the plasma photocatalytic negative ion air deodorization and sterilization apparatus in the present invention.

DETAILED DESCRIPTION

This embodiment is a preferred embodiment of the present invention, and others whose principles and basic structures are the same as or similar to those in this embodiment should fall within the protection scope of the present invention.

Referring to FIG. 1 and FIG. 2, the present invention mainly relates to a kitchen garbage all-around comprehensive treatment system, where the system includes a kitchen garbage bag-breaking apparatus, a kitchen garbage joint screening apparatus, a wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus, a vertical dehydration apparatus, a material crusher and an automatic control apparatus, kitchen garbage is thrown into the kitchen garbage bag-breaking apparatus for bag-breaking treatment and then input to the kitchen garbage joint screening apparatus for joint screening, a screened oil, water and solid mixture is input to the wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus for inactivation treatment, the kitchen garbage that has been inactivated, deodorized, desalted and primarily dehydrated through wet advanced oxidation is sent into the dehydration apparatus by a screw-rod conveying pipeline, a material, after being dehydrated by the dehydration apparatus, is input into the material crusher for crushing, and the automatic control apparatus controls other apparatuses to operate. In this embodiment, a material back-end where the material is input to the material crusher for crushing is further provided with a biochemical treatment apparatus for biochemical treatment, and the material after the biochemical treatment is input to a pre-drying device and a main drying device for drying and then forms feed products after selection by a selection apparatus and mixing by a mixed feed apparatus.

Solid waste output by the kitchen garbage joint screening apparatus is input into a waste

plastic reverse engineering apparatus for treatment, and then, after passing through a distillation-free biodiesel production apparatus and an emulsified biodiesel manufacturing apparatus, forms biodiesel, and residue generated is treated by a coarse carbon black treatment apparatus into coarse carbon black.

5 Sewage produced by the system is input to a rapid sewage recycling apparatus, tail gas produced by the system is input to a tail gas environmental-protection treatment apparatus and a plasma photocatalytic negative ion air deodorization and sterilization apparatus for treatment and then discharged, and sludge produced by the system is input to a hybrid charged adsorbent production apparatus for producing a hybrid charged adsorbent.

10 The present invention includes the following main steps:

A. collecting kitchen garbage, and throwing the kitchen garbage into the kitchen garbage bag-breaking apparatus for bag-breaking treatment;

B. jointly screening the kitchen garbage after bag-breaking treatment through the kitchen garbage joint screening apparatus, to separate solid plastics and others therefrom;

15 C. carrying out inactivation treatment on other kitchen garbage from which the solid plastics have been removed through the wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus;

D. carrying out dehydration treatment on the inactivated garbage through the vertical dehydration apparatus; and

20 E. crushing a dehydrated material through the material crusher.

The present invention is further expounded in combination with a specific structure and operating steps thereof:

The source in the present invention is energy plastic carrying utensils A, kitchen garbage is thrown into the energy plastic carrying utensils A, and then the energy plastic carrying utensils A containing kitchen garbage in kitchen garbage collection points are collected and transported to a production treatment workshop through a special collection truck B. Referring to FIG. 3, steps of a production process of the energy plastic carrying utensils used in the present invention are as follows:

25 A. a process and method for manufacturing an energy plastic carrying utensil of a kitchen garbage source:

Aa. using plastic carrier resin suitable for manufacturing a kitchen garbage can as a basic

material;

Ab. using artificially physically aged carbon black A1 and nanoscale natural energy stone powder A2, ultrafine sharp-titanium type titanium dioxide A3 (in this embodiment, the particle size of titanium dioxide is less than 1 μm) which have been stirred A4 by a mixer as an energy material, where a mixture weight ratio of the nanoscale natural energy stone powder and the carbon black in the energy material are 50%-85% : 50%-15%, the ultrafine sharp-titanium type titanium dioxide accounts for 10%-15% of the total weight of the mixture, and reference can be made to the applicant's prior application, i.e., Chinese Patent with Application No. of 201010154643.3, for the step of manufacturing energy plastic masterbatch of the present invention;

Ac. keeping the energy material at a constant temperature for 1-2 h in the drying device under the condition of 100-120°C A5, and adding an aminosilane or magnesium stearate material that accounts for 2% of the proportion of the energy material as a dispersant to the dried energy material;

Ad. mixing the energy material to which the dispersant has been added with the plastic carrier resin and a calcium filler evenly, where the weight ratio of the plastic carrier resin to the energy material to which the dispersant has been added is 1:2-1:1, and the adding quantity of the plastic carrier resin and calcium is 20:1;

Ae. making the treated material enter into a professional plastic mixing device A6 for mixing, and extruding blanking by an extruder A7 to manufacture the plastic energy masterbatch; and

Af. shaping the plastic energy masterbatch into products through an injection molding machine A7a according to the geometrical shape of a molding die that manufactures kitchen garbage containing utensils.

2. The kitchen garbage containing utensils manufactured through the process in the present invention all can release negative ions of 5000-12000 per cubic centimeter for a long time regardless of the sizes and shapes, due to the special structure of the natural energy stone powder, the natural energy stone powder can emit light with the wavelength of 4-14 μm for a long term, and the wavelength of light is just suitable for exciting photons of titanium dioxide in the containing utensils, so that the garbage containing utensils can produce a photocatalytic reaction process for a long time, and energy to be consumed is from the containing utensils themselves, which conforms to the principle of conservation of energy.

3. The energy plastic kitchen garbage containing utensil used in the present invention can release a large number of negative ions for a long time, further has long-term photocatalytic capability, and photogenerated electrons and optical cavity have strong energy, which is much higher than the strength of molecular chains of kitchen garbage organic pollutants, and can easily
 5 breaks down the organic pollutants into the most primitive state, to form a high efficient antibacterial effect.

B. Garbage carriers in kitchen garbage collection points are collected and transported to a production treatment workshop through a special collection truck.

C. A production-area kitchen garbage collection apparatus.

10 D. A kitchen garbage bag-breaking apparatus.

Referring to FIG. 4, FIG. 5, FIG. 6 and FIG. 7, in the present invention, after the special collection truck B transports the kitchen garbage to the production treatment workshop, the kitchen garbage is thrown into the kitchen garbage bag-breaking apparatus, in this embodiment, the main body of the kitchen garbage bag-breaking apparatus is a cylindrical housing D11, in this
 15 embodiment, the cylindrical housing D11 is disposed as a horizontal structure, and the cylindrical housing D11 is supported by a support bracket (not shown). An opening on one end of the cylindrical housing D11 is a discharge port D18 of the present invention, the other end is blocked, the blocked end is internally provided with a piston D13 that can slide back and forth along the cylindrical housing D11, and the cross section of the piston D13 matches the cross section of the
 20 cylindrical housing D11. An outer side of the blocked end of the cylindrical housing D11 is installed with a power tool D12, in this embodiment, the power tool D12 is a pneumatic power tool or a hydraulic power tool, that is, a cylinder or hydraulic cylinder, etc., the power tool D12 is connected to the piston D13 through a connecting rod, and through telescopic movement of the power tool D12, the piston D13 makes reciprocating linear motion in an inner cavity of the
 25 horizontal cylinder housing D11. In this embodiment, several cutter grooves D14 are opened around the piston D13, the bottom of the cross section of the cutter grooves D14 is rectangular, the top is triangular, it is preferred that the number of the cutter grooves D14 can meet the requirement for bag-breaking, and the number can be adjusted according to the diameter of the housing D11; in this embodiment, the number is eight. In this embodiment, several cutting tools
 30 D16 are fixedly installed to one end of the discharge port D18 of the cylindrical housing D11, the number of the cutting tools D16 is the same as that of the cutter grooves D14, the installation

positions of the cutting tools D16 correspond to those of the cutter grooves D14, that is, each cutting tool D16 corresponds to one cutter groove D14, the shape of the cross section of the cutting tool D16 matches the shape of the cutter groove D14, which may be slightly smaller than the shape of the cutter groove D14, the cutting tool D16 can freely move in the cutter groove D14, and the cross section of the cutting tool D16 is also that the bottom is rectangular and the blade on the top is triangular; in this embodiment, the cutting tools D16 may be in two structural forms, that is, the installation angle of the blade thereof is at an angle of 90 degrees with a cross section of the discharge port of the cylindrical housing D11 or at an angle of 30 degrees with the inner wall. In this embodiment, the length of the cutting tools D16 may be one fifths of the total length of the cylindrical housing D11, and the length of the piston D13 is about two fifths of the total length of the cylindrical housing D11; during specific embodiment, the length of the cutting tools D16 and the length of the piston D13 may be set according to actual requirements. When the piston D13 goes back to the end point, the space between the piston D13 and the cutting tool D16 is a spacing position EQ.

In the present invention, a feeding port D21 is opened in a middle position at the top of the cylindrical housing D11 in the kitchen garbage bag-breaking apparatus, and the feeding port D21 is disposed corresponding to a spacing position D1. In this embodiment, a kitchen garbage collecting tank D19 is fixedly installed at the feeding port D21; in this embodiment, the housing of the collecting tank D19 is funnel-shaped, and the position where the collecting tank D19 is near the feeding port D21 on the cylindrical housing D11 is a blanking pipeline D20; in this embodiment, a pneumatic slide gate valve 18 is installed on the blanking pipeline D20, for partitioning the smell of next treatment section. In this embodiment, a concave sliding rail D17 is fixedly disposed in a lower portion of an inner wall of the cylindrical housing D11, more than one pulley 15 is installed at a position where a lower side of the piston D13 corresponds to the concave sliding rail D17, and the pulleys D15 match the concave sliding rail D17, which can ensure that the piston D13 does not deviate from the center point in the course of action.

In this embodiment, a square rolling clapper D22 is installed corresponding to the position of the discharge port D18 (also called non-power drawing end of the housing), the rolling clapper D22 supplies kinetic energy by a motor D28 in concert with the transmission, which drives it to rotate, and the rolling clapper D22 is installed transverse to the discharge port D18 on the cylindrical housing D11; in this embodiment, a board on each side of the rolling clapper D22 is

opened with several compressed air injection slots D23, the compressed air injection slots D23 are strip-like, and the compressed air injection slots D23 are disposed in parallel. In this embodiment, inside the square rolling clapper D22 is a cavity D25, the cavity D25 is internally installed with a compressed air airway D24 and a gas jet nozzle D26, compressed air is disposed in the compressed air airway D24 and can be ejected through the gas jet nozzle D26, a jet flow direction of the gas jet nozzle D26 is the same as a discharge direction of the discharge port D18, gas injection is carried out 1 to 2 times per second, the air ejected by the gas jet nozzle D26 is ejected through the compressed air injection slots D23, and a plastic bag is blown to the front by using a gas jet.

When the kitchen garbage bag-breaking apparatus in the present invention is in use, and when the kitchen garbage is thrown into the collecting tank D19 in bulk or in a form of being contained in plastic bags from big bags mixed up with small bags to enter into the kitchen garbage collecting tank D19, the piston D13 of the master device uses the pneumatic tool as a source of power to make a horizontal linear push-pull action, and at this time, the square rolling clapper D22 disposed at the discharge port D18 also begins to roll. When the pneumatic slide gate valve D27 of the blanking pipeline D20 of the kitchen garbage collecting tank D19 is opened, the garbage passes through the blanking pipeline D20 from top to bottom, and a feeding spacing position D1 presented when the piston D13 of the master device goes back to the end point is used to cause the kitchen garbage to pass through the feeding port D21 during this period and to enter into the spacing position D1 of the inner cavity of the main device at the same time. After the kitchen garbage in bulk or in bags enters into the inner cavity of the main device, the piston D13 at this time strongly pushes the kitchen garbage to the front through the action of a pushing rod of the pneumatic tool, due to forward shift of the piston D13, the inner cavity below the feeding port D21 is blocked by the piston D13 at the moment, the feeding port D21 is in a closed state, and the kitchen garbage is pushed by the piston D13 to the positions of the cutting tools D16 in an inner circle of the cylindrical housing D11, the cutter grooves D14 disposed at the periphery of the piston D13 are used to make the blades penetrate the cutter grooves D14, and the plastic bags of the kitchen garbage are cut by the blades into several breaches. After the plastic bags containing the kitchen garbage are cut into several breaches, the plastic bags are then pushed by the piston D13 to the position of the rolling clapper D22 of the discharge port D18, the kitchen garbage contained in the cut kitchen garbage containing bags, under the strong clapping action of

the rolling clapper D22, leaks outwards from the breaches of the plastic bags, at the same time, multi-section gravity compressed air in the rolling clapper D22 is ejected through the injection slot D23 ejected to the clapper surface is further removed from the bags, and the plastic bags are blown to the front with the gravity gas jet, thereby avoiding being covered by the kitchen garbage left over to affect next sorting.

Through the lacerating apparatus that sections the kitchen garbage containing bags in the present invention, the production process of targetedly converting the kitchen garbage into microbial protein feeds prevents the necessity of mixing plastic pieces with the feeds, through the apparatus, the joint action of the plastic bag sectioning and cutting, clapper scattering, and blowing air to break the bags can be realized, and the following significant results can be ensured: in the kitchen garbage bag-breaking procedure, the plastic bags are not broken into pieces, especially that the plastic bags are broken but not crushed, the kitchen garbage is removed from the bags and not covered by the garbage.

The kitchen garbage after bag-breaking enters into the kitchen garbage joint screening apparatus for screening, and the kitchen garbage after bag-breaking is first pushed into a magnetic selector for preliminary screening and then added to a liquid air-floating sorting apparatus, which mainly functions to hydraulically sort and salt-clean the kitchen garbage; referring to FIG. 8 and FIG. 9, the kitchen garbage joint screening apparatus in the present invention is mainly used for screening the kitchen garbage after bag-breaking and mainly used for hydraulically sorting and salt-cleaning the kitchen garbage, and thus the part in the present invention is called water-floating screening device or liquid air-floating sorting apparatus.

E. Kitchen garbage joint screening apparatus:

An upper portion of a shell E11 of the kitchen garbage joint screening apparatus in the present invention is cylindrical, a lower portion is composed of an empty cone E18, the feeding port is disposed at a middle-upper portion of the shell E11, the kitchen garbage is pushed into an air-floating zone E10 inside the shell from the exit of the previous section from high to low by using pipeline flow momentum, pipeline water is recycled water treated by a sewage treatment system, an intake pipeline E20 is installed at the position where the pipeline is near the feeding port, the front end of the intake pipeline E20 is provided with a hydraulic booster pump E21, and under the action of the hydraulic booster pump E21, the kitchen garbage is rushed into the air-floating zone E10 inside the shell by using water pressure.

The kitchen garbage joint screening apparatus in the present invention is mainly divided into an air-floating zone E10 and a non-air-floating zone E32, and the shell E11 is internally provided with a partition plate E25; in this embodiment, the partition plate E25 is disposed at a position about one third of a vertical face inside the shell E11, to divide the interior of the shell into an air-floating zone E10 and a non-air-floating zone E32, that is, the air-floating zone E10 accounts for about two thirds of the inner space of the shell, the non-air-floating zone E32 accounts for about one third of the inner space of the shell, and the feeding port is connected to one side of an upper portion of the air-floating zone E10. A rolling tine E30 (or called rolling rake) is installed at a position where the top of the air-floating zone E10 is near the liquid level; in this embodiment, there are two rolling tines E30, the two rolling tines E30 are installed up and down, half of the lower rolling tine is disposed in the liquid level, the upper rolling tine is disposed above the liquid level, and the two rolling tines E30 are synchronously driven to rotate through a rolling rake motor E39. In this embodiment, tooth movement trajectories of the two rolling tines E30 pass through mutual tooth positions, that is, when the two rolling tines E30 rotate, a tooth position of the first rolling tine is disposed between two adjacent tooth positions of the second rolling tine, likewise, a tooth position of the second rolling tine is disposed between two adjacent tooth positions of the first rolling tine, the two rolling tines E30 are used in fishing and unloading operations when low-density materials of the kitchen garbage in a liquid air-floating process float on the water and are mainly used for fishing for plastic bags, toothpicks and other light-density materials, and the lower rolling tine fishes out the plastic bags, the toothpicks and the like, which are then carried away through the upper rolling tine. The bottom of the shell E11 is provided with a residue discharge port E22, the residue discharge port E22 is provided thereon with a valve E23, and the residue discharge port E22 and the valve E23 are mainly disposed corresponding to the air-floating zone E10, used for unloading heavy sundries in the materials. In this embodiment, more than one air nozzle E24 is installed around the residue discharge port E22, which introduces air into the water, used for making blasting and turning actions on the water and materials in the air-floating zone E10; in this embodiment, a circulating water pipeline E40 is installed between the non-air-floating zone E32 and the air-floating zone E10, one end of the circulating water pipeline E40 at the non-air-floating zone is a water outlet E41, while one end at the air-floating zone E10 is a water replenishing port, and the circulating water pipeline is connected through a water storage tank E42, so as to achieve liquid air-floating sorting of the kitchen garbage. In this

embodiment, a half-floating material leakage outlet E26 is installed at a position where the partition plate E25 is at a distance of 20 cm above from the bottom, the leakage outlet E26 is installed with shutter guide grooves E27 opened upwards, the groove position of each shutter guide groove E27 is installed with a pneumatic push-pull rod E28, a pneumatic apparatus E38 pushes the pneumatic push-pull rod E28 to move up and down, so as to achieve opening and closing of the shutter guide groove E27 and control over an opening angle, thereby controlling the half-floating material, which is regarded as that useful kitchen garbage enters into the non-air-floating zone E32. In this embodiment, the non-air-floating zone E32 is another barrel body in communication with the air-floating zone E10, and the air-floating zone E10 and the non-air-floating zone E32 are in communication with each other through the material leakage outlet E26 in a flat-floating layer. In this embodiment, a water outlet E41 disposed on one side of the non-air-floating zone mainly functions to guarantee that a horizontal liquid level of the non-air-floating zone E32 is lower than that of the air-floating zone E10, after the output water enters into the water storage tank E42, water is replenished into the air-floating zone E10, and under the action of the hydraulic booster pump E21 disposed on a water replenishing pipeline, the water is strongly input to the lower portion of the air-floating zone E10, to strengthen turning actions of the water and the materials and enhance that useful half-floating sundries enter into the non-air-floating zone through the shutter guide grooves E27. In this embodiment, the lower portion of the non-air-floating zone E32 is provided with a material output device E33, one end of the material output device E33 is disposed in the non-air-floating zone E32, the other end is exposed to the outer side of the shell E11, an end exposed to the outer side of the shell E11 is provided with an unloading port E35, the material output device E33 is internally provided with a spiral auger E37, an unloading motor E36 is fixedly installed to an outer side of the material output device E33, a transmission E34 is installed corresponding to the unloading motor E36, the unloading motor E36 drives the spiral auger E37 to rotate through the transmission E34, and the materials are stirred out of the interior of the non-air-floating zone E32 from below and then output from the unloading port E35 to next section. In this embodiment, an upper portion inside the shell E11 is provided with a liquid level automatic control apparatus E29, used for controlling the water level in the air-floating zone E10, to prevent the water from overflowing.

The kitchen garbage joint screening apparatus in the present invention is disposed below the ground or above the ground, the kitchen garbage after bag-breaking is pushed into a magnetic

selector (the magnetic selector uses a magnet to remove iron impurities in the kitchen garbage) as preliminary screening and then added to the present invention, the kitchen garbage is pushed into the apparatus by a hydraulic unloading pipe, the materials contain plastic bags, plastic bottles, metal sheets, small lightweight wood, etc., complicated kitchen materials are in the liquid air-floating zone E10, when the plastic bags and the small lightweight wood and the like whose density is lower than that of other materials are pushed to the water surface by the hydraulic power by using air floating, they are caught by one rolling rake E30 and sent to a lightweight material conveying slot through the other rolling rake E30, to enter into the waste plastic reverse engineering apparatus or a waste plastics collecting chamber, while the plastic bottles, glass pieces, metal and other materials with large density in the liquid air-floating zone E10 are laid down to the bottom in the air-floating zone E10, and after a proper period of time, the automatic valve E23 of the heavy material discharge outlet E22 is opened to collect these materials and an automatic conveying tool sends the materials to a pending workshop. After the lightweight materials all float on the water, the shutter guide grooves E27 can be opened, to let kitchen materials for manufacturing high-protein feeds automatically enter into the leakage outlets E26 of the shutter guide grooves E27 and enter into the non-air-floating zone E32 by using water flowing pressure, the push-pull rods E28 disposed at the shutter guide grooves E27 are pneumatically controlled, automatically enable the shutter guide grooves E27 to make opening and closing movement in a setting time in the production process, and function to convey useful materials in the air-floating zone E10 to the non-air-floating zone E32. After the useful materials enter into the non-air-floating zone E32, an inclined helical ribbon conveyor E33 starts to boot, and sends the kitchen materials that have been preliminarily sorted into the apparatus in next section for further treatment while effectively separating some of the water.

The kitchen garbage joint screening apparatus in the present invention can remove plastics, toothpicks and the like in the kitchen garbage by using air floating and water floating, rolling rakes and opening and closing actions of the shutter guide grooves and the water level pressure difference between the air-floating zone and the non-air-floating zone, then removes glass, metal and other heavy sundries in the kitchen garbage by using a deposition process, and finally outputs useful materials for further processing, to realize automatic screening of the kitchen garbage.

After the useful materials enter into the non-air-floating zone, the inclined helical ribbon conveyor starts to boot, and sends the kitchen materials that have been preliminarily sorted into

the apparatus in next section, i.e., the wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus, while effectively separating some of the water.

F. Wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus:

5 The wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus in the present invention mainly sterilizes and cleans the kitchen garbage in the water by using an ozone gas, the apparatus is divided into more than one reactor F34, and the reactors F34 are connected with each other through pumps and pipelines and circulate at each reactor F34; the specific number of the reactors F34 can be set according to actual requirements.

10 The wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus in the present invention will be specifically described below with a structure of a specific reactor F34. Referring to FIG. 10, the reactor F34 is cylindrical and is a stainless steel cavity structure, a lower portion of the reactor F34 is a semicircular head E35, the top of the reactor F34 is a semicircular or flat-top head F37, the top head F37 of the reactor F34 is installed
15 with an automatic exhaust valve F53, the automatic exhaust valve F53 is connected with an ozone destroyer F39, the gas in the reactor F34 can be discharged into the ozone destroyer F39 through the automatic exhaust valve F53, the residual ozone in the gas is removed through the ozone destroyer F39, and then is discharged through a gas discharge pipe section F50. In this embodiment, an inlet of the reactor F34 is connected with an inclined helical ribbon conveyor
20 F36, the sorted kitchen garbage wastes are sent into the wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus F36f through the inclined helical ribbon conveyor F36, and the inclined helical ribbon conveyor F36 is tubular, is internally provided with a conveying helical ribbon, and sends the materials into the reactor F34 through rotation of the conveying helical ribbon. More than one granular activated carbon reaction ball F41 is fixedly
25 installed to the periphery in the inner cavity of the reactor F34, its position is in a middle-upper part in the inner cavity of the reactor F34, the granular activated carbon reaction balls F41 are stainless steel mesh housings, and the granular activated carbon are wrapped inside the stainless steel mesh housings; in this embodiment, the total volume of the granular activated carbon accounts for 15%-98% of the volume of a spherical cavity of the granular activated carbon
30 reaction balls F41, and the joint application of the granular activated carbon reaction balls and the ozone enables the ozone to be rapidly converted to hydroxyl radicals in the liquid, thereby

achieving enhancing the speed at which the ozone artificially inactivates and deodorizes bacteria in the water. In this embodiment, the top of the inner cavity of the reactor F34 is further provided with an online liquid level automatic control monitor F40, used for monitoring the liquid level in the reactor F34, the online liquid level automatic control monitor F40 may be implemented as a liquid sensor, and the liquid level is adjusted through a water level control pipeline F54 of another reactor F34.

In this embodiment, a gas, water and material mixer F42 for ozone-water-material mixing is also installed on a housing of the reactor F34. The mixer F42 is tee joint, one end thereof leads to the inner cavity of the reactor F34 through a communication pipeline F55, the other is in communication with an outlet F43 of a high viscosity cam rotor pump F49, a center end of the mixer F42 is connected with an air intake, the air intake is connected to a waterproof check valve F56, and the gas provided by an ozone generator F44 enters through a gas piping F57 and passes through the waterproof check valve F56 to enter into the mixer F42 to be strongly mixed with water and materials, so as to make a mixture of water-kitchen garbage-ozone conveyed to another reactor F34 through the high viscosity cam rotor pump F49 disposed in a circulating pipeline in the lower portion of the reactor F34, to form a circulating process between two reactors, thereby controlling continuous oxidation time of mixing of the materials.

The structure is a front structure of the wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus in the present invention, and the wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus in the present invention further includes a rear structure, and the rear portion of an advanced oxidation, deodorization, sterilization and salt-reduction apparatus is a solid-liquid separator; referring to FIG. 11, in this embodiment, the separator is composed of a tilted reticular barrel F52, the front end of the separator is connected to a discharge port 15A of the semicircular head F35 at the bottom of the reactor F34, and the barrel F52 is provided thereon with a plurality of rows of meshes; in this embodiment, the diameter of the meshes is 3-8 mm, the barrel F52 is externally provided with a housing F45, and a side face of the housing F45 is provided with a window F46, used for viewing the internal situation of the barrel F52. The bottom of the housing F45 is provided with a water butt F47, used for receiving water leaked down from the reticular barrel F52, a diversion helical ribbon disposed within the full length of the tilted barrel F52 leads to the discharge port F48, that is, a spiral helical ribbon is disposed within the full length of the tilted reticular barrel F52, the

materials are exported through the helical ribbon, the rotating power of the tilted reticular barrel F52 comes from driving of an AC motor coordinating with the transmission, which is not shown in the figure.

When the wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus in the present invention is in use, the mixture of water and kitchen garbage is thrown into the reactor F34 through an inclined conveyor F36, a volume ratio of the kitchen garbage mixture to the water is 5:7, which has mobility, by using the high viscosity cam rotor pump F49 to continuously circulate between the interior and the exterior of reaction kettles and adding an ozone gas to the water-gas mixer F42 to be mixed with water-kitchen garbage materials forcedly, the ozone concentration in the mixed material is 10 g/T-15 g/T, the mixed material uses the time circulating inside and outside the reaction kettles as an advanced oxidization reaction, the full time is 5 min-15 min, as a reduction reaction may occur to the ozone in any time in the water, and a chain reaction is triggered under the assistance of the activated carbon reaction balls, to accelerate the ozone to be converted to hydroxyl radicals, which is similar to the advanced oxidization process of O_3/H_2O_2 or O_3/UV , to generate antozone and a hydroxyl group (OH) with strong oxidation to carry out artificial forced inactivation and deodorization on pathogenic bacteria in the kitchen garbage and remove sodium chloride materials. After the section of artificial inactivation and deodorization on bacteria of the kitchen garbage is completed, the lower valve of the reaction kettle discharge port 15A is opened, the kitchen garbage is input into the solid-liquid separator by using the high viscosity cam rotor pump for dehydration.

By use of the wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus in the present invention, ozone can be used to oxidize, deodorize and desalt the kitchen garbage, to prevent it from giving out unpleasant smell and polluting the air, and at the same time, bacteria, viruses and other microbes in the kitchen garbage can be inactivated, to prevent them from spreading, especially when it is necessary to biochemically treat the kitchen garbage in the next section, the apparatus can ensure that the treatment process is not disturbed by contaminating microorganisms.

G. Vertical dehydration apparatus

The kitchen garbage that has been inactivated, deodorized, desalted and primarily dehydrated through wet advanced oxidization is sent into a dehydration apparatus for dehydration through a screw-rod conveying pipeline; in this embodiment, a vertical dehydration apparatus is adopted for

the dehydration; referring to FIG. 12 and FIG. 13, the vertical dehydration apparatus in the present invention mainly includes three parts, i.e., a housing G49, a vertical inleakage tower G50 and a helical ribbon push rod G51, the housing G49 is vertically cylindrical, the vertical inleakage tower G50 is disposed inside the housing G49, and a stainless steel support sleeve G56 is disposed inside the housing G49 near an inner wall of the housing G49; in this embodiment, the vertical inleakage tower G50 is a vertically installed big-end-down cone (refer to FIG. 13); in this embodiment, the vertical inleakage tower G50 is composed of more than one tower body, each tower body is conical, upper and lower circumferential positions of each tower body are provided with reinforced flanges G67, a connection of adjacent tower bodies are butting joint between upper and lower flanges G67 of the tower bodies, the tower bodies are fixed through bolts G68, and a plurality of tower bodies are spliced into a whole vertical inleakage tower G50; in this embodiment, an inclined anti-recoil diversion eave G59 is disposed at the position of the top flange at the position where the flanges of each tower body are connected. Inside the housing G49, corresponding to four sides of the exterior of the vertical inleakage tower G50, are several high-pressure water recoil nozzles G53, and the high-pressure water recoil nozzles G53 are installed on a water pipe G65; in this embodiment, there is more than one water pipe G65, the water pipes G65 are vertically disposed inside the housing G49 and are distributed around the exterior of the vertical inleakage tower G50, and each water pipe G65 is provided with more than one high-pressure water recoil nozzle G53 for cleaning and anti-clogging the vertical inleakage tower G50. The helical ribbon push rod G51 is disposed inside the vertical inleakage tower G50 and matches the internal shape of the vertical inleakage tower G50, in the middle of the helical ribbon push rod G51 is a helical ribbon rotation shaft, the rotation shaft is installed with a propulsion helical ribbon, helical ribbon axle spacing is gradually narrowed from 25 CM in the lower portion to the tower top, and terminal spacing is 10 CM. An outer side at the bottom of the housing G49 is installed with a motor G54 and a transmission G64, the motor G54 drives the transmission G64 to rotate, the bottom of the housing G49 is installed with a steering transform apparatus G66, the transmission G64 drives the steering transform apparatus G66 to rotate through a belt, the steering transform apparatus G66 converts horizontal rotation to rotation in a vertical direction, and the steering transform apparatus G66 drives the helical ribbon push rod G51 to rotate; in this embodiment, the steering transform apparatus G66 may be a worm-gear pair or a helical gear pair. A feeding port G62 is disposed on one side in the lower portion of the

vertical inleakage tower G50, and a discharge port G60 is disposed on one side in the upper portion of the vertical inleakage tower G50, to make the materials run from below. The top of the vertical inleakage tower G50 is provided with an axis-retaining plate G61 where the helical ribbon rotation shaft is installed, a seal plate that can regulate a discharge speed is further disposed between the axis-retaining plate G61 and a helical ribbon tail end on the helical ribbon push rod G51, the seal plate can be adjusted up and down and is controlled by a hydraulic or pneumatic tool 16, and through up and down adjustment of the seal plate, the size of the discharge port G60 can be adjusted, so as to adjust the discharge speed. A plurality of stainless steel vertical plates G57 are fixedly disposed around the vertical inleakage tower G50, the stainless steel vertical plates G57 are disposed vertically, a plurality of leakage holes G58 are distributed around the vertical inleakage tower G50, and the leakage holes G58 are strip-like and disposed between the stainless steel vertical plates G57. Anti-recoil diversion eaves G59 are disposed on tower-butting-joint flanges of the vertical inleakage tower G50 and outer circles of reinforced traps G69 of the stainless steel vertical plates G57, and each anti-recoil diversion eave G59 is at an angle of 30 degrees with the tower body; in this embodiment, the anti-recoil diversion eaves G59 are disposed against an upper flange G67 of the tower body of the vertical inleakage tower G50 and round edges of the reinforced traps G69. Inside the housing G49, corresponding to four sides of the bottom of the vertical inleakage tower G50, are water catchers G55, used for receiving water leaked down from the vertical inleakage tower G50, and the water catchers G55 are connected with water outlets G63 at the bottom thereof, used for discharging the water. In this embodiment, a door G52 is disposed on a side face of the housing G49, the door G52 is a vertical three-door body, that is, the housing wrapping the inleakage tower is a tetrahedron, where three sides are provided with door bodies that can be opened and closed.

The vertical dehydration apparatus in the present invention mainly carries out dehydration treatment on the kitchen garbage that has been inactivated, deodorized, desalted and primarily dehydrated through wet advanced oxidation, during operation, the apparatus is started, the motor G54 coordinates with the transmission system G64 to serve as a power source, after the tower type helical ribbon push rod G51 is driven to rotate through a shaft lever at first, then the kitchen garbage on which wet advanced oxidation and primary dehydration have been completed is sent into the feeding port G62 of the vertical dehydration apparatus through a convey tool, the materials are pushed from below with a helical ribbon moving direction on the helical ribbon

push rod G51 until to the seal plate at the top of the inleakage tower, the materials are pressed and dehydrated under the action of pressure, and are unloaded from the discharge port G60 at the same time, the removed water is leaked out from the leakage holes G58 of each tower body, and drips into the water catchers G55 at the bottom of the inleakage tower from top to bottom through the anti-recoil diversion eaves G59, to enter into an oil-water treatment section through a water outlet pipeline connected to the water catchers G55, while the unloaded dehydrated materials enter into a material crushing section through a conveying device, and within an interrupted interval when the vertical dehydration apparatus operates, high-pressure water disposed from top to bottom around the inleakage tower is used to recoil-clean the leakage holes G58.

The vertical dehydration apparatus in the present invention uses a vertical inleakage tower to coordinate with a helical ribbon push rod structure to carry out dehydration treatment on the kitchen garbage, has a simple structure and good dehydration effects; moreover, a seal plate that can be adjusted up and down is disposed at the outlet, used for adjusting an output speed and control the dehydration degree.

H. Crushing apparatus:

The kitchen garbage that has been dehydrated is sent into a material crusher H63 through a pneumatic propulsion device; in this embodiment, the crushing apparatus is designed as a multi-shaft structure, and the materials are crushed with a low-speed high-torque shear structure; the technology is the prior art.

After the primary treatment, the kitchen garbage is further recycled and treated.

I. Biochemical fermentation apparatus:

The materials that have been crushed are conveyed into a main biochemical treatment apparatus through a material hoist I64; referring to FIG. 14 and FIG. 16, the biochemical fermentation apparatus in the present invention is mainly used for biochemically treating the kitchen garbage, and the biochemical fermentation apparatus mainly includes several anaerobic fermentation pools I65 used jointly and a primary fermentation apparatus I71, which are anaerobic fermentation and aerobic fermentation respectively. The anaerobic fermentation process is provided with an anaerobic fermentation pool I65, the anaerobic fermentation pool I65 is cylindrical, the top is provided with a sealed cover I66, and opening and closing of the sealed cover I66 is controlled by a pneumatic tool (i.e., an automatic flip device I94); in this embodiment, the automatic flip device I94 is disposed at the top of the sealed cover I66 through a

connecting rod, and pushes the connecting rod to move through a cylinder, and the connecting rod pulls the sealed cover I66 to achieve opening and closing. An automatic unloading system I67 is disposed at the bottom in the anaerobic fermentation pool I65, the automatic unloading system I67 is tubular and internally provided with a spiral stirring blade, a material stirrer I68 that can automatically move is disposed on an upper side in the anaerobic fermentation pool I65, one side of the anaerobic fermentation pool I65 is provided with a strain activation pool I69, a side face of the strain activation pool I69 is provided with a discharge port I95, and the discharge port I95 is in communication with the automatic unloading system 4. In this embodiment, an anaerobic fermentation section is provided with several anaerobic fermentation pools used jointly, where one is the strain activation pool I69.

Referring to FIG. 15, the primary fermentation apparatus is divided into two secondary fermenters I71 and more than one primary fermenter; in this embodiment, a material hoist I64 is provided, the material hoist I64 is used for hoisting the kitchen garbage and throwing the kitchen garbage into one secondary fermenter. The two secondary fermenters I71 are installed above the primary fermenters, between the primary and secondary fermenters is a material conveying pipeline, and the conveying pipeline is an automatic conveying device I74 disposed at the bottom of the secondary fermenters I71; in this embodiment, the automatic conveying device I74 is cylindrical, a cylindrical housing is internally provided with a spiral stirring blade, the materials are sent into the primary fermenters through the automatic conveying device I74, and in the middle of a connecting channel between outlets of the secondary fermenters I71 and inlets of the primary fermenters is a pneumatic valve I85; in this embodiment, inside the secondary fermenters I71 is a stirring device I73 with rubbing and turning actions, the stirring device I73 is a spindle in the middle, and a plurality of stirring vanes are fixedly installed on a central shaft, used for stirring the materials. In this embodiment, an exhaust port I91 is opened on an upper portion of a shell of the secondary fermenters I71, and the exhaust port I91 is connected with an induced draft fan I92, used for discharging the gas produced in the secondary fermenters I71. The primary fermenters each mainly consist of a horizontal shell I75, a bearing I76, a heat conduction oil conveying pipe I77 and a double-layered helical ribbon stirrer I78; in this embodiment, the double-layered helical ribbon stirrer I78 consists of a shaft body, an internal helical ribbon and an external helical ribbon, the internal helical ribbon is disposed inside the external helical ribbon, the internal helical ribbon and the external helical ribbon are helical strips and respectively

fixedly installed on the shaft body, spiral directions of the internal helical ribbon and the external helical ribbon are opposite, and a share vane I79 is added around the shaft body of the double-layered helical ribbon stirrer I78; in this embodiment, the transmission system includes a motor I80, a transmission I81, a gear I82 and a chain I83, the gear I82 and the chain I83 are respectively disposed on two ends of an outer side of the horizontal shell I75, a plurality of transmission I81 are disposed, and the specific number thereof can be set according to actual requirements; in this embodiment, three transmissions I81 are disposed, the motor I80 directly drives a main transmission, the main transmission drives two auxiliary transmissions through a transmission shaft, each auxiliary transmission is provided with a driving gear I82, two ends of the shaft body of the double-layered helical ribbon stirrer I78 are respectively installed with a driven gear, and the two driving gears I82 are connected to the driven gears through the chain I83, to drive the double-layered helical ribbon stirrer I78 to rotate. In this embodiment, a feeding port I84 is opened above the primary fermentation apparatus, and a pneumatic valve I85 is disposed at the feeding port I84. An observation window I86 is installed at a middle-upper part on a side face of the horizontal shell I75, used for viewing a reaction situation in the horizontal shell I75, an air transportation and arrangement pipe I87 and a material sampling port I88 are respectively installed at the middle-upper part on the side face of the horizontal shell I75, the air transportation and arrangement pipe I87 is used for introducing air into the horizontal shell I75 or discharging the air inside the horizontal shell I75, and the material sampling port I88 is used for sampling the materials in the horizontal shell I75. An automatic discharge hole I89 is opened at a lower portion of the horizontal shell I75, and the automatic discharge hole I89 is provided with an automatic valve gate I90, used for unloading the materials. In this embodiment, an exhaust port (not shown) is also disposed in the primary fermenters. The biochemical apparatus in the present invention is further installed with an automatic temperature control system.

A method for biochemical fermentation through the biochemical treatment apparatus includes the following steps:

1. First generate a prefermented material under the simultaneous action of the anaerobic fermentation pool I65 and the two secondary fermenters I71:

- 1-1. Fermentation of the anaerobic fermentation pool I65: a solid basic material is crushed and strains are added thereto for biochemical treatment; in the present invention, the selection of the solid basic material first takes normal crop straw in surrounding areas of a kitchen garbage

treatment plant into account, in this embodiment, bean crop straw (e.g., one or more of soybean, mung bean, red bean and pea) accounts for 50%-80% of the total fermentation basic material weight, seasonal straw of gramineae crop (e.g., wheat, corn, millet and rice) accounts for 20%-50% of the total fermentation basic material weight; in this embodiment, their mixing weight ratio is 60%:40%, the two kinds of straw are mixed as a mixture, and the reason for selecting such a hybrid solid basic material is as follows: the leguminous crop straw has high protein content but low soluble sugar content, at the beginning of the fermentation, microbial activity is not high, while the gramineae crop straw itself has low nutritional values, but high soluble sugar content, so, mixing the two kinds of crop straw not only can improve the quality of fermentation, but also can make nutrients of the two kinds of crop straw complement each other; the mixture is crushed into powder with the particle size of 0.5 mm-1 mm, and a composite inoculant that can break down crude fiber is added to biochemically treat the mixed material; the number of strains in the composite inoculant referred to is not less than two, where one is *Aspergillus oryzae*, the input amount of the composite inoculant is 1% of the hybrid solid basic material, and chemical compositions of calcium oxide, sodium chloride, dibasic sodium phosphate and urea are added.

1-2. The primary fermentation apparatus I70 consists of two primary fermenters and two secondary fermenters, the primary fermentation apparatus I70 consists of two primary fermenters and two secondary fermenters, and at first, the two secondary fermenters respectively preferment the materials through lots of different strains. Firstly, the kitchen garbage that has been artificially inactivated is added to one secondary fermenter 8 as a basic material, bran that accounts for 8%-10% of the weight of the basic material, rice bran that accounts for 10%-15% of the weight of the basic material and white sugar that accounts for 1% of the weight of the basic material are added as a mixture to the crushed basic material to be made into a paste, then 2-3% of the strains are added, the fermentation manner is old leavening (the strain fermented for the first time is bread yeast, the adding quantity is 2%-3% of the total weight of the fermented basic material, brown sugar that accounts for 1% of the weight of the basic material is then fermented, to be mixed with the crushed basic material and made into a paste, the mixture is heated to 24°C-25°C, and then the bread yeast is added thereto), the heat source is generated by heat sources of other sections of kitchen garbage treatment, the mixture is fully stirred to strengthen aeration, so as to enhance yeast growth, and a standing fermentation time between stirring stop and aeration generation is 12 h. In this embodiment, the old leavening means that, after completion of each

fermentation, during unloading, 10% of the total material is stored as a masterbatch for next fermentation, the adding quantity of the bread yeast for the following each fermentation may be reduced, and it is only necessary to add 60% of the weight of the strains added for first fermentation.

5 1-3: Another secondary fermenter I71 is a prefermenter of main raw materials, and the kitchen garbage artificially inactivated, cleaned and dehydrated is used as a basic material for solid-state fermentation. The strain selected in the stage is a four-strain mixed inoculant composed of *Trichoderma viride*, *Candida tropicalis*, water bacteria and *Endomycopsis* yeast, a weight ratio of the four strains is 2:2:1:1, the inoculation quantity (the input amount of the mixed
10 inoculant) is 2% of the total weight, urea that accounts for 1%-1.5% of the total weight is added at the same time, the temperature is preferably 25°C-30°C, the highest temperature should not exceed 42°C, an automatic devices roll the mixture once every hour, the fermentation time is 9 h to 10 h, ventilation is 8 min/h (i.e., ventilation is carried out for 8 min every hour), and the ventilation quantity is 0.2 m³/h. The heat source of the prefermentation section is provided by
15 afterheat generated by heat sources of other sections of the kitchen garbage treatment. In this embodiment, the *Trichoderma viride* in the strains, in concert with the water bacteria, has extremely remarkable effects on reduction of the content of crude fiber in the kitchen garbage, while the effects of the *Candida tropicalis*, the water bacteria and the *Trichoderma viride* on improving crude protein and true protein are apparent, and the *Endomycopsis* yeast serves as
20 auxiliary mould.

2. Inoculate the materials, that is, after the prefermentation section is completed, the materials in the two secondary fermenters are sent into the primary biochemical apparatus for secondary fermentation through an automatic conveying device 10 disposed at the bottom of the fermenters.

25 The materials after biochemical pretreatment are input to the primary fermenters, where treatment in the primary fermenters includes: a straw fermentation material and a material in a biochemical pretreatment apparatus are input into the primary fermenters in the primary biochemical apparatus, the input proportions of the materials are: the straw fermentation material accounts for 10%-40% of the total material weight percentage, the bread yeast fermentation
30 material accounts for 20% of the total material weight percentage, and a second fermentation material to be biochemically pretreated accounts for 40%-70% of the total material weight

percentage; after the three materials after prefermentation treatment enter into the primary fermenters, a double-layered helical ribbon stirrer 14 rotates at 360 degrees under the driving of the power source, the rotating speed is 6-9 r/min, the rotating action is in a round-trip direction, to slowly stir the materials at a low speed, the temperature in the primary fermenters starts to ramp up from initial 20°C and is gradually raised to 28°C, an air valve 23 is closed after a holding time of 4 h, the temperature is raised to 35°C-38°C at the same time, after a holding time of 3 h, an exhaust valve is opened, the moisture is discharged by using positive pressure in the primary biochemical apparatus, after completion of the two holding times, the temperature is raised to 82°C, the time is 2 hours, after the whole secondary fermentation procedure is completed, and an air-inducing apparatus I112 is opened to exhaust air, and at this time, water vapor in the fermentation material will enter into a gas-water separation apparatus and an air environmental-protection treatment apparatus along with an exhaust system for treatment (not a part of the present invention). The whole secondary fermentation time is 9 h in total, and during the working time, the whole process from microbial reproduction to growth peak as well as dormancy or death will be rapidly completed. The fermentation process requires relatively less oxygen, its oxygen is from between a gap and the specific area between dehydrated materials, energy consumption is less, and time is shorter, thereby effectively avoiding the problems that microbes use the carbon skeleton therein as energy while excitant ammonia smell produced by dehydrogenation influences the economic value of the feeds.

3. Discharge the material.

In the present invention, a biochemical treatment apparatus uses a joint fermentation method of anaerobic fermentation aerobic fermentation to achieve an effect of automatic biochemical fermentation through two-step fermentation of primary fermenters and secondary fermenters, which has a simple and reasonable structure and a good fermentation effect.

J. Automatic unloading multi-stage drying apparatus

The fermented materials are dried by an automatic unloading multi-stage drying apparatus; referring to FIG. 17 and FIG. 18, the automatic unloading multi-stage drying apparatus in the present invention mainly includes a pre-drying device J93 and a main drying device, the pre-drying device J93 is installed above the main drying device, and the pre-drying device J93 is an accessory device of the main drying device; in this embodiment, the pre-drying device J93 is designed as a horizontal sleeve and is internally provided with a material automatic flap J94; in

this embodiment, in the middle of the pre-drying device J93 is a spindle, the material automatic
 flap J94 is a turning plate fixedly installed to the spindle, and the spindle can be driven by a
 motor disposed on an outer side of the pre-drying device J93 to rotate. The bottom of the
 pre-drying device J93 is installed with a helical ribbon auger automatic discharging device J95
 5 (or called material automatic conveying discharging device), and the materials that have been
 pre-dried by the pre-drying device J93 are input into the main drying device through the helical
 ribbon auger automatic discharging device J95; in this embodiment, the helical ribbon auger
 automatic discharging device J95 is tubular and internally provided with a helical ribbon auger,
 and the helical ribbon auger is driven by the motor to rotate. In this embodiment, a housing of the
 10 pre-drying device J93 is two-sided, a sandwiched housing cavity J97 of the pre-drying device is
 formed between two sides, the sandwiched housing cavity J97 is internally provided with
 heat-conducting oil and the like, and hot tail gas of the main drying device passes through a
 heat-conducting oil layer of the cavity J97 of the pre-drying device through a pipeline and then
 passes through the exterior of the device. In this embodiment, a hot source in the pre-drying
 15 device J93 is from a tail gas exhaust port J96 of the main drying device and enters into the
 sandwiched housing cavity J97 of the pre-drying device through the pipeline, heat is transferred
 by using the heat-conducting oil carried in the sandwiched cavity, and the tail end of the heat
 pipeline introduces afterheat of the hot tail gas into an air treatment device in the rear end through
 an air-inducing device J98, to collect and environmentally treat the air with smoke, dust and
 20 steam. The main drying device in the present invention is provided with a gas or liquid fuel
 combustion chamber J99 and a burner J100, the burner J100 produces hot gas by burning gas or
 liquid fuel in the combustion chamber J99, and the hot gas is imported into the main drying
 device by an air fairing. Referring to FIG. 19 and FIG. 20, in this embodiment, in the middle of
 the main drying device is a horizontal cylinder body J102 capable of rotating counterclockwise
 25 and clockwise at 360 degrees, and front and rear ends of the main drying device are respectively
 fixed heads J101, to form the main body of the main drying device. In this embodiment, the
 rotating horizontal cylinder body J102 is internally provided with more than two secondary
 barrels that rotate with a primary barrel direction of the rotating horizontal cylinder body J102,
 the barrels have different diameters and lengths, which are respectively big-outside small-inside,
 30 the barrels are nested through layering by taking an outer barrel as a basis, hot air dries the
 horizontal barrels, the barrels are internally provided with several rotary sleeves, when a material

to be dried enters into the innermost sleeve, the material is pushed forward and falls into a second-layer sleeve, at this time, the forward direction of the material in the second-layer sleeve is opposite to that of the innermost sleeve, and the material makes the actions of connecting, falling down and advancing in the multilayered sleeves, until the material enters into the

5 outermost main drum. In this embodiment, cross sections of a plurality of inner barrels are all round, feeding helical ribbons are installed therein in a manner of extending along barrel walls, spiral directions of the feeding helical ribbons on adjacent inner barrels are opposite, airflow disturbance wings J103 are installed along a circumferential direction of outer sides of the barrels, used for disturbing airflow, the installation angle of a diversion plate is 20 degrees to 30 degrees,

10 to function to guide and divert the gas, when the primary barrel rotates, the innermost barrel moves with the primary barrel, kinetic energy of the movement is driven by mechanical rotation outside the primary barrel, and at the same time, the movement direction of the input material is guided by the feeding helical ribbons and advances towards a discharge port direction of the innermost barrel; in this embodiment, an outer side of the outermost barrel is provided with an

15 auxiliary driving wheel J111, a motor J108 drives a main driving wheel J110 to rotate under the driving of a transmission J109, the main driving wheel J110 drives the auxiliary driving wheel J111 to rotate, the auxiliary driving wheel J111 drives all the barrels to move integrally, the feeding helical ribbons in the barrels in various layers are set in different directions, and the material is guided by the feeding helical ribbons to move. In the process, hot airflow disturbs and

20 washes the material, a hazy trajectory phenomenon (mixed layer) occurs in the airflow herein, and thus transportation and dispersion modes of the hot airflow in the barrels are the key to drying the material. When the innermost material heads for the discharge port J104 of the barrel under the guiding of the feeding helical ribbon, the material falls in an inlet J105 of the secondary innermost barrel, moves forward reversely with the direction of the hot airflow under the guiding

25 of the feeding helical ribbon and reaches the discharge port in the layer, and then falls in the discharge port of an outer-layer sleeve of the barrel in the layer; as the method, after the material to be dried contacts the hot airflow forwards and backwards multiple times, the material falls in the primary rotating barrel finally, i.e., the outermost barrel, and is guided to a main discharge port J106 by the feeding helical ribbon, to be transported to next section by an automatic

30 conveying tool, a hot air outlet J107 is disposed on an upper portion of the head on the other end of the automatic unloading multi-stage drying apparatus, and the hot air outlet J107 is connected

to the sandwiched housing cavity J97 of the pre-drying device J93.

The automatic unloading multi-stage drying apparatus in the present invention works as follows: protein nutritional feeds on which biochemical fermentation has been completed (i.e., the kitchen garbage that has been biochemically treated) are sent into a pre-drying device J93 through a material hoist, the material is installed to a stirring and flapping system in the pre-drying device J93 to be stirred at a speed of 10-18 r/s, and at this time, the temperature in the inner cavity of the device, the inner cavity of the pre-drying device J93, has been increased to 80°C-120°C by the hot tail gas of the main drying device through a sandwich layer of the pre-drying device J93. The material stays in the pre-drying device J93 for 1.5 h-3 h, and hot wet air in the pre-drying device J93 is discharged from an exhaust port by using the air-inducing device J98. After the material has satisfied the retention time in a preheating device, the helical ribbon auger automatic discharging device disposed in the lower portion of the pre-drying device J93 sends the material into the innermost cylindrical body of the main drying apparatus, inlet and outlet temperatures of the main drying apparatus are respectively 240°C-280°C and 80°C-120°C, at this time, the material directly contacts the hot air, and under the diversion of the helical ribbons in the drums of various layers, flows downstream to establish a heat-transfer process, and when the material automatically enters into a next-layer drum after being dried by an inner-layer drum, the material enters into the next-layer drum after establishing a heat-transfer process through reverse flow. The rotating speed of the horizontal cylinder body in each layer is 25-29 r/min, the feeds directly contact the hot airflow through so many times of forwarding and backing, to continuously complete material drying, and are sent to a material selection apparatus by the automatic conveying tool, and the material at the moment has become non-selected protein nutritional feeds.

The automatic unloading multi-stage drying apparatus in the present invention uses two-stage hot drying to dry the kitchen garbage and has an automatic unloading function, which has a simple structure and a good drying effect, saves energy and is environmentally friendly.

K. Selection apparatus

The protein nutritional feeds that have been dried enter into a selection apparatus for selection through an automatic conveying system; referring to FIG. 21, the material selection apparatus in the present invention makes final fine screening on the protein nutritional feeds that have been dried, in the process of kitchen garbage treatment, the front-end procedure of the fine

screening is biochemical treatment on the kitchen garbage, and, in the section, the sundries screened but not captured in the front-end procedure and large organic matter not entirely decomposed in the biochemical process are separated from the protein nutritional feeds. In the present invention, a device base K108 is used as a bearing basis, a production protection cover K109 is installed to an upper portion of the base K108, used for preventing the material from running out, and the production protection cover K109 contains an inclined metal rolling sieve tube K110; in this embodiment, the aperture Φ of the sieve tube on the metal rolling sieve tube K110 is 4 mm-6 mm, and an interval between holes is 2 mm; in this embodiment, the oblique angle of the metal rolling sieve tube K110 is 1 degree to 20 degrees, the oblique angle can be adjusted, an adjusting bolt is disposed therein, to adjust the oblique angle thereof, an inner cavity on a downward end of the metal rolling sieve tube K110 is provided with a helical ribbon K111 along a tubular wall, which serves as a directing rail, and after the helical ribbon K111 directs heavy sundries and big sundries to enter into a sundries discharge outlet, the sundries fall into a sundries receiving device K112. In this embodiment, a finished product loader K113 is installed on the base K108 below the metal rolling sieve tube K110, a funnel-shaped receiving apparatus is disposed below the metal rolling sieve tube K110, and the material leaked down from the metal rolling sieve tube K110 falls on the finished product loader K113 through the funnel-shaped receiving apparatus. In this embodiment, the finished product loader K113 is in a shape of a conveyor belt, and an automatic conveying tool K114 is installed to a lower portion of the finished product loader K113, used for conveying finished products into warehouse or directly entering into the feed preparation workshop in next section. In this embodiment, a secondary selector is installed to a lower portion of the sundries receiving device K112, to make a secondary selection on the sundries falling into the sundries receiving device K112; in this embodiment, the secondary selector drives the material to move forward through a chain conveyor K115, a big-and-small-object bypass damper K116 is installed in a front direction of the chain conveyor K115 near the exterior of the tail end, the big-and-small-object bypass damper K116 is disposed at a position not less than 5 mm above the chain conveyor K115, the distance between the big-and-small-object bypass damper K116 and the chain conveyor K115 can be adjusted according to the size of the material to be passed, and the material that can pass through the distance between the big-and-small-object bypass damper K116 and the chain conveyor K115 is input to a finished product conveying system and then enters into the finished product loader.

When big materials are blocked to the front end of the bypass damper K116, a switch plate of a pneumatic switch device K117 installed above the bypass damper K116 moves the big materials detained in the front of the bypass damper K116 into a sundries collecting tank by moving downward at 180 degrees.

5 The working flow of the material selection apparatus in the present invention in use is as follows: the protein nutritional feeds that have been dried (i.e., kitchen garbage products) of the present invention are input at a speed of about 30 kg/min-80 kg/min, the material is rotated by the metal rolling sieve tube K110 and advances along an inclined direction of the metal rolling sieve tube K110, the material is continuously turned with the trajectory of the metal rolling sieve tube K110 in the metal rolling sieve tube K110, big objects or heavy objects are rolled up to continuously advance towards the inclined direction and enter into the directing rail of the helical ribbon K111, and are sent into a heavy-sundries and big-material receiving port, and the finished products fall down from wall holes of the metal rolling sieve tube K110 and enter into the finished product loader K113. When the material sent into the sundries receiving device K112 through the directing rail of the helical ribbon K111 still has several finished products not thoroughly separated, in order to collect the finished products more effectively, the material of the big-sundries receiving device is sent into a chain conveyor belt, the objects are conveyed to a separation port of the object bypass damper K116, and substances that can pass through the clearance of the object bypass damper K116 are finished products. The finished products are sent into the finished product conveying system and then sent into the finished product loader, and the big materials or heavy sundries are separated by the pneumatic switch device and then moved into the sundries collecting tank.

15 In the present invention, through cooperation between the sieve tube and the bypass damper, feed products produced by the kitchen garbage are screened, the screening efficiency is fast and the precision is high. Moreover, automatic feeding, automatic unloading and warehousing and other full automatic treatment can be achieved.

L. Mixed feed apparatus

25 The feeds produced can also be mixed through a mixed feed apparatus; referring to FIG. 22, the mixed feed apparatus used in the present invention consists of six major parts, i.e., a crusher, a cylinder pulse dust remover L117, a spiral mixer L117L, a ring die pelletizer L118, a reflux cooler L118L and a cyclotron classification screener L119 and an automatic weighing wrapper

L120.

M. Waste plastic reverse engineering apparatus:

The kitchen garbage has inevitable waste plastics, for example, plastic bottles, plastic boxes, plastic bags, plastic caps and other waste plastics, the total weight thereof accounts for about 1.2% of the weight of the kitchen garbage that has been primarily dehydrated, some of the waste plastics are repeatedly recycled products, have no economic value of recovery, and at the same time, all kinds of harmful bacteria are hidden in the garbage waste plastics, which must be dealt with in the kitchen garbage disposal project, so as to avoid that the transfer of pollutants causes serious secondary pollution. Referring to FIG. 23, FIG. 24, FIG. 25 and FIG. 26, in this embodiment, the waste plastic reverse engineering apparatus is a next-section apparatus connected to the rolling tine E30 in FIG. 8, when the waste plastics, waste paper, waste cloth and other stuffs sorted by the liquid air-floating sorting apparatus are fished out by the rolling tine E30 and enter into a centrifugal dewatering device of the waste plastic reverse engineering apparatus through the conveying system, the materials are basically dehydrated and then enter into the main treatment apparatus, the main treatment apparatus, starting with a conveyor belt M122, sends the materials into an air-pressure type automatic feeder M123 which can move back and forth through a rail, raw materials are sent into a cracking catalytic horizontal reaction kettle M124 (reference can be made to CN102220152A and Chinese Patent with Publication No. of 201660599U for the structure of the reaction kettle), the reaction kettle M124 can rotate clockwise and counterclockwise at 360 degrees and internally has an automatic random scrapping apparatus M125, arsenic oxide and alumina are added to the materials in the reaction kettle M124 as a combined catalyst, to implement an anaerobic cracking reaction under the action of calcium oxide as a solid chlorine agent, a hot source used may be synthetic fuel of liquid products of the reverse engineering in the section and bio-oil products obtained from the kitchen garbage treatment project, and combustible gas obtained from the reverse engineering, production fuel used is supplied for self use, and the tail gas produced by a cracking furnace M126 during combustion is output by an air outlet of the furnace, which is connected with an exhaust environmental protection equipment system M127 through a pipeline. The materials in the reaction kettle M124 are cracked under anaerobic conditions, to obtain an oil-gas mixture, under the condition that the interior of the reaction kettle M124 falls within a set pressure range, a back-stage vacuum system M130 is automatically opened, then a check valve M128 of the

reaction kettle M124 is automatically turned on, oil and gas first enter into an oil-wax separator M129, after oil and wax are separated, oil and gas enter into a first-stage heavy oil separator M131 along the pipeline under the action of a next-stage vacuum device, lightweight oil and gas enter into a first-stage condenser M132 through a safe water-sealed device, the mixed oil enters into an oil container M133, the gas that cannot be liquefied is transferred to a negative pressure device M134 for clockwise and counterclockwise gas rinse, the rinsed gas continuously enters into a back-stage vertical water-sealed gas safety conveyor M135, the combustible gas is compressed and dehydrated by a special secondary gas compressor M136 and then conveyed to a first-stage gas compressor to compress the gas to 0.5 mpa, the second-stage gas compressor then compresses the gas to 1 mpa, and the combustible gas can be conveyed to a gas repository M137 for later use. After the mixed oil enters into the oil container M133 to be cooled, the mixed oil is input to diesel refinement equipment through a special oil transfer pump, the equipment starts with a first-stage chemical decarburization impurity-removal synthesizer M138, the mixed oil then enters into a decarbonizing pure floating device M139 and a dewaxing and degumming device M140 for chemical treatment, chemical agents required by the decarbonizing pure floating device M139 and the dewaxing and degumming device M140 are disposed in several chemical containers, there are a liquid agent adding zone M141 and a solid agent adding zone M142, and all additives are automatically charged by an automatic quantitative device according to a set procedure. After the oil that has gone through refined treatment passes the detection, the oil enters into a diesel synthesis device M143 for quality adjustment (the oil leaves the factory after being adjusted to the same quality according to different quality of each refinement), and enters into a fixed bed filtering device for clockwise and counterclockwise double-layer filtering, and qualified National III standard diesel is obtained accordingly and transferred to warehouse. During waste plastic cracking, residue that cannot be gasified may be produced, that is, coarse carbon black, and a coarse carbon black treatment apparatus can be used to treat the residue, i.e., coarse carbon black, after anaerobic cracking.

N. Coarse carbon black treatment apparatus:

Referring to FIG. 27, in this embodiment, the coarse carbon black treatment apparatus includes a coarse carbon black artificial aging processor N144, the processor is a device that ages the material by using ozone, after the coarse carbon black chemically aged enters into a physical aging bed N145, the aging bed carries out steam treatment on the coarse carbon black under the

condition of pressure of 2.8 mpa-3.2 mpa for 25-35 min, and the two artificial aging measures function to change the specific volume of particles of the coarse carbon black and forcedly change relatively ordered characteristics of external crystallization of carbon black particles, and help to embed adjuvants and improve the hydrocarbon ratio of carbon black. After artificial aging, the coarse carbon black is input to a material matching device N146 through a special automatic conveying tool, material matching content is divided into two major categories, i.e., liquid and solid, respectively being basic raw coal, polyvalent metal catalysts, hexamethylenetetramine igniting agents, ferrocenyl antismoke agents, adhesives and solid chlorine agents, etc., where the basic raw coal accounts for 32%-45% of the total material weight, the other adjuvants account for 6%-15% of the total material weight, the residue share of the total material weight is the treated coarse carbon black, each matching adjuvant is added by a liquid-solid automatic quantitative charging device N147, the materials are fully mixed and input to a low-sulfur high-energy environmentally friendly cleaning coal forming machine N149 through a multi-layered push-pull type screw rod N148, finished products are obtained after the materials are shaped, and the finished products are called low-sulfur high-energy cleaning coal, the quality is as follows: total sulfur 0.2-0.5%, cinder content Level 1, ash content 5.5-7%, volatile component 8-11%, and calorific value 4300-5300 cal, and reference can be made to Chinese Patent with Publication No. of CN102220179A for the application of the coarse carbon black used in this embodiment.

O. Distillation-free biodiesel production apparatus:

In the present invention, the collecting apparatus, the kitchen garbage bag-breaking apparatus, the kitchen garbage liquid air-floating sorting apparatus, the wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus, the preliminary solid separator and the vertical dehydration apparatus are all provided with outlet pipelines, the oil, water and solid mixtures flowing out of the outlet pipelines are sent into a distillation-free biodiesel production apparatus for biodiesel production; referring to FIG. 28 to FIG. 31, the front end of the biodiesel manufacturing system in the present invention is provided with an oil-water mixing pool O150, the oil, water and solid mixtures produced in various sections during the kitchen garbage treatment are conveyed into the oil-water mixing pool O150 through the outlet pipelines, and the oil-water mixing pool O150 is disposed at tail ends of the outlet pipelines. The rear end of the oil-water mixing pool O150 is provided with a horizontal helical ribbon solid-liquid separation device O151, used for removing solid from the oil, water and solid mixtures; in this

embodiment, the horizontal helical ribbon solid-liquid separation device O151 includes a horizontal cylindrical housing, the housing is internally provided with a strainer, a conveying helical ribbon is fixedly disposed inside the strainer, the motor coordinates with the transmission to drive the strainer and the helical ribbon to rotate, and the bottom of the horizontal helical ribbon solid-liquid separation device O151 is provided with an oil-water mixture conveying pipeline. The oil, water and solid mixtures are input into the horizontal helical ribbon solid-liquid separation device O151 by pumps through the pipelines, and after liquid-solid separation by the horizontal helical ribbon solid-liquid separation device O151, the oil-water mixtures are input to a next treatment apparatus through the conveying pipeline, and the solid is discharged. The rear end of the horizontal helical ribbon solid-liquid separation device O151 is provided with an oil-water separating column O152, and the oil-water mixtures after solid removal are conveyed to the oil-water separating column O152; in this embodiment, the oil-water separating column O152 is vertically cylindrical, a feeding port thereof is disposed at a middle-lower portion of a side face, the oil-water separating column O152 is internally provided with a heating pipeline O153, and the heating pipeline O153 extends to the interior of the oil-water separating column O152 from a lower portion of the oil-water separating column O152 and then is output to an outer side of the oil-water separating column O152 from a middle-upper portion of the oil-water separating column O152; in this embodiment, the heat source used by the heating pipeline O153 is afterheat of a thermal oil furnace, which can save use of energy, and during specific embodiment, the heat source may also be disposed separately. The top of the oil-water separating column O152 is provided with an infrared water liquid-level locator O154, used for locating the height of the oil-water mixture during oil-water separation, so as to automatically control the input quantity of the oil-water mixing liquor. One side of the oil-water separating column O152 near the upper portion is provided with an oil wiper O155 (similar to a windshield wiper, which wipes away the oil) and an oil outlet pipeline O156; in this embodiment, the oil wiper O155 is in a shape of a strip plate, is driven by the motor disposed at the top of the oil-water separating column O152 to rotate and wipes the oil in the oil-water mixtures into an oil tank, which is then output through the oil outlet pipeline O156. In this embodiment, the oil outlet pipeline O156 is provided thereon with an electric valve O157, and the electric valve O157 controls bio-oil to enter into an oil storage container O149 from the oil outlet pipeline O156.

Referring to FIG. 28, in this embodiment, grease removed from the kitchen garbage is used

for biodiesel production, and the front end of the biodiesel production apparatus is a grease colloid removal device O158; in this embodiment, the grease colloid removal device O158 is oblong, a hole impact plate O159 is fixedly disposed in the middle of the grease colloid removal device O158, holes are opened on the impact plate O159, and opposite positions on two sides of the impact plate O159 are respectively installed with a propeller-type hydraulic pusher O160; in this embodiment, the propeller-type hydraulic pusher O160 includes propeller blades disposed inside the grease colloid removal device O158 and a motor disposed on an outer side of the grease colloid removal device O158, and the motor drives the propeller blades to rotate. When it is necessary to produce biodiesel, a special oil pump inputs bio-oil from the oil storage container O149 into the grease colloid removal device O158, to effectively remove phospholipid, sugar, protein and other impurities in the grease, thereby preventing that colloids cover tiny particles of the grease in the following section to hinder the grease from contacting a catalyst. In this embodiment, an ozone oxidation processor consists of an ozone generator O174, a liquid anti-recoil valve O175, a strong air-liquid mixer O176, a reactor O177, a circulating pump O178, an inflow pipeline O179, an oil outlet O180, a liquid level controller O181 and an ozone residual air destroyer O182, the ozone generator O174 is connected with the strong air-liquid mixer O176 through the liquid anti-recoil valve O175, the strong air-liquid mixer O176 is connected with the grease colloid removal device O158 through the inflow pipeline O179, the strong air-liquid mixer O176 is connected with the reactor O177 through a pipeline, the reactor O177 is provided thereon with the circulating pump O178, the bottom of the reactor O177 is the oil outlet O180, the oil outlet O180 is connected with a bio-oil normal-temperature grease exchange device O161 through a pipeline, the reactor O177 is internally installed with the liquid level controller O181, and the top of the reactor O177 is installed with the ozone residual air destroyer O182. The top of the reactor O177 is further installed with a quantitative charger O183. Impurities, pigments, foul smell, protein and the like in the grease can be removed through the ozone oxidation processor. The main body of the biodiesel production apparatus is the bio-oil normal-temperature grease exchange device O161; in this embodiment, the bio-oil normal-temperature grease exchange device O161 is a cylindrical cone-bottom reaction kettle, and the bio-oil normal-temperature grease exchange device O161 contains more than one ultrasonic generator O162, the number thereof is four herein, the periphery of each ultrasonic generator O162 is provided with a casing O163, internal thread jet holes O164 are opened around the casing O163, a locking device O165

is fixedly disposed above the casing O163, a pneumatic lifter O184 is connected above the locking device O165, which functions to control the in-liquid depth of the casing O163 and the ultrasonic generator O162 in the bio-oil normal-temperature grease exchange device, and the ultrasonic generator O162 is installed inside the bio-oil normal-temperature grease exchange device O161 through the locking device O165. The bio-oil normal-temperature grease exchange device O161 contains a liquid diversion pipe O166, one end of the liquid diversion pipe O166 is connected to an upper portion of the bio-oil normal-temperature grease exchange device O161, the other end is connected to the bottom of the bio-oil normal-temperature grease exchange device O161, and a pump O167 is connected onto the liquid diversion pipe O166. The top of the bio-oil normal-temperature grease exchange device O161 is provided with a top cover O168, the top cover O168 is provided thereon with a feeding port O169, and a side of the bio-oil normal-temperature grease exchange device O161 is provided with a window O170. In this embodiment, the bottom of the bio-oil normal-temperature grease exchange device O161 is provided with an air-blowing pipe O171, and one end of the air-blowing pipe O171 is connected with a compressed air engine. After bio-oil is input into the bio-oil normal-temperature grease exchange device O161, methanol and a cosolvent are then added from the feeding port O169; in this embodiment, the cosolvent is preferably selected as a liquid agent that can enhance solubility of oil and methanol, and after a recyclable solid catalyst is added, the ultrasonic generator O162 enters into the bio-oil from the top cover of the bio-oil normal-temperature grease exchange device O161 through a pneumatic or hydraulic tool, at the same time, the compressed air begins air-blowing from the bottom of the bio-oil normal-temperature grease exchange device O161, so as to promote cosolubilization between bio-oil and methanol, a bio-oil mixture is input above the inner cavity of the casing O163 through an oil pump O167, and enters into ultrasonic treatment in a manner of flowing from top to bottom, the ultrasonic frequency is gradually increased from 25 KHz to 30 KHz, and the time is 20-60 min. The rear end of the bio-oil normal-temperature grease exchange device O161 is connected with a liquid separation device O172; in this embodiment, the liquid separation device O172 is vertically cylindrical, the rear end of the liquid separation device O172 is provided with a filtering device O173, a mixed liquid on which the ultrasonic treatment has been completed is input to the liquid separation device O172, and the obtained crude biodiesel passes through the filtering device O173 to obtain biodiesel.

In the present invention, a method for manufacturing biodiesel, that is, a method for

operating the biodiesel manufacturing system includes the following steps:

(1) carrying out solid removal treatment on an oil, water and solid mixture produced during production of the kitchen garbage, to obtain an oil-water mixture;

5 (2) conveying the oil-water mixture to an oil-water separating column O152 for oil-water separation; in this embodiment, during oil-water separation, afterheat of a thermal oil furnace is used to heat the oil-water mixture in the oil-water separating column O152 to 60°C-85°C, after the biolipid floats up, oil water dissociation is achieved, the water in the lower layer is sent to a sewage treatment system through a conveying pipeline, and the biolipid in the upper layer is scraped by an oil scraper O155 and is sent into the oil storage container through an oil outlet
10 pipeline O156;

(3) when it is necessary to process the biolipid, after the biolipid is sent into a grease colloid removal device O158 through tools such as a delivery pump, starting an propeller-type hydraulic pusher O160, adding phosphoric acid whose concentration is 85%, a ratio of the phosphoric acid to the biolipid not exceeding 1% of the total amount of oil, using propeller thrust on two ends of
15 the grease colloid removal device O158 to make the liquids inside the grease colloid removal device O158 generate face-to-face impact, the impact time being set up in a time range required by the set process condition, which is 10 min to 15 min in this embodiment, and after the face-to-face impact of the liquids ends, immediately adding dilute brine, a weight ratio of water to salt in the dilute brine being between 95:5 and 90:10, a weight ratio of the biolipid to the dilute
20 brine being between 90:10 and 80:20, and accelerating flocculation by using the function of electrolyte salt, to make formed micelle more stable;

(4) continuously starting the propeller-type hydraulic pusher O160, the time being 10 min to 20 min;

25 (5) after completion of the degumming procedure, retaining a grease mixture in the device for 60 min to 120 min;

(6) discharging the water with micelle for otherwise treatment, while inputting the biolipid from which colloid has been removed into a bio-oil normal-temperature grease exchange device O161;

30 (7) when a liquid level of the grease input in the bio-oil normal-temperature grease exchange device O161 reaches a liquid level set in a production process (which usually exceeds an ultrasonic converter), stopping the inputting, beginning to start an air-blowing pipe O171 at the

bottom of the bio-oil normal-temperature grease exchange device O161, to make the liquid level strongly roll and float, now opening a feeding port O169, adding a solid catalyst and methanol, dosage of the solid catalyst being 1.5%-3.5% of the mass of the biolipid, and dosage of the methanol being 3%-8% of the mass of the biolipid, and adding a cosolvent after adding the methanol, to strengthen solublizing performance of biolipid and methanol to form a homogeneous system, where the cosolvent is selected as a mixture of methanol and ethanol in any proportion, the adding quantity of the cosolvent is 0.5%-2% of the mass of the biolipid, and in this embodiment, the cosolvent further includes butanol whose adding quantity is 0.5% of the mass of the biolipid;

(8) continuously stirring the mixture for 10 min to 15 min by using a stirrer, and adding a solid metal alkali catalyst (which is a catalyst with Model of South China 713# produced by South China Renewable Resources (Zhongshan) Co., LTD. in this embodiment) the adding quantity being 3%-4.5% of the mass of the biolipid, where the solid anionic metal alkali catalyst is characterized by taking reagent activated carbon and nano particles of cyclic-structure silicate minerals of aluminum, sodium, iron and lithium as a core, at first, it is measured that the core that can release negative ions of 12000 per cubic centimeter is qualified, then the core is immersed in a mixed liquid of alkaline silica sol and alumina sol as well as lithium hydride, after the immersed core is removed, the core is kept at a constant temperature for one hour under a temperature condition of 650-720°C, after cooling, upon screening and refinement, the core is made into a hybrid charged solid anionic metal alkali catalyst with polarity externally wrapped with silicon, aluminum, and lithium mesh skeleton mediums then the carrier is immersed in a KNO_3 solution, and after the carrier is removed, the carrier is dried in a drying device at 110°C to obtain an alkaline catalyst containing 15%-25% of KNO_3 ;

(9) after an adjuvant required is added, closing the feeding port O169, opening a material circulation delivery pump, and opening an ultrasonic generator O162, where the initial frequency of the ultrasonic generator O162 is 25 KHZ, the time is 1 min, then the initial frequency gradually increases to 30 KHZ, the time is 30 min to 40 min, and the reaction temperature is 25°C-35°C;

(10) after grease exchange of the grease is completed in the bio-oil normal-temperature grease exchange device O161, inputting the biolipid mixture to a liquid separation device O172 for standing and layering, where the upper layer is a mixed liquid of methanol and glycerol, and

the lower layer is crude biodiesel; and

(11) first disposing and opening the liquid separation device at a lower liquid outlet, conveying the crude biodiesel into a filtering device O173, obtaining a refined biodiesel after filtering and recycling a solid catalyst, which is recyclable after regeneration. The biodiesel is input into the storage container for further refinement, while a methanol and glycerol mixture is used otherwise.

The biodiesel manufacturing system in the present invention can automatically separate solid, moisture and the like contained in the kitchen garbage, and then further converts the grease contained to biodiesel for use, the device structure is simple, the treatment process saves energy, and the manufacturing cost is low.

P. Emulsified biodiesel manufacturing apparatus:

In this embodiment, the distillation-free biodiesel production apparatus produces crude biodiesel, and the crude biodiesel is further emulsified by the emulsified biodiesel manufacturing apparatus into emulsified biodiesel; referring to FIG. 32, the emulsified biodiesel manufacturing apparatus in the present invention is mainly a shell P174, in this embodiment, an upper portion of the shell P174 is cylindrical, a lower portion is semi-circular, the shell P174 contains a vertical stirrer P175, and a power source drives the vertical stirrer P175 to rotate; in this embodiment, the power source includes a motor P176 and a variable speed device P177, the variable speed device P177 is fixedly installed to the top of the shell P174, the motor P176 is disposed above the variable speed device P177, and the motor P176 drives the vertical stirrer P175 to rotate through the variable speed device P177. In this embodiment, the semi-circular body at the bottom of the shell P174 is provided with a rotation shaft support bracket P180, used for supporting a rotation shaft of the vertical stirrer P175. In this embodiment, a suitable position of a central shaft of the vertical stirrer P175 is provided with several paddle-type flat stirring impellers P178, which may also be replaced with paddle-type blade impellers, at the same time, a lower portion of the central shaft of the vertical stirrer P175 is provided with a turbine or disc curved blade P179, several liquid guide vanes P183 (disposed inside the shell P174, which functions to disturb flow) are installed around the cylindrical inner walls of the shell P174, the top of the shell P174 is provided with a plurality of feeding ports P181, and each feeding port P181 is connected with a quantitative charging device P182 through a pipeline; in this embodiment, the quantitative charging devices P182 are used for automatically loading various additives. The top of the shell

P174 is further provided with an oxygen-enriched water intake pipeline P186 and penetrates into the shell P174 to connect an oxygen-enriched water atomization nozzle P185, the intake pipeline P186 is connected with a high-pressure pump P187, O₃ gas output by an ozone generator P188, after entering into a strong water-gas mixer P189 to be mixed with water, is conveyed by a pipeline P190 to enter into an oxygen-enriched water storage tank P191, and a water outlet of the oxygen-enriched water storage tank P191 is connected with the high-pressure pump P187. One side of a middle-upper portion of the shell P174 is provided with an oil feeding port P192, one end thereof penetrates into the shell through a pipeline, the other end is connected to the oil pump, at the same time, the lower part of the shell P174 is further provided with a finished-product discharge port P184, the obtained emulsified biodiesel is output through the discharge port P184 and then conveyed to an oil depot through a pipeline and a pump, and the oxygen-enriched micro-emulsified biodiesel produced in the present invention is used in various heat-source fuels.

A method for manufacturing emulsified biodiesel in the present invention, i.e., a method for operating the apparatus in the present invention is as follows: the present invention mainly further processes biodiesel obtained from grease through a production process, and the biodiesel is refined with an oxygen-enriched micro-emulsified diesel process.

The method for manufacturing emulsified biodiesel in the present invention includes the following steps:

(1) after measurement on water content of the biodiesel, inputting crude biodiesel into the micro-emulsified biodiesel manufacturing apparatus, starting a stirring system, adding 30%-80% of National III standard diesel, and then stirring the mixture for 5 min;

(2) adding a hydrophilic agent, where, for the hydrophilic agent, a cationic surfactant and non-ionic surfactant associated compound material is selected as a composite active agent, in this embodiment, the two kinds of surfactants are triethanolamine, hexahydroaniline, cetrimonium bromide and ammonia, the mixing proportion is that the cationic surfactant is 50% and the non-ionic surfactant is 50%, the hydrophilic agent is for degrading mask rigidity, increasing liquidity and reducing bending energy required by microemulsion formation, is easy to form hair emulsion, and after the hydrophilic agent is added, the mixture is stirred for 1 min to 15 min;

(3) adding the butanol as an intermediate, where, in this embodiment, the butanol can be used as a cosurfactant, and continuously stirring the mixture directly for 15 min, where, during the stirring, a vertical stirrer 2 stirs the mixture at a rotating speed of 100 r/min-130 r/m;

(4) adding isopentane as a spontaneous combustion temperature regulator, where, in this embodiment, after isopentane is mixed with the liquid in (1)-(3), the mixture is stirred for 5 min; and

(5) adding oxygen-enriched water and Octadec-cis-9-enoic acid, where weight of the oxygen-enriched water depends on product requirements, which ranges from 1% to 20% of the total product weight, in this embodiment, O_3 is supplied by using an ozone generator, gas flow conveyed by ozone is 250 ml/min, the gas, after being mixed with the water in the strong water-gas mixer, is input to the oxygen-enriched water storage tank to be naturally decomposed into rich oxygen in water, the natural decomposition time is 30 min, the content of dissolved oxygen in water reaches 27-35%, to form oxygen-enriched water, usually, the adding quantity of the oxygen-enriched water is 10%-20% of the total weight, after the oxygen-enriched water is added, the mixture is stirred for 15 min, the rotating speed is adjusted as 170 r/min-200 r/min, and then the Octadec-cis-9-enoic acid of which the acid value of the setting quantity is 200 in the formula is added as an emulsifier, and in this embodiment, the adding quantity of the Octadec-cis-9-enoic acid is 70%-90% of the weight of the oxygen-enriched water added, the mixture is continuously stirred by the stirring device until the mixture becomes clear, at this time, the rotating speed of the stirrer is adjusted as 280-340 r/min, the mixture generally needs to be continuously stirred for 40-60 min, and after standing for a certain time, a finished product is obtained after the emulsified oil is observed as clean and transparent without layering. Now, the whole oxygen-enriched micro-emulsified biodiesel refinement procedure has been completed, the product thus produced can have an advantage of not degenerating under a temperature condition of 85°C and a storage period of 240 days, the manufactured micro-emulsified diesel containing 20% of the oxygen-enriched water and containing more than 30% of the national standard III petrochemical diesel can be used for making heat-source fuels, and the manufactured micro-emulsified diesel containing 10% of the oxygen-enriched water and containing more than 80% of the national standard III petrochemical diesel can be used for cleaning automotive diesel.

Through the present invention, the biodiesel refined from the kitchen garbage can be further refined into oxygen-enriched micro-emulsified biodiesel, and application ranges thereof can be expanded.

Q. Rapid sewage recycling apparatus:

The present invention is further provided with a rapid sewage recycling apparatus, which

concentratedly and rapidly treats wastewater produce in all the production processes in the present invention into qualified industrial reused water, to be used as production water of kitchen garbage resource treatment. Referring to FIG. 33, FIG. 34, FIG. 35 and FIG. 36, in this embodiment, the rapid sewage recycling apparatus first lets sewage enter into a sewage filtering

5 basin Q185, sundries in the sewage are isolated by disposed a sundries barrier Q186 in the sewage filtering basin Q185, the sundries barrier Q186 is internally provided with an anti-fouling recoil device Q187, the sewage, after passing through the sundries barrier Q186, is input to a scorching blanket sewage treatment device Q188 through a water pump, the device has an inner cavity Q189 and an enclosure Q190, the sewage passes through a pressure pump and enters into

10 the top of the enclosure, a water pipe is further opened with an escape pipe port Q191, the top of the enclosure is provided with a plurality of atomizing ejection heads Q192 in communication with an intake pipe, below the atomizing ejection heads Q192 is a scorching blanket Q193 dislocated up and down (that is, a two-layered structure, including an upper layer and a lower layer, the two layers are dislocated), a surface of the scorching blanket Q193 is provided with a

15 plurality of running water shallow grooves Q194 (the running water shallow grooves Q194 are crisscrossed, to slow the speed at which the water flows, thereby preventing generation of scale), a heat source of the scorching blanket Q193 is heat transferred by a heat-conducting oil pipeline Q195, the temperature on the blanket surface is controlled between 90°C and 120°C, the bottom below the scorching blanket Q193 is provided with a micro solid precipitation zone Q196 and a

20 sewage outlet Q197 located at the bottom of the micro solid precipitation zone Q196, above the sewage outlet Q197 is an anti-fouling recoil damper Q198, below the scorching blanket Q193 is a high-temperature-resistant cushion layer Q199 for supporting the scorching blanket Q193, non-atomized water enters the bottom of the inner cavity of the device through a waterway between the scorching blanket Q193 and the high-temperature-resistant cushion layer Q199, the

25 top of the enclosure Q190 is opened with an automatic suction and discharge valve Q200, the enclosure Q190 is opened with a hot steam collecting port Q201 above the scorching blanket Q193, the hot steam collecting port Q201 is connected with a heat exchanger Q202 through a pipeline, hot steam is converted to water to flow to a collecting basin Q203 and joins the water discharged from a lower side of the enclosure, the water of the collecting basin Q203 is pumped

30 from the basin into an advanced oxidation system Q204, the system is an ozone-water mixer, is a sleeve structure and has an inner cavity and an outer cavity, the inner cavity is a gas-water

reaction chamber Q205, the outer cavity is a gas-water circular reaction cushion chamber Q206, the inner cavity has an inner shell, the outer cavity has an outer shell, the top of the inner shell is installed with an automatic exhaust valve Q207 and a liquid level control online monitor Q208 for monitoring a liquid level, an end portion of an inlet pipe at a water inlet of the inner cavity of the ozone-water mixer is provided with an activated carbon reaction ball Q209, the reaction ball Q209 is used for speeding up conversion of ozone to hydroxyl radical in the water, to achieve that a speed at which the ozone degrades organic matter in the water is faster, an upper portion of the activated carbon reaction ball Q209 is impermeable, and a lower portion is a reticular water outlet Q210, the ball contains granular activated carbon, and the volume of the granular activated carbon accounts for 15%-95% of the volume of the inner cavity of the reaction ball. The gas-water mixture in the inner cavity is output to the outer cavity through a connecting pipeline Q213 of the inner and outer cavities of the reactor and re-enters into the inner cavity after being input to the gas-water mixer by a water pump Q211 disposed outside the advanced oxidization reactor to be supplemented with ozone, and the gas-water mixture makes such circular movement within a time period of 2-5 min. After the reaction of the gas-water mixture reaches the set time, the gas-water mixture is discharged by a water outlet Q212 disposed at the bottom of the inner cavity, while residual sludge is discharged by a sewage outlet Q212 at the bottom of the reactor, the sewage outlet is connected with a sewage outlet Q212 of the housing, the sewage outlet of the inner cavity is further installed with an anti-recoil damper Q214, the gas-water mixer Q215 is disposed on one position of a circulating pipeline in the advanced oxidization reactor, the mixer is tee joint, two ends are in communication with circulating water, a port in the middle is connected with a waterproof check valve Q216, the other interface of the waterproof check valve Q216 is in communication with a gas pipeline of an ozone generator and leads to a gas, water and material strong mixer Q217, the water after advanced gasification treatment enters into a transit pool Q218, the water enters into a composite filtering device Q220 after being input by the water pump into an activated carbon filter fixed bed Q219, the filtering manner of the device is reverse filtering from below through pressurization, the water after preliminary filtering enters into the composite filtering device Q220 through the water pump and the pipeline, the device Q220 is composed of multiple groups of filtering tanks Q221, the filtering tanks Q221 each are provided with more than one vertical filter column Q222, a water outlet hole is opened at a position half the length of each vertical filter column Q222, the bottom of each of the vertical filter columns

Q222 is provided with a strainer with 80-140 meshes, the working pressure is 0-5-1 mpa, the top of each of the filtering tanks Q221 has a water inlet Q223 and a pressurized pipe Q224, the tank body is divided into two layers, a sealed partition plate Q225 is installed at a position between tanks, the tank in each layer is provided with a filter column carrier Q226, orifices matching the diameter of the filter columns Q222 are opened on the carrier Q226, the number of the orifices is the same as the number of the filter columns Q222 to be installed, leakproof seals Q227 are added at positions where edges of the orifices of the carrier Q226 are in contact with the filter columns Q222, one side of an upper portion of the upper tank body is installed with an influent diversion pipeline Q228, the influent diversion pipeline Q228 leads to an upper portion of the lower tank body, one side of a lower portion of the upper tank body is installed with an effluent diversion pipeline Q229, the effluent diversion pipeline Q229 leads to a lower portion of the lower tank body, and one side of the upper and lower layers of the tank body is respectively installed with an exhaust port Q230. Each filter column Q222 contains two solid adsorbents, the lower layer is activated carbon Q231, the upper layer is a hybrid charged adsorbent Q232, the two adsorbents are randomly bonded, the water outlet after water filtering is disposed on one side Q233 of the bottom head of the composite filtering device, a central position of the bottom head is provided with a precipitate discharge port Q234, the water, after being treated by the composite filtering device, is clear, haze-free and free from extraneous odor and has no heavy metal ions, at the same time, ozone gas and the generated strong oxidant have been basically removed, the clean water, after being treated by the composite filtering device, directly enters into an ultraviolet sterilizer Q235 for final treatment on the water, and the qualified water obtained acts upon production water. In this embodiment, a method for operating the rapid sewage recycling apparatus is as follows: all the sewage in the entire process of kitchen garbage resource treatment concentratedly enters into a sewage collecting basin through discharge pipelines, sundries contained in the sewage are isolated by a barrier, while the water enters into a scorching blanket sewage treatment device, when sewage is sprayed down to contact a scorching blanket, the water instantly contacts the heat of the high-temperature plate in shallow grooves, microbes basically die, hot water steam fog rises up, the rising hot fog steam recovers to liquid water after being imported to a heat exchanger by a hot steam collection port, some water with micro particles and dead microorganisms that does not form hot water steam enters into a micro solid precipitation zone at the bottom of the apparatus through flowing-running water shallow grooves on the

surface of the scorching blanket and is charged from a sewage outlet at the bottom of the micro solid precipitation zone, while clean liquid is discharged from a water outlet on an upper portion of the micro solid precipitation zone, and is input to an advanced oxidation reaction device through a pipeline after joining the water liquefied by the heat exchanger, at first, water liquid
 5 enters into a strong gas-water mixer to be strongly mixed with ozone gas provided by the ozone generator, then enters into the activated carbon reaction ball in the ozone-water reactor, and then enters into a gas-water mixed water circulation system of the reactor through a lower water net of the reaction ball, the water pump continuously makes the water circulate in the inner cavity and the outer cavity to act upon an advanced oxidization reaction, the reaction time is 2-5 min, the
 10 concentration of in-water ozone is 1-5 g/T, in the reciprocating circular reaction of the whole section, the in-water ozone triggers a chain reaction in the water under the action of activated carbon, and speeds up conversion of ozone to hydroxyl radical, which is similar to the advanced oxidization process of O_3/H_2O_2 or O_3/UV , and the residue in a precipitation layer of the lower portion of the reactor is periodically discharged through a sewage outlet. During the reaction,
 15 some ozone gas may overflow, enters into an exhaust pipe disposed at the top of the reactor, and then enters into an ozone destroyer and a gas filter, and the discharged ozone-containing gas is inactivated and filtered, to prevent ozone and carbon dioxide from polluting the atmosphere. The water after the advanced oxidization process first enters into an activated carbon fixed bed for reverse filtering and then is output to a composite filtering device through a pressurized control
 20 valve, the water first passes through a filtering layer of a hybrid charged adsorbent, each solid of the adsorbent uses a non-polar adsorbent as a core, an outer layer is wrapped with silica alumina microporous skeleton polar combined adsorbent, when the water passes through a hybrid charged adsorption layer, the adsorbent greatly and quickly adsorbs various inorganic and organic matter hidden in the water and heavy metal ions in the water, after the water after treatment by the
 25 hybrid charged adsorbent naturally transmits the activated carbon adsorption layer for fine treatment, the water enters into an ultraviolet sterilizer to finally treat the water, ultraviolet radiation is used in the sterilizer, the intensity is $2600-3000\text{ UW/cm}^2$, the wavelength is 235-258 nm, the time of irradiation on the water is 1-4 s, and after completion of treatment in all the processes, the water enters into a water storage container to serve as production water of kitchen
 30 garbage resource treatment.

R. Hybrid charged adsorbent production apparatus:

In the present invention, the sludge attached to the kitchen garbage is treated through a hybrid charged adsorbent production apparatus; in this embodiment, the hybrid charged adsorbent production apparatus can deal with resourceful utilization of sludge produced in necessary attachments of the kitchen garbage and domestic sludge in the plant, is the best choice of non-transfer treatment on environmentally treated residue, and is also implementation and application of a method for treating sewage with sewage. A method for producing the hybrid charged adsorbent mainly uses individual microorganisms surviving in the sludge or dead individual microorganisms as hole modules to manufacture a solid adsorbent with respect to a key problem that alternative utilization of the microorganisms surviving in the sludge has a complicated procedure and high technical requirements, and in a natural drying condition, only metabolic treatment of microbial cells is stagnant but not dies, which may revive once humidity is given. Referring to FIG. 37, FIG. 38 and FIG. 39, in this embodiment, the hybrid charged adsorbent production apparatus first carries out artificial forced inactivation on the sludge through an artificial inactivator R236, then makes the sludge after forced inactivation treatment pass through an automatic conveying device, and sends the sludge into a curing device R237 for a curing or partial curing procedure, after the sludge completes a reaction with an additive in the curing device, the automatic conveying device conveys the cured or partially cured sludge particles into a sludge propeller R238, the sludge is pushed into an anaerobic pyrolysis reaction kettle R239, the sludge propeller is installed onto a guide rail, during feeding, an outlet thereof is connected to a feeding port of the reaction kettle, if the feeding is completed, the propeller can retreat on its own, at this time, the discharge port is disconnected from the feeding port of the reaction kettle, and the feeding port of the reaction kettle is sealed and closed. The housing of the reaction kettle is a furnace body, the reaction kettle is horizontally installed, the other end coaxial with the feeding port is opened with a vapor outlet, the vapor outlet is controlled by a one-way automatic valve, when the reaction kettle is at the set pressure, the valve is opened automatically, vapor enters into a water-sealed combustible gas collection treatment apparatus R240, when combustible gas rises into a heat exchanger through a water-sealed interface, a produced liquid that cannot be liquefied is combustible gas and is conveyed back to the pipeline to return to a pyrolysis furnace as a heat-source fuel to be recycled, and hot smoke discharged by a cracking furnace and hot smoke produced by other devices of kitchen garbage resource treatment are jointly treated by a fuel cracking furnace tail gas treatment system R241. Moisture in gaps of the

sludge after completion of anaerobic thermalization has been forced out to become water vapor, and can be discharged with the combustible gas. After completion within a set pyrolysis time, dead bodies and remaining of microorganisms contained in the sludge in the reaction kettle are coked, the porosity of the sludge is consolidated, at this time, the discharge port of the reaction
5 kettle is opened, the automatic discharge helical ribbon in the reaction kettle is used to unload the sludge, which is transferred to a pipeline-type helical ribbon conveyor to be conveyed to an aging warehouse R242 for natural aging for 12-48 h, microporous sludge particles after natural aging are put in an acidizing device R243, the acidizing time is 12-18 h, so as to function to remove the dead bodies of microorganisms which have been coked, to function to remove metallic impurity
10 ions, and to expose cavity structure skeleton of the particles, making hydrogen ions replace calcium ions in a curing agent, the sludge particles after the acidizing procedure is sent into a hot water rinse pool R244 for rinsing, and after its PH value is adjusted to 6.5-8, a conveying device makes the rinsed particle materials enter into a hot steam bed R245 for preliminary physical activation, where the activation time is 1.5-2.5 h. the microporous particles after the activation is
15 put into a high-temperature anaerobic activation furnace R246 for high-temperature activation for 1-4 h, the heating rate is controlled as 15-30 °C/min, and the tail gas of the activation furnace is discharged to a tail gas environmental-protection treatment system for treatment. After the high-temperature activation procedure is completed and the microporous particles are removed and naturally cooled, finished products after screening are non-polar microporous adsorbents,
20 which become the core of the hybrid charged adsorbent. At this time, after a mixed liquid of acid aluminum and a silicon solution is used to be fully mixed with the non-polar microporous adsorbents, the mixture enters into a high-temperature furnace for treatment, to be kept constant at the temperature of 650°C-700°C for 1 h, and after the materials are removed, the materials are crushed into a hybrid charged adsorbent, i.e., a compound body of a non-polar adsorbent which is
25 the core of nano-sized pores and pore ducts and a super-microporous hole adsorbent whose external layer is loaded with a silicon aluminum mesh skeleton medium with polarity, which can be used for treating the sludge during kitchen garbage resource treatment. In this embodiment, the hybrid charged adsorbent production apparatus and a manufacturing method thereof are as follows: carrying out centralized treatment on residual sludge produced during treatment and
30 recycling of sewage produced in the whole process of the kitchen garbage resource treatment and domestic sewage in plants, where many kinds of microorganisms and dead bodies of

microorganisms naturally survive in the sludge on which the centralized treatment is carried out, and there are hundreds of millions of the microorganisms. In order to well use the microorganism individual and a complicated bacterial structure thereof as a pore-forming agent, at first, the sludge is input into an artificial forced inactivation device, the sludge is in reverse circulation
5 contact with ozone from top to bottom through a vertical circulating conveying helical ribbon in the device, the reaction time is 5-20 min, and the volume of the ozone is 12 g/kg. After the artificial forced inactivation procedure is completed, the sludge enters into a primary curing device through an automatic conveying system, the device is composed of a horizontal multi-layered helical ribbon, helical ribbons rotate counterclockwise and clockwise in pair, the
10 sludge is lifted, torn and rolled for strong cutting, and a quota feeder adds an additive to be mixed with the sludge for 20-25 min; at this time, the temperature of the sludge has naturally risen to about 60°C, the sludge is discharged from an unloading port in the form of large and small particles and is constantly sent into a sludge propeller through a conveyor, and the propeller constantly sends the sludge into a pyrolysis reaction kettle, and when the sludge sent reaches the
15 set number, the feeding is stopped, and the sludge propeller automatically retreats through the guide rail to leave the feeding port of the reaction kettle. At this time, the seal cover of the feeding port of the reaction kettle is sealed and closed, the sludge is in an anaerobic running state in the kettle, the temperature rising speed in the kettle is 30° C/min, the final temperature is 220°C, the sludge is kept at a constant temperature for 1 h, the sludge will produce water vapor
20 and combustible gas during pyrolysis in the kettle, when the set pressure is reached in the kettle, the check valve in the rear end of the reaction kettle is automatically opened, a compound mixture of the water vapor and the combustible gas is pressed into a water-sealed safety device, and the water-containing gas enters into the heat exchanger; at this time, the produced gas that cannot be liquefied is combustible gas and is conveyed back to the pyrolysis furnace through the
25 pipeline, to be used as a supplementary raw material of the heat source. After the sludge in the kettle is cooled, the sludge is discharged from a discharge port on a side of the kettle through an automatic discharge helical ribbon disposed in the kettle, and is sent into an aging warehouse through the conveying device to be naturally aged for 12-48 h, then the sludge that has been naturally aged is thrown into an acidizing device, and sulfuric acid liquid whose concentration is
30 20% is used to statically immerse the sludge for 12 h, to function to remove the coked dead bodies and remaining of microorganisms and remove metallic impurity ions, making hydrogen

ions replace calcium ions in a curing agent. At this time, the sludge has exposed cavity structure skeleton of the particles, the sludge particles after acidification treatment is put into an 80°C hot water rinsing device for rinsing, its PH value is adjusted, then the particles enter into a hot steam bed for physical activation, the flow of the hot steam is 250 mL/min, the activation time is 1.5 h, the sludge particles that have been physically activated are input into a high temperature resistance furnace, the heating rate is controlled as 20 °C/min, the activation temperature in the absence of air is 650°C-700°C, and the constant-temperature activation time is 1 h-1.5 h. after the material is removed from the high temperature activation furnace, that is, a non-polar adsorbent has been made, it is used as the core of the hybrid charged adsorbent. Further, the non-polar adsorbent is processed into particles with a certain size, it is evenly mixed with an acid aluminum solution and a silicon solution, during mixing, the mixing weight ratio of the non-polar adsorbent, the acid aluminum solution and the silicon solution is 20:20:10, the mixed material is put into the high temperature furnace to be treated constantly for 1 h at the treatment temperature of 680°C-720°C, and after cooling, the hybrid charged adsorbent is made.

S. Tail gas environmental-protection treatment apparatus:

In the present invention, a tail gas environmental-protection treatment apparatus further carries out centralized treatment on flue gas, hot flue gas, dust and the like produced in various processes of the kitchen garbage resource treatment, to ensure that the air discharge port has no pungent odor emissions, no harmful and toxic gas emissions, no malodorous gas emissions, no micro particle emissions, no emissions at room temperature and so on. Referring to FIG. 40, FIG. 41, FIG. 42, FIG. 43 and FIG. 44, the tail gas environmental-protection treatment apparatus in the present invention mainly includes a tail gas buffer device, an air inlet, a preliminary purification pipeline, a preliminary gas, water and solid separator S257, a twin-tower rotary spray system S259, a cooling tower S269 and a flue gas emission device S264; in this embodiment, the starting point of the whole system is a tail gas buffer S247, the housing of the tail gas buffer S247 is cylindrical, the bottom is conical, an upper side in the housing of the tail gas buffer S247 is provided with a plurality of air inlets S272, an air buffer chamber contains water, a top end face formed by the water is a water interface S248, the bottom of the housing of the tail gas buffer S247 is provided with a sewage outlet S249, used for discharging sewage, the sewage outlet S249 is communicated to the interior of a circulating water storage tank S258, and the circulating water storage tank is connected with a water circulation pipeline 4, which functions to supplement the

water inside the buffer, to ensure the set interface position of the water and water cooling. In this embodiment, the tail gas buffer S247 is further internally installed with an online liquid level monitor S25, used for real-time monitoring a water interface height inside the tail gas buffer S247. An outer side of the tail gas buffer S247 is provided with a circulating water storage tank S258, the circulating water storage tank S258 is communicated into an ash pond S270 through a pipe section, one side of the sewage outlet S249 in the tail gas buffer S247 is in communication with an upper portion of the circulating water storage tank S258 through a pipe section S275, the pipe section is provided thereon with a water valve S250, the upper portion of the circulating water storage tank S258 is connected with an automatic circulating make-up pump S252 through a pipe section, a water outlet of the automatic circulating make-up pump S252 is connected to the middle portion of the tail gas buffer S247, and circulating water is discharged into the tail gas buffer S247 after passing through a water spray nozzle 26 in the tail gas buffer. A side of the upper portion of the tail gas buffer S247 is provided with a primary flue gas treatment pipeline S253; in this embodiment, several anion charged ceramics S254 are staggered on upper, left and right sides in the primary flue gas treatment pipeline S253, the anion charged ceramics can naturally release negative ions without power on, behind each of the anion charged ceramics S254 is a high-speed spray nozzle S255 and a concave obtuse-angle diversion plate S256, the high-speed spray nozzle S255 forms multiple layers of water curtains in the rear end of the anion charged ceramic S254, which is an anion high-speed spray zone, while the obtuse-angle diversion plate functions to produce an instantaneous airflow trajectory direction change in the high-speed flue gas, so that the movement direction of dust particles with great density does not flow with the gas direction. In this embodiment, the primary flue gas treatment pipeline S253 is disposed obliquely, the front end of the primary flue gas treatment pipeline S253 is connected with the tail gas buffer S247, the rear end of the primary flue gas treatment pipeline S253 is connected with the preliminary gas, water and solid separator S257, and below the preliminary gas, water and solid separator S257 is a carbon slag filter S271, used for filtering out carbon slag in precipitate of the preliminary gas, water and solid separator S257. The preliminary gas, water and solid separator S257 is connected into the twin-tower rotary spray system S259 through a water-gas mixing pipeline. When the flue gas enters into the tail gas buffer S247, the flue gas is directly introduced to a position that is 10-15 cm below the water-sealed interface S248 through a pipeline, and due to the action of positive pressure of the air inlet, the flue gas enters into the

primary flue gas treatment pipeline S253 after leaping out of the water-sealed interface S248. When hot flow carrying carbon particles or other solid particles crashes into the negative ion high speed spray zone at a high speed, an instantaneous airflow trajectory direction change is produced under the action of the concave obtuse-angle diversion plate S256, especially by use of

5 neutralization of negatively charged ions and positive ions carried in carbon dust and disturbance of cold water from high-speed water spraying, moreover, the dust particles have the characteristics of great density, do not flow with the gas direction, but enter into the preliminary gas, water and solid separator S257, and the water carrying carbon particles or other solid particles is sent into a next-stage water-gas mixing pipeline, but the gas is introduced into the

10 twin-tower rotary spray system S259 through an induced draft fan device. In this embodiment, the twin-tower rotary spray system S259 includes two vertical treating columns disposed side by side, the flue gas first enters into one treating column, the gas enters into the lower portion of the other tower from top to bottom, the gas then runs from bottom to up in the lower portion of the tower, at the same time, a rotary high-pressure nozzle S260 installed around the periphery of the

15 two towers sprays water to the gas, to clean the gas clockwise and counterclockwise, the two towers are each provided with a water outlet S261 at the bottom thereof, the gas flows into the water-gas mixing pipeline from the water outlet S261, and the cleaned hot flue gas has already formed hot steam to be introduced into the water-gas mixing pipeline S263 through an air-inducing device S262 installed outside the tower; in this embodiment, the water-gas mixing

20 pipeline S263 is horizontally installed slightly obliquely and connected with the air-inducing device, one end of the water-gas mixing pipeline S263 is higher while the other end is lower, and the water discharged from the water outlet in the lower portion of the twin-tower rotary spray system S259 and the hot air exported from the induced draft fan directly enter into the water-gas mixing pipeline S263 to flow to the lower end and enter into a flue gas emission device S264.

25 Referring to FIG. 3, in this embodiment, the flue gas emission device S264 includes three parts, the lower part is a tank S265, a heat exchanger S266 is connected with the top of the tank S265, and a gas discharge pipeline S267 is disposed in the upper portion of the heat exchanger, where the lower tank S265 is connected with the water outlet of the water-gas mixing pipeline S263, and one side of the lower tank S265 is provided with a wet-slag discharge port and a water outlet

30 S268. In addition, the circulating water in the heat exchanger S266 is provided by a cooling tower S269, the cooling tower S269 draws water in the ash pond S270 through a pump and conveys the

water to the heat exchanger S266 through a pipeline, to cool the hot steam in the heat exchanger S266, after the steam enters into the heat exchanger S266, the steam is cooled and liquefied into water to fall down, enters into the lower tank S265, and is discharged via the water outlet S268, dry clean gas that cannot be liquefied is discharged via the discharge port, and the gas discharge temperature now is not higher than 38°C.

The main point of the tail gas environmental-protection treatment apparatus in the present invention lies in adding a tail gas buffer apparatus to the front end of the tail gas treatment system and its structural design, reference can be made to the prior Chinese patent of the application whose application number is 201010168879.2 and publication number is CN101816874A, for the structures of other parts of the tail gas environmental-protection treatment apparatus in the present invention, and the structure of the patent is substantially the same as the tail gas environmental-protection treatment apparatus in the present invention.

The tail gas environmental-protection treatment apparatus in the present invention can carry out centralized treatment on flue gas, hot flue gas, dust and the like produced in various processes of the kitchen garbage resource treatment, to ensure that the air discharge port has no pungent odor emissions, no harmful and toxic gas emissions, no malodorous gas emissions, no micro particle emissions, no emissions at room temperature and so on. The tail gas environmental-protection treatment apparatus in the present invention can clear away carbon dust particles contained in the tail gas while desulfurizing the tail gas and reducing carbon dioxide emissions, to achieve no pollution and almost no white smoke emissions, which effectively changes the previous defect that the pipeline is easy to damage as weak acid produced during tail gas emission from the gas furnace tail corrodes the pipeline, thereby guaranteeing the service life of the system. The tail gas environmental-protection treatment apparatus in the present invention can reduce the temperature of the tail gas to have substantially the same emission as the atmosphere, thus also guaranteeing the service life of the system.

T. Plasma photocatalytic negative ion air deodorization and sterilization apparatus:

In the present invention, odors produced in the whole treatment process are treated further through a plasma photocatalytic negative ion air deodorization and sterilization apparatus, and the plasma photocatalytic negative ion air deodorization and sterilization apparatus is applied to centralized collection and treatment on odors overflowing from kitchen garbage treatment and the air in the whole plant, continuously and efficiently eliminates harmful microbes for the collected

air, kills bacteria and viruses, and degrades odors in the air. Referring to FIG. 45 and FIG. 46, air inlets T270 of the plasma photocatalytic negative ion air deodorization and sterilization apparatus in the present invention are installed around various kitchen garbage collection pools, to ensure prevention of diffusion of pollutants, and on various production sections where odors may possibly overflow and two sides of the upper portion of the production workshop, a rear end of each air inlet T270 is installed with an automatic slide gate valve T271, the automatic slide gate valve T271 is opened and closed under the control of a pneumatic device or an electric device, the automatic slide gate valve T271 is used for preventing pollution sources from diffusing when an air treatment device fails and stops for repair, a rear end of the automatic slide gate valve T271 is connected with an air delivery pipeline T272, and the air delivery pipeline T272 is internally provided with an anion corrugated plate T273 (in this embodiment, which is formed by coating plastic materials used by an energy plastic loader to two sides of a steel plate and then bending the steel plate into a corrugated one); in this embodiment, a plurality of laminated first anion corrugated plates T273 releasing 15000 per cubic centimeter (designed according to pipelines and the discharge quantity of air) are installed to a front end at a distance of 30 cm-80 cm from the inlet end in the air delivery pipeline T272, the anion corrugated plates T273 herein are installed horizontally, and rear ends of the anion corrugated plates installed horizontally are provided with vertically-installed laminated anion corrugated plates; in this embodiment, a section of horizontal anion corrugated plates coordinate with a section of vertical anion corrugated plates, and during specific embodiment, many sections may be set according to actual demands. In this embodiment, each section of anion corrugated plates include more than one plates, and the plates are at a distance of 10 mm. The tail end of the air delivery pipeline T272 is connected with a photocatalytic main processor T274, after the air is treated by a negative ion zone, an induced draft fan installed in the photocatalytic main processor T274 guides the air to the tail end of the air supply pipeline, and then the air enters into the photocatalytic main processor T274. In this embodiment, the photocatalytic main processor T274 is internally provided with an air channel, the air channel is a Z-shaped air channel, inside the Z-shaped air channel are Z-shaped guide plates T275, the Z-shaped guide plates T275 are all mirror aluminum alloy plates, used for reflecting light emitted by light sources of an ultraviolet light tube T276 into the Z-shaped air channel, the Z-shaped air channel contains several ultraviolet light tubes T276 (horizontally installed) with a light-emitting wavelength of 253 nm-258 nm, and the back side of each

ultraviolet light tube T276 is installed with a smooth reflex plate T277, used for reflecting light sources emitted by the ultraviolet light tube T276 into the air channel, to play its role to the greatest extent. In this embodiment, a honeycomb-like titanium dioxide photocatalytic touch plate T278 is installed to a position at a distance of 10 cm-20 cm from the rear side of the ultraviolet light tube T276, the size and shape of the photocatalytic touch plate T278 are identical with those of the cross section of the Z-shaped air channel, which can be just blocked in the Z-shaped air channel, the photocatalytic touch plate T278 has a thickness of 1 cm-10 cm, with several holes opened thereon, several plasma generators T283 are installed to corner positions of the Z-shaped air channel of the photocatalytic main processor T274, the discharging power of the plasma generator is 2.5 WH/m^3 , the tail end of the Z-shaped air channel in the photocatalytic main processor T274 is connected with an air discharge pipeline T279, the tail end inside the air discharge pipeline T279 is installed with a laminated second anion corrugated plate T280 which can release negative ions of 15000 per cubic centimeter, the structure of the second anion corrugated plate T280 is the same as that of the first anion corrugated plate T273, and the air enters into an activated carbon air filter T281 to be treated and then discharged after passing through the laminated second anion corrugated plate T280; in this embodiment, the activated carbon air filter T281 is provided with activated carbon in the housing, to carry out final activated carbon adsorption on the gas.

A method for operating the plasma photocatalytic negative ion air deodorization and sterilization apparatus in the present invention is as follows: when kitchen garbage enters into a collection pool, an air-inducing device in the present invention is started, automatic slide gate valves T271 in the front end of an air collection tube around the pool are opened, if the workshop or other collection pools do not need to treat the air, the automatic slide gate valves T271 in the front end of the air collection tube are all in a closed state, if the workshop or other collection pools also need to treat the air, the automatic slide gate valves T271 in the front end of the air collection tube are all in an open state, due to the action of the air-inducing device, the air containing bacteria and odors enters into anion corrugated plates T273 in the pipeline for treatment through the gate valves T271, the corrugated plates are at a distance of 5 mm-10 mm, the amount of negative ions released by the anion corrugated plates T273 is 15000 per cubic centimeter without power on, the bacteria and odors with positive ions in the air are captured and killed for the first time and then settled, after the gas that has gone through the initial killing and

deodorization, under the strong action of the air-inducing device, enters into a plasma treatment zone along an air delivery pipeline, the gas continuously enters into a photocatalytic main processor T274, the gas moves from bottom to up in a Z-shaped direction after entering into the main processor, and the gas is fully irradiated by ultraviolet rays emitted by an ultraviolet light tube T276 installed to four walls of the Z-shaped channel and then enters into a channel of a honeycomb-like titanium dioxide photocatalytic touch plate T278; the titanium dioxide photocatalytic touch plate T278 produces photogenerated electrons and photogenerated holes and generates strong energy after absorbing light energy, which reacts with moisture and oxygen adsorbed on the surface of the air to generate hydroxyl radicals and superoxide anion free radicals with lively oxidability, these capabilities are far higher than the strength of the molecular chain of general organic pollutants, and thus, after the air enters into the Z-shaped channel, organic pollutants in the air are decomposed into the most primitive state, especially that the photocatalytic treatment is repeatedly carried out on the air several times in the Z-shaped air channel, airborne bacteria and viruses have been effectively removed, and the odors in the air are degraded at the same time; in order to further ensure that the air discharged is fresh and qualified, a plasma generator 13 is installed at a corner position of the Z-shaped channel, to strengthen degradation and removal of the pollutants, and after the air which has gone through photocatalytic and plasma joint treatment automatically enters into the anion laminated corrugated plate T280 disposed at the tail end of the apparatus for another anion treatment, residual impurities in the air are adsorbed through an activated carbon air processor and the discharged. At this time, the gas discharged is odorless and sterile, has no solid particles and no toxic and hazardous compounds, and is fresh and clean.

The plasma photocatalytic negative ion air deodorization and sterilization apparatus in the present invention can carry out centralized collection and treatment on odors overflowing from various procedures during kitchen garbage treatment and the air in the whole plant, continuously and efficiently eliminates harmful microbes for the collected air, kills bacteria and viruses, and degrades odors in the air. At this time, the gas discharged is odorless and sterile, has no solid particles and no toxic and hazardous compounds, and is fresh and clean.

U. Automatic control apparatus:

The automatic control apparatus in the present invention is mainly applied to auto intelligent control over production procedures of feeding, screening, cleaning, chemically treating, drying,

and refining the kitchen garbage during kitchen garbage resource treatment, and the control system is the prior art. The apparatus completes a central control function through parallel connection of multiple PLCs, each PLC has an independent program, the multiple PLCs automatically communicate with each other internally, on-site electrical appliance units and operation instructions all acquire signals through the PLCs, the signals are transmitted to upper computers through RS-422 communication, to make up a complete distributed control system, all the electrical appliance control units are divided into several on-site control large units according to action requirements of various production devices and apparatus on the site, carry out independent programmed control, and establish a main control chamber, to achieve all monitoring over various control cabinets on the site, opening and closing of all the electrical appliances are controlled in the central control room, all running states and failure warning are displayed on the display, and all programs are logically controlled in a master-station CPU, to complete automatic running of process devices according to pre-designed logic and requirements.

The present invention has the following advantages:

1. The kitchen garbage all-round treatment integrated equipment and method described in the present invention application are a set of highly integrated, automatic and comprehensive equipment in the same trades of kitchen treatment at home and abroad for the first time being compatible with a method for carrying out resource treatment on necessary attachments of the kitchen garbage, adapt to the tendency of international environmental protection industry, and implement safe treatment and disposal without transferring and digesting the residue after centralized comprehensive treatment of waste and without producing secondary pollution.

2. The present invention application provides a method for treating kitchen garbage and necessary attachments thereof, i.e., waste plastic bags, swill sludge and factory domestic sewage, and industrial sewage and sludge output in the production process, in various large system devices in the same equipment.

3. The present invention application provides names of various high value-added products manufactured after comprehensive resource treatment of the kitchen garbage and a manufacturing method and use thereof.

4. The present invention application provides a comprehensive clean production method and mode of energy-saving production and safe production with no residue transfer treatment, no emissions at room temperature, no odor emissions, almost no sewage discharge for the industry

of kitchen garbage treatment.

5 5. The products output in the present invention are three major strategic energy, i.e., National III mineral diesel, low-sulfur high-calorific-value clean environmental-protection coal and gas, which function to reduce the pressure of social supply and demand. At the same time, the high-nutrition microbial protein feed additives produced can effectively fill the missing gaps in the domestic high protein feed additives.

10 6. The present invention provides a kitchen garbage loader (barrel) and a new waste loader (barrel) production method which is capable of natural sterilization and deodorization and can naturally provide clean air in the periphery outside the barrel body, and is a new environmental protection cleaning utensil with extremely broad applications.

15 Detailed applications of the kitchen garbage all-around treatment integrated equipment in the present invention application and a product manufacturing method are described below with a specific embodiment and case. The specific embodiment and case should be understood as technical contents described in the embodiment and aimed to letting the public better understand the present invention, instead of limiting the technical contents of the present invention, and improvements made on the basis of not violating the spiritual substance of the contents of the present invention should fall within the scope of the present invention.

Embodiment and case:

20 As the present invention is a complete set of integrated kitchen garbage treatment equipment, multiple special large apparatus and systems are integrated therein, they all have their own independence and application scopes, but also have consistency between apparatus and circuitous application, and in order to express applications and production procedures of the equipment and a method and related formula thereof more clearly and completely, description is given below with an actual case.

25 The embodiment and case is a secret test in Guangdong, the kitchen garbage used is from restaurants, hotels, Chinese restaurants, western restaurants, government dining rooms, school canteens and the like in a certain prefecture-level city in the pearl river delta of Guangdong province of the People's Republic of China, the produce yield and the method and related formula used in the production in the case are set according to cultural dining habits, characteristics and the quality of food waste of the region, the kitchen garbage removal job referred to in the specific
30 embodiment is in the charge of an environmental-protection removal enterprise designated by a

related government department, the complete set of kitchen garbage comprehensive treatment equipment is provided by South China Renewable Resources (Zhongshan) Co., Ltd., the specific location is the food waste resource treatment base in the company, the daily processing capacity of the base is 200 tons, and the specific embodiment of the present invention is now expressed on the basis of embodiment of a set of integrated equipment with the daily processing capacity of 50 tons and production procedures as well as method and related formula thereof.

1. At first, starting from a kitchen garbage collecting barrel, the collecting barrel is a carrying tool distributed to each kitchen source, is also a transport tool on the way of transportation from the source to the treatment plant, and is quite important for protecting hygienic conditions of the source and avoiding secondary pollution that may possibly appear on the way of transportation, therefore, kitchen garbage cans which have sterilization and deodorization functions in the cans and can release negative oxygen ions and fresh air around and outside the cans need to be used, and a specific manufacturing method thereof is implemented according to the following steps:

At first, ozone oxidation treatment is carried out on carbon black, the particle size of the carbon black is $\leq 2 \mu\text{m}$, the ozone oxidation treatment is conventional oxidation treatment on the carbon black by using an ozone oxidation device in the prior art, making the internal surface area of the carbon black increase more than four times, so as to promote the adsorbability of the carbon black.

Further, the treated carbon black and nanoscale tourmaline powder are fully mixed as a basic material, in which the carbon black accounts for 15% of the total weight of the basic material, the nanoscale tourmaline powder accounts for 85% of the total weight, ultrafine titanium dioxide is added to the mixed basic material, which are fully mixed as an energy material, and the adding quantity of the ultrafine titanium dioxide is 10% of the total weight of the basic material.

Furthermore, the mixed energy material is dried for 1-2 h under the condition of 100-120°C (it is feasible that the mixed energy material is completely dried).

Furthermore, a dispersing agent is added to the dried energy material, the dispersing agent is a coupling agent related to basic resin, especially a coupling agent conducive to mixing with carrier resin, the adding quantity of the dispersing agent is 3% of the energy material, and in the embodiment, a dispersing agent selected is magnesium stearate.

Furthermore, the energy material to which the dispersing agent is added to plastic carrier resin, which are mixed evenly to form a fully mixed material, in the embodiment, the plastic

carrier resin is PE, and a ratio of the adding quantity of the plastic carrier resin to the energy material is 30%:70%.

Furthermore, the mixture is input into a special mixing device for mixing, during the mixing, a coupling agent is added again, in the embodiment, the coupling agent selected is an amino silane coupling agent, a ratio of the adding quantity thereof to the total weight of the energy material and the plastic carrier is 2%:98%, the mixing temperature is set with a conventional temperature of mixed resin, and plastic energy masterbatch is manufactured after the mixture passes through an extruder and completes cooling and sized dicing procedures.

Furthermore, the produced plastic energy masterbatch is detected, the measurement range is that the infrared radiation wavelength is 4-16, normal total emissivity is ≥ 0.86 , and anion concentration is 7000 per cubic centimeter above, after it is determined that the quality of the masterbatch is in line with the requirements, the detected energy masterbatch in line with the production standard is mixed with HPPE and ABS plastic micelle, in which a mixing ratio of PE to ABS should be prepared depending upon the load capacity of the kitchen garbage can, while the energy masterbatch accounts for 70% of the three kinds of mixed plastic resin, finally, a professional injection molding machine is used for injection molding, to make a body and a lid, and the solution flow rate of the mixed resin as well as control over the charging barrel temperature, control over the die temperature, injection pressure and the like during injection molding are all based on conventional production technology methods in the industry.

Further, the kitchen garbage containing barrel is assembled and, after it is detected that the containing barrel can naturally release the content of negative ions of 5000 per cubic centimeter above, distributed to various kitchen garbage collection points, thereby ensuring that the kitchen garbage will not smell within 12 hours from entering into the barrel.

2. The environmental-protection removal enterprise designated by the government goes to the kitchen garbage generation sites to collect the kitchen garbage carried by the carrying barrel and sends the kitchen garbage to the plant area.

3. When the kitchen garbage is sent to a funnel-shaped collection port designated in the plant area, the collection port is operated by a main control room to open the lid, suction opening valves disposed around an upper side of the collection port are opened, and a plasma photocatalyst anion air treatment system is opened at the same time. At this time, the kitchen garbage is sent into a collector by an automatic unloading device, after unloading of the kitchen

garbage is completed, the lid of the collection apparatus is automatically closed, as then air treatment system has been opened, and odors of the garbage are imported into a treatment apparatus for sterilization and deodorization, to ensure that the air environment in the plant area is fresh; at the same time, after the kitchen garbage enters into the collector, a horizontal automatic gate valve in a lower portion of the apparatus is opened, and the garbage naturally falls down into a push-type bag-breaking device.

Furthermore

4. When the kitchen garbage falls into a pipeline of the bag-breaking device from above, a piston of a hydraulic system in the front end of the pipeline is pushed ahead, to push the kitchen garbage in bulk and the kitchen garbage in bags to a pipe casing provided with several fixed cutters, when the piston is pushed ahead, and concave cavities around it pass through engagement of the fixed cutters, to open several crevasses on garbage bags, which are pushed to next procedure along with the kitchen garbage in bulk. The piston of the bag-breaking device is pushed and pulled back and forth along the direction of the pipeline, when the piston is pulled back to the starting point, the kitchen garbage falls from above, when the piston is pushed ahead, the kitchen garbage is torn and pushed to next procedure, the minimum pressure of the hydraulic oil pump is 3 mpa, handling capacity is 20-30 m³/h, and after all the kitchen garbage passes through the bag-breaking device, a horizontal automatic gate connected with an upper portion of the feeding port of the bag-breaking device is closed.

Furthermore

5. After bag-breaking, the kitchen garbage enters into an unloading pipeline, the kitchen garbage is sent into a liquid air-floating sorting apparatus by using impulsive force, an inner cavity of a primary sorting apparatus of the apparatus is 6 m³, at this time, a semi-floating sinking and unloading venetian port disposed in a middle-lower portion on one side of the primary sorting apparatus is closed, the water starts to flood into a primary apparatus through a water pipe system, the water injection rate is subject to the water surface elevation and is controlled by a liquid level automatic locator, the kitchen garbage thrown each time is 1/3-1.5/3 of the total cubic volume of the water of the primary apparatus, after the water rises to the set water surface elevation, main and auxiliary rolling rakes disposed on an upper portion of the primary apparatus begin to roll under the driving of a motor through a gearbox, a compressed air valve disposed in a lower portion of the primary apparatus is opened, the kitchen garbage immersed in the water

body is rolled under the action of buoyancy of water by using high-pressure air ejected from several gas nozzles, and at this time, plastics, cloth, toothpicks and other small-density sundries float to an upper layer of the water, are caught by rake teeth of the rolling rakes to rotate upwards, and are unloaded to a lightweight sundries collection barrel after being captured by the auxiliary rake teeth disposed on an upper portion of the main rolling rake. After the kitchen garbage begins to roll for 5 min in the water, the venetian port disposed in the middle-lower portion of the water is opened, the kitchen garbage in the semi-floating layer is pressed to the venetian port by means of a fluid pressure difference of the water and enters into a secondary apparatus, when the water level of the secondary apparatus reaches a set height, a circulating water pump is started to convey water to a buffer tank to supplement water for the primary apparatus, this functions to ensure that the water level of the primary apparatus is higher than that of the secondary apparatus, when the kitchen garbage in the semi-floating layer basically or completely enters into the secondary apparatus, a residue discharge port valve disposed at the primary apparatus is opened, large-density or large objects sinking to the bottom of the apparatus, for example, metal sundries, glass, broken porcelain, heavy sundries and abandoned chicken, duck, fish or big meat in the kitchen garbage are unloaded from the residue discharge port and are artificially sorted after being sent to set sites by the automatic conveying tool, useful kitchen garbage is selected and input to a crusher, and after liquid air-floating sorting, first-time preliminary desalting step and cleaning process have been basically carried out on resultant kitchen residue helpful to produce protein feeds.

Furthermore

6. The useful kitchen garbage that has been sorted is discharged from the discharge port of the secondary apparatus in the liquid air-floating sorting apparatus and sent into a first-stage reactor and a second-stage reactor of a wet advanced oxidization apparatus through a conveying tool, the inner cavity of the second-stage reactor is 5 m^3 , the adding quantity of the kitchen garbage is 5 T, 2 T of clean water is injected, their injection is controlled by an automatic quantitative tool, and the water level of the reactor is set through a liquid level controlled disposed in the kettle. After the kitchen garbage enters into the first-stage and second-stage reactors, the feeding port is closed and in a sealing state, the valve of the circulating conveying pipeline connected with the two reactors is opened, at this time, ozone gas provided by an ozone generator enters into a gas-water mixer through a waterproof check valve, and the waterproof

check valve mainly functions to prevent the water from flowing back to enter into the ozone generator. While the ozone gas enters into the gas-water mixer, a high viscosity cam rotor pump installed between circulating pipelines is started, a mixture of the kitchen garbage and the water is strongly pushed into a water-gas mixer and implements kitchen garbage-water-ozone gas mixing with the ozone gas entering into the mixer, promotes the ozone to be dissolved in intensified water, and then enters into the reaction kettle, another cam rotor pump strongly inputs the mixture of the kitchen garbage-water-ozone gas in the reaction kettle to another reaction kettle, such repeated cyclic actions are used as a reaction process, especially the ozone-containing material causes a chain reaction in the mixture under the action of the activated carbon fixed reaction balls in the reactor, to accelerate the ozone to be converted to hydroxyl radicals, which is similar to the advanced oxidization process of O_3/H_2O_2 or O_3/UV , single atomic oxygen having the function of oxidization is instantaneously scattered into the water to quickly react with organic matters, bacteria and microorganisms in the kitchen garbage as above, the single atomic oxygen O and the hydroxyl radical OH can carry out forced inactivation on pathogenic bacteria, spores and the like in the kitchen garbage within 1-2 min, in the specific embodiment, the rated operating pressure at the pump port is 0.25 mpa, the conveying strength is 500 kg/min, the reaction time of the mixture in the kettle is 10 min, the concentration of the ozone in the water of the kitchen garbage is 12 g/T, during the whole reaction, the gas overflowing port and the ozone destroyer disposed on the upper portion of the reactors are in an open state all the time, and desalting, inactivation of indigenous bacteria and other procedures have been completed after the kitchen garbage goes through the advanced oxidization process, which effectively ensures the quality of inoculation and expansion in the future protein feed production procedure, and effectively eliminates interference of sundry bacteria and clears away saline matters penetrating into the kitchen garbage.

Furthermore

7. The kitchen garbage after the previous treatment is discharged through an unloading port in the lower portion of the reactor and enters into a preliminary solid-liquid separator, after most of the water is separated, kitchen garbage with water content of 85% is obtained, the kitchen garbage is gradually sent into a vertical dehydration device through a helical ribbon conveying tool, a pressure-adjustable water board installed to an upper portion of the dehydration device is adjusted by a hydraulic press to a closed state, a central shaft throughout the axis of the helical

ribbon is driven by a motor 3.7 KW in concert with a gearbox and rotates at a rotating speed of 580 r/min, an electric ball valve connected with a water outlet of a water receiver installed to a lower portion of a dehydrating tower is automatically opened, at this time, the kitchen garbage is thrown into the feeding port in the lower portion of the dehydrating tower, the kitchen garbage goes with the extrusion action of the big-end-down helical ribbon and the cylindrical shell and blockage of the tower-top depressed plate, the resistance of material conveying increases, when the pressure reaches the set pressure, a discharge door disposed on one side of the tower top is automatically opened, and the discharge port is controlled hydraulically. At this time, the kitchen garbage is uninterruptedly pushed upwards to a dehydration zone through a concentration zone in the lower portion of the dehydrating tower, to implement continuous dehydration and discharging, while the removed water flows out of grids of the cylindrical shell of the tower and flows into the water receiver along a flow deflector disposed on an outer side of a fixed ring of the grids, and is discharged through a drainage port, the discharge rate of the dehydrated material is 8 T/h, the continuous running time of the dehydrating tower is set as not more than 8 h, after shutdown, a high-pressure water recoil nozzle installed around the dehydrating tower is used to clean effluent gaps of the grids, the rated operating pressure of the effluent nozzle is 0.35 mpa, the water supply intensity is 14 L/min, and the cleaning time is 10 min.

After completion of the procedure, a route connected to the procedure is divided into two procedures with different job natures, where one procedure is: oil extraction procedure.

After the oil-containing water produced in the procedures 3, 4, 5 and 6 referred to in the specific embodiment is concentratedly collected in a sediment pond, a water pump is used to input the oil-containing water above the middle portion of the pond into an oil-water separation tower, the oil-water separation tower consists of two tower bodies, which are in communication through a pipeline in the middle portion, the two tower bodies are cavities, the total volume of the cavities is 60 m³, the water loaded is 50 m³, after the oil-containing water is input into the oil-water separation tower, hot gas in a heating pipeline of the tower enters into the water through heat transfer of tube walls, a hot-gas source thereof is collected at hot tail gas of a heat-conducting oil boiler for production, when the oil-containing water is heated to 80°C, grease in the water is fully separated from the water, floats to an upper layer, and after naturally entering into an inclined partition on an upper portion of the oil-water separation tower, flows into an oil bearing zone along a downward slope of the partition, the oil is sent into a biodiesel production

zone through an oil discharge pipeline via an oil scraper plate installed in the bearing zone, and the grease obtained is about 180 kg. When the water in the lower portion of the oil-water separation tower is at the temperature of 80°C, most bacteria and microorganisms are inactivated and input into a sewage treatment zone through a drainage port in the lower portion of the tower.

5 The other procedure in the apparatus with two different job natures is a crushing procedure: when the kitchen garbage output from the dehydration procedure is about 45%, the kitchen garbage is input into a crusher for crushing by a pneumatic push plate, which is the prior art and is not repeated herein.

After the crusher outputs the kitchen garbage, furthermore:

10 8. The crushed kitchen garbage is discharged into a material elevator bucket in batches and is respectively sent into two preliminary biochemical fermenters using different strains according to the set component, one of the two preliminary biochemical fermenters has an interval volume of 10 m³ and contains 7 tons of the kitchen garbage, the other preliminary biochemical fermenter has an interval volume of 30 m³ and contains kitchen garbage and fiber nutritional materials input
15 by another straw biochemical fermentation apparatus, the mixing proportion of the kitchen garbage and the fiber nutritional materials are determined according to requirements of feed kinds finally produced, which account for 50% respectively in the specific embodiment, but the total weight of them in the biochemical fermenters is 20 tons. The bread yeast is selected as a strain for a biochemical processor containing 7 tons of the kitchen garbage, at first, a quota feeder is used
20 to add bran which accounts for 2% of the weight of the basic material, rice bran which accounts for 2.5% and brown sugar which accounts for 1% to the basic material, which are mixed and made into a paste, after the mixture is heated to 25°C by using afterheat of a feed dryer, the bread yeast which accounts for 3% of the weight of the basic material is put into the mixture and then is fully stirred with the mixture to strengthen aeration, so as to enhance yeast growth, and the
25 fermentation time is 12 h. Joint compound strains of *Trichoderma viride*, *Candida tropicalis*, water bacteria and *Endomycopsis* yeast are put into another biochemical processor containing 20 tons of the mixed material kitchen garbage, and the strains all conform to the microorganisms allowed to be directly fed in *China Catalogue of Strains*. The ratio thereof is 2:2:1:1, the inoculation quantity is 3% of the mass of the substrate, the inoculation manner is that the
30 compound strains are added randomly, 0.5% urea is added, the mixture is continuously biochemically fermented for 10 h, the fermentation heat source is provided by afterheat of the

feed dryer, the temperature is set as 32°C, the ventilation condition is 8 min/h, the ventilation quantity is 0.2 m³/h, the *Trichoderma viride* in the strains, in concert with the water bacteria, has extremely remarkable effects on reduction of the content of crude fiber in the kitchen garbage, while the effects of the *Candida tropicalis*, the water bacteria and the *Trichoderma viride* on improving crude protein and true protein are apparent, and the *Endomycopsis* yeast serves as auxiliary mould, to implement initial bacteria spreading in the preliminary biochemical fermenters.

Back to the manufacturing and embodiment method of the fiber nutritional materials indicated above, the treatment region of the case is the pearl river delta region in southern China, locally available materials are selected as the types of the straw in the case, the local legume straw and straw of gramineae crop are mixed, and peanut stalk, bean stalk, bean straw and rice straw of potato stalk, head and tail of sugarcane, and gramineae straw of corn stalk in season are used, for example, wheat straw is added during production in winter. The straw matching referred to as above is based on that, the straw of such leguminous crop has high protein content and low sugar content, the microorganisms is less energetic in the initial stage of the fermentation, and them such straw is mixed with the straw of gramineae crop with higher soluble sugar content, which not only can improve the quality of fermentation but also can make nutriments of the two kinds of crop straw supplement each other, thereby obtaining better feed quality. In the specific embodiment, the blend proportions of the two kinds of straw are that the legume straw is 60% and the gramineae straw is 40%. The crop straw is properly cleaned, to eliminate decayed, moldy parts and sundries such as dirt and gravel and remove surface moisture through exposure, to restrain growth and reproduction of the mould, and the straw is crushed into powder of 0.5-1 mm through a crusher. The powder is put into several biochemical fermentation pools, the put volume of the straw powder is 13.2 tons, and the material is put through an automatic conveying dump truck. In addition, one strain activation pool is disposed, and compound strains are selected, where one category is *Aspergillus oryzae*. As dried bacterial powder basically does not contain medium components, in the case, 1% of a brown sugar water solution is used as an activation solution, the put volume of the complex microbial inoculant is 1% of the weight of the basic material, after the complex microbial inoculant has been put in the activation solution for 1.5 h, a chemical ingredient of 2 kg of calcium oxide, 0.2 kg of sodium chloride, 3 kg of sodium hydrogen phosphate and 0.5 kg of urea are added, and the weight of the chemical ingredient

refers to the weight required by each ton of straw. The chemical ingredient functions to decompose lignose, soften straw, damage the crystalline region structure of plant cell walls, break physical and chemical states where the lignose cellulose are closely bonded, and improve biochemical treatment effects and palatability of feeds. The activation solution and the chemical ingredient are stirred evenly to become fermentation liquor. The fermentation liquor is sprayed into the material in the biochemical fermentation pool, the ratio of the straw and the fermentation liquor is 1:2, then an automatic stirring apparatus installed to the biochemical pool is used to evenly stir the materials in several pools, the time is about 10 min, and the materials are compacted after the stirring ends. After completion of the procedure, a hydraulic auto system seals and closes the biochemical fermentation pool, the biochemical treatment time is 7-9 days in summer, and the required temperature is room temperature. During the whole biochemical process, the complex microbial inoculant biochemically treats the straw, to effectively degrade and saccharify the crude fiber and synthesize rich bacterium protein and physiological active materials, and bio-energy contained in the straw is not consumed basically. Therefore, under normal conditions, the thermal phenomenon, the aerogenesis phenomenon and the pool expansion phenomenon may not occur. After biochemical treatment, the straw is in a bright color and is golden brown, feels soft, and has rich fragrance slightly with wine aroma.

The material to be preliminarily biochemically treated is stated now. After 10-hour pretreatment, the helical ribbon automatic conveying machine disposed at the bottom of a biochemical device inputs the material into two sets of primary biochemical devices in a lower layer, and the volume of the inner cavity of each primary biochemical device is 20 m^3 . However, about 10% of the material using the bread yeast as the strain in a secondary biochemical device needs to remain and does not enter into the primary biochemical devices, so as to be used in next fermentation, because the next fermentation uses old leavening. After the material which has gone through preliminary biochemical fermentation completely enters into the primary biochemical fermenter, an automatic slide gate valve installed at a material conveying port between the primary and secondary biochemical devices is closed. At this time, an air transport pipe disposed in the middle portion on a side of the shell of the biochemical device is opened, a double-layered helical ribbon stirrer is started, which rotates at a rotating speed of 7 r/min and rotates at 360 degrees horizontally, the movement direction of the external helical ribbon of the stirrer is clockwise, while the movement direction of the internal helical ribbon is

counterclockwise. The heat-conducting oil boiler outputs heat-conducting oil, which is conveyed to two sides of the biochemical device through a heat pump, the temperature of the material is raised through heat transfer of the shell of the biochemical device, and an optimum condition is made according to aerobic or anaerobic conditions of many different strains selected and adaptive temperatures of reproduction and growth of the strains. At first, the initial temperature is 20°C and is gradually raised to 28°C, after the temperature is kept constant for 4 hours, an air transport port is closed, the temperature is gradually raised to 35°C-38°C, after the temperature is kept constant for 3 hours, oxygen supply for biochemical fermentation in this period of time is from the gap between materials and between specific areas, after the temperature section is completed, an air-inducing apparatus is opened for lightweight exhaust, to discharge water vapor in the primary generator outside the biochemical device, the temperature is raised to 54°C, to be kept constant for 1.5 h, then is raised to 80°C, to be kept constant for 1 h, at the temperature, it effectively avoids that the microorganisms use the carbon skeleton therein as energy and that dehydrogenation produces pungent ammonia smell to affect the economic value of the products, basically inactivates the microorganisms and dehydrates the material in great quantity, and the moisture content of the material changes from 55% to 35% when the biochemical fermentation completes discharging.

Furthermore

9. The kitchen garbage that has gone through biochemical fermentation has converted to microbial protein feed, the moisture content is about 35%, when the discharge port of the primary biochemical fermenter disposed at the bottom is opened, the feed is unloaded into a feed elevator and sent into a pre-drying device in a drying apparatus through the elevator, hot air of the pre-drying device is from afterheat of tail gas of a primary drying device, the hot gas enters into an enclosure of the pre-drying device, the heat-conducting oil in the inner cavity of the enclosure of the device is used to raise the temperature of the inner cavity, the inner cavity has a volume of 16 m³ and is fed with 8 tons of materials each time, the temperature of the inner cavity of the device is 100°C, when the feed enters into the device, an axial flap installed in the device rotates with power provided by the motor in concert with the transmission, the rotating speed is 12 r/min, at this time, the feed is rotated by the flap, the materials uninterruptedly contact the hot gas and the cylindrical walls to be heated, when the feed whose temperature is lower than the temperature of the cylindrical walls of the device constantly contacts the cylindrical walls, the cylindrical

walls will be cooled, but, under the rotation of the flap, the change cycle is shorter, the variation amplitude of the temperature is small, it can be considered that the temperature of the cylindrical walls is basically unchanged, and the feed not contacting the cylindrical walls will be subject to radiative transfer of heated feed particles, which may also be that particle surfaces accept radiant heat. Within 45 min during which the feed put into a preheat drying device is heated and dried, the moisture carries out gas diffusion from the inside of the feed, and reaches the surface through the layer of the feed, and then the moisture is diffused to the upper portion of the inner cavity of the device through an air film of the feed surface and is discharged from the gas discharge port, to enter into a gas treatment procedure. After the feed completes the pre-drying procedure, all slide gate valves disposed in a lower portion of the pre-drying device are opened, the feed falls into a helical ribbon conveying device connected to the slide gate valves and is sent into a primary drying device. The primary drying device is horizontal shaftless rotating airflow drying device. The primary drying device in the specific embodiment is a four-layered drum structure, inner walls of the drum in each layer are provided with a helical ribbon connected to cylindrical walls, the innermost drum has a screw pitch of 150 mm, the diameter of the main body is 700 mm, and the drum length is 4000 mm; the next-layer drum has a screw pitch of 200 mm, the diameter of the main body is 1200 mm, and the drum length is 4600 mm; the drum in the following layer has a screw pitch of 300 mm, the diameter of the main body is 1800 mm, and the drum length is 4600 mm; the outermost drum is the main drum of the drying device, has a screw pitch of 450 mm, the diameter of the main body is 2200 mm, and the drum length is 6000 mm. The fixed connection of the drums in the layers are based on outer drums, several fixed brackets are installed in the circumference of inner drums, which are fixed one by one, the rotating speed of the drums is 29 r/min, an upper portion in the tail end of the primary drying device is provided with an exhaust port, and the hot gas is exported by an air-inducing device. The heat source of the primary drying device is produced through blasting by a diesel injector burner in a combustion chamber, an adjustable reverse air fan disposed on a side portion of the combustion chamber sends hot air into a hot-gas fairing, and then the hot air enters into the drying device. In the specific embodiment, the feed begins to enter when the set inlet temperature is 280°C and the outlet temperature is higher than 110°C, the feeding speed is 20 kg/min, and the airflow velocity is 1.2 m/s. The feed first enters into the innermost drum and then is pushed along the advancing direction of the helical ribbon to contact the hot steam downstream, after the feed reaches the tail end of the drum,

the feed naturally falls into the drum in the next layer, is pushed along the advancing direction of the helical ribbon to contact the hot steam upstream, and then naturally falls into the next layer, the manner in which the advancing direction of the drum in the layer contacts the hot steam is the same as that of the innermost drum, and the feed finally falls into the main drum and is pushed to the unloading port along the advancing direction of the helical ribbon. During the whole drying process, a sleeve-type horizontal drum is used to extend a forward rail of the feed, thereby ensuring that the material and the hot air have sufficient staying time to contact each other, and the moisture in the feed is rapidly evaporated through heat energy.

Furthermore

10. The dried feed is gradually sent into a feed selection apparatus through a conveying device, the feed rotates in an inclined drum in the apparatus, its trajectory continuously rolls forward, at this time, large objects or heavy objects that cannot pass through the screen mesh of the drum are sent into a helical ribbon drainage device disposed at the tail portion of the drum and fall into a sundries box along the advancing direction of the helical ribbon, while the feed smaller than the screen mesh of the drum falls into a finished-product loader through holes. After large-grained feeds are selected from sundries in the sundries box through secondary screening, the feeds are crushed and conveyed back to the finished-product loader.

The calorie required by the biochemical fermentation and the feed drying process is about 630 cal/kg, the products are high-protein nutritious feeds, the weight of the feeds is 12.7 T, and tested quantity and quality results of the products are:

Moisture 7.84

Crude protein 28.66 (dry matter)

Crude fiber 15.5 (dry matter)

Calcium 6.86

Total phosphorus 3.09

Salt 1.11

Zn 196 mg/kg

Crude fat 4.79 (dry matter)

Crude ash 1.17 (dry matter)

The qualified products are golden brown and in bright colors with little wine fragrance and toast aroma.

Furthermore

11. High nutritional feeds enter into the feed granulation production zone, and according to sizes and adaptive tastes of various aquatic livestock, a special device produces puffing floating materials, semi-floating sinking materials and other special feeds. The technology is the prior art and is not repeated herein.

The specific embodiment only states the main production procedure in comprehensive treatment from collection of the kitchen garbage to entering into the treatment plant area.

Necessary attachments of the kitchen garbage screened and produced in the treatment procedure further needs resource treatment, and the following are specific embodiments of odor treatment, hot flue gas treatment, sewage treatment and sludge treatment.

The specific embodiment of grease treatment is now stated.

12. In the oil extraction procedure of point 7 in the specific embodiment, after the extracted grease water enters into a biodiesel production zone, it is measured that the grease obtained is 1.6 T, which accounts for 3.2% of the kitchen garbage which is 50 T. The method for treating the grease is a distillation-free production manner, the production process is highly adaptable to the raw material, the production process is clean, safe and simple, and the whole production process is carried out at room temperature. The specific embodiment first uses an oil pump to extract coarse biolipid in the oil storage tank from the container, then the coarse biolipid is sent into a biolipid lipid removal impinging stream reactor for colloid removal, at this time, a propeller hydraulic pusher installed to two ends of the impinging stream reactor is started to strongly impinge the grease to a pore plate disposed in an impinger, during the process, phosphoric acid which is 0.8% of the weight of the grease is added to the grease, the mixture impinges the pore plate in opposite directions, holes of the pore plate are used to make the grease at two ends cross strongly, the time is 15 min, the step acts upon phospholipid in the grease which cannot be hydrated, that is to say, non-hydrated phospholipid, especially its structural symmetry, the influences of space effect of the molecular structure, poor hydrophilicity and its being not prone to water swelling to be removed will seriously affect the difficulty and quality of processing biological grease into biodiesel, and thus phosphoric acid is used in the grease for strong mixed washing, to damage micro metal compounds of the non-hydrated phospholipid, so as to convert to hydrated phospholipid. After the step is completed, a dilute salt solution with the content of 10% is added to the grease, the put volume is 120 kg, the grease strongly impinges each other by

means of propeller pushing at the two ends, the striking stops after 20 min, the grease is standing for layering, due to the effect of electrolyte, flocculation of the sundries in the grease is sped up in the hydrated phospholipid, causing the formed colloid to contain less oil. Through the procedure, the colloid in the biological grease is removed, thereby effectively avoiding that the colloid covers grease particles in next lipidation procedure and guaranteeing contact between the grease and a catalyst.

After the grease from which phospholipid and colloid have been removed is separated from the grease impinger, the grease is input to a lipid exchange reaction kettle, the volume of the inner cavity of the reaction kettle is 3 m^3 , after the grease enters into the kettle, a radial impeller installed to the bottom is started to implement medium-speed rotation, making the grease roll rapidly, the discharge port is opened, 80 g of methanol, 3.2 kg of methyl-ethyl ketone and 1 kg of tert-butyl alcohol are added, where methyl-ethyl ketone and tert-butyl alcohol are cosolvents, the cosolvents contain hydrophilic groups compatible with the grease and polar groups that can be combined with methanol, and oxygen atoms contained in molecules form hydrogen bonds in methanol, to promote miscibility between the grease and methanol, thereby form a homogeneous system, which effectively accelerates occurrence of the alcoholysis lipid exchange reaction under the effect of a catalyst. When methanol and the cosolvents are put into the grease, the mixed liquor is rolled by power of the impeller, the mixed liquor enters into a miscibility stage, the time is 15 min, after the stage ends, a solid metal base catalyst (South China 713#) is added, the catalyst uses reagent activated carbon as the core, the mixture is then immersed in a mixed liquid of alkaline silica sol, alumina sol and lithium hydride, and then the mixture is kept constant at the temperature of 650°C - 720°C for one hour after removal. After cooling, the mixture is ground into 50-80-mesh particles, to make a hybrid charged catalyst with polarity which uses a non-polar adsorbent as the core and is externally wrapped with a silicon, lithium and aluminum mesh skeleton medium, and then the catalyst is immersed in a KNO_3 water solution and is dried at 110°C after removal, to make a KNO_3 solid alkali catalyst in which the KNO_3 capacity is 25%. The adding quantity of the solid catalyst is 24 kg. After all the additives have been added thereto, in order to make the reaction system reach homogenization as much as possible, increase a contact surface between molecules of the reaction medium and push the reaction to proceed to a positive direction, at this time, ultrasonic probes installed in the kettle and immersed in the grease are opened, the number of the probes is four, the initial frequency is 25 KHz and gradually

increases to 30 KHz after 1 min, with increase of the ultrasonic frequency and under the ultrasonic radiation effect, the grease flows to produce hundreds of millions of micro-bubble cavitation nuclei to vibrate under the sound field effect, when the sound pressure reaches a certain value, collapsing and cavitation occur, within such a short time, local high temperature and high pressure are generated in tiny spaces around cavitation bubbles, the high temperature increases activity of reactants and promotes formation of radicals and occurrence of pyrolysis reactions, and at the same time, the high pressure causes generation of shock waves and microjets, resulting in a violent collision between the molecules. The whole lipid exchange reaction time is 35 min, the lipid exchange is carried out at the temperature of 35°C, after completion of the lipid exchange, the material in the reaction kettle is input into a dispenser for standing and layering, the methanol-glycerin mixture in the upper layer is removed for other use, while the crude biodiesel in the lower layer is filtered by a filter press to obtain refined bio-diesel, the yield of bio-diesel is 95.2%, and the filtered catalyst is recycled after regeneration.

Furthermore

13. The produced 1.53 tons of bio-diesel still has tiny moisture, and in order to adapt to power self-supply of the kitchen garbage highly integrated resource treatment, emulsified diesel is manufactured under the condition that the bio-diesel is not dehydrated. At first, the water content of the bio-diesel is measured, and it is measured that the water content is 4.6 kg. The bio-diesel is input into a micro emulsified oil special apparatus through an oil pump, a stirring system in the apparatus is started, the set rotating speed is 128 r/min, at this time, a compound ionic surfactant is added as a hydrophilic agent, one is a cationic surfactant, the other one is a nonionic surfactant, the two kinds of surfactants include triethanolamine, hexahydroaniline, ammonia and an intermediate butanol, the combination percentage thereof is that the cationic surfactant and the nonionic surfactant each account for 50%, and the usage amount is 2.5% of the water content of the bio-diesel. In order to make the bio-diesel more adapted to production use, 300 kg of mineral diesel is added to the bio-diesel, the water content in the total weight of the mineral diesel and the bio-diesel is 10%, that is, the water quantity to be added is 180 kg, and at this time, the rotating speed of the stirrer is changed as 200 r/min. The mixture is continuously stirred for 15 min, after the procedure is completed, Octadec-cis-9-enoic acid whose acid value is 200 above is added as an emulsifier, the adding quantity is 120 kg, the rotating speed of the stirrer is adjusted to 340 r/min, the time is 60 min, upon sampling and standing, it is observed that

the microemulsified oil is clean and transparent, after the microemulsified oil is vibrated by a vibrator for 5 min and is not layered, the temperature is slowly raised to 85°C and no layering occurs, and the microemulsified oil is regarded as product oil after the sampling is determined to be qualified. The oil can be stored for 1 years without layering, and the gross calorific value is 1000 cal above.

Waste plastics treatment (waste plastic reverse engineering):

14. Waste plastics are waste plastics screened by the liquid air-floating screening apparatus in the procedure 6 in the specific embodiment, the waste plastics are conveyed, through a conveyor belt, to a waste plastics treatment zone, i.e., a waste plastic reverse engineering production zone, in the embodiment, 280 kg of waste plastics are screened from 50 T of kitchen garbage, including plastic bags, plastic bottles, bottle caps, plastic boxes as well as toothpicks, wooden chopsticks, strips of cloth and the like, as the minimum feeding amount of a special device of plastic reverse engineering is 2.5 tons, waste plastics obtained through screening in the embodiment are only 280 kg, which cannot meet production requirements of the device, and other waste plastics must be added to make up 4.5 tons; operations are as follows:

It is unnecessary to clean the used waste plastics, screening is unnecessary, drying is unnecessary, after the waste plastics are directly conveyed to a pneumatic automatic feeder by a trough through a sealed conveyor belt, by use of reciprocating push and pull actions of the automatic feeder, the waste plastics are continuously sent into a pyrolysis reaction kettle for pyrolysis catalysis, the pyrolysis reaction kettle is a horizontal reaction kettle, the kettle is internally installed with a fin-type shaftless random scraping apparatus, the housing of the reaction kettle is a pyrolysis furnace, the heat source of the pyrolysis furnace is the microemulsified bio-diesel in point 13 of the specific embodiment and is self-supplied fuel, after the first batch of waste plastics are sent into the reaction kettle, the reaction kettle begins heating, the speed is raised to 100 °C/h, and the whole feeding time during which the waste plastics are continuously sent into the reaction kettle is 40 min. afterwards, a set amount of calcium oxide is added immediately, the temperature of the material in the kettle is improved instantaneously by means of the calcium oxide reacting with the water in the waste plastics, thereby preventing walls of the kettle from coking, in the meantime, the material containing chlorine ingredients is converted to calcium chloride and the PH value of the reactant is adjusted effectively, 5 minutes after the procedure of adding calcium oxide, zinc and aluminum metal solid catalysts and

nonmetallic catalysts are added, the adding quantity of the catalysts is 62 kg, where the aluminum metal solid catalyst functions to produce gas, after all the additives are added to the reaction kettle, the feeding port of the reaction kettle are tightly closed, and the reaction in the kettle is in an anaerobic state.

5 Furthermore

When the temperature in the reaction kettle is constantly increased and the pressure in the kettle reaches the set condition, the check valve connected to the rear end of the reaction kettle is automatically opened, water vapor in the kettle enters into the first-stage condenser and then converts to liquid water to be directly discharged from the outfall in the system, the PH value of
 10 the water is 6.5, with increase of the reaction temperature, the material in the kettle enters into the process of pyrolysis, at first, high freezing point wax oil sublimed and output from the reaction kettle enters into a wax-oil collector through the check valve, when the oil gas carrying a small amount of tiny carbon grains continuously passes through the oil-gas separating apparatus, a magnetic ring disposed in the apparatus makes some tiny carbon grains retained, while the oil gas
 15 reenters into a secondary heat exchanger, at this time, the oil easy to be liquefied enters into an oil collector, while combustible gas that cannot be liquefied enters into a gas reverse cleaner under the gravity of a negative-pressure system disposed in the back stage, the negative-pressure system is automatically opened after receiving a signal from a gas electronic sensor disposed in the system, when the combustible gas, after initial cleaning, enters into a weak alkali washing
 20 system in the next stage, the combustible gas rapidly passes through a back-stage safe water-sealed apparatus and enters into a special gas compressor for primary dehydration, the pressure of the combustible gas is raised to 0.5 mpa, then the combustible gas enters into a secondary gas compressor, the pressure of the combustible gas is then raised to 1 mpa, after secondary dehydration, the gas is directly sent into a gas repository for later use, when the
 25 cracking furnace requires the gas to serve as a heat source to add fuel, the combustible gas is output from the repository, is at 0.4-0.5 mpa through first-level decompression, is at 0.1-0.2 mpa through second-level decompression, and is input to the hearth for combustion, and in the specific embodiment, the tail gas of the combustion chamber of the cracking furnace is treated by the tail gas environmental-protection treatment system.

30 Furthermore,

Back to the step following that the oil easy to be liquefied enters into a crude oil collector

The oil in the oil collector is input to a special oil-water separator, and after the moisture simultaneously liquefied with the oil and entering into the oil collector is removed, the oil is input to a diesel refinement system. At first, the oil enters into a first-stage chemical decarbonization and dewaxing reactor, when the oil reaches the liquid level of the reactor, an automatic system automatically stops conveying the liquid, a gas collector and a gas destruction system disposed on the top of the reactor are opened, a stirring device disposed in the reactor is also opened, the oil now is in a tangential-flow motion flow mode, the gas in the lower portion of the reactor blows the system to begin to start, the flow direction of the oil quickly impinges to baffles disposed around a vertical surface in a synthesizer, at this time, a quantitative feeding device adds additives to the oil in batches according to set components, two of which are an acid catalyst and acid clay, and after all the additives are added in order, the reaction time is 30 min. after the first-stage procedure is completed, the oil after decarbonization and degumming is discharged through an oil outlet disposed on one side at the bottom of the reactor and then enters into a second-stage dewaxing, neutralization and quality adjustment synthetic system, when the oil completely enters into the preceding stage of the synthetic system, a stirrer inside the apparatus is started, and the quantitative feeding device adds additives, two materials of which are alkaline clay and dimethylbenzene, the rest are liquid additives, after all the additives are added, the mixture is stirred for 25 min, after 20 minutes' standing, the oil that has been neutralized and dewaxed is input to the back stage of the system and is sampled for test, after whether it is necessary to add the type and component of the chemical material is decided, quality adjustment is carried out, the oil after quality adjustment is conveyed to a 350-mesh slag-liquid separator, and the separated oil enters into a temporary oil reservoir. Finally, the oil is output to a metal catalyst fixed bed processor for the final refinement procedure through the temporary oil reservoir, the oil output by the product output of the fixed bed processor is product oil, its quality is in line with National III standard diesel, the obtained National III standard diesel is 2.2 tons, which functions to provide the oil for kitchen garbage resource treatment collection vehicles.

Now, the specific embodiment of resource treatment on coarse carbon black in the residue of waste plastic reverse engineering is stated:

15. In the waste plastic reverse engineering, coarse carbon black solid residue that cannot be gasified and sublimed remains in the reaction kettle, it is one kind of fine particles and contains high fixed carbon content, however, if on-site reasonable treatment is not carried out but transfer

treatment is carried out, it will cause damage to the land and air, which thus is indispensable in the specific embodiment.

At first, coarse carbon black is discharged from an automatic slag outlet of the pyrolysis reaction kettle, the coarse carbon black is sent into a special ozone aging device through a conveying device which artificially ages the material, with respect to the characteristics that external crystallization of carbon block particles is orderly and the sequence inside the particles is bad, specific volume of the particles is changed with an aging measure, so as to increase oxygen functional groups of the coarse carbon black and increase the hydrocarbon ratio, after aging, the coarse carbon black is discharged from the discharge port in the lower portion of the aging device and then conveyed into a physical aging treatment device for hot vapor treatment on a fixed bed, the treatment is carried out under a condition that the vapor pressure is 2.8 mpa, and the time is 25 min, which effectively increases the embedding quantity of the combustion-supporting material of the coarse carbon black and modifies the characteristics that it is hard to ignite.

Further

After the coarse carbon black that has gone through chemical and physical artificial aging enters into a mixing device of the material and additives, multiple sets of helical ribbons in different motion directions disposed in the mixing device are started, to stir the material from top to bottom and from right to left, at this time, a plurality of automatic quota feeders disposed above the mixing device are started, 1% of NaOH, 0.5% of $\text{Fe}(\text{C}_5\text{H}_5)_2$, 0.6% of $\text{C}_6\text{H}_{12}\text{N}_4$ and 0.2% of V_2O_5 are added, after the mixture is continuously blended for 15 min, 35% of raw coal and 6% of an adhesive are added, after 15 minutes' blending, the discharge port disposed at the bottom of the mixer is opened, the mixed material is discharged by means of thrust of the helical ribbons, and the material is sent into a coal forming machine through a helical ribbon conveying device; high-energy low-sulfur environmental-protection coal is output according to particle sizes and shapes required by the customer, the product quality is that total sulfur is 0.2%, ash content 6.58%, volatile component 11%, characteristic of char residue is Level 1, and dry basis calorific value is 5300 kcal/kg.

Now the specific embodiment of treatment on sewage output in the production procedure and domestic sewage in the plant area is stated:

16. The sewage produced in multiple procedures and the domestic sewage in the plant area referred to in the specific embodiment flow into a water collecting basin through a plurality of

sewage discharge pipes, sundries floating on the water surface are removed through rolling rakes, the sundries are then pumped into a helical ribbon dehydrator through a water pump to remove small solid sundries, at this time, the water discharged from the dehydrator is directly sent into the top of an electrically heated blanket processor by the water pump through a pipeline and then is ejected through a mechanical atomizing nozzle, the rated operating pressure of the nozzle is 0.35 mpa, the water supply intensity is 50-80 kg/min, when a cloud point falls onto a scorching blanket, some of the sewage is converted to water vapor under the thermal action of the scorching blanket while some is converted to hot water, the rising water vapor is converted to liquid water to enter into a water storage tank through a condensation apparatus, while the hot water enters into the water outlet at the bottom of the apparatus through running water shallow grooves of the scorching blanket and is mixed with the liquefied water. At this time, the hardness of the water treated is greatly decreased, high temperature artificial inactivation is implemented on microorganisms in water, meanwhile, purified metal ions are separated from the water, the heat source of the scorching blanket device that treats the sewage carries out heating with heat-conducting oil through a thyristor intermediate-frequency device, an intermediate-frequency power circuit uses a six-pulse rectifying manner, the primary voltage is 380 V, the calorific value of an intermediate-frequency induction coil is 500000 kcal, and the diameter of the scorching blanket is 1.5 m.

Further

After the water that has been treated by the sewage treatment device of the scorching blanket directly enters into the water storage tank, the water enters into a strong gas-water mixer through transportation of the water pump to be mixed with ozone gas, then enters into the front end of an advanced oxidization reactor, and enters into an advanced oxidization reaction after passing through activated carbon reaction balls, at this time, a secondary water pump disposed in the back stage is opened, at first, after the water entering into the reactor is input into the buffer zone of the housing, the water re-enters into the strong gas-water mixer to contact the added ozone gas and then enters into the reactor, such continuously cyclic water motion is used as a reaction process, the reaction time is 5 min, the concentration of the ozone in water in the reaction process is 5 g/T, the water after completion of the reaction stays 2 min in the reaction kettle, and ozone air overflowing in the reaction process is sucked into an ozone destroyer at the top of the reactor for inactivation treatment.

Furthermore

The sewage after advanced oxidation treatment passes through a water outlet disposed on a side in the lower portion of the reaction kettle, a water pump inputs the water into a composite filter apparatus, the apparatus consists of multiple groups of vertical filtering tanks, the water enters from the top of each of the filtering tanks and passes through dozens of filter columns under set pressure, the diameter of the filter columns is 200 mm, the length is 1 m, upper portions in the filter columns are provided with non-polar adsorbents, lower portions are provided with hybrid charged adsorbents, and under the adsorption effect of the two kinds of adsorbents in the filter columns, the water has reached such a degree that it is clear and haze-free, free from foreign smell, and has no heavy metal ions; meanwhile, a strong oxidant existing in the water due to the advanced reaction and converted from the ozone gas is basically removed, and the concentration of the ozone in water now is only 0.008 mg/L.

Furthermore

The water that has been treated by the composite filter apparatus is discharged from the water outlet disposed on the side of the lower portion of the apparatus and then enters into an ultraviolet sterilization apparatus, the ultraviolet radiation intensity used is 2600-3000 UW/cm², the wavelength is 235-258 nm, the irradiation time is 4 s, after the water has gone through ultraviolet sterilization, the whole sewage treatment process has been completed, not only does the water conform to the industrial wastewater reuse criterion to be used as production water for kitchen garbage resource treatment, but also the treatment on the sewage is rapid and reliable, and recycled water produced each hour is about 5 tons.

The specific embodiment of sludge treatment in the sewage treatment is now stated:

17. Dewatered sludge produced during sewage treatment of the sewage produced during production and domestic sewage in the plant area is placed in a sludge storage for 24 hours, naturally surviving or dead microorganisms naturally produced in the sludge are used as pore-forming agents or called pore-forming modules, the sludge after being removed from the sludge storage is put into an ozone processor, to carry out artificial forced inactivation on the microorganisms, the manner used is: the sludge reversely cyclically contacts the ozone from top to bottom in the processor, the time is 2 min, the concentration of the ozone in the ozone processor is 12 g/L, the gas velocity of the ozone is 7 L/min, and the overflowing tail gas of the ozone is collected and treated by a special device.

Furthermore

The sludge that has gone through force inactivation is sent into a preliminary curing device by an automatic conveying device, the device consists of horizontal multi-layered overlapping helical ribbons, after the sludge is put into the curing device, the automatic quota feeder adds calcium oxide which is 10% of the weight of the sludge for uniform mixing, the mixing time is 25 min, and the mixed sludge is cured or partially cured into particles.

Furthermore

The sludge which has become particles is discharged from the bottom of the mixer and is sent into a pneumatic propulsion device by a helical ribbon conveying device uninterruptedly, the conveying system rapidly sends the particle-sized sludge into the reaction kettle, and the temperature in the reaction kettle now is 100°C, which has leaped over methane bacteria's survival condition zones below 75°C. after the sludge completely enters into the reaction kettle according to the set weight, the pneumatic propulsion device automatically leaves the feeding port of the reaction kettle under the guidance of the guide rail, the feeding port of the reaction kettle now is sealed and closed at the same time, the temperature rising speed of the reaction kettle is adjusted as 30°C each 30 min, when the pressure in the kettle reaches 0.6 mpa, a one-way gas valve at the tail end of the reaction kettle is automatically opened, after the gas passes through the safe water-sealed apparatus, the gas enters into the tail gas environmental-protection treatment system, when the temperature in the reaction kettle reaches 160°C, the structure of the sludge is damaged, release of crystal water of the sludge is sped up, and the crystal water becomes water vapor to be drawn out of the tail end of the kettle and is discharged through the one-way gas valve to enter into a water-sealer. When the temperature of the reaction kettle reaches 220°C, dead microorganisms are carbonized, so far the temperature in the kettle is continuously raised to 240°C, cell matrix sols of the microorganisms overflow to the outside of the sludge and are coked and shrunk, and sludge particles basically form multiple phenotypic micro cavities and passages. At this time, the temperature in the reaction kettle enters into a constant state, the temperature is kept constant for one hour, however, in order to prevent the sludge from entering into pyrolysis, the final temperature in the kettle cannot be set to be higher than 260°C. During the constant-temperature period, moisture in the sludge particles in the kettle has been basically removed, and the pore-forming rate of the sludge is consolidated.

Furthermore

The sludge after anaerobic thermalization is cooled, then discharged from an automatic discharge port of the reaction kettle, and sent into a processing library by the automatic conveying tool for natural aging, the aging time is 48 hours, afterwards, the sludge is then sent into an acidification reactor and is statically immersed for 14 hours in liquid sulfuric acid with the concentration of 20%, coking of dead bodies of the microorganisms is removed, metallic impurity ions in the sludge are removed at the same time, and hydrogen ions replace calcium ions in the additives during curing of the sludge. The sludge particles basically completely expose the cavity structure skeleton of the particles in the procedure.

Furthermore

The sludge particles after acidification are discharged from the discharge port of the reactor and then enter into blanching, the water temperature condition of the blanching is 80°C, the PH value is adjusted at the moment, the blanched particles are sent into a hot steam activation chamber by a conveyor for preliminary physical activation, the steam flow is 250 ml/min, and the activation time is 2 hours.

Furthermore

The sludge particles after the physical activation procedure enters into a high temperature pipeline electrothermal furnace for high-temperature activation which is carried out under air isolating conditions, the overflowing hot gas is treated by the tail gas environmental-protection treatment system, the temperature rising speed of the activation furnace is 20 °C/min, the activation temperature is 720°C, the activation time is 2 hours, after completion of the activation procedure, the sludge particles are cooled, output and refined to become core materials of the hybrid charged adsorbent, cavity and passage structures thereof are amorphous structures, the pore size and the pore volume as well as the hole form, the passage size and length are naturally constant according to kinds, forms and quantities of various microorganisms attached to the sludge, the finished products per gram have about 100-150 millions of cavities, the diameter of the cavities is about 0.8-1.2 μm, the length of the passages is about 2-5 μm, and the width is about 0.3-0.4 μm.

Furthermore

An acidic alumina sol and a silica sol are used to be mixed to a certain degree of dilution, where the alumina sol is 60% and the silica sol is 40%, the core materials manufactured above are mixed to the two mixed sols, their weight ratio is 78%:20%, the mixture is then removed to

be put into a high-temperature tubular resistance furnace to be kept constant at the temperature of 650°C for one hour, after the procedure ends, the mixture is cooled, removed and refined, to manufacture a multifunctional hybrid charged adsorbent material synthesized of which the core is a non-polar adsorbent and the external layer is Al-Si skeleton network medium polar adsorbent, the adsorbent has good quality, good mechanical strength, long service life, wide aperture distribution, and has greater adsorption capacity and a faster adsorption rate for various inorganic and organic gases, organic matter and heavy metal ions in an aqueous solution and the like, and the finished products made from sludge, in the specific embodiment, are applied to filter columns of the composite filter apparatus of the sewage treatment system and applied to a smell destroyer in smell treatment.

The specific embodiment of the tail gas environmental-protection treatment system is now stated:

18. At first, heat-source flue gas of the cracking furnace, heat-source flue gas of the heat-conducting flow furnace, heat-source flue gas of the rotary drying apparatus, water vapor of the biochemical apparatus, scorching gas of the high-temperature activation furnace, hot steam of the steam activation bed, dry-dust air produced during feed production and the like enter into a water-sealed flue gas buffer chamber under the action of a two-stage air-inducing device through a tail gas conveying system consisting of multiple pipelines. At this time, after the flue gas is input from 150 mm below the water, the flue gas leaps out of the water from the bottom up, and the action makes multiple channels of flue gas with different pressures, different wind speeds and air flow form uniformly mixed flue gas under the same condition after leaping out of the water. The flue gas, under the action of the back-stage air-inducing device, carries carbon particles and solid particles of other substances to enter into a treatment channel of negative ions and water curtains, and impinges to a ceramic high-speed water curtain zone that can naturally release negative ions at a high speed, an instantaneous airflow trajectory direction change is produced under the guide of the concave obtuse-angle diversion plate dislocated up, left and right, at this time, great-density solid dust particles in the flue gas do not flow with the gas direction in the negative ion zone, fall into a waterdrop mixer installed to the lower portion of the pipeline, and enter into a water-solid mixing pipeline in the system along with the water, while, after smoke and water vapor enter into another buffer chamber, the smoke and the water vapor are washed and cooled by double-layered water curtains disposed in the buffer chamber, so as to prevent the

hot flue gas carrying extant carbon particles from causing destructive thermal shock to the back-stage device. After being effectively cooled in the buffer chamber, the flue gas directly enters into a twin-tower vertical gas-solid separator through a connecting pipeline, weak alkalinity water sprayed by whirl spray nozzles in the two separators carries out large-area washing on the flue gas twice in clockwise and counterclockwise directions, so as to remove tiny solid matter in the flue gas and desulfurize the flue gas, the water vapor that has been washed by the weak alkalinity water enters into a gas-water conveying pipeline through exhaust ports disposed on upper portions of the twin towers, while the tiny solid matter enters into the gas-water conveying pipeline through exhaust ports on lower portions of the twin towers along with the water.

Furthermore

The hot water vapor entering into the gas-water conveying pipeline, on the upper layer in the pipeline, enters into a flue gas emission system, while the water and the tiny solid matter entering into the gas-water conveying pipeline, on the lower layer in the pipeline, also enters into the flue gas emission system, the emission system is divided into three parts, that is, upper, middle and lower parts, when the water and the hot water vapor enter into the lower part of the system, the water and the tiny solid matter directly enter into a three-stage filter through water outlets at the bottom of the system, while the hot water vapor rises from the lower part to the middle part of the system and enters into a heat exchanger disposed in the middle part, the liquefied water falls into a water outlet in the lower part and enters into the three-stage filter, while the gas that cannot be liquefied continuously rises, the gas entering into the upper part of the system is discharged from the outlet, at this time, the temperature of the tail gas discharged is not higher than 38°C, there are no room-temperature gas emissions, and the gas emissions have no odors and carbon particles, and have no black smoke.

The specific embodiment of centralized air treatment on the air in the production site is now stated (plasma photocatalytic negative ion air deodorization and sterilization apparatus):

19. Exhaust pipelines are installed at various procedures in the front end of the biochemical treatment procedure and all positions of connecting ports between devices where odors may exist, exhaust pipelines are also installed around four sides of the manufacturing shop, when odorous air passes through the back-stage air-inducing device of the exhaust pipelines, the odorous air is introduced into corrugated anion zones in the front end of the exhaust pipelines, the anion content

of the zone is 15000 per cubic centimeter, when the odorous air passes from an interval of 8 mm stacked by corrugation, enters into a plasma treatment zone, and continuously passes through an exhaust pipe to enter into a photocatalytic zone, in the reaction process under the photocatalysis, surface moisture and oxygen in the air are used as oxidants, the odors in the air have been completely oxidized into non-toxic harmless substances, under the action of the air-inducing device of 1500 m³/h disposed in the back stage of the photocatalytic zone, the air is introduced into the corrugated anion zones of which the release amount of the negative ions is 15000 per cubic centimeter disposed in the front end of the air outlet and then is discharged, and the air discharged is air which is clean and free from foreign smell.

The specific embodiment of the central intelligent control operation is now stated:

20. The central intelligent control operating system in the specific embodiment is the prior art, which specifically sets up a central intelligent control room, the room has a central control operating platform, a large display screen is used as a human-computer interface, and control cabinets are respectively arranged on production lines of various on-site devices and gas outlets.

The operating platform of the central control room is used as an all monitoring center, observes the operating status of the whole line from the home screen, is synchronous with real-time operations through a computer configuration screen, and monitors and displays fluid dynamics and the running state of the motor, timely data adjustment may also be made according to varying conditions occurring during the production, on-site control is made in the central control system, a certain link in the system can be individually started at any time, and an unattended state can be achieved in the main production zone in the whole kitchen garbage resource treatment.

CLAIMS

1. A kitchen garbage all-around comprehensive treatment system, characterized in that, the system comprises a kitchen garbage bag-breaking apparatus, a kitchen garbage joint
5 screening apparatus, a wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus, a vertical dehydration apparatus, a material crusher and an automatic control apparatus, kitchen garbage is thrown into the kitchen garbage bag-breaking apparatus for bag-breaking treatment and then input to the kitchen garbage joint screening apparatus for joint screening, a screened oil, water and solid mixture is input
10 to the wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus for inactivation treatment, the kitchen garbage that has been inactivated, deodorized, desalted and primarily dehydrated through wet advanced oxidation is sent into the dehydration apparatus by a screw-rod conveying pipeline, a material, after being dehydrated by the dehydration apparatus, is input into the material crusher for crushing, and
15 the automatic control apparatus controls other apparatuses to operate.
2. The kitchen garbage all-around comprehensive treatment system according to claim 1, characterized in that, the lacerating apparatus comprises a horizontal tubular housing (D11), one end of the housing (D11) is a discharge port (D18), more than one cutting tool (D12) is fixed on an inner wall of the one end of the discharge port (D18) of the housing (D11), the
20 other end of the housing (D11) is internally provided with a piston (D13) capable of sliding along an inner cavity of the housing (D11) and is connected with a power tool (D12) pushing the piston (D13) to move, a cutter groove (D14) is opened in a position on the piston (D13) corresponding to each cutting tool (D12), and a feeding port (D21) is opened in a middle position at the top of the housing (D11).
- 25 3. The kitchen garbage all-around comprehensive treatment system according to claim 2, characterized in that, a pulley (D15) is installed at the bottom of the piston (D13), a concave sliding rail (D17) is fixedly disposed in a position at the bottom of an inner wall of the housing (D11) corresponding to the pulley (D15), and the pulley (D15) is capable of sliding back and forth on the concave sliding rail (D17).
- 30 4. The kitchen garbage all-around comprehensive treatment system according to claim 2, characterized in that, a collecting tank (D19) is installed at the position of the feeding port

(D21), an upper portion of the collecting tank (D19) is funnel-shaped, a lower portion is in communication with the feeding port (D21) on the housing (D11) through a blanking pipeline (D20), and the blanking pipeline (D20) is provided thereon with a pneumatic slide gate valve (D27).

- 5 5. The kitchen garbage all-around comprehensive treatment system according to claim 2 or 3 or 4, characterized in that, a rolling clapper (D22) is installed at the position of the discharge port (D18) on the housing (D11), and the motor (D28) drives the rolling clapper (D22) to rotate.
6. The kitchen garbage all-around comprehensive treatment system according to claim 5,
- 10 characterized in that, the rolling clapper (D22) is square or polygonal and is provided with an inner cavity.
7. The kitchen garbage all-around comprehensive treatment system according to claim 6,
- 15 characterized in that, each side of the rolling clapper (D22) is provided thereon with more than one compressed air injection slot (D23), the rolling clapper (D22) is internally provided with a compressed air airway (D24) and a gas jet nozzle (D26), the gas jet nozzle (D26) is connected onto the compressed air airway (D24), and a jet flow direction of the gas jet nozzle (D26) is the same as a discharge direction of the discharge port.
8. The kitchen garbage all-around comprehensive treatment system according to claim 7,
- 20 characterized in that, the compressed air injection slots (D23) are disposed in parallel.
9. The kitchen garbage all-around comprehensive treatment system according to claim 2 or 3 or 4, characterized in that, the blade of a cutting tool (D16) is at an angle of 90 degrees with a cross section of the discharge port of the housing or at an angle of 30 degrees with the inner wall of the housing.
10. The kitchen garbage all-around comprehensive treatment system according to claim 1,
- 25 characterized in that, the kitchen garbage joint screening system comprises a shell (E11), the shell (E11) is internally provided with a partition plate (E25), the interior of the shell (E11) is divided into an air-floating zone (E10) and a non-air-floating zone (E32) through the partition plate (E25), the partition plate (E25) is provided thereon with a material leakage outlet (E26), the air-floating zone (E10) is provided with a feeding port, a lower
- 30 portion of the air-floating zone (E10) is provided with a heavy material discharge outlet (E22), the heavy material discharge outlet (E22) is provided with a valve (E23), around the

heavy material discharge outlet (E22) is more than one air nozzle (E24), an upper portion of the air-floating zone (E10) is provided with a rolling rake (E30), the non-air-floating zone (E32) is internally provided with a material output device (E33), one end of the material output device (E33) is disposed in the shell (E11), the other end is disposed on an outer side of the shell (E11), the material output device (E33) is internally provided with an auger (E37), the material output device (E33) is provided thereon with a motor (E36) and a transmission (E34), and the motor (E33) coordinates with the transmission to drive the auger (E37) to rotate.

11. The kitchen garbage all-around comprehensive treatment system according to claim 10, characterized in that, the material leakage outlet (E26) is provided with a shutter guide groove (E27), the shutter guide groove (E27) is connected to a pneumatic push-pull rod (E28), a pneumatic apparatus (E38) drives the push-pull rod (E28) to move, and the push-pull rod (E28) controls opening and closing of the shutter guide groove (E27).

12. The kitchen garbage all-around comprehensive treatment system according to claim 10, characterized in that, the number of the rolling rake (E30) is two, the two rolling rakes (E30) are disposed up and down, half of the lower rolling rake is disposed in a liquid level of the air-floating zone (E10), the upper rolling rake is disposed above the liquid level of the air-floating zone (E10), and the two rolling rakes (E30) are in mesh.

13. The kitchen garbage all-around comprehensive treatment system according to claim 12, characterized in that, the shell (E11) is provided thereon with a rolling rake motor (E39), and the rolling rake motor (E39) simultaneously drives the two rolling rakes (E30) to rotate.

14. The kitchen garbage all-around comprehensive treatment system according to any one of claims 10 to 13, characterized in that, the transmission (E34) is installed at the material output device (E33), and the motor (E36) drives the auger (E37) to rotate through the transmission (E34).

15. The kitchen garbage all-around comprehensive treatment system according to any one of claims 10 to 13, characterized in that, a liquid level automatic control apparatus (E29) for controlling a liquid level is installed at the air-floating zone (E10).

16. The kitchen garbage all-around comprehensive treatment system according to any one of claims 10 to 13, characterized in that, the shell (E11) is provided thereon with a pipeline for conveying the kitchen garbage into the shell (E11), and the pipeline is connected onto an

intake pipeline (E20).

17. The kitchen garbage all-around comprehensive treatment system according to any one of claims 10 to 13, characterized in that, a circulating water inlet of the air-floating zone (E10) is connected to a hydraulic booster pump (E21), a water source is provided by a circulating water storage tank, middle and lower portions of the non-air-floating zone (E32) are provided with water outlets, and water is input into the circulating water storage tank through a water pump, used for circulating the water in the air-floating zone (E10) and the non-air-floating zone (E32) and strengthening strong rolling of the water in the air-floating zone (E10).
18. The kitchen garbage all-around comprehensive treatment system according to claim 1, characterized in that, the oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus of the kitchen garbage comprises more than one reactor (F34) and a gas, water and material mixer (F42) for mixing ozone, water and a material, the mixer (F42) is connected with a waterproof check valve, one end of the waterproof check valve, after being connected to a gas pipe, is connected to an ozone generating device (F44), the mixer (F42) is further connected with an outlet of a high viscosity cam rotor pump (F49), an outlet of the mixer (F42) extends into one reactor (F34), an inlet of the high viscosity cam rotor pump (F49) is connected with another reactor (F34), the reactors (F34) are internally provided with more than one granular activated carbon reaction ball (F41), the granular activated carbon reaction balls (F41) contain granular activated carbon, and a material outlet is disposed at the bottom of each of the reactors (F34).
19. The kitchen garbage all-around comprehensive treatment system according to claim 18, characterized in that, the total volume of the granular activated carbon accounts for 15%-98% of the volume of a spherical cavity of the granular activated carbon reaction balls (F41).
20. The kitchen garbage all-around comprehensive treatment system according to claim 18, characterized in that, an automatic exhaust valve (F38) is disposed at the top of each of the reactors (F34), and the automatic exhaust valve (F38) is connected with an ozone destroyer (F39).
21. The kitchen garbage all-around comprehensive treatment system according to claim 18 or 19 or 20, characterized in that, a semicircular head (F35) is disposed at the bottom of each of the reactors (F34), and the material outlet is disposed on the semicircular head (F35).

22. The kitchen garbage all-around comprehensive treatment system according to claim 18 or 19 or 20, characterized in that, the most front-end reactor (F34) in the reactors (F34) is provided thereon with an inclined helical ribbon conveyor (F36), and a rear-end reactor (F34) is provided thereon with a water level adjustment pipeline.
- 5 23. The kitchen garbage all-around comprehensive treatment system according to claim 18 or 19 or 20, characterized in that, the material outlet is connected with a solid-liquid separator.
24. The kitchen garbage all-around comprehensive treatment system according to claim 23, characterized in that, the solid-liquid separator comprises a housing (F45) and a tilted reticular barrel (F52), the tilted reticular barrel (F52) is disposed in the housing (F45), the
10 motor coordinates with the transmission to drive the tilted reticular barrel (F52) to rotate, the front end of the tilted reticular barrel (F52) is provided with more than one row of meshes, and the tilted reticular barrel (F52) is internally provided with a helical ribbon connected to an inner wall of the reticular barrel, and a water butt (F47) is disposed at the bottom of the housing (F45).
- 15 25. The kitchen garbage all-around comprehensive treatment system according to claim 24, characterized in that, the helical ribbon accounts for the overall length of the tilted reticular barrel (F52).
26. The kitchen garbage all-around comprehensive treatment system according to claim 24, characterized in that, the housing (F45) is provided thereon with a window (F46).
- 20 27. The kitchen garbage all-around comprehensive treatment system according to claim 18 or 19 or 20, characterized in that, side faces of the reactors (F34) are provided with manholes.
28. The kitchen garbage all-around comprehensive treatment system according to claim 1, characterized in that, the vertical dehydration apparatus comprises a housing (G49), a vertical inleakage tower (G50) and a helical ribbon push rod (G51), the vertical inleakage
25 tower (G50) is disposed inside the housing (G49), the helical ribbon push rod (G51) is disposed inside the vertical inleakage tower (G50), side faces of the vertical inleakage tower (G50) are opened with more than one leakage hole (G58), a feeding port (G62) is disposed at the bottom of the vertical inleakage tower (G50), a discharge port (G60) is disposed at the top of the vertical inleakage tower (G50), the bottom of the housing (G49)
30 is installed with a power source that drives the helical ribbon push rod (G51) to rotate, inside the housing (G49), corresponding to four sides of the bottom of the vertical

inleakage tower (G50), are water catchers (G55), and the water catchers (G55) are connected with water outlets (G63).

29. The kitchen garbage all-around comprehensive treatment system according to claim 28, characterized in that, more than one water pipe (G65) is disposed inside the housing (G49) and around the vertical inleakage tower (G50), and each water pipe (G65) is connected with more than one high-pressure water recoil nozzle (G53).
30. The kitchen garbage all-around comprehensive treatment system according to claim 28 or 29, characterized in that, the top of the vertical inleakage tower (G50) is installed with an axis-retaining plate (G61) of the helical ribbon push rod (G51).
31. The kitchen garbage all-around comprehensive treatment system according to claim 30, characterized in that, a helical ribbon tail end on the helical ribbon push rod (G51) is installed with a seal plate that adjusts a discharging speed.
32. The kitchen garbage all-around comprehensive treatment system according to claim 28 or 29, characterized in that, spacing of helical ribbons on the helical ribbon push rod (G51) is gradually narrowed from a lower portion to the tower top.
33. The kitchen garbage all-around comprehensive treatment system according to claim 32, characterized in that, spacing of helical ribbon lower ends on the helical ribbon push rod (G51) is 25 CM, and terminal spacing is 10 CM.
34. The kitchen garbage all-around comprehensive treatment system according to claim 28 or 29, characterized in that, the power source comprises a motor (G54), a transmission (G64) and a steering transform apparatus (G66) that turns horizontal axial rotation into vertical axial rotation, the motor (G54) drives the transmission (G64) to rotate, the transmission (G64) drives the steering transform apparatus (G66) to rotate, and the steering transform apparatus (G66) drives the helical ribbon push rod (G51) to rotate.
35. The kitchen garbage all-around comprehensive treatment system according to claim 28 or 29, characterized in that, the housing (G49) is internally provided with a stainless steel support sleeve (G56).
36. The kitchen garbage all-around comprehensive treatment system according to claim 28 or 29, characterized in that, around an outer side of the vertical inleakage tower (G49) is more than one stainless steel vertical plate (G56), around the stainless steel vertical plates (G56) is more than one reinforced trap, and each reinforced trap is provided thereon with an

inclined anti-recoil diversion eave.

37. The kitchen garbage all-around comprehensive treatment system according to claim 28 or 29, characterized in that, the vertical inleakage tower (G49) is composed of more than one towers, upper and lower circumferential positions of each tower are provided with reinforced flanges, connections between adjacent towers are abutting joints between upper and lower flanges of the towers, which are fixed with bolts, and an upper flange in a position where flanges of each tower are connected is provided with an inclined anti-recoil diversion eave.

38. The kitchen garbage all-around comprehensive treatment system according to claim 1, characterized in that, the biochemical fermentation apparatus comprises an anaerobic fermentation pool (I65) and a primary fermentation apparatus (I70), the primary fermentation apparatus (I70) comprises two secondary fermenters (I71) and more than one primary fermenter, the two secondary fermenters (I71) are disposed above the primary fermenters, feeding ports (I84) are disposed where the secondary fermenters (I71) are connected with the primary fermenters, the primary fermentation apparatus is externally provided with a material hoist (I64) for inputting a material into the secondary fermenters (I71), the secondary fermenters (I71) are internally provided with stirring devices (I73), the primary fermenters are internally provided with double-layered helical ribbon stirrers (I78), the anaerobic fermentation pool (I65) is connected with the primary fermenters, and the anaerobic fermentation pool (I65) throws the material into the primary fermenters through an automatic unloading system (I67).

39. The kitchen garbage all-around comprehensive treatment system according to claim 38, characterized in that, the double-layered helical ribbon stirrers (I78) each comprise a shaft body, an internal helical ribbon and an external helical ribbon, the internal helical ribbon is disposed inside the external helical ribbon, the internal helical ribbon and the external helical ribbon are helical strips and respectively fixedly installed on the shaft body, spiral directions of the internal helical ribbon and the external helical ribbon are opposite, and a share vane (I79) is added around the shaft body of each of the double-layered helical ribbon stirrers (I78).

40. The kitchen garbage all-around comprehensive treatment system according to claim 38 or 39, characterized in that, in the middle of each of the stirring devices (I73) is a spindle, and

more than one stirring vane is fixedly installed on a central shaft.

41. The kitchen garbage all-around comprehensive treatment system according to claim 38 or 39, characterized in that, an upper side in the anaerobic fermentation pool (I65) is provided with a material stirrer (I68) that can move automatically.

5 42. The kitchen garbage all-around comprehensive treatment system according to claim 1, characterized in that, the automatic unloading multi-stage drying apparatus comprises a pre-drying device (J93) and a main drying device, the pre-drying device (J93) is installed above the main drying device, a housing of the pre-drying device (J93) is two-sided, a sandwiched housing cavity (J97) of the pre-drying device is formed between two sides, the
10 pre-drying device (J93) is internally provided with a material automatic flap (J94), in the middle of the main drying device is a horizontal cylinder body (J102) capable of rotating counterclockwise and clockwise at 360 degrees, front and rear ends of the main drying device are respectively fixed heads (J101), the horizontal cylinder body (J102) is internally provided with more than one secondary barrel fixedly installed together with the horizontal
15 cylinder body (J102), inside the horizontal cylinder body (J102) and the respective secondary barrels are material-guiding helical ribbons, the main drying device is provided thereon with a gas or liquid fuel combustion chamber (J99) and a burner (J100), heat produced by the burner (J100) is introduced into the main drying device, tail gas of the main drying device is input into the sandwiched housing cavity (J97) through a hot air
20 outlet (J107), and a material output port of the pre-drying device (J93) is disposed corresponding to the innermost secondary barrel of the main drying device.

43. The kitchen garbage all-around comprehensive treatment system according to claim 42, characterized in that, the bottom of the pre-drying device (J93) is provided with a helical ribbon auger automatic discharging device (J95), and the helical ribbon auger automatic
25 discharging device (J95) is tubular and internally provided with a helical ribbon auger.

44. The kitchen garbage all-around comprehensive treatment system according to claim 42, characterized in that, the top of the pre-drying device (J93) is provided with an air-inducing device (J98).

45. The kitchen garbage all-around comprehensive treatment system according to claim 42 or
30 43 or 44, characterized in that, the respective secondary barrels are nested together, and material inlets of external secondary barrels are longer than material outlets of internal

secondary barrels.

46. The kitchen garbage all-around comprehensive treatment system according to claim 42 or 43 or 44, characterized in that, outer sidewalls of the respective secondary barrels are fixedly installed with airflow disturbance wings (J103).
- 5 47. The kitchen garbage all-around comprehensive treatment system according to claim 42 or 43 or 44, characterized in that, the material-guiding helical ribbons inside the horizontal cylinder body (J102) and the respective secondary barrels are in opposite directions.
48. The kitchen garbage all-around comprehensive treatment system according to claim 1, characterized in that, the material selection apparatus comprises a base (K108), a metal rolling sieve tube (K110), a material loader (K113), an automatic conveying tool (K114), a chain conveyor (K115) and a bypass damper (K116), the metal rolling sieve tube (K110) is installed on the base (K108), the material loader (K113) is disposed below the metal rolling sieve tube (K110), the automatic conveying tool (K114) is disposed below the material loader (K113), the front end of the metal rolling sieve tube (K110) is provided with screen holes, the rear end is provided with a helical ribbon, the chain conveyor (K115) is disposed below a discharge port of the metal rolling sieve tube (K110), and the bypass damper (K116) is disposed at the tail end of the chain conveyor (K115).
- 10 49. The kitchen garbage all-around comprehensive treatment system according to claim 48, characterized in that, the screen holes each have a diameter of 4 mm to 6 mm, and the screen holes are at a distance of 2 mm.
- 20 50. The kitchen garbage all-around comprehensive treatment system according to claim 48, characterized in that, the metal rolling sieve tube (K110) is disposed obliquely, and an oblique angle is 1 degree to 20 degrees.
51. The kitchen garbage all-around comprehensive treatment system according to claim 48 or 49 or 50, characterized in that, the bypass damper (K116) is provided with an adjustment apparatus for adjusting the height between the bypass damper (K116) and the chain conveyor (K115), and one side of the bypass damper is provided with a pneumatic switch device.
- 25 52. The kitchen garbage all-around comprehensive treatment system according to claim 48 or 49 or 50, characterized in that, an outer side of the metal rolling sieve tube (K110) is installed with a protection cover (K109).
- 30

53. The kitchen garbage all-around comprehensive treatment system according to claim 1, characterized in that, the kitchen garbage joint screening apparatus is provided with a plastic solid output end, and the plastic solid output end of the kitchen garbage joint screening apparatus is connected with a waste plastic reverse engineering apparatus.
- 5 54. The kitchen garbage all-around comprehensive treatment system according to claim 53, characterized in that, the waste plastic reverse engineering apparatus mainly comprises a main-body treatment apparatus, the main-body treatment apparatus conveys a material into an air-pressure type automatic feeder (M123) through a conveyor belt (M122), the material is conveyed into a cracking catalytic horizontal reaction kettle (M124) through the
10 air-pressure type automatic feeder (M123), the reaction kettle (M124) can rotate clockwise and counterclockwise at 360 degrees, the reaction kettle (M124) internally has an automatic random scrapping apparatus (M125), the reaction kettle (M124) is connected with a back-stage vacuum system (M130), the reaction kettle (M124) is connected with an oil-wax separator (M129) through a pipeline, the pipeline is provided thereon with a check valve
15 (M128), the oil-wax separator (M129) is connected with a first-stage heavy oil separator (M131) through the pipeline, the first-stage heavy oil separator (M131) is connected with a first-stage condenser (M132) through the pipeline, the bottom of the first-stage condenser (M132) is connected with an oil container (M133), the rear end of the first-stage condenser (M132) is connected with a negative pressure device (M134), the rear end of the negative
20 pressure device (M134) is connected with a vertical water-sealed gas safety conveyor (M135), the rear end of the vertical water-sealed gas safety conveyor (M135) is connected with a secondary gas compressor (M136), and the secondary gas compressor (M136) is connected with a gas repository (M137).
55. The kitchen garbage all-around comprehensive treatment system according to claim 54,
25 characterized in that, the bottom of the reaction kettle (M124) is provided with a cracking furnace (M126), and an outlet pipeline of the cracking furnace (M126) is connected with a tail gas environmental-protection equipment system (M127).
56. The kitchen garbage all-around comprehensive treatment system according to claim 54, characterized in that, the oil container (M133) is connected with a decarbonizing pure
30 floating device (M139) and a dewaxing and degumming device (M140).
57. The kitchen garbage all-around comprehensive treatment system according to claim 53,

characterized in that, the system further comprises a coarse carbon black treatment apparatus, and the coarse carbon black treatment apparatus is connected at a residue outlet of the waste plastic reverse engineering apparatus.

58. The kitchen garbage all-around comprehensive treatment system according to claim 57,
5 characterized in that, the coarse carbon black treatment apparatus comprises a coarse carbon black artificial aging processor (N144), the coarse carbon black artificial aging processor (N144) is connected with a physical aging bed (N145), the physical aging bed (N145) is connected with a material matching device (N146) through an automatic conveying tool, the material matching device (N146) is connected with a liquid-solid
10 automatic quantitative charging device (N147), the rear end of the material matching device (N146) is provided with a multi-layered push-pull type screw rod (N148), and the rear end of the multi-layered push-pull type screw rod (N148) is connected with a low-sulfur high-energy environmentally friendly cleaning coal forming machine (N149).

59. The kitchen garbage all-around comprehensive treatment system according to claim 1,
15 characterized in that, the system further comprises a distillation-free biodiesel production apparatus, the respective apparatuses first carry out oil-water separation on an oil, water and solid mixture through a pipeline, and then the mixture after oil-water separation is sent into the distillation-free biodiesel production apparatus.

60. The kitchen garbage all-around comprehensive treatment system according to claim 59,
20 characterized in that, the distillation-free biodiesel production system comprises a horizontal helical ribbon solid-liquid separation device (O151), an oil-water separating column (O152), an oil storage container (O149), a grease colloid removal device (O158), a bio-oil normal-temperature grease exchange device (O161), a liquid separation device (O172) and a filtering device (O173), an outlet of the horizontal helical ribbon solid-liquid
25 separation device (O151) is connected to a middle-lower end of the oil-water separating column (O152) through a pipeline, the oil-water separating column (O152) is internally provided with a heating pipeline (O153), the heating pipeline (O153) extends to the interior of the oil-water separating column (O152) from a lower portion of the oil-water separating column (O152) and then is output to an outer side of the oil-water separating column (O152)
30 from a middle-upper portion of the oil-water separating column (O152), the top of the oil-water separating column (O152) is provided with an oil wiper (O155), the oil-water

separating column (O152) is connected with the oil storage container (O149) through an oil outlet pipeline (O156), an inlet of the oil outlet pipeline (O156) is disposed corresponding to the oil wiper (O155), the oil storage container (O149) is in communication with the grease colloid removal device (O158) through a pipeline, a hole impact plate (O159) is fixedly disposed inside the grease colloid removal device (O158), corresponding positions on two sides of the impact plate (O159) are respectively installed with a propeller-type hydraulic pusher (O160), propeller blades of the propeller-type hydraulic pusher (O160) are disposed in the grease colloid removal device (O158), the motor is disposed on an outer side of the grease colloid removal device (O158), the motor drives the propeller blades to rotate, a lower portion of the grease colloid removal device (O158) is provided with a grease outlet, the grease outlet is communicated into the bio-oil normal-temperature grease exchange device (O161) through a pipeline, the bio-oil normal-temperature grease exchange device (O161) is internally provided with more than one ultrasonic generator (O162), the top of the bio-oil normal-temperature grease exchange device (O161) is opened with a feeding port (O169), the bottom of the bio-oil normal-temperature grease exchange device (O161) is communicated to the liquid separation device (O172) through a pipeline, the bottom of the liquid separation device (O172) is connected to the filtering device (O173) through an oil pipeline, and the filtering device (O173) outputs biodiesel.

61. The kitchen garbage all-around comprehensive treatment system according to claim 60, characterized in that, the horizontal helical ribbon solid-liquid separation device (O151) comprises a horizontal cylinder housing, the housing is internally provided with a strainer, a conveying helical ribbon is fixedly disposed inside the strainer, the helical ribbon drives the motor to coordinate with the transmission to drive the strainer and the helical ribbon to rotate, and the bottom of the horizontal helical ribbon solid-liquid separation device (O151) is provided with an oil-water mixture output pipeline.

62. The kitchen garbage all-around comprehensive treatment system according to claim 60, characterized in that, the top of the oil-water separating column (O152) is provided with an infrared water liquid-level locator (O154).

63. The kitchen garbage all-around comprehensive treatment system according to claim 60, characterized in that, the periphery of the ultrasonic generator (O162) is provided with a casing (O163), internal thread jet holes (O164) are opened around the casing (O163), a

locking device (O165) is fixedly disposed above the casing (O163), and the ultrasonic generator (O162) is installed inside the bio-oil normal-temperature grease exchange device (O161) through the locking device (O165).

- 5 64. The kitchen garbage all-around comprehensive treatment system according to claim 60, characterized in that, the bio-oil normal-temperature grease exchange device (O161) contains a liquid diversion pipe (O166), one end of the liquid diversion pipe (O166) is connected to an upper portion of the bio-oil normal-temperature grease exchange device (O161), the other end is connected to the bottom of the bio-oil normal-temperature grease exchange device (O161), and the liquid diversion pipe (O166) is connected with a pump
10 (O167).
65. The kitchen garbage all-around comprehensive treatment system according to claim 60, characterized in that, the bottom of the bio-oil normal-temperature grease exchange device (O161) is provided with an air-blowing pipe (O171), and one end of the air-blowing pipe (O171) is connected with a compressed air engine.
- 15 66. The kitchen garbage all-around comprehensive treatment system according to claim 60, characterized in that, the system further comprises a grease colloid removal device, and bio-oil is input from the oil storage container to the grease colloid removal device by a special oil pump and then enters into the grease exchange device.
- 20 67. The kitchen garbage all-around comprehensive treatment system according to claim 66, characterized in that, the system further comprises an emulsified biodiesel manufacturing apparatus, and the bio-oil from a grease exchange process is output to the emulsified biodiesel manufacturing apparatus.
- 25 68. The kitchen garbage all-around comprehensive treatment system according to claim 67, characterized in that, the emulsified biodiesel manufacturing apparatus comprises a shell (P174), the shell (P174) contains a vertical stirrer (P175), a power source drives the vertical stirrer (P175) to rotate, a central shaft of the vertical stirrer (P175) is provided thereon with more than one paddle-type flat stirring impeller (P178) or paddle-type blade impeller, a lower portion of the central shaft of the vertical stirrer (P175) is installed with a turbine or disc curved blade (P179), an upper portion in the shell (P174) is provided with an
30 oxygen-enriched water atomization nozzle (P185), the top of the shell (P174) is provided with more than one feeding port (P181), each feeding port (P181) is connected with a

quantitative charging device (P182) through a pipeline, one side of a middle-upper portion of the shell (P174) is provided with an oil feeding port (P192) which is connected to the oil pump through a pipeline, the upper portion of the shell (P174) is provided with an intake pipeline (P186) and is connected with a high-pressure pump (P187), a water source of the intake pipeline (P186) is provided by an oxygen-enriched water storage tank (P191), oxygen-enriched water outputs O₃ gas by an ozone generator (P188) and, after entering into a strong gas-water mixer through a gas delivery pipeline and entering into water through a pipeline (P190) for mixing, enters into the oxygen-enriched water storage tank (P191), and a lower portion of the shell (P174) is provided with a finished-product discharge port (P184).

69. The kitchen garbage all-around comprehensive treatment system according to claim 68, characterized in that, the upper portion of the shell (P174) is cylindrical, and the lower portion is semicircular.

70. The kitchen garbage all-around comprehensive treatment system according to claim 69, characterized in that, more than one liquid diversion plate is installed around cylindrical inner walls of the shell (P174).

71. The kitchen garbage all-around comprehensive treatment system according to claim 69, characterized in that, the bottom of the shell (P174) is installed with a support bracket (P180) for supporting a rotation shaft of the vertical stirrer (P175).

72. The kitchen garbage all-around comprehensive treatment system according to any one of claims 68 to 71, characterized in that, the power source comprises a motor (P176) and a variable speed device (P177), the variable speed device (P177) is installed to the top of the shell (P174), the motor (P176) is disposed above the variable speed device (P177), and the motor (P176) drives the vertical stirrer (P175) to rotate through the variable speed device (P177).

73. The kitchen garbage all-around comprehensive treatment system according to claim 1, characterized in that, the system further comprises a rapid sewage recycling apparatus, and sewage produced by the apparatuses is connected to the rapid sewage recycling apparatus through pipelines.

74. The kitchen garbage all-around comprehensive treatment system according to claim 73, characterized in that, the rapid sewage recycling apparatus comprises a sewage filtering

basin (Q185), the sewage filtering basin (Q185) is internally provided with a sundries barrier (Q186), the sundries barrier (Q186) is internally provided with an anti-fouling recoil device (Q187), the sewage filtering basin (Q185) is connected with a scorching blanket sewage treatment device (Q188) through an intake pipeline, the scorching blanket sewage treatment device (Q188) comprises an inner cavity (Q189) and an enclosure (Q190), the top of the enclosure (Q190) is provided with a plurality of atomizing ejection heads (Q192) in communication with an intake pipe, below the atomizing ejection heads (Q192) is a scorching blanket (Q193), the scorching blanket (Q193) is internally provided with a heat-conducting oil pipeline (Q195), the bottom below the scorching blanket (Q193) is provided with a micro solid precipitation zone (Q196), the bottom of the micro solid precipitation zone (Q196) is provided with a sewage outlet (Q197), above the sewage outlet (Q197) is an anti-fouling recoil damper (Q198), below the scorching blanket (Q193) is a high-temperature-resistant cushion layer (Q199) for supporting the scorching blanket (Q193), the top of the enclosure (Q190) is opened with an automatic suction and discharge valve (Q200), the enclosure (Q190) is opened with a hot steam collecting port (Q201) above the scorching blanket (Q193), the hot steam collecting port (Q201) is connected with a heat exchanger (Q202) through a pipeline, the rear end of the heat exchanger (Q202) is connected with a collecting basin (Q203), the collecting basin (Q203) is connected with an advanced oxidation system (Q204) through a pipe section, the advanced oxidation system (Q204) has two cavities, i.e., inner and outer cavities, the inner cavity is a gas-water reaction chamber (Q205), the outer cavity is a gas-water circular reaction cushion chamber (Q206), an end portion of an inlet pipe at a water inlet of the inner cavity is provided with an activated carbon reaction ball (Q209), the activated carbon reaction ball (Q209) contains granular activated carbon, the bottom of the inner cavity is provided with a sewage outlet (Q212), the sewage outlet (Q212) is connected with a sewage outlet (Q213) of the housing, the sewage outlet (Q212) of the inner cavity is further installed with an anti-recoil damper (Q214), an advanced oxidation reactor is connected with a gas-water mixer (Q215) through a circulating pipeline, the gas-water mixer (Q215) is tee joint, two ends are in communication with circulating water, a port in the middle is connected with a waterproof check valve (Q216), the other interface of the waterproof check valve (Q216) is in communication with a gas pipeline of an ozone generator, the advanced oxidation system

(Q204) is connected with a transit pool (Q218), the transit pool (Q218) is connected with an activated carbon filter fixed bed (Q219), the activated carbon filter fixed bed (Q219) is connected with a composite filtering device (Q220), the composite filtering device (Q220) comprises more than one filtering tank (Q221), the filtering tanks (Q221) each are provided with more than one vertical filter column (Q222), a water outlet hole is opened at a position half the length of each vertical filter column (Q222), the bottom of each of the vertical filter columns (Q222) is provided with a strainer with 80-140 meshes, the top of each of the filtering tanks (Q221) has a water inlet (Q223) and a pressurized pipe (Q224), the tank body of each of the filtering tanks (Q221) is divided into two layers, the tank in each layer is provided with a filter column carrier (Q226), orifices matching the diameter of the filter columns (Q222) are opened on the filter column carrier (Q226), the filter columns (Q222) are inserted into the filter column carrier (Q226), one side of an upper portion of the upper tank body is installed with an influent diversion pipeline (Q228), the influent diversion pipeline (Q228) leads to an upper portion of the lower tank body, one side of a lower portion of the upper tank body is installed with an effluent diversion pipeline (Q229), the effluent diversion pipeline (Q229) leads to a lower portion of the lower tank body, one side of the upper and lower layers of the tank body is respectively installed with an exhaust port (Q230), water outlets of the filtering tanks (Q221) are disposed on one side (Q233) of a bottom head of the composite filtering device (Q220), and a central position of the bottom head is provided with a precipitate discharge port (Q234).

75. The kitchen garbage all-around comprehensive treatment system according to claim 74, characterized in that, a surface of the scorching blanket (Q193) is provided with a plurality of running water shallow grooves (Q194).

76. The kitchen garbage all-around comprehensive treatment system according to claim 74, characterized in that, the top of the inner cavity is installed with an automatic exhaust valve (Q207) and a liquid level control online monitor (Q208) for monitoring a liquid level.

77. The kitchen garbage all-around comprehensive treatment system according to claim 74, characterized in that, an upper portion of the activated carbon reaction ball (Q209) is impermeable, and a lower portion is a reticular water outlet (Q210).

78. The kitchen garbage all-around comprehensive treatment system according to claim 74, characterized in that, the volume of the granular activated carbon in the activated carbon

reaction ball (Q209) accounts for 15%-95% of the volume of the inner cavity of the reaction ball.

79. The kitchen garbage all-around comprehensive treatment system according to claim 1, characterized in that, the system further comprises a hybrid charged adsorbent production apparatus for treating remaining solid sludge, and sludge produced by various sections is input to the hybrid charged adsorbent production apparatus.

80. The kitchen garbage all-around comprehensive treatment system according to claim 1, characterized in that, the system further comprises a tail gas environmental-protection treatment apparatus carrying out centralized treatment on flue gas, hot flue gas, dust and the like produced in various processes.

81. The kitchen garbage all-around comprehensive treatment system according to claim 80, characterized in that, the tail gas environmental-protection treatment apparatus comprises a tail gas buffer device, a water-solid separator (S257), a twin-tower rotary spray system (S259) and a flue gas emission device (S264), an air buffer (S247) and a primary flue gas treatment pipeline (S253), tail gas is introduced into the air buffer (S247), input into the primary flue gas treatment pipeline (S253) through the air buffer (S247) and discharged into the water-solid separator (S257) through the primary flue gas treatment pipeline (S253), the outlet of the water-solid separator (S257) leads into the twin-tower rotary spray system (S259), and the tail gas is input into the flue gas emission device (S264) after being treated by the twin-tower rotary spray system (S259) and then is discharged after being treated by the flue gas emission device (S264).

82. The kitchen garbage all-around comprehensive treatment system according to claim 81, characterized in that, the air buffer (S247) comprises a cylindrical housing, an upper side in the housing is provided with more than one water curtain jet (S272), and the bottom of the housing is provided with a sewage outlet (S249).

83. The kitchen garbage all-around comprehensive treatment system according to claim 81, characterized in that, more than one tail gas inlet is opened around a housing of the tail gas buffer device (S253).

84. The kitchen garbage all-around comprehensive treatment system according to claim 82, characterized in that, the tail gas buffer device further comprises a water storage tank, and the sewage outlet (S249) is connected to the water storage tank through a pipe section.

85. The kitchen garbage all-around comprehensive treatment system according to claim 84, characterized in that, pipe sections of the circulating water are connected to an upper portion of the water storage tank through a water valve (S250), and middle and lower portions of the water storage tank are connected to a water curtain sprinkler in the air buffer (S247) through pumps and pipe sections.
86. The kitchen garbage all-around comprehensive treatment system according to claim 82 or 83 or 84 or 85, characterized in that, an upper side inside the air buffer (S247) is further installed with an online liquid level monitor (S251) for detecting a liquid level inside the air buffer (S247).
87. The kitchen garbage all-around comprehensive treatment system according to claim 81 or 82 or 83 or 84 or 85, characterized in that, the primary flue gas treatment pipeline (S253) is internally provided with more than one negative ion charged ceramic (S254), the ceramics can release negative ions naturally without power supply, and a rear end of each negative ion charged ceramic (S254) is correspondingly installed with a high-speed spray nozzle (S255).
88. The kitchen garbage all-around comprehensive treatment system according to claim 87, characterized in that, a rear end of each high-speed spray nozzle (S255) is installed with a diversion plate (S256).
89. The kitchen garbage all-around comprehensive treatment system according to claim 88, characterized in that, the diversion plate (S256) is an obtuse diversion plate.
90. The kitchen garbage all-around comprehensive treatment system according to claim 87, characterized in that, the anion charged ceramics (S254) are installed on left, right and upper surfaces in the primary flue gas treatment pipeline (S253).
91. The kitchen garbage all-around comprehensive treatment system according to claim 81 or 82 or 83 or 84 or 85, characterized in that, the tail gas treatment system further comprises a cooling tower (S269), and the cooling tower (S269) cools hot water in the heat exchanger (S266) in the flue gas emission device (S264).
92. The kitchen garbage all-around comprehensive treatment system according to claim 1, characterized in that, the system further comprises a plasma photocatalytic negative ion air deodorization and sterilization apparatus that treats air thought to be male ends and air in production areas, and air inlets of the plasma photocatalytic negative ion air deodorization

and sterilization apparatus are installed around various kitchen garbage collection pools.

93. The kitchen garbage all-around comprehensive treatment system according to claim 92, characterized in that, the plasma photocatalytic negative ion air deodorization and sterilization apparatus comprises an air delivery pipeline (T272), a photocatalytic main processor (T274) and an activated carbon air filter (T281), gas is input into the air delivery pipeline (T272), the air delivery pipeline (T272) is internally provided with an anion apparatus, the gas is input into the photocatalytic main processor (T274) through the air delivery pipeline (T272), the photocatalytic main processor (T274) is internally provided with an air channel, the air channel is internally installed with more than one ultraviolet light pipe (T276) whose emission wavelength is 253 nm to 258 nm, rear ends of the ultraviolet light pipes (T276) are fixedly installed with titanium dioxide photocatalytic touch plates (T278), the tail end of the air channel is in communication with the activated carbon air filter (T281), and the gas is output through the activated carbon air filter (T281).
94. The kitchen garbage all-around comprehensive treatment system according to claim 93, characterized in that, an air discharge pipeline (T279) is connected between the photocatalytic main processor (T274) and the activated carbon air filter (T281), the air discharge pipeline (T279) is internally provided with an anion apparatus, the tail end of the air channel is in communication with the air discharge pipeline (T279), and the air discharge pipeline (T279) is in communication with the activated carbon air filter (T281).
95. The kitchen garbage all-around comprehensive treatment system according to claim 93, characterized in that, the anion apparatus is an anion corrugated plate (T273), and the anion corrugated plate (T273) is installed in a stacked manner.
96. The kitchen garbage all-around comprehensive treatment system according to claim 95, characterized in that, the anion corrugated plate (T273) is provided with two sections, the front section is installed horizontally, and the rear section is installed vertically.
97. The kitchen garbage all-around comprehensive treatment system according to any one of claims 93 to 96, characterized in that, a front end of the air delivery pipeline (T272) is provided with an air inlet (T270), and a rear end of the air inlet (T270) is installed with an automatic slide gate valve (T271).
98. The kitchen garbage all-around comprehensive treatment system according to any one of claims 93 to 96, characterized in that, back sides of the ultraviolet light pipes (T276) are all

provided with smooth reflect plates (T277).

99. The kitchen garbage all-around comprehensive treatment system according to any one of claims 93 to 96, characterized in that, the air channel in the photocatalytic main processor (T274) is Z-shaped, and a plasma generator is disposed in a corner position of the Z-shaped air channel.
100. The kitchen garbage all-around comprehensive treatment system according to any one of claims 93 to 96, characterized in that, sizes and shapes of the titanium dioxide photocatalytic touch plates (T278) match a cross section of the air channel, which can be just blocked in the air channel.
101. The kitchen garbage all-around comprehensive treatment system according to any one of claims 93 to 96, characterized in that, the titanium dioxide photocatalytic touch plates (T278) are honeycomb-like.
102. The kitchen garbage all-around comprehensive treatment system according to claim 101, characterized in that, the titanium dioxide photocatalytic touch plates (T278) have a thickness of 1 cm to 10 cm, and are opened with more than one holes.
103. A method for manufacturing conversion products by using the kitchen garbage all-around comprehensive treatment system according to any one of claims 1 to 102, characterized in that, the method comprises:
 - A. collecting kitchen garbage, and throwing the kitchen garbage into the kitchen garbage bag-breaking apparatus for bag-breaking treatment;
 - B. jointly screening the kitchen garbage after bag-breaking treatment through the kitchen garbage joint screening apparatus, to separate solid plastics and others therefrom;
 - C. carrying out inactivation treatment on other kitchen garbage from which the solid plastics have been removed through the wet advanced oxidation, deodorization, inactivation, cleaning and salt-reduction apparatus;
 - D. carrying out dehydration treatment on the inactivated garbage through the vertical dehydration apparatus; and
 - E. rushing a dehydrated material through the material crusher.
104. The method according to claim 103, characterized in that, the crushed material in step E is biochemically treated by a biochemical treatment apparatus and then dried by an automatic unloading multi-stage drying apparatus, to form mixed feeds after multi-stage drying and

material selection.

105. The method according to claim 104, characterized in that, the biochemical treatment comprises:

5 A. generating a prefermented material under the simultaneous action of an anaerobic fermentation pool (I65) and two secondary fermenters (I71);

B. after completion of a prefermentation section, feeding the material in the two secondary fermenters (I71) into a primary fermenter through an automatic delivery device (I74) disposed at the bottom of the secondary fermenters (I71), and also feeding the material in the anaerobic fermentation pool (I65) into the primary fermenter through an automatic unloading system (I67), to carry out secondary fermentation; and

10

C. after completion of the secondary fermentation, discharging the material.

106. The method according to claim 105, characterized in that, when the prefermented material is generated in the anaerobic fermentation pool (I65), bean crop straw that accounts for 50%-80% of the total fermentation basic material weight and seasonal straw of gramineae crop that accounts for 20%-50% of the total fermentation basic material weight are crushed into powder whose particle size is 0.5 mm to 1 mm, a composite inoculant that can break down crude fiber is added thereto to biochemically treat the mixed material, the composite inoculant contains not less than two strains, one is *Aspergillus oryzae*, the input amount of the composite inoculant is 1% of a hybrid solid basic material, and chemical compositions of calcium oxide, sodium chloride, dibasic sodium phosphate and urea are added thereto.

15

20

107. The method according to claim 106, characterized in that, when the prefermented material is generated in one of the secondary fermenters (I71), the kitchen garbage artificially inactivated is added to the secondary fermenter (I71) as a basic material, bran that accounts for 1%-2% of the weight of the basic material, rice bran that accounts for 1%-3% of the weight of the basic material and white sugar that accounts for 1% of the weight of the basic material are added thereto to serve as a mixture, an appropriate amount of water is added to make the mixture into a paste, the temperature is controlled in a range between 20°C and 30°C, bread yeast that accounts for 2%-4% of the mixture is added to the mixture and then is fully stirred with the mixture to strengthen aeration, so as to enhance yeast growth, and the fermentation manner may be old leavening.

25

30

108. The method according to claim 107, characterized in that, when the prefermented material is generated in one of the secondary fermenters (I71), the kitchen garbage artificially inactivated, cleaned and dehydrated is added to the secondary fermenter (I71) as a basic material for solid-state fermentation, *Trichoderma viride*, *Candida tropicalis*, water bacteria and *Endomycopsis* yeast are selected to form a four-strain mixed inoculant, a weight ratio of the four strain is 2:2:1:1, the inoculation quantity is 2% of the total weight, urea that accounts for 1%-1.5% of the total weight is added at the same time, the temperature is 25°C-42°C, a stirring device (I73) rolls the mixture once every hour, and the fermentation time is 9 h to 10 h.
109. The method according to claim 108, characterized in that, during the secondary fermentation, the material on which preliminary biochemical treatment has been carried out is input to the primary fermenter, the straw fermentation material accounts for 10%-40% of the total material weight percentage, the bread yeast fermentation material accounts for 20% of the total material weight percentage, the fermentation material in the second secondary fermenter (I71) accounts for 40%-70% of the total material weight percentage, when the three materials after prefermentation treatment enter into the primary fermenter, the double-layered helical ribbon stirrers (I78) rotates at 360 degrees in a round-trip direction, to slowly stir the materials at a low speed, the temperature in the primary fermenter starts to ramp up from initial 20°C, an average temperature of the materials in the ramp-up stage is 20°C-28°C, an air valve I87 is closed after a holding time of 4 h, the temperature is raised to 35°C-38°C at the same time, after a holding time of 3 h, a first-stage air-inducing apparatus I92 is opened, to carry out lightweight ventilation, and after completion of the two holding times, the temperature is raised to 82°C, the time is 2 h, and a second-stage air-inducing apparatus I92 is opened to carry out strong ventilation.
110. The method according to claim 103, characterized in that, waste plastics produced in step B are reversed into biodiesel through the waste plastic reverse engineering apparatus.
111. The method according to claim 110, characterized in that, the artificial aging processor of residue and coarse carbon black produced by manufacturing of the biodiesel ages the materials by using ozone, the coarse carbon black after chemical aging enters a physical aging bed, after artificial aging, the coarse carbon black is input to a material matching device through a special automatic conveying tool, each compatible adjuvant is added by a

liquid-solid automatic quantitative charging device, the materials are fully mixed and input to a low-sulfur high-energy environmentally friendly cleaning coal forming machine through a multi-layered push-pull type screw rod, and the coarse carbon black is obtained after the materials are formed.

- 5 112. The method according to any one of claims 103 to 111, characterized in that, sewage produced in step A to step E, after being treated by a rapid sewage recycling apparatus, is discharged or recycled.
113. The method according to any one of claims 103 to 111, characterized in that, solid sludge produced in step A to step E, after being treated by a hybrid charged adsorbent production
10 apparatus, generates a hybrid charged adsorbent.
114. The method according to any one of claims 103 to 111, characterized in that, flue gas, hot flue gas, dust and pumping-drainage-port air produced in step A to step E are discharged after being treated by an environmental-protection treatment apparatus.
115. The method according to claim 114, characterized in that, the gas after treatment is
15 discharged after being treated by a plasma photocatalytic negative ion air deodorization and sterilization apparatus.
116. The method according to any one of claims 103 to 111, characterized in that, an oil-water mixture produced in step A to step E products biodiesel with a distillation-free biodiesel production method, the method comprising:
20 (1) carrying out solid removal treatment on an oil, water and solid mixture produced during production of the kitchen garbage through a horizontal helical ribbon solid-liquid separation device (O151), to obtain an oil-water mixture;
(2) conveying the oil-water mixture to an oil-water separating column (O152) for oil-water separation, and inputting separated grease to an oil storage container
25 (O149);
(3) when it is necessary to process biolipid, after the biolipid is sent into a grease colloid removal device (O158) through tools such as a delivery pump, starting an propeller-type hydraulic pusher (O160), adding phosphoric acid, a ratio of the phosphoric acid to the biolipid not exceeding 0.8%-1.2% of the total amount of oil,
30 using propeller thrust on two ends of the grease colloid removal device (O158) to make the liquids inside the grease colloid removal device (O158) generate

face-to-face impact, the impact time being 10 min to 15 min, and after the face-to-face impact of the liquids ends, immediately adding dilute brine, a weight ratio of water to salt in the dilute brine being between 95:5 and 90:10, and a weight ratio of the biolipid to the dilute brine being between 90:10 and 80:20;

- 5 (4) continuously starting the propeller-type hydraulic pusher (O160), the time being 10 min to 20 min;
- (5) retaining a grease mixture in the grease colloid removal device (O158) for 60 min to 120 min;
- (6) inputting the biolipid from which colloid has been removed into a bio-oil normal-temperature grease exchange device (O161);
- 10 (7) when a liquid level of the grease input in the bio-oil normal-temperature grease exchange device (O161) reaches a liquid level set in a production process, stopping the inputting, beginning to start an air-blowing pipe (O171) at the bottom of the bio-oil normal-temperature grease exchange device (O161), opening a feeding port (O169), adding a solid catalyst and methanol, dosage of the solid catalyst being 1.5%-3.5% of the mass of the biolipid, and dosage of the methanol being 3%-8% of the mass of the biolipid, and adding a cosolvent after adding the methanol;
- 15 (8) continuously stirring for 10 min to 15 min by using a stirrer, and adding a solid metal alkali catalyst, the adding quantity being 3%-4.5% of the mass of the biolipid;
- 20 (9) after an adjuvant required is added, closing the feeding port (O169), opening a material circulation delivery pump, and opening an ultrasonic generator (O162), wherein the initial frequency of the ultrasonic generator (O162) is 25 KHZ, the time is 1 min, then the initial frequency gradually increases to 30 KHZ, the time is 30 min to 40 min, and the reaction temperature is 25°C-35°C;
- 25 (10) after grease exchange of the grease is completed in the bio-oil normal-temperature grease exchange device (O161), inputting the biolipid mixture to a liquid separation device (O172) for standing and layering, wherein the upper layer is a mixed liquid of methanol and glycerol, and the lower layer is crude biodiesel; and
- 30 (11) first disposing and opening the liquid separation device at a lower liquid outlet, conveying the crude biodiesel into a filtering device (O173), obtaining a refined biodiesel after filtering and recycling a solid catalyst.

117. The method according to claim 116, characterized in that, during the oil-water separation, the oil-water mixture in the oil-water separating column (O152) is heated to 60°C-85°C, after the biolipid floats up, oil water dissociation is achieved, and the biolipid in the upper layer is scraped by an oil scraper (O155) and is sent into the oil storage container through an oil outlet pipeline (O156).
118. The method according to claim 116, characterized in that, the cosolvent is selected as a mixture of methanol and ethanol in any proportion, the adding quantity of the cosolvent is 0.5%-2% of the mass of the biolipid, and the cosolvent further comprises butanol whose adding quantity is 0.5% of the mass of the biolipid.
119. The method according to claim 116, characterized in that, the solid anionic metal alkali catalyst is characterized by taking reagent activated carbon and nano particles of cyclic-structure silicate minerals of aluminum, sodium, iron and lithium as a core, externally wrapped with silicon, aluminum, and lithium mesh skeleton mediums and having a hybrid charged carrier with polarity, then the carrier is immersed in a KNO_3 liquid, and becomes a hybrid charged solid anionic metal alkali catalyst with polarity and containing 15%-25% of KNO_3 .
120. The method according to claim 116, characterized in that, the biodiesel is made into an emulsified biodiesel through a micro-emulsified biodiesel manufacturing apparatus, the method comprising:
- (1) inputting crude biodiesel into the micro-emulsified biodiesel manufacturing apparatus, starting a stirring system, adding 30%-80% of National III standard diesel, and then stirring the mixture for 5 min;
 - (2) adding a hydrophilic agent, whose adding quantity is 2-3% of the total weight of pure biodiesel and the National III standard diesel, to be stirred for 1 min to 15 min;
 - (3) adding the butanol as an intermediate, whose adding quantity is 2-4% of the total weight of the pure biodiesel and the National III standard diesel, and continuously stirring the mixture directly for 15 min, wherein, during the stirring, a vertical stirrer (P175) stirs the mixture at a rotating speed of 100 r/min-130 r/m;
 - (4) adding isopentane as a spontaneous combustion temperature regulator, whose adding quantity is 1.5-2% of the total weight of the pure biodiesel; and
 - (5) adding oxygen-enriched water, wherein the water accounts for 1%-20% of the total

weight of the product, stirring the mixture for 15 min, adjusting the rotating speed as 170 r/min-200 r/m, and adding Octadec-cis-9-enoic acid as an emulsifier, wherein the adding quantity of the Octadec-cis-9-enoic acid is 70%-90% of the weight of clean water added, the mixture is continuously stirred by the stirring device until the mixture becomes clear, at this time, the rotating speed of the stirrer is adjusted as 280-340 r/min, the mixture generally needs to be continuously stirred for 40-60 min, and after standing for a certain time, a finished product is obtained after the emulsified oil is observed as clean and transparent without layering.

- 5
121. The method according to claim 120, characterized in that, for the hydrophilic agent, a cationic surfactant and non-ionic surfactant associated compound material is selected as a composite surfactant, and the mixing proportion is that the cationic surfactant is 50% and the non-ionic surfactant is 50%.
- 10
122. The method according to claim 120, characterized in that, the surfactant is triethanolamine or hexahydroaniline or cetrimonium bromide and ammonia.
- 15
123. The method according to claim 120, characterized in that, the adding quantity of the oxygen-enriched water is 10%-20% of the total weight.
124. The method according to claim 120, characterized in that, the acid value of the setting quantity of the Octadec-cis-9-enoic acid is 200.