

Description

Title of the Invention:

5 EXCREMENT DISPOSAL METHOD AND APPARATUS FOR THE SAME

Technical Field

[0001] The present invention relates to an excrement disposal apparatus which performs
10 disposal when a bedridden user or a user with trouble in walking sets bedpan (cup) at a
crotch and defecates, and relates to an excrement disposal method and an apparatus for the
same configured to discharge sewage stored in the excrement disposal apparatus directly
from a sewage tank to the outside.

15 Background of the Invention

[0002] There are conventionally suggested excrement disposal apparatuses of this kind
each of which takes a sewage tank out of an excrement disposal apparatus main body and
conveys it to a flushing toilet bowl or the like and pours the sewage into the flushing toilet
20 bowl or the like.

Patent Document 1 discloses an apparatus in which an ozone generator, a tank
assembly, a foam generation tank, and a compressed air supply part are provided around
the toilet bowl as detergent generation and supply means and when an upper cover is
opened, the detergent being an aggregate of ozone-containing foam is supplied into the
25 toilet bowl in order to achieve a high odor eliminating effect.

The ozone generator is a device which generates ozone gas and is composed of a
device which performs silent discharge in clean dried air or oxygen (ozonizer), or a device
which utilizes an O₃ lamp or the like.

The tank assembly is composed of a main tank, a washer tank, a water tank, a metering and mixing tank, an A liquid (water) tank, and a B liquid (surfactant solution) tank.

5 The foam generation tank includes a housing main body and a housing bottom part.

The compressed air supply part is composed of an air tank, and a compressor and a motor which are floating-supported by an elastic support body in the air tank.

[0003] Patent Document 2 discloses a portable toilet intended to use a less amount of
10 washing water for a toilet bowl.

This portable toilet includes a movable operating base, a toilet bowl installed on the operating base, a bucket arranged on the lower side of the toilet bowl, a toilet seat arranged on the upper side of the toilet bowl, and means for supplying toilet bowl washing water to the toilet bowl, in which the toilet bowl washing water supply means is arranged
15 at the rear of the toilet bowl and provided with a spray nozzle for spraying water toward the inside of the toilet bowl, the water in the tank is supplied to the spray nozzle via a pipe, a pump, a three-way switching valve, and a pipe, and the water in the tank is made into hot water via a pipe branching off from the three-way switching valve and a heater and is then supplied to a hot-water washing nozzle. After the user sits on the toilet seat and excretes,
20 the hip is dried by using the hot-water washing nozzle. Thereafter, water is sprayed from the spray nozzle to wash the toilet bowl. Since water is sprayed from the spray nozzle to wash the toilet bowl, the amount of water used is small and the number of times of washing the bucket or pouring water into the tank is small.

25 [0004] Patent Document 3 discloses a dirt pot having a toilet bowl part at an upper part and a dirt storage bath at a lower part, which ensures sealing when closing the dirt pot by a lid body at a lower end portion of the toilet bowl part, thereby preventing the leakage of odor.

In order to achieve this object, the dirt pot is provided with a toilet bowl part at the upper part, a dirt storage bath forming a container shape at the lower part, and a lid body closing the opening of the lower end part of the toilet bowl part. Further, a female fitting surface in a tapered shape is formed on the inner peripheral surface of the opening and a male fitting surface fitting to the female fitting surface is formed on the lid body so that the fitting surfaces fit each other, in which the male fitting surface of the lid body is configured to form a surface at a steeper angle than a taper angle of the female fitting surface of the opening.

- 10 [0005] Patent Document 4 discloses an apparatus in which an openable/closable toilet seat is provided on a main body of a movable toilet, a lid is covered on the toilet seat, a bucket which receives excrement and can be taken out is provided under the toilet seat, and a foam water tank is arranged under the bucket so that the foam generated in the foam water tank periodically passes through a cylindrical pipe and is discharged into the bucket from the side at the upper end of the bucket to cover the excrement in the bucket with the foam at all times.

Prior Art Documents

Patent Documents

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- [0006] Patent document 1: Japanese Laid-open Patent Publication No. H11-244193
 Patent document 2: Japanese Laid-open Patent Publication No. 2002-45307
 Patent document 3: Japanese Laid-open Patent Publication No. 2002-200005
 Patent document 4: Japanese Laid-open Patent Publication No. 2008-18188

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Summary of the Invention

Problems to be solved by the invention

[0007] The apparatus in Patent Document 1 is described as including the ozone generator, the tank assembly, the foam generation tank, and the compressed air supply part provided around the toilet bowl as the detergent generation and supply means, in which when the upper cover is opened, the detergent being the aggregate of ozone-containing foam is supplied into the toilet bowl, thereby providing high order eliminating effect. The apparatus however has a problem in a complicated and expensive structure.

The apparatus in Patent Document 2 washes the hip and the bowl part by the spray nozzle after the excretion, but the excretion is put in the bucket installed under the toilet bowl and only covered with the lid, thus causing such a problem that divergence of odor to the outside cannot be suppressed.

The apparatus in Patent Document 3 discloses that the opening between the toilet bowl part constituting the dirt pot and the dirt storage bath at the lower part is covered by the lid body of male and female fitting surfaces in a tapered shape, and has such a problem that divergence of odor during defecation cannot be suppressed.

The apparatus in Patent Document 4 discloses supply of foam for each predetermined time into the bucket but has such a problem that since the excrement is directly stored in the bucket, the foam breaks over time after the excretion and the odor is dispersed.

In particular, in the water washing-type apparatus that is a water-saving type, unless 4 to 5 liters of washing water is used at a time, the dirt in the toilet bowl does not flow into the tank or the bucket, resulting in that the room is filled with odor. Further, since 4 to 5 liters of washing water is used at a time, both the washing water tank and the tank for storing the dirt are needed to be the ones having a large capacity such as 40 to 50 liters, leading to a difficulty in reducing the size of the whole apparatus.

[0008] An object of the present invention is to provide an excrement disposal method and an apparatus for the same which eliminate a problem in odor occurring from a sewage tank by discharging sewage stored in the sewage tank in a main body of the excrement

disposal apparatus directly to the outside with an air pressure.

Means to solve the problems

5 [0009] An excrement disposal apparatus according to the present invention is characterized in that

a sewage tank (25) is arranged on one end side inside a main body cover (73), a pipe (44) is coupled to a top plate portion of the sewage tank (25) via a suction valve (31), a suction and pressure-feed port (30) communicating from the sewage tank (25) to an
10 external air pipe (43) is formed at the top plate portion, a crushing motor (34) of a sewage crusher (33) is attached to the top plate portion, a rotation shaft (34a) of the crushing motor (34) is hung inside the sewage tank (25) and is provided with a crushing blade (35), and an external pressure-feed pipe (45) for coupling to an external discharge part (13) is coupled to a bottom portion of the sewage tank (25) via a pressure-feed valve (32).

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[0010] The excrement disposal apparatus according to the present invention is characterized in that

a joint board (23) for detachably coupling the pipe (44) and a defecation suction pipe (19) of a cup (15) is provided on the outside of the main body cover (73) facing the
20 internal sewage tank (25), the joint board (23) is further detachably provided with a blast pipe (20) and a water pipe (21) to the cup (15) and is provided with a wireless power supply part (24) to which an electric cord (22) to the cup (15) is detachably connected, and the main body cover (73) is provided with, below the joint board (23), an external connection joint (48) for coupling the external pressure-feed pipe (45) and the external
25 discharge part (13).

[0011] The excrement disposal apparatus according to the present invention is characterized in that

a suction motor (26) is arranged at a lower part on another end side inside the main body cover (73), a washing water tank (53) is detachably provided at an upper portion of the suction motor (26), and a switch valve (27) for switching between suction and pressure-feed by the suction motor (26), a mist filter (40), an odor filter (41), and a pressure sensor (42) which are provided on the air pipe (43), and a cooling box (66) and a return box (67) which are provided on a blast pipe (65) coupling between the switch valve (27) and the cup (15), are arranged between the suction motor (26) and the sewage tank (25) inside the main body cover (73).

10 [0012] An excrement disposal apparatus according to the present invention is characterized by

including a cup control part (10) which controls a cup (15) set at a crotch of a user, and a suction and pressure-feed control part (11) which controls suction from the cup control part (10), wherein an air circulation path from an inside of the cup (15) when the cup (15) is worn with a diaper (100) intervening therebetween, to a defecation suction pipe (19) of the cup (15), a pipe (44), a suction valve (31), an inside of a sewage tank (25), a suction and pressure-feed port (30), an air pipe (43), an odor filter (41), a pressure sensor (42), one side on a blast side (A) of a switch valve (27), a suction motor (26), another side on the blast side (A) of the switch valve (27), a blast pipe (65), a cooling box (66), a return box (67), and a blast pipe (20) of the cup (15) back to the inside of the cup, is formed to exhaust part of circulating air from an exhaust throttle valve (68) to outside air via a filter (69) provided in the return box (67) and suck the amount of exhaust from a gap of the diaper (100) to prevent odor from being released to the outside air.

25 [0013] The excrement disposal apparatus according to the present invention is characterized in that

the pressure sensor (42) detects a change in pressure accompanying the suction of air from the gap of the diaper (100) in the air circulation path, and whether the diaper (100)

is normally worn is determined depending on a level of the pressure.

[0014] An excrement disposal apparatus according to the present invention is characterized by

5 including a cup control part (10) which controls a cup (15) set at a crotch of a user, a suction and pressure-feed control part (11) which controls suction from the cup control part (10) and pressure-feed from a sewage tank (25) to an external discharge part (13), and the external discharge part (13) which pressure-feeds and discharges sewage stored in the sewage tank (25),

10 wherein in the external discharge part (13), a drainage pipe (50) is extended to an external connection joint (48) and inserted into a discharge trap (51) of a flushing toilet bowl (49) to pour the sewage into a sewer pipe (52).

[0015] An excrement disposal apparatus according to the present invention is characterized by

15 including a cup control part (10) which controls a cup (15) set at a crotch of a user, a suction and pressure-feed control part (11) which controls suction from the cup control part (10) and pressure-feed from a sewage tank (25) to an external discharge part (13), and the external discharge part (13) which pressure-feeds and discharges sewage
20 stored in the sewage tank (25),

wherein in the external discharge part (13), a drainage pipe (50) is coupled to an on-floor cleaning hole (110) of a sewer pipe (52) by a coupling tool (111) to pour the sewage thereinto.

25 [0016] An excrement disposal apparatus according to the present invention is characterized by

including a cup control part (10) which controls a cup (15) set at a crotch of a user, a suction and pressure-feed control part (11) which controls suction from the cup

control part (10) and pressure-feed from a sewage tank (25) to an external discharge part (13), and the external discharge part (13) which pressure-feeds and discharges sewage stored in the sewage tank (25),

wherein in the external discharge part (13), a backflow prevention pipe (115) is formed behind and coupled to a trap (114) of a waste pipe (113) of a washstand (112) or the like to pour the sewage thereinto.

[0017] An excrement disposal apparatus according to the present invention is characterized by

including a cup control part (10) which controls a cup (15) set at a crotch of a user, and a suction and pressure-feed control part (11) which controls suction from the cup control part (10),

wherein a suction valve (31) on a suction side of a sewage tank (25) has a suction and discharge port (82) provided in a valve attachment plate (81), a pipe (44) of the sewage tank (25) is airtightly attached to the suction and discharge port (82), an elastic swing arm (84) is swingably attached to a rotation shaft (88) provided at one end of the valve attachment plate (81), a pressure adjusting screw (89) is provided on the swing arm (84) in a manner of being freely movable back and forth, a lower end portion of the pressure adjusting screw (89) is brought into pressure contact with a slider (83), a bulging edge (86) is formed at the whole periphery on an inside of the suction and discharge port (82), a guide rail (87) at the same height as a height of the bulging edge (86) is provided continuously from the bulging edge (86) and in a swinging direction of the slider (83), a guide groove (85) in an arc shape is formed in the valve attachment plate (81) on a side opposite to the rotation shaft (88), and a tip end part (84a) of the swing arm (84) is slidably fitted in the guide groove (85).

[0018] The excrement disposal apparatus according to the present invention is characterized in that

a blade-shaped part (92) is formed at an edge portion of the slider (83) sliding in contact with the bulging edge (86).

Effect of the invention

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[0019] According to the invention in claim 1,

a sewage tank (25) is arranged on one end side inside a main body cover (73), a pipe (44) is coupled to a top plate portion of the sewage tank (25) via a suction valve (31), a suction and pressure-feed port (30) communicating from the sewage tank (25) to an
 10 external air pipe (43) is formed at the top plate portion, a crushing motor (34) of a sewage crusher (33) is attached to the top plate portion, a rotation shaft (34a) of the crushing motor (34) is hung inside the sewage tank (25) and is provided with a crushing blade (35), and an external pressure-feed pipe (45) for coupling to an external discharge part (13) is coupled to a bottom portion of the sewage tank (25) via a pressure-feed valve (32), so that all of the
 15 connection and disconnection from the sewage tank 25 to the cup 15 and the connection and disconnection from the sewage tank 25 to the external pressure-feed pipe 45 can be handled on the one end surface of the main body cover (73), leading to excellent workability.

20 [0020] According to the invention in claim 2,

a joint board (23) for detachably coupling the pipe (44) and a defecation suction pipe (19) of a cup (15) is provided on the outside of the main body cover (73) facing the internal sewage tank (25), the joint board (23) is further detachably provided with a blast pipe (20) and a water pipe (21) to the cup (15) and is provided with a wireless power
 25 supply part (24) to which an electric cord (22) to the cup (15) is detachably connected, and the main body cover (73) is provided with, below the joint board (23), an external connection joint (48) for coupling the external pressure-feed pipe (45) and the external discharge part (13), so that the attachment and detachment of the blast pipe 20, the water

pipe 21, and the electric cord 22 at coupling with the cup 15 is easy, and the conduction of electricity to a human body can be prevented since the electric cord 22 is attached via the wireless power supply part 24.

5 [0021] According to the invention in claim 3,

a suction motor (26) is arranged at a lower part on another end side inside the main body cover (73), a washing water tank (53) is detachably provided at an upper portion of the suction motor (26), and a switch valve (27) for switching between suction and pressure-feed by the suction motor (26), a mist filter (40), an odor filter (41), and a
10 pressure sensor (42) which are provided on the air pipe (43), and a cooling box (66) and a return box (67) which are provided on a blast pipe (65) coupling between the switch valve (27) and the cup (15), are arranged between the suction motor (26) and the sewage tank (25) inside the main body cover (73), so that monitoring of the state of connection between the sewage tank 25 and an external pipe becomes easy.

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[0022] The invention in claim 4,

includes a cup control part (10) which controls a cup (15) set at a crotch of a user, and a suction and pressure-feed control part (11) which controls suction from the cup control part (10), wherein an air circulation path from an inside of the cup (15) when the
20 cup (15) is worn with a diaper (100) intervening therebetween, to a defecation suction pipe (19) of the cup (15), a pipe (44), a suction valve (31), an inside of a sewage tank (25), a suction and pressure-feed port (30), an air pipe (43), an odor filter (41), a pressure sensor (42), one side on a blast side (A) of a switch valve (27), a suction motor (26), another side on the blast side (A) of the switch valve (27), a blast pipe (65), a cooling box (66), a return
25 box (67), and a blast pipe (20) of the cup (15) back to the inside of the cup, is formed to exhaust part of circulating air from an exhaust throttle valve (68) to outside air via a filter (69) provided in the return box (67) and suck the amount of exhaust from a gap of the diaper (100) to prevent odor from being released to the outside air, so that the discharge of

the odor in the cup 15 and the air circulation path can be prevented.

[0023] According to the invention in claim 5,

the pressure sensor (42) detects a change in pressure accompanying the suction of
5 air from the gap of the diaper (100) in the air circulation path, and whether the diaper (100)
is normally worn is determined depending on a level of the pressure, so that the diaper
(100) can be worn in a normal state at all times irrespective of the level of skill for wearing
of the diaper (100).

10 [0024] The invention in claim 6

includes a cup control part (10) which controls a cup (15) set at a crotch of a user,
a suction and pressure-feed control part (11) which controls suction from the cup control
part (10) and pressure-feed from a sewage tank (25) to an external discharge part (13), and
the external discharge part (13) which pressure-feeds and discharges sewage stored in the
15 sewage tank (25),

wherein in the external discharge part (13), a drainage pipe (50) is extended to an
external connection joint (48) and inserted into a discharge trap (51) of a flushing toilet
bowl (49) to pour the sewage into a sewer pipe (52), so that the sewage can be discharged
with air pressure without performing any special works between the drainage pipe 50
20 coupled to the external connection joint 48 and the sewer pipe 52.

[0025] The invention in claim 7

includes a cup control part (10) which controls a cup (15) set at a crotch of a user,
a suction and pressure-feed control part (11) which controls suction from the cup control
25 part (10) and pressure-feed from a sewage tank (25) to an external discharge part (13), and
the external discharge part (13) which pressure-feeds and discharges sewage stored in the
sewage tank (25),

wherein in the external discharge part (13), a drainage pipe (50) is coupled to an

on-floor cleaning hole (110) of a sewer pipe (52) by a coupling tool (111) to pour the sewage thereto, so that when the on-floor cleaning hole (110) is provided, the sewage can be surely discharged to the sewer pipe (52) through the dedicated coupling tool (111).

5 [0026] The invention in claim 8

includes a cup control part (10) which controls a cup (15) set at a crotch of a user, a suction and pressure-feed control part (11) which controls suction from the cup control part (10) and pressure-feed from a sewage tank (25) to an external discharge part (13), and the external discharge part (13) which pressure-feeds and discharges sewage stored in the
10 sewage tank (25),

wherein in the external discharge part (13), a backflow prevention pipe (115) is formed behind and coupled to a trap (114) of a waste pipe (113) of a washstand (112) or the like to pour the sewage thereto, so that the sewage can be drained without backflow to the waste pipe (113).

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[0027] The invention in claim 9

includes a cup control part (10) which controls a cup (15) set at a crotch of a user, and a suction and pressure-feed control part (11) which controls suction from the cup control part (10),

20 wherein a suction valve (31) on a suction side of a sewage tank (25) has a suction and discharge port (82) provided in a valve attachment plate (81), a pipe (44) of the sewage tank (25) is airtightly attached to the suction and discharge port (82), an elastic swing arm (84) is swingably attached to a rotation shaft (88) provided at one end of the valve attachment plate (81), a pressure adjusting screw (89) is provided on the swing arm (84) in
25 a manner of being freely movable back and forth, a lower end portion of the pressure adjusting screw (89) is brought into pressure contact with a slider (83), a bulging edge (86) is formed at the whole periphery on an inside of the suction and discharge port (82), a guide rail (87) at the same height as a height of the bulging edge (86) is provided

continuously from the bulging edge (86) and in a swinging direction of the slider (83), a guide groove (85) in an arc shape is formed in the valve attachment plate (81) on a side opposite to the rotation shaft (88), and a tip end part (84a) of the swing arm (84) is slidably fitted in the guide groove (85), so that the slider 83 comes into close contact with the bulging edge 86 by the elastic swing arm 84 and the bulging edge 86 is formed at the whole periphery of the slider 83 and thereby, even if dirt and so on adhere to the valve attachment plate 81, the leakage can be prevented by the sliding in close contact at all times.

10 [0028] According to the invention in claim 10,
a blade-shaped part (92) is formed at an edge portion of the slider (83) sliding in contact with the bulging edge (86), so that even if dirt and so on are caught by the suction and discharge port 82 of the valve attachment plate 81, the blade-shaped part 92 cuts them and allows the sewage to smoothly pass.

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Brief Description of the Figures

[0029]

[FIG. 1] is a block diagram illustrating Example 1 of an excrement disposal method and an apparatus for the same according to the present invention.

[FIG. 2] is a block diagram illustrating Example 1 of a control circuit of the excrement disposal apparatus according to the present invention.

[FIG. 3] is a perspective view illustrating Example 1 of the excrement disposal apparatus according to the present invention as seen from the front.

25 [FIG. 4] is a right side view illustrating Example 1 of the excrement disposal apparatus according to the present invention with a main body cover detached.

[FIG. 5] is a perspective view illustrating Example 1 of the excrement disposal apparatus according to the present invention as seen from a rear surface with the main body cover

detached.

[FIG. 6] is a perspective view of a suction valve (or pressure-feed valve) used in the excrement disposal apparatus according to the present invention.

[FIG. 7] is a detailed view of the suction valve (or the pressure-feed valve) illustrated in

5 FIG. 6, (a) is a front view, (b) is a sectional view taken along a line A-A in (a), and (c) is a sectional view taken along a line B-B in (a).

[FIG. 8] is an exploded perspective view of a bedpan equipped with a diaper, (a) is a

perspective view of an inner, (b) is a perspective view of the diaper, and (c) is a

perspective view of an outer, and (d) is an explanatory view of the bedpan equipped with

10 the diaper set at a crotch part of a user.

[FIG. 9] (a) is a sectional view illustrating an example in which a tip end portion of a

drainage pipe is coupled from a sewage tank to an on-floor cleaning hole of a sewer pipe

by a coupling tool, and (b) is an explanatory view illustrating an example in which the tip

end portion of the drainage pipe is coupled from the sewage tank to a waste pipe of a

15 washstand.

[FIG. 10] is a flowchart of an operation of pressure-feeding sewage from the sewage tank to the outside.

[FIG. 11] is a flowchart of an operation of washing a bedpan (cup) prior to use.

[FIG. 12] is a flowchart of an operation of washing the bedpan (cup) after detection of

20 urine.

[FIG. 13] is a flowchart of an operation of washing the bedpan (cup) after detection of

feces.

[FIG. 14] is a flowchart of an operation of determining whether a care giver normally sets the diaper.

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Mode for Implementing the Invention

[0030] In the present invention

a sewage tank (25) is arranged on one end side inside a main body cover (73), a pipe (44) is coupled to a top plate portion of the sewage tank (25) via a suction valve (31), a suction and pressure-feed port (30) communicating from the sewage tank (25) to an external air pipe (43) is formed at the top plate portion, a crushing motor (34) of a sewage
 5 crusher (33) is attached to the top plate portion, a rotation shaft (34a) of the crushing motor (34) is hung inside the sewage tank (25) and is provided with a crushing blade (35), and an external pressure-feed pipe (45) for coupling to an external discharge part (13) is coupled to a bottom portion of the sewage tank (25) via a pressure-feed valve (32).

10 [0031] In the above configuration,

a joint board (23) for detachably coupling the pipe (44) and a defecation suction pipe (19) of a cup (15) is provided on the outside of the main body cover (73) facing the internal sewage tank (25), the joint board (23) is further detachably provided with a blast pipe (20) and a water pipe (21) to the cup (15) and is provided with a wireless power
 15 supply part (24) to which an electric cord (22) to the cup (15) is detachably connected, and the main body cover (73) is provided with, below the joint board (23), an external connection joint (48) for coupling the external pressure-feed pipe (45) and the external discharge part (13).

20 [0032] Further, in the above configuration, a suction motor (26) is arranged at a lower part on another end side inside the main body cover (73), a washing water tank (53) is detachably provided at an upper portion of the suction motor (26), and a switch valve (27) for switching between suction and pressure-feed by the suction motor (26), a mist filter (40), an odor filter (41), and a pressure sensor (42) which are provided on the air pipe (43),
 25 and a cooling box (66) and a return box (67) which are provided on a blast pipe (65) coupling between the switch valve (27) and the cup (15), are arranged between the suction motor (26) and the sewage tank (25) inside the main body cover (73).

[0033] The present invention includes a cup control part (10) which controls a cup (15) set at a crotch of a user, and a suction and pressure-feed control part (11) which controls suction from the cup control part (10), wherein an air circulation path from an inside of the cup (15) when the cup (15) is worn with a diaper (100) intervening therebetween, to a defecation suction pipe (19) of the cup (15), a pipe (44), a suction valve (31), an inside of a sewage tank (25), a suction and pressure-feed port (30), an air pipe (43), an odor filter (41), a pressure sensor (42), one side on a blast side (A) of a switch valve (27), a suction motor (26), another side on the blast side (A) of the switch valve (27), a blast pipe (65), a cooling box (66), a return box (67), and a blast pipe (20) of the cup (15) back to the inside of the cup, is formed to exhaust part of circulating air from an exhaust throttle valve (68) to outside air via a filter (69) provided in the return box (67) and suck the amount of exhaust from a gap of the diaper (100) to prevent odor from being released to the outside air.

[0034] In the above configuration, the pressure sensor (42) detects a change in pressure accompanying the suction of air from the gap of the diaper (100) in the air circulation path, and whether the diaper (100) is normally worn is determined depending on a level of the pressure, so that the diaper (100) can be normally worn at all times irrespective of the level of skill.

[0035] The present invention includes a cup control part (10) which controls a cup (15) set at a crotch of a user, a suction and pressure-feed control part (11) which controls suction from the cup control part (10) and pressure-feed from a sewage tank (25) to an external discharge part (13), and the external discharge part (13) which pressure-feeds and discharges sewage stored in the sewage tank (25),

wherein in the external discharge part (13), a drainage pipe (50) is extended to an external connection joint (48) and inserted into a discharge trap (51) of a flushing toilet bowl (49) to pour the sewage into a sewer pipe (52).

[0036] Further, the present invention includes a cup control part (10) which controls a cup (15) set at a crotch of a user, a suction and pressure-feed control part (11) which controls suction from the cup control part (10) and pressure-feed from a sewage tank (25) to an external discharge part (13), and the external discharge part (13) which pressure-feeds and discharges sewage stored in the sewage tank (25),

wherein in the external discharge part (13), a drainage pipe (50) is coupled to an on-floor cleaning hole (110) of a sewer pipe (52) by a coupling tool (111) to pour the sewage thereinto.

10 [0037] Further, the present invention includes a cup control part (10) which controls a cup (15) set at a crotch of a user, a suction and pressure-feed control part (11) which controls suction from the cup control part (10) and pressure-feed from a sewage tank (25) to an external discharge part (13), and the external discharge part (13) which pressure-feeds and discharges sewage stored in the sewage tank (25),

15 wherein in the external discharge part (13), a backflow prevention pipe (115) is formed behind and coupled to a trap (114) of a waste pipe (113) of a washstand (112) or the like to pour the sewage thereinto.

[0038] The present invention includes a cup control part (10) which controls a cup (15) set at a crotch of a user, and a suction and pressure-feed control part (11) which controls suction from the cup control part (10),

20 wherein a suction valve (31) on a suction side of a sewage tank (25) has a suction and discharge port (82) provided in a valve attachment plate (81), a pipe (44) of the sewage tank (25) is airtightly attached to the suction and discharge port (82), an elastic swing arm (84) is swingably attached to a rotation shaft (88) provided at one end of the valve attachment plate (81), a pressure adjusting screw (89) is provided on the swing arm (84) in a manner of being freely movable back and forth, a lower end portion of the pressure adjusting screw (89) is brought into pressure contact with a slider (83), a bulging edge (86)

is formed at the whole periphery on an inside of the suction and discharge port (82), a guide rail (87) at the same height as a height of the bulging edge (86) is provided continuously from the bulging edge (86) and in a swinging direction of the slider (83), a guide groove (85) in an arc shape is formed in the valve attachment plate (81) on a side opposite to the rotation shaft (88), and a tip end part (84a) of the swing arm (84) is slidably fitted in the guide groove (85).

[0039] In the above configuration, a blade-shaped part (92) is formed at an edge portion of the slider (83) sliding in contact with the bulging edge (86).

Example 1

[0040] Example 1 of an excrement disposal apparatus (9) according to the present invention will be explained based on the drawings.

In FIG. 3 to FIG. 5, the excrement disposal apparatus (9) has a slightly slim shape of a size having a width of about 230 mm, a depth of about 650 mm, a height of a main body cover (73) mounted on a main body base (72) of about 500 mm so that the excrement disposal apparatus (9) is never an obstruction even when it is installed at a bed or in a bedroom and is easy to use for a care giver.

Slightly large tired front wheels (79) each having a diameter of about 200 mm are provided on both sides of a front portion of the main body base (72), and slightly small and turnable rear wheels (80) each having a diameter of about 50 mm are provided on both sides of a rear portion.

At an upper portion on the front surface of the main body cover (73), two indicator lights (78) are provided which indicate that the operation is normal (still lighting) and error (blinking lighting), and an operation panel (75), a remote controller (76), and a power receptacle (77) are led out at an almost middle portion. The operation panel (75) may be operated while the care giver holds it in a hand, or may be operated while the

operation panel (75) is installed on the upper surface of the main body cover (73). The remote controller (76) performs a simple operation such as ON/OFF of a nurse call switch (99) and the excrement disposal apparatus (9) by a user on the bed while holding the remote controller (76) in a hand.

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[0041] On the upper surface of the main body cover (73), a lid body (74a) is provided which opens/closes when supplying a washing water tank (53) with washing water, and a lid body (74b) is provided which opens/closes in inspecting a later-explained coupling state of an upper surface of a sewage tank (25) and maintenance of the other.

10 A suction motor (26) subjected to countermeasures against noise and vibration is installed on the lower side of the front portion on the upper surface of the main body base (72) and inside the main body cover (73), a sub-tank (54) is fixed to the top of the suction motor (26), and the washing water tank (53) is detachably fitted to the sub-tank (54). Further, a switch valve (27) which switches between two positions for suction and
15 pressure-feed is provided at one end of the suction motor (26).

[0042] On the rear portion side of the main body cover (73), the sewage tank (25) is attached. A return box (67) is arranged in front of the sewage tank (25), a joint board (23) and a wireless power supply part (24) are attached to an upper portion of the return box
20 (67), the joint board (23) has a coupling portion of a defecation suction pipe (19) provided at its upper portion and has a blast pipe (20) and a water pipe (21) to the bedpan (15) provided on its lower portion, and an electric cord (22) is provided at the wireless power supply part (24).

Between the suction motor (26) and the sewage tank (25), a heat insulating tank
25 (60), a water pump (57), a mist filter (40), an odor filter (41), a pressure sensor (42), a cooling box (66) and so on are arranged.

[0043] The schematic arrangement of the constitution sites of the parts has been

explained using FIG. 3 to FIG. 5, and the flow of air, the flow of water, and the flow of electricity will be further explained based on FIG. 1.

In FIG. 1, the excrement disposal apparatus (9) according to the present invention includes:

5 a cup control part (10) which controls a bedpan (15) (hereinafter, referred also to as a cup (15)) set at a crotch of a user;

 a suction and pressure-feed control part (11) which controls suction from the cup control part (10) and pressure-feed to a later-explained external discharge part (13);

 a washing wafer control part (12) which controls washing water to the cup
10 control part (10);

 an external discharge part (13) which pressure-feeds and discharges sewage stored in the sewage tank (25); and

 an electric control part (14) which electrically controls the whole apparatus using a CPU (64) as a main body.

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[0044] In the cup control part (10), the cup (15) is worn at a position of an excretory organ of a crotch of a user (104) together with a diaper (100) as illustrated in FIG. 8(d).

As illustrated in FIG. 8(a), (b), (c), the cup (15) is composed of the diaper (100), an outer (101), and an inner (102).

20 The inner (102) has a feces sensor (17) and a urine sensor (18) inside a defecation receiving part (16), and a urination receiving part (105) has a washing water nozzle of the water pipe (21). The defecation suction pipe (19) communicating with the defecation receiving part (16) is provided, and the blast pipe (20), the water pipe (21), and the electric cord (22) are provided on the rear surface of the urination receiving part (105).

25 The diaper (100) is fitted to a gap between the inner (102) and the outer (101), and has a middle portion made of inside waterproof paper (106) and an outer peripheral portion of the inside waterproof paper (106) made of a cushion material (108).

A soft material excrement disposal method and an apparatus for the same are

formed which project outward from the defecation receiving part (16) and the urination receiving part (105) when the inner (102) is fitted to a defecation part fitting wall and a urination part fitting wall at the outer periphery of an inner fitting recessed part (107).

At the outer (101), the inner fitting recessed part (107) is formed which holds the
 5 diaper (100) in a close contact manner in the gap between the outer peripheral surface of the inner (102) and the inner peripheral surface of the outer (101). Further, a hip receiving portion is attached to a front end portion of the outer (101).

[0045] The diaper (100), the outer (101), and the inner (102) are assembled together in
 10 the following steps.

In the first step, the diaper (100) to be worn at the crotch is put on the back of the inner (102), the inner (102) having the defecation receiving part (16), the urination receiving part (105), and the defecation suction pipe (19) and functioning as a bedpan.

In the next step, the outer (101) is put on the back of the diaper (100) from the
 15 back thereof such that the front surface of the inner (102) is exposed, and holds the inside waterproof paper (106) portion of the diaper (100) between the outer (101) and the inner (102).

[0046] In FIG. 1, the suction and pressure-feed control part (11) is mainly composed of
 20 the sewage tank (25) and the suction motor (26).

To a top plate portion of the sewage tank (25), a pipe (44) is coupled via a suction valve (31) which controls the opening and closing, and a suction and pressure-feed port (30) and a sewage crusher (33) are provided. At a lower end portion of a rotation shaft (34a) of a crushing motor (34) constituting the sewage crusher (33), a crushing blade
 25 (35) is provided to crush solid matters such as discharged feces and toilet paper collected at the center on an inclined guide surface of a crushing cage (36), and discharge them together with sewage to the outside of the crushing cage (36) from a small hole (37). Inside the sewage tank (25) (for example, 8 liters), a full-water sensor (39) for sewage

(detecting it at, for example, 3 liters) and an empty sensor (38) (detecting it at, for example, 0.2 liters) are provided, and a pressure-feed valve (32) is provided at a side portion of a bottom plate. The full-water sensor (39) is attached at a middle portion or a slightly lower portion of the sewage tank (25) to prevent the sewage from leaking from the sewage tank (25) due to the movement or the inclination of the excrement disposal apparatus (9).

The crushed dirt and sewage are sent, when the pressure-feed valve (32) is opened, to a sewage pressure-feed pipe (45) via a check valve (47) and a backflow prevention trap (46) by later-explained pressure-feed of air, and are discharged at the external discharge part (13) coupled to an external connection joint (48). Concrete examples of the external discharge part (13) will be explained later.

[0047] The other end of the pipe (44) is coupled to the defecation suction pipe (19) at a position of the joint board (23). To the suction and pressure-feed port (30) on the upper surface of the sewage tank (25), an air pipe (43) is coupled. The air pipe (43) is coupled to one side of the switch valve (27) via the mist filter (40), the odor filter (41), and the pressure sensor (42). The switch valve (27) is switched between a blast side (A) and a pressure-feed side (B) by the valve motor (28), and one end on the pressure-feed side (B) is communicated with outside air (29). A blast pipe (65) coupled to another side on the blast side (A) of the switch valve (27) passes through the cooling box (66) and the return box (67) and is coupled to the blast pipe (20) at the joint board (23).

In the return box (67), a HEPA filter (69), a supply air temperature sensor (70), and an overtemperature monitoring sensor (71) are provided, and an exhaust throttle valve (68) is provided which releases about 10% of the air circulating in the circulation path, to the outside air.

[0048] In the case where the switch valve (27) is coupled to the blast side (A), an air circulation path is formed which passes through the defecation suction pipe (19) of the cup (15), the pipe (44), the suction valve (31), the inside of the sewage tank (25), the suction

and pressure-feed port (30), the mist filter (40), the air pipe (43), the odor filter (41), the pressure sensor (42), the one side on the blast side (A) of the switch valve (27), the suction motor (26), the other side on blast side (A) of the switch valve (27), the blast pipe (65), the cooling box (66), the return box (67), the blast pipe (20) of the cup (15), and the inside of the cup, and returns to the defecation suction pipe (19).

When the air in the air circulation path is sucked by the suction motor (26), the outside air is sucked through the gap between the crotch and the diaper (100) in a state of being set at the crotch of the user (104) to prevent leakage of odor, and odor corresponding to an amount of sucked air is removed from the exhaust throttle valve (68) and released to the outside air.

When the amount of sucked outside air differs depending on the degree of fastening of the cup (15) equipped with the diaper (100) to the crotch, the stable operation cannot be performed, so that the pressure sensor (42) in the air circulation path performs monitoring in order to make the attachment of the cup (15) equipped with the diaper (100) to the crotch almost constant. The operation at this time will be explained later.

[0049] Concrete structures of the suction valve (31) and the pressure-feed valve (32) which are attached to the sewage tank (25) will be explained based on FIG. 6 and FIG. 7.

The suction valve (31) (the pressure-feed valve (32) also has the same structure) has a suction and discharge port (82) provided at a valve attachment plate (81), and is airtightly attached in a state where the suction and discharge port (82) is aligned with the inner surface of the coupling port of the pipe (44) of the sewage tank (25). At one end of the valve attachment plate (81), a tip end portion of a rotation shaft (88) is projected inward, and an elastic swing arm (84) is swingably attached to the rotation shaft (88).

Two pressure adjusting screws (89) are provided on the swing arm (84) in a manner of being freely movable back and forth, and lower end portions of the two pressure adjusting screws (89) are fitted to recessed parts (91) of the slider (83). A bulging edge (86) is formed at the whole periphery on the inside of the suction and discharge port (82), and a

guide rail (87) at the same height as that of the bulging edge (86) is provided continuously from the bulging edge (86) while extending in the swinging direction of the slider (83).

The valve attachment plate (81) is bent in an arc shape on the side opposite to the rotation shaft (88), a guide groove (85) is formed on the inside of the arc-shape portion, and a tip

5 end part (84a) of the swing arm (84) slides while fitting in the guide groove (85). A blade-shaped part (92) is formed at the edge portion of the slider (83).

To the rotation shaft (88) at the outside of the sewage tank (25), a motor shaft (95) of a motor (94) is coupled via two gears (93).

10 [0050] In the above configuration, the swing arm (84) attached to the rotation shaft (88) fits the tip end part (84a) to the guide groove (85) and supports the slider (83) with the two pressure adjusting screws (89) at the middle portion. The slider (83) is adjusted by the pressure adjusting screws (89) with a predetermined pressure through the elasticity of the swing arm (84) so that the slider (83) is in contact with the bulging edge (86) and the guide

15 rail (87), and slides to control the opening/closing of the suction and discharge port (82). In this event, the blade-shaped part (92) of the slider (83) cuts the dirt and other solid matters and thereby surely shuts the suction and discharge port (82).

The pressure-feed valve (32) has the same structure as that of the suction valve (31), is attached to the inside of the bottom portion of the sewage tank (25), and surely

20 performs opening/closing when pressure-feeding the sewage to the external portion.

For the opening/closing of the suction valve (31) or the pressure-feed valve (32), a photosensor or the like is provided at the position of a stopper (96) of the swing arm (84) to control sure opening/closing.

25 [0051] In the washing wafer control part (12) in FIG. 1, the washing water tank (53) has a capacity for storing the washing water of about 3 liters as the amount of washing water used for defecation and urination 10 times a day and is fitted to the sub-tank (54) which has a water level sensor (55) near the bottom portion. About 0.5 liters of washing water

naturally falls from the washing water tank (53) and is supplied to the sub-tank (54) at all times. The water pump (57) is coupled to the sub-tank (54) with this capacity via the filter (26), and the water pump (57) is controlled in driving time by a timer. To the sub-tank (54), a manual drain (59) is coupled which is drained as needed. To the water pump (57), a relief valve (58) is coupled to prevent and protect the supply path to the cup coupled to the water pump (57) from increasing in pressure due to operation at the time of some kind of abnormality.

[0052] The water pump (57) is coupled to the water pipe (21) coupled to the joint board (23) through the heat insulating tank (60) having a temperature fuse, a temperature sensor, and a full-water sensor, a washing valve (61) which controls the sending of the washing water, and a safety tank (63) having a temperature sensor and an overtemperature sensor. Between the washing valve (61) and the safety tank (63), a drain pump (62) is provided which discharges the washing water in a pipeline up to the cup (15).

[0053] As a first example, in the external discharge part (13), a drainage pipe (50) is extended to the external connection joint (48) and inserted into a discharge trap (51) of a flushing toilet bowl (49) to pour the sewage into a sewer pipe (52) as illustrated in FIG. 1. In this example, the existing flushing toilet bowl (49) is used, and therefore requires no new work. However, the drainage pipe (50) is inserted into the flushing toilet bowl (49), and therefore the flushing toilet bowl (49) needs to be made free from clogging. Further, it is necessary to prevent the lid of the flushing toilet bowl (49) from failing to close or the flushing toilet bowl (49) from suffering from reverse flow when the drainage pipe (50) is inserted at all times.

As a second example, in the external discharge part (13), the drainage pipe (50) is coupled to an on-floor cleaning hole (110) of the sewer pipe (52) by a coupling tool (111) as illustrated in FIG. 9(a). In this example, the external discharge part (13) needs to have the on-floor cleaning hole (110) of the sewer pipe (52). Further, since the shapes of the

on-floor cleaning holes (110) are different depending on manufacturers, it is necessary to prepare dedicated coupling tools (111) matching the shapes.

As a third example, a backflow prevention pipe (115) is formed behind and coupled to a trap (114) of a waste pipe (113) of a washstand (112) or the like as illustrated in FIG. 9(b). In this example, the waste pipe (113) may handle drinking water and therefore needs to be subjected to treatments from the aspect of good hygiene.

[0054] In the electric control part (14), as illustrated in FIG. 2, various switches, sensors, lamps and so on are connected to the CPU (64). More specifically, switches for start, washing temperature setting of the heat insulating tank (60), suction from the bedpan (15), pressure-feed from the sewage tank (25), and display switching of various indicator lights are provided as the switches of the operation panel (75). Indicator lamps for power supply, washing water shortage, sewage full, cup connection, remote controller connection, two-digit numerical value display, and "high" and "low" of suction pressure are provided as the lamps of the operation panel (75).

The CPU (64) is connected to and control the output to the suction motor (26), the input from the pressure sensor (42), the inputs from the temperature sensor (70) and the overtemperature sensor (71) of the return box (67), the inputs from the full-water sensor (39) and the empty sensor (38) of the sewage tank (25), the output to the heat insulating tank (60) and the inputs from the full-water sensor, the temperature sensor, and the overtemperature sensor, the output to the water pump (57), the inputs from the full-water sensor, the temperature sensor, and the overtemperature sensor at direct coupling of tap water to the heat insulating tank (60), the output to the washing valve (61), the output to the drain pump (62), the inputs from the temperature sensor and the overtemperature sensor of the safety tank (63), the input from and output to the wireless power supply part (24) composed of a power transmission board (24b) and a power reception board (24a) connected with the feces sensor (17) and the urine sensor (18) of the cup (15), the output to the valve motor (28) and the inputs from an opening sensor and a closing sensor, the output

to the motor (28) of the suction valve (31) and the inputs from an opening sensor and a closing sensor, the output to the motor (28) of the pressure-feed valve (32) and the inputs from an opening photosensor and a closing photosensor, the input from the water level sensor (55) of the sub-tank (54), the input from a vital sensor pad (97) for nursing sensor function, the input/output for Internet connection of a Web Wifi module (98), the output to the nurse call switch (99), the input from an electric leakage breaker of an AC power supply (77), the input from the remote controller (76) and so on.

[0055] The action of the excrement disposal apparatus (9) configured as above will be explained.

1. Pressure-feed operation (pressure-feed of the sewage from the cup (15))

FIG. 10

- The suction and discharge port (82) is closed by the slider (83) of the suction valve (31), the sewage pressure-feed pipe (45) is closed by the slider (83) of the pressure-feed valve (32), the switch valve (27) is set to B, and the crushing motor (34) is rotated for 5 seconds to crush the solid matters mixed in the dirt in the sewage tank (25).

- The pressure-feed valve (32) is opened, the suction motor (26) is driven, the outside air (29) is pressure-fed from the air pipe (43) into the sewage tank (25) through the suction and pressure-feed port (30) to send the sewage in the sewage tank (25) from the external connection joint (48) to the drainage pipe (50) via the check valve (47) of the sewage pressure-feed pipe (45) and the backflow prevention trap (46) and discharge the sewage from the discharge trap (51) of the flushing toilet bowl (49) to the sewer pipe (52).

In addition to the discharge to the flushing toilet bowl (49), the excrement disposal apparatus (9) may discharge the sewage directly from the on-floor cleaning hole (110) to the sewer pipe (52) through the dedicated coupling tool (111) as illustrated in FIG. 9(a), or may be connected to the rear of the trap (114) of the waste pipe (113) via the backflow prevention pipe (115) to discharge the sewage to the sewer pipe (52) as illustrated in FIG. 9(b).

- The empty output from the empty sensor (38) of the sewage tank (25) becomes Yes, the suction motor (26) is further driven for 5 seconds and then stopped, and the pressure-feed valve (32) is closed to end the pressure-feed operation.

5 [0056] 2. Operation of the cup (15)

In the following explanation of the operation of the cup (15), when the joint board (23) of the cup (15) and the wireless power supply part (24) are coupled, flows of air, water, and electricity communicate.

FIG. 11

10 - When the power supply (73a) is turned on, a water shortage indicator becomes non-lighting, and an alarm occurrence becomes No, the cup operation is on standby.

- When the urine sensor (18) becomes Yes, a later-explained cup urine suction operation in later-explained FIG. 12 is started, and +1 is added by a counter.

15 - When the urine sensor (18) is No and the feces sensor (17) becomes Yes, a later-explained cup feces suction operation in later-explained FIG. 13 is started, and +2 is added by the counter.

20 - In the counter, when the urine suction exceeds 4 (sewage in a urine mode for four times is stored), or when the feces suction exceeds 2 (sewage in a feces mode for two times is stored), the aforementioned pressure-feed operation in FIG. 10 is started, and when the counter becomes 0, the operation turns back.

[0057] 3. Urine suction operation of the cup (15)

FIG. 12(a)

25 - It is confirmed that the switch valve (27) is A, and then the suction motor (26) is operated.

- The cup washing operation in FIG. 12(b) is started, the washing valve (61) is opened, the water pump (57) is operated to send the washing water for 2 seconds for washing, and the water pump (57) is stopped. In this event, the temperature of the

washing water kept warm in the heat insulating tank (60) is checked in the safety tank (63).

- After two seconds counted by the timer, various setting values such as the washing work time of the water pump (57) of 2 seconds, the number of washing times of 3 times, and the washing interval of 18 seconds are set in the respective registers as

5 parameters in the urine suction mode.

- The cup washing operation in FIG. 12(b) is started again to wash the cup (15).

- A hot-water pump washing counter is set to +1. Then, when the feces sensor (17) is not detected, the operation is repeated until the washing counter becomes 3.

- When the feces sensor (17) is detected, various setting values such as the

10 washing work time of the water pump (57) of 4 seconds, the number of washing times of 5 times, and the washing interval of 16 seconds are set in the respective registers as parameters in the feces suction mode. Note that when the feces sensor (17) is detected at the washing time of the urine suction disposal, the operation is shifted to the feces suction mode but not to the urine suction mode.

15 - When the washing counter reaches the number of washing times, in order to avoid the influence of the residual pressure of the water remaining in the pipe, the drain pump (62) is operated for 5 seconds after 5 seconds by the timer to send the residual water in the pipe and air of the cup (15) to discharge them into the cup (15).

20 - After 5 seconds from the drain operation, the suction motor (26) is stopped to finish.

[0058] 4. Feces suction operation of the cup (15)

FIG. 13

25 - It is confirmed that the switch valve (27) is A, and then the suction motor (26) is operated.

- The above cup washing operation in FIG. 12(b) is started, the washing valve (61) is opened, the water pump (57) is operated to send the washing water for 2 seconds for washing, and the water pump (57) is stopped. In this event, the temperature of the

washing water kept warm in the heat insulating tank (60) is checked in the safety tank (63).

- After two seconds counted by the timer, various setting values such as the washing work time of the water pump (57) of 4 seconds, the number of washing times of 5 times, and the washing interval of 16 seconds are set in the respective registers as

5 parameters in the feces suction mode.

- The cup washing operation in FIG. 12(b) is started again to wash the cup (15).

- A hot-water pump washing counter is set to +1. Then, when the feces sensor (17) is not detected, the operation is repeated until the washing counter becomes 5.

- When the washing counter reaches the number of washing times, in order to
10 avoid the influence of the residual pressure of the water remaining in the pipe, the drain pump (62) is operated for 5 seconds after 5 seconds by the timer to send the residual water in the pipe and air of the cup (15) to discharge them into the cup (15).

- After 5 seconds from the drain operation, the suction motor (26) is stopped to finish.

15

[0059] 5. Monitoring operation of the cup wearing

When the air is sucked by the suction motor (26) in the air circulation path of the cup (15), the outside air is sucked through the gap between the crotch and the diaper (100) worn at the crotch of the user (104) to prevent leakage of odor, and odor corresponding to
20 an amount of sucked air is removed from the exhaust throttle valve (68) and released to the outside air.

- The wearing of the diaper (100) differs in degree of fastening to the crotch depending on the level of skill and differs in amount of air for sucking the outside air. Then, the stable operation cannot be performed, and therefore the suction state is displayed
25 by "suction pressure insufficient" and "suction pressure excessive" so that whether the wearing of the diaper (100) is appropriate is determined by the following operation.

FIG. 14

- The cup (15) is worn, and the disposal of urine or feces is started.

- At the beginning of start of the disposal, the suction pressure state from the diaper (100) is not either high or low, and therefore the LEDs are off.

- The suction pressure is handled by the pressure sensor (42) in the air circulation path.

5 - The operation is shifted to FIG. 14(b), in which the suction pressure is acquired every second, and the moving average deviation, for example, in 10 times is calculated and stored in a memory, and ended.

 - The operation is returned to FIG. 14(a), and if whether the pressure value is lower than a set value is Yes, "low LED" is turned on and "high LED" is turned off, and
10 the operation turns back. If whether the pressure value is lower than the set value is No, the operation is shifted to whether the pressure value is higher than the set value, and if it is Yes, "low LED" is turned off and "high LED" is turned on, and the operation turns back.

 - If whether the pressure value is lower than the set value is No and whether the pressure value is higher than the set value is No, "low LED" and "high LED" are both
15 turned off which represents to be normal.

- In a normal state, disposal of urine and feces is being performed.

Explanation of Codes

[0060]

20 9 excrement disposal apparatus

10 cup control part

11 suction and pressure-feed control part

12 washing wafer control part

13 external discharge part

25 14 electric control part

15 cup

16 defecation receiving part

17 feces sensor

- 18 urine sensor
- 19 defecation suction pipe
- 20 blast pipe
- 21 water pipe
- 5 22 electric cord
- 23 joint board
- 24 wireless power supply part
- 25 sewage tank
- 26 suction motor
- 10 27 switch valve
- 28 valve motor
- 29 outside air
- 30 suction and pressure-feed port
- 31 suction valve
- 15 32 pressure-feed valve
- 33 sewage crusher
- 34 crushing motor
- 40 mist filter
- 41 odor filter
- 20 42 pressure sensor
- 43 air pipe
- 44 pipe
- 45 external pressure-feed pipe
- 48 external connection joint
- 25 49 flushing toilet bowl
- 50 drainage pipe
- 53 washing water tank
- 67 return box

68 exhaust throttle valve

73 main body cover

100 diaper

110 on-floor cleaning hole

5 113 waste pipe

CLAIMS:

1. An excrement disposal apparatus characterized in that a sewage tank (25) is arranged on one end side inside a main body cover (73), a pipe (44) is coupled to a top plate portion of the sewage tank (25) via a suction valve (31), a suction and pressure-feed port (30) communicating from the sewage tank (25) to an external air pipe (43) is formed at the top plate portion, a crushing motor (34) of a sewage crusher (33) is attached to the top plate portion, a rotation shaft (34a) of the crushing motor (34) is hung inside the sewage tank (25) and is provided with a crushing blade (35), and an external pressure-feed pipe (45) for coupling to an external discharge part (13) is coupled to a bottom portion of the sewage tank (25) via a pressure-feed valve (32).
2. The excrement disposal apparatus according to claim 1 characterized in that a joint board (23) for detachably coupling the pipe (44) and a defecation suction pipe (19) of a cup (15) is provided on the outside of the main body cover (73) facing the internal sewage tank (25), the joint board (23) is further detachably provided with a blast pipe (20) and a water pipe (21) to the cup (15) and is provided with a wireless power supply part (24) to which an electric cord (22) to the cup (15) is detachably connected, and the main body cover (73) is provided with, below the joint board (23), an external connection joint (48) for coupling the external pressure-feed pipe (45) and the external discharge part (13).
3. The excrement disposal apparatus according to claim 2 characterized in that a suction motor (26) is arranged at a lower part on another end side inside the main body cover (73), a washing water tank (53) is detachably provided at an upper portion of the suction motor (26), and a switch valve (27) for switching between suction and pressure-feed by the suction motor (26), a mist filter (40), an odor filter (41), and a pressure sensor (42) which are provided on the air pipe (43), and a cooling box (66) and a return box (67) which are provided on a blast pipe (65) coupling between the switch valve

(27) and the cup (15), are arranged between the suction motor (26) and the sewage tank (25) inside the main body cover (73).

4. An excrement disposal method characterized by comprising a cup control part
 5 (10) which controls a cup (15) set at a crotch of a user, and a suction and pressure-feed
 control part (11) which controls suction from the cup control part (10), in which an air
 circulation path from an inside of the cup (15) when the cup (15) is worn with a diaper
 (100) intervening therebetween, to a defecation suction pipe (19) of the cup (15), a pipe
 (44), a suction valve (31), an inside of a sewage tank (25), a suction and pressure-feed port
 10 (30), an air pipe (43), an odor filter (41), a pressure sensor (42), one side on a blast side (A)
 of a switch valve (27), a suction motor (26), another side on the blast side (A) of the switch
 valve (27), a blast pipe (65), a cooling box (66), a return box (67), and a blast pipe (20) of
 the cup (15) back to the inside of the cup, is formed to exhaust part of circulating air from
 an exhaust throttle valve (68) to outside air via a filter (69) provided in the return box (67)
 15 and suck the amount of exhaust from a gap of the diaper (100) to prevent odor from being
 released to the outside air.

5. The excrement disposal method according to claim 4 characterized in that the
 pressure sensor (42) detects a change in pressure accompanying the suction of air from the
 20 gap of the diaper (100) in the air circulation path, and whether the diaper (100) is normally
 worn is determined depending on a level of the pressure.

6. An excrement disposal apparatus characterized by comprising a cup control part
 (10) which controls a cup (15) set at a crotch of a user, a suction and pressure-feed control
 25 part (11) which controls suction from the cup control part (10) and pressure-feed from a
 sewage tank (25) to an external discharge part (13), and the external discharge part (13)
 which pressure-feeds and discharges sewage stored in the sewage tank (25),

wherein in the external discharge part (13), a drainage pipe (50) is extended to an

external connection joint (48) and inserted into a discharge trap (51) of a flushing toilet bowl (49) to pour the sewage into a sewer pipe (52).

7. An excrement disposal apparatus characterized by comprising a cup control part (10) which controls a cup (15) set at a crotch of a user, a suction and pressure-feed control part (11) which controls suction from the cup control part (10) and pressure-feed from a sewage tank (25) to an external discharge part (13), and the external discharge part (13) which pressure-feeds and discharges sewage stored in the sewage tank (25),

wherein in the external discharge part (13), a drainage pipe (50) is coupled to an on-floor cleaning hole (110) of a sewer pipe (52) by a coupling tool (111) to pour the sewage thereinto.

8. An excrement disposal apparatus characterized by comprising a cup control part (10) which controls a cup (15) set at a crotch of a user, a suction and pressure-feed control part (11) which controls suction from the cup control part (10) and pressure-feed from a sewage tank (25) to an external discharge part (13), and the external discharge part (13) which pressure-feeds and discharges sewage stored in the sewage tank (25),

wherein in the external discharge part (13), a backflow prevention pipe (115) is formed behind and coupled to a trap (114) of a waste pipe (113) of a washstand (112) or the like to pour the sewage thereinto.

9. An excrement disposal apparatus characterized by comprising a cup control part (10) which controls a cup (15) set at a crotch of a user, and a suction and pressure-feed control part (11) which controls suction from the cup control part (10),

wherein a suction valve (31) on a suction side of a sewage tank (25) has a suction and discharge port (82) provided in a valve attachment plate (81), a pipe (44) of the sewage tank (25) is airtightly attached to the suction and discharge port (82), an elastic swing arm (84) is swingably attached to a rotation shaft (88) provided at one end of the valve

attachment plate (81), a pressure adjusting screw (89) is provided on the swing arm (84) in a manner of being freely movable back and forth, a lower end portion of the pressure adjusting screw (89) is brought into pressure contact with a slider (83), a bulging edge (86) is formed at the whole periphery on an inside of the suction and discharge port (82), a
5 guide rail (87) at the same height as a height of the bulging edge (86) is provided continuously from the bulging edge (86) and in a swinging direction of the slider (83), a guide groove (85) in an arc shape is formed in the valve attachment plate (81) on a side opposite to the rotation shaft (88), and a tip end part (84a) of the swing arm (84) is slidably fitted in the guide groove (85).

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10. The excrement disposal apparatus according to claim 9 characterized in that a blade-shaped part (92) is formed at an edge portion of the slider (83) sliding in contact with the bulging edge (86).