

SPECIFICATION

TITLE OF THE INVENTION

Table Unit for Food Processing

BACKGROUND OF THE INVENTION

(1) Field of the Invention

The present invention relates to a table unit for food processing suitable for processing raw fish, meat and other perishable foods in food processing plants, and so forth.

(1i) Description of the Related Art

In conventional ways, the processing such as the slicing of raw fish, meat and other perishable foods has been made on a working table T as illustrated in Fig. 10 and the arrangement and packing of those have been conducted on a tray 28 in backyards of supermarkets, food processing plants, and so forth.

In Fig. 10, chopping boards 101, and 101 are fixed to both the sides on the upper surface of the working table T, and two (2) shelves 102 are fixed to the central part of the working table T between the two (2) chopping boards. Also, a tray 28 is fixed to an upper board of the shelves 102 for laying cooked foods on it, and rolls of paper and so forth are fitted to the intermediate part between the upper and lower boards of shelves 102 for sweeping waste water (gravy, etc.) of processed foods. Further, kitchen knife holding grooves 25 are formed on the lower board of the

shelves 102 for inserting and holding kitchen knives to slice raw fish, meat, and other foods, a balance 16 is also set up on the same board for measuring cooked foods.

However, in such conventional working table T, foods have been exposed to a room temperature at + 15°C through + 20°C (velocity of 0.5m/s) for about an hour while processing. Accordingly, there has been a risk of deterioration of foods due to the rising of temperature or dryness.

Also, to resolve such problem, a conventional method for establishing the entire inside of the backyard or food processing plant to keep the room condition at a temperature in order not to deteriorate the foods. However, in such a way, the laborers working environment in the plant has considerably been deteriorated with a problem occurred to unfavorably influence working performance, whereby its improvement has strongly been desired.

Furthermore, in the case that the volume of working increases, in order to secure the working space suitable for the increasing works the working table must be extended. In the conventional tables, in such cases the entire working table must be replaced, and thus, a cost problem has inevitably arisen.

SUMMARY OF THE INVENTION

It is an object of the present invention, in consideration of the conventional circumstances as above, to provide a table unit

for food processing to prevent the deterioration of foods in the food processing and to alter a working space according to the volume of works at a reasonable cost.

The table unit for food processing according to the present invention comprises a unit body constituted of an insulated wall, a cooling device accommodated in this unit body, a chopping board detachably attached on the upper surface of the unit body, a cold air supply means for supplying a cold air coming from the cooling device onto the chopping board from the upper side of the chopping board, and a cold air intake means for sucking the cold air from the surroundings of the chopping board into the unit body, wherein the unit body comprises a cooling section containing the cooling device therein, and a sink section selected from sink sections of plural sizes and linked to the cooling section.

According to the present invention, because the cooling device is accommodated in the unit body which is constituted of the insulated wall, the chopping board is fixed to the upper surface of the unit body in an easily installable and removable way, and the cold air sent from the cooling device is supplied to the chopping boards from the upper part above the chopping boards, and is sucked from the circumference of the chopping boards, then the foods for processing on the chopping board can be cold-insulated with the cold air supplied from the upper part. thereby the foods during the processing can be prevented from their deterioration.

Also, because the cold air is sucked from the

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circumferences of the chopping boards into the unit body, the deterioration of working environment does not arise. Further, because the chopping boards are fixed to the unit body in an easily installable and removable way, after the processing works are done, and the boards can be easily removed and washed.

Particularly, since the unit body comprises the cooling section storing the cooling device, and the sink section linked with the cooling section from among those of two or more sizes, even if the expansion of the working space is needed according to the volume of works, the cooling section of the unit body may remain as it is, but only the sink section may be replaced with new one of suitable larger size, thereby the unit becomes widely usable, causing users side to save the cost of equipment, and because of the cooling section becoming the common goods, a cost saving can be enjoyed by the side of manufacturers as well.

Also, when installing, the unit body can be delivered with the cooling device and the sink system separately, and thus, the installing operations can be conducted with extreme ease.

Further, in the table unit for food processing according to the present invention, in addition to the above, when the dimension of the unit body is enlarged with the dimension of the sink section, the reinforcing materials for supporting the edges of the chopping boards installed in parallel are fixed to the unit body.

According to the present invention, in addition to the

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above, since in case that the dimension of the unit body is enlarged with the dimension of the sink section, the reinforcing members for supporting the edges of the chopping boards installed in parallel are fixed to the unit body, then the chopping boards in addition to the chopping board that were used before their dimension is enlarged are installed in parallel, each of the edged can be supported with the reinforcing members, causing the common use of chopping board and the resultant saving in the cost of parts.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective front view showing a table unit for food processing according to the present invention.

Fig. 2 is a perspective side view showing a table unit for food processing according to the present invention.

Fig. 3 is a perspective plan view showing a table unit for food processing according to the present invention.

Fig. 4 is a perspective front view showing a cooling section and a sink section of the table unit for food processing when dividing both the sections.

Fig. 5 is a perspective plan view showing a cooling section and a sink section of the table unit for food processing when dividing both the sections.

Fig. 6 is an exploded side view showing the connections of a cooling section with a sink section.

Fig. 7 is a perspective view showing the connections of a

cooling section with a sink section.

Fig. 8 is an exploded perspective view when reinforcing members are fixed to the unit body.

Fig. 9 is a perspective front view showing two (2) table units for food processing with sink sections in the different length.

Fig. 10 is a perspective view showing a conventional table unit for food processing.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Next, a preferred embodiment according to the present invention is described, referring to the drawings.

In Fig. 1 through Fig. 5, the items with the same numbers in Fig. 10 are the items of similar functions.

A table unit for food processing 1 according to the present invention is laid on the backyard of supermarkets or food processing plants to process and cook the raw fish, meat and other perishable foods, or daily dishes which are sold in the supermarkets and convenience stores. As illustrated in Fig. 1, the table unit for processing the foods 1 is set up at a height equal to the average waist position of workers (for example, 800mm from the floor) with a unit body 3 comprising an insulated wall 2 having an opening on the top.

This unit body 3 comprises a cooling device 6 storing a cooler 4, a sink section 7 connected to the cooling device 6 in an

easily installable and removable way. On the upper surface of this unit body 3, a stainless steel plate 15, for example, is laid and installed in its central part in an easily installable and removable way, and on both the front and rear sides of that plate 15 chopping boards 5, and 5 are laid and installed as if sandwiching the plate as a working table for food processing in an easily installable and removable way. On the upper plate 15 the balance for measuring cooked food materials not illustrated in the drawings can be laid and installed, and also kitchen knife holding grooves 25 .. are formed on the plate to insert and hold kitchen knives 24 .. used for slicing and cooking food materials. These knife holding grooves 25 .. are connected to the inside of sink section 7 in line.

The structure of the cooling section 6 and the sink section 7 is described later, in detail.

Further, on the one side of upper surface of unit body 3, the chopping boards 5, and 5 and the plate 15 do not exist, and both the front and rear side are closed. From the position of the one side of the plate 15 in the closed place, a duct 8 is installed in the standing state vertically toward the unit body 3 for raising a cold air cooled in the cooling device 6.

A holding bar 10 is fixed to the top of the duct 8, extending horizontally toward the upper part of the plate 15. From this holding bar 10, a sock duct 9 made of cloth is suspended in an easily installable and removable way. One end of the sock duct 9 is connected to the duct 8 in line in an easily installable and

removable way, while the other end is closed. The cold air coming up through the duct 8 is flowed into the sock duct 9, and is blown out from minute holes forming around the sock duct 9, and is flowed down onto the chopping boards 5, and 5 in the lower part.

In this case, the distance from the sock duct 9 to the chopping board 5 is said to be, for example, 900mm. Also, a thermometer 27 for measuring the temperature of cold air passing through the duct 8 is equipped on the surface on the upper plate 15 side of the duct 8.

Further, intake inlets 11 ... for sucking the cold air coming down from the sock duct 9 are formed around the chopping boards 5 (the front and other side surfaces on the front side of chopping board 5, the rear and other side surfaces on the rear side), and each of the intake inlets 11 ... is connected to the inside of unit body in line.

Shelves 26 ... are fitted onto the front and rear surfaces of the duct 8 (the upper part on the one side of each chopping boards 5, and 5), and the foods and the tray on which the food can be laid, and other equipment can be laid on the shelves 26 Also, a cart storing section 14 is formed in the lower side of a sink section 7 of the unit body 3 to keep the wastes arisen during the works and to store the cart in an easily drawable way and movable with the wheel 12 fixed to the bottom.

Next, the cooling device 4 accommodated in the cooling section 6 of the unit body 3 is described. In the cooling device 4

of the table unit for food processing 1 according to this embodiment, a cooler 17 is accommodated on the front side in the cooling section 6 and connected to the lower part of the duct 8 in line, and a blower 23 is set up to blow the cold air cooled with the cooler 17 into the sock duct 9 through the duct 8. Further, in the cooling section 6 on the back side of the cooler 17, a compressor 19 forming the known cooling cycle of the cooling device 4 and condensing unit 18 comprising a water cooling type condenser 20 are installed together with the cooler 17.

Further, in the condensing unit 18, the side of sink section 7 is surrounded by a partition 31 and its upper side is surrounded by a partition 30, considering that the heat generated from the condensing unit does not influence the cold air. Also, on the sink section 7 side of the cooler 17 a partition 32 is also set up. Also, on the bottom of sink section side an exhaust outlet 34 is formed to exhaust the water invaded into the unit body 3 (waste water, etc. used for washing in the unit body 3). (Refer to Fig. 7 and Fig. 8.)

Water distributing pipes 21 to supply the cold water to the water cooling type condenser 20 are installed in the duct 8 upward and downward, and are structured so that the connection section 21A can be drawn from the top end of the duct 8, and can be connected to the authorized water supply pipes at the top end of the duct 8. Also, a valve for drainage 22 to drain the cooling water in the water distributing pipes 21 is installed in the bottom part of water distributing pipes 21.

In the above structure, a cold air circulation of the table unit for food processing according to this embodiment of the present invention is described. First of all, the cold air cooled in the cooler 17 accommodated in the cooling section of the unit body 3 is sent out by the blower 23 installed in the lower section of duct 8 to the sock duct 9 above the duct 8.

Next, the cold air comes down far above the chopping boards 5, and 5 through the cavities of cloth of sock duct 9 at a very slow speed. Further, the cold air which came down to the upper part of chopping boards 5, and 5 are sucked from the above cold air intake inlets 11 ... formed around the chopping boards 5, and 5, and returned to the inside of the unit body 3, then flowed into the cooler 17 of cooling device 4 for the heat exchange. Also, as described above, since the kitchen knife holding grooves 25 are connected to the inside of sink section 7 in line, the kitchen knives 24 inserted into the kitchen knife holding grooves 25 are exposed to the cold air dropping from the sock duct 9 and the cold air passing through the inside of sink section 7, then cooled.

In the above circumstances, because of the structure to drop the cold air from the sock duct 9 made of cloth to the upper surface of chopping board 5, the supplied cold air becomes a breeze, and thus, the drying of foods can be restricted. Also, the sock duct 9 is installed in the upper part of chopping board 5 with a specified interval (900mm) in line, it cannot be hindrances when working for processing on the chopping boards 5, causing no

obstacles to the working performance.

Further, since the cold air dropped above the chopping board 5 is sucked from the cold air intake inlet 11 ... into the inside of unit body 3, leaking the cold air around the floor of the table unit for food processing 1 can be avoided as strongly as possible, and the deterioration of working environment can also be prevented. Further, thereby, the foods processed on the chopping boards 5 can be cooled with the cold air supplied from the above sock duct 9, the deterioration of the foods during the processing can be prevented.

Next, the cooling section 6 and the sink section of the unit body are described, referring to Fig. 4 through Fig. 7. As described above, the cooling section 6 is formed with the opening 6A in its upper part, and stores a cooling device 4 in its inside, with the one end connected to the duct 8 in line. Another opening 6B is formed in the cooling section 6 from its front surface to its rear surface for connecting the other end to the sink section 7 in line. Also, legs 40 ... for supporting the cooling section 6 are set up to the four corners on the bottom of the cooler section 6.

Meanwhile, as described above, the sink section 7 is set up on the upper surface of an opening 7A, and such opening 7A is continuously connected to the opening 6A on the upper surface of the cooling section 6. Also, while the one end of the sink section 7 is closed, the other end is connected to the cooling section 6, for which another opening 7B is formed from the front surface to the

rear surface of the sink section 7. Also, on the four corners of the bottom of sink section 7, legs 41 ... are set up for supporting the sink section 7.

Further, such sink section 7 is prepared to provide the sections of two or more sizes in the direction of longer part (two kinds in the embodiment) with the limited size (for example, 900mm) for cooling with the cooling performance of the cooling device 4. (Refer to Fig. 9.)

Thereby, since the sink section 7 connected to the cooling section 6 can be selected from among those of two or more sizes, even if the expansion of working space according to the volume of works is needed, the cooling section 6 of the unit body 3 remains as it is, while the sink section 7 may be replaced with that of suitable size. Thereby, its usability is improved, and thus, users can save their cost of equipment. Moreover, because the cooling section becomes common goods, the cost saving can also be made by the side of manufacturers.

Furthermore, in the opening 6A on the upper surface of the cooling section 6 and the opening 7A on the upper surface of the sink section 7, a supporting section 2F comprising the longitudinal surface 3D and the horizontal surface 2E to support the chopping boards 5, as illustrated in Fig. 4 and Fig. 5, is formed in the position corresponding to the four corners of each of the chopping boards 5, and 5.

Next, the connections of the cooling section 6 with the

sink section 7 are described in detail. Fig. 6 is an exploded side view showing the connections of the cooling section 6 with the sink section 7. Fig. 7 is a perspective view showing the connections of the cooling section 6 with the sink section 7. A connecting board 6C is fixed to the lower side of opening 6B in the cooling section 6 for connecting it with the opening 7B of sink section 7. Such connecting board 6C is projected vertically downward from the lower end of the opening 6B, that is to say, the end on the opening 6B side of the bottom of cooling section 6, and is formed so that it can be equal to the opening 6B in the surfaces. Moreover, in the connecting board 6C, two or more holes 45 ... are formed to fasten bolts 44 for connecting it to the sink section 7.

Also, another connecting board 7C is formed in the lower end of the opening 7B of sink section 7 for connecting it to the opening 6B of the cooling section 6. Such connecting board 7C is projected downward from the lower end of the opening 7B, that is to say, the side end of the opening 7B on the bottom of sink section 7, and is formed so that it can be equal to the opening 7B in the surfaces. Further, similarly to the case of cooling section 6, in the connecting board 7C, two or more holes ... are formed to fasten bolts 44 for connecting to the cooling section 6.

Also, for connecting the cooling section 6 to the sink section 7, metal fittings 43, and 43 and a waterproof sheet 42 are used. The metal fitting 43 is comprised of a vertical surface 43A and an inclined surface 43B lowly inclined toward from the one end

to the other end so that it can be fitted along the inclined surface lowly inclined toward the outside from the inside of the intake inlet 11 formed at the top ends of the cooling section 6 and of the sink section 7 respectively.

Also, two or more holes 46 ... are formed in the vertical surface 43A of such metal fittings 43, and 43 to fasten screws 46 ... for fitting them to the cooling section 6 and the sink section 7. Moreover, two or more holes 48 ... are formed in the upper edge part of the cooling section 6 and in the upper edge part of the sink section 7 for connecting the metal fittings to them.

In the above structure, when connecting the cooling section 6 to the sink section 7, the waterproof material (sheet) is sandwiched between the opening 6B of the cooling section 6 and the opening 7B of the sink section 7, on both the front and rear side the metal fittings 43 are connected to the upper end of the opening 6B of cooling section 6 and the upper end of the opening 7B of sink section 7, then are fixed by fastening the screws 46. Moreover, the connecting board 6C fitted to the cooling section 6 is connected to the connecting board 7C fitted to the sink section 7, and then, after the two or more bolts 44 ... are inserted into the two or more holes 45 ... conformed, each of the connections are stationary in the installable and uninstallable state with nuts 49 ...

Also, the metal fittings 43, and 43 are applied through the upper edges of the cooling section 6 and the sink section 7, and are

fixed stationarily with the screws 48 in the state of conforming the holes 47 and holes 48. Thereby, the cooling section 6 is linked with the sink section 7. At this time, when the chopping boards 5 are washed, a leakage of any wash water invaded into the unit body from the connections of the cooling section 6 and the sink section 7 can be prevented. Also, when installing, because the delivery of unit body with the cooling section 6 and sink section 7 can be made separately, causing the installing works to be extremely easy.

Next, the replacement of sink section 7 of unit body 3 with that of larger size instead of that of standard size is described, referring to Fig. 8. Fig. 8 is an exploded perspective view showing the structure when installing the reinforcing members 50. When replacing, the chopping boards 51, and 51 and the upper board 5 2 for compensating the dimension of the chopping boards 5, and 5 for the portion extended by the alteration of the sink section 7 are fixed parallel, and the reinforcing member 50 is also fixed for supporting those boards.

The reinforcing member 50 is fixed through from the front edge and to the rear edge of the opening 7A on the upper surface of sink section 7. The reinforcing member is comprised of inclined parts 50A, convex meshing parts 50B, and 50B, concave parts 50C, and 50C, a central convex part 50E and the meshing parts 50D, and 50D on both the sides of the central meshing part.

The inclined parts 50A, and 50A are formed on both the sides

of reinforcing member 50, and are, similarly to the metal fittings 43, formed in a state lowly inclining toward the outside from the inside along the inclined surface of opening 7A on the upper surface.

Also, the convex meshing parts 50B, and 50B are formed adjacent to the inside of the inclined parts 50A, and 50A, projecting vertically from the top of the inclined parts 50A. The height of such convex meshing parts 50B is adjusted, considering the intake inlet, so that its height can be equal to the surface of the chopping boards 5, when the chopping boards 51 are laid.

Further, from the end of the convex meshing part 50B opposite of the inclined part 50A, the concave parts 50C, and 50C are formed. This is because the cold air sucked from the surrounding edges of the chopping boards 5 and the chopping boards 51 can be continually passed.

Next, in the end of the concave parts 50C on the opposite side of the convex meshing parts 50B, that is to say, the central part of reinforcing member 51, the meshing parts 50B are formed for supporting the convex meshing part 50B, chopping boards 5 and additional chopping boards 51, and are, similarly to the convex meshing parts 50B, set up so that its height can be equal to that of the chopping boards 5 when the chopping boards are laid.

Also, in the end of such meshing parts 50D on the opposite side of concave parts 50C, that is to say, the central part of the reinforcing member 50, the convex part 50E is formed. Also, the inclined part 50A, convex meshing part 50B, concave part 50C,

meshing part 50D, and convex part 50E of such reinforcing member 50 are all unitedly formed.

Further, an additional upper board 52 of almost the same shape as the upper board 15 and of similar length to the chopping board 51 is laid on the upper surface of such convex part 50E.

In the above structure, when the sink section 7 of the unit body 3 is replaced with that of larger size instead of the standard size, the reinforcing members 50 are laid in the position where the chopping boards 5, and 5 and the chopping boards 51, and 51 are conformed. And the inclined parts 50A, and 50A of the reinforcing members 50 are fixed to both the front edge and the rear edge of the opening 7A with the setscrews. Next, the edge parts of chopping boards 5, and 5 and the chopping boards 51, and 51 are set up and laid on the convex meshing parts 50B, and 50B and the meshing parts 50D, and 50D respectively. Moreover, the upper board 52 is set up and laid on the convex part 50E.

By structuring as above, the reinforcing member 50 for supporting the edge parts of the additional chopping board 51 installed parallel with the chopping board 5 is fixed to the edge part of opening 7A of the sink section 7, and thus, the additional chopping board and the chopping board 5 used before the expansion can be installed parallel, and also each of the edge parts can be supported with the reinforcing members 50, and then, the chopping board 5 can be commonly used, so the cost of parts can be saved.

Further, when the sink section 7 is replaced with the one

of larger size, the sock duct 9 and a supporting bar 10 must be replaced with those of long size according to the above replacement.

Thereby, the upper part above each of the chopping boards 5, and 5
1 can be smoothly cooled after the above expansion.

According to the present invention, as described above in detail, since the cooling device is accommodated in the unit body which is constituted of the insulated wall, and the chopping boards are detachably attached to the upper surface of the unit body, also the cold air sent from the cooling device is supplied to the entire upper parts from the upper part above the chopping boards to that above the chopping boards, and the cold air can be sucked from the upper part of the chopping boards, then the foods processed on the chopping boards can be cooled and kept with its coolness. Thereby, the decay and deterioration of foods during the processing works can be prevented.

Also, since the cold air above the chopping boards is sucked into the unit body from the surroundings of the chopping boards, the deterioration of working environment does not arise. Further, since the chopping boards are detachably installed in the unit body, the boards can be easily removed and washed after the processing works were completed.

Particularly, because the unit body comprises the cooling section storing the cooling device, and the sink section linked to the cooling section selected from among those of two or more sizes, even if the expansion of working space according to the volume of

works is needed, the cooling section of the unit body remains as it is, while the sink section may be replaced with that of larger size.

Thus, its usability is improved, causing the users side to save their cost for equipment, and also the cooling section becomes common goods, causing the manufacturers side to reduce the cost for the production.

Also, when installing, since in the delivery of the unit body the cooling section and the sink section can be separately delivered, then the installing works can be easily conducted.

Also, according to the present invention, in addition to the above, when the size of unit body is enlarged according to the size of the sink section, since the reinforcing members for supporting the edge part of the chopping board installed in parallel is fixed to the unit body, then the chopping boards used before enlarging and an additional chopping boards are installed in parallel, and thus, each of the edge part can be supported by the reinforcing members, and then, the chopping boards become commonly usable, by which the cost of parts can be saved.

WHAT IS CLAIMED IS:



1. A table unit for food processing which comprises a unit body constituted of an insulated wall, a cooling device accommodated in this unit body, a chopping board detachably attached on the upper surface of the unit body, a cold air supply means for supplying a cold air coming from the cooling device onto the chopping board from the upper side of the chopping board, and a cold air intake means for sucking the cold air from the surroundings of the chopping board into the unit body, wherein the unit body comprises a cooling section containing the cooling device therein, and a sink section selected from sink sections of plural sizes and linked to the cooling section.

2. The table unit for food processing according to claim 1, wherein when the size of the unit body is enlarged in accordance with the size of the sink section, reinforcing members for supporting the edges of the parallelly arranged chopping boards are attached to the unit body.

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