

SPECIFICATION

TITLE OF THE INVENTION

Low Temperature Working Table Apparatus

BACKGROUND OF THE INVENTION

The present invention relates to a low temperature working table apparatus suitable for processing perishable foods such as raw meats and fresh fishes in a food processing factory.

Hitherto, in a backyard of a supermarket or a food processing factory, a work for slicing (processing) perishable food (food) such as raw meat or fresh fish, arranging on a tray 2, and packing it is performed on a working bench 101 as shown in Fig. 9.

In Fig. 9, chopping boards 102, 102 are placed on both sides of the working bench 101. A two-stage shelf 103 is provided on the center portion of the working bench 101 on the chopping boards. The trays 28 on which processed food is placed are put on an upper board of the shelf 103. Roll paper 104 for cleaning is attached in a center space between the upper and lower stages of the shelf 103. On the lower stage of the shelf 103, holding ports 25 each of which a kitchen knife for slicing food is inserted to and is held are formed and a scale 16 for weighing when the processed food is placed on the tray 28 is set.

In the conventional working bench 101, however, the

food is exposed during the process at a room temperature of $+15^{\circ}\text{C}$ to $+20^{\circ}\text{C}$ (at a wind velocity of about 0.5 m/sec) for about one hour. Therefore, there is a fear that a deterioration of food occurs due to rise of temperature or dry.

In order to solve the problem, there is conventionally used a method of cooling the backyard or whole of the inside of the food processing factory in a low temperature state in which food hardly deteriorates. According to the method, a labor environment for workers in the factory remarkably deteriorates and a problem which exerts an adverse effect on working properties also occurs. Accordingly, the improvement is fervently desired.

SUMMARY OF THE INVENTION

According to the invention, in consideration of the conventional situations, it is an object to provide a low temperature working table apparatus which can prevent food that is being processed from deteriorating when the food is processed and can improve the working environment.

According to the invention, the low temperature working table apparatus comprises: a main body constructed by adiabatic walls; a cooling device received in the main body; a duct which stands on a back portion of the main body; a cooler of the cooling device, which is installed in the duct; a cold air discharging outlet formed on an upper end of the duct; a working table which is detachably attached on the

upper surface of the main body on the front side of the duct; a blower for supplying cold air heat exchanged by the cooler from the cold air discharging outlet onto the working table; and cold air sucking inlets for sucking the cold air from the periphery of the working table into the main body.

According to the invention, since the apparatus has the main body constructed by the adiabatic walls, cooling device which is received in the main body, duct which stands on the back portion of the main body, cooler of the cooling device, which is installed in the duct, cold air discharging outlet formed on the upper end of the duct, working table which is detachably attached on the upper surface of the main body, on the front side of the duct; blower for supplying cold air heat exchanged by the cooler from the cold air discharging outlet onto the working table, and cold air sucking inlets for sucking cold air from the periphery of the working table into the main body, foods handled on the working table is kept cold by the cold air supplied from the upper cold air discharging outlet. Consequently, the deterioration of food during the working such as assortment or the like can be prevented.

Since the cold air on the working table is sucked into the main body through the cold air sucking inlets provided around the table, no deterioration of the working environment also occurs. Further, since the working table is detachably attached to the main body, it is detached after the work and can be easily washed.

According to the invention, in the above description, the low temperature working table apparatus further has a condenser of a water cooling system which constructs the cooling device and a water arrangement pipe for supplying cooling water to the condenser and the water arrangement pipe passes through the duct and is led out of the upper end of the duct.

Further, in the low temperature working table apparatus according to the invention, in each invention, the cold air sucking inlets are formed between the lower side of the periphery of the working table and the main body. The lower wall of each cold air sucking inlet is outwardly and lowly inclined.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective side elevation view of a low temperature working table apparatus of the invention;

Fig. 2 is a perspective front view of the low temperature working table apparatus of the invention;

Fig. 3 is a perspective plan view of the low temperature working table apparatus of the invention;

Fig. 4 is an exploded perspective view of the low temperature working table apparatus of the invention;

Fig. 5 is a perspective view showing cold air circulation of the low temperature working table apparatus of the invention;

Fig. 6 is a vertical sectional view taken along the

line A-A in Fig. 1;

Fig. 7 is a vertical sectional view taken along the line B-B in Fig. 2;

Fig. 8 is a vertical sectional side elevation view of a duct upper portion of the lower temperature working table apparatus of the invention; and

Fig. 9 is a perspective view of a conventional working bench.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

An embodiment of the invention will now be described in detail with reference to the drawings.

A low temperature working table apparatus 1 of the invention is installed in a food factory or a backyard of a supermarket in which perishable foods such as meats and fresh fishes or household dishes to be sold in a shop such as supermarket or convenience store are processed or cooked. As shown in Figs. 1 to 3, the low temperature working table 1 has a dimension of about the height of the worker's waist. A main body 3 is constructed by adiabatic walls 2 whose upper surface is opened.

The main body 3 is constructed by a mechanical portion 6 on the left which receives a cooling device and a connecting portion 7 coupled to the mechanical portion 6. As shown in Fig. 4, a working table 5 as a working bench to perform the food processing work is detachably placed onto the upper surfaces of them. The working table 5 is arranged

on the front side of a duct 8 which will be described later.

Since the working table 5 is detachably attached onto the main body 3 as mentioned above, the working table 5 is detached after the processing work and can be easily washed, so that it can be always kept clean.

Further, the duct 8 in which a cooler 17 is attached on the back portion of the main body 3 so as to stand perpendicular to the main body 3. A horizontal portion 9 which has an opening on the lower surface and which is constructed by the adiabatic walls 2 is attached on the upper end of the duct 8 so as to be in parallel with the main body 3, namely, perpendicular to the duct 8 as shown in Fig. 1. One end of the horizontal portion 9 communicates with the duct 8 and another end is closed. Cold air which is raised through the duct 8 is allowed to flow into the horizontal portion 9, blown out of a honeycomb member 15 which is attached to the lower surface on the closing end side of the horizontal portion 9 and which is used to rectify cold air, and then allowed to downwardly flow onto the working table 5 attached on the upper surface of the lower main body 3.

Sucking inlets 11 ... to suck the cold air which falls from the horizontal portion 9 are formed around the working table 5. The sucking inlets 11 ... communicate with the inside of the main body 3. The detailed structure of the sucking inlet will be described later.

A shelf 26 on which foods and equipment such as a tray on which food is set can be put is hung on the front

surface of the duct 8. A cart receiving portion 14 for drawably receiving a cart 13 into which garbage generated during the work can be put and which can be moved by wheels 12 attached to the bottom is formed on the lower side of the connecting portion 7 of the main body 3.

The cooling device 4 will now be explained. The cooling device 4 of the low temperature working table apparatus 1 in the embodiment comprises: a condensing unit 18 which is received in the mechanical unit 6 of the main body 3 and which will be described later; and the cooler 17 received in the duct 8. The upper portion of the duct 8 communicates with the horizontal portion 9. A blower 23 for sending cold air cooled by the cooler 17 to the horizontal portion 9 is provided on the communicating portion. The horizontal portion 9 having a structure for discharging cold air will be described later.

The condensing unit 18 comprises: a condenser 19 for constructing a well-known refrigeration cycle of the cooling device 4 together with the cooler 17; and a water cooling condenser 20.

A water arrangement pipe 21 for supplying cooling water to the water cooling condenser 20 is arranged in the duct 8 in the longitudinal direction. A connecting portion 21A of the pipe is led out of the upper edge of the duct 8 and is constructed so that the water arrangement pipe can be connected to a water service pipe at the upper edge of the duct 8.

Since the condenser 20 constructing the cooling device 4 is set to the water cooling system, there is no case where the inside of the main body 3 is overheated by waste heat. In the water cooling condenser 20, the arrangement pipe connection of the water arrangement pipe 21 for supplying cooling water to the water cooling condenser 20 can be easily executed on the outside of the upper portion of the food processing table apparatus 1.

The sucking inlets 11 will now be explained with reference to Figs. 5 to 7. The sucking inlets 11 are formed on the front, back, and side edges of the working table 5 constructing the periphery of the main body 3. On the upper edge of a side wall 2A under the working table 5 (except the corner of the working table 5) on the connecting portion 7 side of the main body 3, as shown in Fig. 6, the top surface of the side wall 2A is formed into an inclined plane 2B which is outwardly and lowly inclined from the inner side and the outer periphery of the inclined plane 2B is formed so as to be substantially coincident with the end portion 5A of the working table 5. The adiabatic walls 2 on the connecting portion 7 side of the main body 3 are formed so that the width of the side wall 2A is narrower than that of a side wall 2C of the adiabatic wall 2 on the mechanical portion 6 side of the main body 3.

In the upper edge of the side wall 2C under the working table 5 (except the corner of the working table 5) on the mechanical portion 6 side of the main body 3, as shown in

Fig. 7, the top surface of the side wall 2C is formed into an inclined plane 2B which is inclined outward from the inside and the outer periphery of the inclined plane 2B is formed so as to be substantially coincident with the end portion 5A of the working table 5. Since the mechanical portion 6 is formed in a portion surrounded by the adiabatic walls 2 on the mechanical portion 6 side of the main body 3, the width of the side wall 2C is formed so as to be wider than that of the side wall 2A of the connecting portion 7.

On an opening of the top surface of the side walls 2 constructing the main body 3, as shown in Fig. 4, holders 2F each of which is constructed by a vertical plane 2D and a horizontal plane 2E for supporting the working table 5 are formed on positions corresponding to four corners of the working table 5.

By the construction, dirty water or garbage of foods which is dropped from the end of the working table 5 during the work and is liable to enter the main body 3 from the sucking inlets 11 is dropped outside along the inclined planes 2B and 2C, thereby effectively preventing it from entering the main body 3. The apparatus can be sanitarilly used.

The horizontal portion 9 having the structure for discharging cold air will now be explained by using Fig. 8. The horizontal portion 9 is attached so as to communicate with the duct 8 which is attached so as to communicate with the main body 3. The blower 23 is attached to a corner

portion in which the horizontal portion 9 and duct 8 are coupled. The blower 23 sucks cold air from the lower side of the duct 8 and discharges it forward in the horizontal portion 9.

On the lower surface of the end on the closing side of the horizontal portion 9 opposite to the side to which the duct 8 is coupled, a cold air discharging outlet 9A for discharging the cold air flowed from the duct 8 is formed so as to correspond to the upper edge of the duct 8. The honeycomb member 15 which can rectify the cold air discharged from the blower 23 is attached to the cold air discharging outlet 9A.

By the above construction, the cold air circulation of the low temperature working table apparatus 1 of the invention will now be described with reference to Fig. 5. First, cold air cooled by the cooler 17 received in the duct 8 is sent to the horizontal portion 9 above the duct 8 by the blower 23 provided on the upper portion of the duct 8.

The cold air falls on the working table 5 through the honeycomb member 15 attached to the cold air discharging outlet 9A formed in the horizontal portion 9. Further, the cold air which falls on the working table 5 is sucked through the above-mentioned cold air sucking inlets 11 ... formed around the working table 5, fed back into the main body 3, and then allowed to flow into the cooler 17 of the duct 8, whereby the heat-exchange can be accomplished.

By the above construction, the food handled on the

working table 5 is kept cold by the cold air supplied from the upper cold air discharging outlet 9A. Consequently, the deterioration of food during the process can be prevented.

Since the cold air on the working table 5 is sucked through the cold air sucking inlets 11 around the table into the main body 3, no deterioration of the working environment also occurs. Further, since the working table 5 is detachably set to the main body 3, it is easily detached after the work and can be washed.

As described above in detail, according to the invention, since the apparatus comprises: the main body constructed by the adiabatic walls; cooling device received in the main body; duct which stands on the back portion of the main body; cooler of the cooling device, which is installed in the duct; cold air discharging outlet formed on the upper end of the duct; working table which is detachably attached onto the top surface of the main body on the front side of the duct; blower for supplying the cold air heat exchanged by the cooler from the cold air discharging outlet onto the working table; and cold air sucking inlets for sucking the cold air from the periphery of the working table into the main body, the food handled on the working table is kept cold by the cold air supplied from the upper cold air discharging outlet. Consequently, the deterioration of food during the process such as assortment can be prevented.

Since the cold air on the working table is sucked from the cold air sucking inlets on the periphery into the

main body, no deterioration of the working environment also occurs. Further, since the working table is detachably set to the main body, it is detached after the work and can be washed.

According to the invention, further in addition to the above, the condenser constructing the cooling device is set to the water cooling system. Therefore, there is no case where the inside of the main body is overheated by waste heat. Since the water arrangement pipe for supplying the cooling water to the condenser passes through the duct and is led out from the upper end of the duct, the arrangement pipe connection can be easily performed on the outside of the upper portion of the apparatus.

According to the invention, further in addition to the invention, since the cold air sucking inlets are formed between the lower side of the periphery of the working table and the main body and the lower walls of the cold air sucking inlets are outwardly and lowly inclined, dirty water or garbage of food dropped from the periphery of the working table hardly enters the main body from the cold air sucking inlets, so that it is clean.



WHAT IS CLAIMED IS:

1. A low temperature working table apparatus comprising:

a main body constructed by adiabatic walls;

a cooling device received in said main body;

a duct which stands on the back portion of said main body;

a cooler of said cooling device, which is installed in the duct;

a cold air discharging outlet formed on the upper edge of said duct;

a working table which is detachably attached onto the top surface of the main body on the front side of said duct; a blower for supplying cold air heat exchanged by said cooler from said cold air discharging outlet onto said working table; and

cold air sucking inlets for sucking the cold air from the periphery of said working table into said main body.

2. The apparatus according to claim 1 further having:

a water cooling condenser for constructing the cooling device; and

a water arrangement pipe for supplying cooling water to said condenser, wherein

said water arrangement pipe passes through said duct



and is let out from the upper end of the duct.

3. The apparatus according to claim 1 or 2, wherein said cold air sucking inlets are formed between the lower side of the periphery of said working table and said main body and the lower walls of said cold air sucking inlets are inclined outward.