July 7, 1931. K. WINKELMÜLLER 1,813,008

FURNACE FOR SMOKING GOODS SUCH AS FISH, MEAT, SAUSAGE, AND THE LIKE

Filed March 15, 1928

Fig. 1

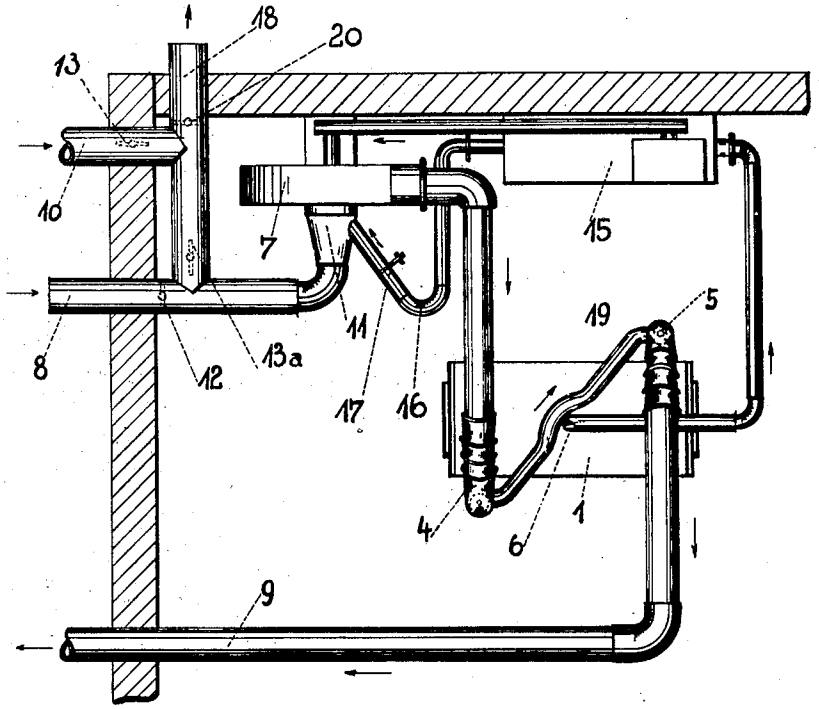
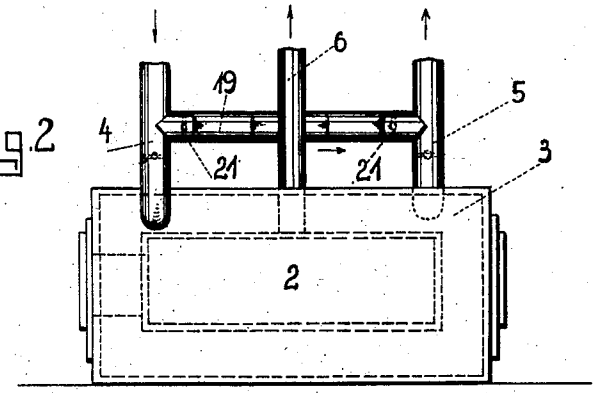


Fig. 2



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FURNACE FOR SMOKING GOODS SUCH AS FISH, MEAT, SAUSAGE, AND THE LIKE

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Smoked goods such as fish, meat, sausage and the like are usually dried prior and frequently also subsequent to the smoking process. Accordingly, in smoke-plants drying and smoking chambers are provided in the form of large drying houses and smoke towers. In these houses and towers the goods to be subjected to the smoking process are suspended from rods provided beside and above each other in large quantities. During the warmer season of the year the natural air-draft is used for the drying, while during the cooler season special heating bodies are provided in the smoking houses, towers or the like. A uniform drying of the goods, however, cannot well be accomplished in this manner. The pieces of goods which are positioned nearest the heating body or immediately within the current of air will undergo the drying process far quicker than other pieces which are in a more unfavorable position, and in addition to this, drying frequently takes place only on one side of these pieces. For this reason the goods to be smoked must be permanently observed and frequently the position of the several pieces must be changed which requires a relatively great number of employees for large plants. Even in case of most careful observation of the goods during the process of smoking and in spite of frequently changing the position of the same it is inevitable that a part of the goods will not be sufficiently dried, while another part of said goods will be subjected to excessive drying. Besides, the duration of the drying process is dependent upon the temporary degree of moisture of the goods, so that in some cases the drying process will require a shorter time and in other cases a longer time. If the temperature in the drying space suddenly decreases, the moisture which is contained in the air will partly condense and deposit upon the outside of the meat, fish, sausage or other goods to be dried, so that the goods will become of soiled appearance. In order to more quickly convey the air, so-called exhausters have been provided within said drying and smoking chambers. In case of using such exhausters, however, the aforementioned drawbacks will likewise be present.

After sufficient drying the goods are conveyed from the drying chambers into the smoking towers and since the temperature of the latter is in most cases different from that of the drying chambers, the goods will either continue to give off moisture and by reason of this become too dry, or the opposite will be the case, viz: the goods will again absorb moisture. At the bottom of the smoke towers there is provided the fumigator, that is the apparatus which serves for developing the smoke. The smoke ascends through apertures which are provided in the ceiling of the fumigator or smoke developing apparatus and is further carried in upward direction alongside the goods to be smoked which are suspended in the form of layers being positioned one above the other. Thereupon the smoke is discharged at the roof of the tower through special wells or chimneys provided for this purpose. The goods which are immediately placed above the ceiling of the fumigator will be more effectively exposed to the smoke gases than that part of the goods which is positioned at a higher place. A further reason for the uneven smoking of the goods consists therein that the smoke gases during ascending within the smoke towers will be subject to a considerable decrease in temperature. In addition to this frequently the smoke does not uniformly ascend within the towers, this being especially the case if the air is pushed unevenly forwards within said towers by the fumigator. In consequence thereof it may happen that at some places the goods will be damaged by burning by reason of the action of the smoke being too strong, while at other places the process of smoking the goods will be quite insufficient. In order to avoid this, also the position of the goods must be permanently changed within the smoke towers. In the present case this is quite especially undesirable because the persons who are employed for this purpose are forced to work within the smoke. A slight inadvertance will frequently suffice to permanently spoil the goods both as re-

gards appearance as well as regards quality.

The process which forms part of my invention is designed to obviate these disadvantages and drawbacks and more particularly to avoid permanent changing of the position of the goods as well as conveying the same from the drying chamber into the smoke towers. The novel features of the process according to my invention consists essentially therein that the drying and smoking is performed in one and the same space, while the air is circulated within said space by means of a special circulating device and carried past a heating body. If necessary, also fresh air may be introduced into said space, while after completed drying said circulating device will supply smoke from the fumigator into said chamber.

By performing the drying and smoking process within a single space, the entire plant will be reduced to one half of its ordinary amount of apparatus. The connecting members serving for introducing the suction and pressure air into the drying chamber as well as into the smoke chamber may conveniently be so arranged and distributed that the goods will be exposed uniformly at every point of their surface to the air-draft as well as to the smoke so that the position of the goods needs no more to be changed. In this manner waste or spoiled goods will be entirely avoided. For this reason and on account of the fact that the goods do not need to be conveyed into another chamber which serves for the smoking process, a considerable reduction of the number of the attendants will be the result. The drying and smoking, in addition to this, will be performed in a much shorter time than had heretofore been possible, and may accurately be inspected even from remote points by means of instruments which are usually employed in connection with airing and heating plants.

The suction and pressure conduits as well as the boiler which serves for supplying the heat necessary for the operation of the plant may be arranged in various ways. Likewise, the boiler and the fumigator itself may be constructed in various forms.

An advantageous construction of a plant according to my invention is shown as an example in the accompanying drawings, in which Fig. 1 is a plan-view of a furnace serving for the production of the smoke and the heating air, and Fig. 2 a lateral view of the apparatus shown in Fig. 1.

The furnace 1 is provided with a double wall, and the combustion space proper is designated with the numeral 2 and the air-jacket therefor with the numeral 3. Pipe connections 4 and 5 are provided on the air-jacket 3 and a similar connection 6 is provided at the combustion space 2. The connecting piece 4 is connected with the pressure-end of an exhauster 7 which draws-in fresh air by means of a conduit 8 and presses said air into the space 3 of the furnace 1. This air will be heated at the wall of the combustion space 2 and carried by way of the connecting piece 5 and a conduit 9 towards the drying chambers. From the drying chamber a conduit 10 leads back to the suction connecting piece 11 of the exhauster 7, so that the hot air will be circulated by action of said exhauster. The supply of fresh air is regulated by means of a choke valve 12 inserted in the conduit 8 serving for the supply of fresh air. Furthermore, the velocity of circulation of the heated air is regulated by means of a choke valve 13 inserted in the conduit 10 serving for carrying back said air. If after some time the goods are sufficiently dried, the connecting pipe 8 is closed up by a choke valve 12.

The connecting piece 6 which leads out of the combustion space 2 of the furnace 1 is connected with a spark-catcher 15, which again is in connection with the suction connecting piece 11 of the exhauster 7 by means of a pipe 16. This connecting pipe, however, is closed up by means of a valve 17 at times when the choke valve 12 of the connecting piece 8 which serves for the supply of warm pressure air is opened. After closing the choke valve 12 the valve 17 is opened so that now the exhauster 7 will draw the smoke gases from the combustion space 2 in which a slow combustion takes place and convey said smoke gases by way of the connecting piece 4 through the heating space 3 and the pipe 9 towards the smoke chambers. The transit from the drying to the smoking process will in this manner be accomplished in a very simple way. After completion of the smoking process the valve 17 is closed, thus again closing up the suction conduit for the smoke and by opening the choke valve 12 warm air will again be circulated which will further dry the smoked goods subsequent to the smoking process proper. In this case also the transit from one operation to the other may be accomplished in a very small time.

In order to be able to dispose of the smoke during transit from the smoking process to the subsequent drawing process, a discharge connecting piece 18 is provided in the conduit 10 which is ordinarily closed up by means of a choke valve 20. When opening this choke valve 20, the choke valve 13*a* will be closed so that during discharging of the smoke the latter will no more be carried into the exhauster. Since during the process of smoking a heating of the smoke is not required, a connecting pipe 19 may also be inserted intermediate the two connecting pieces 4 and 5 of the furnace 1, said connecting pipe 19 being provided with

choking devices 21 and forming an arch for the combustion space 2.

I claim:

In combination with a unitary smoking and drying chamber, smoking and drying apparatus comprising a smoke producing furnace, a jacket surrounding said furnace for heating air delivered thereto, a blower, an air inlet duct for the blower, pipe connections whereby air from said blower may be forced through the jacket space and the air thus heated delivered to said chamber, other pipe connections leading from said furnace to said air inlet duct whereby smoke may be delivered by said blower to said chamber through said first named pipe connections, and dampers in said air inlet duct and second-named connections for controlling the circulation of drying and smoking gases.

In testimony whereof I affix my signature.

KARL WINKELMÜLLER.