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DRYING AND/OR SMOKING OVEN

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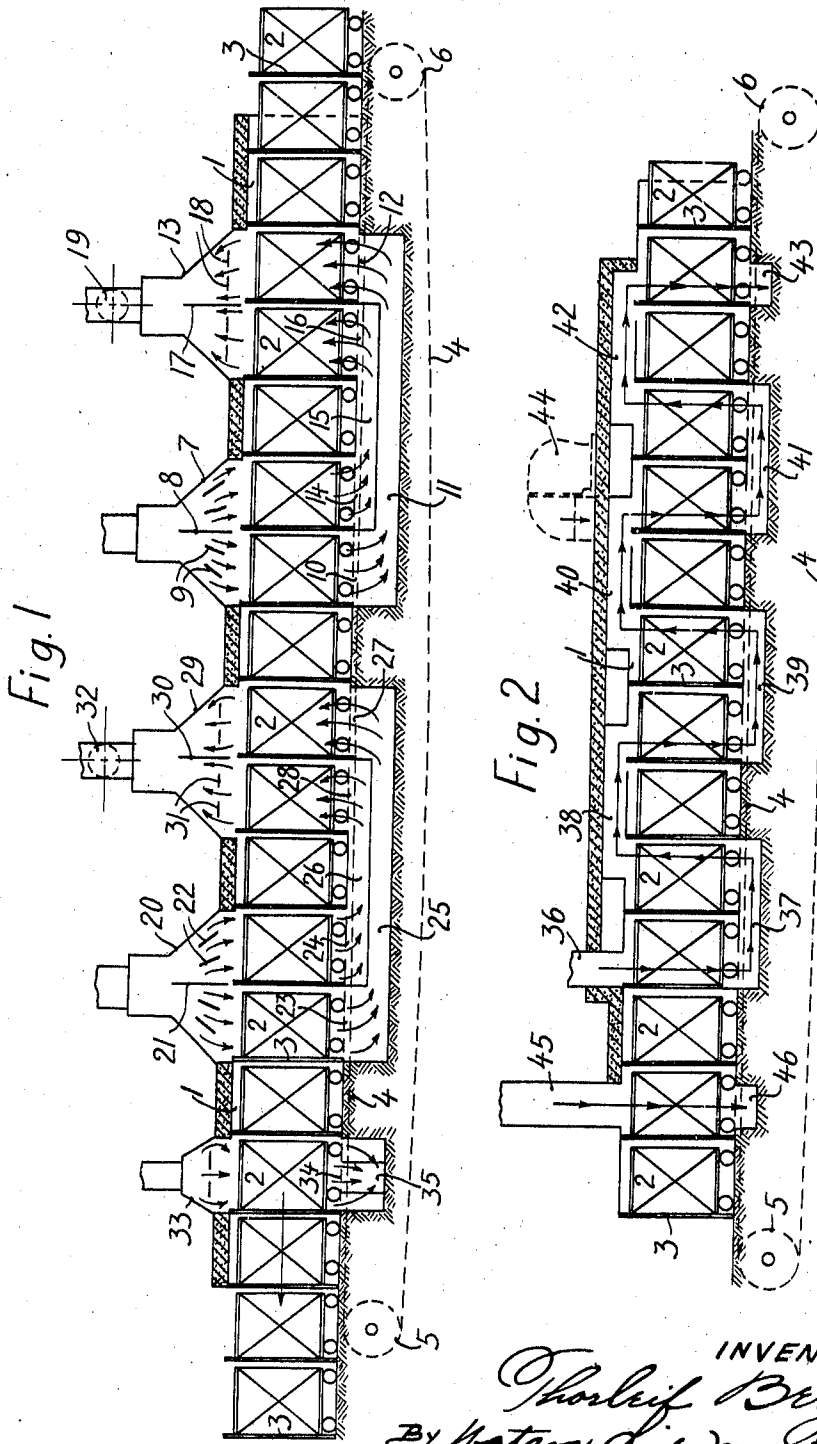


Fig. 1

Fig. 2

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DRYING AND/OR SMOKING OVEN

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The present invention relates to apparatus for drying and/or smoking articles, and particularly foodstuffs, for example, meat and fish, and relates particularly to that type of apparatus which comprises a channel or elongated chamber in which the drying and/or smoking is carried out, and through which the articles to be treated are conveyed on movable carriers, for example wheeled trucks. Such apparatus is well known, and includes generally an elongated chamber open at the ends, and provided with one or more inlets for smoke and heated air, and with suitable outlets. The material to be treated is placed upon wheeled trucks or other suitable conveyors, and passed slowly through the chamber from one end to the other, or permitted to rest within the chamber for a suitable length of time.

It is an object of the present invention to provide means whereby the smoke and/or heated air, and likewise a current of cooling air if desired, is conducted through and past the several trucks in a predetermined path and manner, thus insuring the most efficient use of the smoke and/or air, and the desired treatment of the foodstuffs or other materials. A further object is the provision of means for recirculating the smoke and/or air as often as desired, through the aforesaid predetermined path.

According to the invention each truck is provided with a wall or plate which corresponds in area with the whole or the main part of the cross section of the channel, whereby conduits or passages for air or smoke are formed transversely of the chamber between the walls or plates of consecutive trucks, the air or smoke being conducted to and withdrawn from the chamber through inlet and outlet ports arranged in the walls of the chamber, preferably in opposite walls.

The air or smoke may be conducted across the chamber and past the goods to be treated only once, the inlet and outlet being located at opposite sides of the chamber and in one and the same plane normal or approximately normal to the same, or the flow of air or smoke may be conducted across the chamber through one truck, through a separate channel or passage arranged parallel to the chamber and again across the chamber in the opposite direction. This operation may be repeated once or several times so that the flow of air or smoke passes the goods repeatedly in opposite directions along a zigzag path, the goods meanwhile remaining stationary or being in motion through the channel, as desired. Such systems may be repeated in suc-

cession along the chamber, for example, one system being for hot air, one for smoke and one for cooling air, whereby the drying and smoking operation may be carried out continuously during the passage of the trucks through the chambers.

Figure 1 is a longitudinal vertical section of a drying and smoking oven according to the present invention; and

Figure 2 is a longitudinal vertical section of a modified drying and smoking oven according to the present invention.

The numeral 1 designates the treating chamber and 2 the trucks, each of which is provided with a cross wall or plate 3 corresponding in area to the cross section of the chamber. Alternatively, every second truck only, or trucks in any other desired order, may be provided with said cross plates. The trucks are conveyed through the chamber by means of the endless chain 4 running over the sprocket wheels 5 and 6. The direction of movement of the trucks is indicated by an arrow.

In the embodiment illustrated in Fig. 1 hot air for the drying of the goods is supplied through the conically shaped inlet casing 7 which is provided with a central guide plate 8 and distributing plates 9, 9 for conducting the hot air to the goods supported on the trucks beneath the inlet, whereby the cross plates on adjacent trucks form separate passages for the air. After having passed down through the foremost truck the air flows through an opening 10 in the bottom of the chamber to the channel 11 running parallel to the chamber and from the channel 11 the air is again conducted upwards through the opening 12 to the chamber and across the same to the outlet 13, from where it may be discharged to the open air or in whole or in part recirculated to the oven. In a similar way the air passing down through the rear truck flows through the opening 14 in the bottom of the chamber through the channel 15 running parallel to the channel 11 and again upwards through the opening 16 into the chamber across the same and to the outlet 13.

The outlet 13 is provided with a central guide plate 17 and a number of smaller guide plates 18, 18 for directing the air flow and is further provided with a damper 19 for regulating the velocity of the air.

A similar arrangement is provided for the supply of the smoke, which is conducted to the chamber 1 through the inlet casing 20 provided with guide plates 21 and 22, flows across the

chamber through the trucks located directly below the casing and thereafter through the openings 23 and 24 respectively and through the channels 25 and 26 running parallel to the chamber 1, back to the chamber through the openings 27, 28, and upwards across the chamber to the outlet 29, which is also provided with guide plates 30 and 31 as well as a damper 32 for regulation of the velocity of the flow of smoke.

For the cooling of the goods after the completion of the smoking process cooling air is supplied through the inlet casing 33 from which the air flows across the chamber 1 through the truck or trucks located underneath the casing and is discharged through an opening 34 in the bottom of the chamber and through the discharge conduit 35.

In the embodiment illustrated in Fig. 2 the several channels or conduits for the supply and discharge of air or smoke to the chamber 1 are made as single channels, whereby the flow of air or smoke follows a substantially zigzag path through the oven.

In this embodiment the smoke or a mixture of hot air and smoke is conveyed to the oven through the inlet 36 from where it passes across the chamber 1 to the channel 37 arranged underneath the chamber and parallel to the same, thence again upwards and across the chamber 1 to the channel 38 above the same and thereafter along a substantially zigzag shaped path through the channels 39, 40, 41 and 42 to the discharge 43. If desired, additional drying air may be supplied to the channel, for instance as indicated with dotted lines at 44, from where the air passes across the chamber 1 to the channel 41, again upwards across the chamber to the channel 42 and finally is withdrawn through the above mentioned discharge 43.

Cooling air is supplied through the inlet conduit 45 and passes down across the chamber 1 to the discharge conduit 46 arranged below the chamber.

The hot air and smoke are preferably in part recirculated through the oven, being re-heated and supplied with a quantity of fresh smoke before being returned to the oven.

The invention may be applied to ovens with vertical chambers as well as to ovens with horizontal chambers.

The inlet and discharge openings are preferably arranged in opposite walls of the chamber, as a rule in the top and bottom of the same as shown in the drawing, but corresponding inlet and outlet openings also may be arranged in adjacent walls, i. e. in one wall and in one of the adjacent walls or in both adjacent walls near the opposite wall, whereby the flow of air and/or smoke fumes will come intimately into contact with the goods.

In ovens according to the present invention no covers are necessary at the ends of the chamber, as the plates 3 on the trucks serve to prevent any substantial loss of smoke or hot air through the ends of the chamber.

The terms and expressions employed in the foregoing specification are used in a descriptive, and not a limiting sense, and it is recognized that many variations may be made in the devices described and illustrated, without departing from the scope of the present invention.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In apparatus of the class described, an elongated chamber, article carriers provided with a member extending transversely of said chamber and substantially corresponding in area to the cross section thereof, means for passing said carriers continuously through said chamber, alternate inlet and outlet ports in a wall of said chamber, alternate inlet and outlet ports in another wall of said chamber and disposed in approximately the same transverse planes as the ports in said first wall, the inlet and outlet ports being arranged in such a way that an inlet port and the next following outlet port in the same wall of the chamber are so spaced apart along the chamber that between these ports there exists a part of the chamber without inlet or outlet ports and of a length at least equal to the distance between two consecutive transversely extending members of the said kind provided on the article carriers when said carriers are in abutting relation, an outlet port and the next following inlet port in the same wall of the chamber being connected by a passage lying outside of said chamber, and said ports being arranged so that each inlet port in one wall is opposite an outlet port in the other wall, and vice versa.

2. In apparatus of the class described, an elongated chamber, article carriers provided with a member extending transversely of said chamber and substantially corresponding in area to the cross section thereof, means for passing said carriers continuously through said chamber, alternate inlet and outlet ports in a wall of said chamber, alternate inlet and outlet ports in another wall of said chamber and disposed in approximately the same transverse planes as the ports in said first wall, the inlet and outlet ports being arranged in such a way that an inlet port and the next following outlet port in the same wall of the chamber are so spaced apart along the chamber that between these ports there exists a part of the chamber without inlet or outlet ports and of a length at least equal to the distance between two consecutive transversely extending members of the said kind provided on the article carriers when said carriers are in abutting relation, an outlet port and the next following inlet port in the same wall of the chamber being connected by a passage lying outside of said chamber, and said ports being arranged so that each inlet port in one wall is opposite an outlet port in the other wall, and vice versa, and a separate pair of opposed ports not connected with said other ports.

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