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ROTARY TRANSFER DEVICE IN CONNECTION WITH ENDLESS CONVEYERS

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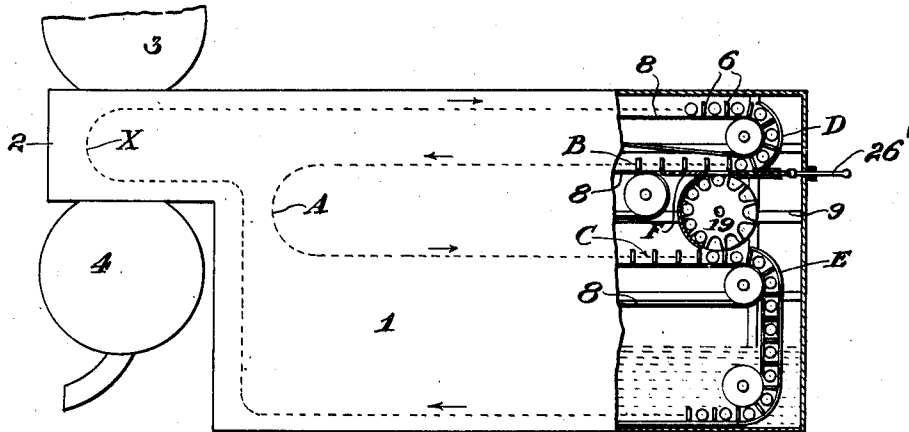


Fig. 1.

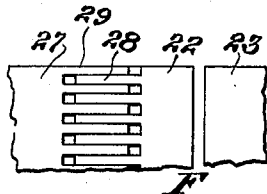


Fig. 5.

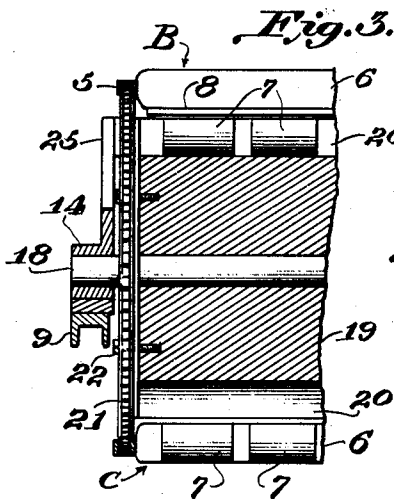


Fig. 3.

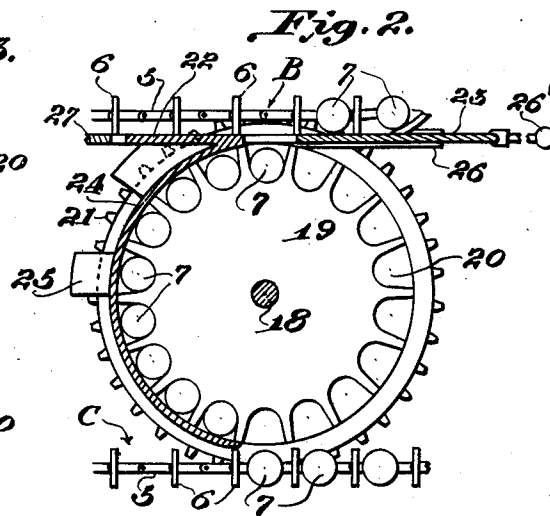


Fig. 2.

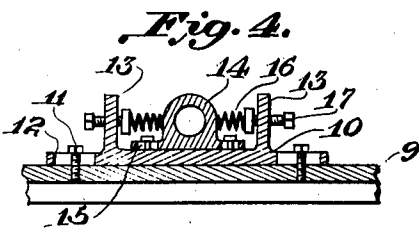


Fig. 4.

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UNITED STATES PATENT OFFICE.

NELSON H. FOOKS, OF PRESTON, MARYLAND.

ROTARY TRANSFER DEVICE IN CONNECTION WITH ENDLESS CONVEYERS.

Application filed December 27, 1924. Serial No. 758,434.

To all whom it may concern:

Be it known that I, NELSON H. FOOKS, a citizen of the United States, residing at Preston, in the county of Caroline and State of Maryland, have invented certain new and useful Improvements in Rotary Transfer Devices in Connection with Endless Conveyers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to apparatus for heat-treating substances in sealed receptacles and more particularly to apparatus of the type employing an endless conveyor arranged in a zigzag path within the shell of the apparatus, the conveyor adapted to progress the receptacles or cans through a heating zone of sufficiently high temperature to properly cook or sterilize the contents of the receptacles and preferably also through a cooling medium such as cool water, whereby the internal pressure of the cans may be reduced before the cans are discharged from the apparatus into the surrounding atmosphere. As is well known, not all food substances require the same period of time for proper cooking or sterilization. If the same apparatus is to be used for heat-treating substances requiring different cooking or sterilizing periods, it becomes necessary to provide some arrangement for limiting the period of time that the food substances are subjected to the heating medium. To this end it has been proposed to provide gates or traps which permit the sealed receptacles to be taken from the conveyor at some intermediate point and be discharged into the atmosphere surrounding the apparatus. Such means, however, so far as I am aware, do not permit of preliminary cooling of the receptacles, or rather the contents thereof, before being discharged into the atmosphere.

It is an object of the present invention to provide mechanism in combination with a conveyor arranged in a zigzag path, and preferably travelling through not only a heating zone but also through a cooling zone that will permit the receptacles to be transferred from one run of the conveyor to another whereby the distance travelled by the receptacles will be shortened and thus the time of heat treatment correspondingly

shortened due to the shortening of the can path within the shell of the apparatus. While the aforesaid mechanism is shown in connection with an apparatus primarily designed as a combined cooker and cooler it is to be understood that it is not limited in its application to such apparatus but may be used in an apparatus performing only one of those functions. When used with a cooker only it is obvious that the cooking period will be shortened by transferring the cans or receptacles from one run of the zigzag path of the conveyor to an adjacent run.

The mechanism for transferring the cans from one run to another of the conveyor chain includes, among other things, a rotary member disposed between a pair of adjacent runs of the conveyor, and a gate or slide between the said member and an adjacent run to allow the cans to pass from the conveyor into can-receiving pockets on said rotary member. For a fuller description of the apparatus reference is to be had to the detailed description and accompanying drawings in which:

Fig. 1 is a side view partly in section of an apparatus embodying my invention.

Fig. 2 is a view on an enlarged scale of features shown in Fig. 1.

Fig. 3 is an end view partly in section of the arrangement shown in Fig. 2.

Fig. 4 is a sectional detail view showing one manner of mounting the shaft bearing for the rotary member shown in Figs. 2 and 3; and

Fig. 5 is a fragmentary plan view of the partition between the rotary member and a conveyor section as shown in Fig. 2.

In the drawings, 1 indicates a shell or tank having an extension 2 at one end thereof, a trap 3 for entering receptacles into the shell to a conveyor, hereinafter described, being shown in connection with the upper part thereof and a trap 4 for discharging receptacles from the shell being also shown diagrammatically under said extension. An endless receptacle conveyor is arranged within the shell to follow a zigzag or circuitous path, such path being shown in part in dotted lines in Fig. 1. It will be noted that the conveyor includes a looped portion X within the extension 2, the receptacles being received on the conveyor from the trap 3 and being discharged therefrom through the trap 4.

The conveyer includes spaced, parallel sprocket chains 5 between and on which are mounted pusher bars 6, the receptacles 7 being positioned between the said bars as they are fed thereto by the trap 3. For supporting the receptacles while the conveyer is moving in a horizontal path, there are provided suitable platforms preferably in the nature of endless belts 8 the upper run of which is arranged below a horizontal run of the conveyer as shown. Where the conveyer makes a loop any suitable means may be provided for guiding and maintaining the receptacles in place between the pusher bars. The apparatus is primarily designed as a combined pressure cooker and cooler, the lower part of the shell for cooling purposes containing cooling water, the conveyer passing through said cooling water and finally up and into the extension 2 where the receptacles are discharged from the conveyer through the trap 4. The above generally described construction is fully described and claimed in my copending application filed December 8, 1924, Serial No. 754,603 and need not be further described in this application.

The shell or tank contains a suitable framework on which the conveyer and other moving parts are supported, part of said framework being shown at 9. Adjustably mounted on opposite sides of the framework 9 are floating bearings, one on each side, each mounted on a bracket 10, adjustment of the same being obtained in any suitable manner as by screw bolts 11 passing through slots in the bracket. Each bracket is provided with upstanding lugs 13 between which is mounted a shaft bearing 14, the bearing being slidably mounted in any suitable manner as by pin-and-slot connections indicated at 15. Disposed between the bearing and adjacent lugs 13 are springs 16 which may be suitably tensioned by screws 17. Mounted in and across bearings 14 is a shaft 18 on which is mounted a rotary member or drum 19 having receptacle-receiving means in the nature of pockets 20 therearound. At one or both ends of the drum is a sprocket wheel 21 which may be secured to the drum as by screws 22 in case the drum is mounted for rotation on its shaft 18. The drum is disposed in the space opposite a loop A of the conveyer and preferably as remote therefrom as possible in order that a maximum length of conveyer path may be cut out in transferring the receptacles from one adjacent run of conveyer to the opposite adjacent run by means of the rotating drum 19. As shown in the drawings the drum will preferably be placed between adjacent runs at the place where the run B is just passing from a loop D and the run C is about to make a loop E. At this point it may be stated that while the

runs B and C are shown as arranged in a horizontal path, the invention is not limited to such arrangement as the runs may be arranged in any position between the vertical and horizontal as regards the functioning of the transfer device. The sprocket wheel or wheels 21 is or are of sufficiently larger diameter than the drum 19 to mesh with the sprocket chains 5 of the adjacent runs B and C of the conveyer whereby the drum is rotated by the conveyer. This manner of rotating the drum also insures the proper synchronization between the drum and conveyer.

Disposed between the drum and adjacent run B of the conveyer is a split partition or wall generally indicated at F, the separate parts or portions thereof being indicated at 22 and 23. This wall, in the apparatus as shown, constitutes a supporting platform for the receptacles 7 as they leave the loop D and until they are received on the endless-supporting-belt platform 8 in line with the partition F. When the parts 22 and 23 of the partition are separated as by drawing the part 23 away from the part 22 the receptacles coming from the loop D will pass through the gateway thus formed in the partition and be received in the pockets 20 of the rotary member or drum 19, it being remembered that the latter is being rotated by the conveyer. The receptacles received by the drum will be carried around through 180° and be deposited on the conveyer run C tangent thereto after which they will be carried along by the conveyer over the loop E and down and out of the shell through the trap 4 as will now be readily understood. By thus transferring the receptacles directly from one run of conveyer to another, the linear distance travelled by the receptacles is obviously shortened by the length of conveyer extending from both sides of the drum to the loop A.

The part 22 of the wall or partition F is supported in any suitable manner. As shown, it is made as a tangential extension of a casing 24 which extends around part of the drum 19 and prevents the receptacles in the pockets 20 in the drum from falling out while being transferred between the runs B and C. The casing is held in fixed position as by means of brackets or arms 25 which extend from the shaft bearing 14, see Fig. 3. The part 23 of the partition F is slidably mounted in a suitable support 26 and has a handle or extension 26' which extends through the adjacent wall of the shell or tank to permit its operation when desired. Disposed in the same plane as the part 22 of the partition F and between it and the endless platform 8 below the run B of the conveyer is a section of wall 27 over which receptacles may pass from the part 22 to the endless supporting plat-

form. As previously indicated the drum 19 is adapted to be shifted bodily along the framework 9 to compensate for slack in the conveyer. In order to prevent any gap occurring between the parts 22 and 27 these parts are made with intermingling fingers 28 and 29, respectively, so that relative movement may be had therebetween without opening any gap through which the receptacles would pass from the conveyer, it being understood that the wall section 22 is part of the casing 24 which partially surrounds the drum and therefore will be bodily moved when the drum is shifted.

It will now be seen that I have provided a very simple device which will permit receptacles to be readily transferred between two runs of a conveyer in order that the path of the receptacles through the shell of the apparatus may be materially shortened with consequent shortening of time that the receptacles remain in the shell subject to heat treatment. It will also be apparent that various structural changes may be made in the apparatus without departing from the spirit of the invention.

What I claim is:

1. The combination with two sections of an endless conveyer, said sections extending direct from a loop in the conveyer, of a rotary member disposed between said sections opposite said loop at a point remote from the latter, said sections after passing the rotary member making bends in opposite directions, a partition between an adjacent section of the conveyer and said rotary member, the latter having receptacle-receiving means therearound, said partition including a movable member for giving a direct passage between the rotary member and adjacent section of conveyer whereby receptacles being moved by that section of conveyer may pass directly into the receptacle-receiving means of the rotary member and be transferred by the latter to the opposite adjacent section of conveyer.

2. In combination, an endless receptacle-conveyer arranged to travel in a path so arranged that portions of the conveyer are travelling in opposite directions, means for transferring receptacles at will between two oppositely-moving portions of the conveyer, said means including a rotary member disposed between adjacent oppositely-moving portions of conveyer, receptacle-receiving means on the rotary member, a gateway between the rotary member and one of the said portions of conveyer, the receptacles received by the rotary member through the gateway being transferred by the rotary member to the adjacent oppositely-moving portion of conveyer, and means for closing said gateway against the passage of receptacles.

3. In combination, an endless receptacle-

conveyer arranged to travel in a path so arranged that portions of the conveyer are travelling in opposite directions, said conveyer having spaced pusher members between which receptacles are received, means independent of the conveyer for maintaining the receptacles between said pusher bars, means for transferring receptacles at will between two oppositely moving portions of the conveyer including a rotary member disposed between oppositely-moving portions of conveyer and having receptacle-receiving means therearound, a gateway between the rotary member and one of said conveyer portions whereby receptacles passing through the gateway may be received by the said rotary member and transferred by the latter to the adjacent portion of conveyer, and means for closing said gateway against the passage of receptacles.

4. In combination, an endless conveyer arranged to travel in a path so arranged that portions of the conveyer are travelling in opposite directions, said conveyer including a pair of sprocket chains between which extend spaced pusher bars adapted to form pockets for receptacles, a rotary member having receptacle-receiving means therearound, gearing between said rotary member and the conveyer whereby movement of the one imparts a definite rate of movement to the other, means independent of the conveyer for maintaining the receptacles between said pusher bars in place therebetween, and means permitting receptacles to pass to the rotary member from an adjacent portion of conveyer, said means including a gateway which may be closed at will.

5. In combination, a rotary member having receptacle-receiving means therearound, an endless receptacle-conveyer arranged on opposite sides of said member, a framework for supporting the conveyer and said member, means for yieldingly supporting said rotary member on the framework, means for rotating the rotary member in synchronism with the movement of the conveyer, and means for passing receptacles at will to the rotary member from an adjacent section of conveyer.

6. In combination, a rotary member having receptacle-receiving means therearound, an endless receptacle-conveyer arranged on opposite sides of said member, a framework for supporting said conveyer, a shaft on which said rotary member is mounted, a bearing in which each end of the shaft is mounted, a bracket adjustably mounted on the framework, means yieldingly and slidably supporting said bearing on said bracket, a gear affixed to said rotary member concentric with the shaft, said conveyer having a sprocket chain which meshes with said gear on opposite sides thereof, the slidable and yielding connection between the shaft bear-

ing and bracket permitting relative displacement between the shaft of the rotary member and the framework whereby the rotary member may be bodily shifted to compensate for slack in the conveyer and thus permit free meshing of the rotary-member gear with the chain of the conveyer disposed on either side thereof, a wall between the rotary member and one of the adjacent portions of conveyer, said wall having a gateway through which receptacles may pass to the rotary member and means for closing said gateway against the passage of receptacles.

7. In combination, a rotary member having receptacle-receiving means therearound, a run of receptacle conveyer movable in a path extending tangentially with respect to the rotary member, means between the rotary member and conveyer normally preventing the receptacles being moved past the rotary member by the conveyer from being received by the rotary member, means for opening a passage through said means between the conveyer and rotary member whereby receptacles being moved by said conveyer may be received by said rotary member, and a second run of conveyer tangentially arranged with respect to the rotary member whereby the cans received by the latter may be transferred to the last-mentioned conveyer.

8. In combination, means for transferring objects from a conveyer run to a conveyer run, comprising a rotary member having receptacle-receiving means therearound, runs of superposed receptacle conveyers between which the rotary member is disposed, means for rotating said member in synchronism with said conveyer runs, a wall between the upper of said conveyer runs and the rotary

member normally preventing receptacles on that conveyer run from being received by the rotary member, means for opening a passage in said wall whereby receptacles meeting said passage may be received by said rotary member.

9. In combination, a rotary member having a plurality of peripheral pockets, a receptacle conveyer extending over and tangentially with respect thereto, said conveyer comprising a plurality of flexibly associated transverse pusher bars, means interposed between the conveyer and the rotary member adapted to support objects between said pusher bars, and means for withdrawing said support means whereby objects may gravitate from said conveyer into the adjacent peripheral pocket of the rotary member.

10. The structure specified in claim 9 with means for synchronizing movement of the conveyer with that of the rotary member.

11. In combination with superposed runs of an endless conveyer, a rotary member having a plurality of peripheral pockets, floating bearings for positioning the rotary member intermediate the conveyer runs and means for synchronizing the movement of the rotary member and the endless conveyer.

12. In combination with superposed runs of an endless conveyer, a rotary member having a plurality of peripheral pockets, said rotary member positioned intermediate said conveyer runs and common gear means for rotating the rotary member and endless conveyer.

In testimony whereof I affix my signature.

NELSON H. FOOKS.