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CANNED MATERIAL COOLING APPARATUS

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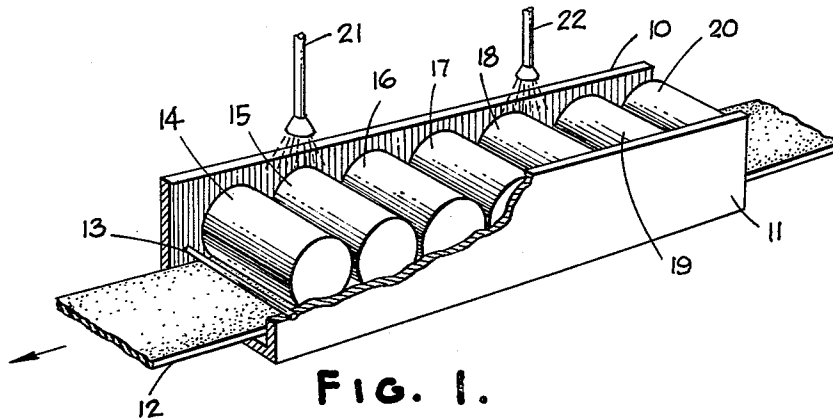


FIG. 1.

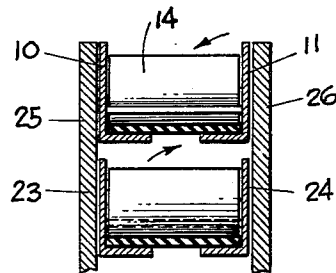


FIG. 2.

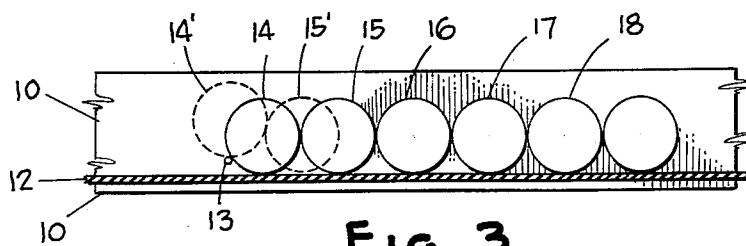


FIG. 3

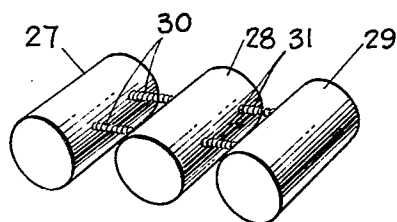


FIG. 4.

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CANNED MATERIAL COOLING APPARATUS

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This invention generally relates to a method and apparatus for treating the contents of sealed containers or cans, and more particularly concerns a simplified method and apparatus for agitating and cooling cans to prevent overcooking of certain portions of the canned product or food.

The present invention has particular applicability in the cooling of cans containing semi-liquid, gelatinous, or solid food products in which the cooling of the exterior side walls of the can must be accompanied by agitation of the can in order that the contents will be shaken sufficiently to provide uniform cooling throughout. Such problems are usually not inherent with cans containing only liquids, although it will be appreciated that the present invention may also be employed with canned products of this type.

Various present day machines are available for not only shaking but also spinning sealed cans about their axes in order to achieve the basic purpose of the present invention. However, such machines are usually of a complex mechanical construction, such that they are frequently relatively expensive to purchase and maintain. Furthermore, such machines oftentimes necessitate a time delay in the overall canning process. On the other hand, machines which do not require a high initial cost or expensive maintenance usually are only capable of imparting a single type of movement to the cans, that is, spinning the cans about their own axes or shaking the cans, such that cans containing gelatinous or semi-solid food products are not completely or uniformly cooled.

It is, therefore, an object of the present invention to provide an unusually simple method and apparatus for cooling and agitating sealed cans in a manner such that semi-solids products contained therein are effectively cooled.

Another object of the present invention is to provide a method and apparatus for agitating and cooling cans which may be embodied in canning processes on a relatively economical basis without high initial cost and without any appreciable maintenance.

Another object of the present invention is to provide a method and apparatus for agitating and cooling cans, which when embodied in can processing lines, will not adversely affect the overall processing time.

Still another object of the present invention is to provide a method and apparatus for agitating and cooling cans which may be adapted and set up at the canning plant with normally available parts without the necessity of the purchase of expensive machine elements.

These and other objects and advantages of the present invention are generally attained by providing a method of treating cans which basically consists of conveying the cans in interengaging side by side relationship over a given horizontal distance with the axes of the cans defining a given plane. As the cans are being conveyed they are successively and respectively momentarily forced to roll upwardly above and then after downwardly to the given plane. Preferably, during this movement, the cans are additionally spinning or caused to spin about their own axes.

A preferred apparatus for performing this method comprises an elongated horizontal can way defining spaced apart side walls. Can conveyor means are adapt-

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ed to carry a plurality of side wall supported, successive interengaging cans in a longitudinal path of movement through the can way with the conveyor means being disposed in a given horizontal plane parallel to the axes of the cans. At least one transverse member is supported between the side walls and spaced above the horizontal plane in the path of movement of the cans such that each can engaging the member is rolling driven upwardly over the transverse member by the momentum of the following cans. Fluid ejecting or cooling means are associated with the apparatus for cooling the cans during and in their path of movement.

A better understanding of the present invention will be had by reference to the drawings, showing an illustrative embodiment of a preferred apparatus for carrying out the method of the present invention, and in which:

FIGURE 1 is a partial isometric view of the basic elements of the apparatus of the present invention;

FIGURE 2 is a partial cross sectional view of FIGURE 1, also illustrating the relative disposition of another can way and means of supporting the can ways;

FIGURE 3 is a longitudinal section of the apparatus shown in FIGURE 1, schematically indicating the movement of cans through the can way; and,

FIGURE 4 illustrates one form of apparatus for forcing the last of the cans through the can way.

Referring now to the drawings, there is shown in FIGURE 1 an elongated angle member 10 and an elongated angle member 11 in opposing relationship and defining together a generally U-shaped channel means or can way for the conveying of cans therethrough.

The angle members 10 and 11 co-operatively support on their laterally extending side walls a movable can carrying member in the form of a belt conveyor 12 adapted to be slidably pulled through the can way in the direction of the arrow by any suitable driving means such as conventional pulley driven mechanisms and the like.

As a primary feature of the present invention, extending between the side walls of the angle members 10 and 11 are a plurality of longitudinally spaced transverse members or rods 13, one only being shown in the view of FIGURE 1.

For purposes of illustration, cans 14, 15, 16, 17, 18, 19, and 20 are shown in FIGURE 1 as being disposed in the can way or channel means defined by the opposing angle members 10 and 11.

For purposes of cooling the cans 14 through 20 as they are moved by the belt 12 through the can way, fluid ejecting means 21 and 22 are schematically indicated in position vertically above the cans. The fluid ejecting means 21 and 22 would conventionally spray cooling water over the cans in accordance with present day practice as they are conveyed through the can way.

In actual construction, a plurality of can ways would preferably be disposed in vertical relationship, one above the other, as partially shown in FIGURE 2. Thus, the can defined by angle members 10 and 11 would be spaced above a can way defined by angle members 23 and 24. Thus, the can 14 would move in the direction of the upper arrow in FIGURE 2 between the angle members 10 and 11 and thereafter in the direction of the reverse low arrow between the angle members 23 and 24. For purposes of reversing the direction of movement of the cans, the belt 12 might pass over a pulley with an appropriate conventional can cage or the like directing the cans back through the angle members 23 and 24 in the usual manner. The vertical spaced can ways could then be supported by supporting means, for example, in the form of side plates 25 and 26, as shown in FIGURE 2.

With such a construction, it will be appreciated that

the cooling water will flow and drip downwardly, and act to form a water film between the belt 12 and underlying lateral walls of the angle members 10 and 11, whereby belt friction is decreased.

The method and operation of the apparatus according to the present invention may be clearly understood by reference to FIGURE 3 in which the movement of the cans 14 through 18 is schematically indicated. Thus, as can 14 engages the transverse member 13 the momentum of the following cans 15 through 18 will force can 14 to the position indicated by 14' by rolling upwardly over the transverse member 13. It will be appreciated that as the can 14 leaves the position 14' to return again to the belt 12 that the can will tend to spin about its own axis while at the same time rolling back to its normal position on the belt 12.

It has been found that the transverse member 13 or rod must be vertically disposed relatively close to the belt 12 and below the normal axial plane of the cans 14 through 18 in order that the following cans 15 through 18 exerting a force against can 14 may force the can 14 to the position of 14'. Furthermore, it has been found that normally five to nine cans are required to be following the individual can being moved upwardly in order to force such individual can over the transverse member 13. Of course, the particular vertical positioning of the member 13 and the number of following cans required will vary according to the dimensions of the specific cans being processed as well as the mass of the contents thereof.

In order to insure complete passage of all cans through the various can ways, pusher means in the form of three dummy cans as shown in FIGURE 4 may be employed. The pusher means in FIGURE 4 comprises three weighted cans 27, 28, and 29 coupled together with spring means 30 and 31. In employing the pusher means, assuming for example that can 18 were the last can being processed, the pusher means would be placed in the processing line after can 18. As can 18 came into contact with rod 13, the spring means 30 and 31 would tend to be compressed to increase the force of can 27 against can 18 and thereby force it over the transverse member 13. In turn, the subsequent compression of spring means 30 and 31 would force can 27 over the transverse member 13. Thereafter, the compression of spring means 31 and pull of can 27 would force can 28 over the transverse member, and cans 27 and 28 would pull can 29 over. Of course, other types of pusher means might be employed in order to insure complete processing of cans in the line.

From the foregoing, it will be apparent that the present invention results in a greatly simplified apparatus and method for agitating and cooling canned products which can be installed and maintained with a minimum amount of expense.

It will be appreciated, however, that many modifications and changes may be made in the method and apparatus of the present invention without departing from the basic spirit and scope thereof as defined by the following claims.

What is claimed is:

1. A can cooling and agitating apparatus comprising: an elongated horizontal can way defining spaced apart side walls; can conveyor means adapted to carry a plu-

ality of side supported successive interengaging cans in a longitudinal path of movement through said can way; said conveyor means being disposed in a given horizontal plane parallel to the axes of said cans, said horizontal plane also including the lowermost points of the sides of said cans; at least one transverse member stationarily supported between said side walls and spaced above said horizontal plane in the path of movement of said cans; whereby each can engaging said member is rollingly driven upwardly and spun on its own axis over said transverse member by the momentum of the following cans to thereafter drop down by gravity into position again on the conveyor means; and, fluid ejecting means associated with said apparatus for cooling said cans in the path of movement thereof.

2. A can cooling and agitating apparatus, according to claim 1, in which said conveyor means comprises a flat belt.

3. A can cooling and agitating apparatus, according to claim 2, in which said can way comprises two opposing angle members.

4. A can cooling and agitating apparatus, according to claim 1, in which said transverse member is a rod.

5. A can cooling and agitating apparatus comprising: an elongated can way defining spaced apart side walls; can conveyor means adapted to carry a plurality of side supported successive interengaging cans in a longitudinal path of movement through said can way; said conveyor means being disposed in a given plane parallel to the axes of said cans, said plane including the lowermost points of said cans; at least one transverse member stationarily supported between said side walls and spaced above said plane in the path of movement of said cans; whereby each can engaging said member is rollingly driven upwardly and spun on its own axis over said transverse member by the momentum of the following cans to thereafter drop down by gravity into position again on the conveyor means; and, fluid ejecting means associated with said apparatus for cooling said cans in the path of movement thereof.

6. A can agitating apparatus comprising: an elongated can way defining spaced apart side walls; can conveyor means adapted to carry a plurality of side supported successive interengaging cans in a longitudinal path of movement through said can way; said conveyor means being disposed in a given plane parallel to the axes of said cans, said plane including the lowermost points of the sides of said cans; at least one transverse member stationarily supported between said side walls and spaced above said plane in the path of movement of said cans; whereby each can engaging said member is rollingly driven upwardly and spun about its own axis over said transverse member by the momentum of the following cans to thereafter drop down by gravity into position again on the conveyor means.

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