TRAY FOR CONVEYING CANDY

Richard E. Fasano, Jackson Heights, N.Y., assignor to
Loft Candy Corporation, Long Island City, N.Y., a
Corporation of New York

Filed June 10, 1980, Ser. No. 819,262

5 Claims. (Cl. 214 — 397)

This invention relates to improved apparatus for transporting candy on a conveyor or the like.

The invention has particular reference to candy which is made by pouring the candy into a paper cup which serves as a mold, and which candy is later hardened within the paper cup. Such candy is commercially sold still within the paper cup.

In accordance with existing known machinery, a plurality of paper cups are placed in a tray, and this tray is placed in a filling station wherein each cup of the tray is filled with liquid chocolate. The tray is then fed from the pouring station to the conveyor, which carries the tray through a tunnel. In the tunnel, the chocolate is cooled and assumes a hard form. When the tray comes out of the tunnel, the cups containing the candy must be separated from the tray for packing.

In present commercial production, it has necessarily been necessary to separate the candy-filled cups from the tray manually, either by lifting them individually from the tray or by turning the tray upside down and dumping the cups. In the latter case, the cups must still be picked up manually and placed within the packing container and this is difficult since many of the cups are upside down or on their sides.

An important object of this invention is to provide a tray and apparatus such that the filled tray is automatically separated from the cups before the cups enter the cooler. This eliminates the need for manually separating the filled cups from the tray, and also eliminates the need for the metal tray to pass through the cooler during the hardening operation. This greatly reduces the mass of material which must be cooled during the hardening operation, and thereby increases the efficiency of this operation.

In accordance with the invention, the tray is made in two parts, a lower portion and an upper portion. The base has a flat bottom wall, a front wall, a rear wall and one side wall, the other side wall being omitted. The upper portion has a top wall with a plurality of holes for reception of cups, and also has depending flanges which rest upon the bottom wall of the base to hold the top wall spaced from the bottom wall.

As further important features of the invention, the apparatus past which the conveyor carrying the filled trays moves is provided with means which may be operated by any suitable means (optionally manually) for sliding the lower portion out from under the top portion of the tray, the top portion moving through the open side of the lower portion. This leaves the flanges of the top portion resting directly upon the conveyor belt. Further means are provided adjacent the moving conveyor for then acting cammingly upon the tray upper portion so as to raise the tray upper portion clearing above the cups during movement of the conveyor. This leaves the filled cups resting upon the conveyor belt as they are fed to the tunnel. I have found that the filled paper cups retain their shape adequately; and even if they tend to go slightly out of shape from the weight of the liquid chocolate, they substantially return to their desired round shape during the cooling operation.

Other objects and advantages of this invention will become apparent from the following description, in conjunction with the annexed drawing, in which a preferred embodiment of the invention is disclosed.

In the drawing:

FIG. 1 is a perspective view of a conveyor belt (broken away), showing a plurality of trays being carried thereon. At the leading end of the conveyor, the chocolate-filled cups are shown separated from the tray and resting upon the conveyor belt itself. Just behind the leading end of the conveyor, a tray upper portion is being shown in the process of being separated from the filled cups. Further to the rear, a tray bottom portion is being shown in the act of being separated from the tray upper portion.

Two trays in filled condition are shown at the rear or trailing end of the conveyor in FIG. 1. For convenience, the apparatus for use in removing the bottom portion or base portion of the tray is omitted in FIG. 1, and also not all of the chocolate is shown in position in the trays or on the conveyor.

FIG. 2 is a section on line 2—2 of FIG. 1, showing a tray bottom portion in process of being removed, and showing somewhat diagrammatically one form of apparatus which may be used in this removal step.

FIG. 3 is a section on line 3—3 of FIG. 1, showing fragmentarily two of the trays.

FIG. 4 is a fragmentary section on line 4—4 of FIG. 2.

FIG. 5 is an exploded perspective view showing the bottom portion and upper portion of a tray.

Upon reference to the drawings in detail, it will be noted that they show a generally horizontal conveyor belt moving in the forward longitudinal direction of arrows 11 and 11a. For convenience of illustration, the means for supporting and moving belt 10 are omitted since they are conventional and do not form any part of this invention.

A pair of angles 12 are fixed to the frame (not shown) at each side of conveyor belt 10. Each said angle 12 has a longitudinally extending horizontal base portion 12a which is fixed to the frame by means of bolts 13 or any other suitable fastening means. Said angle 12 has an upwardly and longitudinally extending flange 12b at the inner edge of flange 12a. Flange 12b has an upper front edge portion 14a which is parallel to conveyor belt 10.

The rear portion of flange 12b is tapered to provide an upper rear cam edge portion 14 which is upwardly inclined in the forward direction. The rear edge of cam edge 14 is optionally spaced slightly above flange 12a.

Cam edges 14a and 14 connect at approximately the midpoint of angle 12.

Rearwardly of angles 12, and at the right side of the conveyor, as taken in FIG. 2, a longitudinally elongated plate 15 is suspended in fixed position above conveyor belt 10 by any suitable means (not shown). Plate 15 also extends laterally outwardly of conveyor belt 10.

Plate 15 has a longitudinally elongated slot 16 whose axis is parallel to the direction of movement of conveyor belt 10, and which overlies the side edge of said belt at the side edge thereof.

Rearwardly of plate 15, a longitudinally extending guide 17 is provided. This guide 17 has an inner longitudinal guide surface which is aligned with slot 16.

The candy tray 18 has two parts, a base or bottom portion 19 and an upper portion 20. Tray bottom portion 19 has a rectangular, laterally elongated bottom wall 21, a front upstanding wall 22 and a rear upstanding wall 23. At the right side of the tray, as viewed from the rear, there is provided an upstanding side wall 24 which connects with front and rear walls 22 and 23 and which is of the same height. Said wall 24 has a central upwardly extending, co-planar extension 24a.

Flange 25 extends outwardly from extension 24a at the upper edge thereof, and flange 26 extends downwardly from flange 25 at the outer edge thereof in parallel.
spaced relationship to wall extensions 24a. Flange 26 serves as a finger piece. The tray upper portion 20 comprises a flat plate 27 which serves as the upper wall of the tray assembly 18. Said plate 27 is rectangular and has a continuous peripherally depending flange 28 which is adapted to rest closely within the walls 22, 24 and 23 of tray bottom portion 19. This flange 28 rests upon bottom wall 21 with walls 27 and 20 parallel to each other. Said plate 27 has a plurality of round holes 29 preferably arranged in rows and columns in a rectangular grid pattern, as is clearly shown in the drawings. Optionally, the longitudinally extending columns of holes 29 are separated by longitudinally extending, laterally spaced flanges 30 which depend from top wall 27 and which rest upon bottom wall 21. A small angle 31 is fixed to top wall 27 at each side thereof and at both the front and rear thereof. Each angle 31 has an upwardly and longitudinally extending portion 31a which is fixed to plate 27 by means of bottom inwardly extending horizontal flange 31b, and has a top outwardly extending flange 31c. These flanges 21c project outwardly of the side edges of plate 27. In operation, each tray is assembled by nesting the tray 20 within the bottom portion 19, with flange 28 abutting walls 22, 24 and 23. The tray is then filled with a plurality of generally cylindrical cups 32 which have top openings and which are received within holes 29, with the base of each cup 22 resting upon bottom wall 21. Cups 32 are then filled with liquid chocolate 33, by means of any suitable filling apparatus which is not a part of this invention and hence is not shown. FIG. 1 shows a succession of trays 18 on conveyor belt 11, these trays being designated for convenience by the respective reference letters A, B, C and D. Hence, according to this designation, trays C and D are the trailing trays. These trays C and D contain the cups 33 filled with liquid chocolate 33 and are loaded on conveyor belt 10 by any suitable means (not shown). Trays 18 are in sliding abutment with the inner surface of guide 17. As tray B passes under plate 15, a tool is inserted downwardly through slot 16. This tool has a flat, vertically and longitudinally extending blade 34 and a handle 35 at the top thereof. This flat blade 34 is extended downwardly between wall 24 and its extension 24a on the one hand, and the right side portion 28b of peripheral flange 28 on the other hand, said alignment with the slit between flange portion 28a and wall 24. With tool blade 34 thus held in position, finger piece 26 is grasped and the bottom portion 19 of tray 18 is withdrawn laterally outwardly in the direction of arrow 36, in the manner clearly shown in FIG. 2. The blade 34 in place prevents the tray upper portion 20 from being withdrawn frictionally from conveyor belt 10 along with the tray bottom portion. The length of blade 34 is substantially less than the length of slot 16, thereby allowing sufficient time, in relation to the movement of conveyor belt 10, for withdrawal of tray lower portion 20. As is clearly shown in FIG. 1 (position of tray A), after the tray bottom portion 19 has been withdrawn, the two front ears or flanges 31c strike and ride upon cam edges 14, thereby elevating the front end portion of tray portion 20 to the position 20' to so clear the cups 32 from holes 29. The tray upper portion 20 may be grasped manually after it has been separated from the majority of the cups 32, and in any event no later than when the rear ears 31c strike the cam surfaces 14. It is important not to wait too long to lift up the tray upper portion 20, as once the tray is on the conveyor belt 10, it is no longer propelled forwardly in the direction of arrow 11 by conveyor belt 10; and it is important to prevent jamming of the cups. The purpose of raising the tray wall 27 is to partly separate it from the cups, so as to facilitate the complete manual raising of the tray upper portion 20. If it were attempted to lift the tray upper portion 20 before it supports the cam edges 14, it would be extremely difficult to lift the tray upper portion 20 from the moving conveyor belt 10 without disturbing the cups 32.

FIG. 1 shows two trailing trays C and D prior to their treatment so as to separate them from the cups. Forwardly of tray A, FIG. 1 shows a plurality of the filled cups 32 after they have been separated from the tray and while they are still filled with liquid chocolate. The conveyor belt 10 may then travel to any suitable station for further treatment of the chocolate, such station being no part of this invention and hence being omitted from the representation. By way of example, conveyor belt 10 may lead the filled cups to a cooling tower or the like, on top of which the chocolate is hardened. After the cups leave the tunnel, they may be removed from the conveyor belt 10 for packaging. It has been found that the invention is advantageous since it results in separation of the cups from the trays before they enter the cooling chamber, thereby making it unnecessary to cool the mass of metal on the trays. Furthermore, since the cups have been separated from the trays, it is relatively easy to remove them from the conveyor belt for packaging after they leave the conveyor belt 10.

While I have described the invention as embodied in a preferred embodiment of the invention and have indicated various changes, omissions and additions which may be made therein, it will be apparent that various other changes, omissions and additions may be made in the invention without departing from the scope and spirit thereof.

I claim:

1. A candy tray for reception of a plurality of cups filled with candy comprising a tray lower portion and a tray upper portion, said lower portion having a bottom wall, front and rear walls, one side wall, and being open at its top, said side wall having a finger piece extending outwardly thereof, said upper portion comprising a top wall and a peripheral flange depending from said top wall and having an open bottom, said upper portion being nested within said bottom portion with said flange resting on said bottom wall and with said top wall being spaced from said bottom wall, said upper portion having ears extending outwardly on the sides of said upper portion, said top wall having a plurality of holes sized and shaped for reception of said cups with each said cup extending slidably through a respective hole and resting upon said bottom wall, the distance between the upper surface of said top wall and said bottom wall being less than the height of said cups, said lower portion being slideable relative to said upper portion to permit withdrawal of said lower portion with said upper portion moving relatively to said lower portion through the open side of said lower portion.

2. Conveying apparatus for cups and the like, comprising a tray having a tray upper portion and a tray lower portion and adapted to receive said cups, a conveyor for carrying said trays in succession in longitudinal forward direction with said tray lower portion resting on said conveyor, said tray upper portion and said tray lower portion being separable, said tray upper portion being nested within said tray lower portion and having an open bottom and a top wall with openings through which said cups can be extended to rest upon said tray lower portion, said tray lower portion having a side opening sloped to allow sliding withdrawal of said tray lower portion whereby said tray upper portion moves relatively to said tray lower portion through said side opening, said tray upper portion and tray lower portion having adjacent sides opposite the side opening, a blade, and guide means for said blade, the path of said conveyor being positioned and adapted to permit placing of said adjacent sides for retaining said tray upper portion on said conveyor while said tray lower portion is withdrawn laterally outwardly, and a pair of upwardly forwardly in-
clined ramps located respectively on opposite sides of said conveyor and adjacent to said trays and beyond said guide means, said tray upper portion having projections adapted to strike and ride upwardly on said ramps so as to lift said tray upper portion above said conveyor, said ramps extending from points below said projections to points above said projections when said tray upper portion is flush upon said conveyor.

3. Conveying apparatus for cups and the like, comprising a tray having a tray upper portion and a tray lower portion and adapted to receive said cups, said tray upper portion and said tray lower portion being separable, said tray upper portion being nested within said tray lower portion and having an open bottom and a top wall with openings through which said cups can be extended to rest upon said tray lower portion, said tray lower portion having a side opening sized to allow sliding withdrawal of said tray lower portion whereby said upper tray moves relatively to said lower tray through said side opening, said tray upper portion and said tray lower portion having adjacent sides opposite the side opening, a conveyor for carrying said trays in succession in longitudinal forward direction with said tray lower portion resting on said conveyor, successive means in the path of said conveyor for first retaining said tray top portion on said conveyor while said tray bottom portion is being removed and for then removing said tray top portion from said conveyor while retaining said cups on said conveyor, and guide means for said means for retaining said tray top portion on said conveyor, said guide means comprising a jig plate having a longitudinally extending slot which is longitudinally aligned with the adjacent sides of said tray upper portion and tray lower portion, said means for retaining said tray top portion on said conveyor comprising a blade adapted to be inserted through the slot of said jig plate and between said adjacent sides of said tray upper portion and tray lower portion, whereby said tray lower portion may be withdrawn laterally outwardly while said blade retains said tray upper portion from said outward movement, the length of said blade being less than the length of said slot in said jig plate, said means for removing said tray upper portion comprising a pair of upwardly forwardly inclined ramps located respectively on opposite sides of said conveyor adjacent to said trays and beyond said guide means, said tray upper portion having projections adapted to strike and ride upwardly on said ramps so as to lift said tray upper portion above said conveyor, said ramps extending from points below said projections to points above said projections when said tray upper portion is flush upon said conveyor.

4. Conveying apparatus for cups and the like, comprising a tray having a tray upper portion and a tray lower portion and adapted to receive said cups, said tray upper portion and said tray lower portion being separable, said tray upper portion being nested within said tray lower portion and having an open bottom and a top wall with openings through which said cups can be extended to rest upon said tray lower portion, said tray lower portion having a side opening sized to allow sliding withdrawal of said tray lower portion whereby said tray upper portion moves relatively to said tray lower portion through said side opening, said tray upper portion and said tray lower portion having adjacent sides opposite the side opening, a conveyor for carrying said trays in succession in longitudinal forward direction with said tray lower portion resting on said conveyor, a blade, and guide means for said blade, said guide means being positioned and adapted to permit placing of said blade between said adjacent sides for retaining said tray upper portion on said conveyor while said tray lower portion is withdrawn laterally outwardly, said conveyor and said tray upper portion having cooperative means which are operative following lateral sliding withdrawal of said tray lower portion from said conveyor for elevating said tray upper portion to clear said cups.

5. In combination with a plurality of cups having cylindrical peripheries and filled with candy, a candy tray for transport of said cups comprising a tray lower portion, and a tray upper portion, said lower portion having a bottom wall, front and rear walls, one side wall, and being open at its top, said side wall having a finger piece extending outwardly thereof, said upper portion comprising a top wall and a peripheral flange depending from said top wall and having an open bottom, said upper portion being adapted to be nested within said bottom portion with said flange resting on said bottom wall and with said top wall being spaced from said bottom wall, said upper portion having ears extending outwardly, said top wall having a plurality of circular holes, said cups being slidable and frictionally inserted through said respective top wall holes and resting upon said bottom wall and extending above said top wall, said upper portion being slidable relative to said lower portion through the open sides of said lower portion.

References Cited in the file of this patent

UNITED STATES PATENTS

D. 965
Waters Nov. 17, 1857
1,945,758
Turner Feb. 6, 1934
2,074,383
Funk Mar. 23, 1937
2,523,852
Seidel et al. July 6, 1953
2,893,594
Burt et al. July 7, 1959