Dec. 15, 1953 P. BIANCHI ET AL 2,662,653

CARTON AND BOX INVERTER

Filed Aug. 7, 1951 2 Sheets-Sheet 1

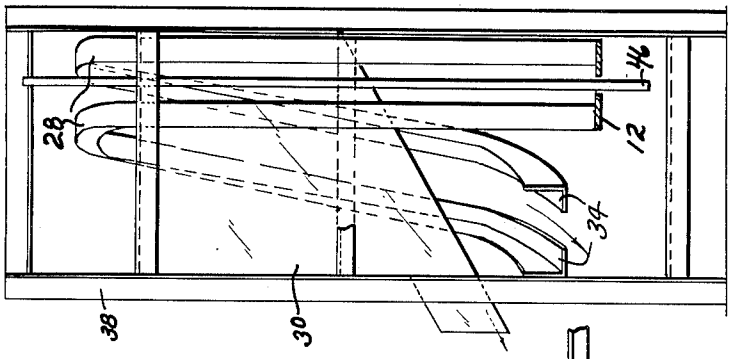


FIG. 2

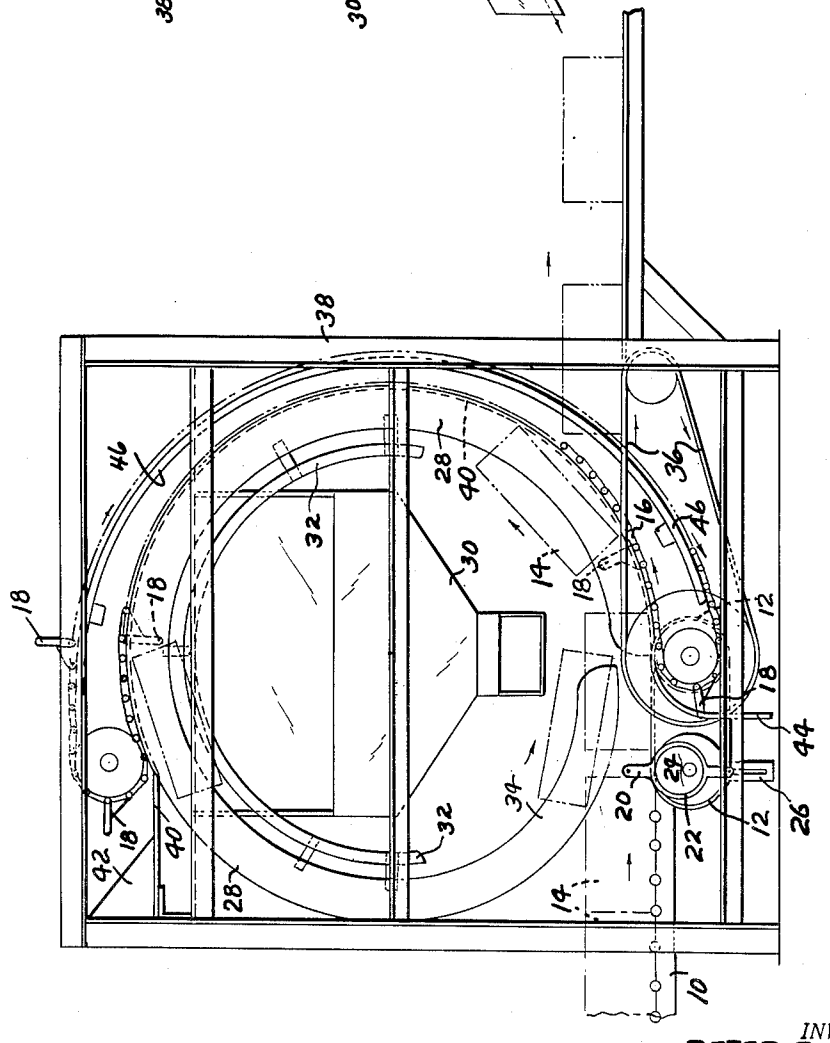


FIG. 1

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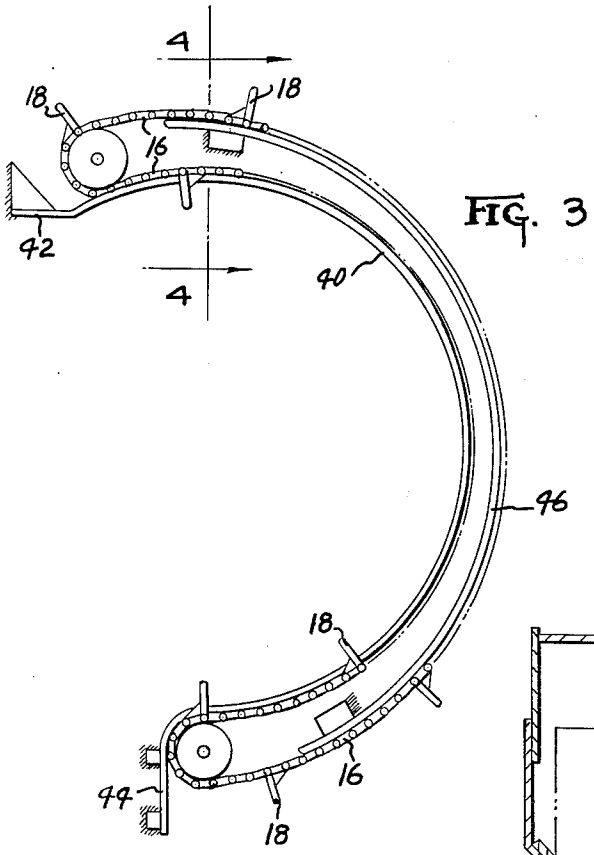


FIG. 3

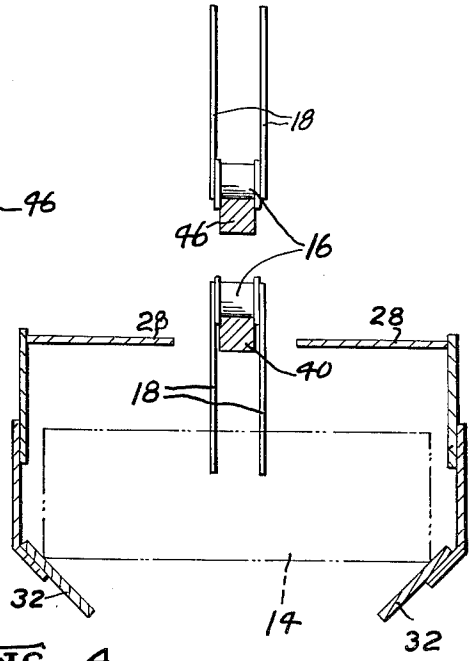


FIG. 4

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2,662,653

CARTON AND BOX INVERTER

Peter Bianchi, New Haven, and John C. Rothwell, Bolton, Conn.; said Rothwell assignor of one-fourth to Joseph T. Donohue, West Boylston, Mass., and one-fourth to John F. Walsh, Columbia, Conn.

Application August 7, 1951, Serial No. 240,732

3 Claims. (Cl. 214—311)

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This invention relates to new and improved cleaning apparatus for boxes and cartons and the principal object of the invention is to provide means for cleaning boxes, cartons, etc., by inversion thereof and collection of trash and detritus falling therefrom into a receptacle placed for the purpose.

Other objects include the provision of a track in the form of a generally vertical loop similar to a spiral, means to space the boxes, cartons, etc., entering at a feed-in station, a conveyor on an arc of the loop carrying the boxes, cartons, etc., upwardly on the track one after the other, a guide holding the boxes and cartons from falling from the track while inverted or at the top portion of the loop, a trash receptacle to receive the contents of the inverted boxes, cartons, etc., and a carry-off or discharge conveyor generally on the level of the feed-in station, i. e., at the bottom of the loop.

Other objects of the invention include the provision of apparatus as above described including a special conveyor support in the form of two spaced bars on the arcs of circles whose centers approximate the center of the loop, and in supporting means for the bars, in combination with an endless roller chain having spaced double fingers thereon to engage and move the boxes and cartons, the fingers straddling the bar on the active or working pass or run of the chain upwardly on the loop, and passing off the bar at the end of the active pass and onto the other bar to continue downwardly on the inactive or idle pass or run to repeat the operation and to continuously travel the boxes and cartons as aforesaid.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a view in side elevation of a machine according to the invention;

Fig. 2 is a view in front elevation, parts being broken away;

Fig. 3 is a detailed view in side elevation of the conveyor arrangement; and

Fig. 4 is a section on an enlarged scale on line 4—4 of Fig. 3.

Boxes, cartons, etc., in industrial and commercial use are frequently re-used to cut the cost to the consumer in the distribution of goods. This is particularly true in the food industry, especially in bottled liquids such as milk, carbonated beverages, etc. Wooden and cardboard boxes and cartons are used to a great extent,

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and all must be cleaned of trash, cigarette ends, etc., that inevitably find their way thereinto while the boxes and cartons are in the hands of the consumer. It is more economical to clean and otherwise process the boxes and cartons continuously and in an in-line process from the receiving department to the filling, loading, and delivery point.

In illustrating the present invention, the numeral 10 indicates a feed-in table of any kind upon which the boxes or cartons are advanced in uncleaned condition in end to end contacting relation. The boxes and cartons are fed into the table in any convenient way, not shown. When the boxes and cartons emerge from the machine, they must be spaced in at least an approximate even relation to proceed to the bottle loading station, as will be made apparent hereinafter.

A conventional belt or the like 12 transfers the boxes or cartons 14 to a roller or the like chain 16 having spaced pairs of box engaging and traveling fingers 18, the latter contacting the separate boxes and pushing the same upwardly on a spiral or loop to cause inversion of the boxes.

A spacer device comprises a constantly moving stop member 20 on the strap 22 actuated in an elliptical path by a constantly driven eccentric 24. The stop member is held vertical by a convenient guide comprising a pin and slot, see numeral 26. The boxes or table 10 are arranged end to end and each tends to push along the boxes ahead. The stop member rises between the last and next to last box on the table and slows down the box to the left in Fig 1. The box to the right has now reached the belt 12 and is pushed thereby into a position to just be engaged by the next following pair of fingers 18. The spacer device and the chain are driven in timed relation and have a relative motion set to accomplish this effect. The spacer does not feed or push the boxes, it shows the next succeeding box to space the same and to position the boxes correctly for pickup by the fingers 18.

The chain 16 is arranged on an arc in accordance with a track 28 which assumes the form of a loop or spiral. This track may be fabricated of angle irons or like material, and the boxes are largely contained within and guided by this track, which is open at the bottom at the top of the loop and thus causes the boxes to be completely inverted so that the trash therein falls into a receptacle 30 provided for this purpose.

The track has guides 32 at each side to pre-

vent the boxes from falling, see Fig. 4. The guides extend only approximately along the top half part of the track, while the latter is substantially complete in one full turn, and the boxes slide down the exit end of the track as a chute at 34. At this point, the boxes are still spaced but if desired, an exit conveyor 36 may be driven at a relatively high speed to further space the boxes for the loader. The conveyor 36 may be positioned vertically offset from the table 10 or the end of chute 34 according to requirements.

A suitable framework 38 may be provided to support the various parts and motors, not shown, and this framework supports the ends of an arcuate bar 40 as at 42 and 44. This bar conforms in general to track 28 and guides and supports the active or working run of chain 16. When rollers are used, they will ride on the bar 40 and fingers 18 will straddle the bar, thus not only forming the arc of the chain but providing against side whip. The inactive or idle run or pass of chain 16 comprises another bar 46 supported anywhere along the length thereof but bar 40 is supported only at the ends and does not interfere in any way with the operation of the machine.

It will be seen that this invention inverts, spaces, cleans, and transfers the boxes or cartons 14 continuously and with no attention necessary on the part of any operator. The apparatus is essentially simple but practical and foolproof and fulfills the objects of the invention and a need long present in the industry.

Having thus described our invention and the advantages thereof, we do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what is claimed is:

1. Apparatus of the class described comprising a generally vertical spiral loop track, a conveyor from the bottom of the loop extending along a side thereof upwardly on an arc to a point past the top of the loop, an inverted guide extending along the top portion of the loop to retain articles in the track, the guide extending well beyond the termination of the conveyor so that articles fall by gravity down along the opposite side of the loop.

2. The apparatus of claim 1 wherein the conveyor is in a vertical plane and the spiral track is located in gradually offset relation thereto horizontally from a point adjacent the top end of the conveyor and proceeding down to the bottom of the loop in the direction of travel of the articles.

3. Apparatus of the class described comprising a generally vertical spiral loop track, a conveyor from the bottom of the loop extending along a side thereof upwardly on an arc to a point past the top of the loop, an inverted guide extending along the top portion of the loop to retain articles in the track, the guide extending well beyond the termination of the conveyor so that articles fall by gravity down along the opposite side of the loop, and means to travel the articles at a relatively higher rate of speed from the end of the track.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,504,838	Rickard	Aug. 12, 1924
1,583,035	Valerius et al.	May 4, 1926
1,593,501	Martin et al.	July 20, 1926
1,945,753	Turner	Feb. 6, 1934
2,032,946	McHenry	Mar. 3, 1936
2,532,594	Bentley	Dec. 5, 1950
2,605,883	Thames	Aug. 5, 1952