

Sept. 10, 1957

R. E. PALMER

2,805,753

CONTAINER HANDLING APPARATUS

Filed Jan. 19, 1955

3 Sheets-Sheet 1

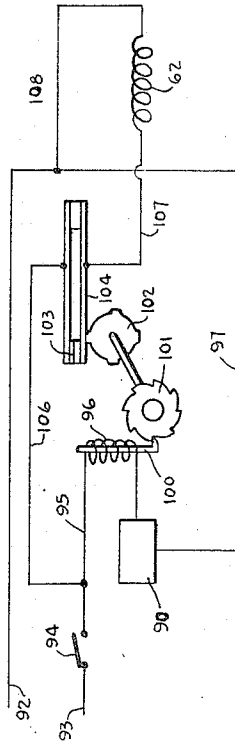
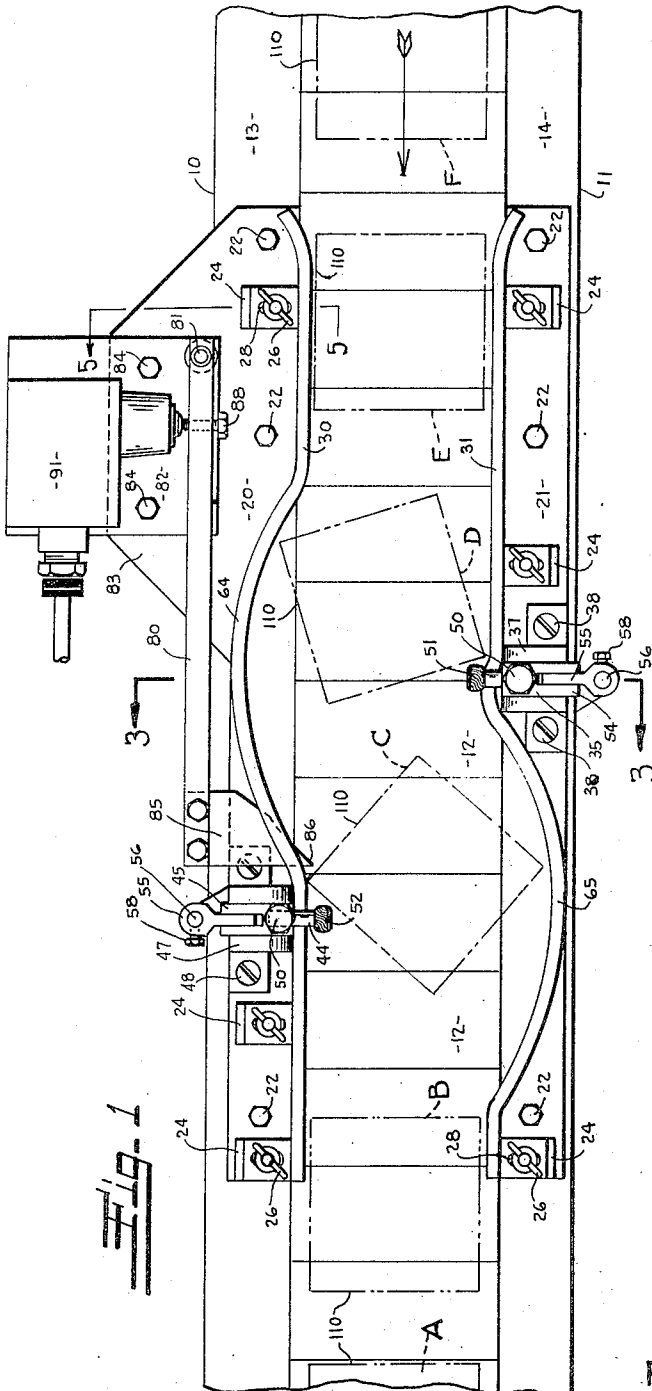


Fig. 6

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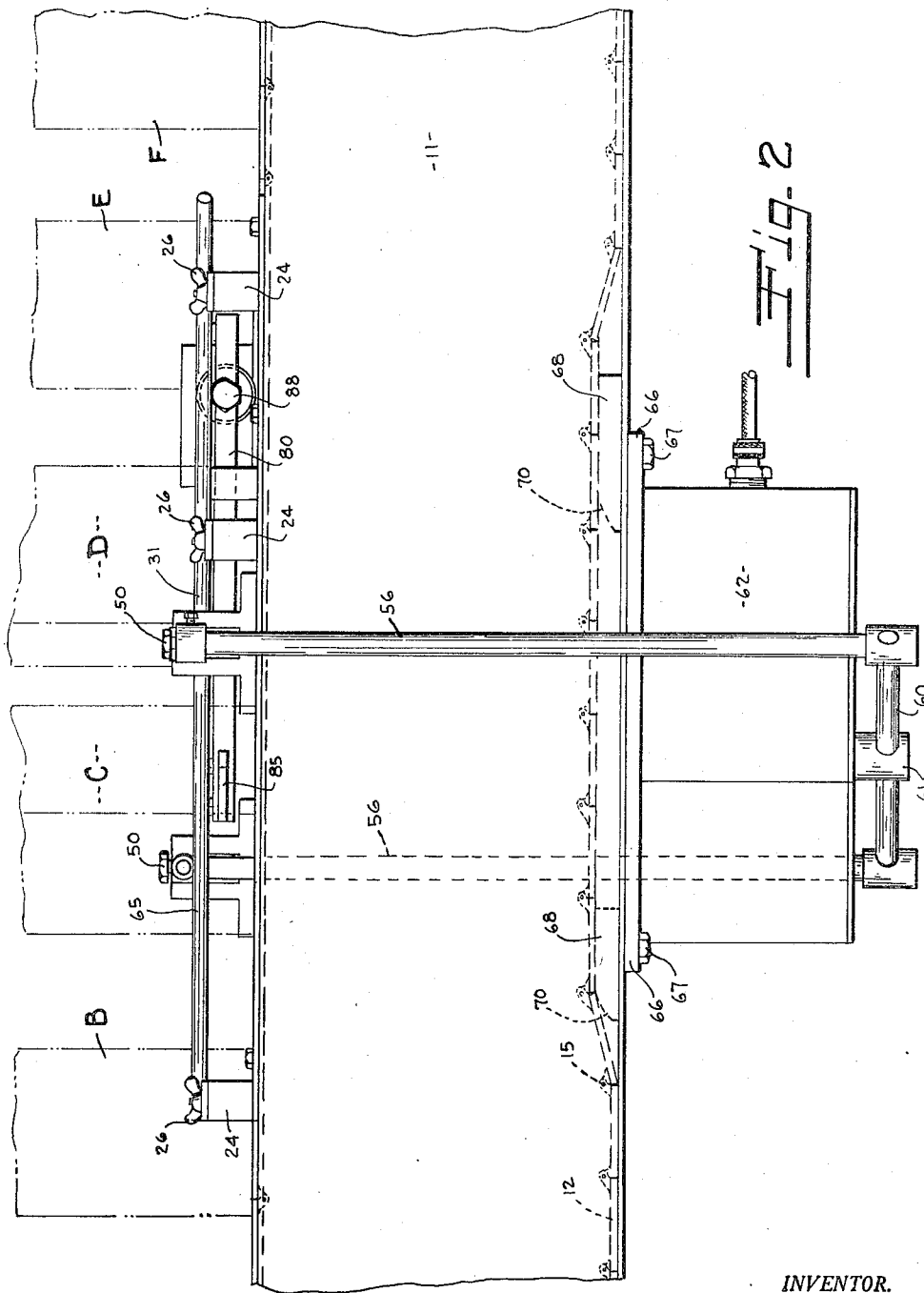


Fig. 2

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3 Sheets-Sheet 3

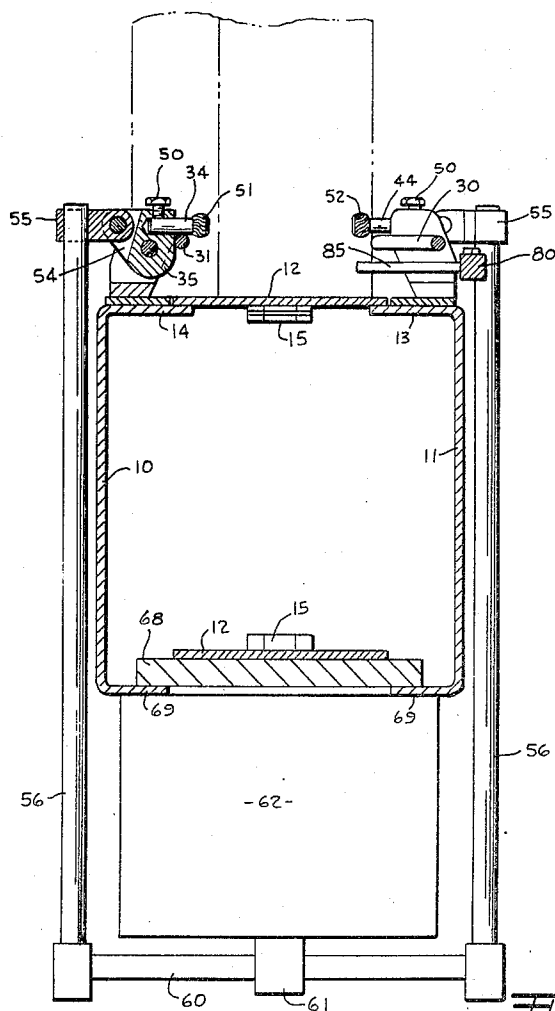


Fig. 3

Fig. 4

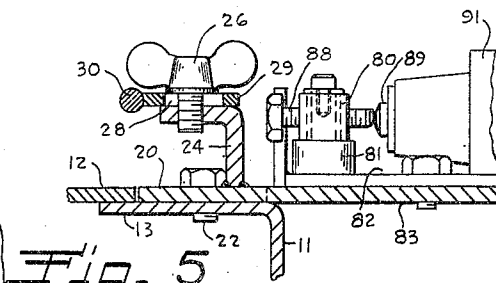
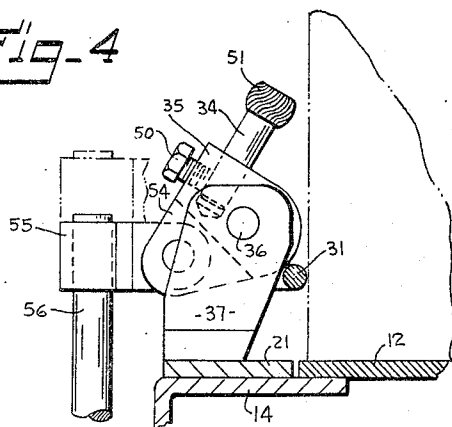


Fig. 5

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CONTAINER HANDLING APPARATUS

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4 Claims. (Cl. 198—33)

This invention relates to apparatus for arranging containers rectangular in cross section advanced in a single file procession in pairs with selected side panels of the containers of each pair in confronting relation.

The invention has as an object a container arranging apparatus as referred to embodying a structure economical to build and which may be readily attached to conventional container conveyors now in extensive use, the apparatus not requiring any modification in the conveyor structure, or the addition of any other conveyor units.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

In the drawings—

Figure 1 is a top plan view of a structure embodying my invention.

Figure 2 is a front side elevational view referring to Figure 1.

Figure 3 is a view taken on line 3—3, Figure 1.

Figure 4 is an enlarged view of the upper left portion of Figure 3 showing the container fulcrum member in retracted position.

Figure 5 is a fragmentary sectional view on line 5—5, Figure 1.

Figure 6 is a schematic wiring diagram of the electrical control circuit.

The containers, indicated in dotted outline A—F in Figure 1, are rectangular in cross section and are advanced to the left, Figure 1, by a continuously moving conveyor. This conveyor consists of side members 10, 11, of channel formation arranged in spaced apart confronting relation. An endless conveyor chain is trained over a pulley or sprockets journaled at each end of the side members 10, 11, and is in the form of a series of flat plates 12 which slide along the upper inwardly extending flanges 13, 14, of the side members 10, 11. The plates 12 are provided with projections 15 pivotally joined together and engaging with the teeth of the actuating sprockets. This type of conveyor is standard and conventional, and is used very extensively in dairies for advancing processions of containers formed of both glass and paper.

The turning apparatus consists of a pair of plates 20, 21, detachably secured to the top flanges 13, 14, of the conveyor, as by means of screws 22. To each of the plates 20, 21, there is fixedly secured, as by welding, a plurality of angle brackets 24 provided with threaded apertures in their upper flanges to receive thumb screws 26 which extend through elongated slots 28 formed in flat plates 29 secured to guide rails 30, 31. The elongated slots 28 provide for adjustment of the guide rails toward and from the center of the conveyor.

There is mounted on the plate 21 a container fulcrum member movable transversely inwardly above the conveyor plates 12 for engagement by the adjacent leading

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corner portions of the containers, and when so positioned, form fulcrums about which the containers are turned during their forward advancement by the conveyor.

The container fulcrum member consists of a stem portion 34 mounted in an aperture formed in a holder 35 mounted for pivotal movement on a pin 36 carried by a bracket 37. The bracket 37 is slotted to receive the holder 35, and the bracket is affixed to the plate 21 as by screws 38.

The apparatus is constructed to effect turning movement of the containers in pairs and therefore, a second container fulcrum member is provided and, as shown in the arrangement disclosed in the drawings, this second fulcrum member is mounted on the plate 20 and has a stem portion 44 mounted in the holder 45 pivotally mounted in the bifurcated bracket 47 attached to the plate 20, as by screws 48. The stem portions 34, 44, are adjustable axially in the holders 35, 45, and are secured in adjusted position by set screws 50, and the stems are provided with knurled head portions 51, 52.

The holders 35, 45 are formed with outwardly extending bifurcated portions 54, to which are pivotally connected arms 55, adjustably secured to the upper ends of rods 56, as by set screws 58. The lower ends of the rods 56 are fixedly secured to a transversely extending rod 60 affixed at its center to a plunger 61 of a solenoid mounted in a box 62 secured to the under side of the conveyor side members 10, 11.

When the coil 62, see Figure 6, of the solenoid is energized, the plunger 61 is drawn upwardly, as shown in Figure 1, 2 and 3. This effects pivotal movement of the holders 35, 45, to move the container fulcrum members 51, 52, inwardly over the conveyor for engagement by the contiguous corner portions of the advancing containers, see Figures 1 and 3. When the coil 62 is de-energized, the plunger 61 and rods 56 drop downwardly, moving the fulcrum members 51, 52, out of the path of the advancing containers.

In order that the fulcrum members may effect turning of the containers in pairs, the member 52 is spaced downstream from the member 51 a distance somewhat greater than the width of a container. Inasmuch as the members 51, 52, are positioned at opposite sides of the conveyor, the container C, comprising the first one of a pair, is caused to turn about the member 52 in a clockwise direction, while the container D, engaging the member 51, is turned in a counter-clockwise direction, see Figure 1.

In order to accommodate the diagonal dimension of the rectangular containers, during the turning movement, the intermediate portion 64 of the rail 30, confronting the fulcrum member 51, is curved or bowed outwardly from the conveyor and likewise, the portion 65 of the rail 31, confronting the member 52, is bowed outwardly from the conveyor.

The spacing of the fulcrum members 51, 52, lengthwise of the conveyor, results in the cross rod 20 extending diagonally of the conveyor, and the relay box 62 also extends in this manner and is provided at each end with a flange 66. These flanges are apertured to receive screws 67 which thread into bars 68 having their ends positioned on the lower flanges 69 of the side members 10, 11. Like edges of the bars 68 are angled as at 70 for guiding the lower run of the conveyor chain onto the upper surface of the bars over the box 62.

The conveyor chain 12 operates continuously, and as the first container of a pair, such as container C, approaches the fulcrum member 52, it engages a container detector which operates to energize the solenoid coil 62 effecting inward movement of the members 51, 52, as previously explained, for engagement by the pair of containers C, D.

This detector may consist of an arm 80 pivotally

mounted at one end on a shouldered stud 81 fixed to a plate 82 secured to a laterally extending portion 83 of plate 20, as by screws 84. The free end of the arm has affixed thereto a vane 85 extending inwardly over the plate 20 with its inner end 86 positioned in the path of the advancing containers. Intermediate the ends of the arm 80 there is an adjusting screw 88 engaging an actuating member 89 of a switch 90, see Figure 6, mounted in a box 91 also carried by the plate 82. The arrangement is such as each container engages the inner end 86 of the vane 85, the arm 80 is moved about the pivot 81 in a clockwise direction, Figure 1, to close the contacts of the switch 90.

Referring to Figure 6, the supply wires are indicated at 92, 93. A circuit from wire 93 passes through a manual shut-down switch 94, wire 95, relay coil 96, switch 90, wire 97, to the other side 92 of the line. The relay is of the step type, the plunger 100 being in the form of a pawl engaging the teeth on a ratchet wheel 101 to effect step by step rotation of a cam disk 102 provided with lobes for closing switch contacts 103, 104. The contact 103 is connected to the wire 95 through wire 106, and the contact 104 is connected to the solenoid coil 62 through wire 107, the opposite side of the coil being connected to the return 92 through wire 108.

The ratchet disk 101 is provided with twice the number of teeth than the lobes on the disk 102 whereby, on successive actuations of the relay, the contacts 103, 104, are successively closed and opened.

With this arrangement, when the first container of a pair engages the detector, the fulcrum members 51, 52, are moved inwardly to container engaging position, whereby both containers of the pair are turned simultaneously. When the second container of the pair engages the detector, the relay 96 is again energized, opening the contacts 103, 104, permitting the plunger 61 to drop and move both the fulcrum members 51, 52, upwardly and out of container engaging position, whereby the second container of the pair will not be turned further.

The containers are advanced with selected sides 110 of the containers facing one side of the conveyor as, for example, facing the guide rail 30. During the turning movement, the selected side 110 of the first container of each pair is moved to face rearwardly as indicated by container A, Figure 1. The selected side 110 of the second container of the pair is moved to face forwardly or in confronting relation to the side 110 of the first container of the pair as indicated by container B, Figure 1.

It will be observed that the apparatus functions automatically to simultaneously turn both containers of each pair about a vertical axis to bring the selected sides in confronting relation. The structure of the apparatus is such that it is readily mounted on the conventional conveyor, requiring no change in the conveyor structure, the mounting consisting only of providing six tapped holes in the top flanges 13, 14, for the screws 22.

What I claim is:

1. Apparatus for arranging containers rectangular in cross section advanced in a single file procession in pairs with selected side panels of the containers of each pair in confronting relation comprising a continuously operating conveyor for advancing a single file procession of containers with selected side panels of the containers facing one side of the conveyor, a pair of container fulcrum members mounted in juxtaposition to the conveyor and being spaced apart in a direction lengthwise thereof, means operable to move said pair of container fulcrum members transversely of the conveyor into position for engagement respectively by a pair of advancing containers, said fulcrum members being cooperable with said conveyor to effect turning of said engaged pair of containers about a vertical axis to bring said selected side panels into confronting relation.

2. Apparatus for arranging containers rectangular in cross section advanced in a single file procession in pairs

with selected side panels of the containers of each pair in confronting relation comprising a continuously moving conveyor operable to advance a single file procession of containers with selected side panels of the containers facing one side of the conveyor, a container fulcrum member mounted at each side of the conveyor, said members being spaced apart in a direction lengthwise of the conveyor and being movable transversely of the conveyor in position for engagement by containers being advanced by said conveyor, means operable to simultaneously move said pair of fulcrum members transversely of the conveyor into position for engagement respectively by a pair of containers advancing in said procession, said container fulcrum members being cooperable with the conveyor to effect turning of the containers in opposite directions about a vertical axis to bring said selected side panels in confronting relation.

3. Apparatus for arranging containers rectangular in cross section advanced in a single file procession in pairs with selected side panels of the containers of each pair in confronting relation comprising a continuously moving conveyor operable to advance a single file procession of containers with selected side panels of the containers facing one side of the conveyor, a guide rail extending along each side of the conveyor, each of said rails having a portion bowed outwardly from the conveyor, the outwardly bowed portion of one rail being spaced lengthwise of the conveyor from the bowed portion of said other rail, a container fulcrum member mounted in confronting relation to the bowed portion of each rail at the side of the conveyor opposite thereto, said container fulcrum members being movable inwardly over the conveyor for engagement by the adjacent corner portions of the advancing containers and forming a fulcrum about which the containers turn during their advancement, a container detector mounted intermediate said container fulcrum members, said detector being positioned in proximity to the down-stream one of said container fulcrum members and being spaced down-stream from said other container fulcrum member a distance greater than the width of a container, means actuated by engagement of the first container of each pair with said detector to simultaneously move both of said container fulcrum members inwardly over the conveyor and being operable upon engagement by the second container of each pair to move said members outwardly.

4. Apparatus for arranging containers rectangular in cross section advanced in a single file procession in pairs with selected side panels of the containers of each pair in confronting relation comprising a continuously moving conveyor operable to advance a single file procession of containers with selected side panels of the containers facing one side of the conveyor, a plate secured to each side of the conveyor, a container guide rail detachably secured to each of said plates, a container fulcrum member mounted on each plate for movement transversely of the conveyor into and out of container engaging position, said members being spaced apart in a direction lengthwise of the conveyor, the portion of each guide rail confronting said fulcrum members on the opposite side of the conveyor being bowed outwardly from the conveyor, a container detector mounted on the conveyor intermediate said fulcrum members, and means actuated by the engagement of the first container of each pair with said detector to simultaneously move both of said container fulcrum members inwardly over the conveyor and being operable upon engagement by the second container of each pair to move said members outwardly.

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