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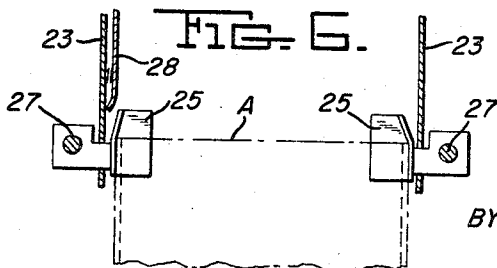
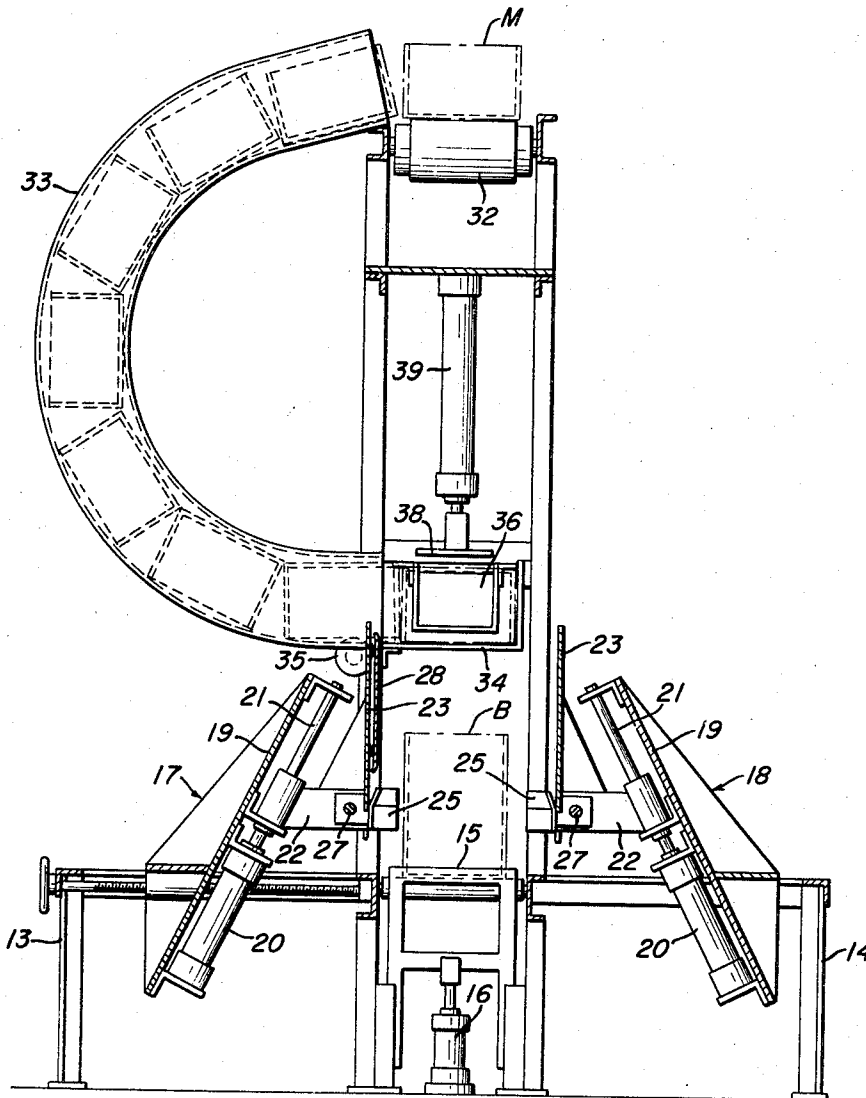
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APPARATUS FOR APPLYING COVERS TO CARTONS

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3 Sheets-Sheet 2

FIG. 2.



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3 Sheets-Sheet 3

FIG. 3.

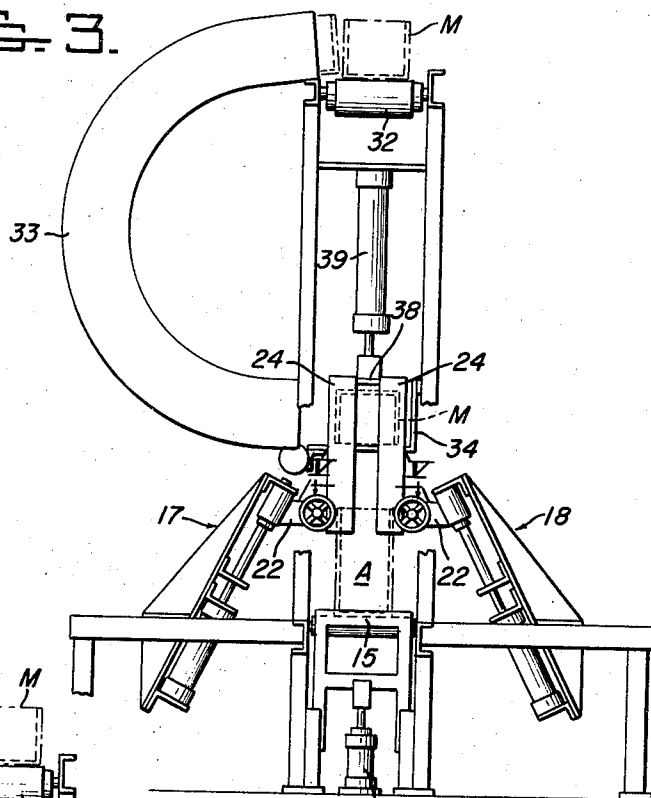
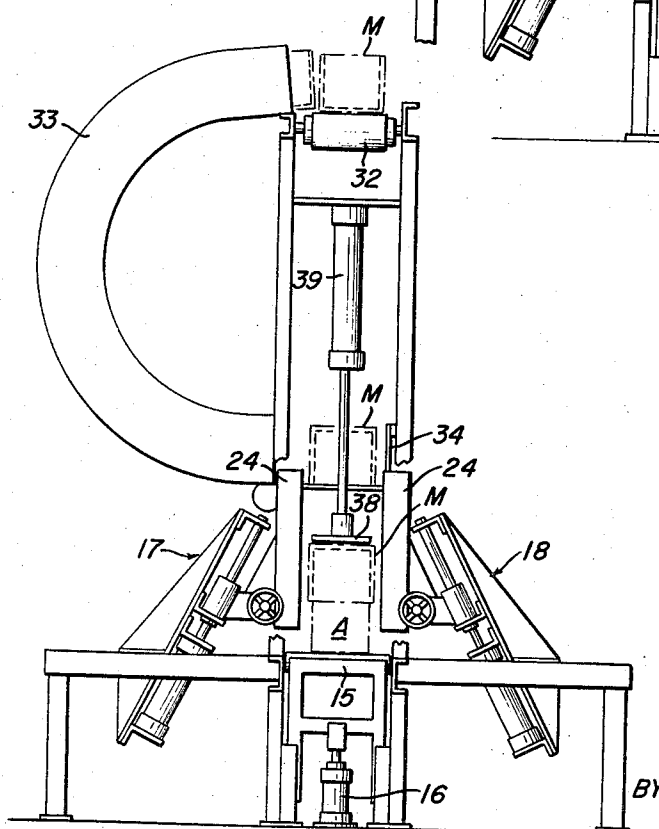


FIG. 4.



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1

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APPARATUS FOR APPLYING COVERS TO CARTONS

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7 Claims. (Cl. 53—306)

This invention relates to a machine for applying covers to containers.

An object of the invention is to provide an improved machine adapted to apply covers rapidly and automatically to successive containers traveling on a conveyor.

A further object is to provide an improved cover-applying machine which overcomes any need for manual handling either the covers or the containers to which they are applied.

A more specific object is to provide an improved cover-applying machine which automatically positions each container of a succession carried by a conveyor, automatically feeds a cover and forces it on the container, and automatically releases the covered container to resume its travel.

In accomplishing these and other objects of the invention, we have provided improved details of structure, a preferred form of which is shown in the accompanying drawings, in which:

Figure 1 is a somewhat diagrammatic side elevational view, with parts broken away, of a machine constructed in accordance with our invention;

Figure 2 is a vertical cross section on line II—II of Figure 1;

Figure 3 is an end elevational view showing the parts in another position;

Figure 4 is a view similar to Figure 3, but showing the parts in still another position;

Figure 5 is a horizontal section on a larger scale on line V—V of Figure 3; and

Figure 6 is a vertical section on line VI—VI of Figure 5.

Our cover-applying machine includes a roller conveyor 10 which carries a succession of containers A, B and C from right to left as viewed in Figure 1. The conveyor extends between a pair of frames 13 and 14 and over a vertically movable retractable stop 15 and a double-acting fluid pressure cylinder 16 for raising and lowering the stop. When a container on the conveyor reaches a position between the two frames, it engages the raised stop, which arrests its travel, although the conveyor rolls may continue to turn.

Side guide mechanisms 17 and 18 are mounted on the frames 13 and 14 respectively and are of similar construction, except that the guide mechanism 17 preferably is adjustable toward and away from the conveyor 10 to accommodate varying widths of containers, while the guide mechanism 18 can be fixed. Each guide mechanism includes a supporting plate 19 which slopes inwardly and upwardly, and a double-acting fluid pressure cylinder 20 and a pair of guide rods 21 fixed to the inner face of said plate. Said rods carry a crosshead 22 which is motivated by said cylinder. As best shown in Figures 5 and 6, each crosshead carries a vertical side plate 23, a vertical end flange 24 fixed to the front end of said plate, and upwardly tapered rear and front corner angles 25 and 26 adjacent the bottom of the plate. The rear angle 25 preferably is adjustably mounted on

2

a screw-threaded spindle 27 so that its spacing with respect to the front angle 26 can be varied to accommodate containers of different lengths, while the front angle can be fixed directly to the plate 23. Preferably the plate 23 of one or both guide mechanisms 17 and 18 carries a spring cushioned compression plate 28, illustrated as applied only to the guide mechanism 17. As best shown in Figure 3, when the cylinders 20 of the respective guide mechanisms are actuated to raise the crossheads 22 thereof, the plates 22 move obliquely upwardly until their angles 25 and 26 engage the upper rear and front corners of a container.

As best shown in Figure 1, a belt conveyor 32 is suitably supported above the roller conveyor 10 and carries a series of inverted covers M. Conveyor 32 discharges the covers to the upper end of a chute 33 which is of semi-circular configuration when the machine is viewed in end elevation (Figure 2), and terminates in an open-ended chamber 34. Covers from conveyor 32 slide down the chute 33 and stop in the chamber 34, being turned over to their upright position in the process. To assure that the covers move fully into the chamber, a power driven booster roll 35 preferably projects into the chute adjacent its juncture with the chamber and positively propels the covers. As shown in Figure 1, the chute and chamber are spaced ahead of the frames 13 and 14 and the bottom of the chamber is located above the maximum container height.

As best shown in Figure 1, a horizontally movable pusher 36, which includes a double-acting fluid pressure cylinder 37, is suitably supported above conveyor 10 in line with the chamber 34 toward the entry side thereof. When the side guide mechanisms 17 and 18 are raised as shown in Figure 3, the cylinder 37 can be actuated, whereupon the pusher shoves a cover M from the chamber 34 into the opening defined by the vertical guide plates 23 and the end flanges 24. The compression plate 28 positions the cover snugly in this opening. A vertically movable pusher 38, which includes a double-acting fluid pressure cylinder 39, is suitably supported on the upper portion of the frames 13 and 14 directly above the opening between the plates 23. After the pusher 36 has thus delivered a cover from the chamber 34 and retracted, cylinder 39 can be actuated, whereupon the pusher 38 shoves the cover downwardly over the upwardly tapered corner angles 25 and 26, which guide the cover smoothly into a position where it receives the upper portion of the container. Simultaneously the guide mechanisms 17 and 18 are lowered, withdrawing the corner angles 25 and 26 obliquely downwardly from the bottom of the cover and moving them clear of the container. Continued actuation of the cylinder 39 pushes the cover fully onto the container, as shown in Figure 4. Finally the cylinder 39 is actuated in the opposite direction to retract the pusher 38, and the cylinder 16 to retract the stop 15 and release the covered container, which resumes its travel on the conveyor 10.

It is seen that our machine is readily adapted for fully automatic operation. It is only necessary to install solenoid operated reversing valves for controlling admission of fluid to the various cylinders and a suitable control circuit, including limit switches, for operating the valves in the proper sequence. Since manual control of the cylinders is entirely feasible and control circuits of this type operate in accordance with well-known principles, we do not deem it necessary to show details of such a circuit. In either event the machine applies covers to containers rapidly and without manual handling of either the covers or the containers.

While we have shown and described only a single embodiment of the invention, it is apparent that modifi-

cations may arise. Therefore we do not wish to be limited to the disclosure set forth but only by the scope of the appended claims.

We claim:

1. A machine for applying covers to containers comprising a conveyor adapted to carry a succession of containers, stop means for arresting travel of a container on said conveyor, guide means adapted to engage the upper portion of a container whose travel has been arrested by said stop means, means for delivering a cover to said guide means above a container engaged thereby, and means for forcing the cover down on the container while disengaging said guide means, said stop means being retractible to allow the covered container to resume its travel on said conveyor.

2. A machine for applying covers to containers comprising a first conveyor adapted to carry a succession of containers, stop means for arresting travel of a container on said first conveyor, a pair of guide mechanisms on opposite sides of said first conveyor adapted to engage the upper portion of a container whose travel has been arrested by said stop means, a second conveyor above said first conveyor adapted to carry a succession of covers, means for delivering a cover from said second conveyor to said guide mechanisms above a container engaged thereby, and means for forcing the cover from said guide mechanisms down on the container while simultaneously disengaging said guide mechanisms, said stop means being retractible to allow the covered container to resume its travel on said first conveyor.

3. A machine as defined in claim 2 in which each of said guide mechanisms includes a supporting frame, a crosshead supported on said frame for movement obliquely upwardly downwardly, motive means for said crosshead carried by said frame, a vertical side plate carried by said crosshead, a vertical end flange carried by the front edge of said plate, and front and rear upwardly tapered corner angles carried by said plate adjacent the lower end thereof.

4. A machine as defined in claim 2 in which each of said guide mechanisms includes a supporting frame, a crosshead supported on said frame for movement oblique-

ly upwardly and downwardly, a double-acting fluid pressure cylinder carried by said frame for motivating said crosshead, a vertical side plate carried by said crosshead, a vertical end flange carried by said plate, said plate and flange being cooperable with those on the opposite guide mechanism to define an opening for receiving and positioning a cover, and rear and front upwardly tapered corner angles carried by said plate adjacent the lower end and being cooperable with those on the opposite guide mechanism to engage the upper corners of a container and guide the cover from said opening over the top of the container.

5. A machine as defined in claim 4 in which one of said guide mechanisms is adjustable toward and away from said first conveyor to accommodate containers of varying width, and each of said rear angles is adjustable toward and away from the respective front angle to accommodate containers of varying length.

6. A machine as defined in claim 2 in which said cover delivering means includes a chute adapted to receive covers from said second conveyor, an open-ended chamber at the discharge end of said chute and spaced above said first conveyor ahead of said plates, and a pusher for pushing a cover from said chamber into said opening.

7. A machine as defined in claim 2 in which said cover delivering means includes a chute of semi-circular configuration adapted to receive covers in inverted position at its upper end, an open-ended chamber at the discharge end of said chute and spaced above said first conveyor ahead of said plates, said chute being adapted to transmit covers to said chamber and turn them over into upright position, means for positively propelling the covers fully into said chamber, and a pusher for pushing a cover from said chamber into said opening.

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