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DEVICE FOR ADJUSTING THE LEVEL OF A CONTAINER'S CONTENTS TO A PREDETERMINED HEIGHT AND FOR CREASING THE CONTAINER'S SIDES ALONG THE EVENTUAL FOLDING LINES

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DEVICE FOR ADJUSTING THE LEVEL OF A CONTAINER'S CONTENTS TO A PREDETERMINED HEIGHT AND FOR CREATING THE CONTAINER'S SIDES ALONG THE EVENTUAL FOLDING LINES

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ABSTRACT OF THE DISCLOSURE

Creasing arms and gauge arms are mounted on rotating arms, the gauge arms entering the open container and contacting the raised container's surface of the contents and the creasing arm pivoting against the outside surface of the container's sides to crease the latter.

BACKGROUND OF THE INVENTION

The invention relates to a device, for use with packing machines, for adjusting the level of the contents of filled, open containers to a predetermined height and for creasing the container walls along the eventual folding lines for closing the container.

With packing machines that make containers out of cardboard blanks, fill the containers with a powdery or granular substance, and then close them, it has been common to impress in the cardboard blank the fold lines required to facilitate folding the upper opening shut. If the volume, and therefore also the height, of the contents varies, the fold-line embosser must be readjusted by hand.

The level of the container's contents is adjusted to a predetermined height at a separate station of the packing machine, while the filled container is stationary.

SUMMARY OF THE INVENTION

The device of the invention enables the contents' level to be adjusted to a predetermined height and the folding lines to be creased virtually simultaneously as the container moves at a constant speed, whereby at the same time the advantage is obtained that the fold lines are creased automatically at the same distance from the contents' level. By eliminating a station at which the container must be held stationary, the output of the packing machine is increased.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be described with reference to the figures of the accompanying drawings, wherein:

FIGS. 1a and 1b respectively show the open and half-closed containers processed by the device of the invention;

FIG. 2 is a schematic view of the device of the invention;

FIG. 3 is a partial view of the device in another work position; and

FIG. 4 is a detail view of the arrangement for operating the creasing arms.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the figures, the arrangement of the invention illustrated in FIG. 2 is intended for containers of the kind shown in FIG. 1a. The open container 1 is filled to the level F, upon which the container must be closed by folding together the side walls. FIG. 15 shows an intermediate stage in the conventional folding arrangement, wherein the two side walls have been folded together. The lip L thus produced is subsequently twice folded upon itself. The end walls are creased along a series of fold lines, shown simply as a single line P, to enable a satisfactory folding of the triangular portion D. The device shown in FIG. 2 incorporates a known conveyor 2, illustrated only schematically, which moves a holder having rigid side walls 3 and a vertically movable bottom 4 at constant speed in the direction of the arrow. An open container 1, filled to the level F, is held in the holder. Located underneath the conveyor 2 is a pusher 5 with a platform 5a operating in synchronism with the passage of the holders, whereby the pusher strokes up and down shifting the holder bottoms 4, provided with rollers 6, upwards.

A shaft 7 rotating at constant speed is located above the conveyor and mounts a three-armed support having the arms 8. The end of the arms each carry a pin 9 which epivnotically mounts a drum lever 10. Each drum lever incorporates a stop 10a. Compression springs 11 bias the levers to the position shown in FIG. 2, wherein the stops 10a bear against the arms 8.

A pin 12, pivotally mounting a plate 13, is fixed to each drum lever. A lever 13a is rigidly connected to each plate. The free end of each lever 13a carries a roller 13b, which runs in a stationary, closed pathway 20 acting as a cam, of which FIGS. 2 and 3 show only a part.

Two inner gauge arms 14 and two outer creasing arms 15 are pivotally mounted on each plate 13. For the sake of simplicity, only a single creasing line is shown for each pair of arms 14 and 15; but it is to be understood that these arms contain all of the creasing lines necessary to effect the desired folding of the container. The pivotal movement of the arms is controlled by cams not shown in FIGS. 2 and 3.

The operation of the outer creasing arms is shown in FIG. 4. The arms 15 pivot on pins 17 and are each provided with a lever 16. A cam 18 is rigidly mounted on the pin 12 of the drum lever 10, and a tension spring 19 presses the levers 16 against the cam. When the drum lever is pivotally relative to the plate 13, the cam 18 acts on the levers 16, causing the arms 15 to spread apart. A similar control cam is provided for the gauge arms 14. The manner of operation of these arms will be presently explained.

The device of the invention further incorporates a cam surface 21 which cooperates with a roller 22 on the drum lever 10.

The invention works in the following manner. The movement of the conveyor 2 and the rotation of the shaft 7 are so synchronized that a pair of gauge arms 14 enters the opening of each container 1 as the latter passes under the device. FIG. 2 shows a pair of inner arms as it begins to descend into a container opening. During this step, the gauge arms 14 are pivotally mounted and the outer arms 15 are spread apart, so as to provide room for the sides of the opening.

As soon as the gauge arms 14 are located within the container opening, these arms are spread apart so that their lower faces form a common plane, as seen in FIG. 3. At this point, the pusher 5 is raised, so that the platform 5a pushes on the roller 6 and thereby lifts the bottom 4 and the container 1 until the lower faces of the gauge arms 14 contact the surface of the container's contents. If the pusher 5 is further raised, the spring 5b is merely compressed. The bottom 4 is held by known means (not shown) in its upper position at least until the closing operation is finished.
In this way, the contents of the container 1 are acted upon by the arms 14 so as always to have the same level. The creasing arms 15 are then pivoted towards the inner arms by the cams 18, so that the creasing dies 15c of the arms 15 enter the corresponding recesses 14a of the arms 14 thereby producing the one or more crease lines P on each end side of the container. The outer and inner arms are then pivoted back to their starting positions and removed from the container opening as the conveyor continues to advance. The closed pathway 20 and the cam surface 21 ensure that the center axis 23 of the plate 13 is exactly perpendicular when the container is raised and creased, and that the plate 13, therefore, moves exactly parallel to the direction in which the container is moved by the conveyor. The cam 21 temporarily raises the stops 10a off the arms 10 during this time. The path of movement of the pins 12 is illustrated in FIG. 2 by the dot-dash line 24.

The container, the contents of which are adjusted to the correct level and the sides of which are creased, is advanced to a succeeding station where it is closed in a known manner.

Although the preferred embodiment of the invention has been described, the scope of, and the breadth of protection afforded to, the invention are limited solely by the appended claims.

1. For use with a packing machine, a device for adjusting the level of the contents of filled, open containers to a predetermined height and for creasing the container walls along the eventual folding lines for closing the containers, including a conveyor for the containers, means for securing holding and raising each container with respect to the conveyor and moving therewith, a support having at least two arms (8) and rotated at a constant speed in synchronism with the conveyor's movement, a drag level pivotally mounted on each said arm, a plurality of gauge arms mounted on each said plate for adjusting the height of the container's contents to a predetermined level, a face incorporated on each said gauge arm for contacting the surface of the contents, cam means (20, 21) for controlling the pivotal movement of each said drag lever and plate to cause the gauge arms of each said plate to enter the opening of a respective container, and a vertically movable pusher means for raising said container holding means, whereby the surface of the container's contents is brought into contact with said faces of the gauge arms.

2. The device as defined in claim 1, including a plurality of creasing arms mounted on each said plate for location outside of the container when said gauge arms are inside thereof, and said gauge arms serve as the anvil for said creasing arms.

3. The device as defined in claim 2, wherein said gauge and creasing arms are pivotally mounted on said plates, and further including means for operating said gauge and creasing arms.

4. The device as defined in claim 1, wherein said cam means comprise a closed pathway for controlling the pivoting of said plates and a cam surface for controlling the pivoting of said drag levers.

5. The device as defined in claim 4, wherein said cam means comprise a closed pathway for controlling the pivot of said plates and a cam surface for controlling the pivoting of said drag levers.

6. The device as defined in claim 5, wherein each said plate carries two cooperating pairs of gauge and creasing arms.

7. The device as defined in claim 6, wherein each said gauge and creasing arm includes a lever, resilient means to cause a pair of said gauge arms and a pair of said creasing arms to pivot on each said plate, and a said cam for each said pair of gauge arms and creasing arms located between the arms thereof to cause said arms to pivot against the force of said resilient means when the respective drag lever pivots.

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