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L. HERMANI

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APPARATUS FOR OPENING METAL CONTAINERS

Filed April 17, 1940

2 Sheets-Sheet 2

Fig. 3.

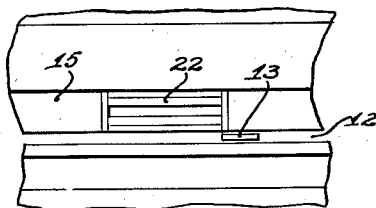
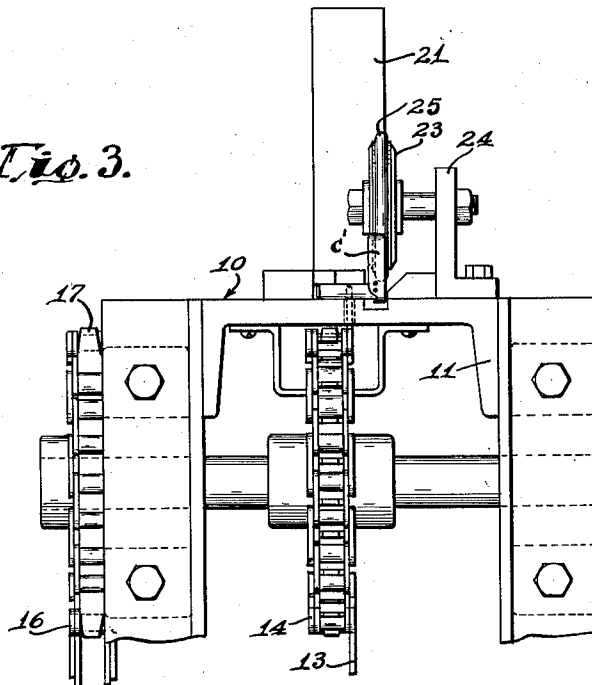


Fig. 6.

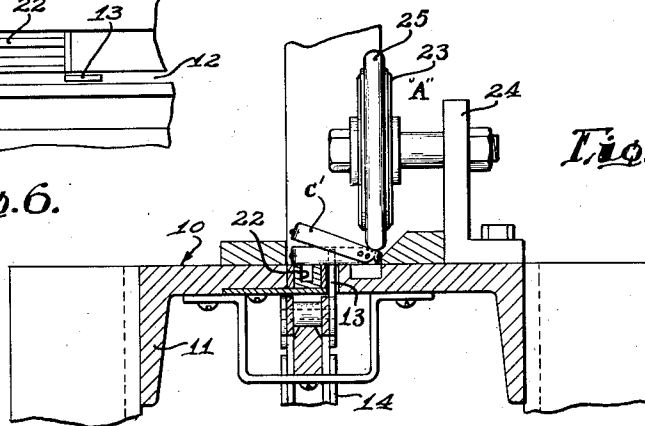


Fig. 4.

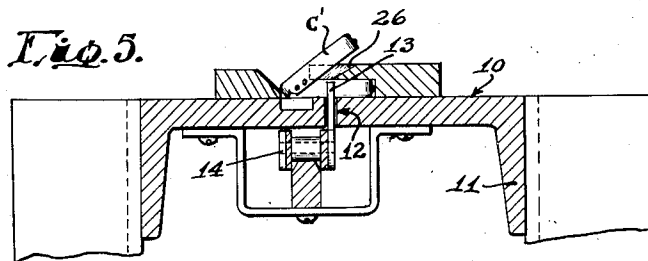


Fig. 5.

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APPARATUS FOR OPENING METAL CONTAINERS

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6 Claims. (Cl. 226—129)

The present invention relates to apparatus for opening metal containers and more particularly is concerned with the provision of apparatus for opening sheet metal containers of the type disclosed in Nyden Patent #2,197,481, issued April 16, 1940, which containers include a cover so hinged to the body of the container that the former will open in response to the application of pressure at any point along a preselected area in proximity to the hinge. Reference may be had to this patent for detail information regarding the construction and operation of the closure.

An object of my invention is the provision of novel positive means for elevating or opening the closures of metal containers, such for example as aspirin boxes, in advance of arrival of the containers at a filling station.

A further object of the invention is the provision of apparatus of the above character which will function automatically at high speed and in operation involve the human element only to the extent of supplying containers to a stack from which they are automatically fed to the closure elevating apparatus.

Other objects will be in part apparent and in part pointed out hereinafter.

In the drawings:

Fig. 1 is a plan view of the container opening apparatus.

Fig. 2 is a side elevational view thereof.

Fig. 3 is an end elevational view.

Fig. 4 is a transverse sectional elevational view taken substantially along the line 4—4 of Fig. 1.

Fig. 5 is a sectional view taken substantially along the line 5—5 of Fig. 1.

Fig. 6 is a fragmentary plan view illustrating the positioning of a permanent magnet which forms a part of the closure opening device.

Briefly, the apparatus comprises means for conveying closed containers in a normal position along a horizontal guideway or channel. At a predetermined point the containers move into position over a permanent magnet which is of sufficient strength to hold the container against tilting movement while the closure is partially opened solely by the application of top pressure at a point in proximity to one longitudinal margin thereof. During this initial opening of the closure, the container is moving continuously. Prior to movement of the container beyond the influence of the permanent magnet and the device which has initially opened the closure, a cam enters the space between the container proper and the partially opened closure and functions

to complete the closure opening operation. The completely opened containers are then conveyed to a filling station in the conventional manner.

The apparatus as illustrated, includes a horizontal frame 10 which may well take the form of an inverted length of channel iron 11. A longitudinal slot 12 is provided in this channel iron, through which the fingers 13 of a conveyor chain 14 project for the purpose of conveying the metal containers C in succession along a channel 15, or guideway, which is provided on the upper side of the frame 10. Continuous movement is imparted to the conveyor chain 14 by means of a sprocket chain 16 which is trained over a pair of sprockets 17. One of these sprockets is driven by an electric motor 18 through a speed reduction gearing 19. The conveyor chain 14 (Fig. 2) is trained over a pair of sprockets 20 which are mounted at opposite ends of the frame 10.

The containers which are to be opened are arranged in a stack in a vertical holder 21 at one end of the channel 15. The fingers 13 remove the containers from the bottom of the stack one at a time and move them in a normal position lengthwise of the channel 15. At an opening station A the containers are brought into engagement with a permanent magnet 22 (Figs. 2, 4, and 6). This magnet is set into a recess in the bottom of the channel 15 and at the side thereof opposite that along which the hinged margin of the closure will travel (Fig. 4). This magnet is of sufficient length and strength to securely hold the body of the container against upward movement or tilting while top pressure for opening the closure is being applied to the hinged margin of the container.

The means for applying top pressure to the closure C' may well consist of a freely rotating wheel 23 which is mounted upon a bracket 24. This wheel 23 projects downwardly into the channel 15 in proximity to one side wall thereof and in such position with respect to the permanent magnet that it will engage the cover C' at a point between the hinge and the adjacent margin of the container. Preferably the wheel includes a soft rubber ring 25, or band, about its periphery for engagement with the containers. Thus, marring of the decorated surface of the containers is avoided. Such application of pressure by the wheel 23 partially opens or elevates the closure C' about its hinge and while so opened and prior to movement entirely beyond the influence of the magnet 22 and wheel, the container moves to a position in which a cam 26

enters the space between the container body and closure. Continued advancing movement of the container relative to the cam 26 results in complete opening of the closure so that when the container arrives at the filling station (not shown) it may be filled mechanically in the usual manner. Thereafter the closure is again lowered to seal the package.

Modifications may be resorted to within the spirit and scope of the appended claims.

I claim:

1. Apparatus for opening containers each of which includes a body and a closure hinged together at a point adjacent to but spaced inwardly from one edge thereof, said apparatus comprising an upwardly facing horizontal channel, means for conveying the containers in a normal position and in succession along said channel, a magnet in the channel for positively holding the containers against tilting movement at a preselected station, a device at said station for applying top pressure to the closures at one side of the hinge to thereby swing said closure upwardly about the hinge and means in proximity to said station for engaging the closure and completing opening thereof.

2. Apparatus for opening containers each of which includes a body and a closure hinged together at a point adjacent to but spaced inwardly from one edge thereof, said apparatus comprising an upwardly facing horizontal channel, means for conveying the containers in a normal position and in succession along said channel, means for positively holding the containers against tilting movement at a preselected station, a freely rotatable wheel mounted upon a horizontal axis at said station for applying top pressure to the closures at one side of the hinge to thereby swing said closure upwardly about the hinge and means in proximity to said station for engaging the closure and completing opening thereof.

3. Apparatus for opening containers each of which includes a body and a closure hinged together at a point adjacent to but spaced inwardly from one edge thereof, said apparatus comprising an upwardly facing horizontal channel, means for conveying the containers in a normal position and in succession along said channel, a magnet in the channel for positively holding the containers against tilting movement at a preselected station, a freely rotatable wheel mounted upon a horizontal axis at said station

for applying top pressure to the closures at one side of the hinge to thereby swing said closure upwardly about the hinge and means in proximity to said station for engaging the closure and completing opening thereof.

4. Apparatus for opening containers each of which includes a body and a closure hinged together at a point adjacent to but spaced inwardly from one edge thereof, said apparatus comprising an upwardly facing horizontal channel, means for conveying the containers in a normal position and in succession along said channel, a magnet in the channel for positively holding the containers against tilting movement at a preselected station, a device at said station for applying top pressure to the closures at one side of the hinge to thereby swing said closure upwardly about the hinge and an elongated blade-like cam at least in part overlying said channel in proximity to said station for engaging the closure and completing opening thereof.

5. Apparatus for opening containers each of which includes a body and a closure hinged together at a point adjacent to but spaced inwardly from one edge thereof, said apparatus comprising an upwardly facing horizontal channel, means for conveying the containers in a normal position and in succession along said channel, a permanent magnet for positively holding the containers against tilting movement at a preselected station, yielding means at said station for applying top pressure to the closure at one side of the hinge to thereby swing said closure upwardly about the hinge and means in proximity to said station for engaging the closure and completing opening thereof.

6. Apparatus for opening containers each of which includes a body and a closure hinged together at a point adjacent to but spaced inwardly from one edge thereof, said apparatus comprising an upwardly facing horizontal channel, means for conveying the containers in a normal position and in succession along said channel, a permanent magnet for positively holding the containers against tilting movement at a preselected station, yielding means at said station for applying top pressure to the closure at one side of the hinge to thereby swing said closure upwardly about the hinge and a cam device at least in part overlying said channel in proximity to said station for engaging the closure and completing opening thereof.

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