

Oct. 28, 1952

C. E. CLOUD

2,615,201

PACKAGING APPARATUS WITH COLLAPSIBLE SEAL

Filed Aug. 3, 1951

Fig-1

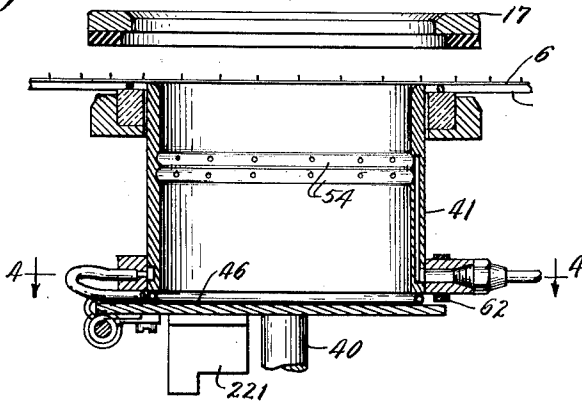


Fig-2

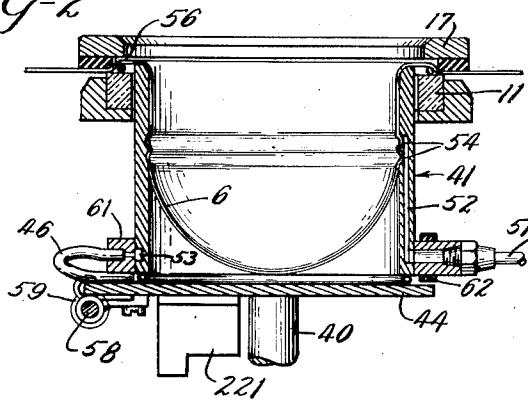


Fig-3

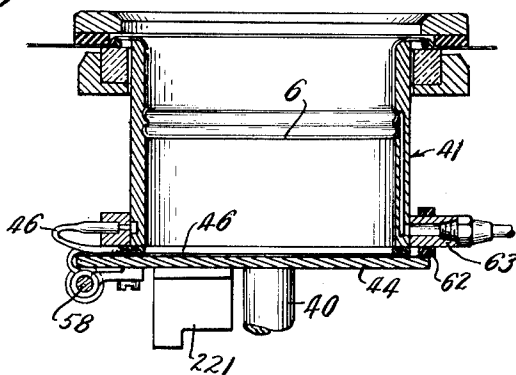


Fig-4

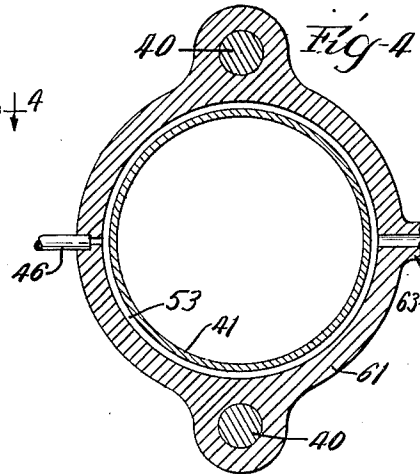
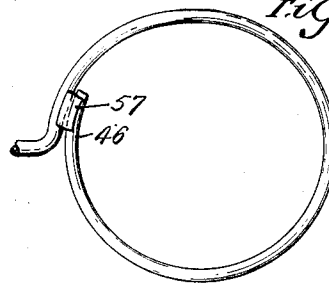


Fig-5



INVENTOR.
Charles E. Cloud
BY
Louis Robertson
Att'y.

UNITED STATES PATENT OFFICE

2,615,201

PACKAGING APPARATUS WITH
COLLAPSIBLE SEALCharles E. Cloud, Wilmette, Ill., assignor to
William S. Cloud, Wilmette, Ill.

Application August 3, 1951, Serial No. 240,249

5 Claims. (Cl. 18—19)

1

In practicing one form of the invention disclosed in my prior application, Serial No. 75,322, the packaging film is stretched down into a shell substantially closed at its bottom by a hinged bottom member which opens automatically at a proper stage in the packaging operation. It is sometimes desirable to release the bottom portion of the stretched film while holding the film peripherally around this bottom portion so as to allow the bottom portion to snap back to a horizontal or flat position. According to my previous application, this was done by the vent in the bottom member which would release the vacuum between it and the film after the vacuum ports or grooves around the side of the shell had been sealed off by the film. Although the apparatus worked successfully in this manner, there was some loss of efficiency. Either the venting aperture had to be small enough to function rather slowly in releasing the vacuum or it would retard the original building up of the vacuum or at the very least represent a wasteful leakage.

According to the present invention, the desired end is accomplished more efficiently and again without any extra valves or other control portions to be driven by the machine. This is accomplished by sealing the hinged bottom member to the shell by means of a small collapsible rubber tube which is connected to the vacuum passages of the shell. As long as the vacuum passages are connected to the space within the shell, the air within that space will sufficiently relieve the vacuum within the passages so that the sealing tube will remain in its round condition and effectively perform its sealing function. However, as soon as the film seals off the vacuum passages from the space within the shell, the vacuum within these passages and within the sealing tube builds up so that the sealing tube is quickly collapsed. The collapse of the tube allows air to flow copiously into the bottom portion of the stretched film to snap back quickly to a flat position.

Additional objects and advantages of the invention will be apparent from the following description and from the drawings.

Designation of figures

Figures 1, 2 and 3 are diagrammatic representations of three successive positions of the parts in successive stages of the packaging operation.

Figure 4 is a fragmentary sectional view taken on the line 4—4 of Fig. 1.

Figure 5 is a view looking down on the sealing tube.

Although the law requires a full and exact description of at least one form of the invention, such as that which follows, it is, of course, the

2

purpose of a patent to cover each new inventive concept therein no matter how it may later be disguised by variations in form or additions of further improvements; and the appended claims are intended to accomplish this purpose by particularly pointing out the parts, improvements, or combinations in which the inventive concepts are found.

General description

Although the apparatus in general, with which the present invention will be used, is fully described in my application, Serial No. 75,322, the disclosure of which is hereby incorporated herein by reference, an understanding of the present invention will be facilitated by a brief description of the major features to the extent pertinent to the present invention.

A film 6 is drawn across a stationary ring 11 and clamped to this ring by a clamp ring 17. Links 40 raise a shell or tube 41 to the upper position shown in the present drawings, in which position it is directly or indirectly sealed to the film 6. The shell 41 is sealed at its bottom by a hinged bottom member 44 and a seal member 46. A pipe 51 is connected by a valve, not shown, to a vacuum pump or tank, so that air is drawn from the inside of shell 41 through vertical passages 52 and annular passage 53, which may be formed in shell 41. The vertical passages 52 communicate with the interior of the shell through ports in grooves 54.

By this vacuum the film 6 is drawn down into shell 41 until it closes off grooves 54, as shown in Fig. 2. The present invention concerns the subsequent release of vacuum in shell 41 so that the bottom of the film 6 may snap back to the position shown in Fig. 3. Whether or not this release feature is provided, the shell 41, while still holding the film 6 in grooves 54 by vacuum, is drawn downwardly by links 40, thereby stretching the portion of the film 6 between grooves 54 and ring 11. The article or fills are dropped into the pocket thus formed. The pocket is closed off above the article and current is passed through a wire 56 to heat it and sever the wrapped article from the surrounding portions of film 6.

Collapsible seal

According to the present invention, the seal 46 is formed by a tube of rubber or rubber-like material, arranged substantially in a circle as shown in Fig. 5. The natural resiliency of the rubber causes it to assume a shape round in cross section, so that it presses itself into sealing engagement with shell 41 as well as with the bottom closure member 44. In practice, the seal 46 is cemented (as with rubber cement) to the closure 44 or to the shell 41 and hence merely presses itself against the other of these two

3

members. In the area 57, where the tube overlaps itself, it may be built both upwardly and downwardly by rubber cement to form a flat zone so that air will not pass between the tube portions. It is somewhat preferred to cement the tube to the shell 41, inasmuch as that avoids flexing of the tube as the closure 44 drops. Furthermore, it would permit the use of a two-part closure opening at the middle, if that should be preferred.

A hinge pin 58 is so loaded that the bottom member will be closed by its spring 59 to a position where the sealed tube 46 will press all around against the shell 41 or the ring or plate 61 by which it is supported and which serves essentially as part of the shell 41.

The tube 46 communicates at one end with the annular passage 53, and has its other end plugged or cemented closed. When vacuum is applied to this passage 53 through tube 51, some air is immediately withdrawn from the tube 46. However, tube 46 is made of stock which does not collapse too readily due to lowering of air pressure therein and hence this vacuum initially has no effect. However, when the film 6 seals the grooves 54, there is no longer any reduction in the degree of vacuum due to the flow of air from inside of shell 41 to the passage 53. Accordingly, the full vacuum available from tube 51 is applied to the rubber tube 46. This immediately collapses the rubber tube so that it assumes the flattened position indicated in Fig. 3. Hence, air may pass freely between the tube 46 and the bottom of shell 41 more or less all around the shell 41. Indeed, if a stop 62 is provided to limit the upward movement of the bottom member 44, as illustrated in Fig. 3, entrance of air all around the bottom of shell 41 may be expected. The stop 62 may conveniently comprise a rubber ring slipped over the fitting 63.

Although the opening provided by the collapse of tube 46 is narrow in height, it is of such great circumferential extent that the vacuum within-shell 41 beneath film 6 is almost instantly completely broken and the film 6 may immediately snap to the position shown in Fig. 3.

The purpose of providing hinge 58 is so that the bottom 44 may be opened to permit the wrapped article to drop from the shell 41. As described in my prior application, this may be accomplished by a hook 221, which is automatically restrained during the initial upward movement of the shell 41, thereby opening the bottom closure 44. As the shell 41 approaches its upper portion, hook 221 is drawn away from its restraining member so that spring 59 swings the closure member 44 upwardly to close the bottom of shell 41. If the wrapped article is removed in some other way, as by inverting shell 41, closure 44 could be fixed, or hose 46 could be replaced by some other valve normally closing some other type of suction relief opening but collapsed or opened by vacuum when a degree of vacuum is reached in excess of that required to draw the film to the position shown in Fig. 2. However, the collapsible tube is preferred to other types of valves because of its simplicity and quick-opening characteristics.

Extensive testing indicates that ordinary smooth walled amber rubber tubing of $\frac{1}{8}$ inch internal diameter and $\frac{1}{4}$ inch outside diameter operates satisfactorily and gives good service. Black tubing is also deemed suitable. These may be bought as pure gum amber or black machine-made tubing.

4

It will be observed that the inside of tube 46 forms a vacuum chamber for controlling the valve action of the tube, which is in fact a valve. This vacuum chamber is connected through the ports in grooves 54 to the inside of shell 41 with relatively free flow until these ports are closed by the film, while the tube 51 connecting both the ports and the tube 46 to the source of suction constitutes enough of a constriction so that the vacuum in tube 26 does not reach the effective valve until the film closes grooves 54.

I claim:

1. Pocketing apparatus for film, including means for holding the film in outstretched condition, a shell adapted to be placed in sealed relation to one face of the film, suction aperture means opening within the shell above the bottom thereof, a closure member for the bottom, a resilient tube for sealing the closure member to the shell, means for connecting the tube to the suction aperture means, and suction means communicating with the suction aperture means for drawing a pocket into the film and for collapsing the tube after the film seals the suction aperture means, to relieve the suction on the lower part of the film and cause it to snap back to flat condition, said tube being stiff enough to resist collapsing until said aperture means is sealed to subject the tube to more suction than was required to stretch the film to seal the aperture means.

2. Pocketing apparatus for film, including means for holding the film in outstretched condition, a shell adapted to be placed in sealed relation to one face of the film, suction aperture means opening within the shell above the bottom thereof, a closure member for the bottom, a resilient tube for sealing the closure member to the shell, means for connecting the tube to the suction aperture means, and suction means communicating with the suction aperture means for drawing a pocket into the film and for collapsing the tube after the film seals the suction aperture means, to relieve the suction on the lower part of the film and cause it to snap back to flat condition.

3. Pocketing apparatus for film, including means for holding the film in outstretched condition, a shell having an open mouth adapted to be placed in sealed relation to one face of the film and having a suction relief opening spaced from said mouth, suction aperture means within the shell between the mouth and the opening, a resilient tube for sealing the opening, means for connecting the tube to the suction aperture means, and suction means communicating with the suction aperture means for drawing a pocket into the film and for collapsing the tube after the film seals the suction aperture means, whereby the lower part of the film is permitted to snap back to flat condition, said tube being stiff enough to resist collapsing until said aperture means is sealed.

4. Pocketing apparatus for film, including means for holding the film in outstretched condition, a shell having an open mouth adapted to be placed in sealed relation to one face of the film and having a suction relief opening spaced from said mouth, suction aperture means within the shell between the mouth and the opening, a resilient hollow member for sealing the opening, means for connecting the hollow member to the suction aperture means, and suction means communicating with the suction aperture means for drawing a pocket into the

5

film and for collapsing the hollow member after the film seals the suction aperture means, whereby the lower part of the film is permitted to snap back to flat condition, said tube being stiff enough to resist collapsing until said aperture means is sealed.

5. Pocketing apparatus for film, including means for holding the film in outstretched condition, a shell having an open mouth adapted to be placed in sealed relation to one face of the film and having a suction relief opening spaced from said mouth, suction aperture means within the shell between the mouth and the opening, a valve for sealing the opening and having a

6

vacuum chamber for opening the valve, means for connecting the vacuum chamber to the suction aperture means, and suction means communicating with the suction aperture means for drawing a pocket into the film and for opening the valve after the film seals the suction aperture means, whereby the lower part of the film is permitted to snap back to flat condition, said valve being sufficiently biased toward its closed position to resist collapsing until said aperture means is sealed.

CHARLES E. CLOUD.

No references cited.