

May 13, 1941.

S. H. BERCH

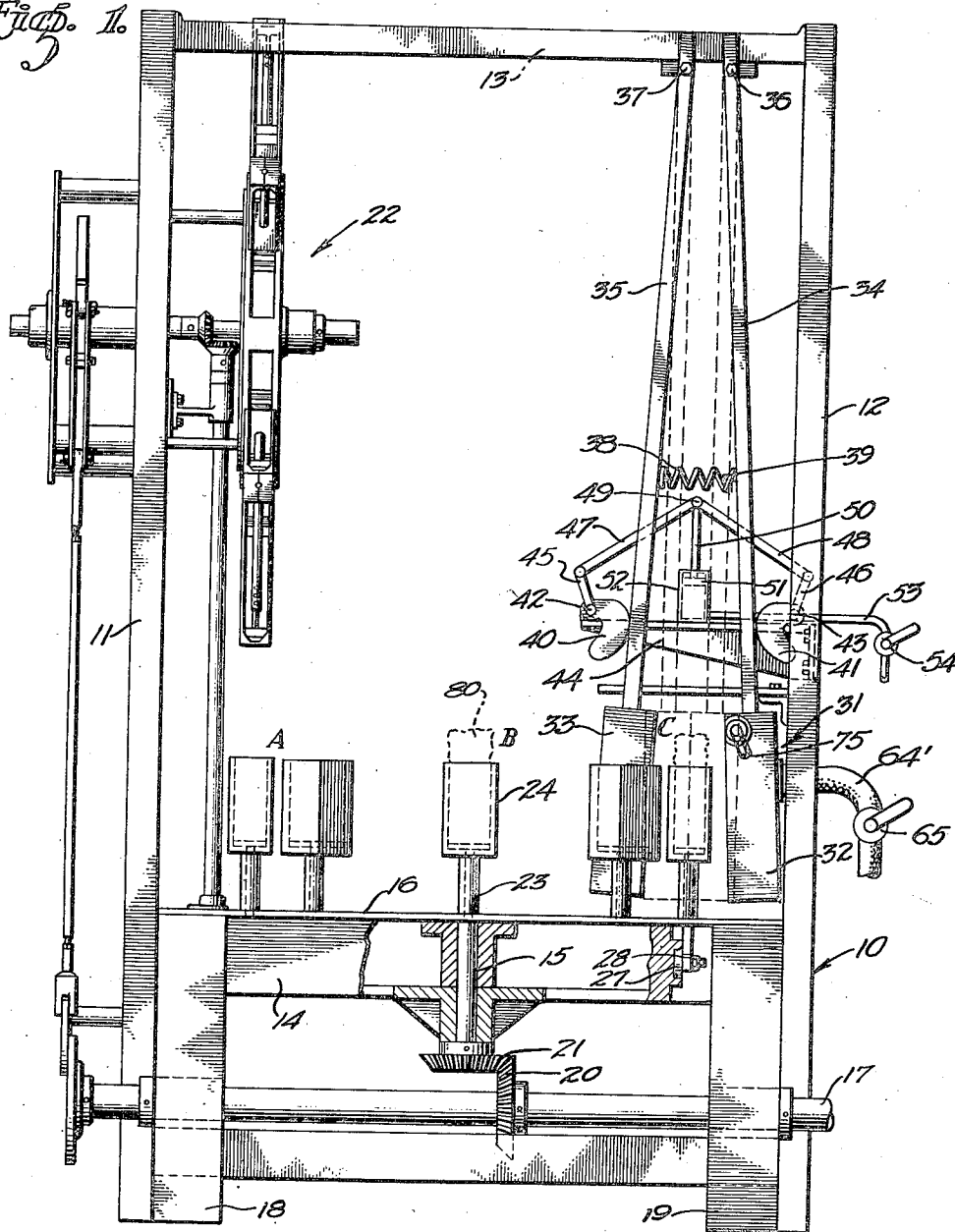
2,241,943

METHOD OF PACKING FOOD PRODUCTS AND THE LIKE

Filed May 25, 1938

3 Sheets-Sheet 1

Fig. 1.



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3 Sheets-Sheet 2

Fig. 2

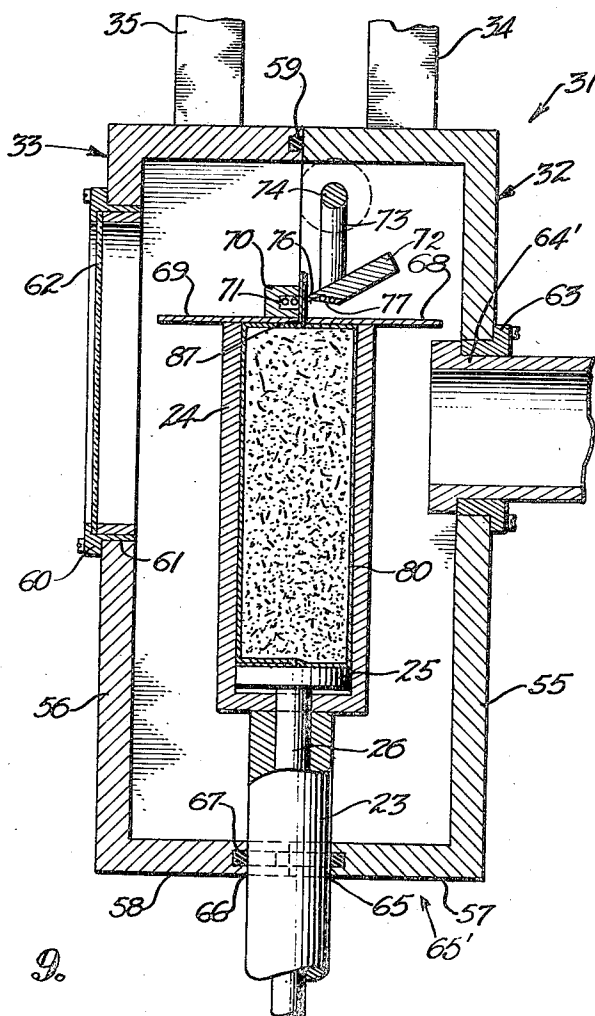
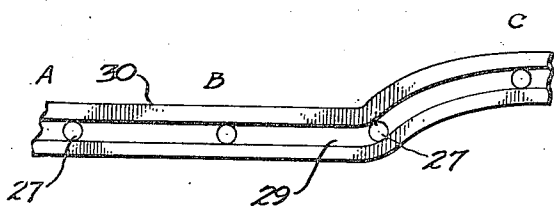


Fig. 9



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3 Sheets-Sheet 3

Fig. 3.

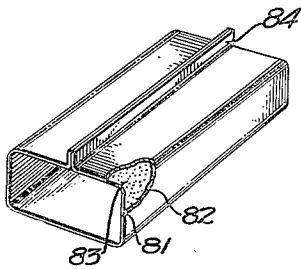


Fig. 4.

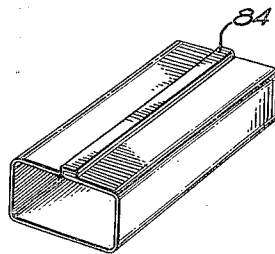


Fig. 5.

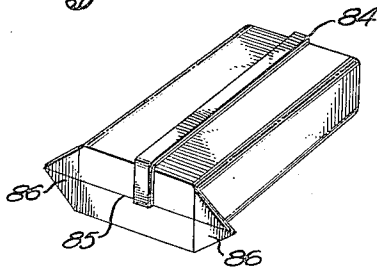


Fig. 6.

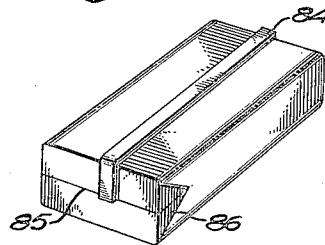


Fig. 7.

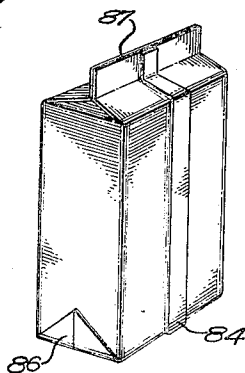
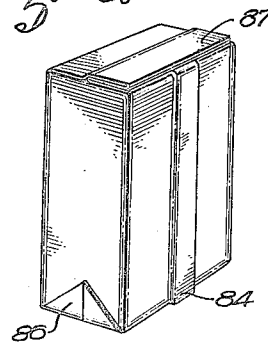


Fig. 8.



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METHOD OF PACKING FOOD PRODUCTS
AND THE LIKE

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Application May 25, 1938, Serial No. 210,038

7 Claims. (Cl. 226—56)

This invention relates to a method and means of packaging goods.

In packaging food products and the like within flexible containers, such as disclosed in the U. S. Letters Patent No. 2,102,716 issued to Samuel H. Berch December 21, 1937, and entitled Method and means of packing food products and the like, difficulty has been experienced in extracting the air from the containers and at the same time causing the flexible container with its products to assume a definite shape, and for the various containers to have uniform size.

In the type of container disclosed in the aforementioned patent an impervious inner container wall was provided, which wall was preferably made of a rubber composition, making it possible for seams to be heat sealed in sealing the container, an outer wall is laminated thereover and held in associated relation therewith by a suitable cement. After the container has been formed and filled it is subjected to vacuum action and its remaining opened portion is heat sealed. In packaging goods in this type of container it was found desirable to shape the container so that it would be of uniform size and shape, and so that the general configuration of the container would be such as to be slightly and to make an attractive commodity. Various attempts were made to shape the package but due to the fact that the entire package and its contents became a hard and compact mass after heat sealing, it was found difficult and impractical to attempt to press the container and thus cause it to assume a desired permanent shape. It has been found, however, that the shape of the container can be definitely controlled and uniformly produced by means associated with and forming steps of the vacuum process utilized in evacuating the container of its gaseous contents.

It is the principal object of the present invention, therefore, to provide simple and effective means whereby granular and other loose or fluid materials may be sealed within a flexible container and may be uniformly shaped and vacuumized as part of the sealing operation, the method involving simple and inexpensive apparatus.

Broadly considered, the present invention contemplates the placing of a filled flexible container within a mold of a configuration which is desired for the final package, the container being filled before or after it is so placed, thereafter subjecting the container and the mold to a vacuum action whereby the air will be evacuated from the mold and the container, then sealing the con-

tainer while subjected to this vacuum action, and thereafter breaking the vacuum prior to removing the container from the mold, whereby the air at atmospheric pressure will act between the contiguous walls of the mold and the walls of the container to shape the same and to compact the contents of the container to assume a shape agreeing with the contour of the inner surfaces of the mold walls.

The invention is illustrated by way of example in the accompanying drawings, in which:

Figure 1 is a view in side elevation showing an apparatus with which the present invention may be practiced.

Fig. 2 is an enlarged view in vertical section showing the vacuum chamber and the mechanism therein.

Fig. 3 is a view in perspective showing the first step in the formation of a container of a type with which the present invention is concerned.

Fig. 4 is a view in perspective similar to that shown in Fig. 3, showing the second step in the formation of the container with which the present invention is concerned.

Fig. 5 is a view in perspective showing one end of the container after it has been heat sealed and closed.

Fig. 6 is a view in perspective similar to Fig. 5, showing the end of the container closed and folded.

Fig. 7 is a view in perspective, showing the container after it has been closed and heat sealed.

Fig. 8 is a view in perspective, showing a final form of the container ready for receiving a label.

Fig. 9 is a view in diagram, indicating a portion of a cam operating mechanism for ejecting the package from the mold.

Referring more particularly to the drawings, 10 indicates a frame here shown as being provided with uprights 11 and 12 secured together by a cross-beam 13 at their upper ends and by a frame member 14 at their lower ends. Suitably journaled in the frame member 14 is a turntable shaft 15 upon which a turntable 16 is supported and by which it is rotated in a horizontal plane. A suitable drive shaft 17 is mounted in frame members 18 and 19 and is fitted with a gear 20 in mesh with a gear 21 on the lower end of the turntable shaft 15. The shaft 17 is also provided with driving mechanism for operating and controlling a container-shaping machine, generally indicated at 22, but which will not be further described or claimed in the present invention.

Mounted upon the turntable 16 and rigidly supported by tubular standards 23 is a series of

molds 24, which are of a desired depth and of desired cross-section area. These molds are preferably rectangular in shape and are of the general configuration desired for the final package. Mounted within the bottom of each of the molds is a plunger plate 25 which is slidable within the mold and agrees substantially with its sectional formation. These plates are mounted upon vertically reciprocating shafts 26 which extend through the standards 23 and are fitted at their lower ends with rollers 27. The rollers are mounted on transverse pins 28 and fit within a cam groove 29 of a barrel cam 30, for a purpose to be hereinafter described.

Disposed at a point in the circular path of travel of the molds 24 is a vacuum unit 31, with which the invention is generally concerned. The vacuum unit comprises a pair of complementary housing members 32 and 33. These members are here shown as rigidly mounted on arms 34 and 35 swinging from pivots 36 and 37, respectively, carried by the upper cross-beam 13 of the frame. The arms 34 and 35 with the housing elements carried thereby are normally held in spaced relation to each other by suitable means, such as an expansion spring 38 mounted on pins 39 carried by the arms. The arms may be forcefully moved toward each other by a pair of cams 40 and 41 mounted upon shafts 42 and 43, respectively. These shafts are supported on a frame structure 44 and may be equipped with lever arms 45 and 46 by which the cams may be swung toward and away from each other. The lever arms are fitted with toggle links 47 and 48 connected to a pin 49. A piston rod 50 is attached to the pin and carries a piston 51 mounted within a cylinder 52. The cylinder 52 is connected by a suitable pipe 53 with a vacuum pump, not shown in the drawing, whereby the piston may be drawn downwardly and the cams 40 and 41 may be operated. These cams act against the arms 34 and 35 and tend to swing the housing sections 32 and 33 toward each other when a valve 54 is opened. It is to be understood that this operating mechanism is shown by way of example only, and that other operating devices might be used and in fact that the valve structure 54 might be operated automatically when a mold comes into an operative position.

The housing sections 32 and 33 are formed with back walls 55 and 56, respectively, and marginal walls 57 and 58. When the arms 34 and 35 have swung the housing sections together the contiguous faces of the marginal walls 57 and 58 will substantially abut against each other, and a packing strip 59 carried in one of said faces will bear against or otherwise form a seal with the abutting face of the other housing section, whereby a vacuum chamber will be created by the combined housing sections, as particularly shown in Fig. 2 of the drawings. Here it will be seen that a frame element 60 is provided and extends through an opening 61 in the back wall 56 of the housing element 33. A window 62 is carried by the element 60 so that the operation of the mechanism within the device may be observed.

A bushing 63 is formed through an opening 64 in the back wall 55 of the housing section 32 and receives a connection 64' for a flexible conduit which leads to a valve 65 and to a suitable vacuum pump not shown. The valve may, if necessary, be a two-way valve so that when it is closed to the vacuum pump it will be opened to the atmosphere and will break the vacuum in the vacuum chamber.

The lower flanges 57 and 58 of the housing sections 32 and 33 are formed with arcuate cut-away portions 65' and 66, respectively, which agree substantially with the circumference of the standards 23 and complement each other in completely circumscribing a standard 23 when the housing sections 32 and 33 are in their closed position. Suitable packing gaskets 67 are formed in the arcuate faces and bear against the surface of the standard 23 to form a seal therewith.

Mounted within the sections 32 and 33 are folding blades 68 and 69, respectively, which are complementary to each other and swing toward each other with the housing sections. These blades clear the upper ends of the molds 24 and when swung toward each other to their extreme closed positions are in substantially the same plane horizontally and extend transversely of and adjacent to the mouth of the mold 24. Between the contiguous edges of the blades 68 and 69 a flat portion of a container is gripped, as will be hereinafter described.

Mounted upon blade 69 is shown a bar 70 carrying a heating element 71. This heating element is connected with suitable electric supply conduits. It will be seen that the bar 70 and its heating element bear against one side of the flat portion of the container.

A movable pressure plate 72 is mounted upon a swinging arm 73 carried by a shaft 74. The shaft 74 is journaled in the side walls of the housing section 32 and may be rotated by a lever 75. This lever may be operatively connected to suitable mechanism or may be manually operated. The lower edge 76 of the pressure plate 72 is adapted to swing against the portion of the container to be sealed. An electric heating element 77 is associated with the edge 76 to impart heat thereto and to cooperate with the heating element 71 in heat sealing the material of which the container walls are formed, as will be hereinafter described.

The shafts 26, which have been previously described as being fitted with rollers 27, are intended to move vertically at certain stages of the travel of the rollers 27 along the cam groove 29. This first vertical movement is indicated in Fig. 9 at station A, where the roller 28 lifts sufficiently to create a pressure against the lower end of the container 80 and tends to lift the filled container upwardly against the blades 68 and 69.

After the heat sealing and seaming operation has been completed and the mold 24 has moved out of its position between the separated mold sections, the roller 27 will move upwardly along the cam rise at station B so that the plate 25 will lift the sealed container and eject it from the mold.

In operation of the present invention the structure of the apparatus is assembled as generally indicated in the drawings. The package is then made from a flexible rectangular sheet of laminated material which includes an inner sheet of material impervious to air and moisture as indicated at 81, over which a non-stretching sheet of material 82 is held by an adhesive substance 83. The ends of the laminated sheet thus made are folded together to form a seam 84 with the faces of the inner sheet 81 lying upon each other. Heat is then applied to the outer sheet 82 to seal a seam along the portion 84. The seam member 84 is then folded down, as shown in Fig. 4 of the drawings, after which a seam is heat sealed across the end of the container as indicated at 85 in Fig. 5. The end is then folded flat,

which will cause tabs 86 to occur. These tabs are folded up along the opposite sides of the container, as indicated in Fig. 5 of the drawings. It will be seen that a container of rectangular formation is provided which will conform substantially to the cavity of the mold 24. The container thus formed is placed within one of the molds 24, such for example as at station A indicated in Fig. 1, after which the mold moves with its turntable 16 to the station B, indicated in Fig. 1. At this station suitable filling means may be provided to fill the container. This material is loose uncompacted material which fills the portion of the container provided to assume the form of the final package. It is to be understood that the shaft 17 is provided with intermittent driving means not shown in the drawings, so that the entire structure may move intermittently through its cycle of operation. After the container has been filled with loose material at station B the mold with the filled container is moved to the station C. During this time the upper end of the open container projects above the top of the mold. When the container reaches the station C the operating cams 40 and 41 swing the arms 34 and 35 with the housing sections 32 and 33 and cause these housing sections to be assembled around the mold 24 and its standard 23, as particularly shown in Fig. 2 of the drawings.

As the housing sections 32 and 33 swing to their sealing positions the blades 68 and 69 will engage the upper projecting portion of the container 80 and will press the walls of the container together to form a flap 87. This flap is shown in Figs. 2 and 7 of the drawings. It will be understood that while the blades 68 and 69 press the walls of the container together that they do not hold it sufficiently tight to hermetically seal the container, thus when the container is subjected to vacuum this may be drawn between the pressed portions of the container wall and the actual sealing will not take place until produced by the heat sealing operation hereinafter described.

The members 70 and 76 will be forced toward each other and will press against the opposite side of the flapped portion 87. The heating elements 71 and 77 will exert sufficient heat which will be transmitted through the outer sheet 82 to the sheet of material 81, so that a heat sealed seam will be formed. Prior to this heat sealing a vacuum action has been created within the closed housing by suction exerted through the conduit 64. This will evacuate the container and will also evacuate the housing and the mold. After the container has been hermetically sealed, the sealing means is released and the vacuum broken by closing the valve 65 to the vacuum pump and opening the valve to the compartment formed between the sections 32 and 33, thus breaking the vacuum seal in the compartment so that air at atmospheric pressure may enter the structure. This is done while the container remains in the mold. It has been found that instantly the air at atmospheric pressure will enter the mold around the container and produce a uniform pressure thereagainst which will collapse the flexible walls of the container against the material therein and compact the same to shape the container to agree with the cavity in the mold so that the package will be shaped by atmospheric pressure acting between the wall surface of the cavity and the flexible walls of the container.

It will be recognized that when the product 75

with which the container is filled is a loose granular product the vacuum action will exhaust the air from the product within the container, causing the granular material to become a hard compact mass. The air acting within the mold and around the container at atmospheric pressure after the vacuum action will shape the container so that the containers treated within this machine will be of uniform shape and size. As the housing sections 32 and 33 spread apart, the turntable will again begin operation, first causing the roller 27 to move along the flat portion of the cam at which time the molds 24 will pass from station A to B. The stations are indicated in Figs. 1 and 9 of the drawings. The roller 27 will then encounter a rise in the cam groove and will pass upwardly therealong to the station C indicated on Figs. 1 and 9 of the drawings, at which point the mold will be lifted preparatory to being enclosed by the sections 32 and 33.

It is to be understood that while the present invention is described being concerned with a particular type of container, as indicated in Figs. 3 to 8 of the drawings, that any other flexible container might be used with equal success, and it is to be pointed out further that while a particular form of device is here shown with which the invention might be practiced that variations and modifications might be made herein.

It will thus be seen that by the structure here disclosed flexible containers may be sealed under vacuum and uniformly shaped and sized by a simple and rapid operation and within a machine having few parts.

While I have shown the preferred form of my invention as now known to me, it will be understood that various changes may be made in the combination and construction of the parts of the apparatus and the steps of the method here employed by those skilled in the art without departing from the spirit of the invention as claimed.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A method of packaging loose comminuted material within a flexible and collapsible container which consists in placing the material in such container and within a mold of a configuration desired for the final package, thereafter subjecting the mold and the container to vacuum action whereby the air will be exhausted from within the container and within the mold around the container, then sealing the container while under vacuum, thereafter breaking the vacuum while the sealed container remains within the mold, whereby air under pressure will enter the mold and surround the container to impart the configuration of the mold to the container.

2. A method of packaging comminuted material within a flexible and collapsible container which consists in placing the material in such container, placing the container within a mold of a configuration desired for the package, exhausting the air from within the container and the mold, sealing the container during the exhaust period, and thereafter admitting air under pressure to the space within the mold and around the container to impart the configuration of the mold to the container.

3. A method of packaging comminuted material within a flexible and collapsible container which consists in placing the material in such container, placing the container within a mold of a configuration desired for the package, subjecting the mold and the container to vacuum

action whereby the air will be exhausted from within the container and the mold, then sealing the package under vacuum, thereafter breaking the vacuum whereby air under pressure will surround the container while within the mold and impart the configuration of the mold to the container.

4. A method of packaging comminuted material which consists in placing the material in a flexible and collapsible container, placing the container within a mold of a configuration desired for the final package, thereafter subjecting the mold to vacuum action so as to exhaust the air from within the container and the mold, then sealing the container while under vacuum, thereafter breaking the vacuum and permitting air under atmospheric pressure to said mold so as to impart the configuration of the mold to the container.

5. A method of packaging comminuted material which consists in placing the material in a flexible and collapsible container and within a mold of a configuration desired for the final package, thereafter subjecting the container to vacuum action so as to evacuate the air from the material therein and whereby the container will collapse around the material, then sealing the container while under vacuum, thereafter breaking the vacuum while the sealed container remains within the mold and allowing air under atmospheric pressure to enter the mold so as to impart the configuration of the mold to the container.

6. A method of packaging comminuted materials, which consists in placing a flexible collapsible container within the cavity of a mold, said cavity conforming substantially to the contour of the container, thereafter filling the container loosely with a comminuted material to be packed, then enclosing the mold with the con-

5 tainer in a vacuum compartment associated with suction creating means, whereby the exterior and interior of the container will be subjected to vacuum action, thereafter vacuum sealing the container, then breaking the vacuum within the compartment and establishing communication with the atmosphere while retaining the sealed container within the mold, whereby the external atmospheric pressure will collapse the walls of the container within the mold and compact the material to form a solid mass having the configuration of the walls of the mold and then removing the package from the mold.

7. A method of packaging materials characterized as being normally in a fluid state, which consists in placing a flexible collapsible container within the cavity of a mold, the walls of said cavity conforming substantially to the contour of the walls of the container, thereafter substantially filling the container with said materials to be packed, then closing the mold to form a vacuum compartment within which the container is enclosed, said vacuum compartment being in communication with suction creating means whereby the exterior and interior of the enclosed container will be subjected to vacuum action, thereafter vacuum sealing the container while enclosed within the mold, then interrupting the suction action within the vacuum compartment and establishing communication with the atmosphere while retaining the sealed container within the mold, whereby the external atmospheric pressure will collapse the walls of the container within the mold and compact the material in a fluid state to form a rigid mass having the configuration of the walls of the mold, and then removing the package from the mold.

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