

Oct. 30, 1962

H. D. RENCH ETAL
LINED CONTAINER PACKAGE

3,061,165

Filed Sept. 1, 1960

2 Sheets-Sheet 1

Fig.1 Fig.2 Fig.3

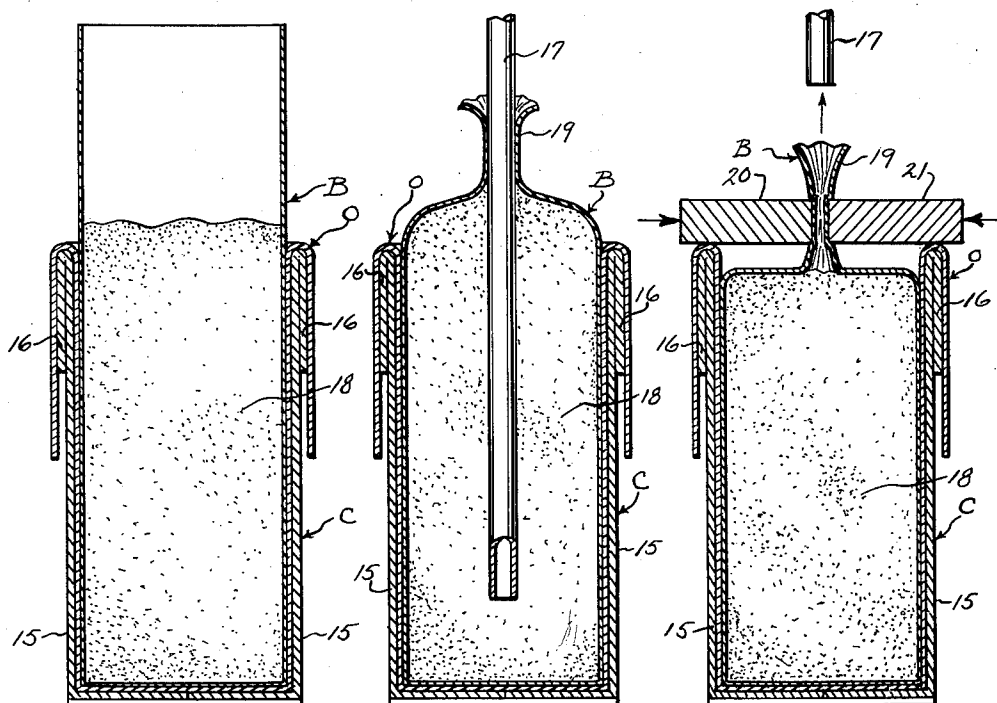
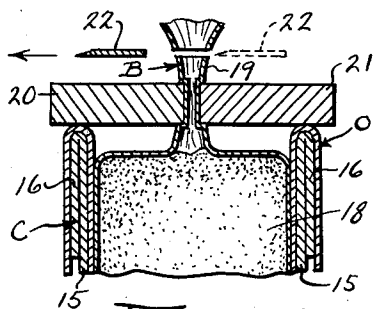


Fig. 4



¹⁵*Fig. 5*

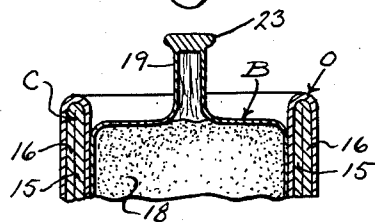
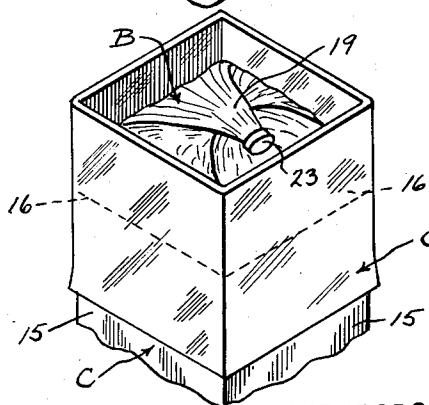


Fig. 6



INVENTORS
HARRY D. RENCH
HERBERT W. HARRIS

BY

Wright Wright
ATTORNEYS

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Fig. 7

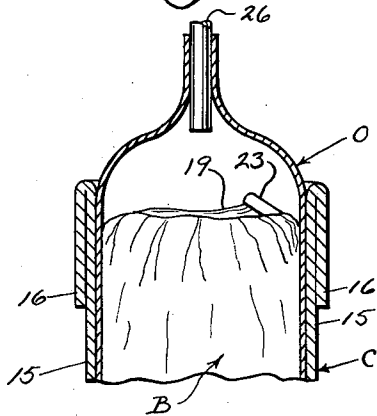


Fig. 8

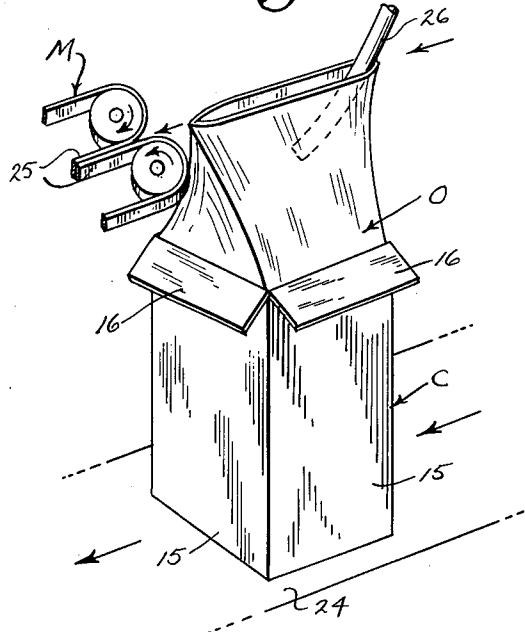


Fig. 9

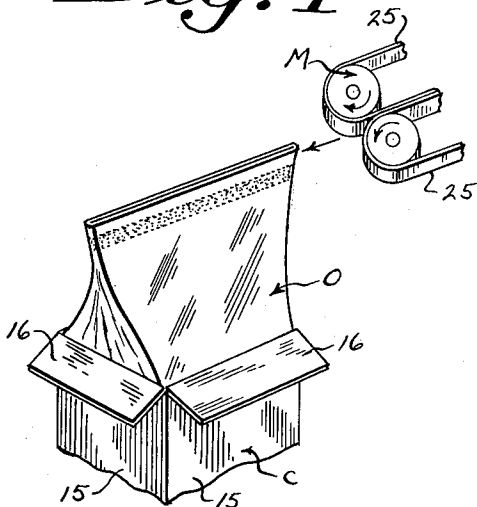


Fig. 10

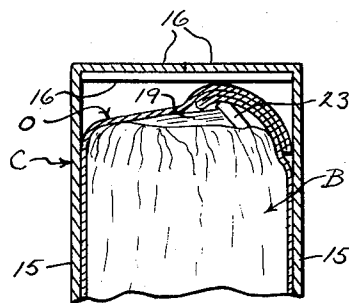
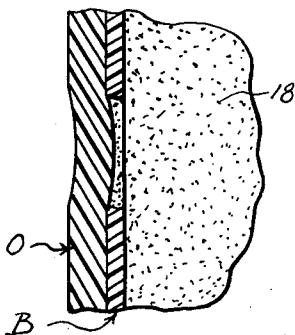


Fig. 11



INVENTORS
HARRY D. RENCH
HERBERT W. HARRIS

BY *Wright Wright*

ATTORNEYS

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3,061,165

LINED CONTAINER PACKAGE

Harry D. Rensch and Herbert W. Harris, Racine, Wis.,
assignors to Racine Industrial Plant, Inc., Racine, Wis.,
a corporation

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4 Claims. (Cl. 229-14)

This invention appertains to the packing of a moist granular or powdered material, and more particularly to the packing of a powder containing a volatile substance used in the dry cleaning of rugs, carpets etc., and is an improvement over our application for patent entitled "Method of Testing Thermoplastic and Like Bags and Compacting the Contents Thereof," S.N. 693,381, filed October 30, 1957.

In such application for patent, the difficulties and problems confronting the packers of a moist powdered material were set forth in detail, and such problems still exist and face the manufacturer and packer.

In our previous application for patent we set forth a convenient means for compacting the powdered material in the packing bags and cartons, and for testing the bags for porosity after being filled and sealed, but prior to the sealing of the cartons.

Where the bags leaked initially after filling and sealing, the same could be initially detected and the bags were broken open and contents returned to the filling machines. This resulted in the expenditure of time for inspection and the like, and some interruption in the carton sealing lines. If the bags appeared perfect at the time of the sealing of the same, but developed leaks after being sold to the trade, then the bags and cartons would swell and the cartons would become stained from the bag contents and thus become unsightly and unsalable.

It is therefore, one of the primary objects of our present invention to provide an inner thermoplastic bag having the desired vapor lock qualities, as existed in our first application, with the contents of the bags compacted by exhausting substantially all of the air therefrom (vacuum packed), in conjunction with an outer bag of a tougher, thicker material, and exhausting from such bag a sufficient amount of air at the time of the sealing thereof, so that atmospheric pressure would function to press the outer bag against the inner bag and whereby, if a leak developed in the inner bag, the rush of air from the outer bag to the inner vacuum packed bag would result in the tight drawing of the outer bag into intimate contact with the inner bag to effectively seal the opening and thus prevent the further entrance of air into the inner bag and the swelling of its contents, and the leaking of volatile substance from out of the inner bag.

A further salient object of our invention is the provision of means for sealing and exhausting air from an inner bag having certain properties, as defined in our first application, with the proved results thereof in combination with an outer bag for sealing any leaks developed in the inner bag at the time when such leaks occur.

With these and other objects in view, the invention consists in the novel construction, arrangement and formation of parts, as will be hereinafter more specifically described and claimed, and illustrated in the accompanying drawings, in which drawings

FIGURE 1 is a central vertical sectional view through a filled inner thermoplastic or like bag contained within an outer bag and a carton as the same leaves a filling machine, the outer bag being shown in its folded down, out of the way position over the carton;

FIGURE 2 is a view similar to FIGURE 1, but show-

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ing the suction tube inserted within the inner bag and into the powder contained in the bag and then gathering of the neck of the inner bag around the tube;

FIGURE 3 is a view similar to FIGURE 2, but showing the further step in the method with the neck of the inner bag firmly clamped and the suction tube entirely removed from the inner bag;

FIGURE 4 is a view similar to FIGURE 3 but showing the trimming off of the neck of the inner bag;

FIGURE 5 is a view similar to FIGURE 4, but showing the neck of the inner bag completely heat sealed by fusing the neck into a solid plug;

FIGURE 6 is a fragmentary perspective view showing the fused neck of the inner bag folded into the carton and prior to the treatment of the outer bag and the sealing of the carton;

FIGURE 7 is a view similar to FIGURE 5, but showing the outer bag pulled up ready for sealing and with the suction tube inserted therein;

FIGURE 8 is a fragmentary perspective view showing the carton moving toward a sealing machine for sealing the flaps of the outer bag and with the suction tube ready for removal from the outer bag;

FIGURE 9 is a view similar to FIGURE 8, but showing the carton leaving the sealing machine with the flaps of the bag completely sealed;

FIGURE 10 is a view similar to FIG. 5, but showing the sealed flaps of the outer bag folded down into the carton and the carton sealed ready for shipping, and

FIGURE 11 is a fragmentary detail section on a highly magnified scale showing the wall of the outer bag drawn into intimate contact with the inner bag and sealing an opening in such bag.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views the letter B indicates an inner bag formed from thermoplastic or like material such as a polyvinyl chloride film, an outer bag O also formed from a thermoplastic or like material.

The inner bag B has certain definite properties one of which is to normally form a vapor lock, i.e., to prevent the normal flow of volatile vapors therethrough and one in which the material can be heat sealed by fusing.

The outer bag O is preferably formed from a thicker, tougher material; however, the material must still possess the qualities of flexibility.

The bags B and O are used in conjunction with a cardboard or like shipping carton C.

The carton C can be of any type now known and in general use, but as illustrated the same includes side walls 15 having end sealing flaps 16. The bottom end flaps are sealed when the carton is set up for use and the upper flaps are not sealed until the carton has been filled and is ready for shipment.

In the filling of the carton, the carton with the bags B and O are placed under the spout of a filling machine (not shown), and the material is fed directly into the inner bag until a desired weight is reached. At this time, the material ceases to flow into the inner bag and the carton and the bags and the contents thereof are removed from the filling machine and brought to a heat sealing machine (not shown). At this point and in accordance with our first invention, a suction tube 17 is inserted into the inner bag and into the moist powder which is indicated by the reference character 18. The tube 17 is connected with an air evacuating apparatus of any preferred make and now in common use with such apparatus will not be described.

Also in accordance with our first invention the upper end of the bag B is gathered around the tube 17 to form a neck 19. The suction created in the tube 17 effectively withdraws all of the air from the inner bag and the moist

powder 18. This results in the compacting of powder within the inner bag due to the atmospheric pressure on the exterior surface of the bag. After the exhausting of the air from the inner bag and the powder, the suction tube 17 is raised to the outer end of the neck 19 and the neck is clamped below the tube 17 tightly by means of clamping jaws 20 and 21. At this time, the tube 17 is completely withdrawn from the bag and surplus material from the gathered neck 19 is severed by a cutting knife 22 or the like above the clamp, as best shown in FIGURE 4. Not only does this eliminate excess material but also trims off the neck 19 in a straight line. During the holding of the neck 19 between clamping jaws 20 and 21, the bags and carton are moved under the heat sealing means with the neck 19 in operative position relative to the heat sealing means and until the upper end of the neck is in a completely fused molten condition, so that as the bag leaves the heat sealing machine the same will be in the form of a solid plug, as indicated by the reference character 23 (see FIG. 5).

The exhausting of the air from the inner bag and sealing of the inner bag is in accordance with our first invention. The inner fused neck 23 is folded down tight against the filled body of the inner bag and below the top of the carton (see FIG. 6).

The next steps now proceed in accordance with our present invention and the neck of the outer bag O is pulled up from off of the carton so as to extend above the carton and the inner bag.

The carton C with the bags is now fed toward a machine as indicated by the reference character M for sealing the neck of the outer bag O and the neck of the outer bag is preferably brought into a substantially flattened condition to form a wide elongated neck and it is this neck that is sealed by the machine M.

The machine M is of a type now in common use and only a sufficient portion thereof has been shown to illustrate the method pursued in accordance with our present invention and hence the machine M can include a conveyor 24 for moving the carton and its contents along the machine. The machine also includes endless facing belts 25 between which the flattened neck of the outer bag is passed and the neck is heat or like sealed during its travel between the belts. As the neck of the outer bag reaches the facing endless belts 25 a suction nozzle 26 is inserted in the outer bag and as the neck enters between the belts, and is grasped thereby, the nozzle 26 is gradually withdrawn. The nozzle 26 is connected with an air evacuating apparatus of any preferred character now in common use and such apparatus will not be described. The nozzle 26 evacuates a given portion of the air from the outer bag but a complete vacuum is avoided, and of a less vacuum than is brought about within the inner bag B. As the carton and its contents leave the belts 25 the neck of the bag is completely and preferably heat sealed against the entrance of air (see FIG. 9), and the sealed neck of the bag is then folded down into the carton over the fused neck of the inner bag. The carton C now has its upper flaps 16 brought down and sealed and the carton and its contents are now ready for shipment and sale.

While the outer bag O forms an additional protection for the inner bag, the main function of the outer bag and the differential of vacuum sealing in the inner and outer

bags is to provide means for effectively bringing about the automatic sealing of any openings present or which might occur in the inner bag.

Attention is now directed to FIGURE 11. If a microscopic opening occurs in the inner bag or actually an opening of any size, the following action will occur. As a leak develops in the inner bag air will tend to rush from the outer bag into the inner bag and as the walls of the outer bag are already in close relation to the inner bag, such inrush of air will cause the drawing of the wall of the outer bag into intimate tight contact with the inner bag at the point where the leak occurs and due to the flexibility of the outer bag the wall of the outer bag will be drawn partially into the openings and around the walls of the openings and effectively seal such opening. This effectively prevents an inrush of an undue quantity of unwanted air into the inner bag and prevents the swelling of the inner bag and ruining of the contents thereof, and the appearance of the carton.

Thus the present invention consists of inner and outer sealed bags having a differential of air exhaust so that if a leak occurs in the inner bag such leak will be automatically sealed.

Various changes in details may be made without departing from the spirit or the scope of this invention, but what is claimed as new is:

1. A package of granular and like material comprising an inner sealed vacuum packed bag and an outer sealed bag completely enclosing the first bag and partially air evacuated to cause the outer bag to closely embrace the inner bag by atmospheric pressure, there being a differential in vacuum between the inner and outer bags and a less air evacuation in the outer bag, whereby upon the occurrence of a leak in the inner bag inrush of air from the outer bag will cause the pulling of the material of the outer bag into intimate contact with the inner bag at the point of leakage in the inner bag to seal said leakage in the inner bag.

2. A package of granular and like material as defined in claim 1, and said inner bag being formed from a thin thermoplastic material having the properties of forming a vapor barrier.

3. A package of granular and like material as defined in claim 1, and said outer bag being formed from a thicker and tougher material than the inner bag.

4. A package of granular and like material as defined in claim 1, and said inner bag being formed from thin thermoplastic material having the properties to form a vapor barrier, and said outer bag being formed of a thicker, tougher material.

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