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S. BERGSTEIN

2,630,262

WATERTIGHT AND GASTIGHT SHIPPING CONTAINER

Filed July 16, 1948

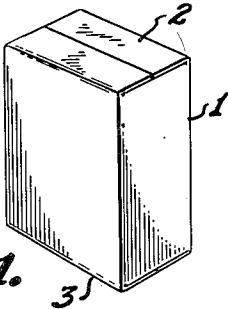


FIG. 1.

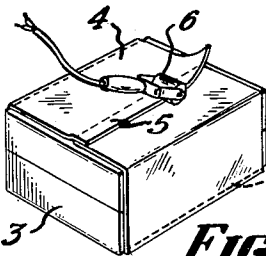


FIG. 2.



FIG. 3.

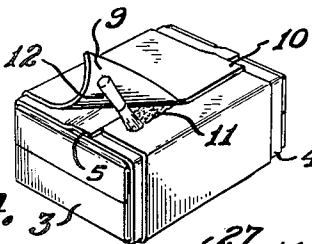


FIG. 4.

FIG. 5.

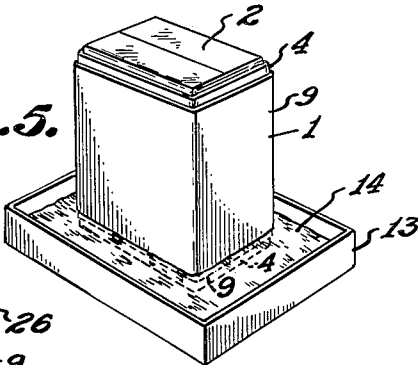


FIG. 6.

FIG. 7.

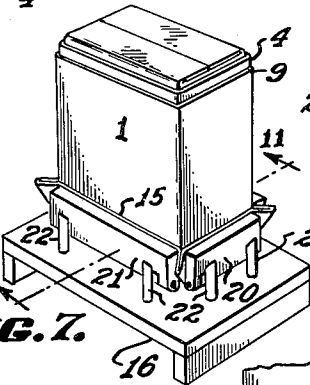
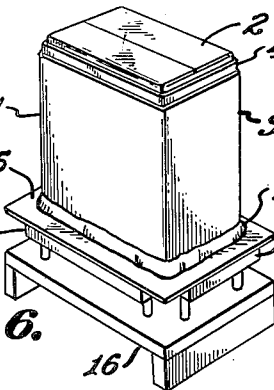


FIG. 8.

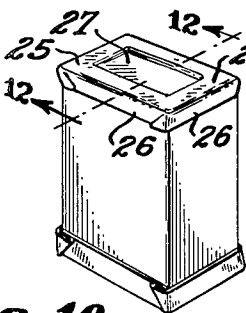


FIG. 10.

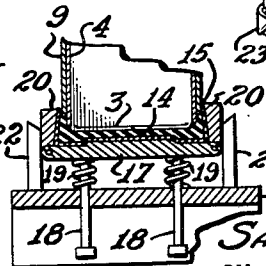


FIG. 11.

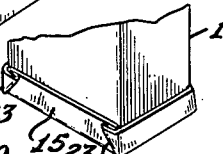


FIG. 12.

INVENTOR.
SAMUEL BERGSTEIN.

BY

Allen & Allen

ATTORNEYS.

UNITED STATES PATENT OFFICE

2,630,262

WATERTIGHT AND GASTIGHT SHIPPING CONTAINER

Samuel Bergstein, Cincinnati, Ohio

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4 Claims. (Cl. 229-3.1)

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My invention relates to the provision of shipping cases or other large size packages made of or comprising corrugated paperboard or fibreboard, which cases can be made water-tight, vapor and gas-tight so as to protect the contents from external moisture and deleterious external gases, or to maintain the contents in protective atmosphere for their preservation.

Means and procedures for gassing packages have been set forth in my issued Patent 2,442,161, issued May 25, 1948, and entitled Method of Making Gassed Filled Flexible Containers and my copending application, Serial No. 553,374, filed September 9, 1944, now Patent 2,506,769, and entitled Method of Gassing Filled Packages. Gassing and sealing procedures of these cases may be employed in connection with the packages of the present invention.

In copending cases, Serial Nos. 620,724, now Patent 2,506,056, filed October 6, 1945, entitled Gas-Tight and Gas-Filled Packages and Method of Making Them and 624,438, now Patent 2,506,057, filed October 25, 1945, and entitled Means and Methods for Rendering Paperboard Cartons Gas-Tight and Package So Produced, I have taught the formation of packages which obviate the necessity of an all-over dip in a thermoplastic substance capable of forming an integral gas-tight film. It is possible in this way to avoid difficulties of appearance and mechanical weakness inherent in all-over films, as well as the subjection of the package and its contents to the amount of heat transfer inherent in all-over dips. In addition difficulties are not encountered with expansion of internal atmosphere during the dipping operation and substantial economies are made in the quantities of external film-forming substance required.

In yet another copending case, Serial No. 661,164, filed April 10, 1946, now Patent 2,548,251, and entitled Means and Methods for Securing the Effect of End Dipping in Gas-Tight Flexible Walled Packages, I have taught a method and means for molding a thermoplastic gas-tight coating substance about the ends of containers. In a preferred embodiment, a tubed paperboard container in knocked down form is covered as to its walls at least, with a gas-tight surrounding sleeve or skin consisting preferably of a membrane or web resistant itself to the passage of gas, such as glassine, or other various non-fibrous films of commerce. The sleeve has an independent seam and will terminate short of the ends of the body walls. A molding device is employed to end cap the container. A flexible cover member is placed on the molding device and folded about the end of the carton over the thermoplastic coating and molded therewith, remaining as a part of the completed carton and, among other functions, keeping the tacky, thermoplastic substance away from the molding means to prevent fouling thereof. The thermo-

plastic substance in a molten or heat-softened condition may be applied first to the end of the carton as by dipping, and may be transferred into the molding device on the end of the carton. Alternatively, the cover member may be formed as a tray and the softened thermoplastic introduced into it prior to the association of the carton therewith. Again, the thermoplastic substance may be preassociated with the cover member and reactivated or softened prior to or during the association of the cover member and the thermoplastic with the carton. In this way it is possible to avoid difficulties encountered in ordinary end dipping. The over-all thickness of the coating may be controlled, and a greater thickness of coating may be marshalled at the points of danger in a closed seal-end carton which are at the corners and along the exposed free edges of flaps. In addition, the molded coating produces an attractive and neatly formed seal.

This application relates to improvements in packages involving many of the characteristics of the packages taught in the last mentioned copending application.

It is an object of my invention to provide shipping cases or other large containers which can be made water-tight and gas-tight in much the same manner as smaller packages which are end dipped and capped.

Shipping cases are heavy and receive much abuse in handling, transportation and warehousing, and, if made gas-tight by means of a gas-tight sleeve, the sleeve must be shielded from being punctured, scratched or torn. It is an object of my invention to provide a second sleeve for said cases made of sufficiently strong paper or craftboard to adequately protect the first or gas-tight sleeve from injury.

These and other objects of my invention, which will be set forth as the description progresses or will be apparent to one skilled in the art upon reading the specifications, I accomplish by those constructions, procedure and arrangements, of which I shall now describe an exemplary embodiment. Reference is made to the drawings wherein:

Figure 1 is a perspective view of a filled and closed shipping case.

Figure 2 is a perspective view illustrating how the inner sleeve structure may be applied to filled and closed shipping cases.

Figure 3 is a partial sectional view illustrating applied sleeve structure.

Figure 4 is a perspective view similar to Figure 2, illustrating how the second or outer sleeve may be applied.

Figure 5 is a perspective view of the sleeved container with its end dipped in the sealing substance.

Figure 6 is a perspective showing an end coated shipping case just prior to molding.

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Figure 7 is a similar perspective view showing the molding device in operative position.

Figure 8 is a partial perspective view of the cover member as it appears immediately after removal of the mold.

Figure 9 is a partial perspective view of a cover member associated with a container body after the corner portions have been folded and adhesively secured.

Figure 10 is a perspective view of the finished gas-tight shipping case.

Figure 11 is a sectional view of my molding mechanism in operative position.

Figure 12 is a sectional view through the end of the shipping case taken along the line 12—12 of Figure 10.

Briefly, in the practice of my invention, I cover the body walls of the case with a moisture, vapor and gas-tight sleeve seamed to itself in any of the known ways. Immediately over the gas-tight sleeve I provide a second sleeve made of strong paper or craftboard which substantially covers the first sleeve, leaving however exposed margins of the first sleeve at each end of the case. The ends of the case are then dipped in molten or heat-softened thermoplastic substance and transferred to a molding device upon which has been positioned a flexible cover member for the end of the case. The mold is then closed causing the cover member to be firmly pressed about the end of the case, the size of the cover members being such that its turned over edges will extend beyond the exposed portions of the first sleeve and contact at least edge portions of the second or outer sleeve. The action of the mold will cause the thermoplastic sealing substance to be evenly distributed, forcing it into exposed cracks or openings. It is important that the thermoplastic dipping material makes substantial contact with the first or gas-tight sleeve, for otherwise portions of the porous protective sleeve might be interposed between them to destroy the gas-tight seal. By allowing end portions of the first sleeve to extend beyond the ends of the second sleeve and then extending the cover member to contact the second sleeve I am assured of a good bond between the thermoplastic sealing substance and the inner gas-tight sleeve.

In Figure 1 I have shown a shipping case or container having body walls indicated generally at 1 with closed ends indicated at 2 and 3. While in the drawings I have illustrated my invention in connection with a container in set-up condition it is not without the scope of my invention to apply the sleeve members to a container in knocked down condition in the manner taught in my copending application Serial No. 624,438 which describes a method of applying flexible sleeve members to a knocked down carton blank.

In Figure 2, the case is shown being wrapped with a gas-tight sleeve 4, seamed as at 5 by means of pressure element 6. The container may be covered with a film of Saran about .001 to .003 of an inch thick; or by a combination of foil laminated to cellulose acetate or ethylcellulose; or Saran laminated to foil. Many other gas-tight films are now on the market and I do not wish to be limited to the selection enumerated above as they have been given only for purposes of illustration. Figure 3 is exemplary of materials of the latter types, that is, plied sheets comprising a ply 7 of a material different from that of the ply 8.

To shield the first sleeve from being punctured, scratched, torn or otherwise abused in the handling, transportation or the like a second or

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outer sleeve having strong wear-resistant properties is provided to cover the first sleeve. Although this second sleeve or wrapper may be applied after the container has been dipped and capped, I have found it desirable both from an aesthetic standpoint and from a practical standpoint to apply the second sleeve immediately following the application of the first sleeve. In Figure 4 I have shown a second sleeve 9 of a heavier weight paper stock, craftboard or the like being seamed about the case as at 10 by means of glue stripe 11 applied by applicator 12. It is extremely important that the second sleeve is shorter than the first so as to leave exposed approximately a 1/2 inch margin of the first at each end of the case as will become apparent hereinafter.

It is preferable to form separate, independent seams for the two sleeve members, applying and seaming first one sleeve and then the other. However, both may be joined in a single composite seam. If the latter be the case, care must be taken to see that portions of the porous, or at least non-gas-tight, outer sleeve are not interposed between layers of the inner sleeve whereby leakage may occur. In my preferred embodiment the inner sleeve is coterminous with the ends of the container and seamed to itself, thus assuring its gas-tight properties, with the second sleeve also seamed to itself, the last mentioned seam lying adjacent to but not overlapping the first mentioned seam.

The thermoplastic substance may be associated with the carton end by dipping. For this purpose I provide a dipping arrangement illustrated in Figure 5, and comprising a pan 13 in which the thermoplastic 14 may be maintained molten by means of a heater or the like (not shown). I have shown the end 2 of shipping case 1 dipped in this device, with the level of the thermoplastic substance covering the exposed areas of the first sleeve 4 and edge portions of sleeve 9. The dipping may be done by hand or by mechanism, and will be done while the coating 14 is in molten condition.

In Fig. 6 I have shown the end of container 1, bearing a dipped coating 14 of the thermoplastic substance, as it is placed on the molding device. This may also be done by hand or by mechanism, and will be done while the coating 14 is still heat softened. A cover member 15 is placed on the platform of the molding device prior to placing the dipped container in position in the mold. It is of flexible sheet materials shaped to correspond substantially to the shape of the molding device as will be explained more fully hereinafter. The cover member may be made of various materials and a wide choice is permissible. I prefer a material which is gas-resistant in itself, but this is not necessary. I also prefer a material which either will not be stained by the hot thermoplastic gas-proof substance or will be uniformly stained thereby for appearance sake. The material may be any flexible paper preferably the same stock from which the second sleeve is formed, or it may be any other fibrous web, or any of the non-fibrous films of commerce, and may be treated or not as desired.

Referring now to Figure 11 I have shown therein exemplary details of the molding device. The molding means proper comprises a platform 17 mounted for vertical reciprocation with respect to the base 16, by means of studs 18, attached to the platform and slidable in perforations in the base thereof. Spring means 19 operate to urge the platform to its highest position. The plat-

form is dimensioned so as to be slightly larger than the ends of the carton to be treated. At the ends of the platform are pivoted end formers 20, and side formers 21 are similarly pivoted to the side edges of the platform. These members are designed to be swung from the horizontal position substantially coplanar with the platform to positions substantially at right angles to the platform. To produce this swinging motion automatically a series of posts 22 are mounted upon the base 16. These posts are of such a length and so placed that the end and side formers 20 and 21 respectively will overlie them when the platform is at its highest position, and the side and end members are substantially horizontal. As will be apparent from Figures 7 and 11, the result of depressing the platform will be to cause the posts 17 to raise the side and end formers to vertical positions.

As indicated above, I prefer to employ my molding mechanism with a cover member. Such a cover member is disposed as shown at 15 in Figure 6 upon the molding device so as to completely cover platform 17 and formers 20 and 21 when they are all coplanar. Once the container is positioned on the molding device, the platform 17 is depressed to the position shown in Figure 7, resulting in the swinging upward of the side and end-forming members 20 and 21, to substantially the vertical position.

The cover member is substantially a rectangle. Triangular bellows portions indicated generally at 23 in Figure 8 will remain at each corner of the molded cover which may then be folded over and secured to the walls by adhesive spots 24. In Figure 9, I have shown the sealed end of a container after the triangular portions 23 have been folded and glued. In place of glue spots 24, openings may be cut in cover member 15 so that areas of the thermoplastic coating 14 will be exposed; the triangular bellows portions being folded over and secured by the exposed coating. Of course, if desired, these triangular portions may be cut from the cover blanks before molding.

The irregular coating 14 of thermoplastic substance will be molded by displacement about the end of the carton and contiguous sections of the carton body walls; and if the position shown in Figure 7 is maintained until the thermoplastic has chilled sufficiently to be self-sustaining, the carton will be provided with a molded end cap which is also covered by the protective cover member 23. As indicated previously, there are various places at the ends of the carton where positive coverage with a sufficient mass of thermoplastic substance is vital, if gas-proofness is to be dependably obtained. These areas usually comprise the exposed free edges of the closure flaps at the corners of the container. I prefer to mold the thicker areas of the thermoplastic at these points or areas of danger. This may be readily done by configuring the platform 17 with side and end forming members 20 and 21. The result of using a molding device of this character will be apparent from Figures 10 and 12. The outer edges of the carton top will form a thickened section of the thermoplastic illustrated and indicated at 25, merging with a thickened, but tapering section 26, about the end edges of the body walls. Centrally of the top there will be a depressed area 27 where an excess thickness of the thermoplastic is not required. Furthermore, the depressed area adds to the appearance of the sealed article as will be evident.

Again with reference to Figure 12 it will be noted particularly that the thermoplastic sealing substance 14 bonds directly with a substantial area adjacent the edges of gas-tight sleeve 4 and not merely with the edge of sleeve 4. It is desirable also that cover member 15 extends a short distance beyond the edges of outer wrapper 9 although this is not absolutely necessary, and the cover may terminate at the edge thereof.

Modifications may, of course, be made in my invention without departing from the spirit of it. Having thus described my invention in an exemplary embodiment, what I claim as new and desire to secure by Letters Patent is:

1. A shipping container for the packaging of material which must be completely sealed against the external atmosphere, which comprises an inner paperboard carton having enclosing body and end walls for receiving the material to be packed, a relatively thin flexible proofing web of moisture- and gas-proof material surrounding the body walls of the carton and tubed with a moisture- and gas-tight longitudinal seam, said proofing web extending substantially the full length of the body walls of the carton, a protective covering of relatively heavy flexible material covering said proofing web, said protective covering terminating short of said proofing web so as to leave marginal end portions of the proofing web exposed, and an imperforate coating of thermoplastic sealing substance completely covering each end wall of the carton and bonded thereto, said imperforate coatings extending around the end edges of the carton body walls and bonded to the exposed marginal end portions of the proofing web, whereby to provide a completely tight shipping container in which the proofing material is covered and protected during handling, transportation and warehousing.

2. The structure claimed in claim 1 wherein protective cover members of relatively heavy flexible material cover the coatings of thermoplastic sealing substance and are bonded thereto, said cover members extending along the body walls of said container a distance sufficient to contact the ends of the protective covering surrounding said body walls.

3. The structure claimed in claim 1 wherein the thermoplastic end coatings are in molded, shaped condition, with areas of predetermined greater thickness adjacent the end edges of the body walls of the container.

4. The structure claimed in claim 2 wherein both the thermoplastic end coatings and the protective cover members are in molded, shaped condition, with areas of the thermoplastic substance of predetermined greater thickness adjacent the end edges of the body walls of the container.

SAMUEL BERGSTEIN.

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