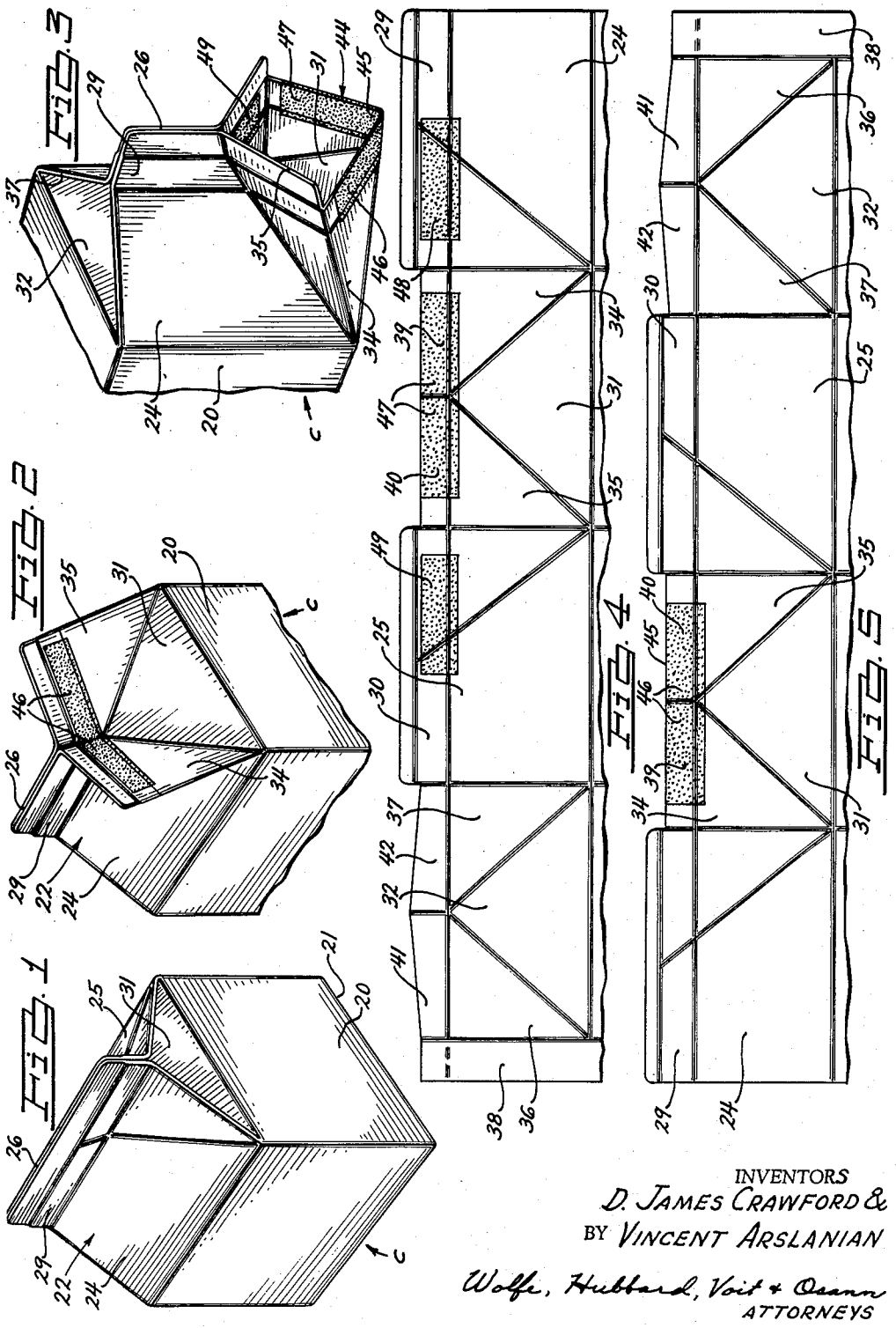
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CONTAINER WITH POURING LIP

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INVENTORS
D. JAMES CRAWFORD &
BY VINCENT ARSLANIAN

Wolfe, Hubbard, Voit & Osann
ATTORNEYS

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CONTAINER WITH POURING LIP

Duncan James Crawford, Franklin, and Vincent Arslanian, Farmington Township, Oakland County, Mich., assignors to Ex-Cell-O Corporation, Detroit, Mich., a corporation of Michigan

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This invention relates to containers made of thermoplastic or thermoplastic-coated paperboard sheet material and having closures which include a pouring lip sanitarily protected therein. More particularly, the invention relates to a container of the character set forth and to an improved composition for rendering the pouring lip area non-adherent to the thermoplastic materials utilized to seal the container closure.

In the packaging of fluids such as milk and other dairy products, extensive use is made of containers formed of paperboard sheet material having an overall coating of thermoplastic film such as polyethylene applied on the surfaces of the sheet. This plastic coated paperboard is impervious to moisture and is particularly suitable for use in packaging acidic products of which milk and orange juice are illustrative. The thermoplastic coating not only serves to moistureproof the container but also can be utilized for sealing the container closure flaps. This sealing action is accomplished by heating the surfaces to be sealed and quickly pressing them tightly together to form a liquid tight plastic-to-plastic bond.

In many such containers a spout having a pouring lip is enclosed within the closure portion of the container. When the container is sealed, the sanitary integrity of the pouring lip is preserved until the container is opened. When the paperboard blank from which the container is formed is initially prepared, all of the surfaces of the container are coated with the thermoplastic material. The pouring lip is thus also coated and, in the event heat is applied directly to the lip surfaces, the lip itself becomes tightly sealed within the closure. When such a container is opened, the lip is apt to become damaged, resulting in objectionable operation and presenting an unsightly appearance.

One object of the present invention is to provide, for use with a container of plastic coated paperboard having a pouring lip sanitarily housed within a sealed closure, an improved sealing resistant composition for protecting the pouring lip from being permanently and inaccessibly sealed within the closure.

Another object of the present invention is to provide an improved non-sealing adhesive composition for use in protecting the pouring lip area of a container closure to prevent the lip from being permanently sealed when the container closure is sealed.

A further object of the present invention is to provide an improved sealing resistant adhesive coating composition for protecting the pouring lip of a plastic coated paperboard container which does not interfere with the closing and sealing of the container closure and which imparts excellent release and non-stick characteristics to this lip.

Other objects and advantages of the present invention will become apparent as the following description

proceeds taken in connection with the accompanying drawings wherein:

FIGURE 1 shows an illustrative container having an enclosed pouring spout to which the present invention has been applied.

FIG. 2 illustrates the container shown in FIG. 1 during a preliminary step of opening the container to expose the pouring spout.

FIG. 3 illustrates a container of the type shown in FIG. 1 with the pouring spout opened and the pouring lip in position for dispensing the container contents.

FIG. 4 is a fragmentary portion of the inside surface of a flat blank of plastic coated paperboard material from which the container shown in FIG. 1 can be erected.

FIG. 5 is a view similar to FIG. 4 but illustrating the outside container surface of the blank.

While certain illustrative forms of the present invention have been described below in considerable detail, and an illustrative use shown in the drawing, it should be understood that there is no intention to limit the invention to the specific form disclosed. On the contrary, the intention is to cover all modifications, alternative constructions, equivalents and uses falling within the spirit and scope of the invention as expressed in the appended claims.

One container of the type with which the present invention finds particular, but not necessarily exclusive utility, is shown in the accompanying drawing. Such a container is also disclosed in considerably greater detail in copending Egleston and Monroe application, Serial No. 707,259, filed January 6, 1958, now abandoned. For present purposes, however, it will suffice to note that such container may be formed from paperboard or other appropriate foldable sheet material and is self sustaining in shape. The sheet material is rendered liquid tight as by means of an overall coating, on both surfaces, of a thermoplastic material such as polyethylene, making the container capable of holding such acidic liquids as milk and orange juice. This thermoplastic coating also serves as a heat sensitive adhesive by which overlapping layers of the sheet material may be sealed together when erecting and sealing the container. The coating adheres tightly to the paperboard so that it, as well as any seals utilizing the coating, remains permanent and liquid tight.

Referring more specifically to FIGURE 1, there is shown an illustrative container C of the character set forth above and formed of plastic coated paperboard. The container comprises a tubular body 20 of generally rectangular cross section, having a flat bottom closure 21 and a top closure 22, which will be recognized as the familiar gable top closure characterized by inclined roof panels 24, 25, surmounted by an upstanding central sealing rib or truss 26. In the present instance, the paperboard from which the container is formed is coated with polyethylene film, the coating being about 0.75 mil thick on the outer container surface and about 1.5 mil thick on the inner surface.

The gable top closure is formed by the inclined roof panels 24, 25 each of which is surmounted by an outer sealing rib panel 29, 30, together with a pair of in-turned triangular end panels 31, 32 each joined to the adjacent roof panels 24, 25 by triangular fold-back panels 34, 35 and 36, 37, respectively. A side seam flap 38 is provided at one edge of the blank for the container C,

for joinder with roof panel 24 and its associated side and bottom panels, to complete the body of the container. To complete the sealing rib, each of the triangular fold-back panels includes adjacent its upper edge a corresponding one of inner rib panels 39, 40, 41, 42. These panels are shown more clearly in FIGS. 4 and 5 which illustrate a layout of a blank adapted to be erected into the completed container and closure of FIG. 1. When a container is erected from such a blank, the side seam flap 33 is first attached to the opposite edge portion of the blank to produce a flat-folded tube. This flat-folded tubular blank may be erected in any manner known in the art to form a container and closure. In a completed closure of the type shown, the rib panels are all laminated together, with the inner rib panels 39, 40, 41, 42 folded between the outer rib panels 29, 30 on the inclined roof panels. To seal the closure, heat is applied to the thermoplastic coating on the various rib panels just before the container is closed, after which a sealing pressure is applied to the sealing rib or truss thus formed by the various rib panels so that the hot plastic on contacting rib surfaces fuses to form a liquid tight sanitary seal.

In order to dispense the contents of the container C, a suitable opening or spout is accessibly provided as a part of the closure. For example, in the case of a gable top closure as shown in FIGS. 1 and 2, one or both of the ends of the closure may be adapted to be pulled out to form a pouring spout 44 as illustrated in FIGS. 2 and 3. This is readily accomplished by separating the portions of the rib 26 above one end panel 31 with opposed thumb pressures applied to the adjacent fold-back panels 34, 35 and then snapping the end panel 31 and the two adjacent fold-back panels 34, 35 out from between the inclined roof panels. The contents can then be poured from the container by utilizing these panels and their associated rib panels 39, 40 as a spout 44 in which the free edge portions of the rib panels 39, 40 serve to define a pouring lip 45.

When the closure is heated and subjected to pressure to effect a seal and thereby provide a sanitary package, all of the rib panels are subjected to heat at a temperature sufficiently high to render the thermoplastic coating on the container molten or tacky so as to effect a liquid tight seal when the container closure elements are pressed together. Because the thermoplastic material forms an extremely tight bond, provision must be made in the structure of the top closure sealing rib 26 to render the pouring spout accessible to the user after the closure has been sealed. However, by placing a heat and sealing resistant material 46 over the pouring lip area, as disclosed in copending application Serial No. 707,259, supra, the lip itself is not permanently bonded to the other parts of the closure although it is completely and sanitarily sealed within the closure. With such a sealing resistant material, hereinafter referred to as an adhesive, on the pouring lip area, it is a simple matter to open the closure and expose a spout having a smooth, undamaged, sanitary pouring lip.

In carrying out the present invention, selected areas of the spout surfaces adjacent the pouring lip and those other rib surfaces which contact the lip area in the completed closure are coated or treated with an improved abhesive, comprising essentially a high molecular weight organo-siloxane gum containing primarily dimethyl siloxane polymers of the general formula $(CH_3)_2SiO_2$. Such siloxane gums have a molecular weight above 150,000, and usually in the range of 150,000–250,000. These gum compositions are capable of being cured or cross-linked, and for this purpose there is added a small amount of monomethyl or methyl hydrogen siloxane polymers, together with suitable catalysts such as the metal salts of carboxylic acids. For example lead, iron, zinc, or cobalt salts of acetic, hexoic or octoic acids.

The siloxane gum composition is applied in a dilute organic solvent solution such as a xylene or toluene solution, as a coating on the lip of the pouring spout and adjacent rib areas, in this instance shown as the shaded areas 46, 47, 48, 49 in the drawings, where it is desired to avoid permanent sealing. Uncoated marginal sealing areas are left around the adhesive areas for use in sealing the container. These siloxane gums employed are of a type generally known in the art and are described by Rochow in "Chemistry of the Silicones," 2d ed., John Wiley & Sons, Inc., New York, 1951 (p. 94), and the references cited therein, such as U.S. Patent No. 2,448,556.

The particular amount of siloxane applied as an adhesive coating is not critical. Satisfactory results have been achieved by applying the solution with conventional inking or gluing equipment, e.g. flexographic printing equipment, in a layer about 0.0001 inch thick over the areas to be protected. The siloxane adhesive is applied from a solvent solution, and after the application the treated surfaces are allowed to dry. Solvent removal may be facilitated by mild heating.

One polysiloxane gum composition found to be useful as an adhesive on the pouring lip of a polyethylene coated container had the following composition:

A 30% solution in xylene of the following gum:

	Parts by weight
Dimethyl polysiloxane 97%, M.W. 222,000; methyl hydrogen polysiloxane 3%, visc. 50 centistokes at 25° C	10
Toluene solvent	89⅔
Metal carboxylate catalyst (zinc octoate, cobalt octoate, etc.)	⅓

A preferred solution of the adhesive composition is given above. In practice, it has been found that between about 5 and about 15 parts by weight of the 30% xylene solution can be employed so long as the final solution is of a viscosity suitable for application by printing or other method which may be employed. The gum solution was then applied as a thin coating about 0.0001 inch thick to selected areas of the lip forming ribs 39, 40 (area 46) of a blank as shown in FIGS. 4 and 5, and to adjacent ribs 29 and 30 (areas 48 and 49) by a flexographic printer, leaving uncoated marginal sealing areas. The blanks were allowed to dry and were subsequently erected, filled and heat sealed in a conventional manner to produce a container like that shown in FIG. 1.

When a container formed from a blank to which the above described adhesive was opened to expose the pouring spout, the sealing rib was readily separated as shown in FIG. 2, and when the spout was extended (FIG. 3) the pouring lip was smooth and undamaged and was ready for use.

It will, of course, be appreciated by those skilled in the art that the present invention is not limited to use on containers of polyethylene or polyethylene-coated paperboard. For example, the method of the present invention may be satisfactorily applied to containers made of or coated with other plastic materials such as polypropylene, rubber hydrochloride polymers, polyvinyl chloride, polyvinyl acetate copolymers, and like polymeric substances.

We claim as our invention:

1. In a dispensing container having a tubular body surmounted by a sealed closure sanitarily housing a pouring lip, said closure and lip being formed of sheet material having a heat sealable thermoplastic surface with a sealing resistant coating applied over said surface at said lip, the improvement wherein said sealing resistant coating comprises a polysiloxane gum.

2. A dispensing container as defined in claim 1 wherein said sealing resistant coating comprises dimethyl polysiloxane gum.

3. A dispensing container as defined in claim 1 wherein said sealing resistant coating comprises dimethyl poly-

siloxane gum and a small amount of methyl hydrogen polysiloxane.

4. In a dispensing container having a body surmounted by a sealed closure sanitarily housing a pouring lip, said body, closure and lip being formed of paperboard sheet material having an overall polyethylene coating with a sealing resistant coating applied over said polyethylene coating at said lip, the improvement wherein said sealing resistant coating comprises a polysiloxane gum which is resistant to sticking to said polyethylene coating when the closure is heat sealed.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,116,002 December 31, 1963

Duncan James Crawford et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 1, lines 52 and 57, column 3, line 56, and column 4, lines 6, 13 and 14, 18, 23, 33 and 49, for "adhesive", each occurrence, read -- abhesive --.

Signed and sealed this 26th day of May 1964.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents