

Sept. 19, 1939.

J. K. M. HARRISON

2,173,585

PAPER AND OTHER CONTAINERS AND THEIR MANUFACTURE

Filed March 27, 1936

2 Sheets-Sheet 1

FIG. I.

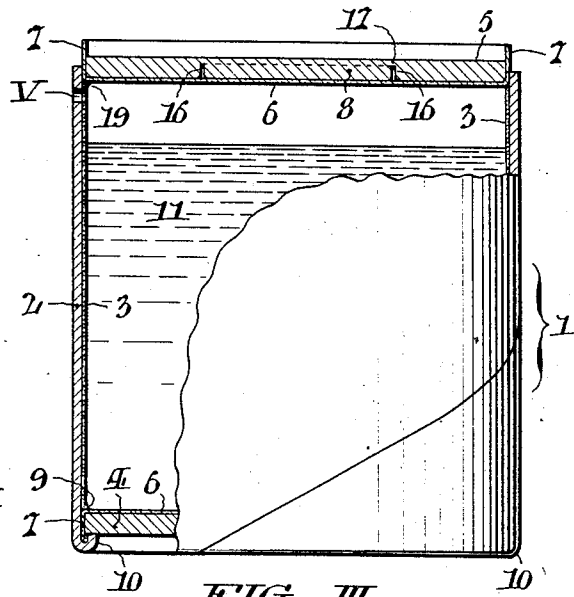


FIG. II.

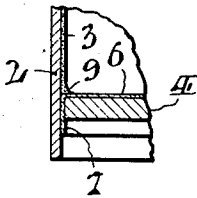


FIG. III.

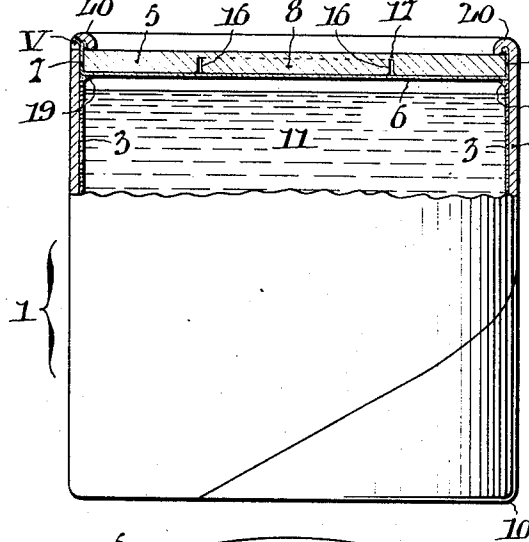


FIG. V.

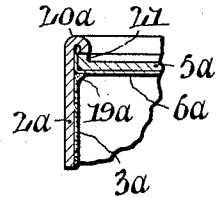
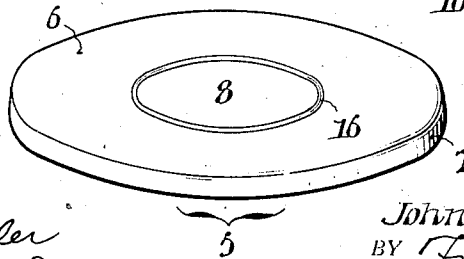


FIG. IV.



WITNESSES:

John A. Weidler
William Bell, Jr.

INVENTOR:

John K. M. Harrison,
BY Tracy Paul
ATTORNEYS.

Sept. 19, 1939.

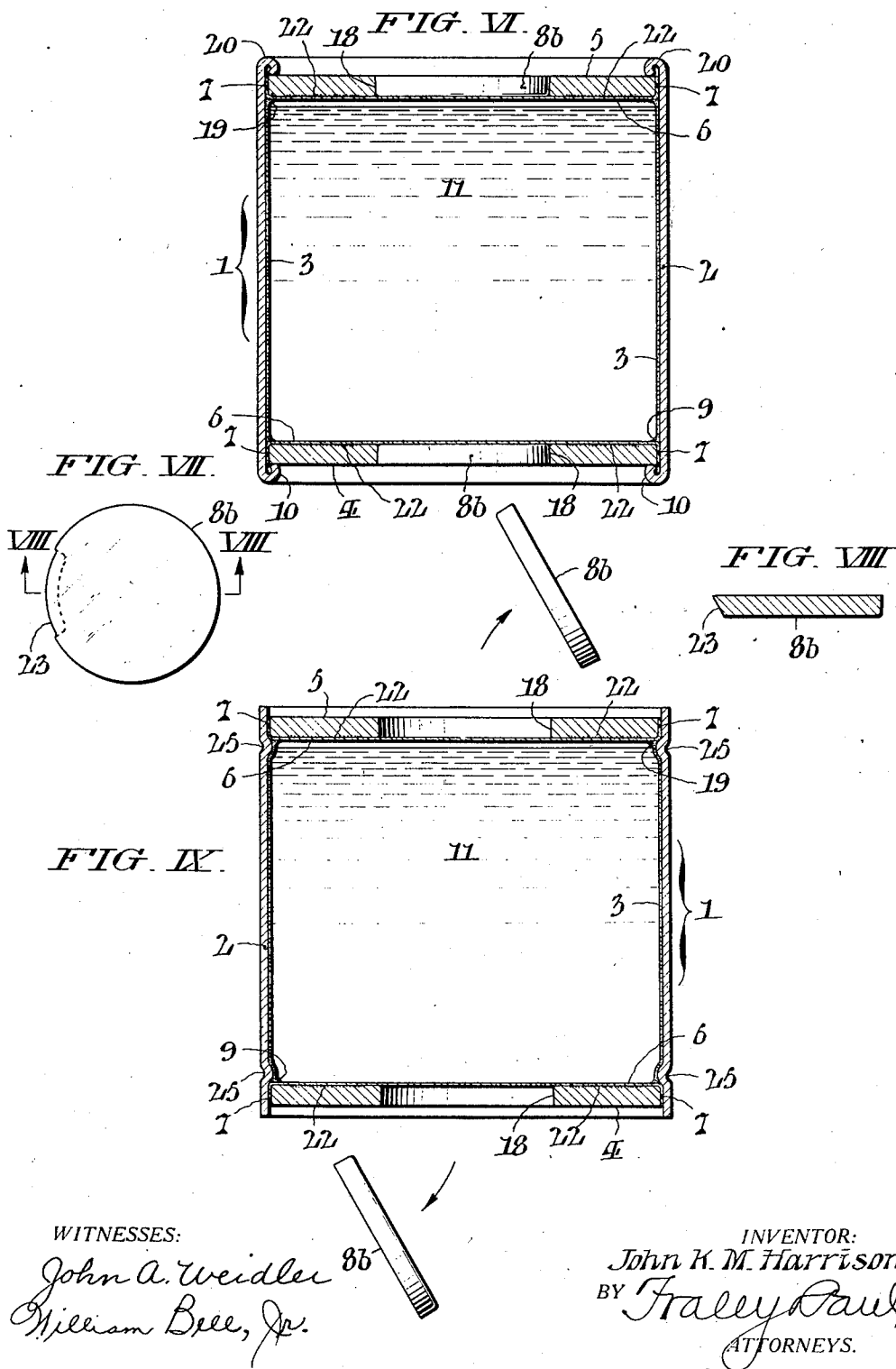
J. K. M. HARRISON

2,173,585

PAPER AND OTHER CONTAINERS AND THEIR MANUFACTURE

Filed March 27, 1936

2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,173,585

PAPER AND OTHER CONTAINERS AND
THEIR MANUFACTURE

John K. M. Harrison, Ogontz, Pa.

Application March 27, 1936, Serial No. 71,104

9 Claims. (Cl. 229—3.1)

This invention relates to containers preferably of paper, fiber, or similar material, adaptable for either solids or liquids, and to be easily sealed hermetically. In forms of construction such as hereinafter described, the container is amply strong and rugged as against injury in handling or shipment, and is easy and economical to manufacture, to fill or charge, and to close. When suitably constructed, moreover, the container is not only easy to open and empty, but permits inspection of its contents without opening or unsealing, if desired, by looking through the contents, which may often greatly facilitate determining their exact character. Inspection of the container contents need not affect their subsequent keeping, nor impair the strength and safety of the container in subsequent handling or shipment. Other features and advantages of the invention will appear from the following description of species or forms of embodiment, and from the drawings. So far as novel, indeed, all features herein illustrated or described are of my invention.

This application is a continuation in part of my pending application Serial No. 55,241, filed December 19, 1935, as to common subject-matter described and claimed.

In the drawings,

Fig. I is a side view, partly in vertical mid section, showing a container filled or charged, with its closure or cover in initial entering position.

Fig. II is a fragmentary sectional view illustrating an earlier stage in the construction of the container shown in Fig. I.

Fig. III is a view similar to Fig. I showing the container fully closed and sealed.

Fig. IV is a perspective view of the closure or cover of the container in inverted position.

Fig. V is a fragmentary sectional view illustrating a modified end wall or closure construction for the container.

Fig. VI shows a vertical mid section through a container of somewhat different construction from that illustrated in Figs. I-IV.

Fig. VII is a top plan view of one of the parts illustrated in Fig. VI, slightly modified.

Fig. VIII shows a cross section through the part illustrated in Fig. VII, taken as indicated by the line VIII—VIII in Fig. VII; and,

Fig. IX is a view similar to Fig. VI illustrating a somewhat different construction of the container, and showing the plug-like covers for its window openings removed.

The container 1 here illustrated comprises a

body shell 2 of paper tubing protectively lined, or internally coated with a coating 3 preferably of thermoplastic and liquid-resistant character like Bakelite or other synthetic resin, and has end walls 4, 5 of cardboard or fiber board in the ends of said body 2. The ends 4, 5 have internal facings or lining 6, 6 of sheet material, preferably liquid-resistant and of transparent or translucent character, such as "Cellophane" or the like. The margins 7 of the internal facings 6, 6 overlap or surround the peripheries of the end pieces 4, 5 in the body shell 2 and are cemented to the body 2, fluid-tight, by the thermoplastic 3. In manufacture, the end pieces 4, 5 with their internal facings 6, 6 are forced with a tight fit into the ends of the body 2 while its internal cementitious coating 3 is softened (as by suitable application of heat) so as to stick to the facings 6, 6 and form thoroughly tight, strong joints. One or both end walls 4, 5 have portion(s) 8 readily removable to expose the internal facing(s) 6. This affords one or more "windows", so to speak, for inspection of the contents of the container 1 without impairing the hermetic seal afforded by the linings 3 and 6, 6; and when both the end-wall sections or covers 8, 8 are removed, the opposite "windows" allow of looking clear through the contents of the container 1,—from end to end. After inspection, the cover(s) 8 can be replaced so as to protect the window(s) during subsequent storage, handling, or shipment of the container 1. Or by piercing such window when exposed by removal of a wall section 8, the container 1 is easily opened and emptied.

In carrying out the invention as particularly illustrated in Figs. I-IV, I take a length, for example, of three layer spirally wound paper or fiber tubing and coat its interior surface, in any convenient manner, with a suitable thermoplastic, preferably of a liquid-resistant character, so as to give said tubing an impervious lining throughout its entire length. The thermoplastic 3, conveniently, may consist of a synthetic resin, such as commercial Bakelite for instance; or any other analogous composition of matter inherently thermoplastic in character may be employed. In fact, any liquid-resistant material, or even a material including a quick drying solvent can be applied to form the tube lining.

The length of thermoplastically lined tubing is next severed into sections suitable for the body shell 2 with a hole V, or more if desirable, adjacent one end thereof, for a purpose later on explained. This hole V, or holes, is, or are, located at that end of the tube section destined to become

the top of the container 1. After cooling, said section is ready for application of the bottom 4. The bottoms 4 are, preferably, made in the form of cardboard discs having applied facings of "Cellophane" 6 on one side, of larger diameter; or said bottoms may be produced from two or three-ply strip paper or fiber glued together with a cover of "Cellophane" suitably adhered to one side thereof. In practice the cardboard discs 4 and applied, relatively larger diameter, "Cellophane" facings 6 are suitably treated to effect flanging of said facings around the discs 4, as indicated at 7.

In applying the bottom 4 to the tube section 2, the former is heated to a temperature of from 230° to 250° Fahrenheit and suitably forced into the lower body section end, which at this time is plain and open like the upper end, as shown in Fig. II. This heating of the bottom 4 is done in order that as said bottom enters the section 2 and is forced into the section 2, the heat transmitted shall sufficiently soften the coating 3 to permit its being pushed forward by the bottom 4 to form a surrounding concaved bead or definite fillet 9 of the coating substance. This fillet 9 constitutes, by impervious adherence to the "Cellophane" covering 6 of the bottom 4, a leak-proof sealing-juncture between the container wall and its bottom end. In order to mechanically reinforce the parts 2 and 4 when united as just described, the end of the former may preferably be suitably spun over and inwardly as indicated at 10, so as to not only strengthen the bottom of the container 1, but also to overlap and form a supplemental sealing juncture with the flanged edge 7 of the "Cellophane" facing 6, in a manner obvious from the foregoing description relating to formation of the sealing-juncture fillet 9. In forcing the bottom 4 into position in the tube section 2, some of the coating 3 is left between the "Cellophane" flange 7 and the inside of said section, constituting a further sealing-juncture.

The container 1 is now ready for filling with a measured quantity of liquid 11, such as an oil for example, to a level below the vent hole V, whereupon the top end closure or cover 5 is applied and forced in,—in the same manner as explained in connection with the bottom 4. The closure 5, shown separately in Fig. IV, consists of a cardboard disc having a "Cellophane" facing 6 flanged at 7 as before set forth; but this top disc is, preferably, formed with a concentric groove 16 which, when the closure 5 is applied, extends from its underside well towards the exposed upper surface as indicated at 17, whereby the inner central portion 8 can be readily removed by a suitable cutting implement applied to the part 17, in an obvious manner.

It is to be particularly noted that as the closure 5 is forced into closure-position as shown in Fig. III, it not only forms a sealing-juncture fillet 19 corresponding with the bottom fillet 9, but during its passage inwardly over the vent hole V it will force out or evacuate substantially all air intervening the top of the liquid 11 and the underside of said cover. Furthermore, it is to be remarked that if a suitable exhausting means be applied to the vent hole V during application of the closure 5, a non-pressure sealing of the container 1 can be effectively accomplished, while said closure is being forced "home." Still further, it will be understood that the central portion 8 of end wall 5 may be removed without cutting through the "Cellophane" facing 6, for the purpose of inspecting the liquid content 11 if

desired, and may be reinserted to protect said facing from damage or fracture; whereas, when it is desired to empty out the liquid 11, the "Cellophane" facing 6 below the portion 8 can also be removed by a suitable implement, and the content poured out, or otherwise discharged from the container 1. Also, after the closure 5 is applied, the upper edge of the container 1 may be spun over inwards at 20 as and for the purpose explained in connection with its bottom end 4.

In the modified form of construction shown in Fig. V, the cover closure 5a is made of the same material as the container body 2 and flanged circumferentially at 21 for stiffening purposes, but in all other respects said modification corresponds with the description of Figs. I-IV; similar reference characters being applied with the exponent a to obviate repetitive description.

It is further to be understood the outside of the container body 2, as well as the outer surface of the bottom and closure members 4, 5, may preferably be waxed or otherwise treated to render them waterproof and moisture resistant.

Incidentally, it is to be understood that the "Cellophane" facings 6, 6 may be dispensed with, and the closure and bottom pieces 4, 5 formed of thermoplastically coated material, with corresponding formation of the leak-proof sealing-junctures 9 and 19, without departing from the fundamentals of this invention.

Obviously, the container body 2 may have an applied liner of "Cellophane" in the form of a tube and the bottom and top discs 4, 5 coated with a thermoplastic, and inserted in the container as hereinbefore described, with corresponding formation of the leak-proof sealing-junctures with said "Cellophane" lining. Also, both the bottom and top pieces 4, 5 may be provided with removable inner portions 8; or said discs may be made in the form of annulae or without the removable inner portions 8. In inserting the bottom 4 or the top 5 into the body 2, heat may of course be applied around the ends of the latter to soften its thermoplastic coating 3, rather than to said ends 4 and 5.

The container 1 particularly illustrated in Fig. VI resembles that of Figs. I-IV in having a paper body shell 2 internally coated with thermoplastic 3, preferably of moisture, oil, and air-proof character, affording an impervious lining. The inserted end walls or bottom and top discs 4, 5 have each a facing 6, on one side and around its peripheral edge, of moisture, oil, and air-proof sheet material that is preferably translucent or transparent,—such as "Cellophane" or the like, for example,—affording impervious linings. Either or each end wall 4, 5 is formed, during manufacture, with an aperture 18 for which a snug-fitting plug-like closure 8b (Figs. VII and VIII) is provided, preferably of the same material as the rest of the end wall 4 or 5. Thus it is unnecessary to cut an end wall 4 or 5 in order to remove the cover portion 8b, as described in connection with Figs. I-IV. Only a comparatively small amount of adhesive 22 is required for securing the facing 6 to an annular disc 4 or 5. The closures 8b are preferably not secured to the facings 6. The adhesive 22 may be applied over just the right areas by suitable annular means, assuring against the presence of adhesive between the closures 8b and the linings 6.

In the use of the containers 1 (especially for oils or other liquids), the plugs or covers 8b are readily removed with the aid of a knife-blade or the like, permitting the contents to be looked

through (if permeable to light) by holding the container up to the light. To facilitate removal, each plug or cover 8b may have a champfer or bevelled undercut in its edge as indicated at 23 in Figs. VII and VIII, so as to afford a convenient hold for a finger-nail or a thin edge of any sort. After inspection of the container contents, plug(s) or cover(s) 8b can then be replaced to protect the facing(s) 6 over the "window(s)" formed by the opening(s) 18. The covers 8b are also useful to sustain the linings 6 against pressure of heavy substances in the container; but they are capable of yielding to allow some expansion or contraction of air in the container 1, for example, and would be blown out by internal pressure sufficient to rupture the linings 6, far below the point of dangerously high pressure.

The container 1 particularly illustrated in Fig. IX differs from that in Fig. VI in that the body shell 2 has internal annular shoulders 25 adjacent its ends, shown as formed by inward offsets rolled or otherwise formed in the shell wall. These shoulders 25 provide seats for the edges of the bottom and top ends 4, 5, and afford greater area and strength for the cementitious joints 9 and 19. Accordingly, the spinning over of the body-shell ends as preferably resorted to in the constructions of Figs. I-VIII is not shown in Fig. IX,—although it might, of course, be used in this construction if desired. In manufacture, also, the shoulders 25 are advantageous to prevent the ends 4, 5 from being pushed into the shell 2 too far.

In Figs. VI-IX, various parts and features are marked with the same reference-numerals as in Figs. I-V (with an added letter, where such distinction appears desirable) as a means of dispensing with repetitive description.

From the foregoing description, it is thought the merits and advantages of the invention will be fully appreciated, and while specific embodiments thereof have been minutely explained, the same are not to be taken as conclusive, inasmuch as modifications in details will suggest themselves to those conversant with the art. Accordingly, it is intended to hereby include all such variations of the invention as fairly come within the scope of the following claims.

Having thus described my invention, I claim:

1. A container comprising a tubular body shell having a thermoplastic inner coating and an orifice near one end through its wall; push-in ends having the inner faces similarly coated and outwardly flanged, said ends, when forced into place, forming definite leak-proof sealing fillet juncture between said body wall and said ends, one of the ends serving to close in the wall orifice aforesaid with evacuation of pressure from therebelow; and inward retroversions of the tubular body extremities reinforcing the container ends.

2. A container comprising a tubular body shell having a thermoplastic inner coating; and push-in ends with inner facings of "Cellophane"

flanged outwardly thereabout, said ends, when forced into place, displacing part of the body coating to form leak-proof definite sealing fillet junctures between the body wall coating and the "Cellophane"-faced ends.

3. A container comprising a tubular body of paper or fiber having a thermoplastic inner lining; push-in ends of cardboard with inner facings of sheet "Cellophane" flanged outwardly thereabout, said ends, when forced into place, displacing part of the body lining to form inner leak-proof definite sealing fillet junctures between the body wall lining and the "Cellophane"-faced ends; and inward retroversions of the tubular body extremities reinforcing the container ends.

4. A container consisting of a tubular body portion having a thermoplastic lining, push-in ends faced with a transparent covering adapted when inserted to form definite sealing fillet juncture between the body portion lining and said ends, and means providing sight apertures through the container for inspection of its content.

5. A container consisting of a tubular body portion having a thermoplastic lining, push-in ends faced with sheet "Cellophane" or the like adapted for fusible definite fillet union with the lining, and a removable section in one end affording access to the "Cellophane" facing.

6. A container consisting of a tubular body portion having a thermoplastic lining, push-in disc ends covered with sheet "Cellophane" or the like on their inner surfaces and adapted for fused definite fillet union with the lining, each said end having an opening therein normally-closed by said covering, and a plug removably engaging in each opening.

7. The combination of claim 6 wherein the removable plug is provided with an arcual tapering section for aiding in its removal from the container end.

8. As an article of manufacture a push-in end of the type described for paper containers and the like, said end having an opening therein, an internal covering of transparent material for said end, and a plug removably engaged in the opening for exposing the transparent covering.

9. A container for liquids comprising a tubular body of paper or fiber having a thermoplastic inner lining, push-in ends of cardboard with inner facings of sheet "Cellophane" flanged outwardly thereabout, said ends, when forced into place, displacing part of the body lining to form inner leak-proof definite sealing fillet junctures between the body wall lining and "Cellophane"-faced ends; and inward retroversions of the tubular body extremities reinforcing the container ends; one of said ends including a readily removable section to afford access to its "Cellophane" facing.

JOHN K. M. HARRISON.