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2,106,738

PAPER AND ANALOGOUS MATERIAL CONTAINER

Filed, Dec. 19, 1935

2 Sheets-Sheet 1

FIG. I.

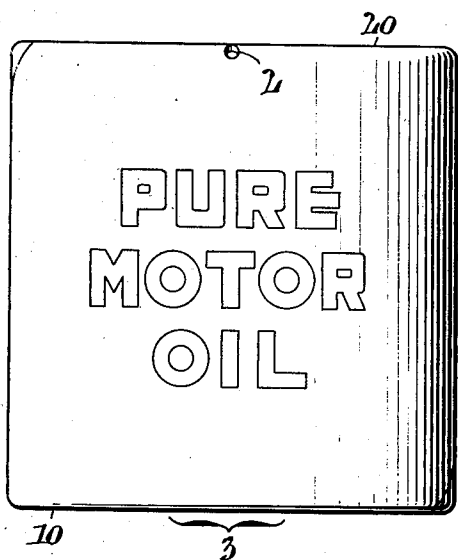


FIG. II.

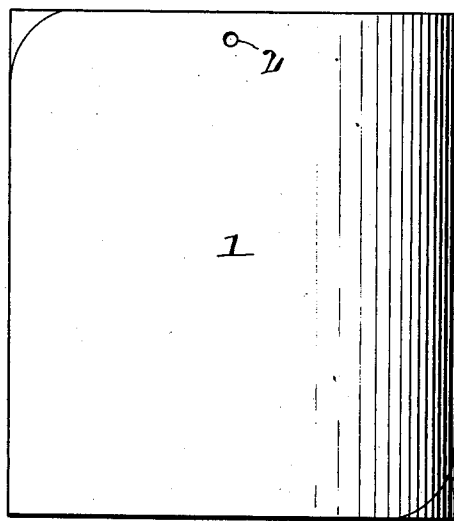
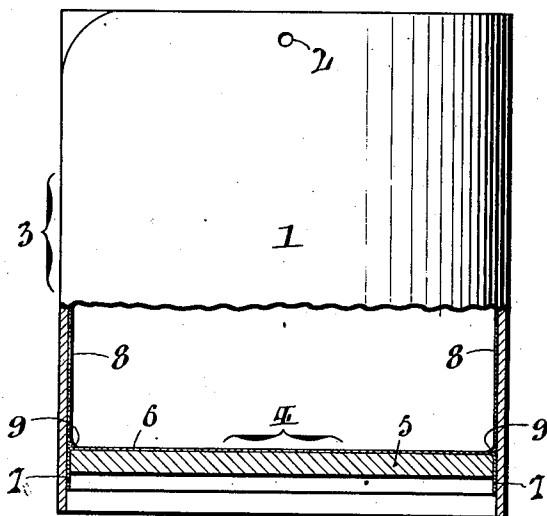


FIG. III.



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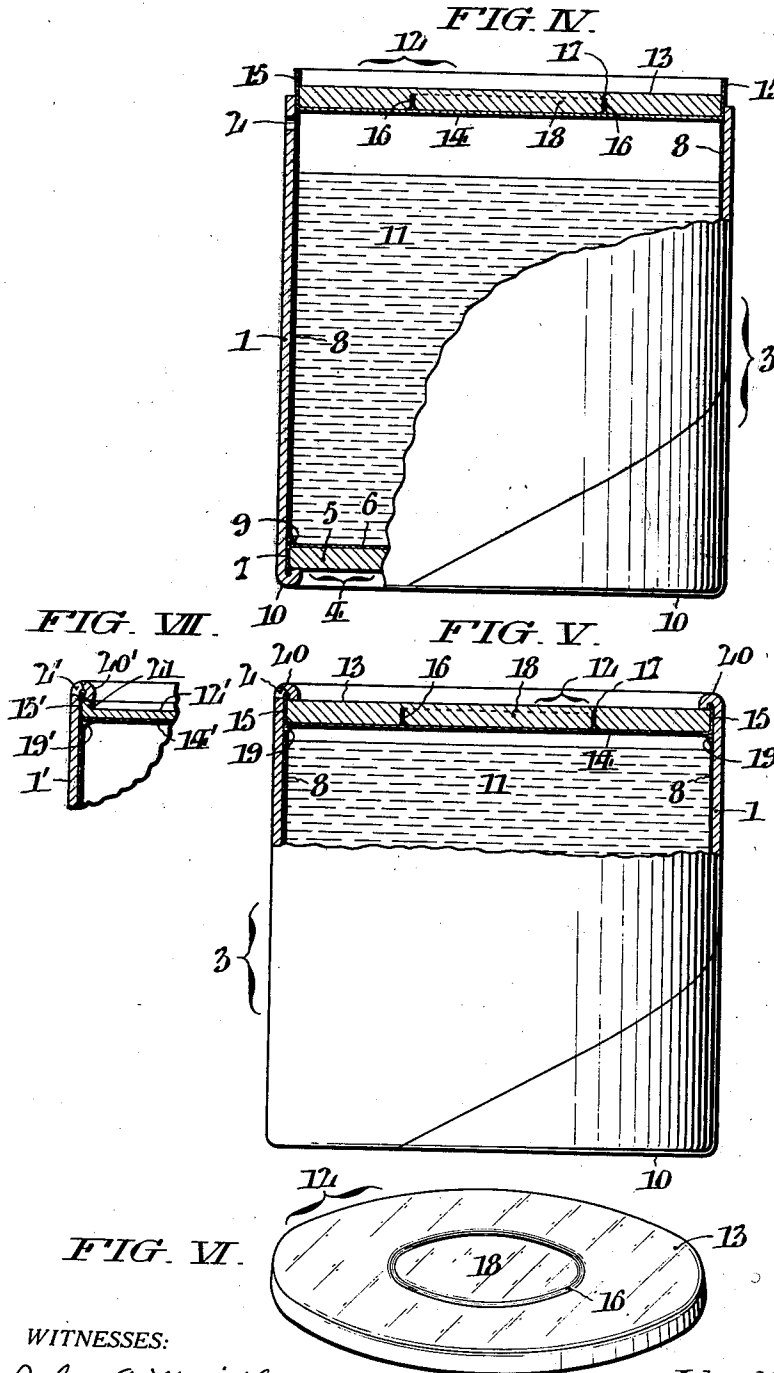
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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PAPER AND ANALOGOUS MATERIAL CONTAINER

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Application December 19, 1935, Serial No. 55,241

23 Claims. (Cl. 93—55.1)

This invention has reference to paper, fiber and analogous containers, and to a novel method of fabricating such containers, and sealing the same incident to filling.

5 The primary object of this invention is to produce paper or fiber containers preferably adapted for holding and shipping measured quantities of liquid.

10 Another object is to provide a container, for the purpose stated, having an interior thermoplastic coating with push-in ends adapted, incident to their insertion, to form interior leak-proof sealing-junctures with the surrounding wall.

15 A further object is to provide a container of the indicated type including means whereby the pressure intervening its content and the closure element is substantially evacuated or reduced to a negligible degree incident to application of said closure element.

20 A still further object is to provide a container closure-sealing element having a readily removable section serviceable for inspection or outlet purposes.

25 Other objects, as well as ancillary advantages, will hereinafter be referred to or become apparent from the following detailed description of practical embodiments of the invention, when considered in connection with the accompanying sheets of drawings illustrative of a preferred form of container fabricated in accordance with said invention.

In the drawings:

Fig. I is a view of a container fabricated in accordance with the invention.

35 Fig. II is a view showing a section of spirally wound paper or fiber tubing cut to the requisite length to form the body portion of the container illustrated in the preceding Figure.

40 Fig. III is a similar view, with the lower portion in diametric section to illustrate how the "bottom" is inserted and forms a surrounding leak-proof sealing-juncture with the container body wall.

45 Fig. IV is a part sectional and part elevational view showing how the bottom of the container is mechanically reinforced, with the closure or cover in initial entering-position, and said container filled to sealing capacity or level.

50 Fig. V is a similar view to the preceding, but illustrating the closure or cover in sealed position, and the upper end of the container mechanically reinforced in correspondence with the lower end.

55 Fig. VI is a perspective view of the closure element in inverted position; and

Fig. VII is a fragmentary sectional view of a modified form of the invention.

In all the views, corresponding parts are designated by the same or similar reference characters.

5 In carrying out the invention as particularly illustrated in Figs. I-IV, I take a predetermined 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, 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.

20 The length of thermoplastically lined tubing is next severed into sections suitable for the body shell 1, with a hole 2, or more if desirable adjacent one end thereof, for a purpose later on explained. This hole 2, or holes, is, or are, located at that end 25 of the body shell 1 destined to become the top of the container 3, and, after cooling, said section is ready for application of a tight-fitting bottom 4. The bottoms 4 are, preferably, made in the form of cardboard discs 5 having an applied facing 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 5 35 and applied, relatively larger diameter, "cellophane" facings 6 are suitably treated to effect flanging of said facing around the discs, as indicated at 7.

40 In applying the bottom 4 to the body shell 1, the former is heated to a temperature of from 230° to 250° Fahrenheit and suitably forced into the lower body shell 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 body shell 1 45 and is forced thereinto, the heat transmitted shall sufficiently soften the thermoplastic coating 8 to permit its being pushed forward by the bottom 4 to form a surrounding fillet 9 of the coating substance 8. This fillet 9 constitutes, by impervious adherence to the "cellophane" covering 6 of the bottom 4, a leak-proof permanent sealing-juncture between the container wall and its bottom end. In order to mechanically reinforce the parts 55

1 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, 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 body section 1 some of the coating 8 is left between the "cellophane" flange 7 and the inside of said section thus constituting a further sealing juncture.

The container 3 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 2 whereupon the tight-fitting top and closure or cover 12 is applied and forced-in, in the same manner as explained in connection with the bottom 4. The closure 12, shown separately in Fig. IV, consists of a cardboard disc 13 having a "cellophane" facing 14 flanged at 15 as before set forth, but this top disc is, preferably, formed with a concentric groove 16 which, when the said closure 12 is applied, extends from its underside well towards the exposed upper surface as indicated at 17, whereby the inner central portion 18 can be readily removed by a suitable cutting implement applied to the part 17, in an obvious manner.

At this juncture, it is to be particularly noted that as the closure 12 is forced into closure-position as shown in Fig. V, it not only forms a sealing-juncture fillet 19 corresponding with the bottom fillet 9, but during its passage inwardly over the vent hole 2 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 2 during application of the closure 12, a vacuum sealing of the container 3 can be effectively accomplished, while said closure is being forced "home". Still further, it will be understood that the central portion 18 of the closure 13 may be removed without cutting through the "cellophane" facing 14, 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 14 below the portion 18 can also be removed by a suitable implement, and the content poured out, or otherwise discharged from the container 3. Also, after the closure 12 is applied, the upper edge of the container 3 may be spun over inwards at 20 as and for the purpose explained in connection with its bottom end.

In the modified form of construction shown in Fig. VII, the closure 12' is made of the same material as the container body 1' and flanged circumferentially at 21 for stiffening purposes, but in all other respects said modification corresponds with the description of Figs. I-VI, similar reference characters being applied with a prime exponent to obviate repetitive explanation.

It is further to be understood the outside of the container body shell 1 or 1', as well as the outer surface of the closure members 4 and 12 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, 14 may be dispensed with, and the end pieces 4, 12 formed of thermo-

plastically 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 shell 1 may have an applied liner of "cellophane" in the form of a tube and the bottom and top discs 5, 13 be 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, 12 may be provided with removable inner portions 18; or said discs may be made in the form of annulae or without the removable inner portions 18. In inserting the bottom 4 or the top 12 into the body shell 1, heat may, of course, be applied around the ends of the latter to soften its thermoplastic coating 8, rather than to said ends 4 and 12.

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 the invention, I claim:

1. The method of fabricating containers which comprises forcing heated tight-fitting closures into the ends of a suitably-lined tube section with incidental formation thereof of permanent sealing juncture-fillets between the tube wall and the adjoining inner edges of said closures.

2. The method of fabricating thermoplastic-lined containers which comprises forcing into the container ends tight-fitting heated discs with incidental formation thereof of permanent sealing-junctures by inward displacement of part of the thermoplastic lining.

3. The method of fabricating containers interiorly coated with a thermoplastic which comprises forcing into the container ends tight-fitting heated discs, with incidental formation of inner leak-proof sealing fillet-junctures, by forward displacement of part of the thermoplastic coating; exhausting pressure from within the container when filled incidental to application of the closing disc to effect nonpressure sealing; and inwardly-retroverting the container extremities into edge abutment with the disc confronting surface and supplementally sealing the container ends.

4. The method of claim 3 wherein the thermoplastic coating consists of a synthetic resin, and the closure discs are similarly coated on their inner faces.

5. The method of claim 3 wherein the thermoplastic coating consists of a synthetic resin, and the closure discs are faced on their inner sides and around the edge with applied sheet "cellophane".

6. The method of fabricating a container of the character described which comprises forcing tight-fitting pieces into the ends of a body shell internally coated with thermoplastic while the latter is softened with heat, so as to form permanent leak-proof sealing fillet-junctures between the shell wall and the inner edges of the end pieces.

7. The method of fabricating a container of the character described which comprises forcing tight-fitting pieces into the ends of a body shell

internally coated with thermoplastic while the latter is softened with heat, so as to form leak-proof sealing fillet-junctures between the shell wall coating and the inner edges of the end pieces, and inwardly retroverting the shell extremities so as to reinforce the container ends.

8. The method of fabricating a container which comprises forcing into a body shell lined with a thermoplastic coating, while the latter is softened with heat, end members having "cellophane" inner facings with their margins flanged around the peripheries of said end members, so as to be squeezed tightly against the inner surface of the body shell and sealed thereto by fillet-forming displacement of the thermoplastic of its coating.

9. The method of producing containers which comprises forcing tight-fitting closure members faced with transparent material into the container ends, under applied heat, and incidentally incorporating the facing material peripheral edge into permanent leak-proof fillet-juncture with the container body wall.

10. The method of producing containers which comprises forcing closure discs faced on the inner side and surrounding edge with sheet "cellophane" into the container ends, under applied heat, and incidentally thereto incorporating the facing edges into leak-proof sealing-juncture with the container body wall.

11. The method of producing containers which comprises forcing closure discs faced on the inner side and surrounding edge with sheet "cellophane" into thermoplastic-lined body shells, under applied heat, and incidentally forming leak-proof sealing fillet-joints between the body shell thermoplastic lining and the "cellophane" facings of the respective closure ends.

12. The method of producing receptacles for oleaginous products by inserting a tight-fitting fibrous bottom disc, coated with oil-resistant thermoplastic on one face and on its periphery, into one end of a body shell also internally coated with a like thermoplastic, with incidental formation of a sealing fillet-juncture between the receptacle coating and that of the bottom disc peripheral edge; retroverting the circumferential edge of the body end until it meets the disc, with application of heat, to effect fusion with the coating; and in a like manner applying a coated fibrous cover disc to the other end of the receptacle after filling of the latter.

13. The method of producing receptacles for oleaginous products by inserting a fibrous disc having a lining of oil resistant sheet material, over its inner surface and edge, into one end of a body shell having an oil resistant inner coating; retroverting the circumferential edge of such end until it meets the disc with incidental inclusion of the fold of a projecting peripheral margin of the disc lining and, with application of heat, effecting fusion with the coating and incidental formation of a leak-proof sealing-fillet at the inside of the receptacle; and in a similar manner applying a fibrous cover disc to the other end of the receptacle after filling of the latter.

14. The method of producing receptacles for oleaginous products by inserting a fibrous disc covered on its inner face and around its peripheral edge with an oil resistant coating into one end of a similarly coated body shell to a position somewhat inward of the edge of such end; retroverting the circumferential edge until it meets the disc, with application of heat, to effect fusion of the coating around the joint; and in a similar

manner applying a fibrous cover disc to the other end of the receptacle after filling of the latter.

15. The method of packing oleaginous products in receptacles coated on the interior with a thermoplastic oil resistant material, said receptacle having an air escape aperture somewhat below its upper edge, by forcing-in a tight-fitting cover disc, similarly coated on one face and about its peripheral edge with like thermoplastic coating material, to a level below the air escape aperture with incidental evacuation of air pressure from within the receptacle by the cover disc overtraveling the said escape aperture, and retroverting the peripheral edge about the top of the container until it meets the disc, with incidental application of heat, to fuse the thermoplastic material and to form a fillet-seal around the joint.

16. The method of producing receptacles for oleaginous products by inserting a fibrous bottom disc, coated with oil-resistant thermoplastic on one face and on its periphery, into one end of a body shell also internally coated with an oil-resistant thermoplastic; retroverting the circumferential edge of such end until it meets the disc, with application of heat to effect fillet-forming fusion with the coating; and in a like manner applying a coated fibrous cover disc to the other end of the receptacle after filling of the latter.

17. The method of producing receptacles for oleaginous products by inserting a fibrous disc having a lining of oil-resistant sheet material over its inner surface and edge into one end of a body shell having an oil-resistant inner coating; retroverting the circumferential edge of such end until it meets the disc with incidental inclusion of the fold of a projecting peripheral margin of the disc lining and, with application of heat, effecting fillet-forming fusion with the coating at the inside of the receptacle; and in a similar manner applying a fibrous cover disc to the other end of the receptacle after filling of the latter.

18. The method of producing and filling paper containers which comprises inserting a tight-fitting bottom, having an inner facing of impervious thermoplastic material, into one end of the container with application of heat to form the container and effect a fused fillet-seal thereabout with the coating, and retroverting the adjoining end of said unit inwardly; filling the container thus formed with the desired substance; inserting a covering having an inner facing, similar to that of the bottom, into the container top with application of heat to form a fused fillet-seal with the container coating; displacing air pressure from above the container content incidental to the insertion of said covering; and retroverting the container top edge inwardly to complete the sealing operation.

19. The method of producing and filling paper containers, having an inner coating of impervious thermoplastic, which comprises forcing-in a tight-fitting bottom having an inner facing of sheet "cellophane", flanged outwardly thereabout, into one end of the container with application of heat to effect fused fillet-sealing of the container coating to the "cellophane" bottom facing, and retroverting the adjoining circumferential edge of the unit inwardly to complete the seal and reinforce the bottom of said unit; filling the container thus formed with the desired substance; inserting a cover having a similar "cellophane" facing and surrounding flange to that of the bottom into the container top with application of heat to effect a fused sealing fillet-joint with the container inner coating; exhausting air pressure

from above the container content as the cover is inserted and overtravels a vent orifice in the wall of said container; and retroverting the unit top edge circumferentially inwards to complete the seal and reinforce the container as aforesaid.

20. The method of fabricating containers which comprises forcing tight-fitting closures into the ends of internally coated tube sections with incidental formation of permanent sealing junctures between the tube wall and the adjoining inner edges of said closures.

21. The method of fabricating containers which comprises forcing tight-fitting end closures into the ends of corresponding section plastically-lined body sections with incidental formation of permanent interior sealing junctures between the body wall and the adjoining inner edges of said end closures.

22. The method of fabricating containers which

comprises forcing tight-fitting apertured-closures faced with a transparent medium to afford slight opening therethrough into suitably-lined body sections with incidental formation of interior sealing fillet-junctures between the container wall and the adjoining inner edges of said closures, as well as making provision for visual inspection of the container content.

23. The method of fabricating containers which comprises forcing tight-fitting centrally-apertured closures faced with a transparent oil-proof medium, to afford sight-opening therethrough, into suitably-lined body sections with incidental formation of permanent interior fillet-section sealing-junctures between the body wall and the adjoining inner peripheral edges of said end closures, as well as providing for visual inspection of the container content.

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