

Feb. 24, 1942.

W. A. ROSELLE

2,274,258

CONTAINER

Filed Oct. 30, 1939

Fig. 1.

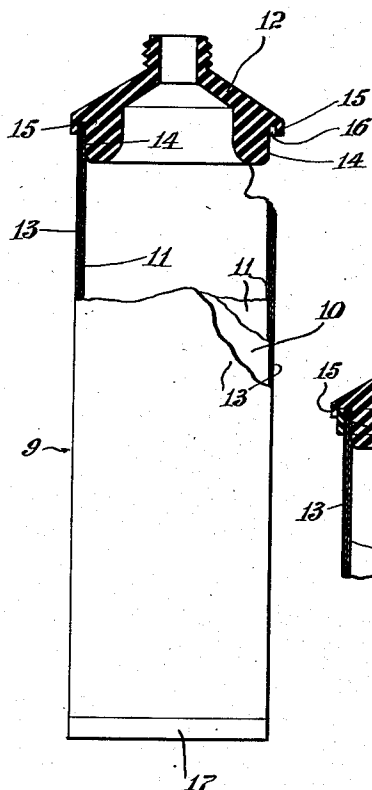


Fig. 2.

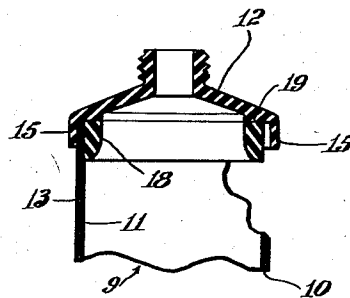


Fig. 5.

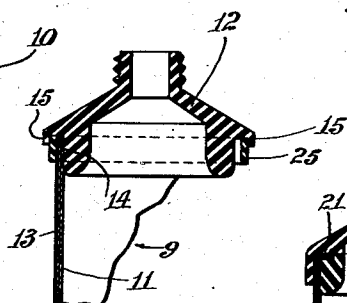


Fig. 3.

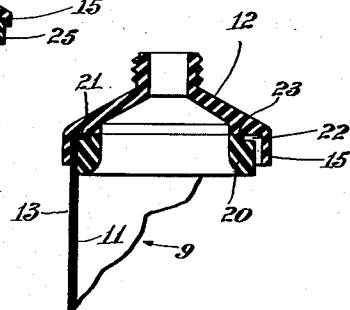


Fig. 6.

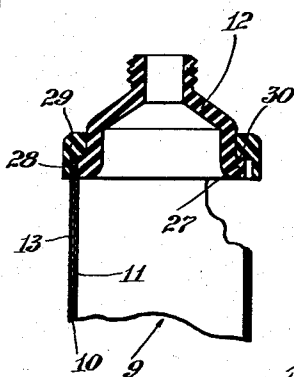


Fig. 4.

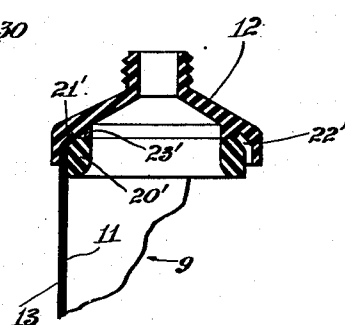
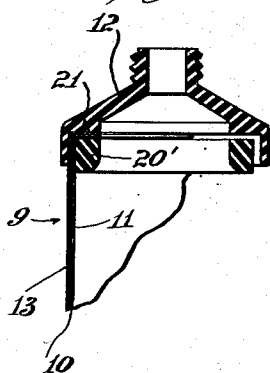


Fig. 7.



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UNITED STATES PATENT OFFICE

2,274,258

CONTAINER

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Application October 30, 1939, Serial No. 301,886

5 Claims. (Cl. 221-60)

My invention relates particularly to improvements in containers having bodies formed of laminations of metal and non-metal secured to non-metallic outlet members and especially to what are frequently called collapsible tubes of the general character of my Patents Nos. 2,002,718 and 2,038,760.

By my present invention I have sought to simplify the method and reduce the cost of construction. Another object is to provide a type of construction which is capable of reducing moisture loss of the contents to a minimum.

In carrying out the invention I provide a body portion and an outlet or top and in effect secure them together autogenously. The body consists of laminations of metallic foil and non-metallic film and the top is formed of a molded composition similar to the composition of the film. The top has a groove with inner and outer walls to which the inner and outer surfaces of the mouth of the body are secured. The body and top are united by applying to the parts to be united a chemical capable of dissolving or softening the surface of the material of the top and of the film so that they cohere without substantial change of structure when the solvent evaporates. In other words the two parts become welded together. The joint between the parts may be arranged in various ways such as shown herein and the composition employed may be varied.

Fig. 1 is a sectional view showing a simple form of joint involving a one-piece top with a groove.

Fig. 2 is a sectional view showing a top in which the inner support for the body wall is formed by an inserted ring secured to the remainder of the top.

Fig. 3 shows another form of joint in which the mouth of the tube body is flanged inwardly and secured between the main part of the top and an inner ring.

Fig. 4 shows another modification similar to Fig. 3.

Fig. 5 shows another form of joint in which an exterior reinforcing ring is provided.

Fig. 6 also shows an external ring as a part of the top.

Fig. 7 shows another form of joint with an inside ring.

The body 10 of the tube is formed of layers of metallic foil and non-metallic film secured together in any suitable manner and rolled either helically or spirally. The foil may be such as aluminum, tin or any other suitable metal. The film 11 on the inside should be of a composition

suitable for union with the top 12. The outside 13 may also be of the same composition.

I have found that material such as a cellulose acetate composition which is capable of being molded and also capable of being formed as a thin film is especially adapted to my purpose. A commercial molded composition known as "lumarith" and a film known as "protectoid" may be used as examples of the type or class of materials capable of being united by the use of a solvent such as acetone or mono methyl ether of ethylene glycol or a combination of the two. A commercial form of solvent is known as "methyl cellosolve."

Another commercial product suitable for molding is known as "tenite." The corresponding film material is known as "kotopac." A similar solvent may be used.

I have also found that the top may be formed of a material such as a vinyl resin compound as for example "Bakelite polystyrene" and the body surface of a film of substantially the same substance. In that case the solvent may be ethyl acetate.

The top is provided with a cylindrical or other shaped wall 14 to fit the inner edge of the mouth of the tube body. The top also has an outer wall 15 to fit the outer edge of the mouth of the tube body. Between the walls 14 and 15 is a groove 16, and the edge of the tube body is inserted into this groove after filling the groove or coating the edge of the tube body with the solvent. The walls of the groove may be tapered slightly so that the edge of the tube body may be wedged in. This is desirable and practical because of the fact that the solvent softens the surface of the film and of the groove walls.

The bottom of the tube may be closed at 17 in any suitable manner.

On account of the fact that in some cases it may not be practical to form a groove of sufficient depth in the rim of the top, I may provide a separate ring 18 of the same composition as the top and which furnishes the inner support for the edge of the tube body and may be welded or autogenously united with the tube body and to the wall 19 of the top. This takes the place of the wall 14 of Fig. 1.

In Fig. 3 I have shown another modification with an inner ring 20 of the same or similar composition to that of the top. The edge 21 of the tube body is flanged over and secured in the groove 22 in the edge of the ring 20. The solvent causes the film of the body to unite with the flange 15, the ring 20 and the wall 23 of the top.

The ring is similarly united with the wall 23 of the top member. This affords an especially strong joint between the tube body and the top.

Fig. 4 shows a similar arrangement but the groove 22' is formed in the main part of the top member and is inclined somewhat and the edge 21' is flanged inwardly at an angle somewhat less than 90°. The ring 20' is secured to the wall 23' of the top and to the edge of the tube body by a suitable solvent action as before described.

In Fig. 5 the groove 16' is made somewhat wider than groove 16 of Fig. 1 so as to accommodate a ring 25 of a composition analogous to that of the remainder of the top. This ring is welded or autogenously or homogeneously united to the outer wall of the body and to the wall 15 and to the top of the groove 16. This ring may be tapered in section so that it may be wedged into the groove 16 and thus afford a stronger joint.

In Fig. 6 another modification is shown in which the top has a flange 27 to which the edge 28 of the mouth of the body is attached. This edge 28 may be flanged over the upper edge of the flange 27 to provide additional holding power. The outer anchorage wall 28 is formed on a ring 29 instead of as a part of the top and this ring has a flange 30 which is seated on the flange 28 (or 27 in case 28 is omitted). It should be understood that these parts are all united by means of a solvent so that in effect they all constitute one piece when united.

Fig. 7 shows a form similar to Fig. 3 except that the ring 20' is welded to the body lining only and not directly to the top.

In selecting the composition to be used as the top and lining of the tube, due regard will of course be had as to the character of the substance with which the tube is to be filled. The composition must of course be inert or insoluble with respect to the contents. It should also be substantially moisture proof and should not impart any disagreeable odor or taste to the contents. The film used in a collapsible tube should be very pliable so that it will not crack when bent.

Any suitable form of closure device may be employed and of course the top will be suitably constructed to carry the type of closure desired.

The word "solvent" is used here in the sense of temporarily softening the surfaces sufficiently to enable the elements to unite.

In the form shown in Figs. 1, 2, 3, 4, 5 and 7 it is possible to apply pressure to the outer wall of the body around the part which is supported by the flange 14 in Fig. 1 or Fig. 5 or the ring 18 in Fig. 2, or the ring 20 in Fig. 3, or the ring 20' in Fig. 4 or Fig. 7, so as to aid in the union between the parts.

In the forms shown in Figs. 2, 3, 4, 6 and 7 the main part of the top and the ring may be pressed together for the same purpose.

The invention is especially directed to collapsible tubes where the problem of adequately uniting thin flexible material to a more or less rigid top has been found so difficult. In its broader aspects, however, I desire that the claims be limited only by their terms and as required by the prior art.

I claim:

1. A collapsible container comprising a one piece top member of molded plastic non-metallic composition having a transversely continuous rigid supporting inner wall and an outer wall spaced from the inner wall with a groove between them, and a tubular flexible body formed of laminations of metallic foil and of plastic

film, at least the inner and outer surfaces of the tubular body received within said groove being of similar chemical composition to the surfaces of the adjacent walls of the top member for autogenously welding the inner and outer groove walls of the top, and said walls and body being so welded whereby the inner wall supports the body against collapse and the outer wall supports the body against expansion, the inner wall being thicker than the wall of said tubular body and the end of the laminated body being sealed in the groove, between the inner and outer walls of the top member.

2. A collapsible container comprising a top member of molded plastic non-metallic composition having a transversely continuous rigid supporting inner wall, an outer wall spaced from the inner wall with a groove between them, and a tubular flexible body formed of laminations of metallic foil and of plastic film, at least the inner and outer surfaces of the tubular body received within said groove being of similar chemical composition to the surfaces of the adjacent walls for autogenously welding the inner and outer groove walls of the top, and said walls and body being so welded that the inner wall supports the body against collapse and the outer wall supports the body against expansion, the inner wall of the top being thicker than the wall of said tubular body and longer than the outer wall of the top, whereby the body may be pressed against the inner wall while being welded to the top and the inner wall reinforcing the body adjacent the groove against being distorted and bent by external pressure to insure the security of the body in the groove.

3. A collapsible container comprising an integral top member of molded plastic non-metallic composition having a transversely continuous rigid supporting flange or wall, an end wall or abutment extending outwardly from said flange and a tubular flexible body formed of laminations of metallic foil and of plastic film, said body fitting over said flange and being of less thickness than the flange, at least the inner and outer surfaces of said body adjacent the top being of material similar to that of the top and the inner surface being pressed against and autogenously welded to the top along the flange, the end wall or abutment being also welded to the ends of the inner and outer surfaces of the body and the end of the laminated body hermetically sealed.

4. A collapsible container comprising a one piece top member of integral molded plastic non-metallic composition having a transversely continuous rigid supporting inner wall, an outer concentric wall integral with but spaced from the inner wall with a groove between the walls, and a tubular flexible laminated body formed of metallic foil with inside and outside layers of plastic film, at least the end portion of the body within said groove having an inner surface of a chemical composition similar to that of the top member to be welded to the inner wall thereof, said inner wall being welded within said groove to at least the inner surface of the tubular body, the inner wall of the top member being thicker than the wall of said tubular body and longer than the outer wall of the top member to form an extended welded union, said inner wall of the top member also reinforcing the body of the tube outside and adjacent said groove to insure the security of the body in said groove.

5. A collapsible container comprising a top

member of molded plastic non-metallic composition having a flange constituting a continuous rigid supporting inner wall, a second flange constituting an outer wall spaced from the inner wall with a groove between them, and a tubular flexible body having inner and outer surfaces of plastic composition, at least the inner and outer surfaces of the tubular body received within said groove being of similar composition to the surfaces of the adjacent walls of the top member and autogenously welded to the inner and outer walls of the groove of the top member whereby

the inner flange supports the body against collapse and the outer flange supports the body against expansion, the inner flange being thicker than the wall of said tubular body and longer 5 than the outer flange to support the body, whereby the body may be pressed against the inner flange while being welded to the top member and the outer flange shields the body against being expanded and bent around an end of the 10 outer flange by internal pressure.

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