Sept. 17, 1940. V. HIMMER 2,215,268

CONTAINER

Filed July 7, 1938

Fig. 1

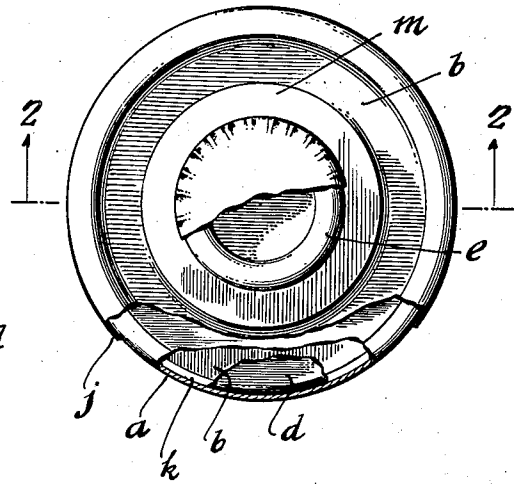


Fig. 2

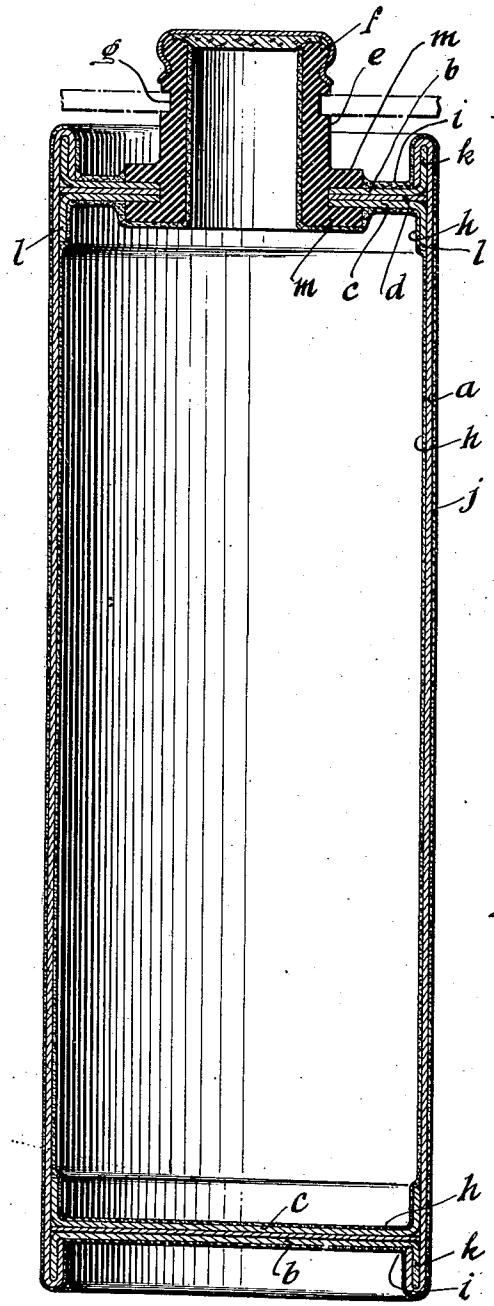
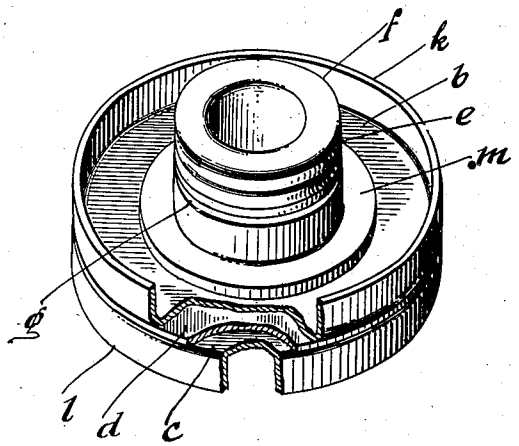


Fig. 3



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CONTAINER

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3 Claims. (Cl. 229—3.1)

This invention relates to an improved container for the storage and shipment of liquids.

A further object of the invention is that of furnishing a unit of this character ideally suited for the storing and dispensing of carbonated or other liquids having relatively high internal pressure.

A still further object is that of providing a container from which liquids may readily be dispensed and which container may have a sealing means associated with it to assure of the maintenance of the stored liquid without spillage, deterioration or loss of carbonated gas.

Another object is that of providing a container which will not contaminate or transmit by odor or taste any objectionable characteristics to the liquids contained therein.

With these and other objects in mind, reference is had to the attached sheet of drawings, illustrating one practical embodiment of the invention, and in which:

Fig. 1 is a plan view of the container with certain of the parts broken away to show underlying construction;

Fig. 2 is a sectional view taken along the lines 2—2 and in the direction of the arrows of Fig. 1; and

Fig. 3 is a perspective view of the top of a container as constructed in accordance with the teachings of my invention.

This application is a continuation in part of my application Serial No. 92,982, filed July 28, 1936.

In the illustrated embodiment, I have shown my invention applied to a preferred form or arrangement for making a high-pressure resisting beverage container and it is understood that this is only illustrative, that certain deviations, substitutes or mechanical equivalents, or use for non-carbonated or non-pressure beverages or other liquid or viscous materials, would not deviate from the spirit of the invention.

Thus *a* illustrates the outer housing wall or body of the primary container structure. This wall is preferably made of a plurality of plys or a number of convolutions of suitable paper rolled upon a mandrel with a suitable adhesive between the layers.

The ends of the container are formed by paper discs *b* and *c* separated and secured together by a stiffening filler plate or disc *d* adhesively attached to them. Each of the end discs *b* is provided with an annular peripheral flange *k* which contacts tightly with the inner surface of the cylindrical wall *a* of the container and to which it is secured by suitable adhesive. As will appear from the drawing, said flange *k* extends outwardly or toward the ends of the container. The inner cover discs *c* are similarly provided with inwardly extending annular flanges *l* similarly secured to the inner wall *a* of the container. The embodied means for further securely fastening the end members to the cylindrical container and integrating same therewith comprises the provision of cylindrical extensions at either end of the side wall *a* of the container, which extensions are curled, clamped or folded and formed over and inwardly along the inner surface of the flanges *k*, *k* and are secured thereto by suitable adhesive previously applied to the surfaces to be secured. Thus the flanges *k*, *k* of the end pieces *b* are adhesively attached to the inner walls of the container which are in turn folded over and inwardly and preferably the inwardly folded ends of said container *a* extend to meet or lie against the outer surfaces of the discs *b*. The construction, as shown and described, is useful in providing a substantially strong and rigid structure which can be readily formed with simple dies or other well known methods and readily assembled. It will be understood, however, that my invention is not limited to any particular physical construction of the end closures of the container, as will be clear from the appended claims.

It is to be noted that one end, constituting the bottom of the container structure is preferably made imperforate, and the opposite end assembly, defining the top, is preferably made with an opening for filling and emptying the container. Thus the upper end pieces *b* and *c*, with the stiffening plate *d*, before being inserted and secured to the tubular body portion *a* have attached, the neck or spout member *e*. This member may be a molded compound and mechanical equivalents may be employed in the form of a flanged member with a threaded neck portion, embracing the end parts *b* and *c* and secured with a locking nut. Regardless of the material and particular configuration of this member, it will be observed that in effect the stiffening plate *d* provides an enlarged flange portion forming a part of the member.

After the body portion of the container structure is completely assembled, with ends inserted and secured with suitable adhesive and the ends of the body portion *a* formed and crimped or flanged over the edges of the end pieces *b* and *b*, the container housing form is thoroughly dried to remove all moisture from the adhesive used.

The fibrous structure is now used as a form

to support within it, an impervious, tasteless, odorless, non-toxic pressure-resisting, elastic and flexible compound, which, when set, constitutes a secondary water and gas impervious container within the fibrous form structure, as illustrated, at *h*.

I have discovered that materials which have a permeation or impregnation characteristic property, as a rule are unsuited as a lining material to resist or sustain pressure. I have also discovered that materials in soluble form, after the evaporation of the solvent, usually leave voids when the compound has dried or set; such voids forming minute channels for the passage and escape of the retained pressure. Such materials as waxes of all kinds, synthetic rubber compounds, synthetic resin varnishes and lacquers, commonly considered to be impervious are entirely unsuited for resisting air, gas or liquids under pressure. This is partly due to the lack of density of the structure or the voids between crystals. I have found that all soluble compounds, used in liquid state, when dry, retain a considerable quantity of residual solvent for a long time, which imparts to beverages with which it comes into contact, detrimental characteristics either in the form of taste or odor or both.

I have accordingly formulated a compound which is free from these defects, consisting of rosin (colophony) as a base material. Hard rosin has a very dense structure, but is very brittle; if applied in a thin film it is subject to checking, fracture and similar injury from slight changes of temperature and rough handling. It is of course obvious that if such a film were used to confine gases or liquids and fractured, the gases or liquids, especially if under pressure, would readily escape.

Moreover, in order for the rosin to be employed as a liner material in connection with containers for carbonated liquids it must be free from oils or soft gums containing oils, which would have a deleterious effect upon the carbonation or otherwise detrimentally affect the contained liquid. I have also discovered that the objections are not simply overcome by employing conventional plasticizing materials, in that they either reduce the melting point of the rosin compound and/or impart to it an undesired taste or odor.

I have, however, found that I can plasticize said compound with a rosin a suitable quantity of polymerized hydrocarbon essentially of straight chain structure. In other words, there is included polymerized isobutylene, which is a polymerized product produced from a hydrocarbon derived for example from the refining of petroleum.

Such a compound results in a product which may readily be caused to flow at proper working temperatures, but which will not melt when subject to temperatures approximating, for example, those commonly used in pasteurizing nor crack or fracture at freezing temperature. The product is flexible, elastic, and tough and readily adheres to a surface to which it is applied. These characteristics may be controlled within any desired limits, depending upon the quantity of the hydrocarbon polymer compounded with the rosin base. It is to be emphasized that the addition of the polymer does not affect the melting point of the compound materially. I preferably employ not less than five to fifteen per cent by weight of the polymerized isobutylene as a plasticizing medium.

The nature of the finished formulated plasticized rosin compound and hydrocarbon polymer is such that the application of the compound is easily accomplished by melting the compound and pouring it into the paper container form and immediately emptying it. A thin dense glazed film *h* will adhere to the inner surface of the container, forming a quasi glass-like inner impervious container within the form housing which imparts the necessary form, strength and structure, this inner container also possessing great elasticity. Since this plasticized compound has no penetration, saturation or impregnation properties, and is poured or applied into the form in a molten state and emptied immediately in the same manner in which slush castings are molded, it is obvious that the impervious or secondary container is a molded impervious container itself, which acquires support from the rigidifying outer container.

Thus, among others, the several objects of the invention as specifically aforenoted are achieved. It will be obvious that numerous changes in construction and rearrangements of the parts might be resorted to without departing from the spirit of the invention as defined by the claims, which are:

1. A liquid and gas impervious container for packaging liquids for human consumption consisting of an interior, impervious film formed principally from a mixture of resin and polymerized isobutylene both of which are tasteless, odorless and non-toxic, said film being supported to resist pressure by means of a rigidifying structure, said rigidifying structure and film being sufficiently flexible to withstand internal pressure without destroying the impermeability of the film.

2. A liquid and gas impervious container for packaging liquids for human consumption consisting of a continuous interior, water and gas-impervious, dry, non-tacky film, composed of rosin and polymerized isobutylene, which is tasteless, odorless, non-toxic and sufficiently flexible to avoid cracking by normal flexure caused by internal pressure and an exterior supporting structure upon which the film is adherent.

3. A liquid and gas impervious container for packaging liquids for human consumption consisting of a continuous interior, water and gas-impervious, dry, non-tacky film composed of 5 to 15 per cent polymerized isobutylene and 80 to 95 per cent rosin, which is tasteless, odorless, non-toxic and sufficiently flexible to avoid cracking by normal flexure caused by internal pressure and an exterior supporting structure upon which the film is adherent.

VITALIS HIMMER.