

April 4, 1950

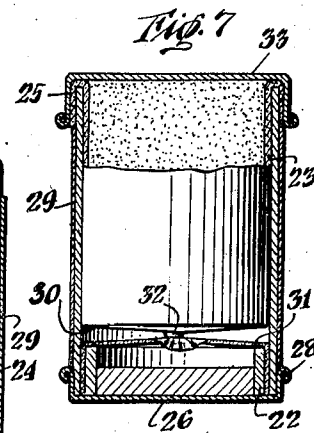
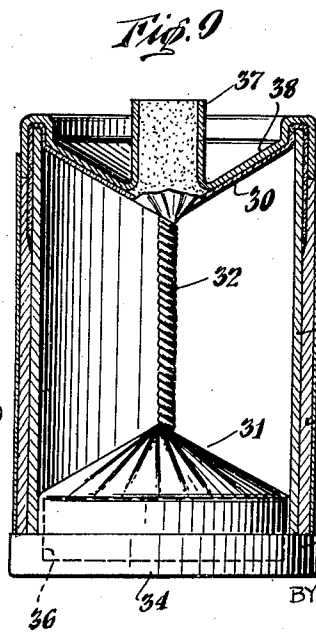
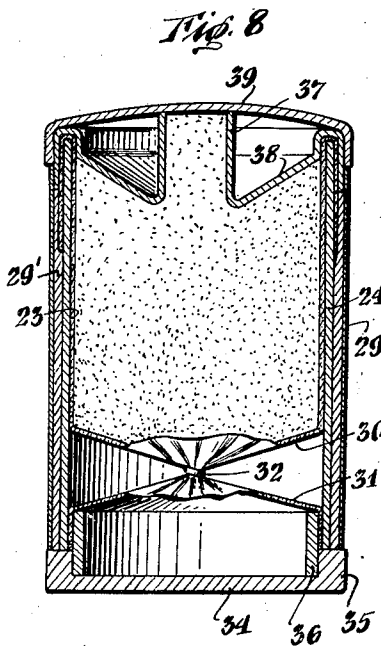
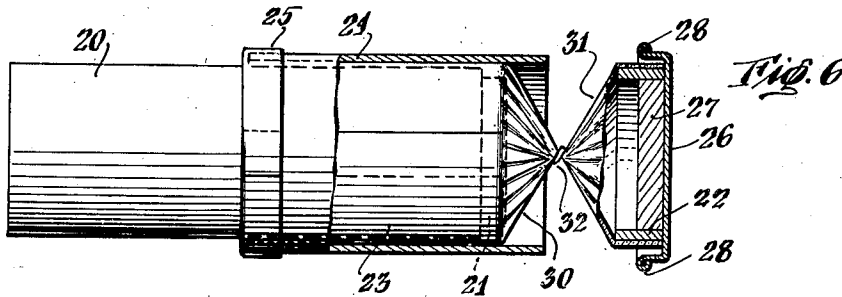
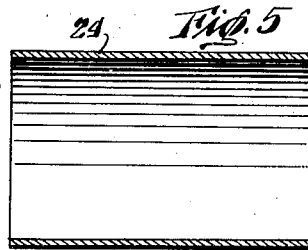
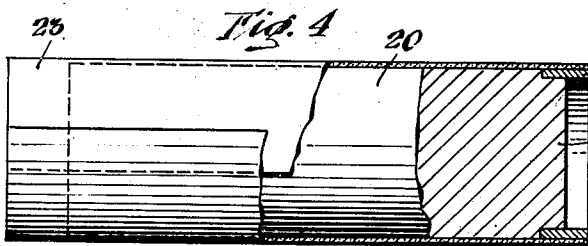
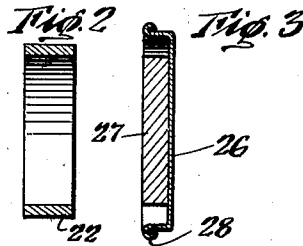
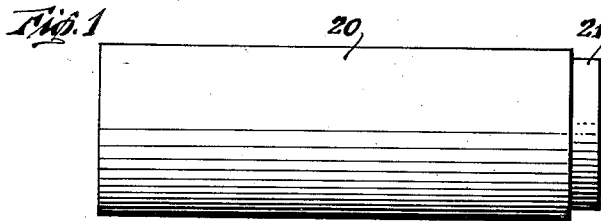
D. BERESFORD

2,502,918

TWISTING TYPE COLLAPSIBLE TUBE DISPENSER

Filed Oct. 25, 1945

2 Sheets-Sheet 1



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April 4, 1950

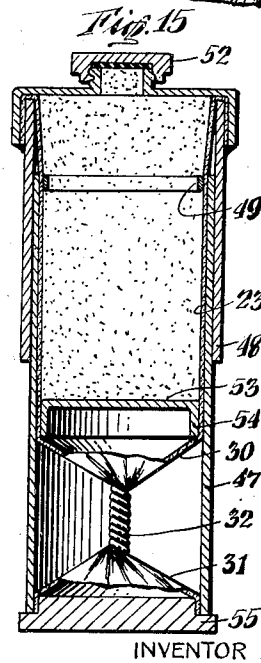
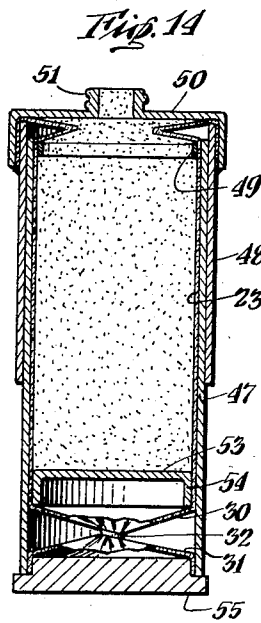
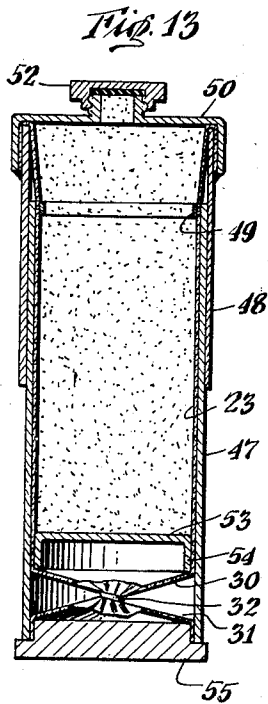
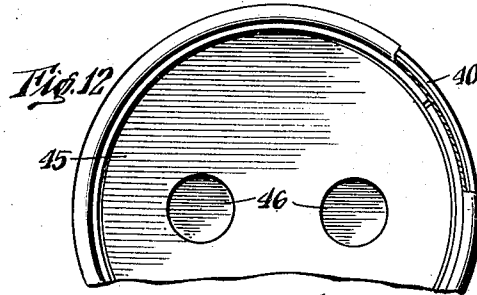
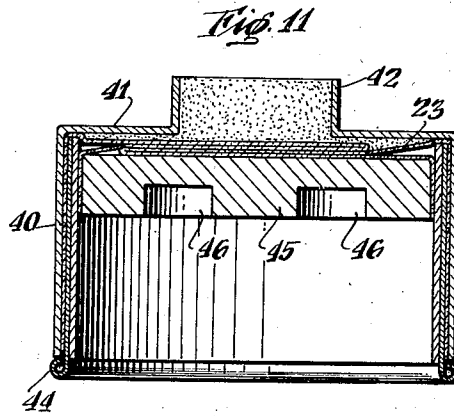
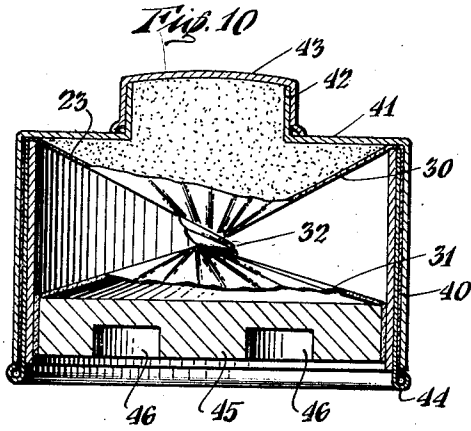
D. BERESFORD

2,502,918

TWISTING TYPE COLLAPSIBLE TUBE DISPENSER

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2 Sheets-Sheet 2



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# UNITED STATES PATENT OFFICE

2,502,918

## TWISTING TYPE COLLAPSIBLE TUBE DISPENSER

Dorothy Beresford, Clifton, N. J.

Application October 25, 1945, Serial No. 624,537

4 Claims. (Cl. 222-104)

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This invention relates to an improved container.

It is an object of the invention to provide an improved container which will serve not only as a commercial package in which merchandise is displayed and sold and as a receptacle for holding and storing materials but also as a dispenser for dispensing materials of a fluid, semi-fluid or plastic character.

My invention pertains particularly to containers having an envelope or inner casing made of flexible material in which the contents of the container are packed. The contents may be expelled or dispensed from the envelope by twisting a portion of the envelope around its longitudinal axis. Containers of this type have not heretofore been satisfactory or practical.

It is an object of the present invention to overcome the difficulties heretofore encountered and to provide an improved container having an envelope made of flexible material which is so formed that the contents of the package will be securely retained therein and protected against leakage but which will readily dispense the contents by twisting one portion of the envelope with respect to the remainder. I accomplish the desired results by providing a supporting casing or frame having an envelope therein made of flexible sheet material, the envelope being connected adjacent its open end to the frame or casing so that it cannot rotate and another portion of the envelope being formed into a pair of spaced diaphragms with an intermediate twisted portion. By rotating the lower diaphragm with respect to the upper diaphragm the upper diaphragm is caused to shift towards the open end of the envelope with the result that the contents are dispensed therefrom. The double diaphragm arrangement affords maximum protection against leakage and also gives increased torque or leverage for facilitating the operation of the dispensing unit.

A further object is the provision of an improved method of making the container by forming the diaphragms while the envelope is disposed around a mandrel. This not only simplifies the method of manufacture but also provides a maximum amount of usable space inside the envelope for the contents of the container.

Other objects of my invention include the provision of an improved container which is attractive in appearance, which is relatively inexpensive to manufacture, which may be used for many purposes such as a commercial package or dispensing unit and which is strong in construction

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so as to give satisfactory service over a long period of time.

This application is similar to my co-pending application Serial No. 559,183, filed on October 18, 1944, and which has since become abandoned.

In the drawings

Fig. 1 is a mandrel which may be used in making a package embodying my invention,

Fig. 2 shows a ring which may be used in forming the base of the package,

Fig. 3 shows a cap used in making the base cap of the package,

Fig. 4 illustrates a step in one method of making my container,

Fig. 5 illustrates a tube which may be used in forming the wall of the outer casing,

Fig. 6 illustrates another step in one method of making my container,

Fig. 7 illustrates a completed container embodying my invention,

Figs. 8 and 9 are elevational views in section of a modified type of container embodying my invention,

Figs. 10 and 11 are elevational views in section of another modified type of container embodying my invention,

Fig. 12 is a bottom plan view partially broken away of the form of container shown in Figs. 10 and 11 and,

Figs. 13, 14 and 15 are elevational views in section of a further modified container embodying my invention.

As previously stated my invention comprises a rigid outer casing or frame and an inner flexible envelope connected adjacent its open end to the outer casing and formed at another portion with a pair of spaced diaphragms and an intermediate twisted portion.

The container and inner envelope may be made in any desired manner, however, one very satisfactory manner is shown in Figs. 1-7 of the drawings. In accordance with this method I provide a mandrel 20 having a stepped portion of slightly lesser diameter at one end as indicated at 21. As the first step in making the container I place a ring 22 made of cardboard, fibre, plastic, wood or metal over the end 21 of the mandrel 20 as illustrated in Fig. 4 and wrap a sheet of suitable flexible material around the mandrel and ring 22 so as to form a tubular envelope 23. The sheet material employed should be flexible and sufficiently strong to hold the contents of the container, also chemically resistant to the contents of the container and capable of withstanding twisting without rupture

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or tearing. I have found that satisfactory sheet materials for this purpose include rubber base materials of the type commercially available under the names of Pliofilm and Thermofilm and also plastic sheet materials such as cellulose acetate and also cellulose sheet materials particularly moisture-proof cellophane.

In forming the sheet material into an envelope I first pre-coat the exterior surface of ring 22 with a suitable adhesive then wrap the sheet material around the ring and mandrel with the longitudinal edges in overlapped relationship as shown in Fig. 4 and with the end opposite ring 22 projecting slightly beyond the mandrel. Where a thermoplastic material is employed such as Pliofilm or cellulose acetate the overlapped edges may be sealed together by means of heat and pressure applied thereto. Where a non-thermoplastic material is employed such as moisture-proof cellophane the overlapped edges can be secured by a suitable adhesive. In either case the overlapped edges in the portion of the envelope projecting beyond mandrel 20 are not secured together but are left unattached.

In order to form a rigid outer casing or frame for the container I next provide a tubular member 24 of such a diameter that it can be fitted over the mandrel and envelope. The tubular member is somewhat shorter than the mandrel and envelope and is slipped over the mandrel and envelope to the extreme left-hand end of the mandrel as viewed in Fig. 4 and the protruding end of the envelope is folded back over the exterior of the tubular member and adhesively secured thereto as shown at 25 in Fig. 6.

Thereafter base cap 26 is connected to ring 22. Thus, base cap 26 has a central disc portion 27 suitably attached thereto which fits into and is adhesively secured to ring 22 and a peripheral flange 28 spaced therefrom which surrounds and overlaps the ring and the end of the envelope 23. When the base cap is applied to the end of the container, ring 22 fits into the tubular member and flange 28 embraces the lower end thereof. If desired an outer layer of moisture-proof or grease-proof material may be secured around casing 24 as shown at 29. The layer 29 preferably terminates a short distance from the open or left-handed end of casing 24 and extends downwardly terminating at or near the base thereof.

The mandrel 20 is then partially withdrawn from the container as shown in Fig. 6 so that the right-hand end of the mandrel is within tubular casing 24 and the base cap is rotated preferably in a clockwise direction forming a pair of diaphragm portions 30 and 31 with an intermediate twisted portion 32. Twisting the base cap so as to form the two diaphragm portions and the intermediate twisted portion results in a shortening of the envelope. The cap should be twisted sufficiently so that the ring portion 22 may be inserted inside tubular casing 24 as shown in Fig. 7. While the diaphragms are being formed the mandrel should be left inside the envelope and casing with its end positioned near the right-hand end of the casing as shown in Fig. 6. In this manner the diaphragms are formed in close proximity to each other and to the base of the container leaving a maximum amount of space in the envelope for the contents of the container.

Up to this point the mandrel 20 is left inside the container a short distance from the inner or lower end of the casing 24 so that diaphragm portion 30 will be formed near the lower end of

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the casing. Thereafter the mandrel is removed and the contents may be placed inside the envelope and a suitable cap or closure 33 may be provided for the upper end thereof.

Referring to Fig. 7 it will be seen that the diaphragms are spaced in close proximity to each other and to the base thereby leaving a maximum amount of space available for the contents.

To dispense the contents from the container the closure cap is removed and the base cap is rotated in a clockwise direction. This increases the length of the twisted portion 32 and causes diaphragm portion 30 to shift upwardly toward the open end of the container dispensing or ejecting the contents therefrom. The double diaphragm arrangement affords adequate protection against leakage and facilitates the operation of the dispensing mechanism.

It will be seen that the container may be used for holding many different types of materials and articles however, it is particularly suitable for holding and dispensing fluid, semi-fluid, and plastic materials or finely divided material having some of the characteristics of fluids. Thus, it may be used for cold cream, shaving cream, petroleum jelly, hydrogenated oil products, lard finely divided or powdered materials and the like.

In Figs. 8 and 9 I have shown a modified form of the container in which I provide the flexible envelope 23, having diaphragm portions 30 and 31 and twisted portion 32, rigid casing 24 having the outer transparent protecting layer 29 an intermediate decorative layer 29'; and a slightly modified type of base cap 34 having a peripheral flange 35 which fits against the lower end of the rigid casing and a ring 36 projecting into the casing. The flexible envelope is adhesively secured to the exterior of ring 36 at its lower end and extends over and is secured to the outer surface of rigid casing 24 at its upper end.

At the top of the container I provide a dispensing spout 31 through which the contents of the container may be dispensed upon the rotation of base cap 34. The spout is centrally positioned on a cap 38 attached to the top of the rigid casing. In this connection I form the cap 38 in the manner indicated with the central portion projecting downwardly at an angle inside the container for the purpose of insuring complete dispensing of the contents of the container. When cap 34 is rotated the twisted area 32 becomes more elongated causing diaphragm portion 30 to shift upwardly. Fig. 8 shows the container with a small portion of the contents dispensed therefrom and it will be noted that the diaphragms assume a conical formation. Cap 38 is made to conform with the shape of diaphragm 30. Thus, when base cap 34 has been rotated so as to shift diaphragm 30 to the top of the container the diaphragm is in contact with cap 38 as shown in Fig. 9 with the result that the contents of the container have been completely dispensed into the spout. If desired a removable closure 39 may be fitted over the end of the container.

Referring now to the form of my invention shown in Figs. 10, 11 and 12 I have here illustrated another type of container which permits all of the contents to be ejected therefrom. Thus, I have provided an envelope 23 made of flexible material and similar in construction to the envelope in the other forms of my invention. It is open at its upper end and is provided with a twisted area 32 at an intermediate point thereby forming diaphragm portions 30 and 31. The

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upper end of the envelope is attached to the rigid casing 40 which may be made of several layers of material as shown. The casing extends over the top of the container as shown at 41 and is provided with a centrally disposed dispensing spout 42 which may be closed by a closure cap 43.

At its lower end the casing may be provided with a peripheral supporting bead 44 upon which the container rests. The lower end of envelope 23 particularly the periphery of diaphragm 31 is secured around the periphery of disc 45 which is positioned in the lower end of casing 40 and serves as an operating handle. When cap 43 is removed and disc 45 is rotated in a clockwise direction the twisted area 32 of the envelope becomes more elongated shifting diaphragm portion 30 upwardly and forcing the contents of the container outwardly through spout 42. When the container has been more than 50% emptied and the diaphragm portion 30 has been shifted to adjacent the top of the container it is of angular or conical formation as shown in Fig. 10. In order to dispense the remaining contents of the container, disc 45 is manually pressed upwardly as shown in Fig. 11. To facilitate the rotation of disc 45 I preferably provide a pair of recesses 46.

In Figs. 13, 14 and 15 I have shown another form of my invention by means of which a measured or predetermined amount of the contents may be dispensed. As in the prior forms of my invention the container includes the envelope 23 made of flexible material having twisted area 32 which forms diaphragm portions 30 and 31. It is also provided with a rigid outer casing but in this form of my invention the rigid outer casing is telescopic consisting of a lower section 47 and upper section 48 which has a sliding fit with the exterior of the lower section.

The upper or open end of envelope 23 extends over the top of upper section 48 and is suitably secured around the outside thereof. A rigid ring 49 is tightly fitted inside the upper portion of lower casing section 47. The ring either has tight frictional engagement with the envelope and casing section 47 at this point or an adhesive is used to secure the ring to the inner surface of the envelope and the envelope to the upper portion of casing section 47 in the area of the ring. A cap 50 is fitted over the top of casing section 48 and is provided with a dispensing spout 51 which may be provided with a removable closure 52. In order to provide for complete dispensing of the entire contents of the container I preferably provide a rigid disc 53 inside the envelope immediately above diaphragm portion 30. The disc is provided with a peripheral portion 54 of substantial width which serves as a guide to maintain the disc in horizontal position as it is fed upwardly. The disc is inserted inside the envelope before filling the container.

The lower portion of the envelope particularly the peripheral edge of diaphragm portion 31 is secured to disc 55 which has a plug portion fitted into the lower end of the casing and a base portion upon which the lower end of the casing rests. Rotation of disc 55 serves to elongate the twisted area and to shift diaphragm portion 30 and disc 53 upwardly.

In using this form of my container the casing sections are arranged in extended position as shown in Figs. 13 and 15 with cap 52 in place.

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Disc 55 is rotated in a clockwise direction until the upper portion of the container above ring 49 has been filled. Thereafter cap 52 may be removed and the upper casing section is telescoped or shifted downwardly over the lower casing until it assumes the position shown in Fig. 14. The result is that the material in the upper portion of the container above ring 49 is dispensed therefrom. The casing sections can again be extended, closure cap 52 replaced, and the operation repeated. In this manner a uniform predetermined amount can always be dispensed from the container.

From the foregoing it will be appreciated that I have provided an improved container which may serve as a commercial package or as a receptacle or as a dispenser. It will also be appreciated that the container is of relatively inexpensive construction but nevertheless will perform its intended function over a relatively long period of time. Modifications may be made in the illustrated and described embodiments without departing from my invention as set forth in the accompanying claims.

I claim:

1. The method of making a container having a rigid tubular casing and a flexible envelope therein which comprises arranging the flexible envelope on a mandrel so that the envelope projects beyond at least one end of the mandrel, superimposing the rigid tubular casing over the envelope and mandrel, then twisting the portion of the envelope which projects beyond the mandrel to provide a diaphragm portion and a twisted portion projecting therefrom, and next withdrawing the mandrel from the envelope and casing.

2. The method of making a container having a rigid tubular casing and a flexible envelope therein which comprises arranging the flexible envelope on a mandrel with the envelope projecting substantially beyond the mandrel at one end, superimposing the rigid tubular casing over the envelope and mandrel with the casing projecting slightly beyond the mandrel at the same end, then twisting the projecting end of the envelope so as to provide a diaphragm portion and a twisted portion projecting therefrom, and next withdrawing the mandrel from the envelope and casing.

3. The method of making a container having a rigid tubular casing and a flexible envelope therein which comprises first forming the flexible envelope around a mandrel, then superimposing the rigid tubular casing over the envelope and mandrel and attaching a handle member to one end of the envelope, next partially withdrawing the mandrel from the envelope and casing so that the end of the envelope to which the handle is attached projects substantially beyond the mandrel and so that the corresponding end of the casing projects slightly beyond the mandrel then rotating the handle relative to the casing, envelope and mandrel so as to provide a pair of diaphragms and an intermediate twisted portion in the envelope adjacent the end of the casing, and then withdrawing the mandrel from the envelope and casing.

4. A container comprising a relatively rigid tubular casing having a dispensing opening at one end and a base opening at the other end, a tubular envelope made of flexible material open at one end and connected adjacent said open end to said tubular casing at a point adjacent the dispensing opening, said envelope being twisted around its longitudinal axis at a point spaced

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from the opening in the envelope so as to provide a diaphragm with a twisted portion extending therefrom and a plug fitted relatively snugly into the base opening of the casing and rotatable and shiftable longitudinally for substantially the entire length of the casing and connected to the envelope beyond the diaphragm portion, said plug being cooperable when rotated to cause an elongation of the twisted area and a shifting of the diaphragm portion towards the opening in the envelope and said plug being also manually shiftable longitudinally of the casing to shift the diaphragm and the contents of the envelope towards the aforesaid opening in the envelope.

DOROTHY BERESFORD.

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