

Sept. 6, 1938.

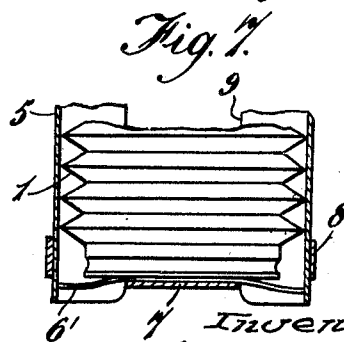
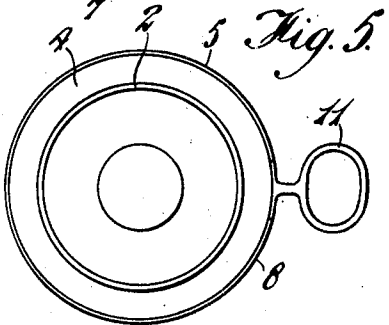
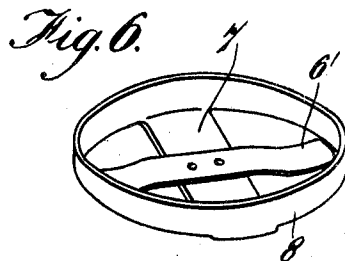
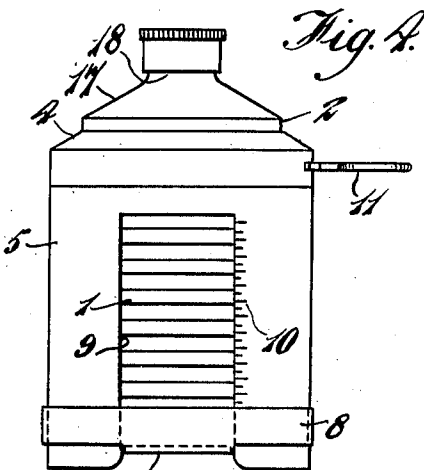
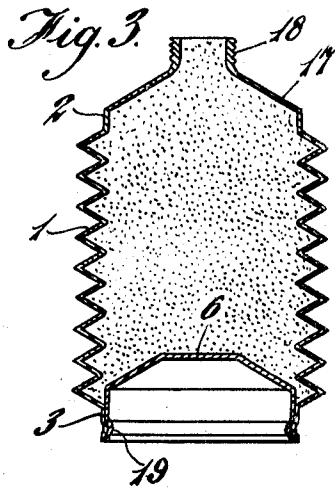
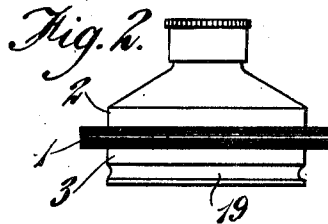
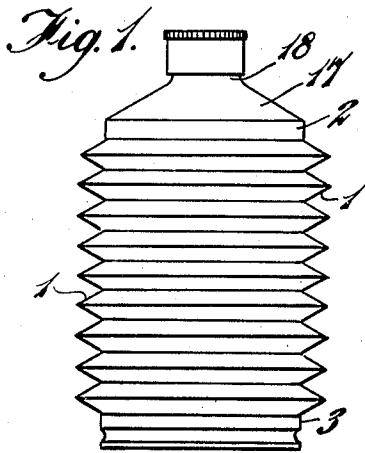
C. DAVIS

2,129,119

EXTRUSION CONTAINER

Filed April 22, 1937

2 Sheets-Sheet 1



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2,129,119

EXTRUSION CONTAINER

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2 Sheets-Sheet 2

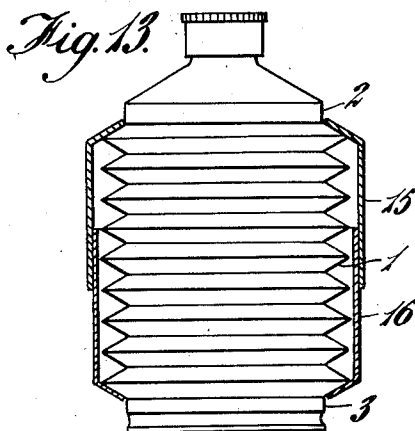
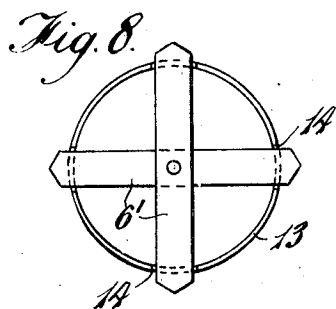


Fig. 14.

Fig. 10.

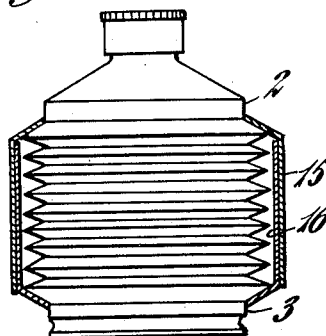
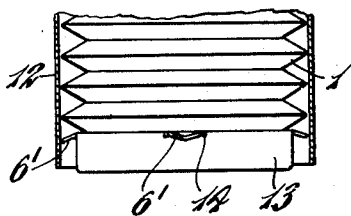
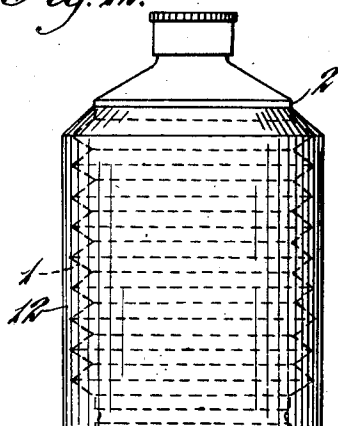
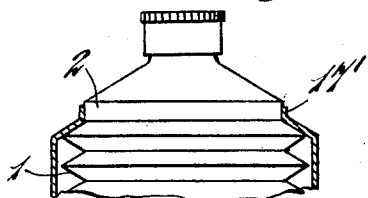


Fig. 11.



Fig. 12.

Fig. 15.



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UNITED STATES PATENT OFFICE

2,129,119

EXTRUSION CONTAINER

Charles Davis, Neuilly-sur-Seine, France

Application April 22, 1937, Serial No. 138,451
In Great Britain December 16, 1936

8 Claims. (Cl. 221-60)

The invention consists in an improved collapsible extrusion-container for fluid, semi-fluid or pasty substances such as tooth-paste, cosmetics, ointment, shaving cream, paint, polishing material and the like.

In order to avoid the disadvantages appertaining to the usual lead, tin, aluminium or like non-resilient metal collapsible tubular extrusion-container, it has already been suggested to provide the tube or body portion of the container with pleats extending inwardly relatively to the tube, it being intended that the tube could be collapsed or concertinized axially, the tube having the usual conical nozzle and screwed nipple and cap at one end and being fitted at the other end with a stopper or piston.

So far as I have been able to ascertain, attempts to make such a container failed. Moreover, such a container, if made, would have the serious disadvantage that its capacity would be very much less than that of the plain tubular container from which it was made.

A pleated container according to the invention diminishes this disadvantage and, moreover, can be collapsed axially into a very compact neat form so that practically all of its contents is extruded. With a suitably shaped stopper or piston, the improved container can stand erect on its base and can be very easily and regularly collapsed by pressure on its upper part.

A characteristic feature of the collapsible tubular container according to the invention is that its tubular body is provided with V-shaped outward pleats, that is, the perimeter of the pleats at their crests is greater than that of the original tubular body before it was pleated.

In a preferred form, an ordinary plain collapsible tubular container is provided with V-shaped outward pleats throughout the greater part of its length, so that a slight plain or non-pleated tubular part is left at one or at each end. The pleats thus extend laterally beyond this non-pleated or original part or parts.

The end of the container remote from the nozzle is fitted with a piston-stopper which is preferably shaped to correspond approximately to the internal shape of the nozzle.

For the purpose of permitting easy and regular collapse of the container and to ensure that practically the whole of the contents shall be extruded from between the pleats of the container, the pleats are of V-shape and the preferred angle of the V is approximately 62°. For the same purpose, the crests and roots of the

V-shaped pleats are preferably as sharp as possible.

In the accompanying drawings:

Figure 1 is a side view of a pleated container in its fully expanded or filled condition.

Figure 2 is a side view of the container with its pleats fully collapsed.

Figure 3 is a section of the expanded container showing the stopper or piston.

Figures 4 and 5 are, respectively, a side view and a plan of a complete container and casing.

Figure 6 is a perspective view of one form of detent,

Figure 7 being a side sectional view of the lower part of the casing of a container showing the lower part of the container and the detent applied.

Figures 8 and 9 are, respectively, a plan and side view of another form of detent,

Figure 10 being a part sectional view showing it applied to the container.

Figure 11 is a side view of a further form of detent.

Figure 12 is a side view of a pleated container fitted with a transparent casing.

Figures 13 and 14 show a telescopic form of casing, and

Figure 15 shows a casing with a modified upper end.

The pleated container shown in Figures 1, 2 and 3 comprises a portion formed by pleats 1 which project beyond two tubular end parts 2 and 3, a stopper or piston 6, a conical nozzle or shoulder 17 and a delivery or extrusion nipple 18. This container may be formed from a plain tube of thin metal such as tin, lead or aluminium (for instance, an ordinary plain collapsible tube), so that the tubular ends 2 and 3 are maintained at the diameter of the original tube while the pleats are caused to protrude beyond the tubular ends. The formation of the container with pleats of a diameter or perimeter greater than that of the tube from which it is formed, i. e. by forcing the pleats outwards instead of pleating inwards, in which case the crests of the pleats are substantially of a diameter equal to that of the original tube, may be effected by internal fluid pressure as described in the specification of my co-pending application for patent, No. 138,452, filed on even date herewith.

The end 2 extending above the pleated portion forms a neck against which the edge of a shoulder or flange 4 of a casing 5 (Figure 4) can neatly fit and be centralized, the bevelled portion resting neatly on the top of the uppermost pleat.

The lower end 3 of the filled container is fitted with a stopper or piston 6, it being preferably rolled or pressed onto the stopper so as to conform to the shape thereof and is shown rolled into a groove 19 in the stopper. The casing 5 extends below the lowermost pleat and a space is left which will accommodate the ends of a detent spring 6' which, in the example shown in Figure 6, is carried by a cross bar 7 of a ring 8. The casing 5 has two slots 9, Figures 4 and 7, to receive the cross bar 7 and a scale 10 may be provided on the casing so that when the stopper or piston 6 is pressed by the thumb to collapse the tube, the ring 8 indicates on the scale the dose extruded.

This form of casing is particularly suitable for a long container, as the slots 9 permit of the passage of the thumb as the container is collapsed.

When the pleats of the container are completely collapsed as shown in Figure 2, it can be removed from the casing 5 and another filled container be inserted in its place. When the container is used for toothpaste, shaving cream or other substance applied by a brush, the casing may be provided with a holder 11 for a brush or razor, Figures 4 and 5.

Another form of detent suitable for a casing 12, Figure 10, having no slot is shown in Figures 8, 9 and 10. Two detent springs 6' are carried inside a cap 13 which fits the stopper or piston of the container. The ends of the springs extend through notches 14 in the cap. In the form shown in Figure 11, the springs 6 are carried below the cap 13.

The casing 5, Figure 4, is preferably made of metal or other strong material. In the case of a comparatively short container, a casing such as 12, Figure 10, is used, and this may be made of metal or of weaker material, such as cardboard. It may be made of transparent material as indicated in Figure 12.

The container may be enclosed in a telescopic case as is shown in Figures 13 and 14. The casing consists of two parts 15 and 16 which make a good sliding fit with one another. When the case has been fully collapsed, as shown in Figure 14, the container can be completely collapsed by pushing it into the case with the thumb. This form of case permits the ready collapse of long containers.

Any of the hereinbefore described cases may have a neck 17' which fits the neck 2 of the container and may be secured to the neck by any suitable means, if desired.

In the accompanying drawings, the thickness of the tube has been shown exaggerated for the sake of clearness, but, in practice, the ordinary tubes of about .1 to .2 millimetre can be used.

The pleats shown are of V shape and the angle of the V is approximately 62°. When the container is collapsed axially, such pleats are easy to collapse regularly and the plastic or pasty substance contained in them can be practically wholly extruded. This action is enhanced if the crests and roots of the V-shaped pleats be sharp, as the sharper the folds, the less resilient is the container, thus facilitating collapse but avoiding or minimizing tendency for the container to expand or regain its form after partial collapse.

I claim:

1. An axially collapsible, non-resilient, metal, extrusion-container for fluid, semi-fluid and pasty substances, comprising a tubular body, an

extrusion nozzle at one end of said body and a stopper at the other end, said body throughout the greater part of its length having V-shaped outward pleats and a plain tubular end adjacent to said nozzle, and a rigid casing surrounding said pleated body and having a shoulder resting on the uppermost pleat of said body and surrounding said tubular end.

2. An axially collapsible, non-resilient, metal, extrusion-container for fluid, semi-fluid and pasty substances, comprising a tubular body having an extrusion nozzle at one end, and a stopper at the other end, said body having V-shaped outward pleats and a plain or non-pleated part adjacent to said nozzle, a rigid casing surrounding said pleated body having a shoulder resting on the uppermost pleat of said body, and a cap fitted on said stopper and having spring detents for engagement with the inside of said casing for the purpose hereinbefore set forth.

3. An axially collapsible, non-resilient, metal, extrusion-container for fluid, semi-fluid and pasty substances, comprising a tubular body having an extrusion nozzle at one end and a stopper at the other end, said body having outward V-shaped pleats, a casing surrounding said pleated body and comprising two telescopic sections, the upper end of one section and the lower end of the other section having a shoulder engaging with the uppermost and lowermost pleat of the body respectively.

4. An axially collapsible, non-resilient, metal, extrusion-container for fluid, semi-fluid and pasty substances, comprising a tubular body having outward V-shaped pleats, a nozzle at one end of said body and a stopper at the other end, a slotted casing surrounding said body having a shoulder bearing on the uppermost pleat, and a scale along the edge of the slot in said casing.

5. An axially collapsible extrusion container comprising a tubular body with plain upper and lower portions of normal tubular diameter, an extrusion nozzle providing a continuation of the upper plain portion, the wall of the tubular body intermediate the upper and lower plain portions being of pleated formation with the inner margins of the pleats coincident with the diameter of the plain portions of the tubular body and the maximum diameter of the pleats being appreciably greater than the diameter of the plain portions of the tubular body, whereby throughout the pleated portion of the tubular body the material receiving area is greater than in the plain portions of the tubular body in order that the material extrusion action through axial movement of the tubular body to collapse the pleats in succession increases the pressure upon the body of the material in the upper plain portion of the tubular body by adding material to the main volume in the successive collapse of the pleats incident to the axial extrusion movement of the tubular body.

6. An axially collapsible non-resilient extrusion container including a tubular body having upper and lower plain portions of the normal diameter of the tubular body with the wall of the tubular body intermediate the plain portions defining in part and uninterrupted material receiver, the normal transverse diameter of which 70 is equal to that of the plain portions, that portion of the tubular body intermediate the plain portions being formed with outwardly extending pleats arranged wholly beyond the normal diameter of the tubular body and providing re-

cesses to receive material in excess of that defined by the normal diameter of the plain portions and the length of the tubular body, the extrusion of the material being provided for by axial movement of the tubular body to successively collapse the pleats, the collapse of each pleat adding material to the main body of such material to increase the extrusion passage through the upper plain portion of the tubular body.

- 10 7. An axially collapsible non-resilient metal extrusion container for fluid, semi-fluid, and pasty substances, comprising a tubular body, an extrusion nozzle at one end of the body, said body having plain tubular ends and V-shaped pleats situated between said ends and extending outwardly beyond said plain tubular ends, a stopper secured to the tubular end remote from the nozzle, a slotted casing surrounding the pleated body and having a shoulder resting on the uppermost pleat, a ring surrounding the casing, and a member connected to said ring, passing through the

slots in the casing and engaging with the stopper in the lower end of the body.

8. An axially collapsible non-resilient metal extrusion container for fluid, semi-fluid, and pasty substances, comprising a tubular body, an extrusion nozzle at one end of the body, said body having plain tubular ends and V-shaped pleats situated between said ends and extending outwardly beyond said plain tubular ends, a stopper secured to the tubular end remote from the nozzle, a slotted casing surrounding the pleated body and having a shoulder resting on the uppermost pleat, a ring surrounding the casing, a member connected to the ring, passing through the slots in the casing and engaging with the stopper in the lower end of the body in the container, and a spring detent carried by the member for engagement with the interior of the casing.

CHARLES DAVIS. 20