May 7, 1968 S. FRANCIS 3,381,857

SELF-DISPENSING CONTAINER

Filed May 8, 1967

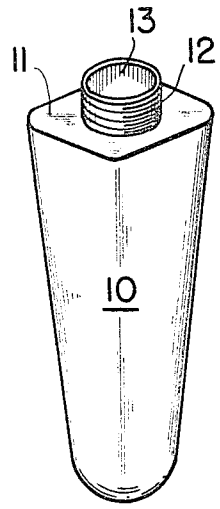

Fig. 1

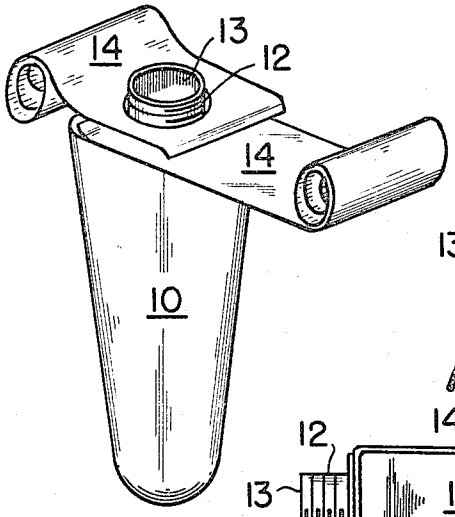

Fig. 2

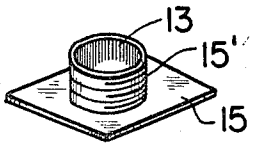

Fig. 3

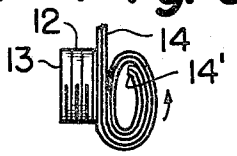

Fig. 4

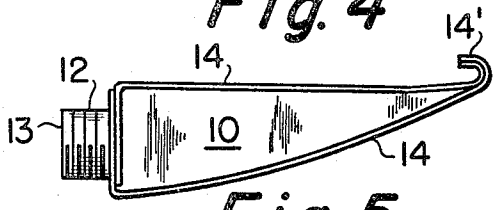

Fig. 5

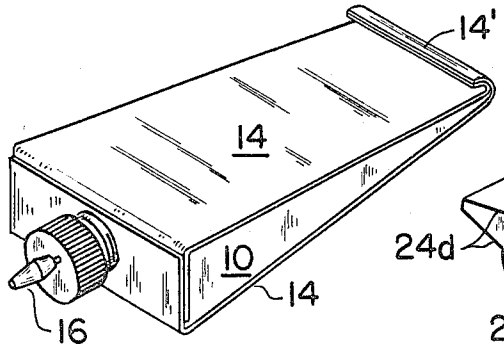

Fig. 6

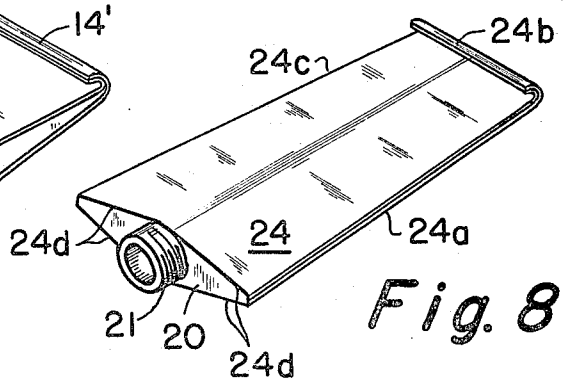

Fig. 8

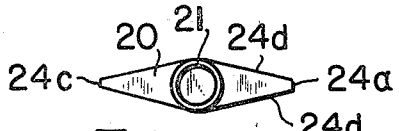

Fig. 9

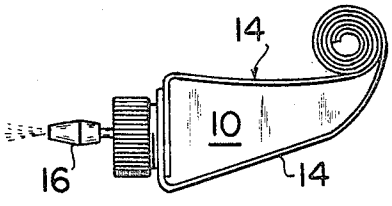

Fig. 7

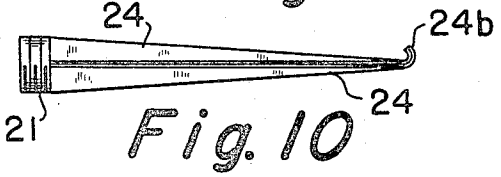

Fig. 10

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SELF-DISPENSING CONTAINER

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ABSTRACT OF THE DISCLOSURE

A self-dispensing container with sides that coil with sufficient force to discharge the contents therefrom, generally a fluid or paste material, and having a valve cap to control the discharge of the fluid or paste material.

Specification

My invention relates to a self-dispensing container for fluid or pastelike material. Heretofore, it has been necessary to apply external force to a container to cause a dispensing of the material contained therein, for example, squeezing, inverting, etc. Often the application of force is inconvenient and this is especially true where the discharge is required to be at a uniform rate and/or directional control is needed. For example, the application of adhesives generally requires a high degree of precision control both with respect to the amount and the area to be covered. However, with conventional containers this control cannot be attained because the external force necessary to dispense the material interferes with the control process or greatly limits it.

My invention overcomes this problem because no external force is required. The user of the container is thereby freed to devote his attention to controlling the flow of fluid or paste therefrom. Furthermore, my invention provides a container that is as convenient to use as aerosol containers where a fine spray is not required, for example, in dispensing shaving cream, but is far less expensive than the conventional aerosol container. My container may be either disposed of after use or reused, thereby adding to its economy features. In such an arrangement, i.e., for reuse, only a portion of the container need be sold to consumers who could insert that portion into the portion they retain.

The container is constructed in such a way that it has an attractive appearance, which is particularly important in marketing a product. The material out of which the container is preferably made is readily adaptable to decoration and promotional literature. Since the container reduces in size as it dispenses, novel advertising may be effectuated utilizing this feature. Moreover, from the consumers' standpoint, the container requires less storage space as the contents are dispensed; that is, storage space is not consumed by a large volume container almost empty.

Generally, my invention comprises a flexible, substantially elongated receptacle having an opening at one of its ends. The opening is fitted with a valve that permits the discharge of material from the receptacle. The valve means may be provided with various kinds of dispensing spouts and their configuration will depend largely upon the type of material contained and the method of utilization. Over the receptacle are a pair of thin, substantially elongated, flexible strips that have a coil proclivity sufficient to cause the dispensing of paste like materials. The strips are secured together at one of their ends with the receptacle sandwiched between the strips and the opening facing the unsecured ends thereof. At the unsecured ends is secured an end member with an opening having a periphery to which the periphery of the opening in the receptace is secured. When the valve is opened, the strips coil together in the direction of the opening to form convolutions that compress the receptacle therebetween to dispense the material.

The container may also be constructed without utilization of a thin flexible receptacle. In this embodiment, the strips are bonded along three of their edges and at one of their ends an end piece is secured to give the bonded strips a substantially tubular shape. It would also be possible to utilize other methods to form a container without a receptacle, for example, by molding.

In the accompanying drawings I have shown the present preferred embodiments of my invention in which:

FIGURE 1 is a perspective view of the flexible receptacle;

FIGURE 2 is a perspective view of the assembly;

FIGURE 3 is a perspective view of an end member adaptable for use in the container;

FIGURE 4 is a side view of the container in its naturally coiled position;

FIGURE 5 is a side view of the container in its elongated uncoiled position;

FIGURE 6 is a perspective view of the container when filled and having a valve to control dispensing;

FIGURE 7 is a side view showing the coiling of the container to dispense the contents when the valve is open;

FIGURE 8 is a perspective view of the container without a flexible receptacle;

FIGURE 9 is a front view of the container shown in FIGURE 8 showing the end member; and

FIGURE 10 is a side view of the container shown in FIGURE 8 in its uncoiled position or filled position.

Referring to FIGURE 1, a thin flexible receptacle **10** is shown having an end portion **11** and a neck **12** that defines opening **13**. The receptacle neck **12** may or may not be threaded and is of a material more rigid than the receptacle. The receptacle is preferably made from a polyethylene material, that provides the desired characteristics of the receptacle, namely, that its walls be very thin, flexible, and fluid-tight. Receptacle **10** can be constructed so as not to have either an end portion **11** or a neck **12**. It is required only to have an opening at one of its ends that is defined by a periphery, which may be formed from the ends of the sides of the receptacle. It is preferable that the receptacle be elongated; however, elongation is not required.

FIGURE 2 illustrates one preferred assembly of the container utilizing a pair of thin flexible strips **14**, having openings in their ends. These strips must have a very great proclivity to coil. Success has been achieved utilizing strips formed from a material sold by E. I. du Pont de Nemours & Co. under the registered trademark "Mylar" which is a polyester film made of polyethylene terephthalate, a polymer formed by the condensation reaction of ethylene glycol and terephthalic acid. "Mylar" type A is preferable because of its very great proclivity to coil. Type A is biaxially balanced—properties are the same in both directions—and the desired proclivity to coil is attained when the sheets of "Mylar" are coiled and heat set to a temperature above the thermal memory of the film, approximately 320° F. The proclivity to coil is increased by reducing the diameter of the coil or increasing the heat setting temperature to a not excessive temperature.

Strips **14**, preferably elongated, are placed over receptacle neck **12** such that the neck passes through the openings provided in the ends of the strips. The strips are overlayed such that end sections having the opening therein tend to coil towards each other. The force created by this tendency to coil holds each strip in juxtaposition to the other when the strips are formed along receptacle **10** and secured to one another at their ends opposite the openings (see FIGURE 5). Further, these strips may be bond-

ed together, for example, by heat bonding, to increase the strength at the points where they overlap.

To increase the strength at the end where strips **14** overlap, an end member **15**, (see FIGURE 3) may be interposed. End member **15** is substantially rigid and may be constructed from a plastic material, for example. The end member must be constructed with an opening therein, but it is not necessary that it have a neck member **15'** as shown. End member **15** can be interposed between strips **14** at their unsecured ends, and thereby constitute the sole end portion by bonding strips **14** to the edges of the end member. In this case, strips **14** do not require openings at their ends and do not overlap.

In the case where receptacle **10** has neck **12**, neck **12** passes through the openings provided at the ends of strips **14** and also through end member **15** when it is interposed between the overlap. Since neck **12** is present, there is no necessity that an end member **15** have neck member **15'**, and it is preferable that end member **15** be utilized only with an opening therein. When member **15** is utilized as the sole end portion, that is, strips **14** do not overlap, neck **12** passes through only the opening in member **15**. Neck **12** is bonded to the periphery of one of the openings through which it passes, and if end member **15** is utilized, the opening therein is preferably the one to which the neck is bonded.

In the case where receptacle **10** does not include neck **12**, the opening in the receptacle is placed in communication with the openings in strips **14** of the overlap. When end member **15** is used either in combination with the overlapping strips or as the sole end portion, the opening of the receptacle is placed in communication with the opening of the combination or end member **15**. The periphery defining opening **13** in receptacle **10** is sealably bonded to the periphery of the opening to which it is in communication. Preferably, the bonding is with the periphery of the opening in member **15**, whether it is used in combination with overlapping strips **14** or alone as the sole end member. However, when end member **15** is not utilized, it is preferred that the bonding is with the periphery of the opening in the strip which is outermost of the overlap.

FIGURE 5 shows the construction of the container having a receptacle with a neck **12** and without the use of end member **15**. When the container is elongated, the end of the strips **14** at their ends opposite the opening are secured so as to preferably form a curl **14'**. Formation of curl **14'** is facilitated by making one of the strips **14** slightly longer than the other. Curl **14'** is not required, however, but it is necessary that the strips be secured so as to coil in the same direction towards the opening. It is to be noted that the curl **14'** is formed if receptacle **10** does not extend the length of the strips **14**. This is due to the fact that strips will coil unless restricted; accordingly, the normal attitude of an unfilled container without a closed valve is as shown in FIGURE 4.

FIGURE 6 shows a filled container assembly having a closed valve means **16**. Valve **16** may be threadably secured to the neck **12** or neck member **15'**, or sealably secured in any opening formed in the end of the container. It is preferred that valve **16** be a twist open type, but any easily controllable valve would be suitable. The valve means may be provided with various different kinds of dispensing spouts and their configuration will depend largely on the type of material contained and the method of utilization.

The size of the opening **13** in the end of the container depends upon the viscosity of the material to be contained in the receptacle and the speed of dispensing required. Generally, the higher the viscosity, the larger opening **13** must necessarily be; however, a smaller opening can be used and will slow the rate of dispensing. If a very slow rate of dispensing is achieved, valve **16** may be a simple removable cap.

When the valve is opened, the pair of strips **14** coil together in the direction of the opening to form convolutions. The sandwiched receptacle **10** is compressed between these forming convolutions and the compression causes the material to be dispensed through the valve, FIGURE 7.

FIGURES 8, 9 and 10 show another embodiment of my invention, a self-dispensing container without a flexible receptacle. Strips **24**, made of the same material as strips **14**, are bonded along three of their edges **24*a***, **24*b*** and **24*c*** to form a sealed member along those three edges. End member **20**, substantially oblong is interposed at the unsecured end of the formed member and sealably secured to the edges **24*d*** of strips **24**. End member **20** can also be substantially circular. The end member has an opening therein in which a valve member could be placed or a neck sealably secured to the periphery thereof. As shown, the end member is provided with neck **21** which may be made as an integral part of the end member, with or without internal or external threads. Further, the end member **20** is preferably made from a material substantially the same as end member **15**, that is, a material more rigid than the strips, for example, plastic.

The insertion of end member **20** causes the formed member to separate and define a container or receptacle. Edges **24*d*** conform to the shape of the end member to which they are bonded and the formed member takes a substantially tapered tubular shape throughout the elongation of strips (see FIGURE 10). Edges **24*b*** are flat and not arcuate as is the remaining portion of strips **24**. Because of this flat configuration, edges **24*b*** will have a natural tendency to coil together, which when the valve is opened, will continue to coil to form convolutions that dispense the material contained within the tubular member.

The opening in the end member and the valve means are variable as with the container having the receptacle. In other words, the valve means may be provided with various different kinds of dispensing spouts and their configuration will depend largely on the type of material contained and the method of utilization. These might include, for example, a simple twist open type valve means and spout having an open and closed position, a twist open valve and spout where the opening is adjustable, or a valve and spout that is closed in a vertical position and opened in various degrees upon moving the valve and spout at an inclination to the vertical.

Moreover, it is contemplated that my container without the receptacle could also be molded or pressed to form a tapered substantially tubular member having at its one end a valve member. The other end would be flat as shown in FIGURES 8 and 10, in particular edge **24*b***. The preferred material in this case is also a material such as "Mylar."

While I have shown and described preferred embodiments of my invention, it may otherwise be embodied within the scope of the appended claims.

I claim:

1. A self-dispensing container for fluids and paste like material comprising:

(A) a flexible, substantially elongated receptacle having an opening;

(B) a valve means adapted for sealable engagement in said opening for permitting discharge of material from the receptacle;

(C) a pair of thin, substantially elongated, flexible strips, each of said strips having a proclivity to coil in the same direction, said strips being secured together at one of their ends and said receptacle being sandwiched between said strips substantially throughout the elongation thereof; and

(D) an end member of a substantially rigid material having an opening formed therein, said end member being secured to said strips at their unsecured ends, and the periphery of said opening in said receptacle being sealably secured to the periphery of said open-

ing in said end member, said valve means being sealably engaged in said opening such that when said valve means is opened, said pair of strips coil together in the direction of the end member to form convolutions that compress the receptacle therebetween to dispense material through said valve means.

2. A self-dispensing container as claimed in claim 1 wherein said strips are coiled and heat set strips of polyethylene terephthalate.

3. A self-dispensing container as claimed in claim 1 wherein said receptacle is formed from polyethylene material.

4. A self-dispensing container as claimed in claim 1 wherein said end member is formed from said pair of strips characterized by having openings in each of their unsecured ends and being formed as to overlap, said openings being in communication with one another and said proclivity to coil of each of said strips is in a counteracting direction so as to form a substantially rigid end member, and said periphery of said opening in said receptacle being sealably secured to the periphery of said opening in the outermost end portion strip.

5. A self-dispensing container for fluid and paste like material comprising:

(A) a pair of thin substantially elongated, flexible strips, each of said strips having a proclivity to coil in the same direction, said strips being sealably secured together at three of their edges to form a member, said

unsecured edges being an end of said formed member;

(B) a substantially circular semi-rigid end element having an opening therein, said end element being sealably secured to the unsecured end edges to form a tapered tubular container throughout a portion of the elongation of said formed member, the end opposite said end element being flat; and

(C) a valve member secured to the periphery of said opening in the end element, such that when said valve means is opened, said flat end of said formed member coils in the direction of the valve means to form convolutions that dispense material contained in said tapered tubular container through said valve.

6. A self-dispensing container claimed in claim 5 wherein said end element is substantially oblong.

7. A self-dispensing container claimed in claim 5 wherein said strips are coiled and heat set strips of polyethylene terephthalate.

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