May 28, 1935. W. A. ROSELLE 2,002,718

COLLAPSIBLE TUBE CONSTRUCTION

Filed Dec. 31, 1934

Fig. 1.

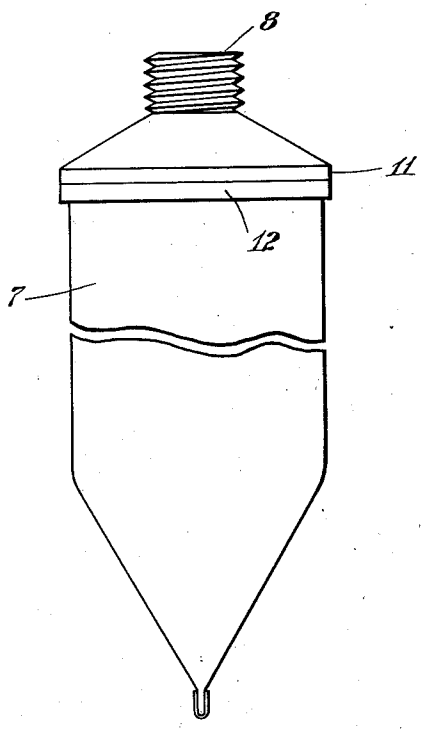


Fig. 2.

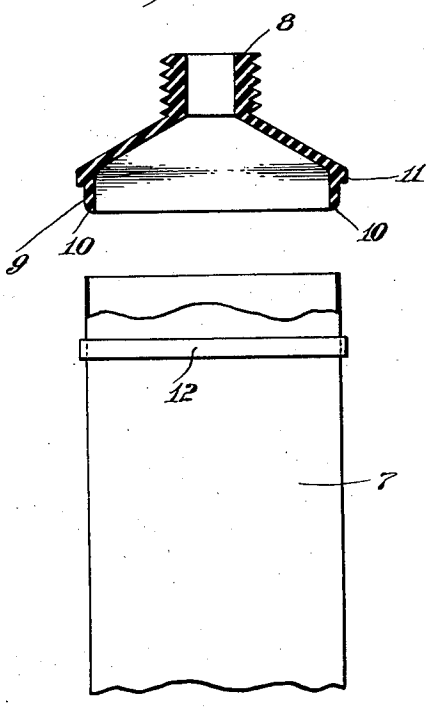


Fig. 3.

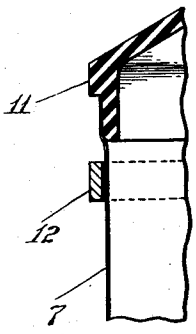


Fig. 4.

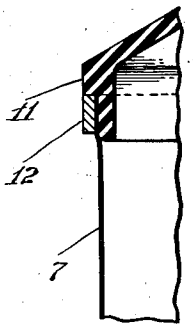
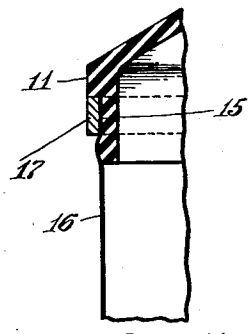


Fig. 5.



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COLLAPSIBLE TUBE CONSTRUCTION

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3 Claims. (Cl. 221—60)

The most commonly used and satisfactory container for pastes, creams, paints, etc. is formed of tin with a neck integral with a collapsible tubular body. As the container can be used but once the cost is a factor of great importance. It is also necessary that the container be absolutely tight—that is, it must not leak.

The main object, therefore, is to provide a container which is as cheap as possible to make and which will be entirely satisfactory to use.

I have found after much research and many experiments a simple and satisfactory solution of the problem which consists in forming the body out of a tube of suitable length and securing to it a top of non-metallic material.

Preferably I construct the body of the container of a suitable length of tin tubing and the top and neck of a molded composition. Such materials are extremely difficult to connect because of the nature of tin and the nature of the molded non-metallic composition. The tin tubing is very thin and extremely fragile and cannot be cemented to a non-metallic material with any degree of security and the non-metallic top material cannot be compressed without danger of breaking. Furthermore the connection between the tubular body and the neck must be very tight.

In its preferred and perfected form the invention contemplates the forming of the top of a molded non-metallic substance and providing it with a shoulder having a slightly tapered, rounded or bevelled edge and forcing upon this shoulder the end of a tubular body which is of slightly smaller inside diameter than the outside diameter of the shoulder. This act expands the end of the tube and fits it to the shoulder without rupturing the fragile tube.

A metallic ring whose inside diameter is substantially the same as the outside diameter of the tube is forced over the expanded end of the tube outside of the shoulder. This forcing action compresses the material of the tube and slightly expands the ring so that the parts are securely and permanently united.

Fig. 1 is a side view of a construction embodying my invention.

Fig. 2 is a side view and partial section showing the parts before assembling.

Fig. 3 is an enlarged fragmentary sectional view showing another step in the assembly.

Fig. 4 is a fragmentary section on an enlarged scale showing the joint between the parts of the completed device.

Fig. 5 is a similar sectional view showing a modification.

The body 7 of the container is formed of cylindrical tubing cut off to suitable length and closed at the bottom in any suitable manner.

The top portion is formed of suitable molded composition such as a phenolic condensation product and is provided with an outlet or tip portion 8 suitably constructed for any desired type of closure.

The outer rim terminates in a cylindrical shoulder 9 whose edge is rounded, tapered or bevelled at 10. A flange 11 extends somewhat beyond the shoulder 9.

The anchorage ring 12 is formed of suitable material such as steel.

The invention is not confined in its broad aspect to specific materials or specific dimensions.

As an illustration of dimensions suitable for a small sized container the tube may be formed of tin 1 inch in outside diameter with the wall .005 of an inch thick. The top member in such a case may have the shoulder 1.015 inches in diameter and the shoulder may be .125 inch in height. The ring to go with these parts may be 1.02 inches in inside diameter and 1.06 inches in outside diameter, the width of the ring being .062 inch.

From this it will be seen that as the shoulder of the top portion is not compressible the end of the tube will have to be expanded in order to force it on to the shoulder. This expansion will make the outside diameter of the expanded tube 1.025 inches which is .005 inch larger than the inside diameter of the ring. When the ring is forced in place, therefore, it must slightly expand and slightly compress the end of the tube. The result is a permanent connection between the parts which is absolutely tight.

In Fig. 5 I have shown a slight modification in which a shallow groove 15 is provided into which the material of the tube 16 is compressed by the ring 17. With some materials such a construction may be desirable. While I have especially designed this invention for the use of tin tubing which can be formed of indefinite lengths and cut off in lengths to suit, it should be understood that a similar method of connection may be applied to structures involving the use of tubing of other flexible and collapsible materials.

Although a one-piece tin tube is desirable for some purposes, tin is very expensive and the top and neck require a considerable weight of material, and furthermore the edge of the top is easily bent out of shape. A molded substance such as a

phenolic condensation product on the other hand is much cheaper and will hold its shape. Furthermore the formation of a top-less tube of tin requires much less expensive machinery than is required for a tube with an integral top.

I claim:

1. A container comprising a collapsible tubular member formed of soft material, a separately formed neck member of substantially incompressible material, and a seamless uniting ring of material harder than the tubular member, said neck member having an outer wall of larger diameter than the inside diameter of the main part of the tubular member, said tubular member having a mouth portion of larger diameter than the diameter of the main part and seated on the outer wall of the neck member, said ring surrounding the enlarged mouth of the tubular member and being under tension and holding the tubular member tightly on the neck member.

2. A container comprising a collapsible tubular member formed of soft material, a separately formed neck member of substantially incompressible material, and a unitary uniting ring of material harder than the tubular member, said neck member having an outer wall of larger diameter than the inside diameter of an adjacent part of the tubular member, said tubular member having a portion thinner than the main part and seated on said outer wall of the neck member, said ring being of substantially the same inside diameter as the outside diameter of the main part of the tube and surrounding the mouth of the tubular member and being under tension and holding the tubular member tightly on the neck member.

3. A container comprising a collapsible tubular member formed of soft material, a separately formed neck member of substantially incompressible material, and a uniting ring of material harder than the tubular member, said neck member having an outer wall of larger diameter than the inside diameter of the main part of the tubular member, said tubular member having a mouth portion of larger diameter than the diameter of the main part and somewhat thinner than the main portion and seated on the outer wall of the neck member, said ring surrounding the enlarged mouth of the tubular member and being under tension and holding the tubular member tightly on the neck member.

WALTER A. ROSELLE.