

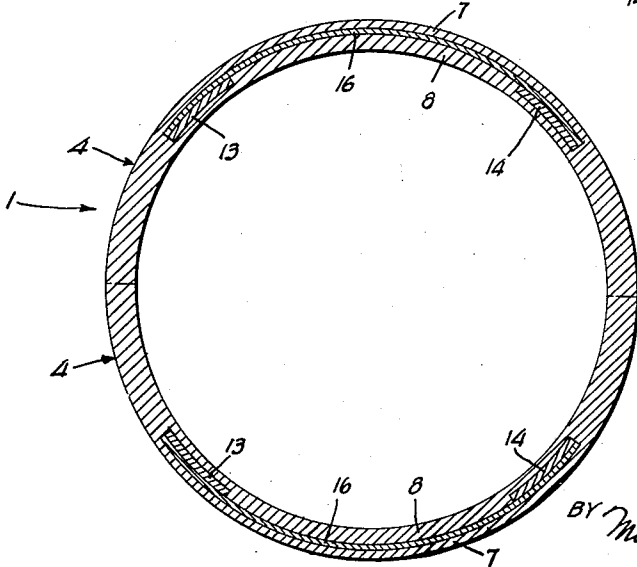
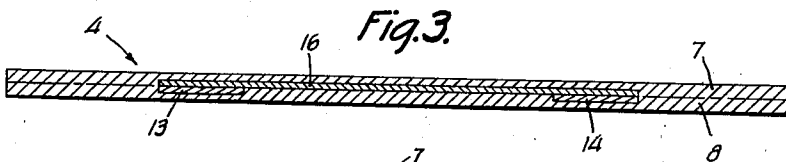
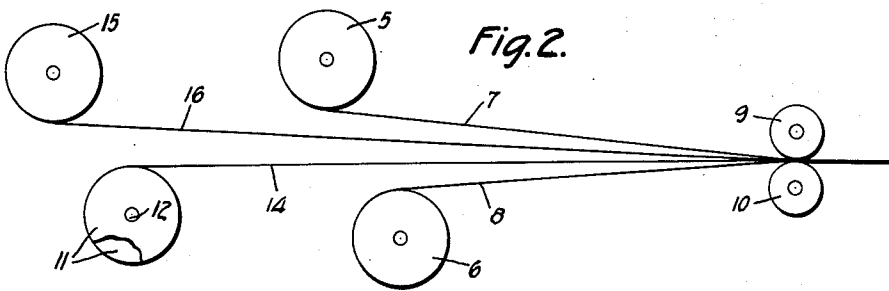
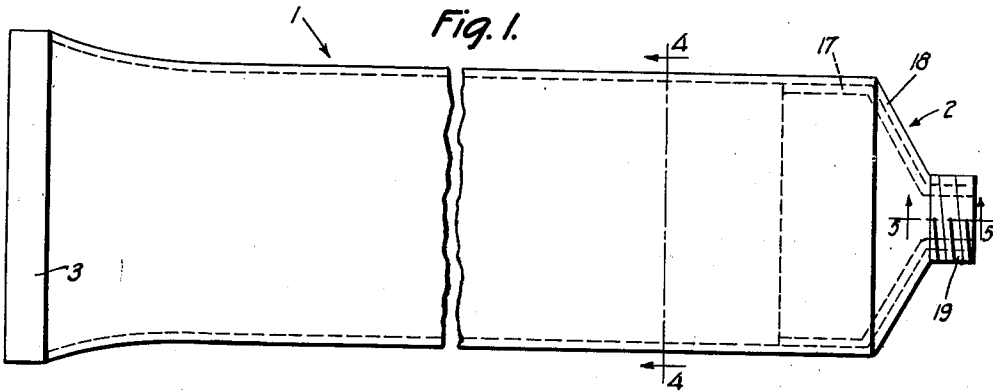
July 29, 1952

S. M. CROCE ET AL
DISPENSING TUBE

2,605,018

Filed Oct. 5, 1949

2 SHEETS—SHEET 1



INVENTORS
Santy M. Croce and
Pascal D. Croce

BY *Mosca, Nolte, Green & Berry*
ATTORNEYS

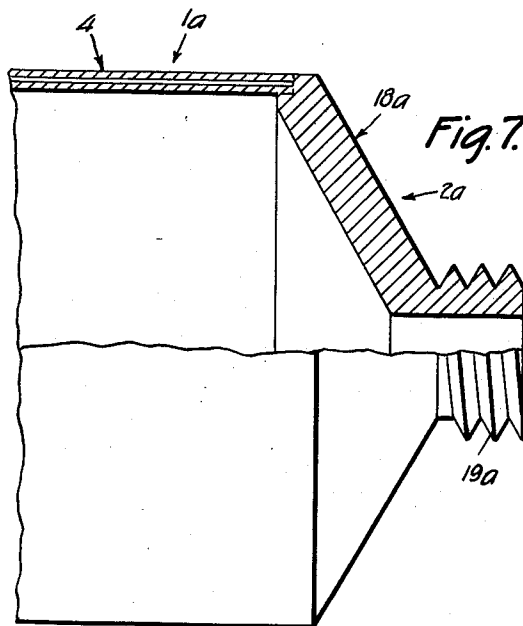
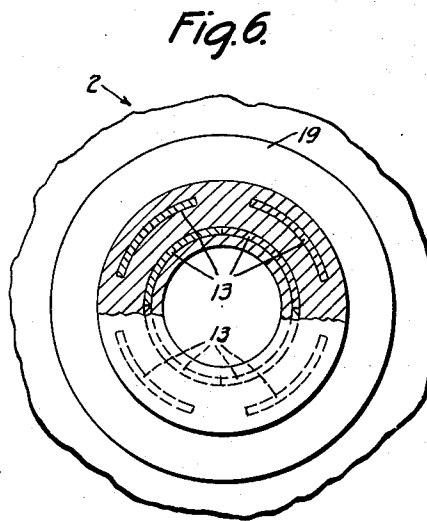
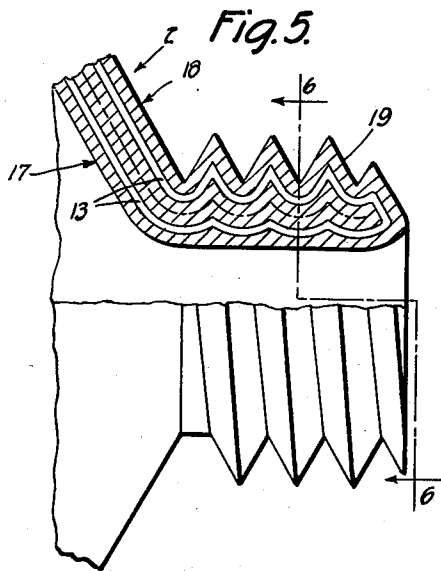
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DISPENSING TUBE

2,605,018

Filed Oct. 5, 1949

2 SHEETS—SHEET 2



INVENTORS
Santy M. Croce and
Pascal D. Croce

BY *Moses, Nolte, Crews & Berry*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,605,018

DISPENSING TUBE

Santy M. Croce, Uniondale, and Pascal D. Croce,
St. James, N. Y.

Application October 5, 1949, Serial No. 119,616

3 Claims. (Cl. 222-107)

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This invention relates to dispensing tubes such as are commonly used for the storing and dispensing of shaving cream, tooth paste, adhesive, and other extrudable and more or less viscous products.

It is a primary object of the invention to provide a tube which can be produced at less expense, and which will serve the required purpose more efficiently and satisfactorily, than tubes of conventional construction.

It is a further object of the invention to provide a simple and inexpensive process of manufacturing the novel tube in the interest of economy of production.

The conventional dispensing tube is made from lead or aluminum which has been extruded into the shape desired. The materials used are comparatively expensive, and, because of their chemical nature make necessary the extra step of coating the interior of the tube with a protective wax or lacquer. This is necessary in the case of lead because lead is likely to render poisonous any food, drug, or cosmetic packed in it. The coating is necessary in the case of aluminum because aluminum is readily attacked and eroded by materials which are even slightly acid or slightly alkaline. These metallic tubes additionally require coloring by an expensive process for greater sales appeal, and the printing of a label on the outer surface.

The novel tube of the present invention is made essentially of one or more flexible plastic materials, such as Vinylite, polyethylene, tenite, nylon, Koroseal, Lucite and others similar in their physical characteristics.

The tube wall is desirably formed of inner and outer layers of plastic material with metallic strips or ribbons sealed between them. The metallic strips are manually moldable so that they may be changed in shape and will tend to hold whatever shape they are changed to. They add rigidity to the tube and they cause the tube not to spring open after it has been rolled up to squeeze out a portion of the contents.

Other objects and advantages will hereinafter appear.

In the drawing forming part of this specification,

Fig. 1 is a plan view broken away intermediate its ends for compactness of illustration, showing an illustrative tube made in accordance with the invention and embodying features thereof;

Fig. 2 is a fragmentary diagrammatic view illustrating the first step in the assembly of the tube components;

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Fig. 3 is an edge view showing in end elevation one of the composite sheets which is utilized in making the tube;

Fig. 4 is a sectional view taken upon the line 4-4 of Fig. 1 looking in the direction of the arrows, the view being upon a larger scale than Fig. 1;

Fig. 5 is a fragmentary sectional view taken upon the line 5-5 of Fig. 1, the view being upon a greatly enlarged scale;

Fig. 6 is a sectional view taken upon the line 6-6 of Fig. 5 looking in the direction of the arrows; and

Fig. 7 is a fragmentary view, partly broken away, showing a modified form of tube made in accordance with and embodying features of the invention.

The illustrative tube of Figs. 1 to 6 comprises a tubular body portion 1 and a shoulder and neck formation 2 which is integral with the body portion. When the tube has been filled through the lower open end thereof, such end is closed and sealed by pressing the opposite walls of the tube together and uniting them in the region 3.

The structure of the tube can be best explained in detail in connection with a description of the procedure followed in making the tube.

The tube body is made up of composite sheets 4, the fabrication of which is illustrated in Fig. 2. Supply reels 5 and 6 furnish webs 7 and 8 of flexible plastic material such as Vinylite, polyethylene, tenite, nylon, Koroseal, Lucite, etc. which are fed into superposition between pressure rolls 9 and 10.

Reels 11 disposed in spaced relation upon a shaft 12 furnish metallic strips or ribbons 13 and 14 of manually moldable material, feeding them into the bight of the rollers 9 and 10 between the outer and inner webs 7 and 8. A reel 15 furnishes a third web 16 of plastic material, this web being printed in advance to form a label. The web 16 is desirably made wide enough to cover and conceal the metallic strips 13 and 14 and to extend across the space between them. The web 16 is fed into the bight of the rollers 9 and 10 above the web 8 and the strips 13 and 14 but beneath the web 7.

The several webs in their areas of direct juxtaposition are desirably united to one another by heat and pressure applied by the rollers 9 and 10, to form a composite web.

The composite web is severed into sheets 4 of suitable length, and end portions 17 of the sheets are doubled back to provide end sections

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of double thickness. The folded portion is desirably heat sealed to the body portion of the sheet. The purpose of this folding over is to provide for an integral shoulder and neck formation having a more massive structure than the walls of the tube body. The reinforcement is desirable because the shoulder and neck portion is relied upon to maintain the sharply defined shape of the tube in service, and must therefore be more resistant to deformation and rupture than the body walls.

Two of the sheets 4, as described, are next heat sealed to one another along their longitudinal edges, and are shaped to tubular form by passing them over a properly shaped die, the resulting structure being substantially as shown in Fig. 4.

The integral shoulder and neck formation is next produced in the section of double thickness by passing the doubled portion into a press which by a combination of heat and pressure form the shoulder 18 and the threaded neck 19.

The shoulder and neck are formed so that the four metallic strips incorporated in the walls of the tube converge in the shoulder and meet in the neck to cause a circular plastic encased metal neck to be provided. In order that the metal may extend continuously or substantially continuously around the neck, the sum of the widths of the metal strips in the walls of the tube is made substantially equal to the circumference of the neck of the tube. At the formation of the shoulder and neck structure, the excess plastic is caused to flow around the shoulder of the tube and to reinforce it.

The advantages offered by a tube of the kind described are many. The process of manufacture is greatly simplified because such steps as internal coating and external coloring and printing are eliminated. In the conventional type of tube this additional work is done after the tube itself has been completed, and, therefore, necessitates extra handling.

With the tube of the present invention coloring and the printed matter are incorporated into the tube during its manufacture. The labels are sealed in the tube walls as the walls are being made, and a tube may be made the desired color by making the inner layer of the walls from a colored web of plastic material while making the outer wall from a transparent web of plastic material.

The materials which can be used for metal tubes are necessarily limited, and even those presently in use are undesirable from the point of view of their chemical nature. This obstacle is completely overcome in the tube of the present invention, because the resistance of most plastics to chemical attack is very good, some even being highly resistant to very concentrated acids and alkalis.

Plastics having different properties can be advantageously utilized for the outer and inner layers of the tube, for example, a plastic highly resistant to chemical attack, such as polyethylene, may be employed for forming the inner wall, while a high strength plastic such as nylon may be used for forming the outer wall. Different plastics may be used in combination in some instances to reduce the total cost of the finished tube and in others, to facilitate the manufacturing operations.

The invention also contemplates, however, the

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employment of the same plastic for the inner and outer walls as well as for the label.

In Fig. 7 a tube 1a of modified construction is illustrated. The body wall 4 is again made up from sheets of composite material, fabricated as described in connection with Figs. 2 and 3.

The sheets of which the body is to be formed are not in this instance provided with any doubled or folded portions, and are simply cut to a length appropriate for use in the tube body. Two of the sheets are united along their edges and expanded to tubular shape as illustrated in Fig. 4.

There is then affixed to the tube wall by heat and pressure a shoulder and neck formation 2a of molded plastic. The shoulder and neck formation is affixed to the tube walls at the same time that it is molded to shape. In this type of construction the shoulder 18a and the neck 19a are without metallic reinforcement, but since they can be made of any thickness desired, it is not a difficult matter to provide a structure having the desired rigidity and strength.

We have described what we believe to be the best embodiments of our invention. We do not wish, however, to be confined to the embodiments shown but what we desire to cover by Letters Patent is set forth in the appended claims.

We claim:

1. In a dispensing tube, a body composed of inner and outer layers of plastic material and interposed parallel longitudinally extending manually moldable metallic strips, and a shoulder and neck formation integral with the body, the metallic strips extending through the head and into the neck, and having a combined width equal substantially to the circumference of the neck.

2. A structure as set forth in claim 1 in which said shoulder and neck formation forms a doubled-over area at one end of the body material.

3. In a dispensing device, a body composed of inner and outer layers of plastic material and interposed parallel longitudinally extending manually moldable metallic strips, the inner plastic layer being opaque, the outer plastic layer being transparent, and a printed label included between the inner and outer layers, the metallic strips extending through the head and into the neck and having a combined width equal substantially to the circumference of the neck, said plastic layers and metallic strips presenting a smooth surface on the inside of the neck, and screw threads on the outside.

SANTY M. CROCE.

PASCAL D. CROCE.

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