Oct. 31, 1939. P. W. TAINSH 2,177,754

COLLAPSIBLE METAL TUBE

Filed Aug. 10, 1938

Fig. 1

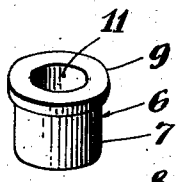


Fig. 2

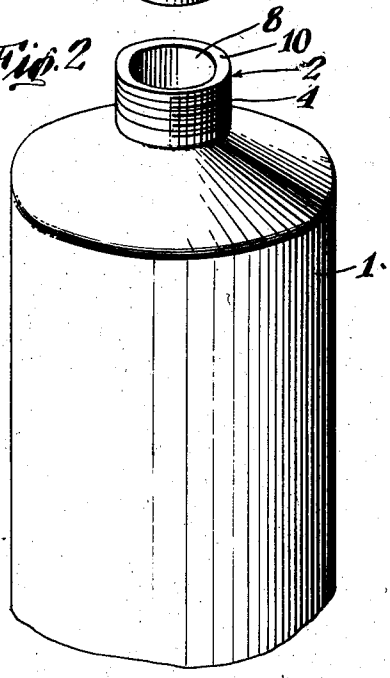


Fig. 3

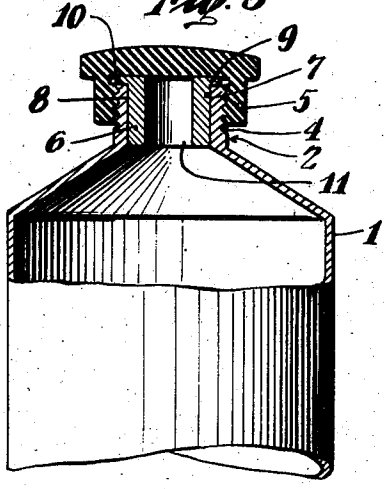


Fig. 4

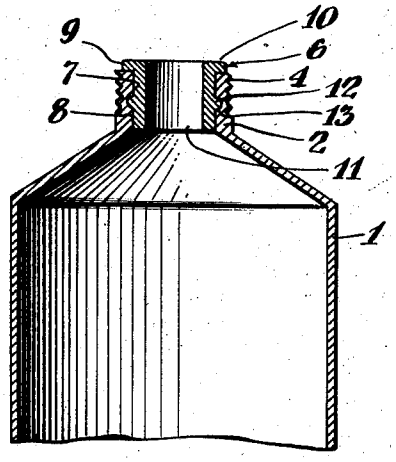
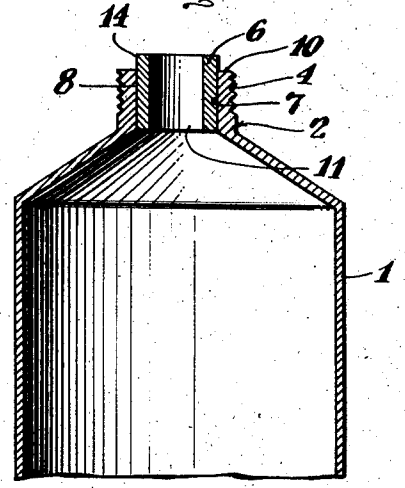


Fig. 5



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Patented Oct. 31, 1939

2,177,754

UNITED STATES PATENT OFFICE

2,177,754

COLLAPSIBLE METAL TUBE

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Application August 10, 1938, Serial No. 224,051
In Great Britain March 22, 1938

1 Claim. (Cl. 221—60)

The present invention relates to collapsible metal tubes and more particularly to an improved nozzle for such tubes whereby the material contained in the tube may be extruded in an improved manner.

The invention is applicable to collapsible metal tubes made of tin, tin-coated lead, or aluminum, adapted to contain tooth paste, shaving cream, face cream and the like, and in which the threaded nozzle is an integral part thereof.

It is well known that when creams and pastes of various kinds are packaged in collapsible metal tubes of a usual construction, the cream or paste, upon being extruded through the nozzle of the tube, often contains streaks, dark spots, or rings of discolored and contaminated material. This effect is particularly noticeable when the paste or cream is removed from the nozzle by a brush or finger. It is also known that the contaminated material tends to accumulate about the nozzle, forming unsightly deposits that give the tube an unsanitary appearance.

The usual collapsible tube construction is one in which both the nozzle and the threaded cap are formed of a metal, such as aluminum or tin, and the contaminating effect upon the extruded material was believed to be caused in a large part by the slight abrasion to which the parts are subjected when the threaded cap is turned on the nozzle. In order to avoid the abrasion due to friction on the threads, it has been proposed heretofore to utilize a cap formed of a material having a non-contaminating effect, such as an artificial resin, but it has been found that the contaminating effect above described is decreased only to a very slight degree.

It has also been proposed heretofore to form both the nozzle and cap of a non-contaminating mouldable material but such a construction is comparatively expensive, and, furthermore, it is not practical because of the difficulty in forming a joint between the metal tube and non-metallic nozzle that is sufficiently sturdy to withstand the stresses of ordinary use and avoid leakage and spoilage of the tube contents.

The present invention is the result of numerous experiments that show that any contaminating effect resulting from the abrasion of the threads is negligible, and that most of the discoloration results from the slight abrasion of the metal at the rim or end of the nozzle when the material extruded therefrom is wiped off. It has been found that contamination is effectively prevented by avoiding frictional contact between the tube contents and the rim of the metal nozzle of the tube. However, it is not intended that the explanation of the beneficial results of the invention shall be limited to this theory of operation.

It is an object of the present invention, therefore, to provide a device which will effectively prevent contaminating contact between the extruded material and the rim of the nozzle.

It is a further object of the invention to provide a device that is adapted to be used in combination with existing types of collapsible metal tubes.

In addition it is an object of this invention to provide a device of the type described which is of simple construction and may be manufactured economically.

The foregoing objects and others that will be readily apparent may be accomplished by providing a tubular conduit of non-contaminating material that is so constructed that it may be inserted into the nozzle and may be so positioned by the inner surface of said nozzle that a portion of the conduit extends outwardly beyond, or has a flange which overlies, the rim of the nozzle. Thus the material may be extruded through the conduit free from any contact, frictional or otherwise, with the rim of the nozzle.

In order that the invention may be more clearly understood, reference may be had to a detailed description hereinafter given in connection with the accompanying drawing, in which:

Figure 1 is a view in perspective of one form of the tubular conduit;

Figure 2 is a perspective view of a portion of a collapsible metal tube having a nozzle adapted to receive the conduit;

Figure 3 is a view, partly in cross-section of a portion of a tube, nozzle, conduit and cap in assembled position;

Figure 4 is a cross-section view of a tube and modified conduit in assembled position; and

Figure 5 is a view similar to Figure 4 showing still another modification.

Referring now more particularly to the drawing, in which like numbers are used to indicate like parts throughout and without limiting the invention to the specific embodiments shown:

In Figures 1, 2 and 3 a collapsible metal tube 1, having a nozzle 2, is formed with a threaded portion 4 adapted to receive a threaded cap 5, which is formed, preferably, of a non-contaminating material as hereinafter defined. The conduit 6 of non-metallic material is adapted to be inserted within the nozzle and has an outer surface 7 adapted to engage the inner surface 8 of the nozzle and be held in position by the friction of

the two surfaces. A flange 9 on said conduit is adapted to overlie the rim 10 when the parts are in assembled position. Thus it will be seen that the material extruded from the tube will pass through aperture 11 in the conduit and will at all times be free of contact with the nozzle 2.

In the modification shown in Figure 4, the conduit 6 is shown formed with a raised portion 12 cooperating with a depression 13 in the inner surface of the nozzle 2 whereby the parts are maintained in assembled position. In the further modification shown in Figure 5, the tubular conduit 6 is formed with portion 14, which extends outwardly an appreciable distance from the nozzle 2.

The conduits hereinbefore described are formed of any non-contaminating material, by which is meant, generically, any material which will not discolor or otherwise affect the tube contents under ordinary conditions of use. Examples of such materials are plastics, such as cellulose esters and ethers, i. e., cellulose acetate, condensation products, such as phenol-aldehyde resins, i. e., "Bakelite", or other resins, artificial or natural. The materials selected will in most cases be non-metallic, and may be ceramic or mouldable material, but the invention is not limited to such use.

The tubular conduit may be held in engagement with the nozzle in any suitable manner with or without the addition of adhesive. For example, when resilient materials are used, the conduit may be forced into the nozzle so as to fit tightly, or it may be preferred to employ suitable threads, grooves or recesses in the adjacent surfaces.

If desired, the conduit may be formed by the application of a liquid enamel, or other drying non-contaminating material. The inner passageway extending through the conduit may be of any usual shape, that is, circular, oval, or slotted.

The invention thus described is not to be limited to the specific illustrative example, and it will be apparent that the invention has modifications and advantages other than those mentioned herein, and may be embodied in other specific forms. All such variations are intended to be included in the invention as defined in the following claim.

I claim:

A collapsible metal tube adapted to prevent contamination of the product extruded therefrom, comprising a nozzle at one end of the tube, a conduit formed of non-contaminating mouldable non-metallic plastic material located within said nozzle, at least a portion of the outer peripheral surface of said conduit engaging at least a portion of the inner surface of said nozzle to hold said conduit in position by said engagement of the conduit with the nozzle, said conduit extending beyond the end of the nozzle thereby providing a passageway through the conduit terminating beyond the end of the nozzle and conducting the extruded product to a point out of contaminating contact with the end of said nozzle.

PETER WRIGHT TAINSH.