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BIPARTITE TUBE

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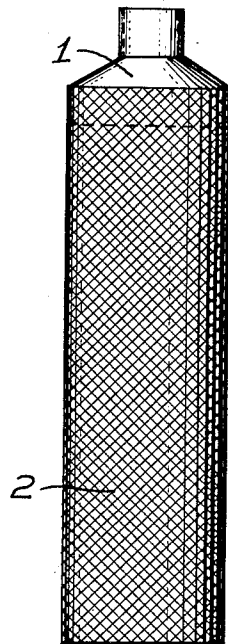


FIG. 1

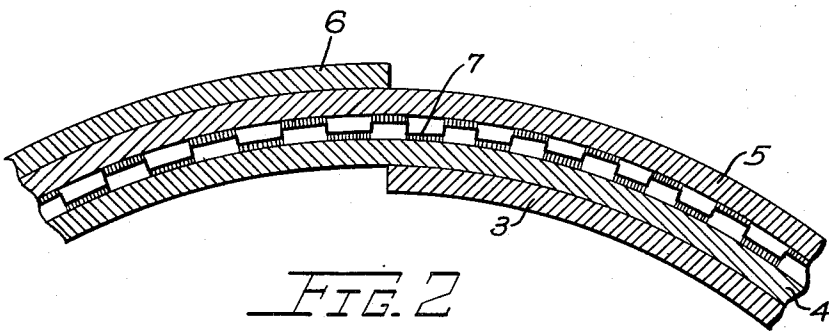


FIG. 2

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UNITED STATES PATENT OFFICE

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BIPARTITE TUBE

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1 Claim. (Cl. 154—46)

The invention relates to bipartite tubes, especially to tubes made from artificial substances, the body of said tubes being wound of several layers and containing at least one layer of metal foil.

For the production of such tubes it is usual to wind a band of varnished hydrate cellulose or the like onto a mandrel and to roll-in one or several layers of metal foil, especially aluminium foil covered with paper, and to then connect the wound body thus produced by gluing with a head piece made separately from plastic phenol, vinylester polymerisates or the like. The metal foil in the wound body serves practically only for packing and can therefore be called a "packing foil," whereas the other layers of the wound body are designed to take up the mechanical forces acting upon a tube when the same is in use, these layers being best called "carrier foils."

Tube bodies of this kind are generally rather stiff and can consequently not be pressed out and rolled up as easily as is desired. The chief reason for this is that the layer of paper on the covered metal foil, which up to the present time could not be eliminated for the reason that without such paper layer sufficiently thin, non-covered metal foils crumple too easily, so that when transparent foils are used, the appearance of the tube body is impaired. Furthermore, in the winding machines, such sufficiently thin foils when devoid of a paper layer exhibit formation of folds which produce an askew running-in, and cause permanent disturbances in the manufacturing process and in the regular production.

These inconveniences are obviated by the present invention, which makes it possible to use non-covered metal foil-inserts. In the invention a so-called "embossed foil" of known type is used as metallic packing insert, i. e. a foil into which a tight mesh of embossings is rolled which can be of any shape and have for instance the form of a single or crosswise fluting or the form of honey-combs, punching fields or the like. Such embossed foils not only make any crumpling which might occur practically invisible, but they are inclined only very little to crumpling. Such foils run always uniformly and without formation of folds into the winding machine for the reason that the embossings impart to them a certain yieldability, which enables conformance to the unavoidable differences in the wall thicknesses of the other foils composing the tube body. The other foils are mostly cast and show therefore quite irregularly, at points distributed like islands, a thickness exceeding or less than the

average thickness. An especially good equalization in this respect is obtained, if the embossings are selected, for instance in the form of a cross net, so that they give to the foil an increased yieldability in both coordinates of its plane.

A further material advantage of the employment of embossed foils according to the invention consists in that these foils, owing to their increased yieldability, participate in the unavoidable relative movements of the other parts of the wound body consisting of organic substances, much better than do simple smooth-rolled metal foils. This advantage is of particular importance for wound tube bodies, the carrier foil of which consists of hydrate-cellulose; as hydrate-cellulose shrinks very strongly, as is known, when it dries. With regard to a tube of known type a few days of especially dry weather is sufficient to detach the metallic packing foil from the shrinking carrier foil which correspondingly stretches, so that the wound body unfolds and sometimes even becomes leaky. This very serious drawback of the tubes of known type is reliably avoided by the use of embossed metallic insert foils in accordance with the invention.

When transparent carrier foils are used, which render visible from the outside the metallic packing foil, it is possible to obtain, by employing a suitably embossed pattern to obtain especially good effects, such as advertisements, which may be enhanced by coating the embossed metallic packing foil, prior to the rolling into the wound body, with a colored covering or transparent lacquer, or colored transparent carrier foil may be used.

In the accompanying drawing:

Fig. 1 is a side elevation of a tube made according to the invention and

Figure 2 is a diagrammatic section on an enlarged scale, taken approximately along the line 2—2 of Figure 1.

The tube head 1, made of plastic phenol, vinylester polymerisates or the like, is stuck together in known manner to a tube body 2 produced separately as a wound body. The wound tube body 2 is built up of transparent hydrate-cellulose foils, between which a metal layer is enclosed which according to the invention is made of embossed metal foil. The embossings of this foil, which in the embodiment shown have the form of a crossed embossing and naturally are visible through the hydrate-cellulose, are shown in Fig. 1 diagrammatically, i. e. without consideration of the perspective distortions as a fine mesh of crossed lines.

As shown in Fig. 2, the thin embossed metal foil 7 is enclosed between the hydrate cellulose layers 3, 4, 5 and 6. The adhering zones 8 are indicated by radial hatching, and it is clear that the metal foil 7, because of being connected with the layers 4 and 5 of the carrier foils at spaced intervals, can yield in peripheric direction as well as to relative movements of the carrier foils 3 to 6 without becoming detached from the foils 4 and 5.

I claim:

A collapsible tube having a body portion made

of a thin band wound upon itself to form a tube, said band consisting of several layers of transparent cellulose, and a packing disposed between the layers consisting solely of a thin metal foil embossed so as to provide alternating depressions and protrusions on opposite sides of said foil, with the protrusions bonded to the surfaces of the adjacent layers and with the depressions unbonded to and spaced from the surfaces of said adjacent cellulose layers.

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