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BIPARTITE TUBE WITH TUBE BODY WOUND OF SEVERAL LAYERS AND CONTAINING AT LEAST ONE LAYER OF METAL FOIL

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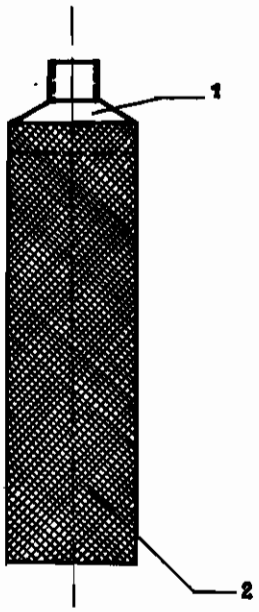

Fig. 1

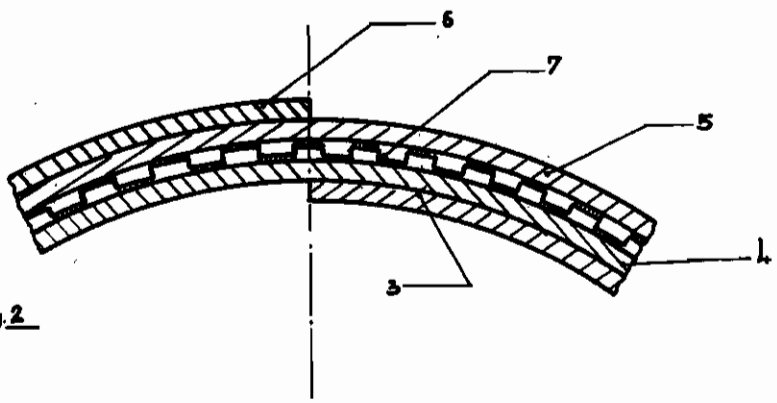

Fig. 2

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BIPARTITE TUBE WITH TUBE BODY WOUND OF SEVERAL LAYERS AND CONTAINING AT LEAST ONE LAYER OF METAL FOIL

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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, in order to then connect the wound body thus produced and suitably glued together 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 destined 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 so easily as is desired. The chief reason herefor is the paper layer of the covered metal foil, which, however, up to the present could not be avoided for the reason that sufficiently thin, non-covered metal foils crumple too easily and consequently, on the one hand, when transparent foils are used, impair the appearance of the tube body, and independently thereon on the other hand in the winding machines, by the formation of folds which produce an askew running-in, cause permanently disturbances in the manufacturing proceeding and in the regular production.

These inconveniences are obviated by the invention, which thus makes it possible to use non-covered metal foil-inserts for the object in view. Owing to the invention a so-called "embossed foil" of known type is used as metallic packing insert, i. e. a foil into which a tight net of embossings is rolled which might 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 make not only scarcely perceivable for the eye any crumpling which might occur, but they are inclined only very little to crumpling. They chiefly 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 the adaptation to the unavoidable differences in the wall thickness of the other foils. The other foils are mostly cast and show therefore quite irregularly, at points distributed like islands, a thickness exceeding or remaining below the average value. 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 at the unavoidable working of the other parts of the wound body consisting of organic substances, much better in the movements of the same than 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 very strongly shrinks, as is known, when loss of moisture occurs. For a tube of known type a few days of especially dry weather are sufficient to detach the sticking between the metallic packing foil and the shrinking carrier foil which correspondingly stretches, so that the wound body unfolds and sometimes even becomes leaky. This very serious inconvenience of the tubes of known type is securely avoided by the use of embossed metallic insert foils according to the invention.

When transparent carrier foils are used, which render visible from the outer side the metallic packing foil, it is possible to obtain, by suitable construction of the embossing pattern used according to the invention especially good effects acting like advertisements and which may be assisted thereby that the embossed metallic packing foil, prior to the rolling into the wound body, is coated with a colored covering—or transparent-lacquer or that the transparent carrier foil is colored.

In the accompanying drawing shows

Fig. 1 a tube made according to the invention and

Fig. 2 diagrammatically a strongly enlarged portion of a section on line *a*—*b*.

The tube head 1, made of plastic phenol, vinylpolymerisates or the like, is stuck together in known mnner with a tube body 2 produced separately as wound body. The wound tube body 2 is built up of transparent hydrate-cellulose foil, between which a metal layer is enclosed which aceording to the invention is made of embossed metal foil. The embossings of this foil, which in the present instance 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 fine net 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 indicated by oblique hatching. The sticking zones are indicated by radial hatching, and it is clear that the metal foil 7, alternately connected with the layers 4 and 5 of the carrier foils, can yield in peripheric direction also to strong working of the corrier foils 3 to 6 without detaching from the foils 4 and 5.

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