Aug. 30, 1932. J. N. WHITEHOUSE 1,875,289

TUBE OF LAMINATED SHEETING

Filed April 19, 1932

Fig. 1.

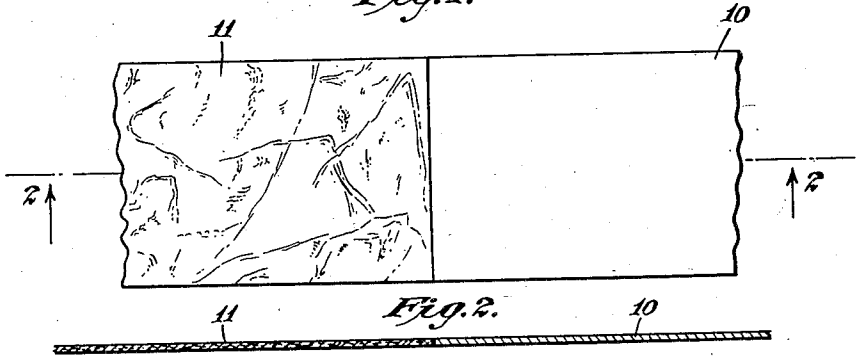


Fig. 2.

Fig. 3.

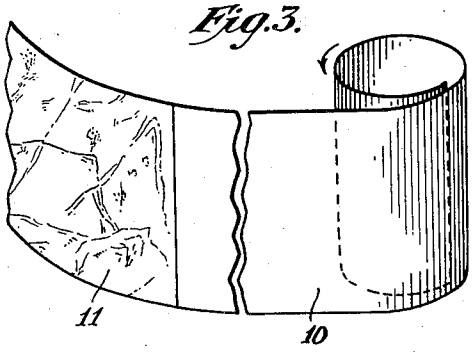


Fig. 4.

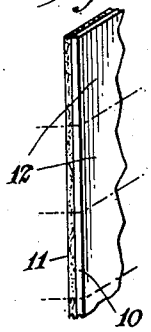


Fig. 5.

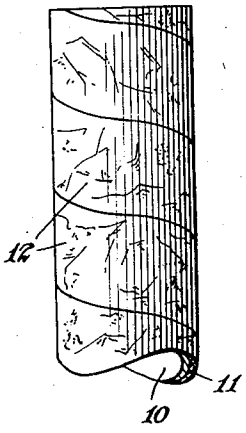


Fig. 6.

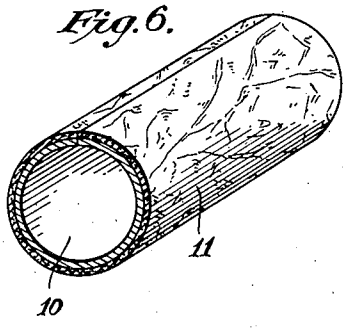
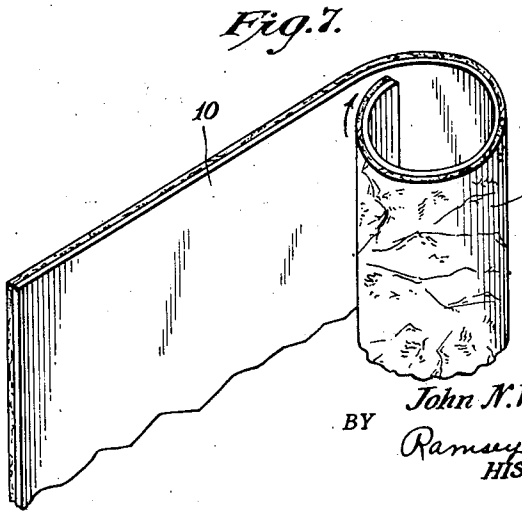


Fig. 7.



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UNITED STATES PATENT OFFICE

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TUBE OF LAMINATED SHEETING

Application filed April 19, 1932. Serial No. 606,112.

This invention relates to tubes made of acetated and nitrated cellulose sheeting and more particularly to tubes and manufacturing methods employed in the preparation of pencil and fountain pen barrels.

The use of rolled pyroxylin sheet material carrying a design has been fully suggested in my allowed application Serial Number 340,311.

It is an object of my invention to produce a tube formed from laminated material which possesses the same characteristic attractive appearance of the tube described in the before mentioned prior application, and which further exhibits qualities of augmented strength and durability.

Another object of my invention is to provide novel structure whereby a tube very closely simulating the appearance of mother-of-pearl, marble, onyx etc. may be prepared at less than the cost involved in previous methods.

Further objects and advantages will become apparent from the following detailed description in conjunction with the appended drawing, of which

Figure 1 is an elevational view of a strip of sheet material used in the preparation of tubing.

Figure 2 is a cross sectional view of the same strip, taken on the lines 2—2 of Figure 1.

Figure 3 is a perspective view of a sheet partly rolled into the tubular form.

Figure 4 is an isometric view of a strip of laminated sheet material.

Figure 5 is an elevational view of a tube generated by a helical strip.

Figure 6 is an isometric view of a tube rolled from laminated sheeting, cemented along its seam.

Figure 7 is an isometric view of a laminated sheet partially rolled into tubular form.

In the present invention, use is made of different materials particularly adapted to perform their respective functions.

As pointed out in my prior filed application Serial No. 340,341, in a tube or pen barrel made up from spirally wound sheeting, the general visual effect is produced largely by the outer layer or layers. It has been found that substituting plain or dyed sheeting underneath the outer layers may increase the strength of the tube without detracting appreciably from the appearance of the article.

Thus the barrel in its improved form is a veneered tube made of sheeting having two distinct layers: an inner layer of relatively inexpensive, plain or base material, and an outer layer of more expensive, designed, or "precious" material. Thus the two respective layers may be described and identified as inner and outer, foundation material and surface material, base layer and precious layer, plain portion and designed portion, strong layer and weak layer, cheap section and expensive section, or any other suitable designation which similarly differentiates the two distinct layers either as to nature or function.

In Figures 1 and 2 is shown a strip of sheet material formed from two sections. A strip of plain sheet material 10 is fastened, as by a butt-cemented joint, to a strip of sheet material 11, having a design therein.

By a plain or "base" material is meant a lamina of a homogeneous synthetic plastic or other transparent or translucent material capable of being rolled and cemented into a tube. It may be dyed or tinted with a soluble dye, provided that homogeneity is maintained. Satisfactory results have been obtained with pyroxylin-camphor compositions pressed into sheet form, either colorless, or tinted to blend with the color effect of the outer layer. Similar results have been obtained with acetated cellulose.

By the designed, or "precious" material is meant transparent or translucent sheeting which carries a design by reason of the fact, for example, of having therein foreign agents which blend with the material to produce attractive illusionary effects, either per se, or as an imitation of more expensive and prohibitive natural products. Thus, for example, the appearance and fascinating iridescence of mother-of-pearl may be closely imitated by adding aluminum powder, genuine fish-scale pearl essence, and syn-

thetic fish scale pearl essence, to the outside sheeting material. This particular design and effect is suggested in the drawing. In a similar manner, metallic or other particles, filaments, and/or salts may be added to lend beauty to the finished product, and to produce the effects of onyx, marble, ivory, hard woods, etc.

The addition of beautifying agents to the outer layer may weaken its mechanical structure, but the strength of the tube may be increased by employing, as herein stated, an inner layer of strong homogeneous material.

Figure 3 discloses the manner in which the sheet is formed into a tube. The base sheeting 10 forms the inner layers, and is coiled spirally as indicated by the arrow. Heat and/or pressure, or a solvent may be employed in any conventional manner to merge the layers into a unified tube.

The dot and dash lines of Figure 4 illustrate the manner in which a sheet of laminated material may be sliced into ribbons 12 for use in tube construction. The laminated sheet comprises a layer of base material 10 and a layer of the precious material 11, securely joined in intimate relationship. Each of the strips or ribbons 12 may be helically wound as shown in Figure 5 to form a tube, and the running seam may be subsequently sealed.

If desired, the laminated sheet, comprising a double layer of the material, that is, a foundation or base sheet and a finishing or precious sheet, may be coiled into a single loop as shown in Figure 6. Here the visual effects of the single outer layer may be enhanced if the inner layer be treated with a suitable dye, such as aniline, of such color as to blend readily with the outer layer and thus provide a background density ordinarily provided by several layers of the precious sheeting. In this manner, the prominent optical effects are predicated substantially upon the nature of the design in the outer layer while the suitably tinted inner layer produces a diffused effect which blends with the outer design and provides by its indistinctness an appearance of depth to the finished product.

The illustration can be more completely established by spirally winding the compound or veneered sheet of Figure 4 into a multi-turn tube as illustrated in Figure 7. The tube thus comprises a series of turns, every alternate layer of which comprises a base or foundation sheet, and an overlying precious or finishing sheet. If the base sheets are formed of clear, transparent material, the design of the innermost turns may be transmitted through the succeeding layers so that the appearance of the finished tube will be a blend of the designs incorporated in the precious sheet of the respective layer. The sharpness of detail decreases with the depth beneath the outer surface. In treating the sheet material with fish-scale essence and winding the laminated material into a multi-turned tube, a shadowy indistinctness is produced in the remoter depths which diffracts and diffuses the light rays, producing an opalescence and iridescence striking characteristic of mother-of-pearl.

It will be noted here, that the precious sheeting may be used in relatively thin strips, the effect of depth being lent by the cheaper and preferably thicker base strips. Thus the finished tube may be made substantially of relatively strong, and cheap base material while the illusionary effects are provided by adjoining layers of more costly but perhaps weaker sheeting, having a design therein.

An important consideration in connection with this invention is the fact that, using a given "designed" sheet, or "precious" material, for the desired main visual effect, I am able, by selecting appropriately colored transparent or translucent "base" material, to build up a tube whose ensemble effect will constitute a color modification of the "designed" material, without involving any actual change in the "designed" material Thus, an infinity of fine shadings in visual effect and color effects in the finished article may be accomplished with a relatively small number of designs of "precious" material.

I claim:

1. A tube of the character described consisting of an inner thickness of base material and an outer surface thickness of designed material, said thickness comprising a laminated sheet spirally arranged with the edges of adjacent convolutions welded together whereby said materials form an amalgamated structure.

2. As a new article of manufacture, a solid walled tube consisting of a core thickness of base pyroxylin material and a surrounding outer surface thickness of designed pyroxylin material the entire surface of which is in welded union with the exterior surface of the core, said thicknesses comprising convolutions of base and designed strip material, respectively, spirally arranged with the edges of adjacent convolutions of each spiral welded together.

JOHN N. WHITEHOUSE.