July 5, 1932. S. A. NEIDICH 1,866,168

METHOD OF FORMING TUBES OF CELLULOID AND THE LIKE

Filed Feb. 11, 1929

FIG. I.

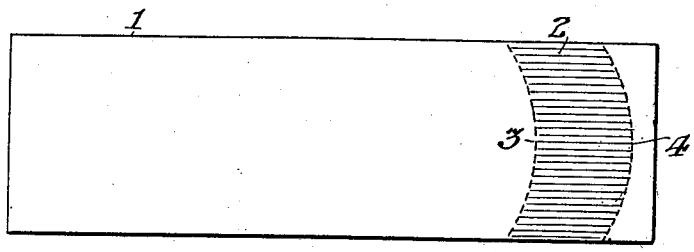


FIG. II.

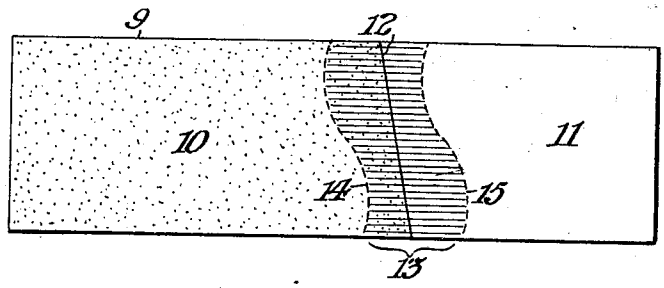
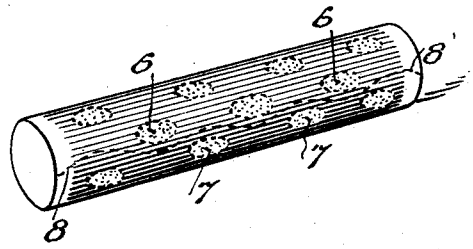


FIG. III.



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UNITED STATES PATENT OFFICE

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METHOD OF FORMING TUBES OF CELLULOID AND THE LIKE

Application filed February 11, 1929. Serial No. 339,251.

My invention relates to products of cellulose, such as celluloid, cellulose nitrate, cellulose acetate, and the like. In accordance with the ordinary methods of manufacture, such products, for commerce, are primarily formed in substantially plane rectangular molded slabs 5″ x 21″ x 51″; commercial sheets of celluloid being shaved from such slabs, of any desired thickness, and trimmed to 20″ x 50″. For most commercial uses, such slabs are formed from celluloid of a uniform color thruout their mass. However, there is a limited demand for celluloid presenting a mosaic appearance, and slabs for that use are formed of an aggregate of initially separate pieces of different colors or textures of celluloid or the like which are joined by compressing the aggregate while the material is softened with any suitable solvent. For instance, acetone for celluloid and cellulose nitrate, and ethyl acetate, or a mixture of alcohol and ether for cellulose acetate.

Perhaps the principal use of such mosaic materials is for the tubular bodies and caps for fountain pens, pencils, and the like. Such tubes may be formed by rolling comparatively thin sheets shaved from a slab of the aggregate of the different pieces above contemplated, but, as such material is more or less translucent, the mosaic appearance of the outer convolution of such tubes is blurred by the different arrangement of the pieces in the contiguous convolutions. Therefore, it is the usual practice to form such tubes, of mosaic appearance, by cutting such slabs into bars and turning the outer surface thereof to cylindrical form and boring such bars in coaxial relation with their outer surfaces. It is obvious that such a complicated method of manufacture is extremely costly. For instance, such mosaic material, in its primary form, costs approximately five times as much as the ordinary material of uniform color or texture, and fountain pens including holders and caps of the turned and bored type cost from $7.50 to $10.00 each, retail.

Therefore, it is the purpose and effect of my invention to produce celluloid and the like, having such mosaic or other pattern appearance in the completed article, but at minimum cost, in comparison with the cost of such articles made in the manner aforesaid characteristic of the prior art.

As hereinafter described, it is characteristic of my invention that celluloid or the like, of uniform color or texture, or both, made by the least costly method and means known to the prior art, are caused to present the desired mosaic appearance by dyeing or printing; with movable type, electrotypes, engraved, etched, or lithographic plates; drawing, painting, photographing, or otherwise marking the material, in the form of sheets which may be rolled, as aforesaid, to form tubes of the desired diameter; the portion of the sheet thus decoratively marked being only sufficient to form one convolution of such a sheet in such a tube.

Celluloid and the like materials, decoratively marked with imprints of dye, are broadly claimed in application (187—28) Serial No. 329,686 filed January 2, 1929 by William Mendel, of which I am the assignee.

Moreover, sheets of celluloid and the like including regions of different kinds of material as hereinafter described and the method of making the same, are disclosed and claimed in my copending application (156—28) Serial No. 319,272 filed November 14, 1928.

Upon attempting to form such marked regions with boundaries extending parallel with the axis of the tube; I discovered that there are slight differences in thickness of the commercial sheets furnished by the manufacturer as of a commercially stated certain nominal size. For instance, sheets thus nominally .010″ thick range from .009″ to .011″ thick and, when rolled upon a mandrel of a standard size to form such tubes; the pattern designed for sheets .010″ thick overlapped in the tube if the sheet happened to be of less thickness, and failed to meet at its boundaries upon the circumference of the tube if of greater thickness than the commercially stated nominal thickness; such mismatching of the pattern being obvious by blank or blurred portions of the tubes, which were thus rendered commercially objectionable.

Therefore, the object and effect of my present invention is to so arrange the pattern of the marked region as to compensate for such irregularities in thickness of the sheets and consequent location of the boundaries of the pattern in the tube. As hereinafter described, the essential feature of my invention is that opposite edges of the marked region, which are boundaries thereof extending transversely to the length of the sheet, have complementary, respectively recessed and extended portions; whereby irregularity in relative location of said edges in the tube is rendered inconspicuous and, consequently, negligible. As hereinafter described, such complementary boundaries of the marked region of the sheet may be similarly waved, so that the circumferentially projecting portions of one boundary extend into the circumferentially recessed portions of the other boundary.

Moreover, as hereinafter described, in using sheets including different materials in different regions, to wit, plain material for the inner portion of the tube and fancy materal for the outer portion thereof, or with transparent material for the outer convolutions and fancy material for inner convolutions visible thru said transparent material; a decorative pattern mark characterized by such an irregular boundary may be located at the junction between different materials in the sheet, so as to render such junction inconspicious and practically invisible.

My invention includes the various novel features of the method and means hereinafter described.

In said drawing; Fig. I is a plan view of a sheet of celluloid or the like, including a decoratively marked region having irregular boundaries in accordance with my invention.

Fig. II is a plan view of a sheet of celluloid or the like, including different regions of different material, with the decorative pattern mark extending across the junction thereof.

Fig. III is a perspective view of a tube having a decorative mark thereon in accordance with my invention.

Referring to Fig. I; the sheet 1 of celluloid or the like is of such dimensions as to form the tube of the desired dimensions when rolled in the direction of its length, beginning at the left hand end thereof. The right hand end of said sheet is provided with the decoratively marked region 2, having opposite edges 3 and 4 which are respectively recessed and extended in the direction of the length of the sheet. The average extent of said region 2, in the direction of the length of the sheet, is preferably such as to form one convolution in the completed tube. When such a sheet is rolled in tubular form, any irregularity in lapping said edges 3 and 4 is rendered inconspicuous by the complementary character of said edges. For instance, as shown in Fig. III, altho the decorative marks 6 are at one boundary of the dyed region and the decorative marks 7 are at the other boundary of said region, the junction between said boundaries, which I have indicated by a dotted line 8 in Fig. III, is in fact rendered inconspicuous and practically invisible.

In the form of my invention shown in Fig. II, the sheet 9, of celluloid or the like, includes a region 10 of fancy material, for instance, what is known as "pearl" celluloid, and a region 11 of other material, for instance, what is known as "pearl" celluloid, and 12 indicates the junction line between said different materials. By placing the marked region 13 so as to overlap said junction line 12, such junction is rendered practically invisible in the completed tube. In other words, in the form of my invention shown in Fig. II, the irregular boundaries 14 and 15 of the decorated region 13, which are respectively recessed and extended as above described, not only render inconspicuous and practically negligible any irregularity in the location of that marked region with respect to the outer surface of the tube, but the location of said region 13 also serves to render inconspicuous and practically negligible any irregularities in the junction 12.

Incidentally, the extension of the transparent portion 11 of the tube over the fancy portion 10 enhances the ornamental appearance of the latter.

Therefore, I do not desire to limit myself to the precise details of construction and arrangement and method of procedure herein set forth, as it is obvious that various modifications may be made therein without departing from the essential features of my invention, as defined in the appended claims.

I claim:

1. The method of forming a tube of cellulosic material presenting a pattern of visibly contrasting regions at its outer surface which includes decoratively marking a region of the material of said tube; wherein the marked region boundary includes opposite edges which have complementary, respectively recessed and extended, portions; whereby irregularity in lapping said edges is rendered inconspicuous and consequently negligible.

2. A method as in claim 1, wherein the boundary of the marked region extends obliquely with reference to the axis of the tube.

3. A celluloid and the like product presenting a pattern of contrasting regions of its outer surface, which are respectively marked and unmarked; wherein the opposite boundaries of the marked region are respectively extended and recessed upon the product in complementary relation.

4. A product as in claim 3, wherein the

boundaries of the marked region extend obliquely with reference to the axis of the tube.

5. A product as in claim 3, formed of a primarily plane sheet, including different materials in different regions, and with the marked regions extending over the junction between said different materials; whereby, said junction is concealed.

In testimony whereof, I have hereunto signed my name at Burlington, New Jersey, this 24th day of January, 1929.

SAMUEL A. NEIDICH.