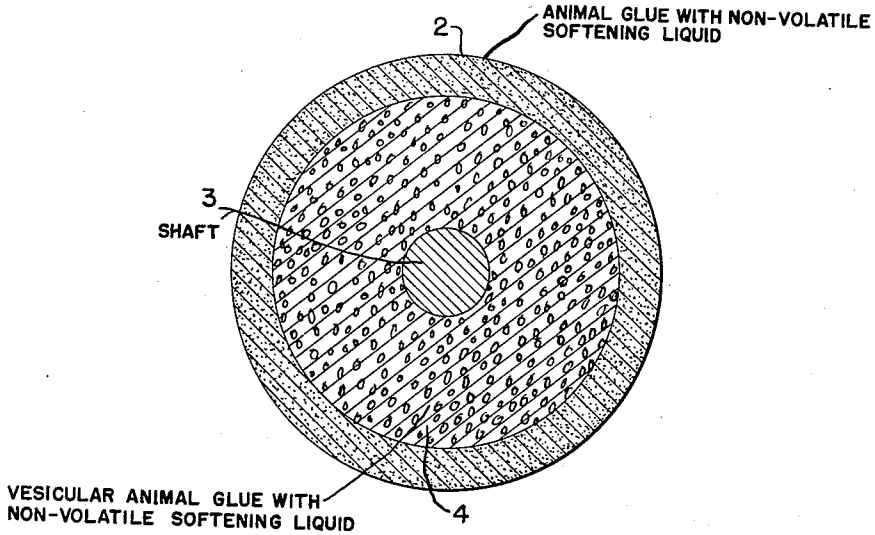
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ROLLER FOR ANIMAL GLUE

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ROLLER OF ANIMAL GLUE

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5 Claims. (Cl. 154—43)

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Printers' rollers, graining rollers, etc., require a peculiar combination of properties, and are subjected to severe usage. Customarily they have been made of glue composition, this giving a combination of the right kind of ink-carrying surface, resistance to oils, low cost, and general availability. Rubber, sponge rubber, vulcanized oils, etc., have been used to some extent in attempted substitution, but have lacked the desired peculiarities of surface property coupled with other requisites capable of meeting the general needs. Moreover, such non-glue structures have developed new problems in use. In accordance with the present invention, rollers may be had, however, which provide not only the fundamentally desirable kind of ink-carrying surface and other essential properties characterizing glue rollers, but additionally a much superior body structure, together with lightness rendering them outstandingly applicable in high-speed machinery and heavy duty use. Other objects and advantages will appear from the following description.

To the accomplishment of the foregoing and related ends, said invention, then, comprises the features hereinafter fully described and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principle of the invention may be employed.

In the annexed drawing the sole figure is a transverse section of a roller embodying the invention.

In accordance with the invention, rollers for printing machinery, inking, transferring, graining, etc., are provided having a seamless or integral surface of glue material, and an interior body of vesicular glue material. Thus, as shown in the drawing the surface layer **2** is solidified animal glue with a softener of non-volatile liquid and between the surface layer and the axial shaft **3** is a body **4** of like material which is a resilient solid lightened by multitudinous gaseous bubble-like cells as a vesicular structure. The glue material may be any usual or preferred detail composition. As well known, such customarily involve animal glue and a softening agent such as glycerine or similar acting substance. The glue material may be formed into the roller structure by casting it in liquefied state, and, for instance, the liquefied glue composition may be supplied into a roller mold, such as known in the art, and then may be chilled or cooled for a time sufficient to form an outside layer of desired

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thickness in the mold, and then the interior yet liquid contents may be withdrawn, and then the resultant space may be supplied with glue material of vesicular character. The thickness of the surface or facing layer of the roller may vary in accordance with particular conditions to be encountered in use, also it may be determined to some extent by the size of the roller. A surface thickness of ¼'' to 2'' or more is thus easily controllable, and rollers not only of common inking size may be produced, but also rollers of immense size such as to make possible graining of very large panels or other structures. The forming of the facing layer of the roller also may be carried out by using centrifugal molds, as known in the art, a sufficient charge of the glue material being supplied to the mold, and by rotation of the latter the glue material may be solidified during cooling in the mold wall, thereby forming the desired surface layer, and then the vesicular glue material may be supplied to the interior and be solidified. However formed, the rollers customarily will contain a metal shaft or arbor, as centered or positioned in the mold for the casting, and on removal from the mold the rollers may be trimmed at the ends as usual.

The preparation of the vesicular glue material may conveniently be carried out, for instance, by beating air into the glue material in liquefied state. Air has particular advantages in this usage, but alternatively the vesicles or cellular structure may be supplied by mixing into the glue material a small percentage of a gasifying agent, as for instance baking soda dissolved in a small amount of water, and then chemically equivalent amount of vinegar or other weak acid to release carbon dioxide. Other gasifying agents or preformed gases may, of course, also be used. In any event, the glue material is thereby transformed into a mass having a vesicular structure or gas of a content to such extent as desired. And, while yet in the liquefied state this material may be handled as a liquid and be cast for the interior filling of the rollers, in highly advantageous manner, as already indicated. It is surprising that this kind of a material can be made to permanently hold a vesiculated structure.

As afore-noted, the glue base composition for rollers involves animal glue, preferably of quite high grade, and a softener such as glycerine, or syrup, or the like, in general, and the proportions are varied depending upon the climate, the season of the year, and the temperature of the work room, etc., for instance from about one and a

half to three or more times as much glycerine or other softener as glue, and the amount of water varies from less than a fourth to equal the amount of the glue. Irrespective of the detail composition, I treat the portion for the body of the roller to convert it to a vesicular or cellulated condition, while the portion for the facing is applied in its normal density. The peculiar and inherently desirable qualities of a glue base roller thus are realized, together with new particularly valuable characteristics not expected from such a material.

As an example: A charge of glue and about three times its weight of glycerine or other softener, and about half its weight of water is heated and the mixture melted to about 160° F. and is then charged to a casting mold and the latter by its cooling jacket is chilled for a few minutes at a temperature of around 60°, or to form a peripheral layer of solidified glue of around ¼'' thickness on the mold wall. Then the remaining liquid material is withdrawn from the mold and similar glue material which has been air-beaten is run in, and the whole is chilled as usual, or for an hour or more by cold water in the mold jacket. Finally, the bottom plate is removed from the mold and the roller is withdrawn.

The roller structure, as seen, involves a seamless or integral facing and an interior body which is of vesicular or foamed character, and by reason of the latter, the roller structure is more "lively" and resilient in usage, thereby particularly adequately making possible uniform inking applications and impressions even on very irregular surfaces with which the roller may have to coact. With the present structure the body yields for irregularities while the surface maintains its dimension such that there is no appreciable distortion of the image transferred, even on such irregular and ordinarily impossible work. Additionally, in contrast to ordinary rollers, the present rollers are lighter, and the weight can be reduced by as much as about two-thirds, and this is a notable advantage in making possible superlarge rollers for graining and transferring; and with the rollers of the present invention some operations now become possible such as were not feasible with rollers of the old type.

Other modes of applying the principle of the invention may be employed, change being made

as regards the details described, provided the features stated in any of the following claims, or the equivalent of such be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A roller of animal glue throughout having an integrally cast surface of animal glue and non-volatile liquid softening material and a solidified central body of similar animal glue and softening material containing multitudinous vesicles of air.

2. A roller of animal glue throughout having an integrally cast surface of animal glue and non-volatile liquid softening material and a solidified central body of similar animal glue and softening material containing multitudinous vesicles of carbon dioxide.

3. A roller of animal glue throughout having an integrally cast surface of animal glue and non-volatile liquid softening material and a solidified central body of similar animal glue and softening material containing multitudinous vesicles of inert gas.

4. A roller of animal glue throughout having an integrally cast surface of animal glue and non-volatile liquid softening material, an axial shaft, and a solidified body of vesicular similar animal glue and softening material between the said surface and shaft and surrounding the shaft.

5. A roller of animal glue throughout having a seamless facing of animal glue and non-volatile liquid softening material and a solidified central body of vesicular similar animal glue and softening material.

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