Nov. 13, 1928. 1,691,336

L. V. CASTO

ROLL

Filed March 14, 1927

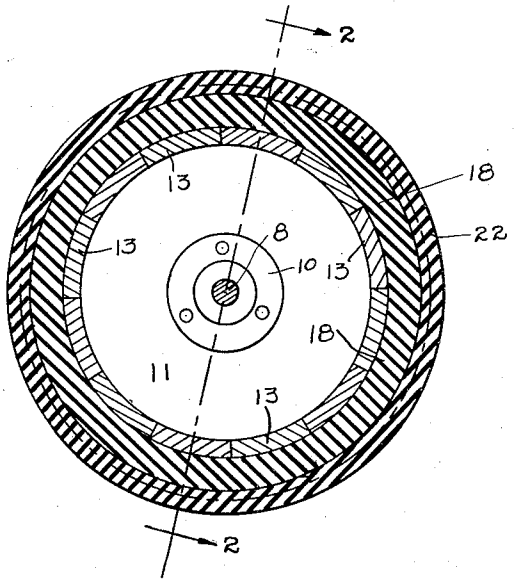


FIG.-1

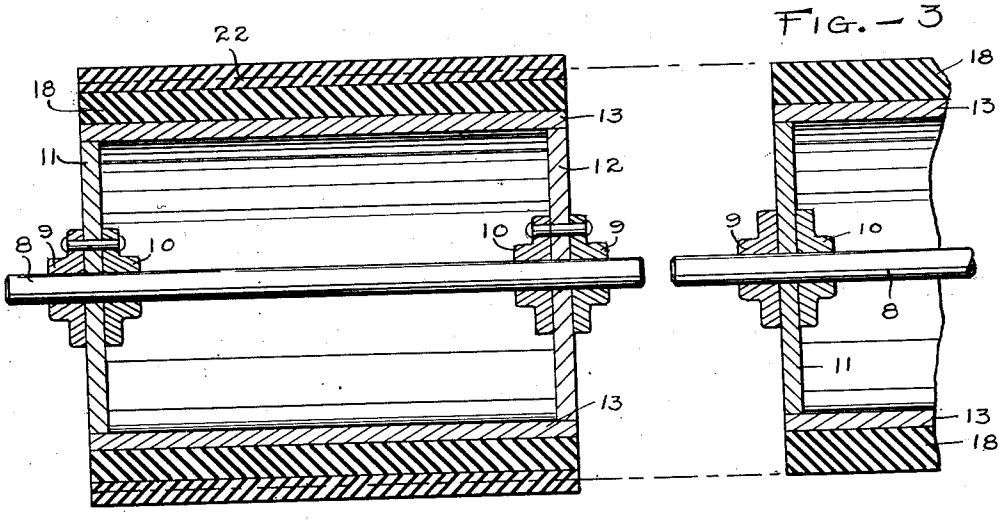


FIG.-3

FIG.-2

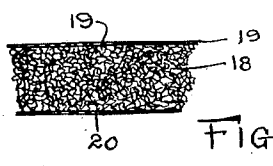


FIG.-4

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UNITED STATES PATENT OFFICE.

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ROLL.

Application filed March 14, 1927. Serial No. 175,308.

This invention is concerned with transfer or impression rolls such as are useful in printing machines and analogous arts, and has for its general object the provision of a durable resilient roll embodying structural features directed to the preservation of the roll in an environment of varying climatic conditions.

More specifically, my invention has for its objects the provision of a roll which will have the usual gum or composition surface but wherein the thickness of the composition may be greatly reduced without detracting from the resiliency of the roll whereby uniformity in the resiliency of the cylindrical surface of the roll may be readily obtained and preserved when in use.

Other objects of my invention will hereinafter become apparent from the following description which refers to the accompanying drawings. The essential characteristics are summarized in the claims.

In the drawings, Fig. 1 is a cross section of a transfer roll embodying the novel features of my invention; Fig. 2 is a cross sectional view of such a roll and Fig. 3 is a cross sectional detail of a part of the roll structure arranged in comparative relation to the structure shown in Fig. 2. Fig. 4 is a cross sectional detail of the resilient layer overlying the core of the roll.

In the making of composition rolls for use in printing machines, intaglio machines and transfer or take-off processes such as transferring pigment patterns from etched rolls or plates, a core structure is usually provided embodying a roll shaft or handle shaft if used manually and about this core structure is molded the body of the roll usually comprising a composition of congealed glucose, gutta percha or other suitable well known composition. Such rolls while found to be serviceable are frequently subjected to alteration in their cylindrical shape due to variations in weather conditions. Likewise such rolls are quite heavy relatively speaking, and when used in any manual transferring processes involve the repeated expending of considerable manual effort and labor.

My invention contemplates the elimination of the greater part of the gum comprising the usual roll body, and I substitute therefor, an underlying sponge rubber structure upon which the gum is cast and I cast the gum upon the sponge rubber body in such manner that the gum surface when permitted to solidify will maintain the underlying sponge rubber structure in a somewhat pre-compressed condition whereby any tendency of cleavage or parting of the gum surfacing material from the body of the roll is prevented. I disclose a process for making such rolls in my co-pending application, Serial No. 168,610, filed February 16th, 1927. The underlying sponge rubber base serves to maintain a uniform resiliency throughout the cylindrical surface of the roll and particularly at the roll ends.

In Figs. 1 and 2 of the drawings I show a preferred form of core structure which may comprise a shaft 8 having secured thereto flange members 9 and 10 which are fastened or secured to disc-like members 11 and 12 comprising the end structures of the roll. The disc members 11 and 12 may be formed of metal or of a more light material such as wood and staves 13 (see Fig. 1) may be secured thereto in any suitable manner. Placed about the staves is a layer of sponge rubber 18 and as shown in Fig. 4 this sponge rubber has preferably a non-porous skin structure 19 and 20 forming the flat surfaces thereof. The sponge rubber may be formed tubularly if desired or it may be made in sheets of the desired thickness and glued or otherwise secured to the staves 13 of the core structure.

After the sponge rubber layer 18 is secured to the body of the roll core, I then place thereover, a layer of gum or composition 22 by molding the same thereon and while maintaining a pressure upon the composition material while in liquid condition. This pressure causes a slight compression of the sponge rubber layer 18 as shown by comparison of Figs. 2 and 3 of the drawings and the composition is maintained in this compressed condition until it solidifies. When the roll is removed from the mold there is a slight expansion of the rubber against the encasing cylinder of composition 22 and incidentally a slight expansion of the composition material, and this permanent condition tends to prevent any slipping or parting taking place between the composition coating of the roll and the sponge rubber cushion beneath.

The thickness of the layer 22 of the composition is shown in Fig. 2 and also the degree of compression of the sponge rubber layer 18 of the roll structure in a somewhat exaggerated condition as represented by the dot and dash lines of Figs. 2 and 3, it being understood that one of the objects of the pres-

ent invention is to maintain the thickness of the gum layer at a minimum.

It will be apparent that I may construct the roll without resorting to the use of a hollow core and that the sponge rubber may be placed on the core in spiral layers if desired and the gum coating then placed thereon by compressing it when in fluid condition and before solidification, in the manner hereinbefore referred to.

By maintaining the gum at a minimum thickness, the concentricity of the roll is thus preserved under varying weather conditions and there is less tendency for the surface to develop fissures and cracks while the degree of resiliency of the roll surface can be controlled by regulating the extent of the porosity of the sponge rubber used in the roll body. A roll made in accordance with the disclosure of the present invention will also have the advantage of being as firm at its cylindrical edges as those portions of the roll near the transverse center thereof.

I claim:

1. In an impression or transfer roll, the combination of a core structure embodying sponge rubber and an overlying composition surface placed thereon in precompressed relation to the sponge rubber.

2. In a roll of the character described, the combination of a sponge rubber cushion having a relatively non-porous gum contacting surface and a layer of composition gum, there being a permanent pre-compressed condition existing between the composition surfacing and the sponge rubber cushion.

3. In an impression or transfer roll, the combination of a core structure embodying sponge rubber having a relatively non-porous surface and an overlying composition surface placed thereon.

4. In a roll of the character described, the combination of a hollow core structure, a sponge rubber cylindrical cushion placed thereon and a cylindrical layer of composition gum placed thereover, there being a permanent pre-compressed condition of the sponge rubber.

5. In an impression or transfer roll, the combination of a core structure embodying sponge rubber having a relatively non-porous cylindrical surface and an overlying concentric layer of composition material placed thereover.

6. In a roll of the character described, the combination of a sponge rubber cushion having a relatively non-porous composition contacting cylindrical surface and a concentric layer of composition gum placed thereover, there being a permanent pre-compressed condition existing between the composition surfacing and the sponge rubber cushion.

In testimony whereof, I hereunto affix my signature.

LLOYD V. CASTO.