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C. T. DICKEY

2,196,010

TEMPLE ROLL

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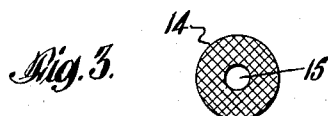
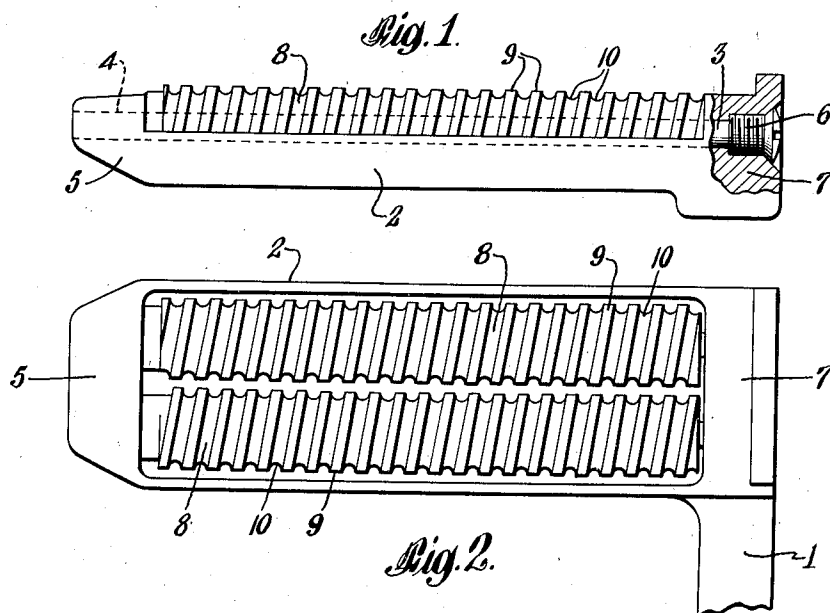


Fig. 5.

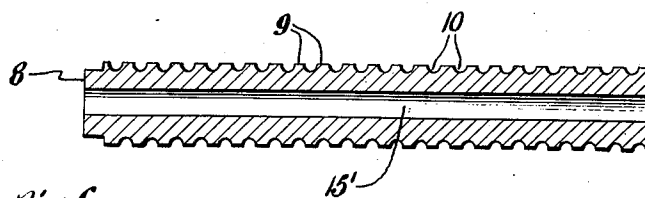
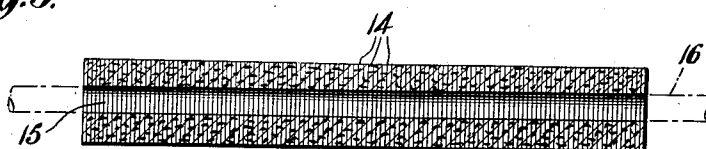


Fig. 6.

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TEMPLE ROLL

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6 Claims. (Cl. 139—296)

This invention relates to a roll for use in a loom temple.

As is well known to those skilled in the art, a loom temple is normally employed at each side of the loom adjacent the fell of the cloth being woven for the purpose of uniformly maintaining the cloth stretched widthwise.

In connection with various types of fabrics, for example, those composed wholly or largely of rayon or cellulose ester filaments as acetated cellulose, or those of a fine and delicate nature, it has long been customary to use rubber or rubber composition as the surface of the roll which engages the cloth. Rubber has many disadvantages, as has pasteboard, wood shavings and the like.

The ideal temple roll according to my researches, is closely approached, where a suitable bonding, agglutinating or matrix material is used as a portion of the temple roll, and has embedded therein a multiplicity of outwardly-projecting fixed fiber or fiber-like ends, to which the frictional-gripping capacity is primarily due; that is, wherein the friction results mainly from a plurality of frayed fibrous ends immovably imbedded, contacting the delicate filaments or filatures constituting the goods being processed.

This invention is related to my application for "Temple roll," filed March 25, 1939, as Serial Number 264,065, which, in turn, is a continuation in part of my co-pending application Serial Number 249,207, filed January 4, 1939, for "Temple roll and process of manufacture."

One of the objects of the present invention is to provide a construction of that type of temple roll employing a non-rubber body, in which the disadvantages inherent in the present types of temple roll are substantially non-existent, as will be more particularly pointed out herein.

Another object is to provide a temple roll having the initial desired frictional gripping surface, which remains uniform and substantially unimpaired for an indefinite period of time.

A third object is to provide a temple roll of required frictional gripping surface which is unacted upon and unimpaired to an observable degree or extent by any of the components of, in, or evolved incident to contact of textile with temple roll.

Another object is the employment of an agglutinating, compacting or bonding medium of such properties as rigidity, that the inner portion of the filaments or fibers, having outwardly-projecting ends, is immovable.

A further object is to provide a temple roll

wherein the surface passing in contact with the cloth, does not leave a mark or streak, or deposit material on the goods as is the case where a rubber roll is used, or a roll having a rubber face, especially when the rubber has been softened by the "fumes" from the filaments being woven.

This is an important point, because the goods are usually plain woven white and afterwards dyed. Even if an almost unnoticeable streak is left on the goods from deposition of tiny traces of rubber or rubber substitute, this materially interferes with uniform penetration of dyestuff in the dyeing operation, for the reason that rubber is absolutely insoluble in water, causing uneven and unlevel dyeings to result.

Other objects of the invention will appear more fully and clearly from the accompanying description and drawing, and will be particularly pointed out in the claims.

The general nature, function and purpose of a loom temple of the roll type are so well known and familiar to those skilled in the art, that it here only becomes necessary to illustrate a portion of one typical form of a temple, together with preferred forms of the invention embodied therein.

In the drawing and illustrative examples are shown and described several preferred forms of temple roll embodying my invention.

Fig. 1 is an end elevation of a temple head with the form of roll embodying the invention located therein;

Fig. 2 is a top plan view of the construction shown in Fig. 1;

Fig. 3 is a face view of one of the units from which the roll is fabricated;

Fig. 4 is a side view of the unit shown in Fig. 3;

Fig. 5 is a longitudinal cross section through a fabricated roll in an intermediate stage of manufacture;

Fig. 6 is a longitudinal cross section through a finished roll.

The invention is shown in connection with the usual type of temple wherein two rolls are rotatively mounted. The temples are arranged in pairs, one at each side of the loom, and may be termed right-handed and left-handed since their function is to laterally stretch the cloth being woven to the right and left side of the loom. The construction of the temple roll is the same in both cases and therefore only a right-handed temple roll has been illustrated.

The form of roll embodied in the present in-

vention is adapted for use in substantially all types of roll temples.

The temple illustrated in Figures 1 and 2 comprises an arm 1, of which only a portion is shown and by which it is mounted upon the loom at the forward end, and a main body portion or pod 2 formed thereon having a trough-like shape in which the rolls are mounted. The temple rolls are journaled on pins 3 supported in the end walls of the pod 2, the inner ends 4 being fitted into the end wall 5 and the outer ends being provided with enlarged screw-threaded heads 6 which are tightly threaded into the end wall 7.

The temple roll 8, to perform its function of putting lateral tension on the cloth being woven, has its surface formed into alternating ridges 9 and grooves 10 arranged in the form of a helix.

The outer part of the roll 8 in which the ridges 9 and grooves 10 are later formed is fabricated or built up of a plurality of washer-shaped members 14 in which the outside diameter is slightly greater than that of the finished roll and the diameter of the hole 15 is slightly larger than pins 3. A suitable rod or mandrel of steel or other suitable material is shown at 16 of Fig. 5.

To construct the roll 8, the proper number of impregnated washer-like members 14 are closely placed on the rod 16 in sufficient number so that when compacted together, a temple roll of the desired length will be formed. The rod with its assembled washers 14 thereon, is then subjected to pressure or heat or heat and pressure, in a device having dies with an internal configuration which will compress, distort, groove and furrow the substantially cylindrical shape of series of members 14 into the helically arranged ridges 9 and grooves 10 of the finished roll 8.

During this operation the members 14 are so compacted and merged into one another that they form a highly resistant, substantially one piece unit having the characteristics desirable in a temple roll.

After the compression operation, the rod 16 which has been used to align the washer-like members is removed, leaving the temple roll as shown in Fig. 6. If desired the temple roll may be molded with one or both ends of smaller outer diameter than the rest of the temple roll. In the drawing, Fig. 6 illustrates such a roll with one end of smaller diameter.

The members 14 are preferably of woven natural or artificial organic or inorganic fibers or admixtures thereof, as cotton, linen, wool, silk, rayon, acetate filaments, asbestos fibers, and impregnated with or compacted by a thermoplastic body or bodies which are substantially unaffected by the fibers being woven, or materials contained therein or evolved therefrom. And conversely, if solvents, non-solvents, diluents, softeners, indurating, insolubilizing or thermoplasticizer bodies be used in conjunction therewith, whether in the gaseous, liquid or solid condition or mixtures thereof, they must be substantially devoid of solvent or deteriorating action upon the filaments or fibers constituting the textile being treated.

Impregnating, compacting and agglutinative bodies suitable for this purpose are cellulose and non-etherized cellulose derivatives; natural resins, resin-like bodies, and synthetic resins of the non-vinyl type; water-soluble or water-emulsifiable bodies as natural and artificial gums, glues, sizes, modified starches and starch products and their substitutes, components present in

milk or obtained therefrom; partially or entirely saponified, sulfonated or sulfated metal salts of the higher fatty acids, with or without the addition of products to modify their natural properties especially solubility and action upon components present in or evolved from, the textile which contacts the temple roll.

If the fiber impregnating material used is to be modified in its properties, for example glue insolubilized by treatment with formaldehyde vapor, in general it has been found more advantageous to submit the impregnating material to such treatment after compression. On the other hand if it is desired to soften, extensify or thermoplasticize in general that step is preferably conducted by treatment of the impregnating portion before compacting.

Example I.—As one method exemplifying my invention using a water-soluble impregnating material, I may take 4 pounds of a ten-ounce duck, drill or canvas, or an equivalent weight of a heavier or lighter weight fabric, and permeate or impregnate the same with a concentrated glue solution or casein solution, using water or equivalent as the diluting medium. The textile is impregnated with the solution, excess removed in any suitable manner, and the cloth subjected to treatment with an insolubilizing or indurating material as bichromate solution, alum solution, metal salts in solution which act as insolubilizers, or an aldehyde in the gaseous or liquid state.

The canvas after impregnation and before or after induration, and after removal of volatile portion therefrom, weighs from six and one-half to six and three-quarters pounds avoirdupois, depending in a measure upon the absorptive capacity of the textile, and the amount of impregnating material removed as by pressure.

From this impregnated or impregnated and indurated textile, washer-like members are fashioned as shown in Fig. 4.

Or the original textile may be cut into washer-like members, and these individually treated in manner above indicated or its substantial equivalent.

Example II.—A method wherein a water-insoluble bonding agent is employed for treatment of the fibers. The textile is saturated with a 3 pounds to the gallon solution of copal or equivalent resin in a mixture of solvent and non-solvent, a mixture of 35 percent isobutyl acetate, 20% ethanol, 30% isobutyl alcohol and 10% acetone, all quantities by volume. Excess impregnating liquid is removed by pressure, and a final evaporative step is conducted to remove traces of higher boiling liquid. Washer-like members are then cut from the above, and treated by heat and pressure as hereinbefore disclosed to form the temple roll.

Example III.—A method wherein a cellulose derivative is employed for treatment of the fibers. The textile is saturated with a thick solution of a Celluloid (cellulose ester with thermoplasticizer therein) in a minimum of volatile solvent or volatile solvent combination, as acetone or acetone diluted with a proportion of commercial benzene, excess of solution removed by a mechanical step, and the remaining volatile solvent removed by a mechanical step, after which washer-like members are cut from the textile, 70 and fabricated into the finished article, as herein set forth.

The impregnated sheets from the foregoing examples or their equivalents may be compacted into a unitary block or slab of thickness approxi-

5 mating the length of the plurality of washer-like members 14 shown in Fig. 5, are then cut in a direction perpendicular to the long axis of the threads or fibers, so as to form unitary, cylindrical hollow bodies with inner diameter nearly equal to the outer diameter of pin 3, and of outer diameter substantially the same as 14, and in appearance will be the equivalent of 14 in Fig. 5, except that the plurality of 14 shown mounted on 16, is replaced by a unitary member.

Compression is then applied, to produce the equivalent of the finished temple roll shown in Fig. 7.

15 In the foregoing examples, after removal from the press the helically arranged ridges 9 are more or less rounded from bonding material thereon. The final operation is a grinding or abrasive treatment whereby 9 is smoothed until a flattened face is formed, as shown at 9 in Fig. 6.

The plurality of woven or unwoven fibers may be dyed, mercerized or otherwise treated before impregnation, and the impregnating medium 25 may be colored as by addition of dyestuff, lake or pigment.

The important feature of this invention resides primarily upon two counts:

30 (1) The efficiency depends upon the relative percentage of raw edges of outwardly-projecting fibers constituting the fabric-engaging surface the periphery of 14 as shown in Fig. 5, and so bonded that the fiber body is immovably affixed in the bonding composition, and so remains during an indefinite and prolonged period of wear.

35 (2) The bonding body or composition must not be deleteriously affected by components in, or evolved from, the fibers, filaments or textiles which pass over the helically raised edges and ridges 9 of Fig. 6, wherein the surface of 9 is substantially parallel with the inner cylindrical hole 15.

What I claim is:

45 1. A temple roll of a homogeneously appearing body composed of a helically grooved cylinder comprising a plurality of compacted layers

of immovably fixed fibers having outwardly projecting raw ends, said cylinder being adapted to engage a cloth surface without damaging the same and retain a satisfactory uniform cloth-engaging and frictionally gripping surface during the wearing of the same, said fibers being impregnated with a thermoplasticized cellulose organic ester and bonded together by heat and pressure.

2. A temple roll of a unitary body composed of a spirally channelled cylinder comprising a plurality of compacted layers of woven fibers with outwardly projecting raw ends bonded together with a nitrated cellulose substantially inert to acids or alkalis, said temple roll being adapted to engage a cloth surface without damaging the same and retain a permanent cloth-engaging and frictionally gripping surface during wear.

3. A temple roll comprising a helically grooved, hollow cylinder composed of fibers so arranged in a matrix of a plasticized cellulose inorganic ester, that the long dimensions of said fibers are perpendicular to the axis of the cylinder.

4. A temple roll of a unitary body composed of a helically grooved cylinder comprising a plurality of compacted layers of woven fibers with outwardly projecting ends embedded in a cellulose inorganic ester, said temple roll being adapted to engage a cloth surface without damaging the same, and retain a satisfactory uniform cloth-engaging, frictionally gripping surface during the wear of said surface.

5. A temple roll of a unitary body composed of a helically grooved cylinder comprising a plurality of compacted layers of woven fibers with outwardly projecting ends embedded in a plasticized nitrated cellulose, said cylinder being adapted to engage a cloth surface without damaging the same and retain a satisfactory uniform cloth-engaging and frictionally gripping surface during the wearing of said surface.

6. A temple roll comprising a helically grooved, hollow cylinder composed of fibers arranged in a thermoplasticized cellulose nitrate matrix that the long dimension of said fibers is perpendicular to the axis of the cylinder.

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