Jan. 20, 1948. E. B. TIFFT 2,434,820

LOOM TEMPLE ROLL

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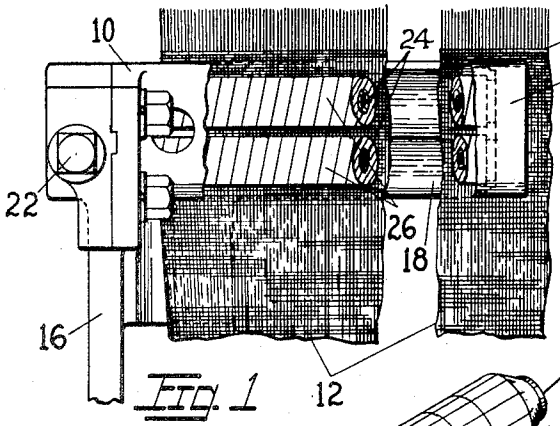


Fig. 1

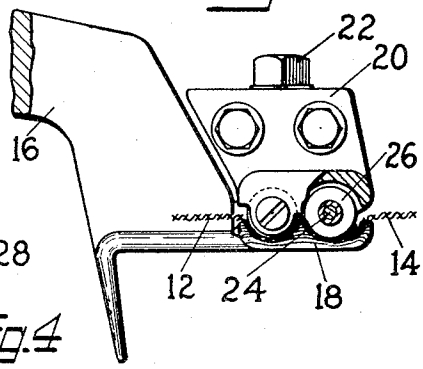


Fig. 2

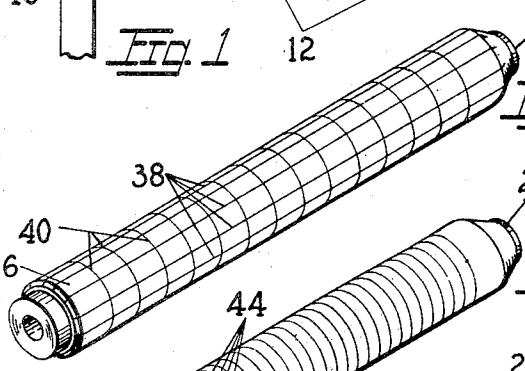


Fig. 4

Fig. 5

Fig. 3

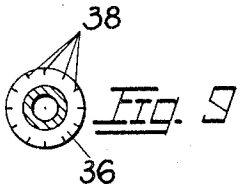


Fig. 9

Fig. 6

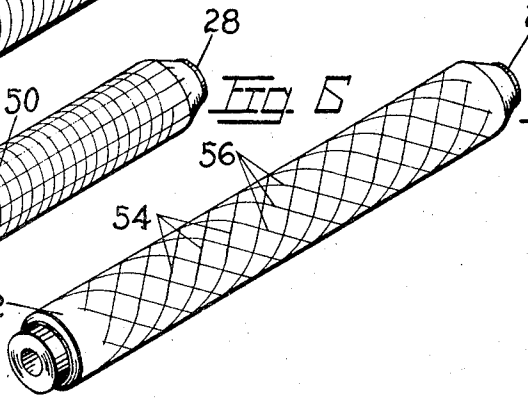


Fig. 7

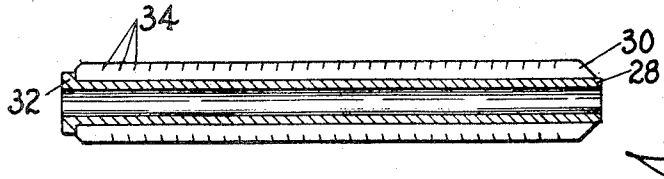


Fig. 8

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LOOM TEMPLE ROLL

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9 Claims. (Cl. 139—296)

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This invention relates to loom temples, and more particularly to rolls for such temples. In a weaving loom as usually constructed the cloth as it is drawn from the weaving line under considerable tension has a pronounced and strong tendency to stretch warpwise and contract weftwise. Since weft wise contraction at or near the weaving line is undesirable due to resultant excessive wearing of the reed and for other reasons, the loom has at each side means in the form of a temple to maintain the cloth at full width at or near the fell or weaving line. Commonly the temple is in the form of a frame including a slide having a base or pod and a cover over the pod. The cover is equipped with a plurality of rolls extending generally weftwise of the cloth and accommodated in depressions formed in the base. In another common construction the rolls are mounted in the base and are accommodated in depressions in the cap or cover. The rolls are of two general types, metal studded with pins, and friction rolls. All except the heaviest cloths are apt to be injured by the pins of pin-type rolls, and as a consequence the majority of temple rolls now used are of the friction type, constructed with a tubular core of wood or other relatively rigid material and a tubular sleeve-like cover of rubber, synthetic rubber, or textile material. It is to the friction type of temple roll that the present invention is directed.

Heretofore temple rolls of the class indicated have been made, as mentioned above, with a hollow cylindrical wood core member, upon which was secured a tubular sleeve of a selected cloth-gripping friction material. In view of the fact that the cloth is gripped and held under a very considerable tension, it is evident that the material of which the cloth engaging surface of the roll is made should be of such material and configuration that good frictional tractive contact with the cloth is secured. Further it should be such that reasonably long life of the roll is attained, and such that the gripping qualities or characteristics do not appreciably vary during the life span of the roll. Rubber, and certain of the synthetic rubbers, have been found by long practice and experimentation to be the best materials at present available for the roll surface. It has been the practice to form the rolls with ribbed surfaces or toothed surfaces, in order to obtain good cloth-gripping characteristics, it having been found that a plain cylindrical surface did not furnish enough grip or traction for any except the lightest of fabrics. The ribs are almost universally arranged or disposed in spiral formation along the surface of the roll. In addition to rolls having plain spiral ribs, rolls have been made having in addition to the spiral rib formation a series of axially extending grooves, thus giving the roll surface a series of spirally disposed teeth arranged in longitudinally extending rows. All of the mentioned types of covered rolls suffered one or more defects. The plain cylindrical rolls failed to furnish the requisite grip or traction on the cloth for all except the lightest cloths; the ribbed rolls, while giving improved grip, suffered from relatively rapid wearing; and the toothed type of roll, while giving better traction than the plain ribbed roll, had the shortest life of all. While it is evident that wear-resistance could be improved by making the roll cover or surface of harder material, the traction furnished is found to be roughly inversely proportional to the hardness of the material. Hence materials such as plastic-impregnated textile fabric, while giving a roll of long life-expectancy, at the same time gave a roll possessing inferior cloth-gripping characteristics.

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With the above mentioned defects of prior art temple rolls in mind, it is an object of the present invention to provide a temple roll having a portion of elastic material forming a generally cylindrical cloth-engaging surface, the portion being characterized by a circumferentially disposed inwardly extending slit at and near its outer cylindrical surface, whereby the roll has a wearing surface area as great as possible and also is provided with at least one cloth-engaging edge or corner. It is a further object of the invention to provide in a temple roll a cloth-engaging surface of generally cylindrical conformation formed by a multiplicity of mutually interengaging individually deformable block-like portions of an elastic material. A further object of the invention is to provide a temple roll comprising a rigid core and a tubular cover of resilient material on the core, the cover being characterized by a series of axially disposed inwardly extending slits and at least one circumferentially disposed inwardly extending self-closing slit, said slits being at and near the surface of the sleeve.

It is another object of the invention to effect improvements in friction type temple rolls generally.

The above mentioned objects, and others that shall appear hereinafter, are attained by the invention, a preferred form and several modified forms of which are illustrated in the accompanying drawings and disclosed in the following speci-

fication considered in conjunction with the drawings.

In the drawings:

Fig. 1 is a top view of a temple equipped with rolls according to the invention, with portions broken away;

Fig. 2 is a side view of a temple as viewed from the cloth side with a portion broken away to show one roll and spindle in section;

Fig. 3 is an isometric view of a preferred form of temple roll according to the invention;

Figs. 4, 5, 6 and 7 are isometric views of other forms of temple rolls according to the invention;

Fig. 8 is a longitudinal sectional view in elevation of the temple roll of Fig. 3; and

Fig. 9 is a right sectional view of the temple roll of Fig. 4.

Referring to the drawings there is illustrated in Fig. 1 a portion of the left hand loom temple 10, through which is directed the cloth 12 as it is drawn away from the fell or weaving line 14. The temple comprises a shank or bar 16 terminating in a base 18 to which is secured a cap 20 as by a cap screw 22. In the cap are two spindles 24, upon each of which is rotatably mounted a temple roll 26. The structure thus far described, excepting rolls 26, may be as is usual in the art, and is well known and understood by those skilled in the art. According to the present invention the temple rolls are of the general form and nature hereinafter described and illustrated in detail in Figs. 3 to 9 inclusive. Considering first Fig. 3, which illustrates a preferred form of the invention. there is shown a temple roll comprising a core 28 and a roll cover 30. The core preferably is formed of wood although any other suitable material of sufficient rigidity may be employed; and it may have at one end a head 32 preferably formed integrally with the body of the core. The cover 30 is in the form of a cylindrical sleeve which may be of any suitable elastic material, such as, for examples, rubber, synthetic rubber, rubber composition, and elastic synthetic resin. The principal requisites of the material are elasticity and durability, and it has been found that many rubber and rubber-like composition are eminently suitable. Commencing near one end an inwardly directed circumferentially disposed spiral slit 34 is cut in the cover, the slit extending to or near to the opposite end. This slit may be made by any suitable sharp cutting instrumentality, as for example, by a razor blade mounted in a lathe tool holder and properly engaged with the roll while the latter is rotated by the lathe. The slit is preferably but not necessarily cut or made at a slight angle to a true radial direction. Cuts made at an angle of approximately 80° as measured between the plane of the cut and the axis of the roll have proven to be satisfactory. This type of slit is illustrated in section in Fig. 8 of the drawings, wherein the slit is shown, in its inwardly directed course, inclined or disposed at a slight angle to a line intersecting the slit and normal to the axis of the roll. The slit is preferably not extended to the ends of the cover, to obviate any tendency for the cover to "peel" while in engagement with the cloth. The slit may be of any desired depth, depending somewhat upon the diameter of the roll and the pitch of the spiral, but a depth of from one thirty-second to one-sixteenth of an inch has been found to be practical for a roll of five-eighths inch outside diameter. The pitch of the spiral slit may be widely varied, but for most fabrics a pitch of from one-sixteenth to one-eighth of inch has been found to be satisfactory. No part of the material is removed in forming the slit, hence it is self-closing due to the resilience of the material. It has been found that the cover, slit as just described, has greatly improved traction characteristics as compared with a cover of the same material and dimensions but having a plain cylindrical surface; and further that the service life of the slit cover is considerably greater than that of a ribbed cover of the same material and dimensions. It is thought that the increased tractive effect is the result of the presentation to the ridges of the cloth of a multiplicity of substantially square edges of the cover material as the latter is silghtly deformed by the forces exerted upon it by the cloth. It will be noted that as compared with a spirally ribbed cover, wherein there are alternating ribs and grooves, a cover according to that described and of the same general dimensions will have twice as many cloth engaging edges, one for each rib and one for each groove of the ribbed roll. It is thought that the improved wear resistance as compared with a ribbed cover may be due to the considerably greater effective area of cover material engaged by the cloth. As is obvious, that area is substantially double that of a ribbed roll of like dimensions. In Figs. 4, 5, 6 and 7 there are depicted several other temple rolls with covers made according to the invention. In each of these rolls the core member is the same in all material respects as that described in connection with Fig. 3, and only the slits formed in the covers differ from that of the principal embodiment of the invention. In Fig. 4 the cover 36 is provided with a plurality of slits 38 extending longitudinally or axially of the cover, and preferably extending or directed radially inwardly from the surface. These slits may extend throughout the entire length of the cover, since they furnish no tendency for the cover to peel. In addition to slits 38 the cover 36 is provided with a series of inwardly directed circumferentially disposed continuous slits 40 formed at substantially right angles to slits 38, giving the cover a grid-like surface appearance. Slits 40 are preferably but not necessarily formed at a slight angle to a plane normal to the roll axis, similarly to the way previously mentioned slit 34 is formed. Slits 38, and 40, may be spaced apart any desired distances, respectively. Spacings of one-fourth inch in each case have been found to be satisfactory on a roll of five-eighths inch diameter. It is found that as the spacing is increased, the tractive pull exertable upon a cloth is reduced, but the service-life of the cover is increased. Hence the spacings may be varied to give only the required traction and the maximum service life, for each of various fabrics and weaving conditions. Fig. 9 is a cross-sectional view of the temple roll shown in Fig. 4, taken normal to the axis of the roll and between a pair of slits 40, and showing the nature and inward extent of slits 38 in a preferred form of that embodiment of the invention.

In Fig. 5 the core 28 is provided with a cover 42 similar to that shown in Fig. 3 except that instead of having a single spiral slit there is provided a series of circumferentially disposed inwardly directed slits 44. The series of slits is preferably terminated short of the ends of the cover, as shown, to obviate the aforementioned peeling or stripping of the cover. Slits 44 may be formed and spaced similarly to slits 40 in cover 36 (Fig. 4). Spacings of from one-sixteenth inch to one-fourth inch have been found to give ex-

cellent results for various grades, weights, and widths of fabrics.

In Fig. 6 the core 28 is provided with a cover 46 having longitudinal slits 48 similar to slits 38 (Fig. 4) and having a spirally extending slit 50 similar to slit 34 (Fig. 3). In this modified form of the preferred embodiment of the invention the slits 48 are preferably made to extend inwardly in a radial direction and slit 50 is cut as is previously mentioned slit 34 (Fig. 3). The material of the cover is the same as that of cover 30 (Fig. 3).

In Fig. 7 is shown an additional modified form of the preferred embodiment of the invention. The core 28 is provided with a cover 52 which, like covers 36, 42 and 46, may be of the same material as cover 30 previously described. Cover 52 is provided with two oppositely spiraled series of slits, 54 and 56, each slit preferably being formed to extend inwardly toward core 28 and inclined slightly toward head 32 of the core. The several slits of each series intersect the several slits of the other series, and are preferably but not necessarily terminated short of the ends of the cover, as shown. The intersecting slits produce a tractive surface composed largely of a number of distorted-diamond shaped sections. In this form of the roll, as in those forms previously described, the pitch of the spiral of each slit may be considerably varied, but is preferably such that the oppositely extending slits intersect substantially at right angles. Likewise the number of slits in each series may be varied to attain just sufficient tractive effect for the particular fabric to be handled, yet leave a maximum of service life in the cover. Preferably the number of slits in both series of slits is the same.

It will be noted in the case of each of the covers 30, 36, 42, 46 and 52 that while substantially all of the cylindrical surface area of the cover is left to engage the fabric and resist abrasion and wear, nevertheless the cover is provided with a multiplicity of fabric engaging edges or corners. Thus the cover has the desirable long service life of a plain ribless cylindrical cover and has the desirable greater tractive effect of a ribbed roll.

Having disclosed the invention it will be evident that changes and modifications thereof will occur to those skilled in the art, and what I claim and wish to secure by Letters Patent of the United States is:

1. A loom temple roll comprising an integral body of elastic material presenting a generally cylindrical cloth-engaging surface, said body having between its ends at least one circumferentially directed inwardly directed self-closing slit extending only partly through the body toward its longitudinal axis.

2. A loom temple roll comprising an integral cover of elastic material presenting a cylindrical cloth-engaging surface, said cover having between its ends a circumferentially disposed spiral slit directed inwardly of the cover from said surface and extending only partly through the cover toward its longitudinal axis.

3. A loom temple roll comprising an integral cover of elastic material presenting a cylindrical cloth-engaging surface, said cover having between its ends a series of circumferentially disposed inwardly directed slits.

4. A loom temple roll comprising a rigid core member and an integral resilient tubular cover on said core, said cover presenting a generally cylindrical cloth-engaging surface and having between its ends a circumferentially disposed slit directed from the surface of the cover inwardly toward the axis of the cover and terminating short of the inner surface of the tubular cover.

5. A loom temple roll comprising an integral elastic portion of tubular form presenting a generally cylindrical cloth-engaging surface, said surface being substantially equal in area to the curved cylindrical surface area of a smooth cylinder of like diameter and length, said cloth-engaging surface being made discontinuous lengthwise thereof by an inwardly directed circumferentially disposed self-closing slit in said portion, said slit extending only partly through the portion from said cylindrical surface toward the inner surface of the portion.

6. A loom temple roll comprising a rigid core and an integral elastic cover on said core, said cover presenting a generally cylindrical cloth-engaging surface interrupted between its ends by a circumferentially disposed inwardly directed self-closing slit formed in said cover and extending only partly through the cover from said surface toward said core.

7. A loom temple roll comprising a rigid cylindrical core and an integral elastic cover on said core, said cover presenting a generally cylindrical cloth-engaging surface interrupted by a series of circumferentially extending endless self-closing slits direct inwardly from said surface toward the axis of the roll and disposed at a slight angle to a plane normal to said axis.

8. A loom temple roll comprising a rigid cylindrical core and an integral tubular elastic cover on said core, said cover presenting a generally cylindrical cloth-engaging surface interrupted lengthwise of the cover by a circumferentially disposed spiral self-closing slit directed inwardly from said surface toward the axis of the roll and disposed at a slight angle to a line intersecting said slit and normal to said axis, said slit extending from said cloth engaging surface only partly through the cover toward said core.

9. A loom temple roll comprising a rigid core and an integral elastic cover on said core, said cover being of cylindrical form and presenting a cloth-engaging surface formed by a multiplicity of mutually interengaging individually deformable block like formations at the exterior surface of said cover.

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