Aug. 3, 1948. L. D. CLARK 2,446,211

RING ROLL

Filed June 9, 1947

FIG. 1.

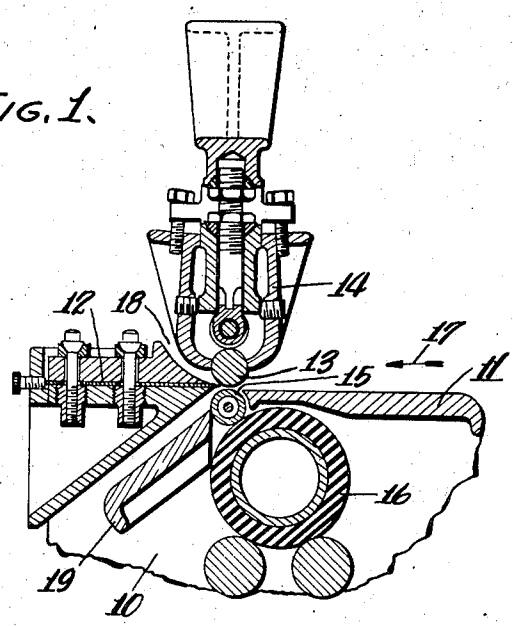


FIG. 2.

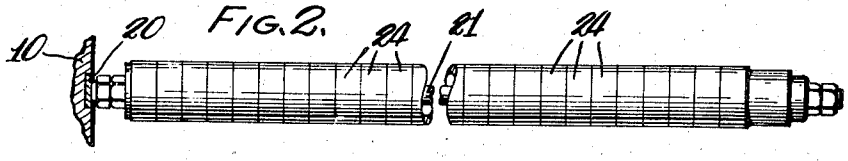


FIG. 3.

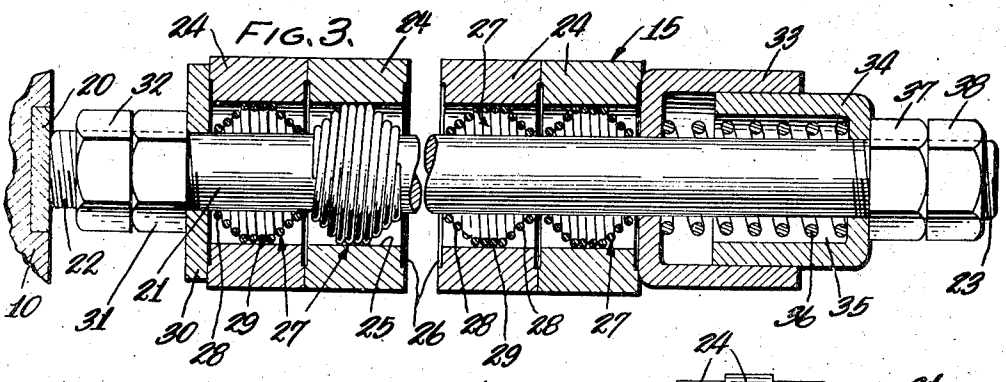


FIG. 4.

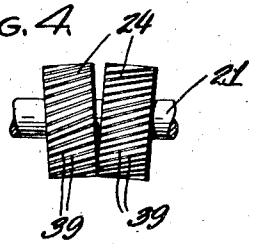
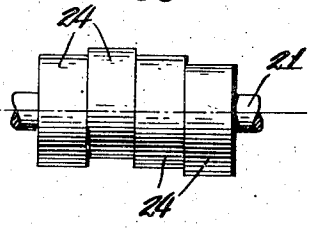


FIG. 5



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2,446,211

RING ROLL

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7 Claims. (Cl. 69—13)

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My invention relates to ring rolls, more particularly to ring rolls for leather splitting machines, and the principal object of my invention is to provide new and improved ring roll constructions.

In the splitting of material, particularly of leather, the ring roll construction must be such that the ring sections are individually free to vary in proportion to locally thickened portions of the material being split, yet to return to position when such thickened portion is passed.

Prior to this invention, the art has made an attempt to provide a satisfactory ring roll construction, and the patent to J. A. Meyer, Number 1,586,100, May 25, 1926, is an example of prior art construction.

However, actual operating tests of such prior art constructions have indicated that they are wanting in many respects. For example, in the Meyer patent referred to, a rubber shoe is interposed between a ring section and a shaft carrying the ring section, the rubber shoe being carried by an inner section. This construction required that the rubber shoe be stretched sufficiently so that it may be assembled with the inner section, and in some cases such stretching caused serious distortion of the rubber shoe. In any event, such construction causes considerable difficulty in assembly and disassembly operations during cleaning of the ring roll construction.

Further, the hides after treatment prior to the splitting operation may still be wet, and moisture, dirt, grease and the like has a tendency to enter the ring section and deteriorate the rubber shoe and also creep behind the rubber shoe and thus cause the ring section to run off center. When such conditions existed, the ring roll could no longer be used.

Tests on the ring roll construction provided by my invention have shown that such construction will give far longer service without attention, and when cleaning was required, the component parts were readily removable and replaceable without repairs. It will be appreciated that a ring roll of my improved construction has a high degree of utility, since improper functioning of the ring roll construction during the splitting of a hide materially lessens the value of the hide, thus increasing manufacturing costs because of spoilage and because of increased labor cost.

In the drawing accompanying this application and forming a part of this specification, there is shown, for purposes of illustration, an embodiment which my invention may assume, and in this drawing:

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Figure 1 is a longitudinal sectional view showing a ring roll in combination with a leather splitting machine of a commercial type,

Figure 2 is a fragmentary elevational view of my improved ring roll,

Figure 3 is an enlarged longitudinal sectional view through the ring roll, parts being shown in elevation,

Figures 4 and 5 are views showing relative positions of the adjoining ring sections of the ring roll.

Referring particularly to Figure 1, the leather splitting machine therein disclosed comprises a frame 10 having a table 11 upon which the hide to be split is fed toward the band-type splitting knife 12. A gauge roll 13 is carried by a suitable support 14, which is adjustable so that the gauge roll 13 may be adjusted to accommodate hides of various thicknesses. The ring roll 15 is freely carried by a rubber back up roll 16.

In operation, the hide is fed along the table 11 in the direction shown by the arrow 17, the gauge roll 13 and ring roll 15 feeding the hide toward the band knife 12, the even split of the hide passing outwardly through a passage 18, and the remainder of the hide passing downwardly along a slide 19.

In this particular illustration, the ring roll 15 is driven only by frictional contact with the driven rubber roll 16. The ring roll bears against the uneven side of the material to be split and takes up inequalities of material thickness by sinking into the rubber roll 16. The ring roll is further supported by engagement with an adjoining part of the slide 19. To prevent the ring roll 15 from creeping endwise, one or both of its ends may bear against hardened inserts, carried by the frames as shown at 20.

The ring roll 15 herein shown to disclose an embodiment of my invention comprises a shaft 21 having threaded ends 22 and 23.

A plurality of similar ring sections 24 are carried by the shaft 21, each ring section having an interior annular surface 25 of a diameter larger than the diameter of the shaft, and each ring section has its side surfaces recessed, as at 26, so that such side surfaces may be readily machined so as to lie in planes substantially normal to the axis of the ring section.

Resilient means is interposed between each ring section 24 and the shaft 21, the resilient means urging the ring section to concentricity with respect to the shaft 21, yet permitting each ring section to individually move out of concentricity. In the embodiment herein disclosed, the resilient means comprises a coil spring 27 having coned

ends 28 and an intermediate cylindrical portion 29. The extremity of each coned end 28 is formed to closely fit about the shaft 21, substantially at the side surfaces of the respective ring section, and the intermediate cylindrical section is formed to closely fit within the interior annular surface 25 of the respective ring section.

The resilient means herein disclosed provides a resilient support for its respective ring section. The coned ends 28, because of their spaced engagement with the shaft 21 provide a stable base and these ends, because of their closer coiling, are less resilient than the intermediate portion 29, so that a greater part of the flexing is done at the connection of the intermediate portion with the coned ends. In this manner, the resilient means flexes in a predetermined manner, and proper construction will insure that flexing of the resilient means will not tend to cock the ring sections to position such as shown in Figure 4. It will be appreciated that the spring 27 may be readily removed from or replaced with respect to its ring section and the shaft without distortion of any of the parts.

Cocking of the ring sections, as shown in Figure 4, is objectionable, since the edges score the hide, and such score lines impair the value of the hide. To restrain cocking, my invention provides means for yieldably holding the ring sections in adjoining side-to-side relationship and to movement in a direction normal to the axis of the shaft 21.

In the embodiment herein disclosed, one end of the shaft 21 is provided with an abutment having a surface disposed in a plane substantially normal to the axis of the shaft. Specifically, the abutment is formed by a washer 30 interposed between the exposed side surface of a ring section at one end of the ring roll and an adjusting nut 31. A lock nut 32 backs up the nut 31 and maintains its position.

At the other end of the ring roll 15, means are provided for yieldably pressing the ring sections against each other. In this embodiment, such means comprises a pair of cup-shaped members 33 and 34, slidably carried by the shaft 21, the member 34 telescoping with the member 33 and cooperating therewith to form a closed chamber 35.

A coil spring 36 is interposed between the bottoms of the cup-shaped members 33, 34, and yieldably presses the member 33 against the exposed side of the adjoining ring member 34 and also presses the member 34 against a nut 37 threaded on the shaft end 23. A lock nut 38 maintains nut 37 in position. The urging force of the spring 36 may be varied by adjustment of the nut 37. It will be appreciated that the force of the spring 36 will be transmitted through adjoining ring sections 24, thus maintaining such sections in side-to-side relation which not only prevents foreign matter from entering the interior of the ring sections but also restricts transverse movement of respective ring sections to a direction substantially normal with respect to the axis of the shaft.

Accordingly, it will be appreciated that cocking of the ring sections is largely prevented, and the ring sections may move individually, as suggested in Figure 5, to pass any locally thickened portion of the hide, therefore providing a split in the hide of uniform thickness without any damaging blemishes or markings. In some cases, as for instance when the hides are wet, it may be desirable to provide the exterior surfaces of the ring sections 24 with traction providing means, such as the shallow diagonally arranged grooves 39 shown in Figure 4.

From the foregoing, it will be apparent to those skilled in the art that I have accomplished at least the principal object of my invention, and it also will be apparent to those skilled in the art that the embodiment herein disclosed may be variously changed and modified, without departing from the spirit of the invention, and that the invention is capable of uses and has advantages not herein specifically described; hence it will be appreciated that the herein disclosed embodiment is illustrative only, and that my invention is not limited thereto.

I claim:

1. A ring roll, comprising: a shaft; a ring section disposed about said shaft; and a coil spring interposed between said shaft and the interior surface of said ring section, said coil spring having coned ends fitting said shaft and an intermediate cylindrical portion fitting said interior surface, whereby said ring roll and said shaft are urged to concentric relation, yet are permitted to move out of concentric relation.

2. A ring roll, comprising: a shaft; a plurality of ring sections disposed about said shaft; and a coil spring interposed between the interior surface of each ring section and said shaft, said coil spring having coned ends fitting said shaft and an intermediate cylindrical portion fitting said interior surface, each of said coil springs urging respectve ring sections to concentricity with respect to said shaft, yet permitting an individual ring section to be moved out of concentricity.

3. A ring roll, comprising: a shaft; a ring section disposed about said shaft; and resilient means interposed between said shaft and said ring section, said resilient means urging said ring section to concentricity with respect to said shaft, yet permitting said ring section to be moved out of concentricity, said resilient means having end portions engageable only with said shaft and an intermediate portion having engagement only with the interior surface of said ring section.

4. A ring roll, comprising: a shaft; a plurality of ring sections disposed about said shaft, each being movable transversely of the axis of said shaft; and means carried by said shaft for yieldably holding said ring sections to movement substantially normal with respect to the axis of said shaft, comprising a pair of telescoping cup sections carried by said shaft and resilient means interposed between said cup sections.

5. A ring roll, comprising: a shaft having an abutment including a surface substantially normal to the axis of said shaft; a plurality of ring sections disposed about said shaft in side-to-side relationship, each ring section having its sides disposed in planes substantially normal to its axis, and being movable transversely of the axis of said shaft, the ring section at one end of said ring roll having its exposed side bearing against said abutment surface; and means yieldably pressing against the exposed side of the ring section at the other end of said ring roll, the pressure being transmitted through adjoining ring sections, whereby the ring sections are yieldably held in side-to-side engagement and to transverse movement substantially normal with respect to the axis of said shaft, said pressing means comprising a pair of telescoping cup members and resilient means interposed between said cup members.

6. A ring roll, comprising: a shaft; a plurality

of ring sections disposed about said shaft in side-to-side relationship; a coil spring interposed between each of said ring sections and said shaft, said coil spring having coned ends fitting said shaft and an intermediate cylindrical portion fitting the interior of a respective ring section; and means, carried by said shaft, for yieldably holding said ring sections in side-to-side relationship, yet permitting each ring section to be moved transversely with respect to the axis of said shaft.

7. A ring roll, comprising: a shaft; a ring section disposed about said shaft; and a coil spring interposed between said shaft and the interior surface of said ring section, said coil spring having coned ends closely fitting said shaft and an intermediate cylindrical portion closely fitting said interior surface, said coil spring, said ring section,

and said shaft being assemblable and disassemblable without distortion of any part thereof.

LOUIS D. CLARK.

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The following references are of record in the file of this patent:

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