May 25, 1926. 1,586,100

J. A. MEYER

RING ROLL FOR LEATHER SPLITTING MACHINES

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Fig. 1

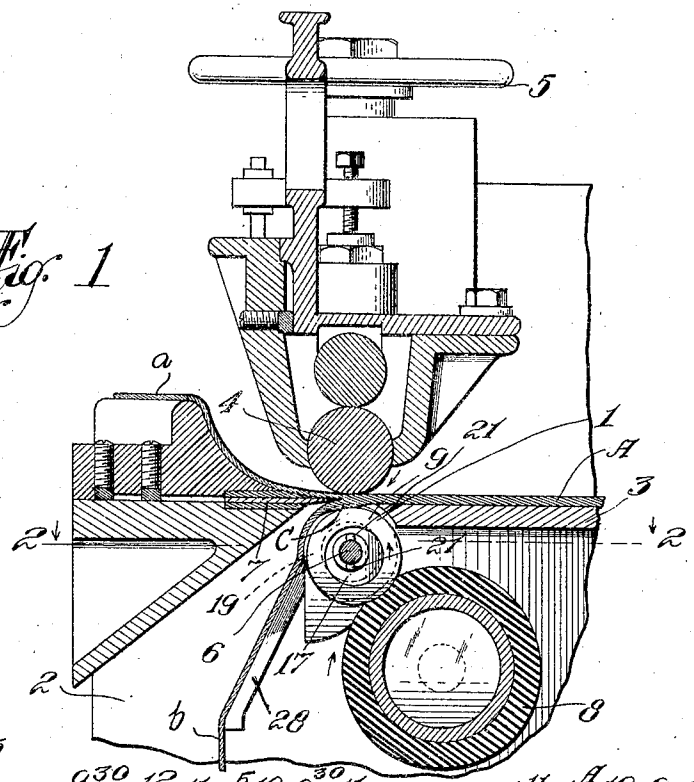
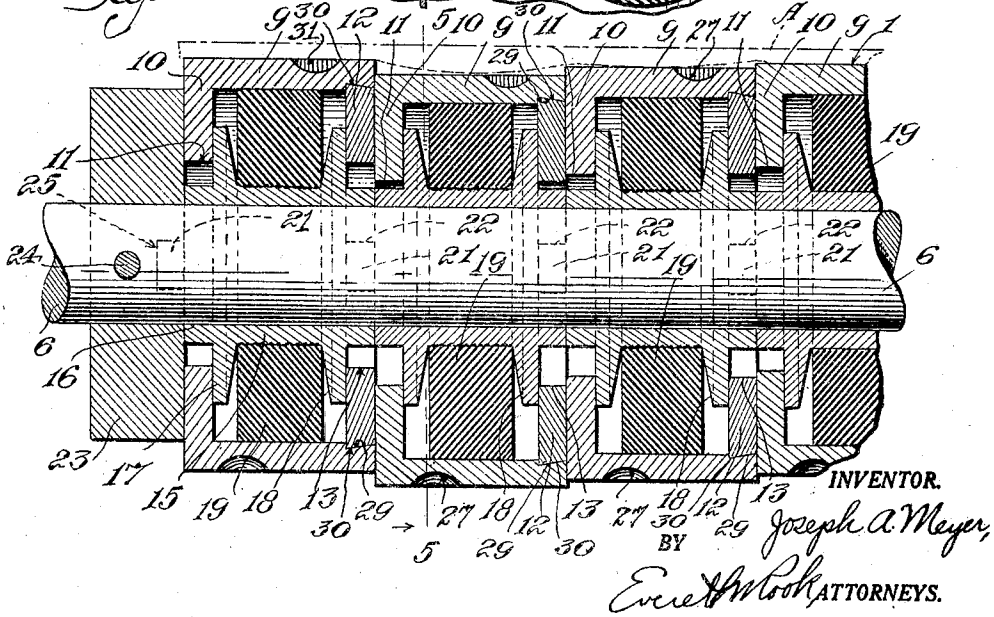


Fig. 3



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Fig. 5

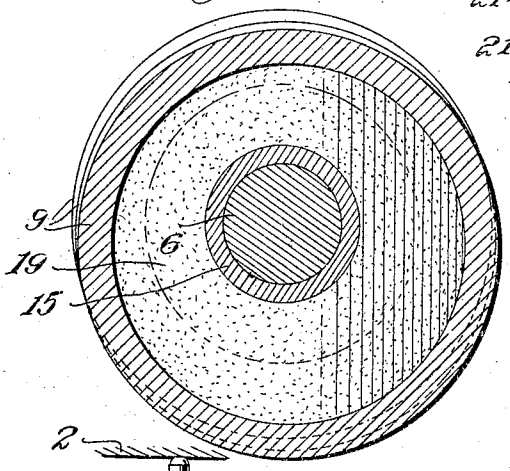


Fig. 6

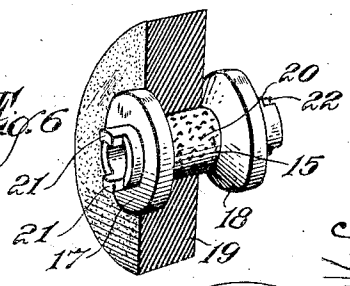


Fig. 7

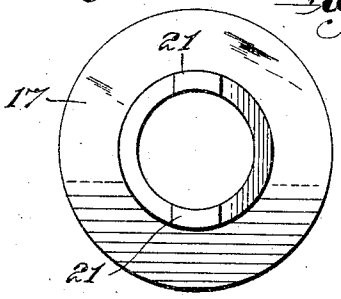


Fig. 4

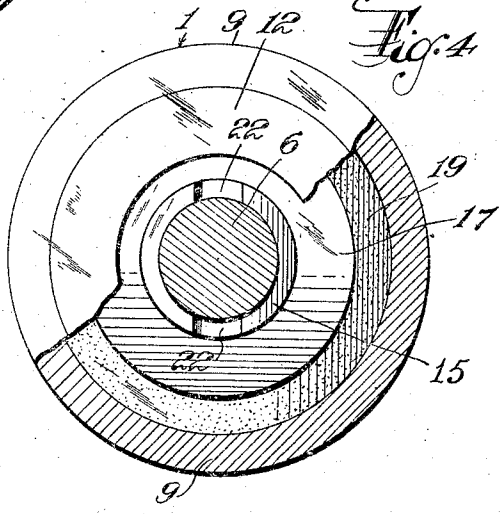


Fig. 2

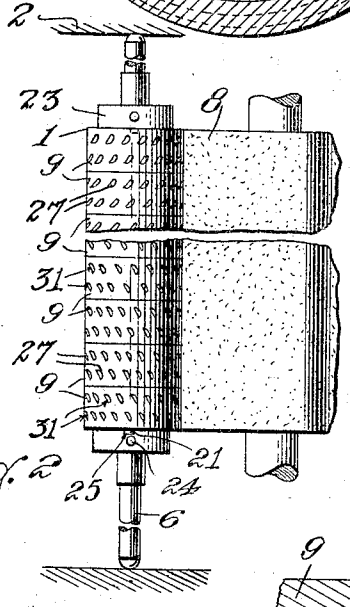
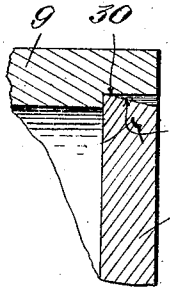


Fig. 8



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UNITED STATES PATENT OFFICE.

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RING ROLL FOR LEATHER-SPLITTING MACHINES.

Application filed May 22, 1924. Serial No. 715,067.

This invention relates in general to a ring roll for leather splitting machines of the types described in my United States Patents No. 1,410,703 and No. 1,434,019, dated March 28, 1922 and October 31, 1922, respectively.

As is known in the art ring rolls constructed of ring sections which are positively driven, as by a keyed connection with the shaft, have the objection of not easily accommodating different speeds of travel of the hide at different points in the width of the machine due to the difficulty of the operator holding back or retarding the faster moving portions, such as the flank or marginal portions, with respect to the slower moving portions, such as the middle or back portions of the hide, which are harder to split. Such ring rolls have the further objection of a positive and unyielding drive of a ring section which has become jammed or stuck so that operation of the machine must be stopped or damage done to the hide or the machine. On the other hand, ring rolls having the ring sections frictionally driven from the shaft or from each other, while overcoming the above mentioned difficulties, have been found in practice to be objectionable in the retardation by the frictional drive of the return of the ring sections into normal position after having been displaced by an inequality in the thickness of the hide.

The primary object of the present invention is to provide a ring roll embodying ring sections of novel and improved construction whereby the ring sections are frictionally driven from the rubber roll and from each other and are yieldingly maintained in alinement by means in addition to the rubber roll, thereby ensuring freedom of independent and relative rotation of the ring sections when one or more thereof become jammed or otherwise retarded and when it is desired to retard the movement of the flank or marginal portions of a hide being fed into the machine, and also ensuring the full return of every ring section to its normal position in alinement with the others immediately after an inequality or lump on the hide which has depressed the ring section has passed over it.

Another object is to provide a ring roll for leather splitting machines in which each of the ring sections is provided with yielding means within itself permitting radial displacement under inequalities in thickness of the hide and automatically and instantaneously returning it to normal position after said inequality has passed.

A further object to provide a ring roll construction in which said yielding means also serves to frictionally drive the ring sections.

Other objects are to provide a ring roll composed of ring sections each having means within itself in frictional engagement therewith and normally maintaining it in alinement with the other sections, said means yieldingly permitting temporary radial displacement of said ring section, and said means of each ring section being positively connected with the corresponding means of each next adjacent ring section to frictionally drive each ring section from the next adjacent one; to thus provide a ring section for ring rolls having a hub adapted to positively connect with the hubs of the next adjacent ring sections, and a rubber ring shoe on said hub frictionally engaging the corresponding ring section; to provide a ring roll having the peripheries of the ring sections constructed to effectively cooperate with the stripping plate to peel the hide from the ring roll; and to obtain other results and advantages as may be brought out by the following description.

Referring to the accompanying drawings in which the same characters of reference designate the corresponding and like parts throughout the several views:—

Figure 1 is a fragmentary vertical sectional view through a leather splitting machine embodying a ring roll constructed in accordance with my invention.

Figure 2 is a top plan view of the ring roll and rubber roll taken on the line 2—2 of Figure 1, portions being broken away.

Figure 3 is an enlarged longitudinal vertical sectional view through one end of the ring roll.

Figure 4 is an end view of one of the rings, portions being broken away to show the hub and ring shoe.

Figure 5 is a transverse vertical sectional view taken on the line 5—5 of Figure 3.

Figure 6 is a detached perspective view of one of the hubs and ring shoes, portions of the ring shoe being broken away.

Figure 7 is an end view of one of the hubs showing the end thereof opposite that illustrated in Figure 4, and

Figure 8 is a fragmentary transverse sectional view showing the preferred manner of connecting the closure plate of the ring section to the body of the ring section.

A ring roll 1 constructed in accordance with my invention is specifically designed for use in connection with a conventional leather-splitting machine comprising a frame 2 upon which is mounted a table or bed 3 to support the hide A to be split as it is fed to the splitting device. Above the table 3 longitudinally of the machine is mounted the gage roll 4 adjustable by known means 5, and below the gage roll and parallel thereto is mounted my improved ring roll 1 on a ring roll shaft 6, the leather to be split passing between the gage roll 4 and the ring roll 1 to the usual band knife 7 and being split in the usual manner into the two pieces *a* and *b*. The gage roll 4 is adjustable relatively to the ring roll 1 to accommodate hides of various thicknesses and the ring roll is held yieldingly in engagement with the underside of the hide by the rubber roll 8 which has frictional contact with said ring roll.

The ring roll is frictionally driven by the rubber roll 8, and the ring roll is so constructed that the ring sections are also individually and frictionally driven from each other, at the same time being free to slip with respect to each other and move radially relatively to the ring roll shaft to accommodate various speeds of travel of different portions of the hide and irregularities in the surface of the hide. Each ring section 9 of the ring roll 1 is substantially a hollow cylinder having one integral end 10 provided with an axial opening 11 of substantially greater diameter than the ring roll shaft 6 to allow the ring section to move radially upon the shaft. The other end of the ring section is closed by any suitable means such as the plate 12 which has an axial opening 13 similar to the opening 11 and for the same purpose. Within each of the ring sections is arranged a hub 15 of a length substantially equal to the length of the cylinder 9, said hub being provided with an axial opening 16 to fit the shaft 6. The hub 15 is provided with two longitudinally spaced annular flanges 17, the outer face of one of which is adapted to loosely engage the inner wall of the portion 10 of the ring section, while the outer surface of the other of which is adapted to loosely engage the inner side of the closure plate 12 of the ring section. The adjacent faces of the flanges 17 converge inwardly toward the axis of the hub as indicated at 18. A ring shoe 19 of suitable yielding material, such as rubber, is arranged on the hub 15 between the flanges 17, the said ring shoe being annular in shape and of a diameter greater than that of the interior diameter of the cylinder 9. The portion of the hub 15 between the flanges 17 is preferably roughened as at 20 to insure tight frictional engagement of the ring shoe with the hub. With this construction it will be observed that the ring shoe 19 will have a frictional engagement both with the hub 15 and the cylinder 9 so that rotation of the hub 15 will cause rotation of the cylinder 9. At the same time it will be observed that the ring shoe may yield under radial pressure on the cylinder 9, this yielding being accommodated by the eccentric relation of the cylinder 9 to the hub, and the flanges 17. The ring shoe may be applied to the hub by stretching the same over one of the flanges 17.

One end of each hub 15 is provided with a pair of diametrically opposite longitudinally extending lugs 21 and the other end is provided with a pair of notches 22 similar in shape and size to the lugs 21. The ring sections 9 are arranged upon the ring roll shaft 6 side by side as clearly indicated in Figures 2 and 3, the hubs 15 being slipped over one end of the shaft 6, and the lugs 21 of one hub 15 engaging the notches 22 of the next adjacent hub. At each end of the thus assembled ring sections the shaft is provided with a collar 23 fixed thereon in any suitable manner as by a pin 24. One of said collars is provided with a notch 25 to receive the lugs 21 on the adjacent hub 15 while the other collar may be provided with corresponding lugs (not shown) to engage the notches 22 in the adjacent hub.

In operation, the ring roll with the ring sections assembled as above described is positioned in the machine upon the rubber roll 8, the ends of the ring roll shaft 6 loosely engaging the sides of the frame 2 of the machine as shown in Figure 2. In operation of the machine the rubber roll, ring roll and gage roll rotate in the directions indicated by the arrows to feed the hide A to the band knife 7, the ring roll being driven by frictional contact with the rubber roll 8. It will also be noted in addition to the drive of the ring roll from the rubber roll 8, each ring section is driven through the engagement with the hubs of the next adjacent ring sections. The ring sections 9 in the ring roll are yieldingly held against the under side of the hide by the rubber roll 8, and should the projection or the irregularity in the hide, as indicated by *c* in Figure 1, strike one of the ring sections, said ring section will yield radially upon the ring roll shaft and press into the rubber roll which tends to cause the ring to assume its normal position after the irregularity has passed. Under such displacement of the ring, the corresponding ring shoe 19 is also

compressed, and the ring shoe will quickly expand after the irregularity has passed the ring section and instantaneously return the ring section to its normal position. There is thus no possibility of the ring section remaining displaced during such time as would permit the hide to sag so that the knife could cut a hole in the hide. It will also be noted that this displacement of the ring section in no way affects other ring sections which will continue to operate freely, and there is always a constant tendency for the displaced ring to rotate under the joint action of the rubber roll 8 on the displaced ring section and the driving power exerted on the hub of the displaced ring section by the next adjacent ring sections which are driven from the rubber roll. Furthermore, should one or more of the ring sections be stopped by the wedging or jamming of a piece of hide or other foreign matter between the ring sections, the remaining ring sections at both sides of the jammed sections will continue to rotate, being individually driven from the rubber roll and from the ring-shoes and hubs which are always positively connected and at least some of which are always being driven from engagement of the cylinders 9 with the rubber roll, and there is the additional tendency of the operating ring sections to overcome the friction produced by the jamming and rotate the jammed ring sections. With this construction the frictional drive of the ring sections allows the rings at the ends of the shaft to be rotated and slipped backwardly, at the same time allowing the other ring sections to rotate in the usual manner and at the usual speed to feed the hide.

The rings extending from the center of the shaft to the collars 23 are respectively provided with a plurality of oppositely extending and helically arranged depressions or recesses 27, the said depressions being preferably semicircular shaped as shown in Figure 2 of the drawing, the edges of the said semicircular depressions causing the ring sections to have a tight frictional engagement with the hide so as to cooperate with the gage roller 4 to feed the hide, and the helical arrangement of said depressions serving to smooth and stretch the hide from the center to the edges thereof to prevent bagging or wrinkling. The straight sides 31 of said depressions are preferably arranged in advance of the curved sides in the direction of rotation of the ring-roll and at angles to the axis of the roll or helically as shown. It has been found that these depressions tend to prevent the hide from following the ring roll past the edge of the stripping plate 28, the edges of the depressions having a shear-like action with relation to the stripping plate which tends to peel the hide from the ring roll, and the curved bottom of the depressions from the straight edges to the curved edges having a wedge like pushing action on the hide as the same engages the edge of the stripping plate tending to force the portions of the hide out of the depressions and thereby off the ring roll and preventing the hide from jamming between the stripping plate and the edges of the depressions. Further, due to the helical arrangement of the depressions, only one depression and only a portion of the edges of that depression crosses the edge of the stripping plate at any one time and then at an angle thereto so that a large even bearing engagement of each ring section on the stripping plate is provided and the tendency of the said edges of the depression to abut or strike the edge of the stripping plate and break, dent, roughen or wear away the same, is materially reduced; and the shear-like action of the edges of the depressions on the edge of the stripping plate tends to maintain the latter smooth and straight.

One convenient manner of closing the ring section by the closure plate 12 has been found to be the beveling of the edge of the closure plate a few thousandths of an inch as indicated at 29 and fitting the closure plate in a rabbet 30 at the end of the ring section, after which the end of the ring section is pressed inwardly over the beveled edge 29 of the closure plate whereby the closure plate is secured in the cylinder 9. It will be noted that with the construction of the ring sections above described, the interior of the ring is fully enclosed by the end portion 10, the closure plate 12 and flanges 17 of the hub 15, so that pieces of hide or other foreign matter are prevented from entering the ring section. Furthermore, the ring sections are provided with flat sides which may have frictional engagement with each other so as to maintain the ring sections in vertical planes transverse of the axis of the shaft 6 and guide the ring sections in their displacement and return so as to prevent ring marks on the hide.

While I have shown and described one possible embodiment of my invention, it will be understood that this is mainly for the purpose of illustrating the principles thereof, and that various modifications and changes can be made in the details of construction without departing from the spirit and scope of the invention. For instance, other means than the lugs 21 and notches 22 may be provided for driving the ring sections from each other, the construction of the hubs may be varied, and the relation of the hub and the ring section may be changed. The essential feature of the invention is the provision of means whereby the ring sections may have a frictional drive in addition to the rubber roll and at the same

time be quickly returned to their normal positions after displacement. Therefore, I do not desire to be understood as limiting myself except as required by the following claims when construed in the light of the prior art.

Having thus described the invention, what I claim is:—

1. In a ring roll, the combination of a shaft, a plurality of ring sections mounted thereon and capable of displacement transversely thereof, and independent yielding means for each of said ring sections interposed between its respective ring section and said shaft for yieldingly holding said ring sections against such displacement, said yielding means having driving frictional contact with their respective ring sections, and means for operatively connecting adjacent yielding means, whereby said yielding means may be driven one from another.

2. In a ring roll, the combination of a shaft, a plurality of ring sections mounted thereon and capable of displacement transversely thereof, a rubber ring shoe interposed between said shaft and each of said ring sections and having a driving frictional contact with said ring section, and means for operatively connecting adjacent ring shoes, whereby said ring shoes may be driven one from another.

3. In a ring roll, the combination of a shaft, a plurality of hollow cylindrical ring sections, a hub for each of said ring sections mounted on said shaft, said ring sections being capable of displacement transversely of their respective hubs, and a yielding means between each of said hubs and its ring section for holding said ring sections against such displacement, said yielding means having a driving frictional contact with both said hubs and said ring sections and adjacent hubs being operatively connected to each other whereby said hubs may be driven one from another.

4. In a ring roll, the combination of a shaft, a plurality of hollow cylindrical ring sections, a hub for each of said ring sections mounted on said shaft, said ring sections being capable of displacement transversely of their respective hubs, and a rubber ring interposed between each of said hubs and its respective ring section for holding said ring sections against such displacement, said rubber ring having driving frictional contact with both said hubs and said ring sections and adjacent hubs being operatively connected to each other whereby said hubs may be driven one from another.

5. In a ring roll, the combination of a shaft, a plurality of hollow cylindrical ring sections, a hub for each of said ring sections mounted on said shaft, said ring sections being capable of displacement transversely of their respective hubs, and a yielding means between each of said hubs and its ring section for holding said ring sections against such displacement, said yielding means having a driving frictional contact with both said hubs and said ring sections, one end of each of said hubs having a plurality of lugs and the other end a plurality of corresponding notches, said notches of one hub receiving said lugs of the next adjacent hub to produce a driving connection between all of said hubs

6. In a ring roll, the combination of a shaft, a plurality of hollow cylindrical ring sections having end portions formed with axial openings, a hub for each of said ring sections mounted on said shaft, said axial openings of the ring sections loosely receiving said hubs to permit displacement of the ring sections transversely of said hubs, each of said hubs being formed with a pair of annular flanges spaced longitudinally thereof and closing said axial openings of its respective ring section, and a rubber ring mounted on each of said hubs between said flanges to hold said ring sections against such displacement transversely of said hubs.

7. In a leather splitting machine the combination with a frame, a knife, a gage roll mounted at one side of said knife, a rubber roll mounted at the other side of said knife, and means for rotating said rubber roll, of a ring roll comprising a shaft, a plurality of ring sections mounted thereon and capable of displacement transversely thereof, each of said ring sections having frictional contact with and being driven by said rubber roll, and means within each of said ring sections adapted to yield upon such displacement of the ring section and having constant driving frictional contact therewith, and means for operatively connecting adjacent yielding means, whereby said yielding means may be driven one from another.

8. In a leather splitting machine the combination with a frame, a knife, a gage roll mounted at one side of said knife, a rubber roll mounted at the other side of said knife, and means for rotating said rubber roll, of a ring roll comprising a shaft, a plurality of ring sections mounted thereon and capable of displacement transversely thereof, each of said ring sections having frictional contact with and being driven by said rubber roll, and a rubber ring shoe within each of said ring sections adapted to yield upon such displacement of the ring section and having constant driving frictional contact therewith, and means for operatively connecting adjacent rubber ring shoes, whereby said ring shoes may be driven one from another.

9. In a ring roll, the combination of a shaft, a plurality of hollow cylindrical ring sections having end portions formed with

axial openings, a hub for each of said ring sections mounted on said shaft, said axial openings of the ring sections loosely receiving said hubs to permit displacement of the ring sections transversely of said hubs, each of said hubs being formed with a pair of annular flanges spaced longitudinally thereof and closing said axial openings of the respective ring section, and a yielding member mounted on each of said hubs between said flanges to hold said ring sections against such displacement transversely of said hubs.

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