March 4, 1941. J. J. STEHLING 2,233,495

LEATHER WRINGING MACHINE

Filed Oct. 10, 1938 4 Sheets-Sheet 1

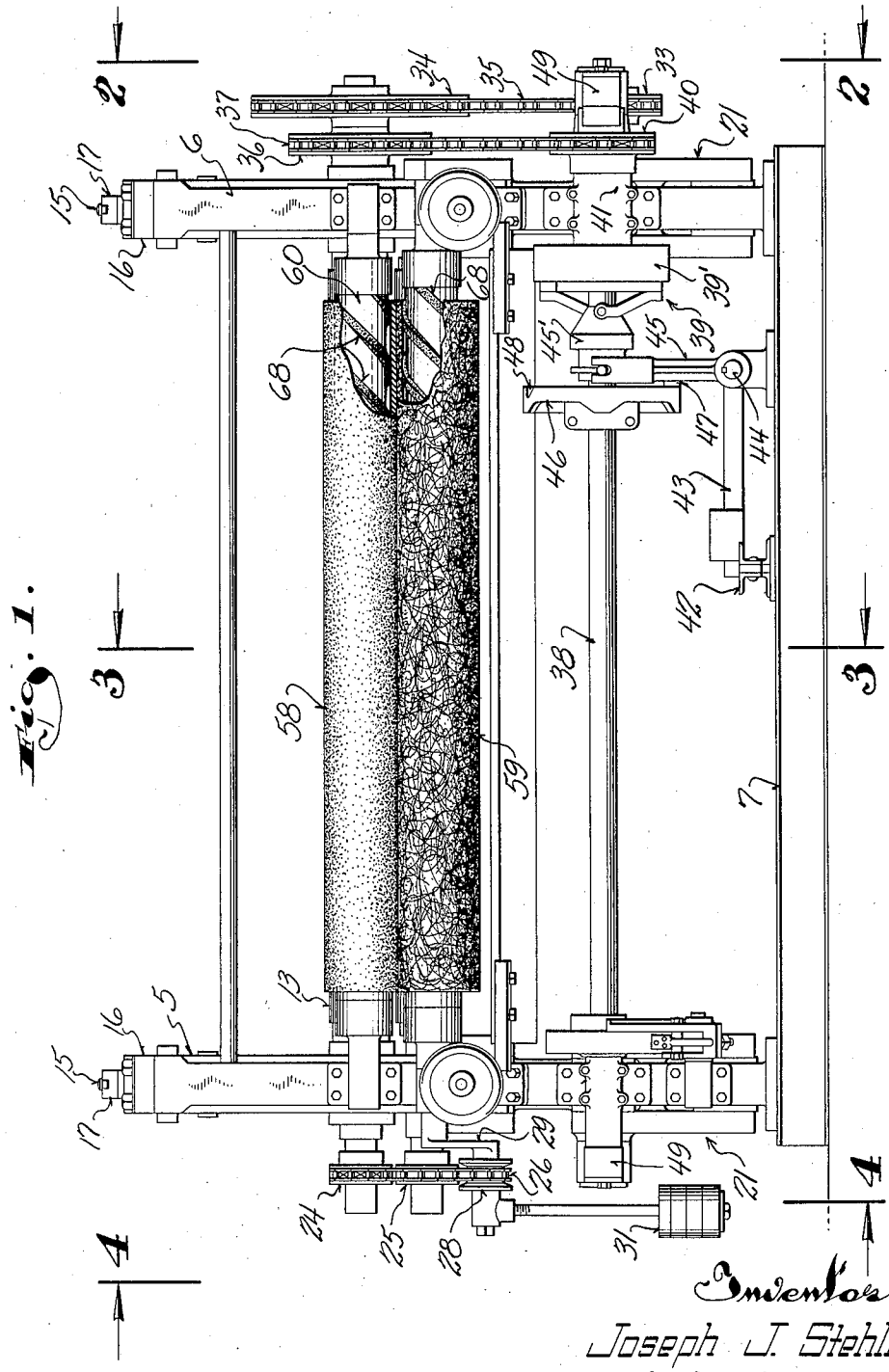

Fig. 1.

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Fig. 2.

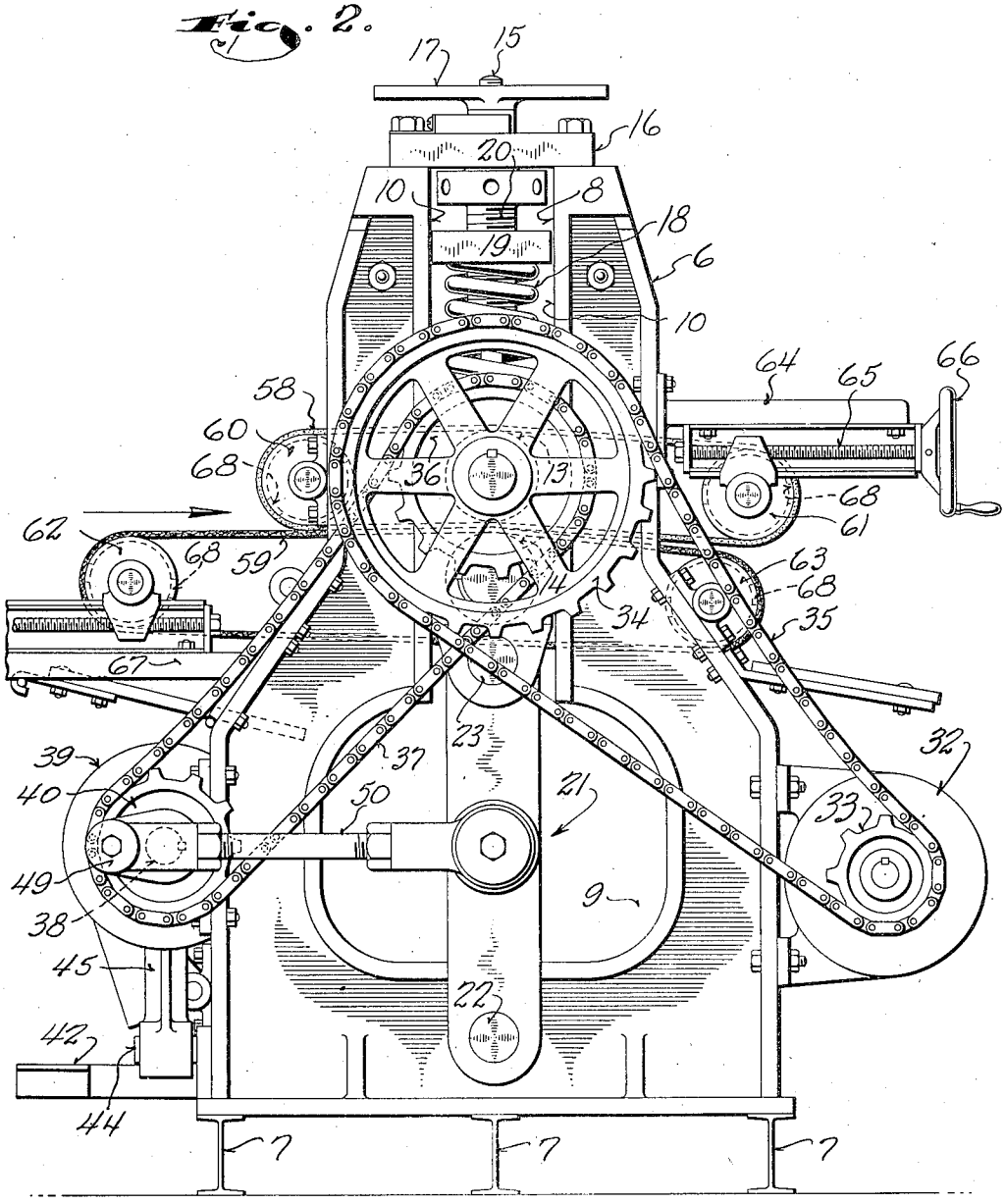

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Fig. 3.

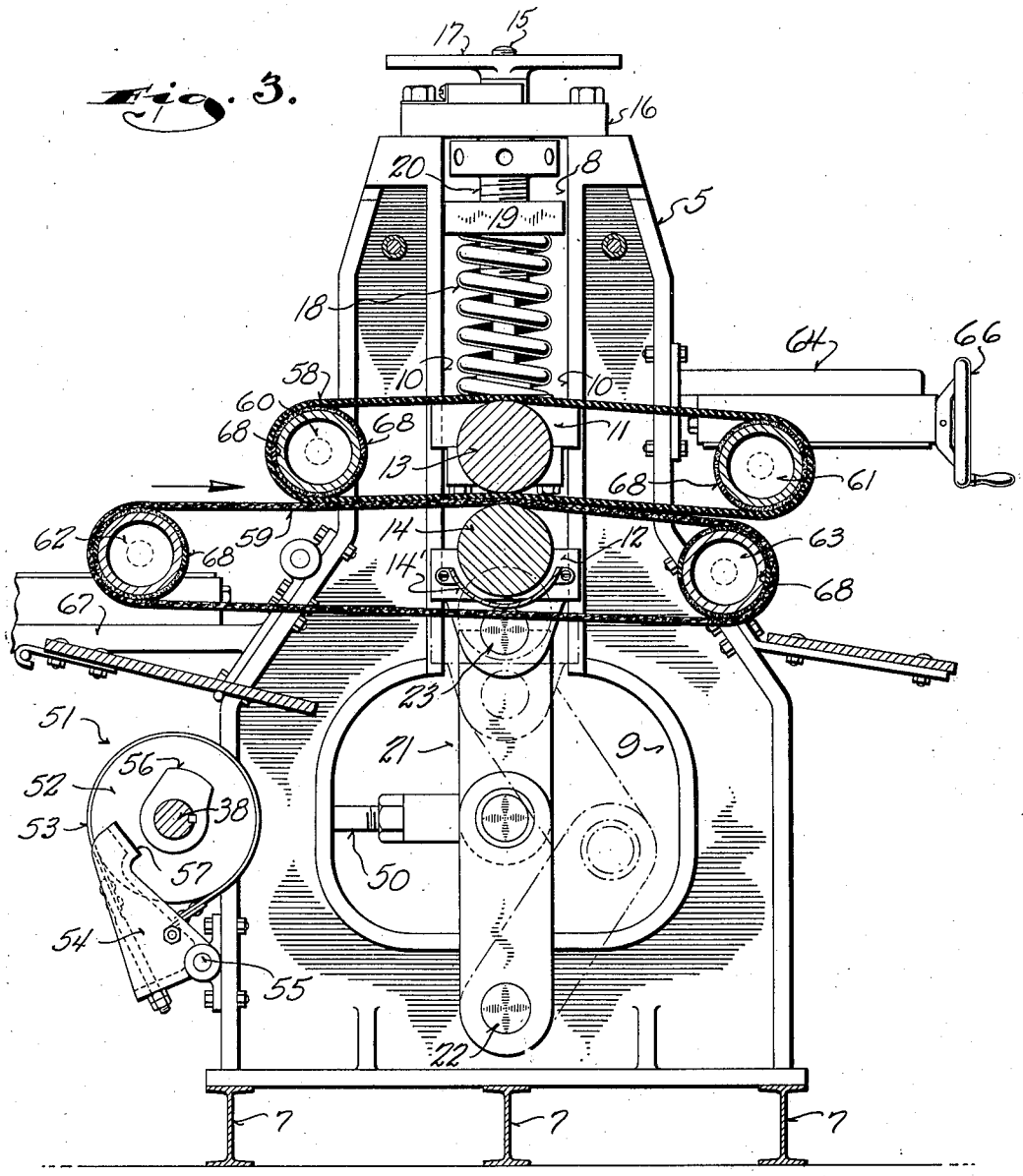

Fig. 5.

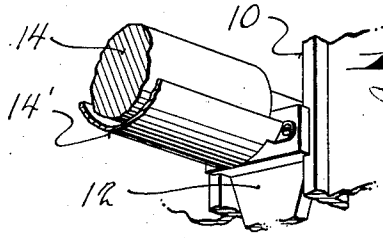

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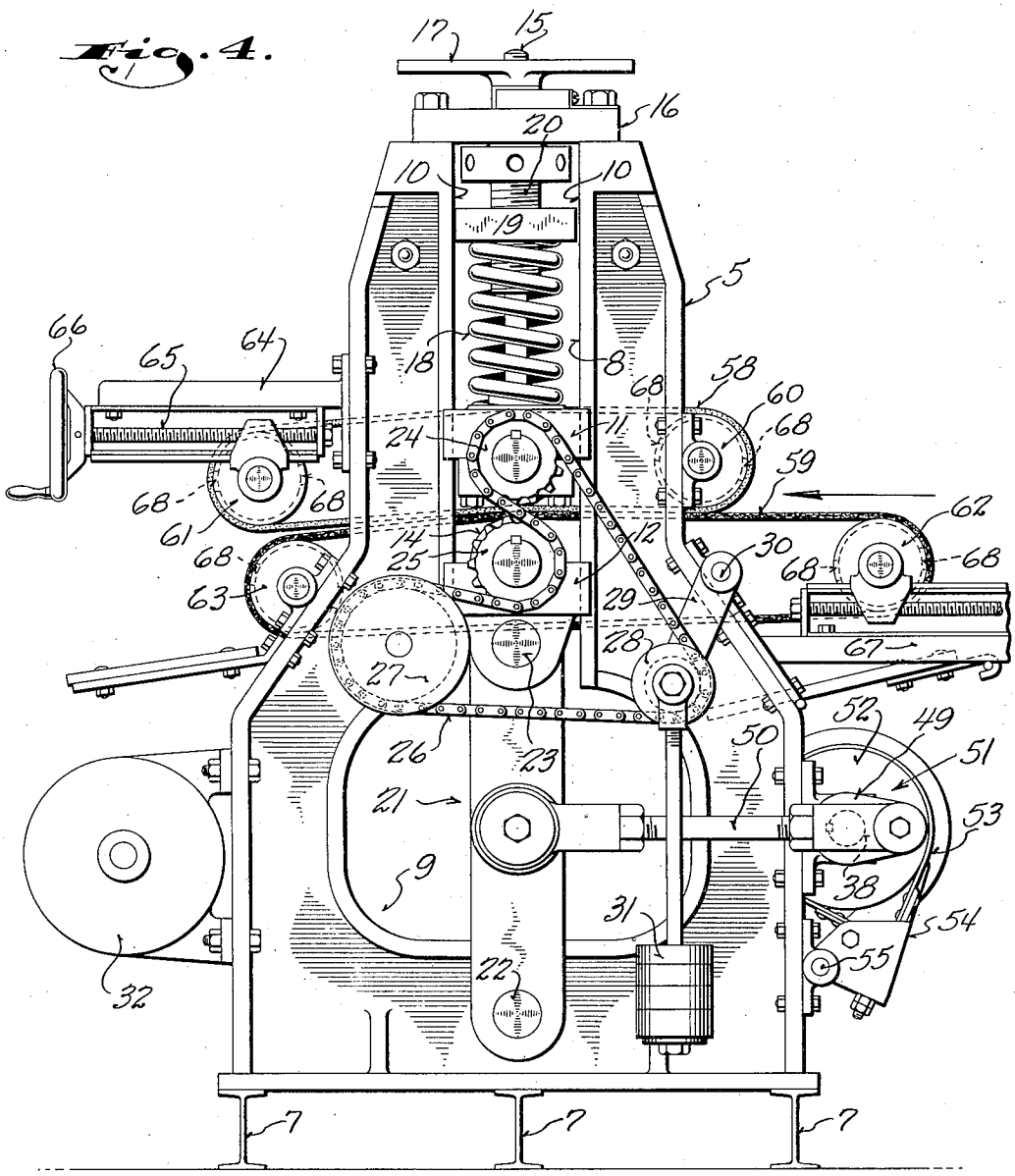
Fig. 4.



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2,233,495

UNITED STATES PATENT OFFICE

2,233,495

LEATHER WRINGING MACHINE

Joseph J. Stehling, Milwaukee, Wis.

Application October 10, 1938, Serial No. 234,139

2 Claims. (Cl. 149—23)

This invention relates to improvements in wringers and refers particularly to leather wringing machines designed especially for handling small pieces of stock. For this work it is desirable to use a continuous type of wringer in which the pressure rolls are continuously closed, as distinguished from such wringing machines wherein the rolls are opened and closed for each piece of stock.

In wringing out leather great pressure must be employed, and as a consequence, the provision of a proper surface for the pressure rolls has always been a problem. Past experience has shown that the best results are obtained with a loosely fitted sleeve of felt or other similar material, as shown in Patent No. 2,094,761 issued to Joseph J. Stehling October 5, 1937.

However, while machines constructed in accordance with this patent are very satisfactory for intermittent operation, that is, where the rolls are separated to permit insertion of each piece of stock, they are wholly unsuited for continuous operation.

This follows from the fact that as the endless sleeves are progressively compressed between the pressure rolls together with the stock moving therebetween, the inevitable differences in pressure and feeding force at different portions of the sleeves cause them to creep and twist. This condition is obviously objectionable, as it breaks down and wrinkles the sleeves so that satisfactory operation is impossible.

To overcome this objection attempts were made in the past to substitute resilient sheaths directly carried by the pressure rolls for the loose endless sleeves, but no material has ever been produced which is capable of withstanding the great pressures involved without breaking down when used in this manner. Nothing has ever been proposed in the past to take the place of the endless loose sleeve, but as stated, the machines heretofore in use could not be used for continuous operation because the sleeves would twist and creep.

It is therefore an object of this invention to provide a leather wringing machine which is so constructed that the desirable loose sleeves may be used without danger of objectionable creeping or twisting.

As stated hereinbefore, these endless sleeves in the past have generally always been made of felt. It was generally regarded to be the only material which could be used successfully, but even this desirable material has the objectionable characteristic of marring the grain side of the leather by the formation of slight impressions, especially after the outer nap is worn off.

This invention thus contemplates as a further object the provision of an endless belt or sleeve formed of material not subject to the possibility of pressing indentations into the grain surface of the leather.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described, and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate one complete example of the physical embodiment of the invention constructed in accordance with the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a front view of a leather wringing machine constructed in accordance with this invention;

Figure 2 is a side view of the machine taken on the plane of the line 2—2 in Figure 1;

Figure 3 is a cross sectional view taken through Figure 1 on the plane of the line 3—3;

Figure 4 is a side view taken on the plane of the line 4—4 in Figure 1; and

Figure 5 is a fragmentary perspective view illustrating a detail of the machine construction.

Referring now particularly to the accompanying drawings in which like numerals indicate like parts, the numerals 5 and 6 designate two upright side frames mounted on a base of longitudinally extending rails 7. These side frames 5 and 6 are substantially identical, and each has a vertical central slot 8 extending down from its upper end and joining with a large opening 9 formed in its lower portion.

The parallel sides 10 of the slots 8 provide guideways between which bearings 11 and 12 are slidably mounted. The bearings 11 have the trunnions of an upper pressure roll 13 journalled therein, and the bearings 12 similarly support the trunnions of a lower pressure roll 14.

The upper bearings 11 are supported against dropping by threaded rods 15 which pass through plates 16 seated on the tops of the frames and have nut members 17 threaded on their outer ends. Upward movement of the bearings is,

however, permitted. Such upward movement is opposed by heavy springs 18 confined between the bearings 11 and nut members 19 held against turning by being slidably fitted in the guideways 10. These nut members are threaded onto tubular screws 20 which encircle the rods 15 and bear against the undersurfaces of the plates 16. Hence, by rotation of the screws 20, it is possible to adjust the compression of the springs 18 which oppose upward movement of the bearings 11 and consequently the top pressure roll.

The bearings 12 of the lower pressure roll 14 are supported for vertical movement by toggle joints 21. The lower legs of these toggle joints straddle the frame portions beneath the openings 9 and are mounted thereon by pivot pins 22. The upper ends of the upper legs of the toggle joints are connected to the bearings 12, as at 23. Inasmuch as the pivot pins 22 are directly beneath the bearings 12, it follows that by straightening out the toggle joints, the lower pressure roll is raised into cooperative relationship with the upper roll and by collapsing the toggle joints, it is lowered.

Actuation of the toggle joints to open and close the rolls is effected by power driven mechanism to be hereinafter described.

Both upper and lower pressure rolls are driven. To this end their trunnions at the left side of the machine (when viewed from the front) have sprockets 24 and 25 fixed thereto, the sprocket 24 being on the trunnion of the upper roll. Trained about these sprockets is an endless chain 26, which also passes over an idler 27 positioned beneath and rearwardly of the lower sprocket 25, and over a swinging idler 28. The swinging idler 28 is supported on the outer end of an arm 29 pivoted as at 30 from the adjacent side frame, and to yieldingly hold the same in a position maintaining the sprocket chain 26 taut without interfering with the raising and lowering of the lower roll, a weight 31 is hung from the pivot of the idler 28. This arrangement keeps the sprocket chain 26 taut at all times and insures simultaneous rotation of the pressure rolls in opposite directions, and proper drive transmission from the upper roll to the lower roll.

The upper or stationary pressure roll is driven from a motor 32 mounted on the back of the side frame 6. For this purpose, a sprocket 33 fixed to the motor shaft and a large diameter sprocket wheel 34 fixed to the trunnion of the upper roll are drivingly connected by a sprocket chain 35 trained about both.

The trunnion of the upper roll at this side of the machine also has a smaller sprocket wheel 36 fixed thereon over which a sprocket chain 37 is trained to drive a countershaft 38 under control of a clutch 39. The driving part 39' of the clutch is fixed to a tubular shaft journalled in a bearing 41 fixed to the adjacent portion of the side frame 6 and carrying a sprocket wheel 40. The chain 37, being trained over this sprocket wheel 40, thus continuously drives the clutch part 39', but the countershaft 38 is driven only when engagement of the clutch is effected by pressing down on a treadle 42.

Pressure on the treadle 42 lifts a weighted arm 43 fixed to a shaft 44, which swings an upright shifter fork 45 fixed to the shaft 44, to slide a clutch cone 45' toward the driving clutch part 39' and thereby effect engagement of the clutch to carry the drive to the countershaft 38.

Directly after the initial rotation of the countershaft 38, the clutch is held in its engaged position by a retaining disc 46 fixed to the shaft 38 and engaging a lug 47 on the shifter fork 45. Through these elements engagement of the clutch is maintained until the shaft 38 has made a half turn, whereupon one of two notches 48 in the disc 46 aligns with the lug 47 to allow disengagement of the clutch.

Such half turns of the countershaft 38 carry cranks 49 through one hundred and eighty degrees of rotation. These cranks 49 are connected by pitmans 50 with the toggle joints so that in swinging from their positions illustrated in Figures 2 and 4, they collapse the toggle joints, as shown in dotted lines in Figure 3. The next subsequent actuation of the cranks returns the toggle joints to their straightened positions.

It is to be appreciated that the countershaft 38 extends entirely through the clutch mechanism to mount the crank 49 at that side of the machine, the shaft of the driving clutch member 39' which is journalled in the bearing 41, being tubular as stated to permit the extension of the shaft 38 therethrough.

During collapsing of the toggle joints, the weight of the pressure roll 14, if not offset, would not only impose considerable shock upon the crank actuating mechanism as it operates to open the machine, but might cause a rebound and interfere with the proper release of the clutch. To obviate this objectionable possibility, the descent of the roll 14 is snubbed by a brake 51.

This brake, as best shown in Figure 3, consists of a brake drum 52 fixed to the shaft 38 and a brake band 53 encircling the same with both ends thereof attached to a bell crank-like member 54 pivoted from the frame 5 as at 55. The relative dispositions of the ends of the brake band with respect to the pivot 55 are such that upon outward swinging movement of the bell crank lever, the brake band is tightened.

Such outward swinging motion is imparted to the bell crank member 54 at the instant the roll 14 approaches its lowermost position, by a cam 56 fixed to the shaft 38 and arranged to bear against the outer surface 57 of the bell crank member.

Each of the pressure rolls is encircled by an endless sleeve or apron. The uppermost sleeve or apron 58, which is smaller in circumference than the lower sleeve 59, is held in a substantially horizontal position by front and rear idler rolls 60 and 61, respectively, mounted in front of and in back of the roll 13. The lower sleeve 59 is held with its upper stretch directly adjacent to the lower stretch of the sleeve 58 by front and rear idler rolls 62 and 63, respectively, positioned in front of and in back of the lower roll 14.

The front idler roll 60 is journalled in bearings carried directly by the side frames, but the rear idler roll 61 is journalled in bearings adjustably supported from brackets 64 fixed to the rear of the side frames. Adjustment of these bearings is effected by screws 65 driven by hand wheels 66, and through this adjustment, the tension of the upper sleeve is readily controllable.

The idler rolls 62 and 63 which carry the lower sleeve 59 are mounted in a similar manner, but in this instance, the rear idler roll 63 is directly supported from the side frames, while the front idler roll is adjustably mounted on brackets 67 carried by the side frames.

It is to be observed, however, that while the relative positions of the upper and lower idler rolls are such that the adjacent stretches of the sleeves contact each other to carry work between

the pressure rolls, the front idler roll **62** being positioned a substantial distance forwardly of the idler roll **60** precludes having the workman's hands or arms squeezed between these two rolls, as the upper stretch of the lower sleeve is sufficiently flexible to prevent the application of any dangerous pressure.

All of the idler rolls are preferably equipped with spiral ribs **68** which continuously spread the sleeves outwardly toward the ends of the roll and keep them smooth and straight. This straightening of the sleeves plus proper adjustment of the idler rolls **61** and **62** insures proper tracking of the sleeves regardless of the tendency of the pressure rolls to twist the sleeves during operation as the engagement of the pressure rolls with the sleeves is restricted to a narrow edge-like contact and obtains for only a very short time. Any tendency thus imposed by the pressure rolls to twist the sleeves or cause them to creep is continuously corrected by the idler rolls.

When the machine is in operation, the water which is squeezed out of the stock runs down around the lower pressure roll **14** and to preclude its dripping onto the lower stretch of the sleeve **59**, a trough **49'** is mounted under the pressure roll as shown in Figures 3 and 5. This trough is conveniently mounted by having its ends secured to the bearings **12**. The ends of the trough are spaced from the bearings to allow the water to drain therefrom.

As noted hereinbefore, it is desirable to avoid impressing the grain side of the leather which sometimes occurs where the sleeves are formed of felt, and to overcome this objection the upper sleeve **58** which contacts the grain surface of the leather is formed of rubber having approximately the resiliency of felt.

If desired, the lower sleeve **59** also may be formed of rubber, but inasmuch as it is not important that impressions be precluded on the flesh side of the leather, this lower sleeve may be formed of felt so that its bibulous characteristics may be taken advantage of.

From the foregoing description taken in connection with the accompanying drawings, it will be readily apparent to those skilled in the art that this invention provides a leather wringing machine which is capable of satisfactory continuous operation, and that through the substitution of rubber for the customary felt sleeve, especially at the upper roll which engages the grain side of the leather, objectionable marring of the grain surface of the leather is avoided.

What I claim as my invention is:

1. In a leather wringing machine of the character described: two superimposed pressure rolls; means mounting the lower roll for substantial movement toward and from the upper roll; driving means connected with one of the pressure rolls for driving the same; a sprocket on each of the pressure rolls; spaced apart idler pulleys; means mounting one of said idler pulleys beneath the lower pressure roll and for arcuate movement toward and from the same; a chain trained about the outsides of said idler pulleys and the sprocket of the upper pressure roll and around the underside of the sprocket for the lower pressure roll, whereby movement of the lower pressure roll away from the upper pressure roll lifts the movable idler pulley by means of the chain; and tensioning means connected with said movable idler pulley for yieldingly resisting lifting thereof to thereby maintain the chain taut and under tension at all times regardless of the relative positions of the pressure rolls.

2. In a leather wringing machine of the character described: two superimosed pressure rolls; means mounting the lower roll for substantial movement toward and from the upper roll; driving means connected with one of the pressure rolls for driving the same; a sprocket on each of the pressure rolls; spaced apart idler pulleys; means mounting one of said idler pulleys beneath the lower pressure roll and for arcuate movement toward and from the same; a chain trained about the outsides of said idler pulleys and the sprocket of the upper pressure roll and around the underside of the sprocket for the lower pressure roll, whereby movement of the lower pressure roll away from the upper pressure roll lifts the movable idler pulley by means of the chain; and tensioning means connected with said movable idler pulley for yieldingly resisting lifting thereof to thereby maintain the chain taut and under tension at all times regardless of the relative positions of the pressure rolls, said tensioning means including an adjustable weight for holding the removable idler pulley spaced away from said lower pressure roller.

JOSEPH J. STEHLING.