Oct. 5, 1937. J. J. STEHLING 2,094,761

LEATHER WRINGING AND PUTTING-OUT MACHINE

Filed July 13, 1935 3 Sheets-Sheet 1

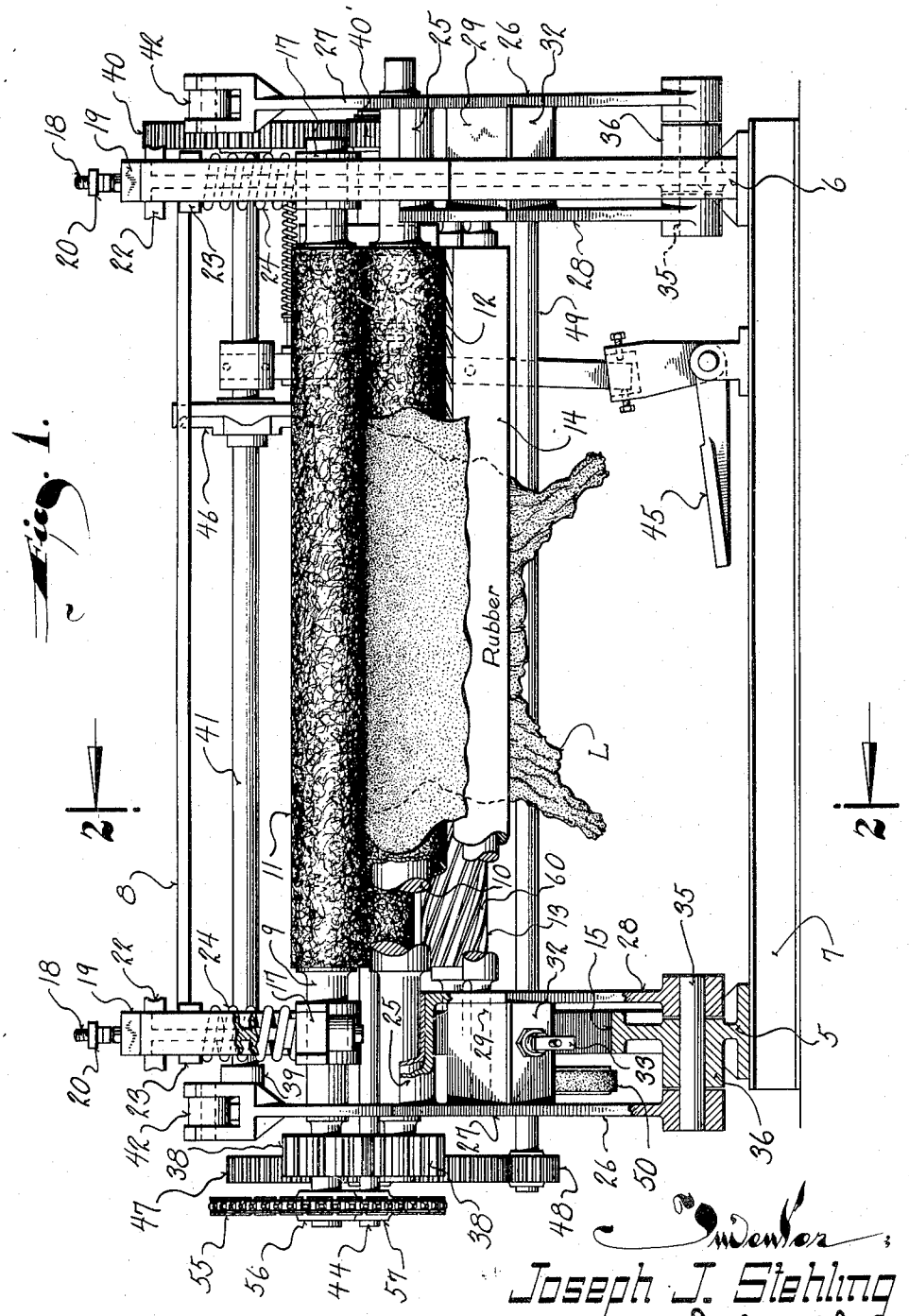



Fig. 1.

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Oct. 5, 1937. J. J. STEHLING 2,094,761

LEATHER WRINGING AND PUTTING-OUT MACHINE

Filed July 13, 1935 3 Sheets-Sheet 2

Fig. 2.

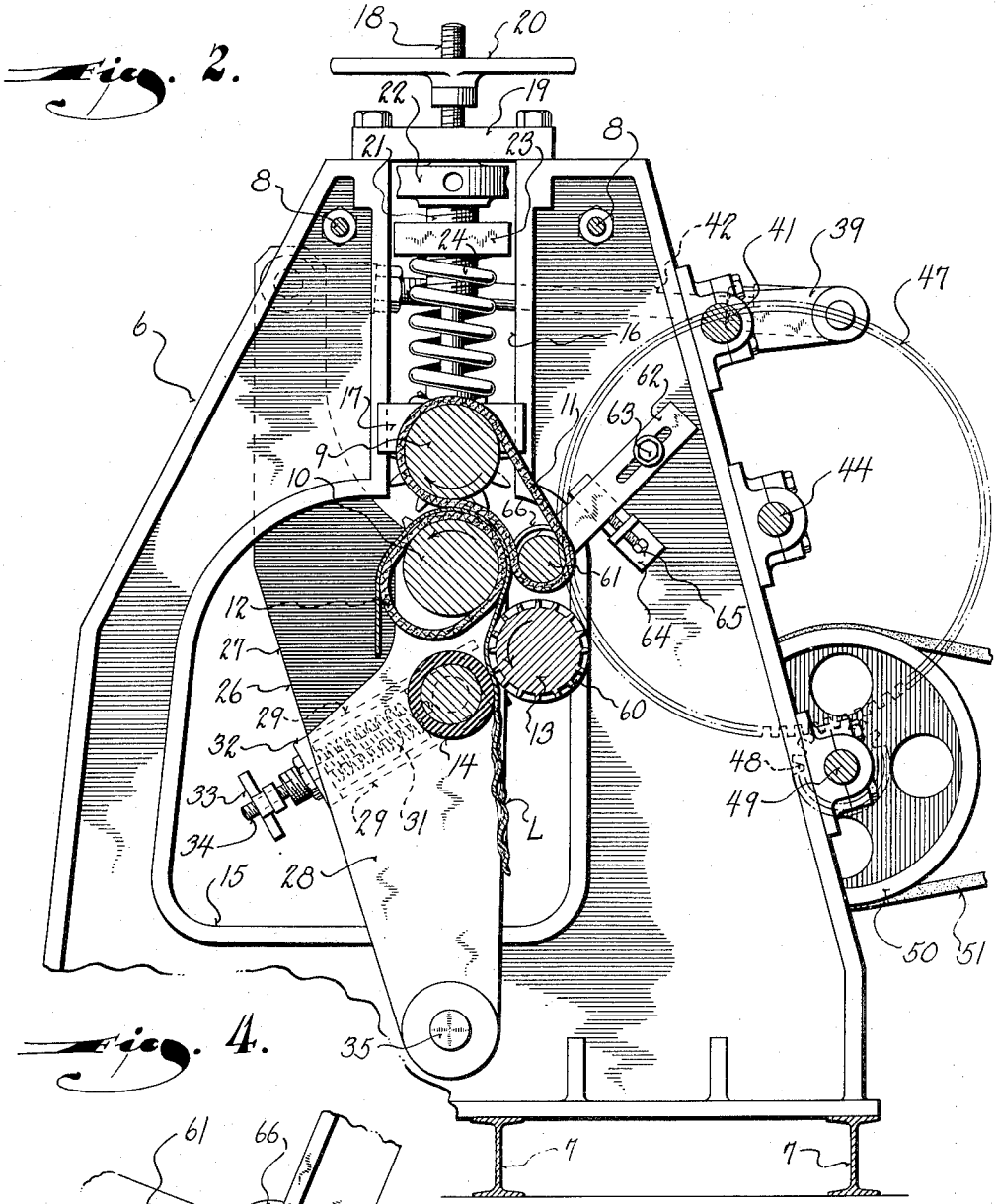
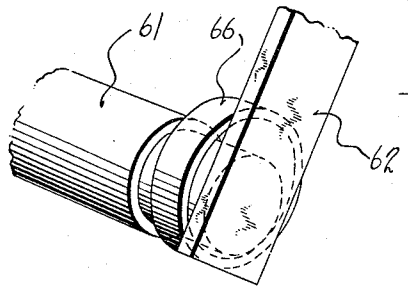



Fig. 4.




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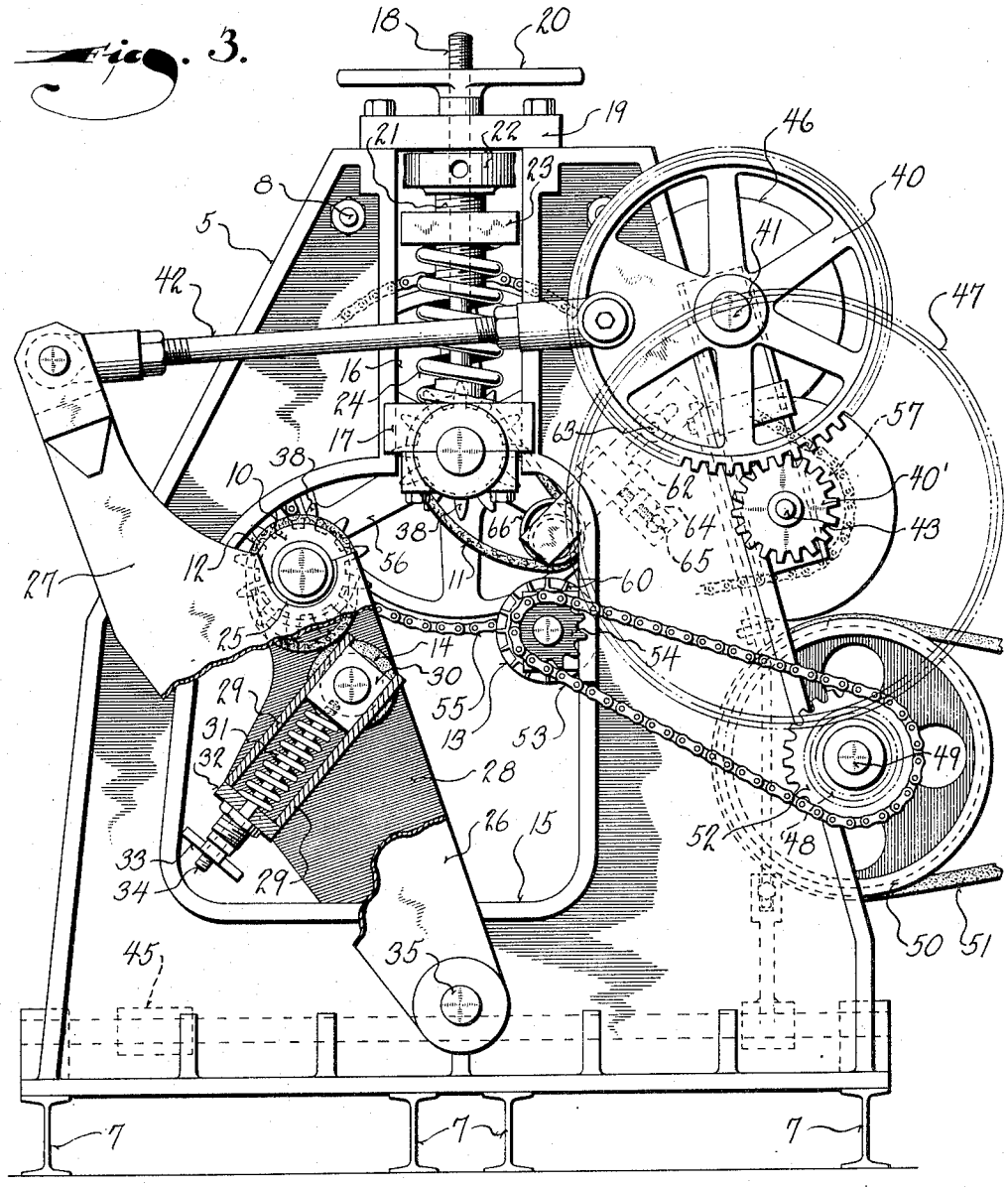
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Oct. 5, 1937. J. J. STEHLING 2,094,761

LEATHER WRINGING AND PUTTING-OUT MACHINE

Filed July 13, 1935 3 Sheets-Sheet 3

Fig. 3.




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# UNITED STATES PATENT OFFICE

2,094,761

## LEATHER WRINGING AND PUTTING-OUT MACHINE

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Application July 13, 1935, Serial No. 31,213

15 Claims. (Cl. 149—20)

This invention relates to leather working machinery and refers more particularly to machines for wringing out and straightening wet hides or skins.

After being taken from the tanning bath, the hides or skins must be wrung out or treated in some manner to remove the water therefrom. Also, to prepare them for the splitting or skiving knives, they must be flattened or smoothed out to remove all wrinkles and creases.

Heretofore, the water content of the hides or skins was sometimes removed by placing the hides or skins in large presses, but the more customary practice is to pass the hides or skins between wringer rolls especially built for this purpose. The straightening and smoothing out of the hides or skins which is known to the industry as "putting-out" is done by pressing them against a rapidly rotating roll having spiral vanes on its surface so pitched with respect to the direction of rotation as to work the material simultaneously toward opposite ends of the roll.

This invention contemplates the provision of a combined wringing and putting-out machine.

Combined wringing and putting-out machines have been used before, but the machines heretofore in use were limited in their speed of operation and consequently, their output. This was due primarily to the toggle-like construction of the pressure applying mechanism, the component parts of which were loosely jointed so that high speed operation was impossible. Also, the life of the machine because of the excessive wear which the many loose fitting joints entailed likewise was limited.

It is therefore one of the objects of this invention to provide a combined leather wringing and putting-out machine which is so constructed that the speed of operation may be greatly increased over that possible with past machines and wherein loose fitting connections and excessive wearing are entirely obviated.

Another serious disadvantage of the machines heretofore in use was that wrinkles or pleats in the shanks or trailing end portions of the hides or skins could not be removed. As a consequence, these portions of the hides or skins made splitting particularly difficult and required considerable manual attention. The inability of the machines to properly straighten out the shanks and end portions and remove wrinkles and pleats also resulted in a substantial waste of leather.

With this disadvantage of past machines of this character in mind, it is another object of this invention to provide a combined leather wringing and putting-out machine wherein all portions of the hides or skins will be properly flattened out and wrinkles and pleats in the shanks or end portions will be eliminated.

In machines of this character, the wringer rolls have felt sleeves loosely mounted thereon. The pressure of the wringer rolls is applied to the stock through these felt sleeves which soak up the water as it is wrung from the stock.

To improve the functioning of the machine in this respect, the present invention contemplates as a further object to provide a construction wherein the area of engagement between the hides or skins and at least one of the felt sleeves is considerably increased by partially wrapping the sleeve of one roll about the other roll.

Another object of this invention is to so dispose this increased area of contact between the sleeve and the stock that it becomes effective on the stock directly after it leaves the putting-out roll so as to prevent the shanks or trailing end portions of the hides or skins from wrinkling and creasing after they have been straightened by the putting-out roll.

A further object of this invention is to provide a construction wherein at least one of the felt sleeves is constantly being freed of its water content so as to increase its bibulosity.

A still further object of this invention is to provide a machine of the character described which is of rugged and simplified design and construction.

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 according to 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 machine constructed in accordance with this invention, parts thereof being broken away and in section;

Figure 2 is a cross section view taken through Figure 1 on the plane of the line 2—2;

Figure 3 is an end view of the machine, parts thereof being broken away and in section; and

Figure 4 is a fragmentary perspective view illustrating a detail of construction.

Referring now more particularly to the accompanying drawings in which like numerals indicate like parts throughout the several views, the numerals 5 and 6 designate left and right hand end frames, respectively. These frames are rigidly secured to longitudinal rails 7 which form the base of the machine. The upper ends of the frames are connected by tie rods 8.

Extending longitudinally across the space between the end frames are upper and lower wringer or pressure rolls 9 and 10, respectively. As is customary in machines of this character, these rolls have sleeves 11 and 12, respectively, of felt or other bibulous material loosely encircling the same so that as the skins or hides L are passed between the pressure rolls, the felt sleeves soak up the water squeezed therefrom.

Also disposed in the space between the end frames 5 and 6 and extending longitudinally of the machine is a putting-out roll 13 and a rubber covered pressure roll 14 which serves to press the hide or skin against the putting-out roll, as shown in Figure 2.

The end frames 5 and 6 may be in the form of castings, but are preferably built up of heavy steel plate with its flanges welded thereto, as shown. Each frame has a large centrally disposed opening 15 to permit the extension of the ends of the lower pressure roll and accommodate swinging of the same to and from its operative position beneath the upper pressure roll. The openings 15 also provide space for withdrawing and replacing the felt sleeves and in general facilitate assembly of the machine. The bearings for the putting-out roll, it will be noted, are fixed to the rear edges of these openings.

From the upper edge of each opening 15 a slot 16 extends to the top of the frame. Slidably disposed in the slots 16 are bearings 17 in which the upper pressure roll 9 is journalled. The bearings have removable caps as is customary to permit disassembly of the roll therefrom for the purpose of applying and removing the sleeve 11.

The bearings 17 and consequently the upper pressure roll are supported against dropping by spring rods 18 having their lower ends attached to the bearings and their upper ends slidably extending through caps 19 fixed to the tops of the end frames across the open slots 16. Adjusting nuts 20 threaded on the rods 18 and resting on the caps 19 adjustably support the rods 18.

Slidable on the rods 18 are pressure screws 21, the upper ends of which bear against the undersides of the caps 19 and have heads 22 provided with radial holes to enable the application of turning force thereto. These pressure screws 21 are threaded through pressure nuts 23 held against turning by having flat surface to surface engagement with the sides of the slots 16. Confined between these pressure nuts 23 and the bearings 17 are springs 24 which serve to yieldingly force the pressure roll 9 downwardly and when the machine is open, that is, when the lower pressure roll 10 is swung away from the roll as shown in Figure 3, the downward limit of movement of the roll 9 is defined by the positions of the nuts 20 on the spring rods 18.

The lower pressure roll 10 has its ends journalled in open topped bearings 25 carried by swinging arms 26. Inasmuch as the bearings 25 are open at the tops, it will be readily apparent that the pressure roll 10 may be lifted therefrom to permit removal and replacement of the felt sleeve 12.

The arms 26 like the end frames are preferably built up from pieces cut from steel plate welded together, and each arm comprises an outer long plate 27 and an inner short plate 28. The bearings 25 serve to rigidly connect the plates 27 and 28, and to assist the bearings in maintaining the plates 27 and 28 rigidly connected transverse plates 29 are welded thereto beneath the bearings 25.

The plates 29 provide enclosures for bearings 30 in which the rubber pressure roll 14 is journalled. The bearings 30 are yieldably urged inwardly and toward the putting-out roll 13 by pressure springs 31 confined between the bearings 30 and plates 32 which form part of the arm construction.

Adjusting nuts 33 threaded on the outer ends of the spring rods 34 fixed to the bearings 30 provide an adjustment for the rubber pressure roll and determine its proximity to the periphery of the putting-out roll when the machine is closed.

The lower bifurcated ends of the swinging arms straddle the lower portions of the end frames as shown and are mounted on shafts 35 fixed in bearings 36 carried by the end frames. Obviously, the axes of the shafts 35 of both swinging arms are in axial alignment.

It will be noted that the swinging arms 26 are of solid one-piece construction and have no loosely jointed portions apt to wear out or preclude rapid operation of the machine, and it is also noted that when the arms are swung to their closed positions, shown in Figure 2, the axis of the lower pressure roll 10 is on dead center thus relieving the closing mechanism of strain incidental to the wringing pressure on the work.

It is also to be observed that as the arms 26 are swung to bring the pressure rolls into operative relationship, the upper pressure roll is forced upwardly against the action of the springs 24 so that the full pressure of the springs 24 is applied to the work, and as the pressure rolls are brought into operative relationship, they are drivingly connected through the meshing of gears 38 fixed to the left hand ends of the rolls, the upper pressure roll 9 being positively driven in a manner to be hereinafter described.

The arms 26 are simultaneously swung from their open positions shown in Figure 3 to their closed positions shown in Figure 2 and vice versa by a crank motion provided by a crank 39 and a gear 40 fixed to the opposite ends of a shaft 41 journaled in bearings mounted on the rear of the end frames. Connecting rods 42 connect the upper ends of the swinging arms with the crank 39 and the gear 40. The length of the crank throw is such that a half revolution of the shaft 41 carries the swinging arms through their range of motion.

Rotation is imparted to the shaft 41 to effect the movement of the swinging arms by a pinion 40' meshing with the gear 40. The pinion 40' is fixed to a stub shaft 43 journalled in a bearing carried by the adjacent end frame 5 and is axially aligned with but separate from a shaft 44 extending across the machine to the opposite end frame where it is journalled in a bearing carried by said end frame.

A conventional clutch mechanism indicated in dotted lines in Figure 1 is mounted at the adjacent ends of the stub shaft 43 and the shaft 44. This clutch mechanism is adapted upon depression of a treadle 45 to effect a driving connection between the shaft 44 and the stub shaft 43 carrying the pinion 40', and inasmuch as the shaft 44 is continuously driven, it follows that

when this clutch connection is established the gear 40 will be driven to actuate the swinging arms.

Associated with the clutch mechanism is a dogging contrivance indicated generally by the numeral 46 which serves to automatically disengage the clutch at the completion of a half revolution of the gear 40 and its shaft 41 and also to releasably hold the clutch mechanism in its disengaged condition.

Inasmuch as the clutch and the dogging mechanism 46 are of conventional construction and form no part of this invention, they have not been shown in detail and further description thereof is unnecessary.

As stated, the shaft 44 is continuously driven. For this purpose, a gear 47 fixed to the shaft 44 outwardly of the left hand end frame meshes with a pinion 48 fixed to a drive shaft 49 extending longitudinally across the machine. The drive shaft has a drive pulley 50 secured thereto which is driven from a motor (not shown) by means of a suitable transmission belt 51. In practice, it is preferable to mount the motor directly on the machine, but for the sake of clarity it has not been so shown.

The drive shaft 49 besides driving the gear 47 also drives the putting-out roll 13 through a sprocket chain 53 trained about a sprocket 52 fixed to the drive shaft and a sprocket 54 fixed to the shaft of the putting-out roll 13.

The top pressure roll 9 is continuously driven by means of a sprocket chain 55 trained over a sprocket wheel 56 fixed to the shaft of the roll 9 and trained over a sprocket 57 fixed to the shaft 44. As shown in Figure 1, the sprocket drive for the top roll is disposed outwardly of the gear 47.

In operation, the wet hide or skin is thrown down between the pressure rolls so that its forward edge is in position to be clamped between the pressure rolls as they are brought together. As the rolls are brought together by rocking the swinging arms rearwardly in the manner hereinbefore noted, pressure is applied on the hide or skin.

Simultaneously with the gripping of the work by the pressure rolls, the rubber pressure roll 14 is brought into operative relationship with the putting-out roll 13 to press the hide or skin against the periphery of the putting-out roll. The putting-out roll revolves at a comparatively high speed and through the operation of its spiral vanes 60, the hide or skin is spread out toward the ends of the rolls and kept taut about the cylindrical surface of the lower pressure roll.

As the machine continues to operate, the hide or skin is carried up and forwardly past the putting-out roll and through the pressure rolls and the water squeezed from the hide or skin is absorbed by the bibulous sleeves so that as it emerges from the pressure rolls it is comparatively dry. Heretofore, in machines provided for this purpose, both sleeves were loose on their rolls as is the sleeve 12 encircling the lower pressure roll 10. As a consequence, the degree of contact between the work and the sleeves and particularly between the top sleeve and the work was comparatively small. However, in the present invention the top sleeve 11 is held in contact with a substantial portion of the work at all times through the provision of an idler roll 61.

This idler roll is disposed within the top sleeve 11 and is supported entirely thereby during the pressing operation as shown in Figure 2. Endwise displacement of the idler roll 61 is prevented by adjustable arms 62 adjustably secured to the end frames by screws 63 and supported by brackets 64 in which supporting screws 65 are threaded. The lower ends of the arms 62 have rings 66 welded thereto in which rings the ends of the idler roll 61 are disposed. Inasmuch as the rings 61 are considerably larger than the end portions of the idler roll disposed therein, the rings do not interfere with the support of the idler roll by the sleeve 11 during the pressing operation, but do provide a support for the roll independently of the sleeve 11 when the pressure rolls are separated.

Particular attention is directed to the fact that the circumferential length of the sleeve 11 is such that the idler roll is supported in a position beneath the lower pressure roll as it is swung into operative position, and as the idler roll 61 is solid and has substantial weight, the sleeve 11 is held taut and is drawn or wrapped tightly about the curvature of the lower pressure roll. The sleeve 11 is thus maintained in close contact with the work throughout a substantial area and the increased absorption which the provision of this additional area of contact between the sleeve and the work provides, makes it possible to run the machine at higher speeds without sacrificing good results.

It is also to be noted that the idler roll 61 is closely adjacent the putting-out roll 13 so that when the pressure rolls are in operative relationship and the pressing operation is taking place, the work travels but a very short distance from the time it leaves the periphery of the putting-out roll until it is clamped between the felt sleeves. Consequently, the shanks and the trailing end portions of the hides or skins will not have time to curl up or wrinkle after they have been straightened out by the putting-out roll. This insures the practical elimination of all wrinkles and pleats in the stock as it leaves this machine.

Another advantageous feature of the idler roll 61 is the fact that it causes the water accumulated in the upper sleeve 11 during the pressing operation to be expelled from the ends of the sleeve and thus precludes excessive saturation of the upper sleeve 11.

From the foregoing description taken in connection with the accompanying drawings, it will be readily apparent to those skilled in the art to which this invention appertains, that this invention provides a substantial improvement in combined leather wringing and putting-out machines and that through the elimination of loosely jointed pressure applying mechanism and the more rapid water absorption afforded by the novel arrangement of the bibulous sleeves, faster operation of the machine is made possible, and also that objectionable wrinkles and pleats in the shanks and end portions of the hides or skins are substantially entirely eliminated.

What I claim as my invention is:

1. In a machine of the character described, a pair of pressure rolls, one of which is movable into cooperative relation with the other, a bibulous sleeve encircling each roll, and means located in the path of the movable roll for maintaining a substantial area of the sleeve of the other roll wrapped about the curvature of the movable roll.

2. In a machine of the character described, a stationary pressure roll, a movable pressure roll movable to and from operative relationship to the stationary pressure roll, a bibulous sleeve encircling the stationary roll, and means automatically operable upon movement of the movable roll

into operative relationship to the stationary roll for holding a substantial area of said bibulous sleeve tightly wrapped about the curvature of the movable roll.

3. In a machine for wringing out wet leather and the like, a pair of separable pressure rolls adapted to have a piece of leather disposed therebetween, means for separating the rolls to allow insertion of a piece of leather therebetween and for bringing the rolls together, a bibulous sleeve encircling each roll through which pressure is applied to the stock, and an idler roll arranged inside the sleeve of one roll and located so as to hold said sleeve in the path of the other roll as the rolls are brought together so that a substantial area of said sleeve is wrapped about the curvature of the other roll to afford a large area of surface to surface contact between the bibulous sleeves and the stock.

4. In a machine for wringing out wet stock, a stationary upper pressure roll, a movable lower pressure roll, means mounting said movable roll for swinging movement to and from operative relationship beneath the stationary pressure roll, a bibulous sleeve encircling each pressure roll, and means for holding the sleeve of the upper stationary roll in such position that the swinging movement of the lower movable roll into operative relationship beneath the upper roll renders said sleeve of the upper roll taut with a substantial portion thereof wrapped about the curvature of the lower movable roll.

5. In a machine for wringing out wet stock, a stationary pressure roll, a movable pressure roll, means mounting the movable pressure roll for swinging movement to and from operative relationship to the stationary roll, a bibulous sleeve encircling the stationary roll, and an idler roll supported by the sleeve in the path of the movable roll as it is swung into operative relationship to the stationary roll whereby said idler roll maintains the bibulous sleeve taut with a substantial area thereof tightly wrapped about the curvature of the movable roll.

6. In a machine for wringing out wet stock, upper and lower pressure rolls, means mounting the lower pressure roll for swinging movement to and from an operative position beneath the upper pressure roll, a bibulous sleeve encircling the upper pressure roll, said bibulous sleeve having a substantially larger circumferential length than the circumference of said upper roll, an idler roll disposed within said sleeve, and means for loosely holding said idler roll in the path of the lower roll as it is swung into operative position beneath the upper roll so that as the lower roll is swung to its operative position the weight of the idler roll is supported entirely by the sleeve to cause a substantial area of the sleeve to be wrapped tightly about the curvature of the lower roll.

7. In a machine for wringing out wet stock, an upper pressure roll, a lower pressure roll, means mounting the lower pressure roll for swinging movement into and out of operative relationship under the upper roll, a bibulous sleeve encircling the upper roll, and an idler roll supported in the sleeve, said bibulous sleeve having a circumferential length such that the lower pressure roll contacts the sleeve between the upper pressure roll and the idler roll as the lower roll is swung into operative position so that the weight of the idler roll maintains a substantial area of the sleeve wrapped tightly about the lower pressure roll.

8. In a machine for wringing out wet stock, a pair of complementary superimposed pressure rolls, a bibulous sleeve encircling the upper roll so as to have direct contact with the stock passed between the rolls, and an idler roll supported in the sleeve, the sleeve having a circumferential length substantially greater than the circumference of the upper roll so that the weight of the idler roll so holds the sleeve with respect to the lower roll as to maintain a substantial area of the sleeve wrapped tightly about the curvature of the lower roll whereby a substantial surface to surface contact between the stock and the sleeve is effected to thereby insure more rapid absorption of liquid from the stock.

9. In a machine for wringing out wet stock, a pair of complementary superimposed pressure rolls, a bibulous sleeve loosely encircling the upper roll to have direct contact with the stock passed between the rolls, said sleeve having a circumferential length great enough to enable a depending portion of the sleeve to drape over the side of the lower roll, and a member supported in the lowermost portion of the sleeve for maintaining a substantial portion of said sleeve wrapped tightly about the curvature of the lower roll and for coacting with the inner surface of the sleeve to expel liquid from the ends of the sleeve.

10. In a machine for wringing out wet stock, a pair of complementary pressure rolls, a bibulous sleeve loosely encircling one of said rolls, and an idler roll supported on the inside of said sleeve for maintaining a substantial area of the sleeve drawn tightly about the other roll and for coacting with the inner surface of the sleeve to cause liquid accumulated by the sleeve from the stock to be expelled from the ends of the sleeve.

11. In a machine for wringing out and straightening wet stock, a pair of superimposed complementary pressure rolls, means substantially beneath the rolls for straightening and flattening the stock before it is passed between the pressure rolls, a bibulous sleeve encircling the upper pressure roll, and an idler roll hanging in said sleeve so as to drape a depending portion of the sleeve over the curvature of the other roll, the circumferential length of the sleeve being such that the point of tangency between the sleeve and said other roll is closely adjacent the straightening and flattening means so as to preclude wrinkling of the stock after it has been straightened and flattened.

12. In a machine of the character described, complementary stationary and movable pressure rolls, a putting-out roll, a pressure member for holding stock against the putting-out roll, means mounting the putting-out roll and the pressure member in such positions with respect to the pressure rolls that the movable pressure roll lies substantially between the stationary pressure roll and the putting-out roll and whereby stock fed from the putting-out roll to the pressure rolls is wrapped a substantial distance about the movable pressure roll and travels in a straight line tangent to the putting-out roll and said movable pressure roll, a bibulous sleeve encircling the stationary pressure roll, and an idler roll within the bibulous sleeve yieldingly maintained in a position close to the putting-out roll to lie in the path of the movable roll and to retain said sleeve tightly wrapped about the roll to a point closely adjacent to the point of tangency of the stock and the putting-out roll.

13. In a combined leather wringing and putting-out machine, the combination of upper and lower pressure rolls, a putting-out roll adjacent the lower pressure roll, means for holding stock

against the putting-out roll, a bibulous sleeve encircling the upper pressure roll, and an idler roll supported by the sleeve in a position directly above the putting-out roll so that the weight of the idler roll maintains the sleeve wrapped about the lower pressure roll to a point closely adjacent the putting-out roll to prevent the stock wrinkling up after it leaves the pressure roll.

14. In a combined leather wringing and putting-out machine, the combination of a stationary upper pressure roll, a putting-out roll mounted beneath the upper pressure roll, a movable lower pressure roll, yielding means for pressing stock against the putting-out roll, swinging arms mounting the lower pressure roll and said yielding means, said arms being adapted to carry the lower pressure roll into an operative position under the upper pressure roll and said yielding means into operative relationship with respect to the putting-out roll to press work thereagainst, a bibulous sleeve encircling the upper pressure roll, and an idler roll supported in the sleeve, said sleeve having a circumferential length such that the lower pressure roll engages the sleeve between the upper pressure roll and the idler roll whereby the weight of the idler roll maintains the sleeve drawn tightly about the lower pressure roll to a point closely adjacent the putting-out roll.

15. In a machine of the character described, a pair of separable pressure rolls, one of said rolls being stationary and the other being a movable roll, means for moving the movable roll into and out of cooperative relation with the stationary roll, a bibulous sleeve encircling the stationary roll, said sleeve having a circumferential length greater than the circumference of the stationary roll, and means for yieldingly holding the sleeve in the path of the approaching movable roll as it moves toward the stationary roll and for maintaining a substantial portion of the sleeve wrapped about the movable roll when the rolls are in closed cooperative relation.

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