May 31, 1932. F. S. JONES 1,860,713

LEATHER WORKING MACHINERY

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Fig. 1.

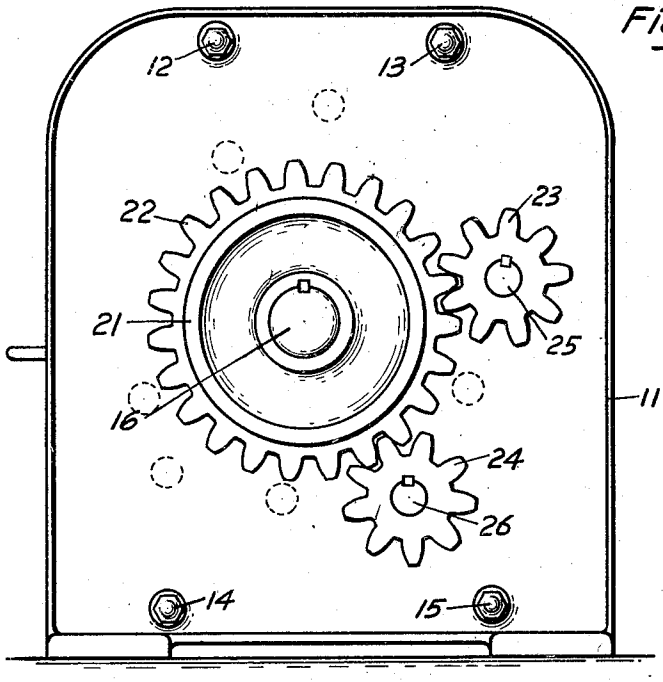
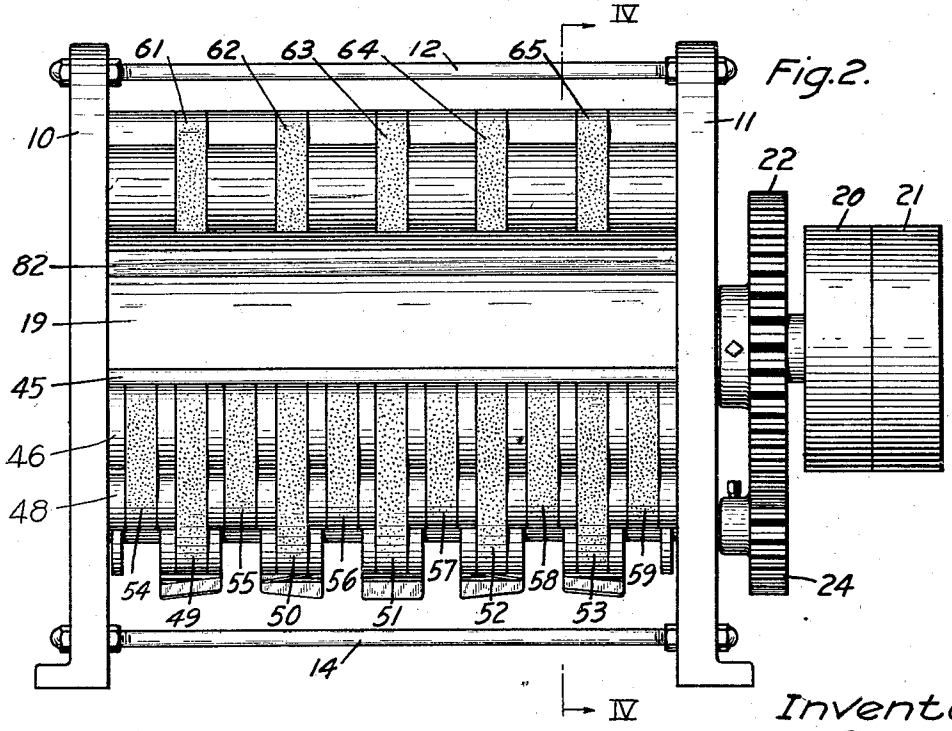


Fig. 2.



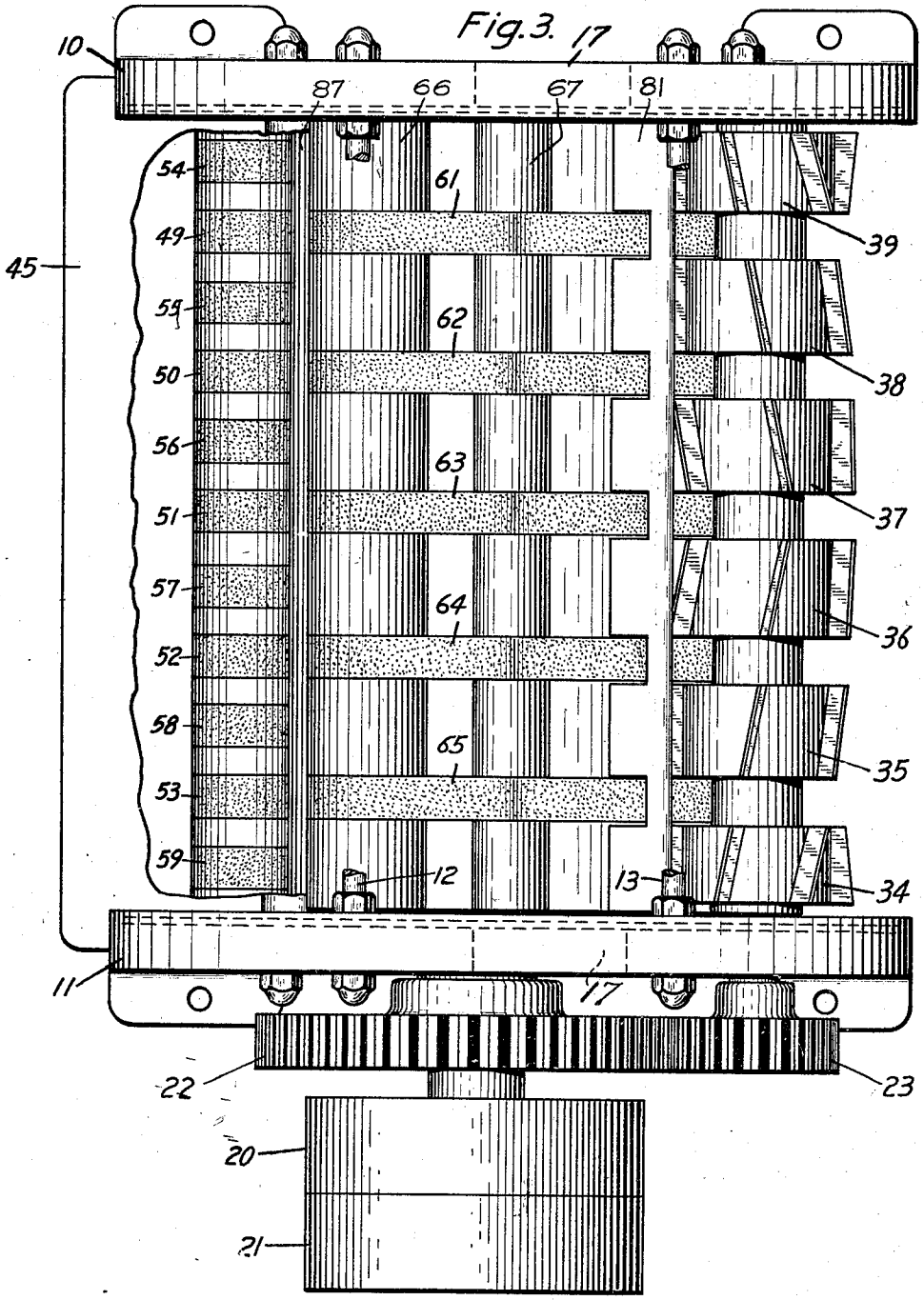
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Fig. 3.



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Fig.4.

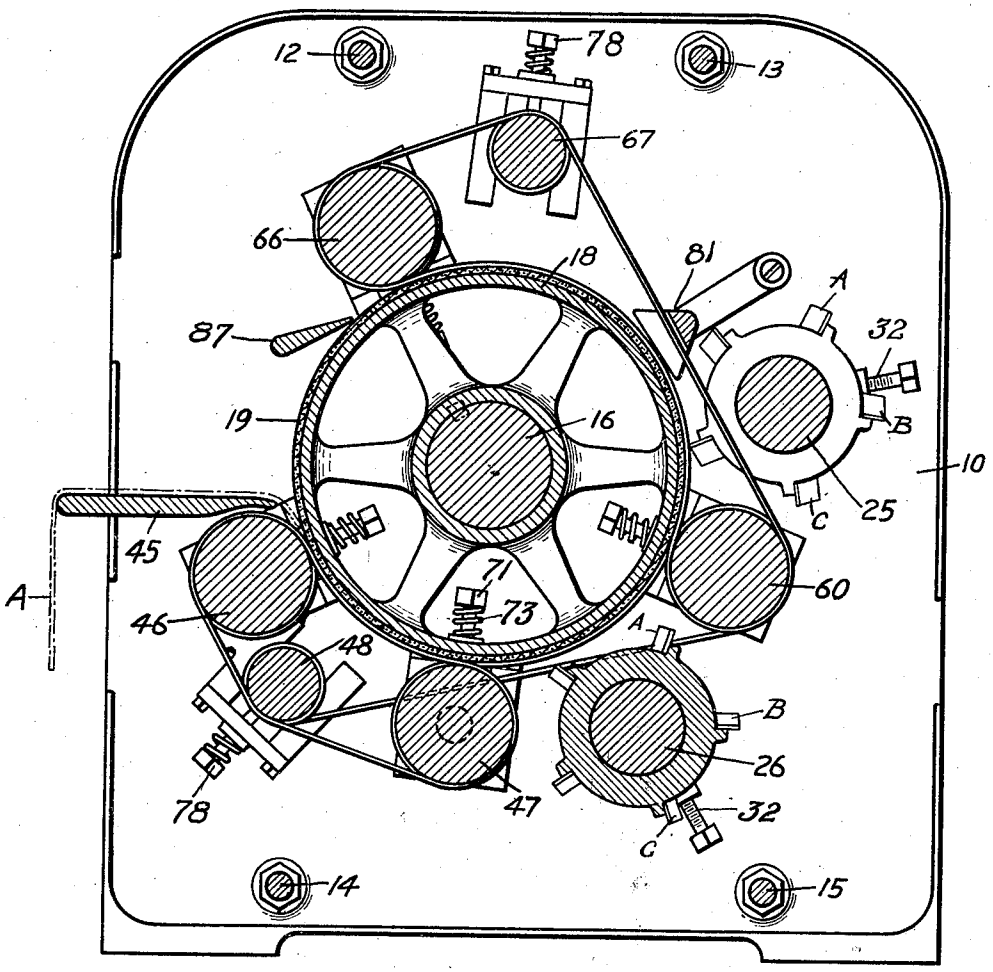


Fig.6.

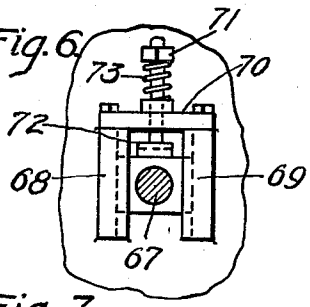


Fig.8.

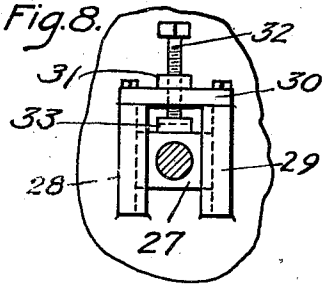


Fig.9.

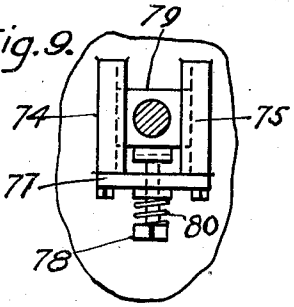
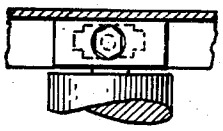


Fig.7.



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LEATHER WORKING MACHINERY

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Fig. 5

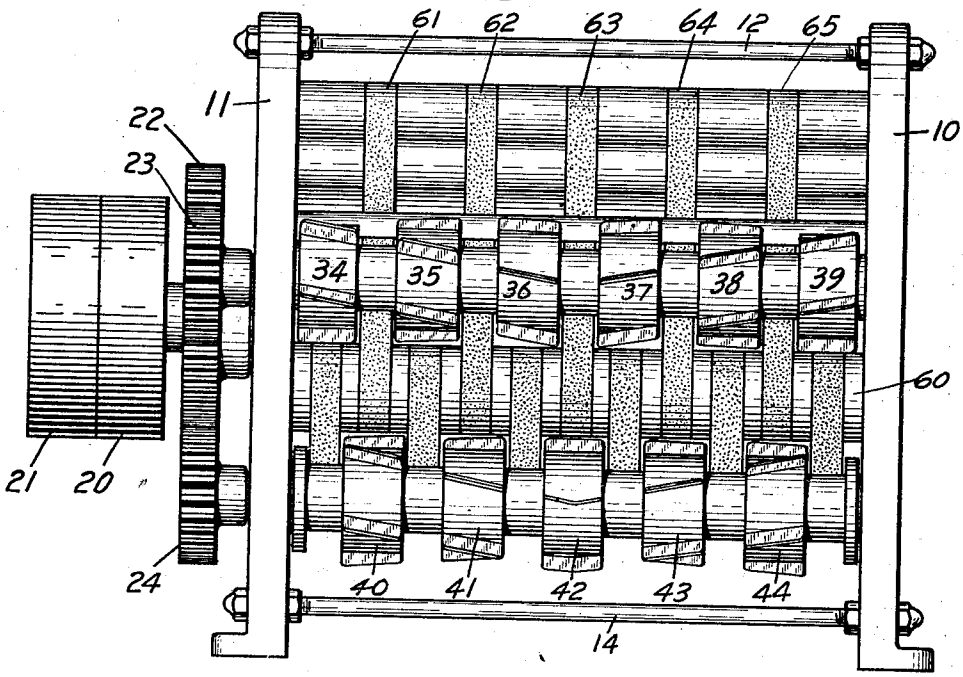


Fig. 10

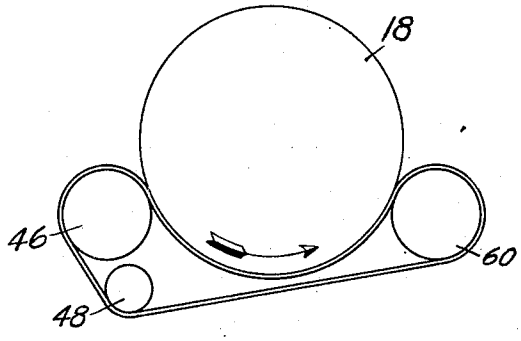


Fig. 12.

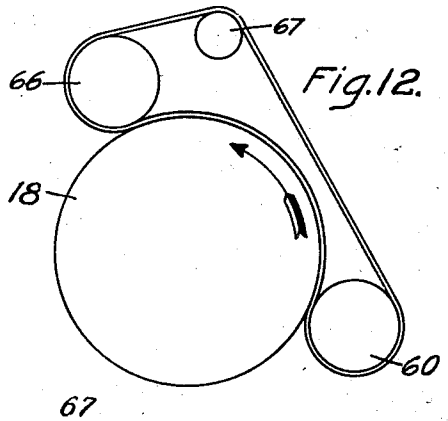


Fig. 11.

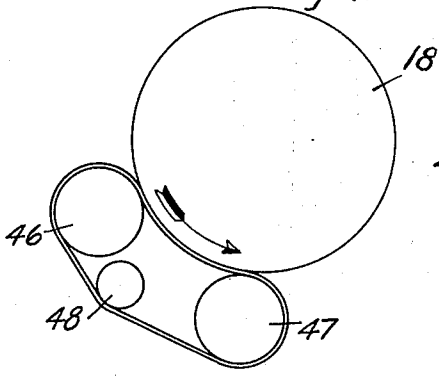
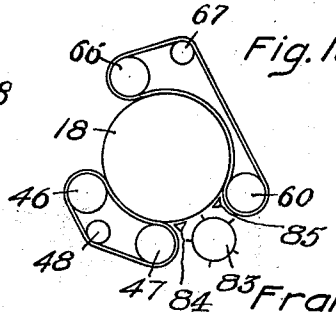


Fig. 13.



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Patented May 31, 1932 1,860,713

UNITED STATES PATENT OFFICE

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LEATHER WORKING MACHINERY

Application filed May 27, 1922. Serial No. 564,171.

This invention relates to machines for operating upon hides, skins, leather, and other similar pieces of work and is illustrated as embodied in a machine for unhairing hides and skins. It is to be understood, however, that the invention and various important features thereof may have other applications and uses.

In unhairing machines of the type disclosed in United States Letters Patent No. 784,017, granted Feb. 28, 1905, upon application of W. B. Turner, a number of work supports are employed in presenting pieces of work for unhairing to a plurality of sets of bladed cylinders, and following the operation the piece of work is returned to its initial position so that the operator can remove it from its table and substitute a fresh piece of work therefor. It is to be noted that this machine is operative completely to unhair a hide or skin in one passage through the machine. However, the machine is expensive to build and to maintain in proper operating condition. It is clear, therefore, that for many tanneries a smaller and less expensive machine would be more desirable.

Accordingly, it is an object of the invention to provide a simple and inexpensive machine of the drum or roll type for treating hides, skins, and other pieces of work and completing the treatment of the whole piece of work at one operation in an effective manner, the piece of work being returned to the operator without any necessity on his part of exercising control of the machine to secure such return of the work.

To these ends, and in accordance with an important feature of the invention, means is provided in the illustrated construction for holding a piece of work against the cylindrical surface of a rotary drum while other means is operating on the entire surface of the work not in contact with the drum while the latter, in its rotation, carries the work past the work operating means and finally delivers it to the operator at the front of the machine. Conveniently, a number of sets of belts are employed in holding each piece of work in turn on the surface of the drum, the latter supporting the work against the thrust of the treating tools which operate continuously upon the work as the latter is presented by the continuously rotating drum.

Preferably and as shown, the supporting or holding belts are arranged in sets, the belts of one set being arranged in side-by-side overlapping relation to the belts of another set, thus leaving spaces between the belts of each set in which the treating tools may operate. In order that all portions of the surface of the work not in contact with the drum may be operated upon in spite of the fact that the supporting belts are disposed in spaced relation to each other over the surface to be treated, a plurality of bladed cylinders are employed with the blades of one cylinder in staggered relation to the blades of another cylinder, so that the blades of one cylinder operate in spaces between one set of belts while the blades of the other cylinder operate in spaces between another set of belts in staggered relation to the first-mentioned set of belts.

In order to maintain the belts at proper tension while at the same time accommodating pieces of work of different thicknesses and pieces of work of varying thickness in each piece, rollers are employed for pressing yieldingly on the belts to maintain the tension thereof while other rollers are also employed as supporting rollers for the belts and are mounted so as to press the belts yieldingly against the surface of the drum. To assist in guiding the pieces of work in their travel around the drum, guide members may be employed positioned in predetermined spaced relation to the surface of the drum, another guide member being provided near the front of the machine and in predetermined relation to the drum to serve as a stripper by which the work is removed from the drum and delivered upon a table at the front of the machine where the operator stands to introduce pieces of work into the machine and to remove treated pieces of work therefrom.

These and other features of the invention and novel combinations of parts will now be described in detail with reference to the accompanying drawings and then pointed out more particularly in the appended claims.

In the drawings—

Figure 1 is a side elevation of the machine showing the driving mechanism.

Figure 2 is a front elevation of the same.

Figure 3 is a plan view.

Figure 4 is a transverse section showing the operating mechanism.

Figure 5 is a rear elevation.

Figures 6 and 7 are detail views showing the movable bearings.

Figures 8 and 9 are detail views of the adjustable rigid bearings.

Figures 10, 11, and 12, are diagrammatic views of the feeding belts disclosed in Fig. 4.

Figure 13 is an alternative construction showing a single blade.

Referring to the drawings, 10 and 11 indicate side frames of the machine which are held rigidly together as a unit by rods 12, 13, 14, and 15. The side frames 10 and 11 are held between two adjustable clamping nuts threaded on rods 12, 13, 14, and 15 for adjusting the frame to the supported members. Mounted in the side frames 10 and 11, is a main driving shaft 16 which rotates in rigid bearings 17, Figure 3. Fixed upon shaft 16 is a master drum 18, around which the various operations of the machine take place. The periphery of the drum 18 is covered with a rubber matting 19, although any suitable material may be utilized which is flexible in its nature for a working and an operating surface. The shaft 16 is provided with tight and loose pulleys 20 and 21 although it may receive its power from any suitable source. Mounted on the shaft 16 and rotating with it is a driving gear 22 which meshes with driven gears 23 and 24. The gears 23 and 24 are secured to shafts 25 and 26 respectively, which are mounted in adjustable bearings in the side frames 10 and 11. These bearings are adjustable in radial relation to the drum 18.

As these bearings are identical in construction, a description of one will be sufficient. The bearings consist of a babbitted box 27 (Fig. 8) which slides in guides 28 and 29. Connecting the guides 28 and 29 is a cap 30 secured thereto by bolts. Integral with the cap 30 is a boss 31 in which is threaded an adjustable bolt 32. The bolt 32 is free to turn in a loose connection 33 which allows the turning movement of the bolt 32 to impart radial movement of the box bearing 27 in relation to the drum 18. There are two sets of these bearings in each side frame 10 and 11 respectively. Mounted on the shaft 25 are blade cylinders 34, 35, 36, 37, 38, and 39, having a considerable clearance space between them for facilitating the operation of the machine, the description of which will be taken up hereinafter. Mounted on the shaft 26 are blade cylinders 40, 41, 42, 43, and 44 in line and overlapping the spaces between the cylinder blades 34, 35, 36, 37, 38, and 39 which give the operating effect of a single cylinder and blades, the object of which will be taken up hereinafter. The blade cylinders 34 to 39 inclusive and 40 to 44 inclusive, are provided with blades formed on the well known helical curve, although any blades best adapted for the variation in the working operation may be provided. The skin or hide A may be fed over a table 45, although the table is not absolutely necessary. The skin or hide passes between the master drum 18 and a first set of feed rolls 46 and 47 (shown in Figure 4) and idling roll 48, the latter compensating for the flexibility of the belts. Mounted on the rolls 46, 47, and 48 are belts 49, 50, 51, 52, and 53 (Figs. 3, 4 and 11). Operating between these belts is an intermediate set of belts 54, 55, 56, 57, 58, and 59 (Figs. 3, 4 and 10) which practically feed the skin or hide half way around the drum and are mounted on the first mentioned rolls 46 and 48, and extend across and under the drum 18 to the roll 60 which completes half of the feeding operation.

The belts 49 to 53, inclusive, Figure 3, being laterally located between the belts 54 to 59, inclusive, Figure 3, allow the whole skin or hide to be fed in and straightened out as it passes under the drum 18 to the lower cutting blades mounted on the blade cylinder 40 to 44, inclusive. The hide then passes upwardly under the blades on the blade cylinder 34 to 39, inclusive, it being the latter half of the feeding operation. As the hide or skin leaves the roll 60, it passes to a third set of belts 61, 62, 63, 64, and 65. These belts mounted on the rolls 60, 66, and 67, (Figs. 3, 4 and 12) complete the feeding operation. The feed rolls or drums 46, 47, 60 and 66 have grooves in which the co-operating belts are received, the grooves being of the width of the belts to be received therein and of a depth to correspond closely to the thickness of the belts. Hence the annular portions of the rolls 46, 47, 60 and 66 between the belts will also engage the hide or skin on the master drum 18 and assist in the feeding thereof. It is to be noted also that roll 47 is more deeply grooved at regular intervals to permit passage of belts 54, 55, 56, 57, 58 and 59 in straight line runs between rolls 48 and 60, as indicated in Fig. 4 in connection with belt 59. From an inspection of this latter figure of the drawings it will appear that feed roll 46 has the function of a starting feed roll and may be so termed, while feed roll 66 has the function of a delivery feed roll and is so referred to in the claims hereto appended, while feed roll 60 is an intermediate feed roll about which two sets of feed belts pass while extending in opposite directions to engage respectively with the starting and the delivery feed rolls.

The shafts 25 and 26, as mentioned hereinbefore, are mounted on adjustable bearings

27 to allow the blade to be regulated in proper relation to the skin or hide resting on the drum. It is well known that hides or skins are of varying thickness so that it becomes necessary to adjust the blades to suit the cutting of flesh or the removing of hair, and it is by this adjustment that the blade can be regulated to suit the conditions required, and at the same time remain rigid under the cutting operation.

The large rolls 46, 60, 47, and 66, are provided with bearings which are movable and spring pressed so as to force the said rolls firmly but yieldingly against the master drum 18. The bearing consists of a box 67′ (Fig. 6) which is free to slide radially in the guides 68 and 69. The guides 68 and 69 are provided with a cap 70 in which the bolt 71 is threaded. One end of the bolt is secured to the loose connection 72, which allows the bolt 71 to turn and impart a radial movement to the box 67′. Located between the cap 70 and the head of the bolt 71 is a spring 73. By increasing or decreasing the tension on the spring 73, the rolls 46, 47, 60 and 66 will adapt themselves to the varying thickness of hides or skins in their path around the drum during the fleshing or unhairing operation.

The smaller rolls 48 and 67 are tension devices for retaining the belts in position and taking up the slack caused by the skins passing between the master drum 18 and the rolls 46, 47, 60, and 66. They also compensate for the stretching of the belts and at all times render the belts in proper condition for operation. The shafts supporting the rolls 48 and 67 are mounted in a box 79 (Fig. 9) which is supported in guides 74 and 75 formed integral with the side frames 10 and 11. Secured to the guides 74 and 75 is a cap 77 in which the bolt 78 is threaded. One end of the bolt 78 is secured rotatably in the boss formed on the box 79. Interadjacent to the head of the bolt 78 and cap 77 is a spring 80 which pulls in the direction to continually force the bolt 78 outwardly, whereby the springs 80 at opposite ends of the rolls 48 and 67 serve as tighteners to retain the said bolts 78 outwardly, and hence also as tighteners to retain the said belts in proper relation to the working operation.

Pivotally secured to the side frame is a guide 81 (Fig. 4) to prevent the hides or skins from being destroyed or from turning over due to the movement of the blades in their path over the drum. The pivotal mounting allows the guide 81 to rock under the varying condition of the skin or hide and compensates for any varying condition which may arise.

Secured to the side frames 10 and 11 is a guide 87 (Fig. 4) set close to the master drum 18, which causes the hide or skin to move away from the rotating drum and drop off when the operation is completed.

Although we have shown the advantage of a system of feeding hides or skins in connection with two sets of blades, it is to be understood that the system of feeding can be used with a single set of blades as shown in modified view in Figure 13. The feed rolls are practically the same as shown in the other views, the middle set of belts (Fig. 10) being omitted. In this case the blades and blade cylinder 83 extend across the master drum in one piece to operate upon the work throughout the width of the latter, unobstructed by any belts, and are used with guiding members 84 and 85. These guiding members prevent the hide or skin from dropping down or wrapping around the feeding cylinders as the said skin or hide passes around the master drum in the fleshing or unhairing operation.

In operation, a raw hide or skin A′ is placed on the table 45 and fed over the roll 46 between the two sets of belts 49 to 53 inclusive and 54 to 59 inclusive. As the skin or hide passes over the belts it is straightened out and brought into a smooth and flat relation to the master drum 18 and then it passes over the roll 47, immediately after which the first cutting or unhairing operation takes place, and this is practically one-half of the entire cutting or unhairing operation. After this first operation, the skin or hide passes under the rolls 60 and 66, during which the blades on the shaft 25 cut or clean the unfinished surfaces which were left by the preceding blades. The arrangement of the belts is such that the entire surface of the hide or skin is exposed in alternate strips to the action of the blades. This completes the operation and the skin is fed along and delivered to the operator.

I have described the apparatus which I now consider to represent the best embodiment of my invention; but I desire to have it understood that the apparatus shown is only illustrative, and that various changes may be made within the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a leather working machine, means for unhairing hides or skins comprising a plurality of blades, a feed drum, means for continuously feeding the hide or skin around the drum to the starting position during the unhairing operation, and means for operating the blades to effect unhairing operations upon every part of the hair-bearing surface of said hides and skins.

2. In a leather working machine, means for unhairing hides or skins, a feed drum, and feed belts co-operating with the drum for continuously feeding the hide or skin around the drum to the starting position during the unhairing operation.

3. In a leather working machine for unhairing hides or skins, a feed drum, feed belts co-operating with the drum for continuously

feeding the hides or skins around the drum to the starting position, and knives arranged to work in proper relation to the feed belts for unhairing the hides or skins.

4. In a leather working machine for unhairing hides or skins, a feed drum, feed belts co-operating with the drum for continuously feeding the hides or skins around the drum to the starting position, knives arranged to work in proper relation to the feed belts for unhairing the hides or skins, and holding members for supporting the knives and movable to cause the knives to operate on the hides or skins.

5. In a leather working machine for unhairing hides or skins, a frame, a master feed drum rotatable in the frame, bearings in the frame, feed drums in the bearings, feed belts on the feed drums co-operating with the master drum for continuously feeding the hides or skins around the master drum to the starting position, knives arranged to work in proper relation to the feed belts for unhairing the hides or skins, and members spaced from each other distances corresponding to widths of the feed belts and movable to cause the knives to operate on the hides or skins.

6. In a leather working machine for unhairing hides or skins, a frame, a master feed drum rotatable in the frame, bearings in the frame, feed drums in the bearings, feed belts on the feed drums co-operating with the master drum for continuously feeding the hides or skins, knives arranged to work in proper relation to the feed belts for unhairing the hides or skins, and means additional to the belts for guiding the said hides or skins in their path around the master drum.

7. In a leather working machine for unhairing hides or skins, a frame, a master feed drum rotatable in the frame, bearings in the frame, feed drums in the bearings, feed belts on the feed drums co-operating with the master drum for continuously feeding the hides or skins, knives arranged to work in proper relation to the feed belts for unhairing the hides or skins, and a guide member secured to the frame and in proper relation to the feed drums for guiding the said hides or skins in their path around the master drum.

8. In a leather working machine for unhairing hides or skins, a frame, a master feed drum rotatable in the frame, bearings in the frame, feed drums in the bearings, feed belts on the feed drums co-operating with the master drum for continuously feeding the hides or skins, knives arranged to work in proper relation to the feed belts for unhairing the hides or skins, and rotary members for supporting the knives and for causing them to operate on the hide or skin.

9. In a leather working machine for unhairing hides or skins, a frame, a master feed drum rotatable in the frame, bearings in the frame, feed drums in the bearings, feed belts on the feed drums co-operating with the master drums for continuously feeding the hides or skins, knives working in proper relation to the feed belts for unhairing the hides or skins, and means for operating the knives in the spaces between the feed belts.

10. In a leather working machine for unhairing hides or skins, a frame, a master feed drum rotatable in the frame, bearings in the frame, feed drums in the bearings, feed belts on the feed drums co-operating with the master drum for continuously feeding the hides or skins, knives working in proper relation to the feed belts for unhairing the hides or skins, cylinders spaced from each other distances corresponding to widths of the feed belts and serving as supports for the knives, and means for rotating the master drum and the knife cylinders.

11. In a leather working machine for unhairing hides or skins, a frame, a master feed drum rotatable in the frame, bearings in the frame, feed drums in the bearings, feed belts on the feed drums co-operating with the master drum for continuously feeding the hides or skins, knives working in proper relation to the feed belts for unhairing the hides or skins, cylinders upon which the knives are secured, a gear secured to the master drum, and a gear secured to the cylinders which hold the knives, for rotating the said master drum and the knives.

12. In a leather working machine for unhairing hides or skins, a frame, a master feed drum rotatable in the frame, bearings in the frame, feed drums in the bearings, feed belts on the feed drums co-operating with the master drum for continuously feeding the hides or skins, and knives working in proper relation to the feed belts for unhairing the hides or skins, some of the feed drums having grooves for receiving said belts and having annular portions spaced by said grooves for engaging with the hide or skin to press it against the master drum to assist in the feeding of the hide or skin.

13. In a leather working machine for unhairing hides or skins, a frame, a master feed drum rotatable in the frame, bearings in the frame, feed drums in the bearings, feed belts on the feed drums co-operating with the master drums for continuously feeding the hides or skins, and knives working in proper relation to the feed belts for unhairing the hides or skins, said feed drums having portions for engaging with the hide or skin to press it against the master drum to assist in the feeding of the hide or skin.

14. In a leather working machine for unhairing hides or skins, a frame, a master drum rotatably mounted in the frame, a starting feed roll, an intermediate feed roll, and a delivery feed roll mounted in the frame, two sets of belts extending substantially around the master drum and respectively around dif-

ferent sets of two of the three feed rolls for forming a continual feed for the hides or skins, and means for unhairing the hides or skins.

15. In a leather working machine for unhairing hides or skins, a frame, a master drum rotatably mounted in the frame, a starting feed roll, an intermediate feed roll and a delivery feed roll mounted in the frame, two sets of belts extending partially around the master drum and respectively around different sets of two of the three feed rolls for forming a continued feed for the hides or skins, and means for unhairing the hides or skins between the feed belts.

16. In a leather working machine for unhairing hides or skins, a frame, a master drum rotatably mounted in the frame, a starting feed roll, an intermediate feed roll and a delivery feed roll mounted in the frame, two sets of feed belts extending partially around the master drum and respectively from the starting and delivery roll to the intermediate roll which is practically covered by the two sets of belts, and two sets of knives, one below and one above the intermediate roll for unhairing the hides or skins between the feed belts.

17. In a leather working machine for unhairing hides or skins, a frame, a master drum rotatably mounted in the frame, a starting feed roll, a tension feed roll, an intermediate feed roll and a delivery feed roll mounted in the frame, two sets of feed belts extending partially around the master drum and one set of feed belts extending from the starting feed roll and the other set from the delivery feed roll both to the intermediate roll which is practically covered by the two sets of belts, two sets of knives, one below and one above the intermediate roll for unhairing the hides or skins between the feed belts and a set of feed belts on the starting roll and acting against the master drum and also extending around the tension feed roll to keep the hide or skin smooth and even as it enters the machine.

18. In a leather working machine for unhairing hides or skins, a frame, a master drum rotatably mounted in the frame, a starting feed roll, an intermediate feed roll and a delivery feed roll mounted in the frame, two sets of feed belts extending partially around the master drum and one set of feed belts extending from the starting feed roll and the other set from the delivery feed roll both to the intermediate roll which is practically covered by the two sets of belts, two sets of knives, one below and one above the intermediate roll for unhairing the hides or skins between the feed belts, and means for holding the belts tightly against the feed rolls and master drum.

19. In a leather working machine for unhairing hides or skins, a frame, a master drum rotatably mounted in the frame, a starting feed roll, an intermediate feed roll and a delivery feed roll mounted in the frame, two sets of feed belts extending partially around the master drum and one set of feed belts extending from the starting feed roll and the other set from the delivery feed roll both to the intermediate roll which is practically covered by the two sets of belts, and two sets of knives for unhairing the hides or skins between the feed belts, the knives of one set being in staggered relation to the knives of the other set to work in between the belts of the two sets.

20. In a leather working machine, a master feed drum, feed belts co-operating with the master drum for continuously feeding a hide or skin around the master drum to the starting position, and means working in spaced relation to the feed belts for unhairing the hide or skin.

21. In a leather working machine, a frame, means for unhairing hides or skins, a master feed drum rotatable in the frame, and means for feeding hides or skins under the master drum and for carrying the hides or skins around the master drum to the upwardly facing surface of the drum to discharge the hides or skins adjacent to the point of entrance to the feeding means.

22. In a leather working machine, a frame, a master feed drum rotatable on the frame, feed rolls, belts on the rolls arranged to keep a hide or skin pressed against the master feed drum, and knives for operating against the hide or skin as it travels around the master drum in a continuous operation.

23. In a leather working machine, a frame, a master drum rotatable in the frame, and feed belts extending around the master drum from the under side to the upper side thereof, and means for unhairing a hide or skin comprising knives working in the spaces between the feed belts.

24. In a leather working machine, a frame, means for unhairing hides or skins, a drum rotatable in the frame, and a plurality of sets of feed belts extending in overlapping relation around the drum.

25. In a leather working machine, a frame, a drum rotatable in the frame, a plurality of sets of feed belts extending around the drum to hold a hide or skin thereon, and two sets of knives, one set arranged to work between the belts of one set of belts and the other set of knives being arranged to work between belts of another set of belts.

26. In a machine for operating on hides, skins, leather and other similar pieces of work, a drum for supporting a piece of work, a plurality of sets of feed belts extending in end to end overlapping relation to hold a piece of work against the surface of the drum, and an instrumentality for operating on the work while supported by the drum.

27. In a machine for operating on hides, skins, leather and other similar pieces of work, a drum for supporting a piece of work, belts for holding the piece of work against the surface of the drum, and means arranged to treat the entire surface of the work facing away from said drum while the piece of work is held on each side of the field of treatment by said belts, said work treating means being located with respect to the belts to treat said entire surface of the work without contacting with said belts.

28. In a machine for operating on hides, skins, leather and other similar pieces of work, a drum for supporting a piece of work, means for holding the piece of work against the cylindrical surface of the drum, and means arranged to treat the entire surface of the work facing away from said drum while the piece of work is held on each side of the field of treatment by said holding means, said work treating means being located with respect to the work holding means to treat said entire surface of the work without contacting with said work holding means.

29. In a machine for operating on hides, skins, leather, and other similar pieces of work, a work support, a plurality of tools arranged in sets, the tools in one set being arranged in staggered relation to the tools of another set to operate upon the entire exposed surface of the piece of work, and feed belts operating in the spaces between the tools and arranged to contact with the piece of work to feed it past the sets of tools.

30. In a machine for operating on hides, skins, leather and other similar pieces of work, a drum adapted to support a hide or skin, belts adapted to hold the hide or skin against the cylindrical surface of the drum and to expose the entire surface of the hide or skin in alternate strips, and means comprising blades arranged to treat the entire surface of the hide or skin facing away from said drum while the hide or skin is held by said belts, the blades being arranged with respect to the belts to treat said entire surface of the work, including portions between the belts, without contacting with said belts.

31. In a machine for operating on hides, skins, leather and other similar pieces of work, means to treat hides or skins comprising a plurality of blades, a cylindrical drum adapted to support a hide or skin during treatment thereof, and means adapted to hold the hide or skin on the work supporting surface of the drum and to expose the entire surface of the hide or skin in alternate strips, while the drum is rotating to carry the hide or skin past the plurality of blades for the operation of the latter on the hide or skin, said blades being arranged with respect to the holding means to treat one entire surface of the hide or skin without contacting with said holding means.

32. In a machine for operating on hides, skins, leather and other similar pieces of work, a drum adapted to support a hide or skin, belts adapted to hold the hide or skin against the cylindrical surface of the drum and to expose the entire surface of the hide or skin in alternate strips, and means to remove the hair from the entire hair-bearing surface of the hide or skin without contacting with said belts.

33. In a machine for operating on hides, skins, leather and other similar pieces of work, a cylindrical drum adapted to support a hide or skin during treatment thereof, means adapted to hold the hide or skin on the work supporting surface of the drum and to expose the entire surface of the hide or skin in alternate strips, while the drum is rotating, and means comprising a plurality of blades arranged to remove the hair from the entire hair-bearing surface of the hide or skin without contacting with said holding means.

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