Aug. 15, 1939. H. E. BEYSTER 2,169,754

FLESHING MACHINE

Filed Nov. 23, 1936 3 Sheets-Sheet 1

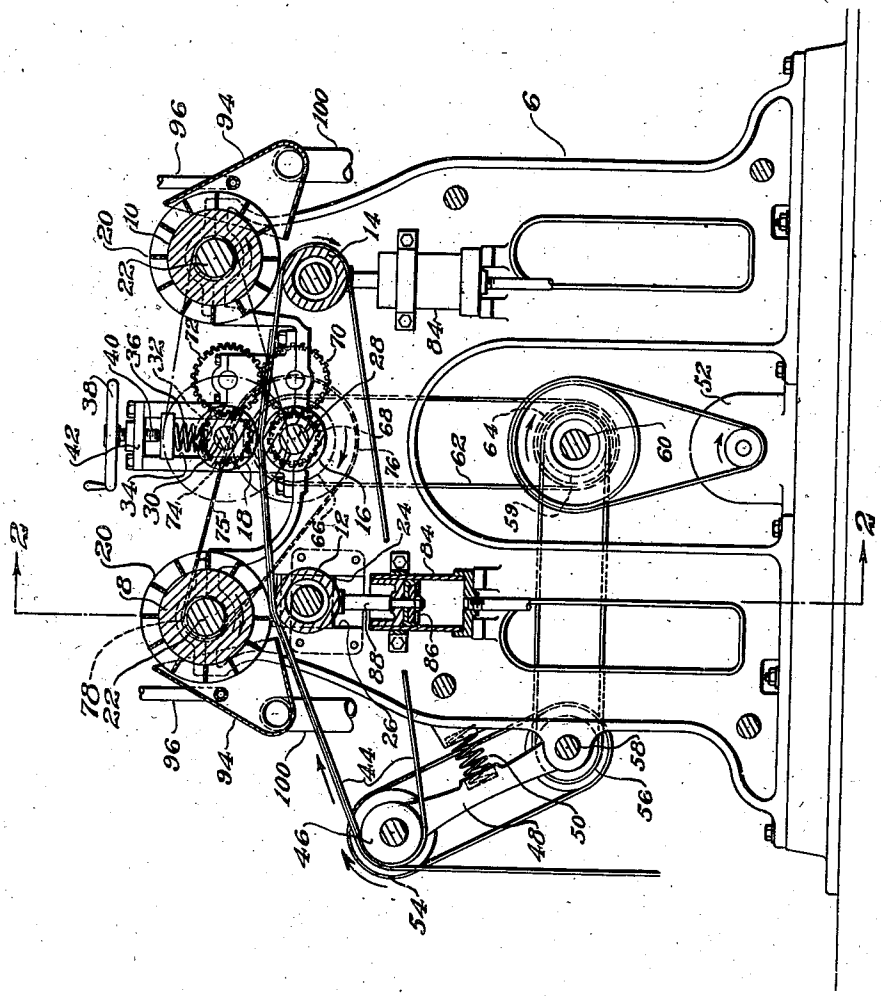


Fig. 1

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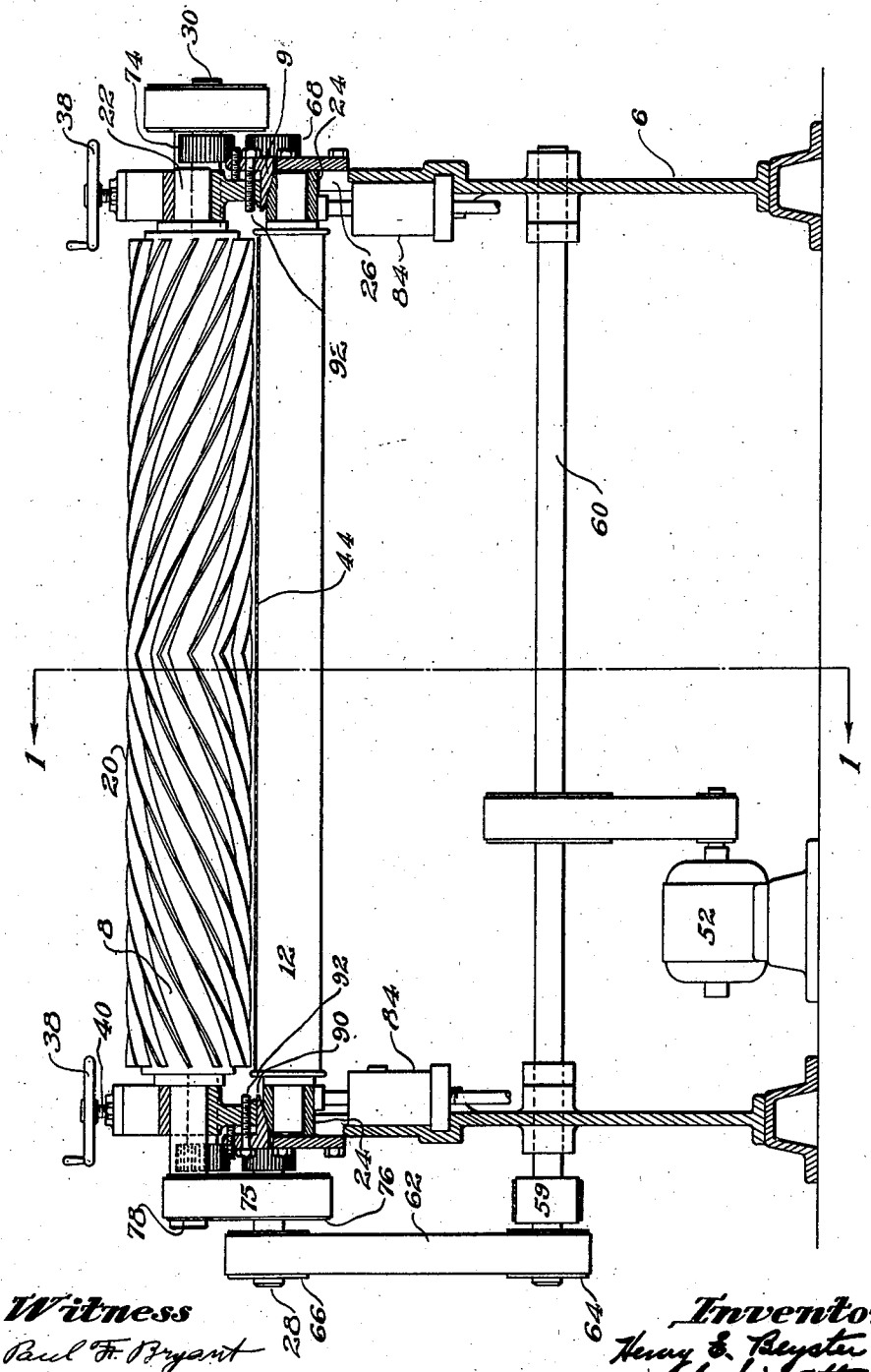



Fig. 2

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Filed Nov. 23, 1936 3 Sheets-Sheet 3

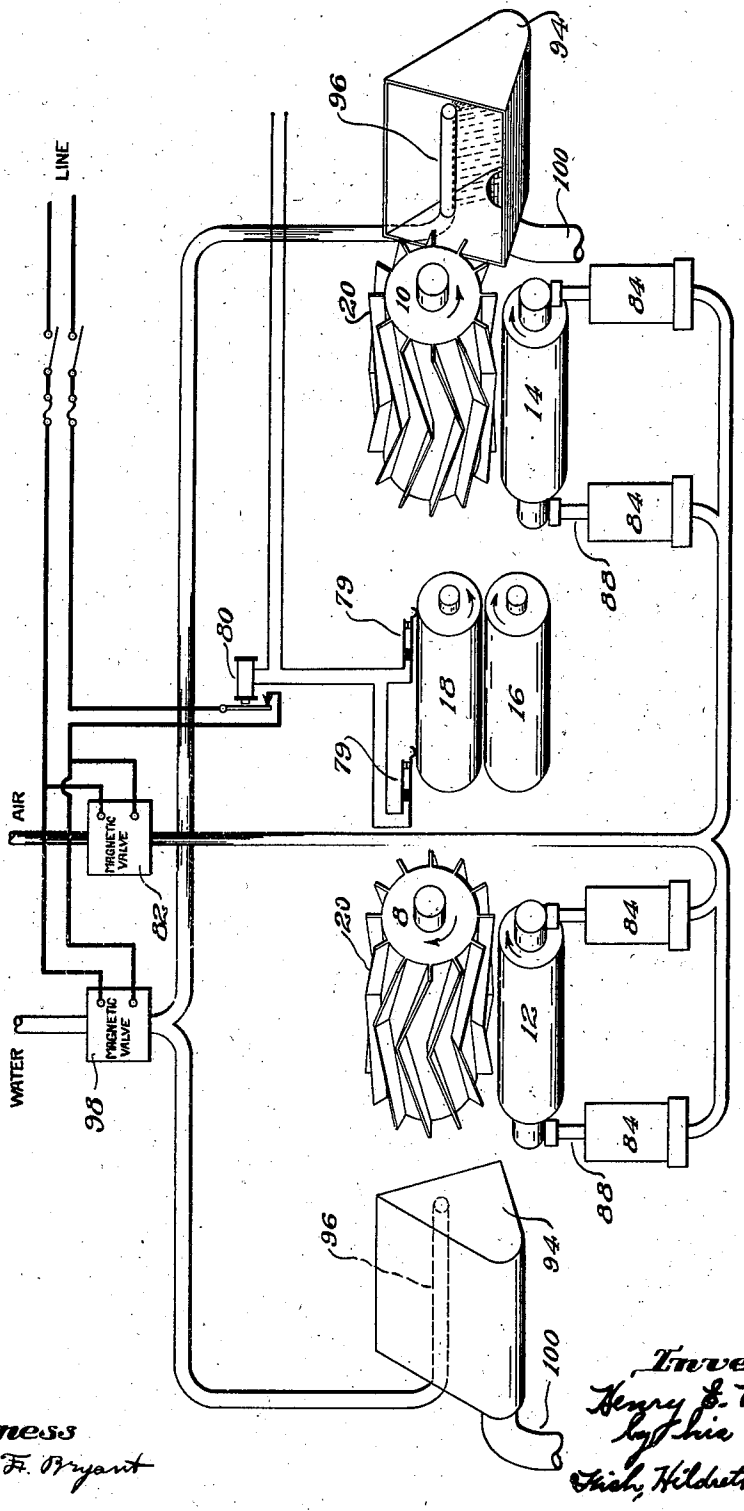



Fig. 3

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# UNITED STATES PATENT OFFICE

2,169,754

## FLESHING MACHINE

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11 Claims. (Cl. 149—19)

The present invention relates to a leather working machine and method for working upon the surface of hides, skins, and leather for performing the fleshing, setting out, or other analogous operations thereon.

Heretofore such machines have been constructed to operate upon only a portion of the hide or skin in each operative passage of the material through the machine, two or more of such passages being required for treatment of the entire surface of the skin. Moreover, in such prior machines the work or material is fed by means of rolls which engage directly with the skin. In the case of untanned skins or with soft, yielding sheepskin or similar tanned leather, such a method cannot successfully be employed to carry the material to the working tools or rolls but only to draw it away therefrom.

It is the object of the present invention to provide a leather working machine in which the entire surface of a skin from one end to the other may be fleshed, set out or otherwise worked in a single continuous and progressive operation.

Another object of the invention is to provide in a leather working machine mechanism responsive to the presence of the hide or skin in the machine for automatically rendering operative the working instrumentalities.

Still another object is to devise a leather working machine in which the skin or hide will be fed to and past the working instrumentalities with certainty and precision, irrespective of the stiffness or flexibility of the hide.

A further object of the present invention is to provide a method of fleshing, setting out, or otherwise working hides, skins and leather in a more expeditious and effective manner and at less expense.

Other objects and features of the invention will appear from the following description, taken in conjunction with the accompanying drawings in which Fig. 1 is a sectional view in right hand side elevation of a machine embodying the invention, taken along the line 1—1 of Fig. 2; Fig. 2 is a sectional view in front elevation, taken along the line 2—2 of Fig. 1; and Fig. 3 is a view illustrating in schematic fashion the electro-pneumatic controlling and actuating mechanism for the work-supporting rolls and the waste removal devices.

Briefly, the machine illustrated on the drawings comprises a pair of rotating working rolls provided with oblique blades or knives which engage the surface of the skin or leather. The material is fed past the working rolls by means of a moving endless belt or bolster which is supported or backed opposite each working roll by a supporting roll. A pair of feed rolls intermediate the working rolls directly engage the belt and the work or material to assist in the feed and insure the predetermined rate of movement.

Normally the supporting rolls and the overlying sections of the belt are spaced from the rotating blades of the working rolls, but when a skin on the moving belt reaches the feed rolls, the separation of these rolls, caused by the entrance of the skin therebetween, throws into operation pneumatic mechanisms which raise such rolls and belt to render the working rolls operative. With the passage of the skin from between the rolls, the reverse operations take place, the supporting rolls are lowered and the working rolls become again inoperative.

The machine also is provided with hoppers to catch the waste material removed by the working rolls and with flushing means, also controlled by the separating movements of the feed rolls, to wash out such material during effective operation.

The leather working machine illustrated in the drawings comprises a frame 6 in which are mounted the fleshing cylinders 8, 10, work supporting rolls 12, 14, and feed rolls 16, 18, together with the mechanism for actuating and controlling these parts.

The fleshing rolls 8 and 10 consist of cylinders having spaced about the periphery thereof sharpened blades 20 extending lengthwise of the cylinders in two oppositely oblique series for engaging and removing the fat and flesh from the hides as they pass through the machine. The cylinders are mounted on shafts 22 which are journalled in bearings in the frame of the machine. The fleshing rolls are rotated in opposite directions by mechanism hereinafter described.

The work supporting rolls 12 and 14 comprise cylinders of semi-resilient rubber or other suitable material mounted on shafts which are journalled in bearing blocks 24 arranged for vertical sliding movement in guideways 26 in the frame of the machine. By mechanism hereinafter described, these bearing blocks are raised and lowered in the guideways to move the supporting rolls toward or away from the fleshing rolls.

The feed rolls 16 and 18 comprise cylinders of material similar to that of the supporting rolls and are mounted on shafts 28 and 30. The lower feed roll 16 turns in bearings fixed in the frame of the machine, while the upper roll 18 is journalled in bearing blocks 32 slidably mounted in

vertical guideways 34. These bearing blocks are forced downward by springs 36, the pressure of which may be varied by turning hand wheels 38 to revolve studs 40 threaded into the cap pieces 42 at the top of each guideway.

A traveling belt or bolster 44, substantially the width of the supporting and feed rolls, supports and conveys the hides or skins in their passage through the machine. The bolster passes over the supporting rolls and between the feed rolls, also over a combined tension and driving roll 46 mounted in a frame 48 pivoted at its lower end to the frame of the machine. The frame is forced outwardly by a spring 50 to maintain the bolster under uniform tension.

The bolster belt 44 is driven at constant speed by a motor 52 located in the base of the machine by a system of belts and pulleys comprising a pulley 54 on the shaft of the driving roll 46, driven by a belt from a pulley 56 free to rotate on the pivot shaft 58 of the frame 48. This pulley 56 is belted to a pulley 59 from the counter-shaft 60 which in turn is driven by the motor 52.

The feed rolls are rotated at the same surface speed as that of the bolster belt 44 by means of a belt 62 running over a pulley 64 on the counter-shaft and over a pulley 66 on the shaft of the lower feed roll 16.

The upper feed roll 18 is rotated in a direction opposite to that of the lower roll by means of a train of gears comprising gears 68 on the ends of the shaft of the lower feed roll, meshing with idler gears 70, which in turn mesh with a second set of idler gears 72. The gears 72 mesh with gears 74 on the ends of the shaft of the upper feed rolls 18. By use of the two sets of idler gears, the adjacent surfaces of the feed rolls are caused to move in the same direction. Inasmuch as the axis of the upper feed roll and the idler gears 72 are normally in the same horizontal plane, the feed roll is free to move up and down for a considerable distance without danger of its gears 74 being carried out of mesh with the idler gears 72.

The fleshing cylinders are rotated in opposite directions to one another by belts 75 running from pulleys 76 on the ends of the feed roll shafts to pulleys 78 on the ends of the fleshing cylinders. The fleshing roll at the front end of the machine is rotated in a clockwise direction from the bottom feed roll 16, while the fleshing roll 10 at the rear of the machine is rotated in a counter-clockwise direction from the upper feed roll 18, as viewed from the right hand side as in Fig. 1. The driving pulleys 76 are larger in dimension than the driven pulleys 78 in order that the fleshing cylinders may revolve at considerably higher speed than the feed rolls.

Mechanism for raising and lowering the work supporting rolls to move a skin, as it is carried on the bolster belt 44 into and out of contact with the fleshing cylinders, is controlled by electrical means responsive to relative movements of the feed rolls toward and away from each other so that the supporting rolls are in operative position only during the time a skin is passing between the feed rolls.

The mechanism for accomplishing this result is illustrated schematically in Fig. 3, and comprises switches 79 so positioned at each end of the upper feed roll 18 that upon a slight rise of the roll, such as occasioned by the entrance of a skin between the rolls, an electrical circuit is completed, said circuit comprising the switches 79, a source of low voltage electricity, and the energizing coil of a relay 80. The switches are connected in series so that both ends of the roll must rise in order to complete the circuit, thus insuring that small particles of hide or foreign matter on the bolster will not cause the supporting rolls to move into operative position.

The relay 80, upon being energized, completes a circuit made up of a source of electricity and a magnetic valve 82, which valve controls the admission of compressed air to cylinders 84 positioned on the frame of the machine directly below each bearing block 24 of the supporting rolls 12, 14. A piston 86 in each cylinder is connected by a rod 88 with the respective bearing block so that upon the admission of compressed air to the cylinders the rolls are moved bodily upward toward the fleshing rolls 8, 10.

The supporting rolls are limited in their upward movement by wedge-shaped abutments or stops 90 (see Fig. 2) cooperating with inclined surfaces on the bearing blocks 24, said stops being adjustable by means of studs 92 to regulate the depth of the fleshing cut and to accommodate for various thickness of hides.

The magnetic air valve 82 is of conventional type having a venting port which opens simultaneously with the closing of the main valve. This venting port insures quick return of the supporting rolls to inoperative position by permitting the air in the cylinders 84 to escape into the atmosphere immediately upon cutting off the supply of compressed air.

The machine is provided with hoppers or pans 94 for catching debris thrown off by the fleshing cylinders. Spray pipes 96 are connected to a water supply through a magnetic valve 98 connected in parallel with the magnetic air valve 82, so that the spray is on when a hide is in the machine and the fleshing operation in progress. Drain pipes 100 serve to carry away the debris and water.

In carrying out the fleshing operation the hide is laid out on the moving bolster which carries it beneath the front fleshing cylinder without coming into contact therewith, the supporting roll 12 at this time being in its lower position. As the hide enters between the feed rolls, the upper roll is raised, the electrical circuits closed, and the mechanism hereinbefore described actuated to raise the work supporting rolls and bring the hide into contact with the front fleshing cylinder 8, which fleshes from a point somewhat in advance of the middle of the hide to the rear edge thereof. Since this fleshing cylinder is turning against the direction of movement of the belt, the hide is stretched out between the fleshing cylinder and the feed rolls, thereby eliminating any risk of the hide piling up and being cut by the fleshing roll.

The first part of the skin, that which passes under the front fleshing cylinder without contact therewith, is fleshed by the rear fleshing cylinder 10, to which it is brought by the bolster. The latter revolves in the direction of the feed of the work, but at considerably higher linear speed, thereby stretching out the skin on the belt. Since the skin, however, is firmly gripped by the feed rolls, it cannot be drawn through too rapidly, nor can it pile up in front of the cylinder. This cylinder fleshes the front edge of the skin to a point in the rear of the middle, as determined by the rear edge of the skin passing from between the feed rolls 16 and 18, permitting the upper roll to fall with the resulting opening of the circuits and the lower-

ing of the pressure rolls 12 and 14. The rear portion of the skin continues to pass beneath the rear fleshing roll, but out of operative contact therewith. Thus the entire skin is fleshed by the action of the two cylinders, the front cylinder operating primarily upon the rear half of the skin and the rear cylinder upon the front half, and both upon the intermediate or middle portion.

By the use of the feed belt or bolster the skin or hide is supported throughout its entire surface, thus insuring the presentation of the work to and past the fleshing rolls in the proper manner and at the predetermined speed, without regard to the condition of the skin or hide as to stiffness or flexibility, thus avoiding the uncertain action of feed rolls which engage the work on substantially line contacts only, to present a soft and yielding hide or skin to the working rolls.

Moreover, by supporting the work from beneath while the rolls operate on the top surface, the hide is accurately positioned with respect to the working rolls and removal of waste material only to the proper depth can take place, which is not the case where the rolls operate from beneath and a sagging of the work over the roll with consequent excessive depth of action may occur.

Furthermore, by delaying the coming into operation of the working rolls until the hide or skin is gripped by the feed rolls and terminating such operation directly upon the release of the skin by such rolls, the piling up or wrinkling of the skin by the fleshing rolls with resulting damage to such work is rendered impossible.

While the present invention has been illustrated and described as embodied in a machine particularly adapted for the removal of fat or flesh from an untanned skin, it is to be understood that the invention is not limited to that particular material or operation, but may be employed for the purpose of setting out a hide or skin or for other analogous purposes, the working rolls being then provided with blades having rounded work-engaging edges. Where in the claims reference is made to a leather working machine or to leather, this language is to be taken to include machines for operating upon both tanned and untanned hides or skins and whether for the purpose of removing fat or flesh or for setting out or for performing some other operation for which such machines are adapted.

Nor is the invention limited to the specific construction of machine herein shown and described as the form and arrangement of the parts thereof may be changed or varied within the scope of the language of the appended claims.

The nature and scope of the invention having thus been described, what is claimed is:

1. A leather working machine comprising a pair of spaced working rolls for engaging and operating on the leather, a feed roll located between the working rolls, and devices controlled by the feed roll for rendering the working rolls operative and inoperative.

2. A leather working machine comprising a pair of spaced working rolls rotating in opposite directions for engaging and operating on the leather, a feed roll located between the working rolls, and devices responsive to the passage of the work past the feed roll for rendering the working rolls operative.

3. A leather working machine comprising a pair of spaced working rolls for engaging and operating on the leather, a pair of feed rolls located between the working rolls, work supporting rolls for supporting the work opposite the working rolls, means for moving the supporting rolls toward and from the working rolls, and controlling devices for said means, such devices being responsive to relative movements of the feed rolls toward and from each other.

4. A leather working machine comprising a working roll, a work supporting roll, a hopper adjacent the working roll to receive waste material from the same, a discharge pipe for the hopper, and a water pipe for supplying water to the hopper to carry away the waste material through the discharge pipe.

5. A leather working machine comprising a working roll, a work supporting roll, a hopper adjacent the working roll to receive waste material from the same, a discharge pipe for the hopper, a water pipe for supplying water to the hopper to carry away the waste material through the discharge pipe, and automatically operating controlling devices for the water pipe responsive to the passage through the machine of material to be operated upon.

6. A leather working machine comprising a pair of spaced working rolls for engaging and operating on the leather, a pair of feed rolls located between the working rolls, work supporting rolls for supporting the work opposite the working rolls, means for moving the supporting rolls toward and away from the working rolls, and controlling devices for said means including electric switches at each end of the feed rolls and responsive to relative movement of said rolls toward and away from each other.

7. A leather working machine comprising a pair of spaced working rolls for engaging and operating on the leather, a pair of feed rolls located between the working rolls, work supporting rolls for supporting the work opposite the working rolls, means for moving the supporting rolls toward and away from the working rolls, and controlling devices for said means including a plurality of electric switches responsive to relative movement of said feed rolls towards and away from each other.

8. A leather working machine comprising a working roll, a work supporting roll, pneumatic means serving one of said rolls relatively to the other to render the working roll operative and inoperative, automatically operating devices for controlling the operation of the pneumatic mechanisms, said devices including an electrically operative pneumatic valve and an electric circuit for actuating the valve, the circuit having an electric switch responsive to the presence and absence of the material to be operated upon at a point spaced from the working roll, a hopper adjacent the working roll to receive waste material from the same, a discharge pipe for the hopper, a water pipe for supplying water to the hopper to carry away the waste material through the discharge pipe, and automatically operating controlling devices for the water pipe, said devices including an electrically operated valve actuated by the electric circuit of the pneumatic valve controlling means.

9. A leather working machine comprising a pair of spaced working rolls rotating in opposite directions for engaging and operating on the leather, means for feeding the work, and devices responsive to the passage of the work past a point intermediate the working rolls for rendering the working rolls operative.

10. A leather working machine comprising a pair of spaced working rolls for engaging and operating on the leather, a pair of feed rolls located between the work rolls, work supporting rolls for supporting the work opposite the working rolls, means for moving the supporting rolls toward and away from the working rolls, and controlling devices for said means including electric switching mechanism responsive to the presence of work between the feed rolls.

11. A leather working machine comprising a pair of spaced working rolls for engaging and operating on the leather, a pair of feed rolls located between the working rolls, work supporting rolls for supporting the work opposite the working rolls, means for moving the supporting rolls toward and from the working rolls to render the same operative and inoperative, and controlling devices to render said means operable only when work is present at the feeding rolls.

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