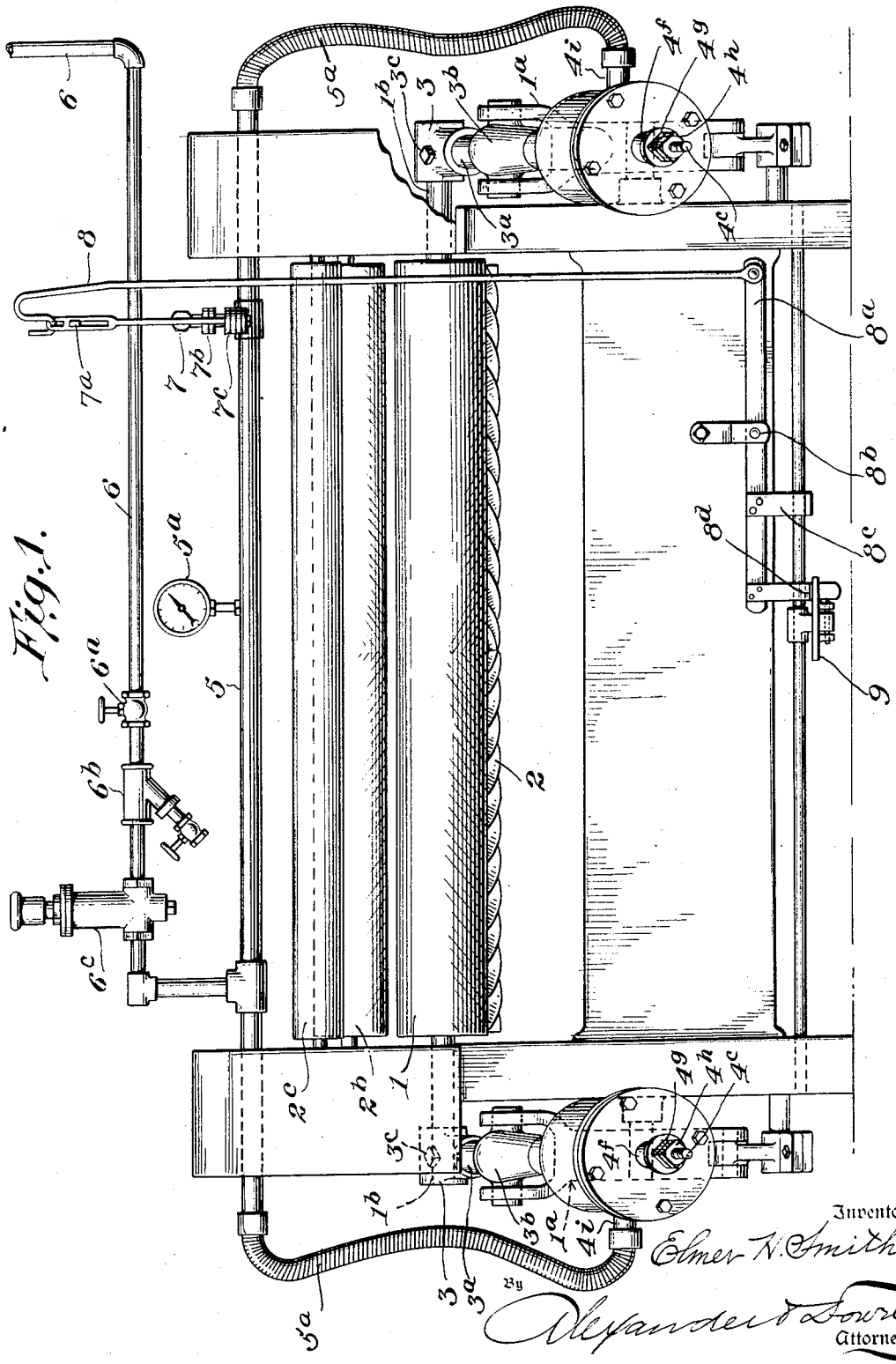
Dec. 26, 1933. E. H. SMITH 1,940,825

PNEUMATIC PRESSURE CONTROL DEVICE FOR FLESHING MACHINES, ETC

Original Filed Dec. 29, 1930 2 Sheets-Sheet 1



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Fig. 2.

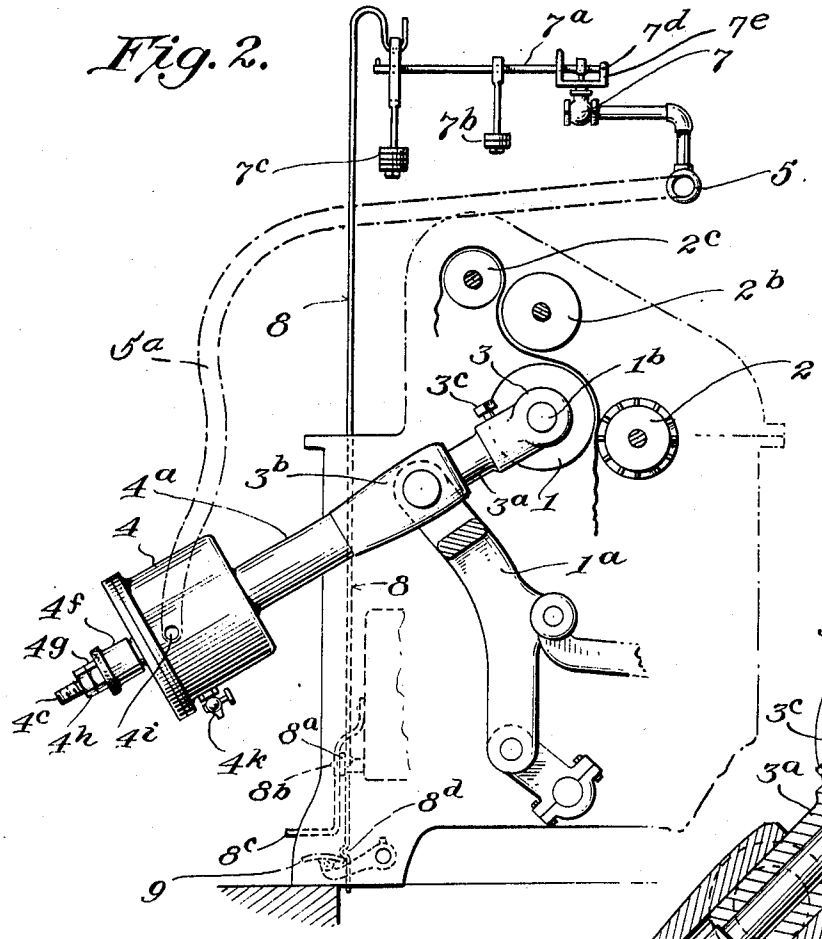
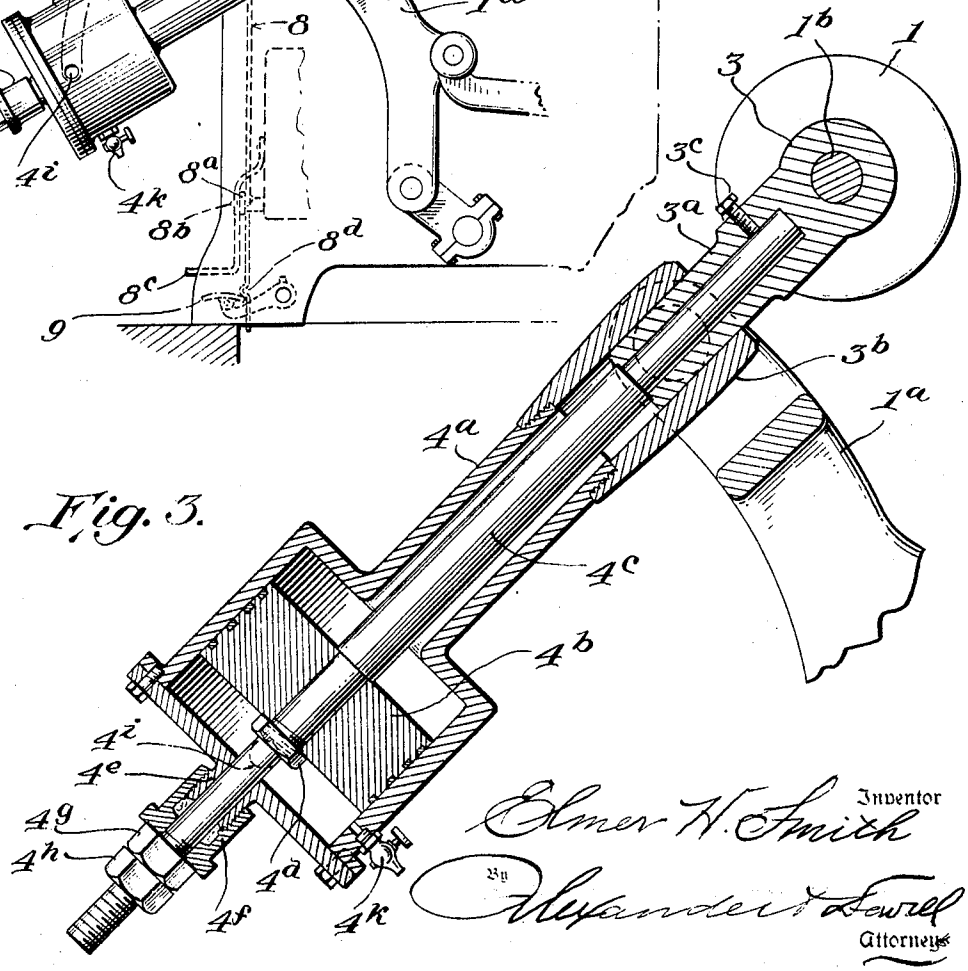


Fig. 3.



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UNITED STATES PATENT OFFICE

1,940,825

PNEUMATIC PRESSURE CONTROL DEVICE FOR FLESHING MACHINES, ETC.

Elmer H. Smith, Endicott, N. Y., assignor, by mesne assignments, to The Turner Tanning Machinery Company, Portland, Maine, a corporation of Maine

Application December 29, 1930, Serial No. 505,410
Renewed March 10, 1932

20 Claims. (Cl. 149—16)

This invention relates to machines for operating upon hides, skins, leather and other similar pieces of work. While the invention is illustrated as embodied in a fleshing machine and is described with special reference to its applicability to such a machine, it is to be understood that the invention and various important features thereof may have other applications and uses such, for instance, as in unhairing and setting machines for use in the manufacture of leather.

Each hide or skin both before and after tanning varies considerably in different portions thereof in thickness and in texture. Usually the portions lying along each side of the backbone line of the hide or skin are firmer and more resistant to stretching than the flank and shank portions of the same hide or skin. However, since the flank and shank portions are usually thinner and more readily compressible than the denser portions near the backbone line, they can ordinarily be submitted to as much pressure during treatment as that to which the backbone portions are subjected. Not infrequently, however, the head and neck portions of these hides or skins are substantially thicker and of looser texture than the portions further back along the backbone line of the hide or skin. Hence, if the head and neck portions are subjected to as much pressure as the other portions just referred to during teatment in fleshing, unhairing or setting operations the head and neck portions are likely to be damaged. Occasionally the head and neck portions of a very heavy hide may be ruined and the machine clogged in the attempt to treat such heavy portions.

It is an object of the invention to provide for treatment of different portions of hides and skins under different degrees of pressure to secure improved results, the pressure being greater when the firmer body portions of the hide or skin are being treated and of lesser degree when the neck and/or head portions are being operated upon. Since every hide or skin differs from every other hide or skin, it is a further object of the invention to provide for convenient control of the pressure to be applied in such manner that the operator may select the point at which the pressure will be changed upon the hide or skin undergoing treatment. A still further object of the invention is to provide a machine organization adapted for performing operations such as those referred to as nearly automatically as possible consistently with the desired control by the operator.

To these ends, and in accordance with an important feature of the invention, means is provided in the illustrated machine as constituting a preferred embodiment of the invention for applying a predetermined operating pressure to certain portions of a piece of work and subsequently a predetermined different pressure to other portions of the same piece of work. As above indicated, an advantage of such a construction resides in the fact that different portions of a piece of work may receive different treatments in view of different qualities or characteristics of the parts to be treated. Conveniently the pressure means is regulated by an operator-controlled member so that the operator may select points at which the pressure will be changed. Such control is an important feature of the illustrated machine for operating upon hides, skins and pieces of leather organized to secure the best results, since no two hides or skins or pieces of leather are alike, either in size, in thickness or in the areas wherein considerable changes in the qualities or other characteristics may occur.

Preferably, and as illustrated, the pressure at which the treatment of the piece of work is carried on is provided by a suitable fluid-actuated means. Advantages of such a means are found in the fact that the pressure may be regulated to a nicety through suitable valve mechanism and in the further fact that the pressure may be readily predetermined by setting valve mechanism at the different pressures desired. Another well-known advantage of utilizing fluid-actuated means resides in the fact that the pressure exerted by such means is more uniform than it is practicable to obtain from such mechanical elements as springs and weighted levers. Accordingly it is a further feature of applicant's invention that fluid-actuated means is provided for effecting the pressure of the operation of the work-treating instrumentality in an organization wherein means is provided for applying a predetermined operating pressure to certain portions of the piece of work and subsequently a predetermined different operating pressure to other portions of the same piece of work. The special mechanism for securing these different pressures may conveniently comprise a valve set to hold the pressure at the maximum degree desired and means for relieving the pressure on the valve so that it will be operative to hold the pressure at a predetermined lesser degree.

It is desirable that the means for securing different degrees of operating pressure upon different portions of pieces of work undergoing op-

eration should be so constructed and arranged as to provide in the normal operation of the machine for the application of the same predetermined operating pressure upon the entering portion of the work when the latter is entered in the routine manner in each successive operation of the machine. There is a distinct advantage in such an arrangement since in this way the machine is conditioned, without further effort on the part of the operator, to operate properly upon each piece of work as the latter is introduced in the routine manner notwithstanding the fact that the machine may have been set to operate at a different pressure during its operation upon a preceding piece of work. To this end and in accordance with an important feature of the invention the illustrated machine is provided with means for controlling the means for securing different degrees of pressure upon different portions of the piece of work in such manner that the last-mentioned means is conditioned without effort or attention on the part of the operator in timed relation to movements of a work presenting member to effect subsequent operation of the machine at the same initial pressure upon each successive fresh piece of work. In the illustrated construction, treadle mechanism for controlling the means for securing different degrees of pressure upon different portions of the piece of work undergoing treatment is provided with a catch member adapted to engage with the usual treadle for initiating operations of the machine so that, upon subsequent depression of the last-named treadle the treadle mechanism first referred to will be caused to operate to condition the pressure means for the application of the predetermined initial pressure upon introducing a piece of work into the machine.

In the accompanying drawings the invention has been illustrated as embodied in a "Whitney" fleshing machine of the type disclosed in United States Letters Patent No. 1,238,235 granted August 28, 1917, to R. F. Whitney, and reference may be had to this Whitney patent for an understanding of the construction and operation of parts of the illustrated machine not shown or described or only briefly described herein.

The above recited and other features of construction and novel combinations of parts will now be described in detail in the specification and then pointed out more particularly in the appended claims.

In said drawings,

Fig. 1 is a front view of a fleshing machine partly broken and equipped with my novel pressure applying and controlling devices.

Fig. 2 is an end view thereof partly broken away.

Fig. 3 is an enlarged detail sectional view of one of the air cylinders and its connections with the rubber roll.

The machine shown comprises a rubber pressure roll 1, a fleshing or cutting roll 2; and, mounted above the pressure roll, the usual feed and discharge rolls 2*b* and 2*c*. The aforesaid parts may be constructed as usual and driven by power means commonly employed in such machines. Each of the journals 1*b* of the roll 1 is shown as mounted in a yoke 3, such yoke having a tubular extension 3*a* which slidably engages a sleeve 3*b* which is pivotally mounted on the upper end of a swingable lever 1*a*. As shown, the end of a sleeve 4*a* on the head of an air cylinder 4 is secured to the end of the sleeve 3*b*. In cylinder 4 is a piston 4*b* which is connected to a piston rod 4*c* that extends through the sleeve 4*a* and sleeve 3*b*, and its upper end is fastened to the yoke 3*a* and may be secured thereto by a bolt 3*c*. The piston is fixedly attached on the piston rod in any suitable way, being shown as clamped thereon by a nut 4*d*. The lower end of the piston rod passes through a flange 4*e* on the lower head of the cylinder 4 and through a gland 4*f* which is suitably packed to prevent leakage of air or fluid.

The operative position of the roll 1 relative to the cutting roll 2 can be regulated by the adjusting and locking nuts 4*g*, 4*h* on the outer ends of the piston rods 4*c* of the cylinders 4 at opposite ends of the roll 1.

Air can be admitted into the cylinder 4 below the piston 4*b* through an inlet 4*i*. Water in the cylinder can be drained therefrom through a petcock 4*k*. Air or suitable fluid is supplied to the cylinder inlet by a flexible hose 5*a* leading from a pipe 5 which is connected to an exterior air supply pipe 6, the passage of air from pipe 6 to pipe 5 being controlled by a hand valve 6*a* (Fig. 1). An air strainer 6*b* may be placed in the pipe 6 if desired.

The pressure of air in pipe 5, and hence in the cylinders 4, can be observed by means of a pressure gage 5*a*; and the working pressure of the air in pipe 5 can be controlled by a pressure regulating valve 6*c* preferably located between valve 6*a* and pipe 5.

Connected with pipe 5 is a relief valve 7 which is preferably of a type to be controlled by a lever 7*a* pivoted at 7*d* to a stationary bracket 7*e* (Fig. 2); and this valve lever 7*a* is provided with an adjustable weight 7*b* and also with a second related adjustable weight 7*c*. The weight 7*c* may be raised (so as to free the lever 7*a* from such weight) by means of a lift rod 8 the upper end of which is loosely engaged with the weight 7*c* as shown. The lower end of said rod 8 is operatively connected with one end of a lever 8*a* which is pivoted at 8*b* on a suitable portion of the frame and near the other end of the lever 8*a* is connected a treadle 8*c* which treadle stands near the usual foot trip lever 9 by which the machine itself is thrown into or out of operation, the lever or treadle 9 being connected to initiate operation of a power mechanism for moving the roll 1 between work receiving and work presenting positions. By depressing treadle 8*c* the rod 8 may be raised (Fig. 1), thus relieving the lever 7*a* of the load of the adjustable weight 7*c*. When foot-lever 8*c* is depressed it is temporarily retained in depressed position by means of a catch 8*d* on the end of the lever 8*a* engaging with the foot treadle 9. This catch 8*d* is released when the treadle 9 is subsequently depressed to initiate return of the roll 1 to open or work receiving position.

Operation

When the feed rolls 2*b*, 2*c* are separated the workman can insert the hide between the rolls 2*c*, 2*b*. The treadle 9 is then depressed to initiate operation of the usual power means which moves the roll 1 into operative relation with the cylinder 2 which cuts the flesh from the hide. As above stated, the fibers of a hide are looser at the neck or head than in other portions. For this reason it is desirable to decrease the pressure when the grinding cylinder or cutting roll 2 reaches the neck or head of the hide. If for example 60 pounds pressure is desired for the body of the hide, and 40 pounds for the neck portion, the control valve 6*c* (Fig. 1) is set at the pressure which the operator desires for the body of the

hide (60 pounds) and the weight 7b for the valve 7 is adjusted on lever 7a to the pressure which is desired for the head and neck (40 pounds). Then the weight 7c is adjusted on lever 7a until the normal operative pressure of valve 7 is the same (60 pounds) as that of the control valve 6c. The body portion of the hide is then inserted in the machine and as it passes between rolls 1 and 2 is subjected to the higher pressure (60 pounds). When the neck or head portion of the hide nears roll 2, the operator depresses the pedal 8c which causes lever 8a to raise rod 8 and lift weight 7c off of lever 7a thus immediately reducing the pressure on valve 7 and hence on roll 1 to the amount (40 pounds) which was determined for the head and neck.

The air control valve 6c may be set at any desired pressure for different classes of hides or materials, and valve 7 loaded accordingly. For instance, if valve 6c is set at 35 pounds pressure; then both weights 7b and 7c on lever 7a are arranged to hold valve 7 down at 35 pounds, the arrangement being such that when weight 7c is raised by treadle 8c, the weight 7b holds the valve 7 at a predetermined pressure less than 35 pounds.

I claim:—

1. In a machine for treating hides, skins, leather etc. having portions of varying density; a work roll, a roll for presenting the hides to the work roll, fluid pressure devices connected with the journals of said movable roll, and means for applying a predetermined maximum pressure to the dense portions of the hide and a predetermined lesser pressure to the softer portions of the hide.

2. In a machine of the character specified having cooperating rolls, fluid pressure cylinders and pistons therein connected with the ends of one of the rolls and adapted to hold it against the other roll; a valve for holding the fluid pressure in the cylinders at a predetermined maximum limit of pressure, a second valve for holding the fluid pressure in the cylinder at a predetermined minimum pressure, and manually controlled means whereby the latter valve is held closed until it is desired to lower the pressure.

3. In a hide fleshing machine, the combination of a work roll, a pressure roll, means for moving the pressure roll to or from the work roll, fluid-pressure-controlled means engaging each trunnion of the pressure roll for holding it in contact with the work roll, a fluid supply connected with the said means, a valve whereby a predetermined maximum fluid pressure is exerted on the pressure roll while the thicker or denser portion of a hide is being treated, a second valve whereby a predetermined lesser pressure may be maintained on the roll when softer portions of the hide are being treated, means for normally holding the second valve closed under the maximum pressure; and manually operable means whereby the said holding means is released to permit the second valve to relieve the pressure on the roll when soft portions of the hide are presented to the work roll.

4. In a machine for treating hides, skins, leather or other material having cooperating rolls, and fluid-actuated-means for holding one roll to the other; a valve for controlling the pressure in the said fluid-actuated-means, means for holding said valve closed under a predetermined minimum pressure, supplemental means for holding the valve closed under a predetermined maximum pressure; and means for relieving the valve of said supplemental means; the valve being held closed under maximum pressure while the thick or dense portion of a hide is being treated, and relieved of the supplemental closing means to reduce the pressure when the soft portion of the hide is being treated.

5. In a machine for treating hides, skins, leather or other material having cooperating rolls, fluid-actuated-means for holding one roll to the other, and a fluid pressure supply connected with said fluid-actuated-means; a valve for holding the pressure in the said fluid-actuated means at a predetermined maximum pressure, a second valve for holding the pressure at a predetermined minimum, supplemental means cooperating with the second valve for holding such valve closed under the predetermined maximum pressure; and means for releasing the second valve from said supplemental means whereby the maximum pressure may be exerted on the thick or dense portion of a hide, and the pressure reduced to the minimum when the soft portion of the hide is being treated.

6. In a machine for treating hides, skins, leather or other material, a work roll, a cooperating pressure roll, fluid-pressure controlled means for holding the pressure roll to the work roll; comprising cylinders, pistons in the cylinders and operative connections between the pistons and the pressure roll; a fluid pressure supply connected with said cylinders, a valve for controlling the pressure in the said cylinders, means for holding the valve closed under a predetermined minimum pressure, supplemental means for holding the valve closed under maximum pressure, the valve being held closed under maximum pressure by the action of both means, and manually operable means whereby the valve may be relieved of the supplemental closing means to reduce the pressure.

7. In a machine for treating hides, skins, leather and other similar pieces of work having portions of varying density or thickness, a work roll, a roll for presenting a piece of work to the work roll, means for applying a predetermined pressure through said work presenting roll to all portions of the piece of work engaged at a given time between said rolls and subsequently a considerably different predetermined pressure to all portions of the piece of work engaged at another time by said rolls, and a manually operable member mounted in a location accessible to the operator at the front of the machine and having connections to said means to adjust the latter.

8. In a machine for treating hides, skins, leather and other similar pieces of work having portions of varying density or thickness, a work roll, a roll for presenting a piece of work to the work roll, means arranged to operate upon said work presenting roll to apply a predetermined pressure to certain portions of the piece of work and subsequently a predetermined different pressure to other portions of the piece of work, and means automatically operative to condition the last-mentioned means to secure the application of the same predetermined initial pressure to each successive piece of work.

9. In a machine for treating hides, skins, leather and other similar pieces of work having portions of varying density or thickness, a work roll, a roll for presenting a piece of work to the work roll, means arranged to operate upon said work presenting roll to apply a predetermined pressure to certain portions of the piece of work and subsequently a predetermined different pres-

sure to other portions of the piece of work, and means arranged to condition the last-mentioned means in timed relation to the movements of the work presenting roll to secure the application of the same predetermined initial pressure to each successive piece of work.

10. In a machine for treating hides, skins, leather and other similar pieces of work, a work roll, a roll for presenting pieces of work to the work roll, means arranged to hold the work presenting roll yieldingly in predetermined relation to the work roll during operation on a portion of a piece of work and to effect treatment of said portion at a predetermined pressure between said work roll and said work presenting roll, means under control of the operator for changing the pressure to a predetermined degree at any point during the operation of the machine, and means operated in timed relation to movements of the work presenting roll to condition the first-mentioned means for the application of the same predetermined initial pressure to each successive piece of work.

11. In a machine for treating hides, skins, leather and other similar pieces of work, a work treating instrumentality, a work support for presenting pieces of work to said instrumentality, means arranged to hold the work support yieldingly in predetermined relation to the work treating instrumentality during operation on a portion of a piece of work and to effect treatment of said portion at a predetermined pressure between said instrumentality and said work support, and means mounted on the frame of the machine in a position readily accessible to, and under control of, the operator for changing the pressure to a predetermined degree at any point during the operation of the machine.

12. In a machine for treating hides, skins, leather and other similar pieces of work, a work roll, a roll for presenting pieces of work to the work roll, means arranged to move the work presenting roll to operative position, means arranged to operate upon said work presenting roll to apply a predetermined yielding pressure to one portion of a piece of work and a predetermined different pressure to another portion of the piece of work, and an operator-controlled lever for regulating said means whereby the pressure may be changed at a point selected by the operator.

13. In a machine for treating hides, skins, leather and other similar pieces of work, a work treating instrumentality, a work support for presenting pieces of work to said instrumentality, power means operative to move the work support to operative position, means for causing the work treating instrumentality and the work support to operate at a predetermined maximum pressure on all that portion of the piece of work engaged by said instrumentality and said work support and subsequently at a predetermined lesser pressure on another portion of the piece of work, and an operator-controlled member mounted on the frame of the machine for regulating the last-mentioned means whereby the pressure may be changed at a point selected by the operator.

14. In a machine for treating hides, skins, leather and other similar pieces of work, a work roll, a roll for presenting pieces of work to the work roll, power means for moving the work presenting roll between work receiving and work presenting positions, a manually operable member for controlling said power means, means arranged to cause the work presenting roll to press the work against the work roll initially at a predetermined pressure, and means comprising a manually operable lever for causing the work presenting roll to present the work to the work roll at a different pressure.

15. In a machine for treating hides, skins, leather and other similar pieces of work, a work roll, a roll for presenting pieces of work to the work roll, power mechanism for moving the work presenting roll between work receiving and work presenting position, a manually operable member for controlling said power mechanism, means arranged to cause the work presenting roll to press the work against the work roll initially at a predetermined maximum pressure, means comprising a manually operable member for causing the work presenting roll to present the work to the work roll at a lesser predetermined pressure, and means arranged to connect the last-mentioned manually operable member with the first-mentioned manually operable member so that upon operation of the latter the first-mentioned means is conditioned to operate at the first-mentioned predetermined pressure.

16. In a machine for treating hides, skins, leather and other similar pieces of work, a work roll, a roll for presenting pieces of work to the work roll, power mechanism for moving the work presenting roll between work receiving and work presenting position, a manually operable member for controlling said power mechanism, means arranged to cause the work presenting roll to present the work to the work roll at a predetermined maximum pressure and subsequently at a predetermined lesser pressure, a manually operable member for controlling the said means, and a connection between the last-mentioned manually operable member and the first-mentioned manually operable member whereby upon operation of the latter the former effects operation of the pressure means to condition the work presenting roll for application of the predetermined maximum pressure first applied upon the piece of work.

17. In a machine for treating hides, skins, leather and other similar pieces of work, a work roll, a roll for presenting pieces of work to the work roll, power mechanism for moving the work presenting roll between work receiving and work presenting position, a manually operable member for controlling said power mechanism, means arranged to secure a predetermined pressure upon a portion of the piece of work and subsequently a predetermined different pressure upon another portion of the piece of work, a manually operable member for controlling said means, and a connection between the last-mentioned manually operable member and the first-mentioned manually operable member whereby the latter effects operation of the former to condition the said pressure means for application of the predetermined pressure first applied upon pieces of work.

18. In a machine for treating hides, skins, leather and other similar pieces of work having portions of varying density or thickness, a work treating instrumentality, a work support for presenting pieces of work to said instrumentality, fluid-actuated-means for holding said instrumentality and work support in co-operative relation at a predetermined maximum pressure on all portions of the piece of work engaged at a given time between said instrumentality and said work support and subsequently at a predetermined lesser pressure on all portions of the piece

of work engaged at another time by the said instrumentality, and a manually operable member mounted in a location accessible to the operator at the front of the machine for regulating the last-mentioned means whereby the pressure may be changed at any point selected by the operator.

19. In a machine for treating hides, skins, leather and similar pieces of work, a work roll, a roll for presenting pieces of work to the work roll, means comprising a fluid pressure device for applying a predetermined pressure to certain portions of a piece of work and a predetermined different pressure to other portions of the piece of work, and a manually operable member for controlling the said means whereby the operator is enabled to select the point at which the pressure is changed.

20. In a machine for treating hides, skins, leather and other similar pieces of work, a work roll, a roll for presenting pieces of work to the work roll, means comprising a fluid pressure device for applying yieldingly a predetermined pressure to certain portions of a piece of work and subsequently a predetermined different pressure to other portions of the piece of work, a valve mechanism in said fluid pressure device, and a manually operable member for controlling the valve mechanism whereby the pressure may be changed from the initial predetermined pressure to the predetermined different pressure at a point selected by the operator.

ELMER H. SMITH.

CERTIFICATE OF CORRECTION.

Patent No. 1,940,825. December 26, 1933.

ELMER H. SMITH.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, strike out lines 116 to 129 inclusive, comprising present claim 7, and insert the following as claim 7:

7. In a machine for treating hides, skins, leather and other similar pieces of work, a work treating instrumentality, a work support for presenting pieces of work to said instrumentality, means for causing said instrumentality and work support to operate at a predetermined yielding pressure on one portion of a piece of work and subsequently at a considerably different predetermined pressure on another portion of the same piece of work, and a manually operable member mounted in a location accessible to the operator at the front of the machine and having connections to said means to adjust the latter.

And that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 3rd day of April, A. D. 1934.

F. M. Hopkins

(Seal) Acting Commissioner of Patents.