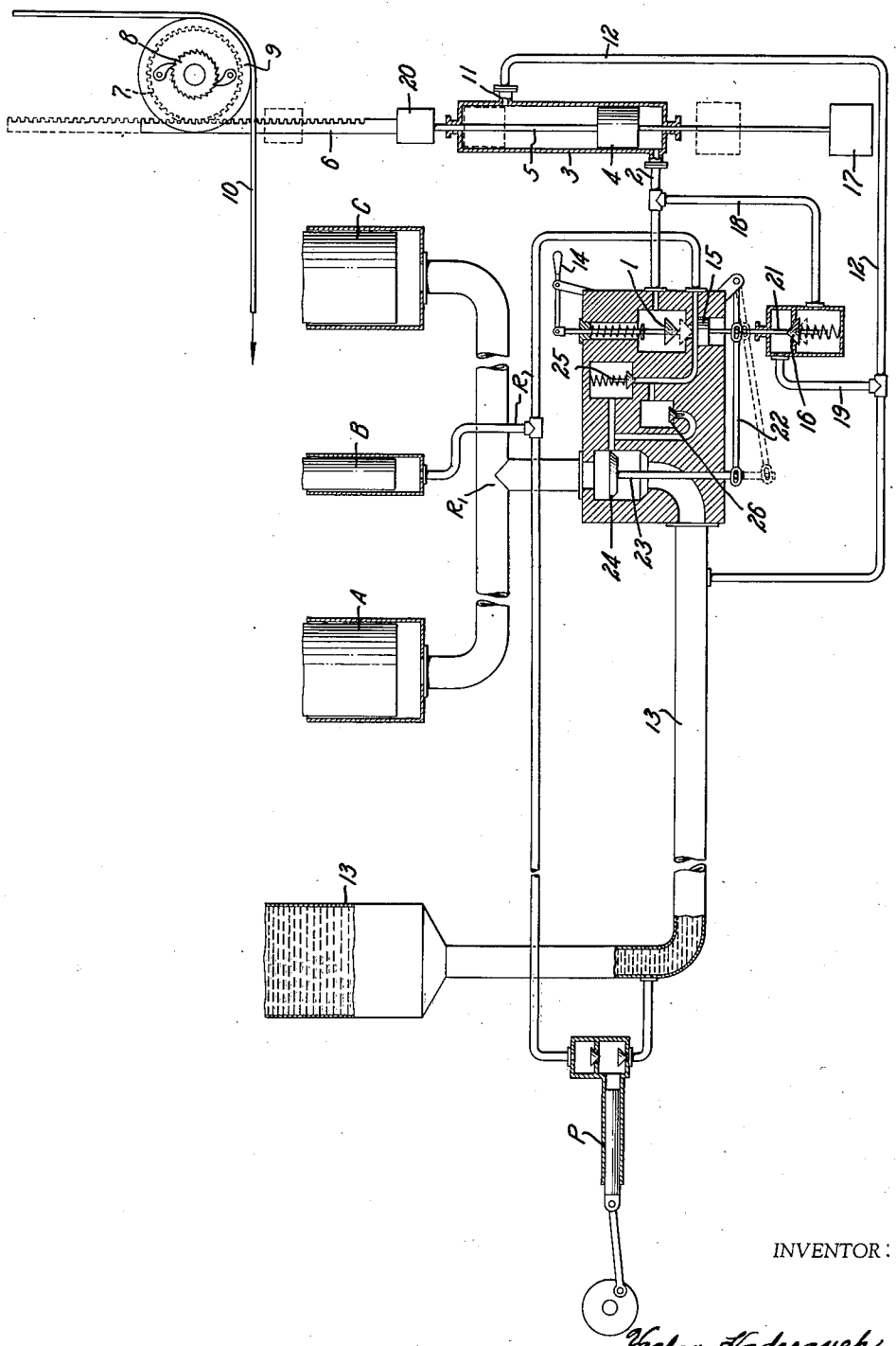
March 11, 1952 V. KADEŘÁVEK 2,588,845

APPARATUS FOR FEEDING LEATHER TO SMOOTHING PRESSES

Filed Aug. 4, 1949



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Patented Mar. 11, 1952

2,588,845

UNITED STATES PATENT OFFICE

2,588,845

APPARATUS FOR FEEDING LEATHER TO SMOOTHING PRESSES

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Application August 4, 1949, Serial No. 108,467
In Czechoslovakia September 8, 1948

3 Claims. (Cl. 69—48)

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In the existing leather smoothing or pressing machines, the leather is guided by hand to the working space of the press. This operation is tedious and very dangerous since the leather has to be straightened out under the press plate, and its position has to be adjusted continuously, if a perfect smoothing or pressing effect is to be obtained all over the surface treated. As a rule, the capacity of the pressing device is not fully utilised, because the preparatory operations on the leather to be treated require a longer period than the time which is necessary to carry out the smoothing or pressing operation itself.

Accordingly, attempts have been made to secure by mechanical means the automatic feeding of the leather to the press, but not one of the methods hitherto proposed has proved successful, as the feeding devices have been of complex nature and the control and supervision of the work have been difficult.

The present invention makes it possible to avoid completely the above disadvantages and to accelerate and simplify considerably the control and supervision of the machine and thereby to minimize the losses of time.

The essence of the invention is that the drive of the endless band which conveys the leather to the working space of the smoothing hydraulic press is effected by hydraulic means, the flow of pressure liquid being used for this purpose at the moment when the said pressure liquid has terminated the pressing operation and the press is being opened.

The manner and the means for achieving the desired results are described more fully in the following description with reference to the accompanying drawing which shows diagrammatically an example of means for feeding the leather in accordance with the present invention.

The leather is fed to the working space of the smoothing press by means of an apparatus which comprises a valve 1, a pipe 2 and a cylinder 3 in which a driving piston 4 with its piston rod 5 operates, the piston rod being extended at one extremity to form a toothed rack 6. The rack 6 engages with a gear wheel 7 which by means of a ratchet wheel 8 and associated pawls drives a drum 9 and an endless conveyer band 10 guided around the drum. The piece of leather to be treated is placed on the endless band 10. The end of the piston rod 5 which projects downwards from the cylinder 3 carries a weight 17 while the opposite end portion of the piston rod 5 which projects upwards from the cylinder 3 is provided with a shock absorber 20. An overflow conduit

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11 connected to a pipe 12 serves to equalize the pressure to that prevailing in the supply tank 13 for the pressure liquid as soon as the press has terminated its work. A hand lever 14 is provided for the control of the valve 1 which in turn controls indirectly an auxiliary piston 15 and a valve 16 associated therewith, the piston 15 and the valve 16 being connected together by means of a draw rod 21. To insure the co-operation of the two valves 1 and 16 they are interconnected by the pipes 2 and 18, and for pressure equalization a pipe 19 is connected to the pipe 12 which leads to the supply tank 13. The draw rod 21 has a pivotal connection with a lever 22 which, by means of a rod 23, is adapted to lift a valve 24 in association therewith. The valve 24 is so arranged as to cut off the connection between the pressure pipe R_1, which feeds pressure liquid under the press pistons A and C, and the supply tank 13. The pressure pipe R provides for the continuous direct supply of pressure liquid both to the space under the lifting piston B and through the excess pressure or safety valve 25 to the pressure pipe R_1 arranged underneath the press pistons A and C, and also to the cylinder 3 through the valve 1 and pipe 2. During the press opening movement which is initiated by unseating the valve 1, the valve 26 operates to reduce the pressure exerted by the liquid in the pipe R_1 on the valve 24 in order that the latter may be lifted more easily whereby a rapid transfer of pressure liquid to the supply tank 13 is obtained.

The apparatus so far described operates as follows:

When the press is being opened, the pressure liquid from underneath the lifting piston B, together with the pressure liquid which is continuously supplied by a pump P to the pipe R from the supply tank 13, flows through the valve 1 and thence through the pipes 2 and 18 under the valve 16. The pressure liquid thus flowing into cylinder 3 causes the driving piston 4 to move upwards together with the piston rod 5 and the toothed rack 6. A portion of the pressure liquid which flows at the same time through pipes 2 and 18 under the valve 16 closes the latter. The closing movement of the valve 16 causes simultaneously the linkage 21, 22, 23 to be moved up and thereby opens the valve 24 so that pressure liquid flows from the pipe R_1 back to the supply tank 13. But shortly before this takes place the operation of the valve begins so as to prepare the necessary conditions for the lifting of valve 24. The pressure fluid which is contained in the pipe R_1 and under the press pistons A and C exerts pressure on the valve

24, and this pressure does not permit the valve to be opened under the action of the force used for its normal lifting. For this reason it is necessary to reduce the pressure in the pipe R_1 to such a degree that for lifting the valve 24 no greater force is necessary than that required for closing the valve 16. Owing to the excess pressure of the liquid in the pipe R_1, the valve 26 is opened and the pressure liquid escapes past the same until the valve 24 opens.

When the piston 4 is moving up, the rack 6 is in engagement with the gear wheel 7 which, by means of the pawls and ratchet wheel 8, rotates the drum 9 so that the endless conveyor band 10 travels in the direction of the arrow shown in the drawing.

Between the piston rod and the rack 6 a shock absorber 20 is preferably arranged to absorb the first impact of the pressure liquid against the piston 4, when the endless band 10 is not yet enclosed within the working space of the press.

The advance of the conveyor band can be adjusted in such a way as to move the leather always within the working width of the press plate. When the leather is displaced to this extent, the piston 4 is raised above the overflow conduit 11, so that the pressure liquid admitted into the cylinder 3 is free to flow back through the overflow conduit 11 into the pipe 12 and thence to the supply tank 13. As has been mentioned, the piston 4 occupies its upper end position shown in dotted lines and the conveyor band is stationary.

When the valve 1 has been closed by means of the hand lever 14, the pressure of the liquid in the pressure pipe R begins to build up due to the constant supply of pressure liquid by the pump P. The piston B then moves up together with the press pistons A and C, so that the press is closing, pressure liquid flowing under the press pistons A and C from the supply tank 13 through the open valve 24. When the working faces of the press have been brought in contact, the increase of the pressure in the pipe R continues until it overcomes the resistance of the safety valve 25. At the same time the higher liquid pressure causes the auxiliary piston 15 to move down whereby the valve 16 is opened. The opening of the valve 16 causes the draw rod 21 and lever 22 to move the rod 23 in downward direction, whereby the valve 24 is closed. Then the pressure liquid flows under increased pressure under the pistons A and C, thereby generating a powerful pressure on the leather under treatment.

During the described working process, the pressure under the piston 4 is removed after valve 1 has been closed and valve 16 has been opened. Under the action of the weight 17 the piston 4 moves down in the cylinder 3 so that the liquid contained in the cylinder under the piston 4 is driven through the pipes 2 and 18, the open valve 16 and the pipes 19 and 12 into the supply tank 13, and through the pipes 19, 12 and the overflow conduit 11 into the cylinder 3 above the piston 4 to accelerate the fall of the latter in the cylinder 3.

During the downward movement of the piston 4, the rack 6 which also is moving down rotates the gear wheel 7 in the opposite direction and the pawls slide idly over the teeth of the ratchet wheel 8 so that the conveyor band 10 remains stationary.

When the press is opened again, the above described operations are repeated with concurrent advance of the endless conveyor band.

As it appears from the foregoing description, in the apparatus according to the present invention the manuel operations are limited to the placing of each subsequent leather piece upon the endless conveyor band as soon as the treatment of the preceding piece has been terminated, and to the actuation of the hand lever 14 for controlling the valve 1, while the operation for feeding the leather to the working space of the press is effected in a fully automatic way.

The working process is quite safe since any irregularities of the leather may be evened by the assistant when the leather is still located on the endless conveyor band while hitherto this operation has had to be made directly in the working space of the press.

What I claim is:

1. An apparatus for feeding leather to a hydraulic press for smoothing and pressing the same in which the feeding of the work pieces takes place after a preceding pressing operation and coincident with opening of the press, said press including press cylinders having pistons therein for operating the press, a fluid reservoir, a fluid supply line for flow of fluid between said reservoir and said press cylinders, a cut-off valve in said supply line adapted when seated to cut off return flow of fluid from the press cylinders to said reservoir, a pressure fluid line, a pump for supplying pressure fluid from said reservoir to said pressure fluid line, a conveyor band for the work pieces, driving mechanism for advancing the conveyor band step-by-step through the press, a hydraulic cylinder, a piston in said cylinder connected to actuate said driving mechanism, an inlet connection from said pressure fluid line to one end of said hydraulic cylinder, a manually controlled valve in said inlet connection, an outlet connection from adjacent the other end of said hydraulic cylinder positioned to be uncovered by travel of the piston to said end, a fluid return line connecting said outlet connection to said fluid reservoir, a connection from said pressure fluid line to the fluid supply line for the press cylinders between the latter and the cut-off valve, a spring loaded one-way excess pressure valve in the last mentioned connection, an auxiliary piston exposed to the pressure in said pressure fluid line, a spring biased valve connected to said auxiliary piston, a by-pass from the inlet connection to said hydraulic cylinder to the underside of said spring biased valve and from the other side thereof to said return line, the bias on said valve being such that said valve is opened when the manually controlled valve is closed, and vice versa, actuating connections between said auxiliary piston and the cut-off valve in the supply line between the fluid reservoir and the press cylinders so arranged that when the auxiliary piston is depressed by the pressure fluid the cut-off valve is closed, a relief valve communicating with the pressure fluid line for relieving the pressure above said cut-off valve when the manually controlled valve is opened, whereby to permit the cut-off valve to be opened by the pressure acting to close said spring biased valve.

2. The apparatus as set forth in claim 1, wherein a shock absorber is provided between the rod of the piston in said hydraulic cylinder and a rack bar operated by said piston to drive the feeding mechanism of the conveyor band, and a counterweight urging the said piston downwards to discharge liquid from the hydraulic cylinder back through the inlet connection thereto and

thence through the by-pass to the return line when said manually controlled valve is closed.

3. The apparatus defined in claim 2, wherein a press-closing cylinder and piston of lesser volume than said press cylinders is connected to said pressure fluid line to effect a quick closing of the press upon closing of the manually controlled valve.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,090,433	Voss	Mar. 17, 1914
1,204,092	Voss	Nov. 7, 1916
1,593,565	Bredenberg	July 27, 1926
2,005,616	Franzen et al.	June 18, 1935
2,286,873	Schwartz	June 16, 1942
2,360,007	Muller	Oct. 10, 1944