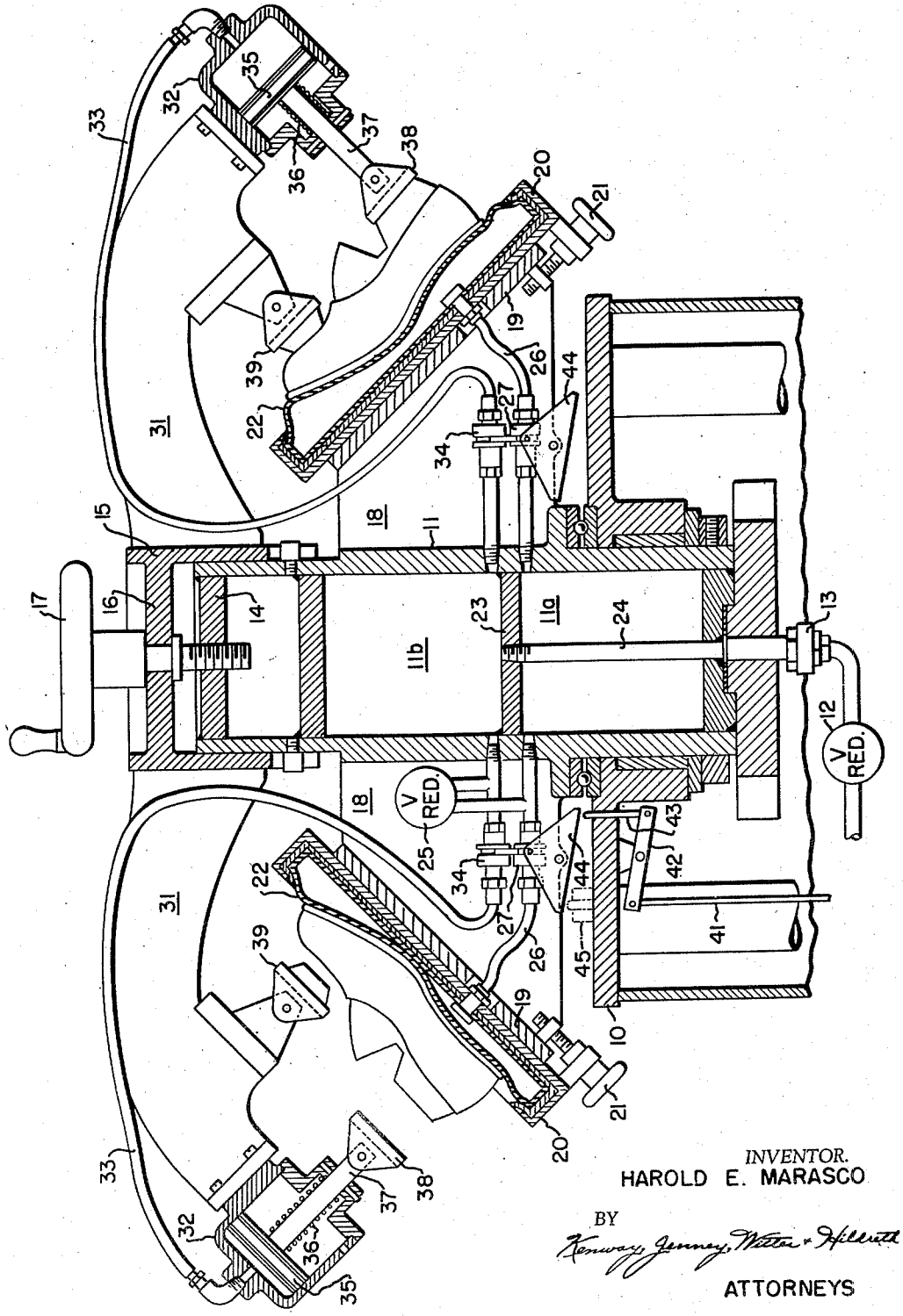
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SOLE PRESSING MACHINE

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SOLE PRESSING MACHINE

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This invention relates in general to sole pressing machines and particularly, to presses of the turret type for conforming and attaching soles to the bottoms of lasted shoes by fluid pressure. In my prior United States Letters Patent No. 2,608,703, dated September 2, 1952, there is shown a sole pressing machine to which the present invention is applicable as an improvement, although application of this invention is not by any means limited to only the machine disclosed in that patent.

In my patent entitled "Fluid-Pressure Sole Press," No. 2,787,799, granted April 9, 1957, I have disclosed an improvement in the press of the above-mentioned patent which consists essentially in a fluid-operated heel post arranged to move simultaneously with the pad on which the sole rests to improve the speed and accuracy of the sole laying operation. In addition to improved speed and accuracy, clearance is provided for the convenient insertion and removal of work. Furthermore, the press may be adapted to handle high and low heel shoes without mechanical adjustment.

Although the improvement disclosed in the pending application has enjoyed wide acceptance and has performed in a completely satisfactory manner, the cost of the machine has been undeniably increased because of the complexity of certain of the parts. Because my machine is basically of the turret type and has a plurality of radially disposed stations about a central cylinder, a valve was originally used in each of the radial lines extending from the central cylinder to the pad and to the heel post cylinder. Furthermore, to obtain the greatest benefits from my improved machine, I found it desirable to provide a different pressure for operating the heel post cylinder from that applied to the inflatable pad. The area of the inflatable pad in contact with the sole of the shoe is, of course, considerably greater than that of the piston of the heel post cylinder. To compensate for the difference in areas and maintain equal opposing pressures, a greater pressure is advantageously applied to the heel post cylinder.

It is, therefore, an object of the present invention to equalize the pressures being applied from opposite sides to a heel post and a sole during a sole attaching process.

Another object is to provide simple apparatus for establishing equal and opposing pressures without a multiplicity of reducing valves.

Still another object of the present invention is to simplify the structure of turret type machines which utilize two or more different fluid pressures for processing operations.

In general, my invention consists in a compartmented central reservoir for fluid which is incorporated into the central support member of the turret type machine. Fluid under pressure is admitted to the compartment having the highest pressure and a connection is made between that compartment and the compartment having the next highest fluid pressure. This connection is made by way of apparatus such as a reducing valve which maintains the desired difference in pressure between the two compartments. In those instances where it is desired, additional compartments may be formed in the central reservoir and reducing valves provided between adjacent compartments. Radial taps for each of the stations disposed about the turret extend from the appropriate compartments. Thus,

from a single reducing valve between adjacent compartments of different fluid pressure, it is possible to obtain fluid at the desired pressure for all of the stations of the machine.

For a better understanding of the present invention together with other and further features, objects and advantages, reference should be made to the following description of a preferred embodiment thereof selected for purposes of illustration and shown in the accompanying drawing, the single figure of which is a view in elevation with certain parts shown in longitudinal section.

To simplify the showing and to permit easier understanding of the present invention, it is shown as embodied in the machine of my above-identified prior patent. Numerous details such as the starting and stopping mechanism, the valve and valve operating mechanism, the drive motor and gearing as well as other conventional structure are not shown herein but may be similar to corresponding parts shown in the patent above identified.

In the machine as shown, a frame **10** supports a rotatable turret which includes a vertically disposed cylinder **11** having a peripheral flange supported by ball bearing upon the frame. Fluid under pressure, such as compressed air, is supplied to the upper compartment **11***b* of the cylinder by way of a reducing valve **12**, a rotatable joint **13** and an inlet pipe **24** which extends through the lower compartment **11***a*. The upper end of the cylinder **11** is closed by a head **14**. A sleeve **15** is telescopically mounted on the upper end of the cylinder **11** and together with a disk **16** forms a head for the hub of a spider vertically adjustable by means of a hand wheel **17** having a stem threaded into the head **14** of the cylinder **11**.

The turret carries a plurality of sole press units of which two are shown in the drawing. Arms **18** project radially from the cylinder **11** and each carries at its outer end a base plate **19** inclined downwardly and outwardly at an angle which may be of the order of 45°. Upon each of the base plates **19** is mounted a pad box **20** adjustably connected to the base plate by a screw **21**. The pad box contains an inflatable pad **22** attached to the pad box **20** and constructed in the conventional manner. The cylinder **11** is divided by means of a disk **23** into two compartments **11***a* and **11***b*. The inlet pipe **24** extends from the rotating joint **13** up through the lower compartment to the compartment **11***b* through an aperture in the disk **23**. In this fashion fluid under pressure determined by the reducing valve **12** is introduced into the upper compartment **11***b*.

Communication between the upper compartment **11***b* and the compartment **11***a* is by way of connections including a reducing valve **25**. Each of the pad boxes **20** is connected to the compartment **11***a* of the fluid pressure cylinder **11**. This connection is made by way of a pipe line **26** in which a valve **27** is provided. Operation of the valve **27** will be explained in greater detail hereinbelow.

The adjustable cap **15** is provided with outwardly extending, overhanging arms **31** which correspond to and are similarly disposed to the arms **18** of the cylinder **11**. Each arm **31** is provided with a bracket at its extreme end to which is attached a fluid pressure cylinder **32**. A fluid pressure line **33** leads from the head of each pressure cylinder **32** to the compartment **11***b* of fluid pressure cylinder **11**. Interposed in the fluid pressure line **33** is a valve **34**. The operation of this valve will also be explained in greater detail hereinbelow.

A piston **35** is disposed within the air cylinder **32**. A compression spring **36** is coiled about the piston rod **37** to which the heel post **38** is attached. The compression spring **36** normally urges the piston toward the top of the cylinder as seen in the drawing, thus maintaining the heel post **38** in a retracted position of maximum separa-

tion from the pad 22 under normal circumstances. There is also attached to each arm 31, a toe post 39 which is arranged to engage the forepart of the shoe during the sole laying operation but which is not retractable in the manner of the heel post 38. In the showing at the left side of the drawing, the heel post 38 is retracted and the pad 22 is deflated. In this position, with the pad deflated and the heel post retracted, maximum clearance is available and at this station, loading of the shoes may be accomplished. After the work is properly positioned on the inflated pad 22, the valves 27 and 34 are opened. Immediately, the pad becomes inflated and the heel post 38 is advanced. Triggering of the valves to accomplish these functions may be done automatically or manually. The mechanism for operating the valves includes a rod 41 pivotally connected to a lever arm 42 which in turn, is pivotally connected to a push rod 43. Push rod 43 contacts the end of a pivoted triangular rocker 44 which is connected to sliding gates in valves 27 and 34. Triangular rocker 44 is normally maintained in the position shown in the left hand portion of the drawing by reason of a cam 45 shown in phantom at the left of the drawing which urges the rocker 44 in a clockwise direction when the rocker engages its upper surface. The cam is actually located on a portion of the frame 10 not shown in the figure.

However, when the rod 41 is depressed, triangular rocker 44 pivots and pulls the valves open, permitting the pad 22 to become inflated and the heel post 38 to bear down on the heel cone of the last.

At the right hand side of the drawing the disposition of the various elements of my sole press after application of pressure may be seen. Actually, the press may be arranged to index as many times as desired about a circle. Pressure may be maintained for as much of the circular travel as is required for proper attachment of the soles to the lasted shoes. After the application of full fluid pressure to the pad and to the heel post cylinder, the first indexing action carries the turret a sufficient distance to bring the next arm before the operator. Either manually or automatically, as by contact of cam 45 with rocker 44, the unit arriving before the operator is deflated, fluid being vented through the valves 27 and 34, permitting easy removal of the finished shoe. After unloading, loading as described previously, recommences. The loading and unloading may be performed at the same or different stations depending upon the requirements of the process.

Having thus disclosed my invention and described in detail a preferred embodiment thereof, I claim as new and desire to secure by Letters Patent:

1. A sole press comprising an inflatable pad mounted to underlie the bottom of a lasted shoe, a fluid operated heel post mounted opposite the heel end of the pad, a first reservoir of fluid having connections for inflating said pad, a second reservoir of fluid having connections for actuating said heel post, and means interconnecting said first and second reservoirs for maintaining a difference of fluid pressure therebetween.

2. A sole press comprising a normally deflated inflatable pad mounted to underlie the bottom of a lasted shoe, a normally retracted fluid operated heel post mounted opposite the heel end of the pad, a first reservoir of fluid connected to said inflatable pad, a second reservoir of fluid connected to said heel post, means interconnecting said first and second reservoirs for maintaining a difference of fluid pressure therebetween, means disposed between said first reservoir and said inflatable pad and means disposed between said second reservoir and said heel post for simultaneously inflating said pad and advancing said heel post.

3. A sole press comprising a rotatable turret, a plurality of sole pressing units carried by said turret, each including an inflatable pad, an overhanging arm, a fluid-pressure cylinder mounted on said arm, a piston in said cylinder, a heel post carried by said piston, a first source of fluid pressure, a second source of fluid pressure, means interconnecting said first and said second sources to maintain a difference of pressure therebetween, means disposd between said first source and said inflatable pad and means disposed between said second source and fluid pressure cylinder for simultaneously inflating said pad and actuating said cylinder to advance said heel post toward said inflatable pad.

4. A sole pressing machine comprising a main frame, a compartmented cylindrical fluid-pressure reservoir mounted in said frame for rotation about a vertical axis, a plurality of units spaced radially about said reservoir, each of said units including an inflatable pad, an overhanging arm, a cylinder carried by said arm, a piston disposed in said cylinder, a heel post attached to said piston, a first fluid-pressure connection between one compartment of said reservoir and said pad, and a second fluid-pressure connection between a second compartment of said reservoir and said cylinder.

5. A sole pressing machine as described in claim 4 including a controlling valve connected between said one compartment and said second compartment of said fluid-pressure reservoir for maintaining a difference of fluid pressure therebetween.

6. A sole pressing machine as described in claim 5 including means for simultaneously controlling the introduction of fluid under pressure to said pad and to said cylinder.

7. A turret sole pressing machine comprising an inflatable pad for underlying a lasted shoe, an overhanging arm, a fluid-pressure cylinder and pison mounted on said arm, a heel post attached to said piston, a spring normally urging said piston and heel post away from said pad, a compartmented fluid pressure reservoir disposed centrally of said machine, means for introducing fluid at a predetermined pressure to a first compartment of said reservoir, means including a reducing valve connecting said first compartment to said second compartment, a first fluid-pressure connection between said first compartment and said cylinder, and a second fluid-pressure connection between said second compartment and said pad.

8. A turret sole pressing machine as described in claim 7 including a first valve disposed in said first fluid-pressure connection, a second valve disposed in said second fluid-pressure connection, and means for simultaneously operating said valves to control the application of fluid under pressure to said cylinder and to said pad.

9. A turret sole pressing machine comprising a main frame, a compartmented cylindrical fluid-pressure reservoir mounted in said frame for rotation about a vertical axis, a plurality of sole pressing units carried by said turret and spaced radially about said reservoir, each of said units including an inflatable pad for underlying a lasted shoe, a like plurality of overhanging arms similarly radially spaced about said reservoir, a fluid-pressure cylinder and piston carried by each said arm, a heel post mounted on each said piston, a spring disposed in each said cylinder and acting on each said piston to maintain each said heel post normally retracted from its associated inflatable pad, a like plurality of fluid-pressure connections between each said cylinder and a first compartment of said cylindrical reservoir, a like plurality of fluid-pressure connections between each said inflatable pad and a second compartment of said fluid-pressure reservoir, means including a reducing valve connecting said first compartment to said second compartment, a first valve disposed in each said fluid-pressure connection between each said cylinder and said first compartment, a second valve disposed in each said fluid-pressure connection between each said inflatable pad and said second compartment, and means for simultaneously operating said first and second valves to control the application of fluid under pressure to said cylinder and said pad.

No references cited.