ABSTRACT OF THE DISCLOSURE

A pulling over machine having a support for a last over which a shoe upper is to be tensioned, grippers carried on a support and engageable with the last, through the manner of the upper, means for moving the last support relatively to the gripper support, other means for moving the gripper support relatively to the last support, and means for selectively causing relative movement of either the last support or the gripper support to tension the upper.

The present invention relates to machines in which uppers of footwear are stretched and pulled over a last. On such machines, the last rests on a three-point support or other suitable support and in one embodiment pincers grip the upper leather and pull said upper leather downwardly over the stationary last when the machine is actuated. In another embodiment of such machines, the upper leather is engaged in the pincers which are stationary, and the last support is moved upwardly with the last to effect the stretching and pulling of the upper which is held firmly in position by the pincers.

It has been found in practice that either one or the other mode of operation will produce a good result, depending on how the model is cut, or whether the last in question is pointed or slightly rounded.

After the stretching of the upper is completed, it is often necessary to correct the position of the upper on the last. This is carried out in different manner in different machines. In one such machine the entire pincer arrangement is rotated about a central pivot, while in another the position of the pincers can be adjusted individually and separately, and the pull or tension of the individual pincers can be readjusted manually. However, when the pull for the tensioning of the upper is effected, the upper leather is stretched tightly over the last, and it therefore becomes very difficult to carry out necessary corrections which may even result in distortions within the leather structure.

It is an object of the invention to provide a machine which will overcome the above difficulties. More specifically, it is an object of the invention to provide a machine capable of operating in either of the above said modes of operation for the stretching and pulling of the upper on the last.

Another object of the invention is to provide a machine in which the position of the pincers can easily be adjusted during stretching.

The machine, according to the present invention, is adapted for effecting either of the aforesaid modes of stretching and turning of the upper, namely, either by the fixing of the last on the last support with downward pull of the pincers, or by the fixing of the position of the pincers with upward movement of the support and the last. The machine according to the invention, therefore, also permits the selective successive use of the two modes of operation for stretching and pulling the upper on the shoe last. In addition, the machine according to the present invention permits necessary pincer corrections, subsequent to the stretching of the upper, in an easy and simplified manner, by releasing the tension in the upper resulting from the stretching prior to the correction by means of a special device therefor.

In a machine of the above type having pincers for engaging an upper on a last to stretch and pull the upper on the last to conform thereto, there is provided in accordance with the invention a last support and which is displaceably supported on the machine frame for movement relative to the pincers, and a support for the pincers which is also displaceably supported on the machine frame but for movement relative to the last, said last and pincers being relatively displaceable to cause an upper placed on the last to be drawn and pulled thereon.

In further accordance with the invention, the last support and the support for the pincers are separately and individually activated by respective selectively operable drive means. Preferably, each drive means is a hydraulic piston and cylinder arrangement operated selectively by a respective electromagnetic valve.

According to the invention, corrections of the tension of the upper leather can be obtained by the swivelable arrangement of a plate carrying the pincers and by a manually adjustable control lever for the tension of the pincers. This is made possible in accordance with the invention by the provision of an electric switch for actuating the electromagnets of the valves, said switch being arranged on the holder of the control lever. In one position, said electric switch causes lowering of the pressure in the cylinders, while in the other position it restores the pressure. According to the invention, the effecting of the different modes of operation of the machine for the stretching and pulling of the upper on the last is achieved by an electric toggle switch for alternately operating the magnets of the electromagnetic valves.

The invention will next be described in conjunction with the attached drawing, the sole figure of which shows diagrammatically in section an embodiment of the invention.

In the drawing, the last rests on a last support 1, the latter being secured to a bracket 2 which is guided for displacement in a slide guide 3 on the frame of the machine. The bracket 2 is able to move upwardly in the slide guide 3 by being driven by hydraulic piston 6 and the associated cylinder 7 by way of an angle lever 5 and a draw or trailing lever 5'. The hydraulic piston 6 is actuated by an electromagnetic valve 8. After the upper leather has been engaged by the pincers 9 which are fixed on a common base plate 10, the process of stretching and pulling the upper over the last is initiated by the valve 8, which causes the angle lever 5 and the lever 5' to be actuated by the hydraulic piston 6, whereby the support 1 with the bracket 2 is moved upwardly to cause the last 17 resting on the support 1 to be thereby pressed upwardly against the upper.

Alternatively, the pincers 9 mounted on the common base plate 10 can be moved downwardly by a hydraulic piston 11 and a cylinder 12 associated therewith with said piston. This motion is controlled by an electromagnetic valve 13 associated therewith. Thereby two modes of operation can be effected for stretching and pulling the upper over the last. When changing from one mode to the other, a simple toggle switch (not shown in the drawing) enables switching off one of the valves 8 or 13 and switching on of the other of the valves, so that when valve 8 is inoperative, the support 1 remains fixedly positioned on the bracket 2 and the last is able to rest thereon so that the pincers 9 can be pulled downwardly with their common base plate 10 by the hydraulic piston 11. The operation is reversed when valve 8 is operative and valve 13 inoperative so that now the pincers are stationary and the last is movable against the upper leather which is engaged in the now stationary pincers.
The correction which may be necessary after the stretching of the upper is completed, is effected by a regulating or control lever 15 which is capable of pivoting the base plate 10 which carries the pincers 9. In order to facilitate the correction, the pull of the pincers or else the upward pressure of the support 1 is relaxed by operating valve 8 or valve 13, depending on the mode which has been elected. Valve 8 or 13 is operated in such a manner that the hydraulic pressure either in cylinder 7 or in cylinder 12 is reduced. The control is carried out by means of an electric push button 16 which is arranged directly on the handle 14 of the regulating lever 15. When the push button 16 is released, the original pressure in hydraulic cylinder 7 or 12 is restored at once.

Numerous modifications and variations of the disclosed embodiment will become apparent to those skilled in the art, without departing from the scope and spirit of the invention as defined in the attached claims.

What is claimed is:

1. A machine for tensioning a shoe upper on a last, comprising a support for the last movable heightwise in the machine, grippers adjacent the last for engaging the margin of the upper, a support for the grippers movable heightwise to cause the grippers to tension the upper on the last, first means for moving the last support in one direction relative to the gripper support while the grippers hold the upper under tension, second means for moving the gripper support in the opposite direction relative to the last support to cause the grippers to pull the upper in that direction over the last, and operator controlled means for selectively operating one or the other of said first and second means to cause relative movement between the last support and the gripper support in the desired direction to tension the upper on the last, said first and second means each comprising a cylinder and a piston movable therein and connected respectively to the last support and to the gripper support, said operator controlled means including valve means connected to the respective cylinder and means for actuating either of said valves with the other valve inoperative.

2. A machine as claimed in claim 1, comprising a control lever connected to the gripper support and actuable to cause movement of the gripper support for adjusting the angular position of the grippers relative to the upper on the last, and wherein the actuating means comprises switch means mounted on the control lever and connected to the valves controlling the fluid pressure in the cylinders associated with the last support and the gripper support, actuation of said switch means causing release of the fluid pressure in the selected cylinder to enable the operator to adjust the upper on the last.

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