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FASTENING PULLING MACHINE

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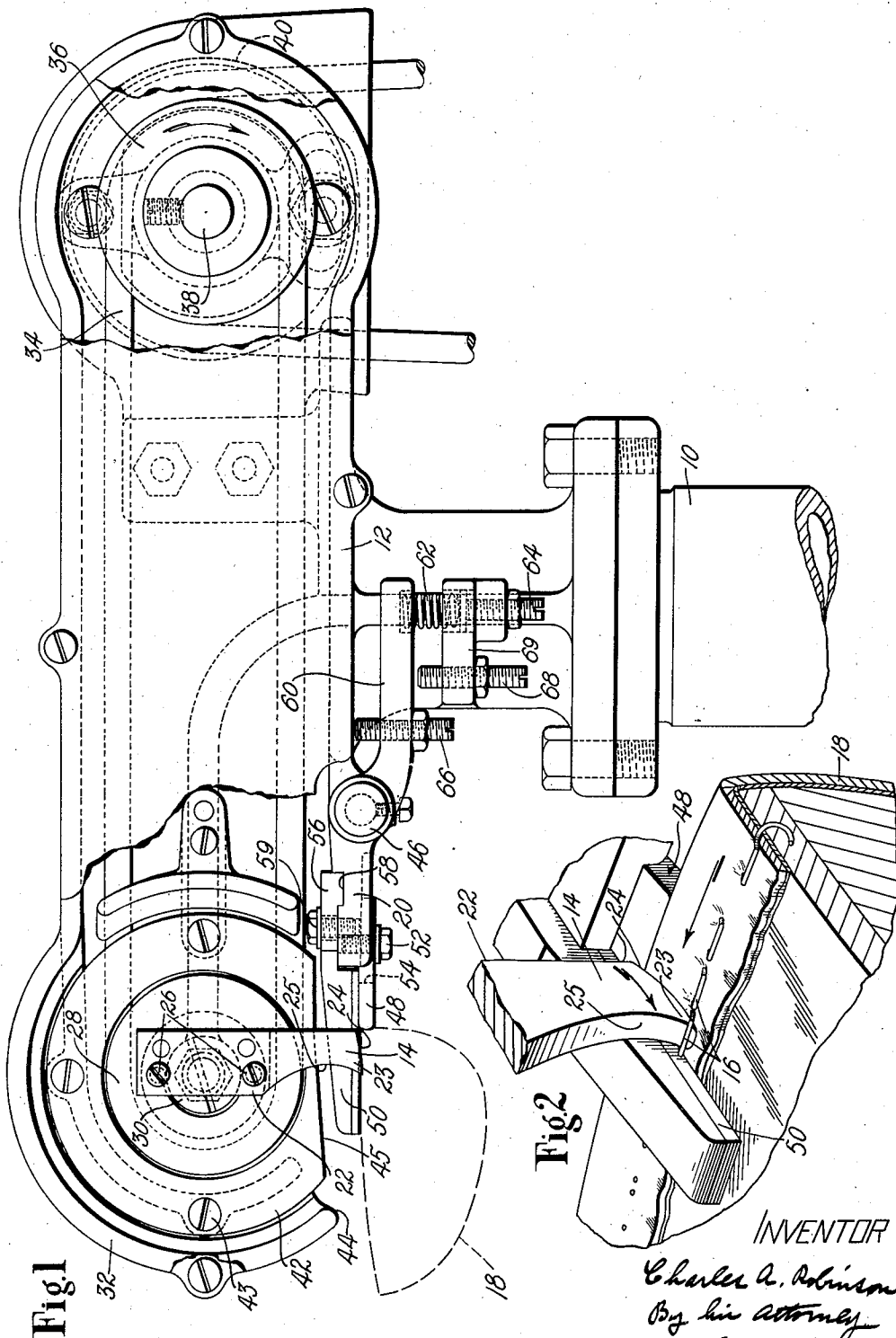


Fig. 2

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UNITED STATES PATENT OFFICE

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FASTENING PULLING MACHINE

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7 Claims. (Cl. 12—16)

This invention relates to machines for pulling fastenings and is herein illustrated as embodied in a machine for pulling staples from shoes.

In various processes employed in manufac-
turing shoes fastenings are driven into the work temporarily to secure together a plurality of parts, and are later removed from the work. An example of this kind is found in shoes in which the uppers are lasted over the shoe bottom and permanently secured thereto by cement, staples being driven through marginal portions of the upper and into the insole to hold the upper in position while the cement is setting. These staples are often upstanding, that is, they are not driven into the materials to the extent that the crossbars of the staple are flush therewith.

It is an object of the present invention to provide an improved machine for pulling such fastenings which is particularly adapted rapidly and effectively to remove staples from the work without damage thereto.

To this end and as illustrated, I have provided, in a machine of the type referred to, a rotary fastening pulling tool which is arranged to engage and pull fastenings from work, together with a member arranged to engage the work and successively to locate fastenings in predetermined operative relation to the tool as the work is advanced past the tool. Preferably and as shown, the member comprises a yieldable abutment, adjacent to the plane of the path of movement of the tool, against which the bottom of a shoe is forced and which is arranged to extend across a line of temporary fastenings in the shoe with the result that successive fastenings when brought into engagement with the member will be located in the path of movement of the tool. This construction is advantageous in that it minimizes the effort on the part of an operator in presenting the work to the tool and in locating the fastenings in position to be pulled.

These and other features of the invention are disclosed in the accompanying specification and drawing and are pointed out in the claims.

In the drawing,

Fig. 1 is a view in side elevation of the upper portion of a machine embodying my invention; and

Fig. 2 is a perspective view illustrating the operation of the pulling tool upon the work.

As illustrated in Fig. 1 of the drawing, the invention is embodied in a fastening pulling machine having a frame or column 10 which carries a head 12 in which there is mounted a rotary tool 14 arranged to pull fastenings such as curved staples 16 (Fig. 2) from a shoe 18 which is located in operative relation to the tool by means of a work rest indicated generally by the

reference character 20. The tool 14 comprises a shank portion 22 (Fig. 1) which terminates in a slightly hooked nose portion 23 of such width that it can enter between the legs and beneath the crossbar of staples 16 to be pulled from the shoe. The nose portion 23 of the tool has a slightly convex end face 24 to engage the shoe bottom intersected by an inwardly curved upper face 25 for engaging the crossbars of staples, the faces forming the sides of a wedge operable readily to remove staples without damaging the shoe bottom.

The tool is secured by screws 26 to a pulley 28 mounted upon a stud 30 carried by a hollow extension 32 on the head 12. The pulley 28 and the tool 14 are rotated in a clockwise direction (Fig. 1) by a belt 34 from a second pulley 36 on a shaft 38 which in turn is driven by a pulley 40. Surrounding the pulley 28 is a guard plate 42 secured to the frame extension 32 by screws 43 and arranged to prevent staples from entering the hollow portion of the extension. The extension 32 and the guard plate 42 are cut away as indicated at 44 and 45 (Fig. 1), respectively, in order to permit presentation of the work to the tool along the lower portion of its path of movement.

The work rest 20 is in the form of a lever pivotally mounted upon a stud 46 on the frame for slight angular movement in a heightwise direction. The work rest carries a gage 48 arranged to contact with the side of a shoe to be presented to the tool and there is provided an abutment 50 also carried by the work rest 20 and extending outwardly beyond the axis of rotation of the tool and closely adjacent to the plane of the path of movement thereof, for engaging the bottom of a shoe presented to the tool. The abutment 50 is of such length that when the side of a shoe such as shoe 18 is presented to the gage 48 the abutment will extend across a line of fastenings such as the partially driven curved staples 16 (Fig. 2) with the result that when the shoe is advanced along the gage successive fastenings of the line of fastenings will be brought into contact with the abutment, thereby to locate the fastenings in the path of movement of the tool.

The gage 48 is mounted for adjustment laterally of the axis of the tool by means of a bolt 52 extending through an elongated slot 54 in the work rest, the arrangement being such that the gage can be secured in position to locate a shoe with a row of fastenings therein in predetermined position along the path of the tool, preferably tangent to the path at its lowermost point. The abutment 50 is provided with a tongue 56 which is slidably engaged in a groove 58 of the work rest for movement in the direction of the axis of rotation of the tool

for adjusting the position of the abutment laterally of the tool, the abutment being arranged to be locked in adjusted position by a bolt 59. The purpose of this is to provide for the positioning of the abutment laterally of the plane of the path of movement of the tool such that a staple when brought into contact with the abutment will be accurately located in the path of the tool.

- 10 The work rest 20 is yieldingly mounted for angular movement about its pivot 46 and has a tail portion 60 which is engaged by a spring 62 normally operative to force the work rest with the abutment 50 and gage 48 in a downward direction, the pressure of the spring being regulated by a screw 64. Downward movement of the work rest is limited by a stop screw 66 carried by the tail portion 60 and positioned to engage the under side of the head 12. This construction is such that when it is necessary to pull a deeply embedded fastening the shoe can be forced upwardly against the abutment which yields to such an extent as to permit the nose of the pulling tool to press into the material of the upper a sufficient distance to enter beneath the crossbar of the fastening. In order to prevent damage to shoes by permitting them to be forced too far into the path of the tool I have provided a stop screw 68 carried by a lug 69 on the frame and adapted to engage the under side of the tail 60 to limit upward movement of the work rest.

In the operation of the machine the shoe 18 is presented bottom up to the abutment 50 and the side of the shoe is held in engagement with the gage 48. The shoe is then moved in the direction of the arrow (Fig. 2) past the tool 14. The staples 16 successively engage the abutment 50 at which time they will be in the path of movement of the tool which will engage each staple to pull the same. During this operation the shoe is pressed upwardly against the abutment which yields sufficiently to permit the tool to enter beneath the crossbar of the staple being pulled. The movement of the shoe along the gage 48 will be arrested intermittently as the successive staples engage the abutment and the shoe will be held stationary while the tool pulls out the staple adjacent to the abutment at that particular instant.

- 50 Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A fastening pulling machine comprising a fastening pulling tool, a gage extending transversely of the path of movement of the tool and having a portion constructed and arranged to contact with the side of a shoe to guide the same past the tool with a row of fastenings in the shoe directed toward the plane of the path of movement of the tool, an abutment located adjacent to the plane of the path of movement of the tool for engaging the bottom of the shoe and constructed and arranged to extend across the row of fastenings in the shoe for locating successive fastenings in the path of movement of the tool as the shoe is advanced past the gage.

2. In a fastening pulling machine a rotary staple pulling tool, and a yieldable work rest for locating in operative position relatively to the tool a shoe having a line of upstanding staples in the

bottom thereof and comprising a member for locating the shoe with the line of staples substantially tangent to the path of movement of the tool, and a member located along said path and constructed and arranged to extend across the line of staples to locate successive staples in the path of the tool as the shoe is advanced past the tool.

3. A fastening pulling machine comprising a fastening pulling tool, means for locating a shoe in operative position relatively to the tool comprising a gage for contacting with the side of the shoe, and an abutment for engaging the bottom of the shoe and extending across a row of fastenings therein for successively locating the fastenings in the plane of the path of movement of the tool, and means for mounting the abutment and gage for yielding movement along the plane of the path of movement of the tool.

4. A fastening pulling machine comprising a rotary fastening pulling tool, an abutment adjacent to the plane of the path of movement of the tool arranged to engage the bottom of a shoe to locate the same in a plane substantially tangent to the path of the tool, a gage for locating the shoe with a row of upstanding fastenings therein in predetermined position along the path of the tool, and means for mounting the abutment and gage for movement along the plane of the path of movement of the tool in presenting fastenings to the tool.

5. A fastening pulling machine comprising a rotary fastening pulling tool, for contacting with the shoe to locate a row of fastenings therein along the path of movement of the tool, an abutment extending transversely of the axis of rotation of the tool adjacent to the plane of the path of rotation thereof to locate successive fastenings of the row of fastenings in the path of the tool, means for yieldably mounting the gage and abutment for movement heightwise of the tool, and stops for limiting heightwise movement of the gage and abutment in either direction.

6. A fastening pulling machine comprising a rotary staple pulling tool, a work rest comprising a gage for contacting the side of a shoe for locating the shoe with a row of staples therein in predetermined position along the path of the tool, and an abutment for engaging the bottom of the shoe to locate the same in operative position relatively to the tool, the abutment being constructed and arranged to extend adjacent to the path of movement of the tool and across the row of staples to locate successive staples in the path of movement of the tool, and means for mounting the abutment for adjustment laterally of the plane of the path of movement of the tool.

7. A fastening pulling machine comprising a frame, a rotary tool mounted in the frame, a work rest pivotally mounted upon the frame and positioned adjacent to the tool for locating a shoe relatively thereto, and carrying a gage for positioning the shoe transversely of the axis of the tool, and an abutment for engaging the bottom of the shoe in positioning it in the plane of the path of operation of the tool, yielding means normally operative to move the work rest in a direction to force the work away from the tool, and stops for limiting movement of the work rest in either direction.

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