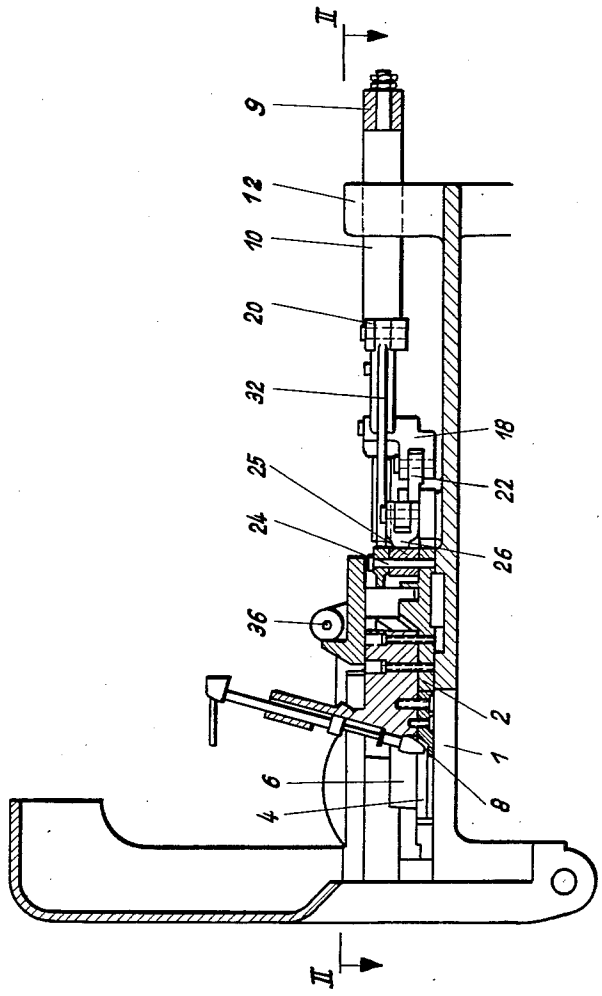
April 18, 1961 K. GÜNSCHEL 2,979,743

SHOE-END LASTING MACHINE WITH COMMON DRIVE FOR THE FEEDING AND CLOSING MOTION OF PIVOTED WIPERS

Filed Jan. 2, 1958 4 Sheets-Sheet 1

Fig. 1



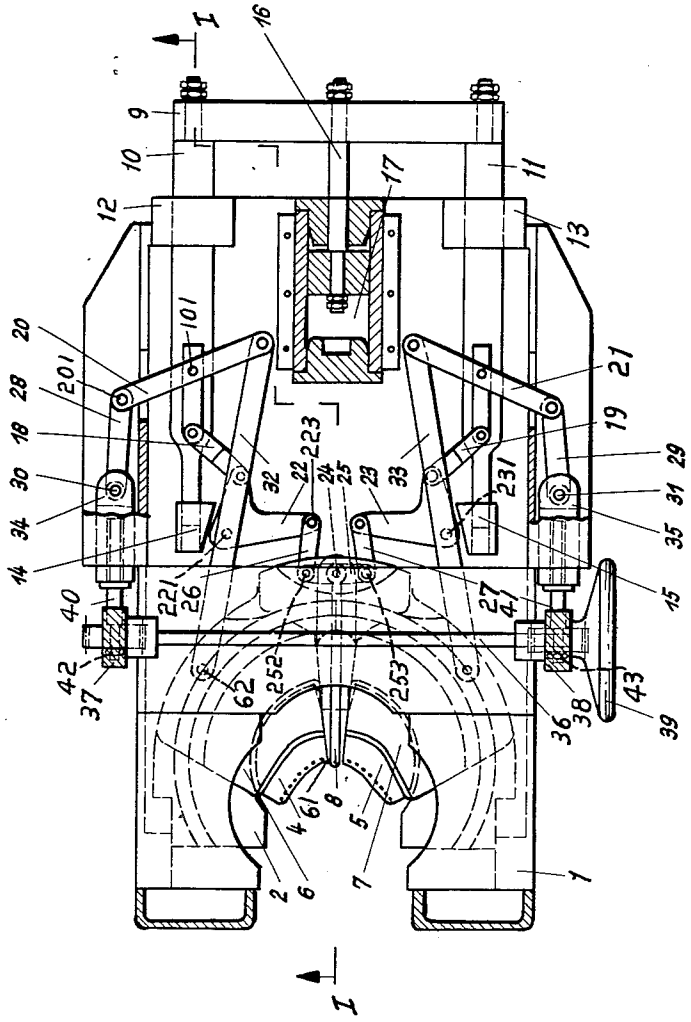
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Fig. 2



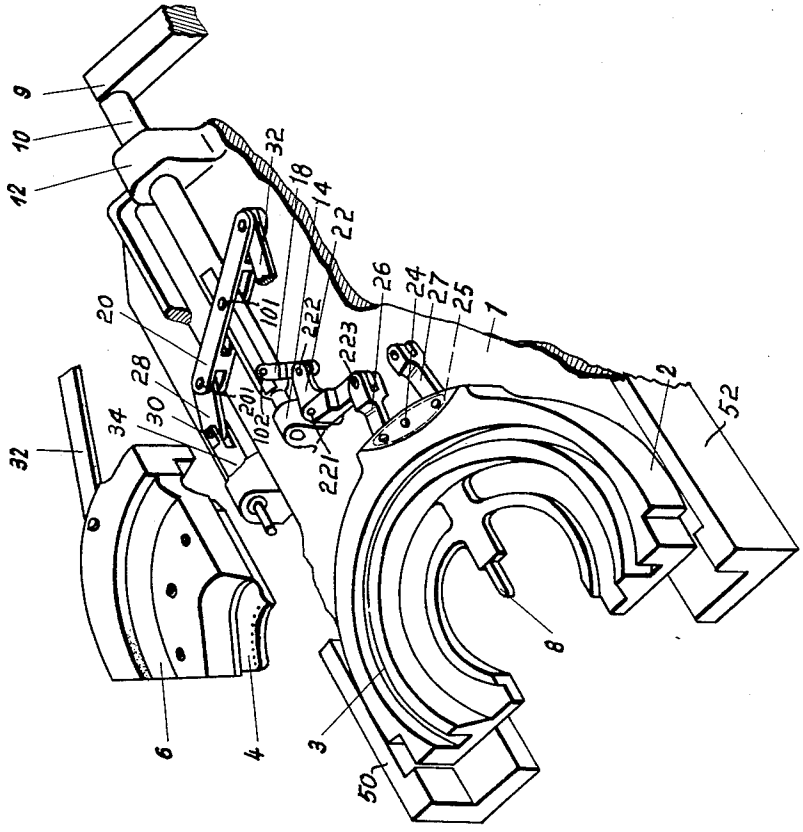
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Fig. 3



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Filed Jan. 2, 1958 4 Sheets-Sheet 4

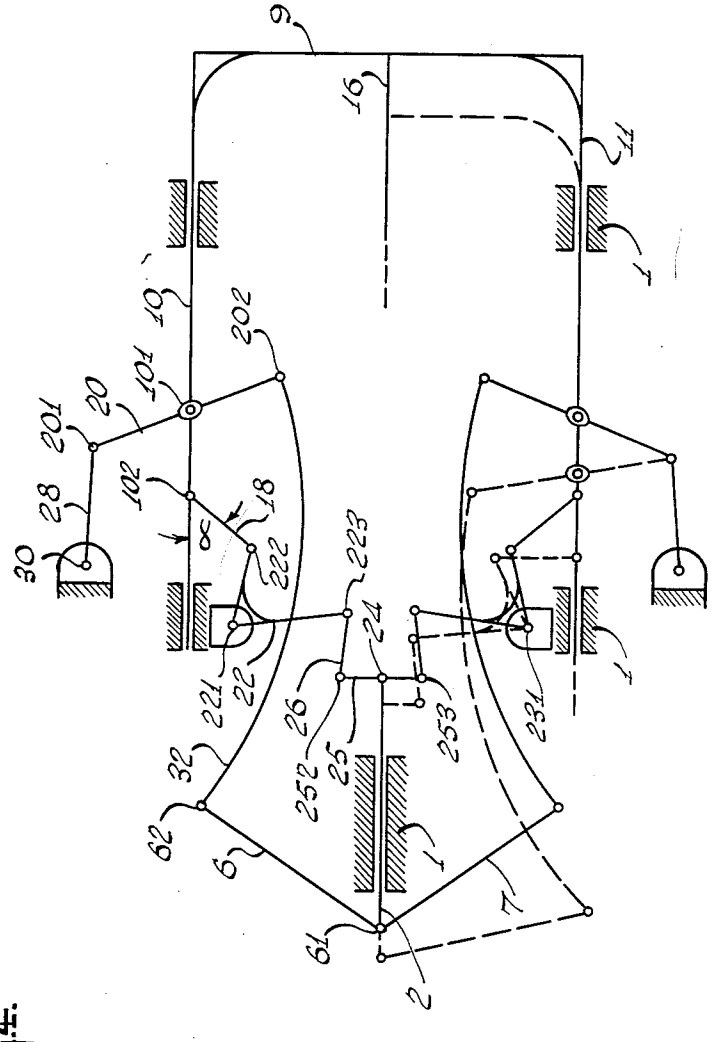


Fig. 4.

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SHOE-END LASTING MACHINE WITH COMMON DRIVE FOR THE FEEDING AND CLOSING MOTION OF PIVOTED WIPERS

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6 Claims. (Cl. 12—12.3)

This invention relates to machine tools and more particularly to a shoe-end lasting machine.

In certain conventional lasting machines of this type, the wiper slide is articulated with a hand lever that is supported upon the machine frame, and the setting slide directly effects the forward motion of the wipers. Usually a bearing pedestal for a link is disposed upon the setting slide that is connected with a toothed segment supported on the machine for its closing movement. The toothed segment engages a number of teeth of a second slide which is articulated with the wipers at a point removed from the fulcrum thereof. In response to the actuation of the hand lever, the wipers are advanced by the wiper slide, and by the adjustable coupling of the setting slide with the wiper slide, closing motion of the wipers is produced. The parts are so arranged that in response to the start of the forward movement of the wipers, they are simultaneously urged toward a closed position.

It has been found in practice, however, that the closing motion of the wipers begins only after they have already been forwardly actuated. Furthermore, the forward movement of the wipers should be delayed as they approach the end of their forward stroke. The actual closing movement of the wipers should take place only after they are already in the final forward position or directly in front of this final forward position. This is impossible with present lasting machines and, to be sure, it is only possible in the case of presently available machines to delay the forward motion of the wipers toward the head of the stroke, but it is not possible to adapt the closing motion thereof in the desired manner to the forward motion. The reason is that the setting slide and the wiper slide pass with practically the same speed into the end position. Furthermore, the delay of the forward movement of the wipers is dependent upon a corresponding reduction of the angular velocity of the hand lever, and thus, upon the skill of the operator.

In order to avoid these disadvantages, there are presently available lasting machines in which the common drive means for the two movements of the wipers consists of a drum having one or two cam grooves. In these machines, the cams can be so shaped to impart the desired movements. However, such a drum is costly to manufacture and is easily worn out. Furthermore, at least the closing movement of the wipers requires a very complicated rack mechanism whereby these lasting machines become extremely complicated and are thus subject to breakdown and expensive maintenance problems.

The present invention is generally similar to that disclosed and described in U.S. Patent No. 1,712,979, granted May 14, 1929, on an application by A. F. Carlson, but includes certain improved mechanisms for controlling both the forward advance of the wiper slide and the closing movement of the wiper members.

The present invention includes a reciprocable frame actuated by an hydraulically or pneumatically controlled piston. The frame includes two rods upon each of which is mounted a double armed lever. The lever is

connected to one of the wipers to effect their arcuate movement. The rods are also provided with a link pivotally connected to each rod. The links are connected to the wipers to reciprocate them in accordance with the movement of the rods. The closing arcuate movement of the wipers is adjusted by varying the relative position of the double-armed levers in relation to their associated rods. The adjustment is made by a hand wheel setting adjustment mechanism connected to each lever.

Accordingly, an object of the present invention is to provide a lasting machine that will overcome the aforementioned difficulties in a very simple and efficient manner.

Another object of the present invention is to provide a lasting machine that has a pair of doubled armed levers for effecting the closing movement of the wipers and a pair of links for actuating the slide which bears the wipers and effects their feed motion, such links being supported transversely to the longitudinal axis of the setting slide, and each double armed lever having its outwardly directed arm pivotally connected to the setting slide control.

A further object of the present invention is to provide a lasting machine of the above type in which the forward movement of the wipers is delayed toward the end of its stroke so that the actual closing process thereof takes place when the wipers have reached their final position.

Other objects of the invention are to provide a lasting machine bearing the above objects in mind which is of simple construction, has a minimum number of parts, is inexpensive to manufacture and efficient in operation.

For other objects and for a better understanding of the invention, reference may be had to the following detailed description taken in conjunction with the accompanying drawing, in which:

Figure 1 is a longitudinal cross sectional view taken along line 1—1 of Figure 2;

Figure 2 is a transverse cross sectional view taken along line 2—2 of Figure 1;

Figure 3 is a perspective view of certain parts of the apparatus shown in Figures 1 and 2; and

Fig. 4 is a schematic illustration of the lever mechanism of the shoe end lasting machine constructed in accordance with the invention.

In accordance with the present invention, a shoe end lasting machine has been provided that has a common drive for the feeding and closing movements of the wipers with the aid of two slides, the motion of each being dependent upon the other, and the drive means being connected to the setting slide.

Referring now more in detail to the drawing, a machine made in accordance with the present invention is shown to include a frame 1 with the wiper slide 2 guided for longitudinal sliding movement on frame 1 between guide walls 50 and 52. A pair of wipers 4, 5 and their carriers 6, 7 are received within the arcuate groove 3 of the slide 2. The wipers, together with their carriers, can be swung in a known manner about the point 8 of the tongue of the wiper slide 2. A setting slide is guided for parallel movement with the wiper slide 2 in the machine frame 1.

This setting slide includes a cross member 9 directed at right angles to its longitudinal axis and has two rods or bars 10, 11 directed at right angles to the cross member. The machine frame is provided with bearing eyes or lugs 12, 13, 14, 15 for guiding these bars 10, 11. The cross member 9 is connected with the piston rod 16 of a hydraulic or pneumatic pressure device 17 for driving the setting slide. Adjacent one end of each of the rods 10, 11, there is pivotally mounted a separate link 18, 19 and spaced slightly therefrom a separate double

armed lever 20, 21. These members 18, 19, 20, 21 are thus swingable parallel to the wide side of the setting slide 9, 10, 11. The inwardly directed end of each of the links 18, 19 is each pivotally connected with a corresponding angle lever or crank arm 22, 23. These angle levers are supported upon the machine frame.

At the rear end of the wiper slide 2, a double armed lever 25 is connected to a pin 24. The angle levers 22, 23 are connected by links 26, 27 to the ends of the double armed lever 25. Angle levers 22 and 23 are centrally pivotally mounted on bolts 221 and 231 respectively of the machine frame 1. It will thus be recognized that in the event that the setting slide 9, 10, 11 is in the out of operation position, the links 18, 19 turn their end connected with one of the angle levers 22, 23 toward the slide 2. When in the operating position, the setting slide 9, 10, 11 is so disposed that the links 18, 19 are approximately at right angles to the longitudinal axis of the setting slide. In case of a continuously constant speed of movement of the setting slide 9, 10, 11 the forward speed of the wiper slide 2 will thus be continuously reduced. The outwardly directed arms of the double armed levers, 20, 21 are connected by means of links 28, 29 to bearing bolts 30, 31 that are provided upon the machine frame. The inwardly directed arms of the double armed levers, 20, 21 are connected through links 32, 33 with the wipers 4, 5 and their associated carriers 6, 7. These double armed levers 20, 21 are at approximately right angles to the longitudinal axis of the setting slide 9, 10, 11 when the latter is approximately in the center of its forward movement.

The bearing pins 30, 31 are located on slide bearings 34, 35 which are guided for movement parallel to the longitudinal axis of the setting slide 9, 10, 11 in the machine frame 1. These slide bearings are in connection with a drive shaft 36 through gears 37. 38 or the like. By turning the hand wheel 39, the slide bearings 34, 35 can thus be displaced axially together. It is thus possible for the machine to be set to any particular shoe size.

Rod or bar 10 is pushed to the left in Fig. 2 by cross member 9 through piston rod 16. Referring to Fig. 4, the same displacement occurs to pivot point 101 of double lever 20 and 102 of link 18. In the starting position link 18 forms an angle α with bar 10. The bar 10 is linked to angle lever 22 at 222. The angle lever 22 has a central stationary pivot point at 221. In the end position, when the angle α becomes 90°, i.e., when link 18 is at a right angle with bar 10, the turning movement of angle lever 22 is zero. This displacement of slide 2 with the pivot point 61 (see 8 in Fig. 3) of carrier member 6 also rapidly decreases to zero with respect to the uniformly moved bar 10. The double lever 20 is pivoted to link 28 at 201 and to link 32 at 202. The link 32 is in turn pivoted at 62 to carrier 6. Link 32 with pivot points 202 and 62 is moved through point 101 of bar 10 with approximately double the speed of the bar. The dimensions of the members are so chosen, that at the beginning of the movement bar 10 and points 61(8) and 62 of carrier 6 have a uniform speed, the speed of point 61 dropping rapidly during the movement to zero, so that at the end of the movement a rapid turning of carrier 6 about point 61(8) will take place. The pressure device 17 subsequently moves all drive members back to their starting position.

Viewed as a drive, the members 20, 32, 6 represent a linkage in which 20 is the driving crank, 32 the coupling link, and 6 the driven crank, the latter being first displaced parallel and then assuming a turning movement about point 62 of slide carrier 6 due to its decrease in velocity down to zero. Slide 2 is the driven member of the push crank drive 22, 26, 2, which receives its drive from bar 10 of the crank drive 10, 18, 22. With the velocity of bar 10 remaining unchanged, the velocity of crank 22 and thereby the velocity of slide bar 2 drops to zero during the movement.

In order to be assured that the actual closing movement of the wipers is delayed toward the end, it is only necessary to be assured that the double armed levers are approximately at right angles to the axis of the setting slide when the setting slide is in its central position, while the links for the wiper slide, on the other hand, assume approximately this position when the setting slide is in its front end position.

The slide bearings 34 and 35 have internal threads, and the stationary shaft portions 40 and 41 have counter threads for engagement therewith. The stationary shaft portions 40 and 41 are secured against displacement and each carries a worm gear 42 and 43, respectively, which are in engagement with gears 37 and 38, respectively. By turning the shaft 36 by means of hand wheel 39, shaft portions 40 and 41 are rotated and this causes an axial displacement of slide bearings 34 and 35.

It will thus be recognized that a shoe end lasting machine has been provided that can be quickly and readily adapted for use with lasts of substantially any size.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

What I claim as new and desire to protect by Letters Patent of the United States is:

1. A shoe lasting machine comprising a frame, a wiper slide reciprocably mounted on said frame, a pair of complementary wipers slidably mounted on said wiper slide and confined thereon for arcuate sliding movement, a pair of members reciprocably mounted on said frame, driving means connecting each of said members for reciprocating them simultaneously, a double armed lever pivotally connected to each of said members, means connecting one arm of each of said levers to a respective one of said wipers to move the latter along an arcuate path, setting means connected to the other arm of each of said levers to adjust the relative position thereof in respect to the associated member, and means connecting said wiper slide with each of said members to reciprocate said slide with said members.

2. A shoe lasting machine comprising a frame, a wiper slide reciprocably mounted on said frame, said slide including an arcuate groove, a pair of complementary wipers slidably mounted on said wiper slide and confined in said groove for converging and diverging movement in respect to each other, a pair of rods reciprocably mounted on said frame, driving means connecting each of said rods for reciprocating them simultaneously, a double armed lever centrally pivotally connected to each of said rods, means connecting one arm of each of said levers to a respective one of said wipers to move said wipers in the arcuate groove, setting means connected to the other arm of each of said levers to adjust the relative position thereof in respect to its associated rod, a link pivotally connected to each of said rods, and means connecting the free end of said links and said wiper slide to reciprocate said wiper slide with said rods.

3. A shoe lasting machine according to claim 2, wherein said double armed levers are directed approximately at right angles to said rods when the latter are in their central position of movement and said links assume this position when said rods are in the fully advanced position.

4. A shoe lasting machine according to claim 2, wherein said setting means includes a sliding member connected to each of said double armed levers, and hand operable adjusting means connected to said sliding members for positioning the latter.

5. A shoe lasting machine comprising a frame, a wiper slide reciprocably mounted on said frame, said slide including an arcuate groove, a pair of complementary wipers slidably mounted on said wiper slide and confined for movement along said groove, a reciprocable setting frame, including a rod at each side of said frame, driving means connected to said frame for reciprocating the

latter, a double armed lever centrally pivotally connected to each of said rods, means connecting one arm of each of said levers to a respective one of said wipers to move the latter along the arcuate groove, setting means connected to the other arm of each of said levers to adjust the relative position thereof in respect to its associated rod, a link pivotally connected to each of said rods, first and second crank arms pivotally mounted on said frame, each having one arm thereof connected to the free end of said links and the opposite arm thereof connected to said wiper slide whereby to reciprocate said slide with said rods.

6. A shoe lasting machine comprising a frame, a wiper slide reciprocally mounted on said frame, a wiper slidably mounted on said wiper slide and confined thereon

for arcuate sliding movement, a member reciprocably mounted on said frame, driving means connecting said member for reciprocating said member, a double armed lever pivotally connected to said member, means connecting one arm of said lever to said wiper to move said wiper along an arcuate path, setting means connected to the other arm of said lever to adjust the relative position thereof in respect to said member, and means connecting said wiper slide with said member to reciprocate said slide with said member.

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