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APRIL 27, 1943.
BY A. P. C.

W. GLEISSNER

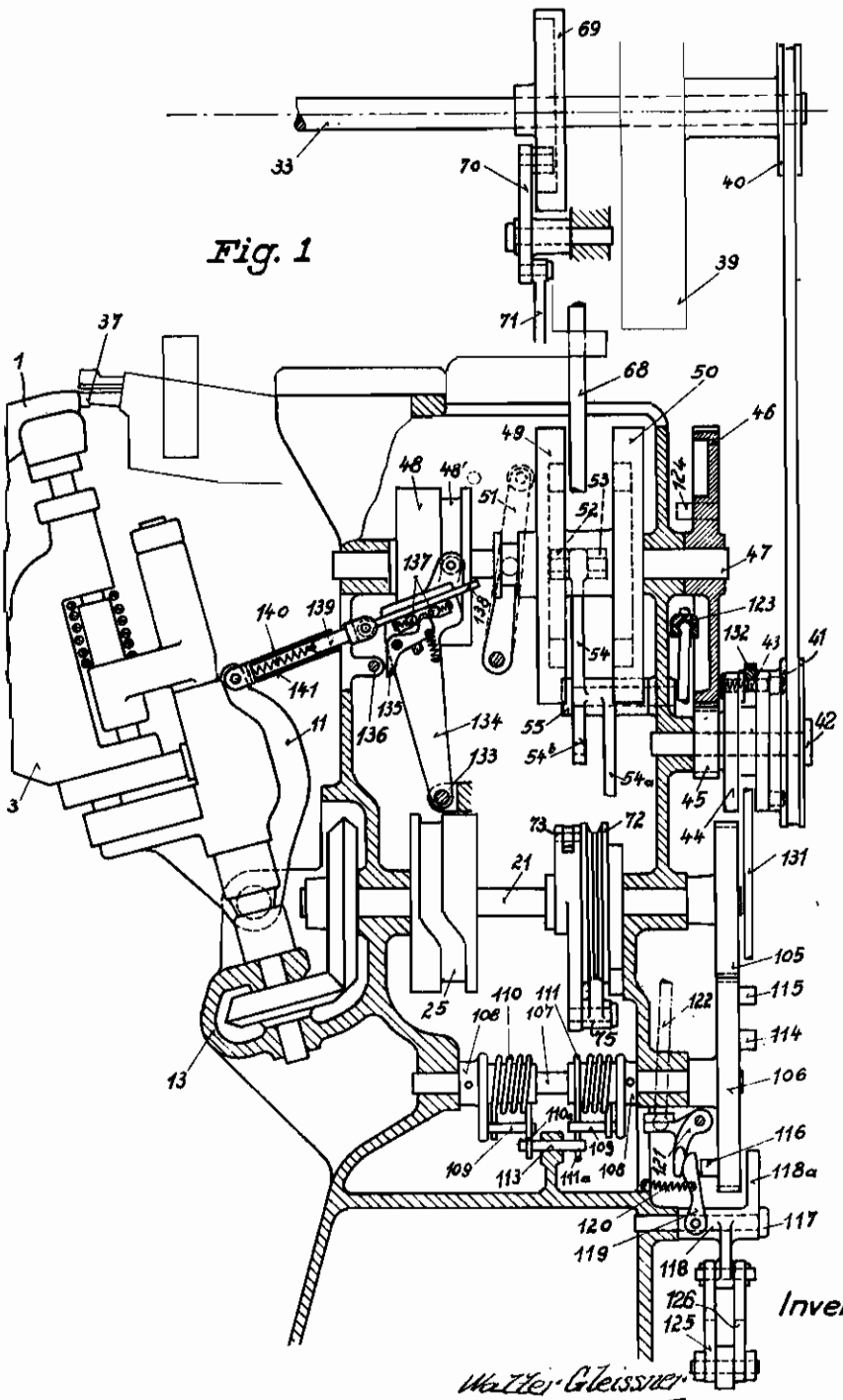
SHOE-TIP TACKING MACHINE WITH PUNCHING DEVICE

Filed Sept. 23, 1940

Serial No.
357,954

5 Sheets-Sheet 1

Fig. 1



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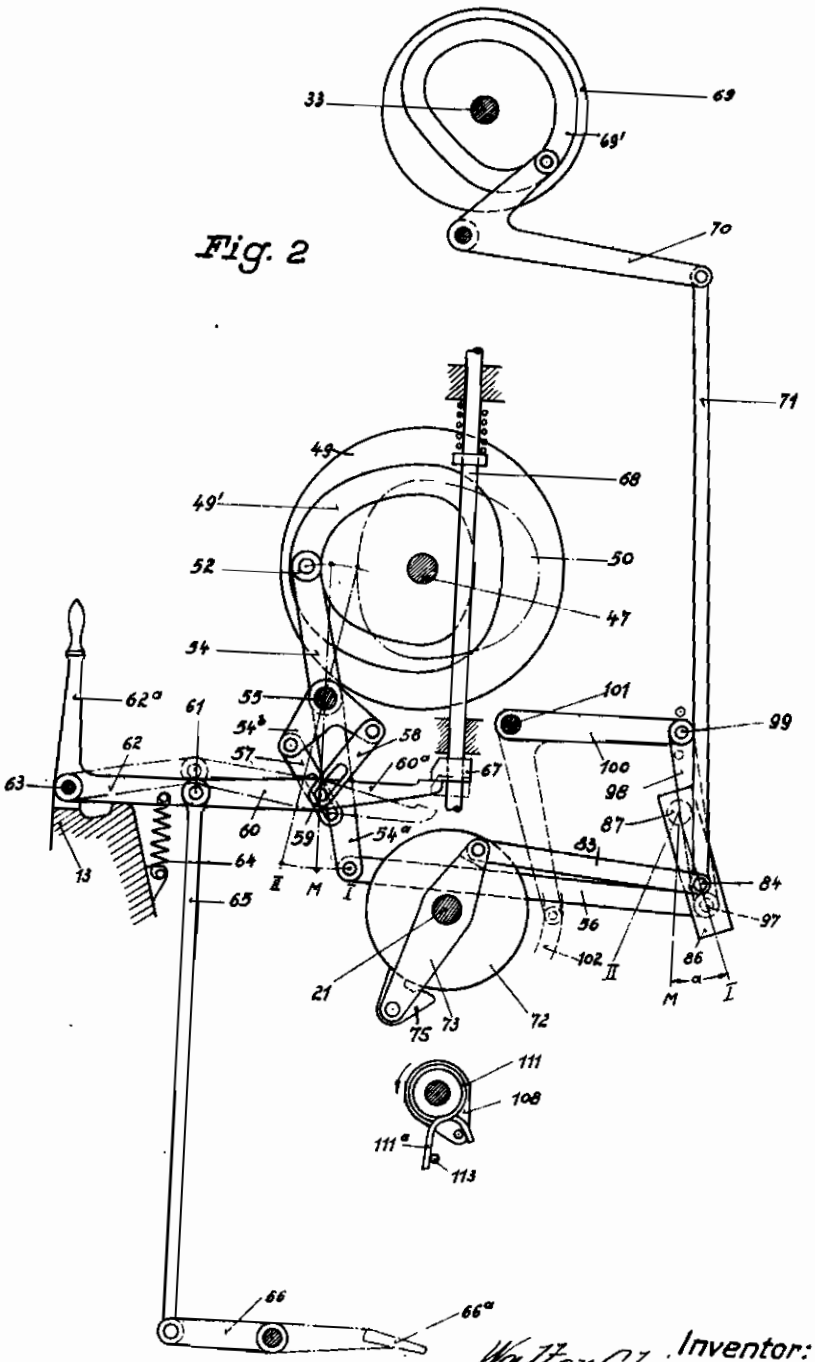
5 Sheets-Sheet 2

Fig. 2



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5 Sheets-Sheet 3

Fig. 3

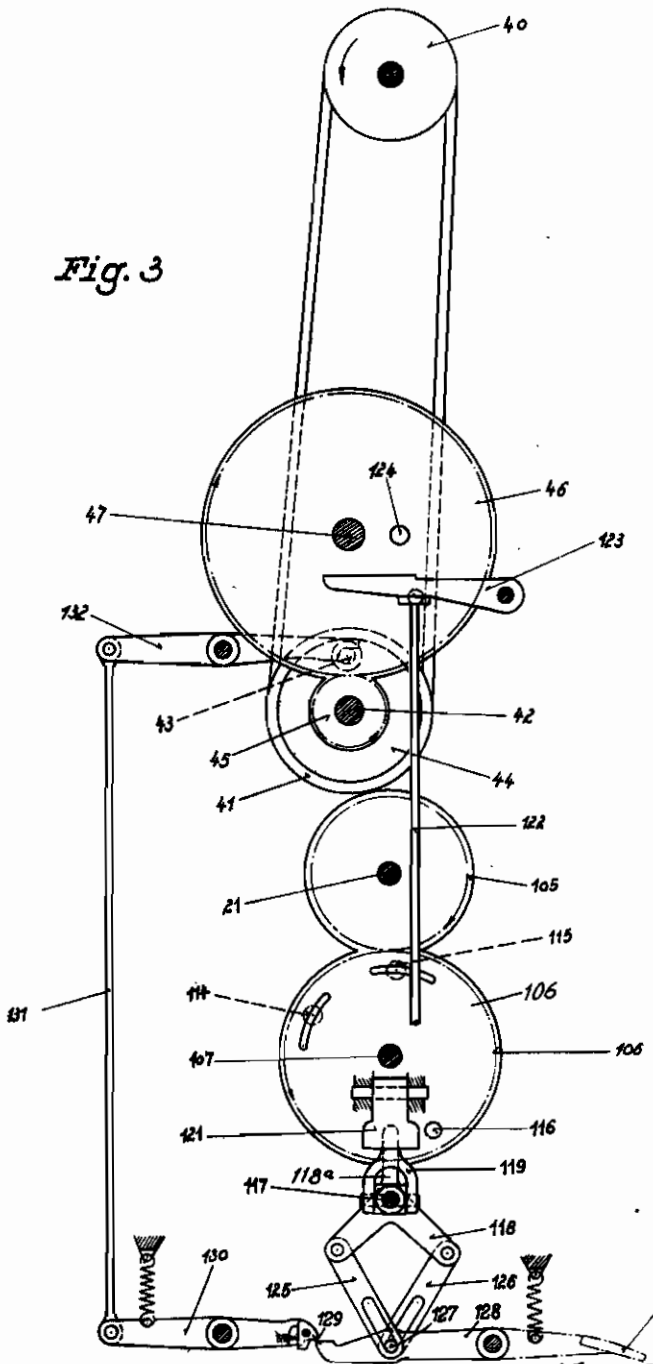

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Fig. 4

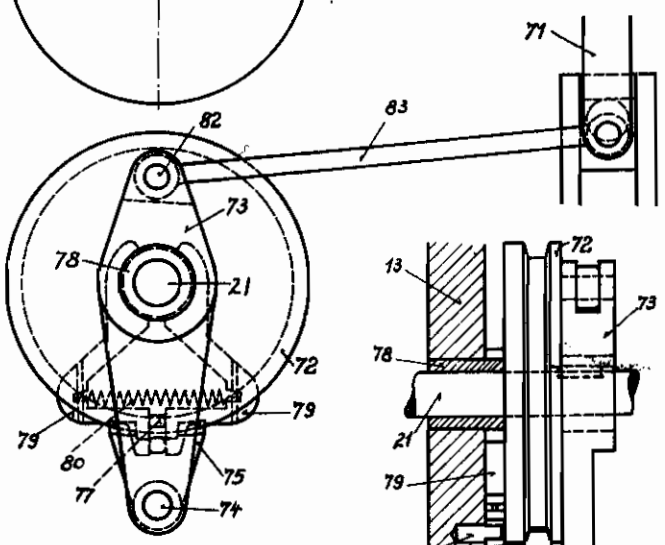

Fig. 5

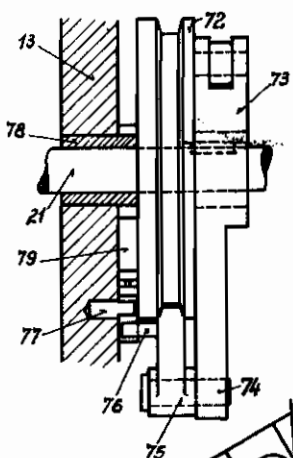

Fig. 5a

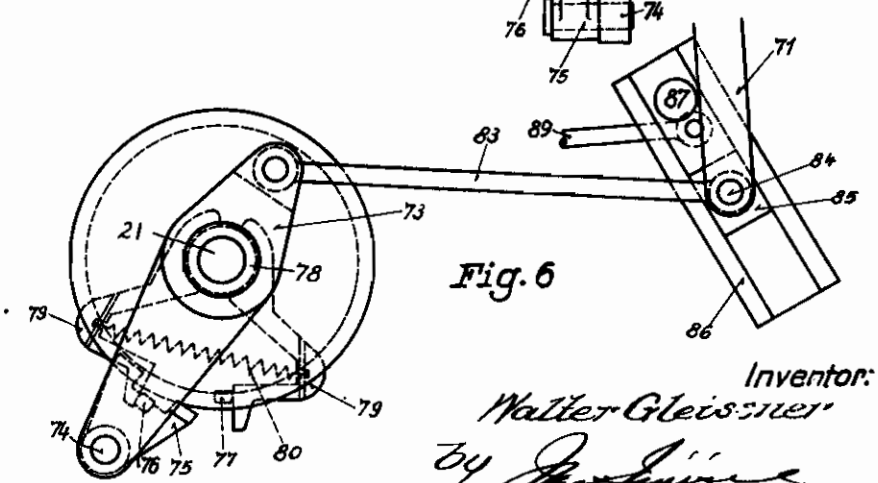

Fig. 6

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5 Sheets—Sheet 5

Fig. 7

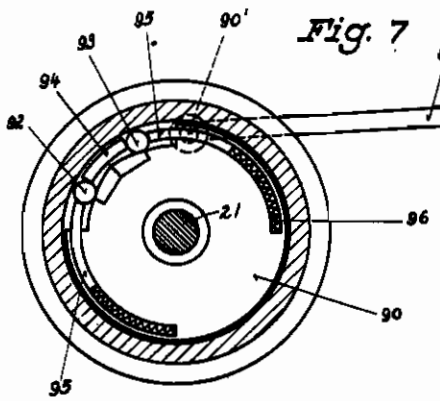


Fig. 7a

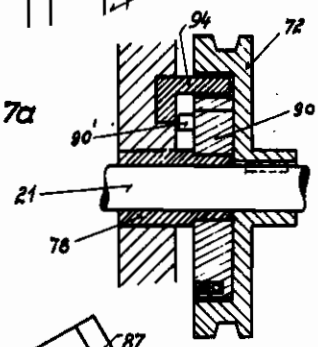


Fig. 8

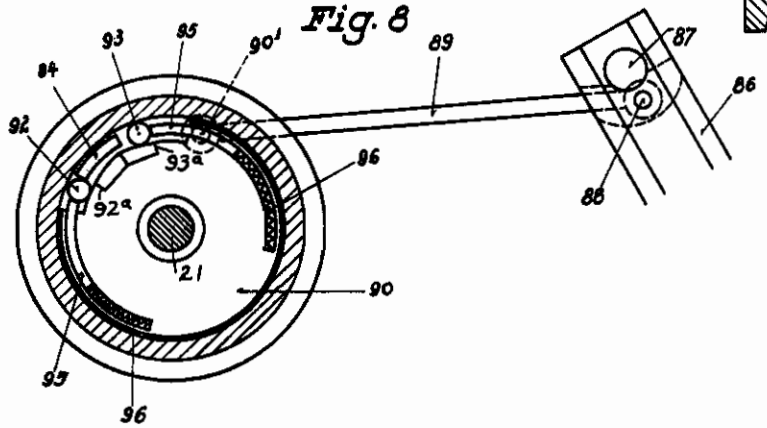


Fig. 9a

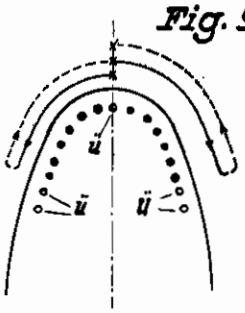


Fig. 9b

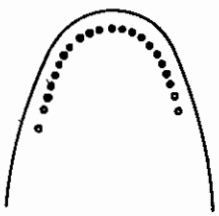
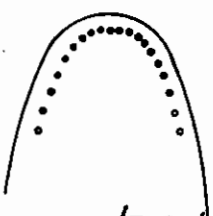


Fig. 9c



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ALIEN PROPERTY CUSTODIAN

SHOE-TIP TACKING MACHINE WITH PUNCHING DEVICE

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vested in the Alien Property Custodian

Application filed September 23, 1940

Machines are known for making shoes, particularly tacking machines. With these known machines the shoe is guided so that the working part moves continuously from the one side of the shoe round the tip to the other side of the shoe. This manner of guiding the shoe is not applicable in the case of tacking machines with a punching device.

The invention relates to a shoe-tip tacking machine with a shoe support moved by the machine drive. The invention consists therein that the machine is provided with a punching device and that the shoe support is controlled by an auxiliary shaft rotated alternately to the right and to the left so that the tacking and punching, commencing at the shoe-tip, is first effected towards the one side of the shoe, whereupon the tools are stopped and the drive of the auxiliary shaft is disengaged, the shoe support returning to the initial position, and when the machine is started again, the auxiliary shaft is driven in opposite direction and the other side of the shoe is worked. The machine makes it possible to tack the front of the shoe, commencing at the tip, in one single automatically effected operation with simultaneous punching, avoiding damaged goods usually occurring in manual guiding, relieving the operator, and ensuring that, apart from proper stretching of the leather, the punching is effected at equal distances from the edge of the shoe, the distances between the punched holes are approximately equal, and that the working of the leather on to the edge of the last, the punching, and the shifting are effected in a perfect manner.

Another feature of the invention is that the auxiliary shaft, after each complete revolution, controls an automatically disconnected coupling, whose driven part upon each revolution causes a partial rotation of the steering shaft, controlling the shoe transport and the engagement of the tacking and punching device, corresponding to one of the several, for example four, partial motions of the shoe support. Thus it is attained that all operations of the machine are positively performed in correct succession, without requiring special manipulations. Therefore, the machine, when started, moves the shoe support in such a manner that the shoe, from its position of rest, first performs a movement to the left, then returning, moving to the right and returning again.

The switching shaft is connected with the driven coupling part by a pair of toothed wheels, the toothed wheel on the switching shaft having a diameter four times as large as the counter-wheel arranged at the driven half of the coupling. Each complete revolution of the driven half of the coupling, therefore, corresponds to a quarter of a revolution of the switching shaft. The throwing-in of the coupling for performing the four successive partial revolutions of the switching shaft may, for example, be effected by means of a controller wheel driven from the auxiliary shaft and acting via stops upon the control rods of the coupling. For controlling the transport and for engaging the drive of the shaft of the tool head, a cam is arranged on the switching shaft. This cam is provided at the bottom with two equal curves displaced by 180 degrees with respect to each other, their optional use making it possible to commence the transport of the shoe either to the left or to the right. For producing the forward feed, it is advantageous to use a link drive, which is moved from the shaft of the tool head and thereby drives the auxiliary shaft with the shoe support intermitting at regular intervals. By reversing the link, the forward feed is changed from left hand to right hand motion. The coupling rods, which are controlled from the machine for engaging the drive of the shaft of the tool head, are provided with a lever operated by the hand or the foot, whereby optional stopping of the machine drive is made possible, in order to be able to thus interrupt the tacking work at any time.

A constructional form of the subject of the invention is illustrated by way of example in the accompanying drawing in which:

Fig. 1 is a total view of the gear,

Figs. 2 and 2*a* are a side view and a diagram of the transporting device,

Fig. 3 is a side view of the changing-over and coupling device,

Figs. 4 to 6 show the transport guiding and the transport pulley driven thereby,

Figs. 7 to 8 show a blocking device for the transport pulley, and

Figs. 9*a* to 9*c* are partial views of the shoe.

The V-belt pulley **40**, which is rigidly connected with the driven pulley **39**, runs loosely on the shaft **33** of the tool head and drives the coupling pulley **41** which is mounted on the bolt **42**. The pulleys **39**, **40**, **41** are, therefore, in continuous rotation, even when the machine itself is not engaged for operation. The toothed wheel **45**, which is rigidly connected with the coupling part **44**, engages the toothed wheel **46** attached to the shaft **47**, the diameter of the toothed wheel **46** being four times as large as

that of the toothed wheel 45. The cam 48 is also rigidly mounted on the shaft 47, whereas the cams 49 and 50 may be shifted on the shaft 47 in its longitudinal direction by the hand lever 51, in order to bring the rolls 52 or 53 of a control lever 54 optionally into engagement with the gear groove 41' of the cam 49 or 50' of the cam 50.

The arm 34*a* of the lever 54 causes via the rod 56 (Fig. 2) the reversal of a transporting and blocking device for the motion of the shoe, which will be described hereinafter, to left hand or right hand rotation. The double arm 54*b* of the control lever 54 serves to control a coupling provided between the shaft 33 of the tool head and the continuously rotating pulley 39. For this purpose, it carries two links 57 and 58 (Fig. 2), whose slots surround the bolt 59 of a releasing lever 60. This releasing lever is connected by a bolt 61 with a steering rod 62, linked to the frame 13 by the bolt 63 and drawn towards the frame by the spring 64. Also linked to the bolt 61 is the rod 65, which is connected to a pedal 66. The releasing lever 60 is controlled by a control lever 54 via one of the links 57 or 58 in order to press the releasing rod 68 via the arm 60*a* and the catch 67 in upward direction. Thereby the coupling (not illustrated) connecting the shaft 33 of the tool head with the continuously rotating driving pulley 39 is thrown in. The shaft 33 carries, besides the usual cams for the tacking tools and the punching device, a further cam 69, moving the reversible shoe transport mentioned above by the arm 54*a* via the angle lever 70 and the rod 71, with the aid of the transport pulley 72 rigidly mounted on the shaft 21.

Fixed to the shaft 21 is the toothed wheel 105 engaging a controller wheel 106 fixed to the shaft 107 and provided with a fixed stop 116 and two adjustable stops 114 and 115. The spring boxes 108 of the shaft 107 with the bolts 109 receive pre-tensioned torsional springs 110 and 111. In the position of rest, i.e. in the initial position of the shafts 107 and 21 and at the same time of the shoe support 3 both spring legs 110*a* and 111*a* lie on the stationary supporting bolt 113. If the shaft 107 is moved, for example, in anticlockwise direction, which amounts to a steering to the left of the shoe support 3, the tension of the spring 111 is increased, whereas the spring leg 110*a* of the spring 110 moves away from the supporting bolt 113, so that this spring becomes ineffective. If, on the other hand, the shaft 107 is moved in clockwise direction, the shoe support being steered to the right, the spring 110 is further tensioned and the spring 111 becomes ineffective. The spring 110 or 111, whichever is tensioned, serves to retain the shoe support 3, as well as the switching and reversing elements connected therewith, in the initial position or to return them into the position of rest.

The automatic throwing in of the coupling between the pulleys 41 and 44, shifted after each revolution of the pulley 41, is effected from the controller wheel 106. The star lever 118 mounted on the bolt 117 (Fig. 3) co-operates with the stops 114, 115, and 116 of the controller wheel 106, the switching lever 119 being linked as a fork to the star lever 118 transverse to the longitudinal axis of the bolt 117. The spring 120 (Fig. 1) keeps the switching lever 119 out of the path of the stop 116 and in contact with a plate-shaped widening of the angle lever 121, which is connected by the rod 122 with the lever 123 (Fig. 3) oscillating about a stationary bolt. This lever 123 is controlled by the bolt 124 of the toothed wheel 46. The star lever 118 lies with its one arm 118*a* in the path of the stops 114 and 115 of the controller wheel 106 and carries links 125 and 126 linked to its two other arms. The links enclose with their slots the bolt 127 of the interrupter 128 controlling the coupling lever 132 and therewith the coupling bolt 43 of the pulleys 41 and 44 via the interrupting latch 129 of the lever 130 and the rod 131.

The parts described so far operate as follows:—

After the shoe 1 has been placed on the shoe support in its central position shown in Fig. 9*a*, the coupling pulley 44 is connected by the bolt 43 with the coupling pulley 41 with the aid of the pedal 128*a* (Fig. 3) via the levers 128, 130, 132, whereby the toothed wheel is caused to make one revolution. Consequently, the shaft 47 performs a quarter of a revolution by 90 degrees, i.e. its first partial revolution. In the illustrated position of the lever 51, the lever 54 is thereby oscillated by the curved groove 49' of the cam 49 into the position I (Fig. 2), whereby its arm 54*a* also brings the transport guide 88 into the position I. At the same time, the link 58 lifts the releasing rod 68 via the lever 60, so that the shaft 33 of the tool head is coupled with the continuously rotating pulley 39 and is caused to move. By means of the curved groove 69' of the cam 69, the shoe support is turned via the transporting and feeding device, which will be described hereinafter, and the other cams mounted on the shaft 33 control the tacking and punching tools for tacking the shoe from the centre of the tip towards the left side. During this time, the toothed wheel 105 of the shaft 21 turns the shaft 107 (Fig. 3) with the controller wheel 106 in anticlockwise direction until the stop 114 comes into contact with the switching arm 118*a* of the star lever 116 and oscillates the latter about the bolt 117, whereby the link 125 moves the lever 128 so that the coupling 41 to 44 is thrown in again.

In the now effected second partial revolution of the control shaft 47, the lever 123 is pressed down by the bolt 124 and brings the switching lever 119 via the pressing rod 122 and the lever 121 (Figs. 1 and 3) into the range of action of the stop bolt 116 of the control wheel 106. At the same time, the lever 54 (Fig. 2) is guided by the curved groove 49' back into its central position M. Therefore, the double arm 54*b* releases the lever 60, so that the releasing rod 68 falls off and the coupling between the pulley 39 and the shaft 33 of the tool head is disconnected. When the shaft 33 comes to rest, the tacking and punching tools and the transporting device are stopped. Upon bringing the transport guide 86 into its central position again by the arm 54*a*, the blocking 89 to 96 (Fig. 7) which will be described later on, is released. After the blocking has been removed, the shaft 107 and, therefore, the shoe support 3 return, owing to the action of the tensioned spring 111, into the central (initial) position. At the end of the return motion, the stop bolt 116 knocks against the switching arm 119 of the star lever 116 and reconnects the coupling 41 to 44 via the link 126 and the arms 128, 130, 132, so that the control shaft 47 performs its third partial revolution.

In the third partial revolution of the shaft 47, the bolt 124 of the toothed wheel 46 releases the arm 123, so that the spring 120 can again move the switching arm 119 out of the path of the bolt 116. Now, the curved groove 49 oscillates the lever 54 into the position II, whereby the arm 54*a*

also moves the transport guide 86 into the position II. At the same time, the shaft 33 is again coupled with the pulley 39 by the link 57 of the double arm 54b via the lever 60 and the rod 88. Now, the shaft 33 steers, from the curved groove 69' of the cam 69 via the reversed transport guide 86, the drive of the shoe support towards the other side and at the same time operates via its other cams the tacking and punching tools so as to effect the tacking of the second half of the tip. As the shaft 107 now turns in clockwise direction, the switching bolt 115 steers, at the end of the third partial revolution, the coupling 41 to 44 by acting upon the arm 119a of the star lever 118 via the link 126. Then, the control shaft 47 performs its fourth and last partial revolution, by which the lever 54 is returned into its central position and thus, on the one hand, moves the link 96 via the arm 84a back into its central position and, on the other hand, releases with the link 57 the lever 60 for disconneeting the coupling of the shaft 33. Therefore, the shoe transport and the tool drive come to rest and the blocking of the shoe transport is removed. The return of the shaft 107 and, therefore, of the shoe support 3 into the central position is effected by the spring 110, which is tensioned during the third partial revolution. The machine now comes to rest, as the switching lever 119 is now outside the path of the stop 116, so that an automatic throwing-in of the coupling 41 to 44 cannot be effected.

The two cams 49 and 50, which can be shifted from the hand lever 51 on the shaft 47, carry similar curves displaced by 180 degrees with respect to each other, as indicated in Fig. 2. By optionally connecting one of these curves with the corresponding rolls 52 or 53 of the lever 54, the transporting motion of the shoe support may either be commenced by the left-hand or by the right-hand action.

As already mentioned, the revolution of the shaft 21 to the left and to the right, steering the shoe support 3, is effected via the levers 70 and 71 and the transport pulley 72 by the curved groove 69' of the cam 69. The transport lever 73 (Figs. 4 to 6), with its double clamping lever 75 oscillating about the bolt 74, is rotatably mounted on the hub of the transport pulley 72. Two switch levers 79 surrounding an axle box 78 fixed to the machine frame, are drawn with their legs in the position of rest by a spring 80 towards a stationary stop 77 and thereby retain the double clamping lever 75 by means of its resting bolt 78 in its ineffective position (Fig. 5). The transport lever 73 is joined by the bolt 82 to a rod 83, which is connected with the rod 71, steered from the curved groove 69', by a link bolt 84 carrying the slide block 85. This slide block 95 engages the transport guide 86, which is oscillatable about the stationary bolt 87 and is brought, as already mentioned, by the arm 54a of the lever 54, according to the position of the curved groove 49' or 50', from the central position M into the position I or II (Fig. 2). When the transport guide 86 is in the position I, the left clamping jaw of the double clamping lever 75, in the downward movement of the slide block 85 caused by the curved groove 69' via the levers 70 and 71, engages under the action of the spring 90 the transport pulley 72 and thereby causes a partial revolution of this pulley and, therefore, of the shaft 21 and of the shoe support 3. The return movement of the shaft 21, which would be caused, when the slide block 85 moves upwards, by the spring 110 or 111 via the shaft 107 and the toothed wheels 108 and 185, is prevented by the blocking indicated in Figs. 7, 7a, and 8.

According to these illustrations, the transport pulley 72 co-operates with a blocking wheel 90, which is joined by the bolt 90', the rod 89, and the bolt 89 to the transport guide 98. The segment discs 95, mounted in the blocking wheel 90 and subjected to spring action, press the freely movable clamping rolls 92 and 93 against a stationary stop 94, so that, in the central position of the transport guide 86 and, consequently, with the blocking wheel 90, the pulley 72 is able to freely turn with the shaft 21 in both directions. But, if the guide 86, as indicated in Fig. 8, is in the position I according to Fig. 2, the clamping roll 93 will act with the co-ordinated wedge surface of the blocking wheel 90 in such a way that the pulley 72 is turned with the aid of the left clamping jaw of the lever 73 in clockwise direction and is blocked in opposite direction. On the other hand, in the position II of the guide 86, the pulley 72 is turned in anti-clockwise direction by the right clamping jaw of the lever 73, the clamping roll 92 with the co-ordinated wedge surface of the blocking wheel 90 preventing the backward rotation. Therefore, with each revolution of the cam 69 of the shaft 33, a short partial revolution of the shaft 21 is effected, so that the shoe support is turned with interruptions at regular intervals, as long as the shaft 33 revolves.

In the central position M of the transport guide 86, the blocking device is ineffective, so that the shaft 21 with the shoe support 3 is turned back by the spring 110 or 111, whichever is tensioned. In this position of the guide 66, any further moving of the slide block 85 would be practically without influence upon the shoe transport. The steering of the tensioning device by means of the rod 89 could, of course, also be effected by a special cam on the shaft 47.

By shifting the working point 97 of the lever 56 at the transport guide 86, the size of the oscillating angle α of the transport guide 86 may be varied. This also alters the deflection of the lever 73 and the amount of the partial revolutions of the shaft 21, which is equivalent to a decrease or increase of the spacing of the tacks (Figs. 9a and 9b). The shifting of the point 97 may be effected by a lever 100 via the rod 98 linked at 99 in such a way that the spacing of the individual tacks is altered, for example increasing the spacing of the tacks from the tip towards the side (Fig. 9c). If, in this case, the lever 100 oscillating about a bolt 101 is steered by a cam 102 driven by the machine, as indicated in Fig. 2, the spacing of the tacks is altered completely automatically.

The cam 48 fixed to the shaft 47 serves to keep the shoe, while being worked, constantly in contact with the stop 37. The curve roll of the pulling lever 134 oscillating about the bolt 133 engages the cam 48. At the lever 134, the slide rod 138 is guided by the blocking rolls 137, the piston 139 of the tension spring 140 being joined to the slide rod 138, the sleeve 141 of the spring 140 being connected to the oscillating support 11 of the shoe support 3. In the position according to Fig. 1, the blocking rolls 137, which are pressed against each other by springs, rest on inclined surfaces of the lever 134 and thus block the rod 138. However, when the machine does not move, a blocking lever 135 oscillatably mounted at the pulling lever 134 leans aaginst a stationary stop 136. Thereby, the rolls 137 are

separated, so that the rod 138 and, thereby, the oscillating support 11, is released.

The shoe support 3, 11, after the shoe 1 has been placed thereon, is moved by hand towards the stop 37 and is first held. When starting the machine, the pulling lever 134 is moved already at the commencement of the first partial revolution of the control shaft 47 by the curved groove 48' of the cam 48 in such a way that first the blocking lever 135 is released and, therefore, the blocking of the slide rod 138 at the lever 134 is effected, which in the further revolution of the cam 48 tensions the spring 140. The shoe is thereby held powerfully against the shoe stop 37. At the end of the fourth partial revolution of the shaft 47, the tension of the spring 140 and the blocking of the slide rod 138 at the pulling lever 134 are released, and the shoe support can move back.

By moving the lever 62 (Fig. 2), for example by means of a pedal 86a, it is possible at any time to interrupt the tacking operation. When lifting the lever 62, the bolt 61, hitherto serving as pivot for the lever 60, is shifted upwards. The lever 60 occupies the position indicated by dotted lines in Fig. 2, the bolt 59 serving as fixed pivot, and the end 60a of the lever releasing the releasing rod 68. In this way, the shoe can be tacked by steps or even be moved back into its central position without being worked.

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