April 7, 1931. K. WOLLNY 1,799,996

PULLING OVER MACHINE

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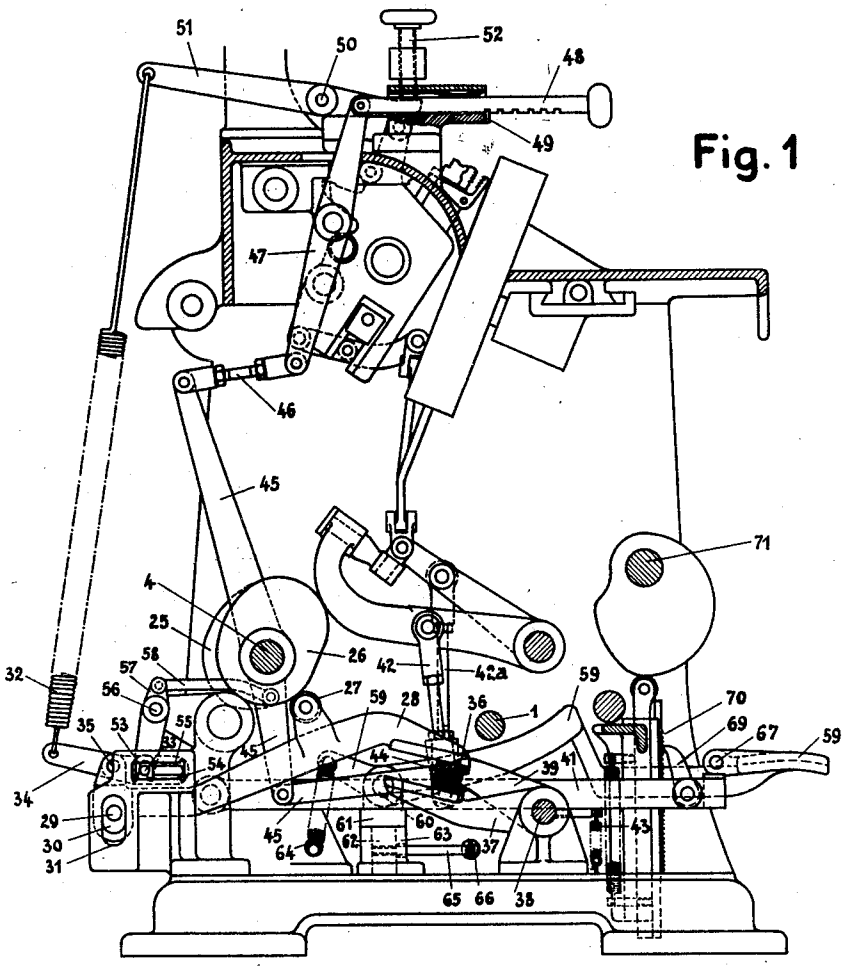


Fig. 1

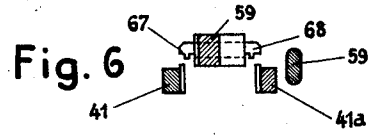


Fig. 6

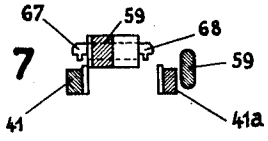


Fig. 7

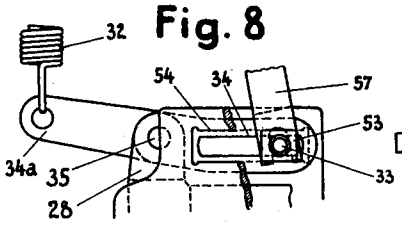


Fig. 8

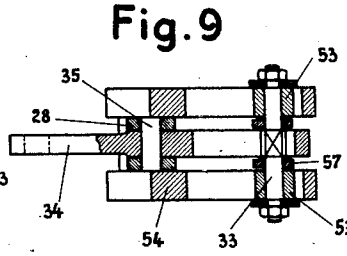


Fig. 9

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Fig.2.

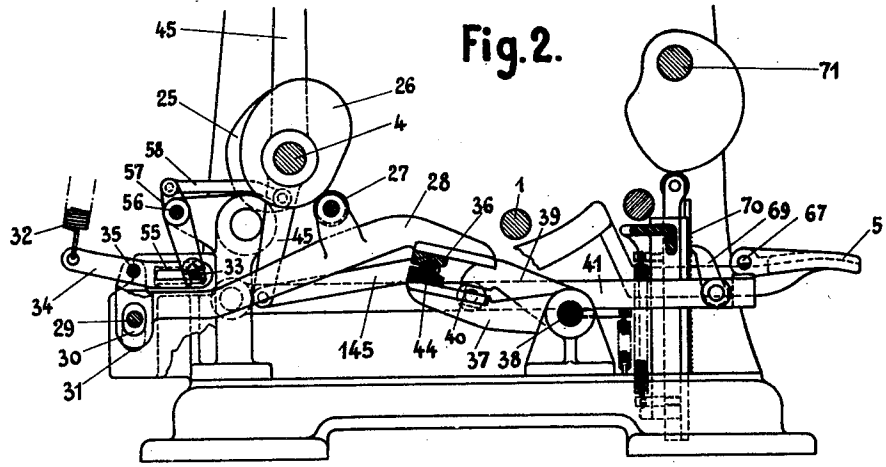
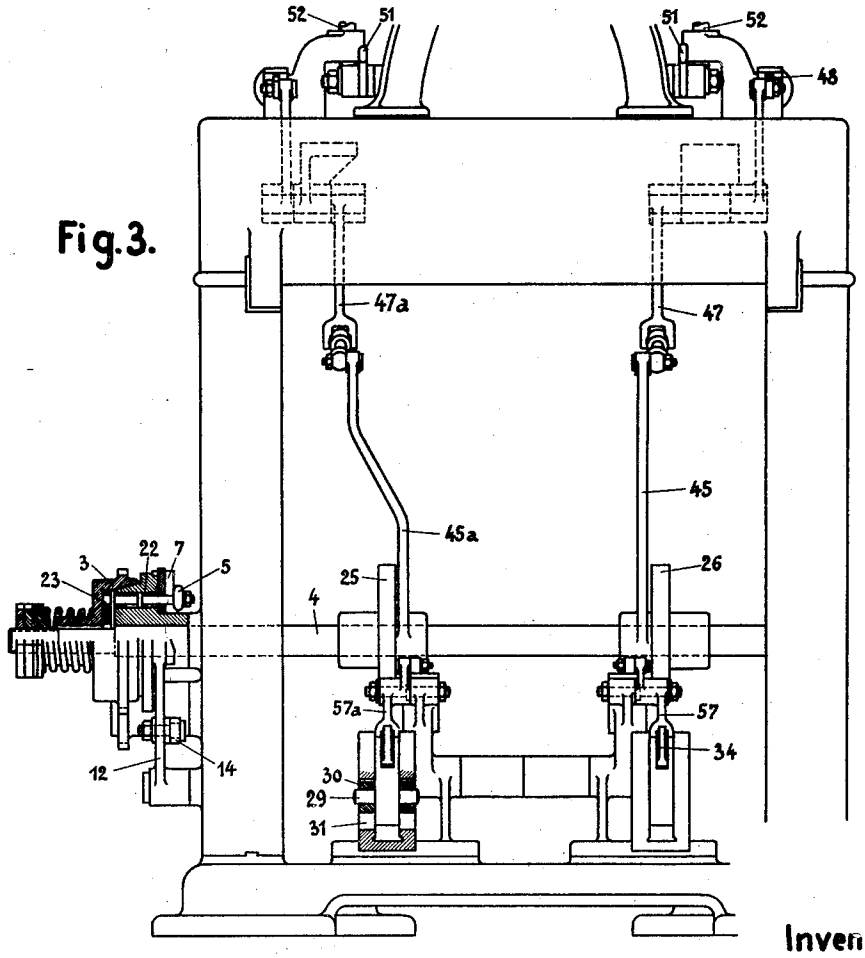


Fig.3.



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Fig.5.

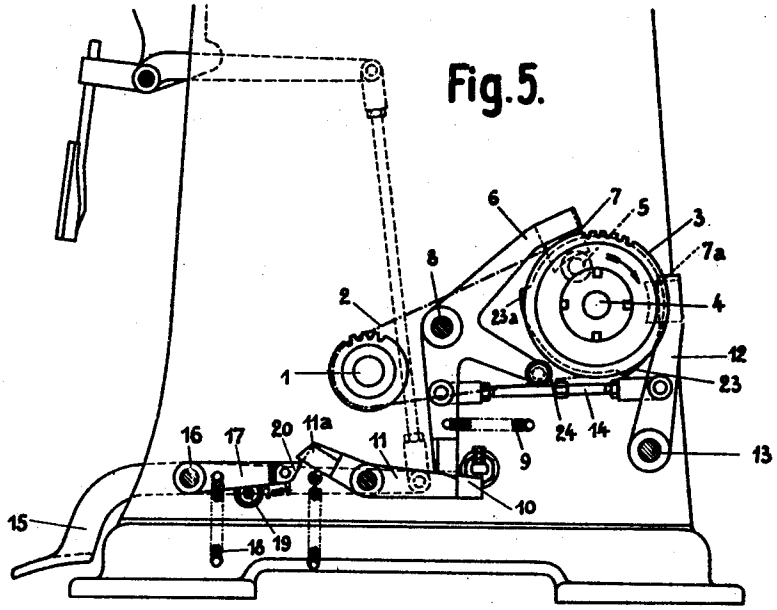
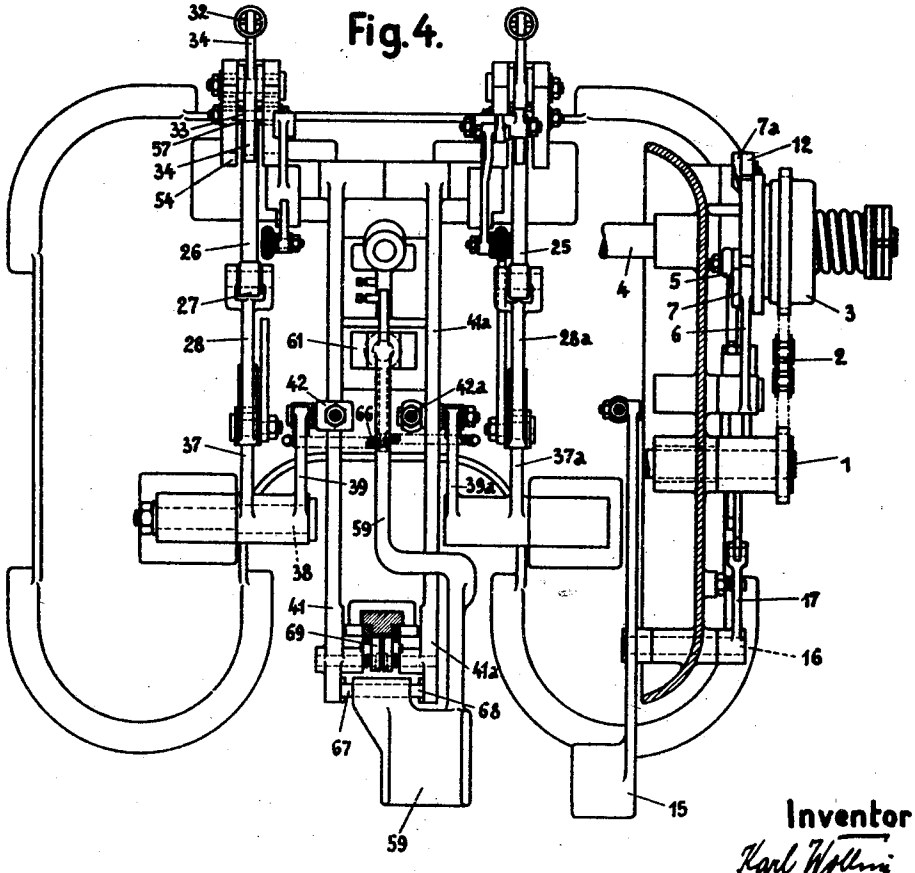


Fig.4.



Inventor

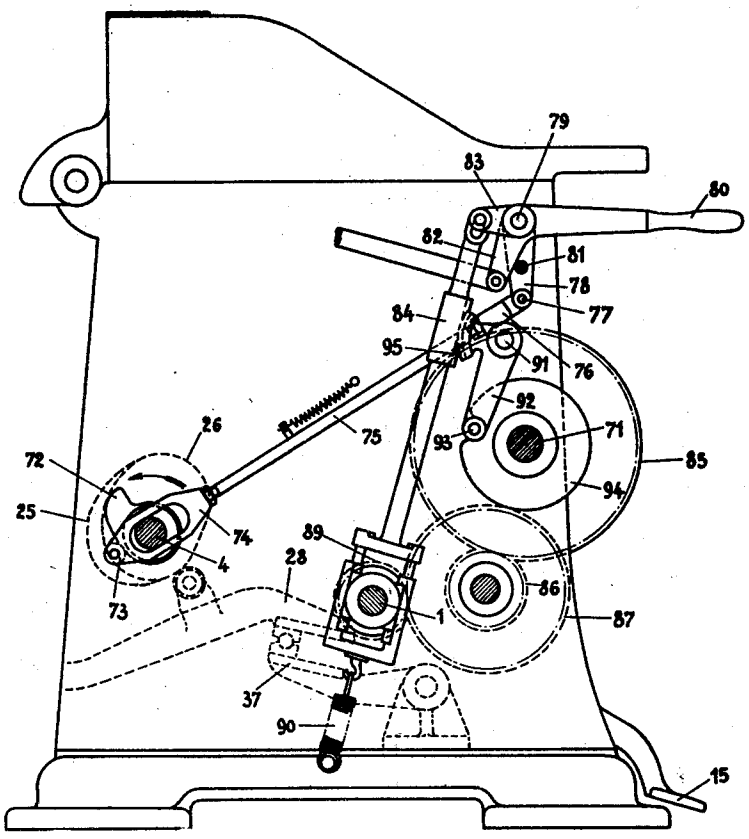
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Fig.10.



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UNITED STATES PATENT OFFICE

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PULLING-OVER MACHINE

Application filed June 10, 1929, Serial No. 369,649, and in Germany July 2, 1928.

The invention relates to improvements in pulling over machines of the kind described in the U. S. Patent No. 1,688,556 and in the British specification No. 239,890 and has for its object means for better adapting the machine to the varied demands upon it. For this purpose the machine is so arranged and constructed that the closing and pulling of the pincers can be effected at will either automatically or by a treadle, while the other movements of the pincers, as in particular the release and return to the starting point are in any case effected by the motor drive. After pulling, whether automatically or by foot, the pincers are coupled to a lock device which is controlled to release the pincers by a gear adapted to be separately coupled. The new arrangement also enables the pulling stage to be effected in any desired order partly automatically and partly at will. Pulling over machines are known in which the automatically stretched upper leather can be additionally stretched by hand. This arrangement is therefore not claimed per se herein.

The invention is illustrated in the accompanying drawings for the better understanding of which attention is directed to the above mentioned prior specifications.

Fig. 1 is an elevation of the machine partly in section.

Fig. 2 is similar to the lower part of Figure 1 but with certain parts in a different position.

Fig. 3 is a partial rear view of the machine.

Fig. 4 is a plan of the machine partly in section.

Fig. 5 shows the coupling of the motor drive to the pincers.

Figs. 6 and 7 are sections of the treadle.

Figs. 8 and 9 show in elevation and horizontal section certain details of the machine, and

Fig. 10 shows certain of the coupling means of the machine.

The driving disc 3 of a known form of pin coupling mounted on the cam shaft 4 is driven by means of a chain 2 from the continuously rotating main shaft 1. The coupling pin 5 is held out of engageemnt by a wedge 7 on the coupling lever 6. The coupling lever 6 is pivoted on a pin 8 and is urged against an abutment 10 on a lock lever 11 by a tension spring 9. A second lever 12 which is pivoted on a pin 13, is connected to the coupling lever 6 by a rod 14. A treadle 15 is secured on a rotatable shaft 16, which at one end carries a release lever 17 which is urged against a fixed abutment 19 by a tension spring 18.

Upon depression of the treadle 15 a pawl 20 on the lever 17 lifts the arm 11*a* of the lock lever 11 whereby the abutment is moved downwards and the coupling lever 6 is released. The tension of the spring 9 draws the wedge 7 on the lever 6 outwards and the coupling pin 5 is pressed into the aperture 23 in the driving disc 3 by a spring 22, whereby the cam shaft 4 is coupled up and its rotation started.

During the further rotation of the coupling a cam 23 acts upon a roller 24 and brings the lever 6 with the wedge 7 again into the uncoupling position. Since the second coupling lever 12 is connected by a rod 14 with the lever 6, this lever, which also carries a wedge 7*a*, effects a similar inward movement. By suitably shaping the cam 23 the inward movement of the coupling levers takes place before the coupling pin 5 has reached the wedge 7*a*. Upon reaching the wedge 7*a* the pin 5 is again uncoupled after the shaft 4 has first made a fraction, about one-third, of a revolution. Upon further actuation of the treadle 15 the two coupling levers again swing out, whereby the coupling is again engaged. The shaft 4 completes the remainder of its revolution, and the pin 5 is again uncoupled when it reaches the wedge 7.

By the provision of the two coupling levers which are connected together, the result is obtained that upon actuation of the treadle 15 the shaft 4 first makes for example only one-third of a revolution and then comes to rest, and then only makes the remainder of the revolution upon a further actuation of the treadle 15.

By suitable adjustment of the lever 12 the further result can be obtained that upon actuation of the treadle 15, the shaft 4 at

once makes a complete revolution. For this purpose the lever 12 is set so far outwards by rotation of the rod 14 which is provided with a right and left handed screw adjustment, that the wedge 7*a* in its innermost position no longer engages and withdraws the pin 5, so that uncoupling only takes place at one point, namely at the wedge 7.

Upon the shaft 4 are two cams 25 and 26 for actuating the two similar lever gears for motor closing and pulling of the toe pincers and the side pincers respectively. Only the devices for operation of the side pincers are described below since those for the toe pincers are essentially similar. The cam 26 acts upon the roller 27 of a lever 28. The lever 28 is pivoted upon a pin 29. This pin is borne in slide blocks 30 which can move up and down in guides 31. A tension spring 32 pulls on a spring lever 34 pivoted on the axis 33. This lever is hinged to the lever 28 by a pin 35. The effect of the spring 32 is to hold the pin 29 forming the fulcrum of the lever 28 together with the slide blocks 30 forcibly at the upper end of the guides 31. The lever 28 is in loose connection with a lever arm 37 through a divided slide block 36. A lever arm 39 is connected to the lever 37 by a common hub which is pivoted on a pin 38. The lever 39 rests loosely on a pin 40 in the pincer pulling lever 41. The pulling rod 42 for actuating the pincers is mounted on the lever 41.

By means of a tension spring 43 the two levers 37, 39 are held in their uppermost positions and the lever 28 with its roller is forcibly pressed against the cam 26. The angular stroke of the lever 28 occasioned by the rotation of the cam 26 always has the same value. The divided slide block 36 is rotatable on the pin 44 of a link 145. The slide block can be moved by a lever 45 loose on the shaft 4 and the linkage 46, 47, 48, the adjustment being maintained by the aid of a catch 49 engaging notches in the adjusting bar 48. By altering the position of the slide block 36, the angular stroke of the lever arms 37, 39, is increased or decreased and the stroke of the pincer stretching lever upon which the amount of downward movement of the pincers depends, also adjusted.

The tension spring 32 is attached to a lever 51 pivoted on a pin 50. By means of an adjusting screw 52 against which the shorter arm of the lever 51 bears, the tension of the spring 32 can be regulated. The spring tension is so adjusted that when the increased resistance which arises when the leather is fully stretched by the pincers occurs, the fulcrum support 29 of the lever 28 yields, the slide blocks 30 moving downwards in the guides 31. When this takes place the pin 44 of the slide block 36 acts as the fulcrum.

When the slide block 36 is adjusted to increase the stroke of the levers 37, 39, the tension of the spring 32 must be increased since the ratio of the distance pin 29—roller 27 to the distance roller 27—pin 36, upon which the effect of the spring tension at the point 35 depends, changes. In order to avoid an additional adjustment by hand of the spring 32 after setting the slide block 36, an arrangement is provided by which the spring tension exerted on the lever 28 is automatically changed in the desired ratio during adjustment of the slide block 36. For this purpose the fulcrum 33 of the lever 34 is slidably arranged, in order to enable the lever ratio 33—35 to 35—34*a* to be varied, whereby the tension exerted at 35 is correspondingly varied. The pin 35 is provided on each side with a slide block 53, which blocks slide in the guides 54. The lever 34 is slotted at 55 to engage the pin 33 while the limbs of the forked end of a lever 57 pivoted on a pin 56 pass on each side of the lever 34 and prevent the pin 33 from sliding uncontrolled along the guides 55. The lever 57 is connected to the lever 45 by a link 58.

When the slide block is adjusted by means of the bar 48 from the position shown in Fig. 1 to the position shown in Fig. 2, to obtain a short stroke of the lever arms 37, 39, the fulcrum 33 of the lever 34 also moves under the action of the lever 45, rod 58 and lever 57 from the position shown in Fig. 1 to that shown in Fig. 2. The effective lever arm 35—33 is thereby altered to correspond to the altered distance 27 to 44, so that tension of the spring 32 exerted at 35 upon the lever 28 remains substantially the same as in the previous setting.

In order to enable the pincers to be closed and pulled by the muscular power of the operator independently of or in common with the devices for motor operation of the pincers, the treadle 59 is provided. This is pivoted on a pin 60 supported in an eye 61. The latter is pivoted on a pin 62 in a pedestal 63, so that the treadle 59 in addition to moving vertically about the pin 60 can also move horizontally about the pin 62. The treadle 59 is maintained in its upper position of rest, by means of a tension spring 64, and it is maintained in its horizontal mid position by means of a rod 65 secured to the pin 62 and two tension springs 66.

If both pincer levers are to be actuated without the use of the motor, the operator presses down the treadle 59, which engages abutments on the pincer levers 41, 41*a* thus pressing the levers downwards. Upon release the treadle is lifted by the spring 64 into its upper position of rest, while the levers 41, 41*a* remain locked in their lowered position by pawls 69 engaging in racks 70.

If now only the lever 41 for the side pincers is to be operated, the operator before depressing the treadle, presses it sideways into

the position shown in Fig. 7. Upon depression, only the lever 41 is engaged by the projection 67 and driven downwards. Similarly when the treadle is pushed to the opposite side it engages only the lever 41*a*.

Method of operation of the machine

The front end of the upper leather to be pulled over is first introduced into the open toe pincers. Then the treadle 15 is actuated, whereby the shaft 4 is coupled and makes about one-third of a revolution, then coming to rest again. During this partial rotation of the shaft 4, the cam 25 actuates through the linkage 28*a*, 37*a*, 39*a* the pincer lever 41*a* for operating the toe pincers, whereby the latter are closed and drawn down a certain distance, in order to pull the leather slightly over the toe of the last. At the end of this step the sides of the upper leather are introduced into the open side pincers and the pin coupling again engages by depression of the treadle 15, when the shaft 4 completes the remaining, two-thirds or thereabouts, of the revolution. During this movement, under the action of the appropriately formed cams 25, 26, the side pincers first close and move downwards in order to pull the sides of the upper leather firmly over the last. During the descent of the side pincers the toe pincers complete their downward movement, so that at the end of this working stage the upper leather is firmly pulled over the last. Before the termination of the rotation of the shaft 4 the levers 28, 37, 39 return to their upper free positions, while the pincer pulling levers 41, 41*a* are held in their lower positions by the pawls 69 which engage in the rack 70.

If the leather is fully stretched before the downward movement of the levers 28, 37, 39 is complete, the fulcrum 29 of the lever 28, which is forcibly urged upwards by the spring 32, yields thus avoiding further movement of the pincers and tearing of the leather. Accordingly as the leather is barely or amply sufficient, the pincer stroke is shortened or lengthened by adjustment of the slide block 36 by moving the adjusting bar 48. The tension of the spring 32 is adjusted by the screw 52 to suit the extremity and strength of the leather to be operated upon. The pressure exerted on the fulcrum of the lever 28 by the tension once set in this way remains substantially constant after adjustment of the slide block 36 to obtain a shorter or longer pincer stroke, owing to the action of the members 58, 57, coupled to the lever 45.

If the leather is not sufficiently firmly pulled over the last after the end of the downward movement of the levers 28, 37, 39, 41, the leather can be additionally stretched by the muscular power of the operator by his depressing the treadle 59; the toe pincers and side pincers can be actuated separately by this treadle action, or all the pincers can be drawn downwards together.

If to save time all pincers are to be closed and moved downwards together in a single operation, the coupling lever 12 is moved out of action by adjusting the rod 14 (Fig. 5). After this adjustment, upon a single depression of the treadle 15 the shaft 4 makes one complete revolution without interruption. In this case the leather is previously introduced into all the pincers at once. Then in a single operation all operations take place without interruption in the following order—closure and pulling of the toe pincers—closure and pulling of the side pincers—further downward movement of all the pincers together.

After the upper leather has thus been satisfactorily pulled over the last, the operator engages a shaft 71 for one revolution by means of a hand lever 80, to effect inward and upward movement of the pincers and tacking to the insole as described and illustrated in the U. S. Patent No. 1,688,556 and the British specification 239,890.

The shaft 71 is coupled through gear wheels 85, 86, 87, 89, with a disc mounted freely on the shaft 1, which disc is coupled to the shaft by upward movement of a rod 84. This upward movement is effected by the hand lever 80 pivoted on a pin 79 the rod 84 being connected to the rear arm 83 of the lever.

In addition on the pin 79 is pivoted an arm 78 which is connected to a tension rod 75 by a pin 77. The latter has a stirrup 74 enclosing the shaft 4. On the stirrup is a roller 73 which co-acts with a cam 72 fast on the shaft 4. The cam imparts a swinging movement to the arm 78 through the rod 75. According to the invention this swinging motion can be transmitted to the hand lever 80 and the coupling rod 84. For this purpose the arm 78 is provided with a removable pin 81 against which bears a downwardly directed arm 82 on the hand lever 80. If the pin 81 is removed the swinging of the parts 75, 78 remains without effect.

A spring 90 acts to urge the rod 84 downwards. In the lowermost position, a roller 93 on one end of an angle lever 92 pivoted at 91 rests in a corresponding recess in a disc 94, the other end of the angle lever having a toothed sector 95 meshing with teeth on the rod 84. If the hand lever 80 is depressed, then simultaneously with the coupling of the shaft 71, the roller 93 reaches the periphery of the disc 94 which maintains the coupling during the rotation of the shaft 71 and at the end of the revolution automatically permits uncoupling.

What I claim is:

1. A pulling over machine having toe and side pincers, a continuously rotating drive shaft, a shaft driven therefrom for power op-

erating the toe and side pincers, means for coupling said shafts constructed and arranged when first operated to actuate said toe pincers and when subsequently operated to actuate the side pincers, means permitting the adjustment of said last mentioned means whereby said coupling means will cause the toe and side pincers to be actuated upon a single operation of said coupling means, means for manually actuating said toe and side pincers either successively or simultaneously, and a separate shaft adapted to be coupled to said drive shaft for returning the pincers to their original open position.

2. In a pulling-over machine a continuously rotating machine-drive, means operated by the attendant for closing and pulling the pincers by muscular power, a shaft to be coupled to the machine-drive for automatically closing and pulling the pincers, and a separate shaft to be likewise coupled to the machine-drive for inwardly moving and releasing the pincers.

3. A pulling over machine having toe and side pincers, a continuously rotating drive shaft, a shaft driven therefrom for power operating the toe and side pincers, means for coupling said shafts constructed and arranged when first operated to actuate said toe pincers and when subsequently operated to actuate the side pincers, and means permitting the adjustment of said last mentioned means whereby said coupling means will cause the toe and side pincers to be actuated upon a single operation of said coupling means.

4. In a pulling-over machine, a motor-driven lever for pulling the pincers, means for adjusting the effective length of the lever, an abutment for the lever, a spring holding the lever upon the abutment, and means for automatically altering the influence of the spring with the adjustment of the effective length of the lever.

In testimony whereof I affix my signature.

KARL WOLLNY.