

R. F. McFEELY.
GRIPPERS.

APPLICATION FILED JULY 27, 1907.

959,874.

Patented May 31, 1910.

2 SHEETS—SHEET 1.

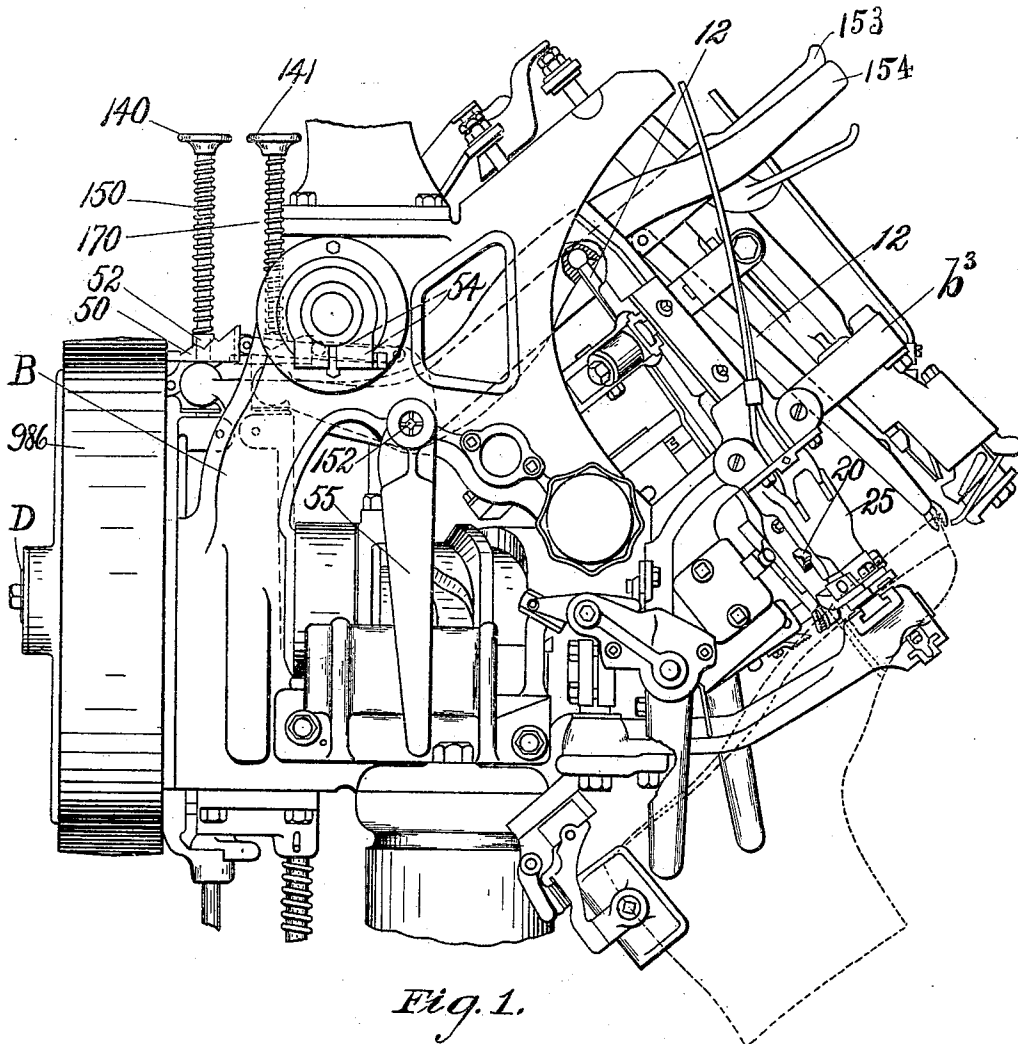


Fig. 1.

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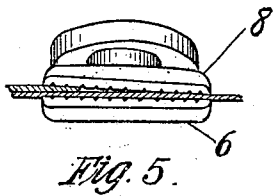
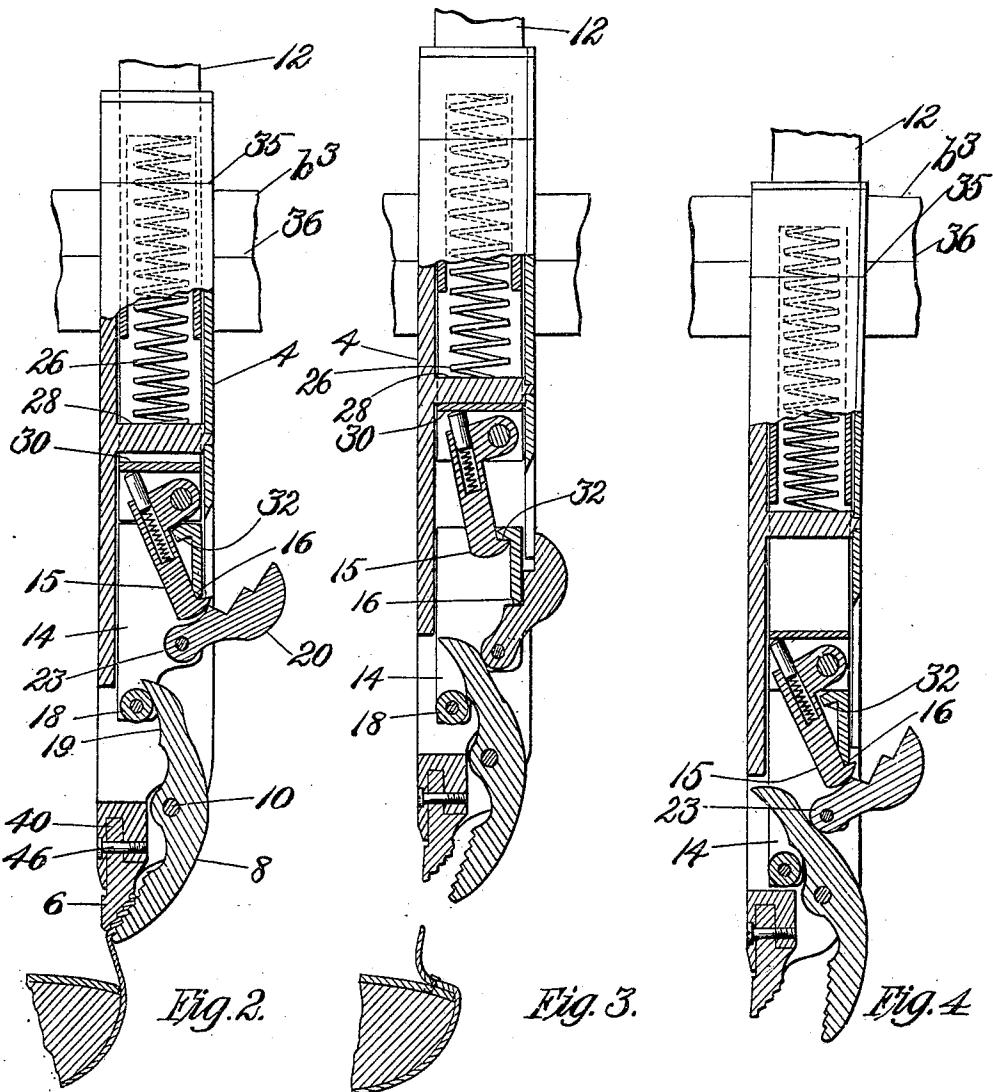


Fig. 5.

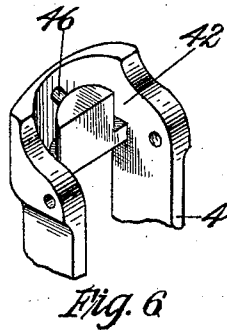


Fig. 6.

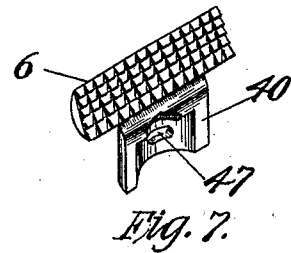


Fig. 7.

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UNITED STATES PATENT OFFICE.

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GRIPPERS.

959,874.

Specification of Letters Patent.

Patented May 31, 1910.

Original application filed October 12, 1906, Serial No. 338,635. Divided and this application filed July 27, 1907. Serial No. 385,805.

To all whom it may concern:

Be it known that I, RONALD F. McFEELY, a citizen of the United States, residing at Beverly, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Grippers, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to grippers such as are used, for example, in machines for working uppers over lasts and has for its object to improve in certain respects gripper mechanisms of this class, the present application being a division of my application Serial No. 338,635, filed October 12, 1906. The invention is herein shown as embodied in grippers which are used in pulling-over machines of the type shown in my pending application Serial No. 149,966. In that machine the grippers after having pulled the shoe upper are arranged to be automatically opened after the upper stretched by them has been clamped to the last by other devices employed for preventing it from slipping back. In practice it is only necessary that the grippers be opened far enough at this time to let the upper escape from between them and it is found that if the grippers are fully opened they sometimes get into the way of other parts of the machine and interfere with the subsequent operations. In accordance with a feature of this invention I provide in a grippers mechanism means to limit the opening movement of the grippers for releasing the stock, combined with means by which the grippers may be further opened for again receiving stock. In the construction of grippers mechanism in which this feature of the invention is shown as embodied the grippers are opened and closed by the coöperation therewith of a longitudinally movable slide which is adapted to engage one side of the movable gripper member for closing the grippers and to engage the opposite side of said member for opening the grippers. The slide has detachable connection with an operating bar by which it is raised for closing the grippers. The machine has provision for automatically impelling the slide downwardly to open the grippers when the slide

is disengaged from the operating bar and I have provided means in the illustrated embodiment of this feature of my invention for limiting this downward movement and thereby limiting the extent to which the grippers are opened. This is accomplished as herein shown by limiting the movement of the slide with relation to the operating bar. During the subsequent operation of the machine the bar and slide are actuated together for further opening the grippers to reëngage stock.

The illustrated machine comprises grippers for engaging the upper of a shoe at the opposite sides of the fore part and also at the toe. It frequently happens that the stock engaged by the side grippers, particularly, is thicker in one part than in another—as, for example, if the grippers engage the upper at the toe tip seam. Under such conditions the relatively thick portion of the stock where the vamp and tip overlap prevents the grippers from securely engaging the thinner portion of the stock so that said thinner portion is not always pulled over into proper position to receive the securing tacks. In accordance with a feature of this invention the gripper members are constructed and arranged for relative movement to enable them to grasp securely stock varying in thickness from one lateral edge of the gripper members to the other lateral edge thereof. In the embodiment of this feature of the invention herein shown one of the gripper members is arranged to have a positioning movement about a center located substantially in its gripping face. Preferably the grippers are constructed with one member movable about an axis extending widthwise of the grippers as usual to grip the stock and the other member movable about an axis substantially perpendicular to the first axis and approximately parallel with the gripping face of said member for movement to vary the relative distance between the gripper members at their lateral edges. This latter movement permits the grippers to hold securely stock varying in thickness from one edge of the grippers to the other edge. Means is preferably provided for limiting the extent of this positioning movement of the gripper member. These and other features of the invention, including certain details of construction and

combinations of parts, will be fully explained in the following description and pointed out in the annexed claims.

In the drawings, which show a preferred form of this invention,—Figure 1 is a side elevation of a pulling-over machine in which the present invention is embodied. Fig. 2 is a side elevation partly in longitudinal section of a pair of grippers, showing the relative position of the several parts when the grippers are holding stock under tension. Fig. 3 is a similar view showing the relative position of the parts when the grippers have been tipped and partially opened to release the stock. Fig. 4 is a similar view showing the relative position of the parts when the grippers have been fully opened to receive the next piece of stock to be gripped. Fig. 5 is a bottom plan view of the grippers closed upon stock, as in Fig. 2, for example. Figs. 6 and 7 are detail perspective views of parts which will be described.

The head B of the machine is supported upon a column and provided with bearings for a driving shaft D driven by a pulley 986 and having connection with the several operating mechanisms of the machine which, except as hereinafter pointed out, will preferably be constructed and arranged substantially as shown and described in detail in my said application. It may be stated that in presenting the shoe to the machine the operator positions it as shown in dotted lines in Fig. 1 with the bottom uppermost against a sole rest and the edge of the upper between the jaws of the grippers of which one is located at each side of the ball of the shoe and one at the toe end of the shoe. The grippers illustrated in Figs. 2-7 for the purpose of explaining the present improvements is one of the side grippers and includes a casing or carrier 4 which supports gripper jaws or members 6 and 8, the latter being pivoted to the carrier at 10 for swinging movement toward and from the gripping face of the member 6. Movable longitudinally within the carrier 4 are the operating bar 12 and the grippers-controlling device 14. The operating bar is provided on its lower end with a spring actuated swinging hook 15 by means of which said bar is detachably connected with the controlling device, the hook engaging a shoulder 16 on said device. The controlling device is provided with a roller 18 arranged to engage with the inclined inner face 19 of the upper portion of the gripper member 8 for rocking said gripper member in the direction for engaging stock. The controlling device also carries a latch 20, the hub 23 of which is arranged to engage the outer inclined face of the gripper member 8 for moving the said member in the direction to open the grippers.

The grippers are closed by connecting the swinging hook 15 with the shoulder 16 of

the controlling device 14 and uplifting the operating bar. In this movement the controlling device is drawn upwardly in the grippers carrier, the roll 18 engaging the gripper member 8 and rocking it to close the grippers. In the further upward movement of the operating bars the grippers are held closed and are lifted by the engagement of said roller with the swinging gripper member 8. When the upper has been pulled and fitted to the last, it is clamped to the last for holding it from backward movement, and the grippers are opened by actuating the latch 20 inwardly to disengage the swinging hook 15 from the controlling device. This may be accomplished in any convenient way but in the machine shown it is done automatically by the engagement with the latch of a swinging arm 25 shown in Fig. 1. A spring 26 is held under compression between a ledge 28 on the grippers carrier and the upper end of a socket formed in the operating bar 12. When the operating bar is disconnected from the controlling device, as just described, the spring 26 impels the grippers carrier downwardly from the position shown in Fig. 2, thus relieving the pull of the grippers upon the shoe upper and also impelling downwardly the controlling device 14 by reason of the engagement of gripper member 8 with the roll 18 of said device. The extent of this downward movement of the grippers carrier by means of the spring 26 is limited by the engagement of the ledge 28 with a cross plate 30 on the operating bar 12. The abruptness with which this downward movement of the grippers carrier is checked insures that the controlling device shall move downwardly with relation to the grippers, thus withdrawing the roller 18 from the inclined rear face of the gripper member 8 and permitting said member to open for releasing the stock. In the downward movement of the controlling device with relation to the grippers the part 23 engages the outer face of the gripper member 8 and turns said member in the direction for opening the grippers. If this movement of the controlling device is unchecked the device may move downwardly to a position shown in Fig. 4, where the grippers are opened widely as is desirable for the insertion of the next stock to be gripped.

In order to prevent unnecessary "sprawling" of the grippers and avoid liability of the swinging gripper member getting into the way of other portions of the machine it is advantageous to prevent the grippers from opening widely until a later period in the machine's operation. For the purpose of limiting the opening movement of the grippers the controlling device 14 is provided with a shoulder 32 arranged to be engaged by the swinging hook 15 after said

hook has been disengaged from the shoulder 16 of said device, as shown in Fig. 3. The controlling device is thus permitted to move downwardly with relation to the grippers 5 far enough to permit the grippers to release the stock, but not far enough to allow the grippers to open fully. Later in the operation of the machine the several parts are restored to position to act upon another 10 shoe and at this time the operating bar 12 is depressed. In this movement the grippers carrier 4 is lowered until the shoulders 35 thereon engage ledges 36 on the portion 3 of the machine frame. When this engagement takes place the downward movement of the grippers carrier is discontinued and the operating bar slides downwardly in the carrier until it engages the upper end of the controlling device and the swinging 20 hook 15 reengages the shoulder 16 of said device. The downward movement on the operating bar then continuing the controlling device is pushed before said bar, causing the part 23 to engage the outer inclined 25 face of the gripper member 8 and fully open the grippers, as shown in Fig. 4.

Sometimes it is desirable to have the grippers grip and pull stock which varies in thickness at different points in the lateral 30 extent of the gripping jaws. This frequently occurs when the side grippers engage the shoe upper in the region of the toe tip seam where the overlapping top tip and vamp form a double thickness of stock, 35 as shown in Fig. 5. In order to enable the gripper to hold firmly the thinner portion as well as the thicker portion of the stock engaged by them one of the gripper members as, for example, the gripper member 40 is movably connected to the gripper carrier to enable it to adapt its position to variations in the thickness of the stock at different portions of the width of its gripping face. As herein shown the gripper member 45 6 is provided with a shank 40 segmental in transverse section and the lower portion of the grippers carrier is provided with a guiding recess 42 shaped to receive this shank and to permit a limited sliding movement 50 of the shank in the direction of the width of the gripping face of the member 6. This lateral positioning movement preferably takes place about a center located approximately in the gripping face of the member 55 6. A retaining screw 46 in the carrier extends through an elongated slot 47 in the shank of the gripper member for holding said member in the guiding recess.

The movement of the operating bars 12 60 for closing and uplifting the grippers is yieldingly effected in the machine herein shown through springs 150, 170 interposed between the levers 153, 154, to which the operating bars are connected, and the cams 65 by which the levers are actuated. The ini-

tial tensions of the springs 150, 170 are determined by the devices 140, 141, which confine the springs in position. It is desirable, however, to adjust the tension of these springs, during the operation of the machine, 70 in accordance with the class of shoes being pulled over or with the quality of the leather of a particular shoe. To this end a notched wedge block 50 is interposed between the rear end of each of the gripper levers 153, 75 154 and the springs 150, 170, a collar 52 being interposed between each spring and the cooperating wedge block and formed to fit the notches in said block. The wedge blocks are each connected by means of links 54 with 80 the upper arm of a lever 55 fulcrumed at 152 and extending into position to be conveniently engaged by the operator while the machine is running, whereby the wedge blocks may be shifted forwardly or back- 85 wardly to increase or diminish the tension of the springs. Preferably the wedge blocks have notches or seats which correspond to the maximum and minimum tension which it is desirable to give the springs 90 and also notches which correspond to one or more intermediate tensions. Preferably also the wedge block cooperating with each of the gripper springs is connected to the same operating lever 55, whereby the tension of 95 all the springs may be adjusted simultaneously. This construction also enables the operator to shift the several wedges for increasing or decreasing the strain on the upper after the grippers have pulled it in 100 their automatic movements. It will be understood that there are three grippers mechanisms, one for the toe and one for each of the opposite sides, although the grippers mechanism and its operating lever and 105 spring located on the right hand side of the machine are hidden in the side elevation of the machine shown in Fig. 1.

The operation of the grippers so far as this invention is concerned has been sufficiently explained in the description of the illustrated construction. 110

Having set forth the nature of the invention and described a preferred embodiment thereof, I claim as new and desire to secure 115 by Letters Patent of the United States.

1. In a machine of the class described, the combination with grippers, and means for opening the grippers to release the stock, of means for limiting the opening movement 120 of the grippers, said machine having provision for further opening the grippers to reengage stock.

2. In mechanism of the class described, the combination with grippers, of a grippers 125 controlling device, means for actuating said controlling device to open the grippers preparatory to engaging stock and for thereafter actuating said device to close the grippers, means to actuate said device for par- 130

tially opening the grippers to release the stock, and means for limiting the latter movement of the grippers.

3. In a machine of the class described, the combination with relatively movable grippers, of automatic actuating mechanism therefor having provision for closing the grippers to engage stock, for opening the grippers a limited distance to release stock, and for subsequently opening the grippers further preparatory to reengaging stock.

4. In a machine of the class described, the combination with grippers, comprising a movable gripper member, and a cooperating gripper member, of a controlling device for engaging the movable gripper member, means for actuating the controlling device to close the grippers for gripping stock, means for actuating the controlling device to open the grippers for releasing stock, and means for limiting the latter movement of the grippers, said machine having provision for further opening the grippers to reengage stock.

5. In a machine of the class described, the combination with grippers, of a controlling device therefor, an operating bar, means for detachably connecting the bar and device, means for actuating the bar and device to close the grippers, means for effecting disengagement of the bar and device, a spring for actuating the device relatively to the bar for opening the grippers, and means for limiting the opening movement of the grippers, said machine having provision for subsequently actuating the controlling device for further opening the grippers.

6. A machine of the class described, comprising grippers, and actuating mechanism for opening and closing the grippers, said mechanism having provision for checking the opening movement when the grippers are partially opened and then continuing the movement to open the grippers fully.

7. In a machine for working an upper over a last, a grippers mechanism comprising cooperating gripper members, and means for actuating them to pull the upper, one of said gripper members being supported for movement relatively to the other gripper member about an axis extending longitudinally of the grippers.

8. In a machine for working an upper over a last, a grippers mechanism comprising cooperating gripper members and means for actuating them relatively to one another about a transverse axis to grip the upper, one of said members being supported to have a positioning movement about a longitudinal axis located between the jaws.

9. In a machine for working an upper over a last, a grippers mechanism comprising cooperating gripper members, and means for actuating them to pull the upper,

one of said gripper members being supported for angular movement laterally in a predetermined path relatively to the other gripper member to adapt its position to the thickness of the gripped stock at different points in the width of the grippers.

10. A machine for pulling-over a shoe having, in combination, grippers arranged at opposite sides of the shoe in position to grip the upper at and adjacent to the toe tip seam, and means for actuating the grippers to seize and pull the upper, said grippers comprising cooperating jaws one of which is supported to have an angular positioning movement relatively to the other jaw and independent of its gripping movement to adapt the grippers to hold firmly the relatively thick stock at the seam and the thinner stock adjacent to the seam.

11. In a machine for working an upper over a last, the combination with a gripper member, of a cooperating gripper member movable toward and from the first member, and means for actuating the gripper members to engage and pull the upper, of supports for said gripper members, and a connection between one of said members and its support constructed and arranged to permit said member to be positioned in different angular relations to the cooperating member by movement about an axis extending in the direction of the pull.

12. In a machine for working an upper over a last, the combination with cooperating gripper members, and means for actuating them to engage and pull the upper, of supports for the gripper members, one of said supports having a grooved guideway in which the gripper member carried thereby is mounted for movement rotatively to position itself with relation to the other gripper member in accordance with the thickness of the gripped stock at different points.

13. A machine for working an upper over a last, having in combination cooperating gripper members constructed and arranged for relative angular movement in the direction of their widths from one lateral edge to the other said movement taking place about an axis located at the inner side of the plane of the gripping face of the angularly moving member to adapt themselves to the varying thickness of different portions of the upper gripped by them, and means for actuating the grippers toward each other to grip the upper.

14. A machine of the class described, comprising gripper members relatively movable for gripping stock and relatively movable in a path of predetermined direction extending transversely of the direction of said first-mentioned movement for adapting themselves to the thickness of the gripped stock at different points.

15. In a pulling-over or like machine, the

combination with grippers and automatic means for opening the grippers to a relatively great extent to receive stock, of means that for the purpose described are adapted at times to stop the grippers from opening to such extent but permit them to open sufficiently to release stock.

16. In a pulling-over or like machine, the combination with grippers, of automatic actuating mechanism therefor, said mechanism having provision for closing the grippers to engage stock, for opening the grippers a definite distance to release stock and for subsequently opening the grippers fully to reengage stock.

17. In a pulling-over or like machine, the combination with grippers and a controlling device therefor that has movement relatively to the grippers to open them to receive stock, of means that cause such movement to take place in two steps whereby the grippers are first opened slightly to release stock and are subsequently opened widely to reengage stock, with means for permitting reversal of such movement in one step to close the grippers.

18. In a pulling-over or like machine, a grippers mechanism comprising grippers, a controlling device therefor, an operating bar, means for actuating the operating bar and device to close the grippers, means for disengaging the bar and device, and a spring for moving the device relatively to the bar for opening the grippers, in combination with means for limiting the opening move-

ment of the grippers and means for further opening the grippers.

19. In a pulling-over or like machine, a grippers mechanism comprising cooperating gripper members and means for actuating them to grip stock, one of said members being supported to having an additional positioning movement about a center located between the jaws.

20. In a pulling-over or like machine, a grippers mechanism comprising cooperating gripper jaws one of which is pivoted, an operating bar, a hook on the bar, and a controlling device arranged to be engaged by the hook, said device comprising means for engaging the pivoted jaw to open and close it, means to be engaged by the hook to position it for closing the jaw, and means to be engaged by the hook for positioning it to open the jaw a limited distance.

21. In a pulling-over or like machine, a grippers mechanism comprising cooperating gripper jaws one of which is pivoted, an operating bar, a hook on the bar, and a controlling device arranged to be engaged by the hook and including a shoulder and latch.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RONALD F. McFEELY.

Witnesses:

CHARLES H. HOYT,
ARTHUR L. RUSSELL.