

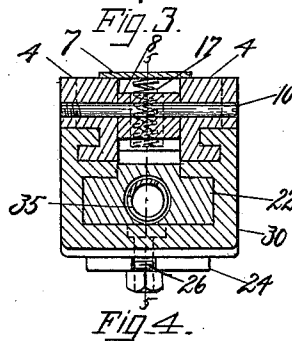
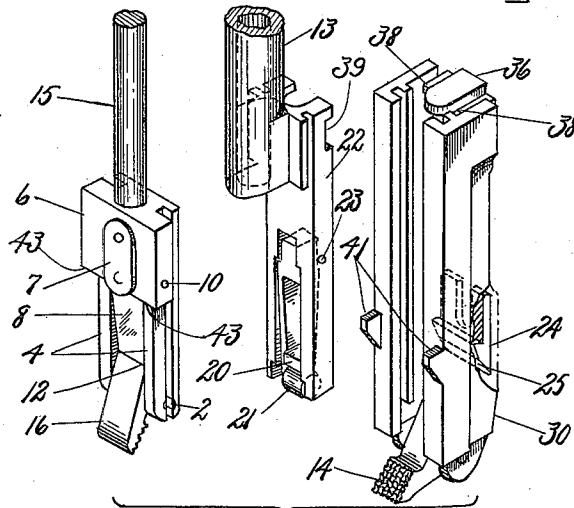
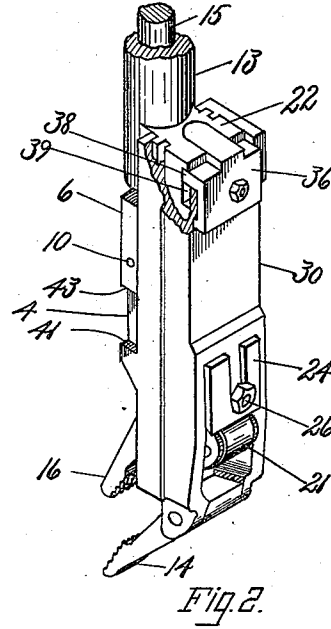
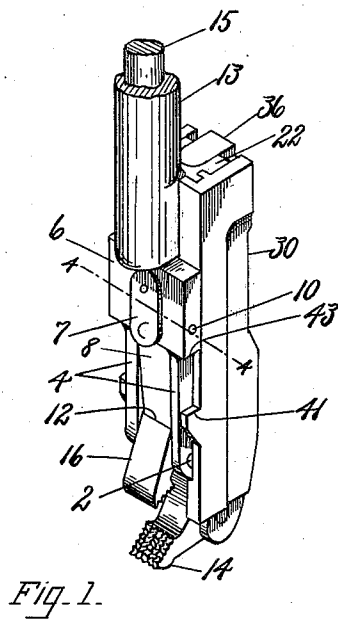
R. F. McFEELY.
GRIPPER.

APPLICATION FILED JUNE 19, 1905.

1,014,835.

Patented Jan. 16, 1912.

3 SHEETS-SHEET 1.



WITNESSES.
Charles E. Grush.
Arthur L. Russell.

INVENTOR.
Ronald F. McFeely

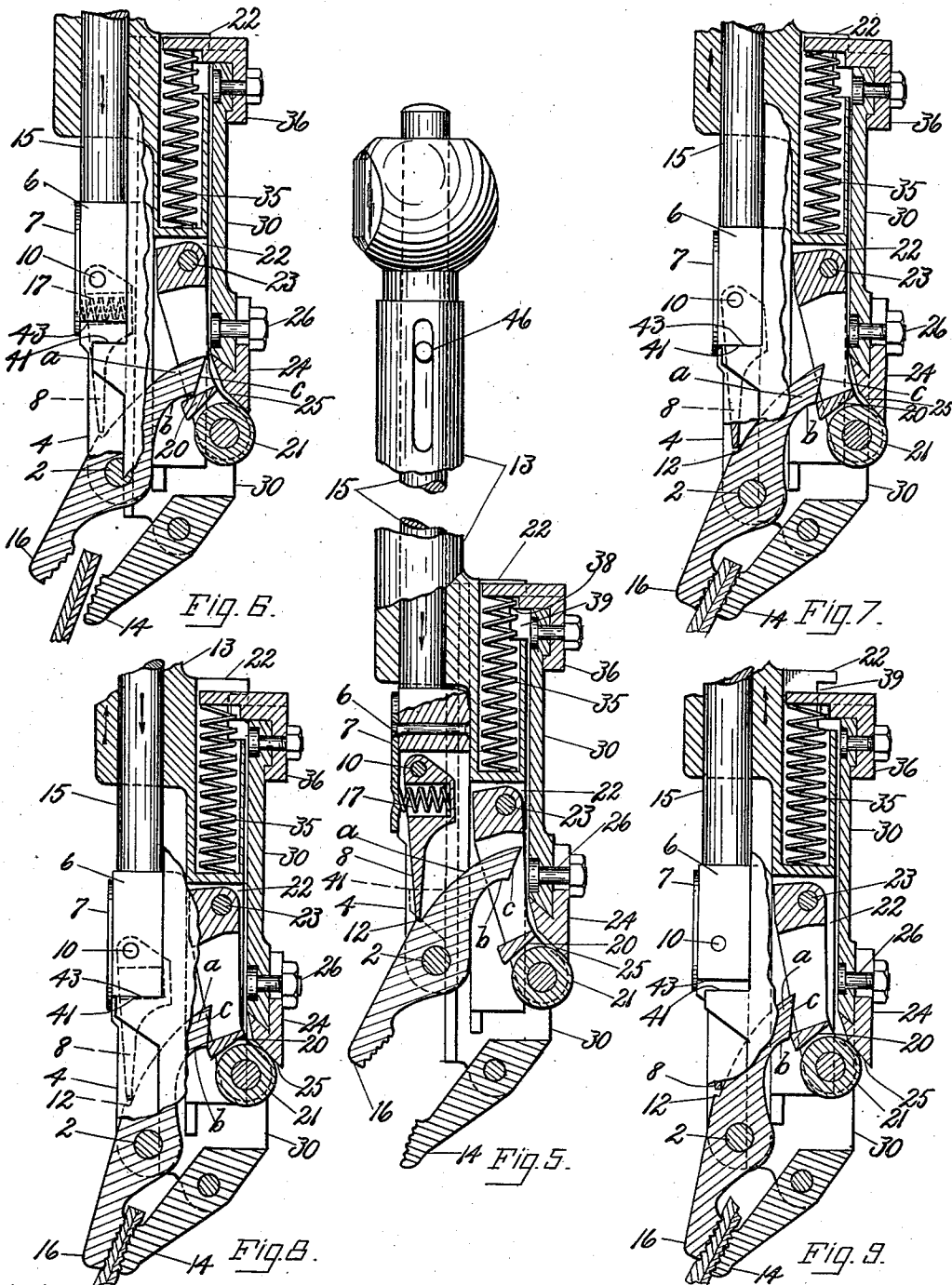
R. F. McFEELY.
GRIPPER.

APPLICATION FILED JUNE 19, 1905.

Patented Jan. 16, 1912.

3 SHEETS-SHEET 2.

1,014,835.



WITNESSES.
Charles E. Grubb.
Arthur L. Russell

INVENTOR.
Ronald F. McFeely

R. F. McFEELY.
GRIPPER.

APPLICATION FILED JUNE 19, 1905.

Patented Jan. 16, 1912.

3 SHEETS—SHEET 3.

1,014,835.

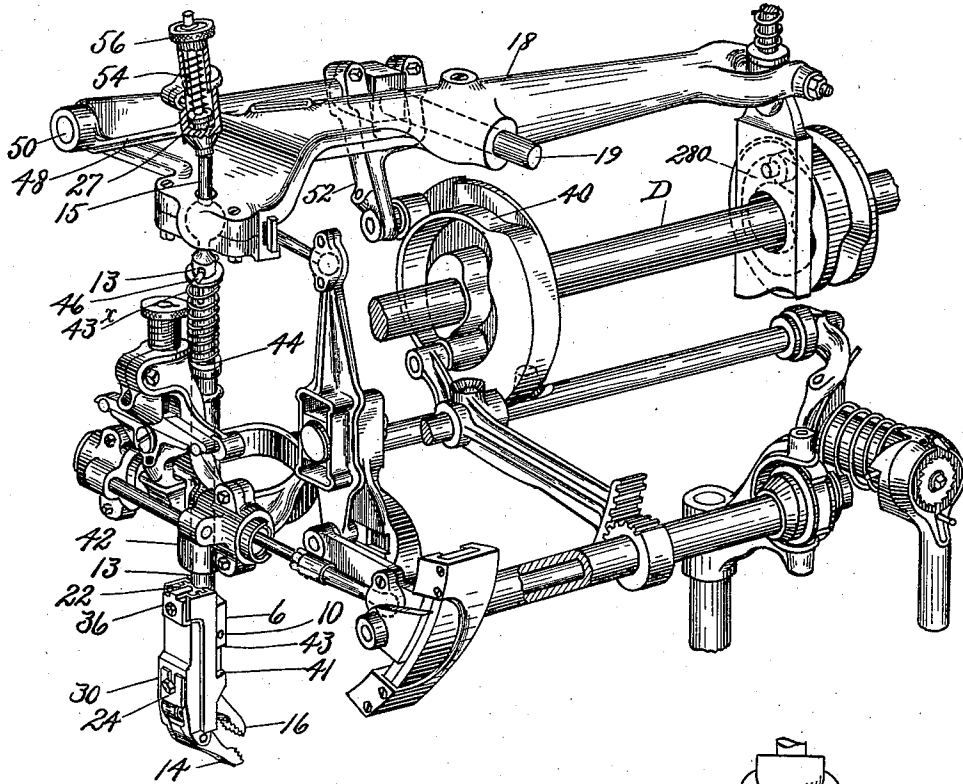


Fig. 10.

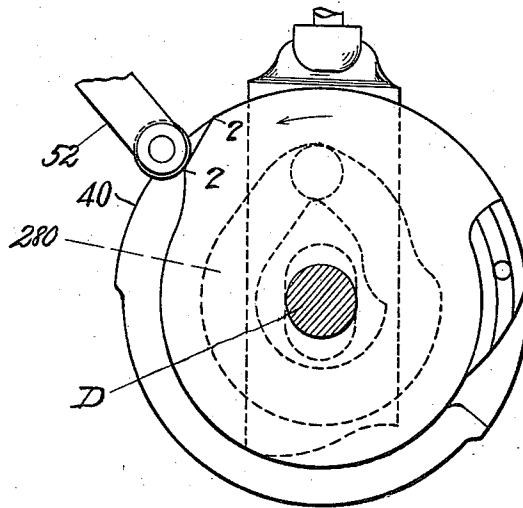


Fig. 11.

WITNESSES.

Charles E. Smith.

Arthur R. Russell.

INVENTOR.

Ronald F. McFeely

UNITED STATES PATENT OFFICE.

RONALD F. McFEELY, OF BEVERLY, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

GRIPPER.

1,014,835.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Application filed June 19, 1905. Serial No. 265,924.

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 and is herein described and shown as embodied in a grippers mechanism which is adapted for use in machines for working the uppers of boots and shoes over lasts, and particularly in machines of the type known as the "hand method lasting machine," an example of which is shown in United States Letters Patent No. 584,744, of June 15, 1897.

A feature of the invention consists in a novel construction of grippers and their actuating mechanism. One of the advantages of this construction is that the grippers will grip positively and with the same force stock varying greatly in thickness. This capacity of the grippers to adapt themselves to different thicknesses of stock is of great importance in lasting machines of the type mentioned which act on different portions of the upper successively, because the thickness of stock at the side of the shoe, where it usually comprises merely the vamp and lining, is very much less than the thickness of stock at the toe of the shoe, where it often comprises also a toe cap and one or more layers of stiffening material.

Another feature of the invention consists in grippers which are securely locked after having gripped the stock whatever may be the relative positions of the gripper members determined by the thickness of the stock gripped. In the illustrated embodiment of these features of the invention the force with which the gripper members are pressed together for holding the stock, whatever its thickness, increases as the force applied in pulling the stock is increased, so that all danger of the stock being drawn from between the grippers by severe pulling is avoided.

A further and very important feature of

the invention consists in grippers for pulling stock comprising jaws or members which are relatively movable, during the pulling operation, substantially in the plane of the gripped stock or approximately in the direction of the pull of the stock being strained.

It is, of course, well known that the leather of a shoe upper is much more elastic than the lining and stiffening materials, which latter sometimes include a sole leather "box" applied at the toe, and the unequal stretching of the upper leather and the other materials makes it difficult to fit the upper properly to the last without unduly straining the lining and pulling the stiffening material out of proper position. To overcome this difficulty I have in the present embodiment of my invention mounted the gripper member which engages the inner or lining side of the stock so that it may move substantially in the plane of the gripped stock during the movement of the grippers for pulling the stock. In the construction shown as embodying the invention two gripper members are employed which are arranged for relative movement approximately longitudinally of their gripping faces from an extended position, in which the stock to be gripped may be inserted, to a position in which their gripping faces are approximately opposite to each other. Preferably the gripper members are relatively moved laterally toward each other for causing them to embrace the stock during the latter part of the longitudinal movement. The final closing of the grippers is then effected by a relative lateral movement of the gripper members without longitudinal movement, and this final lateral movement is produced by a device which will be herein referred to as the "closing device." The closing device is moved for this purpose between one of said gripper members and a cooperating wedging face and is thereafter held between said parts for locking the gripper members in closed relation while the grippers mechanism is lifted for pulling the stock. The lifting of the grippers for pulling the stock is effected through the same device which is instrumental in closing and locking the grippers,

whereby said device is pressed continuously between said wedging faces and the gripper members are held closed and locked by a force proportional to the pull upon the stock. As illustrated, one of the gripper members is formed as a lever arranged to rock for moving its gripping face toward and from that of the cooperating gripper member and said rocking member is mounted for longitudinal movement from the extended position described to a position with its gripping face opposite to that of the other gripping member.

A further feature of the invention consists in providing a grippers mechanism having means for gripping a plurality of thicknesses of stock and constructed and arranged to hold one of the thicknesses of stock more securely than another thickness or to apply to one thickness of stock in a pulling operation a greater pulling tension than to another thickness of the stock. In the illustrated embodiment of the invention the gripper member which engages the inner or lining side of the stock, if the work being operated upon is a shoe upper, is connected to the lifting bar of the grippers actuating mechanism by a supporting slide which is movable in the direction of the pull of the stock during the uplifting of the grippers. The slide and its gripper member are yieldingly held normally in their uppermost position with relation to the other gripper member, but are permitted to move downwardly relatively to the other gripper member when the tension of the shoe lining or other layer of stock engaged by the slidably supported gripper member exceeds the resistance to the downward movement of the slide. By this arrangement the upper may be stretched to conform to the shape of the last without tearing the lining or pulling the stiffening materials out of position. It is important that the relative longitudinal movement of the gripper members during the pulling operation shall not cause any relaxation of the grip of said members upon the stock, and it is also desirable that the resistance to this relative longitudinal movement of the gripper members shall vary as the force varies which is exerted in lifting the grippers, whereby different degrees of strain may be applied to the lining materials as well as to the upper. Both of these objects are attained in this present construction by arranging the closing device for movement transversely of the grippers as well as longitudinally thereof and by providing the slide which carries the longitudinally yielding gripper member with the wedging face before described as cooperating with said closing device, said wedging face being so formed that as the slide of this gripper member moves downwardly with relation to the other gripper

member the closing device will be actuated laterally not only to maintain but preferably also to tighten the grip on the stock. This insures that there shall be no relaxation of the grip on the stock during the downward movement of the longitudinally yielding gripper member with relation to the other gripper member, and further that such relative downward movement shall take place against the resistance occasioned by tightening the grip on the stock. A returning spring is arranged to add to this resistance to the relative downward movement of the longitudinally yielding gripper member and to restore said member to normal position when the stock has been released.

Other features of the invention, including details of construction and combinations of parts, will be hereinafter described and pointed out in the claims.

Figure 1 is a perspective view of a preferred construction of grippers mechanism embodying the present invention, as seen from the front side. Fig. 2 is a perspective view of the grippers mechanism as seen from the rear side. Fig. 3 is a detail view showing the parts of the grippers mechanism separated. Fig. 4 is a transverse section on the dotted line 4—4 of Fig. 1. Fig. 5 is a longitudinal section of the grippers mechanism on the dotted line 5—5 of Fig. 4, this view showing the grippers in their extreme open position and including the operating bars by which the grippers are closed and lifted. Fig. 6 is a similar view showing the grippers at the time when the rocking gripper member has been moved downwardly into position to be turned for engaging the stock. Fig. 7 is a similar view showing the rocking gripper member as having completed its downward movement with relation to the other gripper member and as having been rocked into engagement with the stock to be gripped. Fig. 8 is a similar view showing the grippers in the position assumed when the final closing of the grippers has been effected by the completion of the turning of the rocking member, this closing movement having been produced by a relative upward movement of the grippers-locking device. Fig. 9 is a similar view showing the relative position of the several parts of the mechanism at the time when the lifting of the grippers has been effected for pulling stock comprising layers of material of different degrees of elasticity, such as the upper and lining of a shoe. Fig. 10 is a perspective view of the grippers and the grippers actuating mechanism of a lasting machine. Fig. 11 is a detail view illustrating the relation of the cam paths which effect the closing and lifting of the grippers.

The grippers mechanism in which the invention is shown as embodied comprises

members 14 and 16 which are connected respectively to the bars 13 and 15, the bar 13 being provided with a guideway to receive the bar 15. The bars 13 and 15 are relatively moved longitudinally by suitable means for effecting the closing and opening of the grippers, a particular mechanism especially adapted to cooperate with the bars for actuating the grippers being hereinafter described. As herein shown, the gripper member 14 is mounted on the bar 13 to permit relative longitudinal movement of said member and bar, while the gripper member 16 is mounted on the bar 15 to permit rocking movement for carrying the gripping face or jaw of said member laterally toward and from the gripping jaw of the cooperating member for gripping and releasing the stock. The term "longitudinally" is herein used, in referring to the movements of the parts of the grippers mechanism, to define a movement approximately in or parallel with the gripping plane, while the term "laterally" is employed to indicate a movement transversely of the gripping plane. The gripper member 16 is shown as a lever pivoted above its gripping face at 2 to the side portions 4 of a forked head 6, which is formed on or secured to the lower end of the bar 15. A spring-pressed plate or finger 8 is pivoted at 10 to the head 6 and engages the upper arm *a* of gripper member 16 for rocking and holding the gripping jaw of said member normally away from the cooperating jaw of gripper member 14. A spring 17 for actuating the finger 8 is confined in a seat in the finger by a cap secured to the head 6. The gripper member 16 is preferably provided with a stop shoulder 12 located in position to engage the lower end face of the finger 8 for limiting the rocking movement effected by said finger, as shown most clearly in Fig. 5. The gripper member 14 is rigidly secured to a supporting slide 30 which is mounted on a laterally-offset extension 22 of the bar 13 to permit relative longitudinal movement of the bar with relation to the slide and gripper member 14. The slide is normally pressed upwardly by a spring 35 located in a socket in the extension 22 and acting at its upper end against a cap plate 36, removably secured to the slide and having a portion extending over the upper end of the spring. The cap plate is also provided with a lug 38, as shown in Fig. 2, which extends into an elongated notch 39 in the adjacent face of the extension 22, said lug and notch limiting the relative movement of the slide 30 and bar 13. Between the slide and the upper arm *a* of the gripper member 16 is located a device 20, herein sometimes designated as the "closing device," which is unyieldingly con-

nected to the extension 22 of the bar 13, in the illustrated embodiment of the invention. Said device 20 is adapted to be engaged by the inner side of the upper arm *a* of the gripper member 16, said inner side of arm *a* being preferably provided with inclined faces *b* and *c*, as shown, whereby said gripper member is rocked during its downward movement for swinging its gripping jaw toward that of the cooperating member 14 to embrace the stock to be pulled. The device 20 is engaged on the side opposite the gripper member 16 by the inclined face 25 of a block 24 adjustably secured by the bolt 26 to the slide 30. When the device 20 is moved upwardly it is wedged between the inclined face 25 and the arm *a* of gripper member 16, thereby rocking said gripper member for closing the grippers and locking them, and as the gripper member 14 and the slide 30 are moved downwardly with relation to said device 20, as hereinafter described, the device is automatically forced laterally by the inclined face 25 for further rocking the gripper member 16 and holding it in gripping engagement with the stock. As shown, the closing device 20 is provided with an anti-friction roll 21 for engaging the inclined face 25 and said device is cut away between its ends to receive the upper portion of gripper member 16. The particular construction and arrangement of the closing device, however, may be varied as desired.

In the operation of the grippers the gripper member 16 is held by the finger 8 in the angular relation shown in Fig. 5 while said member is moved downwardly from the position shown in Fig. 5 to the position shown in Fig. 6. As the gripper member continues its downward movement the face *b* meets the closing device 20, which causes the gripper member to be rocked for swinging its gripping jaw rapidly toward the jaw of member 14 for embracing the stock, as shown in Fig. 7, and as the jaw closes the face *b* rides off from the device 20 and face *c* comes into engagement with said device. Approximately at the time the position of the parts is reached which is shown in Fig. 7 shoulders 43, which are formed on the head 6 of the bar 15, engage shoulders 41 formed on the slide 30. The engagement of these cooperating shoulders causes the slide 30 and gripper member 14 to accompany the bar 15 and gripper member 16 in any further downward movement said bar 15 may have relatively to the bar 13 and closing device 20. In such movement of the two gripper members with relation to the closing device, which is unyieldingly connected to the bar 13, the inclined face 25 on the slide forces the closing device laterally against the face *c* of the gripper member 16 and rocks the

gripping jaw of said member sharply toward the other member 14 for finally closing and firmly gripping the stock. It will now be understood that during the downward movement of the gripper member 16 said member is rocked into the position shown in Fig. 7, thus closing the grippers enough to embrace loosely stock of any thickness. The final closing is then effected by a movement of the closing device relatively to both gripper members without any further longitudinal movement of the gripper members with relation to each other. In this movement for finally closing the grippers the device 20 moves more or less between the regularly inclined faces 25 and *c* of the block 24 and the gripper member 16 and therefore acts with the same efficiency for closing and locking the grippers without regard to the extent of such movement determined by differences in thickness of stock. It will, therefore, be understood that the grippers will operate exactly as well upon stock of one thickness as upon stock of a different thickness. It is to be noted that the movement for finally closing the grippers is a relative longitudinal movement of the gripper members and the device 20 and may be effected either by continuing the downward movement of the bar 15 or by upwardly actuating the bar 13, to which the device 20 is attached, or, it may be, by a combination of these two movements in reverse directions, according to the particular arrangement or adjustment of the grippers actuating mechanism employed. Preferably the downward movement of the bar 15 will be discontinued at the time the shoulders 43 and 41 engage, or shortly thereafter, and the bar 13 will at that time begin to rise, pulling the device 20 upwardly between the inclined faces 25 and *c*. By this means I insure that the final closing of the grippers will be effected by a lateral rocking of the movable gripper member unaccompanied by any longitudinal movement of either gripper member with relation to the other.

I have shown in Figs. 10 and 11 a grippers actuating mechanism with which the grippers above described are especially adapted for use and will briefly describe this mechanism in order that the preferred operation of the grippers may be better understood. When this actuating mechanism is employed the grippers mechanism as a whole is lowered into gripping position and, after having gripped the stock, is lifted for pulling the stock by a lever 18 which has connection at its front end with the spherical head of the bar 13 and is fulcrumed at 19 on the machine frame, the lever being yieldingly actuated through a connection at its rear end with a groove cam 280 on the shaft D of the machine. The bars 13 and 15, arranged as described, with the bar 15 extend-

ing longitudinally through the bar 13, are guided by a sleeve 42, which is supported by means not necessary to consider in this connection, but which is fully described in said Letters Patent No. 584,744. The bar 15 and the gripper member 16 are normally held in their most elevated position with relation to the gripper member 14 by a spring 43*, which rests at its lower end on a collar 44 fast on the bar 13 and pressed upwardly against a cross pin 46 carried by the bar 15 and projecting through slots in the bar 13. The bar 15 extends upwardly through and above the spherical head of the bar 13 and the downward movement of said bar 15 and gripper member 16 is effected through a spring-pressed plunger 27 carried on one arm 48 of a rockshaft 50, journaled in a bearing in the lever 18, the other arm 52 of which rockshaft is engaged by a face cam 40 on the shaft D. Said rockshaft 50 is herein shown as mounted in bearings on the lever 18. The tension of the spring 54, which acts on the plunger 27, may be adjusted by a screw cap 56. The cams 280 and 40 are timed with relation to each other, as indicated by their relative positions in Fig. 11, so that the grippers-depressing cam 280 reaches its point of maximum throw and begins to move the grippers mechanism upwardly while the closing cam 40 has yet a rise 2—2 to traverse, whereby the force applied to the bar 15 through the spring 54 for moving or holding the grippers pressed down increases during the first portion of the upward pull on the bar 13, which, it will be recalled, is unyieldingly connected to the device 20 and is yieldingly connected to the gripper member 14. By this arrangement the bar 13 is updrawn for wedging the closing device 20 between the inclined faces 25 and *c* for effecting the final closing movement of the gripper member 16, as shown in Fig. 8, while the bar 15 is held down with an increasing pressure until the grippers have firmly gripped the stock, and then, the pressure on the bar 15 continuing uniform, the upward pull on the bar 13 and device 20 uplifts the grippers and strains the stock. As the upward pull on the device 20 continues during the updrawing of the stock said device becomes wedged more and more tightly between the inclined faces 25 and *c*, whereby the gripper members are held and locked upon the stock with a force which increases as the upward pull on the stock becomes greater, this force being, however, the same for any thickness of stock.

It will now be understood that in closing the grippers the member 16 is given first a longitudinal movement downwardly until it reaches a position nearly opposite the member 14 and then it is rocked rapidly toward the member 14 as its relative downward movement is continued and it is caused

to embrace the stock, as shown in Fig. 7. At this point in the operation the shoulders 43 and 41 come into engagement and then occurs a movement of the two gripper members with relation to the closing device 20, said device 20 being preferably the part which is actually moved, or the gripper members and the device 20 may be moved in opposite directions, the gripper members moving downwardly and the device 20 moving upwardly. In this relative movement the device 20 is drawn upwardly between the inclined face 25 on the slide and the face *c* of gripper member 16 and wedges these faces apart for firmly closing and finally locking the grippers upon the stock, as shown in Fig. 8. During the continued upward movement of the bar 13, caused by the rocking lever 18, the grippers mechanism will be lifted, the lifting force being applied to the gripper members through the device 20, which constantly tends to wedge the faces *c* and 25 farther apart so that the force with which the said members grip the stock is increased as the pulling strain is increased. It will be recalled that the gripper member 14, which, when the grippers are employed for lasting shoes, engages the lining material of the shoe, is longitudinally movable on the bar 13 with the slide 30. When the stock is being pulled said slide and gripper member 14 are upheld or restrained from yielding downwardly by the engagement of face 25 with the device 20 and also by the comparatively light spring 35. This arrangement enables the gripper member 14 to yield downwardly with relation to the member 16 under heavy pulling strains and thereby compensate for lack of elasticity of the lining material as compared with the elasticity of the leather. In this downward movement of the gripper member 14 and slide 30 with relation to the member 16 the inclined face 25 forces the device 20 laterally against the face *c* of gripper member 16 so that the grip on the stock is not permitted to slacken, but in fact may be actually increased, thus avoiding the possibility of the stock pulling out from between the grippers. The force with which the closing device is wedged between the face *c* of gripper member 16 and face 25 on the slide 30 varies with the force exerted in uplifting the grippers to pull the stock. It will, therefore, be apparent that the resistance offered by the closing device to the relative downward movement of the gripper member 14 and its slide 30 will vary according to the uplifting force applied in pulling the stock. This insures that the force with which the lining of a shoe is pulled shall vary approximately as the force applied for uplifting the grippers.

Having explained the nature of my invention and described a mechanism embody-

ing the invention in the best form now known to me, I claim as new and desire to secure by Letters Patent of the United States:—

1. In a grippers mechanism, the combination with a gripper member and a cooperating gripper member with relation to which the first-mentioned member is arranged to rock, of means for moving said rocking gripper member longitudinally toward the cooperating gripper member, a closing device movable laterally with relation to said cooperating gripper member, and other means for actuating the closing device to swing said rocking gripper member toward the cooperating gripper member.

2. In a grippers mechanism, the combination with a plurality of gripper members, of means for relatively moving the gripper members longitudinally, a closing device substantially stationary during said longitudinal movement, and means independent of the gripper members for relatively actuating the closing device and one of said gripper members to swing that gripper member laterally toward the other gripper member.

3. In a grippers mechanism, the combination with a plurality of gripper members, of means for relatively moving said gripper members longitudinally to position their gripping faces approximately opposite each other, a closing device, and means arranged to remain inoperative until after the gripping faces have assumed this relation for actuating the closing device relatively to the gripper members for moving said gripping faces from a position approximately opposite each other into a position in holding engagement with the work.

4. In a grippers mechanism, the combination with a plurality of gripper members, of means for relatively moving said gripper members longitudinally to position their gripping faces approximately opposite each other, a closing device for engaging one of said gripper members, and means independent of the means which effects said relative longitudinal movement of the gripper members for actuating said closing device laterally to close the grippers.

5. In a grippers mechanism, the combination with a rocking gripper member and a cooperating gripper member, of a closing device for engaging said rocking gripper member, means for relatively moving the rocking gripper member and the closing device lengthwise of the grippers mechanism, and automatic means for actuating said closing device laterally to turn the rocking gripper member toward the cooperating member for gripping the stock.

6. In a grippers mechanism, the combination with a rocking gripper member having an inclined face and a cooperating grip-

per member, of a closing device movable relatively to said gripper members and adapted to engage said inclined face, and means for lifting the gripper mechanism having provision for automatically moving said closing device longitudinally and laterally for actuating the rocking gripper member toward the cooperating gripper member.

7. In a grippers mechanism, the combination with a plurality of gripper members, one of said gripper members having an inclined face, of means for relatively moving said gripper members longitudinally to position their gripping faces approximately opposite each other, a closing device for engaging said inclined face, and means to actuate the closing device after said relative longitudinal movement of the gripper members for imparting to the gripper members a relative movement in a different direction to grip the stock.

8. In a grippers mechanism, the combination with a plurality of gripper members, one of said gripper members having an inclined face, of means for relatively moving said gripper members longitudinally to position their gripping faces approximately opposite each other, a closing device normally inactive but arranged for engaging said inclined face when the gripping faces are opposite each other, and other means for relatively actuating longitudinally said closing device and the gripper member having the inclined face whereby one of said gripper members is moved laterally for closing the grippers.

9. In a grippers mechanism, the combination with a rocking gripper member and a cooperating gripper member, of a closing device, means for actuating the rocking gripper member relatively to the cooperating gripper member and relatively to the closing device for positioning its gripping face substantially opposite that of the cooperating gripper member, and means for then reversely actuating the closing device with relation to the two gripper members for causing them to grip the work.

10. In a grippers mechanism, the combination with a rocking gripper member and a cooperating gripper member, of a closing device, an adjustable block connected with one of said gripper members and having an inclined face, and means for wedging the closing device between said inclined face and the other gripper member whereby the rocking gripper member is actuated into engagement with the work to be gripped.

11. In a grippers mechanism, the combination with a rocking gripper member and a cooperating gripper member, of a closing device, means for actuating one of said gripper members longitudinally with relation to the other gripper member toward gripping

position, and means whereby the closing device is moved at substantially right angles to the movement of the gripper members for closing the grippers.

12. In a grippers mechanism, the combination with a rocking gripper member and a cooperating gripper member, of a closing device, means for actuating one of said gripper members longitudinally with relation to the other gripper member and the closing device to bring said gripper member into gripping position and partially close it, and means for actuating the closing device for closing the grippers.

13. In a grippers mechanism, the combination with a plurality of gripper members and a closing device, of means for actuating one of said gripper members longitudinally to position its gripping face opposite to the gripping face of the other gripper member, and other means for actuating the closing device laterally for relatively moving said gripper members to close the grippers.

14. In a grippers mechanism, the combination with a plurality of gripper members and a closing device, of means for moving one of said gripper members longitudinally with relation to the closing device and the other gripper member for positioning its gripping face substantially opposite the gripping face of said other gripper member, and means adapted to cause said other gripper member to move longitudinally with the first member but relatively to the closing device for gripping the work.

15. In a grippers mechanism, the combination with a plurality of gripper members and a closing device, of means for moving one of said gripper members longitudinally with relation to the closing device and the other gripper member for positioning its gripping face substantially opposite the gripping face of said other gripper member, and means for thereafter moving the closing device relatively to said two gripper members for closing the grippers.

16. In a grippers mechanism, the combination with a plurality of gripper members and a closing device of means for moving one of said gripper members longitudinally with relation to the closing device and the other gripper member for positioning its gripping face substantially opposite the gripping face of said other gripper member, means adapted to cause said other gripper member then to move with the first gripper member, and means for simultaneously moving the closing device in the opposite direction whereby the grippers are closed.

17. In a grippers mechanism, the combination with a plurality of gripper members arranged for relative longitudinal and lateral movements for closing upon stock, of

means for relatively moving said gripper members longitudinally without substantial lateral movement into position approximately opposite each other, and means which has been previously inactive for then relatively moving said gripper members laterally to grip the stock.

18. In a grippers mechanism, the combination with a rocking gripper member and a cooperating gripper member, of means for actuating the rocking gripper member longitudinally only and then longitudinally and laterally into gripping position, and means for then actuating said rocking gripper member laterally without longitudinal movement for closing the grippers.

19. In a grippers mechanism, the combination with cooperating gripper members, of means for relatively actuating said gripper members longitudinally into gripping position, means whereby further relative longitudinal movement is prevented, means for relatively moving said gripper members laterally to grip the stock, and means for moving the gripper members together longitudinally in a reverse direction to pull the stock.

20. A grippers mechanism comprising gripper members arranged for independent movement in substantially the plane of the gripped stock while the stock is being pulled in a right line.

21. A grippers mechanism comprising cooperating gripper members arranged for independent movement in substantially the plane of the gripped stock while the stock is being pulled, said mechanism having provision for tightening the grip upon the stock during said movement.

22. A mechanism for working an upper over a last comprising a gripper member for engaging the upper, and a cooperating gripper member adapted to engage the lining material and arranged for movement relatively to the upper-engaging gripper member substantially in the plane of the stock while the stock is being pulled, the movement of said gripping member engaging the lining being in a direction to decrease the pull on the lining with relation to the pull exerted on the upper.

23. In a mechanism for gripping and pulling stock comprising a plurality of plies, the combination with cooperating gripper members, of actuating mechanism therefor arranged to permit the gripper members to have independent longitudinal movement while holding the plies engaged by the respective gripper members against movement with relation to the engaging surfaces of the gripper members.

24. In a mechanism for gripping and pulling stock, the combination with cooperating gripper members one of which is yieldingly supported, of actuating mechanism

therefor having provision for allowing the yieldingly supported gripper member to move relatively to the other in substantially the direction of the pull of the stock during the operation of said actuating mechanism.

25. In a mechanism for gripping and pulling stock, the combination with actuating means, of a gripper member arranged to be positively lifted by said actuating means, and a gripper member connected to said means for movement with relation thereto in substantially the plane of the gripped stock during the lifting movement of said actuating means.

26. In a mechanism for gripping and pulling stock, the combination with a plurality of gripper members, and actuating mechanism for closing and lifting the grippers, of a connection between one of said gripper members and the actuating mechanism to permit said gripper member to yield downwardly relatively to the other gripper member in substantially the plane of the gripped stock while the stock is being pulled.

27. In a mechanism for gripping and pulling stock, the combination with cooperating gripper members, of actuating means, connections by which one gripper member is positively lifted by said actuating means, and yielding connections between said means and the other gripper member whereby said last-mentioned gripper member may move relatively to the other gripper member during the pulling of the stock.

28. In a mechanism for gripping and pulling stock, the combination with lifting means, a support yieldingly mounted thereon, and a gripper member carried by said support, of a cooperating gripper member, means for relatively actuating the gripper members to grip the stock, and means for actuating said lifting means to pull the stock, said yielding support permitting the gripper member carried by it to yield with relation to the other gripper member while the stock is being pulled.

29. In a mechanism for gripping and pulling stock, the combination with a plurality of gripper members, and actuating mechanism for closing and lifting the grippers, of a connection between one of said gripper members and the actuating mechanism to permit said gripper member to move relatively to the other gripper member in the direction of the strain while the stock is being pulled, a connection between the other gripper member and the actuating mechanism arranged to prevent similar movement of the other gripper member, and means for causing the grippers to grip the stock with increasing force as said gripper members move relatively.

30. In a mechanism for gripping and pulling stock, the combination with a rocking gripper member and a cooperating gripper

per member, of actuating mechanism for closing and lifting the grippers, and a yielding connection between said cooperating gripper member and the actuating mechanism adapted to permit said member to
 5 move longitudinally with relation to the rocking gripper member while the stock is being pulled, said mechanism having provision for causing said cooperating gripper
 10 member as it moves to turn the rocking gripper member for firmly holding the stock.

31. In a mechanism for gripping and pulling stock, the combination with a plurality of gripper members and actuating mechanism for closing and lifting the gripper members, of a connection between one of
 15 said gripper members and the actuating mechanism adapted to permit said gripper member to move relatively to the other gripper member in the direction of the pull of
 20 the stock during the lifting of the gripper mechanism, and a connection between the other gripper member and the actuating mechanism arranged to prevent similar
 25 movement of said other member, said mechanism having provision for automatically tightening the grip of said members on the stock during said relative movement.

32. In a mechanism for gripping and pulling stock, the combination with a plurality of gripper members and actuating mechanism for closing and lifting the gripper members, of a connection between one of
 30 said gripper members and the actuating mechanism adapted to permit said gripper member to move relatively to the other gripper member in the direction of the pull of
 35 the stock during the lifting of the grippers mechanism, and a connection between the other gripper member and the actuating mechanism arranged to prevent similar
 40 movement of said other member, said mechanism including members having cooperating inclined faces arranged to be shifted by said
 45 relative movement of the gripper members for further closing the gripper members upon the stock.

33. In a machine of the class described, the combination with a plurality of gripper
 50 members and a device cooperating therewith and arranged to be lifted for closing and raising the grippers, of means for lifting the said closing device, and means arranged
 55 to act with increasing force during the first portion of said lifting movement for reversely pressing the gripper members against the closing device.

34. In a grippers mechanism, the combination with a pivoted gripper member and a
 60 cooperating gripper member, of a spring-pressed finger engaging said pivoted gripper member to hold it normally open, and a stop on said pivoted gripper member for engaging an end face of said finger to limit the
 65 opening movement of the gripper member.

35. Means for gripping two thicknesses of stock and pulling the stock in a substantially right line, said means comprising
 70 opposed gripping members and operating mechanism therefor, said parts being constructed and arranged to allow relative movement of the gripping members in the
 75 direction of the pulling force during the pulling operation to effect holding of one of the two thicknesses of the stock more securely than the other thickness.

36. In a grippers mechanism, means for gripping and pulling two thicknesses of stock, said means comprising opposed gripping members and operating devices there-
 80 for constructed and arranged to allow automatic change in relation of the gripping members in the direction of the pulling force to apply to one thickness of stock a
 85 greater pulling tension than to the other thickness.

37. In a grippers mechanism, means for gripping a plurality of thicknesses of stock, comprising gripping jaws, and operating
 90 mechanism for relatively moving said jaws to grip the stock and pull it, said mechanism having provision for applying a greater pulling tension to one thickness of the stock
 95 than to another.

38. In a grippers mechanism, opposed
 95 rigid gripping members and operating devices for gripping and pulling a plurality of thicknesses of stock comprising means for sustaining one gripping member yieldingly
 100 with relation to the cooperating gripping member to allow one thickness of stock to slip while another thickness is held.

39. In a mechanism for pulling an upper over a last, a serrated gripper member for
 105 engaging the upper and a cooperating gripper member adapted to engage the lining material, said parts being constructed and arranged to permit movement of the member which engages the lining in a direction
 110 to facilitate the movement of the lining relatively to the upper during the pulling operation.

40. A grippers mechanism arranged to be closed by force applied in one direction and to be actuated to pull by force applied in the
 115 reverse direction having, in combination, a gripper member, a cooperating gripper member, a closing device, means for moving one gripper member relatively to the closing
 120 device to embrace the stock and then relatively moving it and the closing device in operative engagement one with the other for gripping the stock.

41. A grippers mechanism arranged to be closed by force applied in one direction and
 125 to be actuated to pull by force applied in the reverse direction having, in combination, a gripper member, a cooperating gripper member, a closing device, means for moving
 130 one gripper member relatively to the closing

device while that device remains substantially inactive whereby the stock to be gripped is embraced and then continuing the movement of the gripper member but in
5 active engagement with the closing device to close upon and grip the stock.

42. A grippers mechanism arranged to be closed by force applied in one direction and to be actuated to pull by force applied in the
10 reverse direction having, in combination, a gripper member, a cooperating gripper member, a closing device, means for moving one gripper member relatively to the closing device to embrace the stock and then further
15 to grip the stock and other means for reversely moving the gripper members to pull the stock.

43. A grippers mechanism arranged to be closed by force applied in one direction and to be actuated to pull by force applied in the
20 reverse direction having, in combination, a gripper member, a cooperating gripper

member, a closing device, means for moving one gripper member relatively to the other gripper member and the closing device to
25 grip the stock, means to prevent further relative movement in the same direction, and means for reversely moving the gripper members together to pull the stock.

44. In a mechanism for pulling upper ma-
30 terials over a last, cooperating gripper members arranged for relative movement in substantially the plane in which the tension is being applied whereby one of two thick-
35 nesses of stock between said members may be pulled more than the other.

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

RONALD F. McFEELY.

Witnesses:

ARTHUR L. RUSSELL,

BARTHOLOMEW T. McDONOUGH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."