L. G. FREEMAN.

INSOLE AND LASTING TACK PULLER AND TOE WIRE REMOVER.

APPLICATION FILED JAN. 27, 1911.

1,019,313.

Patented Mar. 5, 1912.

3 SHEETS—SHEET 1.

Fig. 1.

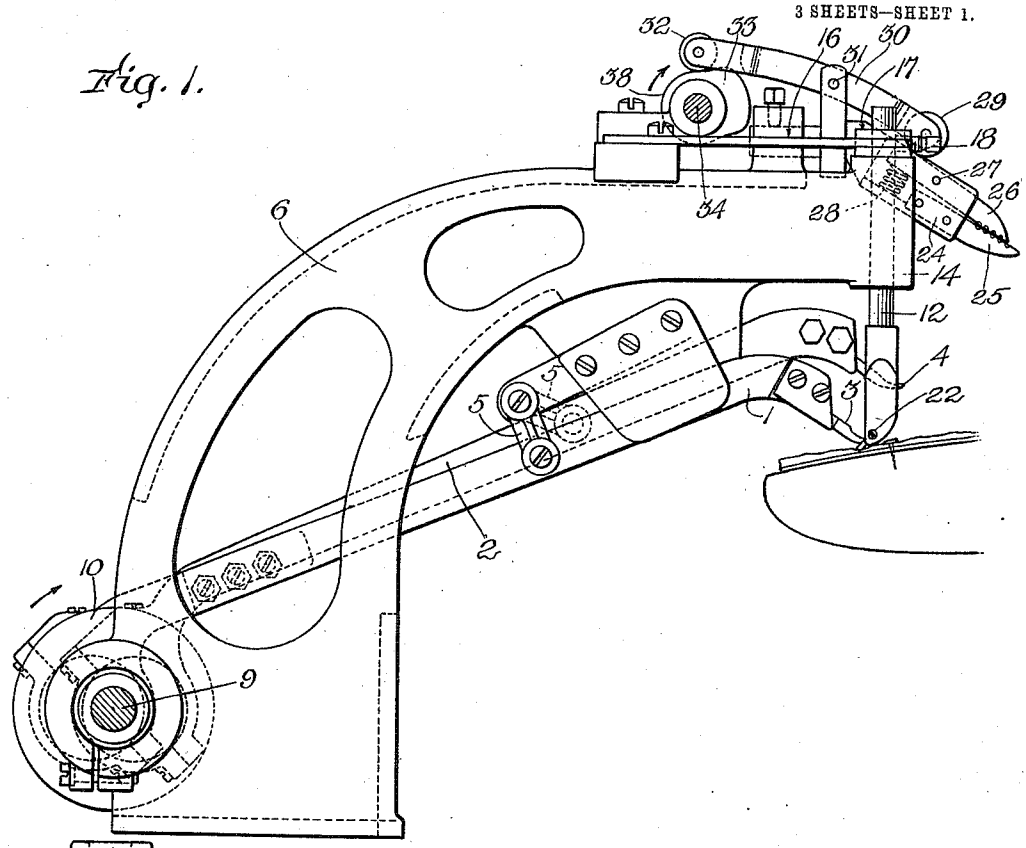
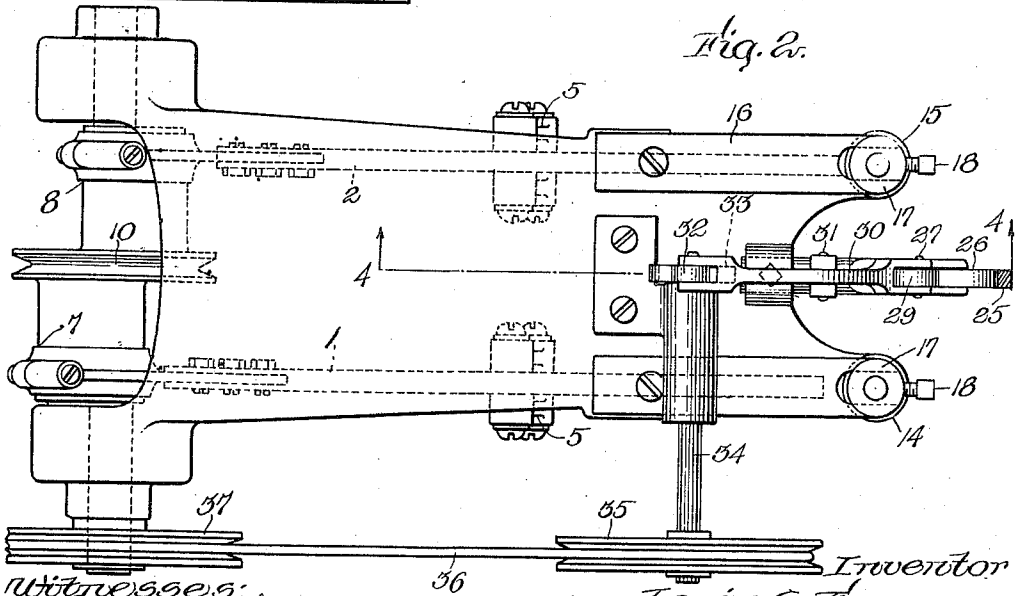


Fig. 2.



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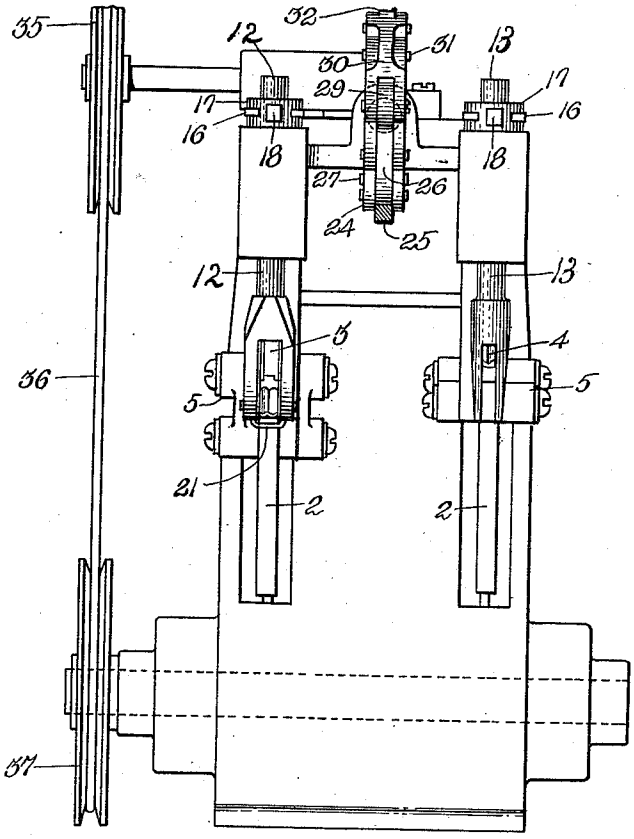

Fig. 3.

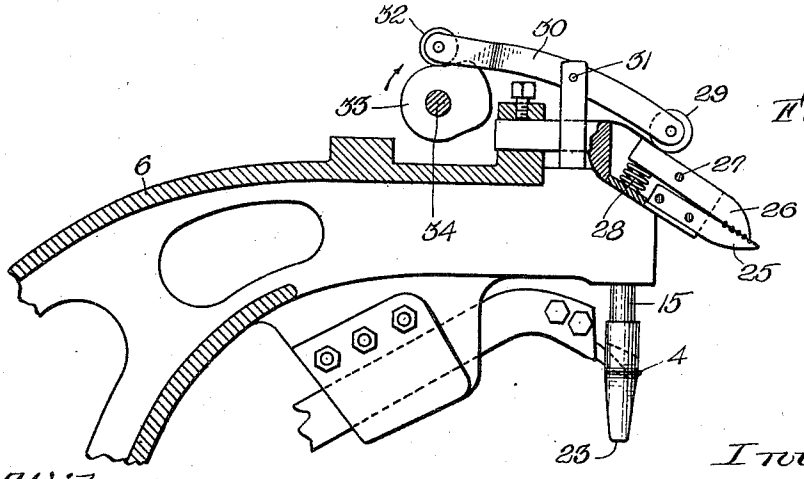

Fig. 4.

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3 SHEETS—SHEET 3.

Fig. 5. Fig. 6. Fig. 7. Fig. 8.

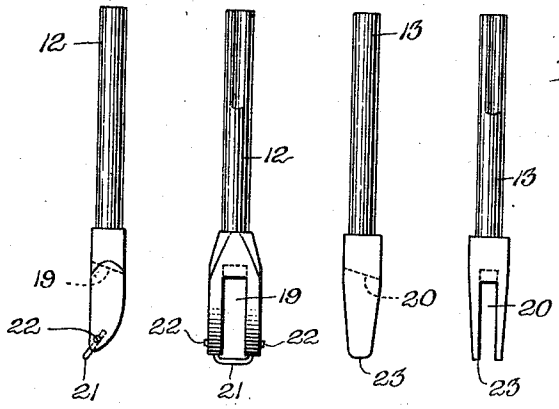


Fig. 9.

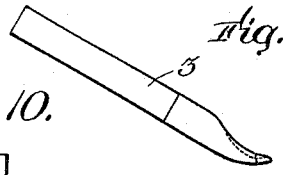


Fig. 10.

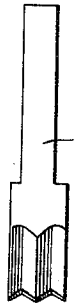


Fig. 11.

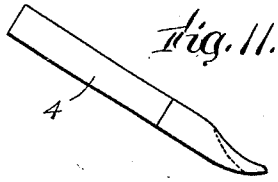


Fig. 12.

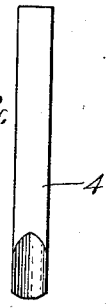


Fig. 13.

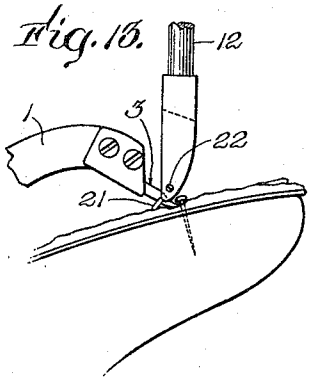


Fig. 14.

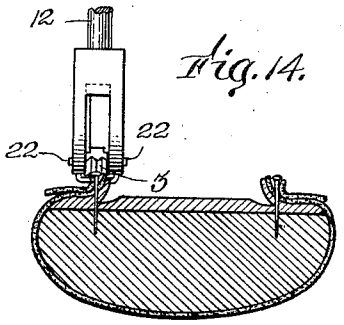


Fig. 15.

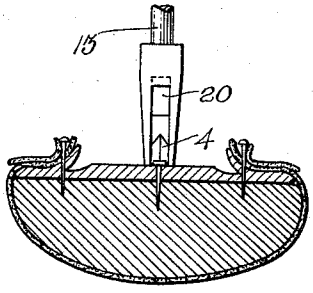
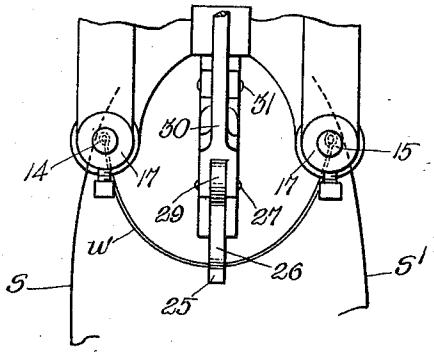


Fig. 16.



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UNITED STATES PATENT OFFICE.

LOUIS G. FREEMAN, OF CINCINNATI, OHIO.

INSOLE AND LASTING TACK PULLER AND TOE-WIRE REMOVER.

1,019,313. Specification of Letters Patent. Patented Mar. 5, 1912.

Application filed January 27, 1911. Serial No. 605,017.

To all whom it may concern:

Be it known that I, LOUIS G. FREEMAN, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented an Improvement in Insole and Lasting Tack Pullers and Toe-Wire Removers, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention is a machine for pulling the insole and side tacks and removing the toe-lasting wire usually employed in the process of lasting welt innersoles.

Innersoles are usually secured to the last by three or more holding tacks located as to hold the innersole in place on the last and usually driven down hard into the last, and quite a number of tacks are driven along the side at the points where displacement of the upper would be most apt to occur, to insure the retaining thereof in proper lasted relation to the innersole.

My invention provides coöperative means for pulling these two sets of tacks, including the anchor tacks for the toe-lasting wire, and in conjunction therewith provides means whereby the toe-lasting wire can be quickly and easily removed.

A prominent characteristic of the invention is the special juxtaposition of parts to accomplish these functions, whereby the several results come about virtually as component parts of a single operation.

The invention provides a novel form and arrangement of power controlled gripper for the toe-lasting wire, an especially effective arrangement of side tack-puller, and other improvements in detail, which will hereinafter more fully appear.

In the drawings, in which I have shown a preferred embodiment of my invention, Figure 1 is a side elevation of the machine; Fig. 2 is a plan view thereof; Fig. 3 is a front elevation; Fig. 4 is a sectional side elevation on line 4—4 of Fig. 2, showing details of the toe-wire gripper; Figs. 5 and 6 are side and front elevations respectively of the side tack puller gage; Figs. 7 and 8 are side and front elevations respectively of the insole tack-puller gage; Figs. 9 and 10 show, enlarged, the side tack-pulling tool in side and front elevation respectively; and Figs. 11 and 12 show, also enlarged, in side and front elevation respectively the innersole tack-pulling tool; and Figs. 13–16 illustrate the operative positions of the mechanism when at work, Fig. 13 showing in side elevation the side tack puller engaging a tack, Fig. 14 the same in front elevation, Fig. 15 the insole tack puller in front elevation, and Fig. 16 a top plan view illustrating a capability of pulling the wire upward by means of the member 25 while the shoe is strained downward to bring one or the other of the end tacks into position to be knocked out or pulled out by an adjacent tack puller.

In the machine of the drawings, I have shown two laterally spaced-apart tack moving tools carried on reciprocating arms 1, 2, the tack-engaging fingers or tools proper 3, 4 carried by these arms having special form adapted for the side tack-pulling and innersole tack-pulling respectively, as later described. The reciprocating arms 1, 2 are similarly mounted, each being suspended intermediate its length on short oscillating links 5 from the frame head 6 and being actuated by eccentrics 7, 8 on a driver shaft 9 actuated by driving pulley 10. This eccentric movement in connection with the link suspension of the arms at 5, will cause the tack-engaging points of the tools to traverse a cycloidal path for digging and pulling the tacks. The two eccentrics 7 and 8 are shown as oppositely mounted on the shaft 9, so that as either tool is advanced the other will be retracted.

The side tack-pulling tool 3 and the innersole tack-pulling tool 4 are arranged to coact with yielding backing posts or gages 12, 13 respectively. These posts or gages are slidably mounted in bearings 14, 15 at the front end of the frame head 6 and are normally urged to a lower limit of movement as by springs 16 fixed to the frame head, engaging collars 17 adjustably secured to said gages or posts by screws 18, the limit of downward movement of said posts being determined by the engagement of the collars 17 with the top of the frame head in whatever position the posts are mounted relative to said collars. The gages 12, 13 are enlarged and forked at their lower extremities, as shown at 19, 20, to permit the movement of the operative ends of the tools 3, 4 therethrough, and the end of gage 12 along which the edge of the shoe is adapted to be engaged and slid as shown in Fig. 1, has its end cut away so that the shoe form may

more easily and properly slide along, and an obliquely bowed yoke or cross bar 21 is inserted at the lower rear portion of the gage by set-screws 22 to make it adjustable. This arrangement provides a backing or support for the welt seam, as illustrated in Figs. 1, 13, and 14, while the tool 3 is pulling the side tacks, and makes it practically impossible for said tool 3 unduly to gouge the shoe while the latter is being moved along into position for the successive side tacks to be pulled. The shoe is thus kept in substantial longitudinal alinement with the direction of the pulling devices for the pulling of the several side tacks, it being only necessary then for the operator to move the shoe in the proper lengthwise positions to pull the tacks. The other post or gage 13 has its forked bottom rounded as shown at 23, this being adapted to engage the insole between the welt seams to enable the insole tack puller 4 to dig out the insole tacks as described in Patent No. 923,828, issued to me June 8, 1909. The side tack puller 3, operated in like manner as the insole tack puller, has a similar orbital path of movement, as more fully set forth in said patent, to engage under the head and lift the tack by a nearly vertical movement, this side tack puller having its prime distinction in the special form of its backing post or gage 12 which coöperates therewith and also has relation to the insole tack puller as now to be explained. It is thus apparent that the successive side tacks can be quickly removed by the tool 3, the shoe being slid along in engagement with the gage 12, and kept in proper position thereby for operation on the several side tacks, and, when desired, as the several insole tacks come adjacent the insole tack puller, the operator is enabled to pull said insole tacks by the tool 4, an adjacent part of the sole being then pressed against the gage 13. One pulling device is going back while the other is coming forward, thereby facilitating rapid pulling and the ready manipulation of the shoe before one or the other of the pulling devices with great freedom and without confusion or liability of injuring the work.

Fixed to and projecting from the forward end of the frame head 6 intermediate and preferably somewhat above the two pullers, is a fixed lower jaw 24 of a toe-lasting wire gripper, extending beyond or forward of the tack-pullers and slightly inclined downward from the horizontal to coöperate to the best advantage with the rest of the machine in dislodging specially hard and obstinate wires and their end-holding tacks. This lower jaw 24 has a sharp beak 25 to be forced underneath the wire at the toe of the shoe, to coöperate with a movable jaw 26, pivoted at 27 to the frame support and normally urged toward closed position by a coiled spring 28 under its inner end. This jaw is intermittently opened by the engagement with the top of its inner end by a roller 29 on the end of a lever arm 30 pivoted at 31 to a projection upstanding from the frame, this arm being actuated by engagement of a roller 32 on its inner end by a cam 33 fixed on a shaft 34 suitably journaled in the frame head. This shaft is driven by any suitable means, as by a pulley 35 and a belt 36 from a pulley 37 on the driving shaft 9. The cam 33 has a relatively long cut-away portion 38 to permit the jaws to remain closed about two-thirds of a revolution of the cam, so as to give sufficient time to enable the operator to manipulate the shoe, if required or desired, to bring either the wire or wire-holding tacks into coöperation with the adjacent puller tool 3 or 4.

The gripper is so located and its operation preferably timed, with reference to the two tack pullers, to permit the operator with the utmost celerity to remove the wire and the two anchor tacks which hold its opposite ends, and, as already explained, the two tack digging and pulling tools and their operating mechanism and adjacent parts, are so located with reference to each other as to permit the operator to remove all the tacks progressively and with extreme speed, the respective pullers being preferably separated sufficiently and also operating alternately so that there is no possibility of their both engaging the shoe at once, but on the contrary, as constructed, they permit the operator at will to use either to the best advantage and yet to shift instantly to the other if desired, and to bring either into coöperation with the wire gripper whenever desired. For example, when a toe wire is to be removed, the operator catches the wire *w* over the beak 25 or the latter is dug under the wire to permit the wire to be gripped and the shoe is then instantly pulled or jerked downward by the operator in that direction which will bring the obstinate wire-holding tack in position to be pulled or knocked out by the adjacent pulling device.

In Fig. 16 the range of lateral movement required of the shoe is indicated at *s* and *s'* to bring the left hand wire-end tack or the right hand tack as the case may be into position so that when the shoe is pulled down to bring its toe wire taut the adjacent pulling tool will strike the taut wire or the tack and thereby dislodge the latter and free the wire.

The respective tack pullers and gripper may be spaced apart widely or narrowly and preferably also the pullers operate at a high speed, the usual skilled workman becoming quickly expert in handling the shoe in each of its positions and in bringing either of the three tools to the aid of the other or others

whenever required or desired, so that a shoe can be freed of its wire and tacks in an exceedingly short time and without danger of injury to the shoe.

It is to be noted that the wire gripper is opened by power and closed by a spring, thereby making it practically impossible to injure the operator, the shoe, or the mechanism through carelessness, as would be liable to be the case for instance if the gripper were closed by power.

I regard the yoke or cross-bar 21, which spans the forked end of the tack puller rest or gage 12 as important, because it makes it practically impossible for the tool 3 to gouge the welt ridge while said gage is sliding along the same and said tool is operating between the forked sides thereof to pull the side tacks. The stationary member 24 of the wire gripper projects slightly so as to permit the operator to use the same to dig out a particularly obstinate wire (or, for that matter, a tack if desired) when buried in the welt seam.

I believe myself to be the first inventor of a twin tack puller having tools adapted to co-act as set forth and particularly also in conjunction with a toe-wire gripper disposed for co-action therewith as explained.

While I prefer the form of reciprocating tool, moving in an orbital path, as herein shown, I do not limit myself to this particular tool and operating mechanism therefor except as set forth in the claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In combination, two tack pullers constructed and relatively arranged to engage respectively the insole tacks and the side tacks of a lasted shoe as component parts of a single operation, backing gages formed to coöperate with said pullers respectively, and operating mechanism for actuating said respective pullers to afford opportunity for the operator to control the shoe properly with reference to one or the other of said tack pullers, as required by the special conditions of the particular lasted shoe being operated on, said tack pullers and said gages being both arranged for presentation of the lasted shoe endwise thereto and spaced apart so as to receive the shoe so presented between them, whereby both pullers may be brought into operation by a lateral shift of the shoe.

2. In combination, two tack-pullers spaced apart and constructed to engage respectively the insole tacks and the side tacks of a lasted shoe, operating mechanism for dissimultaneously actuating said respective pullers, a wire gripper and its operating means constructed and located to permit the shoe to be brought into operative relation to either of said tack-pullers while its toe-wire is engaged by the wire gripper.

3. In combination, two tack pullers constructed and relatively arranged to engage respectively the insole tacks and the side tacks of a lasted shoe as component parts of a single operation, operating mechanism for actuating said respective pullers, and a power controlled wire gripper arranged adjacent to said tack pullers for coöperation therewith, said gripper being located between and slightly above said two tack pullers.

4. An intermittingly operating tack-puller, combined with an intermittingly operating wire gripper located slightly above the tack-puller to permit, when desired, the puller to be engaged with the wire or an adjacent tack while the wire is gripped by the gripper.

5. An intermittingly operating tack-puller, combined with an intermittingly operating wire-gripper located slightly above and at one side of the tack-puller to permit, when desired, the puller to be engaged with the wire or an adjacent tack while the wire is gripped by the gripper.

6. In a machine of the kind described, a power operated tack puller, and a wire gripper adjacently arranged in coöperative relation thereto, said wire gripper comprising a pair of jaws with automatic power mechanism for positively opening said jaws, and yielding means for closing said jaws to grip a toe wire.

7. In a machine of the kind described, a power operated tack puller, and a toe wire gripper arranged adjacent thereto and for coöperation therewith in removing the toe wire and lasting tacks, said gripper comprising a pair of gripping jaws one above the other, the lower of said jaws being stationary and projecting beyond the other jaw, with a digging end.

8. In a machine of the kind described, a power operated tack puller, and a toe wire gripper arranged adjacent thereto for cooperation therewith in removing the toe wire and lasting tacks, said gripper comprising a pair of gripping jaws one above the other, the lower of said jaws being stationary and projecting forward in a direction inclined downward from the horizontal.

9. In a machine of the kind described, a power operated tack puller, and a toe wire gripper arranged adjacent thereto and at a higher elevation for coöperation therewith in removing the toe wire and lasting tacks, said gripper comprising a pair of gripping jaws one above the other, the lower of said jaws being stationary and projecting beyond the other jaw in a direction slightly inclined downward from the horizontal in position to catch under a toe wire and lift said wire upwardly while the shoe is pulled downward by the operator into coöperative relation with said tack puller.

10. In a machine of the kind described, a tack-puller having a gage or work-rest with a bifurcated lower end, a reciprocating pulling tool for operating in said bifurcated end, and a cross-bar secured across the lower end of said gage below the path of movement of the pulling tool in position to rest upon the welt ridge as said tool is pulling a side tack from adjacent the inseam.

11. In a machine of the kind described, a tack-puller having a gage or work-rest with a bifurcated lower end, a reciprocating pulling tool for operating in said bifurcated end, and a cross-bar adjustably secured across the lower end of said gage below the path of movement of the pulling tool in position to rest upon the welt ridge as said tool is pulling a side tack from adjacent the inseam.

12. In a machine of the kind described, a tack-puller having a gage or work-rest with a bifurcated lower end, a reciprocating pulling tool for operating in said bifurcated end, and a cross-bar secured across the lower end and rear side of said gage below the path of movement of the pulling tool in position to rest upon the welt ridge as said tool is pulling a side tack from adjacent the inseam.

13. In a machine of the kind described, a tack-puller having a gage or work-rest with a bifurcated lower end, a reciprocating pulling tool for operating in said bifurcated end, a cross-bar secured across the lower end of said gage below the path of movement of the pulling tool in position to rest upon the welt ridge as said tool is pulling a side tack from adjacent the inseam, and means for adjusting said cross-bar downwardly and rearwardly.

14. In a machine of the kind described, a tack-puller having a vertically yielding gage or work-rest with a bifurcated lower end, a reciprocating pulling tool for operating in said bifurcated end, and a cross-bar secured across the lower end of said gage below the path of movement of the pulling tool in position to rest upon the welt ridge as said tool is pulling a side tack from adjacent the inseam.

15. In combination, an insole tack puller, a yielding gage coöperative therewith, a side tack puller arranged laterally adjacent said insole tack puller for coöperation therewith in removing the insole and side tacks respectively, and a yielding gage coöperative with said side tack puller formed to engage and guide a shoe, said tack pullers and gages being spaced apart and arranged to receive a lasted shoe endwise between them.

16. In combination, a tack-puller having a tool extending obliquely downward, said tack-puller having a mounting and operating means arranged to give said tool an orbital movement forward, downward and upward, and a gaging member mounted to yield upwardly and having a yoke extending obliquely downward in a direction opposite to that of said tool, said gaging member being forked to receive said tool.

17. In combination, a tack-puller, means for operating the same, and a wire gripper mounted adjacent the operative portion of said tack-puller, said wire gripper being constructed and arranged for coöperation with said tack puller in removing the toe wire and lasting tacks.

18. In combination, a tack-puller, means for operating the same, a wire gripper mounted adjacent the operative portion of said tack-puller, and power means for intermittingly and positively opening the same, said wire gripper being constructed and arranged for coöperation with said tack puller in removing the toe wire and lasting tacks.

19. In combination, twin tack-pullers mounted in spaced-apart relation, and a wire-gripper mounted adjacent the operative portions of said tack-pullers, said wire gripper being constructed and relatively arranged for coöperation with said tack pullers in removing the toe wire and lasting tacks.

20. In combination, twin tack-pullers mounted in spaced-apart relation, common operating means therefor, and a wire-gripper mounted between said tack-pullers, said wire gripper being constructed and relatively arranged for coöperation with said tack pullers in removing the toe wire and lasting tacks.

21. In combination, an insole tack-puller, a side tack-puller mounted in parallel spaced-apart relation thereto, common operating means for said tack-pullers, a wire-gripper mounted intermediate said tack-pullers, and power means for intermittingly opening the same to permit insertion of a toe wire, said wire gripper being constructed and relatively arranged for coöperation with said tack pullers in removing the toe wire and lasting tacks.

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

LOUIS G. FREEMAN.

Witnesses:
M. J. FORMAN,
GEO. H. MAXWELL.