L. E. JOHNSON.
AWL MECHANISM FOR NAILING MACHINES.
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1,109,844.

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3 SHEETS—SHEET 1.

Fig. 1.

Witnesses:
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Inventor:
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Attty.
To all whom it may concern:

Be it known that I, LAWRENCE E. JOHNSON, a citizen of the United States of America, and a resident of Winthrop, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Awl Mechanism for Nailing-Machines, of which the following is a specification.

This invention relates to machines for making and driving nails, and particularly to machines of this class designed for use in the manufacture of boots and shoes, the object of the present invention being to provide a simple construction of awl mechanism adapted to pierce the work and then feed the work with the awl therein so that the puncture will be positioned beneath the driver when said awl has been removed from the work and returned to its normal position.

This invention is an improvement on the nailing machine shown and described in U. S. Letters Patent No. 1,078,147, issued to me Nov. 11, 1913.

The invention consists in certain novel features of construction and arrangement of parts which will be fully understood by reference to the description of the drawings and to the claims hereinafter given.

Of the drawings: Figure 1 represents a front elevation of a machine embodying the features of the present invention. Fig. 2 represents a side elevation of a portion of the same. Fig. 3 represents a section through the driving and oscillating shafts showing in elevation the cam mechanism for operating the awl bar. Fig. 4 represents a horizontal section of the front portion of the same, the cutting plane being on line 4-4 on Fig. 1. Fig. 5 represents a vertical section showing the cam mechanism for controlling the movement of the nail carrying member, and Fig. 6 represents a sectional detail on line 6-6 on Fig. 1.

Similar characters designate like parts throughout the several figures of the drawings.

In the drawings, 10 is a framework having suitable bearings in which is mounted the revolving shaft 11 having secured to its front end a lifter 12, and to its rear end the pulley 13 revoluble in the direction of the arrow a on Fig. 1 of the drawings. In the front end of the frame 10 is mounted a reciprocating driver bar 14 having secured in its lower end a driver 15. The driver bar 14 is raised by means of the lifter 12 engaging the collar or lifting block 16 secured thereto, and when the lifter 12 is disengaged from said collar 16 the driver bar is moved downwardly by means of the driving member 17 actuated by the coiled spring 18 all in a well-known manner. A reel 19 is provided from which a wire 20 is fed by any well-known mechanism into a peripheral slot 21 in a nail carrying member 22 pivoted at 23 to the frame 10. When a portion of the wire 20 has been fed into the peripheral slot 21, movement of the nail carrying member 22 in the direction of the arrow b on Fig. 4 of the drawings will cause that portion of the wire positioned in said slot to be separated from the main portion of the wire 20, as shown and described in my previous patent herein referred to, thus forming a nail which is adapted to be carried by said member 22 into a position immediately beneath the driver 15 so that when the driver bar 14 is released by means of the member 12 and said bar is driven downwardly, the driver 15 will force the nail through the work 24 supported upon the horn 25 and positioned therein by means of the presser foot 26. The member 22 is provided with a rearwardly extending arm provided with ears 27 between which the upper face of said arm is provided with a concaved depression 28 as indicated in Figs. 4 and 5 of the drawings.

Supported in the ears 27 with its axis concentric to the wall of said concaved recess is a cylindrical pin 29 having flat sides intermediate its ends and on which is mounted the movable forked block 30 having formed thereon a radiating stud on pin 31. This pin or stud 31 is positioned within a socket 32 formed in the lower end of a lever 33 pivoted at 34 and having at its upper end a roller 35 positioned in the cam path 36 of the cam disk 37 secured to and revoluble with the driving shaft 11. As the cam disk 37 rotates in the direction of the arrow c on Fig. 5 of the drawings, the rocking movements imparted to the lever 33 will cause an oscillation of the member 22 about its pivot 26 in an obvious manner. During this operation it is evident that the pin 31 is adapted to reciprocate in the socket 32 and the block 30 is adapted to reciprocate...
lengthwise of the pin 29 and to oscillate slightly about the axis of said pin, thus producing a universal connection between the free end of the lever 35 and the outer end of the rearwardly extending arm of the nail carrying member 22.

The frame 10 is provided with an ear 38 in which is positioned an oscillating shaft 39 to the rear end of which is secured a lever 40 and to the front end of which is secured an arm 41. The frame 10 is also provided with an extension 42 in the bearing in which is positioned an oscillating shaft 43 having secured to its rear end the lever 44 and to its front end the forked member 45. The free end of the arm 41 has pivoted thereto an awl carrying bar 46, the lower end of which has clamped thereto the awl 47. This awl carrying bar is provided with an ear 48 having an elongated slot 49 therein, through which extends the threaded shank 50 of a stud 51, the rear end of which has a washer 52 secured thereto by means of the screw 53. This stud 51 is provided with a peripheral flange 54 between which and the washer 52 is interposed a block 55 positioned within the slot 56 in the forked member 45, said block 55 being adapted to freely move about the axis of said stud 51.

The stud 51 may be moved in the slot 49 and secured in adjusted position by the nut 50, thereby varying the feed movement of the awl 47. The free end of the lever 40 is provided with a truck 57 positioned in the cam path 58 of a disk 59 secured to the driving shaft 11. The cam path 58 is so constructed as to cause an oscillation of the shaft 39 and through the arm lever 41 a reciprocating vertical movement of the awl bar 46. The opposite side of the disk 59 is provided with a cam path 60 in which is positioned a roller 61 secured to the end of the lever 44, this cam path 60 being so constructed as to produce an oscillation of the shaft 43, and through the forked member 45 a reciprocatory movement of the awl-bar 46.

The throws of the cams 58 and 61 are so timed that a downward movement will first be imparted to the awl-bar 46 to cause the awl 47 to pierce the work 24. During this movement the member 52 is being moved about its pivot 23 so that the groove 21 will be brought into the position shown in Fig. 4. When in this position an opportunity is given for the awl-bar 46 to move laterally swinging about its pivotal connection with the lever 41 and thereby feeding the work 24 the required distance, the amount of movement being dependent upon the position of the stud 51 in the slot 49. When the feeding operation has been completed the awl 47 is directly beneath the driver 15. The awl is then withdrawn from the work by upward movement of the awl-bar 46 and as soon as it has been wholly removed a lateral movement is imparted by the cams to the awl-bar to return the awl to its normal position preparatory to another operation.

It will be observed that the combined operations of the cam members upon the awl-bar 46 causes the awl to travel in a rectangular path.

When the awl 47 has returned to its normal position the member 22 with a nail carried in its peripheral slot 21 will be moved about its pivot 23 until the slot is beneath the driver 15 which is then permitted to operate and the nail is driven into the work.

As the means for feeding the wire, forming the nail, and driving it into the work, are all substantially the same as shown and described in said earlier patent referred to, no detailed description of these mechanisms is herein given.

It is believed that the operation and many advantages of this invention will be fully understood from the foregoing description.

Having thus described my invention, I claim:

1. In a device of the class described, the combination with a work support and driver, of a pivoted awl-carrying bar; means for operating said bar to cause said awl to move in a rectangular path to pierce and feed the work; a pivoted member having a pocket in its periphery for carrying a nail into position below said driver; and means for moving said member about its pivot out of the path of said bar prior to the work feeding movement of the awl.

2. In a device of the class described, the combination with a work support and driver, of a pivoted awl-carrying bar; means for operating said bar to cause said awl to move in a rectangular path to pierce and feed the work; a pivoted member having a peripheral nail carrying slot adapted to be brought into position beneath said driver; a pivoted lever; a universal connection between the free ends of said lever and member; and a cam for operating said lever to move said pivoted member from the path of the awl bar prior to the work feeding movement thereof.

3. In a device of the class described, the combination with a work support and driver, of a pivoted awl-carrying bar; means for operating said bar to cause said awl to move in a rectangular path to pierce and feed the work; a pivoted member having a peripheral nail carrying slot adapted to be brought into position beneath said driver; a pivoted lever; a forked block carried by said member and movable horizontally thereon; a pivotal connection between said block and the free end of said lever; and a cam for operating said lever to move said pivoted member from the path of the awl bar prior to its work-feeding movement thereof.
4. In a device of the class described, the combination with a work support and driver, of a pivoted awl-carrying bar; means for operating said bar to cause said awl to move in a rectangular path to pierce and feed the work; a pivoted member having a peripheral nail carrying slot adapted to be brought into position beneath said driver; a pivoted lever; a forked block carried by said member and movable horizontally thereon; a pin extending outwardly from said block and adapted to reciprocate in a hole in the end of said lever; and a cam for operating said lever to move said pivoted member from the path of the awl-bar prior to the work feeding movement thereof.

5. In a device of the class described, the combination with a work support and driver, of a pivoted awl-carrying bar; means for operating said awl to move in a rectangular path to pierce and feed the work; a pivoted member having a peripheral nail carrying slot adapted to be brought into position beneath said driver; a pivoted lever; a forked block carried by said member and movable horizontally thereon; a flat sided pin in said member on which said block is adapted to reciprocate; and a cam for operating said lever to move said pivoted member from the path of the awl-bar prior to its work-feeding movement thereof.

6. In a device of the class described, the combination with a work support and driver, of a pivoted awl-carrying bar; means for operating said bar to cause said awl to move in a rectangular path to pierce and feed the work; a pivoted member having a peripheral nail carrying slot adapted to be brought into position beneath said driver and also provided with an arm having two ears in its upper face; a flat sided pin movable in said ears; a block reciprocable on said pin and movable about the axis thereof provided with a radial cylindrical pin; a pivoted lever having a socket for said pin in which it is adapted to reciprocate; and a cam for operating said lever to move said pivoted member from the path of the awl-bar prior to the work-feeding movement thereof.

Signed by me at 4 Post Office Sq., Boston, Mass., this 29th day of May, 1913.

LAWRENCE E. JOHNSON.

Witnesses:
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