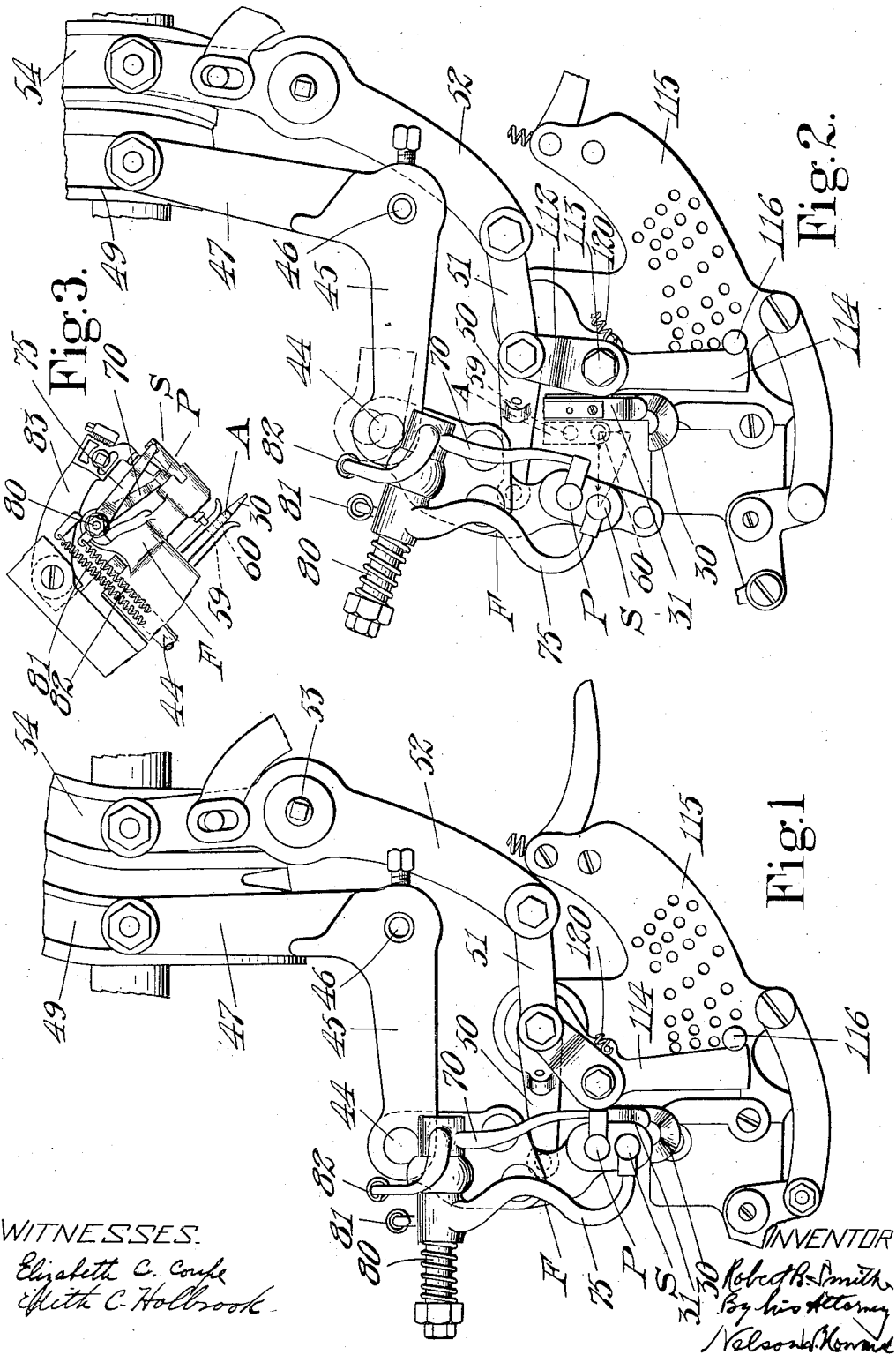


R. B. SMITH.
EYELETING MACHINE.
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1,017,602.

Patented Feb. 13, 1912.



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EYELETING-MACHINE.

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To all whom it may concern:

Be it known that I, ROBERT B. SMITH, a citizen of the United States, residing at Stoughton, in the county of Norfolk and State of Massachusetts, have invented certain Improvements in Eyeletting-Machines, 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.

The present invention relates to improvements in machines for inserting fasteners such as lacing studs, eyelets, or the like and more particularly to improvements in eyeletting machines of the type disclosed in Letters Patent of the United States No. 934,066 granted September 14, 1909 on the application of George Goddu.

The objects of the invention are to reorganize and improve the construction and organization of such eyeletting machines, particularly in respect to their feeding mechanism.

In certain eyeletting machines, of which that above mentioned is an example, the feeding movement of the work transversely of the machine is effected between the insertion of successive eyelets by swinging a work engaging member about a fixed axis. Usually the work engaging member comprises a punch or setting die which is mounted in a pivoted head or lever, the head or lever having imparted to it an angular movement proportional to the distance required between successive eyelets. It will be apparent that with this construction the movement of the work feeding means is not rectilinear but curved on a radius equal to the distance of the punch or set from the pivot of the head or lever in which it is mounted. In setting eyelets having a relatively close spacing the path of the feeding means departs so little from a straight line that no difficulty is experienced in properly guiding the work to setting position, but in setting large eyelets which are commonly spaced a considerable distance apart the curved movement of the feeding means becomes objectionable.

With these conditions in view it is an object of the present invention to provide mechanism for imparting feeding movement in a rectilinear path to a work engaging

member mounted for movement with a pivoted head.

A preferred manner of procuring a rectilinear feeding movement consists in arranging the pivoted head or lever, or that part of the head or lever in which the work engaging member is mounted, for bodily movement in a direction substantially perpendicular to the line of feed and in providing means for advancing the work engaging member simultaneously with its transverse movement in such a way that the resultant feeding movement will be along a straight line.

Preferably my invention may include in its embodiment a work engaging member arranged to engage the work loosely during the feeding movement in order that the angular change of position in the work engaging member during the feeding movement may not be imparted to the work. Where a punch or set is utilized as a work engaging member, this result may be effected by slightly retracting such punch or set after it has operated upon the work so that the punch, for example, may turn in the work during the feeding movement, the work being guided by a suitable presser foot.

The invention will be best understood and appreciated from the following description of a preferred embodiment thereof selected for purposes of illustration and shown in the accompanying drawings, in which,—

Figure 1 is a plan view of the feeding mechanism of an eyeletting machine in its initial position; Fig. 2 is a similar view of the feeding mechanism at the end of its feeding movement, an intermediate position, being indicated in dotted lines; Fig. 3 is a fragmentary view in elevation on a reduced scale of the pivoted head and associated parts.

The present invention may be embodied advantageously in a duplex eyeletting machine of the type described in the patent above mentioned. In that machine the punches and setting devices are mounted in and carried by a pivoted head. Heretofore the feeding of the work has been effected by swinging the head about its pivot while the setting dies remain in engagement with the eyelets just set.

In the accompanying drawings various

parts of the machine have been omitted in order to avoid confusion but it is understood that the parts not shown may be substantially similar to those fully described and illustrated in Patent No. 934,066. The present machine, like that of said patent, comprises oppositely disposed punches P and oppositely disposed setting dies S arranged in bearings in the feeding frame F, with an anvil or die plate A also supported in said head and arranged between the oppositely disposed punches and setting dies. The anvil plate A carries a punching block 59 in alinement with the punches and an upsetting die 60 in alinement with the sets. The feed frame F is pivoted at its rear end on a journal pin 44 carried by the arm 45 of a bell crank lever pivoted to the frame of the machine on a pin 46. The other arm 47 of the bell crank lever carries a cam roller which runs in a cam track 49. The bell crank lever 45, 47 is oscillated in a properly timed relation by the cam 49 and serves to carry the head F bodily forwardly and rearwardly for purposes which will be hereinafter set forth.

Transverse pivotal movement of the head F about its pivot 44 is effected through the links 50, 51 and the cam lever 52 pivoted to the frame of the machine on a pin 53 and carrying a cam roller which runs in the cam track 54. The transverse pivotal movement of the head F constitutes one component of the feeding movement and to vary the extent of the feeding movement, and thereby the spacing of the eyelets, mechanism is provided for varying the amount of movement transmitted through the links 50 and 51 to the head F from the feed lever 52. At the pivotal point of the links is secured a link 112 which is pivoted at 113 upon an arm 114 movable over the face of the quadrant plate 115, a stop pin 116 being provided to limit this movement. The arm 114 is pivoted at its rear end to the quadrant plate 115 and it will be seen that by swinging the lever toward the right the pivotal point 113 of the link 112 will be moved into positions in which the link 112 will guide the pivot point of the links 50 and 51 on an arc extending in a direction substantially perpendicular to the transverse pivotal movement of the head F, a greater component of the movement of the pivot point of the links 50 and 51 becoming lost motion as the arm 114 is moved farther and farther toward the right. A spring 120 connected to the arm 114 serves to hold the arm against the stop pin 116.

The punch and set are mounted in parallel bearings in the head F and are connected with retracting levers 70 and 75, respectively, the levers being pivoted on a transverse journal 80. Mounted in the frame of the machine is a lever 83, operated by a cam, not shown, and arranged for depressing the

punch and set at the proper time for punching the work or setting an eyelet while springs 81, 82 are provided for retracting the punch and set through the levers 70 and 75. Fig. 3 shows the set S in its retracted position and the punch P in operative relation with the actuating lever 83. A guide plate 30 and presser foot 31 are mounted upon a fixed part of the machine frame and serve to guide the work to setting position.

The cam 49, which actuates the bell crank lever 47, is constructed so as to move the head F quickly toward the rear after the punching operation, then forwardly a short distance during the feeding operation, and again forwardly during the return transverse movement.

In operation, the work is inserted between the guide plate 30 and the presser foot 31 when the head F is in the position shown in Fig. 1, the point on the work where it is desired to set the first eyelet being located directly under the punch P. When the machine is started the punch P is forced downwardly to perforate the work and immediately retracted. The cam 49 then swings the arm 47 of the bell crank lever 45, 47 to the right moving the head F directly toward the rear into the position indicated in dotted lines in Fig. 2. The extent of this rearward movement carries the set S and its cooperating upsetting die 60 mounted in the anvil plate A into alinement with the previously punched hole in the work. The set S is then depressed to clench an eyelet which has previously been moved into position. At the conclusion of the setting operation the setting die is retracted slightly but is still maintained in engagement with the eyelet. The feeding movement of the head F then takes place. This is accompanied by the simultaneous action of the feed lever 52 and the bell crank lever 45, 47. The feed lever 52 acting through the links 50, 51 imparts a pivotal movement to the head F about its pivot 44 and simultaneously the lever 47 is swung toward the left sufficiently to advance the head F by the amount which it would have departed from a straight path had it swung only about its pivot 44. At the end of the feeding movement the head F occupies the position illustrated in Fig. 2 and in this position the set S is moved out of engagement with the work and the head is returned to its initial position by the simultaneous operation of the levers 52 and 47, the set following some such path as that indicated in dotted lines in Fig. 2. During the feeding movement the work is frictionally engaged between the guide plate 30 and the presser foot 31 between which it is drawn by the action of the set and the engagement of the set with the eyelet is sufficiently loose to allow the set to turn slightly in the eye-

let so that no angular movement is imparted to the work which would tend to throw it out from the guide plate.

While the present invention has been illustrated and described as embodied in an eyeletting machine of the duplex type it is in no sense limited in its application to this or any other particular type of machine but with proper modifications may be applied to any machine wherein it is desired to feed work rapidly and intermittently to tools for performing various operations.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. A machine of the class described having, in combination, work guiding means, fastener inserting means including a work feeding member arranged to engage the work intermittently and being mounted for pivotal movement in a plane parallel to the work, and means for moving said member to draw the work through said guiding means in a straight path.

2. A machine of the class described having, in combination, stationary work guiding means, fastener inserting means including a work feeding member arranged to engage the work intermittently and being mounted for pivotal movement about an axis at the rear of said fastener inserting means, said work feeding member having provision whereby it may be moved in a straight path transversely with respect to the work guiding means.

3. A machine of the class described having, in combination, a pivoted head, a punch and set mounted therein, a device for actuating one or the other to engage the work, means for swinging said head about its pivot while the work is so engaged and simultaneously moving the head in such a manner that the work shall receive feeding movement in a straight path.

4. A machine of the class described having, in combination, a pivoted head, a punch and set carried thereby and arranged for movement toward the work to engage the same, means for swinging said head about its pivot while the work is engaged by one of said elements, and means for simultaneously moving the head so that a rectilinear feeding movement is imparted to the engaging element.

5. A machine of the class described having, in combination, a pivoted head, a work-engaging member mounted therein, means for swinging said head about its pivot while the work-engaging member is in engagement with the work, and means for simultaneously moving said head in such a manner that the work engaging member shall receive a rectilinear movement.

6. A machine of the class described hav-

ing, in combination, a head, a pivot therefor, and means for moving said head about its pivot, together with a work engaging member carried by said head, and separate means for moving said member during the pivotal movement of said head whereby a resultant rectilinear movement is imparted thereto.

7. A machine of the class described having, in combination, a head, a pivot therefor, and means for swinging said head transversely about its pivot, together with a work engaging member movable transversely with said head, and means for moving said member outwardly with respect to the initial position of said pivot during the pivotal movement of said head.

8. A machine of the class described having, in combination, a pivoted head, a work engaging member movably mounted therein, means for moving said member relatively to the head for engaging the work, means acting thereafter to swing said head about its pivot and also to move it radially with respect to the initial position of its pivot to impart a rectilinear feeding movement to said work engaging member.

9. A machine of the class described having, in combination, a pivoted head, a fastener setting device mounted therein, means for swinging said head about its pivot while said setting device is in engagement with the work, and means for moving said head in such a direction that the setting device shall receive a rectilinear movement.

10. A machine of the class described having, in combination, a pivoted head, a fastener setting device mounted therein, means for swinging said head about its pivot while said setting device is in engagement with the work, and means for moving said head radially simultaneously with its pivotal movement for imparting a rectilinear movement to the work.

11. A machine of the class described having, in combination, a movable head, a fastener setting device mounted therein, a punch arranged in parallel relation with said setting device, means for moving said head to bring the setting device into the position previously occupied by the punch, and means acting thereafter to impart a rectilinear movement to said setting device in a transverse direction.

12. A machine of the class described having, in combination, a movable head, a setting device mounted therein, a punch disposed at the rear of said setting device, actuating means therefor, and means for moving said head rearwardly after the punching operation, the means by which the head is moved rearwardly being so constructed and arranged as to act, in part, to move the setting device transversely in a rectilinear path.

13. A machine of the class described having, in combination, a movable head, setting

devices mounted therein, a punch disposed at the rear of said setting devices, actuating means therefor, and a cam for moving said head rearwardly after the punching operation, said cam being so shaped as to act, in part, to move the setting device transversely in a rectilinear path.

14. A machine of the class described having, in combination, fastener inserting means including a work engaging member, said member being arranged for loose engagement with the work to permit angular movement thereof with respect to the work, and means for moving the work-engaging member angularly and simultaneously imparting thereto a rectilinear feeding movement.

15. A machine of the class described hav-

ing, in combination, a longitudinally movable pivoted head having a punch and set mounted therein, means for successively actuating the same, and means for moving said head angularly and longitudinally, said set being moved to release slightly the clenched eyelet and having then imparted to it a transverse rectilinear feeding movement by the combined angular and longitudinal movement of the head.

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

ROBERT B. SMITH.

Witnesses:

HERBERT W. KENWAY,
EMILE H. TARDIVEL.

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