March 25, 1924. 1,487,731

E. F. H. ENNA ET AL

EYELET SETTING MACHINE

Filed Sept. 11, 1922

Fig. 1.

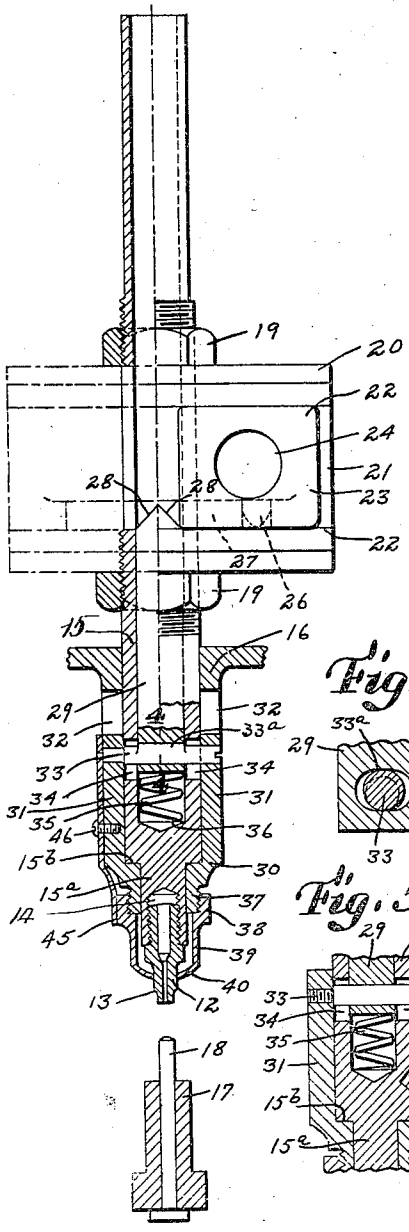


Fig. 2.

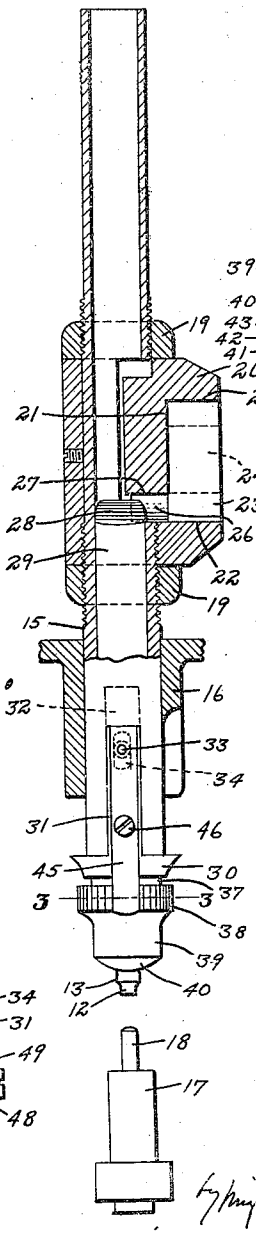


Fig. 6.

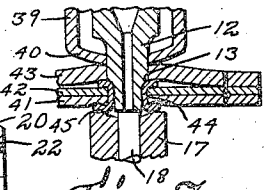


Fig. 7.

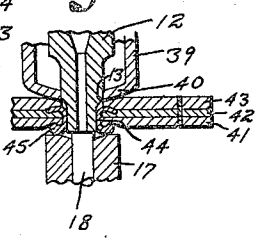
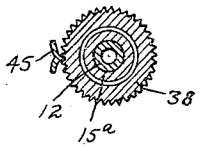


Fig. 4.

Fig. 5.

Fig. 3.



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UNITED STATES PATENT OFFICE.

ERNST F. H. ENNA AND ANTON HAAHR, OF COPENHAGEN, DENMARK; SAID HAAHR ASSIGNOR TO SAID ENNA.

EYELET-SETTING MACHINE.

Application filed September 11, 1922. Serial No. 587,297.

To all whom it may concern:

Be it known that we, ERNST F. H. ENNA and ANTON HAAHR, subjects of the King of Denmark, residing at Copenhagen, Denmark, have invented new and useful Improvements in Eyelet-Setting Machines, of which the following is a specification.

This invention relates generally to the parts or elements of an eyelet-setting machine which include the setting member and the elements which cooperate therewith in spreading and splitting the end of an eyelet barrel opposite the previously formed flange or head, and in clenching the prongs into which the barrel end is split, to completely set the eyelet in the material by which it is carried.

The invention relates in particular to said elements, when organized to perform the operation of blind eyeleting, the eyelet being inserted, in some instances, in the inner side of a group composed of a plurality of superimposed layers including an inner facing layer, a lining, and an outer layer constituting an exposed portion of a shoe upper.

In other instances the eyelet is inserted from the outer side of the group of layers. In each instance the eyelet is clenched in and secured to layers at one side of the group and concealed by the layer at the opposite side without being engaged therewith.

The chief object of the invention is to provide means whereby the eyelets are effectively clenched between the engaged layers and the concealing layer, without liability of entering, or in any way engaging the concealing layer, so that the latter is entirely separate from the eyelets.

The invention is embodied in improved means for accomplishing the above-mentioned and other objects of the invention.

Of the accompanying drawings forming a part of this specification,—

Figure 1 is a front elevation, partly in vertical section, showing the elements constituting the preferred embodiment of the invention, associated with other elements of an eyelet-setting machine.

Figure 2 is a side elevation, partly in vertical section, showing the elements illustrated by Figure 1.

Figure 3 is a section on line 3—3 of Figure 2.

Figure 4 is a fragmentary section on line 4—4 of Figure 1.

Figure 5 is a view similar to a portion of Figure 1, showing a modification.

Figures 6 and 7 are enlargements of portions of Figure 1, illustrating different stages of the setting operation.

The same reference characters indicate the same parts in all of the figures.

In the drawings, 12 represents the setting member which is, in this instance, a tubular punch, adapted to form coinciding holes in a plurality of superimposed layers of material, although it may be adapted to set eylets in previously punched holes, in which case it will not be formed as a punch.

The setting member is enlarged above its lower end, to provide a circumferential downwardly facing setting shoulder 13, adapted to split and spread one end of the barrel of an eyelet pressed against said shoulder, the eyelet having at its opposite end the usual previously formed flange or head.

The upper end portion of the setting member is externally screw-threaded, and engaged with a tapped socket 14, in a vertically-reciprocating plunger 15, which is movable in a fixed guide 16, suitably supported on the frame of an eyelet-setting machine of a well known type, such as the Glass machine, disclosed by Letters Patent of the United States, No. 686,928, dated November 19, 1901, or 673,815, dated May 7, 1901. The setting machine is equipped with the usual anvil 17, on which the head of the eyelet rests, and with the usual positioning point 18, which catches and properly positions the eyelet upon the anvil, as the eyelet is fed from the reservoir through the chute or raceway of the machine.

To the plunger 15 is fixed, as by nuts 19, a cross-head 20, having a recess 21, in its outer side, the upper and lower sides 22 of said recess forming horizontal guides in which a block 23 is moved by any suitable means to vertically reciprocate the cross-head and plunger. As here shown, the block 23 is provided with a socket 24, in which may be

loosely fitted a wrist-pin, to which an orbital movement is imparted in such manner as to cause the block to move both horizontally and vertically, the block sliding from end to end of the guides 22, and at the same time reciprocating the cross-head and plunger vertically.

Projecting from the inner side of the block 23 is a lug 26, which is movable in a horizontal slot 27, in the cross-head 23, and is provided with inclined or bevelled side faces, preferably curved, as shown by dotted lines in Figure 1, and adapted to engage correspondingly bevelled end faces 28, on the upper end of a cylindrical slide or secondary plunger 29, which is vertically movable to a limited extent in the bore of the plunger 15, the latter, which may be called the primary plunger, being tubular above its lower end portion, to form a guide for said secondary plunger.

30 represents a ring or sleeve, which embraces and is slidable to a limited extent on the reduced lower end portion 15^a of the primary plunger, and is normally held yieldingly, by means presently described, against a shoulder 15^b at the upper end of said reduced portion. The ring 30 is provided with a pair of upwardly projecting arms 31, which are movable in vertical guiding slots 32, in opposite sides of the fixed guide 16.

To the upper ends of the arms is secured a transverse pin 33 closely fitted in a transverse orifice in the secondary plunger 29, and passing through vertical slots 34 in the primary plunger 15. A spring 35 interposed between the lower end of the secondary plunger, and an abutment 36, formed by the closed end of the bore of the primary plunger, normally holds the ring 30 yieldingly against the shoulder 15^b, and yieldingly supports the secondary plunger with its bevelled end faces 28 in the path of the block lug 26.

The ring 30 is provided at its lower end with a reduced externally threaded nipple 37, with which is adjustably engaged an annular hammer, composed of a base 38, internally threaded to engage the nipple 37, and a sleeve 39, surrounding a portion of the setting member 12, and provided with an inwardly projecting annular flange 40, which constitutes the head of the hammer and surrounds the setting member above the shoulder 13.

When the primary plunger 15 is raised, the setting member 12 is spaced from the anvil 17, as shown by Figures 1 and 2, the block 23 being at one end of its movement in the cross-head 20, so that the lug 26 is spaced from the end faces 28 of the secondary plunger, as shown by Figure 1. The movement of the block which depresses the cross-head and the primary plunger, causes said plunger and the secondary plunger 29 to move downward in unison, until the upper end of the barrel of an eyelet 44, whose head 45 is supported by the anvil 17, is partially split and spread by the shoulder 13 of the setting-member, as shown by Figure 6. When the setting member reaches this position, the lug 26 of the block 23 encounters one of the end faces 28, and in passing across the same, additionally depresses the secondary plunger 29, thereby depressing the hammer to the position shown by Figure 7. The hammer in moving to this position, acts through the layer 43, hereinafter described, to complete the clenching of the eyelet, so that the eyelet is clenched by two operations, one following the other.

In using the described mechanism for blind eyeleting, the eyelet is inserted in and clenched on superimposed layers 41 and 42, without being clenched on a concealing layer 43, superimposed on the layer 42. The layer 43, which is provided with orifices coinciding with the eyelet-receiving orifices in the layers 41 and 42, embraces the setting member, above the shoulder 13, and bears on the head 40 of the hammer, said orifices being formed by the setting member when the latter is formed as a punch. The descent of the setting member to the position shown by Figure 6, causes the shoulder 13 to partially spread the eyelet barrel to such an extent that the spread end is of greater diameter than the orifice in the concealing layer 43, before said layer is pressed by the hammer head 40 against the barrel. The completion of the spreading of the eyelet barrel is therefore effected without liability of the entrance of the prongs formed by the clenching of the eyelet into the concealing layer, the latter being pressed by the hammer head 40 against the clenched end of the barrel, without being penetrated by the prongs, and therefore without adhesion to the clenched eyelet. The prongs of the clenched eyelet easily find their way between the layers 42 and 43, without engaging the latter, so that the concealing layer is entirely free from the eyelet after the clenching operation.

The block lug 26, in passing across one of the faces 28, imparts a quick downward movement or hammer blow to the hammer, and this is followed by a quick upward movement of the hammer caused by the spring 35.

The adjustable connection between the hammer and the ring 30, embodied in the externally threaded nipple 37, and the internally threaded base 38, enables the hammer to be raised or lowered relatively to the ring, by rotation on the nipple, and thus conformed to the thickness of the concealing layer 43.

To prevent accidental rotation of the ham-

mer on the nipple 37, a spring latch or detent 45 is provided, this being a resilient metal strip attached by a screw 46 to one of the arms 31, and having a free end formed as shown by Figure 3, to engage teeth formed on the hammer base 38, the teeth and detent being formed to permit a forcible rotation of the hammer and prevent an accidental rotation.

To compensate for wear of the secondary plunger faces 28 by the block lug, and to regulate the force of the hammer blow, we provide means for adjusting the secondary plunger vertically with relation to the primary plunger, so that the secondary plunger may be moved slightly upward, as occasion may require. To this end, the stud 33 may have an eccentric portion 33a, (Figures 1 and 4), rotatable in a slot in the secondary plunger 29, to raise the latter. Or, as shown by Figure 5, one of the arms 31 may be provided with a tapped socket, engaging a screw 48, having a conical inner end bearing on one side of a conical socket 49, formed in the primary plunger, and out of alinement with the screw. When the screw is turned inward, its conical end slides on the wall of the socket 49, and raises the secondary plunger.

We are not limited to the specific mechanism of the preferred embodiment of the invention shown by the drawings, except as otherwise required in certain of the more limited claims hereto appended.

We claim:

1. An eyelet-setting device, comprising a setting member adapted to cooperate with an anvil in partly spreading an eyelet barrel inserted in adjacent layers; a hammer adapted to cooperate with the anvil and with a concealing layer in clenching the eyelet on one of said adjacent layers; means for depressing said setting member and hammer successively, so that the partial spreading of the eyelet precedes the clenching thereof, and the clenching is effected wholly at one side of the concealing layer, and means for guiding the setting member and hammer in the performance of their functions.

2. An eyelet-setting device substantially as specified by claim 1, comprising also means for adjusting said hammer toward and from the lower end of the setting member, according to the thickness of said layers.

3. An eyelet-setting device substantially as specified by claim 1, the said depressing means including a primary plunger rigidly connected with the said setting member, a secondary plunger rigidly connected with said hammer and independently movable to a limited extent, and mechanism organized to first depress the setting member, and then depress the hammer while the setting member is at rest.

4. An eyelet-setting device substantially as specified by claim 1, the said depressing means including a primary plunger rigidly connected with said setting member and provided with a cross-head having upper and lower guides transverse to said plunger, a secondary plunger rigidly connected with said hammer and having bevelled end faces, a spring yieldingly maintaining said end faces above the lower guide, and a block movable on said guides to depress the primary plunger, and provided with a bevelled lug which is movable across said faces to independently depress the secondary plunger and the hammer.

5. An eyelet-setting device substantially as specified by claim 1, comprising also adjusting means for said hammer including an externally threaded nipple, and an internally threaded base on the said hammer, engaged with and rotatable on said nipple to adjust the hammer.

6. An eyelet-setting device substantially as specified by claim 1, comprising also adjusting means for said hammer including an externally threaded nipple, an internally threaded base on the said hammer, engaged with and rotatable on said nipple to adjust the hammer, teeth on said base, and a spring latch yieldingly engaging said teeth to prevent accidental rotation of the hammer.

7. An eyelet-setting device substantially as specified by claim 1, the said depressing means including a primary plunger rigidly connected with said setting member and provided with a cross-head having upper and lower guides transverse to said plunger, a secondary plunger rigidly connected with said hammer and having bevelled end faces, a spring yieldingly maintaining said end faces above the lower guide, a block movable on said guides to depress the primary plunger and provided with a bevelled lug which is movable across said faces to independently depress the secondary plunger and the hammer, and means for adjusting the secondary plunger to compensate for wear of the end faces thereof and regulate the force of the hammer blow.

8. An eyelet-setting device comprising a fixed tubular guide having longitudinal slots, a primary plunger movable in said guide, a setting member fixed to the primary plunger, a secondary plunger movable in the primary plunger provided with bevelled upper end faces, an annular hammer formed to surround the setting member, means rigidly connecting the hammer with the secondary plunger, said means including upwardly projecting arms on the hammer slidable in the said slots in the fixed guide, a transverse pin secured to the said arms and engaged with the secondary plunger, the primary plunger being provided with slots permitting a limited independent movement of the secondary plunger and the hammer, a spring

interposed between the secondary plunger and an abutment in the primary plunger, whereby the secondary plunger is yieldingly raised, a cross-head rigidly attached to the primary plunger and provided with transversely extending upper and lower guides, and a block movable on said guides to reciprocate the cross-head, and provided with a bevelled lug, which is reciprocated in the cross-head by the block, the arrangement being such that the end faces of the secondary plunger are normally held by said spring in the path of said lug, the movements of the block and lug first depressing the primary plunger, and then depressing the secondary plunger, while the primary plunger is at rest.

9. An eyelet-setting device substantially as specified by claim 8, comprising also means for vertically adjusting the secondary plunger.

10. An eyelet-setting device substantially as specified by claim 8, the said transverse pin being rotatable, and provided with an eccentric portion within the secondary plunger, whereby the latter may be vertically adjusted.

In testimony whereof we have affixed our signatures.

ERNST F. H. ENNA.
ANTON HAAHR.

Witnesses for Mr. Haahr:
CHR. ZEMINNTZ,
O. R. SUGFÖRER,
THEO NALLE,
AVERELSON LOVE.