Sept. 18, 1923. 1,468,039

R. B. SMITH

ART OF EYELETING

Filed Feb. 7, 1916

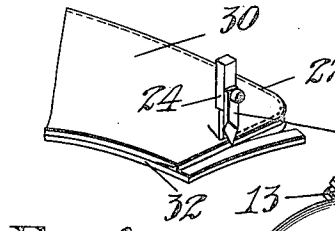


Fig.1.

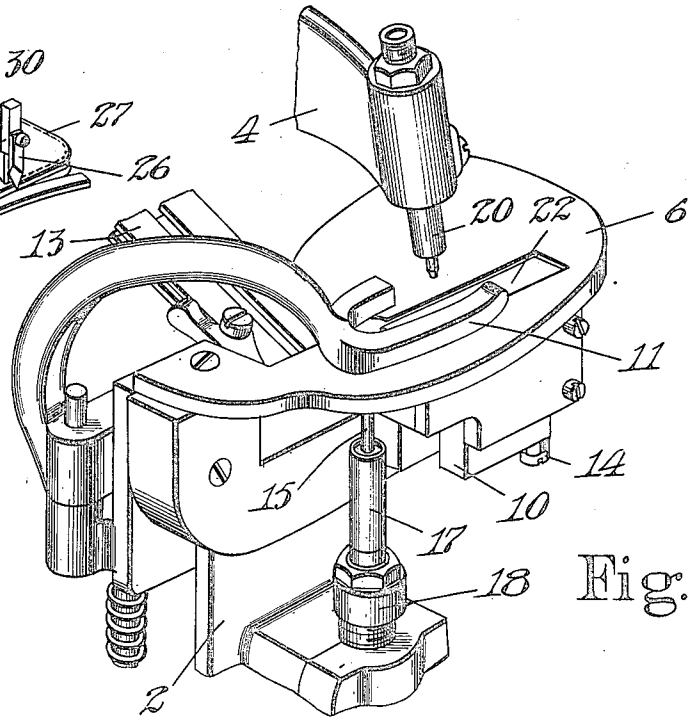


Fig.2.

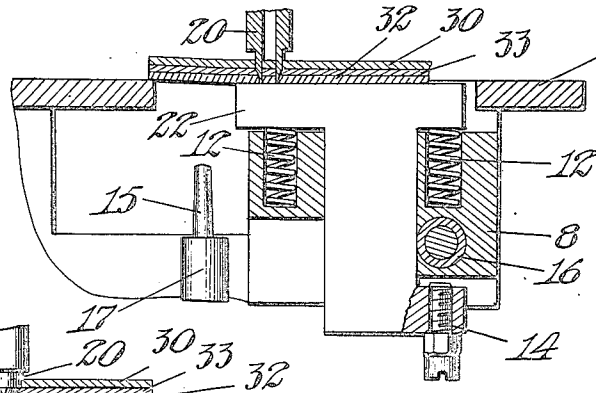


Fig.3.

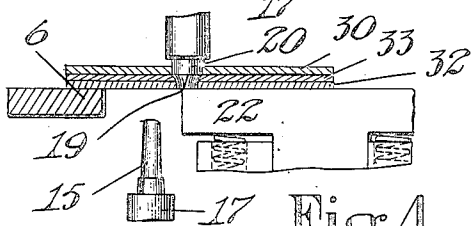


Fig.4.

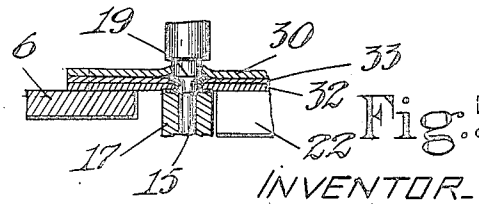


Fig.5.

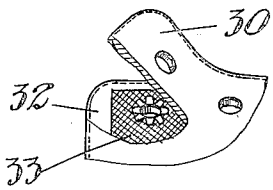


Fig.6.

INVENTOR.

Robert B. Smith

Patented Sept. 18, 1923. 1,468,039

UNITED STATES PATENT OFFICE.

ROBERT B. SMITH, OF STOUGHTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

ART OF EYELETING.

Application filed February 7, 1916. Serial No. 76,639.

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 the Art of Eyeleting, 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 improvements in the art of inserting fasteners and particularly to the art of setting blind and invisible eyelets in the manufacture of boots and shoes.

By the practise of the improved method of this invention it is practicable to insert fasteners such as blind or invisible eyelets in shoe uppers after the upper leather and lining parts of the upper have been stitched together along the lacing slit and around the top of the upper, without disturbing the normal relation of those parts of the shoe upper. This is particularly advantageous, as compared with the prior practice of parting the leather and the lining parts after the lacing holes had been punched, and setting the eyelets in one or the other of those parts after the fashion of regular visible eyelets, leaving the uneyeletted lacing holes in the other part, in that it provides for performing in a single operation what previously required two separate operations and in that it produces work of a very superior quality.

As herein exemplified the method of this invention comprises permanently securing together, as by stitching, the leather and lining parts of a shoe upper in that relation which they are to occupy in the finished shoe, then punching a hole through both parts by the use of a combined punching and setting tool, feeding the work without withdrawing the tool, and finally inserting an eyelet through one part of the upper and clenching the eyelet barrel upon the hidden surface of the covered part of the upper, that is, between adjacent layers of the work.

As herein shown, the upper is supported upon a yieldingly mounted cutting block and in a feeding operation the combined punching and setting tool is moved transversely over the surface of the yielding cutting block.

The machine of the accompanying drawings, by which the method above outlined may be practiced in the preferred manner, is not claimed herein, it being the subject-matter of my copending application, Serial No. 143,177, filed January 18, 1917.

In the accompanying drawings certain steps of my improved method are illustrated in connection with one form of mechanism by which they may be carried out and in these drawings,—

Fig. 1 illustrates the step of securing together the parts of the upper;

Fig. 2 is a view in perspective of portions of an eyeleting machine of well known construction with mechanism for carrying out certain steps of the method;

Figs. 3, 4 and 5 illustrate successive steps in the punching, feeding and setting operations; and

Fig. 6 is a view in perspective of a portion of a shoe upper, partly broken away, to show the clenched end of an invisible eyelet.

In practicing the method of my invention in the manner herein illustrated in connection with the insertion of invisible eyelets, the leather and lining parts of the upper are prepared in the usual manner. The leather part 30, as shown in Fig. 1, is prepared by having those portions which are to form the edges in the finished shoe folded back upon the body of the blank in the usual manner. The lining part 32 is cut approximately to the size of the leather part and a reinforcing strip 33 of canvas or similar material is cemented to the inner surface of the lining in the proper position to receive the eyelets and afford them an additional holding.

The leather part is then placed upon the lining part with the edge of the latter registering with the edge of the leather part or projecting slightly beyond it. The two parts are then secured permanently in that relation which they are to have in the finished shoe by a line of stitching 27 extending entirely about the edges of the upper which are exposed in the finished shoe. The forward or lacing slit edge of the upper is one of these edges and in accordance with my invention this edge is stitched as well as the top edge

of the upper. The stitching operation is usually combined with an operation known as "under trimming" which consists in trimming off the surplus margin of the lining part. As shown in Fig. 1, the needle bar 24 of the sewing machine is equipped with a trimming blade 26 for this purpose.

The work is now ready for the punching of the lacing holes and the insertion of the eyelets. Each hole is punched through all the layers of the upper and thus appears in the finished shoe, while each eyelet is set in the hole formed in the lining part with its flange inside the upper and the end of its barrel clenched on the lining beneath the leather or outer part. The step of punching the upper is illustrated in Fig. 3 of the drawing in which a tubular punch 20 is shown as perforating the work upon a cutting block 22.

The work is then fed to carry the hole in the upper from punching position into alinement with an eyelet inserting tool and this is effected by moving the punching tool transversley without withdrawing it from either part of the upper.

In order to clench the eyelet as desired it is necessary to introduce an upsetting surface into position beneath the outer part of the upper and as herein illustrated, this is effected simultaneously with the punching operation by providing the tool 20 with a shouldered upsetting surface 19 located sufficiently near the end of the tool to be carried through the outer part 30 of the upper in the punching operation. It should be understood, however, that this is a condition which it is not practical to maintain at all times and it is not essential in the practice of the invention that the upsetting surface 19 be passed through the outer layer 30 of the stock at the time of the punching operation.

After the tool 20 has fed the work to eyelet inserting position, an eyelet is introduced into the hole through the lining part and its barrel is upset against the upsetting surface 19, which is then located between the layers of the shoe upper, so that the end of the barrel will be clenched upon the concealed surface of that part of the upper through which it has been inserted.

I will now briefly describe the practice of my method when its various steps are carried out by such mechanism as that herein illustrated and to this end the construction of the mechanism will be first explained.

The machine illustrated in Fig. 2 will readily be identified with the well-known Samson eyeleting machine shown, for example, in United States Letters Patent No. 1,205,277, granted Nov. 21, 1916, on application of Walter Shaw. Such portions of the machine as are not herein illustrated may correspond to similar parts of the machine illustrated in said Letters Patent. The machine frame 2 has mounted thereon a lever 4 which is arranged to be moved vertically to effect the punching operation and also transversely to effect the feeding operation. The tool 20 mounted in this lever has the combined functions of punching and feeding the work as well as upsetting or clenching the end of the eyelet barrel. As shown in Figs. 3 and 4 the tool is of tubular construction having an opening extending completely through it to afford passage for the punchings. Its lower end is formed as a pilot portion terminating in a cutting edge shaped to perforate the work and cooperating with a cutting block 22. A short distance above its end the tool is provided with an outwardly and upwardly curved shoulder 19 which constitutes the upsetting surface.

The frame 2 carries a stationary work table 6 perforated for the passage of the setting tools and slotted to receive the punching block 22. The punching block is shown in detail in Fig. 3. It is provided with a downwardly extended shank and is mounted for a limited vertical movement in ways formed in a stationary block 8. The block 8 has sockets for a pair of springs 12 which bear beneath the opposite ends of the block 22 and tend normally to lift it. The normal position of the cutting block is adjustably controlled by a stop screw 14 set in a lug in the lower end of the shank 10 and bearing against the under surface of the stationary block 8. An anti-friction roller 16 is journalled in the block 8 in position to bear upon one side of the shank 10 and thus prevent cramping of the shank and consequent loss of free vertical movement in the cutting block which might result from the pressure of the punch upon the end of the cutting block where the punch would ordinarily act.

The frame 2 is provided with vertical bearings for a plunger 18 in the upper end of which is mounted the lower or eyelet inserting die 17. The inserting die 17 is provided with a center spindle 15 which is adapted to pick one eyelet after another from the end of a raceway 13 preliminarily to each inserting operation. A vertically movable presser foot 11 is provided for holding the work at rest upon the work plate 6 between the feeding operations.

In using the mechanism herein illustrated in the practice of the present method the stitched upper is presented upon the work table 6 with the point at which the first eyelet is to be set above the cutting block 22 and in alinement with the tool 20. The machine is thereupon started and the tool is moved downwardly, perforating both parts of the upper and slightly depressing the cutting block as shown in Fig. 3. The tool 20 is then lifted sufficiently to permit the cutting block to return to its normal posi-

tion and is then moved transversely toward the left, as shown in Fig. 4, with its end in light engagement with the surface of the cutting block. It will be seen that when the feeding operation is carried out in this manner there is no possibility of the upper slipping off the end of the feeding tool. The feeding operation terminates with the tool 20 in alinement with and above the inserting die 17 to which an eyelet has been supplied by the raceway. In the final step of the method the inserting die is elevated and the end of the eyelet barrel forced through the lining part of the upper, being guided by the reduced end portion of the tool 20 against the curved upsetting surface 19. The position of the tools at the conclusion of the setting operation is shown in Fig. 5.

While the novel method has been herein described with reference to the insertion of invisible eyelets, it should be understood that it is applicable also to the insertion of blind eyelets and other barreled fasteners.

Having now described the method of my invention together with the product thereof, and one form of mechanism for carrying out the method, I claim as new and desire to secure by Letters Patent of the United States:

1. In the manufacture of boots and shoes, the method of setting blind or invisible eyelets which consists in yieldingly supporting the upper, perforating both the outer and lining parts of the upper by a punching tool, feeding both parts forwardly while the upper remains yieldingly supported, and setting an eyelet in the lowermost part of the upper in register with the hole in the other part.

2. In the manufacture of boots and shoes, the method of setting blind or invisible eyelets consisting in permanently and completely securing together in their normal relation the leather and lining parts of a shoe upper, perforating both parts, feeding both parts forward without withdrawing the punching tool from either of said parts and setting an eyelet in one part in register with the hole in the other part.

3. The herein-described method of setting blind or invisible eyelets consisting in permanently and completely securing together a plurality of layers of material by stitching the edges thereof adjacent to the eyelets, perforating said layers, feeding said layers forward without withdrawing the perforating tool and setting an eyelet in one of said layers.

4. The improved method of inserting fasteners in a plurality of layers of material which comprises forcing a combined punching and setting tool through a plurality of layers of material to perforate the layers and advancing a fastener into engagement with the setting shoulder of the tool while said shoulder is between adjacent layers of the material and clenching the fastener between said adjacent layers.

5. The improved method of inserting fasteners in a plurality of layers of material which comprises permanently securing together a plurality of layers of material, perforating said layers, introducing a fastener through the hole in one or more of said layers without disturbing the relative position of the layers, and clenching the end of the fastener against the perforating tool and between adjacent layers of the material.

6. That improvement in methods of inserting barreled fasteners in a plurality of layers of material, and clenching the ends of the fastener barrels between adjacent layers of the material which is characterized by the fact that a punch provided with a setting shoulder is caused to perforate the work and to clench the end of the fastener barrel between adjacent layers of the material while its setting shoulder is located between said adjacent layers.

7. The herein-described method of setting blind or invisible eyelets consisting in permanently securing together a plurality of layers of suitable material, said layers being stitched together around their entire edges, perforating said layers and then setting an eyelet in one of said layers before the perforating tool is withdrawn from said layers.

8. The herein-described method of setting blind or invisible eyelets consisting in securing together in normal position a plurality of layers of suitable material, perforating said layers and then setting an eyelet in one of said layers before the perforating tool is withdrawn from either of said layers.

9. The herein-described method of setting blind or invisible eyelets consisting in securing together in normal position a plurality of layers of suitable material, perforating said layers and feeding said layers forward and setting an eyelet in one of said layers before the perforating tool is withdrawn from any of said layers.

10. The herein-described method of setting blind or invisible eyelets consisting in securing together in normal position a plurality of layers of suitable material, perforating said layers and then setting an eyelet in one of said layers before the perforating tool is withdrawn from said layers by forcing the end of the barrel of said eyelet against a portion of the perforating tool to clench the said barrel of the eyelet on said layer.

11. The herein-described method of setting blind or invisible eyelets consisting in securing together in normal position a plurality of layers of suitable material, perforating said layers and then setting an eyelet in one of said layers before the perforating tool is withdrawn from said layers by forc-

ing the end of the barrel of said eyelet against the setting shoulder of the perforating tool to clench the said barrel of the eyelet on said layer.

12. The herein-described method of setting blind or invisible eyelets consisting in permanently securing together a plurality of layers of suitable material, said layers being stitched together at their edges, perforating said layers and then setting an eyelet in one of said layers by forcing the end of the barrel of said eyelet against a portion of the perforating tool to clench the barrel of the eyelet on said layer.

13. The herein-described method of setting blind or invisible eyelets consisting in securing together in permanent and normal relation a plurality of layers of suitable material, perforating said layers, feeding said layers forward without withdrawing the perforating tool therefrom and then setting an eyelet in one of said layers by forcing the end of the barrel of said eyelet against a portion of the perforating tool to clench the said barrel of the eyelet on said layer.

In testimony whereof I have signed my name to this specification.

ROBERT B. SMITH.