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S. L. GOOKIN

1,748,952

EYELET

Filed Aug. 23, 1923

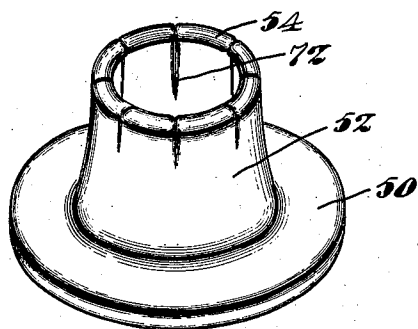


Fig. 1.

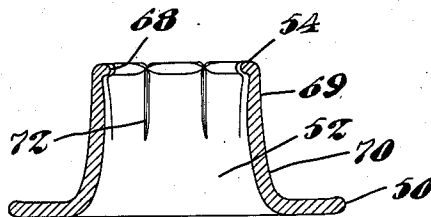


Fig. 2.

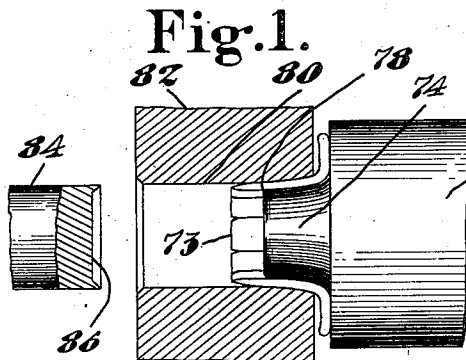


Fig. 5.

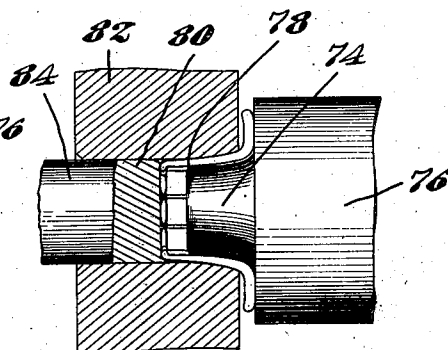


Fig. 6.

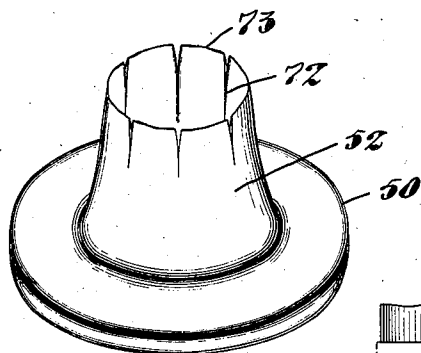


Fig. 3.

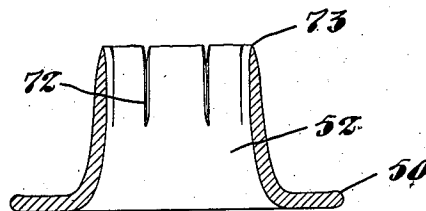


Fig. 4.

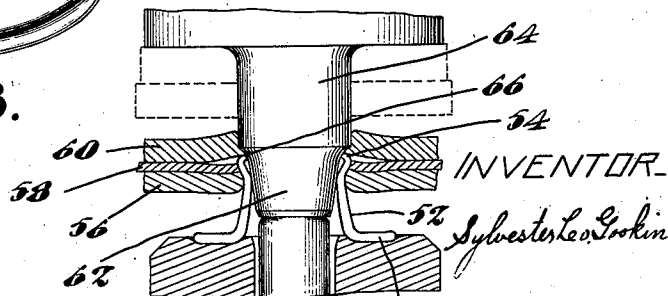


Fig. 7.

UNITED STATES PATENT OFFICE

SYLVESTER LEO GOOKIN, OF ATLANTIC, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY

EYELET

Application filed August 23, 1923. Serial No. 658,991.

This invention relates to eyelets and is disclosed herein as embodied in an eyelet especially adapted to be inserted through one or more of several layers of stock and to have the end of its barrel clenched between adjacent layers of the stock. When eyelets are so inserted in the manufacture of shoes the operation is known as blind or invisible eyeletting. As a specific object of the invention was to produce an improved eyelet which would be more satisfactory for use in invisible eyeletting than the eyelets of the prior art, the invention will be described herein for purposes of illustration with reference to eyelets particularly adapted to invisible eyeletting.

Prior to this invention, the eyelets used for invisible eyeletting did not differ, except for necessary changes in dimensions, from eyelets which had been used for many years prior to the introduction of invisible eyeletting in the shoe industry. That is, there had been no material change made in such eyelets and there had been no improvement in eyelets which had been intended or adapted to facilitate their use in invisible eyeletting.

In the manufacture of the eyelets of the prior art, including those used for invisible eyeletting, the eyelet barrel is drawn out, incidentally to the well-known methods of eyelet manufacture, to form a thin, sharp edge at the end of the barrel.

Heretofore, in invisible eyeletting, the eyelets of the prior art have frequently failed to force the outer layer properly past the clenching shoulder of the setting tool. Sometimes the thin, sharp edge at the end of the eyelet barrel pushed the outer layer of the shoe upper only part way past the clenching shoulder so that the end of the eyelet barrel was clenched in the lacing hole in the outer layer and was clearly visible on the exterior of the shoe. Occasionally the end of the eyelet barrel passed entirely through the outer layer and was not clenched at all. Frequently the prongs of the eyelet barrel caught on the flesh side of the upper leather and distorted the upper leather around the lacing hole.

Moreover the prior art eyelets have been

so formed that the restricted clenching shoulder necessarily employed in invisible eyeletting frequently failed to deflect the prongs of the eyelet properly. In such cases, even though the upper leather was pushed completely past the clenching shoulder, the prongs of the eyelets did not curl outwardly and downwardly as they should between the upper leather and the adjacent layer of the stock but projected past the clenching shoulder in an upward or in an upward and outward direction between the adjacent layers, thus holding those layers separated.

These difficulties inherent in setting the prior art eyelets invisibly were further aggravated by the general practice of reducing the clenching shoulder of the setting tool to substantially the smallest practicable diameter in order to provide the small lacing hole insisted upon by the trade.

For the purpose of overcoming these and other difficulties heretofore encountered in invisible eyeletting, the present invention provides an eyelet which can be depended upon effectively to push the stock and thereby to insure that the outer layer of the stock shall be forced uniformly and properly past the clenching shoulder of the setting tool. This eyelet can also be depended upon to clench properly between the outer layer and an adjacent layer of the stock without damaging or distorting the outer layer, the eyelet barrel also being formed to facilitate the passage of the end of the eyelet barrel through the inner layer or layers of the stock.

In the illustrated exemplification of this invention, the thin edge formed on the eyelet barrel during the manufacture of the eyelet is blunted or thickened throughout its circumference to cause the entering end of the barrel to engage the stock at points removed from the lacing hole, the end of the eyelet barrel being formed so that it will also engage the stock at the edge of the lacing hole, thereby rendering the eyelet barrel effective both to push the stock and to pass through the inner layer or layers of the stock.

To insure that the prongs formed when the eyelet bursts will be properly clenched upon

an inner layer of the stock, such as the lining or eyelet stay of the shoe upper, the illustrated eyelet has its barrel for a substantial portion of its length toward its entering end of a substantially non-tapering formation so that it will closely embrace the pilot of the setting tool and so that the prongs formed when the eyelet bursts may be depended upon to engage the clenching shoulder of the setting tool substantially throughout its entire width thereby causing the prongs to curl outwardly and downwardly between the outer layer and the adjacent layer of the stock as the prongs pass the clenching shoulder of the tool. The engagement of the eyelet and the clenching shoulder of the setting tool, by reason of the non-tapering formation of a substantial portion of the eyelet barrel, over substantially the whole area of the clenching shoulder of the setting tool until the clenching of the eyelet is well under way, produces a much more favorable condition for the clenching of the eyelet than has heretofore existed in invisible eyeleting and permits, if desired, use of a setting tool having a smaller clenching shoulder than has heretofore been practicable.

In addition to the above stated advantages of this improved eyelet, which have been demonstrated by extensive use of the eyelet in invisible eyeleting under practical conditions, it has been found that the end of the eyelet barrel may be made smaller than has heretofore been practicable while at the same time maintaining the comparatively large internal diameter of the eyelet flange necessary to provide for free passage of the lacing tip. This makes practicable a corresponding reduction in the size of the pilot and of the clenching shoulder of the setting tool and thus makes it practicable to provide the desired small lacing hole.

While the invention is disclosed herein as embodied in an eyelet particularly intended for invisible eyeleting in the manufacture of shoes, it should be understood that in various of its aspects it is not so limited.

A novel method of setting eyelets, in the practice of which my improved eyelet has been successfully utilized, is set forth and claimed in my co-pending application, Serial No. 593,358, filed October 9, 1922.

In the drawings,

Fig. 1 is a perspective view and Fig. 2 a cross section of an eyelet embodying the present invention;

Fig. 3 is a perspective view and Fig. 4 a cross section of the same eyelet at a stage in its manufacture before it has been provided with its thickened end;

Figs. 5 and 6 illustrate the method of blunting the end of the eyelet barrel; and

Fig. 7 illustrates a stage in the setting of the eyelet, showing the end of the eyelet barrel pushing the outer layer of a shoe upper

past the clenching shoulder of a setting tool.

The illustrated eyelet, which is particularly adapted for use in the invisible eyeleting of shoes, is provided with a relatively large flange 50 having a hole of ample size for the insertion of a lacing tip and with a thin barrel 52 tapering from the flange toward its entering end. The entering end of the eyelet barrel is deformed to provide an effective work-engaging end surface 54 which, during the insertion of the eyelet, will push the lining or facing 56, the eyelet stay 58 and the outer layer or upper leather 60 of a shoe upper along the pilot 62 of a setting tool 64 and will ultimately push the outer layer 60 past the clenching shoulder 66 of the setting tool 64, as illustrated in Fig. 7 and as more fully set forth in my co-pending application having Serial No. 593,358, above referred to.

The barrel of the illustrated eyelet is deformed by having its end blunted and thickened throughout its circumference (Figs. 1, 2 and 6), and is provided with an inwardly turned bead 68 (Fig. 2) as well as with the smooth end surface 54 which engages the work during the setting of the eyelet at points removed from the lacing hole and is effective to push the outer layer of the material along the pilot 62 and past the clenching shoulder 66 of the setting tool 64. Moreover, the blunted end of the eyelet barrel engages the pilot 62 of the setting tool as well as the stock at the edge of the lacing hole early in the eyelet inserting operation thereby facilitating the entrance of the eyelet barrel into the lacing hole. The eyelet barrel, for a substantial portion of its length toward its entering end, is substantially non-tapering or cylindrical in form, as shown at 69, Fig. 2, so as to cause the eyelet barrel to embrace closely the pilot 62 of the setting tool 64. This insures that the prongs formed when the eyelet bursts will engage the clenching shoulder 66 of the setting tool 64 substantially throughout its entire width, thereby insuring that the prongs curl progressively outwardly and downwardly between the layers of the material as they pass said setting shoulder. The fact that a considerable portion 68 of the eyelet barrel, extending substantially from the entering end toward and, as illustrated, approximately half way to the flange, is non-tapering, causes the eyelet barrel to engage substantially the whole of the clenching shoulder 66 until the clenching operation is well under way, and this independently of the configuration of the extreme entering end of the eyelet barrel as seen in end view. A smaller clenching shoulder can accordingly be used than is practicable with the older eyelets (for example, as disclosed in Letters Patent of the United States No. 53,234, granted March 13, 1866, on an application of Jesse F. Richards) the portions adjacent to the entering ends of

which taper. Such old eyelets, as the tapering entering ends of their barrels are expanded during the clenching operation, present progressively larger openings to the setting tool from the starting of the clenching, so that from the beginning of the clenching a continually diminishing part of the clenching shoulder engages the eyelet.

The portion of the eyelet barrel toward the flange tapers as shown at 70, Fig. 2, so as to provide a hole through the clenched eyelet larger than the hole at the entering end of the barrel of the unclenched eyelet, thereby facilitating the passage of the lacing tip through the clenched eyelet. The eyelet is preferably scored, as indicated at 72, the scoring running from the thickened end of the barrel toward the flange.

In the manufacture of eyelets as commonly carried out, the stock is formed into a cup-shaped blank or cap which is operated upon to punch out the opening at the entering end of the eyelet barrel. In these operations the metal of the wall of the eyelet barrel is drawn out so that the entering end of the barrel is substantially thinner than the wall of the barrel nearer to the flange. As eyelets have heretofore been made, the entering end of the eyelet barrel has been drawn down as an incident to these operations substantially to a knife edge, the sharp, thin, entering end of the eyelet barrel being left about as illustrated at 73 in Figs. 3 and 4. The eyelet illustrated in Figs. 1 and 2 may conveniently be produced from such an eyelet or blank by deforming and blunting the thin entering end 72 of the eyelet barrel, as indicated in Figs. 5 and 6. In this operation the eyelet may be supported by a projection 74 formed upon the end of a rod 76, the projection 74 being of such size and shape as to fit the eyelet barrel rather loosely through a substantial proportion of its length. The end of the projection 74 is illustrated as having its edge slightly rounded or beveled at 78 so as to facilitate its introduction into the eyelet barrel. The eyelet, supported by the projection 74, is inserted, entering end foremost, into the hole 80 of a die 82, the hole of the die being shaped to correspond with the form of the eyelet barrel and being of a size to receive the eyelet barrel with a rather snug fit so that the wall of the eyelet barrel is supported throughout the greater part of its length by the wall of the hole 80 in the die 82. With the eyelet supported by the projection 74 and the die 82, as illustrated in Fig. 5, a forming tool 84, having its operating end provided with a depression 86 having a flat bottom and a beveled side wall, is introduced into the die hole 80 and caused to impinge upon the thin end 72 of the eyelet barrel 52, bending and upsetting the latter, as shown in Fig. 6, so as to blunt and to thicken the end of the eyelet barrel. It will be observed that when

the end of the eyelet barrel is treated in this manner it is rolled inwardly, being formed with the internal circumferential bead 68, and is provided with the smooth end surface 54 illustrated as of a width approximately twice the thickness of the wall of the eyelet barrel adjacent to the bead and approximately one-tenth as wide as the over-all diameter of the entering end of the barrel. This end surface of the eyelet barrel is of a form to resist penetration of the stock during the insertion of the eyelet and is well adapted to engage the stock during the setting operation, to push the stock along the pilot of the setting tool and ultimately to force the outer layer past the setting shoulder of the tool. Moreover, the structure of the eyelet barrel is sufficiently stout to stand up under the punishment which the eyelet receives during the invisible eyeleting operation so that its end formation is retained as long as is necessary to force the stock past the clenching shoulder of the setting tool and to insure the proper clenching of the eyelet. The usual abutment, indicated in dotted lines in Fig. 7, may be used to prevent the outer layer from being pushed too far past the clenching shoulder 66 of the setting tool 64.

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

1. An eyelet for invisible eyeleting having the end of its barrel formed to provide means to engage the stock at points removed from the lacing hole and also means to engage the stock at the edge of the lacing hole, thereby rendering the end of the eyelet barrel effective both to push the stock and to pass through one or more layers of the stock.

2. An eyelet for invisible eyeleting having the end of its barrel formed to provide means to engage the stock at points removed from the lacing hole, and also means to engage the stock at the edge of the lacing hole, the barrel of the eyelet for a substantial portion of its length toward its entering end being shaped closely to embrace the pilot of the setting tool.

3. An eyelet for invisible eyeleting having the end of its barrel formed to provide means to engage the stock at points removed from the lacing hole to facilitate pushing the stock along an invisible eyeleting tool, the barrel of the eyelet being shaped to insure that the prongs formed when the eyelet bursts will engage the clenching shoulder of the tool substantially throughout its entire width thereby causing the prongs to curl outwardly and downwardly between adjacent layers of the stock as the prongs pass the clenching shoulder of the tool.

4. An eyelet for invisible eyeleting having the end of its barrel formed to engage the stock at points removed from the lacing hole to facilitate pushing the stock, and having its barrel for a substantial portion of its

length toward its entering end formed closely to embrace the pilot of the setting tool thereby facilitating the passage of the barrel through one or more layers of the stock and insuring that the prongs formed when the eyelet bursts will curl outwardly and downwardly between adjacent layers of the stock as the prongs pass the clenching shoulder of the tool.

5. An eyelet for invisible eyeleting having the end of its barrel formed to provide means to engage the stock at points removed from the lacing hole to facilitate pushing the stock along an invisible eyeleting tool and also formed to engage the pilot of said tool, the barrel of the eyelet for a substantial portion of its length toward its entering end being shaped to cause successive portions of the prongs formed when the eyelet bursts to engage the clenching shoulder of said tool progressively substantially throughout its entire width thereby causing the prongs to curl outwardly and downwardly between adjacent layers of the stock as the prongs pass the clenching shoulder of the tool.

6. An eyelet for invisible eyeleting having the end of its barrel formed to engage the stock at points removed from the lacing hole to facilitate pushing the stock, and having the portion of its barrel adjacent to its flange of a tapering formation and a substantial portion of its barrel toward its entering end shaped to embrace closely the pilot of the setting tool to cause the prongs formed when the eyelet bursts to curl outwardly and downwardly between adjacent layers of the stock as the prongs pass the clenching shoulder of the tool.

7. An eyelet for invisible eyeleting having the end of its barrel blunted throughout its circumference to engage the stock at points removed from the lacing hole thereby to provide means for pushing the stock into position for the clenching of the eyelet between adjacent layers of the stock.

8. An eyelet having a scored barrel the entering end of which is thickened throughout its circumference sufficiently to provide a work-engaging end surface considerably wider than the thickness of the material of the adjacent portion of the eyelet barrel.

9. An eyelet for invisible eyeleting having the thin edge formed on its barrel during the manufacture of the eyelet blunted, thereby rendering the end of the eyelet barrel effective to push the stock.

10. An eyelet having a barrel the entering end of which is formed with a bead shaped to push the stock of a shoe upper to force the outer layer of the stock past the shoulder of a setting tool.

11. An eyelet having a substantial portion of its barrel toward its entering end of a non-tapering formation and having the end of its barrel formed to provide means for engaging

the stock at points removed from the lacing hole.

12. An eyelet having a substantial portion of its barrel toward its entering end of substantially uniform diameter and having the extreme end of its barrel blunted throughout its circumference.

13. An eyelet having a flange and a barrel tapering from the flange part way to the entering end and then merging into a non-tapering portion terminating in a blunted end.

14. An eyelet having a barrel which has a substantially conical portion adjacent to the eyelet flange and a substantially cylindrical portion toward the entering end of the barrel terminating in a blunted end surface.

15. An eyelet having a flange and a barrel provided with a tapering portion extending from the flange part way to the entering end of the barrel and merging into a non-tapering portion extending substantially to the entering end of the eyelet barrel.

16. An eyelet having a flange and a barrel, said barrel having a substantially conical portion adjacent to the flange and a substantially cylindrical portion toward the entering end of the barrel.

17. An eyelet having a barrel, and a flange at one end of said barrel, said barrel being of substantially uniform diameter adjacent to its free end and then flaring at a considerable angle toward said flange for a distance such that the portion of the eyelet split and turned outwardly when the eyelet is set includes a substantial part of said flaring portion, whereby the minimum internal diameter of said eyelet is substantially increased during the setting operation.

18. An eyelet having a barrel and a flange at one end of said barrel, said barrel having a portion of substantial length adjacent to its free end of substantially uniform diameter and acting to properly center the eyelet on a spindle snugly fitting therein prior to the setting of the eyelet, and said barrel having a flaring portion extending from said substantial parallel portion to said flange, said flaring portion being of such length that a substantial portion thereof is split and turned back when the eyelet is set whereby the minimum internal diameter of the eyelet when set is substantially larger than the external diameter of the spindle.

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

SYLVESTER LEO GOOKIN.