April 29, 1930. F. G. NEUBERTH 1,756,256

EYELET

Original Filed Oct. 5, 1923 2 Sheets-Sheet 1

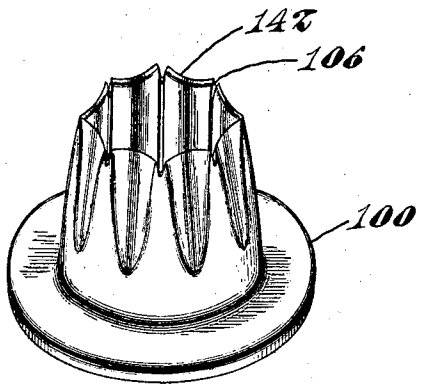


Fig. 4.

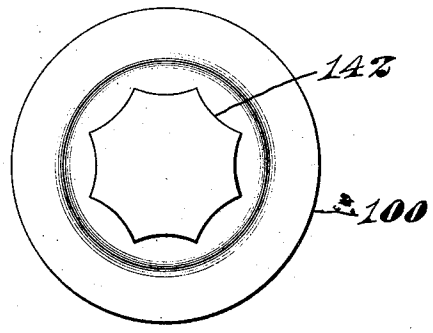


Fig. 5.

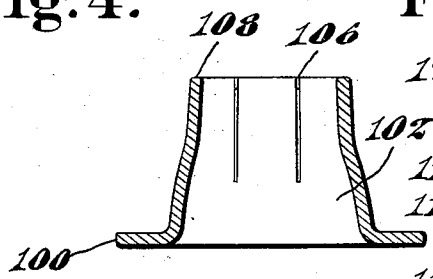


Fig. 3.

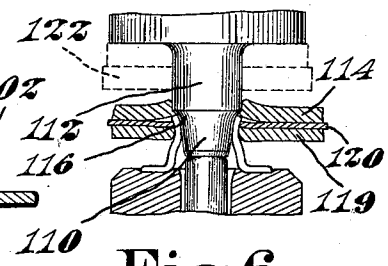


Fig. 6.

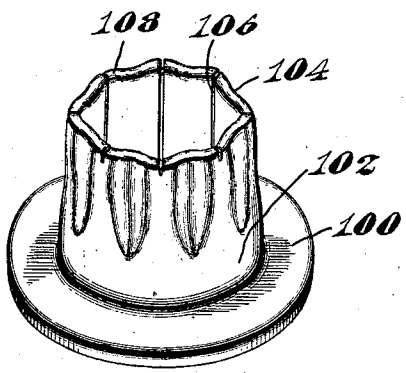


Fig. 1.

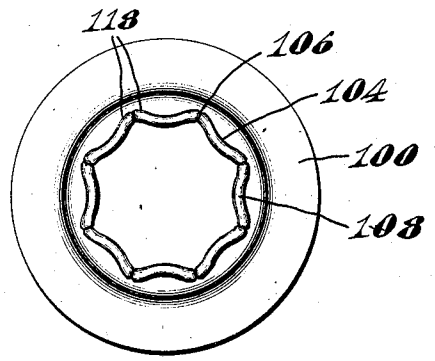


Fig. 2.

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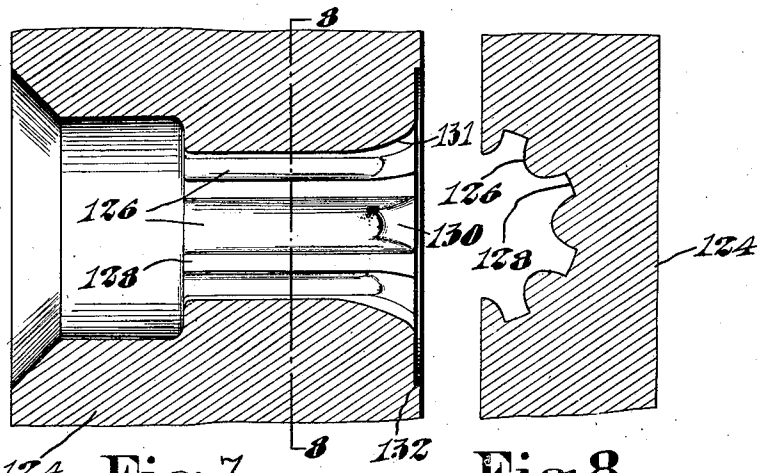
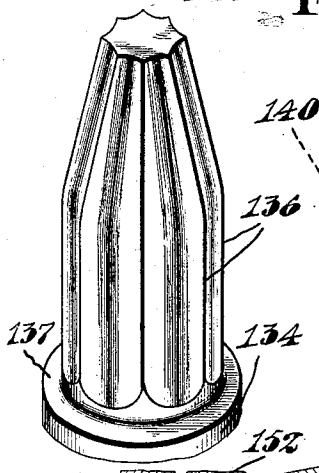


Fig.9.

Fig.7.

Fig.8.



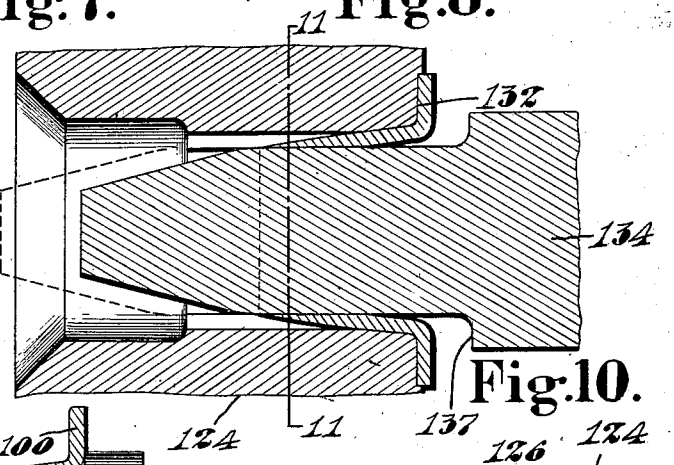


Fig.10.

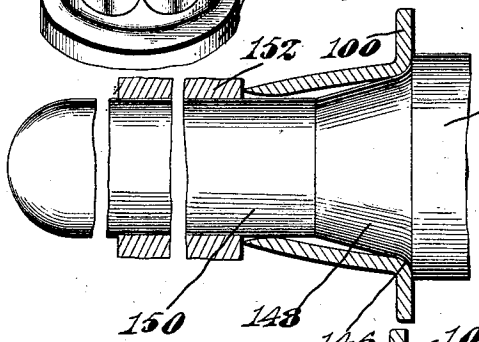


Fig12.

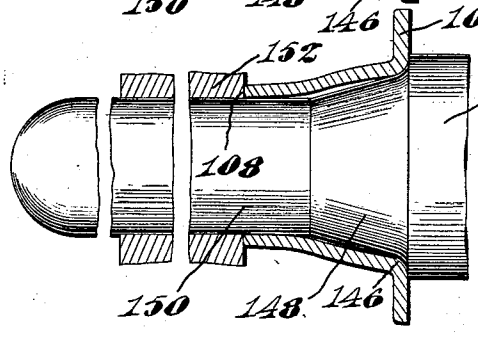


Fig.13.

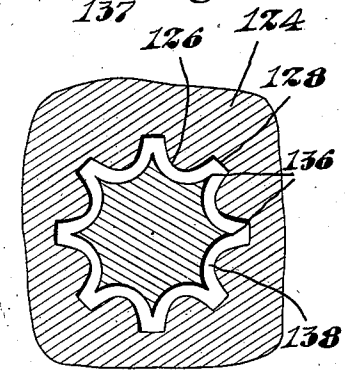


Fig.11.

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UNITED STATES PATENT OFFICE

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EYELET

Application filed October 5, 1923, Serial No. 666,862, and in Germany September 13, 1923. Renewed April 9, 1927.

This invention relates to eyelets and is disclosed herein with particular reference to eyelets especially adapted to be used for invisible eyeleting in the manufacture of boots and shoes.

In order to insure that the outer layer of the stock will be properly forced past the clenching shoulder of the setting tool in the insertion of invisible eyelets, it is an object of the present invention to provide an improved eyelet having the end of its barrel formed to provide effective means to push the stock in which the eyelet is to be inserted along the pilot of the setting tool and ultimately to force the outer layer of the stock past the clenching shoulder of the tool. Further objects of the invention are to provide an eyelet for invisible eyeleting which will be satisfactory in the best grades of shoes and which can, at the same time, be produced in quantity at a cost which will permit its use in shoes of any type or grade in which it is desired to insert invisible eyelets.

With these objects in view, the herein disclosed eyelet is provided with a blunted, polygonal or scalloped end providing a plurality of outwardly projecting, stock-pushing portions arranged to engage the work at points removed from the lacing hole, alternating with a plurality of portions arranged to engage the edge of the lacing hole, this formation being such as to insure that the upper leather is properly forced past the clenching shoulder of the setting tool and also facilitating the ready passage of the end of the eyelet barrel through the lacing hole and the clenching thereof between adjacent layers of the stock. In order to cause the prongs formed when the eyelet bursts to curl progressively outwardly and downwardly toward the flange of the eyelet as they pass the clenching shoulder of the setting tool, the portion of the barrel of the illustrated eyelet at and adjacent to its entering end and extending a substantial distance towards the flange of the eyelet is of a non-tapered formation so that the eyelet barrel has a long bearing upon and closely embraces the pilot of the setting tool.

While the invention is disclosed herein in connection with 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.

With the above and other objects in view, the invention will now be described in connection with the accompanying drawings and pointed out in the claims.

In the drawings,

Figs. 1, 2 and 3 are a perspective, a plan view, and a longitudinal section, respectively, on a much enlarged scale, of my improved eyelet;

Figs. 4 and 5 are a perspective and a plan view, respectively, of the eyelet prior to the performance of the final upsetting and blunting of the end of its barrel;

Fig. 6 is a sectional view illustrating the relative position of the setting tool, the eyelet and the stock at a selected stage during the clenching of the eyelet;

Fig. 7 is a longitudinal section of a die used in the scalloping and scoring of the eyelet barrel;

Fig. 8 is a section on the line 8—8 of Fig. 7;

Fig. 9 is a perspective view of a punch which co-operates with the die of Fig. 7 to scallop and score the eyelet barrel;

Fig. 10 is a longitudinal section through the punch, die and eyelet during the scalloping and scoring operation, indicating also in dotted lines the position of the punch relatively to the die at the conclusion of that operation;

Fig. 11 is a cross section on the line 11—11 of Fig. 10, with the eyelet omitted; and

Figs. 12 and 13 illustrate the upsetting and blunting of the entering end of the eyelet barrel.

The eyelet illustrated in Figs. 1, 2 and 3 is provided with a flange 100 and a barrel 102, the latter being polygonal or scalloped, as indicated at 104, at its entering end. As shown particularly in Fig. 1, this polygonal or scalloped formation extends a substantial distance toward the flange 100. The eyelet is provided with scorings 106 at the apexes between the successive scallops. At its entering end the eyelet barrel is upset and blunted, as shown at 108, so as to provide a flat or

plane work-engaging end surface of a form effective as a pushing member to push the layers of a shoe upper along the pilot 110 of an invisible eyeleting tool 112 (Fig. 6) and ultimately to force the outer layer 114 (that is, the upper leather) past the clenching shoulder of the setting tool. The scalloped formation of the entering end of the eyelet barrel is of material assistance in forcing the outer layer 114 of the stock past the clenching shoulder 116 of the setting tool 112 in that it provides the entering end of the barrel with effective pushing portions 118 (Fig. 6) at and adjacent to the apexes of the scallops which engage the material at points or over an area removed from the lacing hole thereby, during the relative movement of the eyelet and the setting tool 112, forcing the outer layer of the stock past the clenching shoulder 116 of the setting tool. On the other hand, this polygonal or scalloped formation also permits portions of the end of the eyelet barrel to engage the edge of the lacing hole and to embrace closely the pilot 110 of the setting tool 112 so as to facilitate the passage of the end of the barrel through the facing or lining 119 and the eyelet stay 120 of the shoe upper, the abutment 122 preventing the upper leather 114 from being forced too far past the clenching shoulder 116.

As illustrated, this scalloped formation extends more than halfway from the entering end toward the flange of the eyelet. Moreover, the portion of the barrel of the illustrated eyelet at and adjacent to its entering end, and extending approximately halfway to the flange of the eyelet, is of a substantially non-tapered formation, the remainder of the barrel flaring at a considerable angle toward the flange. Thus the internal diameter of the eyelet barrel, measured on any longitudinal plane of cross-section, is substantially uniform at all points in said plane between its extreme end and the beginning of the flaring portion. See particularly Fig. 3. This causes the eyelet barrel to have a long bearing upon and closely to embrace the pilot 110 of the setting tool 112, insuring effective cooperation of the eyelet barrel and the clenching shoulder 116 of the setting tool 112 throughout the clenching operation and causing the prongs formed when the eyelet bursts to curl progressively outwardly and downwardly toward the flange of the eyelet as they pass the clenching shoulder of the tool. It also causes the hole through the clenched eyelet to be larger than the hole through the entering end of the barrel of the unclenched eyelet, since a substantial part of the flaring portion is split and turned back when the eyelet is clenched. Accordingly there is no danger that the hole through the clenched eyelet will be too small to permit the passage of the tip of a shoe lacing.

This novel eyelet may conveniently be formed from a blank having the flange and barrel of the ordinary eyelet, by scalloping and scoring the barrel, as indicated in Figs. 4 and 5, by tools illustrated in Figs. 7 to 11 and by subsequently upsetting and blunting the entering end of the barrel, as shown in Figs. 12 and 13, as will be more fully described.

In Figs. 7, 8, 10 and 11 is shown a hollow die member 124 formed with a series of ribs 126 separated by grooves 128, the ribs 126 tapering off at the entering end of the die, as shown at 130 (Fig. 7), thus forming an enlarged entrance 131. Conveniently at its entering end the die is provided with a recess 132 adapted to receive the flange of the eyelet blank to be operated upon. A punch 134, illustrated in Figs. 9, 10 and 11, is used in cooperation with die 124 to scallop and score the eyelets. This punch is itself scalloped, as clearly shown in Figs. 9 and 11, the successive scallops meeting and forming cutting edges 136. The entering end of punch 134 is tapered to facilitate its introduction into the barrel of an eyelet which has previously been introduced into die 124, as shown in Fig. 10. Punch 134 is provided also with a shoulder 137 which co-operates with recess 132 of die 124 properly to limit the movement of punch 134 relatively to an eyelet operated upon. The punch 134 enters the portion of the eyelet barrel adjacent to the eyelet flange freely and without obstruction but, as it passes toward the smaller entering end of the eyelet barrel, edges 136 of the punch score the interior of the barrel, finally cutting all the way through the barrel at the entering end thereof. At the same time the barrel is scalloped, being forced into the space (indicated at 138, Fig. 11) between the punch 134 and die 124. Punch 134 is passed through die 124 approximately to the position indicated in dotted lines at 140 in Fig. 10, after which it is withdrawn leaving the eyelet in the condition shown in Figs. 4 and 5, with a thin, sharp edge 142 at its entering end. After this the eyelet is placed upon a spindle 144 (Fig. 12) having a shoulder 146 arranged to support the flange 100 of the eyelet adjacent to the lacing hole and having a tapered portion 148 terminating in a cylindrical portion 150 arranged substantially to fill the entering end of the eyelet barrel. Cooperating with spindle 144 is a die 152 having a hole therethrough of a size to be a good working fit on the cylindrical portion 150 of spindle 144. With the eyelet supported upon spindle 144, as indicated in Fig. 12, die 152 and spindle 144 are given relative movement so as to force die 152 against the end of the eyelet barrel supported upon the cylindrical portion 150 of the spindle, upsetting and blunting the end of the eyelet barrel, as shown at 108, Fig. 13. Die member 152 is then withdrawn and the eyelet removed from spindle

144, after which the substantially completed eyelet may be subjected to any desired finishing operation. This method of manufacturing eyelets is not claimed herein, since it forms the subject-matter of my co-pending application Serial No. 78,414, filed December 30, 1925, as a division of this application.

By reducing the depth of grooves 128 in die 124 and by correspondingly reducing the size of punch 134, the depth of the scalloping of the eyelet may be reduced. Indeed this may be carried to such an extent that the entering end of the eyelet barrel will take the form of a polygon each of whose sides is a straight line instead of the curved line shown in Fig. 5. Eyelets so formed, or scalloped eyelets formed as shown in Figs. 4 and 5 without the upset or blunted end, are more effective than the sharp-ended circular eyelets of the prior art in pushing the layers of the shoe upper along the pilot of an invisible eyeleting tool and in forcing the upper leather past the clenching shoulder of the tool, since portions of the end of the eyelet barrel engage the stock at points spaced from the lacing hole, though such eyelets are less effective in this respect than the eyelet of Figs. 1, 2 and 3. However, since such eyelets are cheaper to manufacture (the upsetting and blunting being omitted), and since they operate satisfactorily with many kinds of stock, they are of real utility in the art and are considered to be within the scope of the present invention.

Having described my 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 entering end of its barrel shaped to provide a plurality of pushing portions formed to engage the stock at points removed from the lacing hole to facilitate pushing the stock, alternating with a plurality of portions formed to engage the edge of the lacing hole to facilitate the passage of the end of the eyelet barrel through one or more of the layers of the stock.

2. An eyelet for invisible eyeleting having the entering end of its barrel formed with a plurality of outwardly projecting portions for engaging the stock at points removed from the lacing hole, the barrel of the eyelet also having portions alternating with said outwardly projecting portions and extending for a substantial distance from the entering end of the barrel toward the flange of the eyelet, said alternating portions being arranged to embrace closely the pilot of the setting tool thereby to cause the prongs formed when the eyelet bursts to curl progressively outwardly and downwardly toward the flange of the eyelet as they pass the clenching shoulder of the tool.

3. An eyelet for invisible eyeleting having a barrel formed with a blunted, polygonal entering end to provide portions to engage the stock at points removed from the lacing hole to facilitate pushing the stock, alternating with portions to engage the edge of the lacing hole to facilitate the passage of the end of the eyelet barrel through one or more of the layers of the stock.

4. An eyelet for invisible eyeleting having the entering end of its barrel scalloped to engage the stock at a plurality of points removed from the lacing hole and also at a plurality of points at the edge of the lacing hole thereby rendering the eyelet effective both to push the stock and to pass through one or more layers of the stock.

5. An eyelet for invisible eyeleting having the entering end of its barrel formed with a plurality of outwardly projecting portions for engaging the stock at points removed from the lacing hole, alternating with a plurality of portions arranged to engage the edge of the lacing hole.

6. An eyelet having the entering end of its barrel of a polygonal formation with the apexes thereof formed and arranged to engage the stock in which the eyelet is to be inserted at points removed from the lacing hole and with the portions between the apexes formed and arranged to engage the edge of the lacing hole.

7. An eyelet having a flange and a barrel, the entering end of the barrel being of a polygonal formation and having its apexes arranged to engage the stock in which the eyelet is to be inserted at points removed from the lacing hole to provide means for pushing the stock, the eyelet barrel being scored at said apexes from its entering end toward the flange.

8. An eyelet having the entering end of its barrel scalloped to engage the stock at a plurality of points removed from the edge of the lacing hole.

9. An eyelet having the entering end of its barrel scalloped and terminating in a plane end surface.

10. An eyelet having a barrel the entering end of which terminates in a plane end surface formed to push a plurality of layers of stock along an invisible eyeleting tool and to force one of said layers of stock past the clenching shoulder of the tool.

11. An eyelet for invisible eyeleting having a substantial portion of its barrel at and adjacent to its entering end of a non-tapered formation, the entering end of the eyelet barrel being formed with a plurality of outwardly projecting portions for engaging the stock at points removed from the lacing hole and having also portions alternating with said outwardly projecting portions formed to engage the edge of the lacing hole.

12. An eyelet having a barrel and a flange, the entering end of the barrel being of a polygonal formation with the apexes thereof formed and arranged to engage the stock

in which the eyelet is to be inserted at points removed from the lacing hole and with the portions between the apexes formed and arranged to engage the edge of the lacing hole, the polygonal formation of the eyelet barrel extending from its entering end a substantial distance towards its flange.

13. An eyelet for invisible eyeleting having the entering end of its barrel formed with a plurality of outwardly projecting portions for engaging the stock at points removed from the lacing hole, the entering end of the eyelet barrel and a substantial portion of the barrel adjacent thereto being of substantially non-tapered formation and having portions alternating with said outwardly projecting portions arranged to engage the edge of the lacing hole, said eyelet barrel by reason of its non-tapered formation being arranged to have a long bearing upon and to embrace closely the pilot of the setting tool, thereby causing the prongs formed when the eyelet bursts to curl progressively outwardly and downwardly toward the flange of the eyelet as they pass the clenching shoulder of the tool.

14. An eyelet having a barrel with a flange at one end of said barrel, said barrel having a portion of substantially non-tapering formation and of substantial length extending from its extreme end part way to its flange, said barrel also having a flaring portion extending from said substantially non-tapered 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 hole through the entering end of the barrel of the unclenched eyelet.

15. An eyelet having a barrel with a flange at one end of said barrel, said barrel having its internal diameter measured on any longitudinal plane of cross-section substantially uniform at all points in said plane between the extreme end of the barrel and a point located a substantial distance from the end of the barrel, said barrel having a flaring portion extending from the flange to said last-named point, said flaring portion being of such length that a substantial portion thereof is split and turned back when the eyelet is clenched whereby the minimum diameter of the eyelet when set is substantially larger than the internal diameter of the entering end of the eyelet barrel.

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

FRANKLIN G. NEUBERTH.

CERTIFICATE OF CORRECTION.

Patent No. 1,756,256. Granted April 29, 1930, to

FRANKLIN G. NEUBERTH.

It is hereby certified that the name of the assignee in the above numbered patent should have been written and printed "The S O and C Company", instead of "The S. O. and C. Company", as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 24th day of June, A. D. 1930.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)