Jan. 12, 1937. C. CASANOVA 2,067,845

FLEXIBLE FOOTWEAR

Filed Sept. 21, 1936 2 Sheets-Sheet 1

Fig. 1

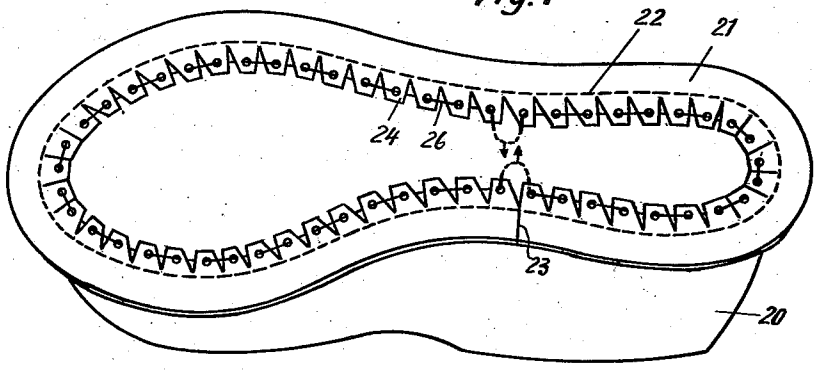
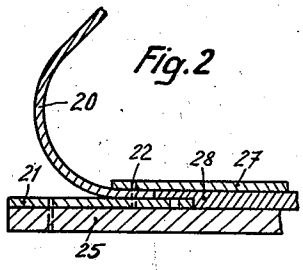


Fig. 2



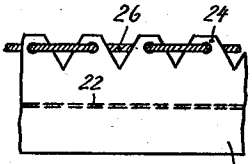


Fig. 3

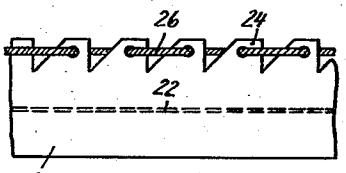


Fig. 4

Fig. 5

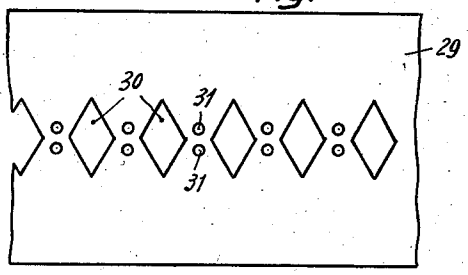


Fig. 6

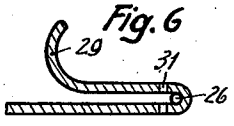
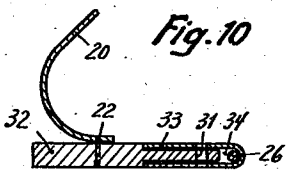


Fig. 10



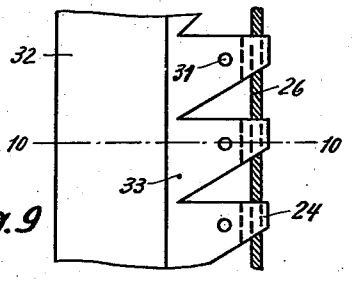
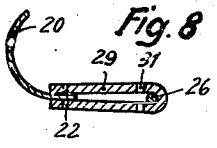


Fig. 9

Fig. 8



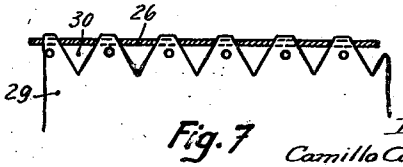


Fig. 7

Inventor
Camillo Casanova,
By John E Eastlack
Attorney

Jan. 12, 1937. C. CASANOVA 2,067,845

FLEXIBLE FOOTWEAR

Filed Sept. 21, 1936 2 Sheets-Sheet 2

Fig. 12.

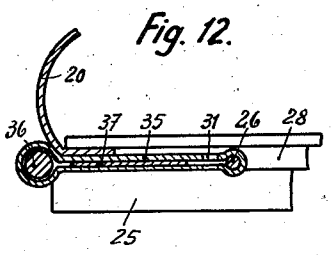


Fig. 15

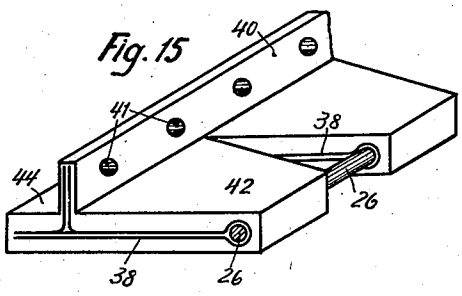


Fig. 11

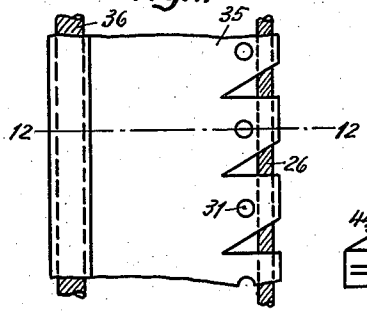


Fig. 18

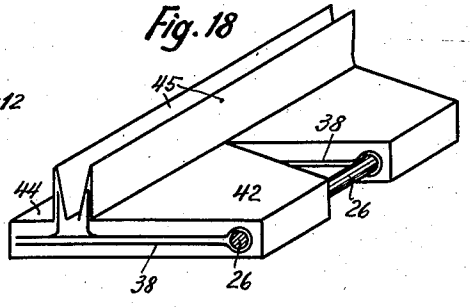


Fig. 14

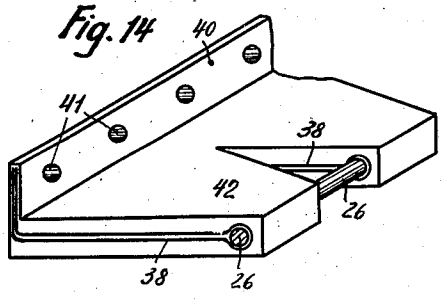


Fig. 13

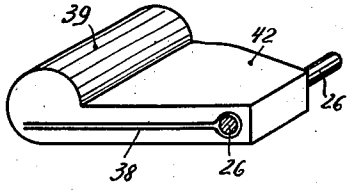


Fig. 17

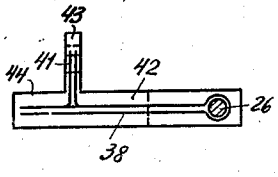
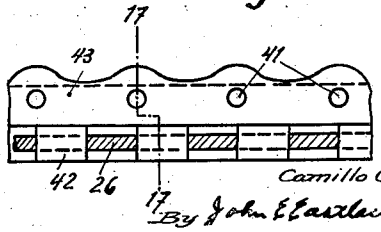


Fig. 16



Inventor
Camillo Casanova,
By John E. Eastlack Attorney

Patented Jan. 12, 1937 2,067,845

UNITED STATES PATENT OFFICE

2,067,845

FLEXIBLE FOOTWEAR

Camillo Casanova, Zurich, Switzerland

Application September 21, 1936, Serial No. 101,850
In Germany November 17, 1934

13 Claims. (Cl. 12—142)

Hitherto, flexible footwear has been produced by cutting out the upper with a pull over portion of considerable width, about ½" to ⅝" being left standing over the last. The upper cut out in this manner is pulled over the last and the surplus portion is bent outwardly, i. e. towards the edge of the last, by means of a special device. Hereupon the sole edge treated with adhesive is secured in position. The outer sole is attached to the upper by means of a double seam.

According to this method only sandals and light summer shoes are produced, which are in favour due to their flexibility, which can only be achieved by the special method of pulling over. In this type of footwear it can be ascertained that the foot treading in them causes all bending movements to be transmitted to the double seam, which in any case is imperfect owing to the upper being pulled over outwardly and forms the only connection between the two parts. After a short period of wear the double seam begins to wear through, so that the outer sole becomes detached from the upper. Since the outwardly pulled over upper does not permit any further connection, e. g. by adhesive, between it and the outer sole, the defects of this type of footwear cannot be eliminated.

The present invention has reference to a method of producing flexible footwear, which does not suffer from the defects of the known types, is durable and retains its flexibility and is also applicable to footwear which so far could not be produced in accordance with the aforesaid flexible pull over method.

The method according to the present invention consists in attaching to the upper a rim strip which follows the outline of the outer sole and is formed with a series of spaced, apertured tongues provided with a binding string, the apertured tongues substituting the pulled over edge of the upper in such a manner that the binding string engages the tongues themselves and pushes same together in a creaseless manner owing to the gaps therebetween, whereupon the outer sole may be secured to the rim strip, which hereinafter will be referred to as "welt".

The invention is illustrated by way of example in the accompanying drawings, wherein:—

Fig. 1 is a perspective view of the bottom of a shoe made according to the invention, without the outer sole.

Fig. 2 is a fragmentary sectional view of the shoe.

Figs. 3 and 4 are plan views of two different parts of a welt of single type.

Fig. 5 is a plan view of a double welt before it is folded.

Fig. 6 is a sectional view of the double welt showing the folding, with binding string in the double tongue fold.

Fig. 7 is a plan view of a serrated double welt, and

Fig. 8 is a sectional view of same with the upper sewn between the folds of said double welt.

Fig. 9 is a plan view of part of a serrated and apertured welt made of two different materials, while

Fig. 10 is a sectional view on the line 10—10 of Fig. 9 but showing an upper attached to the welt.

Fig. 11 is a plan view of a welt with an outer bead and binding string,

Fig. 12 is a sectional view taken on the line 12—12 of Fig. 11 part of the upper, the insole and the outer sole being also shown.

Figs. 13 to 15 are perspective views partly in section of further forms of welts made of rubber with reinforcements,

Fig. 16 is an elevational view of the welt shown in Fig. 15 but provided with a slightly different form of upper-attaching flange.

Fig. 17 is a sectional view on the line 17—17 of Fig. 16.

Fig. 18 is a perspective view partly in section of a welt similar to that shown in Fig. 15, and differing from the latter only in the shape of its upstanding outer edge.

The welt 21, made of a straight strip of material, is attached to the upper 20, with the aid of a stitched seam 22, so that the outer edge of the welt 21 projects laterally from the last, like the outer sole 25 to be fitted later. The point where the two ends of the welt 21 meet is indicated at 23 in Fig. 1. Prior to its attachment to the upper the welt 21 is provided at its lower edge with apertured tongues 24, as shown in Fig. 1.

These tongues 24 may be formed as equal (Fig. 3) or unequal sided (Fig. 4) trapeziums, the holes being preferably disposed near the free ends of the tongues. In the case of unequal sided trapezium shaped tongues one side thereof is normal to the edge of the welt. However, the tongues may be of any other shape. A binding string 26, is pulled through the holes in the tongues the ends of the string being connected together in known manner, whereupon, as indicated in Fig. 1 two opposite loops, to be con-

nected also in known manner, are formed for tightening the string after the upper so prepared has been pulled over the last, so that the welt together with the upper assumes the shape of the last.

For the purpose of producing footwear for special purposes, such as summer shoes, week end shoes, and so forth, a double welt as shown in Figs. 5 to 8 may be made of one piece of material. A sufficiently wide strip of material 29 is provided with parallelogram shaped apertures 30 (which may be square or rhombic if the tongues are of equal sided trapezium shape) and pairs of holes 31 disposed symmetrically with reference to the centre line of the strip of material 29, as shown in Fig. 5 the strip being then folded along said centre line, as indicated in Fig. 6 in section, and in Fig. 7 in plan, so that the form shown in section in Fig. 8 is obtained, the holes 31 of the two strip halves being superimposed. The edge of the upper 20 is introduced between the edges of this folded welt and is secured by means of a stitched seam 22.

The welts 21 and 29 may be made of leather or other suitable material, according to the purpose for which the shoe is to be used. The free space between the insole 27 and the outer sole may be filled out with padding 28 (Fig. 2) provided a known profiled insole is not employed.

The welt may also be made of a strip of leather 32, which is shouldered at its inner edge on both sides (Fig. 10). A strip 33 is bent in U shape and made of a material which is untearable when used for the purpose in view, such as rubberized textile material or the like, is pasted or sewn or pasted and sewn on this welt, in such a manner that inside the fold a hollow space 34 is left. Thereupon the tongues 24 and the holes 31 are punched and the binding string 26 is inserted. The tongues may be of a shape other than shown.

The welt may also be made of a tubular piece 35 (Figs. 11 and 12) of round woven, practically untearable material, which is pressed flat by means of pressing rollers or the like, whereupon the tongues and the holes 31 are punched in any desired shape. At the outer non-apertured edge a string 36 is inserted to form a bead which is applied to the upwardly extending upper 20. A free space is left at the apertured edge and a binding string 26 is introduced thereinto, whereupon the superimposed parts of the shoe are cemented or otherwise connected together at 37. After the outer sole 25 has been fixed in position the bead formed by the string 36 lies against the upper face of the upper 20, and protects the shoe against external influences and lends to it a pleasing appearance.

With the forms of welt shown in Figs. 9 to 12 the same result is obtained as with the form shown in Figs. 5 to 8, in which the binding string 26 is located in the fold of a doubled welt.

The holes in the tongues have a particular function which is especially emphasized in the case of the double welt according to Figs. 5 to 8 or the equivalent welts according to Figs. 9 to 12. When the outer sole is cemented by means of one of the known shoe cementing substances on to the finished tightened welt, the holes in the tongues are partly filled where the binding string is pulled through the holes themselves, or wholly where the binding string is located in the fold of the double welt and such cementing material in the holes acts, after the cementing material has hardened, as elastic rivets which afford in all cases a very durable connection between the welt and the outer sole. However, the rivets formed by the cementing material penetrating into the holes also ensures in the case of shoes made with insoles that the latter is firmly connected to the outer sole.

These apertured tongues not only take up the pull of the binding string 26 in a uniform manner and transfer it point by point to the upper sewn thereto, but they also ensure perfect fit all over, but particularly at the toe and heel curves, since the gaps in the welt between the individual tongues enable same to be pushed together from base to tip (as indicated in Fig. 1) without overlapping, folding or creasing of the welt material.

The further function of the apertured tongues resides in assuring very great flexibility in the whole of the sole portion. The tongue incisions, which start in the vicinity of the seam 22 connecting the welt and the outer sole and the gaps produced by cutting out parts of the welt act as so many interruptions, not only transversely from side to side but also in the longitudinal direction from toe to heel.

An elastic material, such as rubber, may also be used for making the welt, by employing a reinforcing insertion 38 upon which the rubber is moulded in known manner, means being provided for the insertion of a binding string 26 into the fold of the insert 38 after the tongues have been punched out.

The welt 42 may be provided with a bead 39 (Fig. 13) on the non-apertured side, said bead serving the same purpose as the bead 36 in Figs. 11 and 12. The upper, not shown, is attached to the welt with the aid of a stitched seam.

Instead of the bead an upright outer edge 40 (Fig. 14) may be provided into which the reinforcing insertion 38 extends and which is provided with holes 41, these enabling the edge 40 to be connected with the upper by means of a string. The connection between the outer sole and the welt 42 is effected by cement. The upright edge 43 (Figs. 15 to 17) may also be disposed on the welt 42 in such a manner that an outer ledge 44 is left, which enables the outer sole to be attached by means of a double seam. The embodiment according to Figs. 16 and 17 differs from that according to Fig. 15 only in the form of the upright edge which, as shown in Fig. 18 may be of U shaped section. This upright edge 45 enables the upper to be connected to the welt by sewing, pasting or cementing. The embodiment of the welt according to Fig. 18 enables an easily fraying material to be used for the upper, the structure of which is not as strong as that of leather. Such materials are fabrics, plaited straw, mixed fabrics of straw and textile fibres and so forth.

I claim:—

1. A shoe comprising an upper, a welt connected to the upper and having its inner edge formed with notches providing spaced tongues decreasing in width toward their free ends and extending entirely around the inner edge of the welt, each of said tongues having an opening therethrough, an endless binding string extending through said openings and following the contour of the welt, said endless binding string having portions extending inwardly toward each other at opposite sides of the shoe, and an outsole secured to the welt.

2. A shoe comprising an upper, a welt connected to the upper and having its inner edge

formed with notches providing spaced tongues decreasing in width toward their free ends and extending entirely around the inner edge of the welt, each of said tongues having an aperture therethrough, an endless binding string threaded through said apertures, said endless binding string passing through adjacent tongues in opposite directions and having portions extending inwardly toward each other at opposite sides of the shoe, and an outsole secured to the welt.

3. A shoe comprising an upper, a welt connected to the upper and having its inner edge formed with notches providing spaced tongues decreasing in width toward their free ends, each of said tongues having an aperture therethrough, and a binding string extending through said apertures and along the contour of the shoe, said string passing through adjacent tongues in opposite directions.

4. A shoe comprising an upper, a double welt connected to the upper and having a folded inner edge formed with notches providing spaced tongues decreasing in width toward their free ends and extending entirely around the inner edge of the welt, an endless binding string extending between the folds of the tongues at said inner edge and following the contour of the welt, said endless binding string having portions extending inwardly toward each other at opposite sides of the shoe, and an outsole secured to the welt.

5. A shoe comprising an upper, a double welt connected to the upper and having a folded inner edge formed with notches providing spaced tongues decreasing in width toward their free ends, and a binding string extending between the folds of the tongues at said inner edge.

6. A shoe comprising an upper, a welt connected to the upper and having a double wall inner edge portion formed with notches providing spaced tongues decreasing in width toward their free ends, and a binding string extending between the walls of the tongues in said inner edge portion.

7. A shoe comprising an upper, a welt connected to the upper and having its inner edge formed with notches providing spaced tongues decreasing in width toward their free ends, each of said tongues having an opening therethrough, a binding string extending through said openings, an outsole secured to the welt, and a bead formed on the welt and in engagement with the outer face of the upper.

8. A method of making a shoe consisting of connecting to an upper adjacent its lower edge a welt having one edge provided with tongues decreasing in width toward their free ends and having openings adapted to receive therethrough a binding string, threading a binding string through said openings and securing the ends of the string together to make the string endless, pulling portions of the endless string, at opposite sides of the shoe, toward each other to last the upper, and securing an outsole to the welt.

9. A method of making a shoe consisting of connecting to an upper adjacent its lower edge a welt having one edge provided with tongues decreasing in width toward their free ends and having openings adapted to receive therethrough a binding string, threading a binding string through said openings, tightening the binding string to last the upper, and securing an outsole to the welt.

10. A method of making a shoe consisting of connecting to an upper adjacent its lower edge a welt having one edge provided with tongues decreasing in width toward their free ends and having apertures adapted to receive therethrough a binding string, threading a binding string through said apertures so that the string passes through adjacent tongues from opposite directions, tightening the string to last the upper, and securing an outsole to the welt.

11. A method of making a shoe consisting of connecting to an upper adjacent its lower edge a folded welt having one edge provided with tongues decreasing in width toward their free ends, threading a binding string between the folds of the tongues in said folded welt, tightening the binding string to last the upper, and securing an outsole to the welt.

12. A method of making a shoe consisting of connecting to an upper adjacent its lower edge a welt having a double wall edge portion provided with tongues decreasing in width toward their free ends, threading a binding string between the walls of said tongues, tightening the binding string to last the upper, and securing an outsole to the welt.

13. A method of making a shoe consisting of connecting to an upper adjacent its lower edge a welt having a bead adjacent one edge and further having its other edge provided with tongues decreasing in width toward their free ends and having openings adapted to receive therethrough a binding string, threading a binding string through said openings, tightening the binding string to last the upper with said bead engaging the outer face of the upper, and securing an outsole to the welt.

CAMILLO CASANOVA.