Sept. 25, 1951 J. P. TARBOX 2,568,974

VAMP AND SOLE CONNECTION

Original Filed April 25, 1945

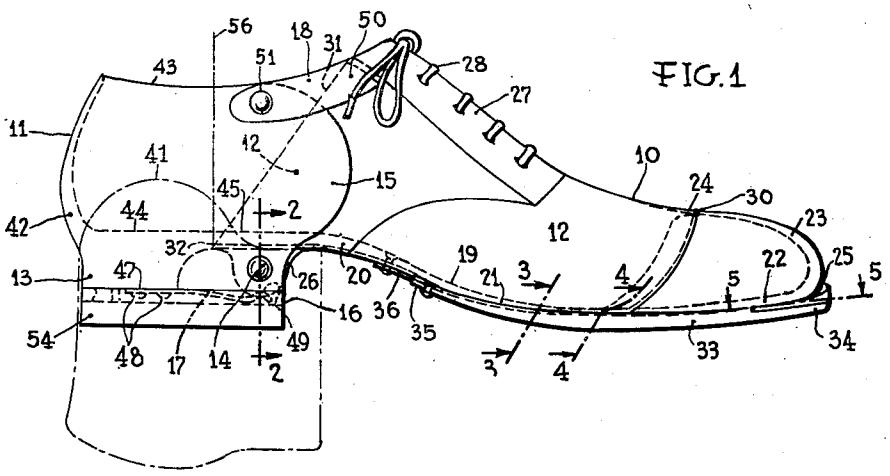


FIG. 1

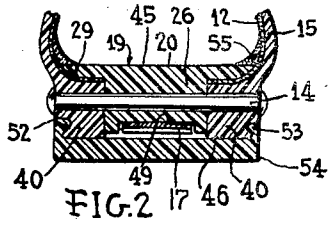
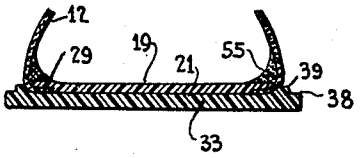


FIG. 2

FIG. 3



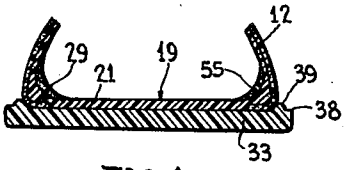


FIG. 4

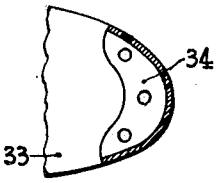


FIG. 5

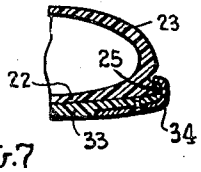


FIG. 7

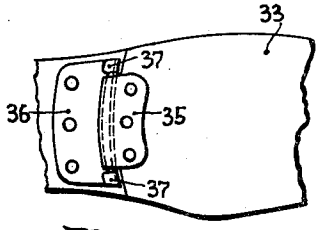


FIG. 6

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VAMP AND SOLE CONNECTION

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Original application April 25, 1945, Serial No. 589,722. Divided and this application May 20, 1947, Serial No. 749,290

2 Claims. (Cl. 36—12)

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This application is a division of my copending application S. N. 589,722 filed April 23, 1945, which has matured into Patent No. 2,452,502, granted October 26, 1948.

The shoe construction of my invention is that type in which the shoe is opened and closed for fastening about the foot of the wearer by a hinge movement between the heel and the vamp portions. This type of shoe has hitherto been proposed in the art several times but has failed in practical adoption because the construction was impractical.

According to my invention I have completely revised the general construction of the shoe with a view to attaining these practicabilities to a high degree. In so doing I utilize molded plastic material to a considerable extent. Among the many moldable plastic materials known to the art at the time this application was filed and at the time of applicant's invention there are a number which possess or approach those degrees of toughness and wear resistance possessed by leather and rubber, the materials commonly used in making shoes. Rubber is a moldable plastic material in many of its forms and has long been used in making shoes. In the art of synthetic moldable plastics, including those having a silica base, not only have there been produced qualities of plastic which has actually been used in the making of shoes as has rubber, but also the shoes so produced have actually been marketed. Applicant contemplates using in his shoe construction any plastic whatsoever which possesses those characteristics needful for use in shoes to such degree that they are suitable for the purpose, for example, the plastic contemplated by Pym in his U. S. Patent No. 2,349,374.

In the vamp portion I form as one molded unit the inner sole and the toe, a part of the outer sole, and a part of the hinge joint. In the heel portion I form it entirely of molded plastic material. These changes in materials and construction enable me to improve the nature of the joint in general between the vamp portion and the heel portion of the shoe as hinged thereto, including improvements in the heel joint itself and the securing means utilized in connection with the heel joint. They also enable me to apply readily removable and replaceable heel and sole portions.

All of these things and the various and sundry details of construction are delineated in the following drawings and described in the annexed specification.

Of the drawings:

Figure 1 is a side elevation of the shoe;

Figure 2 is a cross-section on line 2—2 in a vertical plane of the hinge joint between the heel and toe portions;

Figure 3 is a transverse section of the sole just behind the toe portion;

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Figure 4 is a similar transverse section along the line 4—4 near the rear edge of the molded toe;

Figure 5 is a section of the toe portion of the removable sole on line 5—5 of Figure 1 in the direction of the arrows, showing a form of the front attaching clip;

Figure 6 is a view of the bottom of the sole showing in plan form the rear attaching clip of the removable sole; and

Figure 7 is a longitudinal section of the toe portion of the shoe showing a modified form of front attaching clip.

The vamp portion is designated generally 10, the heel portion generally 11. The general division between the vamp and the heel portions is transversely of the shoe in the general vicinity of the front wall 16 of the heel per se 13 of the shoe. The two portions are hinged together on an axis 14 and the side flexible walls 15 of the heel portion overlap outwardly the side walls 12 of the vamp portion in this region. The arrangement is such that when the heel portion is freed of means 17 and 18 (presently to be described) which keep it about the foot of the wearer, it may be moved downwardly with respect to the vamp portion 10 approximately 90° as shown in dotted lines in Figure 1.

The vamp portion 10 is built about a sole 19. This sole 19 is of molded plastic material. It comprises a heavy, relatively rigid afterpart 20, a relatively thin and flexible intermediate part 21 (in the region of the ball of the foot), and a relatively thicker and less flexible toe part 22. Molded integrally with the toe part 22 of the sole is the whole toe proper of the shoe 23, which is shaped precisely as required for the finished shoe toe, both inside and outside. It is preferably of heavy cross-section at the front and at the sides and top the section is gradually reduced to thinly tapered margins 24. Just beneath and in front of the point of the toe the toe portion 22 is extended at 25 to receive the renewable sole, as will presently be described. Integrally formed with the heavy and relatively rigid rear end 20 of the sole is a central hinge ear 26 of a width sufficiently less than the gross width of the sole in this region to accommodate hinge ears formed on the heel portion 11.

The vamp proper of the shoe comprises walls 12 and may be constructed of any suitable flexible material as leather, cloth, rubber and the like. Its general construction and form insofar as it covers the region of the shoe between the toe proper 23 and the line of division between the vamp and heel portions 10 and 11 is of the same contour and extent as usually employed in shoes. Too, it is provided in its center with the usual divided top 27 tied together adjustably by strings 28. Its means of securement to the toe proper

and sole, however, are quite different from those usually employed. The sole 19 has its under margins rabbeted at 29 and the flexible walls 12 of the vamp are brought down over the outer edges of the sole 21 and cemented in the rabbet 29 beneath the sole, cement being applied to the lateral edges as well if desired, thus affording a strong bond which is stressed in shear. At the front the vamp is overlapped outwardly upon the tapered rear margin 24 of the toe 23 and cemented there, with its front edge abutting a raised bead 30 which in effect forms a rabbet in connection with the tapered front margin 24 of the toe. The rear edge 31 of the vamp wall 12 extends diagonally downwardly and rearwardly to the rear end 32 of the sole portion 20, which projects behind the hinge axis 14. This edge may be finished in any desired manner (not shown) as, for example, by longitudinal seams and the like. So constructed and extended the vamp walls in this rear region of the vamp portion constitute an effective downwardly and rearwardly stressed tie to the sole against which the tension of the strings 28 are exerted to keep the vamp portion smoothly pulled over the instep.

Secured removably beneath the toe portion 22 and the adjoining flexible portion 21 of the sole is the removable and replaceable outer sole 33. This sole is of varying cross-section longitudinally, thickest in its central portion under the ball of the foot and the thin portion of sole 19, where it is subjected to greatest wear, and of decreasing thickness toward its opposite ends beneath the thicker sole portions 20 and 22. It is flexible and preferably elastic to a considerable degree. At its front end there is riveted to it a metallic clip 34 of curvilinear plan form (see Fig. 5) and channel cross-section which fits over the correspondingly curvilinear front end projection or terminus 25 of the sole in such a manner as to hold the front end of sole 33 tightly up against the under face of sole portion 22. Its rear end has similarly riveted to it a metallic hook 35 of a width approaching but not equal to the width of sole 19 at this point. This clip meets with a complemental clip 36 of similar form and somewhat greater width riveted to sole 19. Clips 35 and 36, as shown in Figure 6, interlock when in engagement, 36 being provided with small nibs 37 at each end over which 35 may slide, and between which it sockets. The outer sole 33 is considerably wider than the inner sole throughout the regions to which it is applied, its rounded projecting edges 38 providing the plan form outermost contour of the shoe. Each of these projecting edges 38 is provided adjoining the vamp wall 12 with an upwardly projecting and close-fitting rib 39, the two ribs 39 being adapted closely to embrace the lower outer corners of vamp 12 and sole 19 between them when the sole is stretched in place. The relative dimensions of the parts and the relative rigidities, flexibilities and elasticities of the component parts and portions are such that when clip 34 is entered over the projecting front end 25 of the inner sole 19, the outer sole may be pulled rearwardly and at the same time clip 35 entered laterally over nib 37 at one end of clip 36. The sole 33 may then be pushed laterally under the vamp portion, clip 35 entering clip 36 fully and becoming seated between the nibs 37, and ribs 39 slipping one on either side of vamp walls 12 and sole 19 to snugly socket themselves into place. So attached sole 33 is retained under its own stress combined with such stress as is imposed upon coacting portions of the sole 19.

The heel portion 11, as has been remarked, is molded entirely of plastic material. Upon the forepart 16 of the heel per se 13 are formed hinge ears 40 spaced apart and of dimensions to receive snugly between them the coacting hinge ear 26 integrally formed on the sole portion 20, to underlie the laterally overhanging parts of sole part 20 beneath the vamp wall receiving rabbets 29, and to form frontal extensions of the outer side walls of the heel per se 13.

The upper walls 15 of the heel portion 11 extend integrally upwards from the top portion of the heel per se 13. These walls 15 are themselves of varying cross-section and flexibility. At the front they are purposely of thin cross-section and relatively very flexible, being formed transversely of a contour and dimension which enables them to flex outwardly under moderate pressure to fit the sides of the foot as contoured by the walls 12 of the vamp. In this region walls 15 are extended forwardly toward the toe of the shoe a considerable distance in advance of the front of the heel per se and the hinge axis 14 in order that when the heel portion is moved to its 90° dotted-line position the front margins 41 (see the dotted-line position) will overlap outwardly the rear margins 31 of the vamp walls 12, whereby the interior-exterior relations of the respective walls 12, 15 are not changed when the shoe is opened to receive the foot. However, the walls 15 thicken up in section at their bottom regions and toward the rear or heel wall 42, becoming relatively thicker and stiffer, even rigid, at and toward the extreme rear. Vertically, however, in the rear section, the walls 15 are progressively thinned and at the top margins 43 are again relatively thin and flexible whereby to accommodate themselves more agreeably and comfortably to the horizontal contours of the foot. At the top margin 43 the edges may be suitably rounded and beaded for further comfort.

The heel per se 13 is hollowed out on its under side to the rear of axis 14. In its forepart it is hollowed out complementally to abuttingly receive the rearwardly projecting end 32 of the sole portion 20 against the fore-edge of its floor portion 44 in a vertical plane, whereby to accurately define the foot-enclosing position of the heel portion 11 with respect to the vamp portion 10, and to accurately maintain the floor 44 of the heel in alignment with the floor 45 of the sole.

To the rear of the abutting edges of the rear end 32 of the sole portion 20 and the upper portion 44 of the heel 13 the hollow in heel per se 13 decreases in depth rearwardly (see Figure 1). Near the rear the decreased depth provides a shelf 47. Secured by screws 48 to this shelf is the temporary retaining spring 17. The fore-end of this spring is offset upwardly and engages in a notch 49 in the central hinge ear 26 of the sole portion 20. The angle of the engagement is such that under force applied downwardly to the heel portion 11 as respects the vamp portion 10, whether on or off the foot of the wearer, the spring end may be forced from the retaining notch 49 to release the heel portion 11 to be swung downwardly. Yet the retaining force of the end of the spring in the notch 49 is such that the heel portion 11 is retained in its normal position about the foot against the application of moderate or ordinary forces of dislodgement, even if desired under the most severe dislodging forces usually encountered in wear. Supplementing this spring retainer 17, however, and of a

nature to exert much stronger holding force, are permanent retaining means 18 previously referred to as located at the top edge of the shoe. These are in the form of flexible leather or fabric strips 50 sewed to the top of the vamp near the rear edge 31 and following the top margins 43 of the heel walls 15, where they are provided with push-button fasteners 51, the one element of which is carried by the strips 50 and the other element of which is mounted in walls 15. The dimensions are such that these strips 50 are pulled tight when the fore-end of the floor 44 of the heel portion 11 vertically abuts the rear end 45 of the sole 19 and when the buttons 51 are fastened. On the other hand, merely by grasping in one's fingers the rearwardly projecting rear ends of the strips 50 on either side of the shoe the buttons may be instantly released and the heel portion dropped as hitherto described to release the shoe from the foot.

The outer lower edges 52 of the molded main body of the heel 13 are grooved all the way around, on each the front wall 16, the side walls, and the rear walls. Snapped over the bottom 46 and into these grooves is the complementally formed upper edge flange 53 of a flexible and elastic, removable and replaceable heel pad 54.

Interiorly of both the heel portion 11 and the vamp portion 10 there is or may be provided in the corners between the vamp and heel walls 12 and 15 and the sole 19 and floor 44 any suitable lining, filling and shaping material such as indicated at 55 in each of Figures 2, 3 and 4. These materials are, of course, divided in the vertical plane 56 of the abutting parts 45, 44 and appropriately treated at this point of division to insure accurate meeting without deterioration of their abutting portions during use.

The advantages of my new shoe construction are many. Outstanding among them are the following:

The shoe may be much more cheaply constructed than leather and fabric shoes as ordinarily made, jointly for the reasons that molding of plastic material and cementing of such pliable material as is used in conjunction therewith eliminates sewing and special forming during sewing, and the required quantity of expensive pliable material like leather and special fabrics is a minimum.

Utilization of plastic material improves durability of the shoe by improving the wearing qualities of both the rear heel walls 42 and the toe 23, effectively providing against scuffing of the same.

The facility with which provision may be made for removable and replaceable soles and heels is also an outgrowth of the use of plastic materials.

There should be mentioned in this connection, incidentally, too, not only the wide range of choice of colors and color tones which molded plastic provides, but also the preservation of finish and polish during use.

Outstandingly, however, the molded plastic construction serves the purposes of effecting hinging together of the vamp and heel portions 10 and 11 for most efficient, quick action for putting on and taking off of shoes. The hinge joint becomes entirely concealed, neat and effective, a thoroughly efficient mechanical device. Without conflicting with the full application and use of pliable material in the vamp, it insures close-fitting, stable jointing of the two portions. The joint never changes from its accurate shoe size. It affords the wearer the same feeling of substantiality and security he has in a one-piece shoe. Finally, the joint of my invention lends itself to the application of both temporary and permanent retaining means of a substantial but quick-acting type.

Especially in the instance of a radical departure from conventional constructions such as is this shoe construction, the invention is susceptible of numerous modifications without departing in any wise from its generic spirit. The fact that such a radical departure is itself so very new may in one or several instances be the source of descriptive and claim terminology which fall short of fully expressing the generic spirit. Applicant's invention should none the less be protected to him by the appended claims in the fullness of this generic spirit.

What I claim is:

1. A shoe comprising a sole of moldable plastic material and an upper, the lower edge of which upper is extended downwardly over the lateral edges of the sole and beneath the under edges of the same where it is secured to the sole, in which the under edge of the sole is rabbeted for the thickness of the lower edge of the upper and the lower edge is secured in the rabbet, in combination with an overlying toe wall of plastic material molded integrally with the sole and having its rear edge rabbeted on its upper side, the front edge of the upper being secured therein, the said latter rabbet being surmounted by an ornamental bead adjoining the shoulder of the rabbet.

2. A shoe comprising a sole portion of moldable plastic material and an upper, the lower edge of which upper is extended downwardly over the lateral edges of the sole and beneath the under edges of the same where it is secured to the sole, together with a toe portion molded integrally with the sole, the said upper terminating at the rear edge of the toe portion in an overlap therewith on an outer toe wall surface which emanates from the under portion of the sole to which the upper is secured, and in which shoe there is formed in the edges of the sole and the toe to which the upper is secured one continuous rabbet over both the sole and toe to receive the secured edges of the upper.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
411,776	Beattie	Oct. 1, 1889
474,574	Bruzon	May 10, 1892
1,081,678	Langerak	Dec. 16, 1913
1,516,305	Pierce et al.	Nov. 18, 1924
1,622,860	Cutler	Mar. 29, 1927
2,199,713	Perugia	May 7, 1940
2,239,206	Tietig	Apr. 22, 1941
2,302,167	Austin	Nov. 17, 1942
2,303,431	Brophy	Dec. 1, 1942
2,349,374	Pym	May 23, 1944
2,403,442	Klaus	July 9, 1946
2,429,354	Glass	Oct. 21, 1947

FOREIGN PATENTS

Number	Country	Date
769,952	France	June 18, 1934