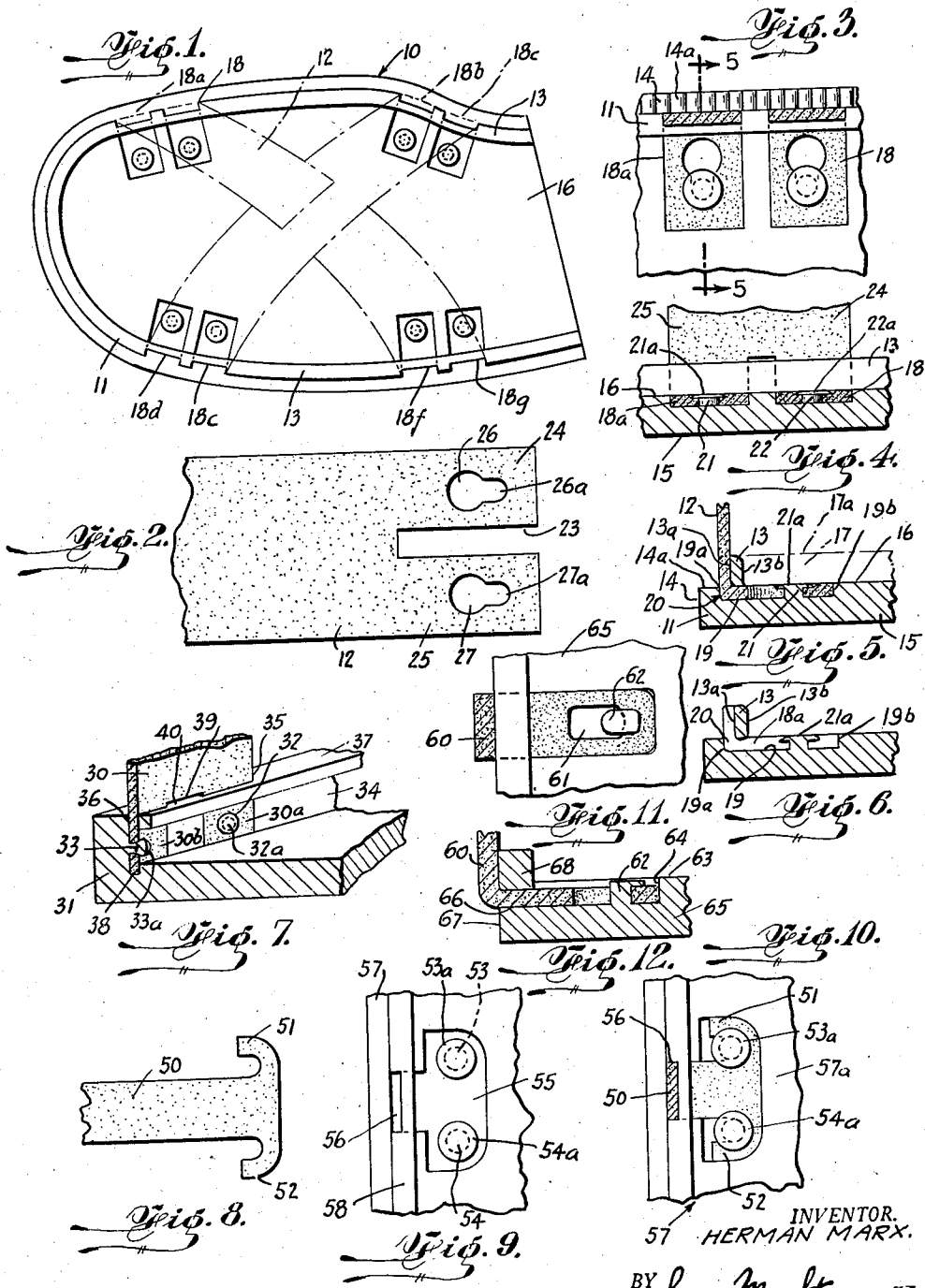


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SHOE STRUCTURE
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SHOE STRUCTURE

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This invention relates to shoe structures, and more particularly to fastening means and method to attach the upper to the outsole of a shoe.

It is one of the main objects of this invention to provide fastening means for connecting upper and outsole of the shoe together without resorting to any metallic fastening means, such as tacks, nails or the like, or to adhesive binders, stitching or similar fixing methods.

Another object of the present invention is to provide complementary fastening means positioned respectively at the upper and at the outsole of the shoe, said means forming intergal parts of the upper and the outsole, respectively, and being very practical and highly efficient for the purpose intended.

A further object of this invention is to provide retaining or attaching means for firmly and rigidly connecting the upper to the outsole and to dispose said attaching means so as to conceal the same at their location of fixation.

Still a further object of this invention is to provide means which do not require any machine operations or any skilled labor for connecting together the upper to the outsole, said means rendering the invention very practical from a manufacturing standpoint.

It is still another object of the present invention to provide means for releasably attaching upper and outsole of a shoe with one another, said means extending and being disposed with respect to the outsole so as to permit deviation of stresses, pulling and other forces exerted by the upper on the outsole.

Still another object of the present invention is to provide anchor means in the outsole and substantially below the insole of a shoe and to provide further means complementary to said anchor means and disposed at or along the extremity of the upper for releasably and lockingly engaging said anchor means.

Still a further object of the present invention is to provide attaching means integrally united with the upper of a shoe and which are so shaped as to allow air circulation through the shoe.

Yet, another object of the invention is to provide retaining means for the upper of the shoe, said means of said upper being brought into engagement with the outsole by introducing said upper retaining means either from above or horizontally through an open outer end of a channel provided in the outsole.

A still further object of the present invention is to provide means at the inner face of the outsole for cooperation with means provided at the

upper whereby said upper and said outsole may be assembled and locked in position with respect to each other by simple and easy manipulation.

These and other objects and advantages of the invention will appear from the following disclosure thereof together with the attached drawing which illustrates certain forms of embodiments thereof. These forms are shown for the purpose of illustrating the invention since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized and that the invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described.

In the drawing:

Fig. 1 is a top plan view of an embodiment of this invention, showing outsole and upper (indicated in dot and dash lines) in assembled condition.

Fig. 2 is a plan view of a part of an upper on an enlarged scale and provided with means for attaching the same to an outsole.

Fig. 3 is a plan and fragmentary view, partly in section, of an upper in locking engagement within the outsole.

Fig. 4 is a vertical sectional view of a part of an outsole at the location of its locking engagement with the upper.

Fig. 5 is a sectional view taken along line 5—5 of Fig. 3.

Fig. 6 is a sectional view of a portion of an outsole, the upper being removed therefrom.

Fig. 7 shows a fragmentary perspective view of an embodiment of the invention in modified form illustrating in their locking position outsole and upper partly in section.

Figs. 8 to 10 show exploded views of the fastening means at upper and outsole and demonstrate steps of the method for fastening the upper to the inside of the outsole of a shoe.

Figs. 11 and 12 illustrate, respectively, fragmentary horizontal and vertical sectional views of a further embodiment of the invention with the upper hooked over at the inner face of the outsole.

Referring now in greater detail to Figs. 1 to 5, inclusive, there is indicated by numeral 10 a part of a shoe, including outsole and upper embodying one of many possible forms of this invention. Shoe 10 is provided with outsole 11 and upper 12. Outsole 11 may be made of any suitable material, such as rubber, rubber composition, synthetic rubber masses, plastic or resinous material

("Vinylite," "Lucite" and the like), leather, composite leather, wood, etc. Outsole 11 is provided with a projection or ledge 13 integrally united therewith and extending along and at a distance from the outer boundary 14 of outsole 11, thus providing a rim 14a, which may be grooved or shaped in any other way, as clearly seen in Figs. 3 and 5.

The outer or lower surface 15 of outsole 11 may be grooved or profiled in any suitable manner, whereas the upper surface 16 is provided with a plurality of channels for a purpose hereinafter described. Insole 17 (indicated in dot and dash lines) is adapted to cover said channels recessed in said outsole 11, said insole being substantially flush at its upper surface 17a with upper edge of ledge 13, as indicated in Fig. 5.

In outsole 11, there are provided a plurality or pairs of spaced channels, 18, 18a; 18b, 18c; 18d, 18e; 18f, 18g, each channel consists of a substantially horizontal portion 19, open and accessible at the upper surface 16 of outsole 11 and of a portion 20 over which passes ledge or bridge means 13. The aforesaid channels have inner ends and open outer ends, said bridge means 13 extending adjacent the outer ends of said channels in crosswise direction thereto and terminating at a predetermined distance from said inner ends of said channels. The bridge means 13 have inner and outer ends or edges 13a, 13b and the distance therebetween is shorter than the distance between the outer and inner ends 19a, 19b of said channels, as clearly illustrated in the drawing (Figs. 5 and 6).

As exemplified by Figs. 3 and 4, in channels or recesses 18, 18a are provided upwardly projecting means, such as buttons or stems 21, 22, which terminate into heads 21a, 22a, respectively. These buttons are integrally united with the material of the outsole 11, their length not extending beyond the upper surface 16 of outsole 11, as can be seen in Figs. 4, 5 and 6.

Upper or foot retaining means 12, in this instance, consists of crossed strap means, as used for sandals or the like, each strap end or extremity being provided with a substantially U-shaped cut-out 23, thus forming lugs 24, 25 at each outer extremity of said strap means 12. Lugs 24, 25 are provided with circular apertures or openings 26 and 27, respectively, communicating with elongated slots 26a; 27a, both slots being narrower in width than the diameter of circular openings 26 and 27.

In order to fasten each strap end of upper 12 to the outsole 11, all that is required is the introduction of the lugs 24, 25 underneath bridging means 13 through channel portions 20 to extend into horizontal portions 19 of open channel portions of channels 18 and 18a for engagement of openings 26, 27 with projecting means 21, 22, respectively. By outwardly pulling strap 12, projecting means 21 and 22 will engage with the slots 26a, 27a, so that the end walls of said slots abut against said studs or projecting means 21, 22, whereby the extremities of said strap means are locked in position and are prevented from being disengaged from stems 21, 22 since the diameter of heads 21a, 22a is larger than the width of elongated slots 26a, 27a. It is to be noted that the upper, which may be of any style or shape, does not require any last in order to bring about engagement and fixation of the connecting means 24, 25—22, 21 (Fig. 4) provided at the upper and at outsole 11, respectively.

Since the ends of the upper substantially fill

out the spaces of the recesses or channels 18, 18a and the insole 17 when applied to the upper surface of outsole 11 covers and conceals the locations of fixation within the body of outsole 11, the foot of the wearer will not be in any way affected by the connecting means hereinabove set forth.

Fig. 7 shows the connection of a part of upper 30 with an outsole 31 in modified form. Upper 30 is provided with lugs 30a, 30b having openings 32, 33, respectively. These openings are brought in engagement with buttons 32a, 33a provided at vertical wall 34 of outsole 31. As can be seen from Fig. 7, the lugs 30a, 30b are guided through channels 35, 36 passing through ledge 37 of outsole 31, said lugs 30a, 30b further extending downwardly into a holding groove 38 for fixing the extremities of said lugs in position therein.

As can be realized from the drawing, lugs 30a, 30b are of such length that the U-shaped cut-out 39 extends somewhat above ledge 37 and thus leaves therebetween a slot 40 to afford air circulation for the shoe in crosswise direction to the length of the shoe.

Figs. 8 to 10 show some steps in carrying into effect the method for assembling upper and outsole together. As seen in Fig. 8, a part of the upper in form of a strip 50 is shown, having the hook-shaped ends 51, 52. These ends may be brought in engagement with projections 53, 54 provided with heads 53a, 54a, respectively, which are disposed within channel 55 of outsole 57 communicating with channel portion 56 over which passes ledge 58 of outsole 57.

According to Fig. 10, strip 55 is provided with hook-shaped ends 51, 52 adapted for engagement through channel portion 56 at ledge 58 and open channel portion 55 within which there project buttons comprising studs 53, 54 provided with heads 53a, 54a, respectively, whereby the extremity of strap 50 of the upper is locked and fixed in position within said channel portion 55 open and accessible at the surface 57a of outsole 57.

Figs. 11 and 12 show a further modification of connecting strap means 60 having at its outer extremity an opening 61 for engagement with hook-shaped projection 62 let in outsole 65 and positioned immediately below surface 63 of said outsole 65 within channel 64. Communicating with channel 64 is channel portion 66 extending substantially horizontally in the direction toward said projection 62. Bridging means, such as ledge 68, which is integral with the outsole 65 passes across said channel portion 66, as clearly seen in Fig. 12.

In order to bring strap 60 into engagement with hook-shaped projection or button 62, upper strap 60 with its hole or opening 61 at its outer extremity is passed through bridged channel portion 66 to extend into open channel 64, is then slipped over hook-shaped projection 62, whereby engagement of opening 61 with projection 62 will be brought about, as may be realized from Figs. 11 and 12.

Since the fastening or connecting means of the outsole are integrally united therewith and do not extend beyond the upper surface of the outsole, the insole, when placed on and attached to the upper surface of said outsole, will lie flush thereon. The fastening means of the outsole are effectively concealed by the insole and will not conflict with the latter when the foot is resting on the insole.

It is well understood that strap parts at the extremity of the upper of the shoe may be guided

and threaded through a bridged channel portion passing through a vertical wall of the outsole for connection thereat, as seen in Fig. 7, or these strap parts may be led along the outside of the outsole and may then be passed through a substantially horizontal tubular channel for connection with projecting means provided in a channel portion, which is open at the top surface of the outsole. Only simple manipulation by the hand of the operator is required to fasten or button the upper by means of straps to the outsole and to simultaneously lock the straps in position, as exemplified in Figs. 3 to 6 and 11 and 12.

It is to be mentioned that the upper may have any suitable shape and may be made of any suitable material, such as leather, fabric, composite material suitable for the purpose intended. According to this invention, it is not only contemplated to provide the upper with crosswise disposed straps, as applied to a sandal (Fig. 1), but any other conventional shape of upper may be employed whose extremity may be provided with strap extensions and means integral therewith for coupling the upper with means which in turn are provided within the confines of channels in the outsole and preferably below the top surface thereof, so that such coupling or connecting means do not interfere with the insole to be placed on the top surface of the outsole within the shoe.

It is further to be observed that any insole may be used for the shoe made in accordance with Fig. 7, said insole filling out the space provided at wall 34 between ledge 37 and top surface of the outsole 31.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to the above embodiments, it will be understood that various substitutions and changes in the form and details of the connecting means illustrated and their operation may be made by those skilled in the art without departing from the spirit of the invention.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent, is:

1. An article of footwear comprising an outsole and foot retaining means thereon, said foot retaining means including strap means for connection with said outsole, each strap means having an outer extremity, transverse elongated channels provided in said outsole below the top surface thereof and having outer and inner ends, integral means adapted to engage the outer extremities of said strap means and projecting from the bottom of said channels adjacent the inner ends thereof, and bridge means integral with said outsole and extending adjacent the outer ends of said channels in crosswise direction thereto and terminating in lengthwise direction of said channels in edges positioned a predetermined distance from said inner ends of said channels, the channel portions extending between said edges and said inner ends of said channels being open at the top surface of said outsole to provide access from the top surface of said outsole to said engaging means, said strap means passing underneath said bridge means for connecting the outer extremities of said strap means with said engaging means.

2. An article of footwear comprising an outsole and foot retaining means thereon, said foot retaining means including strap means for connection with said outsole, each strap means having an outer extremity, elongated channels provided in said outsole below the top surface there-

of and having open outer ends, means within said channels adapted to engage the outer extremities of said strap means, and bridge means extending adjacent the outer ends of said channels in crosswise direction thereto and terminating in lengthwise direction of said channels in edges positioned a predetermined distance from said engaging means, said bridge means being integrally united with said outsole and forming with the portions of said channels crossed by said bridge means passageways, the channel portions extending between said edges of said bridge means and said engaging means being open at the top surface of the outsole and communicating with the top surface of said outsole, said engaging means being attached to the bottom wall of said open channel portions and being accessible from the top surface of said outsole to facilitate connection of said engaging means with the outer extremities of said strap means, said strap means extending from underneath said bridge means into said open channel portions.

3. An article of footwear comprising an outsole and foot retaining means thereon, said foot retaining means including strap means for connection with said outsole, each strap means having an outer extremity, elongated channels provided in said outsole below the top surface thereof and having inner ends and open outer ends, said inner ends including end walls extending from the bottom of said channels to the surface of said outsole, said channels including bridged channel portions integral with said outsole and positioned adjacent said open outer ends and channel portions open at the top surface of said outsole and extending between said bridged channel portions and said end walls, and means disposed in said open channel portions and engaging the outer extremities of said strap means, said strap means extending through said open outer ends and through said bridged portions of said channels for engagement of said outer extremities with said engaging means.

4. A sole for footwear comprising an elongated body having a bottom surface and a top surface, elongated channels having outer ends and directed from said outer ends crosswise through said body between said top surface and said bottom surface, bridge means integrally united with said body extending crosswise to said channels and adjacent the outer ends thereof, and means adapted to engage extensions of an upper of a shoe, said engaging means being integrally united with said body, said bridge means terminating in lengthwise direction of said channels in edges, portions of said channels extending beyond said edges of said bridge means being open at the top surface of said body and accessible therefrom, said engaging means being disposed in said open channel portions for retaining therein said extensions of said upper passing underneath said bridge means.

5. A sole for footwear comprising an elongated body having a bottom surface and a top surface, elongated channels having open outer ends, said channels being directed from said open outer ends through said body and extending between said top surface and said bottom surface, bridge means integrally united with said body and extending crosswise to said channels, and means adapted to engage extensions from foot retaining means and positioned within the confines of said channels, said bridge means being located adjacent said open outer ends and extending in lengthwise direction of said chan-

nels to terminate in inner edges, the distance between said inner edges and said open outer ends being shorter than the length of said channels, portions of said channels extending beyond said inner edges being open at the top surface of said body and accessible therefrom, said engaging means being adapted to retain said extensions in said channels when said extensions pass underneath said bridge means and through said open outer ends.

6. A sole for footwear comprising an elongated body having a bottom surface and a top surface, elongated channels having open outer ends, said channels being directed from said open outer ends through said body and extending between said top surface and said bottom surface, bridge means integrally united with said

body and extending crosswise to said channels, and means positioned within the confines of said channels and adapted to engage extensions from foot retaining means, said bridge means being located adjacent said open outer ends and terminating in lengthwise direction of said channels in outer and inner edges, the distance between said outer and inner edges being shorter than the length of said channels, portions of said channels extending beyond said inner edges being open at the top surface of said body and accessible therefrom, said extensions being adapted to pass underneath said bridge means and to be retained on said body by said engaging means.

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