Oct. 16, 1962 C. R. OSGOOD 3,058,240

BASIC SHOE UNIT

Filed Oct. 9, 1959 3 Sheets-Sheet 1

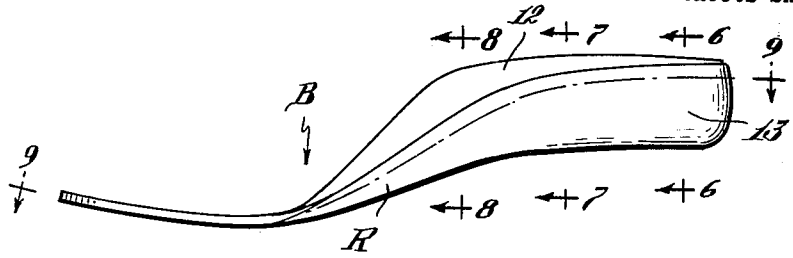


Fig. 1

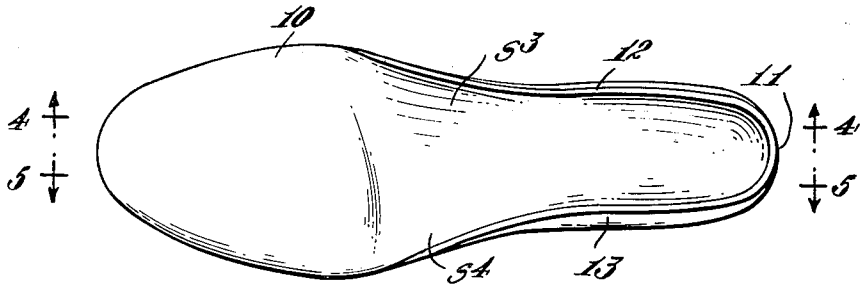


Fig. 2

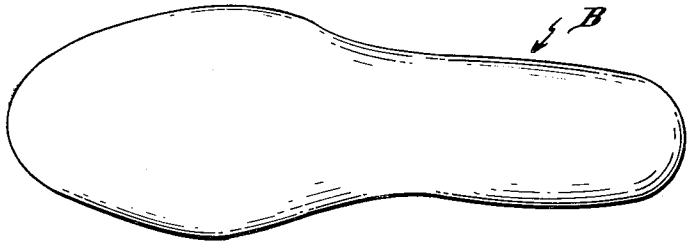


Fig. 3

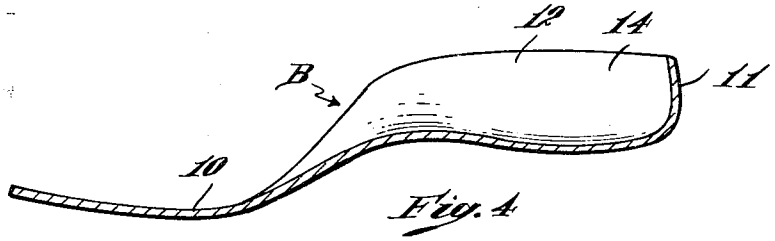


Fig. 4

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BASIC SHOE UNIT

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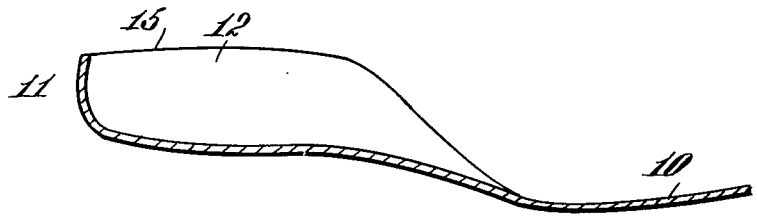


Fig. 5

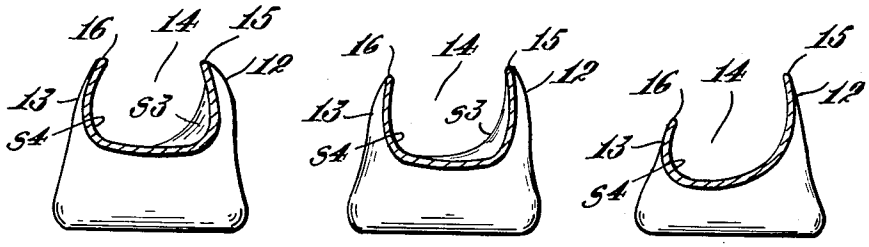


Fig. 6 Fig. 7 Fig. 8

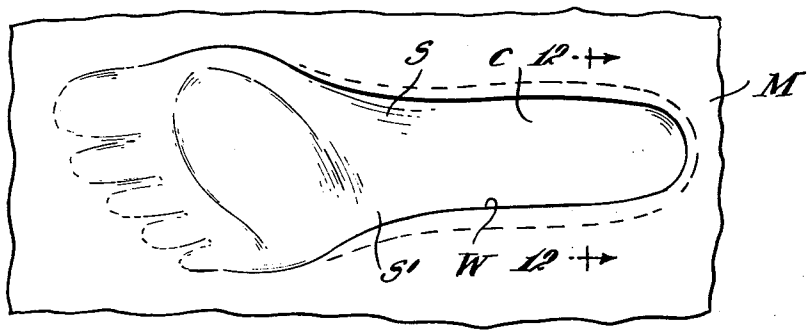


Fig. 13

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BASIC SHOE UNIT

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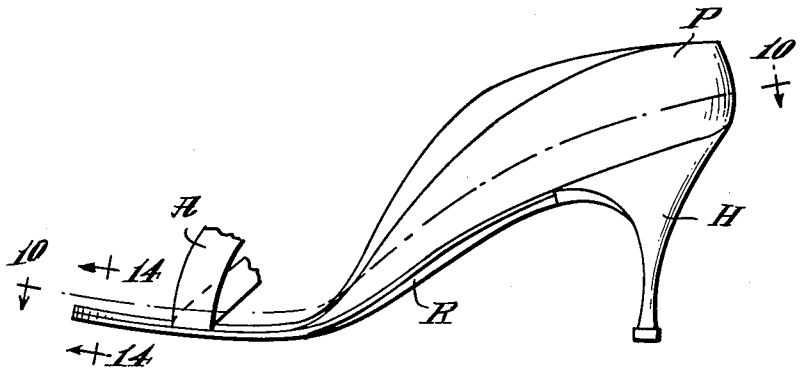


Fig. 9

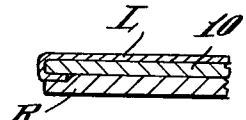


Fig. 14

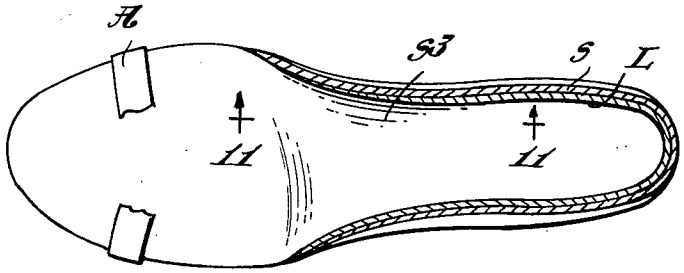


Fig. 10

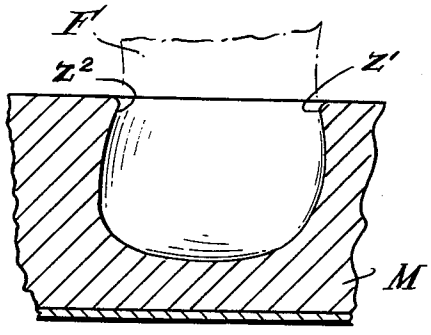


Fig. 12

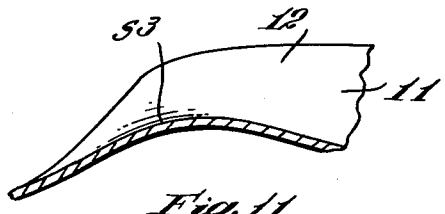


Fig. 11

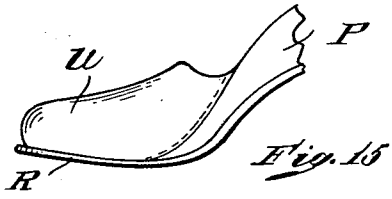


Fig. 15

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3,058,240

BASIC SHOE UNIT

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1 Claim. (Cl. 36—2.5)

This invention pertains to footwear, more especially to a shoe having novel characteristics and which comprises a novel basic unit which is capable of use, with but slight modification, as a shoe of the "open" type, or which, alternatively, may provide a foundation of a definite predetermined shape, to which other parts, for instance an upper, are attached, or to which any desired elements, either utilitarian or ornamental, may be united, said basic unit in respect to its utility in determining the final shape of the shoe, being somewhat suggestive of a dressmaking dummy.

Heretofore, the accepted practice in the mass production of shoes has been to cut and make up the upper to standard size dimensions, and then to last the upper to an insole, mounted upon a last, usually having a bottom whose contour has little resemblance to the actual contour of the bottom of the human foot. In other words, the customary shoe is designed from the top down, the major effort, so far as actual fit is concerned, being concentrated upon the shaping of the upper by the lasting operation. None of the shoes so made, accurately fits the bottom of the foot, either at the heel or inside arch.

To be really effective for its intended purpose, a shoe should so cling to the foot that it will not shift substantially relatively to the foot during use, and ideally, should contact the foot at all points as though it were a flexible outer skin.

Heretofore, except with respect to shoes of the so-called "open" type, customary practice has been to provide the shoe with an upper whose forepart portion is shaped to provide a chamber into which the forepart of the foot may be thrust. Since the walls of this chamber are relied up to prevent transverse motion of the shoe relatively to the foot, the upper is so shaped and dimensioned that a shoe, "fitted" according to the prevailing practice, constricts the forepart portion of the foot transversely, the maximum constriction being at approximately the location of the joints which unite the metatarsal bones with the phalanges. However, in the normal foot (that is, one which has not been deformed by the wearing of the footwear of civilization), the metatarsals diverge forwardly from their junctions with the cuneiform bones, and the phalanges also diverge forwardly from their junctions with the metatarsals, so that so far as the normal bone structure is concerned, the foot is of maximum width at approximately the forward ends of the phalanges and is substantially narrower at the heel. Because of manufacturing expediencies and the demands of style, the forepart of the customary shoe upper narrows quickly toward the toe tip with the result that normal blood circulation is impeded and the human foot is gradually deformed from infancy to adult life with the resultant ills from which most people suffer. Even though open type shoes may have portions of the upper cut away at toe, shank or heel, thus lessening the transverse constriction of the foot, the manufacturing procedure does not differ otherwise from that of conventional shoes, so that they are no better in respect to the shape of the foot supporting surface than ordinary shoes.

An object of the invention is to provide a basic shoe comprising a sole member whose upper surface conforms to the under surface of the wearer's foot and which so hugs the wearer's heel that close confinement of the forepart portion of the wearer's foot is unnecessary.

A further object is to provide a basic shoe consisting

of a homogeneous unitary mass of moisture-pervious material and which comprises an insole portion whose upper surface conforms to the bottom of the wearer's foot and a quarter portion extending from the ball portion rearwardly and about the heel, and whose inner surface snugly conforms to the wearer's heel and inside arch, and to which bottom and/or upper elements may be attached to form a complete shoe.

A further object is to provide a shoe comprising an integral unit including an insole and a quarter portion, said unit being of moisture-pervious material, the upper surface of the insole being of a shape such as to conform to the bottom of the wearer's foot, and the inner surface of the quarter portion being of a shape snugly to fit about the wearer's heel and against the inside arch of the foot, and an unlasted upper united to said unit.

A further object is to provide a shoe whose bottom comprises an insole of moisture-pervious material, whose upper surface conforms to the surface of the wearer's foot, and an outersole directly contacting the under surface of said insole and which is united to the latter by adhesive, the entire bottom structure of the shoe being devoid of metallic fastener elements.

A further object of the invention is to provide a basic shoe having a foot-contacting surface which conforms closely to the under surface of the human foot, particularly at the heel and arch, the emphasis thus being placed upon the fit of the bottom structure rather than upon the fit of the upper which is the customary practice.

A further object is to provide a basic unit or shoe which snugly fits the heel and arch portions of the foot, and which thus differs substantially from shoes made by the customary lasting procedures.

A further object of the invention is to provide a basic unit or shoe having a foot supporting surface which, in transverse and longitudinal contour is a close replica, but in reverse, of the under surface of the average normal human foot within a given range of sizes.

A further object is to provide a basic unit or shoe whose upper surface is shaped to conform to the rounded bottom of the human heel and also to follow the arch line of the human foot at the inside of the arch forwardly to the head of the first metatarsal bone.

A further object is to provide a basic unit or shoe of unitary construction consisting of a moisture-pervious material which may readily be molded to the desired shape and which has the desired strength and shape retaining qualities and the necessary resiliency to insure the requisite gripping of the heel portion of the foot and which may be used without covering material, if desired, to constitute the entire basic shoe, or which may readily be covered either inside or out, or both, with a suitable material, for example, kid leather, as a step in converting it into a shoe of more conventional appearance.

A further object is to provide a shoe comprising a basic unit which is of unitary construction, combining the functions of several parts customarily made separately, thus substantially reducing the cost of manufacture.

A further object is to provide a shoe comprising a basic unit of unitary construction such as may be made very cheaply and readily by a simple molding operation, and of a material which possesses the moisture-pervious characteristics of natural leather.

A further object is to provide a shoe comprising a preshaped unitary base or foundation whose upper surface smoothly conforms to the bottom contours of the foot, including the inside arch, the metatarsal arch and the heel, and which may be assembled with and united to other parts to provide a shoe of conventional appearance, but providing a degree of comfort which is never

found in shoes made in accordance with mass production lasting methods.

A further object is to provide a novel method of making a basic shoe unit comprising an insole portion and a quarter portion integral therewith.

A further object is to provide a pre-shaped foundation or base upon which a shoe may be built from the bottom up, rather than from the top down, as is customary practice.

Other and further objects and advantages of the invention will be pointed out in the following more detailed description by reference to the accompanying drawings, wherein,

FIG. 1 is a side elevation illustrating a basic unit or shoe embodying the present invention;

FIG. 2 is a plan view of the basic unit or shoe of FIG. 1;

FIG. 3 is a bottom view of the shoe of FIG. 1;

FIG. 4 is a longitudinal section substantially on the line **4—4** of FIG. 2;

FIG. 5 is a longitudinal section substantially on the line **5—5** of FIG. 2;

FIG. 6 is a vertical section, to larger scale, on the line **6—6** of FIG. 1;

FIG. 7 is a vertical section, to larger scale, on the line **7—7** of FIG. 1;

FIG. 8 is a vertical section, to larger scale, on the line **8—8** of FIG. 1;

FIG. 9 is a side elevation showing a complete shoe, comprising the basic unit of FIG. 1, an outersole and heel; and an upper comprising lining and outer plies and attaching straps;

FIG. 10 is a section on the line **10—10** of FIG. 9;

FIG. 11 is a fragmentary vertical section substantially on the line **11—11** of FIG. 10;

FIG. 12 is a diagrammatic vertical section illustrative of the shape of a heel imprint such as is produced in the process of preparing a mold for use in the manufacture of the basic shoe of the present invention;

FIG. 13 is a fragmentary plan view showing a foot imprint such as is employed in the preparation of the mold;

FIG. 14 is a section, on the line **14—14** of FIG. 9; and

FIG. 15 is a perspective view showing a shoe comprising the basic unit of the present invention combined with a conventional upper.

While the bony structure at the forepart portion of the human foot, as above described, comprises a plurality of bones which normally diverge forwardly and which may be forced together, the heel end of the foot comprises a single bone, which is widest at its lower part and which tapers upwardly. Thus the heel end of the foot narrows upwardly in width toward the ankle bone or talus. The present invention takes advantage of this shape of the heel portion of the foot to provide a basic shoe which inherently tends to cling to the heel portion of the foot. Since this part of the foot comprises a single bone, the basic shoe may be designed to hug this part of the foot with substantial pressure without discomfort and without danger of deforming or injuring the foot at this point. Thus a shoe incorporating this basic unit need not be designed to apply constrictive pressure to the forepart of the wearer's foot.

Referring to FIG. 12 of the drawings, the character M designates a mass of a moldable material which sets and becomes shape retaining. It may be thermo-plastic or any other appropriate material such as is customarily used in making casts or the like. A mass of this material in moldable condition is placed upon a suitable support or within an appropriate container, and a bare human foot F (FIG. 12) is placed thereon and pressed down so as to form an imprint of the foot in the material. Usual precautions will be employed to keep the foot from sticking to the material. The foot is held in this position while the material sets. When the foot is withdrawn, there is left a cavity C (FIG. 13) which is the exact replica, but in reverse, of the bottom surface, heel and arch portions of the foot, it being noted that because the major portion of the weight of the model is carried by the heel, the cavity tends to be deeper rearwardly of the ball portion than at the forepart. It will be noted that unlike the upper surface of the forepart portion of the insole of a shoe lasted upon the usual last and which is transversely concave, the upper surface of that part of the sole of the basic shoe of the present invention which underlies the metatarsal knobs is approximately flat transversely thus permitting the foot to flex as nature intended, as the bare foot does when walking upon flat ground. In making the impression, the moldable material should be caused to extend upwardly (FIG. 13) about the heel and forwardly along each side of the arch at the location of the quarter portion of a shoe, but forwardly of the ball portion, the depression made by the metatarsal knobs of the normal foot during molding is of slight depth. The heel end of this cavity will be cup-like (FIG. 13), while at the inside of the arch the surface S of the cavity will be convex both longitudinally and transversely. At the outer side of the arch the surface S' of the cavity will be of but slight curvature in either direction, while forwardly of the ball the cavity will have little, if any, depth, although the upper surface of the molded material may show slight imprints of the toes. This procedure, or its equivalent, will be employed in the making of a substantial number of foot imprints, using different models whose feet are normal, although differing slightly in minor particulars, as may be expected, but which are all within a definite range of sizes as respects the customary mode of sizing shoes. From these several imprints, a composite average imprint is constructed, thus producing a prototype cavity which will closely approximate, in shape and contour, the average human foot within the selected size range. Using this prototype cavity, a multi-part mold is now made from suitable material, for example, cast iron or steel, which may then be employed for the mass production of basic shoes according to the present invention. The mold employed should be so designed that the basic shoe produced by its use should be of substantially uniform thickness throughout. While one procedure for the preparation of such a mold has hereinabove been suggested, by way of example, it is to be understood that the present invention is not limited to any specific mode of preparing the mold.

Having provided such a mold, a basic shoe B, such as illustrated in FIGS. 1 to 5, may be prepared, employing as as a material a selected moldable substance, having the desired characteristics. For example, shredded leather, short wool fiber, or the like, is incorporated in a thermo-setting binder, such as to provide a substance which sets to form a stiffly resilient, moisture-pervious material. The basic shoe thus produced comprises an insole portion **10**, which may, merely by way of example, be of the order of $\frac{1}{16}$ inch thick in vertical thickness, and an upstanding wall or quarter comprising the heel portion **11** and the shank portions **12** and **13**, said wall or quarter being integral with the sole portion and merging smoothly with the latter to provide a cavity **14** (FIGS. 6, 7 and 8) whose inner surface closely conforms to the surface of the foot.

Since, as above noted, the heel bone or calcaneum of the human foot tapers upwardly, the flesh and blood heel (FIG. 12) is widest near its bottom and tapers upwardly slightly, so that in making the initial impression of the foot, the walls Z^1, Z^2 of the resultant cavity, at its heel end, incline inwardly. Thus in the molded basic shoe, as shown in FIG. 6, the distance between the upper edges **15** and **16** of the walls **12** and **13** is less than the width of the cavity **14** at its lower part. Likewise the heel end **11** of this wall inclines slightly inwardly and thus when a normal foot, within the proper size range, is placed in the cavity **14** of the basic shoe, the shoe resiliently clings to the heel. At the inner side of the shank portion, the wall **12** of the basic shoe is of maximum height, because

in making the initial foot imprint, the moldable material, as above described, is caused to extend up along the arch and about the heel at the area corresponding to the quarter portion of a shoe. The inner surface S^3 of the foot receiving cavity 14 is curved both longitudinally and transversely in the shank portion, as shown in FIGS. 6 and 11, respectively, thus snugly conforming to the surface of the foot at the inside arch. At the outer side of the shank, the wall 13 is of lesser height than at the inner side and the inner surface S^4 of the cavity has but little curvature, in this respect conforming to the outer side of the foot. Merely by way of example, the height of the upstanding wall may be of the order of 1¼ inches at the rear part 11, then increasing to a maximum height of the order of 1⅝ at the inside 12 of the shank and increasing to a maximum height of 1⅜ at the outerside 13 of the shank, and then, from the points of maximum height, tapering in height, at both sides, downwardly and forward to the level of the sole portion.

The basic shoe B thus made is a unitary mass of molded shape-retaining moisture-pervious and resilient material comprising an insole portion and an upwardly directed wall or quarter, and has a foot receiving cavity 14 of a shape to receive the heel and arch portions of the foot with a glove-like clinging fit, leaving the forepart portion of the foot entirely free of all constraint either transversely or vertically. Such basic shoes consisting only of the molded material as described, may be placed in stock by the manufacturer and used, as required in the manufacture of complete shoes, as by the addition of upper elements and/or bottom parts. Thus, to this basic shoe, there may be attached an outersole R or heel H (FIG. 9); it may be colored or otherwise surface finished, or provided with a lining L and/or an outer ply P (FIG. 9), for example, of thin kid leather. Likewise, upper elements, for example, the straps A (FIG. 9) or a complete upper (FIG. 15) or any desired trim may be provided and attached, without requiring lasting, to the basic unit. To insure flexibility and foot comfort the outersole and heel, if used, should be attached directly, without intervening filler elements, to the under side of the basic unit, by a suitable adhesive, thus avoiding the introduction of metallic fasteners into the shoe bottom. The upper, if a complete upper be employed, should be cut to fit by pattern, rather than by reliance upon lasting stress.

Thus the basic unit or shoe of the present invention, and which may be made cheaply and by mass production procedures, may be used, with but slight modification, as a slipper, or as a foundation to which a conventional upper U (FIG. 15) may be sewn or otherwise attached, and to which an outersole and heel may be secured so as to provide a shoe of conventional appearance, but which provides a foot supporting surface conforming to the wearer's foot, and which so clings to the rear portion of the foot that transverse constriction of the forepart portion of the upper is not necessary. Moreover, the bottom structure is flexible, substantially uniform in thickness and devoid of filler, tacks or staples.

While one desirable embodiment of the invention has herein been disclosed by way of example, it is to be understood that the invention is broadly inclusive of all modifications falling within the scope of the appended claim, and that when herein the term "shoe" is employed, it will be understood that it is used in a generic sense and as inclusive of articles of footwear in general.

I claim:

A basic shoe designed to be worn on a normal human foot which hugs the heel and arch portions of the wearer's foot with a glove-like clinging fit such that close confinement of the forepart portion of the foot is unnecessary, said basic unit comprising a sole portion whose upper surface conforms to the undersurface of the wearer's foot, the basic shoe being a unitary mass of molded, shape-retaining, moisture-pervious, resilient material and being of substantially uniform thickness throughout, the basic shoe comprising an upstanding quarter including a heel portion and inner and outer shank portions, the inner surface of said quarter merging smoothly with the upper surface of the sole, the shank and heel portions of the quarter leaning inwardly and the upper surface of the heel portion of the sole being concave thereby defining a cup-like cavity for and which closely conforms to the wearer's heel, the maximum height of the quarter being at the inner shank portion, the sole forwardly of the quarter being substantially flat transversely, the upper surface of the heel-receiving cavity being curved both longitudinally and transversely in the shank portion so as to conform snugly to the surface of the inside arch of the wearer's foot.

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