Jan. 2, 1940. B. J. SILVER 2,185,526

SOLE MODIFYING INNER SOLE

Original Filed May 21, 1934 2 Sheets-Sheet 1

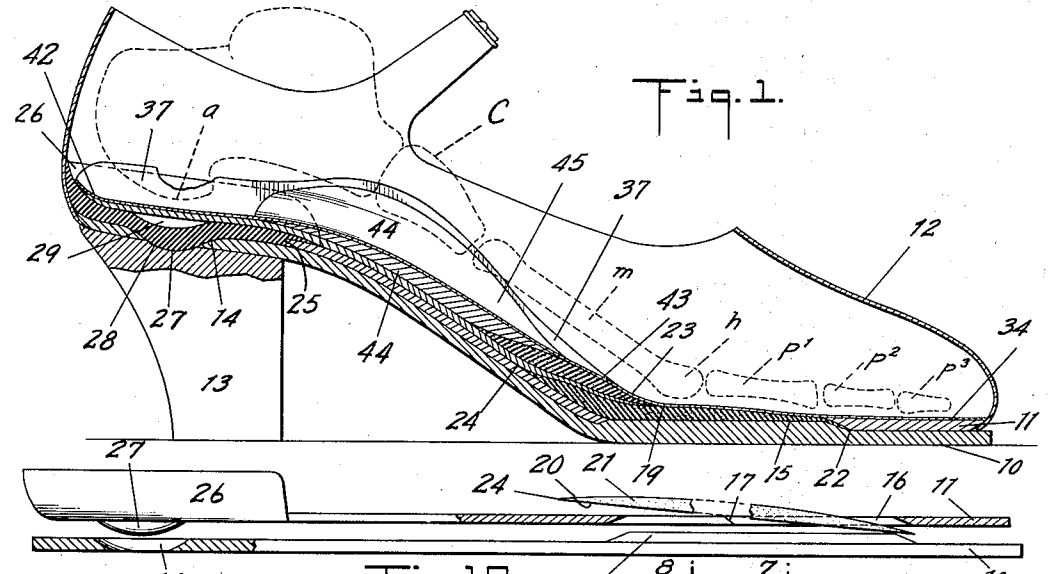


Fig. 1.

Fig. 1a.

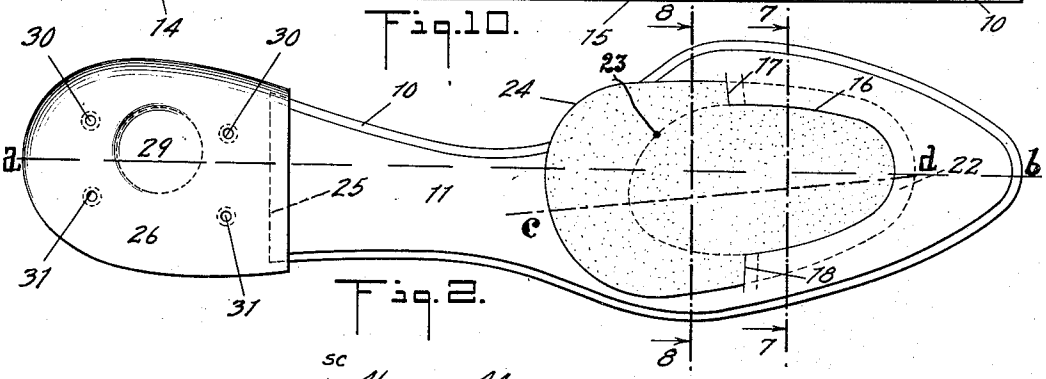


Fig. 2.

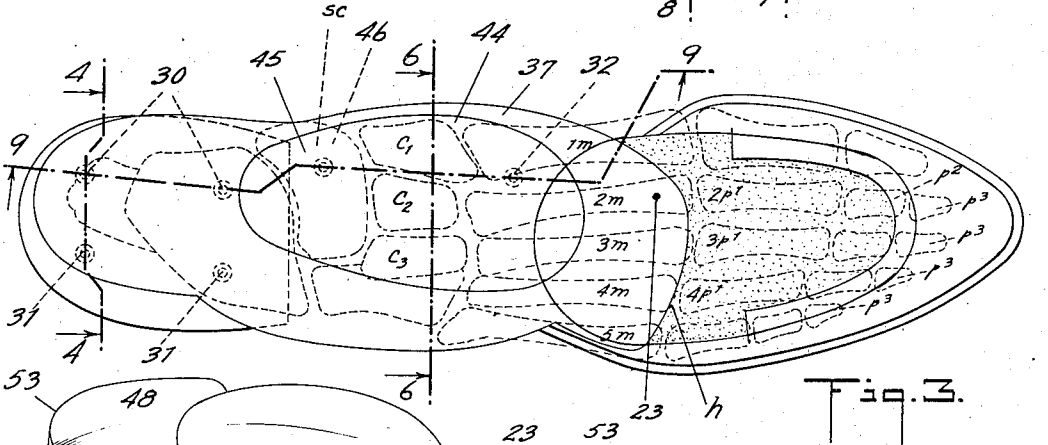


Fig. 3.

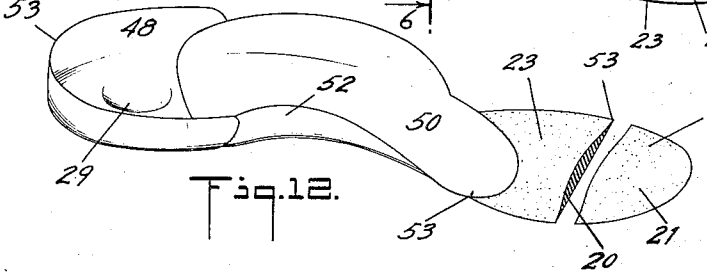


Fig. 12.

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SOLE MODIFYING INNER SOLE

Original Filed May 21, 1934 2 Sheets-Sheet 2

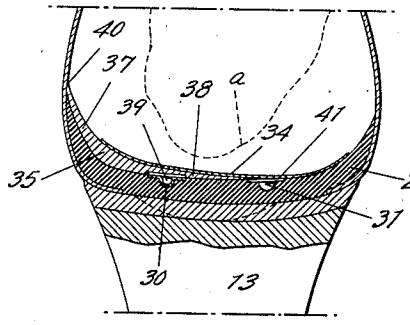


Fig. 4.

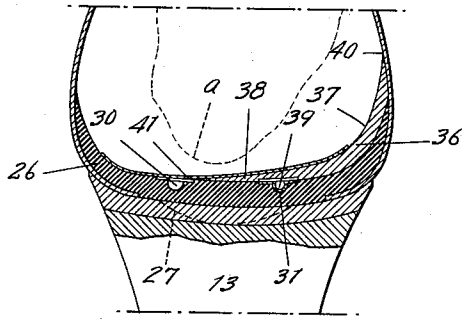


Fig. 5.

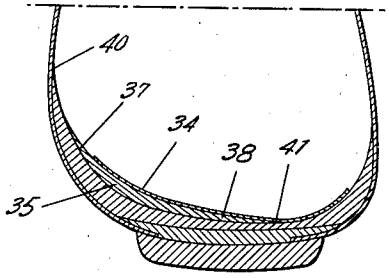


Fig. 6.

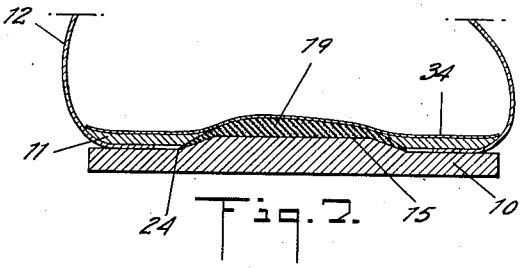


Fig. 7.

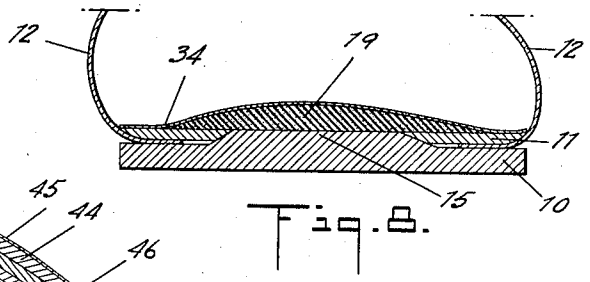


Fig. 8.

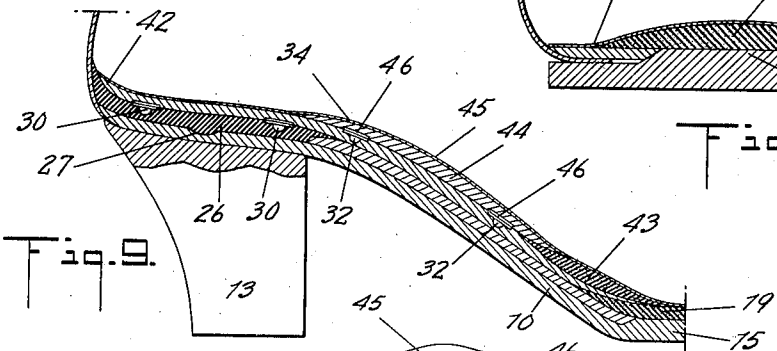
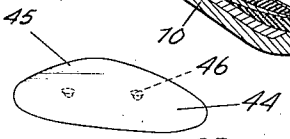


Fig. 9.



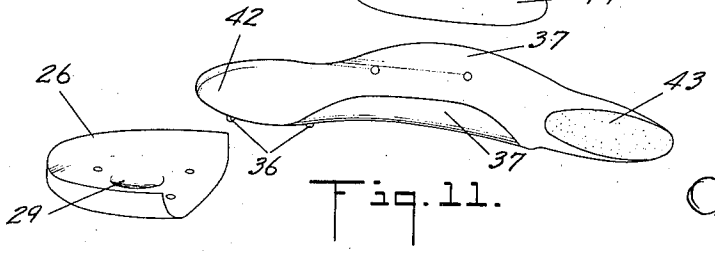


Fig. 11.

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UNITED STATES PATENT OFFICE

2,185,526

SOLE MODIFYING INNER SOLE

Benjamin J. Silver, New York, N. Y.

Original application May 21, 1934, Serial No. 726,738. Divided and this application May 10, 1937, Serial No. 141,753

24 Claims. (Cl. 36—71)

The invention relates to a shoe and more particularly to the conformation of the foot engaging surface of the inner sole of a shoe and the disclosure herein constitutes an improvement and development of the invention disclosed in my Patent No. 2,046,190 granted June 30, 1936, and the present disclosure constitutes a division of my copending application Serial No. 726,738 filed May 21, 1934.

The present invention, as was the case with the disclosure in the above identified patent, features the providing of a basic shoe which can be produced as a factory proposition and supplying with the basic shoe a plurality of sole modifying inserts having both cushioned and uncushioned areas by means of which inserts the store salesman can selectively adopt the basic shoe to fit more accurately than is now possible the peculiar conformation of the foot of the particular person for whom the basic shoe is being modified.

In the prior patent, the basic sole contour was therein featured as having low arch characteristics approaching a flat footed condition, but in the device illustrated in this application while the sole may have low arch characteristics the basic sole is designed to more nearly approach arched contours not necessarily of maximum low arch characteristics.

The primary object of the present disclosure, as was the primary object of the disclosure in the above patent, is to provide what may be called a store or factory produced shoe, in distinction from a custom made shoe, and which basic shoe can be readily modified in its sole conformation to more nearly fit the peculiar variations of the maximum number of customers so as to give them a more accurate fit considered anatomically than has been possible heretofore. The present disclosure is not particularly intended to function as a curative or corrective shoe, although obviously it may be used for such purposes at least to a limited extent.

Another object of the invention is to provide an improved form of inner sole contour which in its cooperative relation to cushioned and uncushioned or inelastic sole areas will provide a distribution of cushioned support to supplement the tissue areas beneath the points of pressure from the bone structure of the foot, with the cushioned areas located and arranged to distribute weight loads over enlarged areas of the sole and thus tend to minimize the localizing of pressure areas within limited areas of the shoe sole.

The present disclosure features an improving of the cushioning area at the ball of the foot, distinguishing from the similar construction in the prior patent in that the cushioned area herein is formed of an integral insert rather than of the two separate inserts disclosed in the above identified patent. In this application the cushioning insert beneath the ball of the foot has its point of maximum elevation located slightly in the rear of the heads of the three middle metatarsal bones, rather than beneath the head of the second bone as in the prior patent. There is also featured herein the extension of the cushion rearwardly from this point of maximum elevation so as to provide a support for the anterior portion of the metatarsal dome just in the rear of the heads and a forward extension therefrom to a position slightly in advance of the heads of the metatarsal bones, or, differently expressed, to a position which underlies the area of the three middle proximal phalanges. As this ball cushioning area must be located accurately relative to the balance of the cushioned foot, the present disclosure features the combining of the ball support area in prefixed relation to the heel bone as a point of reference.

Much discomfort is noticed in known forms of shoes in that a ridge or joint is formed between the sole forming the flat portion of the heel pocket and the upstanding sides or counters forming the back of the heel portion of the shoe. Accordingly, another object of the invention is to provide a socket or heel saddle of a single integral piece of material, preferably of a resilient or cushioning material such as rubber, which saddle is of a scoop-like form with the concaved upper heel receiving concavity free of joints and like breaks in the heel forming material, and which saddle is designed to distribute throughout the same pressures imposed thereon by the plantar inner tuberosity of the oscalcis heel bone and the soft tissue around the heel bone.

Another object of the invention is to provide inserts for the basic shoe which will function as modulants of the sole contour provided by the basic shoe particularly in its function of providing longitudinal arch supporting features selectively for the inner or outer longitudinal arch as may be required in any particular case as well as the heel portion to help rotate the foot from heel to ball as a unit by the wedges herein featured.

Still another object of the invention is to pro-

vide an improved form of sole and heel contour modifying inserts which can be fitted to standard makes of shoes not necessarily of the type herein featured as a basic shoe.

Various other objects and advantages of the invention will be in part obvious from an inspection of the accompanying drawings and in part will be more fully set forth in the following particular description of one form of construction embodying the invention, and the invention also consists in certain new and novel features of construction and combination of parts hereinafter set forth and claimed.

In the accompanying drawings:

Fig. 1 is a vertical sectional view taken longitudinally through the basic shoe with two sole modifying inserts shown in position located with reference to the bone structure of the foot shown in side elevation in dotted outline, and illustrating a preferred embodiment of the invention;

Fig. 2 is a plan view looking down upon the inner sole of the basic shoe shown in Fig. 1 and with the replaceable inserts omitted;

Fig. 3 is a similar view with the inserts in place and located relative to the bone structure shown in plan;

Figs. 4 and 6 to 8 inclusive are transverse sectional views taken through the shoe of Fig. 1 and through the vertical planes therethrough in the several positions indicated by the similarly designated section lines in Figs. 2 and 3; Fig. 6 is a view similar to Fig. 4; Figs. 4 and 5 distinguishing from each other in that Fig. 4 shows a left flange upwardly extending insert and Fig. 5 is a similar right flange type of insert;

Fig. 9 is a longitudinal sectional view through the rear portion of the shoe and taken on the irregular line 9—9 of Fig. 3 facing outwardly as indicated by the arrows;

Fig. 10 is an explanatory figure in longitudinal section showing the construction of the inner and outer sole with the fixed ball pad shown in side elevation with a part broken away and located in position before the soles are pressed together;

Fig. 11 is an exploded view showing the inserts of Fig. 1 displaced from the heel saddle; and

Fig. 12 is a view in perspective of a single unitary insert for insertion in any standard make of shoe and forming a modified showing of the invention.

In the drawings and referring first to the basic shoe construction illustrated in Fig. 1, there is shown a conventional form of woman's shoe comprising an outer sole 10, an inner sole 11 with the edge of the upper 12 secured at its forward portion between the soles as particularly shown in Figs. 4 and 8 and at its rear end secured between the upper sole and the top of the heel 13 as shown in Figs. 1 and 9. In one commercial form of the device herein disclosed, the inner and outer soles were split from a single layer of leather. The outer sole 10 extends from end to end of the shoe and is provided above the heel 13 with an opening 14 extending therethrough directly beneath the plantar inner tuberosity *a* of the bone skeleton. In the region beneath the ball of the toes, the outer sole is provided with an upwardly extending integral projection 15, said projection may be either of leather or replaced by a resilient material, being somewhat elliptical in plan and located to intrude into the similarly shaped opening 16 in the inner sole 11 and from which opening the projection 15 was previously cut. The opposite long sides of the opening 16 are split outwardly as indicated at 17, 18. A ball or metatarsal area pad 19 is located in position with its forward end intruded into the opening 16 to receive the ball of the foot. This pad is formed of highly flexible material, such as soft rubber, has a flat underside 20 and a flatly arched upper side 21. When viewed in plan the pad is somewhat egg shaped, or, differently described, is the segment of an egg form. The forward, relatively narrow half of the pad 19 is disposed to extend over the projection 15 with its forward edge 22 projecting beyond the forward edge of the opening 16, extending at its midlength through the slits 17 and 18 with its rearmost and relatively wider end overlapping the portion of the inner sole adjacent the rear edge of the opening 16 as particularly shown in Fig. 2.

The pad is accurately formed with relation to the bone structure of the fore part of the foot, it being noted that it underlies the second, third and fourth metatarsals, designated respectively $2m$, $3m$, $4m$, leaving the first and fifth metatarsals, designated respectively $1m$, $5m$, uncushioned, or substantially so. Considered lengthwise the pad 19 extends forward a distance just sufficient to underlap the first phalanges p^1, specifically designated in Fig. 3 as $2p^1$, $3p^1$, and $4p^1$ of the second, third and fourth toes, leaving all the phalanges of the first and fifth toes as well as the second and third phalanges, designated respectively p^2 and p^3, of the second, third and fourth toes uncushioned. In other words, there is no intent herein to cushion the toes but on the contrary to provide for the toes the conventional form of leather support. Considered rearwardly the pad 19 underlaps the anterior half of each of the shanks of the second, third and fourth metatarsals *m*. It is a feature of this pad that it has its point of highest elevation indicated at 23 just back of the head *h* of the second metatarsal bone $2m$ and decreases in all radial directions from this point of highest elevation to its outlying feathered edge 24. This provides a portion of greatest thickness disposed at the inner side of the central line or medial longitudinal section line of the shoe, indicated by the dash line *a*—*b* of Fig. 2. The pad 19 is substantially symmetrical relative to its axis indicated by the dot and dash line *c*—*d* of Fig. 2 which extends at a slight angle from the line *a*—*b* in the direction towards the outer side of the shoe. The high point 23 is located on the side of the line *a*—*b* opposite the side containing the pad axis *c*—*d* and adjacent the portion of the outlining edge 24 which overlaps the outwardly curved portion of the inner sole. The inner margin of the pad 19 as well as its equivalent 49 overlies the shoe upper 12 adjacent the narrowest portion of the inner sole 11 and forwardly and adjacent to the outwardly forwardly curved inner edge thereof. It is the intent of this construction to provide a cushioned support for the forward central portion or crown of the metatarsal dome just in rear of the heads of the metatarsals and also to provide a transversely curved support of slightly less heighth for the transverse arch formed by the heads of the metatarsal bones and to provide a curved support for the region just in advance of the heads of the metatarsal bones.

The present disclosure particularly features the peculiar fitting of an arch support with its maximum elevation at the point 23 approximately just back of the head of the second metatarsal bone or close thereto with the gradual decreasing in all directions in elevation from this point of maximum elevation but to provide an uncush-

ioned area surrounding the cushioned area and underlying the bones of the first and fifth toes.

The rear edge of the inner sole 11 terminates at transverse line 25 at the forward edge of the heel 13, it being understood that the plantar arch p^a at the shank of the shoe may be reinforced conventionally but with the shoe herein featured such shank reinforcements are not regarded as necessary except in the case of shoes designed to fit extremely heavy persons or in the case of large size shoes.

A heel saddle 26 formed as an integral molded structure of rubber or other resilient material is fitted in the opening in rear of the edge 25. It is understood that both the pad 19 and the saddle 26 are fixed parts of the basic shoe and are installed in place as part of the factory operation.

The heel saddle is provided on its underside with a protuberance 27 which extends through the opening 14 and may even be of a depth to intrude into a cavity 28 scooped out of the top of the heel 13. It is suggested that the protuberance 27 be less resilient than the balance of the heel saddle so that strains on the saddle from the heel bone will be more or less distributed uniformly across the entire bottom area of the saddle. While the upper heel engaging surface of the saddle is of smooth rounded contour from edge to edge it is suggested that a shallow depression 29 be formed in the upper surface directly beneath the heel bone and specifically beneath its plantar inner tuberosity *a*. This has the effect of pocketing the plantar inner tuberosity of the os calcis and thus tends to prevent forward slipping of the heel out of its fixed position in the heel saddle. The inner sole including the saddle is provided with two lines of sockets arranged on opposite sides of the medial line of the shoe. Two sockets 30 are located on the left side of the saddle and two sockets 31 are similarly located on the right side of the saddle. The inner sole is provided at its shank portion with a pair of sockets 32 along the left or inner side of the sole and with a pair of sockets (not shown but corresponding to 32) along the right or outer edge of the sole, said sockets being adapted for use as elements of readily detachable snap fastening means for securing in place the inserts hereinafter described.

A sock lining 34 hereinafter sometimes referred to as a top layer or sole engaging member extends along the entire length of the inner sole as is usual and conceals the eyelets or sockets when the shoe leaves the factory. The shoe as thus far described is complete in itself and is referred to herein as the basic shoe. The inner sole with the heel saddle and metatarsal area pad in place, either with or without the sock lining, will be referred to hereinafter as the basic sole.

It will be understood that the shoe as so far described and without sole modifying inserts may be used by a person having a normal foot but with lower than average arch conformation. The large majority of persons, particularly those in adult life, have developed anatomical abnormalities, particularly along the region of the inner longitudinal arch and, less prevalently, along the outer longitudinal arch. Attempts have been made heretofore to provide lifts and braces of different kinds, sometimes called arch supporters, which fit under and thus tend to elevate fallen foot arches. These longitudinal arch supporters are usually of limited area, are difficult to locate accurately in the shoe and usually have no relation whatsoever to other correlative parts of the shoe. To supply the necessity in such cases for providing support to the dome of the longitudinal arches and even perhaps to contribute some curative effect in the case of fallen arches, the salesman is provided at the time he fits the shoe with one or more sole modifying inserts, hereinafter referred to as sole modulants each comprising a bottom portion and which may also be provided along one longitudinal edge with an upturned flange and with one set of the inserts provided with different forms of upturned flanges at both longitudinal edges of the insert. This insert will be referred to hereinafter sometimes as the large or basic insert. The showing in Figs. 4 and 6 discloses a left flange modulant 5 and the showing in Fig. 5 discloses a right flange modulant 36. In each case the insert is provided with a curved flange 37 rounding downwardly and then sharply into a bottom or undersole portion 38. In the showing in Fig. 11 the modulant is provided with flanges on both longitudinal edges. The flat bottom portion is provided with coacting fastening elements 39 in the instant case shown to be of the snap fastener type disposed to fit either in the left hand line of elements 30 as shown in Fig. 4 or into the right hand line of elements 31 as shown in Fig. 5 depending upon whether a left or right flange modulant is used. Considered in cross section as shown in Figs. 4 and 5 the modulants are of greatest thickness adjacent the round angle between the flat bottom portion and the upstanding flange, reducing in thickness to a feathered edge 40 at the top of the flange and a feathered edge 41 just beyond the medial line of the sole.

The modulants each include a heel socket 42 which is designed to fit snugly into the heel saddle 26 and in this way accurately locate the flanges 37 in proper position considered both longitudinally and transversely of the shoe to provide the support to the longitudinal arches of the foot. The modulants all underlie the inner longitudinal arch of the foot at the junction of the scaphoid *sc* and the entocuneiform C_1, the mesocuneiform C_2 and the ectocuneiform C_3, the two latter forming the internal cuneiform bones. It is also suggested that the bottom portion 38 be extended forwardly beyond the shank to provide additional elevation to the portion of the sole supporting the metatarsal dome and for this purpose a pad 43 is included in the forward portion of the modulant and disposed to give additional elevation to the high point 23 and to continue the support of the arch further rearwardly than is provided by the pad 19 alone. As shown in Fig. 1 the pad 43 extends rearwardly to the juncture of the metatarsal *m* and the scaphoid *sc*. It will be understood that these modulants are not of any material thickness, even at their places of maximum thickness and the showings in the drawings have been purposely exaggerated so as to show clearly the relation of the detail parts.

It will be understood in general that the present disclosure features a refinement in the modification of the basic sole structure but there is no intent to provide for the gross variations imposed on standard shoes by the use of the arch elevators and lifts now found on the market. The difference between the sole of a properly fitted shoe and one that seems to fit is a matter of refined dimensions of the order of hundredths of an inch. In the instant case the basic shoe is presumed to fit the wearer in the usual sense of

the term and the use of the inserts herein disclosed is simply to add that small increment of sole variation properly located to give a nicety of fit to minimize foot fatigue over what would be provided simply by what is designated as a properly fitting shoe in the commercial trade.

It so happens, of course, that with a relatively small number of persons something more than this refined variation provided by the large or basic insert or modulant hereinbefore discussed is necessary to insure the desired perfection of fit and this necessary building up most frequently occurs somewhat high on the longitudinal arch, particularly the inner longitudinal arch. In order to meet this condition, there is disclosed herein an additional or supplemental arch pad 44 hereinafter referred to as a supplemental variant. This variant has its underside conforming to the portion of the flange which is to be built up and the upper side 45 of which variant engaged by the foot is contoured to meet the particular foot condition which it is intended to remedy. Both the bottom portion 38 as well as the pad 44 underlie the inner longitudinal arch at the junction of the scaphoid *sc* and the internal cuneiform bones C^1, C^2 and C^3. Fastening means 46, such as the snap fasteners previously described, are used to secure the variant in place, it being understood that the variants have previously been fitted to the modulants as a factory operation.

The invention as thus described is predicated upon forming the basic shoe with its metatarsal pad 19 and heel saddle 26 incorporated in the shoe as a factory operation so that these cushioning elements are fixedly located relative to each other in the finished shoe. There is disclosed in Fig. 12 an insert designed to be fitted in a standard make form of shoe which when installed in such a shoe will make of it a shoe approximating the basic shoe in its sole conforming outline with the heel saddle and metatarsal pad properly located. This insert 47 is shown to comprise a heel saddle 48 which corresponds to the heel saddle 26, except that it has a flat curve on its underside with the protuberance 27 omitted and with the cavity 29 retained and which cavity is necessarily made shallow in those cases where lack of clearance necessitates the thinning out of the under portion of the saddle. Properly located in forwardly spaced relation to the saddle is a metatarsal pad 49 corresponding to the pad 19 and like the pad 19 formed of highly resilient material and a material having greater resiliency than the material of which the heel saddle is composed. Positioned between the saddle and the pad is a spacer 50 of non-resilient material, such as leather, and which may have no material thickness in those cases where there is no intent to modify the shank portion of the conventional shoe. The spacer 50 extends anteriorly from the heel saddle 48 and medially along the longitudinal medial plane of the shoe. In those cases where it is desired to modify this portion of the sole, the spacer 50 may have the form of one of the modulants 35 or 36, or as shown may have both flanges corresponding to 37 of Figs. 4 and 5 and in this case designated 51 and 52. The spacer 50 overlaps at its rear end and is secured to the advance portion of the heel saddle and overlaps at its forward end and is secured to the rear portion of the pad 49. Even though the rear edge of the spacer 50 be bevelled in order to avoid the presentation of pronounced ridges to the underside of the foot, still it functions at least to a limited degree in preventing forward movement of the heel from the heel saddle 48 and in this way supplements the similar function of the depression 29. The entire construction shown in Fig. 12 resembles the basic shoe of Fig. 1 with its inserts and likewise is provided with a feathered edge 53 which assists in avoiding sharp breaks, ridges or joints between the insert and the inner face of the shoe in which the insert is fitted.

Instead of the snap fasteners herein disclosed, it is obvious that the inserts may otherwise be detachably secured in place or the inserts may be more permanently located as by gluing, cementing or vulcanizing.

While there have been shown, described and pointed out in the annexed claims, certain novel features of the invention, it will be understood that various omissions, substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention.

I claim:

1. In a shoe, a cushioning pad forming a segment of an egg shape form with its flat side downward and its arch side upward having its point of maximum elevation under the shaft of the second metatarsal bone thereby to fit under and tend to support the metatarsal dome, said thickness reducing from its point of maximum thickness in all directions to a feathered edge, said pad having its major axis extending longitudinally of the shoe, terminating at its rear end beneath the middle metatarsal bones, terminating at its forward end beneath the middle phalanges and having a width to underlap the heads of the three middle metatarsal bones leaving the heads of the first and fifth metatarsal bones uncushioned, or substantially so and a supplemental pad having its forward edge located rearwardly of the forward edge of the first named pad, overlapping its portion of maximum elevation and thus modifying the contour of the upper side of the first named pad in the region adjacent said point of maximum thickness and the rear edge of said supplemental pad terminating adjacent the bases of the three middle metatarsal bones.

2. In a shoe, means providing a basic sole including a cushioning pad substantially elliptical in plan and having a convex upper surface with its point of maximum elevation beneath the metatarsal area and in rear of the head of the second metatarsal bone, said pad projecting forward beyond said head, and a replaceable insert for modifying the contour of the basic sole, said insert extending from the heel portion and having its forward end overlapping the rear portion of said pad and adding to the maximum elevation at the pad forming part of the basic sole.

3. In a shoe, means providing a basic sole including a cushioning pad having a convex upper surface with its point of maximum elevation beneath the metatarsal area and in the rear of the head of the second metatarsal bone, said pad projecting forward beyond said head, and a replaceable insert for modifying the contour of the basic sole, said insert extending from the heel portion and having its forward end overlapping the rear portion of said pad and adding to the maximum elevation at the pad forming part of the basic sole, and said insert including an elevated padded area located, when the insert is in place, in position centered approximately be-

neath the midlength of the shank of the middle metatarsal bone.

4. In a shoe, means providing a basic sole including a cushioning pad having a convex upper surface with its point of maximum elevation beneath the metatarsal area and in the rear of the head of the second metatarsal bone, said pad projecting forward beyond said head, and a replaceable main insert for modifying the contour of the basic sole, said insert extending from the heel portion and having its forward end overlapping the rear portion of said pad and adding to the maximum elevation at the pad forming part of the basic sole, and a second insert constituting a supplemental variant for modifying a portion of the sole engaging contour of the main insert and means detachably securing the second insert to the main insert.

5. An inner sole for a shoe having two cushioned areas and the balance of the sole surface engaging the foot being uncushioned, one of said areas located to receive the entire heel of the wearer and the other area extending longitudinally of the shoe in advance of the shank and in the rear of the third phalanges of the second, third and fourth toe, said other cushioned area being confined to the anterior half of the metatarsal dome, to the heads of the second, third and fourth metatarsal bones and extending forward of said heads and a removable insert having a substantially uncushioned area overlapping the cushioned heel and a cushioning area overlapping the rear portion of said other cushioned area of the shoe.

6. An inner sole for a shoe having two cushioned areas and the balance of the sole surface engaging the foot being uncushioned, one of said areas located to receive the entire heel of the wearer and the other area extending longitudinally of the shoe in advance of the shank and in the rear of the third phalanges of the second, third and fourth toe, said other cushioned area being confined to the anterior half of the metatarsal dome, to the heads of the second, third and fourth metatarsal bones and extending forward of said heads, and a replaceable insert constituting an inner sole modulant for the shoe, said insert having a convexed underside at one end fitting in the cushioned heel area and having a concaved heel receiving socket and said modulant having its forward end substantially flat and containing in the flat area a slightly elevated cushioning area located beneath the central portion of the metatarsal dome and having its anterior end overlapping the posterior portion of the first mentioned cushion.

7. An inner sole for a shoe having two cushioned areas and the balance of the sole surface engaging the foot being uncushioned, one of said areas being located to receive the entire heel of the wearer and the other area extending longitudinally of the shoe in advance of the shank and in the rear of the third phalanges of the second, third and fourth toes, said other cushioned area being confined to the anterior half of the metatarsal dome, to the heads of the second, third and fourth metatarsal bones and extending slightly forward of said head and a replaceable insert having at its midlength upwardly curved side flanges rounding at their lower edges into the substantially flat portion of the insert at the shank of the shoe.

8. An inner sole for a shoe having two cushioned areas and the balance of the sole surface engaging the foot being uncushioned, one of said areas located to receive the entire heel of the wearer and the other area extending longitudinally of the shoe in advance of the shank and in the rear of the third phalanges of the second, third and fourth toes, said other cushioned area being confined to the anterior half of the metatarsal dome, to the heads of the second, third and fourth metatarsal bones and extending slightly forward of said heads, a replaceable insert having at its midlength upwardly curved side flanges rounding at their lower edges into the substantially flat portion of the insert at the shank of the shoe, and a second relatively small slightly curved insert located on one of the said flanges and constituting a supplemental variant for modifying slightly the sole contour of the shank portion of the shoe sole as formed by the main replaceable insert.

9. A replaceable one-piece insert for modifying the inner sole conformation of a shoe, said insert comprising a concaved heel receiving socket at one end including an upwardly curved rim, upturned side flanges into which merge the ends of said rim, a shank fitting extension projecting forwardly of the flanges and having a length to terminate in the rear of the heads of the metatarsal bones and a cushioning pad projecting forwardly from the shank extension to underlap the heads of the middle metatarsal bones.

10. A replaceable one-piece insert for modifying the inner sole conformation of a shoe, said insert comprising a concaved heel receiving socket at one end including an upwardly curved rim, upturned side flanges into which merge the ends of said rim, a shank fitting extension projecting forwardly of the flanges and having a length to terminate in the rear of the heads of the metatarsal bones, said extension being provided adjacent its forward end and centrally thereof with a cushioning pad located beneath the anterior half of the three middle metatarsal bones.

11. In a shoe construction, a single fabricated and easily removable insert comprising a heel saddle of resilient material and including a flange outlining the side and rear edge of the same, a metatarsal pad of resilient material and a connector of relatively non-flexible material forming the shank portion of the insert and fixedly connecting the heel saddle and metatarsal pad in prefixed relative position, said non-flexible shank portion being provided with an upturned flange lapping one side of the heel saddle flange and coacting therewith to form an upstanding side providing a support for one of the longitudinal arches of the wearer's foot.

12. A preformed insert for a shoe comprising in order a heel saddle having its upper surface conformed to receive the heel of the wearer and formed integrally of resilient material, a longitudinal arch support of non-resilient material and a metatarsal pad of greater resiliency than the saddle, the arch support including a bottom portion and a side flange rounding downwardly and inwardly about a curve of short radius into the bottom portion, and said insert reducing in thickness towards a feathered outlining edge.

13. In a foot controller, a heel portion, a curved upturned arch thrust portion extending anteriorly from the heel portion, said heel portion tapering gradually from an interior portion towards its outer longitudinal edge, the arch thrust portion provided with a pad of approximate elliptical form adapted to underlie the inner longitudinal arch at the junction of the scaphoid and the internal cuneiform bones, and means for secur-

ing the heel and arch thrust portions against movement when applied in a shoe.

14. In a high-heeled shoe, a sole construction embodying an insole having a portion of narrowest width at the juncture of the shank and the forepart of the shoe and curving outwardly forwardly of this point along the inner edge, an impost pad adapted to support the forward end of the metatarsal arch of the foot and filling the space normally occurring between the foot and the shoe sole at the region posterior of the distal ends of the metatarsal bones at the juncture of the shank and the forepart of the shoe, which space occurs due to the increased heel height, the longitudinal cross section of the pad being varied in thickness so as to form an uninterrupted continuation of the curvature of the shoe sole and the transverse section being such as to provide a portion of greatest thickness disposed at the inner side of the central line of the shoe, and the inner margin of the pad overlying the shoe upper adjacent the narrowest portion of the insole and forwardly and adjacent to substantially the entire outwardly forwardly curved inner edge thereof.

15. In a shoe, a sole construction embodying an insole having a portion of narrowest width and curving outwardly along the inner edge, a pad adapted to support the forward end of the metatarsal arch of the foot and filling the space normally occurring between the foot and the shoe sole at the region posterior of the distal ends of the metatarsal bones at the juncture of the shank and the forepart of the shoe, the longitudinal cross section of the pad being varied in thickness so as to form an uninterrupted continuation of the curvature of the shoe sole and the transverse section being such as to provide a portion of greatest thickness disposed at the inner side of the central line of the shoe, and the inner margin of the pad overlying the shoe upper adjacent the narrowest portion of the insole and adjacent to a portion of the outwardly forwardly curved inner edge thereof.

16. In a shoe, a sole construction embodying an insole having a portion of narrowest width at the junction of the shank and the fore part of the shoe and curving outwardly forwardly of this point along both the inner and outer edge, a pad adapted to support the forward end of the metatarsal arch of the foot and filling the space normally occurring between the foot and the shoe sole at the region posterior of the distal ends of the metatarsal bones at the juncture of the shank and the forepart of the shoe, the longitudinal cross section of the pad being varied in thickness so as to form an uninterrupted continuation of the curvature of the shoe sole and the transverse section being such as to provide a portion of greatest thickness disposed at the inner side of the central line of the shoe and overlapping and extending entirely across the shoe upper adjacent the narrowest portion of the insole and forwardly and adjacent a portion of the outwardly forwardly curved edge thereof.

17. In a shoe, the combination of an outer sole, a metatarsal pad of approximate elliptical form located on top of said sole in the region supporting the metatarsal arch and located with its major dimension extending substantially longitudinally of the shoe, said pad having its upper surface curved downwardly in all directions from a high point towards an outlining feathered edge, said high point being located on one side of the longitudinal medial line through the shoe and a part of the outer edge of the pad overlapping and extending beyond the adjacent edge of said sole and an additional pad overlapping the rear portion of the elliptical pad and means for securing the pad to the sole.

18. In a shoe, the combination of a top layer shaped to conform in one part thereof to the shank portion of the shoe, an arched member underlapping the underface of said top layer and conforming in shape to one of the longitudinal arches of a human foot, said arched member having one of its side edges extended beyond the adjacent side edge of the top layer and a supporting pad secured to one of the surfaces of said arched member, the outer edge of said supporting pad extending beyond the adjacent edge of the top layer and terminating short of the outer edge of the arched member.

19. An arch support for shoes comprising a sole engaging member adapted to be positioned in a shoe, said member being shaped to conform to the shank portion of the shoe, an arched member overlapped by the engaging member and extending throughout the width thereof, said arched member conforming in shape to the inner longitudinal arch of a human foot and having one of its side edges extended beyond the adjacent side edge of the sole engaging member, an arch supporting pad having a thick portion and a thin porion, and means for securing said arch supporting pad to one of the faces of the arched member with its thick portion positioned beneath the outer edge portion of the arched member.

20. In a shoe, a sole construction embodying an insole having a portion between the narrowest part of the shank and the fore part of the shoe and having an edge curving outwardly and forwardly from said narrowest part, a pad substantially elliptical in plan overlapping said part of the insole and adapted to support the forward end of the metatarsal bones of the foot, an edge portion of the pad overlapping a portion of said forwardly curving edge of the insole, the longitudinal cross section of the pad being varied in thickness so as to form an interrupted continuation of the curvature of the shoe sole and the transverse section being such as to provide a portion of greatest thickness disposed at one side of the medial line of the shoe and a sole engaging member at least partially overlapping the pad and extending rearwardly of the pad and thus overlapping the portion of the insole which is located rearwardly of the pad.

21. In a shoe, a sole construction embodying an insole having a portion between the narrowest part of the shank and the forepart of the shoe and having an edge curving outwardly and forwardly from said narrowest part, a pad substantially elliptical in plan overlapping said part of the insole and adapted to support the forward end of the metatarsal bones of the foot, an edge portion of the pad overlapping a portion of said forwardly curving edge of the insole, the longitudinal cross section of the pad being varied in thickness so as to form an interrupted continuation of the curvature of the shoe sole and the transverse section being such as to provide a portion of greatest thickness disposed at one side of the medial line of the shoe.

22. In a shoe, the combination of an inner sole, a pad substantially elliptical in plan and with one end wider than the other end and having a slightly curved top surface, said pad disposed to support the forward end of the metatarsal arch of the foot, the longitudinal axis of the pad ex-

tending at a slight angle to the longitudinal medial plane of the insole, said pad having a point of maximum thickness located on the side of the medial plane opposite the axis of the pad and nearer the inner than the outer edge of the insole and said top surface gradually curving from said point of maximum thickness in all directions towards its outlining edge and a sole engaging member overlapping and projecting in all directions beyond the outlines of the pad.

23. In a shoe, the combination of an inner sole, a pad substantially elliptical in plan and with one end wider than the other end and having a slightly curved top surface, said pad disposed to support the forward end of the metatarsal bones of the foot, the longitudinal axis of the pad extending at a slight angle to the longitudinal medial plane of the insole, said pad having a point of maximum thickness located on the side of the medial plane opposite the axis of the pad and nearer the inner than the outer edge of the insole and said top surface gradually curving from said point of maximum thickness in all directions towards its outlining edge.

24. In a shoe, the combination of an inner sole, a rubber pad forming a continuation of the inner sole at the heel portion of the shoe, a resilient layer of soft material covering the ball portion of said inner sole, a piece of thin upper leather covering said resilient layer whereby an inner sole hard at the toe but soft at the ball portion is formed and a metatarsal support having its forward portion overlapping the rear portion of the soft layer and adapted to support the second, third and fourth metatarsal bones, the first and fifth metatarsal bones resting at least partially on the soft layer exteriorly of the metatarsal support.

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