June 24, 1952 F. F. FISHER 2,601,509

FOOT SUPPORT

Filed Jan. 15, 1947 2 SHEETS—SHEET 1

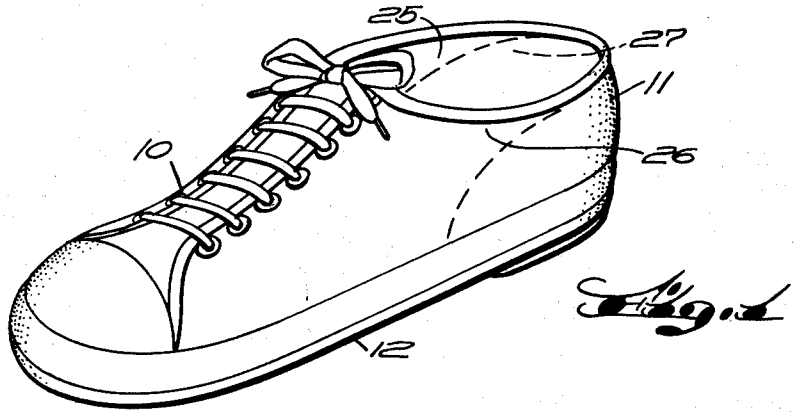


Fig. 1

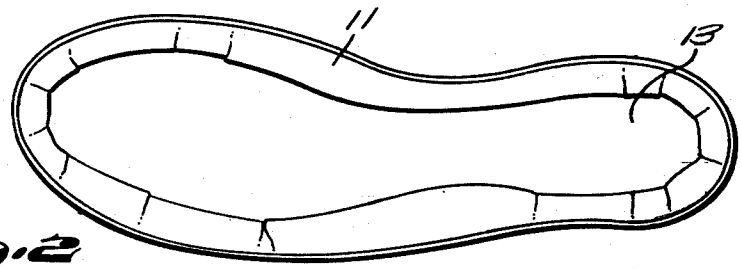


Fig. 2

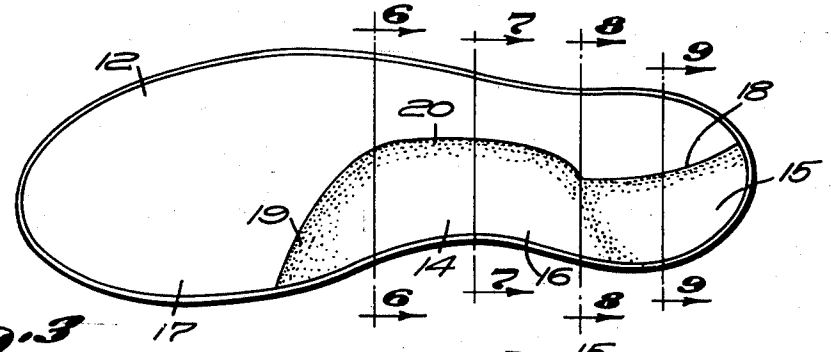


Fig. 3

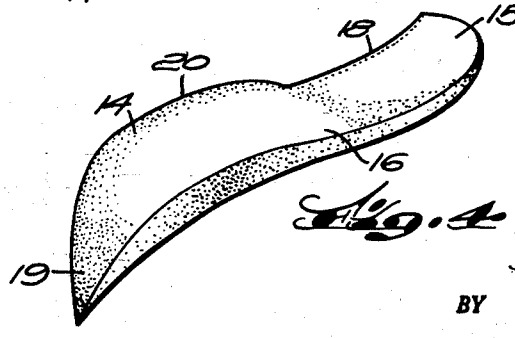


Fig. 4

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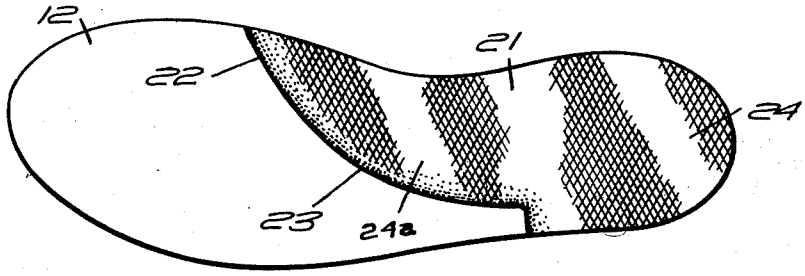


Fig. 5

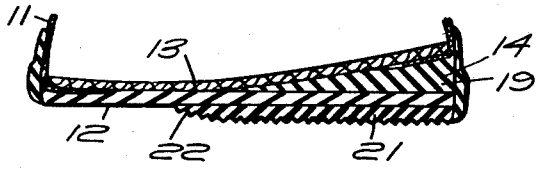


Fig. 6

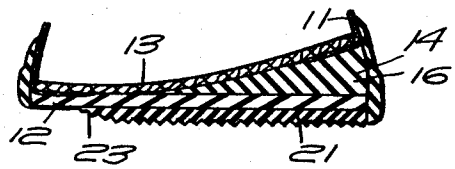


Fig. 7

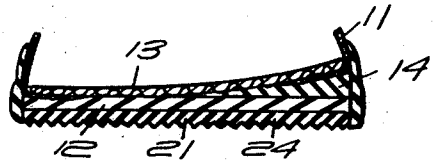


Fig. 8

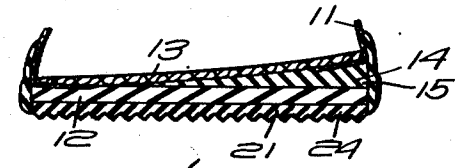


Fig. 9

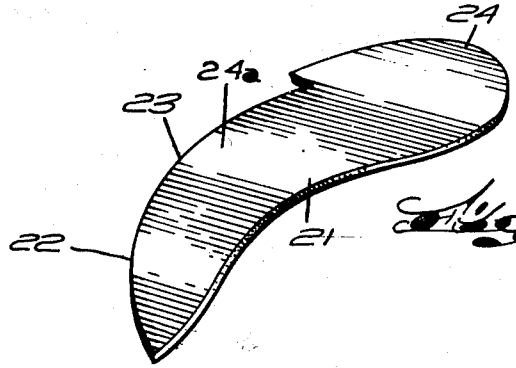


Fig. 10

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FOOT SUPPORT

Frederick F. Fisher, Cranston, R. I.

Application January 15, 1947, Serial No. 722,125

1 Claim. (Cl. 36—71)

1

The present invention relates to soft soled rubber and fabric shoes such as are commonly used for tennis and other sports, and has particular reference to a novel arch support construction therefor.

The resilient rubber used in the sole and the canvas upper of this type of shoe do not afford sufficient support for the foot, with the result that the foot and leg ligaments and the tendons and muscles are subjected to great strain, become stretched, and create a foot imbalance.

The principal object of the invention is to provide an improved construction for a canvas shoe of the described type, which reestablishes a normal foot balance, eases the strains on the foot and leg ligaments, and the tendons and muscles and holds the heel and arch bones in proper relation.

With the above and other objects and advantageous features in view, the invention consists of a novel arrangement of parts more fully disclosed in the detailed description following, in conjunction with the accompanying drawings, and more specifically defined in the claim appended thereto.

In the drawings:

Fig. 1 is a side view of an illustrative rubber sneaker which embodies the novel construction therein;

Fig. 2 is a bottom plan view of the upper, disclosing the insole;

Fig. 3 is a top plan view of the outsole with inner insert;

Fig. 4 is a perspective view of the novel inner insert;

Fig. 5 is a bottom plan view of the outsole, disclosing the outer portion;

Fig. 6 is a section on the line 6—6 of Fig. 3;

Fig. 7 is a section on the line 7—7 of Fig. 3;

Fig. 8 is a section on the line 8—8 of Fig. 3;

Fig. 9 is a section on the line 9—9 of Fig. 3; and

Fig. 10 is a perspective view of the novel outer portion.

It has been found desirable to construct a rubber soled canvas shoe which has built-in elements that hold the heel and arch bones in proper balance to establish a basic stability for the foot structure and prevent undue stretching and strain of the foot and leg ligaments, the tendons and the muscles.

I have found that when body weight is placed on the sole of a shoe the entire tarsal portion of the foot tilts inwardly and the pads on the inside in the usual rubber fabric shoe are forced down until the arch portion of the sole comes in

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contact with the ground. This creates a strain and a weakening action on all parts of the foot and leg and the posterior portion of the foot becomes depressed and the ankle rotates inwardly because the base of the shoe along the inner side of the tarsal portion of the sole is not balanced and reinforced. This weakening is due to the arrangement of the foot structure which makes up the tarsal portion, which is musculature in nature and is thus dependent on the tone of the muscles to hold the foot in balance.

I have found that present day types of sneakers produce excessive strain and thus destroy some of this tone and cause the ligaments to stretch. Since the outer side of the foot should carry the weight and the tripod formed by the plantar surface of the os calcis, the first metatarsal head and the fifth metatarsal head has the heel bone set over to the outer side, the bone structure is not balanced and depends on the muscles, ligaments and tendons to effect a balance. The entire inner side of the tarsal portion is thus an area where balance is apt to be disturbed, with resulting strain.

I have therefore found it desirable to construct a rubber and fabric shoe which inclines the tarsal and the metatarsal portions of the foot up and over to the outside, and I reinforce the entire medial side of the tarsal portion of the shoe between the insole and outsole to provide a firm and continuous foundation upon which the foot can rest on the ground in a normal position when weight is placed upon it, the parts being so arranged that they exert a leverage which prevents downward displacement of the bones constituting the arches of the foot and keeps the heel bone from rotating inwardly.

I accomplish these advantageous results by modifying the construction of the sole before it is attached to the insole and upper of the shoe to include a wedge-shaped portion, an arch pad portion, and an outer portion which cooperate together. The wedge-shaped portion is elevated on the medial side and is beveled on the outer side and follows the contour of the outsole pattern, starting somewhat laterally to the area of the tendon of Achilles and continuing around the heel to the medial side until it reaches a point directly under the navicular bone, where it is tapered. The arch pad portion is beveled to the outer side and anteriorly and posteriorly to fit into the longitudinal inner portion of the shoe between the insole and outsole and to extend almost to the outer longitudinal arch, the pad portion extending from the wedge-shaped por-

tion from a point directly under the navicular bone and rising to conform to the longitudinal arch and the arch created by the navicular, first cuneiform, first metatarsal base and first metatarsal head.

Although the wedge-shaped portion and the arch pad portion which forms the support may be molded integrally with the outsole of the shoe, it may be preferable to mold them in the form of a separate specially shaped insert, as the quality of the rubber may be better controlled. The outer portion is mounted or molded on the outer sole where it comes in contact with the ground, and begins at the head of the first metatarsal, follows the curve of the outsole pattern around the heel to seat beneath the cuboid bone, and then cuts across somewhat diagonally to meet the point where it started on the medial side.

I have also found it desirable to design the canvas upper to firmly support the navicular bone, which is the highest bone in the arch of the foot and is therefore subjected to great strain. I therefore shape the inside quarter of the upper to cover the navicular bone, without, however, interfering with the internal malleolus. In addition, I place a heavy reinforced canvas backing, sufficiently firm to prevent sagging, around the counter portion of the inside of the shoe, starting at the outer side and continuing around the heel to the medial side and extending to a point where the quarter unites with the vamp. If the patterns used do not have such a union, the extending is to the point where the head of the first metatarsal ends.

Referring to the drawings, Fig. 1 discloses a canvas, rubber soled shoe **10** made in accordance with my invention, the shoe having a canvas upper **11** and a rubber outsole **12**. The canvas upper includes an insole **13**, and the outsole **12** is provided with a special inner support **14**, see Fig. 4, which has a heel portion **15** and a shank portion **16**. The heel portion is of greater thickness than the toe portion **17** of the outsole, and tapers down from the inside to the outside, terminating in a curved line **18** as illustrated in Fig. 3; the shank portion is higher than and tapers down to the heel portion, the front end **19** of the shank portion being skived to taper down to the toe portion **17**, and the outside edge **20** of the shank portion being skived to terminate in an irregular line across the sole and spaced from the outside edge of the outsole and extending outwardly from below the first metatarsal head and then rearwardly to the heel portion, as illustrated in Fig. 3.

The above described inner support functions as a combined heel and arch support, to exert a leverage for outwardly tilting the foot while maintaining the heel and the longitudinal and metatarsal arch bones in proper balance. The outward tilting effect is supplemented by providing an outer portion **21**, see Fig. 10, which is preferably of generally uniform thickness, but is skived at the front and sides as indicated by the reference numerals **22**, **23**, and has a uniformly thick heel section **24**, the front and side **22**, **23** forming a generally arcuate line which extends diagonally rearwardly from below the first

metatarsal head to provide a shank section **24***a* which terminates at the heel section within its outer edge, as illustrated. The outer portion is shaped to firmly support the cuboid bone, whereby the impact of the foot in a sneaker type shoe provides an unyielding leverage in combination with the wedge and pad portions which holds the cuboid bone and keeps its socket in proper relation to the shelf-like projection of the heel bone while at the same time tilting the foot outwardly and bracing the metatarsal shafts. If desired, part of the outer portion directly below the cuboid bone may be slightly thickened to increase upward pressure on the cuboid bone.

The inside quarter **25** of the upper is higher than the outside quarter **26**, as illustrated in Fig. 1, to cover the navicular bone, and a heavy reinforced canvas backing **27** is placed around the inside of the counter portion to provide firmness and prevent sagging.

I have thus provided a rubber soled canvas shoe that is completely reinforced to properly support the entire length of the medial side of the foot from the heel bone to the head of the first metatarsal while keeping the foot in tilted weight bearing position, whereby strain and tension is reduced, the heel is held firm, and the tendon of Achilles cannot deviate from its vertical setting.

While I have described a specific embodiment of the invention, it is obvious that the described inventive features may be applied to any kind or type, whether canvas or leather, and that changes in the size, shape and material of the parts may be made to suit the requirements for different shoes, without departing from the spirit and the scope of the invention as defined in the appended claim.

I claim:

In a shoe having a heel section, a shank section and a toe section, an inner support comprising a heel portion and a shank portion, the heel portion having a thick inner edge and tapering uniformly to an outer edge, said heel portion outer edge beginning centrally of the heel section and curving inwardly, and the shank portion having a thick inner edge and tapering uniformly to an outer edge which extends transversely beyond the first metatarsal head and curves outwardly along the shank section and then sharply inwardly to the heel portion outer edge.

FREDERICK F. FISHER.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,571,106	Burger	Jan. 26, 1926
1,607,867	Chase	Nov. 23, 1926
1,701,839	Diveley	Feb. 12, 1929
1,720,120	Diveley	July 9, 1929
1,728,219	Smith	Sept. 17, 1929
1,728,243	Marshalek	Sept. 17, 1929
2,109,324	Tebutt	Feb. 22, 1938
2,109,706	Musebeck	Mar. 1, 1938