PATENT SPECIFICATION

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COMPLETE SPECIFICATION.

Rubber Soled Footwear and method of manufacture of Footwear.

I, HEINZ WALTER ROLLMAN, a citizen of the United States of America, of Balsam Road, Waynesville, North Carolina, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The invention relates to footwear and a method of manufacture of footwear of the type having a sponge rubber sole formed by the vulcanization of a sponge rubber mix. The bottom of said sole is usually covered by a treadsole of dense rubber which is connected to the sponge rubber sole by vulcanization.

The object of the invention is to provide footwear which has the advantages of the type of footwear mentioned above, has improved flexibility and can be manufactured faster and with less expensive equipment and therefore with lesser cost than footwear of comparable types.

The invention comprises a sponge rubber sole and an upper connected indirectly to said sole by an independent intermediary member, which may form an insole or an extension of an insole and which is located above the sponge rubber sole and is integrally vulcanized to said sponge rubber sole at one portion and at another portion is fastened to said upper in such a manner that said intermediary member forms the only connection between the sole and the upper.

It is known to connect by integral vulcanization the upper directly to the sponge rubber sole in such way that the upper is in contact with the sponge rubber forming mixture already during the time said sponge texture is developed and set. The rubber then enters partly into the material of the upper and a strong bond is created.

With the arrangement according to the present invention said strong bond of integral vulcanization is used to connect the sponge rubber sole indirectly to an independent intermediary member which in turn is connected to the upper by stitching or other fastening means. Footwear with such intermediary members has an improved flexibility compared to footwear where the upper is directly integrally vulcanized to the sponge rubber sole, but has not lost the advantages of the older type of footwear.

As the stitching or other fastening of the upper to the intermediary member is done according to one execution of the invention after the vulcanization of the sponge rubber sole, the footwear may have an upper of material which would be damaged if subjected to the heat of the vulcanization. The absence of the upper from the assembly subjected to the vulcanization allows to replace the last as means for closing the vulcanization mould by a plate, which is far less expensive and much easier to heat.

In order that the invention may be more clearly understood reference will now be made to the accompanying drawings wherein Fig. 1 is a cross section of a shoe, showing the main parts thereof in the relation according to the invention, Fig. 2 is a cross section of a shoe with the upper connected edgewise to an intermediary member, Fig. 3 is a cross section of a shoe where the insole and an intermediary member are both connected to the upper, Fig. 4 is a cross section of a shoe where the insole is extended to form an intermediary member, Fig. 5 is a cross section of a shoe with an intermediary member located so that it cannot be seen on the outside of the shoe, Fig. 6 is a cross section of a shoe where the upper covers the extended part of the insole which forms the intermediary member, Fig. 7 is the cross section of a shoe where the intermediary member is formed by two parts stitched together, one of which is the insole, Fig. 8 shows a cross section of a shoe with a similar arrangement, but here the insole is only indirectly connected to the upper, Fig. 9 shows a cross section of a shoe where the insole is vulcanized to the sponge rubber sole and carries a part stitched to the upper, Fig. 10 shows a cross section of a mould to be used to carry out the method of manufacture of footwear according to the invention.

As may be seen in Fig. 1, the footwear according to the invention comprises a

[Price 2/-]

sponge rubber sole 1, covered on its bottom by a dense rubber treadsole 2. Integrally connected by vulcanization to said sponge rubber is an intermediary member 3, of which one edge 4 is turned outwards. This edge may be partly or wholly embedded in the sponge rubber mass. If partly embedded the edge 4 will form the cover of the outer upper rim of the sole. The edge 5 is turned upwards and connected to the upper 6 by stitching or any other of the various other means of fastening parts of uppers together. The upper 6 may overlap the edge 5 as shown in Fig. 1 and reach down close to the bend of the part 3 or it may be fastened edgewise, as shown in Fig. 2. The intermediary member 3 is then fully visible. To increase the strength of the connection between the upper and the intermediary member the invention may provde, as shown in Fig. 3, an insole 7 with an upturned edge 8, so that the upper or vamp 6 may be fastened to said edge 8 as well as to the edge 5. Here the intermediary member 3 is in its lower part integrally vulcanized to the sponge rubber sole 1 and the insole 7 is held in its place by fastening its edge 8 to the edge of part 3.

Fig. 4 shows an arrangement where the insole 7 forms the intermediary member and an essential part of the connection between sole and upper. The centre part of the insole is integrally vulcanized to the sponge rubber sole 1 and the outer edge 8 is turned upwards. The upper 6 is fastened after the vulcanization by stitching or other means such as braiding to the edge 8. The insole 7 should be made in this case from material at least as strong as the upper.

In some cases it may be desirable not to show in the footwear that part of the shoe construction which forms the indirect connection between the main part of the upper and the sole. As shown in Figs. 5 and 6 the upturned edge of the intermediary part 3 (Fig. 5) or of the insole 7 (Fig. 6) are then fastened in these embodiments of the invention to the inside of the upper.

The indirect connection between the upper and the sole may also be realized, according to the invention, by composing the member, forming said indirect connection, of two or more pieces, one of which preferably forms the insole of the footwear, as shown in Figs. 7, 8 and 9. The insole may be vulcanized integrally to the sponge rubber sole 1 either in its central part only, as shown in Fig. 7, or over its entire surface, as shown in Figs. 8 and 9. The part 3 is connected to the insole 7 by stitching or other means of fastening before vulcanization. After the vulcanization the upturned edge 5 or 8 is fastened to the upper 6.

The upturned edge may extend over the entire circumference of the sole or may have interruptions for open toe or open heel shoes or may exist in form of local protrusions only if the upper consists of straps as it is known for beach sandals.

In connection with this invention the term " rubber " is used to designate any material which has qualities similar to rubber from the Hevea plant, it may be from other plants or a synthetic plastic. The term " sponge rubber " designates any rubber material in a texture having a multitude of open or closed pores as it is obtained by vulcanization of rubber mixtures or latex containing a gas or gas forming ingredients.

The mould for the manufacture of footwear according to the invention comprises, as shown in Fig. 10, a mould for the sole which preferably encloses the bottom, the sides and the upper rim of the sole. Into the mould 10 the treadsole 2 and the sponge rubber forming mixture 11 and the lower part of the member 3 or the insole are placed. The mould is then closed by the plate 12. This assembly can easily be vulcanized in a platen press, as the heat transfer required for the vulcanization is favoured by the flat surfaces of the mould 10 and of the plate 12. This is an advantage which is only offered by the footwear construction and the method of this invention. This method places the sponge rubber mix and the intermediary member into the mould, applies heat to said assembly until the rubber is cured and fastens the upper to the intermediary member after removal from the mould. The intermediary member forms a part of the upper of the finished footwear.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An article of footwear comprising a sponge rubber sole and an upper connected indirectly to said sole by an independent intermediary member, which may form an insole or an extension of an insole, and which is located above the sponge rubber sole and is integrally vulcanized to said sponge rubber sole at one portion and at another portion is fastened to said upper in such a manner that said intermediary member forms the only connection between the sole and the upper.

2. An article of footwear according to Claim 1, wherein said intermediary member is formed by a strip extending at least over a part of the circumference of the sole.

3. An article of footwear according to Claim 1, wherein said intermediary member is formed by an insole which is integrally vulcanized at its central part to the sole and which has upwardly extending parts fastened to the upper.

4. An article of footwear according to Claim 1, wherein said intermediary member

sponge rubber sole 1, covered on its bottom by a dense rubber treadsole 2. Integrally connected by vulcanization to said sponge rubber is an intermediary member 3, of which one edge 4 is turned outwards. This edge may be partly or wholly embedded in the sponge rubber mass. If partly embedded the edge 4 will form the cover of the outer upper rim of the sole. The edge 5 is turned upwards and connected to the upper 6 by stitching or any other of the various other means of fastening parts of uppers together. The upper 6 may overlap the edge 5 as shown in Fig. 1 and reach down close to the bend of the part 3 or it may be fastened edgewise, as shown in Fig. 2. The intermediary member 3 is then fully visible. To increase the strength of the connection between the upper and the intermediary member the invention may provde, as shown in Fig. 3, an insole 7 with an upturned edge 8, so that the upper or vamp 6 may be fastened to said edge 8 as well as to the edge 5. Here the intermediary member 3 is in its lower part integrally vulcanized to the sponge rubber sole 1 and the insole 7 is held in its place by fastening its edge 8 to the edge of part 3.

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3. An article of footwear according to Claim 1, wherein said intermediary member is formed by an insole which is integrally vulcanized at its central part to the sole and which has upwardly extending parts fastened to the upper.

4. An article of footwear according to Claim 1, wherein said intermediary member

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is composed of at least two interconnected parts, one of which is integrally vulcanized to the sponge rubber sole and the other part fastened to the upper.

5. An article of footwear according to Claim 1, wherein said intermediary member covers at least partly the rim of the upper surface of the sponge rubber sole.

6. An article of footwear according to Claims 1 to 5, wherein the intermediary member is fastened to the upper by braiding or lacing.

7. A method of manufacturing footwear with sponge rubber soles which consists in placing a sponge rubber forming mix into a mould, placing a part of an intermediary member also into the mould, vulcanizing said rubber mixture in contact with such part of said intermediary member and thereby creating a permanent bond, demoulding said assembly and fastening the upper to the unattached portion of said intermediary member.

8. Articles of footwear substantially as herein described with reference to any of the accompanying drawings.

Dated this 17th day of March, 1948.

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