METHOD OF MANUFACTURING WATERPROOF SHOES

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REFERENCES CITED

UNITED STATES PATENTS

2,365,103 12/1944 Olson
3,101,496 8/1963 Bingham et al.
3,345,663 10/1967 Batchelder et al.

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ABSTRACT

A method of manufacturing waterproof shoes wherein an exterior upper body including sides and sole is molded in one piece. The sole is removed leaving a marginal strip. A lining made in a unitary body having sides and sole is inserted in the exterior body. A bottom is thereafter applied to the marginal strip.

4 Claims, 2 Drawing Figures
METHOD OF MANUFACTURING WATERPROOF SHOES

BACKGROUND OF INVENTION

The present invention relates to the manufacture of shoes and in particular to a novel shoe construction and method of making waterproof shoes.

In general, the classic method of making shoes from natural or synthetic leathers, rubbers, plastics or similar man-made materials includes the steps of cutting a plurality of suitably shaped blanks corresponding to the various parts, such as: the vamp, toe, side quarter, etc., of the upper shoe part; and thereafter sewing these blanks together to form a completed shoe upper. Thereafter, a suitable bottom part comprising the insoles, the outsoles, and/or the welts are applied by sewing or by adhesively binding such bottom members to the completed shoe upper. These classic methods, in addition to being time consuming and requiring much hand labor, do not provide a fully waterproof shoe since they do not fully prevent the penetration through the seams of any water or moisture. It has been suggested that shoes be produced by completely molding them, inside and out, in a unitary piece from rubber, thermoplastic, or thermosetting materials. The bottom outsole and heel may be molded with it or subsequently attaching it to by any one of the classical bonding or seaming methods. Such shoes have been found suitable for special purposes as, for instance, ski boots, snow shoes and other foul weather gear. They are, however, not suitable for daily use, either as indoor or outdoor footwear, or as for dress or work shoes since their unitary molded structure is completely impervious not only to moisture but to air and does not allow the foot inserted therein, to breathe.

It is an object of the present invention to provide a shoe having a true waterproof construction yet one which is suitable for daily wear.

It is another object of the present invention to provide a shoe which is completely waterproof and which has a high degree of breathability.

It is another object of the present invention to provide a waterproof shoe having a simpler construction, less expensive to manufacture and is both waterproof and breathable.

The above objects together with numerous other objects and advantages will be set forth in the following specification.

SUMMARY OF THE INVENTION

According to the present invention, a waterproof shoe is formed comprising a unitary completed exterior upper shoe body of impermeable material, having a portion of its sole removed leaving a marginal strip along its periphery. A liner conforming in shape and size to the exterior body (including side quarter, toe and sole portions) and formed of a permeable material capable of breathing, is inserted into the exterior body. A bottom comprising at least an outsole is secured to the marginal strip of the shoe body in a manner to form a water-tight seal therewith.

According to the method of the present invention, waterproof shoes are formed comprising the steps of molding a unitary completed exterior shoe body having an upper and bottom portion, of an impermeable material. A portion of the sole of the body is removed so as to leave a marginal strip along the periphery thereof. A unitary lining including a sole portion is formed of permeable material capable of breathing and/or absorbing sweat, of a size and shape conforming to the exterior body. The liner is inserted into the exterior of the body and secured to it. Bottom members comprising at least sole and heel portions are thereafter applied to the marginal strip of the exterior body and secured in a water-tight relationship therewith.

It will thus be seen that the upper portion of the shoe is made of two parts, namely: an outer impermeable portion and an inner permeable portion which is separable from the outer portion, at least in part and which allows the foot to breathe. Moisture and air circulate through the lining of the sweat absorbing material and around the inside bottom portion of the shoe. The outer portion and the bottom portion of the shoe are secured together in water-tight relationship preventing the penetration of any water into the shoe from the exterior.

A full and complete description of the present invention is set forth in the following disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded perspective view showing a shoe and its parts made in accordance with the present invention, and

FIG. 2 is an end view partially sectioned of a shoe made in accordance with the present invention.

In the drawings and in following description, the various portions of the shoe, as well as their relationship and construction are, unless otherwise noted, conventional. The terms for specific shoe members and portions etc., are all used in their conventional and classic meaning. Should any specific definitions be desired, reference may be made to such works as the Encyclopedia Americana, International Edition, 1963, Americana Corp. New York, N. Y., Vol. 4 pp. 254–261, which is incorporated herein by reference as if more fully set forth.

DESCRIPTION OF INVENTION

Before turning to the method by which the shoes of the present invention are made, it will be interesting to note that the resultant shoe itself, as seen in the Figures, when finished, appears to be fully conventional in its characteristics. The shoe comprises an upper 10 having the equivalent of the side quarters, vamps, tips, tongues, and other units forming the classic upper and a bottom 12 having the usual sole, heal, similarly found in classic shoes.

According to the present invention, the upper part 10 is made of two parts, namely: an exterior body 14 and a separable interior or lining body 16. The exterior body 14 is formed as a unitary body of a highly impermeable material such as thermoplastic or thermosetting resin, natural or synthetic rubber or similar impermeable flexible material. The upper body 14 is molded or cast in its unitary form so that it is seamless and completely formed in one operation so as to have conforming portions to the side quarters, vamps, toe boxes, tips, etc., of the conventional shoe. In addition, the exterior body is formed with a complete sole portion 18 so that it comprise a fully enclosed "shoe" or "boot."
Preferably a method such as slush casting in which a preformed hollow mold is filled with a small amount of the material which is then caused to line the surface of the mold and the proper application of heat and cooling is caused to form a film of uniform depth on the walls. The film, after solidification and cooling, is then peeled from the mold and the unitary body. Other molding or casting techniques such as injection molding, extrusion molding, blow molding, etc., may all be used if desired. In any event, the mold may be modelled or made from a cast of natural leather shoe so that the exterior surface of the upper body 14 will have the texture, feel and appearance of a natural material. The mold, may if desired, include means for forming in appearance, such conventional characteristics of handmade shoes such as stitch marks, eyelets, seams, grainings and other distinctions, as seen in the drawings.

Simultaneously the interior or lining body 16 of the upper part is formed. This lining body is made from natural leather, fabric or synthetic materials which are permeable, absorbing sweat and which permit "breathing" or passage of moisture or air through it. The lining is formed from individually cut blanks conforming to the side quarters, vamps, and other units of the shoe and include as well a sole portion. These units are sewn, glued, or otherwise seamed or joined together as along line 20 to form a completed lining body. The lining body 16 is of a size and shape conforming to that of the exterior upper portion and is capable of being inserted within the preformed exterior upper. The lining when finished also appears as a complete "shoe."

Before inserting the lining within the exterior upper body, the sole portion 18 of the exterior upper body 14 is removed by cutting or clicking and a narrow peripheral margin or strip 22 conforming to the width of the lasting margin is left along the periphery of the exterior upper portion. The lining is then inserted within the exterior portion and the two are united by gluing, bonding, sewing, or otherwise seaming the two parts together to form a complete unitary upper member. At least the sole portion of the liner is left free. The upper edge or rim of the lining and exterior body may be covered by a hem member 24 or merely left in a seamed condition.

The upper exterior body is thus completed by combining the fully closed or "shoe" inner lining 16 with the exterior body which has had its sole 18 cut or clicked away. The combined upper body is then provided with the bottom part comprising at a sole 26. Heel 28 and insole support 30 and other members may be used if desired so as to complete the shoe with the conventional characteristics. The bottom members may be made of natural leather, rubber, plastic resins and/or other conventional materials which are themselves waterproof. These members are preferably preformed or prepared so that the same may be adhered or secured directly to the lasting margin of the preformed upper.

The bottom members are attached to the completed upper body by conventional means as by sewing, gluing or seaming, although molding methods or casting methods may be used. These later methods are preferred since then a completely waterproof joint or juncture, with or without the use of a Welt, may be made between the bottom part and the upper part. Nevertheless, by any of these conventional or classic methods of securing the shoe bottom to the shoe upper a suitable waterproof seam can be obtained, as is well known to those skilled in this art.

The following is an example of the application of the present invention to the production of a man's walking shoe:

By conventional Galvan-o-technique a hollow plastic mold having a nickel lining was prepared. The mold was modeled and cast from a shoe formed of natural leather having the fashion and appearance desired in the final shoe. In addition to the shape and the design of the shoe, various characteristics such as graining, seam stitching etc., were formed into the mold, as seen in the drawings. The mold was used in conventional slush molding technique, and a mass of polyvinylchloride in paste or viscous form was inserted therein. The polyvinylchloride was inserted under heated conditions and the mold rotated so that the resin formed a uniform film over its interior surface. The mold was then thoroughly cooled and the body thus formed was removed therefrom. The formed body resembled a completed shoe upper in all its aspects but in addition, including a sole portion. Thereafter the sole portion was removed from the preformed upper body by clicking and a lasting margin of conventional width was left around the periphery of the sole.

Simultaneously, the inner lining part of the upper body part was made of the two blanks cut from pieces of semi-chrome leather which was sewn together to form an conforming body to that of the preformed exterior upper. Semi-chrome leather is highly absorbent material but sufficiently strong to provide a rugged all enclosed lining. The inner lining was then inserted into the upper body and adhered with a suitable bonding agent to the interior surface of the preformed exterior body. The upper rim of both the inner lining and the exterior upper body were finished by securing a hem about it.

The completed upper was then placed on a last and was then provided in classic manner, with conventional reinforcements in the heel and support for the inner sole portion thereof. The lasted shoe upper with its reinforced heel and inner sole were then returned into the mold wherein the outsole completing the bottom tread of the shoe was applied by a slush molding technique from another paste or viscous mass of polyvinylchloride. The outsole was thus integrally secured to the lasting margin and the peripheral portion of the preformed shoe upper so as to provide a completely exteriorly waterproof shoe.

A number of other examples of the present invention were also preformed employing the same technique except that the outsole was secured to the preformed upper exterior by injection molding rather than slush molding or comprised preformed of leather material, plastic, such as polyurethane or rubber material which was then adhered or bonded to the upper by suitable waterproof adhesives and completely sealed around the periphery in classic method so as to also provide a completely waterproof outer shoe body.

It will thus be seen that the present method provides numerous advantages over the previously known methods for forming waterproof shoes. The finished
shoe has completely waterproof outersurface or outer skin comprising both the shoe upper and the shoe bottom which are adhered, welded, molded or otherwise secured together so that moisture or water cannot penetrate by any means. Material forming the outer members of the shoe are impenetrable and impermeable. On the other hand, the shoe is provided with a complete whole and separable unit, lining having side quarters, vamps and a sole portion which in part is not secured to either the shoe upper or the shoe bottom. The lining is therefore free of the exterior skin, to permit the foot to "breathe." The lining of the material is capable of absorbing sweat from the feet of the user and permit the moisture to flow and aerate. Thus the feet are properly ventilated within the shoe itself. Shoes of this type wear extremely long and since they can be molded with all the characteristics of shoes made of conventional leather, they can be made indistinguishable from them. It will also be observed that the method, according to the present invention is extremely economical in that the number of pieces by which the shoe is formed is drastically reduced thereby reducing the labor costs and other costs of manufacture.

It will be obvious that various modifications and changes may be made in that the various molding techniques the techniques of forming the inner linings. The techniques of securing the various parts together may be modified and changed to suit the specific materials, design and fashion of the shoe to be obtained. It is accordingly intended that the present disclosure be illustrative only of the present invention and not limiting of it in any manner.

What is claimed is:

1. A method of manufacturing waterproof shoes comprising the steps of molding a unitary completed exterior shoe body of impermeable material, removing a portion of the sole of said body leaving a marginal strip along the periphery thereof, forming a unitary complete lining conforming to the size and shape of the exterior shoe body, said lining being made of permeable material capable of absorbing sweat, inserting said lining into said exterior said body thereafter applying a bottom to the exterior shoe body and sealing said bottom to the marginal strip of said upper body to thereby form a water-tight outer shoe having an integral upper and bottom and a lining at least in part separable therefrom.

2. The method according to claim 1 wherein the shoe bottom is molded unitarily with the exterior upper shoe portion.

3. The method according to claim 1 wherein the bottom includes at least an out sole, said lining being separable from the outsole.

4. The method according to claim 3, including the step of securing said lining and said upper body together.

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