

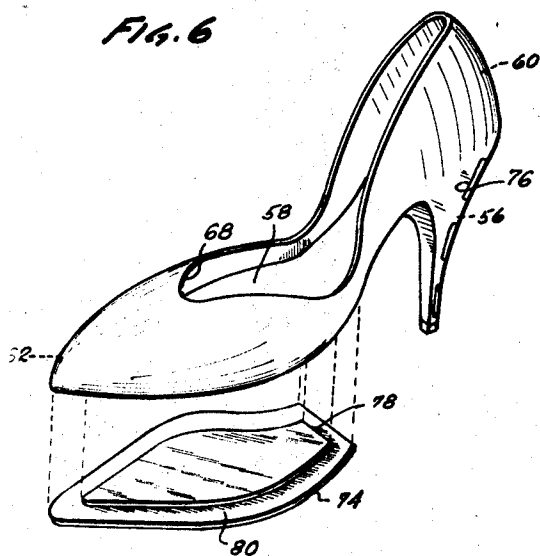
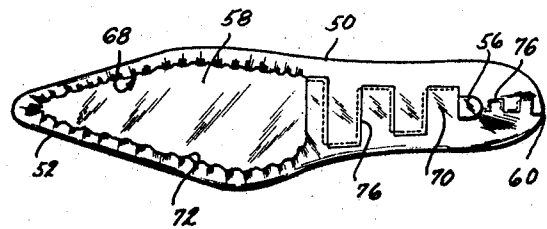
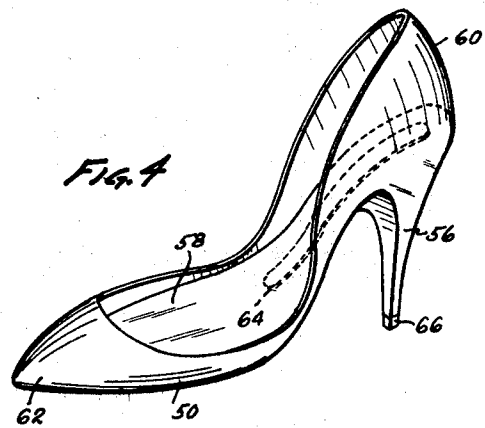
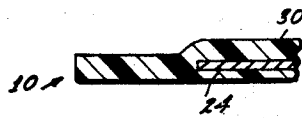
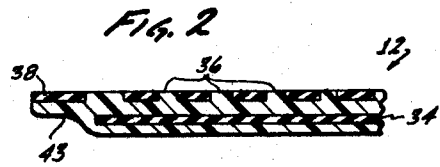
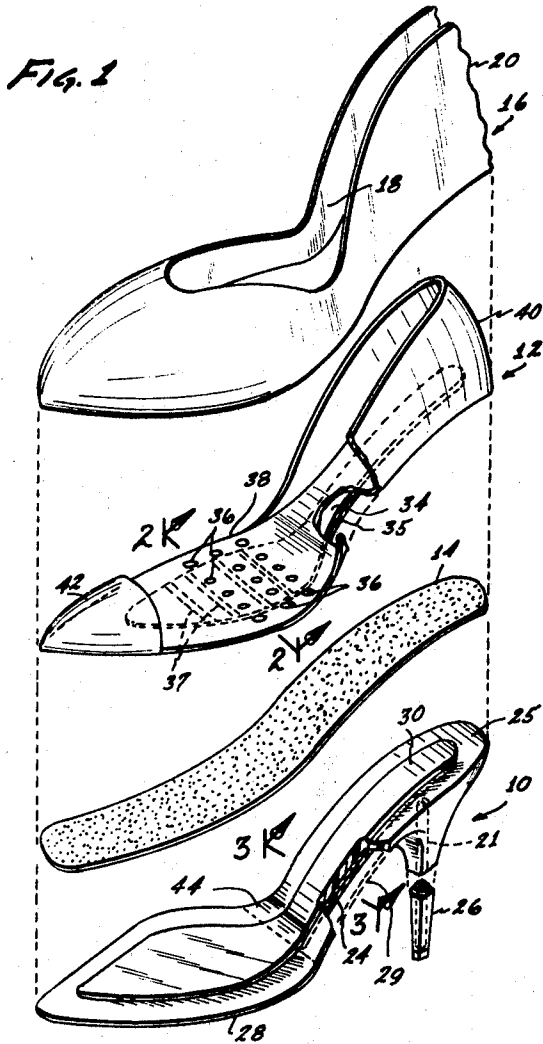
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3,523,379

PROCESS FOR MANUFACTURING SHOES

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PROCESS FOR MANUFACTURING SHOES

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6 Claims

ABSTRACT OF THE DISCLOSURE

An improved system is disclosed for manufacturing improved shoes utilizing fewer components. Specifically, various parts of the shoe are formed as major sub-assemblies which comprise integral units and which may be readily assembled to complete a shoe. Examples of such sub-assemblies include: an inner sole with an arch bracket and cushion molded therein; an inner sole which also includes counters; an outer sole including an arch brace molded therein; an outer sole including an arch brace and a heel formed as an integral unit; and a sole structure, including an arch brace, a heel, and counters, ready to receive uppers and an outer wear sole. Integral sub-assemblies illustrated herein are disclosed to be molded of plastic or other material with component parts, e.g. an arch brace, or the like integrally molded therein.

BACKGROUND AND SUMMARY OF THE INVENTION

Present methods employed in the production of shoes have been strongly influenced by the evolution of the western-style shoe. In this regard, well over 100 operations may be involved in the production of a single modern shoe. To efficiently accomplish the many and varied operations involved in shoe production, factories have organized specialized departments. Specifically, a shoe factory cutting room may be employed to cut and form the upper part of the shoe to the proper size and shape as well as the provide the shoe linings. A stitching room receives the different parts of a shoe upper and lining, and in that room, those parts are stitched together. The operations of stock fitting, or providing the insoles, outsoles, counters and box toes may also be performed in a separate and distinct room, or department. In still another department, the shoe parts are assembled and shaped on a last e.g. a wooden form resembling the human foot, after which the soles are attached to the shoe, again usually in a separate department. Subsequently, the shoes are heeled, trimmed, and finished as with wax or gum.

Modern technology has enabled the mass production of shoes primarily by automating methods that are closely analagous to those previously employed by hand workmen. However, these methods have many inherent limitations. For example, the appearance of shoes manufactured by the conventional techniques is somewhat limited as is the ultimate cost of production. Furthermore, shoes as presently manufactured in accordance with methods developed over a period of many years, are not entirely safe. This consideration is particularly true with regard to various high-heeled styles of women's shoes. Similarly, the aesthetics of women's shoes particularly are limited by prior production techniques.

In recent years, various attempts have been made to substitute certain synthetic materials for the leather conventionally used in shoes. In some instances, these substitutions have been quite successful and well received by consumers. However, these materials may not be utilized to their fullest capability in the manufacture of shoes by

conventional processes. However, as disclosed herein, synthetic materials may now be employed, very economically to manufacture improved shoes, both with regard to appearance and function.

In general, the present invention resides in the discovery that various components can be effectively provided in the form of shoe sub-assemblies which comprise single integral units, which sub-assemblies can be effectively assembled to accomplish an improved shoe at a lower production cost.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawing, which constitutes a part of this specification, an exemplary embodiment demonstrating various objectives and features hereof is set forth, specifically:

FIG. 1 is a somewhat-exploded perspective view illustrating the components for assembly of a shoe constructed in accordance with the present invention;

FIG. 2 is a fragmentary sectional view taken along line 2-2 of FIG. 1;

FIG. 3 is a fragmentary sectional view taken along line 3-3 of FIG. 1;

FIG. 4 is a perspective view of another form of a shoe component constructed in accordance herewith;

FIG. 5 is a bottom plan view of the shoe component of FIG. 4, somewhat more complete; and

FIG. 6 is perspective exploded view illustrating completion of a shoe constructed in accordance with the present invention as preliminarily illustrated in FIGS. 4 and 5.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENT

As required, detailed illustrative embodiments of the invention are disclosed herein. However, it is to be understood that these embodiments merely exemplify the invention which may take many different forms that are radically different from the specific illustrative embodiments disclosed. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims defining the scope of the invention. Somewhat in this regard, the illustrative embodiments herein comprise women's dress shoes; however, it is to be emphasized that the process hereof is readily adaptable for the production of many different forms of shoes, as men's and childrens' as well as women's.

Referring initially to FIG. 1, there is shown an outer sole component 10 (bottom of figure) which is adapted to be matingly joined to an insole component 12 by a layer of adhesive 14 (representatively illustrated) after the upper 16 (illustrated unformed) has been affixed to the insole component 12. Of particular importance with regard to the present invention is the fact that the outer sole component 10 and the insole component 12 are provided as pre-formed sub-assemblies, which may incorporate reinforcement means, cushions and the like, and furthermore which may each comprise a generally-uniform molded body. In this regard, it is important to recognize that at least one of these components must be somewhat rigidly formed to afford arch support for the resulting shoe.

Considering an exemplary process of providing a shoe in accordance herewith in greater detail, the upper 16 is formed separately of leather, fabric, synthetic, sheet plastic, or so on using well-known techniques of the prior art.; Specifically, the material for the upper 16 is cut to the preliminary shade desired, including a collar or opening 18 which will define the access to the shoe. After cutting, to the desired shape, the upper 16 is sewn, as by the stitching 20 to generally define the desired configuration. Of course, the upper 16 may be variously preliminarily formed, depending on the desired style and the

material employed. However, the various parts of the upper 16, as well-established in the art (tip, throat, vamp, collar, arch, foxing and so on) may be provided in accordance with the shoe design, employing various techniques as well known in the prior art.

Contrary to the conventional methods employed to form the upper 16, the outer sole component 10 and the insole component 12 are formed by radically-different techniques. Specifically, the outer sole component 10 (lower) may comprise homogenous molded plastic formed by any of a variety of techniques including injection molding. In this regard, the outer sole component 10 (FIG. 1) comprises a molded body formed for example, of any of a wide variety of materials generally termed plastics, e.g., vinyls, acrylics, or various trademarked simulated leather materials. The component 10 encapsulates a metal reinforcing heel post 21 and a separate brace 24. The heel post 21 may comprise an aluminum rod, while the arch brace 24 may comprise spring steel and is formed to extend from the load center or heel seat 25 (above a heel 26 integral with the component 10) at least to the sole 28 (integral with the body). The molded body, defining the sole 28, the shank 29 and the heel 26 also defines a central elevation or ridged section 30 which substantially coincides to a peripherally-recessed configuration of the component 10 and which affords the requisite spacing for the edge of the tucked upper 16 that is matingly held between the insole component 12 and the outer sole component 10.

The insole component 12 of the shoe manufactured in accordance with the illustrative process of FIG. 1 is also formed as an integral body and contains a cushion or pad 34, of cork for example, molded therein and may also include a brace 35, as shown. Furthermore, cork inserts, fiber pads, or other vent structures 36 (FIGS. 1 and 2) may also be provided. The pad 34 extends to cushion the central portion of the entire foot and defines transverse apertures or channels 37 to provide flexibility.

The insole component 12 also includes integral counters 40 and box toes or caps 42. In forming the insole component 12, plastics similar to those described above may be molded to define the actual insole portion 32 with a lower peripheral shoulder 43 (FIG. 2) to accommodate tucking the upper 16. The component 12 also includes the counters 40 and the cap 42, as an integral unit containing a cork pad 34 and vent structures 36. Of course (as with regard to the outer sole component 10) these units may be mass produced at exceedingly high production rates and at relatively low cost. It is to be noted, that while the insole compartment 12 may be formed in one color, e.g. black or light tan, the outsole component 10 will be formed of a color to mate or harmonize with the foxing 16.

Considering the assembly of the components considered above into a shoe, as depicted in FIG. 1, the upper 16 is first lasted onto the insole component 12. In this regard, the insole component may be placed upon a last as generally well known in the prior art, after which the highly skilled lasting operation is performed wherein the shoe upper is evenly shaped to the desired configuration. Of course, the counters 40 and the toe cap 42 serve to strengthen the shoe substantially, somewhat as these elements have been employed in the past. During this operation the upper 16 is tucked and adhesively secured to the shoulder 43 of the insole component 12.

After the upper portion of the shoe has been formed, the bottom of the insole component 12 is covered with a uniform adhesive coating 14 (separately illustrated) for coupling the shoe together as a completed product. It is to be noted that the raised section 30 on the outer sole component 10 is matingly received within the ridge defined by the tucked edge of the upper 16 which more than fills the space of the shoulder 43. Therefore the surface of the insole component 12 is joined with the surface of the outer sole component 10 in mating relationship, and

so held by the intermediate layer of adhesive coating 14. As a result, a safe economical and attractive shoe is provided. In this regard, as the heel 26 is not separate from the sole 28, and therefore, it is not likely to become disengaged from the shoe, therefore the shoe as manufactured is particularly safe. Additionally the arch brace 24 (being integrally bonded within the component 10) affords a structure having an exceedingly high resistance to "break-down" of the shank 29, as frequently occurs when women's high-heeled shoes become somewhat worn.

With regard to the aesthetic considerations, it is to be noted that conventional seams and junctions in the shoe structure either can be indicated by casting breaks in the component 10, or can be totally avoided if desired. Furthermore, the heel 26 may now be colored uniformly on all sides and may also match the shank 29 and the sole 28. This aesthetic consideration has often hampered shoe stylists in the past.

Regarding the economy of the method, it is readily apparent that a vastly reduced number of operations are involved in the process hereof and that such operations can be readily automated and mechanized. The final assembly of the shoe simply involves the lasting operation as practiced in the past followed by adhesively coupling the outer sole component 10 to the insole component 12. Of course, the process hereof may be widely varied and differently adapted. In this regard, it is readily apparent that the outer sole component 10 may be divided along an indicated dashed line 44. Such a division may be desirable in order to manufacture shoes which may be readily resoled when they become worn.

In the embodiment as described above, the uppers are formed by rather conventional techniques. As a result, the shoe may have an appearance very much like a conventionally-produced shoe. However, in some instances, and in the accommodation of style changes, it may be desirable to provide a shoe that fully utilizes the concepts hereof and departs somewhat from styles which previously were necessitated by manufacturing processes. An illustrative process for making such a shoe will now be described with reference to FIGS. 4, 5 and 6.

In accordance with this specific, illustrative process, the frame or body 50 (FIG. 4) of the shoe is formed to include the heel 56, a single unitary sole 58, a counter 60, and a toe cap 62. This integral structure may be injection molded of various plastic materials with a reinforcing arch brace 64 and heel post 66 separately molded in situ. Next, an upper 68 (FIG. 5) is pulled and cemented on the body 50, employing techniques well known in the prior art. However, the upper 68 not only extends about the rear portion of the heel 56 but furthermore extends fully under the shank section 70. At the forward portion of shoe, the upper 68 is simply tucked and glued along a tucked edge 72, in accordance with processes of the prior art. The shoe of this process is then completed by the step illustrated in FIG. 6 in which a wear sole 74 is affixed to the bottom of the shoe over the edge 72. Specifically, in this regard, the sole 74 includes a central raised section 78, defining a lip 80 to accommodate the tucked uppers 68 along the edge 72 (FIG. 5). Thus, the sole 74 (FIG. 6) formed of leather or synthetic material is matingly received by the body 50 (FIG. 5) bearing pulled upper 68. The coupling therebetween may be accomplished by various adhesives (not shown).

The seam 76 (FIG. 5) may take a decorative form (as shown) in which case it is provided as false stitching in the upper 68, prior to pulling. Alternatively, the stitching may be eliminated, and the edges of the upper 68 can be cut to abut thereby affording a straight line extending along the axial bottom of the shoe.

From a consideration of the above, it may be seen that the process hereof may be employed to accomplish safe shoes of attractive patterns by economical methods. In general, the concept involves the utilization of integrally formed (as by molding) sub-assemblies which may be

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conveniently and easily coupled or joined to provide a completed shoe. Additionally, several distinct and separate aspects cooperatively exist along with such a general consideration, e.g. reinforcement for selective rigidity and adhesive coupling. Of course, as indicated above, the process hereof may be readily adapted to provide a wide variety of different shoes of a wide variety of different styles and types and may be practiced in a wide variety of different specifically-detailed processes; therefore, the processes illustratively disclosed herein are to be deemed merely exemplary embodiments, and the scope hereof shall not be restricted accordingly but rather shall be interpreted in accordance with the claims as set forth below.

What is claimed is:

1. A process for producing a shoe having an elevated arch, comprising the steps of:

preforming a unitary sole member, including a heel and a sole which jointly define said elevated arch, said sole member being a unitary structure;

preforming a shoe upper, including a preclosed under section which extends to cover the under side of said elevated arch;

pulling and affixing said shoe upper onto said sole member, whereby said preclosed under section of said upper covers at least a portion of said under side of said elevated arch; and

affixing a wear sole to said sole member to leave exposed said under side of said elevated arch as covered by said under section, and to shield certain edges of said shoe upper.

2. A process according to claim 1 wherein said step of preforming said sole member comprises preforming a unitary member including a heel and sole defining said arch and further includes a counter and a toe cap.

3. A process according to claim 1 wherein said shoe upper is formed to additionally include a heel cover section for covering a portion of said heel.

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4. A shoe of the type having an elevated arch support, comprising a sole member, including a heel and a sole which jointly define said elevated arch support, said sole member being a unitary structure;

a shoe upper including an undersection preclosed to cover the underside of said elevated arch, said shoe upper being affixed over said sole member whereby to define the upper portion of said shoe and cover at least a portion of the underside of said elevated arch support; and

a wear sole affixed to said sole member to extend to said elevated arch as defined by said sole member whereby to leave the undersection of said elevated arch support exposed.

5. A shoe according to claim 4 wherein said sole member additionally includes a counter and a toe cap.

6. A shoe according to claim 4 wherein said shoe upper includes a heel cover section for covering a portion of said heel as defined by said sole member.

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