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(54) **FOOTWEAR HAVING A FLEXIBLE  
OUTSOLE**

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(57) **ABSTRACT**

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An article of footwear is constructed from an outsole to which there is attached an upper. The outsole is provided with an upstanding sidewall and adjoining lip which form an outwardly projecting edge. The outsole is attached to the outer surface of the lip adjacent the edge by stitching and/or adhesive bonding. The outsole defines a hollow interior for receiving footwear components such as lining material, an insole and the like.

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**Related U.S. Application Data**

(60) Provisional application No. 60/347,570, filed on Oct. 25, 2001.

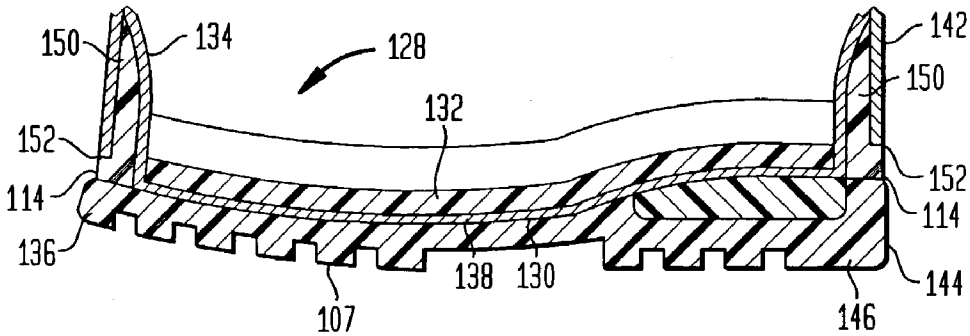


FIG. 1

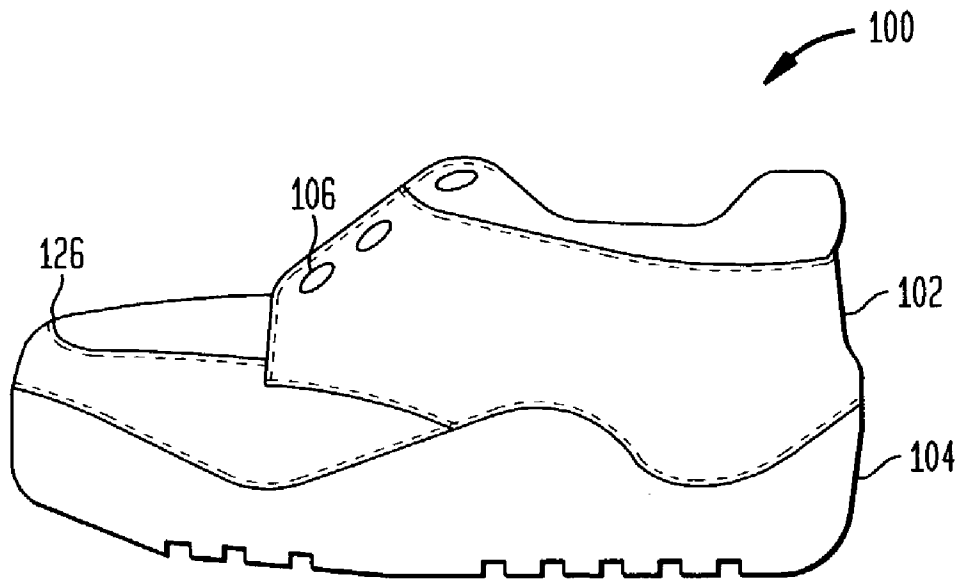


FIG. 2

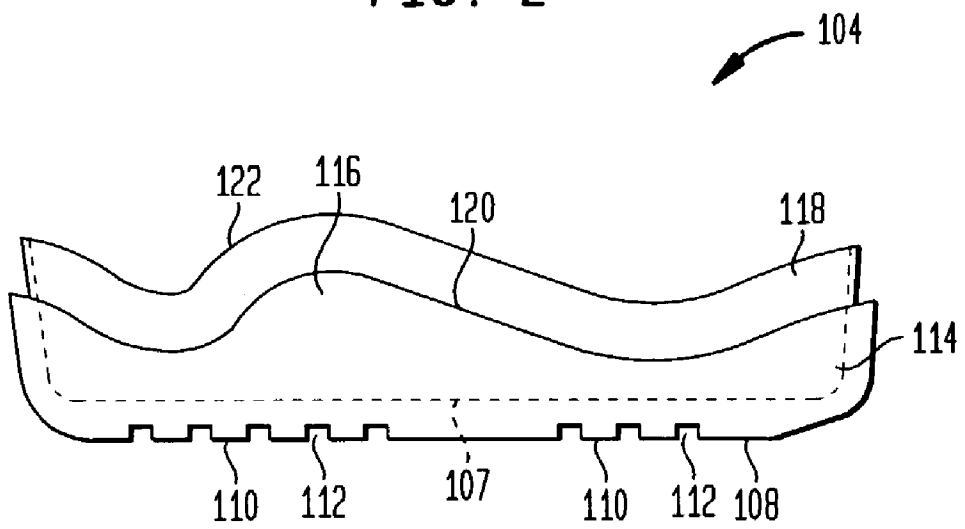


FIG. 3

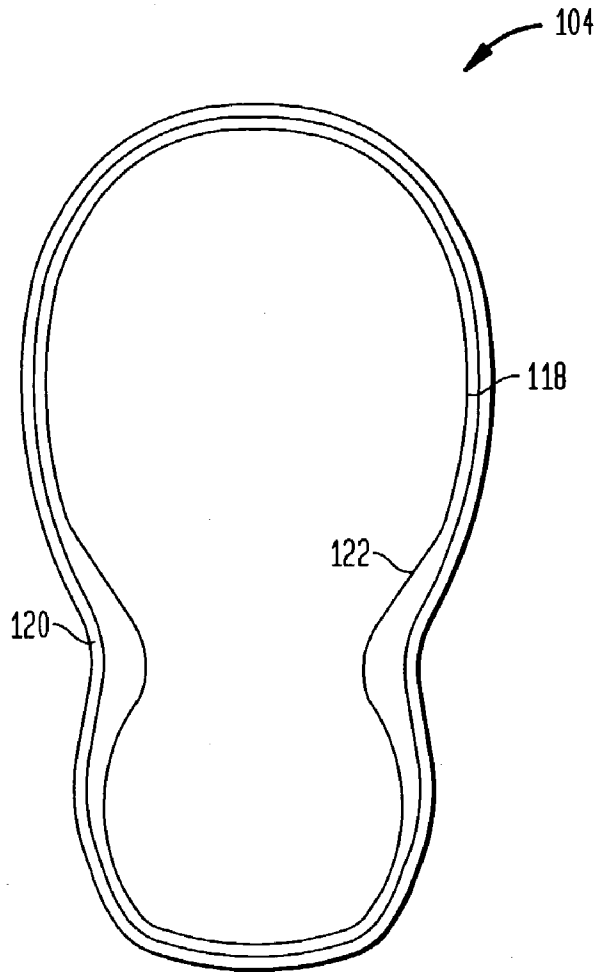


FIG. 4

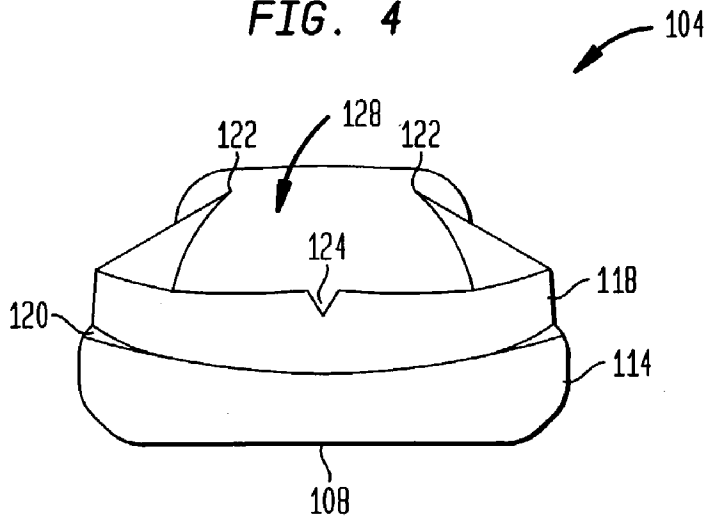


FIG. 5

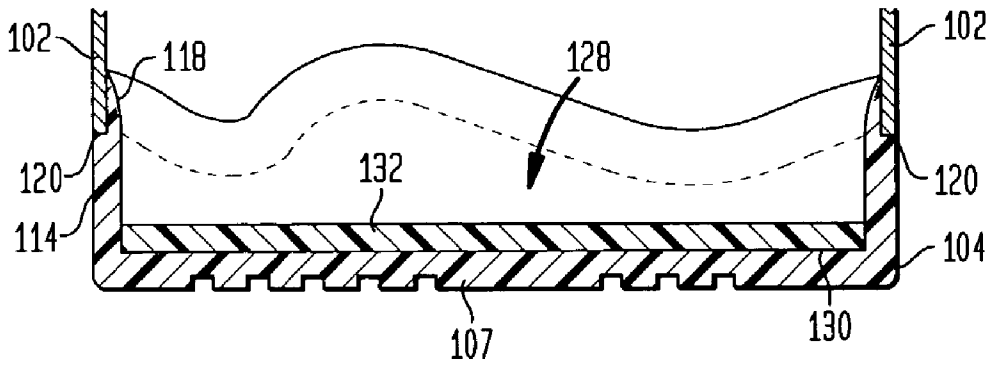


FIG. 6

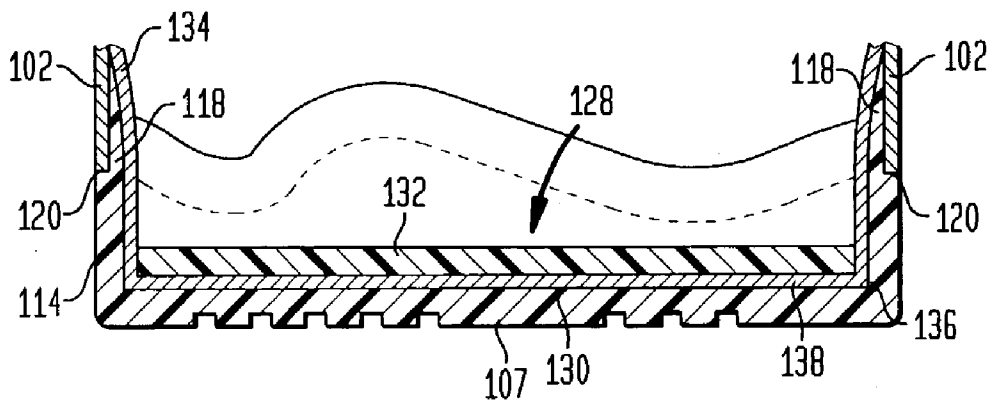


FIG. 7

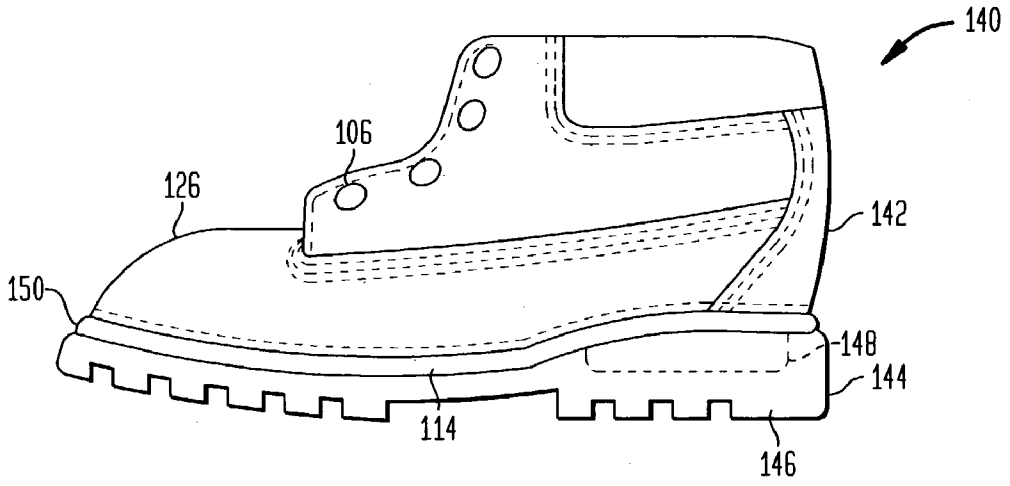


FIG. 8

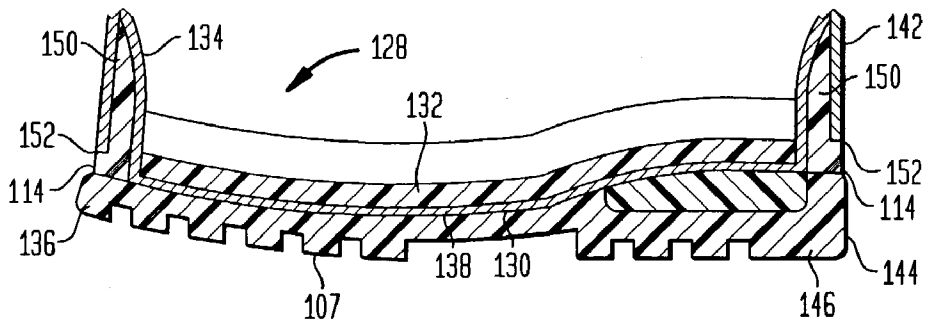


FIG. 9

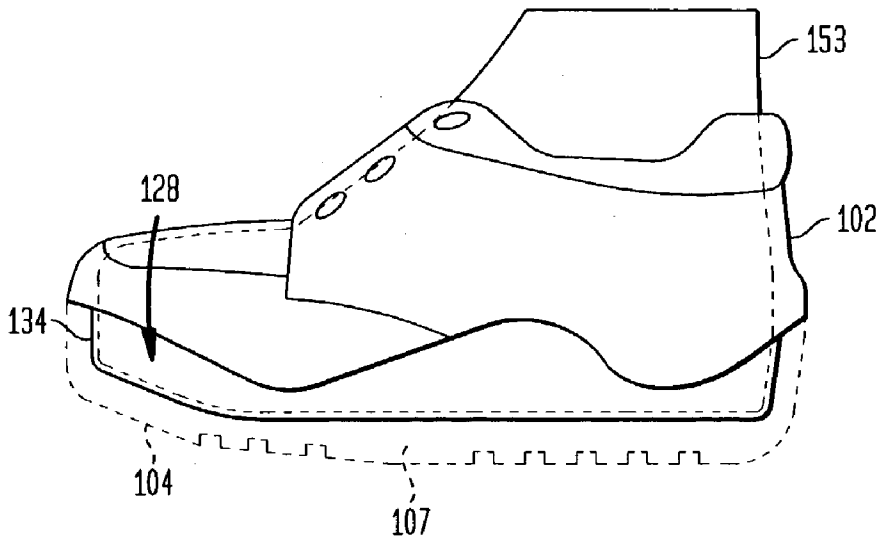
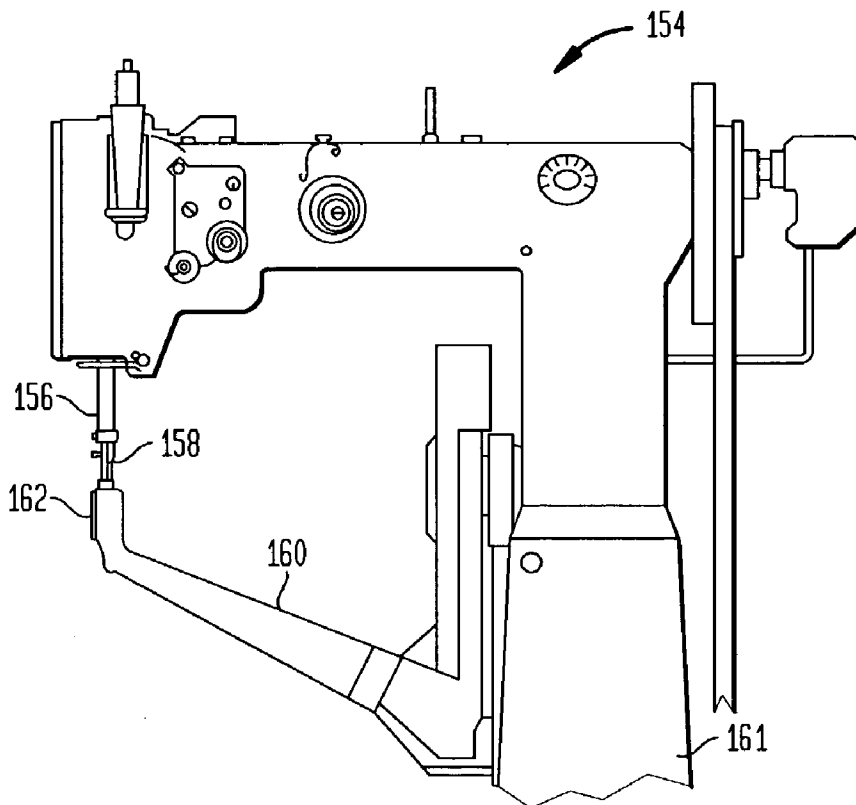


FIG. 10



## FOOTWEAR HAVING A FLEXIBLE OUTSOLE

### CROSS-RELATED APPLICATIONS

[0001] The present application claims the benefit of U.S. provisional application No. 60/347,570 filed Oct. 25, 2001, which is incorporated herein by reference.

### TECHNICAL FIELD

[0002] The present invention relates in general to the footwear industry, and more particularly, to various forms of footwear such as shoes, boots, sneakers and the like having an upper secured to an outsole.

### BACKGROUND OF THE INVENTION

[0003] Footwear is constructed from a number of components of various construction and design which are assembled to form the finished product. Two components that are most universally found in footwear are an outsole and an upper. An outsole is broadly defined as the outer sole or bottom walking surface of the footwear. An outsole can be constructed from a variety of natural and synthetic materials, for example, leather and polymers. The upper is broadly defined as that part of the footwear which is attached to and extends above the outsole. The upper can also be constructed from a variety of natural and synthetic materials, for example, leather and polymers, as well as combinations thereof.

[0004] In a variation, the footwear may also include a midsole which is provided on the outsole and to which the upper may be fully or partially attached. The midsole, like the outsole, can be constructed from a variety of materials. Typically, the outsole and the midsole will be formed of polymer materials having different properties of flexibility, resiliency and/or cushioning effect. In this regard, the outsole can be constructed of a more rigid wear resistant polymer to accommodate the abrasive and functional requirements of an outsole. On the other hand, the midsole may be constructed as a more flexible or resilient material to provide cushioning and shock absorbing properties for the wearer.

[0005] In constructing the footwear, the upper must be secured to the outsole or midsole during the assembling process. There are known various techniques by which the upper is attached to the outsole or midsole, for example, using board lasting, slip lasting, stitch and turn and stitch down techniques. Each of these techniques have their own advantages and disadvantages which are known in the footwear construction industry.

[0006] In board lasting, which is the most common, a board material is tacked onto a last which is a block of wood, metal or plastic shaped like a person's foot on which the footwear are formed. The upper is pulled over the last using significant force and glued to the board material. The pattern of the upper is not required to be exact as any excess material is pulled over and attached to the board material. In the event a gap remains about the glued periphery of the upper over the board material, the gap is filled in with felt material so that the user does not feel the void when walking. The felt material is often glued to the board material. The upper undergoes a heating and cooling process to mold the upper to the shape of the last. In the final processing, the outsole

is glued to the bottom of the upper which is overlying the board material, as well as the felt material if present. In a variation, a midsole is first glued to the upper and board material, followed by gluing an outsole to the midsole. Subsequently, the last is removed from the completed footwear and subsequently checked for the removal of all tacks which could cause injury to the wearer.

[0007] Board lasting construction is generally extensive in that excess material, for example leather, is required for the uppers so as to enable adhering to the board material. The use of glue, as well as the requirement for felt fillers, also adds to the construction expense and resulting purchase price of the footwear. In addition, the formation of multiple layers over the last, e.g., board material, upper material, felt material and glue decreases the flexibility of the outsole.

[0008] In stitch lasting, an upper is stitched around an insole which is constructed from a soft flexible material. The resulting assembly is referred to as a bootie. Due to the flexible nature of the bootie, the bootie can be slipped over the last without the need of excessive force as required in board lasting construction. However, the bootie must be based upon a precise pattern such that the bootie fits exactly to the last both in size and shape. The construction of a bootie is faster and easier than the aforementioned board lasting construction, but as noted, requires a precise pattern. Subsequently, the bootie supported by the last undergoes a heating and cooling cycle until the desired shape of the upper is achieved. Finally, the outsole, or combination with midsole, are adhered to the bootie.

[0009] Slip lasting construction has a number of advantages. For example, there is no need for felt fillers and the use of less leather as there is no wrapping of the upper over the board material. The elimination of these components, as well as the glue layers, results in the footwear being more flexible than those of board lasting construction.

[0010] In stitch and turn construction, the outsole is provided with a peripheral circumscribing edge whose surface is parallel to the top surface of the outsole. A peripheral bottom edge of the upper is turned inwardly and positioned over the upper surface of the circumscribing edge. The upper is adhered by stitching downwardly through the upper into the surface of the edge around the perimeter of the outsole. Subsequently, the footwear is placed over a last and subjected to the heating and cooling cycle for shaping the footwear. In a similar process incorporating a midsole, the technique is referred to as stitch down construction.

[0011] Accordingly, there is known a variety of techniques for manufacturing footwear, each technique having its own advantages and disadvantages. In general, resilient support and flexibility are of paramount importance in the construction of footwear. These properties greatly enhance and comfort and wearability of the footwear for the end user. Although slip lasting and stitch and turn construction provide greater flexibility, vis-à-vis board lasting construction, these constructions possess the aforementioned disadvantages, for example, the need for precise patterns for the upper.

[0012] There is therefore the need for further improvements in the construction of footwear which provides enhanced flexibility to the outsole.

## SUMMARY OF THE INVENTION

[0013] Footwear such as shoes, boots, sneakers and the like are constructed to include an upper which is attached to an outsole. The outsole can be constructed from a variety of materials, and preferably, synthetic materials such as polymers suitable for functioning in an environment to which the article of footwear will be subjected by the wearer. The outsole further can be constructed in a variety of shapes and sizes to accommodate the various styles desired. The outsole in accordance with one embodiment of the present invention includes a foot-shaped support having a top surface, a bottom surface and a peripheral edge. An upstanding sidewall circumscribes the peripheral edge of the support. An upstanding lip extends circumferentially about the sidewall in the manner as an extension of the sidewall. The outer surface of the lip forms with the outer surface of the sidewall an outwardly projecting edge circumscribing the sidewall and the foot-shaped support. The outer surface of the lip is provided with a surface region adapted for securing a portion of an upper thereto such as by stitching and/or adhesive bonding. The top surface of the support, the inner surfaces of the sidewall and lip form a hollow region sized and shaped to receive a human foot upon completed construction of the footwear.

[0014] In accordance with one embodiment of the present invention there is described an article of footwear including an upper and an outsole attached to the upper. The outsole includes a foot-shaped support having a top surface, a bottom surface and a peripheral edge; an upstanding sidewall circumscribing the peripheral edge of the support, the sidewall having an inner surface and an outer surface; an upstanding lip extending circumferentially about the sidewall, the lip having an inner surface and an outer surface, the outer surface of the lip forming with the outer surface of the sidewall an outwardly projecting edge circumscribing the sidewall, the top surface of the support, the inner surface of the sidewall and the inner surface of the lip forming a hollow region adapted for receiving a human foot; the upper attached to the outer surface of the lip adjacent the outwardly projecting edge.

[0015] In accordance with another embodiment of the present invention there is described an outsole for an article of footwear. The outsole includes a foot-shaped support having a top surface, a bottom surface and a peripheral edge; an upstanding sidewall circumscribing the peripheral edge of the support, the sidewall having an inner surface and an outer surface; an upstanding lip extending circumferentially about the sidewall, the lip having an inner surface and an outer surface, the outer surface of the lip forming with the outer surface of the sidewall an outwardly projecting edge circumscribing the sidewall, the outer surface of the lip adapted for securing a portion of an upper thereto; and the top surface of the support, the inner surface of the sidewall and the inner surface of the lip forming a hollow region adapted for receiving a human foot.

[0016] In accordance with another embodiment of the invention there is described an outsole for an article of footwear, the outsole comprising a foot-shaped support having a top surface, a bottom surface and a peripheral edge; an upstanding member extending circumferentially about the support adjacent the peripheral edge, the member having an inner surface and an outer surface, the member providing

an outwardly projecting edge adjacent said peripheral edge circumscribing the support, the outer surface of the member adapted for securing a portion of an upper thereto; and the top surface of the support and the inner surface of the member forming a hollow region adapted for receiving a human foot.

[0017] In accordance with another embodiment of the invention there is described an article of footwear comprising an upper; and an outsole attached to the upper; the outsole comprising a foot-shaped support having a top surface, a bottom surface and a peripheral edge, an upstanding member extending circumferentially about the support adjacent the peripheral edge, the member having an inner surface and an outer surface, the member providing an outwardly projecting edge adjacent said peripheral edge circumscribing the support, the top surface of the support and the inner surface of the member forming a hollow region adapted for receiving a human foot, the upper attached to the outer surface of the member adjacent the outwardly projecting edge.

## BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The above description, as well as further objects, features and advantages of the present invention will be more fully understood with reference to the following detailed description of a footwear having a flexible outsole, when taken in conjunction with the accompanying drawings wherein:

[0019] FIG. 1 is a side elevational view of an article of footwear constructed in accordance with one embodiment of the present invention;

[0020] FIG. 2 is a side elevational view of an outsole constructed in accordance with one embodiment of the present invention as shown in FIG. 1;

[0021] FIG. 3 is a top plan view of the outsole as shown in FIG. 2;

[0022] FIG. 4 is a front elevational view of the outsole as shown in FIG. 2;

[0023] FIG. 5 is a cross-sectional view taken longitudinally through the article of footwear as shown in FIG. 1 in accordance with one embodiment of the present invention;

[0024] FIG. 6 is a cross-sectional view taken longitudinally through the article of footwear as shown in FIG. 1 in accordance with another embodiment of the present invention;

[0025] FIG. 7 is a side elevational view of an article of footwear constructed in accordance with another embodiment of the present invention;

[0026] FIG. 8 is a cross-sectional view taken longitudinally through the article of footwear as shown in FIG. 7 in accordance with another embodiment of the present invention;

[0027] FIG. 9 is a side elevational view of an upper having an inner lining supported on a last during the manufacturing process; and

[0028] FIG. 10 is a diagrammatic illustration of a sewing machine with sewing arm adapted for stitching an upper to an outsole in accordance with the present invention.



#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0029] In describing the preferred embodiments of the subject matter illustrated and to be described with respect to the drawings, specific terminology will be resorted to for the sake of clarity. However, the invention is not intended to be limited to the specific terms so selected, and is to be understood that each specific term includes all technical equivalence which operate in a similar manner to accomplish a similar purpose.

[0030] Referring now to the drawings, where like reference numerals represent like elements, there is shown in FIG. 1 an article of footwear in the nature of an infant's sneaker designated generally by reference numeral 100. The invention in accordance with one embodiment will be described with reference to the sneaker 100. It is to be understood that the invention is equally applicable to other forms of footwear other than the sneaker 100 as shown. For example, the present invention is suitable for incorporation in all forms of footwear, for example, adult sneakers, jogging shoes, tennis shoes, boots, work boots, casual shoes, dress shoes and the like. In general, the present invention is adapted for use in any article of footwear in which an upper is to be attached to an outsole.

[0031] In this regard, and as shown in FIG. 1, the sneaker 100 will often include a variety of components, and specifically, includes an upper 102 and an outsole 104. The upper 102 and outsole 104 define the shape and style of the sneaker 100. The upper 102 and outsole 104 can be constructed from a variety of natural and synthetic materials, as well as composites thereof. For example, the upper 102 is often formed from leather, or a combination of leather and man-made polymer materials such as nylon, polyurethane, polyester and mesh. The upper may be formed in a variety of colors and surface finishes such as brushed leather, smooth, weaved, mesh, pattern embossed, etc. The upper 102 may be formed with various devices for closing the footwear opening such as laced eyelets 106, clips, elastomeric materials and the like. In designing the footwear such as the sneaker 100, it is to be understood that an infinite variety of shapes, sizes, materials and designs may be incorporated into the finished footwear embodying the present invention.

[0032] The outsole 104 is preferably formed from a synthetic polymer, however, it is contemplated that natural materials such as leather can also incorporate the present invention. In the case of polymers, suitable polymers include, by way of example and not by limitation, thermoplastic rubber, rubber, polyurethane, thermoplastic polyurethane and polyvinyl chloride. It is also contemplated that the outsole 104 may be formed from combinations of polymers having different properties of, for example, mechanical strength, resiliency, wear resistance, rigidity, cushioning effect and the like. Thus, various portions of the outsole 104 may be molded from one type of polymer material, and another portion of the outsole co-molded with another polymer material having different physical characteristics. Thus, the outsole 104 can be tailored to provide varying degrees of mechanical properties at different portions of the outsole as may be desired depending upon the intended wearer and function of the footwear. For purposes of simplifying the explanation of the present invention, the upper 102 will be described as being constructed from leather, and the outsole 104 constructed from polymer material.

[0033] Referring to FIGS. 2-4, there will be described the construction of the outsole 104 in accordance with one embodiment of the present invention. As shown, the outsole 104 is generally molded as an interval one piece outsole using any suitable molding or polymer casting technique. The outsole 104 is provided with a bottom member 107 having a bottom surface 108 which engages a supporting surface, such as a floor when wearing the sneaker 100. To this end, the bottom surface 108 may be provided with ribs 110, which in addition to providing traction, also increases the flexibility of the outsole 104 by providing transverse channels 112 of reduced polymer thickness within the bottom member 107. In particular, the channels 112 could be formed at a location along the bottom surface 108 where the outsole 104 would typically bend during flexing of a person's foot while walking or running. However, it is to be understood that the formation of ribs 110 and/or channels 112 are not required pursuant to the present invention.

[0034] The outsole 104 is formed with a circumscribing upstanding sidewall 114 which is integral with the bottom member 107. The sidewall 114 may be of various heights and profiles such as including arcuate portions to define the style and aesthetics of the sneaker 100. As shown in FIG. 2, the sidewall 114 is undulating having a high portion 116 in the region of the sneaker's arch support. It is to be understood that the sidewall 114 may be of any shape, generally having a height in the range of 5 to 25 mm, although other heights greater and less are contemplated in accordance with the present invention.

[0035] The sidewall 114 merges with a circumscribing upstanding lip 118 which is integrally formed therewith during the manufacturing process of the outsole 104. The lip 118 is provided with an outer surface which is inwardly offset from the outer surface of sidewall 114 to provide a circumscribing edge 120. On the other hand, the inner surface of the sidewall 114 is often flush with the inner surface of the lip 118. The lip 118 typically follows the contour of the sidewall 114 as best shown in FIG. 2. As will be explained in detail hereinafter, the upper 102 is attached to the outer surface of the lip 118 by any suitable means such as adhesives, stitching and the like.

[0036] In general, it is contemplated that the edge 120 will have a width approximately corresponding to the thickness of the upper 102. This will result in the outer surface of the upper being flush with the outer surface of sidewall 114. By way of example, uppers have a thickness in the range of 1 to 2 mm, and preferably about 1.6 mm. It is also contemplated that the width of the edge 120 may be greater or less than the thickness of the upper 102 providing the sneaker 100 with a particular aesthetic design feature if so desired.

[0037] The lip 118 has sufficient width for supporting the lower edge of the upper 102 and for securing same thereat. The upper 102 can be attached directly to the lip 118 by any suitable means, for example, by stitching, stapling, adhesive bonding and the like. Suitable adhesives include glue, cement, thermo-set adhesives, hot melt adhesives, thermoplastic adhesives and the like. In general, a lip 118 having a width of about 6 mm is suitable for practicing the present invention. However, it is contemplated that a lip 118 having a width in the range of about 2 to 15 mm may also be used. The outer surface of the lip 118 and edge 120 form a receiving space to accommodate the lower portion of the upper 102.

[0038] The lip 118 may be of uniform thickness across its width, or tapered to reduced thickness circumferentially about its upper edge 122. By tapering the lip 118, this provides the lip with greater flexibility as well as providing less bulk material along the sides of the wearer's foot to increase wearing comfort. By way of example, the lip 118 adjacent edge 120 may have a thickness in the range of 1 to 12 mm, and preferably about 5 mm. As noted, the upper edge 122 may be feathered or tapered to a substantially thinner dimension if desired.

[0039] As shown in FIG. 4, the front edge of the lip 118 is provided with a notch 124 which is shown as V-shaped. However, the notch 124 may be U-shaped, rectangular, circular and the like. In addition, the lip 118 may be provided with a plurality of notches about the forward edge of the lip 118. The notch or notches 124 provide the ability of the upper portion of the lip 118 to conform to the curved shaped of the upper 102 without bunching up. In this regard, as shown in FIG. 1, the upper 102 at its forward portion 126 curves inwardly to define a region of reduced circumference. The notch 124 allows the lip 118 to conform to the shape of the forward portion 126 within the region of reduced circumference without bunching up. The notch 124 is therefore to be understood as an optional feature of the outsole 104 and not essential to the practicing of the present invention. In this regard, based upon the design of the footwear and size of the lip 118, the aforementioned considerations may not be present.

[0040] As best shown in FIG. 5, the outsole 102 is formed to include a large hollow region or cavity 128 which extends throughout the interior of the outsole 104, e.g., bound by the interior surfaces of the sidewall 114, lip 118 and top surface 130 of the bottom member 107. The hollow region 128 is sized and shaped to receive the remaining components of the sneaker 100 as to be described, as well as the wearer's foot in a comfortable and shape conforming manner.

[0041] In accordance with one embodiment as shown in FIG. 5, the upper 102 is attached circumferentially about lip 118 of the outsole 104 adjacent ledge 120. The attachment may be accomplished by any suitable method, for example, stitching, adhesive bonding and/or combinations thereof. When a stitching technique is incorporated, it is generally preferred that the stitch line be proximate the edge 120 of the outsole 104. This prevents potential flaring of the bottom edge of the upper 102 away from the lip 118. It is to be understood that multiple stitch lines may be used to secure the upper 102 to the outsole 102. Once the upper 102 has been attached to the outsole 104, a last is placed into the hollow region 128 to mold the upper 102 into the desired shape of the footwear during the subsequent heating and cooling process.

[0042] In completing the construction of the sneaker 100, an insole 132 of various materials may be placed overlying the top surface 130 of the bottom member 107 of the outsole 104. The insole 132 may be freely removable or adhered using a suitable adhesive. The insole 132 can be formed from a variety of natural and synthetic materials, as well as combinations thereof. In the preferred embodiment, the insole 132 will be formed of a synthetic material which provides shock absorbing and cushioning properties to aid in the comfort for the wearer. By way of example, suitable materials for the insole include ethyl vinyl acetate (EVA),

polyurethane and thermoplastic polyurethane. The insole 132 also provides a smooth supporting surface for the wearer's foot thereby covering any irregularities in the top surface 130 of the bottom member 107.

[0043] In accordance with the preferred embodiment, the upper 102 is attached to the outsole 104 in the manner as shown in FIG. 6. The upper 102 is initially provided with an inner lining 134. The inner lining 134 is adhered to the inner surface of the upper 102 by any suitable means, for example, by stitching around an upper peripheral edge, by adhesive bonding and/or the like. The inner lining 134 may be constructed from a variety of natural and synthetic materials to provide comfort to the wearer, for example, to provide a soft, comfortable surface against the wearer's foot.

[0044] As shown in FIG. 6, it is preferred that the lining extend beyond the length or bottom of the upper 102. In this regard, the inner lining 134 will extend beyond the location of edge 120 of the outsole 104 to a location proximate the top surface 130 of the bottom member 107. The bottom edge 136 of the inner lining 134 is attached to a second layer of lining material 138. The lining material 138 may be the same or of a different composition from the inner lining 134. For example, the inner lining 134 may be constructed from leather material, while the lining material 138 may be constructed from synthetic material. The inner lining 134 is attached to the edges of the lining material 138 by any suitable means, for example, by peripherally stitching along the bottom edge 136 and/or the use of adhesives. The resulting combination produces a bootie having a closed end by virtue of the lining material 138. As in slip lasting construction, the bootie requires that its pattern conform closely to the shape and size of the last which is being used in the construction process.

[0045] The lining material 138 is positioned on the top surface 130 of the bottom member 107 with the inner lining 134 extending upwardly over the inner surface of sidewall 114 and lip 118, and the upper 102 extending over the outer surface of the lip terminating adjacent and overlying edge 120. As shown, the lip 118 is captured between the inner lining 134 and lower portion of the upper 102. In the manner as previously described, the lower portion of the upper 102 is stitched, adhesive bonded or other ways secured to the lip 118 adjacent edge 120. It is not a requirement that the inner lining 134 be adhered to the lip 118. The lining material 138 is preferably adhered to the top surface 130 of the bottom member 107 using a suitable adhesive.

[0046] The upper 102 is sized and shaped by placing a last into the hollow region 128 and subjecting the assembly to a heating and cooling process. An insole 132 may be placed into the hollow region 128 overlying the lining material 138 to provide resilient cushioning and shock absorbing properties as previously described.

[0047] Based upon the foregoing construction of the sneaker 100 or other article of footwear in accordance with the present invention, the sneaker is provided with enhanced flexibility in the outsole 104. In addition, the presence of the hollow region 128 allows for the use of a cushioning resilient insole 132 which can have varying characteristics depending upon the footwear's application, e.g., jogging shoes, work boots, etc. Thus, the outsole 104 of the present invention does not require the incorporation of a midsole to provide the cushioning effect of the prior constructions. The

desired cushioning effect is achieved by the use of an insole **132** which can be tailored to provide the desired effect by selecting the materials of construction and thickness of the insole. The construction of an article of footwear in accordance with the present invention provides a great degree of latitude in designed features to provide an article of footwear which is flexible while accommodating various footwear components such as linings and insoles.

[0048] Referring to **FIG. 7**, there is shown a work boot **140** constructed in accordance with the present invention. The work boot **140** includes an upper **142** and an outsole **144**. The upper **142** may be constructed in a similar manner to the upper **102** as previously described. Similarly, the outsole **144** may be constructed in a similar manner to the outsole **104** as previously described. However, variations in the outsole **144**, both cosmetic and functional, may be incorporated into the outsole design. As shown by way of one example, the outsole **144** is provided with a raised heel **146** which may include an inner hollowed out region **148** which reduces the mass of material of the outsole **144** thereby providing greater flexibility in the heel region.

[0049] A peripherally circumscribing lip **150**, as best shown in **FIG. 8**, is provided with an outwardly protruding edge **152** adjacent the sidewall **114** as similarly described with respect to lip **118** and edge **120**. The sidewall **114** is of a lesser height than the sidewall shown in the embodiment described in **FIG. 5**. This provides the work boot **140** with a different look than the sneaker **100**. It is to be understood that the lip **150** can extend upwardly directly from the top surface **107** of the bottom member **130**. In this regard, the edge **120** would be formed by the protruding portion of the top surface **130** of the bottom member **107**.

[0050] The lip **150** and sidewall **114** may be integrally formed, for example, by molding with the bottom member **107** of the outsole **144**. The lip **150** and sidewall **114** can be constructed from the same or similar material as the remaining portion of the outsole **144**. However, the lip **150** and sidewall **114** can be constructed by co-molding two different polymer materials having different characteristics, one for the lip and sidewall and one for the bottom member **107**. In this regard, the bottom member **107** can be constructed of a wear resistant flexible material, while the sidewall **114** and lip **150** may be constructed of a stiffer material to which the upper **142** is to be attached. Accordingly, by using a variety of natural and/or polymer materials, various characteristics of the outsole **144** can be achieved, for example, flexibility, resiliency, wear resistance, etc.

[0051] As further shown in **FIG. 8**, the outsole **144** is provided with a hollow region **128** which is designed to receive the bootie formed from the assembly of upper **142**, inner lining **134** and lining material **138**. The resulting bootie is attached to the outsole **144** via the lip **150** as previously described with respect to the bootie illustrated in **FIG. 6**. In the event the heel **146** is provided with a hollowed out region **148**, it can be filled with similar material to the lining material **138**. This provides a smooth, flat surface **107** for supporting the insole **132**. Once the bootie via the upper **142** is attached to the outsole **144**, the assembly is processed as thus far described by inserting a last into the bootie and conforming the upper **142** to the last shape by a heating and cooling process. Accordingly, it can be appreciated that a variety of styles and designs of an article of footwear can be

constructed incorporating the principles of the present invention as thus far described and equivalence thereof.

[0052] Referring to **FIG. 9**, an upper **102** having an inner lining **134** is shown stretched over a last **153** in the shape of the finished footwear, the outsole **104** being shown in phantom. The bottom portion of the last **153** extends downwardly into the hollow region **128** and is supported on top surface **130** of the outsole **104**. In this regard, the last **153** extends outwardly beyond the bottom edge of the upper **102**. This extended portion of the last **153** is received within the hollow region **128** of the outsole **104**. Accordingly, the last **153** drops into the outsole **104**, as opposed to being supported onto the top surface of the outsole as is known from the prior footwear constructions. By having the last **153** extending into the hollow region **128** of the outsole **104**, the upper **102** which begins at the bottom of the last essentially starts within the outsole **104** at the top surface **130**. This construction allows the upper **102** to have a lower height than previously known constructions. That is, in accordance with the prior footwear as previously noted, the top of the outsole is supported directly on the bottom of the last **153** thereby increasing the height of the upper **102**. Having an upper **102** of a lower profile provides an enhanced aesthetic appeal to the article of footwear.

[0053] This construction, as previously noted, also provides a region for receiving an insole **132**. In the prior footwear constructions, the insole which is supported on the outsole, occupies a portion of the interior of the upper where a person's foot would be received. In order to accommodate the thickness of the insole, it is generally required that the upper be increased in height to provide additional volume. This increased height can detract from the aesthetics of the footwear. By providing a hollow region **128** within the outsole **104**, the hollow region can accommodate an insole **132** of varying thicknesses without the necessity of increasing the height of the upper **102**.

[0054] As previously described, the upper **102**, **142** can be attached to the lip **118**, **150** by means of stitching. This can be accomplished using a sewing machine of the type used in the footwear industry, such as in the manufacture of footwear of slip lasting and stitch and turn construction. As shown in **FIG. 10**, a sewing machine adapted for the stitching process is shown generally in diagrammatic illustration and identified by reference numeral **154**. The sewing machine **154** includes a head **156** adapted for reciprocal motion of an attached needle **158** to perform the stitching operation. The head **156** should be of minimum size so as to not interfere with the turning of the article of footwear during the stitching process. As is conventional in a sewing machine, the head **156** reciprocates while removably securing the needle **158** thereto during the stitching process.

[0055] The sewing machine **154** generally requires a backing plate which supports the article to be stitched underlying the reciprocating head **156**. Known sewing machines are provided with a stationary, fixed backing plate. This construction of a sewing machine makes it difficult to perform the stitching operation for securing the upper **102**, **142** to the outsole **104**, **144**. Accordingly, a conventional sewing machine can be modified whereby the conventional backing plate is replaced with a swing arm **160** which is pivotably attached to the sewing machine base **161**. The swing arm **160** is provided with a backing plate **162** which can be

positioned underlying the needle **158** or rotated away from the needle as may be required to initiate the stitching process.

[**0056**] More specifically, the swing arm **160** is initially swung away from under the needle **158** to provide clear access to the backing plate **162**. The backing plate **162** is sized and shaped to be received within the hollow region **128** of the article of footwear underlying the region where the stitching process is to be performed. In accordance with the present invention as thus far described, this region is generally underlying the lip **118**, **150** adjacent edge **120**. The swing arm **160** is returned to its operative position in alignment underlying the needle **158**. During the stitching process, the article of footwear is turned about the backing plate **162** to enable stitching of the upper **102**, **142** to the lip **118**, **150** as the article of footwear is turned about the backing plate **162**. The backing plate **162** is accordingly sized in relationship to the hollow region **128** to allow turning of the article of footwear  $360^\circ$  about the backing plate during the stitching process.

[**0057**] Although the present invention has been described with respect to the use of a particular sewing machine **154**, it is to be understood that other designs of a sewing machine may be used to effect the stitching of the upper to the outsole. In addition, where an adhesive is used, any form of adhesive applicator known in the footwear industry may be used. Accordingly, it is to be understood that the present invention is not to be limited in any respect as to the manner of stitching, adhesive bonding, or otherwise adhering the upper to the outsole.

[**0058**] Although the invention herein has been described with reference to particular embodiments, it is to be understood that these embodiments are merely illustrative of the principles and applications of the present invention. It is therefore to be understood that numerous modifications may be made to the illustrative embodiments and that other arrangements may be devised without departing from the spirit and scope of the present invention as defined by the appended claims.

1. An outsole for an article of footwear, said outsole comprising a foot-shaped support having a top surface, a bottom surface and a peripheral edge; an upstanding member extending circumferentially about said support adjacent said peripheral edge, said member having an inner surface and an outer surface, said member providing an outwardly projecting edge adjacent said peripheral edge circumscribing said support, said outer surface of said member adapted for securing a portion of an upper thereto; and said top surface of said support and said inner surface of said member forming a hollow region adapted for receiving a human foot.

2. The outsole of claim 1, wherein said projecting edge is formed by a portion of said top surface of said support adjacent said peripheral edge and an adjacent portion of said outer surface of said member.

3. The outsole of claim 1, wherein said projecting edge has a width no less than about a width of an edge portion of an upper adapted to be secured to said member.

4. The outsole of claim 1, wherein said member has a front edge provided with at least one notch therein.

5. The outsole of claim 1, wherein said member has an upper portion which is tapered in cross-section and a lower portion of uniform cross-section.

6. The outsole of claim 1, wherein said member comprises an upstanding sidewall circumscribing said peripheral edge of said support, said sidewall having an inner surface and an outer surface; and an upstanding lip extending circumferentially about said sidewall, said lip having an inner surface and an outer surface, said outer surface of said lip forming with said outer surface of said sidewall said projecting edge circumscribing said sidewall, said outer surface of said lip adapted for securing a portion of an upper thereto.

7. The outsole of claim 6, wherein said projecting edge has a width no less than about a width of an edge portion of an upper adapted to be secured to said lip.

8. The outsole of claim 6, wherein said sidewall has a uniform cross-section.

9. The outsole of claim 6, wherein said lip has a tapered cross-section.

10. The outsole of claim 6, wherein said inner surface of said sidewall is flush with said inner surface of said lip.

11. The outsole of claim 6, wherein said sidewall and said lip are formed as an integral piece.

12. The outsole of claim 6, wherein said projecting edge is spaced above said top surface of said support.

13. The outsole of claim 6, wherein said lip has a front edge provided with at least one notch therein.

14. An outsole for an article of footwear, said outsole comprising a foot-shaped support having a top surface, a bottom surface and a peripheral edge; an upstanding sidewall circumscribing said peripheral edge of said support, said sidewall having an inner surface and an outer surface; an upstanding lip extending circumferentially about said sidewall, said lip having an inner surface and an outer surface, said outer surface of said lip forming with said outer surface of said sidewall an outwardly projecting edge circumscribing said sidewall, said outer surface of said lip adapted for securing a portion of an upper thereto; and said top surface of said support, said inner surface of said sidewall and said inner surface of said lip forming a hollow region adapted for receiving a human foot.

15. The outsole of claim 14, wherein said projecting edge has a width no less than about a width of an edge portion of an upper adapted to be secured to said lip.

16. The outsole of claim 14, wherein said sidewall has a uniform cross-section.

17. The outsole of claim 16, wherein said lip has a tapered cross-section.

18. The outsole of claim 16, wherein said inner surface of said sidewall is flush with said inner surface of said lip.

19. The outsole of claim 16, wherein said sidewall and said lip are formed as an integral piece.

20. The outsole of claim 14, wherein said lip has a front edge provided with at least one notch therein.

21. An article of footwear comprising an upper; and an outsole attached to said upper; said outsole comprising a foot-shaped support having a top surface, a bottom surface and a peripheral edge, an upstanding sidewall circumscribing said peripheral edge of said support, said sidewall having an inner surface and an outer surface, an upstanding lip extending circumferentially about said sidewall, said lip having an inner surface and an outer surface, said outer surface of said lip forming with said outer surface of said sidewall an outwardly projecting edge circumscribing said

sidewall, said top surface of said support, said inner surface of said sidewall and said inner surface of said lip forming a hollow region adapted for receiving a human foot, said upper attached to said outer surface of said lip adjacent said outwardly projecting edge.

**22.** The article of claim 21, wherein said projecting edge has a width no less than about a width of an edge portion of said upper.

**23.** The article of claim 21, wherein said sidewall has a uniform cross-section.

**24.** The article of claim 21, wherein said lip has a tapered cross-section.

**25.** The article of claim 21, wherein said inner surface of said sidewall is flush with said inner surface of said lip.

**26.** The article of claim 21, wherein said sidewall and said lip are formed as an integral piece.

**27.** The article of claim 21, wherein said projecting edge is spaced above said top surface of said support.

**28.** The article of claim 21, wherein said lip has a front edge provided with at least one notch therein.

**29.** An article of footwear comprising an upper; and an outsole attached to said upper; said outsole comprising a foot-shaped support having a top surface, a bottom surface and a peripheral edge, an upstanding member extending circumferentially about said support adjacent said peripheral edge, said member having an inner surface and an outer surface, said member providing an outwardly projecting edge adjacent said peripheral edge circumscribing said support, said top surface of said support and said inner surface of said member forming a hollow region adapted for receiving a human foot, said upper attached to said outer surface of said member adjacent said outwardly projecting edge.

**30.** The article of claim 29, wherein said projecting edge is formed by a portion of said top surface of said support adjacent said peripheral edge and an adjacent portion of said outer surface of said member.

**31.** The article of claim 29, wherein said projecting edge has a width no less than about a width of an edge portion of an upper adapted to be secured to said member.

**32.** The article of claim 29, wherein said member has a front edge provided with at least one notch therein.

**33.** The article of claim 29, wherein said member has an upper portion which is tapered in cross-section and a lower portion of uniform cross-section.

**34.** The article of claim 29, wherein said member comprises an upstanding sidewall circumscribing said peripheral edge of said support, said sidewall having an inner surface and an outer surface; and an upstanding lip extending circumferentially about said sidewall, said lip having an inner surface and an outer surface, said outer surface of said lip forming with said outer surface of said sidewall said projecting edge circumscribing said sidewall, said outer surface of said lip adapted for securing a portion of an upper thereto.

**35.** The article of claim 34, wherein said projecting edge has a width no less than about a width of an edge portion of an upper adapted to be secured to said lip.

**36.** The article of claim 34, wherein said sidewall has a uniform cross-section.

**37.** The article of claim 36, wherein said lip has a tapered cross-section.

**38.** The article of claim 36, wherein said inner surface of said sidewall is flush with said inner surface of said lip.

**39.** The article of claim 36, wherein said sidewall and said lip are formed as an integral piece.

**40.** The article of claim 34, wherein said lip has a front edge provided with at least one notch therein.

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