US 20020104174A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2002/0104174 A1

Bartlett et al. (43) Pub. Date: Aug. 8, 2002

(54) SAFETY FOOTWEAR HAVING METATARSAL GUARD, AND METHODS

(76) Inventors: **Timothy Joe Bartlett**, Lake City, MN (US); **James Alan Isaacson**, Cannon Falls, MN (US)

Correspondence Address:
MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903 (US)

(21) Appl. No.: **09/777,411**

(22) Filed: **Feb. 6, 2001**

Publication Classification

(51) **Int. Cl.**[7] **A43B 23/00**

(52) **U.S. Cl.** ..... **12/145**; 12/146 D; 36/72 R

(57) **ABSTRACT**

A metatarsal guard inserted in the upper of a safety shoe is made of plastic and defines an arch extending from the sole of the shoe on one side of the wearer's instep to the sole on the other side of the wearer's instep. A rear portion of the metatarsal guard includes at least one longitudinal tongue extending away from the toe portion of the guard, preferably three tongues. An appropriately sized metatarsal guard is used for each size of footwear. The guard is shaped and size by the last used to make the footwear.

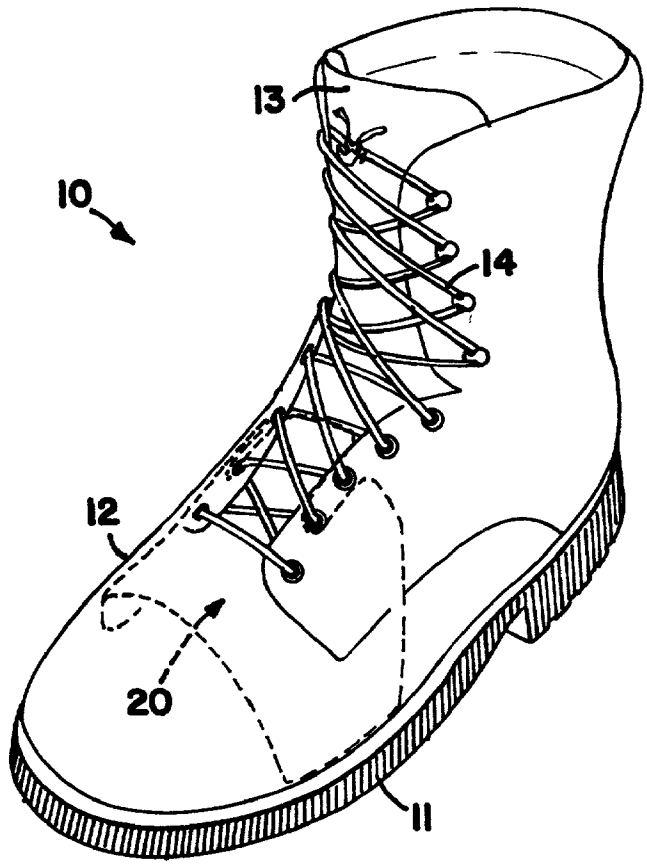
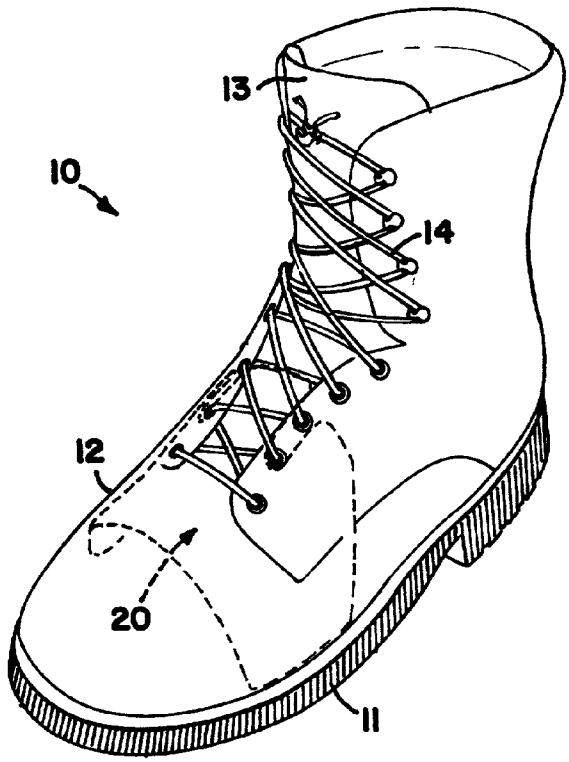


FIG. 1



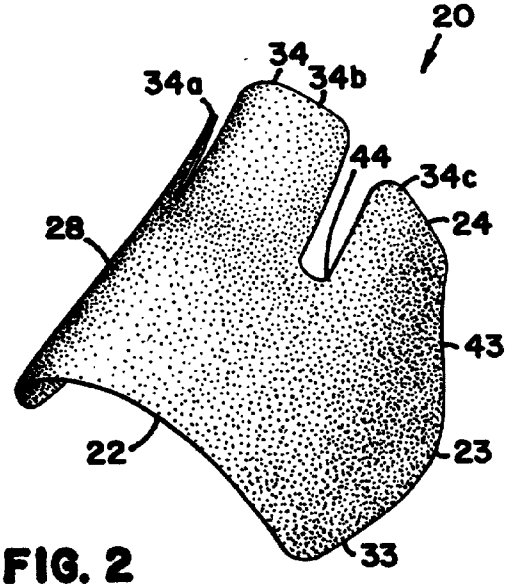


FIG. 2

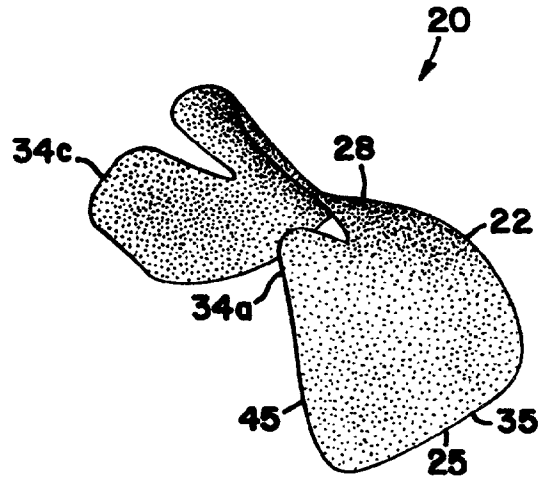


FIG. 3

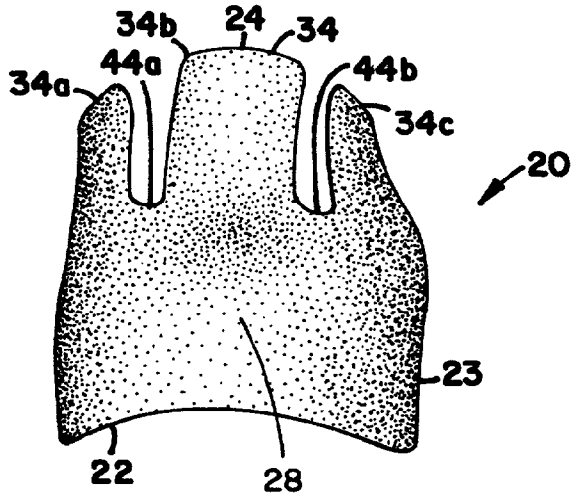


FIG. 4

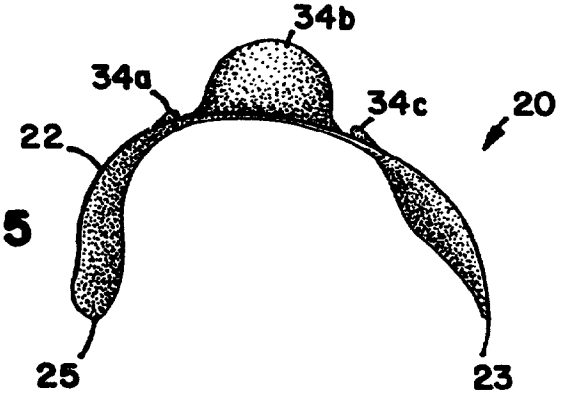


FIG. 5

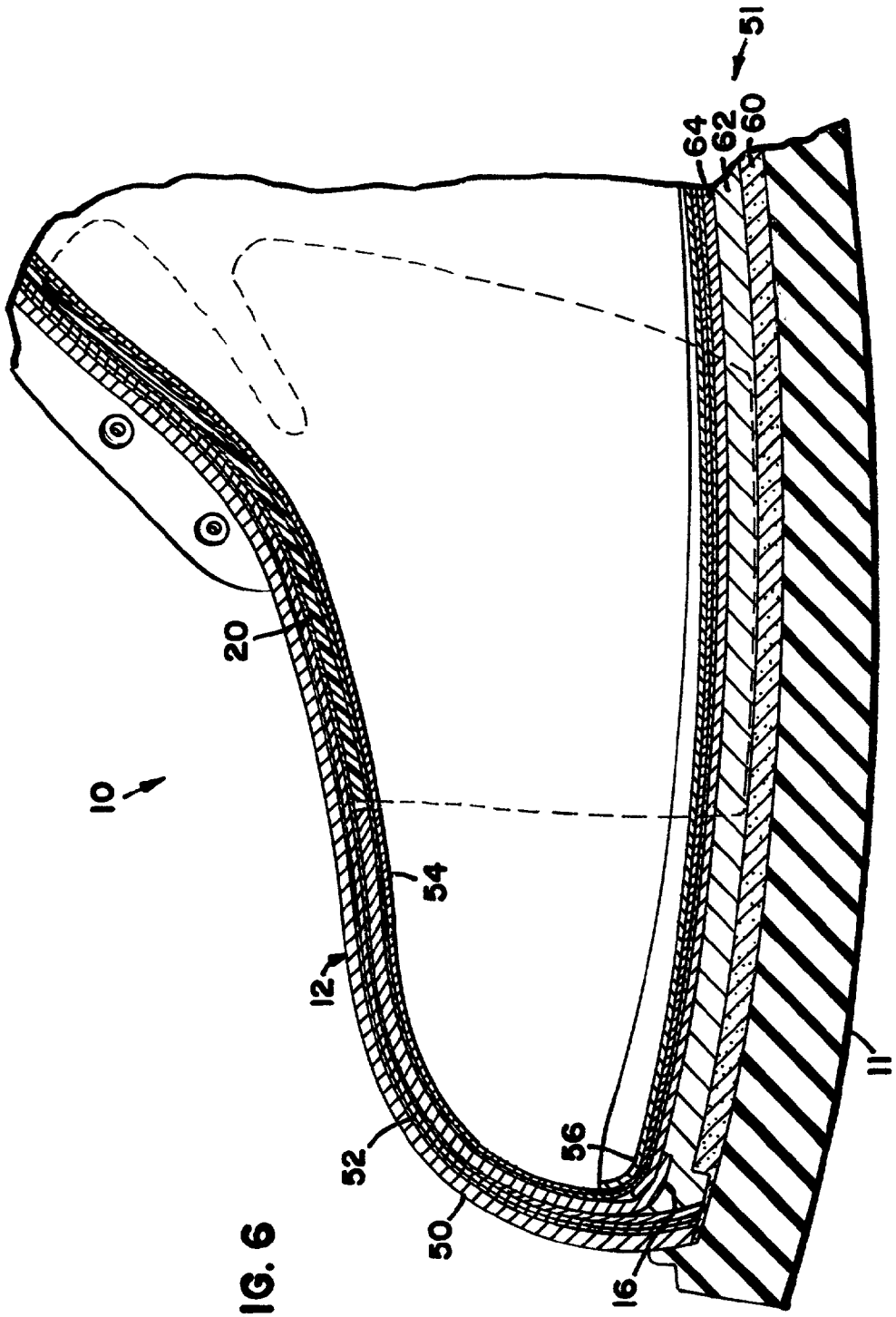


FIG. 6

SAFETY FOOTWEAR HAVING METATARSAL GUARD, AND METHODS

[0001] This application is directed to safety footwear. In particular, this application is directed to footwear having a metatarsal guard to protect the wearer's instep, and methods of making the metatarsal guard.

BACKGROUND OF THE INVENTION

[0002] Many industries, particularly construction, production, and assembly industries, require that workers wear safety footwear to protect their feet against injury caused by falling objects, or by crushing activities. Even the most simple safety footwear includes a built-in toe protector, which is usually from steel or other metal. The toe protector is incorporated into the footwear during construction of the footwear and is an integral part of the shoe or boot. From here comes the common term "steel toed shoes" or "steel toed boots".

[0003] The toe protector provides a protective box around the toes to protect the toes from falling and crushing objects. However, the toe protector typically extends only over the toes and a small portion of the rest of the foot. This leaves the remainder of the foot, in particular the instep, or metatarsal region, exposed to falling and crushing objects.

[0004] To protect the instep from injury, many types of footwear, specifically boots, incorporate a metatarsal guard in the construction. In older designs, the metatarsal guard is positioned on the exterior surface of the footwear; however, in most modern designs, the guard is positioned between various layers of the footwear construction. The metatarsal guard extends from the toe protector up over the instep or metatarsal area of the foot. Generally, the metatarsal guard is separate from, and not connected to, the toe protector. This allows the footwear to flex as the foot is moved. To improve flexibility of the metatarsal guard and the footwear, various segmented designs of metatarsal guards are known.

[0005] What is desired is an improved internal metatarsal guard that provides adequate instep protection yet can be easily incorporated into the construction of the footwear and that is comfortable to the wearer.

SUMMARY OF THE INVENTION

[0006] The present invention provides a metatarsal guard that can be easily molded from a polymeric material and incorporated into footwear. The metatarsal guard has a front edge which, when the guard is incorporated into footwear such as a boot, is in close proximity to a metal toe protector. The metatarsal guard has an opposite back edge, which defines at least one tongue, the tongue extending away from the toe protector.

[0007] Specifically, the invention is directed to a unitary metatarsal guard comprising a unitary, non-segmented body defined by a front edge, a continuous inner edge, a continuous outer edge, and a back edge. The body includes an impact-absorbing portion from which extends the tongue, the tongue extending longitudinally from the impact-absorbing portion and defined by the back edge. The tongue is generally flexible in relation to the impact-absorbing portion; that is, the tongue flexes, preferably at an area where the tongue joins a major portion of the impact-absorbing portion. The guard can include a second tongue and a third tongue, each of the second tongue and the third tongue also extending longitudinally from the impact-absorbing portion and defined by the back edge. Typically, the metatarsal guard is made from a polymeric material.

[0008] The metatarsal guard is intended to be incorporated into safety footwear, such as a work boot. Such safety footwear comprises a sole, an upper, and the metatarsal guard positioned within the upper. The present invention is directed to providing an appropriately sized metatarsal guard for a narrow range of different footwear. In accordance with the present invention, the metatarsal guard is generally sized and shaped to the shape of the boot, in particular, to the upper, in which the guard will be incorporated. Preferably, the metatarsal guard is specifically sized and shaped to the shape of the upper. Thus, in one embodiment, a metatarsal guard for a size 8 boot has a different shape and size than a guard for a size 10 boot, which is different than for a size 12 boot, and so on. In some embodiments, a guard may be used for a range of sizes, such as sizes 8, 8½ and 9.

[0009] The present invention also provides methods for making the metatarsal guard. The guard can be molded into its three-dimensional shape either from a flat sheet of plastic, or from an unshaped mass of material. In either method, the metatarsal guard is shaped and sized by the last used for the making of the boot in which the guard will be incorporated, or by using the shape of the last used to make the boot. In some embodiments, the last or shape of the last is used to form a mold that is used to form the metatarsal guard. This provides a metatarsal guard that better fits with the footwear in which it is incorporated.

[0010] Specifically, the invention includes a method of making safety footwear, the safety footwear comprising a sole, an upper, and a metatarsal guard. The method comprises the steps of forming a metatarsal guard having a shape determined by a last, and building the safety footwear on the last. Generally, different sized footwear will have a different sized metatarsal guard. For example, four different metatarsal guards can be provided: (1) for shoe sizes 6 to 8½; (2) for sizes 9 to 10½; (3) for sizes 11 to 12½; and (4) for sizes 13 to 14. It is understood that other numbers of different metatarsal guards can be provided for a line of footwear.

[0011] The objects, advantages and other features of the present invention will be more apparent upon reading the following non-restrictive description, given by way of example only with reference to the accompanying figures.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] **FIG. 1** is a perspective view of a boot, showing, in phantom, placement of a metatarsal guard;

[0013] **FIG. 2** is a top and side perspective view of a metatarsal guard of a preferred embodiment of the invention;

[0014] **FIG. 3** is a rear perspective view of the metatarsal guard of **FIG. 2**;

[0015] **FIG. 4** is a top perspective view of the metatarsal guard of **FIGS. 2 and 3**;

[0016] **FIG. 5** is a perspective view from the front side of the metatarsal guard of FIGS. **2-5**; and

[0017] **FIG. 6** is a cross-sectional view of a boot, showing various layers of the boot including the metatarsal guard.

DETAILED DESCRIPTION OF THE DRAWINGS

[0018] In **FIG. 1**, footwear, specifically a boot, **10** is shown. Boot **10** is a commonly referred to as a "safety boot", having features therein as required to meet minimum safety standards, such as provided by regulatory agencies such as OSHA. Boot **10** includes various features such as a sole **11**, an upper **12**, a tongue **13**, and laces **14**. Boot **10** also includes a metatarsal guard **20**, shown in phantom. Metatarsal guard **20** is incorporated within the structure of boot **10**, between various layers, as will be described in detail in reference to **FIG. 6**. Referring again to boot **10** in **FIG. 1**, metatarsal guard **20** is positioned so as to protect the instep or metatarsal region of a wearer's foot.

[0019] In **FIGS. 2 through 5**, a metatarsal guard in accordance with the present invention is generally identified by the reference numeral **20**. It is noted that although **FIGS. 2 through 5** illustrate a metatarsal guard **20** intended for use in a left footed boot, it should be understood that the right metatarsal guard would be identical, but the mirror image, of the left guard **20**.

[0020] Metatarsal guard **20** has a generally arched shape that follows the natural shape of the top of the foot's instep. This arched shape extends both laterally across the foot, from an inside edge of the sole to an outside edge of the sole, and longitudinally along the foot, from the toes to the ankle. The specific arch of guard **20** is defined by the last used to produce boot **10**, which is also used to size and shape guard **20**, as will be described below. Guard **20** extends longitudinally or rearwardly from a front edge **22** at the toes to a back edge **24** to cover the wearer's instep. Guard **20** has an outer edge **23**, seen best in **FIG. 2**, and an inner edge **25**, seen best in **FIG. 3**; outer edge **23** is positioned at the outside edge of the foot's sole, and inner edge **25** is positioned at the inner edge of the sole. Edges **23**, **25** extend from front edge **22** to back edge **24**, and together, these edges **22**, **23**, **24**, **25** define the perimeter of guard **20**.

[0021] Front edge **22** is a continuous edge extending continuously and uninterrupted from outer edge **23** to inner edge **25** across the wearer's instep. Front edge **22** is preferably sized and shaped to follow the contours of a toe protector that would be incorporated into boot **10**. Front edge **22** should not overlap the toe protector, nor should a large gap be left between the toe protector and front edge **22** when guard **20** is incorporated into boot **10**. Front edge **22** transitions, with a curvature, into outer edge **23** and inner edge **25**. In some embodiments, it may be desired to include recesses or other such structures into front edge **22** to modify the flexibility or comfort of guard **20**.

[0022] As stated above, outer and inner edges **23**, **25** extend from front edge **22** to back edge **24**. Outer edge **23** defines an outer lateral edge surface **33** and inner edge **25** defines an inner lateral edge surface **35**, both lateral edge surfaces **33**, **35** resting on either the top surface of sole **11** or some other layer parallel, or essentially parallel, to sole **11** of safety boot **10**. Lateral edge surfaces **33**, **35** extend at least a portion of the length of edges **23**, **25**, and not necessarily the entire length thereof. Metatarsal guard **20** therefore is an arched structure extending from sole **11** (or another layer closely positioned to and generally parallel to sole **11**) on the inner side of the foot to the sole **11** on the outer side of the foot. In such a way, metatarsal guard **20** is supported by sole **11** or another associated layer to prevent falling objects from striking and injuring the wearer's foot, specifically the instep. This arched area, from outer edge **23** to inner edge **25**, is generally referred to as an impact-absorbing portion **28**. Accordingly, when an object falls on the metatarsal guard **20**, specifically on impact-absorbing portion **28**, the force is applied to the sole **11** and not on the wearer's foot.

[0023] As can be seen in the various Figures, metatarsal guard **20**, particularly impact-absorbing portion **28**, is a unitary structure. That is, guard **20** is preferably not composed of multiple segments, or multiple pieces. Guard **20** has a generally smooth, uninterrupted structure. This smooth, uninterrupted structure is evident at impact-absorbing portion **28**, and at front edge **22**, and outer and inner edges **23**, **25**. It is understood that attached to guard **20** may be a pad or other cushioning to increase comfort when incorporated into footwear, however guard **20** itself, in particular impact-absorbing portion **28**, is a unitary structure.

[0024] Outer edge **23** includes a transition edge **43** that extends from outer lateral edge surface **33** to back edge **24**. Similarly, inner edge **25** includes a transition edge **45** that extends from inner lateral edge surface **35** to back edge **24**. In most guard designs, there is no definite point where transition edges **43**, **45** begin or end; rather, transition edges **43**, **45** are smooth transitional regions that can be viewed as a part of either edges **23**, **25**, or of back edge **24**. In most embodiments, transition edges **43**, **45** define a portion of a tongue **34**.

[0025] Back edge **24** of metatarsal guard **20** defines at least one tongue **34**, and typically a plurality of tongues **34**, such as inner tongue **34***a*, center tongue **34***b*, and outer tongue **34***c*, which protrude longitudinally away from impact-absorbing portion **28** and front edge **22**. Although tongues **34** are not considered as part of impact-absorbing portion **28** in this discussion, it is understood that tongues **34** nevertheless provide protection to the metatarsal area of the foot by absorbing impact and protecting the metatarsal area from forces. Metatarsal guard **20** may have either an odd number of tongues **34**, i.e., one, three, five, etc., so that a central tongue is positioned at the peak or center of the wearer's instep, or guard **20** may have an even number of tongues **34**, i.e., two, four, etc., so that the inner and outer sides have the same number of tongues **34**. The preferred embodiment, shown in **FIGS. 2 through 5**, has three tongues **34**, specifically **34***a*, **34***b*, **34***c*. Tongues **34** are generally rectangular or trapezoidal in shape, but it is not necessary that tongues **34***a*, **34***b*, **34***c* have the same shape. Tongue **34** is generally about one to two inches (about 2.5 to 5 cm) long, and the width will depend on the number of tongues **34** present. For a guard **20** with three tongues **34**, the width is generally about one to two inches (about 2.5 to 5 cm).

[0026] Tongue **34** is flexible in relation to impact-absorbing portion **28**; that is, tongue **34** can be flexed, although tongue **34** is a unitary piece with impact-absorbing portion **28**.

[0027] If there is a plurality of tongues **34**, adjacent tongues **34** are separated by a slit, recess or groove **44**. Referring to **FIG. 4**, tongues **34***a* and **34***b* have groove **44***a* therebetween, and tongues **34***b* and **34***c* have groove **44***b* therebetween. Grooves **44** extend between multiple tongues **34** and terminate at a concave or radiused region. Grooves

44 can terminate at a square or angled end, although a curved end is preferred. The width of grooves **44** is generally about 0.5 to 2 cm. It is noted that inner tongue **34***a* is defined or bounded by groove **44***a* and transition edge **45**, and that outer tongue **34***c* is defined or bounded by groove **44***b* and transition edge **43**.

[**0028**] Tongues **34** increase the flexibility of metatarsal guard **20** and increase the wearer's comfort by improving the conformity of metatarsal guard **20** to the wearer's foot. Adjacent tongues **34** will typically spread apart from each other to follow the movement of the foot when the wearer is walking, thereby preventing metatarsal guard **20** from pinching, squeezing, or otherwise impeding or hindering walking or other movement. Crouching is one particular movement in which the foot flexes significantly and the probability of pinching, squeezing or the like, is high. Tongues **34** provide significantly enhanced comfort, compared to a guard without tongues, when the wearer is crouching.

[**0029**] To increase flexibility of the metatarsal guard **20** and improve flexing capabilities when the wearer is walking, moving, or in a crouching posture, side slits or other areas of weakness, which extend from either or both of outer edge **23** and inner edge **25** to the center of guard **20**, may be present. However, any such slit should extend no more than about half of the distance to a centerline between outer edge **23** and inner edge **25**, preferably no more than about 35% of the distance.

[**0030**] As seen throughout **FIGS. 2 through 5**, metatarsal guard **20** is not symmetric from one side to the other side. For example, outer edge **23** is shaped different than inner edge **25**; transition edge **43** is shaped different than transition edge **45**; and tongue **34***a* is different than tongue **34***c*. As best seen in **FIG. 5**, the overall arch or shape of metatarsal guard **20**, in both the lateral and longitudinal directions, is unsymmetrical. Such an unsymmetrical design is modeled after the last used to build a shoe, which is modeled after the structure of a typical foot, particularly the instep or metatarsal region.

[**0031**] Metatarsal guard **20** is made from a stiff, yet slightly flexible plastic material that is capable of providing impact resistance yet flexibility. Preferred plastic materials for guard **20** include ABS (acrylonitrile-butadiene-styrene) resins, polycarbonate, high density polyethylene, and high density polypropylene. "Kydex," an acrylic polyvinyl chloride alloy plastic available from Rohm & Haas, is also a preferred plastic material.

[**0032**] Metatarsal guard **20** is formed by molding, thermoforming, or by other such techniques that can provide the desired, three-dimensional, shape to the plastic material. Guard **20** is a unitary, non-segmented piece, that has an overall smooth and continuous form. In accordance with the present invention, metatarsal guard **20** is sized and shaped approximately to the specific size of boot in which guard **20** will be incorporated. In one embodiment, four different metatarsal guards **20** are provided: (1) for shoe sizes 6 to 8½; (2) for sizes 9 to 10½; (3) for sizes 11 to 12½; and (4) for sizes 13 to 14, these sizes being U.S. standard sizes. In another embodiment, an individual metatarsal guard can be shaped and sized for a more narrow range of sizes. For example, (1) for shoe sizes 6 and 6½; (2) for sizes 7 and 7½; (3) for sizes 8 and 8½; and so on.

[**0033**] The number of metatarsal guards designed for a line of footwear is dependent on the overall range of sizes in the line, and the number of sizes for each guard. So although metatarsal guard **20** may not be exactly sized for the boot or other footwear (e.g., a size 10 guard for a size 9 boot), it is approximately sized. Further, although the sizes listed here are given in U.S. standard sizes, it is understood that the metatarsal guard of the invention can be used with any footwear sizing system (e.g., European sizing), and can be used for any width of footwear. In some embodiments, it is desired to form two different metatarsal guards **20** for each range of shoe sizes. For example: (1) for AAA to B widths for sizes 6 to 8½; (2) for C to EEE widths for sizes 6 to 8½; (3) for AAA to B widths for sizes 9 to 10½; and so on. In other embodiments, a single metatarsal guard is used for the entire spectrum of widths, or, any number of guards can be used for the range of widths.

[**0034**] In a first embodiment, a flat sheet, or a generally flat sheet, of plastic material is formed to the desired shape of the metatarsal guard **20**. It is not necessary that the sheet has the same thickness throughout; in some embodiments the sheet has varying thickness. The flat plastic sheet is preferably in the final perimeter shape, with the various edges **22**, **23**, **24**, **25** and tongues **34** present in the sheet prior to forming or molding the sheet to the three dimensional form. The sheet may be stamped, die cut, laser cut, water cut, or otherwise formed to the desired flat shape. The flat sheet could also be molded, such as by injection molding or other form molding. The flat sheet is then formed, typically with the application of heat, to the shaped, three-dimensional metatarsal guard **20**. After forming to the desired three-dimensional form, guard **20** is cooled.

[**0035**] In a second embodiment, the shaped metatarsal guard **20** is molded, such as by injection molding, from a mass of polymeric material, often available as pellets.

[**0036**] In either method, whether forming the three-dimensional guard **20** from a flat sheet or from an unshaped mass of material, the overall three-dimensional shape and size of metatarsal guard **20** is provided by the last used to shape and size boot **10**. In some instances, the same last will be used to shape and size metatarsal guard **20** and boot **10**, but in most instances, the shape of the last used to make boot **10** is used to shape metatarsal guard **20**. In the case where metatarsal guard **20** is injection molded from a mass of material, the mold used to form guard **20** was formed by the last. By using the last for forming metatarsal guard **20**, guard **20** better fits into the construction of boot **10**, thereby providing a more comfortable fit for the boot wearer and also improving the appearance of the exterior surface of boot **10**.

[**0037**] The size of metatarsal guard **20** is such that metatarsal guard **20** comfortably extends across the wearer's foot with each of outer lateral edge surface **33** and inner lateral edge surface **35** contact either sole **11** or a layer parallel to sole **11** of boot **10**. As the length of boot **10** increases, such as from a size 8 to a size 9 to a size 10, and so on, the overall size or volume of boot **10** also increases. In order for the size or volume of boot **10** to increase, the upper **12** (**FIG. 1**), in which metatarsal guard **20** is incorporated, also increases. Thus in order for metatarsal guard **20** to properly function and to be comfortable, metatarsal guard **20** should also increase in volume. The present invention is directed to providing an appropriately sized metatarsal guard **20** for each size of footwear.

[**0038**] For example, a metatarsal guard for a size 10 men's workboot has a front edge **22** having a length of about 3½

inches (about 8.75 cm), an outer edge **23** having a length of about 3 inches (about 7.5 cm) (with the transition edge **43** being about 1½ inches (about 3.75 cm)), and an inner edge **25** having a length of about 2½ inches (about 6.25 cm) (with the transition edge **45** being about 2 inches (about 5 cm)). The length between front edge **22** and the farthest point of tongue **34**, specifically tongue **34***b*, is about 3½ inches (about 8.75 cm). The thickness of guard **20**, specifically of impact-absorbing portion **28** at each front edge **22**, outer edge **23**, inner edge **25** and at tongue **34***a* is about 0.070 inch (about 1.75 mm).

[**0039**] In contrast, a metatarsal guard for a size 8 men's work boot has a front edge **22** having a length of about 3¼ inches(about 8.125 cm), an outer edge **23** having a length of about 2½ inches (about 6.25 cm) (with the transition edge **43** being about 1¼ inches (about 3.125 cm)), and an inner edge **25** having a length of about 2¼ inches (about 5,625 cm) (with the transition edge **45** being about 1⅞ inches (about 4.69 cm)). The length between front edge **22** and the farthest point of tongue **34**, specifically tongue **34***b*, is about 3¼ inches (about 8.125 cm). The thickness of guard **20**, specifically of impact-absorbing portion **28** at each front edge **22**, outer edge **23**, inner edge **25** and at tongue **34***a* is about 0.070 inch (about 1.75 mm).

[**0040**] Further in contrast, a metatarsal guard for a size 14 men's work boot has a front edge **22** having a length of about 4⅛ inches (about 10.3 cm), an outer edge **23** having a length of about 3¼ inches (about 8.125 cm) (with the transition edge **43** being about 2 inches (about 5 cm)), and an inner edge **25** having a length of about 2¾ inches (about 6.875 cm) (with the transition edge **45** being about 2⅛ inches (about 5.3 cm)). The length between front edge **22** and the farthest point of tongue **34**, specifically tongue **34***b*, is about 3⅞ inches (about 9.69 cm). The thickness of guard **20**, specifically of impact-absorbing portion **28** at each front edge **22**, outer edge **23**, inner edge **25** and at tongue **34***a* is about 0.070 inch (about 1.75 mm).

[**0041**] For these three embodiments, when made from an acrylic polyvinyl chloride alloy plastic, it is preferred that metatarsal guard **20** has a thickness of 0.070+/−0.005 inch. This thickness provides the protection required by OSHA standards yet provides the needed flexibility to guard **20**. In some embodiments, the thickness may vary; for example, the thickness at front edge **22** may be greater than about tongue **34**.

[**0042**] As can be appreciated by one of ordinary skill in the footwear art, metatarsal guard **20** is inserted into and incorporated into upper **12** of safety boot **10**. In **FIG. 6, a** cross-section of boot **10** is shown having metatarsal guard **20** between an outer layer **50**, such as leather or other suitable material such as leather-like man-made materials, and an inner liner **54**. Typically, various other layers **52** are present in the boot construction; examples of typical layers **52** include polytetrafluoroethylene (known commonly under the tradename "Goretex") as a water barrier, insulation, and padding material. In most embodiments, additional layers, such as foam or other cushioning or padding materials, are present between metatarsal guard **20** and inner liner **54**.

[**0043**] As well known to those of ordinary skill in the art, boot **10** includes a toe protector or toe box **16**, which is generally made of steel in order to protect the wearer's toes against falling objects. Toe box **16** and metatarsal guard **20** are positioned within the construction so that front edge **22** of metatarsal guard **20** is in close proximity to the end of toe box **16**, with no greater than about 1 cm, typically no greater than about 0.5 cm of distance between the two. Typically toe box **16** and metatarsal guard **20** occupy the same layer within the boot construction.

[**0044**] Metatarsal guard **20** is shown in phantom, as extending down and resting on various layers **51** which are positioned on, and generally or essentially parallel to, sole **11**. In the particular boot **10** shown, various layers **51** include a cork,cork-like or other filler layer **60**, foam layer **62**, and a foam insole **64**. Inner and outer lateral edge surfaces **33, 35** are positioned against one of the various layers **51** so as to provide support for metatarsal guard **20**. A removable insole liner **56** is also shown in **FIG. 6**.

[**0045**] The above specification and examples provide a complete description of the manufacture and use of the invention. Since many embodiments of the invention can be made without departing from the spirit and scope of the invention, the invention resides in the claims hereinafter appended.

What is claimed:

1. A method of making a safety footwear, the safety footwear comprising a sole, an upper including a first layer and a second layer, and a metatarsal guard positioned between the first and second layers of the upper, the method comprising the steps of:

(a) forming a metatarsal guard having a shape determined by a first last;

(b) building the safety footwear on a second last, wherein the first last and the second last have the same shape.

2. The method according to claim 1, wherein the step of forming a metatarsal guard having a shape determined by a first last comprises:

(a) molding a sheet of material to the first last to provide the metatarsal guard.

3. The method according to claim 1, wherein the step of forming a metatarsal guard having a shape determined by a first last comprises:

(a) injection molding a mass of material using a mold having been shaped by the first last.

4. The method according to claim 1, wherein the step of building the safety footwear on a second last comprises:

(a) providing the sole;

(b) positioning the metatarsal guard between the first layer and the second layer of the upper; and

(c) attaching the upper to the sole.

5. The method according to claim 4, wherein the step of positioning the metatarsal guard between the first layer and the second layer of the upper is done prior to the step of attaching the upper to the sole.

6. The method according to claim 4, the safety footwear further comprising a safety toe box, the method further comprising:

(a) positioning the toe box between the first layer and the second layer of the upper.

7. The method according to claim 1, wherein the first last and the second last are the same last.

8. A method of making a metatarsal guard, the method comprising:

(a) shaping a flat sheet of plastic by a mold, the mold having a shape and size of a last, the last being used to construct footwear into which the metatarsal guard will be incorporated.

9. The method according to claim 8, wherein the step of shaping a flat sheet of plastic by a mold comprises:

(a) heating the flat sheet of plastic to the shape of the last.

10. A metatarsal guard made by the process of:

(a) shaping a flat sheet of plastic by a mold, the mold having a shape and size of a last, the last being used to construct footwear into which the metatarsal guard will be incorporated.

11. A method of making a plurality of safety footwear, the plurality of safety footwear being similar except for their size, the plurality comprising a first footwear having a first size, a second footwear having a second size different than the first size, and a third footwear having a third size different than each of the first size and the second size, the method comprising:

(a) making the first footwear on a first last, comprising the steps of:

(i) forming a first metatarsal guard having a shape determined by a second last, the second last having a shape similar to a shape of the first last;

(ii) building the first footwear on the first last;

(b) making the second footwear on a third last, comprising the steps of:

(i) forming a second metatarsal guard having a shape determined by a fourth last, the fourth last having a shape similar to a shape of the third last;

(ii) building the second footwear on the third last;

(c) making the third footwear on a fifth last, comprising the steps of:

(i) forming a third metatarsal guard having a shape determined by a sixth last, the sixth last having a shape similar to a shape of the fifth last;

(ii) building the third footwear on the fifth last.

12. The method according to claim 11, wherein the first footwear has a first size, the second footwear has a second size, and the third footwear has a third size.

13. A unitary metatarsal guard comprising a unitary, non-segmented body defined by a front edge, a continuous inner edge, a continuous outer edge, and a back edge, the body comprising an impact-absorbing portion having a thickness of about 0.065 to 0.075 inches, and a first tongue, a second tongue, and a third tongue, each of the tongues extending longitudinally from the impact-absorbing portion and defined by the back edge, with the body made from a polymeric material from the group of acrylonitrile-butadiene-styrene, polycarbonate, high density polyethylene, high density polypropylene, and acrylic polyvinyl chloride alloy plastic.

* * * * *