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 - (71) Applicant (for all designated States except US): **2001 BRANDS, INC.** [US/US]; 24 Scott Road, Fitchburg, MA 01420 (US).
 - (72) Inventor; and
 - (75) Inventor/Applicant (for US only): **HEARN, William, L.** [US/US]; 24 Scott Road, Fitchburg, MA 01420 (US).
 - (74) Agent: **PRATT, Shannon**; Wolf, Greenfield & Sacks, P.C., Federal Reserve Plaza, 600 Atlantic Avenue, Boston, MA 02210-2206 (US).
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(54) Title: FOOTWEAR WITH INSTEP FOOTSTRAP

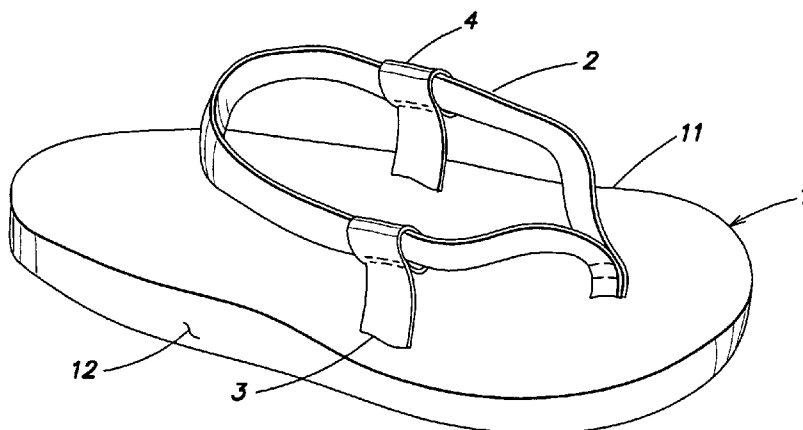


FIG. 1

(57) Abstract: Footwear including a sole, a footstrap constructed to extend over at least a portion of the wearer's foot and secure the foot to the footwear, a medial footstrap stay and a lateral footstrap stay attached to medial and lateral sides of the sole, respectively, is provided. The footstrap may be secured to the sole near the toe end of the sole and may have a loop portion that extends rearwardly from the toe end along the medial and lateral sides of the sole and extends across the sole approximately near a mid-foot region of the sole. The medial and lateral stays may be arranged to slidably engage with the loop portion of the footstrap so that the loop portion can move in a heel-to-toe direction relative to the stay. The medial stay may be attached to the sole at a location that is nearer the toe end of the sole than a location where the lateral stay is attached to the sole. The loop portion may have a cross-sectional area that varies along its length.



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FOOTWEAR WITH INSTEP FOOTSTRAP

FIELD OF INVENTION

The present invention relates to footwear with a foot strap.

SUMMARY OF INVENTION

In one illustrative embodiment, footwear includes a sole with a footbed constructed to support a wearer's foot and a bottom portion constructed to contact a surface on which the wearer stands when wearing the footwear, the sole having medial and lateral sides, a toe end and a heel end. The footwear also includes a footstrap constructed to extend over at least a portion of the wearer's foot and secure the foot to the footwear, the footstrap being secured to the sole near the toe end of the sole and having a loop portion that extends rearwardly from the toe end along the medial and lateral sides of the sole and extends across the sole approximately near a mid-foot region of the sole. The footwear also includes a medial footstrap stay and a lateral footstrap stay attached to medial and lateral sides of the sole, respectively, the medial and lateral stays each being arranged to slidably engage with the loop portion of the footstrap so that the loop portion can move in a heel-to-toe direction relative to the stay, the medial stay being attached to the sole at a location that is nearer the toe end of the sole than a location where the lateral stay is attached to the sole.

In another illustrative embodiment, footwear includes a sole with a footbed constructed to support a wearer's foot and a bottom portion constructed to contact a surface on which the wearer stands when wearing the footwear, the sole having medial and lateral sides, a toe end and a heel end. The footwear also includes a footstrap constructed to extend over at least a portion of the wearer's foot and secure the foot to the footwear, the footstrap being secured to the sole near the toe end of the sole and having a loop portion that extends rearwardly from the toe end along the medial side of the sole, extends to the lateral side of the sole and extends forwardly along the lateral side toward the toe end. The footwear also includes a medial footstrap stay and a lateral footstrap stay attached to medial and lateral sides of the sole, respectively, the medial and lateral stays each being arranged to slidably engage with the loop portion of the footstrap so that the loop portion can move in a heel-to-toe direction relative to the stay, where the loop portion has a cross-sectional area that varies along its length.

BRIEF DESCRIPTION OF DRAWINGS

In the drawings, each identical or nearly identical component that is illustrated in the various figures is represented by a like numeral. For purposes of clarity, not every component may be labeled in every drawing.

Various embodiments of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

FIG. 1 illustrates a piece of footwear according to one embodiment;

FIG. 2 illustrates a medial side view of piece of footwear shown in FIG. 1;

FIG. 3 illustrates a piece of footwear according to one embodiment shown on a wearer's foot;

FIG. 4 illustrates a top view of the piece of footwear on a wearer's foot shown in FIG. 3;

FIG. 5 illustrates a footstrap according to another embodiment;

FIG. 6 illustrates a piece of footwear according to another embodiment;

FIG. 7 illustrates a piece of footwear according to yet another embodiment;

FIG. 8 illustrates a piece of footwear according to another embodiment;

FIG. 9 illustrates a piece of footwear according to yet another embodiment; and

FIG. 10 illustrates a piece of footwear according to another embodiment.

DETAILED DESCRIPTION

Aspects of the invention relate to footwear, such as a flip-flop type sandal, that have a loop-shaped footstrap that extends over the top of the wearer's instep to keep the footwear engaged with the foot. A pair of stays, one each on medial and lateral sides of the sole, may attach the loop portion of the footstrap to the sole and allow the loop portion to exert force downwardly on the instep. A forward end of the footstrap may be attached at a toe end of the sole, e.g., in the manner of a toe bar on flip-flop type sandals, or may be unattached. This arrangement in accordance with aspects of the invention may provide advantages over existing flip flop sandals, including allowing the wearer to run or otherwise move the foot in ways that would commonly cause a flip flop sandal to come off of the foot. This is because in standard flip flop sandals, the footstrap that extends over the top of the wearer's foot does not exert any force on the foot, e.g., downward on the top of the foot, that helps keep the sandal on the foot. Instead, the footstrap in standard flip flop sandals fits loosely on the foot,

requiring the wearer to engage toes with the sandal or otherwise manipulate the foot to keep the sandal on in some situations. In contrast, footwear in accordance with aspects of the invention exert a type of light “clamping” force on the foot with a conforming footstrap in the general form of a flip flop sandal.

In one aspect of the invention, footwear, such as a sandal, includes a sole with a footbed constructed and arranged to support a wearer’s foot and a bottom portion constructed and arranged to contact a surface on which the wearer stands when wearing the footwear. The sole may have medial and lateral sides (sides adjacent an inside and outside of the wearer’s foot), a toe end and a heel end. A footstrap may extend over at least a portion of the wearer’s foot and secure the foot to the footwear, e.g., whether by way of exerting a “clamping” force on the foot or not. The footstrap may be secured to the sole near the toe end of the sole, e.g., in the manner of a toe bar, and have a loop portion that extends rearwardly from the toe end along the medial and lateral sides of the sole and extends across the sole approximately near the mid-foot region. A medial footstrap stay and a lateral footstrap stay may be attached to medial and lateral sides of the sole, respectively, and the medial and lateral stays may each be arranged to slidably engage with the loop portion of the footstrap so that the loop portion can move in a heel-to-toe direction relative to the stay. In one aspect of the invention, the medial stay may be attached to the sole at a location that is nearer the toe end of the sole than a location where the lateral stay is attached to the sole. For example, the inventor has found that an effective location for attachment of the medial stay to the sole is just rearward of the wearer’s ball-of-the-foot region. Similarly, an effective location for attachment of the lateral stay to the sole is just rearward of the wearer’s smallest toe joint region where the smallest toe attaches to the foot. This arrangement places the medial stay forward on the sole relative to the lateral stay, and has been found to improve comfort and ability of the footwear to engage with the foot.

Fig. 1 shows an illustrative embodiment of a piece of footwear that incorporates aspects of the invention. In the embodiments described, footwear configured for wearing on a left foot is shown. However, it will be understood that aspects of the invention may be extended to a right foot configuration, e.g., by forming a mirror image of the left foot embodiment. The sole 1 may be formed in any suitable way, such as by laminating or otherwise assembling two or more components (e.g., a footbed portion with a tread portion), injection molding, cutting or stamping from a larger piece of material, and so on. In this embodiment, the sole 1 is formed as a unitary member molded of a foam material. A footstrap 2 is attached to the sole 1 at a toe end of the sole 1, and may be arranged in any

suitable way. In this embodiment, the portion of the footstrap 2 attached to the sole 1 is arranged to function like a toe bar in flip flop sandals, i.e., to be positioned between the wearer's toes when the footwear is worn. The footstrap 2 extends rearwardly on lateral and medial sides 11 and 12 of the sole 1, and across the sole 1 near a mid-foot region. A medial stay 3 engages with the footstrap 2 on the medial side 12 of the sole 1, and a lateral stay 4 engages with the footstrap 2 on the lateral side 11 of the sole 1. Both of the stays 3 and 4 engage with the footstrap 2 so that the footstrap 2 may slide in the heel-to-toe direction relative to the stay 3, 4. Such engagement may be accomplished in any suitable way, such as by forming a sleeve at an upper end of the stay 3, 4 through which the footstrap 2 passes. In this embodiment, the stays 3, 4 are formed of a flat webbing that is folded back on itself and stitched to form a loop or sleeve at the upper end of the stay 3, 4. However, the stay 3, 4 may have a ring (e.g., formed of a plastic material) or other arrangement to engage with the footstrap 2 and allow for heel-toe movement of the footstrap 2. Of course, the footstrap 2 may be engaged with the stays 3, 4 in other ways. For example, in one embodiment, the footstrap 2 may have a vertical slot running along the length of the footstrap 2 near the connection point to the stays 3, 4. The stays 3, 4 may have a portion that passes up through the slot and is capped at the top or otherwise arranged to prevent the stay 3, 4 from pulling through the slot while still allowing heel-toe movement of the footstrap 2. In another embodiment, the stays 3, 4 may include a rigid member attached to the sole 1, and a hinge or sliding-type connection may be provided between the stay 3, 4 and the footstrap 2. In another embodiment, the sole may have a slot or channel running in a heel-toe direction, and a T-nut or other feature connected to the footstrap 2 may engage the slot, allowing the footstrap 2 to move in the heel-toe direction along the slot or channel, but otherwise securing the footstrap 2 to the sole 1. In other embodiments, the footstrap 2 may be fixed to the sole 1 or stays 3, 4, e.g., by stitching, adhesive, etc., and no heel-toe movement may be permitted of the footstrap 2 at the connection point to the sole 1 or stays 3, 4.

In one aspect of the invention, and as can be seen in Figs. 2 and 4, the medial stay 3 is positioned forward on the sole 1 relative to the lateral stay 4. In one embodiment as shown in Fig. 4, the medial stay 3 is attached to the sole 1 just rearward of the wearer's ball-of-the-foot region. The lateral stay 4 is attached to the sole 1 rearward of the wearer's smallest toe joint region, i.e., where the smallest toe attaches to the foot. As discussed above, this arrangement may help better engage the footwear on the wearer's foot.

As shown in Figs. 3 and 4, the portion of the footstrap 2 rearward of the stays 3, 4 passes over the wearer's instep region of the foot. The footstrap 2 and stays 3, 4 may be

arranged so that the footstrap 2 exerts a downward force on the instep, thus providing a light “clamping” force on the foot, helping to keep the footwear in place. Thus, the footstrap 2 may be resilient to provide the clamping force as well as remain comfortable on the foot. In one embodiment, the footstrap 2 may also be arranged to bias the stays 3, 4 toward the center of the sole 1, e.g., providing a mild squeezing of the foot between the stays 3, 4 in the view shown in Fig. 4. This squeezing coupled with the clamping on the instep may help maintain the footwear on the foot. These features together with the placement of the stays 3, 4 may provide a footstrap 2 that is conforming, yet very effective in maintaining the footwear in a desired position on the foot.

In one aspect of the invention, the footstrap 2 may have properties that vary along the length of the strap. For example, as shown in Fig. 5, the footstrap 2 may vary in cross-sectional area along its length so that the footstrap 2 has a smaller area near the toe end and a larger area near the instep region. This feature may allow the footstrap 2 to be more flexible and comfortable near the wearer’s toes, yet have greater stiffness in the instep region to provide desired force and/or greater size to improve comfort (e.g., by spreading the “clamping” force over a wider area) on the instep. In another embodiment, the footstrap 2 may have a stiffness that varies along the length of the footstrap 2 without having a varying cross-sectional area. For example, the footstrap 2 may have a softer material near the toe end, and a stiffer material near the instep region. In another aspect, the footstrap 2 may have a cross-sectional shape that varies along the length of the footstrap 2. In this embodiment, the footstrap 2 has a generally circular cross-section (e.g., is in the form of a tube), but the footstrap 2 may have any desired cross-sectional shape, e.g., square, rectangular, oval, flat or ribbon-shaped, and so on. In addition, the footstrap 2 shape may vary along its length, e.g., be flat or ribbon-shaped in the area near the toe end (e.g., in the area between the wearer’s toes), and have a circular cross-sectional shape in the instep region.

In one aspect of the invention, the footstrap 2 is formed to have a foam material positioned within an outer casing, such as a tubular nylon webbing, a braided tubing, a flat webbing wrapped around a foam core, or other. The foam may be arranged in the outer casing so that the foam is held under compression by the outer casing, which may help define the resiliency of the footstrap 2. The foam may be positioned within the outer casing in any suitable way, such as by forcing a cylindrically shaped foam member into a rigid tube that has a cross-sectional area or other size that is smaller than the cross-sectional area of the outer casing. With the rigid tube/foam positioned within the outer casing, the rigid tube may be removed while maintaining the foam in the outer casing. This action may release the foam,

which may expand and press against the inner wall of the outer casing. In another embodiment, the foam member may be initially sized to be smaller than the cross-sectional area of the outer casing and positioned within the outer casing. Thereafter, the foam member may be heated, causing the foam member to expand and press against the inner wall of the outer casing. Other techniques may be used to locate a foam member within an outer casing, such as injecting a liquid foam material in the outer casing that expands and stiffens after injection. Another technique is to wrap an outer casing around the foam member and stitch or otherwise fasten the outer casing in place.

As discussed above, the footstrap 2 may be attached to the sole 1 at the toe end in any suitable way, if attached at all. Fig. 6 shows one such alternative in which the toe end of the footstrap 2 is attached at two ends to a toe cap portion 13 of the sole 1. Other arrangements will occur to those of skill in the art. In another embodiment shown in Fig. 7, the footstrap 2 at the toe end may be joined together and be positioned over the wearer's toes, and not be attached to the sole 1. In another embodiment shown in Fig. 8, the footstrap 2 may terminate at the stays 3, 4 and only have a portion that extends over the instep region of the wearer's foot, e.g., the embodiment shown in Fig. 7 may be modified so that the portion of the footstrap forward of the stays 3, 4 is removed. The ends of the footstrap 2 forward of the stays 3, 4 may be capped (e.g., with caps 6) or otherwise arranged to prevent the footstrap ends from passing rearwardly through the stays 3, 4, yet still allow forward/rearward movement of the footstrap 2 relative to the stays 3, 4. Alternately, the footstrap 2 may not be movable in a heel/toe direction relative to the stays 3, 4. In another embodiment shown in Fig. 9, a pair of medial stays 3 and a pair of lateral stays 4 may be provided for the footstrap 2. The forward stays 3, 4 may be positioned near the point where the wearer's toes join the rest of the foot, and the rearward stays 3, 4 may be positioned on opposite sides of the wearer's instep. As with the other embodiments, the footstrap 2 may rest on top of the wearer's foot, i.e., at the instep and toe region. A heel strap may be additionally be provided with any of the embodiments, if desired. The heel strap may extend from the footstrap 2, from the stays 3, 4 or from the sole 1. In another embodiment shown in Fig. 10, a piece of footwear may include medial and lateral stays 3, 4 with a footstrap 2 as shown generally in Fig. 7, and additionally include a toe strap 5 near a forward end of the sole 1.

Having thus described several aspects of at least one embodiment of this invention, it is to be appreciated various alterations, modifications, and improvements will readily occur to those skilled in the art. Such alterations, modifications, and improvements are intended to be

part of this disclosure, and are intended to be within the spirit and scope of the invention. Accordingly, the foregoing description and drawings are by way of example only.

What is claimed is:

CLAIMS

1. Footwear comprising:
 - a sole including a footbed constructed and arranged to support a wearer's foot and a bottom portion constructed and arranged to contact a surface on which the wearer stands when wearing the footwear, the sole having medial and lateral sides, a toe end and a heel end;
 - a footstrap constructed and arranged to extend over at least a portion of the wearer's foot and secure the foot to the footwear, the footstrap being secured to the sole near the toe end of the sole and having a loop portion that extends rearwardly from the toe end along the medial and lateral sides of the sole and extends across the sole approximately near a mid-foot region of the sole; and
 - a medial footstrap stay and a lateral footstrap stay attached to medial and lateral sides of the sole, respectively, the medial and lateral stays each being arranged to slidably engage with the loop portion of the footstrap so that the loop portion can move in a heel-to-toe direction relative to the stay, the medial stay being attached to the sole at a location that is nearer the toe end of the sole than a location where the lateral stay is attached to the sole.
2. The footwear of claim 1, wherein the loop portion of the footstrap has a circular cross-section.
3. The footwear of claim 2, wherein the cross-sectional area of the loop portion varies along the length of the loop portion.
4. The footwear of claim 1, wherein the loop portion of the footstrap includes a tubular foam member.
5. The footwear of claim 4, wherein the tubular foam member is enclosed within a tubular casing.
6. The footwear of claim 5, wherein the tubular casing is a tubular webbing.
7. The footwear of claim 1, wherein the medial and lateral stays include a sleeve through which respective portions of the loop portion pass.

8. The footwear of claim 7, wherein the medial and lateral stays are formed from webbing that is arranged to form the sleeve.

9. The footwear of claim 1, wherein the medial stay is attached to the sole at a location that is just rearward of a wearer's ball-of-the-foot region when wearing the footwear.

10. The footwear of claim 1, wherein the lateral stay is attached to the sole at a location that is just rearward of a wearer's smallest toe joint region when wearing the footwear.

11. The footwear of claim 1, wherein the sole is molded of a foam material.

12. The footwear of claim 1, wherein the sole is molded as a unitary member.

13. The footwear of claim 1, wherein the footstrap has a toe bar portion that is attached to the toe end of the sole so as to be located between a wearer's toes when the footwear is worn.

14. The footwear of claim 1, wherein the loop portion located rearward of the stays is constructed and arranged to apply downward force on the wearer's instep region when the footwear is worn.

15. Footwear comprising:

a sole including a footbed constructed and arranged to support a wearer's foot and a bottom portion constructed and arranged to contact a surface on which the wearer stands when wearing the footwear, the sole having medial and lateral sides, a toe end and a heel end;

a footstrap constructed and arranged to extend over at least a portion of the wearer's foot and secure the foot to the footwear, the footstrap being secured to the sole near the toe end of the sole and having a loop portion that extends rearwardly from the toe end along the medial side of the sole, extends to the lateral side of the sole and extends forwardly along the lateral side toward the toe end; and

a medial footstrap stay and a lateral footstrap stay attached to medial and lateral sides of the sole, respectively, the medial and lateral stays each being arranged to slidably engage

with the loop portion of the footstrap so that the loop portion can move in a heel-to-toe direction relative to the stay,

wherein the loop portion has a cross-sectional area that varies along its length.

16. A method for forming a footstrap for footwear according to any one of claims 1-15, comprising:

positioning a foam member within an outer casing; and
expanding the foam member while the foam member is located within the outer casing.

17. The method of claim 16, wherein the step of positioning the foam member within the outer casing comprises:

positioning the foam member within a constriction member having cross-sectional area that is less than a final cross-sectional area of the foam member;
positioning the constriction member and foam member within the outer casing; and
removing the constriction member from the outer casing while maintaining the foam member within the outer casing.

18. The method of claim 16, wherein the step of expanding comprises:
heating the foam member so as to cause the foam member to enlarge.

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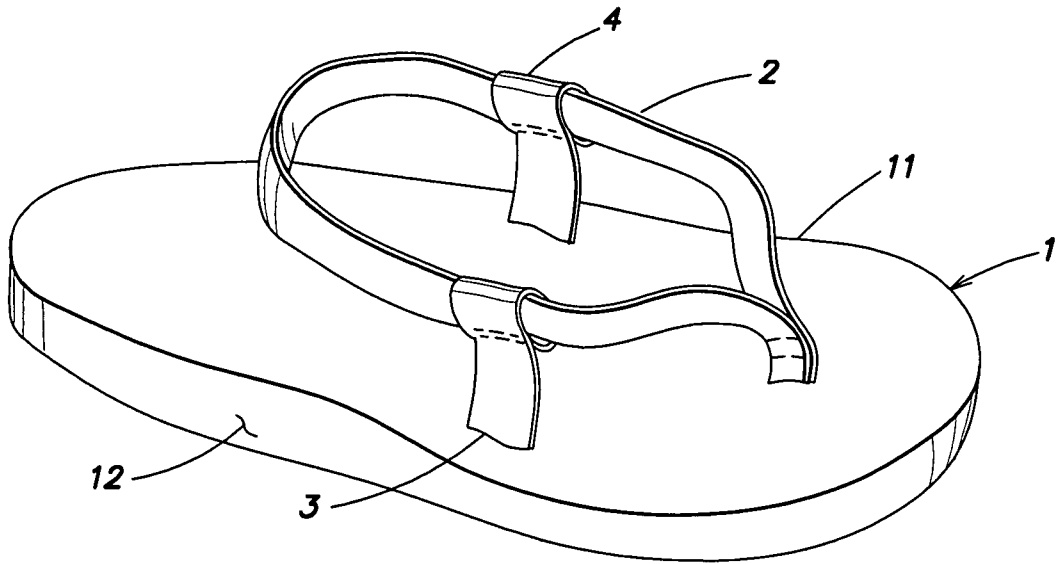


FIG. 1

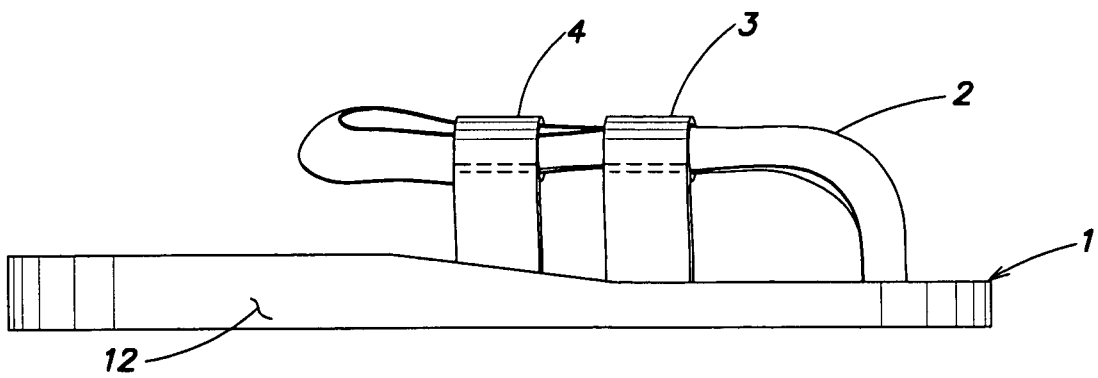


FIG. 2

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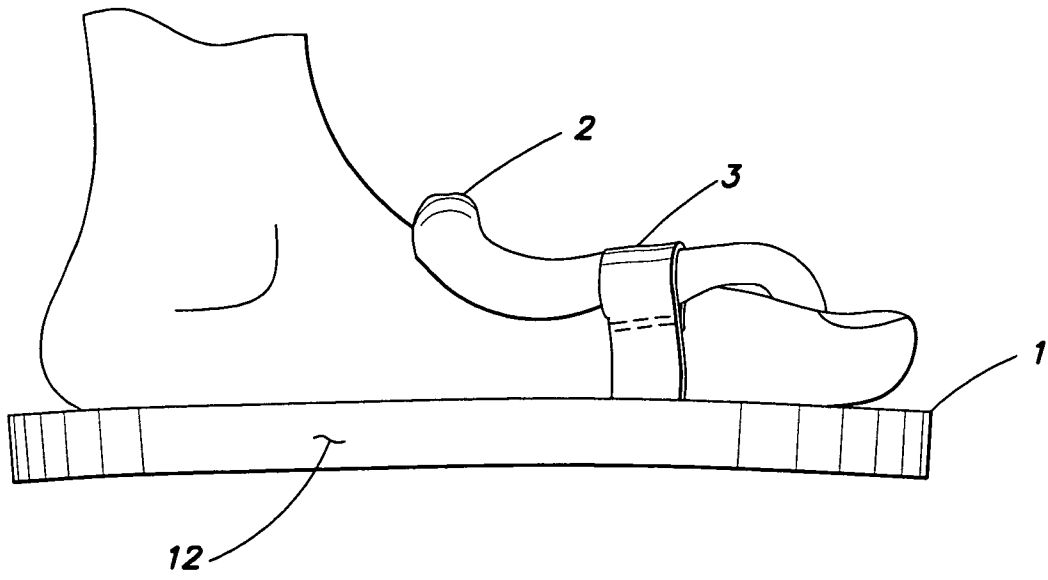


FIG. 3

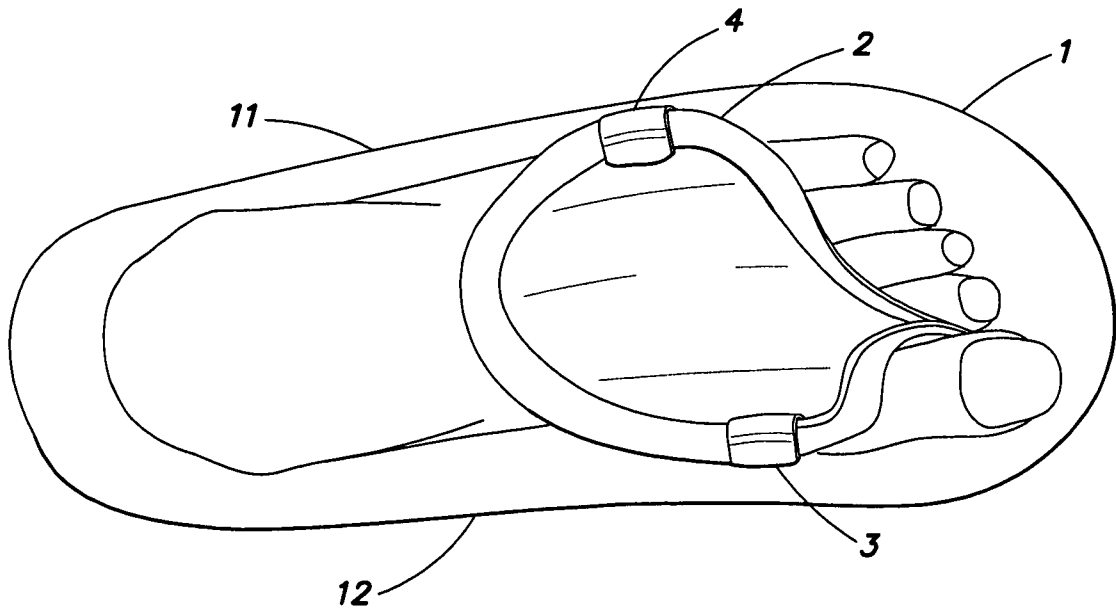


FIG. 4

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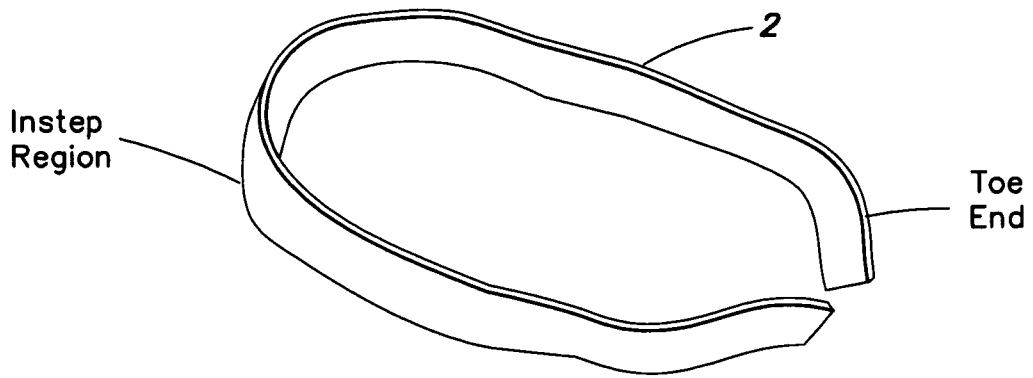


FIG. 5

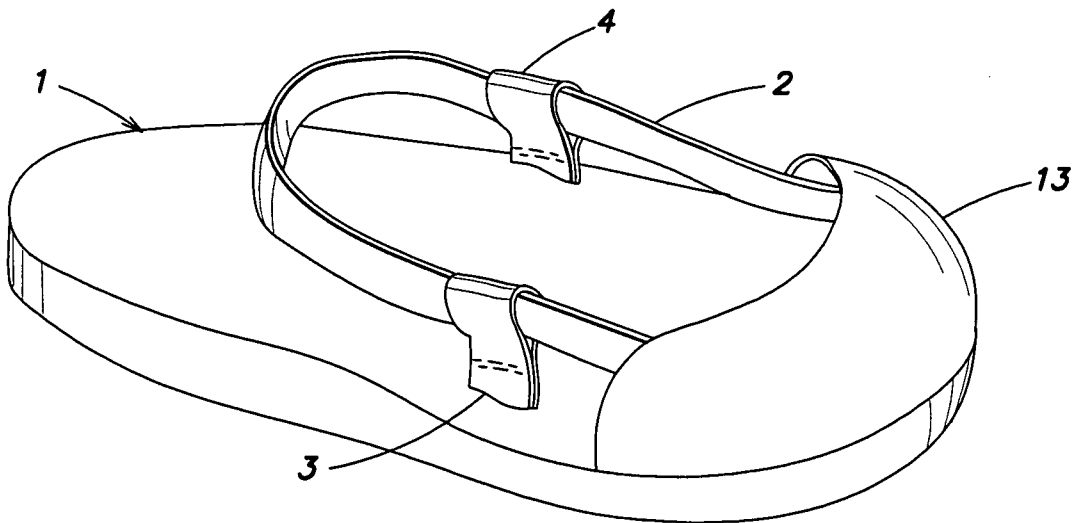


FIG. 6

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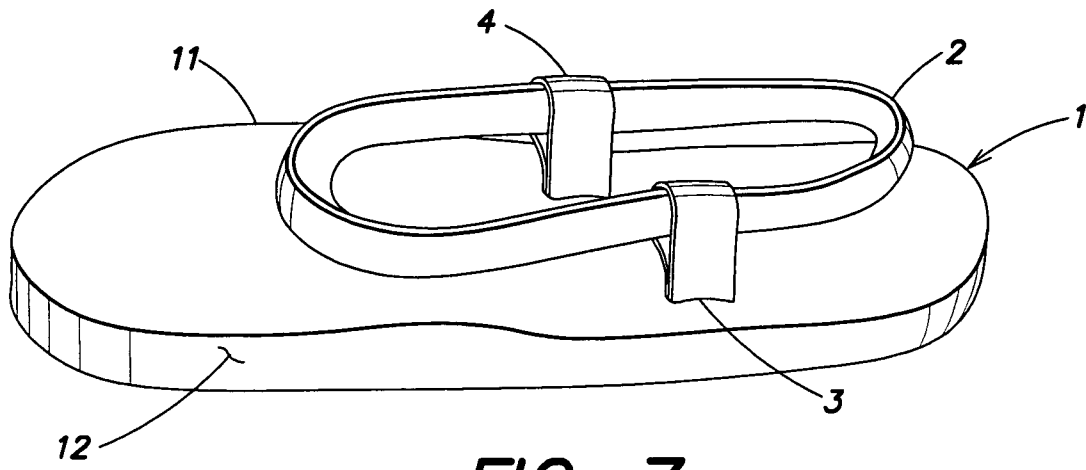


FIG. 7

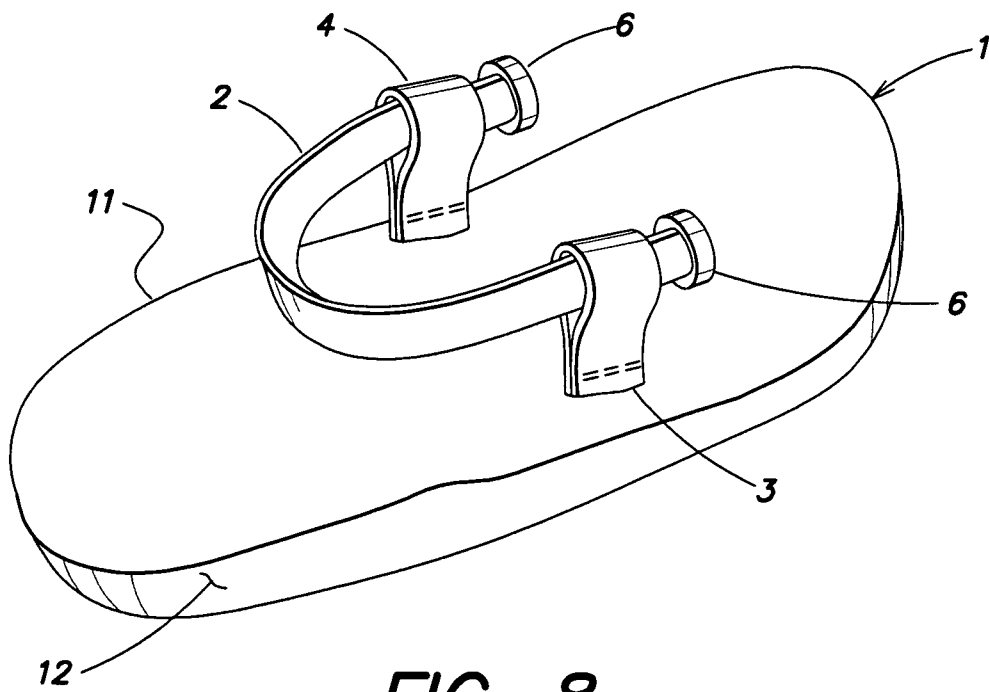


FIG. 8

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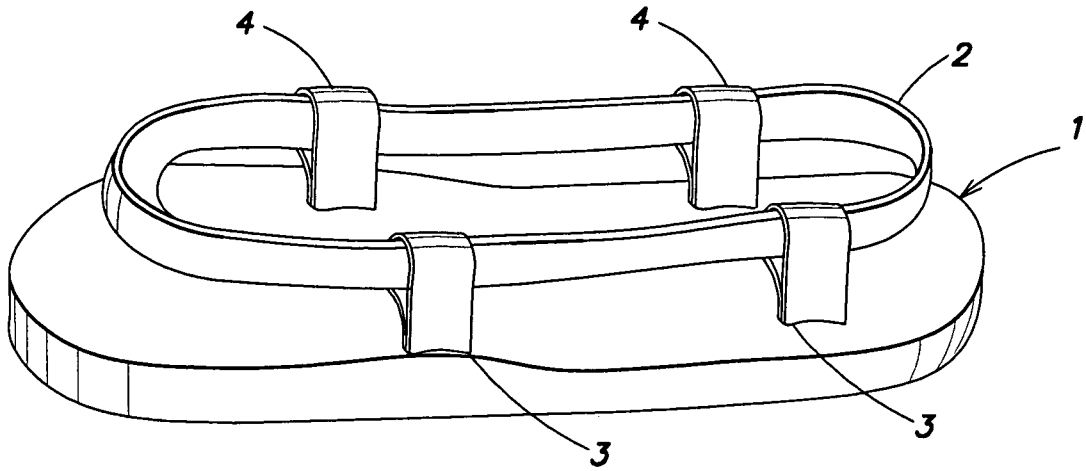


FIG. 9

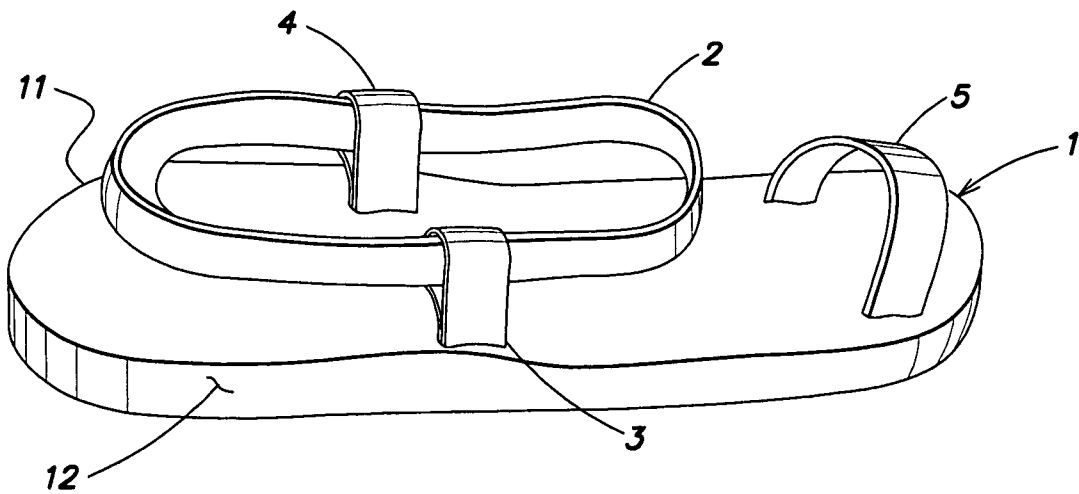


FIG. 10