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(54) **ORTHOTIC DEVICE AND METHOD THEREFOR**

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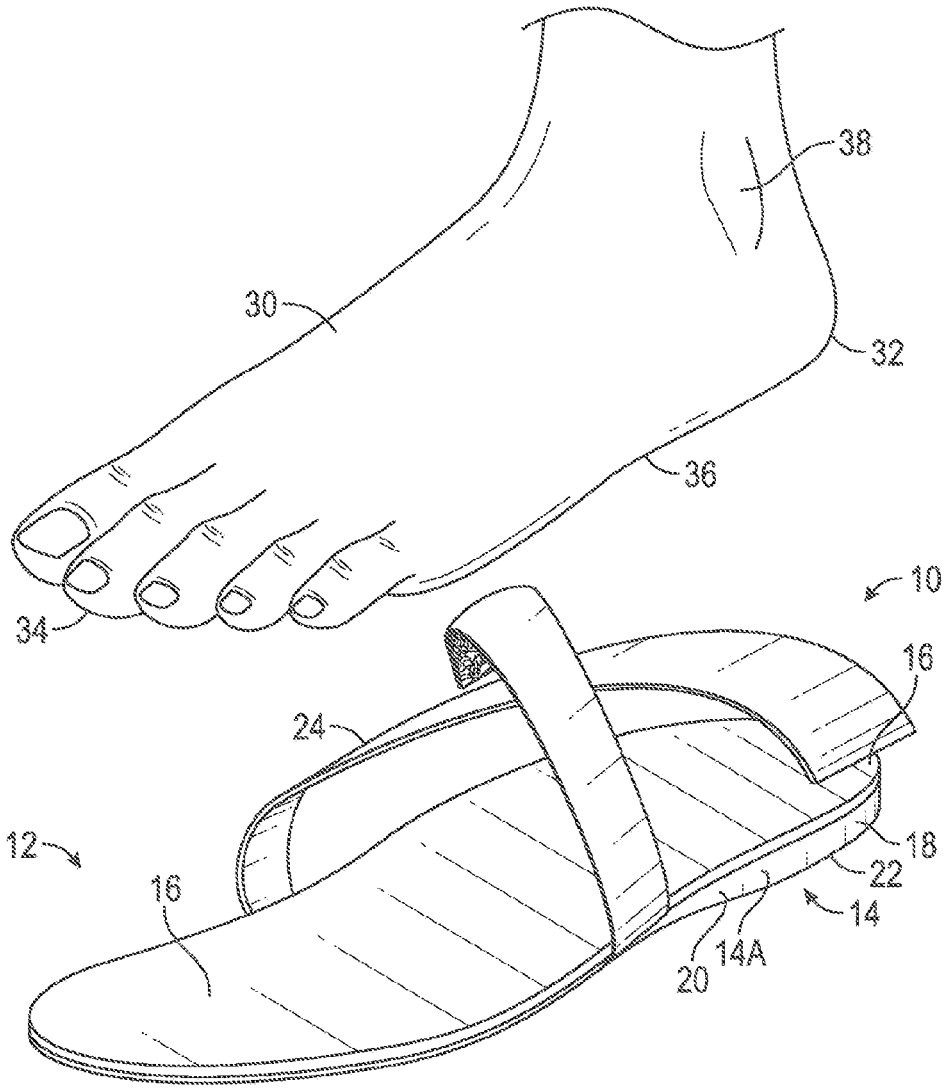
(57) **ABSTRACT**

A foot orthotic device has an insole. A strap is removably coupled to a bottom surface of the insole in a midfoot area of the insole.



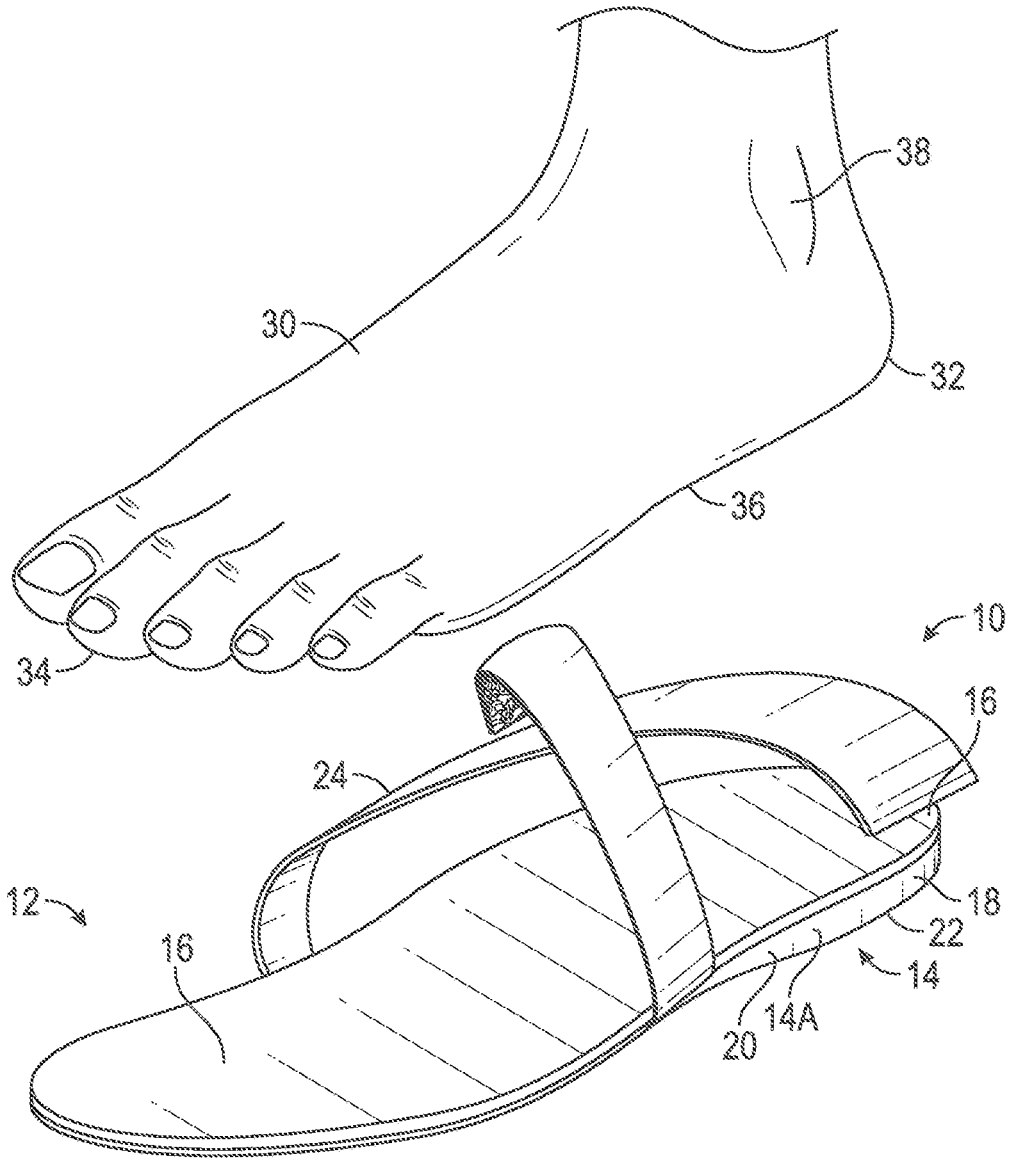


FIG. 1

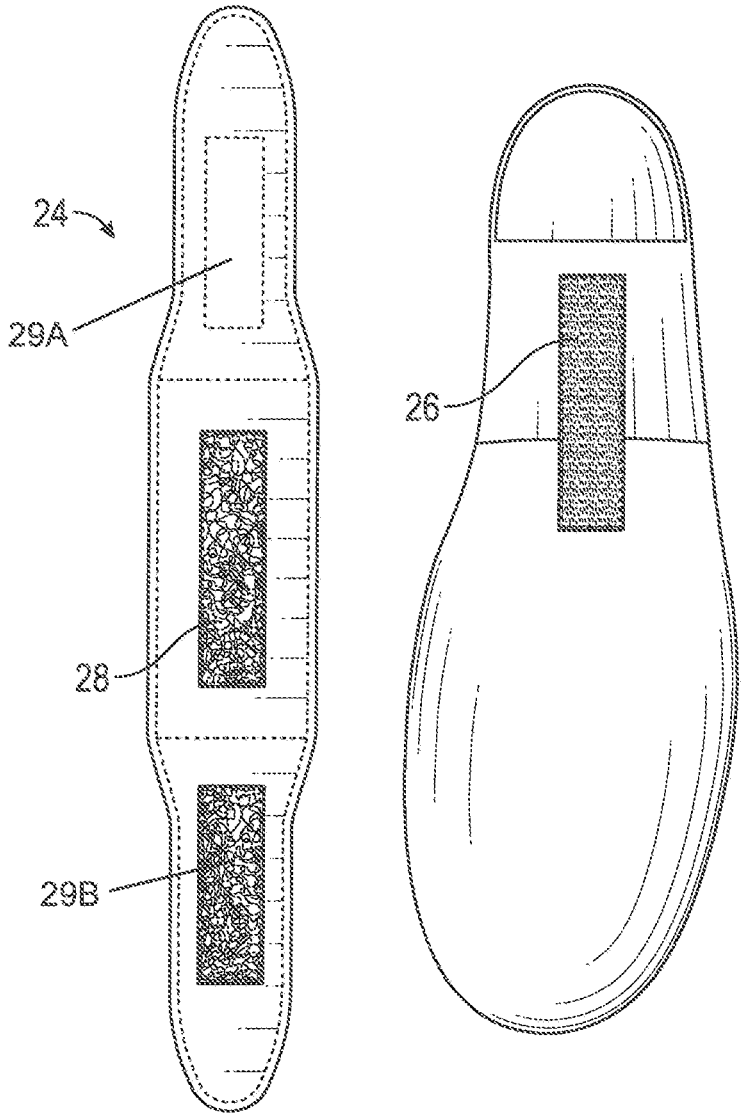


FIG. 2

ORTHOTIC DEVICE AND METHOD THEREFOR

RELATED APPLICATIONS

[0001] The present patent application claims the benefit of U.S. Provisional Application No. 62/560,098, filed Sep. 18, 2017, entitled "NEW ORTHOTIC DEVICE", and further related to U.S. patent application Ser. No. 15/611,565, entitled OPTIONAL TWO PIECE SUPRA MALLEOLAR AND ANKLE FOOT ORTHOSIS SYSTEM AND METHOD THEREFOR, filed Jun. 1, 2017 both of which are incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present application generally relates to orthotic devices, and, more particularly, to a foot orthotic device having a detachable strap, the detachable strap allowing varus and/or valgus control of the mid-foot.

BACKGROUND

[0003] Foot orthotic devices are devices that may be placed within a shoe or other footwear to support a wearer's feet. Foot orthotic devices may be designed to correct an abnormal or irregular walking pattern, by altering slightly the angles at which the foot strikes a walking or running surface.

[0004] Orthotic devices typically consist of a shell that extends across all or a portion of the length of a shoe's insole. The shell may be used to support various parts of the wearer's foot such as, but not limited to the wearer's heel, arch, metatarsal area, and toes.

[0005] Most orthotics are formed of one or more layers of material having a uniform thickness the entire length thereof. Because known orthotic devices are typically formed with a uniform thickness, they do not provide enough support for portions of a foot requiring greater orthotic thickness. Further, known orthotic devices do not allow for the wearer to have varus and/or valgus control of the midfoot.

[0006] Therefore, it would be desirable to provide a device and method that overcomes the above. The orthotic devices do not allow for the wearer to have varus and/or valgus control of the midfoot.

SUMMARY

[0007] In accordance with one embodiment, a foot orthotic device is disclosed. The foot orthotic has an insole. A strap is coupled to a bottom surface of the insole in a midfoot area of the insole.

[0008] In accordance with one embodiment, a foot orthotic device is disclosed. The foot orthotic device has an insole. A strap is removably coupled to a bottom surface of the insole in a midfoot area of the insole. A first attachment device is formed on the bottom surface of the insole in a midfoot area of the insole. A second attachment device formed in a central area of the strap. The first attachment device and the second attachment device are hook and loop material.

[0009] In accordance with one embodiment, a foot orthotic device is disclosed. The foot orthotic device has an insole. A strap is removably coupled to a bottom surface of the insole in a midfoot area of the insole. A first attachment device is formed on the bottom surface of the insole in a midfoot area of the insole. A second attachment device formed in a central area of the strap. A first end attachment is coupled to a first end of the strap. A second end attachment coupled to a second end of the strap opposite of the first end. The first end of the strap and the second end of the strap are arranged in a crossing pattern to exert force to counteract movement of the foot.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The present application is further detailed with respect to the following drawings. These figures are not intended to limit the scope of the present invention but rather illustrate certain attributes thereof.

[0011] FIG. **1** is a perspective view of an exemplary foot orthotic device according to one aspect of the present application; and

[0012] FIG. **2** is bottom view of the exemplary foot orthotic device of FIG. **1** with the strap removed and placed to the side in accordance with one aspect of the present application.

DESCRIPTION OF THE APPLICATION

[0013] The description set forth below in connection with the appended drawings is intended as a description of presently preferred embodiments of the disclosure and is not intended to represent the only forms in which the present disclosure can be constructed and/or utilized. The description sets forth the functions and the sequence of steps for constructing and operating the disclosure in connection with the illustrated embodiments. It is to be understood, however, that the same or equivalent functions and sequences can be accomplished by different embodiments that are also intended to be encompassed within the spirit and scope of this disclosure.

[0014] Embodiments of the exemplary foot orthotic device may be configured to enhance control of the midfoot of the wearer. The foot orthotic device may have a detachable strap which may provide varus and/or valgus control of the midfoot of the wearer.

[0015] Referring now to FIG. **1**-FIG. **2** a foot orthotic device **10** (hereinafter device **10**) may be shown. The device **10** may be formed of a customizable insole **12**. The insole **12** may be customized to conform to a shape of a user's foot **30**. A length of the insole **12** can be dependent on foot size and may extend from the user's heel **32** towards the front **34** of the foot **30**.

[0016] The insole **12** may include a base layer **14** and an upper layer **16**. The base layer **14** may extend from the back of the heel **32** of the user's foot past the arch **36** of the foot **30**. The base layer **14** may be molded to conform to the bottom of the foot **30**. The base layer **14** may be used to control the subtalar joint and foot biomechanics of the user. In general, the base layer **14** may be formed from a thin, firm material. For example, subortholen, polypropylene, copolymer, and carbon graphite composites may be used to form the base layer. The material forming the base layer **14** may be heated to allow the material to be malleable. Once heated, the base layer may be molded to conform to a shape of the bottom of the user's foot **30**. Alternatively, the material forming the base layer **14** may be milled or formed via a 3D printer to conform to a shape of the bottom of the user's foot **30**.

[0017] The base layer **14** may have a heel cup **18** formed on one end thereof. The heel cup **18** may be used to keep the heel **32** and hence the foot **30** from moving side to side. The heel cup **18** may further be used to elevate one side of the heel **32** to correct foot posture and gait. A medial longitudinal arch area **20** may be formed extending from the heel cup **18** along an inner side **14**A of the base layer. The medial longitudinal arch area **20** may be used to support the arch **36** of the user's foot **30** and to redistribute the weight of the user to different areas to prevent excessive pressure. The medial longitudinal arch area **20** may also correct alignment issues.

[0018] A heel section **22** may be formed on a bottom section of the base layer **14** below the heel cup **18**. The heel section **22** may slightly raise the area of the base layer **14** where the heel section **22** is located.

[0019] The upper layer **16** may be applied over the base layer **14**. The upper layer **16** may extend past the base layer **14** to the end of the user's foot **30**. The upper layer **16** may be formed of a flexible material. A foam, gel or similar material may be used for the upper layer **16**. The upper layer **16** may provide a cushion to relieve any soreness, discomfort or the like in the foot **30**.

[0020] The device **10** may have a strap **24**. The strap **24** may be attached to the insole **12**. As may be seen in FIG. **2**, the strap **24** may be positioned in front of the heel section **20** and within the medial longitudinal arch area **18**. In accordance with one embodiment, the strap **24** may be formed wherein a center area of the strap **24** is wider than the ends of the strap **24**. This may allow for the strap **24** to have a greater surface area to secure to the bottom surface of the base layer **14**.

[0021] The strap **24** may be permanently or removably attached to the bottom surface of the base layer **14**. In accordance with the present embodiment shown, the strap **24** may be removably attached to a bottom surface of the base layer **14**. As may be seen in FIG. **2**, an attachment device **26** may be formed on bottom surface of the base layer **14**. The attachment device **26** may be used to removably secure the strap **24** to the bottom surface of the base layer **14**. A corresponding attachment device **28** may be formed in a center area of the strap **24**. The attachment device **28** of the strap **24** may engage the attachment device **26** on the bottom surface of the base layer **14** to removably secure the strap **24** to the bottom surface of the base layer **14**. In accordance with one embodiment, the attachment device **26** and the attachment device **28** may be hook and loop material or the like.

[0022] End attachment devices **29**A and **29**B may be formed on opposing ends of the strap **24**. As may be seen in FIG. **2**, the end attachments **29**A and **29**B may be formed on opposing side ends on the width of the strap **24**. The end attachments **29**A and **29**B may be used to exert force to control movement of the foot **30**. The straps **24** may go from medial to lateral, lateral to medial or both in order to control movement of the foot **30**. The end attachments **29**A and **29**B may be attached in a crossing pattern over a top of the foot **30** and/or shoe of the user and below the malleoli **38** (ankle bone) of the user. The end attachments **29**A and **29**B may be attached in a crossing pattern such that the end attachments **29**A and **29**B may attached to opposing ends of the strap **24**, to a shoe upon which the device **10** is placed, to soft extensions from the device or the like. The strap **24** may allow the user to have varus/valgus control of the midfoot of the user. Thus, one may exert more force either laterally, to counteract the foot **30** going in a supinatory movement outward and to the outside, or medially to counteract a pronatory movement inward and to the inside.

[0023] The foregoing description is illustrative of particular embodiments of the invention, but is not meant to be a limitation upon the practice thereof. The following claims, including all equivalents thereof, are intended to define the scope of the invention.

What is claimed is:

1. A foot orthotic device comprising:
an insole; and
a strap coupled to a bottom surface of the insole in a midfoot area of the insole.

2. The foot orthotic device of claim **1**, comprising:
a first attachment device formed on the bottom surface of the insole in a midfoot area of the insole; and
a second attachment device formed in a central area of the strap.

3. The foot orthotic device of claim **1**, comprising:
a first end attachment coupled to a first end of the strap; and
a second end attachment coupled to a second end of the strap opposite of the first end.

4. The foot orthotic device of claim **1**, wherein ends of the strap are arranged in a crossing pattern to exert force to counteract movement of the foot.

5. The foot orthotic device of claim **1**, wherein the insole comprises:
a base layer extending from a back of a heel of the foot past an arch of the foot;
a heel cup formed on one end of the base layer;
a medial longitudinal arch area extending from the heel cup along an inner side of the base layer; and
an upper layer applied over the base layer, the upper layer **16** extending past the base layer to an end of the foot.

6. The foot orthotic device of claim **5**, wherein the insole comprises a heel section formed on a bottom section of the base layer below the heel cup.

7. The ankle and foot orthotic device of claim **5**, wherein the upper layer is formed of a flexible material.

8. A foot orthotic device comprising:
an insole;
a strap removably coupled to a bottom surface of the insole in a midfoot area of the insole;
a first attachment device formed on the bottom surface of the insole in a midfoot area of the insole; and
a second attachment device formed in a central area of the strap;
wherein the first attachment device and the second attachment device are hook and loop material.

9. The foot orthotic device of claim **8**, comprising:
a first end attachment coupled to a first end of the strap; and
a second end attachment coupled to a second end of the strap opposite of the first end.

10. The foot orthotic device of claim **9**, wherein the first end attachment and the second end attachment are hook and loop material.

11. The foot orthotic device of claim **9**, wherein the first end of the strap and the second end of the strap are arranged in a crossing pattern to exert force to counteract movement of the foot.

12. The foot orthotic device of claim **8**, wherein the insole comprises:

a base layer extending from a back of a heel of the foot past an arch of the foot;

a heel cup formed on one end of the base layer;

a medial longitudinal arch area extending from the heel cup along an inner side of the base layer; and

an upper layer applied over the base layer, the upper layer **16** extending past the base layer to an end of the foot.

13. The foot orthotic device of claim **12**, wherein the insole comprises a heel section formed on a bottom section of the base layer below the heel cup.

14. The ankle and foot orthotic device of claim **12**, wherein the upper layer is formed of a flexible material.

15. A foot orthotic device comprising:

an insole;

a strap removably coupled to a bottom surface of the insole in a midfoot area of the insole;

a first attachment device formed on the bottom surface of the insole in a midfoot area of the insole;

a second attachment device formed in a central area of the strap;

a first end attachment coupled to a first end of the strap; and

a second end attachment coupled to a second end of the strap opposite of the first end;

wherein the first end of the strap and the second end of the strap are arranged in a crossing pattern to exert force to counteract movement of the foot.

16. The foot orthotic device of claim **15**, wherein the first attachment device and the second attachment device are hook and loop material.

17. The foot orthotic device of claim **15**, wherein the first end attachment and the second end attachment are hook and loop material.

18. The foot orthotic device of claim **15**, wherein the insole comprises:

a base layer extending from a back of a heel of the foot past an arch of the foot;

a heel cup formed on one end of the base layer;

a medial longitudinal arch area extending from the heel cup along an inner side of the base layer; and

an upper layer applied over the base layer, the upper layer **16** extending past the base layer to an end of the foot.

19. The foot orthotic device of claim **18**, wherein the insole comprises a heel section formed on a bottom section of the base layer below the heel cup.

20. The ankle and foot orthotic device of claim **18**, wherein the upper layer is formed of a flexible material.

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