The present invention relates to a removable modular heel assembly that is attached to a high heel shoe, which shoe may be adapted to accept the assembly, and which assembly is designed to increase the surface area of the heel or shoe to enhance stability, comfort, and/or balance for the wearer.
MODULAR HEEL ASSEMBLY FOR HIGH HEEL SHOES

RELATED PATENT APPLICATIONS


FIELD OF THE INVENTION

[0002] The present invention relates to modular heel assemblies for high heel shoes and to high heel shoes. More particularly, the invention relates, for example, to a removable modular heel assembly that fits against a high heel shoe that may, for example, be adapted to accept the assembly, and which may be further designed to increase the surface area of the heel and enhance stability for the wearer.

BACKGROUND OF THE INVENTION

[0003] Many versions of high heel shoes, for example stiletto heels, have small surface areas where the heel portion of the high heel shoe contacts the ground. This results in significant disadvantages for the wearer. For example, fatigue and discomfort in the ankle and foot often occur from the extra effort required to stabilize the wearer’s ankle and foot in a high heel shoe with a small surface area.

[0004] In addition, traversing anything other than smooth, level surfaces presents perils for the wearers of high heel shoes with a small heel surface area. Subway grates, sidewalk cracks and cobblestone walkways are just some of the surfaces that these high heel wearers can not traverse easily, or perhaps safely, if at all. Often, these rough surfaces damage the heel of the shoe, and the wearer may suffer a fall or risk injury.

[0005] To avoid the foregoing disadvantages of wearing high heel shoes with small heel areas, a wearer often carries a second pair of shoes with a different heel style, such as a sneaker, changing shoes before walking on rough terrain. This is inconvenient, however, because the extra pair of shoes may be heavy and use space that could hold other items, and because changing shoes causes unnecessary delay, expense, or inconvenience.

[0006] Hence, there remains a need in the art for a removable apparatus that will attach to small heel area-high heel shoes to widen the heel area and thus improve the stability of these fashion staples.

SUMMARY OF THE INVENTION

[0007] An object of the present invention provides for a removable modular heel assembly for high heel shoes that increases the stability of the shoes. Another object of the invention provides for a high heel shoe adapted such that a modular heel assembly may be attached.

[0008] One embodiment of the invention provides for a removable modular attachment for a shoe for increasing the surface area of the heel contacting the ground, including an apparatus affixed to or configured within the high heel shoe, and a heel modular attachment molded to fit into the fixed heel apparatus.

[0009] In one aspect of the invention, the modular attachment comprises a spring-loaded hook, and the fixed heel apparatus is a receptacle for the spring-loaded hook. In another aspect of the invention, the modular attachment includes screw threads or reverse screw threads, and the fixed heel apparatus comprises reverse screw threads or screw threads, respectively, that accept the modular attachment. These threads may be configured as a single helical coil, interrupted turns of a coil, threads having interruptions, blunted ends, twisted ends, or any of a number of known thread configurations or combinations thereof. In another aspect of the invention, the modular attachment comprises a snap-on attachment, and the fixed heel apparatus comprises grooves to accept the snap-on attachment. In yet another aspect of the invention, the modular attachment is a wedge that slides into place, having an insert portion in the front of the wedge, and at least one attachment means in the back of the wedge, in which the fixed heel has been configured with openings oriented to receive the modular attachment insert portions and the attachment means. In a particular aspect of this embodiment, the attachment means include protrusions and a pressure-activated clip that holds the modular heel unit in place against the fixed heel of the shoe.

[0010] In another embodiment of the present invention, a modular attachment may be provided, for example, without a corresponding configuration within the shoe or shoe heel. For example, an attachment may be provided that includes a spring-loaded hook for attachment to a shoe heel. In another aspect of the invention, the modular attachment may include a screw thread or reverse screw thread for application to a shoe heal and may also include a means for applying a corresponding thread to an existing shoe heel, such as by self-tapping threads or removably attached threaded insert on the outside of the heel. In another aspect of the invention, the modular attachment comprises a snap-on attachment to snap on to a shoe heel, sole or another portion of a shoe of a given configuration. In yet another aspect of the invention, the modular attachment is a wedge that slides into place onto a shoe heel, wedging the original heel into the modular attachment. In another embodiment, a modular attachment may include a pressure-activated clip that is adapted to assist the modular heel unit in remaining in place about the shoe heel. Another embodiment of a modular attachment may include one or more set screws for fixedly pushing against a portion of the shoe or heel. The shoe may further include or be modified to include a receptacle for that set screw.

[0011] Another embodiment of the present invention provides for a high heel shoe into which an attachment means has been manufactured such that the shoe may accept a removable modular attachment for the shoe, such that when the modular attachment is in place, it increases the area of the shoe where the heel contacts the ground.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] A more complete appreciation of the present invention and many of its attendant advantages may be more readily understood by reference to the following drawings. These drawings are provided for demonstration of particular embodiments or aspects of the present invention and are not to limit the invention.
FIG. 1 depicts a bottom view of the area under a high heel (stiletto) shoe that makes contact with the surface below it.

FIG. 2 depicts a bottom view of an embodiment of the invention in which the sole of the high heel shoe is equipped to receive a modular attachment to increase the surface area of the heel.

FIGS. 3A and 3B show a side perspective view of an embodiment of the present invention in which a stability plate extending from the toe portion of the shoe sole is provided to accept a wedge modular heel attachment. FIG. 3A depicts a side view of a shoe and a separate side perspective view of an embodiment of a modular heel attachment; FIG. 3B shows a side view of a modular heel attachment attached to the shoe.

FIGS. 4A, 4B, 4C and 4D depict an embodiment of the invention in which a modular heel attachment fits over a fixed heel and includes a spring-loaded mechanism that attaches to a receptacle on a high heel shoe. FIG. 4A is a side view of a shoe with a modular heel attachment; FIG. 4B is a bottom view showing the increased surface area of the bottom of the heel with modular heel attachment of FIG. 4A; FIG. 4C depicts a side perspective view of a modular heel attachment; and FIG. 4D is an exploded view of an embodiment of a spring-loaded mechanism.

FIG. 5 is a cross sectional perspective view of a bottom portion of an embodiment of the present invention for a shoe adapted to receive a protruding portion of a modular attachment.

FIG. 6 is a bottom perspective exploded view of an embodiment of the present invention with a shoe adapted to receive a wedge-style modular heel and modular heel components.

FIG. 7 is a top perspective exploded view of an embodiment of the present invention having a shoe adapted to receive a wedge-style modular heel and modular heel components.

FIG. 8 is bottom perspective view of an embodiment of the present invention having a wedge-style modular heel, showing a spring-loaded hold and release mechanism.

FIG. 9 is a side perspective cross sectional view of an embodiment of the present invention having a wedge-style modular heel with a stiletto shoe.

FIG. 10 is a close-up side perspective view of an embodiment of the invention having connecting meeting points at the back of a shoe and modular heel unit.

FIG. 11 is a bottom perspective view of an embodiment of the present invention with a modular heel unit in place on the bottom of a shoe.

FIG. 12 is a side perspective exploded view of an embodiment of the invention having a modular heel with tabs that fit into grooves configured on both sides of a shoe.

DETAILED DESCRIPTION OF THE INVENTION

It should be understood that this invention is not limited to the particular methodology, designs and materials, etc., described herein and as such may vary. The terminology used herein is for the purpose of describing particular embodiments only, and is not intended to limit the scope of the present invention, which is defined solely by the claims.

As used herein and in the claims, the singular forms "a," "an," and "the" include the plural reference unless the context clearly indicates otherwise. Thus, for example, the reference to a rod is a reference to one or more such rods, including equivalents thereof known to those skilled in the art. Other than in the operating examples, or where otherwise indicated, all numbers expressing quantities or conditions used herein should be understood as modified in all instances by the term "about." The term "about" when used in connection with percentages may mean ±1%.

All patents and other publications identified are expressly incorporated herein by reference for the purpose of describing and disclosing, for example, the methodologies described in such publications that might be used in connection with the present invention. These publications are provided solely for their disclosure prior to the filing date of the present application. Nothing in this regard should be construed as an admission that the inventors are not entitled to antedate such disclosure by virtue of prior invention or for any other reason. All statements as to the date or representation as to the contents of these documents is based on the information available to the applicants and does not constitute any admission as to the correctness of the dates or contents of these documents.

Unless defined otherwise, all technical and scientific terms used herein have the same meaning as those commonly understood to one of ordinary skill in the art to which this invention pertains. Although any known methods, devices, and materials may be used in the practice or testing of the invention, the methods, devices, and materials in this regard are described here.

Current high heel shoes, such as those including stiletto heels, very often have very little heel surface (25) contacting the ground, as exemplified in FIG. 1. This small contact area may cause instability, imbalance, fatigue, and/or risk for the wearer. The present invention provides for a modular heel attachment to increase the surface area of the heel portion of a high heel shoe, such as a shoe including a stiletto heel, and increase the wearer’s stability, comfort, or balance while traversing surfaces or reducing risk, fatigue, or discomfort.

Shoes with adjustable-height heels have been suggested. See, e.g., U.S. Pat. No. 6,785,987; No. 6,021,586; and No. 5,887,360. These shoes, however, do not obtain the advantages of the present invention.

Current high heel shoes often comprise a single-piece heel that is either molded as a single piece with the sole of the shoe, or attached to the sole with some combination of nails, screws, or adhesive. The embodiments of the present invention are adapted to be compatible with one or more of these construction techniques. Rigid injection molded thermoplastics, for example, provide materials suitable for the present invention, although any variety of materials will be readily available to those of ordinary skill in the art in light of the present specification.

The high heel shoe of the present invention may be fabricated with, or be modified to contain, an apparatus to which a modular heel assembly may, for example, be
reversibly attached. The apparatus may be constructed of metal, plastic, wood, or other synthetic or natural materials, or any combination thereof. The apparatus may form a rod to which a spring-loaded hook may attach; a groove designed to receive a clip; or screw threads or reverse screw threads. The apparatus may, for example, be constructed directly into the attached heel portion of a high-heeled shoe. The apparatus may be applied or attached to a heel or other portion of a shoe.

[0033] Alternatively, the high heel shoe of the present invention may be fabricated or be modified to reversibly accept a modular heel assembly. These fabrications or modifications may be, for example, grooves into which protrusions or clips of the modular unit fit.

[0034] FIG. 2 depicts the sole portion of a high heel shoe of an embodiment of the invention, without the modular heel unit in place, so that an embodiment of an attachment apparatus is visible. More specifically, the sole of the shoe (10) may for example be adapted during construction, or thereafter, such that attachment cavities (8) are placed near the point where the heel is affixed (7). The attachment cavities (8) may then accept attachment rods (9) of the modular heel unit.

[0035] An embodiment of a modular attachment of the present invention may be adapted to attach to a high heel shoe through a reversible locking mechanism or reversible screw mechanism, to increase the surface area of the heel. The modular attachment may be removable, so that the wearer may have the look of the stiletto heel when desired, and the stability of a larger heel when desired. The modular attachment may be molded and manufactured to match construction of a high heel shoe which may be manufactured to receive the modular attachment. The modular attachment may be constructed of metal, plastic, wood, other synthetic or natural materials, or any combination thereof that can be configured to screw, slide, attach or lock into place. The surface area of the heel may, for example, be increased by any amount, up to the maximum of the full surface area underneath the shoe. In the latter instance, the shoe style of the shoe would be that of a “wedge”, depending on the modular attachment used. In certain instances, a larger surface area than the sole may be provided, for example to provide additional stability in certain weather conditions or for individuals having certain disabilities.

[0036] For example, the attachment apparatus of the high heel shoe may include openings designed to receive spring-loaded hooks. In this embodiment, the modular heel attachment unit includes one or more rods to which one or more spring-loaded hooks may be attached. As shown in FIGS. 4A and 4C, the modular heel attachment (12) contains an opening (3) designed to accept the existing fixed heel. The modular heel (12) is contoured to fit snugly against the shoe, each being made to accommodate the other. The wearer opens the spring (2) loaded hooks (6), shown in FIG. 4D, by applying pressure to the hook, then releases the pressure when the modular heel is in place such that the hook closes into the attachment apparatus. To remove the heel, the wearer again applies pressure to the spring-loaded hook to open the hook, pulls the modular heel away from the shoe, and releases the hooks. When two hooks are used, such as on the inside and outside portion of the shoe, pressure is applied easily with the thumb on one hook and the index finger on the other hook, in a grasping or pinching fashion.

[0037] In another embodiment, the attachment includes a stability plate built into or attached to the toe portion of the shoe against which a wedge-shaped modular heel rests. The plate may, for example, extend backwards of the shoe sole, or be built into the back of the sole portion as a slot designed to accept a protrusion built on the front portion of the wedge.

FIGS. 3A and 3B depict the former embodiment. In this embodiment, the modular heel (12) is a wedge style with a groove (5) into which the fixed heel fits, that rests and fits snugly against the stability plate (4) built into the sole portion of the shoe. The modular heel unit (12) also contains attachment means to connect with the attachment apparatus on the shoe. The attachment means may be spring-loaded mechanisms such as one or more hooks (6) for attachment to the apparatus on the heel area of the shoe, as shown in FIGS. 3A and 3B. Alternatively, the attachment means may be one or more clips built into rods that are embedded within the modular heel unit. In either of these cases, the shoe may include a groove, cavity, or other appropriate opening to receive, for example, a clip or hook.

[0038] In a wedge embodiment of the present invention, a wearer may, for example, snap the wedge into place under the shoe by pressing the spring-loaded hook or clip-ended rod to open it, then releases the pressure when the modular unit is in place. FIG. 12 presents a schematic in which the modular heel unit (12) includes two rods (30), one positioned on each side of the unit, each with a snap-on attachment (31). The shoe contains complementary grooves (32) to receive the clip of the snap-on attachment. The modular heel unit is engaged or disengaged from the shoe by pressing the spring-loaded mechanisms or rods (30), then sliding the fixed heel into or out of the groove (3) or of the modular unit (12). An alternative wedge embodiment is discussed in greater detail in Example 1.

[0039] The spring-loaded hooks or clips of a modular heel embodiment complement the attachment apparatus and may, for example, be placed at various points along the sole of the shoe, depending on comfort, style, and stability concerns as determined by those of ordinary skill in the art. Attachment rods and corresponding cavities may, for example, be placed on either side of an area in which the modular heel contacts the sole of the shoe. A corresponding spring-loaded mechanism may be built into the modular attachments to fit into one or more apparatus cavities and against one or more attachment rods.

[0040] The modular heel attachment embodiments described above may, for example, be easier to carry than a second pair of shoes because of less weight and/or smaller size. The modular heel unit itself may, in various embodiments, be easy to replace, and/or less costly than a pair of shoes. Indeed, the high heel shoe of the present invention may be configured to accept more than one style of modular heel unit, providing the wearer with a choice of styles, each unit providing, for example, improved stability over the fixed heel.
EXAMPLES

Example 1

Stiletto Shoe with Assembly for Receiving Modular Wedge Apparatus

[0041] In this embodiment of the invention, grooves have been manufactured into the body of the shoe that is designed to accept protrusions of the modular wedge. FIG. 5 presents a schematic cross-sectional view of the bottom portion of the shoe (10) which contains a groove (14) in the posterior section of the body of the shoe under the ball of the foot. This groove may be in the outsole, or may start in and pass through the outsole and end within the midsole of the shoe. The modular attachment (12) includes a tongue-like protrusion (15), manufactured contiguous with the modular heel that fits into the groove (14). This groove adaptation is also depicted in FIG. 6, which presents a view from below of the shoe and modular heel assembly. FIG. 6 also shows that the shoe contains a groove at the top of the back of the heel (16), adapted to receive a posterior edge (17) of the modular attachment, depicted on FIG. 7. A close-up schematic of the top posterior portion showing the groove (16) of the shoe and the edge (17) of the modular unit is visible in FIG. 10.

[0042] The spring-loaded lever mechanism of this embodiment, which allows stable attachment and easy release of the modular heel, is depicted in FIG. 8. A lever-advancing element (20) includes a tab (21) that protrudes from the lever-advancing element to the exterior of the modular heel. The lever-advancing element is secured into the modular heel with pin (24) upon which the advancing element may pivot. A lever (27) is secured into the modular heel with pin (29), and also includes a catch (28), that is designed to lock the heel portion of the shoe (25) in place. A spring (23) rests in between and presses against the lever-advancing element (20) and the lever element (27).

[0043] FIGS. 8 and 9 are schematics showing the heel (25) in place within the modular heel unit. Referring to FIG. 8, when the modular heel is slid onto the shoe, the pressure applied by the sliding motion causes the catch (24) to move with the lever (27) against the spring (23), then once the heel (25) is in place, the catch (28) snaps into position because of the pressure of the spring (23). The modular heel in the attached position is shown schematically in FIG. 11. To release the mechanism so that the modular heel unit may be removed, the wearer applies pressure to the tab (21), which activates the lever-advancing element (20) and its end (22) presses against the lever (27). The lever pivots on pin (29) and pulls the catch (28) away from the heel of the shoe such that the modular heel may be slid away from the shoe heel.

[0044] Returning to FIG. 7, this shows a base plate (18) that forms the bottom of the modular heel unit, providing greater contact surface area and covering the internal mechanisms of the unit. The base plate (18) has reinforcing features structures (19) that fit over the pins (24) and (29) (shown in FIG. 8, not shown in FIG. 7). The base plate also has holes (13), through which screws thread into the body of the modular unit through matched holes (26) (FIG. 8).

[0045] The base plate is also depicted in FIG. 6 (18). FIG. 6 also shows the body of a modular unit (12), which has an opening (13) to house the tab (21) of the lever-advancing element. Note, however, that in one potential commercial embodiment of the invention, the base plate and the bottom of the shoe molding may be covered with the appropriate outsole material(s).

What is claimed is:

1. A device for increasing the surface area of a high heel shoe contacting the ground, comprising:
   a modular heel unit adapted for attachment to a shoe.
2. The device of claim 1, wherein said shoe is adapted to receive said modular heel unit.
3. The device of claim 2, wherein said modular heel unit comprises a spring-loaded hook on a top surface of the unit, and said shoe comprises a receptacle for receiving said spring-loaded hook.
4. The device of claim 2, wherein said modular heel unit comprises screw threads and said shoe comprises mating screw threads adapted to accept said modular unit screw threads.

5. The device of claim 2, wherein said modular heel unit comprises a snap-on attachment on a top surface of said heel unit, and said shoe is configured with a groove on a portion of a sole adapted to accept said snap-on attachment.

6. The device of claim 2, wherein said modular heel unit comprises a wedge having a body and a leading edge, said unit adapted for receiving a heel of said shoe, said wedge further comprising an insert portion on said leading edge, and at least one attachment means within said body of said wedge; and

   wherein said shoe comprises an opening on a bottom surface of said shoe oriented to receive said modular unit insert portion.

7. The device of claim 5, wherein said attachment means comprises a pressure-sensitive lever system adapted to fixedly attach said heel of said shoe inside said unit.

8. A shoe comprising an attachment means adapted for removable attachment of a modular heel unit for said shoe, wherein said modular heel unit is configured to increase the area of said bottom surface of said shoe at a location where said heel is adapted for ground contact.

9. A device for increasing the surface area of a high heel shoe at a location where a heel of said shoe is adapted for contacting the ground, comprising:

   a modular heel unit adapted for attachment to a shoe, wherein said shoe is configured to receive said modular heel unit, wherein said modular heel unit comprises a wedge body into which said heel of said shoe fits, said heel unit further comprising an insert portion on the front of said wedge, and wherein said shoe comprises an opening on a bottom surface of said shoe, said opening oriented to receive said modular unit insert portion;

   a pressure-sensitive lever system within the body of said modular heel unit adapted to attach to said heel of said shoe inside said unit.

* * * * *