Abstract: A shoe heel support device for providing support and stability to a heel of a shoe when worn, is described. The support device includes an attachment means for fastening the device to the heel of a shoe, and a ground contacting surface. The ground contacting surface contacts a surface of ground in use, such that a generally downwards force applied by a wearer of the shoe to a base of the shoe heel is distributed over an area that is greater than that of a surface area of the base of the shoe heel. The device is particularly useful for application in instances where a high heeled shoe is being worn upon surfaces that are soft, by preventing or inhibiting the heel of the shoe from sinking into the ground.
SHOE HEEL SUPPORT DEVICE

FIELD OF THE INVENTION

The present invention relates to a shoe heel support device for providing a supporting platform to a heel of a shoe, such as providing support for a stemmed or high heel, particularly useful for preventing or inhibiting the heel from sinking into a surface when the shoe is being worn.

BACKGROUND OF THE INVENTION

It is well known that there is a large number of different types of footwear, including shoes that cater for different functions and fashions. Women's shoes, in particular, are often equipped with a raised or high heel. In many instances, the design of the heel is such that the heel is relatively narrow in width, with the heel essentially consisting of an elongate stem. An example of this is the known stiletto heel. However, there are many other different types of heel designs that generally consist of a stemmed shape or configuration.

A problem that may be encountered by a person wearing shoes with such a heel is that the heel may sink into the ground that is being walked upon. This is a particular problem when the ground is soft, such as sand or grass. In these instances, it can become difficult for the person to walk upon such a surface, as the heel must often be pulled out of the ground with each step. A similar problem can be encountered when the ground is relatively unstable, such as when walking on a gravel road or path. In such an event, the narrow stem structure of the heel can sink in between rocks or pebbles that make up the ground. This may lead to general instability for the person walking thereon, thereby increasing the possibility of injury by, for example, falling and spraining or twisting an ankle. In addition, in such circumstances, there is also the capacity for causing damage to the shoe, in particular the heel. The likelihood of damage to the shoe is greater for those shoes that are manufactured from delicate materials, such as suede or fine fabrics. Unfortunately, it is often the case that such shoes are most often the most expensive to buy and their subsequent repair or replacement may come at significant expense to their owner.

Similar safety and shoe maintenance problems can also be encountered when high heeled shoes are worn whilst walking upon a surface that has numerous or significant gaps, for example, upon planks of a decking surface.
The present invention attempts to overcome at least in part the aforementioned disadvantages and problems that may be encountered whilst wearing raised or high heeled shoes, particularly whilst standing or walking upon surfaces that are soft, unstable or generally uneven.

5 SUMMARY OF THE INVENTION

In accordance with one aspect of the present invention there is provided a shoe heel support device, the support device having an attachment means for attaching the device to a heel of a shoe and a ground contacting surface, wherein a generally downwards force applied by a wearer of the shoe to a base of the shoe heel is distributed over an area that is greater than that of a surface area of the base of the shoe heel.

Preferably, the attachment means includes a recess, the recess being arranged to receive at least a portion of the heel of the shoe and to retain the heel therein.

Further preferably, the recess of the attachment means has a hollow shaft extending upwardly and continuously from the recess, so that the shaft and recess together form a bore to receive the heel. This offers a particular advantage in those instances where the shoe heel is stemmed or elongate. In this manner, the bore is better enabled to receive an elongate stem of the heel and retain the stem therein.

In a preferred embodiment, the recess has a tapered or narrowed portion at a lowermost end, adjacent an upper surface of the base portion. The tapered or narrowed portion advantageously acts to constrict movement of the heel once received in the recess, and assists in retaining the heel therein.

It is particularly preferred that at least part of an inner surface of the recess, including the narrowed portion, is lined with a resilient and non-abrasive material, having the ability to provide grip upon sides of the heel, such as silicone, without causing frictional damage to sides of the heel.

In a preferred embodiment, at least part of the inner surface of the recess is lined with or is comprised of a heat-deformable material, such as a thermoplastic or thermoset polymer, which is solid in an unheated state and malleable in a heated state. This advantageously enables the creation of a
custom-fit plug within the recess to better facilitate the ability of the attachment means to grip and retain the heel.

An additional discrete quantity of the heat deformable, thermoplastic or thermoset material may optionally be provided, to add to the material present within the recess, to further assist in the creation of the advantageous custom-fit plug about the heel. The additional amount of material is particularly useful in instances where the heel is smaller relative to the inner dimensions of the recess.

BRIEF DESCRIPTION OF THE DRAWINGS

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

Figure 1 is a perspective of a preferred embodiment of a shoe heel support device in accordance with the present invention;
Figure 2a is a side cross-section of the shoe heel support device of Figure 1;
Figure 2b is a side cross-section of an alternative embodiment of a shoe heel support device in accordance with the present invention, having a shape adapted for use with shorter shoe heels;
Figure 2c is a side cross-section of a further embodiment of a shoe heel support device in accordance with the present invention, including a sole portion;
Figure 2d is a side cross-section of a further embodiment of a shoe heel support device in accordance with the present invention;
Figure 3 is a side cross-section of the shoe heel device of Figure 2b, including a sole portion;
Figure 4 is a side cross-section of the shoe heel device of Figure 3, further including a plurality of protrusions extending downwardly from the sole portion;
Figure 5 is a side cross-section of a further embodiment of a shoe heel device in accordance with the present invention;
Figure 6 is a side cross-section of an embodiment of the shoe heel device with an alternative attachment means;
Figure 7a is a side cross-section of the device showing application of a deformable compound to provide a custom-fit plug for a heel of narrow width;
Figure 7b is a side-cross section of the device showing application of the deformable compound to provide a custom-fit plug for an irregular shaped heel;

Figure 8a is a side view of a removable protective sleeve for the device;

and

Figure 8b is a side view of the protective sleeve of Figure 8a in place upon the device.

DESCRIPTION OF PREFERRED EMBODIMENT

Referring to the Figures, there is shown a shoe heel support device 10 for use with a heel 11 of a shoe, for providing greater stability for a wearer of the shoe in use, such as by preventing or inhibiting the heel 11 from sinking into a surface. The device 10 is particularly suited for use with a stemmed or elongate heel of a high heel shoe. However, embodiments of the device 10 are also described, for use with shorter shoe heels.

Referring initially to Figures 1 and 2a to 2e, the device 10 comprises a base portion 12 with an attachment means 14 for removably fastening the device 10 onto the shoe heel 11. The base portion 12 has a ground contacting surface 16 at a lowermost portion of the base portion 12. The contacting of the surface 16 with the ground acts to distribute the force that is applied to a base of the shoe heel 11 by a wearer of the shoe, over a surface area that is greater than the surface area of the base of the heel 11. By distributing the force over a greater area, the base portion 12 effectively provides a stabilising platform for the heel 11 and can thereby act to minimise the amount the heel 11 sinks into the ground, particularly when the ground is soft or unstable.

In the embodiment shown in the Figures, the base portion 12 comprises a generally circular platform, with a lowermost surface defining the ground contacting surface 16. However, the base portion 12 may be provided in any shape that will provide adequate contacting between the lower surface 16 and the ground so as to disperse the downwards force as applied to the heel over a greater surface area than the surface area of the base of the heel. For example, a further preferred shape of the base portion 12 is a substantially U-shaped platform, with the bottom of the U being disposed towards a rear of the shoe.
Alternatively, it is also within the scope of the invention that the base portion 12 and ground contacting portion 16 be provided in further desired shapes, or having patterns or a design thereupon. An example of this is the provision of the ground contacting portion 16 in the shape of a promotional logo, or having a company brand embossed or imprinted upon the surface.

In the embodiments shown in the Figures, the ground contacting surface 16 comprises the entire surface area of the lowermost surface of the base portion 12. However, in an alternative embodiment (not shown), the ground contacting surface 16 need not necessarily be a solid surface. Rather, it need only have sufficient contact points with the ground so as to be able to distribute the downward force applied to the heel by the wearer over a surface area that is greater than the base of the heel. For example, the ground contacting surface 16 may be comprised of a number of relatively small surface areas, arranged in a pattern or configuration that is able to distribute the force over a greater surface area than the surface area of the base of the shoe heel.

The base portion 12 is preferably constructed from a resilient material, having high impact resistance and preferably some flexibility, such as a hard resin, ethyl vinyl acetate or polyurethane. However, the base portion 12 and the majority or totality of the device 10 may be comprised of any suitable material, such as any hard plastic or rubber. Further preferably, the base portion 12 is translucent or transparent so as to minimise any visual detraction from the aesthetic of the shoe itself. However, the base portion 12 and device 10 in its entirety may optionally be provided in any colour, such as a colour that matches the colour or material of the shoe.

In the embodiment shown in Figures 1 through to 5, the attachment means 14 includes a recess 21 extending downwardly into the base portion 12 from an upper surface 18 thereof. The recess 21 is preferably disposed centrally to the base portion 12. The recess 21 has an opening 23 adjacent the upper surface 18 that is arranged to receive the stem of the heel 11. As such, the opening 23 and recess 21 are preferably of a shape and configuration that is comparable to and thus able to accommodate the size and shape of the heel 11 stem being received. That is, the shape of the opening 23 and recess 21 can be varied
between different and discrete units of the device 10 so as to accommodate different types of heel stems.

The shape and configuration of the recess 21 may also be varied to better accommodate variation in heel shape and configuration. Referring now to Figures 2a and 2c to 2d, it will be seen that the recess 21 of the attachment means 14 is upwardly elongate, to accommodate a heel with an elongate stem. In these embodiments, the recess 21 further includes a hollow shaft 20 extending upwardly from the upper surface 18 of the base portion 12. The hollow shaft 20 is provided with an internal bore 21, which is arranged to receive a length of the heel stem substantially in the manner described above. Preferably, the shaft 20 is integrally moulded with the base portion 12. It is also preferred that an upper end 38 of the shaft 20 be rounded, to minimise any possible contact damage where the upper end 38 meets the shoe once the device 10 is attached.

In Figure 2b, there is shown an embodiment of the device 10 where the recess 21 of the attachment means 14 is suited for receiving a heel having a shorter length. In this embodiment, there is no requirement for a shaft 20, as the height of the recess 21 is sufficient to support and retain a lower heel therein.

In any of the abovementioned embodiments, it is particularly preferred that the recess 21 has a tapered or narrowed portion 24 at a lowermost end, adjacent the upper surface 18 of the base portion 12. The narrowed portion 24 is provided to better enable the recess 21 to more readily accommodate heel stems of differing widths or diameter, whilst still being able to grip and thereby secure the device 10 thereon. In this manner, the narrowed portion 24 constricts movement of the heel stem within the recess 21 to grip the base of the heel and provide a stable grip on the base of the heel so as to retain the heel therein.

It is also particularly preferred that an inner surface of the recess 21 and, where applicable, the shaft 20, is at least partially comprised of or at least partially lined with a material 22 that is non-abrasive and has the ability to provide grip sides of the heel or heel stem. A non-limiting example of such a material is silicone. Lining the inner surface of the recess 21 and/or shaft 20 with such a material 22 offers the advantage whereby the heel is not damaged by frictional interaction with the inner surface of the recess 21 or shaft 20, yet the heel is gripped within the recess 21 so as to retain therein. This is particularly
advantageous in instances where the device 10 is fitted onto shoes manufactured from delicate materials, such as silk or suede.

Referring to Figures 7a and 7b, there is shown a particularly preferred embodiment, where at least part of the inner surface of the recess 21, including the narrowed portion 24, is comprised of a heat deformable material 36, such as a thermoplastic or thermoset polymer. The material 36 has properties which enables it to be softened with the application of moderate heat, and is solid, preferably slightly flexible, in an unheated state. In this manner, the material 36 may be softened by, for example, placing the device into a body of hot or near-boiling water.

The material 36 is thus advantageously able to form a custom-fit plug around the heel 11 by taking an exact impression of the heel 11 once the heel 11 is appropriately placed into the recess 21 and pressing into the material 36. The shape of the custom-fit plug is maintained by the material 36 upon cooling.

This material 36 may also be provided as a separate and additional component to the device 10, to be used if necessary. In the event where there is inadequate material 36 present within the recess 21 to retain the heel 11 firmly therein, the additional material 36 may be inserted into the recess 21 prior to heating of the material 36 and introduction of the heel 11 into the recess 21. The additional material 36 adheres to the material 36 already present within the recess 21 so the combined amount is able to form the custom-fit plug about the heel 11. This is particularly useful in those instances where the dimensions of the heel 11 are significantly smaller than the inner dimensions of the recess 21.

Although the aforementioned is a preferred attachment means 14, it should be understood that the attachment means 14 may be any mechanism or arrangement that is able to securely yet removably fasten the device 10 to the heel 11 of a shoe. For example, referring to Figure 6, there is shown an alternative embodiment of the device 10, having an attachment means 14 comprising a spike 32, extending generally upwardly within the recess 21. The spike 32 has a pointed tip 34, arranged to pierce the base of the heel 11 upon appropriate placement of the heel 11 into the recess 21.

The spike 32 attachment means 14 is particularly useful in those instances where the recess 21 is relatively shallow. The provision of a shallow recess 21,
as shown in Figure 6, is particularly adapted for use with shoes having a heel 11 for which greater stability or protection is desired, but which does not have a relatively great length. That is, in those instances where the heel 11 is not particularly high.

It is also within the scope of the present invention that the device 10 in any of the forms as hereinbefore described, be provided with additional features for adapting the device 10 for use upon different grounds and terrain. For example, to accommodate the wearing of the shoe whilst standing or walking upon surfaces composed substantially of particulate matter, such as gravel, woodchips or pebbles, the base portion 12 is further provided with a sole portion 26, as shown in Figure 4. The sole portion 26 is layered upon the lowermost surface of the base portion 12 and is effectively the ground contacting surface 16. Preferably, the sole 26 is comprised of rubber padding, hard rubber or other similar material, in order to provide some gripping property between the device 10 and the ground. The sole 26 may optionally have a tread so as to increase the ability of the device 10 to grip the ground.

The sole portion 26 or the ground contacting surface 16 of the base portion 12 may also be provided with a plurality of downwardly extending protrusions 28. The protrusions 28 may be in the form of metal spikes or rubber nodules and are provided to assist the device 10 to grip upon slippery surfaces, such as polished floors or even on icy surfaces.

In a further embodiment, shown in Figure 5, the ground contacting surface 16 of the base portion 12 is concave, forming a generally inverted cup 30. The inverted cup 30 configuration is particularly adapted for use when walking upon sandy or other similar surfaces comprised of fine particulate matter. Upon walking on such surfaces, the cup 30 fits over and partially into the particulate matter and the particulate matter fills into the cup 30. In this way, the particulate matter is captured within the cup 30, thereby forming a cushion of the material so as to provide support for the heel 11 to which the device 10 is fastened.

Referring now to Figures 8a and 8b, there is shown a protective sleeve 40, adapted to be fitted over the ground contacting surface 16 and at least part of the base portion 12 of the device 10. The sleeve 40 is provided to enable the basic device 10, as shown in, for example, Figures 2a to 2c, to be safely worn whilst
walking upon a greater variety of surfaces. For example, the sleeve 40, which is preferably comprised from a firm yet deformable rubber, can be provided with tread or downwardly extending protrusions, to afford greater grip upon the surface when worn in use.

The sleeve 40 is provided in any suitable deformable material, so that sides of the sleeve 40 can be squeezed together to enable the device 10 to fit into an upper opening 42 of the sleeve 40. The sleeve 40 is thus arranged to be fitted over an outer surface of the base portion 12, as shown in Figure 8b.

The sleeve 40 may be provided in any suitable shape and configuration to appropriately fit a particular shape of device 10. It will be seen, particularly from Figures 2a to 2d, that the overall shape and configuration of the device 10 may be varied. For example, the device 10 as shown in Figure 2a has a base portion 12 with an upwardly curving upper surface 18 and a rounded outer edge. In Figures 2b and 2c, the outer surface slopes upwardly in a generally linear fashion. In Figure 2d, the upper surface 18 of the base portion 12 has a gentle slope towards the shaft 20. Such modifications in the design, shape and configuration of the device 10 can be made for aesthetic or functional purposes, such as to provide reinforcement and strength to the base portion 12, and are considered to be non-limiting and within the scope of the present invention.

In use, the device 10 is fastened onto the heel 11 of a shoe by engagement with the attachment means 14. In the embodiment shown in the Figures, this engagement entails the stem of the heel 11 being inserted into the recess 21 and/or shaft 20 of the attachment means 14 so that the base of the heel 11 is adjacent the base portion 12.

When appropriate for the particular circumstances, the material 36 is softened by heat, prior to introduction of the heel 11 into the recess 21. An additional amount of material 36 may be inserted into the recess 21 if required. The device 10 is then placed on a firm surface and the heel 11 introduced into the recess 21. The heel 11 is firmly pushed into the material 36 to form an impression of the heel 11 in the material 36. The material 36 is then cooled, optionally by running under cool water, so as to set the material 36 in this shape. The heel 11 may be removed from the recess 21 prior to cooling the material 36.
It will be appreciated that the provision of, and manner of use of the material 36 in forming a custom-fit plug for the heel 11 is such that the shape of the material 36 may be customized, as applicable, for different heels 11 of varying sizes and dimensions. This is facilitated by alternate heating and cooling of the material 36 as required.

In the embodiment having the upwardly extending spike 32, the heel 11 is impaled upon the spike 32 so as to firmly attach the device 10 thereto.

The device 10 is thus suitably fastened onto the heel 11 in a manner that is sufficiently secure to allow the person wearing the shoe to walk without the device 10 falling off or becoming loose.

If the surface being walked upon requires, the protective sleeve 40 may be placed over the ground contacting surface 16 and base portion 12 in the manner described above.

When the surface being walked upon becomes amenable for walking upon in high heeled shoes without any added support or stability, the device 10 may no longer be required. In this event, the device 10 may be removed from the heel of the shoe by simply grasping the base portion 12 or shaft 20 and pulling the attachment away and off from the heel 11.

Modifications and variations of the aforementioned invention, as would be apparent to a skilled addressee are deemed to be within the scope of the present invention.

It should also be understood that comprises/comprising and grammatical variations thereof, when used in this specification and the accompanying claims, are to be taken to specify the presence of stated features, integers, steps or components or groups thereof, but are not limited so as to preclude the presence or addition of one or more other features, integers, steps, components or groups thereof.
CLAIMS:

1. A shoe heel support device, the support device having an attachment means for attaching the device to a heel of a shoe and a ground contacting surface, wherein a generally downwards force applied by a wearer of the shoe to a base of the shoe heel is distributed over an area that is greater than that of the surface area of the base of the shoe heel.

2. A shoe heel support device according to claim 1, wherein the attachment means has a recess, the recess being arranged to receive at least a portion of the shoe heel and to retain the heel therein.

3. A shoe heel support device according to claim 2, wherein the recess has a narrowed portion at a lowermost end, adjacent an upper surface of the base portion, the narrowed portion constricting movement of the heel within the recess so as to grip the heel therein.

4. A shoe heel device according to claim 2 or 3, wherein an internal surface of the recess is at least partially comprised of a material having properties to enable the material to grip sides of the heel upon insertion of the heel into the recess.

5. A shoe heel device according to claim 4, wherein the material is a heat deformable material, whereby the material may be softened by the application of heat to receive the heel within the recess and form a plug about the heel.

6. A shoe heel device according to claim 5, wherein the heat deformable material is a thermoset or thermoplastic material.

7. A shoe heel device according to any one of claims 2 to 6, wherein the attachment means further includes a hollow shaft extending continuously and upwardly from the recess.
8. A shoe heel device according to any one of claims 2 to 7, wherein the attachment means further includes a spike, extending upwardly from a base of the recess and arranged to engage with the base of the shoe heel.

9. A shoe heel device according to any one of the preceding claims, wherein the ground contacting surface comprises a platform with a lowermost surface defining the ground contacting surface.

10. A shoe heel device according to claim 9, wherein a sole portion is layered upon the lowermost surface of the base portion, the sole portion providing a gripping surface.

11. A shoe heel device according to any one of the preceding claims, wherein the ground contacting surface has a plurality of downwardly extending protrusions arranged to assist the device to grip upon ground.

12. A shoe heel device according to any one of the preceding claims, wherein the ground contacting surface is concave and forms a cup portion.

13. A shoe heel device according to any one of the preceding claims, wherein the base portion tapers outwardly from a mid-region towards an outer perimeter.

14. A shoe heel device according to claim 13, wherein an upper surface of the base portion is concave as it tapers outwardly.

15. A shoe heel device according to any one of the preceding claims, wherein the device is provided with a removable protective sleeve, the sleeve adapted to fit adjacent the ground contacting surface and at least part of the upper surface of the base portion.
INTERNATIONAL SEARCH REPORT

International application No
PCT/AU2007/000530

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.
A43B 13/22 (2006.01)   A43B 21/42 (2006.01)   A43C 15/04 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

DWPI: Keywords; shoe, boot, heel, force, pressure, flare, taper, distribute, area, floor, device, protector & similar terms

GOOGLE: Keywords; "high heel", floor, protect, stiletto & similar terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tr>
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<td>US 531 1675 A (TOPEL) 17 May 1994 See the drawings</td>
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<td>X</td>
<td>US 1875806 A (GIVENS) 6 September 1932 See the drawings</td>
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<td>X</td>
<td>US 2875534 (GROSSMAN) 3 March 1959 See the drawings</td>
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Date of the actual completion of the international search
08 May 2007

Date of mailing of the international search report

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