

**CUSTOMISABLE INSERTS, FOOTWEAR FOR USE WITH SAME AND A
METHOD OF SELECTING AN INSERT FOR FOOTWEAR**

FIELD OF THE INVENTION

5 The present invention relates to customisable inserts, footwear adapted to be used with the customisable inserts and a method of selecting an insert for footwear.

BACKGROUND

10 The following discussion of the background to the invention is intended to facilitate an understanding of the present invention. However, it should be appreciated that the discussion is not an acknowledgment or admission that any of the material referred to was published, known or part of the common general knowledge in any jurisdiction as at the priority date of the application.

15 Shoes vary in style, shape and general appearance. As a result, the three-dimensional profile of shoe soles also varies from shoe to shoe. With manufacturers making decisions on the limited number of shoe sole profiles that they will produce for a particular style of shoe, this means that people not substantially conforming with at least one of the shoe sole profiles will not be able to properly wear such shoes. This may then result in lost sales.

20 Furthermore, the profile of each person's foot is unique. This means that mass-produced shoes – being made for the average shape of the foot as determined by the style of shoe, region and size – are unlikely to be the optimal selection for a person. Having footwear that varies substantially from the optimal selection can result in the person's feet being susceptible to stress fractures, ankle problems
25 and other medical problems.

Also taking into account the fact that mass-produced shoes are made in mirrored pairs, even if one shoe is the optimal selection for one foot, it is unlikely that the shoe will be an optimal selection for the other foot. This means that foot-based assessment systems for determining which mass-produced shoe is most
30 appropriate are unable to provide an optimal solution unless each foot is provided

with a different style shoe which could be quite unsightly and make the wearer feel self-conscious.

One method for solving this problem is for the profile of each person's feet to be analysed and a new pair of shoes developed to best suit this profile in line with the person's intended use of the shoes (for example, walking, running, or a particular sport). This process of developing customised footwear generally requires the making of a mould for the shoes and as a result involves a substantial amount of time, materials, effort and cost to produce. Also, the profile of a person's foot may change over time, due to growth, injury or ailment. With such a change in profile, the customised pair of shoes will no longer be the optimal selection for such person.

One solution to the above problem is disclosed in WO 2005/058085 which discusses fabrication of custom insoles by providing insoles suitable to a particular foot width and length. The height of the insole at particular locations, and the support provided by the insole, can be adjusted through the adhering of plastic components of the desired shape and size. While the applicant notes that such a system solves the aforementioned problems, the construction of such an insole is complicated, labour intensive and not cost effective.

The contours of most inserts often collapse over time.

It is therefore an object of the present invention to provide inserts for shoes that overcome, or at least ameliorate in part, one or more of the aforementioned problems.

SUMMARY OF THE INVENTION

In accordance with a first aspect of the present invention there is a customisable insert consisting of an integrated insole and midsole customised to match the
5 internal profile of an item of footwear in which it will be used.

The integration of the insole and midsole provides sufficient thickness to the insert to allow for integrated moulding with the medial post as this may provide shock absorption and motion control. This has been a key problem of inserts in
10 the past. Thin inserts do not have sufficient thickness to incorporate shock absorption and motion control elements.

However, to accommodate such an insert, an item of footwear preferably consists solely of the outsole and the upper to prevent poor fit, imbalance and discomfort
15 during use. This may allow a wearer with different foot types to have the same style shoe with different inserts suitable for their different foot types.

The customisable insert is preferably further profiled to provide support for one of the following: a low arch foot type; a neutral arch foot type; or a high arch foot
20 type. Alternatively, the customisable insert is preferably further profiled to provide support for a particular profile of a person's foot.

The customisable insert may be made of one or more or a combination of the following materials: ethylene vinyl acetate, thermoplastic rubber, graphite, nylon,
25 thermoplastic polyurethane, plastics or rubber. Where the customisable insert is provided with an arch support, ideally the material used to form the arch support (and, optionally, the surrounding region) is of a greater density than the material used to form the remainder of the insert.

30 Further, the material used to form the arch support is preferably resilient.

The insole may further include elements such as:

- a plurality of grooves to allow for flex and grip during use;
- an energy returning fore-foot cushioning pad;

a balancing web;
a heel cushioning pad; and/or
a heel cup.

- 5 In accordance with a second aspect of the present invention there is a footwear shell comprising an upper and an outsole, the footwear shell adapted to receive a customisable insert according to the first aspect of the invention.

In accordance with a third aspect of the present invention there is a method of
10 customising foot support for footwear including the steps of:

identifying a foot type of at least one foot of a person;
prescribing a foot support insert type for an item of footwear, the insert
type corresponding to the identified foot type

where the prescribed insert type comprises an integrated insole and midsole
15 customised to match the internal profile of the item of footwear.

Preferably, the step of identifying the foot type of at least one foot of a person includes the sub-step of analysing the at least one foot by way of at least one of the following methods: foot imprint measurement; foot imaging; foot scanning;
20 foot impression onto a material. Using this method it may be possible for a person to quickly obtain customised footwear that matches in outward appearance but may have vastly different interior profiles suitable for their foot types.

The method may further include the step of selecting a style or type for the item of
25 footwear. The style or type of the item of footwear that may be chosen may be universal or be restricted with reference to the identified foot type of the person.

BRIEF DESCRIPTION OF THE DRAWINGS

30 Figure 1 shows an embodiment of a customised insert for low arch foot types.

Figure 2 shows an embodiment of a customised insert for neutral foot types

Figure 3 shows an embodiment of a customised insert for high arch foot types.

Figure 4 shows an embodiment of a customised insert for motion control

Figure 5 shows an exploded view of footwear including an embodiment of the present invention with an outsole and footwear upper.

DESCRIPTION OF PREFERRED EMBODIMENTS

In accordance with a first aspect of the invention there is an insert 12 for footwear 10.

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The insert as shown in Figures 1 to 4, comprises an integrated insole 14 and a midsole 16. The footwear 10, as shown in Figure 5, comprises an outsole 18 and an upper 20. The upper 20 is bonded to the outsole 18 such that the footwear 10 looks like a standard shoe.

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The invention will now be described in the context of its intended use:

A person walks into a retail outlet for the inserts. The retail outlet may be an ordinary shoe store, a specialist footwear outlet or a podiatrist's office. On requesting a new pair of shoes, the person is referred to a selection of footwear shells. Each footwear shell differs in size, width and style. The footwear shells are adapted to receive a customisable integrated insole and midsole insert. To allow this the footwear shells are typically much deeper than a standard shoe with enough space between the outsole and the upper to house the integrated insert and a foot of the wearer.

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Upon selection of a desired footwear shell, the profile of each foot of the person is individually assessed. In this example, the assessment is made by the person walking over a pressure sensitive pad to provide a foot imprint measurement. The foot imprint measurement is then assessed on an experiential basis to determine a foot type, width and size for that foot.

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On determining a foot type, width and size, an insert 12 is chosen from a set of inserts 12 in the size and profile required to meet the desired foot type. The insert

12 is then inserted to the appropriate shoe (left or right) for the profiled foot. The process is then repeated with reference to the person's other foot so that the footwear provided to them matches in outward appearance but may have vastly different interior profiles.

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This whole process is done very quickly often in less than 2 hours, in a matter of between 5 to 30 minutes, preferably in 7 to 20 minutes, and usually in about 10 minutes. Hence, the person can have customised footwear that suits their foot type very quickly. Instead of the 1 to 2 weeks it takes to obtain a pair of customised footwear using currently available methods this new invention allows the person to obtain a pair of customised footwear in less than 2 hours.

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In accordance with a variation on the first aspect of the invention, the set of inserts 12 are directed to the following foot types:

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- neutral foot types;
- low arched foot types, also known as flatfoot; and
- high arched foot types.

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The flat foot type insert 12a, as shown in Figure 1, is provided with a metatarsal support 110 and an arch support 100 integrated with the insole 14. A portion 106 of the insert 12a starting from the heel 102 and extending along the medial side of the insert towards the ball area of the insert slightly past the centre of the insert 104 is made of a denser material, such as ethylene vinyl acetate ("EVA"). This portion of denser material 106 is longer on the flat foot type insert 12a to allow for smooth pronation control during the transition from heel-strike to toe-off for this foot type.

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The neutral foot type insert 12b is provided with a metatarsal support 110 and an arch support 100 integrated with the insole 14 (see Figure 2). A portion 106 of the insert 12b starting in the heel area 102 and extending along the medial side of the insert to a place substantially parallel to the highest point of the medial arch 108 is made of a denser material, such as ethylene vinyl acetate ("EVA"). This portion of denser material 106 is concentrated around the arch support region 100 of the

neutral foot type insert 12b to allow for smooth pronation control during the transition from heel-strike to toe-off for this foot type.

5 The high arch foot type insert 12c, as shown in Figure 3 is provided with a metatarsal support 110 with extra cushioning at the metatarsal area of the foot and an arch support 100 to provide more even weight distribution. The high arch foot type does not require extensive pronation control hence in this example there is no portion of denser material 106 along the medial side of the insert around the arch support region. Other examples may include a portion of denser material
10 along the distal side of the insert for supination control. In this way the portion of denser material provides motion control.

All the inserts for the neutral, the low arched and the high arched foot types is preferably provided with a metatarsal support 110 and an arch support 100
15 integrated with the insole 14. The metatarsal arch support 110 helps to redistribute pressure on the middle of the foot as the wearer walks or runs. It is provided in the form of a raised section, moulded to fit roughly in the area of the ball of a wearer's foot to raise the metatarsals of the wearer. The arch support 100 provides strong support to prevent the wearer's arch from falling.

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The surface of the insert that comes into contact with the outsole i.e. the exposed surface of the midsole 16 is shown in Figure 4. All the inserts for the different foot types preferably contain cushioning at the metatarsal area 112. This is provided by an energy return cushioning pad made of soft flexible material that is
25 preferably less dense than the predominant material of the inserts. In this preferred embodiment the cushioning 112 is resilient to allow the person to walk or run with minimised risk of the arch of their foot collapsing. Preferably there are balancing webs 114 on both the medial and distal side of the midsole 16 for extra stability. The balancing webs 114 are made of a hard dense material that is less
30 flexible than the other components of the insert. Preferably there is further cushioning at the heel in the form of pads 116 made of soft flexible material that is preferably less dense than the predominant material of the inserts. The embodiment shown in Figure 4 has grooves 118 cut across from the distal side of

the midsole 16 to the center across the toe region of the insert. This provides comfort and flexibility of the insert during motion.

5 It should be appreciated that any customised insert as described above may be utilised with a wide variety of footwear, such as boots, shoes, sandals and sports footwear. Furthermore, the customised insert may be further modified to provide reflexology or massage effects and other medical needs.

10 The person skilled in the art should also appreciate that the invention is not limited to the embodiments described above and that variations and modifications can be made without departing from the scope of the invention. Examples of such potential variations and modifications include:

- 15 • The insert may be made from a variety of materials or composite materials including: EVA, thermoplastic polyurethane ("TPU"), graphite, nylon, thermoplastic rubber ("TPR"), plastics or rubber.
- The technique by which the profile of a person's foot may be obtained may be different from that described above. For example, any of the following techniques may be used to obtain such a profile: foot imaging; foot scanning; foot impression onto a material.
- 20 • The profile of a person's feet may be obtained prior to selection of the footwear in which the insert will be used. In this manner, the person may be provided with a selection of recommended footwear based on the profiles obtained from which to choose from.
- The insole may further include elements such as:
 - 25 a plurality of grooves to allow for flex and grip during use;
 - an energy returning fore-foot cushioning pad;
 - a balancing web;
 - a heel cushioning pad; and/or
 - a heel cup.

30 It should be further appreciated that features described in one embodiment, not being mutually exclusive to a feature described in another embodiment, may be combined to form yet further embodiments of the invention.

CLAIMS

1. A customisable insert consisting of an integrated insole and midsole customised to match the internal profile of an item of footwear in which it will be used, wherein the insert is profiled to provide support for an arch foot type and the insert is further profiled to provide motion control.
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2. A customisable insert according to claim 1, wherein when the arch foot type is a low arch foot type, the insert is further profiled to comprise a portion of the insert formed of a denser material starting from the heel and extending along the medial side of the insert towards ball area of the insert slightly past the
10 centre of the insert.
3. A customisable insert according to claim 1, wherein when the arch foot type is a neutral arch foot type, the insert is further profiled to comprise a portion of the insert formed of a denser material starting from the heel and extending
15 along the medial side of the insert to a location substantially parallel to the highest point of the medial arch.
4. A customisable insert according to claim 1, wherein when the arch foot type is a high arch foot type, the insert is further profiled to comprise uniform density
20 material throughout the insert.
5. A customisable insert according to any preceding claim, where the insert is made of one or more or a combination of the following materials: EVA, TPU, graphite, nylon, TPR, plastics or rubber.
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6. A customisable insert according to claim 2 or 3, wherein the portion of the insert formed of a denser material is resilient.
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7. A customisable insert according to any preceding claims further comprising a metatarsal support.

8. A customisable insert according to any preceding claims further comprising an arch support.
9. A customisable insert according to any preceding claim where the item of footwear is comprised solely of an outsole and an upper.
10. A customisable insert according to any preceding claim, where the insert is further profiled to provide reflexology, massage and/or cushioning effects to the wearer during use.
11. A customisable insert according to any preceding claim, where the insert further includes at least one of the following features: a plurality of grooves to allow for flex and grip during use; an energy returning fore-foot cushioning pad; a balancing web; a heel cushioning pad; and/or a heel cup.
12. A footwear shell comprising an upper and an outsole, the footwear shell adapted to receive a customisable insert according to any one of claims 1 to 11.
13. The footwear shell of claim 12 further comprising the customisable insert according to any one of claims 1 to 11.
14. A method of customising foot support for footwear including the steps of:
identifying a foot type of at least one foot of a person;
prescribing a foot support insert type for an item of footwear, the insert type corresponding to the identified foot type
where the prescribed insert type comprises an integrated insole and midsole customised to match the internal profile of the item of footwear, wherein the insert is profiled to provide support for the identified foot type and the insert is further profiled to provide motion control.
15. A method according to claim 14, where the step of identifying the foot type of at least one foot of a person includes the sub-step of analysing the at least

one foot by way of at least one of the following methods: foot imprint measurement; foot imaging; foot scanning; foot impression onto a material.

16.A method according to claim 14 or claim 15, further including the step of
5 selecting a style or type for the item of footwear adapted to receive a customisable insert.

17.A method according to claim 16, where the step of selecting a style or type is
restricted such that the style or type of footwear that may be selected is
10 recommended for the identified foot type of the person.