

Description

[0001] The present invention relates to the construction of footwear and in particular to the attachment of a heel.

[0002] It is known to produce shoes having a separate heel portion and there are a variety of known ways of attaching the heel portion to the insole of such a shoe. For example, conventional methods of attaching a heel portion include the use of adhesives placed between the heel portion and the insole of the shoe, and the use of nails, screws or staples driven through the insole of the shoe into the heel portion, the exposed heads of the nails, screws or staples subsequently being covered with, for example, an inner sock. It is also possible to use a number of such methods in conjunction with one another.

[0003] Shoemaking engineers select the method of attachment to ensure that the final assembly is fit for the purpose. Guidelines exist for the pattern of nail placement, the strength of the inner sole components, and the position of selected reinforcement relative to the other constituent parts of the assembly. These are all well known to those skilled in the art, and it is not the intention of this invention to redefine these guidelines.

[0004] According to the present invention there is provided a footwear construction comprising a sole member having an upper surface and an underside and a separate heel, the heel being secured relative to the underside of the sole member by means of a snap-fit connection.

[0005] In preferred constructions the sole member has a through hole in its heel region, a spigot extending through the hole from the upper surface and remaining captive relative to the upper surface of the sole member, the spigot engaging the heel with said snap-fit connection. Conveniently the spigot has an upper flange which remains captive in a corresponding relieved portion in said upper surface of the sole member surrounding said hole.

[0006] Preferably a number of resiliently deformable fingers depend from the flange at spaced locations, each finger having a hooked portion remote from said flange for engaging with said snap-fit below a rib provided in an upwardly facing recess in the heel.

[0007] It is a preferred feature that the flange surrounds an opening and a locking pin is provided in the opening so as to lock the fingers against moving out of their positions engaged below said rib.

[0008] With certain arrangements the flange and the relieved portion are circular and the opening is circular.

[0009] To aid correct positioning, there may be one or more projections which engage in corresponding recesses, the projections and recesses being provided on the heel and the underside of the sole member. Ideally two upward projections are provided on the heel, one forward of the spigot and one rearward and the corresponding recesses are provided in the underside of the sole member. Also, the spigot has a locking rib below the flange for engagement with a locking groove formed in a mar-

ginal portion adjacent the hole in the sole member.

[0010] Usually, a cover is secured relative to the upper surface of the sole member so as to cover the spigot. In some constructions the cover has a downwardly extending plug which is pressed into the opening of the spigot. Ideally, the cover is formed from a resilient, shock-absorbing material.

[0011] In a preferred embodiment the leading lower edges of the hooked portions of the fingers are chamfered so as to ease flexing when they engage the rib. Usually each finger has an internal projection below which an engaging formation of the locking pin is received and also the leading edge of said engaging formation is chamfered so as to ease flexing of the fingers when they engage therewith. A further preferred feature is that the locking pin has an upper formation spaced from the engaging formation by an annular groove, the internal projections being received in said groove when the locking pin is fully inserted.

[0012] Conveniently, the components are all moulded from plastics materials.

[0013] Embodiments of the invention will now be described in more detail. The description makes reference to the following drawings in which:

Figure 1 shows an exploded front perspective view of the components of a sole unit for use in a footwear construction according to the present invention, Figure 2 is a perspective cross-section through a partially assembled heel portion of the figure 1 arrangement, a cover portion not yet attached, Figure 3 is a perspective view from above of a heel component as shown in figure 1, Figure 4 is a perspective view from below of a sole member as shown in figure 1, Figure 5 is a perspective view from below of a spigot as shown in figure 1, and Figure 6 is a perspective view from below of a locking pin as shown in figure 1.

[0014] The figures show a sole unit 10, or components thereof, for use in a footwear construction such as a shoe or boot or sandal etc. The complete footwear construction would incorporate an upper of some kind which would be provided above the sole unit but which has been omitted from the current drawings for the sake of clarity.

[0015] The sole unit 10 comprises a sole member 11, which is preferably but not necessarily formed from a plastics material by moulding for example. The sole member has an upper surface 12 and an underside 13. A through hole 14 is provided in the heel area of the sole member 11, the hole having a circumferentially extending relieved portion 15 in its upper surface 12. In the underside 13 of the sole member 11 are a pair of recesses positioned one forward and one rearward of the hole 14. The forward recess 16 is in this embodiment an elongate, lengthwise extending slot and the rearward recess 17 is in this embodiment a circular closed bore.

[0016] The sole unit 10 also comprises a heel component 20 which comprises a heel 21 and a generally planar forward extension 22 therefrom. The forward extension 22 provides some support for the midsole region of the sole member 11. The heel component 20 also provides forward and rearward upstanding projections in the form of a round pin 23 at the rear and an elongate wall 24 on the forward extension 22. The upstanding projections 23, 24 engage with the corresponding recesses 16, 17 in the underside 13 of the sole member 11 and ensure correct positioning of the heel component 20 and the sole member 11 so that the hole 14 is aligned with a downwardly extending recess 25 provided in the heel component. The recess 25 has an annular internal rib 26 which is shown in figure 3 as being discontinuous but could also be continuous.

[0017] The sole unit 10 further includes a spigot 30 which has an annular upper flange 31 from which depend four equi-spaced flexible fingers 32. Each of the fingers 32 has an outward hook portion 33 and a chamfered leading lower edge 34. The inside of each finger 32 also has an internal projection 35. The underside of the flange 31 has a downwardly projecting locking rib 36 for registration with corresponding aligned locking grooves 37 formed in a marginal portion adjacent the hole 14 in the sole member 11 and in the heel component 20. In addition the flange 31 is shaped and dimensioned to be received in the relieved portion 15 in the upper surface 12 of the sole member 11 with the fingers 32 projecting through the hole 14 and into the recess 25 of the heel component 20.

[0018] In addition there is a locking pin 40 having a lower pin portion 41 and an enlarged upper portion 42 which is shaped and dimensioned to be received in the opening surrounded by the flange 31/fingers 32. The enlarged upper portion 42 provides a lower engaging formation 43 which has a chamfered outer lower edge 44, the formation being spaced from an upper formation 45 by an annular groove 46. The groove 46, in use, receives the internal projections 35 of the fingers 32.

[0019] A cover 50 having a generally planar portion 51 and a downward projection plug 52 is also provided. The plug 52 is received and held in the opening surrounded by the flange. Ideally the cover 50 is made from a resilient, shock absorbing plastic and provides extra cushioning directly above the heel 21 by virtue of the plug 52 which engages the top of the locking pin 40.

[0020] To assemble the sole unit, to which a shoe upper can be pre- or post-assembled, the heel component 20 is engaged with the sole member 11 so that the projections 23, 24 of the heel component are received in the corresponding recesses 17, 16 in the sole member. This ensures correct positioning of the two components and prevents relative rotation between the two components. The fingers 32 of the spigot 30 are then pushed through the hole 14 in the sole member 11 and into the recess 25 of the heel component. When the chamfered lower edges 34 of the fingers 32 engage the internal rib 26 of the recess 25, the fingers 32 flex inwardly until the hook

portions 33 engage below the rib 26 with a snap-fit. In this position the flange 31 of the spigot 30 is received in the relieved portion 15 surrounding the hole 14 in the sole member. Ideally the top of the spigot 30 does not project above the general contour of the upper surface 12 of the sole member.

[0021] Although the heel component 20 is securely connected to the sole member 11, the fingers 32 of the spigot 30 are prevented from subsequent inward deflection by means of the locking pin 40. This is inserted through the opening surrounded by the annular flange 31. The chamfered lower edge 44 of the lower engaging formation 43 engages the internal projections 35 of the fingers 32 of the spigot 30. Slight outward flexing of the fingers 32 allows the formation 43 to pass the projections 35 which engage in the annular groove 46 of the locking pin 40 with a snap-fit. The lower end of the pin portion 41 can abut a bottom surface 27 of the recess 25 to provide extra rigidity. The locking pin 40 thus prevents inward flexing of the fingers 32 which could result in the heel component becoming detached from the sole member 11.

[0022] The cover 50 is then attached by inserting the plug 52 into the opening surrounded by the flange and above the locking pin 40. In preferred arrangements the planar portion 51 of the cover extends forwardly and rearwardly above the recesses 16, 17 to provide additional cushioning above the projections 23, 24 of the heel component.

[0023] It will be appreciated that the numbers, locations and dimensions of the components illustrated in the above embodiment are for illustrative purposes and are a matter of design choice. Even some of the components are optional. It could be envisaged, for example, embodiments in which the cover and/or the locking pin are not provided, as long as suitable modifications were made to other components. Also, other snap-fitting arrangements could provide acceptable results although only one has been illustrated in detail. In preferred arrangements, such as the one illustrated above, all of the components are formed from plastics materials. This can result in a light construction and can eliminate the use of metal in the shoe construction.

Claims

1. A footwear construction comprising a sole member having an upper surface and an underside and a separate heel, the heel being secured relative to the underside of the sole member by means of a snap-fit connection.
2. A footwear construction as claimed in claim 1 wherein the sole member has a through hole in its heel region, a spigot extending through the hole from the upper surface and remaining captive relative to the upper surface of the sole member, the spigot engag-

ing the heel with said snap-fit connection.

3. A footwear construction as claimed in claim 2 wherein the spigot has an upper flange which remains captive in a corresponding relieved portion in said upper surface of the sole member surrounding said hole. 5
4. A footwear construction as claimed in claim 3 wherein a number of resiliently deformable fingers depend from the flange at spaced locations, each finger having a hooked portion remote from said flange for engaging with said snap-fit below a rib provided in an upwardly facing recess in the heel. 10
5. A footwear construction as claimed in claim 4 wherein the flange surrounds an opening and a locking pin is provided in the opening so as to lock the fingers against moving out of their positions engaged below said rib. 15
6. A footwear construction as claimed in claim 4 or 5 wherein the flange and the relieved portion are circular. 20
7. A footwear construction as claimed in any one of claims 4 to 6 wherein the opening is circular. 25
8. A footwear construction as claimed in any one of claims 2 to 7 wherein there are one or more projections which engage in corresponding recesses, the projections and recesses being provided on the heel and the underside of the sole member. 30
9. A footwear construction as claimed in claim 8 wherein two upward projections are provided on the heel, one forward of the spigot and one rearward and the corresponding recesses are provided in the underside of the sole member. 35
10. A footwear construction as claimed in any one of claims 3 to 9 wherein the spigot has a locking rib below the flange for engagement with a locking groove formed in a marginal portion adjacent the hole in the sole member. 40
11. A footwear construction as claimed in any one of claims 2 to 10 wherein a cover is secured relative to the upper surface of the sole member so as to cover the spigot. 45
12. A footwear construction as claimed in claim 11 wherein the cover has a downwardly extending plug which is pressed into the opening of the spigot. 50
13. A footwear construction as claimed in claim 11 or 12 wherein the cover is formed from a resilient, shock-absorbing material. 55
14. A footwear construction as claimed in claim 4 wherein the leading lower edges of the hooked portions of the fingers are chamfered so as to ease flexing when they engage the rib.
15. A footwear construction as claimed in claim 14 wherein each finger has an internal projection below which an engaging formation of the locking pin is received.
16. A footwear construction as claimed in claim 14 or 15 wherein the leading edge of said engaging formation is chamfered so as to ease flexing of the fingers when they engage therewith.
17. A footwear construction as claimed in claim 16 wherein the locking pin has an upper formation spaced from the engaging formation by an annular groove, the internal projections being received in said groove when the locking pin is fully inserted.
18. A footwear construction as claimed in any one of claims 1 or 17 wherein the components are all moulded from plastics materials.

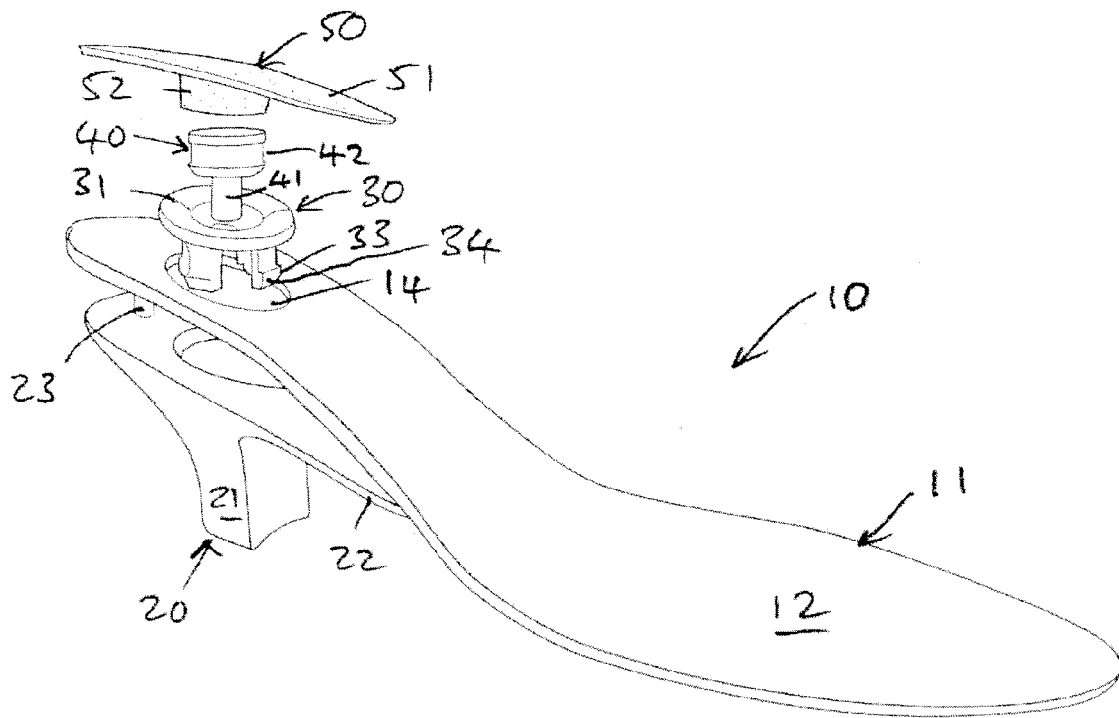


FIGURE 1

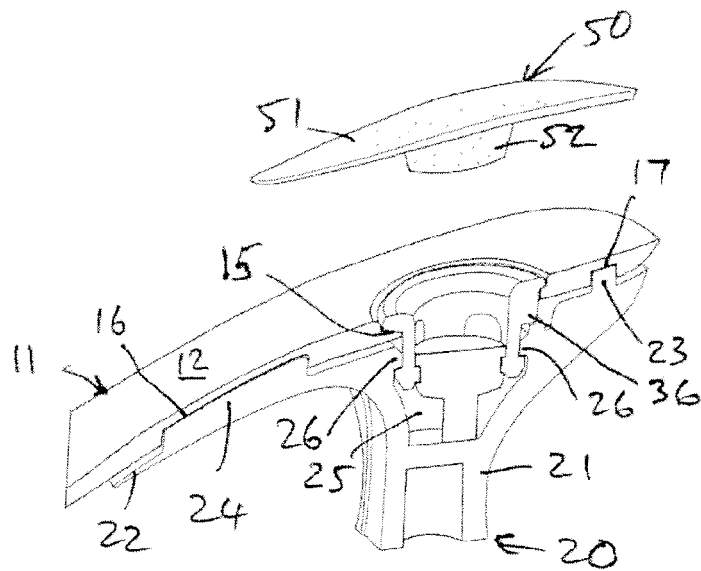
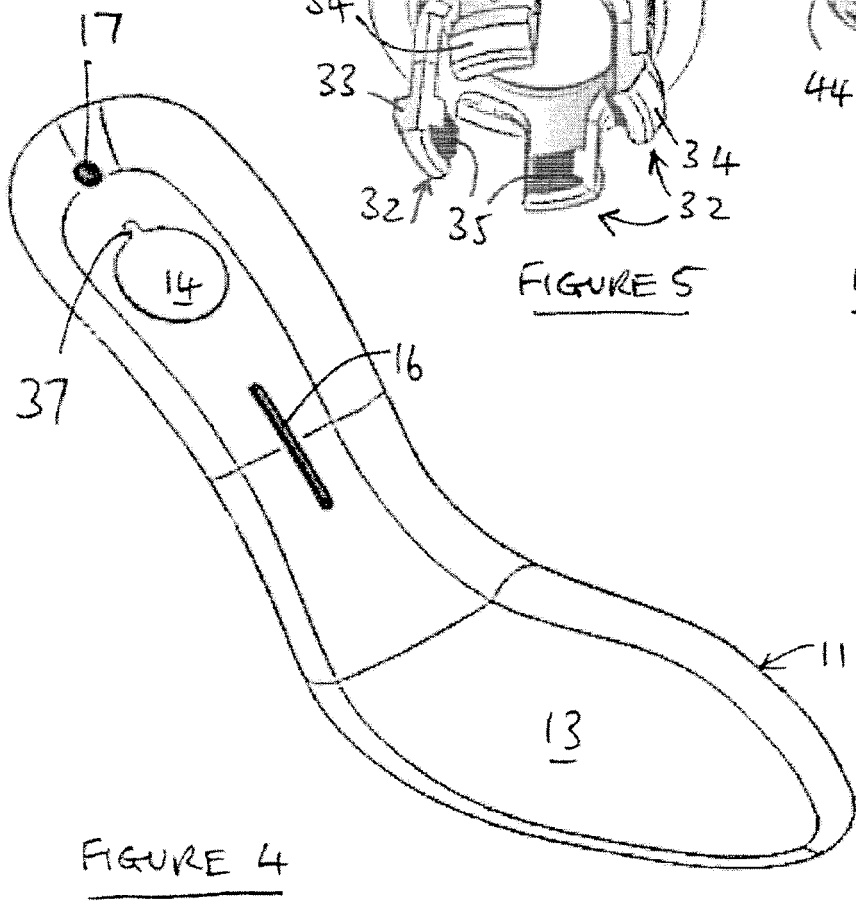
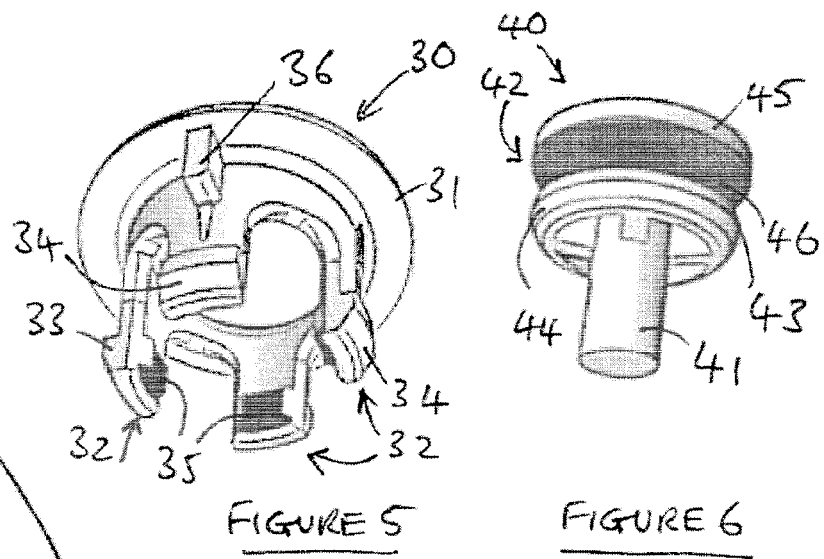
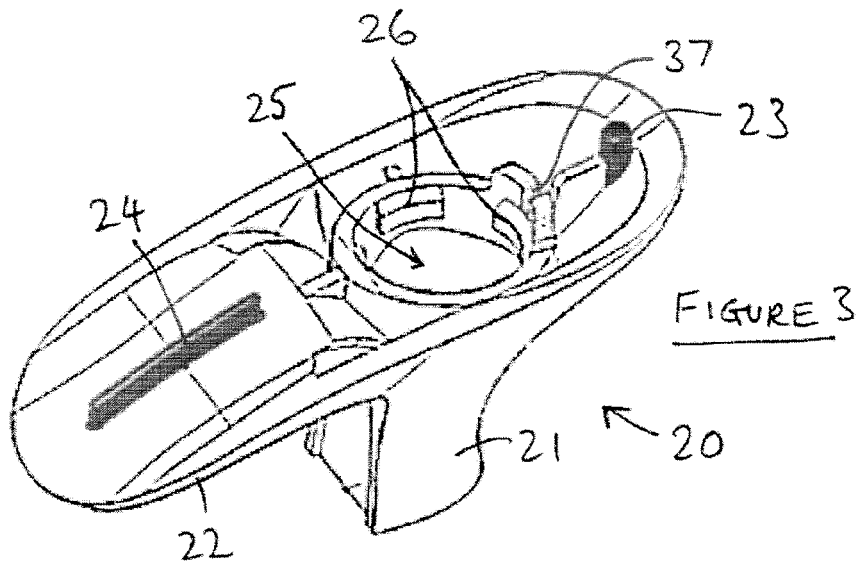


FIGURE 2





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 10 9752

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	FR 2 858 924 A (EMILE BARBIER ETS [FR]) 25 February 2005 (2005-02-25)	1-8,14,18	INV. A43B13/22
Y	* page 3, line 14 - page 6, line 13; figures *	9,11,13	A43B13/34 A43B21/37
Y	----- US 5 675 916 A (LEWIS ROSALIE [US]) 14 October 1997 (1997-10-14) * column 11, lines 6-29; figures 2,7-9 *	9,11,13	
X	----- GB 2 420 687 A (OKWAUOSA NONSO [GB]) 7 June 2006 (2006-06-07) * page 3; figures 8-10 *	1-4,11,13	
X	----- DE 18 28 647 U (JORDAN HERBERT [DE]) 23 March 1961 (1961-03-23) * page 3, lines 22-25 - page 4, lines 11-22; figures *	1,2,8,18	
X	----- US 5 953 836 A (WATT WILLIAM T [US] ET AL) 21 September 1999 (1999-09-21) * column 4, lines 31-49; figures *	1,2,8	
			TECHNICAL FIELDS SEARCHED (IPC)
			A43B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		25 September 2007	Herry, Manuel
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

1
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 10 9752

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

25-09-2007

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2858924	A	25-02-2005	NONE	
US 5675916	A	14-10-1997	NONE	
GB 2420687	A	07-06-2006	NONE	
DE 1828647	U	23-03-1961	NONE	
US 5953836	A	21-09-1999	NONE	