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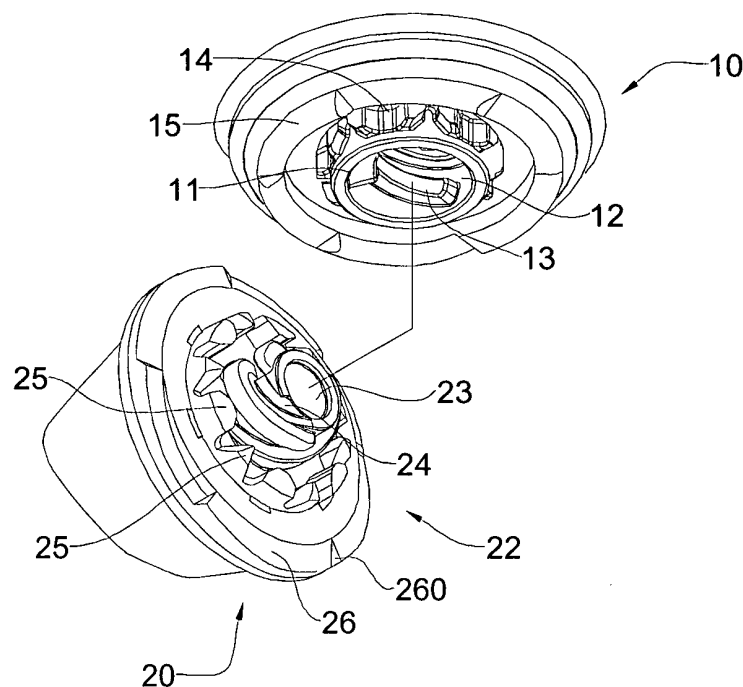
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**(54) Spike assembly for a spiked shoe**

(57) A spike assembly has a spike (22) and spike connector (10). The spike connector (10) has multiple threads formed on an inner surface. The multiple threads include a specific thread (13) has a width larger than that of the others. The spike (22) has multiple grooves formed in an outer surface. The multiple grooves include a spe-

cific groove (24) having a depth deeper than that of the others and corresponding to the width of the specific thread on the spike connector. Accordingly, the spike is easily connected with the spike connect at a specific orientation, and to assemble the spike assembly is convenient.



**FIG.3**

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## Description

**[0001]** The present invention relates to a spike assembly, and more particularly to a spike assembly having a spike and a spike connector and firmly attached together in a desired orientation.

**[0002]** Shoes are provided to keep warm and a protection effect to feet of users and are designed to different types, such as sport shoes, mountaineering boots or spiked shoes.

**[0003]** To increase friction between shoes and ground, multiple spikes are always mounted on a bottom of a shoe. With reference to FIG.7, a conventional spiked shoe in accordance with the prior art comprises a sole (30) and multiple spikes (31). The spikes (31) are formed on and extend down from the bottom of the sole (30) at different orientations. With the spikes (31) extending toward different orientations, the spiked shoe is able to provide more friction to effectively accelerate a person who wearing the spiked shoes.

**[0004]** However, the spikes are integrally formed on the sole (30) by an injection molding process and are not replaceable. If anyone spike (31) is damaged or broken, the spiked shoe can't be used anymore.

**[0005]** With reference to Fig. 8, a conventional spiked shoes with replaceable spikes substantially comprises a sole (40) and multiple spikes (41). The sole (40) has a bottom and multiple threaded holes (42) defined in the bottom. Each spike is attached to one of the threaded holes (42) and has a bottom end and a top end. The bottom end has a tip for inserting into the ground to increase friction, and the top end has a threaded stub (410) to screw into the corresponding threaded hole to mount the spike on the sole (40). Such that the spikes (41) are detachable, the spiked shoe is still useful by replacing new spikes (41) when any spike is broken or damaged.

**[0006]** However, to screw the spikes (41) into the threaded holes (42) in the sole (40) is time-consuming, such that to assemble the conventional spiked shoe is trouble. In addition, if the spikes (41) are not tightly screwed into the threaded holes (42) in the sole (40), the spikes (41) are easily unintentionally detached from threaded hole and the user is easily injured. Furthermore, the spikes (41) are unable being attached to the sole (40) with different orientations.

**[0007]** To overcome the shortcomings, the present invention provides a spike assembly to obviate or mitigate the aforementioned problems.

**[0008]** An objective of the present invention is to provide a spike assembly that can firmly attach a spike onto a spike connector at a particular orientation in convenient.

**[0009]** To achieve the objective, the spike assembly in accordance with the present invention has a spike connector and a spike.

**[0010]** The spike connector is mounted in a sole of a spiked shoe, and has a bottom with a center, an inner periphery and an outer periphery, a connecting hole, mul-

tiple notches and multiple fasteners.

**[0011]** The connecting hole is defined in the center of the bottom and has an inner surface and multiple threads formed on the inner surface, wherein a specific thread has a width larger than that of the others. The multiple notches are defined along the inner periphery of the spike connector. The multiple fasteners are formed along the outer periphery of the spike connector, and each fastener has a buckling edge.

**[0012]** The spike has a head and a base. The head is adapted to contact with the ground. The base has a top with a center, an inner periphery and an outer periphery, a threaded shank, multiple protrusions and multiple fasteners.

**[0013]** The threaded shank is formed on the center of the top and has an outer surface and multiple grooves formed on the outer surface. The multiple grooves include a specific groove being deeper than the others, and the depth of the specific threaded groove corresponds to the width of the specific thread on the spike connector.

**[0014]** The multiple protrusions are formed along the inner periphery of the top of the base and correspond respectively to the multiple notches in the spike connector.

**[0015]** The multiple fasteners are formed along the outer periphery of the top of the base and correspond respectively to the fasteners of the spike connector, and each fastener has a buckling edge. The buckling edges of the fasteners on the spike and the spike connector abut against with each other to provide an extra retaining effect to hold the position of the spike and the spike connector in place.

**[0016]** Other objectives, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

Fig. 1 is an exploded perspective view of a sole with spike assemblies in accordance with the present invention;

Fig. 2 is a bottom view of the sole with the spike assemblies in Fig. 1;

Fig. 3 is an exploded perspective view of a spike assembly in Fig. 1;

Fig. 4 is a bottom view of a spike connector of the spike assembly in Fig. 3;

Fig. 5 is a top view of a spike of the spike assembly in Fig. 3;

Fig. 6 is a cross sectional side plan view of the spike assembly in Fig. 3;

Fig. 7 is a perspective bottom view of a conventional spiked shoe in accordance with the prior art; and

Fig. 8 is an exploded perspective bottom view of another conventional spiked shoe in accordance with the prior art.

**[0017]** With reference to FIG.1 to 6, a spike assembly

in accordance with the present invention is attached to a bottom of a sole of a spiked shoe and comprises a spike connector (10) and a spike (20). The spike connector (10) is securely mounted on the sole and has a bottom with a center, an inner periphery and an outer periphery, a connecting hole (11), multiple notches (14), multiple fasteners (15) and an optional mark (12).

**[0018]** The connecting hole (11) is defined in the center of the bottom and has an inner surface and multiple threads formed on the inner surface, wherein the multiple threads include a specific thread (13) having a width larger than that of the others thread. The multiple notches (14) are defined along the inner periphery of the bottom of the spike connector (10). The multiple fasteners (15) are formed along the outer periphery of the bottom of the spike connector (10), and each fastener (15) has a buckling edge (150). The mark (12) can be defined on a position of the bottom of the spike connector (10) such that when the spike connector (10) be mounted in a sole, the orientation of a spike (20) connecting with the spike connector (10) can be ensured according to the mark (12).

**[0019]** The spike (20) has a head (21) and a base (22). The head (21) is adapted to contact with the ground and can be formed into any specific type such as a plank (as shown in FIG.7) or a taper (as shown in FIG.8). The base (22) has a top with a center, an inner periphery and an outer periphery, a threaded shank (23), multiple protrusions (25) and multiple fasteners (26).

**[0020]** The threaded shank (23) is formed on the center of the top and has an outer surface and multiple grooves formed on the outer surface, wherein the multiple grooves include a specific groove (24) is deeper than the others grooves, and the depth of the specific groove (24) is corresponding to the width of the specific threaded (13) on the spike connector (10). Only if the specific threaded groove (24) opposites and embeds in the specific thread (13) of a corresponding connecting hole (11), the threaded shank (23) can be screwed into the connecting hole (11) and the spike will connect to the spike connector (10) with specific orientation then.

**[0021]** The multiple protrusions (25) are formed along the inner periphery of the top of the base (22) and respectively correspond to and engage with the multiple notches (14) in the spike connector (10). With the engagements between the protrusions (25) and the notches (14), an auxiliary fastening effect is provided to keep the spike (20) from detaching from the spike connection (10) unintentionally.

**[0022]** The multiple fasteners (15) are formed along the outer periphery of the top of the base (22) and correspond respectively to the fasteners (15) on the spike connector (10). Each fastener (15) has a buckling edge (150). The buckling edges (150) of the fasteners on the spike (20) and the spike connector (10) can abut against with each other to provide an extra retaining effect to hold the position of the spike (20) and the spike connector (10) in place and to prevent the spike (20) from inverse rotation relative to the spike connection (10).

**[0023]** In such an arrangement, the spike (20) is easily connected to the spike connector (10) at a specific orientation. Moreover, because the grooves and the teeth are more and shorter than the prior art, that to assemble and to disassemble the spike assembly in accordance with the present invention is convenient and work saving.

**[0024]** Even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description together with details of the structure and function of the invention, the disclosure is illustrative only. Changes may be made in detail especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

## Claims

1. A spike assembly for being mounted in a sole of a spiked shoe and comprising

a surface with a center, an inner periphery and an outer periphery;

a connecting hole being defined in the center of the surface and having an inner surface and multiple thread teeth formed on the inner surface, wherein the multiple thread teeth include a specific thread having a width larger than that of the others thread.

2. The spike connector as claimed in claim 1, wherein the spike connector further has multiple notches being defined along the inner periphery of the surface of the spike connector.

3. The spike connector as claimed in claim 1, wherein the spike connector further has multiple fasteners being formed along the outer periphery of the surface of the spike connector, and each fastener having a buckling edge.

4. The spike connector as claimed in claim 1, wherein the spike connector further has a mark being defined on a position of the surface of the spike connector.

5. A spike for the spike connector as claimed in claim 1, wherein the spike has

a head being used to contact with the ground and being formed into a specific type;

a base having

a surface with a center, an inner periphery and an outer periphery;

a threaded shank being formed on the center of the surface and having an outer surface and multiple thread grooves formed on

the outer surface, wherein the multiple thread grooves include a specific threaded groove being deeper than the others did, and the deep of the specific threaded groove being corresponding to the specific thread. 5

6. The spike as claimed in claim 5, wherein the spike further has multiple protrusions being formed along the inner periphery of the surface of the base. 10
7. The spike as claimed in claim 5, wherein the spike further has multiple fasteners being formed along the outer periphery of the surface of the base and each fastener having a buckling edge. 15
8. The spike as claimed in claim 5, wherein the head of the spike is formed into a plank.
9. The spike as claimed in claim 5, wherein the head of the spike is formed into a taper. 20

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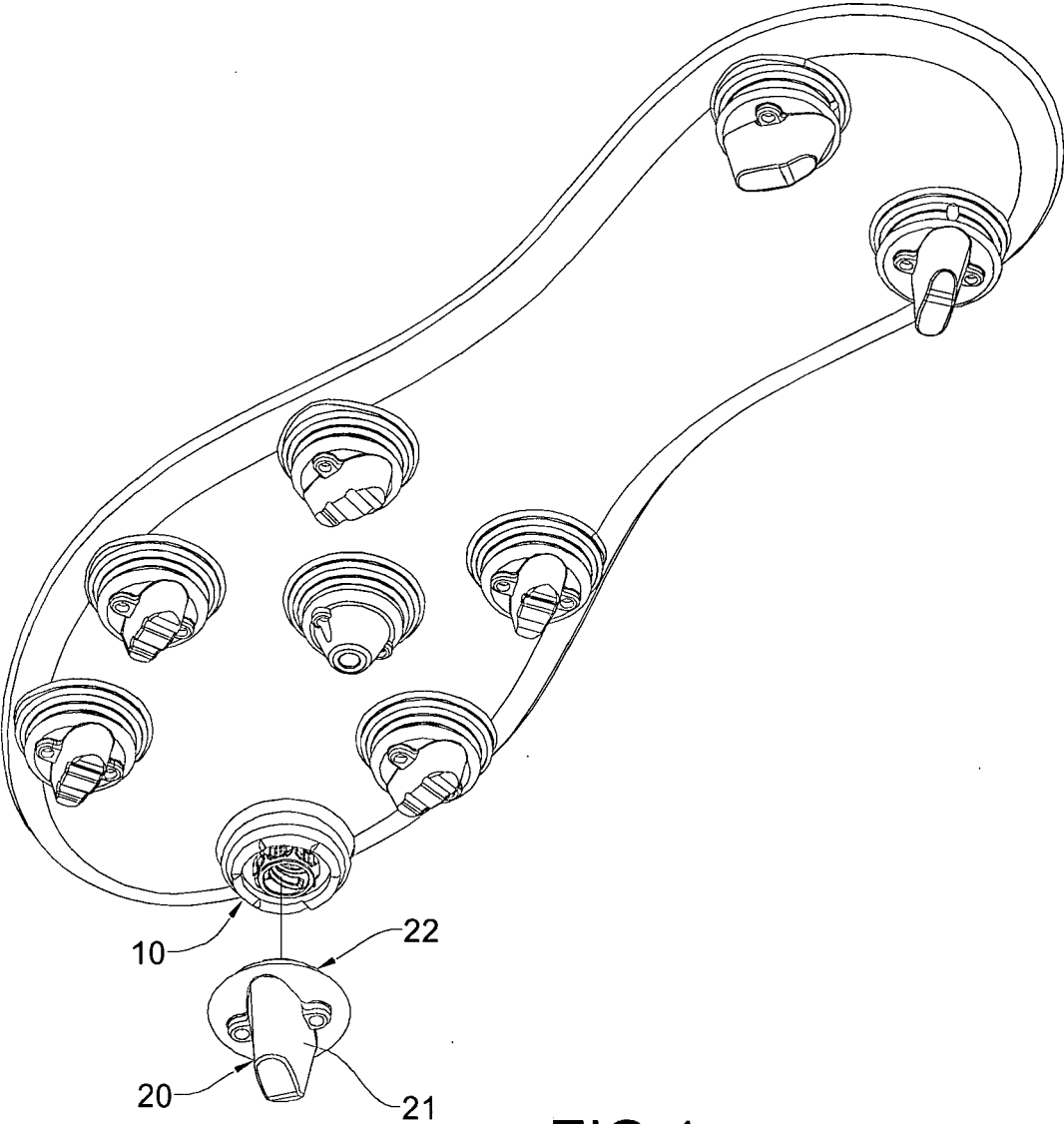


FIG.1

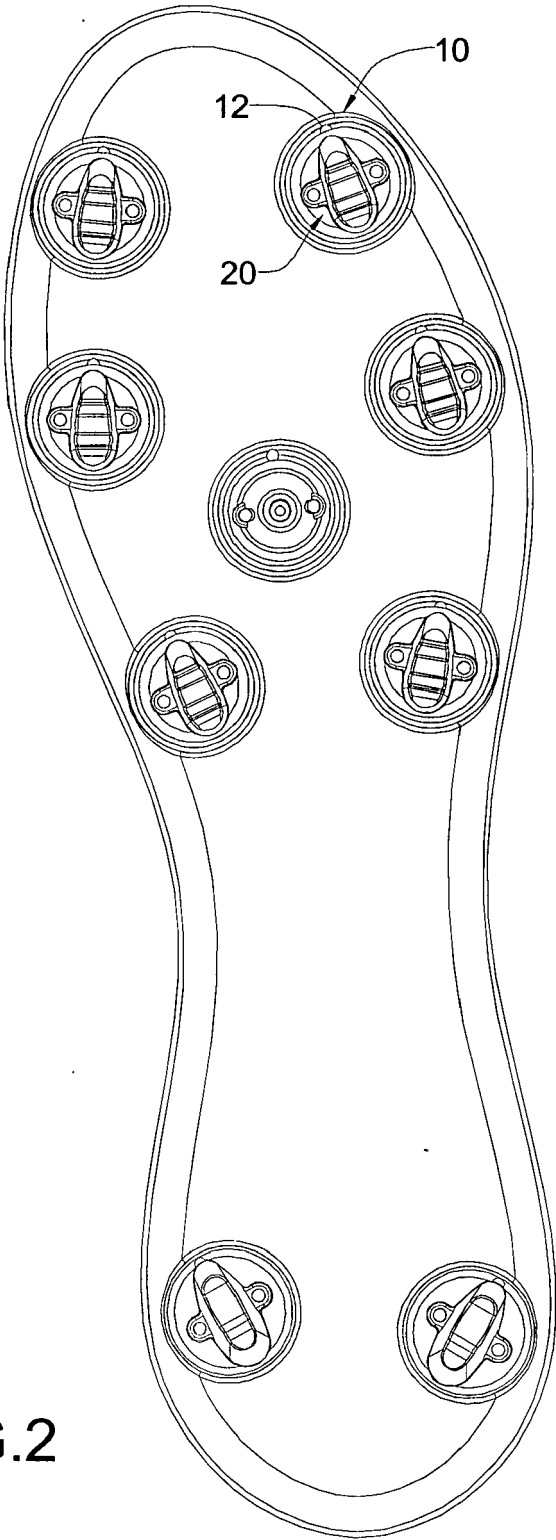


FIG.2

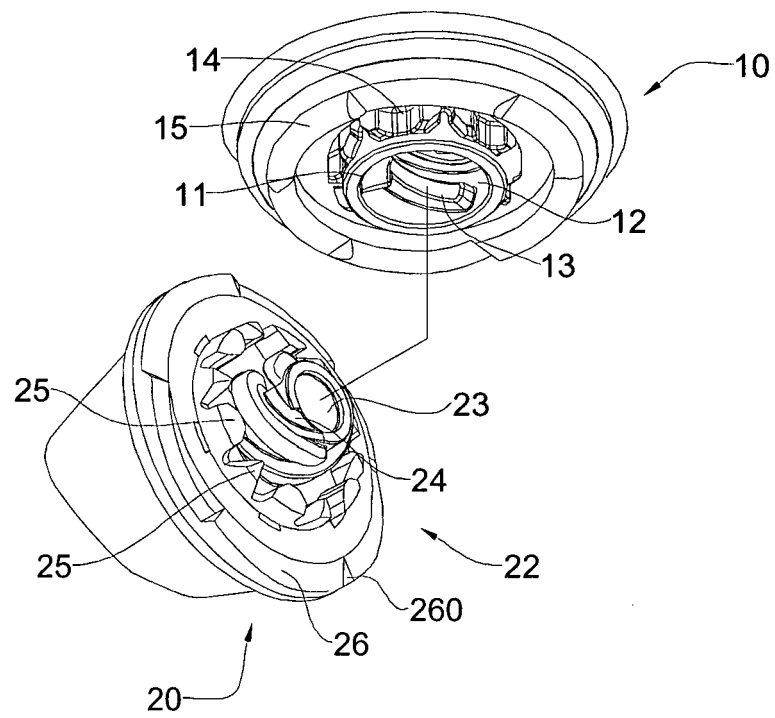


FIG.3

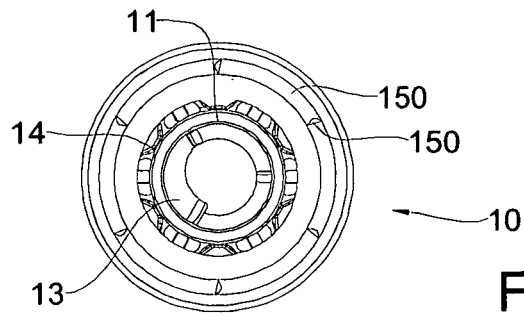


FIG. 4

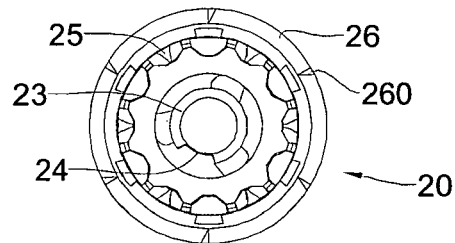


FIG. 5

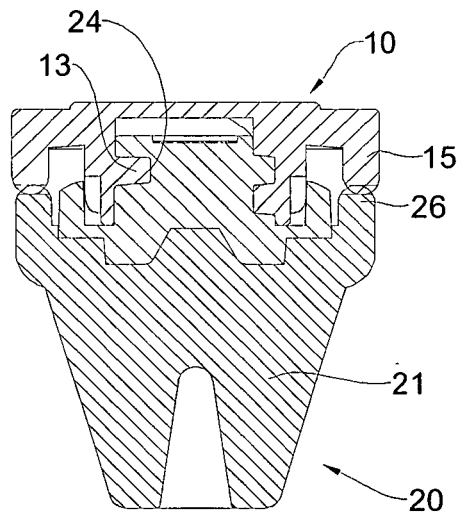


FIG. 6



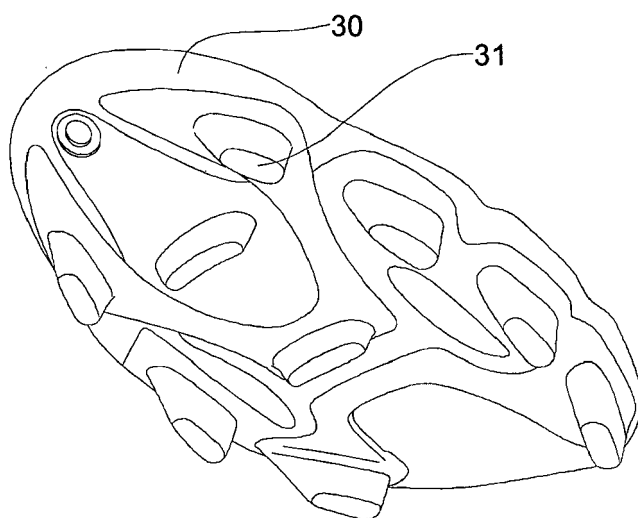


FIG.7

PRIOR ART

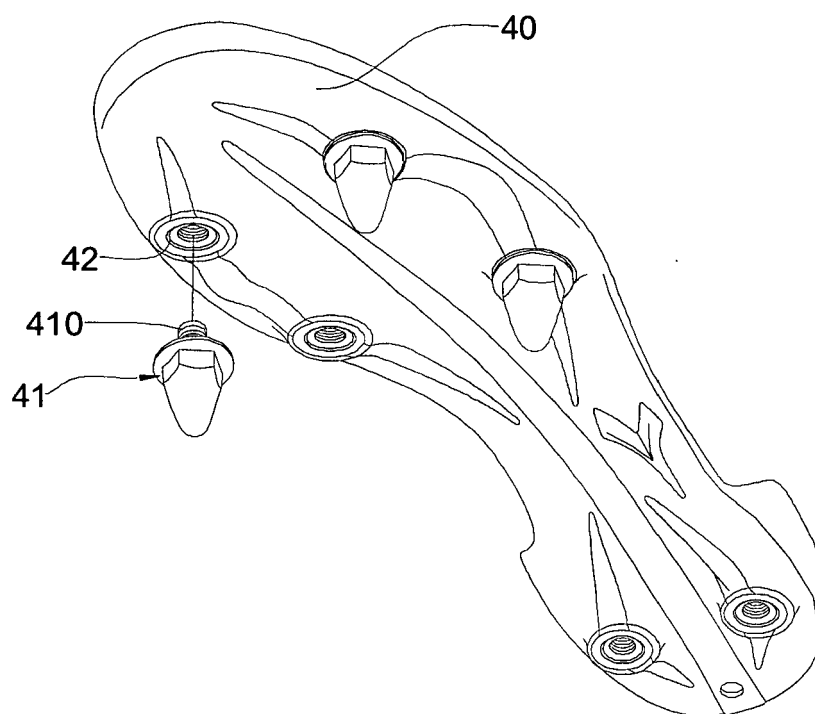


FIG.8  
PRIOR ART



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 06 00 2650

| 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                                                                                                                                                                                                                                                      | WO 02/39840 A (TRISPORT LIMITED; KELLY, PAUL, ANDREW; SHUTTLEWORTH, LEE, PAUL)<br>23 May 2002 (2002-05-23)<br>* page 13, line 5 - page 16, line 25;<br>claims 4-6; figures 11-14 *<br>----- | 1-9                                                                                                                                                                                                                                                                                   | INV.<br>A43C15/16                       |
| A                                                                                                                                                                                                                                                      | GB 1 471 209 A (DASSLER A; ADIDAS SPORTSCHUHFABRIKEN ADI DASSLER KG)<br>21 April 1977 (1977-04-21)<br>* the whole document *<br>-----                                                       | 1                                                                                                                                                                                                                                                                                     |                                         |
| A                                                                                                                                                                                                                                                      | US 2004/031171 A1 (CHEN MING-CHI)<br>19 February 2004 (2004-02-19)<br>* the whole document *<br>-----                                                                                       | 1-9                                                                                                                                                                                                                                                                                   |                                         |
|                                                                                                                                                                                                                                                        |                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                       | TECHNICAL FIELDS SEARCHED (IPC)         |
|                                                                                                                                                                                                                                                        |                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                       | A43C                                    |
| The present search report has been drawn up for all claims                                                                                                                                                                                             |                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                       |                                         |
| Place of search<br><b>The Hague</b>                                                                                                                                                                                                                    |                                                                                                                                                                                             | Date of completion of the search<br><b>10 July 2006</b>                                                                                                                                                                                                                               | Examiner<br><b>Schölvinck, T.S.</b>     |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document |                                                                                                                                                                                             | T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>.....<br>& : member of the same patent family, corresponding document |                                         |

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EPO FORM 1503 03.82 (P04/C01)

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

EP 06 00 2650

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  
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10-07-2006

| Patent document<br>cited in search report |    | Publication<br>date |      | Patent family<br>member(s) |  | Publication<br>date |
|-------------------------------------------|----|---------------------|------|----------------------------|--|---------------------|
| WO 0239840                                | A  | 23-05-2002          | AT   | 257337 T                   |  | 15-01-2004          |
|                                           |    |                     | AU   | 783119 B2                  |  | 29-09-2005          |
|                                           |    |                     | AU   | 2379802 A                  |  | 27-05-2002          |
|                                           |    |                     | CA   | 2396876 A1                 |  | 23-05-2002          |
|                                           |    |                     | CN   | 1395469 A                  |  | 05-02-2003          |
|                                           |    |                     | DE   | 60101723 D1                |  | 12-02-2004          |
|                                           |    |                     | DE   | 60101723 T2                |  | 01-07-2004          |
|                                           |    |                     | DK   | 1241958 T3                 |  | 17-05-2004          |
|                                           |    |                     | EP   | 1241958 A1                 |  | 25-09-2002          |
|                                           |    |                     | ES   | 2211829 T3                 |  | 16-07-2004          |
|                                           |    |                     | HK   | 1050462 A1                 |  | 21-10-2004          |
|                                           |    |                     | JP   | 2004513691 T               |  | 13-05-2004          |
|                                           |    |                     | NZ   | 520160 A                   |  | 25-06-2004          |
|                                           |    |                     | PT   | 1241958 T                  |  | 31-05-2004          |
|                                           |    |                     | TW   | 516942 B                   |  | 11-01-2003          |
| -----                                     |    |                     |      |                            |  |                     |
| GB 1471209                                | A  | 21-04-1977          | AT   | 415474 A                   |  | 15-12-1977          |
| -----                                     |    |                     |      |                            |  |                     |
| US 2004031171                             | A1 | 19-02-2004          | NONE |                            |  |                     |
| -----                                     |    |                     |      |                            |  |                     |