

THE JOINT EXAMINATION BOARD

PAPER P4

AMENDMENT OF SPECIFICATIONS FOR UNITED KINGDOM PATENTS/APPLICATIONS
IN PROSECUTION, REVOCATION PROCEEDINGS OR OTHERWISE

Wednesday 1st November 2006

10.00 a.m. – 1.00 p.m.

*Please read the following instructions carefully. **Time Allowed – 3 HOURS***

1. Please note the following.
 - a. Enter the Paper Number (P4) and your Examination number in the appropriate boxes at the top of each sheet of paper.
 - b. The scripts are photocopied for marking purposes. Please write with a **dark inked pen** on one side of the paper only and within the printed margins, and do not use highlighters in your answer.
 - c. Do not staple or join pages together in any way.
 - d. Do not state your name anywhere in the answer.
 - e. Write clearly: examiners cannot award marks to answers that cannot be read.
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THE JOINT EXAMINATION BOARD

PAPER P4

QUESTION

A United Kingdom patent application comprising the attached specification (identified as GB 0523123.4) was filed at the UK Patent Office on 3 January 2005 without any claim to priority. The UK Patent Office has issued the attached Official Letter.

You have received information from your client in the form of the attached letter.

Your task is to prepare the following.

1. A letter to the UK Patent Office in response to the Official Letter, accompanied by a set of amended claims if appropriate. Note that for the purpose of this examination you are **not** required to prepare any amendments to the description of the patent application.
2. A memorandum consisting of notes (not a letter) explaining the actions you have taken and the reasons for those actions, and providing a basis for later advice and comment to your client. These notes should be restricted to patent matters; you are **not** required to consider any other matters such as copyright or design protection.

Note the following.

(a) You should accept the facts given in the paper and base your answer on those facts. In particular you should **not** make use of any special knowledge that you may have of the subject-matter concerned, and you must assume that the prior art referred to is in fact exhaustive. Where only extracts of documents are presented, you should assume that those extracts contain all relevant material.

(b) If your advice to your client will include a suggestion that any divisional application(s) should be filed, you should draft the corresponding independent claim(s) and your memorandum should explain why divisional filing is advisable. You should **not** draft a description or any dependent claims for a divisional application.

(c) If you submit any amended claim set and/or divisional claim(s), put these at the top of the papers when handing in your answer and number the pages accordingly.

Document List:

Client's letter - 2 pages

Official letter - 1 page

Client's application GB 0523123.4 - 6 pages text, 3 pages drawings

GB2012345 (Manik Shoes Ltd) - 3 pages text, 2 pages drawings

EP2134254 (Blanolo & Co) - 2 pages text, 1 page drawings

LETTER FROM CLIENT

Mr P. Agent
Chartered Patent Attorney

Dear Mr Agent

I realise that I have left this rather late, but I would like you to respond to the Examiner's objections. Please use your judgement to obtain the best possible protection now – I'd really rather avoid the cost of any further rounds of correspondence with the Patent Office. I can also see that today is the deadline – I know you mentioned that we had an extension of time available, but I'd much rather that we get this done today because I'm going to be away for a while.

As we originally discussed, my removable shoe lift has numerous advantages. Primarily, by moulding the lift in two layers, upper and lower, it is possible to select material for each layer having properties that are suitably matched to the various needs. Thus, if one of the layers is moulded from a hard material and the other layer from a relatively soft material, it is possible to obtain an advantageous lift construction. Both health and wearing comfort can be achieved, for example by reducing reverberation to the head of the wearer that would otherwise be caused by impact shock from the floor. At the same time sufficient rigidity can be given to the entire lift.

I can see that the Blanolo document does have this, but clearly there is the risk that the layers will detach as they are only glued together. To me, the direct integrated attachment of the two layers is very important.

The Manik document doesn't seem to be like mine, and is certainly far more complicated. I'm not sure I understand the Examiner's comment on this. It all seems a bit speculative to me.

I must admit that I've rather moved on since this application was filed. I'm not sure that the claims fully cover all of the designs that I am now contemplating. In particular, the term "dovetail" seems to me to imply a straight-sided projection, which is not necessary as you can see from Figure 6(b) below. Of course, you may have used the term to mean something broader, so I'd like your advice on this.

I'd like to add further, newer designs to my patent. I've got a couple of models of this, both of which are currently being copied by my competitor. Please give me your thoughts on how best to get over this. For your benefit, and as time is short, I've prepared this piece for you to insert in the text:

With advanced moulding methods, it is not necessary for the projections to go right through the other layer. Fig. 6(a) shows an example with screwhead-shaped connecting projections 3b; Fig. 6(b) shows an example of knob-shaped connecting projections 3b. In either case, in the same way as described above, the upper and lower layers are composed such that it is impossible for them to become separated.

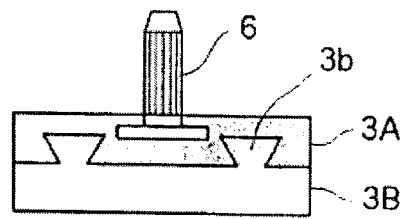


Fig. 6 (a)

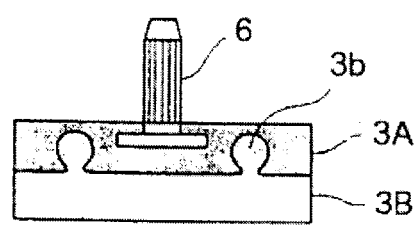


Fig. 6 (b)

I look forward to getting your report in due course. Unfortunately I will be away as mentioned so I hope you have everything you need.

Yours sincerely,

Jim Cobbler
Sharpshoe Ltd.

OFFICIAL LETTER

Application no. 0523123.4
Applicant: Sharpshoe Limited
Examiner: James Phillips

Latest Date for reply: 1 November 2006

PATENTS ACT 1977**Examination Report under Section 18(3)****Prior Art Raised**

1) The following documents will be referred to throughout this communication:

D1: GB2012345 (Manik Shoes Ltd) Published: 16 February 1983
D2: EP2134254 (Blanolo & Co) Published: 23 August 2002

Novelty/Obviousness

- 2) The claimed subject-matter is not new and/or is obvious in view of what has already been disclosed in D1 and D2.
- 3) D2 appears to anticipate claim 1, as does D1, at least in the alternative described at the end of the description in D1.
- 4) D1 describes a heel block which is of a hard polymer material. A top lift 24 is provided and retained by means of pins which are, to all intents and purposes, a dovetail connection as specified in claim 2. Moreover the top lift 24 and the resilient skirt 26 also constitute a lift of the kind claimed. The D1 arrangement describes all the features of claims 1, 2 and 4.
- 5) D2 describes a lift with a construction corresponding to the general construction of the lifts in the present application, which could be combined readily with the subject-matter of D1 to render the construction obvious.
- 6) Nothing in claims 3, 5 and 6 defines subject-matter with the necessary characteristics of novelty and inventive step if combined with claim 1. Moulded components as in claims 5 and 6 are conventional, and mentioned in both D1 and D2.

Clarity and Support

- 7) Use of the terms 'hard' and 'soft' in claim 1 leads to inevitable lack of clarity as to the scope of protection sought. Amendment of claim 1 is therefore required to clearly identify the subject matter which claim 1 is intended to encompass.

Yours faithfully

James Phillips

Shoe lift construction

5 This invention relates to a lift construction for a shoe, in which the lift attached to the bottom of the heel of a shoe is moulded into a single piece from two polymer layers.

There have been recent changes in the constructions used for shoe heels. The lifts attached to the bottom of shoe heels have always been easily subject to wear, and the replaceability of those lifts has been an important problem. Iron ring lifts, hard rubber, and other
10 constructions were originally used for the lifts on women's shoes, but there were problems with wear resistance. Recently, the most common material used for lifts has been urethane polymer, which features excellent wear resistance.

However, the change to this material did not eliminate the need for replaceability. Because
15 of their small surface area, the lifts of high-heeled shoes are subject to severe wear and require frequent replacement. In the past, as it has been difficult to replace lifts other than at a specialist shop, this resulted in shorter shoe life. For this reason, heel lifts have been proposed which it is possible to replace without requiring special skill. However, even in such cases, the lift as a whole would still be moulded in a solid piece from urethane polymer
20 or a similar substance. Various problems occurred as a result of this, as follows.

- (1) If the lift were moulded from hard urethane polymer, the impact shock from walking on a hard floor surface would reverberate to the head of the wearer, thus presenting problems with health and wearing comfort.
- 25 (2) In addition, the lifts were often coloured black (coloured with carbon black) in order to present a slim appearance from a design aspect, and this could result in marks being made on the floor surface while walking.
- (3) Furthermore, if the lift as a whole were moulded instead from soft polymer to take account of the health of the user, the manner in which the weight of the wearer was applied
30 while walking could cause the lift to tilt sideways, thus increasing the danger of a twisted ankle.

It is therefore a general object of this invention to provide a lift construction which increases the product value of the shoe, by making a replaceable lift in a single piece from two polymer

layers, upper and lower, and, moreover, by selecting polymers having properties which are suitably matched to the various needs.

5 A shoe lift constructed in accordance with this invention is defined in claim 1, with preferred constructions in the sub-claims.

10 Moulding the lift into two layers, upper and lower, enables choice of the layers according to need. If one of the upper and lower layers is moulded from a hard polymer and the other from a relatively soft polymer, the shock-absorbing action of the soft polymer layer prevents the impact force from the floor from reverberating to the head of the wearer, thus improving the health aspect and providing good wearing comfort. In addition, the hard polymer layer makes it possible to ensure sufficient rigidity for the lift as a whole, thus eliminating the danger of the wearer twisting an ankle. Furthermore, it is possible to select different colouring for the upper and lower layers, and in particular, if the lower layer is a urethane polymer layer, a bright, natural colour can be easily used, thus making it possible to prevent marking of a floor surface.

The following is a description of an embodiment of the invention, given with reference to the figures of the accompanying drawings, wherein:

- 20 Figure 1 is a perspective view of a shoe heel incorporating a shoe lift;
Figure 2 is an enlarged side view of the heel with some parts in section;
Figures 3(a) to (d) are schematic diagrams of steps in moulding a shoe lift;
Figures 4(a) and 4(b) are plan and perspective views of the lower layer of the lift;
25 Figures 5(a) to 5(c) are plan views of variant examples of the lower layer of the lift.

The shoe shown in Figure 1 comprises a shoe body 1, a heel body 2 made of rigid plastic which projects from the bottom rear of the shoe body 1, and a two-layer moulded lift 3 which is attached to the bottom of the heel body 2, to be described later. The heel body 2 is moulded into two separate layers, upper and lower.

The heel body 2 is attached as a continuous single piece to the bottom of the shoe body 1. A wedge-shaped notch 4 (see Figure 2) is formed at the bottom of the heel body 2. In addition, an insertion hole 5 is formed in the centre part of the bottom of the heel body 2,

substantially perpendicular to the bottom surface 2a of the body 2. A metal mounting fixture 6 projects upwardly from the top of the horseshoe-shaped lift 3 and fits into this insertion hole 5 so that, as shown in Figure 2, the heel body 2 and the lift 3 are connected together as a single piece. The mounting fixture 6 has a head or flange 6a embedded in the lift 3 to secure it to the lift 3 as a single piece. Grooves on the circumference of a shank or insertion part 6b increase adhesion and prevent turning: the part 6b is sized to fit tightly in the hole 5.

The notch 4 is used when removing a worn lift 3 to replace it. By inserting the tip of a screwdriver D into the notch 4 as indicated in Figure 2, the lift 3 can be prised loose. The notch 4 is on the inward-facing side of the bottom of the heel body 2 so that it is not especially visible from the outside.

As shown in Figure 2, the lift 3 is moulded from two polymer layers, an upper layer 3A and a lower layer 3B. One layer is moulded from hard nylon polymer, and the other from relatively softer urethane polymer. If different polymers are used, it becomes easy to provide each layer with properties which meet the corresponding needs. A relatively soft polymer layer is used so that, by providing a shock-absorbing function, the impact shock generated on a hard surface does not reverberate to the head of the wearer, thus improving health, wearing comfort etc.

A urethane polymer layer may be useful for the lower layer 3B, because the black colouring (coloured with carbon black) previously used in order to present a slim appearance could result in marks being made on the floor surface while walking. This is avoided by using urethane polymer for the lower layer and using its bright, natural colour.

If the upper layer 3A and the lower layer 3B were both moulded into a single piece from the same soft polymer, the lift 3 as a whole would lack rigidity. By composing a layer which comprises one-half of the lift from a hard polymer, it is possible to provide the rigidity required for the lift as a whole, thus eliminating such danger.

Thus it becomes possible to achieve a lift which has multiple composite functions.

The upper and lower polymer layers which comprise the lift construction of this invention are not connected together into one piece by adhesive, but are composed in the moulding stage so as to form a single piece by a male-female dovetail type of connection. This avoids the

two layers parting in use, as the connection surface defined between the two is formed to oppose disconnection of the two layers. Any fitting formation between the two surfaces which provides such a form interlock would be equally appropriate.

5 In other words, as shown in Figure 2, multiple connecting projections 3b are formed so that they project from the top of the polymer layer of the lower layer 3B and fit into connecting holes 3a formed in the polymer layer of the upper layer 3A in order to connect the two layers together into one piece. Direct connection of this type provides better connection than can be achieved using adhesive.

10

With the lift construction of this invention as described above, manufacture by injection moulding is possible, as shown in Figure 3. In step (a) of Figure 3, the mounting fixture 6 described earlier is first placed and secured in the prescribed location in a female die 7 having projections 7a of trapezoidal cross-section inside it. A male die or cover 8 is set in place on the die 7, forming a cavity 3A' which forms the upper layer of the lift inside the dies. Then, after securing the dies 7 and 8, urethane polymer is injected through an injection port 8a. The flange 6a is exposed on its top and bottom sides. The injected polymer flows into the space between the flange 6a of the mounting fixture 6 and the die 7, embedding and securing the mounting fixture 6.

20

After the polymer has solidified, the dies are opened and the moulded piece 3A corresponding to the upper layer of the lift plus the fixture 6 is released. Due to the trapezoidal shape of the mould projections 7a, parts of this moulded piece have trapezoidal cavities 3a having a reverse taper, i.e. the connecting holes 3a.

25

In step (b), the moulded piece which corresponds to the upper layer 3A of the lift is then placed inside a different female die 9 and a cover die 8 is placed in position in the same way as just described, as shown in step (c).

30 The inside of this die 9 is formed with a cavity 3B' for the purpose of moulding the lower layer 3B of the lift. The layer 3A is placed on a flat bottom surface 9a of the cavity 3B', and the shank of the mounting fixture 6 extends downwardly into a hole 9b at the bottom. The side walls 9C of the cavity 3B' fit snugly around the layer 3A. After the dies 8 and 9 are secured, molten polymer (for example, nylon polymer) is injected through the injection port 35 8a. This nylon polymer also fills the connecting holes 3a having a trapezoidal cross-section

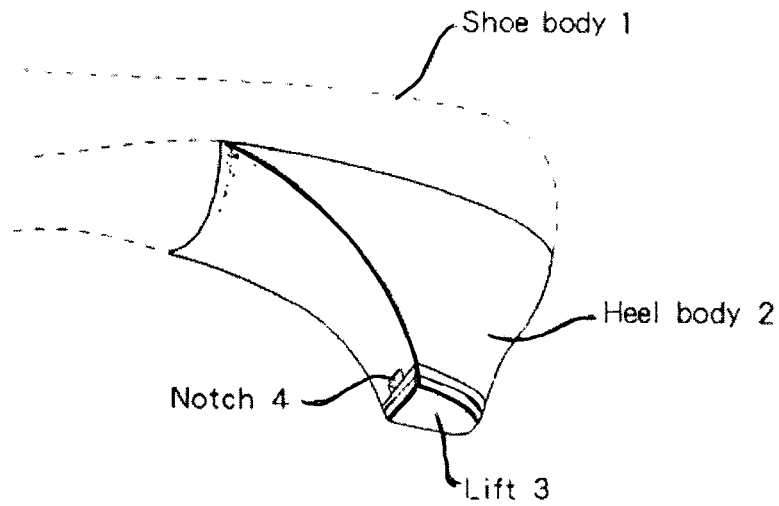
with a reverse taper which were formed in the polymer of the upper layer 3A. After the injected polymer solidifies, the dies are opened, the moulded piece is released and removed from the dies, and thus the moulded lift of this invention shown in step (d) is obtained.

- 5 Because the connecting holes 3a mentioned above are formed with a reverse-taper trapezoidal cross-section, when they become filled by the lower layer polymer, reverse-taper connecting projections 3b are formed. Thus a dovetail type of connection between the layers is formed, connecting the polymer layer of the lower layer 3B into essentially one piece with the polymer layer of the upper layer 3A in such a manner that it is almost impossible for them to become separated. In this construction, the connecting holes 3a are formed as through-holes in order to make it possible to open the dies 7,8. For the shape or positioning of the connecting projections 3b which fit into the connecting holes 3a, for example, see Figure 4. Conically or mushroom-shaped connecting projections 3b are formed on the horseshoe-shaped lower layer 3B in three or four locations according to the area. Or, as shown in Figure 5, avoiding the space occupied by the flange 6a of the mounting fixture 6, it is possible to form a continuous U-shaped connecting projection 3b (Figure 5(a)) or two longitudinal or lateral elongated connecting projections 3b (Figs. 5(b) and 5(c)), still with the reverse-taper trapezoidal cross-section.

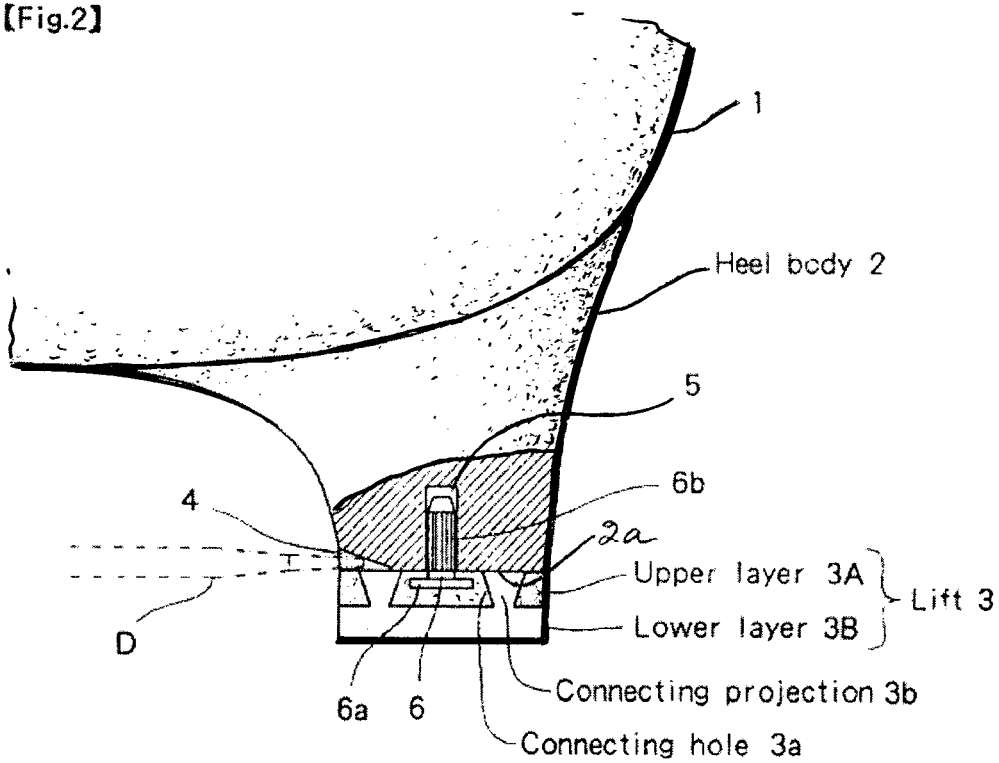
Claims

1. A shoe lift for a shoe having a heel, said lift comprising an upper polymer layer and a lower polymer layer, one of said polymer layers comprising a hard polymer and the other of
5 said layers comprising a relatively soft polymer.
2. A shoe lift as described in claim 1, wherein at least one connecting hole is formed in one of said layers and at least one connection projection is formed on the other of said layers, thereby securing said layers together by dovetail connection.
10
3. A shoe lift as described in Claim 1, wherein said layers comprise an upper layer and lower layer, said upper layer being moulded from nylon polymer and said lower layer being moulded from urethane polymer.
- 15 4. A shoe lift as described in Claim 1, wherein said projection and said hole are aligned in an axial direction of said heel.
5. A shoe lift as described in Claim 1, wherein one of said layers is a moulded part and the other of said layers is moulded on said part.
20
6. A method of making a shoe lift as claimed in any of the preceding claims, comprising forming said at least one connecting projection by moulding.

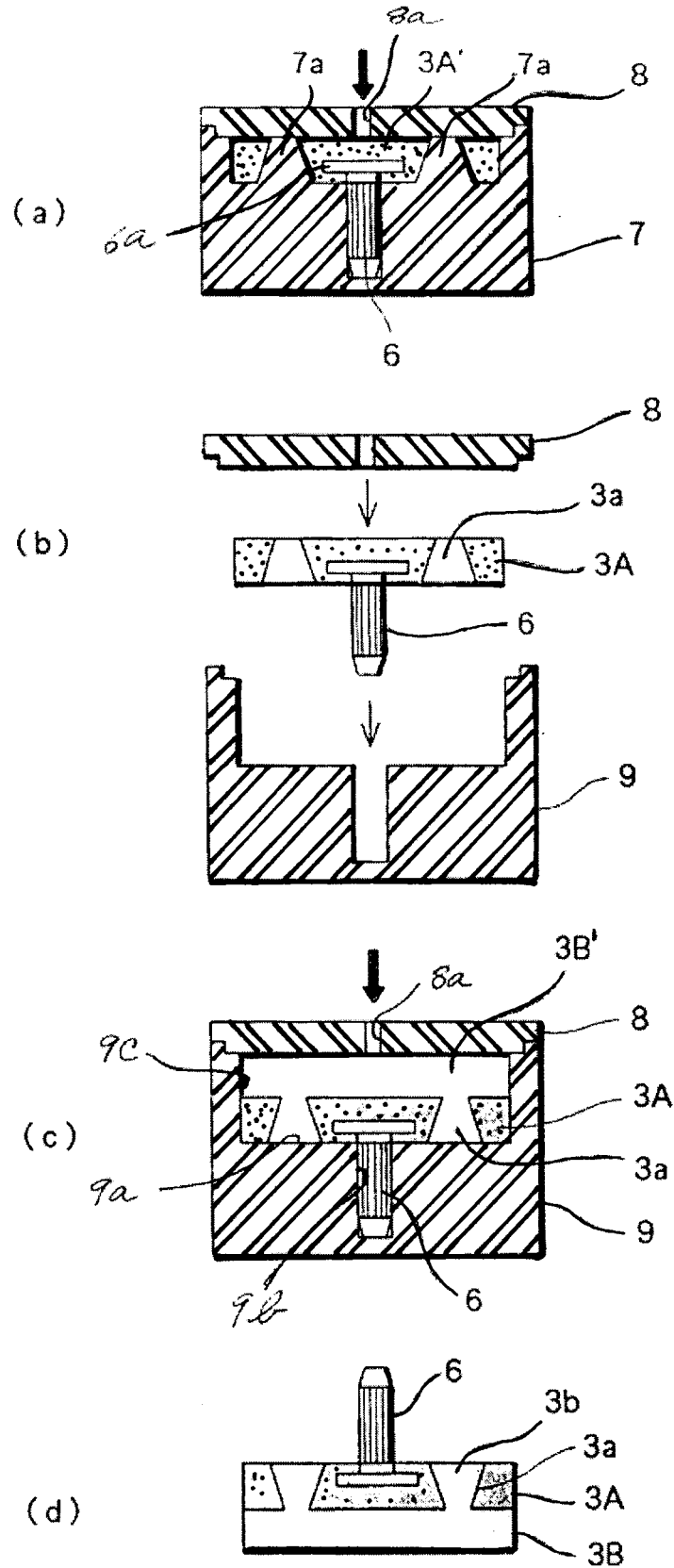
【Fig.1】



【Fig.2】



【Fig.3】



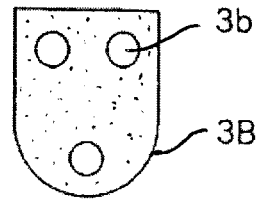


Fig. 4 (a)

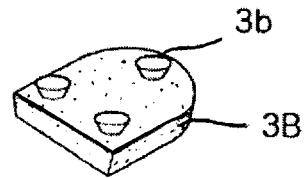


Fig. 4 (b)

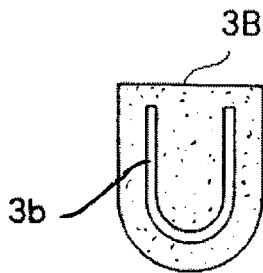


Fig. 5 (a)

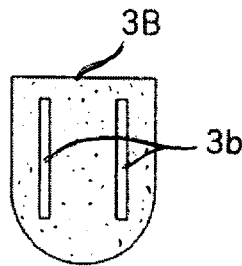


Fig. 5 (b)

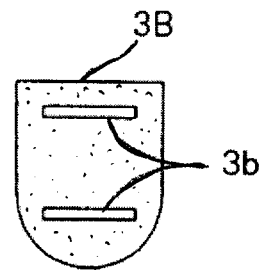


Fig. 5 (c)

Shoe Heel

This invention relates to shoe heels that can attenuate impacts.

5

Traditional dress or casual shoes worn by women have rigid heels that transfer impact with little attenuation to their feet, causing discomfort after long periods of walking or standing on hard surfaces.

10 Efforts have previously been made to incorporate shock-absorbing devices into the heels of dress and casual shoes, but for the most part without success. Some of these devices could not withstand the impacts themselves, whilst others were too complex and cost too much to manufacture. Hence typical dress or casual shoes continue to have a solid heel that transmits impacts to the wearer's heel with little or no attenuation.

15

The present invention involves a shoe heel having a top lift coupled to a rigid block that can be depressed towards the top lift under moderate force. By incorporating a body of resilient material that bears against the upper surface of the top lift, the heel acts to absorb impacts.

20 FIG. 1 is a perspective view of a shoe having a heel constructed according to the present invention;

FIG. 2 is an exploded perspective view of the heel;

FIG. 3 is a sectional view taken along line 3-3 of FIG. 1;

FIG. 4 is a sectional view taken along line 4-4 of FIG. 3; and

25 FIG. 5 is a sectional view taken along line 5-5 of FIG. 3

The shoe A shown in FIG. 1 has a heel 20 attached to the sole 14 beneath a heel seat 18 thereof. The heel 20 includes (FIGS. 1, 2 and 3) a rigid heel block 22, a top lift layer 24 located beneath the heel block 22 and a decorative resilient skirt 26 between the block 22
30 and top lift 24.

In addition, the heel 20 has a slug 28 of resilient material (such as an elastomer), extending down from within the heel block 22 onto the top surface of the top lift 24. The rubber slug 28 is firm enough to support the heel block 22 on the top lift 24 under the weight of the wearer,
35 yet flexible enough to deform resiliently and attenuate impacts.

The top lift 24 possesses some flexibility and extends fore and aft of the slug 28 so that it can flex in those regions.

- 5 The heel block 22 is formed from a rigid substance, preferably a moulded material, and has a central bore 40 (FIG. 3) that opens perpendicularly out of the bottom surface 32. The bore 40 forms a cavity large enough to accommodate the slug 28, the latter being longer than the bore 40 so that its lower end projects below.
- 10 The heel block 22 also has (FIG. 3) guide bores 42,44, two in front of and one behind the slug bore 40. Each guide bore opens at the bottom surface 32 of the heel block 22 at its lower end and into a wider counterbore 46 at its upper end, with a retaining shoulder 48 between each bore 42,44 and its counterbore 46.
- 15 The decorative resilient skirt 26 is formed from a soft, light, cellular material that provides substantially no shock attenuation. Microcellular polyurethane is suitable. It is attached with adhesive to the bottom surface 32 of the heel block 22 with its exterior surface 50 flush. The cavity 52 in the skirt 26 is large enough to enclose the shock attenuation mechanism of the heel.
- 20 The top lift 24 includes a moulded base 60 of a material more rigid than the skirt 26 and slug 28 and resistant to wear during walking, yet with a measure of flexibility. Polyurethane is suitable. The base 60 (FIG. 2) is attached with an adhesive to the bottom of the skirt 26. The top lift 24 carries (FIGS. 2-4) front and rear stabilising pins 70,72, firmly secured in the base 60 and projecting up from its top surface 66. The pins 70,72 are preferably moulded from a material that is somewhat flexible, but more rigid than that of the base 60.
- 25

The shanks 78 of the stabilising pins 70,72, slidable in the guide bores 42,44, allow the top lift 24 to move toward and away from the heel block 22, but prevent it from rotating so that it stays aligned under the skirt 26 and heel block 22.

30

At the upper end of its shank 78, each guide pin 70,72 has a head 80 projecting out over the retaining shoulder 48 where the bore 42,44 opens into the counterbore 46, and this prevents the pins from escaping from the bores in normal use. Each head 80 has a bevelled leading surface 82 and an axial slot 84 extending down into the shank 78, enabling the head 80 and

35

the shank 78 to contract resiliently. During assembly, the heads 80 of the pins are aligned with the respective bores and the entire top lift 24 is forced toward the heel block 22. The heads 80 contract, pass through the bores 42,44 and, when they enter the respective counterbore, snap outwardly to lock.

5

The elastomeric slug 28 supports the heel block 22 over the top lift 24, transferring the weight of the wearer. Materials suited for the slug 28 include polyurethane elastomers. It has the capacity to yield resiliently under compressive force so that impacts are absorbed and, in so doing, expands into the cavity 52. The skirt 26 also deforms, but offers little support for the heel block 22 since the material from which it is formed is considerably softer than the elastomer from which the slug 28 is formed. Extremely heavy forces will bring the bottom surface 32 of the heel block 22 down onto the solid feet 74 of the pins 70,72, which prevent further descent.

10

As the slug 28 compresses, the stabilising pins 70,72 slide in their guide bores 42,44, but offer essentially no resistance. However they prevent the top lift 24 from rotating relatively to the heel block 22, by their longitudinal and lateral rigidity, so that when the wearer turns or pivots the shoe A, the top lift 24 follows the heel block 22 stably. The skirt 26 is essentially for appearance and covering only.

20

The central slug 28 supported in bore 40 is convenient because it stands clear of the sliding pins and can expand freely. However in an alternative construction, the slug 28 and bore 40 are omitted and a layer of elastomer is positioned in space 52, the pins 70,72 passing through holes in the elastomer layer to hold the layer in place.

Fig.1

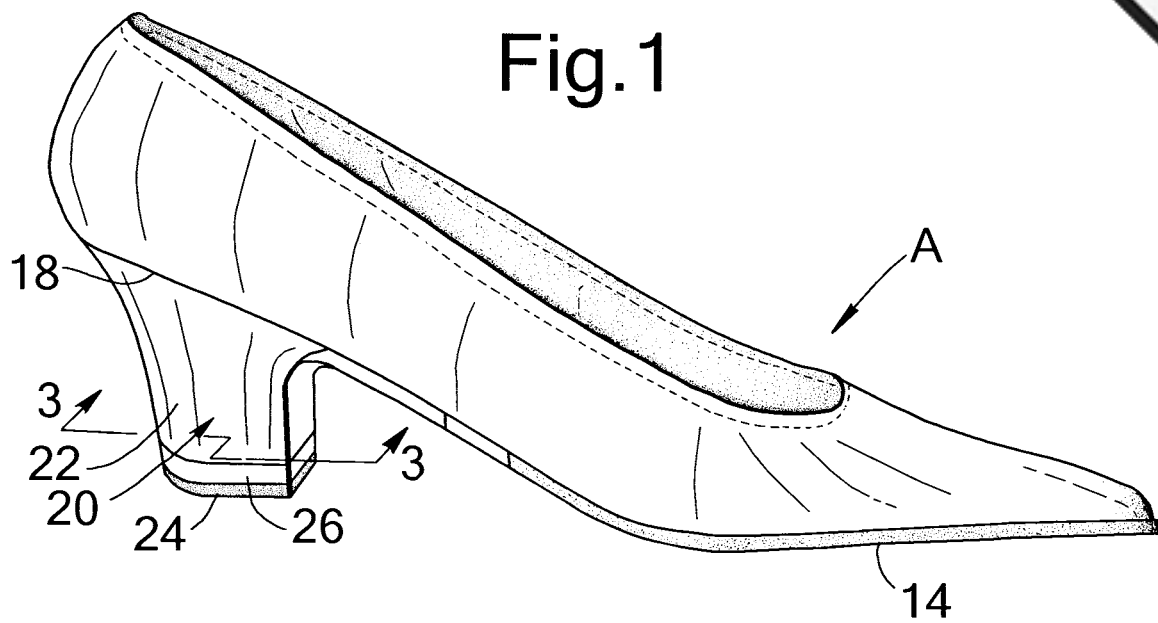


Fig.3

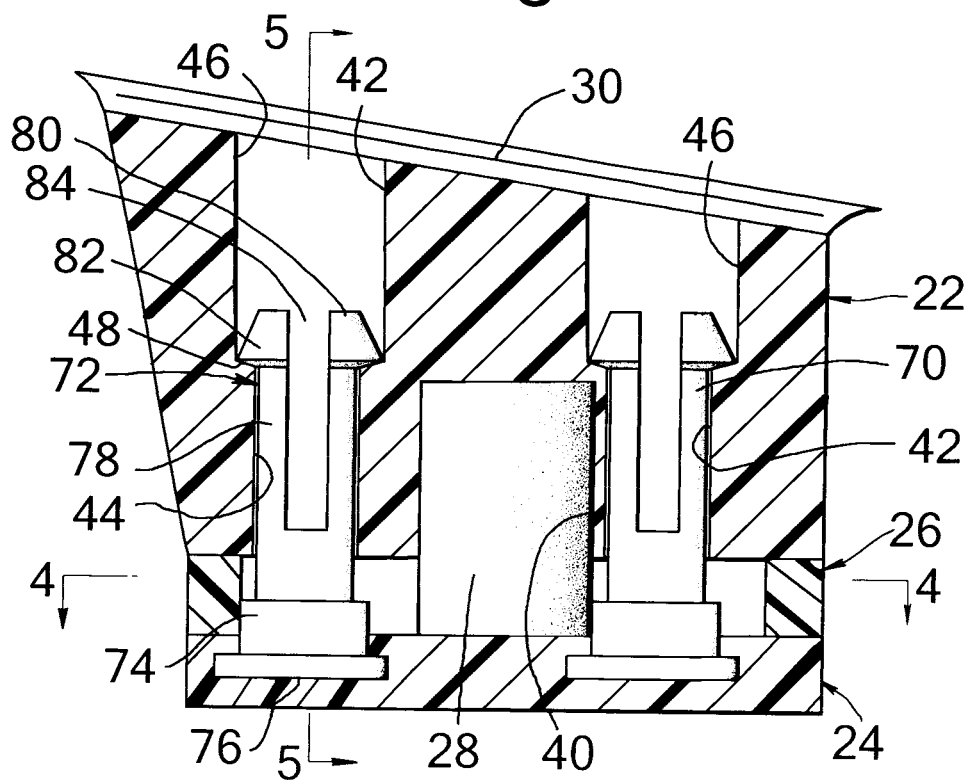


Fig.4

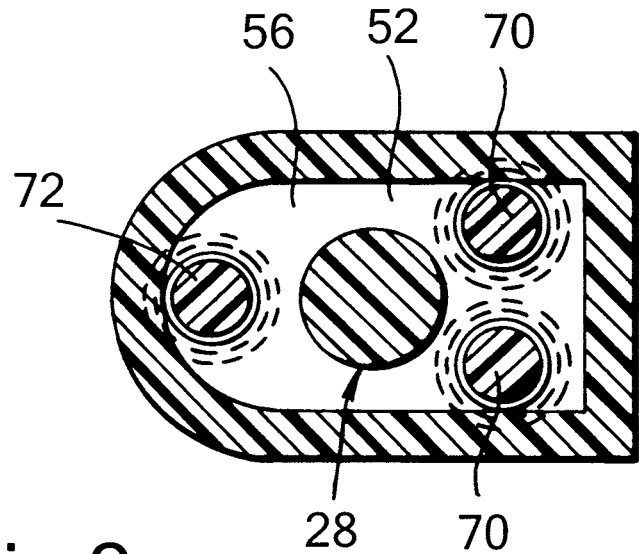


Fig.2

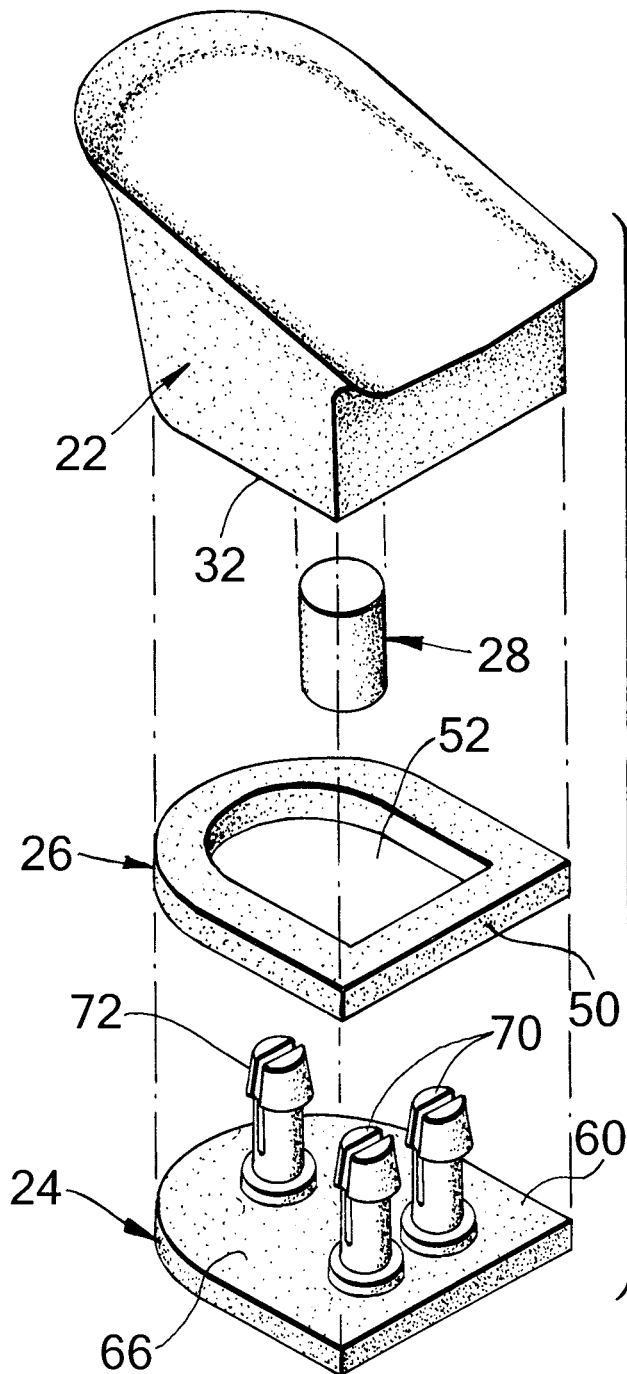
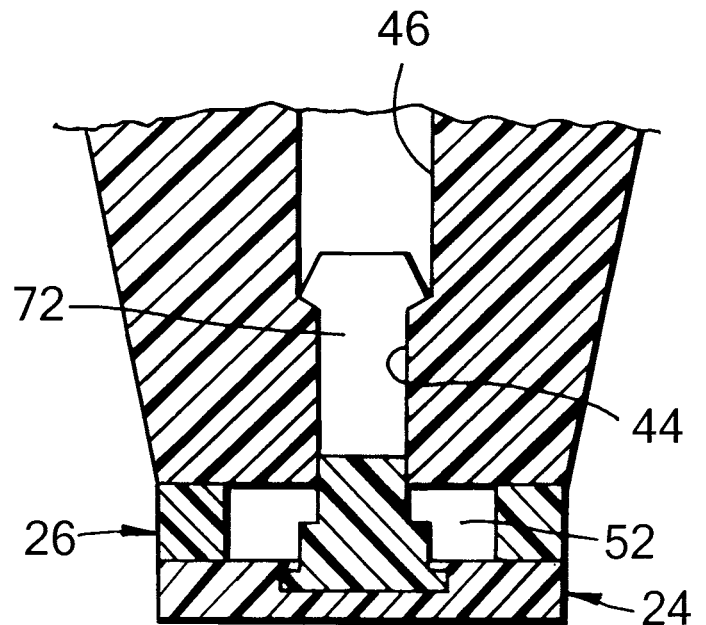


Fig.5



Shoe with Improved Heel Hardness

The present invention relates to women's casual and dress shoes, focusing on the heel-lift portion of the heels of these shoes.

5

A dowel-lift is a type of heel-lift employed with elevated heels and is moulded around an upward metal pin or dowel which is driven into a hole in the heel.

10 Prior dowel-lifts were constructed of a metal dowel and a single material, typically hard thermoplastic polyurethane resin. These dowel-lifts cap off the main portion of the heel of each shoe, giving wear resistance.

15 However they create a loud noise on a hard surface, causing embarrassment to wearers, and also tend to be slippery.

Also their wear resistance is only moderate and they have to be replaced frequently. It has been common practice to include a
20 replacement set of these dowel-lifts in the original shoebox.

Previously, these inferior characteristics were accepted, because it was thought that only conventional hard materials could be moulded effectively, with other materials being found difficult to fix to
25 the metal dowel.

The present invention involves securing a softer material, such as a thermoset polyurethane elastomer or soft thermoplastic polyurethane, to a harder material. The latter can be the thermoplastic
30 polyurethane of a conventional dowel-lift. The soft material can be attached to the harder material by an adhesive.

Such a unique dual hardness heel-lift overcomes the drawbacks of prior art shoes without sacrificing the benefits of conventional
35 polyurethane top-lifts. The harder portion secures better to the

dowel pin than the softer material, whereas the softer portion of the dowel-lift has the required better non-slip and cushioning performance characteristics, and better wear is available with selected materials.

5

In the drawings:

Figure 1 is a perspective view of the shoe of our invention and Figure 2 is a partial cross-section along line 2-2 of the shoe shown in Figure 1.

10

The shoe heel 13 shown in Figure 1 has a dowel-lift 15 at its bottom, the enlarged cross-sectional view of which is depicted in Figure 2. The dowel-lift 15 has a moulded first piece 19 at the top and a second piece 21 at the bottom. A metal dowel 17 includes a shaft section 23 having grooves 25 that grip the heel 13 when the dowel 17 has been driven into the heel. Further, the bottom of the dowel 17 includes a horizontal flanged portion 27.

15

Any suitable adhesive can be applied to the dowel.

20

The first piece 19 can be made from conventional hard thermoplastic polyurethane materials used for women's dowel-lifts, or it can be cast from a hard thermosetting polymer.

25

The material of the second piece 21 is softer than the first piece 19 and possesses rebound resilience, preferably being cast from any readily available thermoset polymer. It is thin and can be attached to the hard first piece 19 by any adhesive 29 suitable for bonding such materials, for example a cyanoacrylate adhesive product.

30

One could also use materials such as polyurethane resins or glass filled nylons to produce the dowel portion.

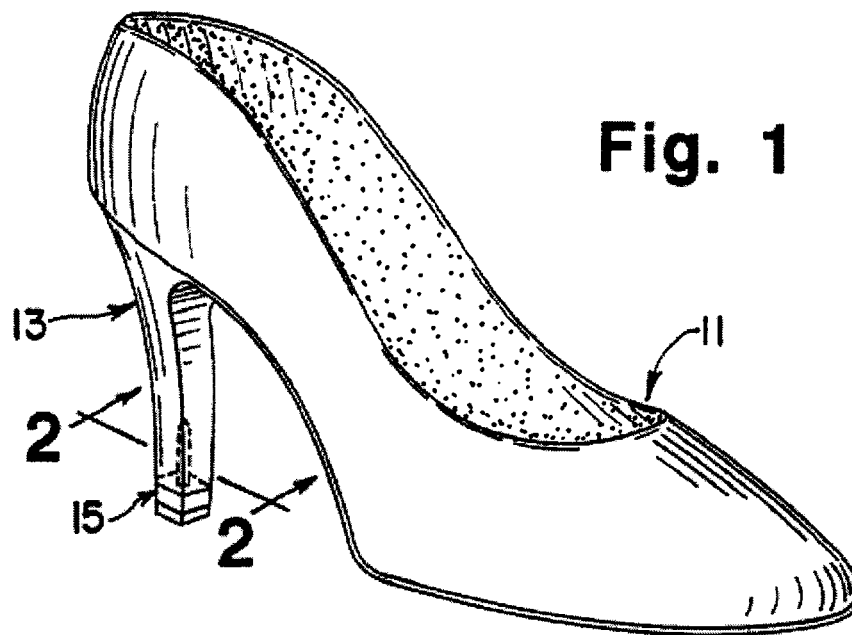


Fig. 2

