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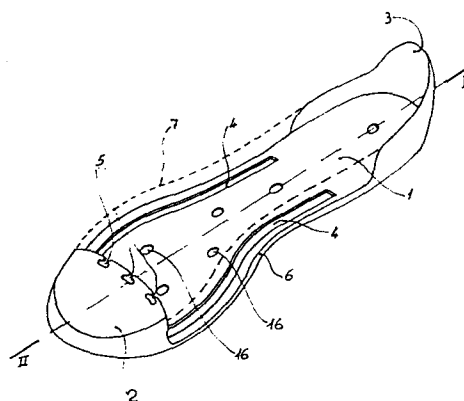
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**Insole with integral toe puff and heel counter.**

An insole (1) is formed in one piece with a boxed-in toe puff (2) and a raised edge heel counter (3) by injection moulding of plastics material. This is economical and simplifies assembly of the eventual shoe.



"INSOLE WITH INTEGRAL TOE PUFF AND HEEL COUNTER"

The present invention concerns an insole designed to incorporate both a toe puff and a heel counter, particularly suitable for use in the manufacture of sports shoes.

5        Insoles designed in various styles and materials are well known for being formed as a special flat element which during assembly of a shoe is attached to a counter which provides reinforcement to the heel and to a toe puff at the front to stiffen the point of  
10       the shoe. This is particularly so in the case of sports shoes such as snow shoes and mountaineering boots. Usually different materials are used for different parts of this assembly because the stiffness of various parts of the shoe must be different. During assembly various  
15       parts have to be connected to each other by stitching and/or by adhesive. Very often the stitching projects from the insole surface and this can be uncomfortable for the person wearing the shoe.

20       An object of this invention is to provide an economical one-piece insole including all the necessary parts which will simplify assembly and production of the eventual shoe, which can be produced by utilizing standard equipment in the footwear industry.

25       With this object in view, the present invention provides an insole formed in one piece with a boxed-in toe puff, a raised edge heel counter, by injection moulding of plastics material.

Preferably, the insole is also formed with varying degrees of thickness for the obtainment of different

degrees of local stiffness, as well as channels in its upper surface for stitching and a channel in its lower surface for housing either an entire supporting strip or a part thereof.

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

Fig. 1 is a perspective view of a preferred embodiment of an insole according to the invention;

10       Fig. 2 is a longitudinal section according to line II-II in Fig. 1;

Fig. 3 is an upside down view of the insole shown in Fig. 1 and the supporting strips which can be attached thereto;

15       Fig. 4 is a section according to line IV-IV in Fig. 3; and

Fig. 5 is a partial section of an assembled shoe incorporating the insole shown in Figs. 1 to 4.

20       With reference to the drawings, a preferred embodiment of the insole of the invention comprises a flat element, which is anatomically formed so as to resemble the underside of a foot, at the front of which a boxed in toe puff 2 is integrally formed and at the back of which a heel counter 3 is integrally formed.  
25       The heel counter 3 is formed as a raised edge at the central back part of the heel.

      These three parts, namely the insole element 1, the toe puff 2 and the heel counter 3 are formed in one piece by a conventional method of injecting  
30       plastics material into an appropriate mould.

On the upper surface of the insole element 1 there are two grooves or channels 4 adjacent the side edges. These reduce the insole thickness and are designed to contain some assembly stitching when the rest of the shoe, namely the upper and sole are attached to the insole. In this way the stitching stays beneath the level of the upper surface of the insole and therefore no discomfort is caused to the wearer of the shoe.

The toe puff 2 has a plurality of flexing cuts 5 along its free edge enabling it to adapt itself as the shoe bends during walking.

Between the toe puff 2 and the heel counter 3 a side connecting edge 6 is provided which can either be lower or higher as shown by the dotted line 7.

The insole element 1 has a flexible and deformable central region 8 which is not as thick as the side or edge regions.

By appropriate selection of the thickness over the entire insole, varying deformability can be obtained thus making some parts more flexible and other parts stronger and stiffer.

The lower surface of the insole element 1 has a longitudinal channel 9 for receiving a stiff metal supporting strip or leaf spring 10 of the same size as the channel 9 which is attached by rivets passing through the respective holes 11 on the strip 10 and 12 on the insole. Alternatively, as shown in Fig. 3, the channel 9 may receive a portion 13 which is partially cut out of a larger supporting strip 14. This sort of strip 14 is additionally held in place by rivets passing through

holes 15 in the strip 14 and corresponding holes 16 in the insole 1.

The strip 14 in this case extends rearwardly and at its end is formed as a hook 19 which will project  
5 from the assembled shoe.

In use the insole is assembled with an upper 17 and a sole 18 and these are attached together by stitching etc. to form a shoe, as illustrated in Fig. 5.

The insole has the desired stiffness and local  
10 deformability suitable for the use to which the shoe is to be put. It maintains its shape and does not alter the product in any way. Its shape is very important because with the toe puff and heel counter integrally formed it simplifies manufacture of the shoes.  
15 Moreover, the orthopaedic and functional characteristics of the product are improved.

The stitching which is necessary for attachment of the sole, upper and insole is contained in the channels 14 which prevent the thread from being ruined  
20 or from causing discomfort to the foot.

The combination of such insoles with metal supporting strips of different sizes and forms allows for shoes with specific characteristics for special uses. Indeed, the insole of the invention is particularly  
25 suitable for use in making sports footwear such as snow shoes and mountaineering boots.

It will of course be understood that the foregoing is illustrative and not limitative of the scope of the invention and variations are possible within the scope  
30 of the claims.

CLAIMS

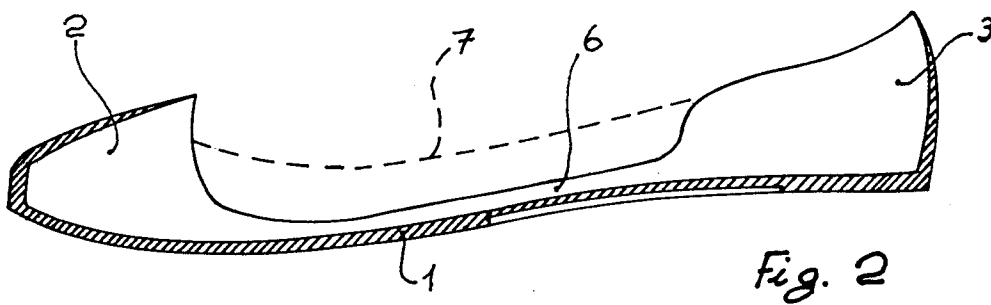
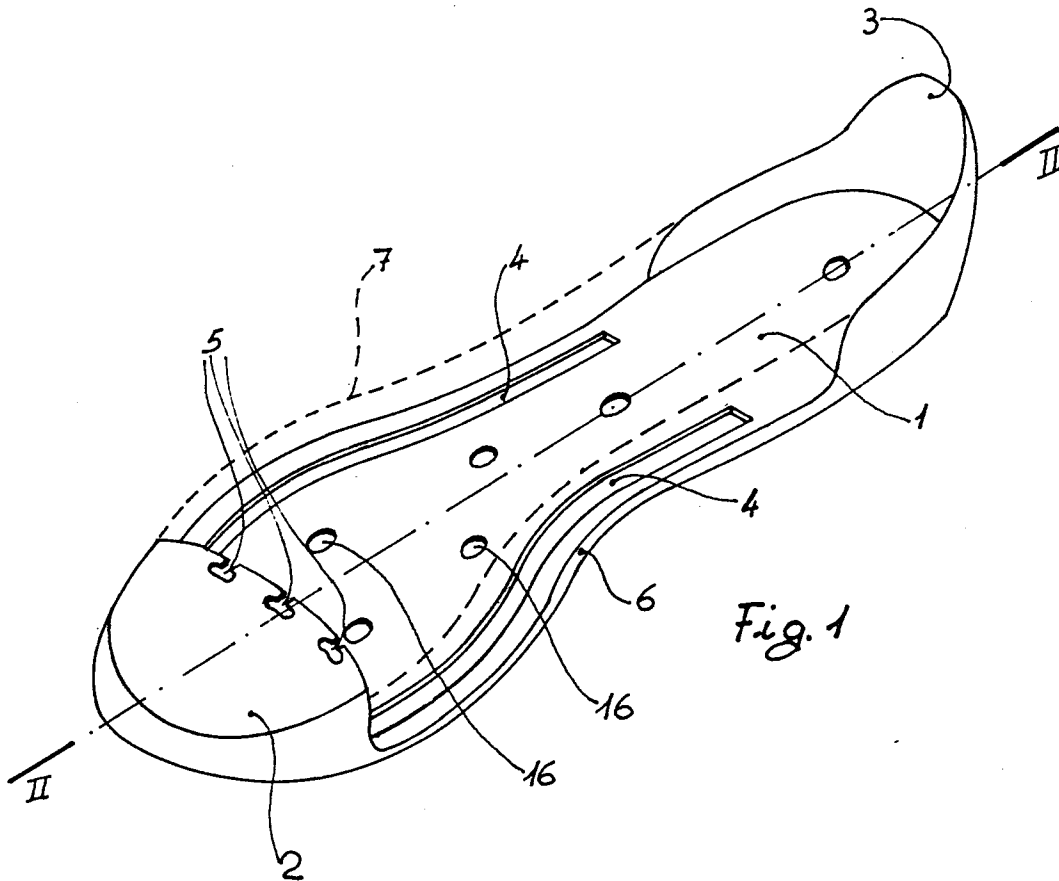
- 1           1. An insole formed in one piece with a boxed-in  
2 toe puff and a raised edge heel counter by injection  
3 moulding of plastics material.
- 1           2. An insole as claimed in claim 1 formed with a  
2 thicker outer region and a thinner central region  
3 so that the outer region is stiffer and the central  
4 region is more flexible and deformable.
- 1           3. An insole as claimed in claim 1 or 2 formed  
2 with grooves or channels in its upper surface adjacent  
3 the edges thereof to accommodate stitching for attach-  
4 ing the insole to an upper and a sole.
- 1           4. An insole as claimed in claim 1,2 or 3 formed  
2 with a recess or channel in its lower surface which  
3 receives a metal strip or leaf spring of equal size or  
4 a portion of a larger supporting strip.
- 1           5. An insole as claimed in claim 4 wherein the  
2 recess or channel in the lower surface receives a por-  
3 tion of a larger supporting strip which projects beyond  
4 the rear of the insole and is formed at its end as a  
5 hook which will project from the finally assembled  
6 shoe for attachment of accessories.
- 1           6. An insole formed in one piece with a toe puff  
2 and a heel counter substantially as hereinbefore  
3 described with reference to and as illustrated by the  
4 accompanying drawings.
- 1           7. A method of manufacturing an insole, characterized  
2 in that it comprises the step of forming, by injection  
3 moulding of a plastics material, an insole formed in  
4 one piece with a boxed-in toe puff and a raised edge  
5 heel counter.

1           8. A method according to claim 7, wherein said  
2 insole is formed with a thicker outer region and a  
3 thinner central region so that the outer region is  
4 stiffer and the central region is more flexible and  
5 deformable.

1           9. A method according to claim 7 or 8, wherein  
2 said insole is formed with channels in its upper  
3 surface adjacent the edges thereof to accommodate  
4 stitching for attaching the insole to an upper and a  
5 sole and wherein said insole is formed with a recess  
6 in its lower surface, said recess being adapted to  
7 receive a metal strip or leaf spring of equal size or  
8 a portion of a larger supporting strip and wherein said  
9 recess formed in said lower surface of said insole is  
10 adapted to receive a portion of a larger supporting  
11 strip which projects beyond the rear of the insole  
12 and is formed at its ends as a hook which will project  
13 from the finally assembled shoe for attachment of  
14 accessories.

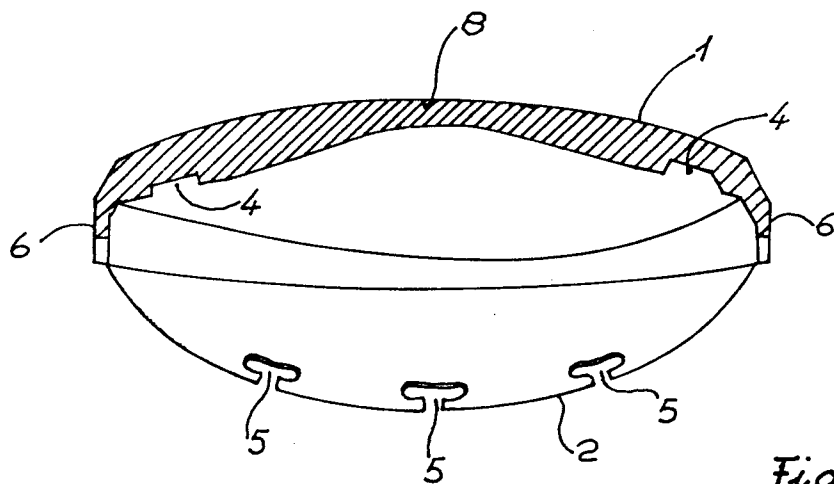
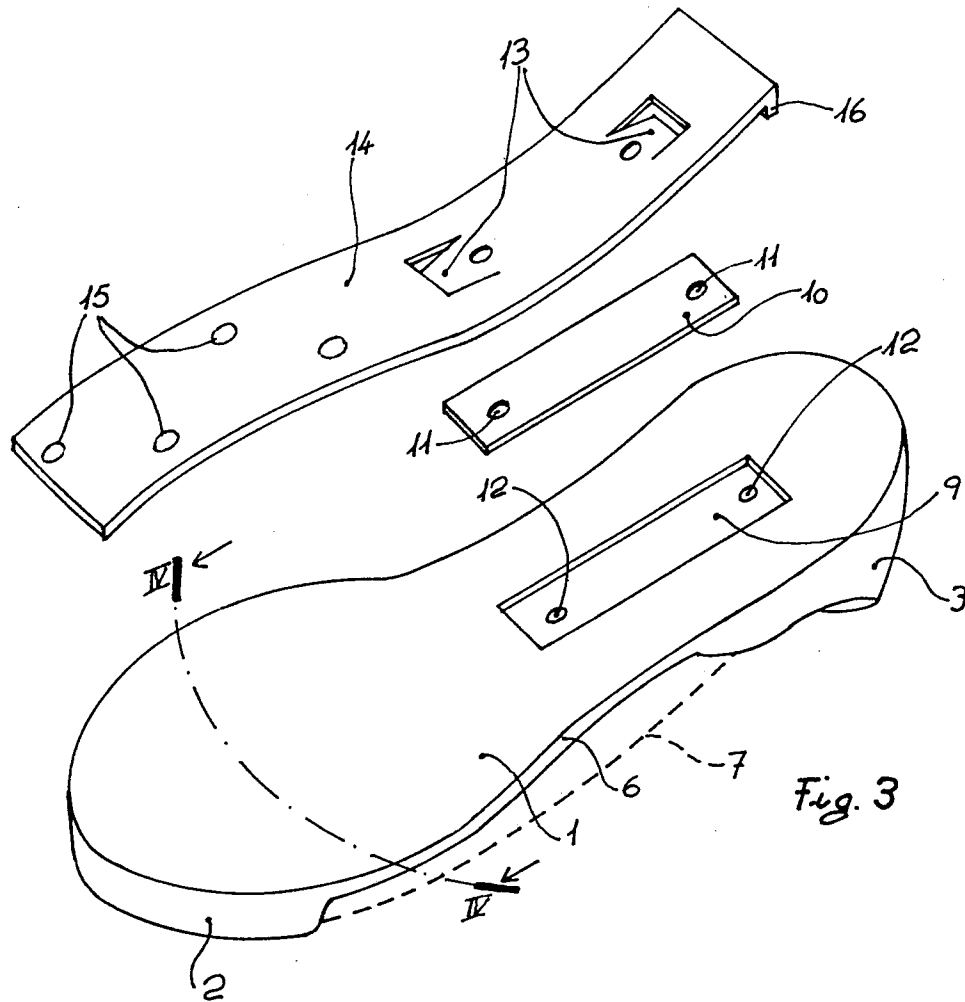
1           10. A shoe including an insole as claimed in  
2 claims 1-6.

TAV. I





TAV. II



TAV. III

