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(54) Assembly insole for assembling shoes, shoe assembled on the insole and preparation method

(57) The invention relates to an assembly insole (9) for the assembly of shoes, of the type in which an upper is folded and fixed below the insole (9). The insole (9) includes a supporting base (10) which has, on the lower side, a hot-melting adhesive so that the upper can adhere to the insole (9) by heating. The insole (9) preferably includes a shank (14) which is arranged above the supporting base (10) and a reinforcement above the shank (14) so as to form a single body. The invention furthermore includes a shoe which is assembled on the insole (9).

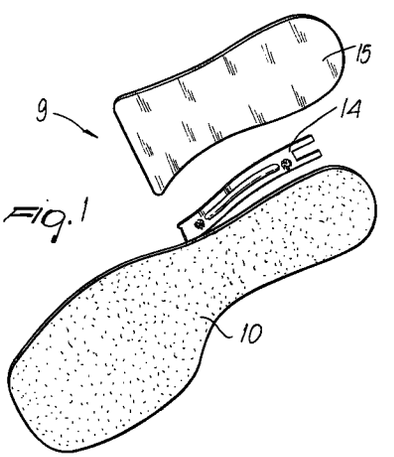

Fig. 1

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Description

[0001] The invention relates to an assembly insole for assembling shoes of the type in which an upper is folded and fixed below the insole.

[0002] The invention furthermore relates to the shoe assembled on the insole.

[0003] Types of shoe assembly in which the upper is folded and fixed below the insole are exemplified for example by the Good-year, Black, San Crispino and Ago types.

[0004] In the above mentioned types of shoe, the upper is fixed to the insole by virtue of a hot-melting adhesive which is injected at the time of assembly in the region between the lower part of the assembly insole and the folded upper so that it is possible to assemble the upper part of the shoe with a single operation. Then, according to known methods, the folded upper is glued onto the lower part of the insole and is milled so as to obtain a flat surface on which the sole is finally glued in order to obtain the finished shoe. In the rear part, the insole generally includes, below a supporting base, a metal shank and a reinforcement member which is arranged below the metal shank. The shank is generally fixed to the reinforcement member.

[0005] The above is the main field of industrial application of the invention but is not a limitation, since the invention can be applied in equivalent fields as stated by claim 1.

[0006] Examples of insoles according to the above field of industrial application are disclosed by EP 525 324, US 3 906 570, and US 2 259 586.

[0007] Adhesives suitable for assembling shoes are described for example on GB 1 601 372, GB 2 081 279, US 4 125 522 and US 3 362 036.

[0008] Assembling methods are described on US 2 259 586, US 3 533 117, US 3 483 582, US 3 362 036 and US 3 271 799

[0009] The above mentioned known systems, however, are not free from drawbacks. First of all, the injection of a hot-melting adhesive during the assembly of the shoe causes localized accumulations of adhesive which stiffen the shoe. This stiffening has a severely negative effect as regards both the comfort of the wearer of the shoe and the health of the foot, which is hindered from performing its natural movement. This occurs in any case when a localized accumulation of adhesive is used, even if the adhesive is not injected during the assembly of the shoe as described in US 3 271 799

[0010] Furthermore, from the point of view of plant maintenance and productivity, the known system that uses the injection of hot-melting adhesive has problems because the adhesives tend, over time, to clog some parts of the systems, for example the nozzles. This is generally due to the fact that the high temperature at which the molten thermoplastic adhesive is kept before injection causes the adhesive to undergo cracking over time inside the machine. In practice, deposits form which block the passages and must be eliminated by stopping the plant, with obvious costs in terms of both maintenance and productivity loss.

[0011] Finally, only certain kinds of adhesive are capable of withstanding, with the above limitations, the prolonged thermal stress caused by being kept for a long time at a high temperature. These adhesives tend to be inherently rigid after cooling and therefore worsen the problems mentioned above in relation to a high rigidity of the resulting shoe.

[0012] The aim of the present invention is therefore to solve the above drawbacks with an assembly insole for assembling shoes, of the type in which an upper is folded and fixed below the insole, and characterized in that the insole comprises a supporting base which is covered, on the lower side, with a layer of a hot-melting adhesive in an amount of less than 300 g/m^2 and preferably less than 180 g/m^2, so that said upper can adhere to said insole by heating.

[0013] In other words, the insole comprises a supporting base which includes, on the lower side, a hot-melting adhesive so that said upper can adhere to said insole by heating.

[0014] Preferably, the insole bears an amount of adhesive between 50 and 300 g/m^2 and preferably between 50 and 180 g/m^2.

[0015] Preferably, the adhesive has a melting point between 40 and 180°C, preferably between 45 and 120°C, when measured with the DSC method, with a gradient of 10°C/min.

[0016] Preferably, the adhesive includes a polymer which is chosen among: polyesters, copolyesters, polyamides, copolyamides, polyolefins, polyurethanes, ethyl vinyl acetates, acrylic resins, polyvinyl acetates, vinyl polymers. More preferably, the adhesive is chosen among: polyesters, copolyesters, polyurethanes, ethyl vinyl acetates, polyamides and copolyamides.

[0017] Even more preferably, the adhesive is formed by a mix of polyurethane and polycaprolactone.

[0018] Preferably, the adhesive is included in the lower part of the supporting base by depositing adhesive powder. However, in the context of an extensive industrial production, it is feasible to use an adhesive in film form arranged above the lower part of the supporting base.

[0019] The supporting base can be formed, for example, by an impregnated fabric, by a fabric, by a non-woven fabric, by an impregnated non-woven fabric, by an extruded component, by a coextruded component, by agglomerated fibers or by reclaimed leather.

[0020] In the case of a coextruded component, the supporting base can be coextruded together with an adhesive film, so as to automatically assemble the two above described parts.

[0021] The reinforcement can be formed by agglomerated fibers, for example cellulose fibers impregnated with a latex.

[0022] The supporting base can be provided with

microperforations in order to allow the transpiration of moisture.

[0023] The invention furthermore relates to a method for preparing an insole as described above, wherein a microperforation is performed with preferably heated needles.

[0024] The invention furthermore relates to a shoe which is assembled on an assembly insole as described above, wherein the adhesive arranged between a lower part of the supporting base and the upper is preferably present in an amount of less than 300 g/m^2 and more preferably less than 180 g/m^2.

[0025] The present invention will become apparent with reference to the accompanying drawings, wherein:

Figure 1 is a bottom exploded view of the insole according to the invention;

Figure 2 is a perspective view of a second embodiment of the insole according to the invention, in which a microperforation is provided;

Figure 3 is a bottom perspective view of the insole of Figure 1, to which an upper has been applied;

Figure 4 is a top perspective view of the insole of Figure 1;

Figure 5 is a lateral sectional view of a shoe assembled on the insole of Figure 1;

Figure 6 is a lateral sectional view of a shoe according to a third embodiment of the insole according to the invention;

Figure 7 is a bottom perspective view of a finished shoe according to the invention;

Figure 8 is a bottom exploded view of the insole according to the embodiment shown in Figure 6; and

Figure 9 is a top perspective view of the insole of Figure 8.

[0026] An insole 9 for the assembly of shoes 11, of the type in which an upper 12 is folded at 13 and fixed below the insole 9, is illustrated with reference to Figures 1 to 7.

[0027] The insole 9 is formed by a supporting base 10 which includes a hot-melting adhesive on its lower side; by a shank 14, which has a stiffening function; and by a reinforcement which is arranged above the shank. The reinforcement 15 is fixed above the supporting base so as to form a single body, using for example a neoprene adhesive. The shank, in the preferred metallic embodiment, is fixed to the supporting base by clinching.

[0028] The reinforcement 15 covers the rear part of the supporting base 10. In the rear part, the support 15 and the supporting base 10 are provided to size. In other words, in this rear part a dimension of the supporting base 10 and a dimension of the reinforcement 15 are identical.

[0029] With particular reference to the embodiment of Figure 6, the assembly insole 9 includes a lower layer 16 which is arranged below, and to the rear part of, the supporting base 10. The lower layer 16 has a dimension which is substantially smaller than a dimension of the supporting base 10, so as to leave free a perimetric region 17 of the supporting base 10. The perimetric region 17 allows adhesion of the upper 12 to the supporting base 10 despite the presence of the lower layer 16, which in itself does not have adhesive characteristics. The lower layer 16 is preferably used if it is necessary to further reinforce the shoe, for example in the case of shoes requiring the application of a high heel.

[0030] It has been observed that the invention allows to overcome all the known drawbacks and to achieve the following advantages:

[0031] it is no longer necessary to apply any adhesive during the assembly of the upper, considerably simplifying this assembly step, reducing the costs and the maintenance burdens. In particular, the complete absence of any device for transferring a liquid adhesive at high temperature clearly drastically simplifies the entire assembly operation. All the downtimes that were dedicated to cleaning the plant, the nozzles et cetera are furthermore clearly eliminated entirely.

[0032] It has furthermore been noted that despite using a highly automated method it is possible to obtain shoes with a flexibility that could be achieved only with old manual assembly methods but was absolutely not within the capabilities of currently active modern plants. In particular, it is possible to obtain much more flexible shoes, with obvious advantages.

[0033] Surprisingly, it is possible to use the same machines that were used for known methods without having to perform particular modifications. This is a great advantage from the industrial point of view, since the important advantages stated above can be provided immediately without having to sustain high investment costs to modify the machines required to assemble the shoes.

[0034] The invention is susceptible of numerous modifications, all of which are within the scope of the same inventive concept.

Claims

1. Assembly insole (9) for the assembly of shoes (11), of the type in which an upper (12) is folded and fixed below said insole (9), characterized in that said insole (9) comprises a supporting base (10) which is covered, on the lower side, with a layer of a hot-melting adhesive in an amount of less than 300 g/m^2 and preferably less than 180 g/m^2, so that said

upper (12) can adhere to said insole (9) by heating.

2. Insole according to claim 1, comprising a preferably metallic shank (14) which is fixed above said supporting base (10).

3. Insole according to at least one of the preceding claims, comprising a reinforcement (15) which is fixed above said supporting base (10) and above said shank (14), said supporting base (10) being suitable to cover an entire sole of said shoe (11), said reinforcement (15) being suitable to cover a rear part of a sole of said shoe (11).

4. Insole according to claim 3, wherein in the rear part a dimension of said supporting base (10) and a dimension of said reinforcement (15) are identical.

5. Insole according to at least one of the preceding claims, comprising a lower layer (16) which is arranged below, and in the rear region of, said supporting base (10) and has a dimension which is substantially smaller than a dimension of said supporting base (10), so as to leave free a perimetric region (17) of said supporting base, said perimetric region allowing said adhesion of said upper (12) to said supporting base (10).

6. Insole according to at least one of the preceding claims, wherein said supporting base (10) is provided with a microperforation in order to allow adequate transpiration.

7. Insole according to at least one of the preceding claims, wherein said adhesive can be included in said supporting base (10) by depositing powdered adhesive or a film.

8. Insole according to at least one of the preceding claims, wherein said adhesive is present in an amount between 50 and 300 g/m^2, preferably between 50 and 180 g/m^2.

9. Insole according to at least one of the preceding claims, wherein said adhesive has a melting point between 40 and 180°C, preferably between 45 and 120°C, when measured with the DSC method, with a gradient of 10°C/min.

10. Insole according to at least one of the preceding claims, wherein said adhesive comprises a polymer chosen among: polyesters, copolyesters, polyamides, copolyamides, polyolefins, polyurethanes, ethyl vinyl acetates, acrylic resins, polyvinyl acetates, vinyl polymers and preferably chosen among: polyesters, copolyesters, polyurethanes, ethyl vinyl acetates, polyamides and copolyamides.

11. Insole according to at least one of the preceding claims, wherein said adhesive comprises a mix of polyurethanes and polycaprolactones.

12. Insole according to at least one of the preceding claims, wherein said insole (9) comprises a supporting base (10) which includes, on the lower side, a hot-melting adhesive so that said upper (12) can adhere to said insole (9) by heating.

13. Shoe assembled on an assembly insole according to at least one of the preceding claims.

14. Shoe according to claim 13, wherein said adhesive arranged between a lower part of said supporting base (10) and said upper (12) is present in an amount of less than 300 g/m^2 and preferably less than 180 g/m^2.

15. Method for preparing an insole according to at least one of the preceding claims, wherein said microperforation is performed with preferably heated needles.

16. Any new characteristic or new combination of characteristics described or illustrated therein.

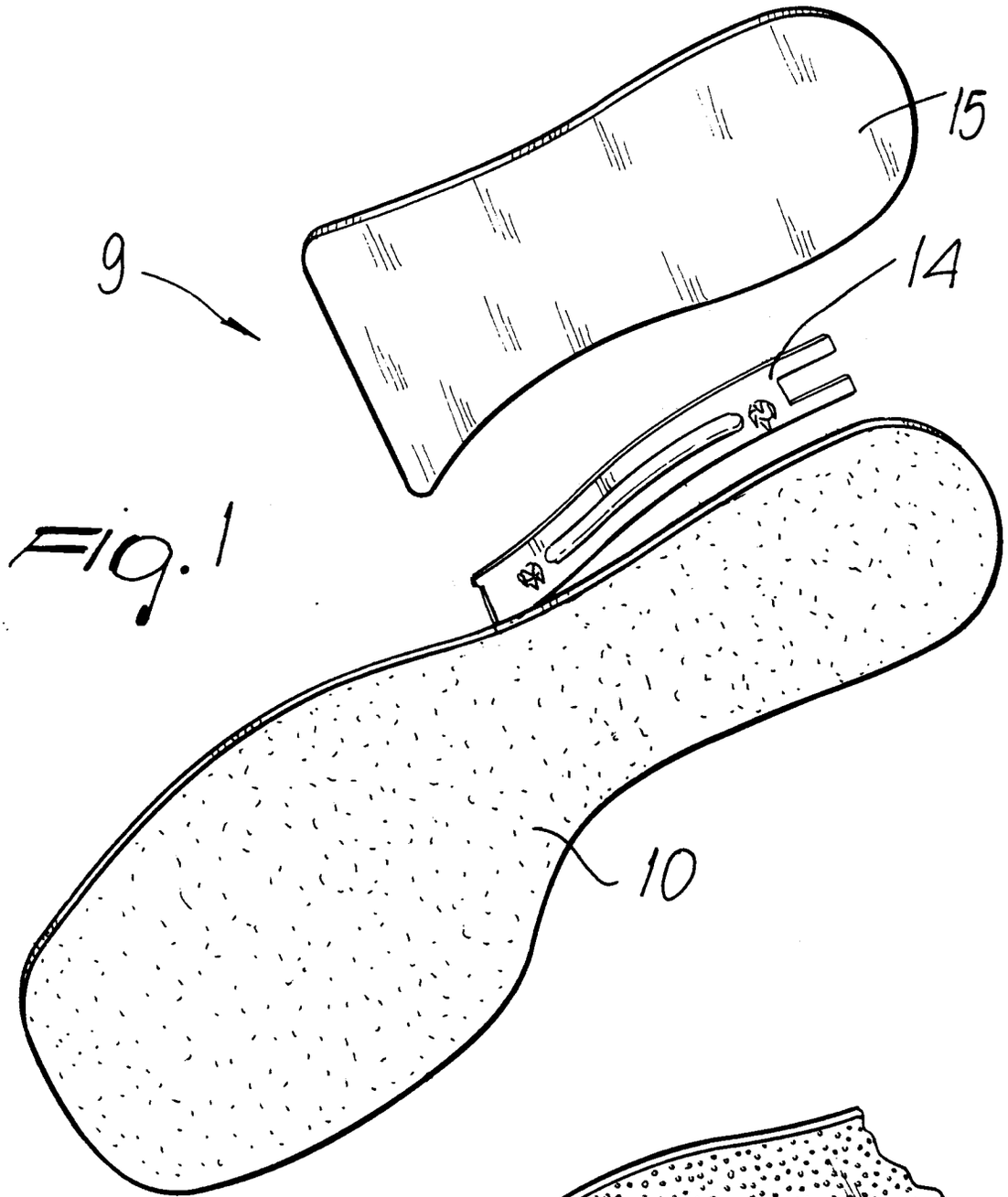

FIG. 1

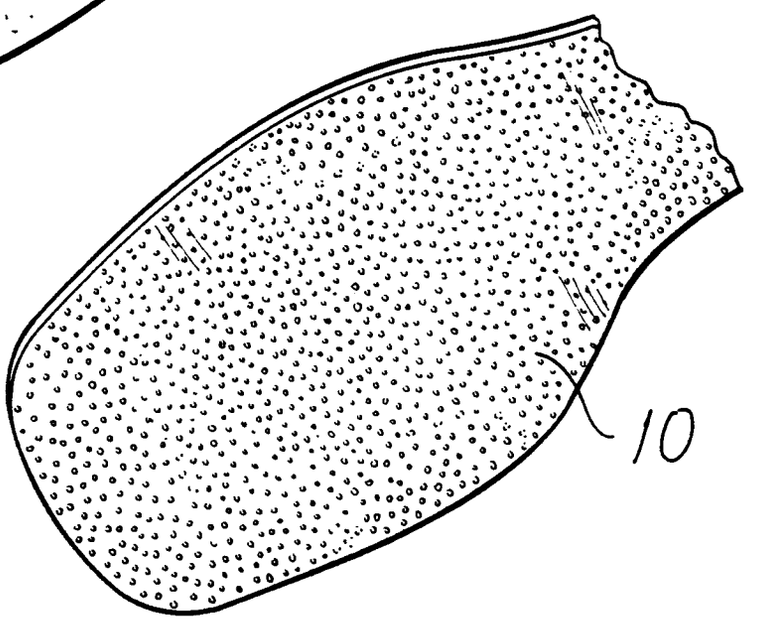

FIG. 2

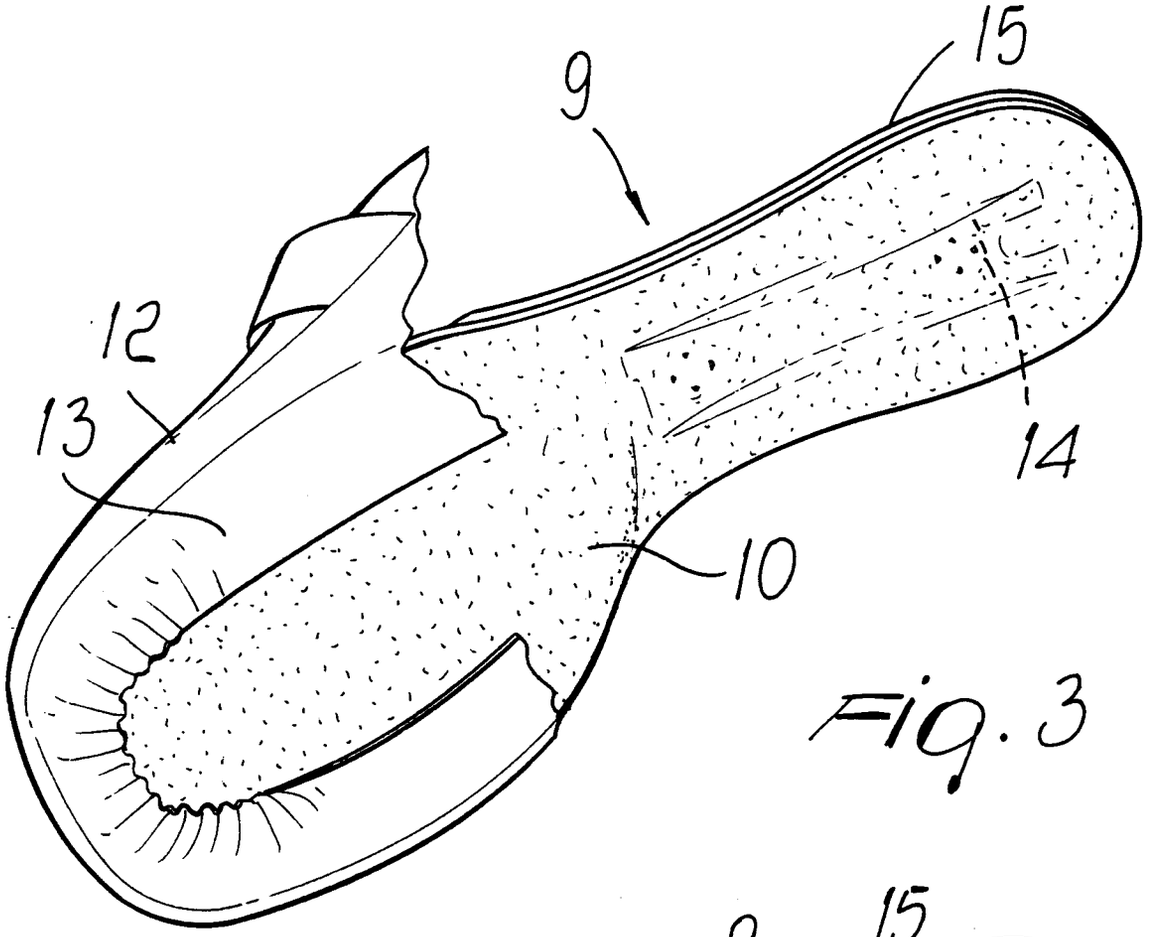

Fig. 3

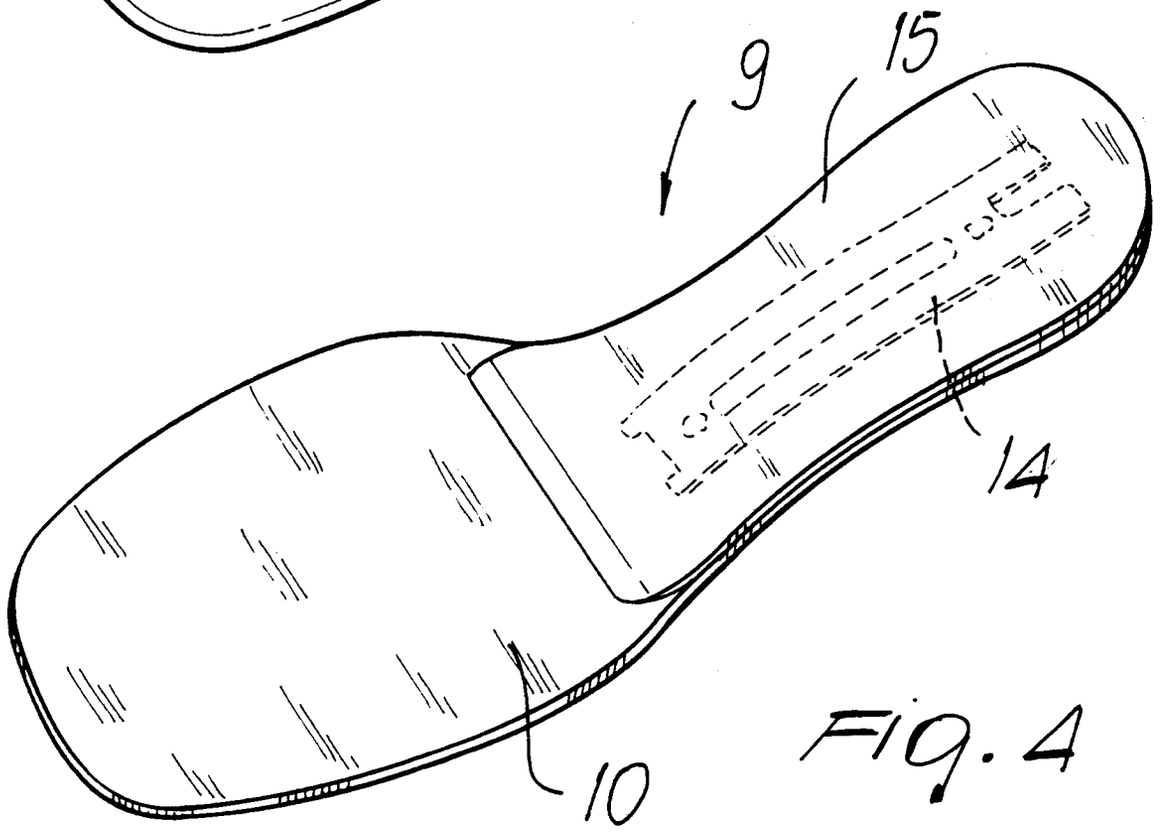

Fig. 4

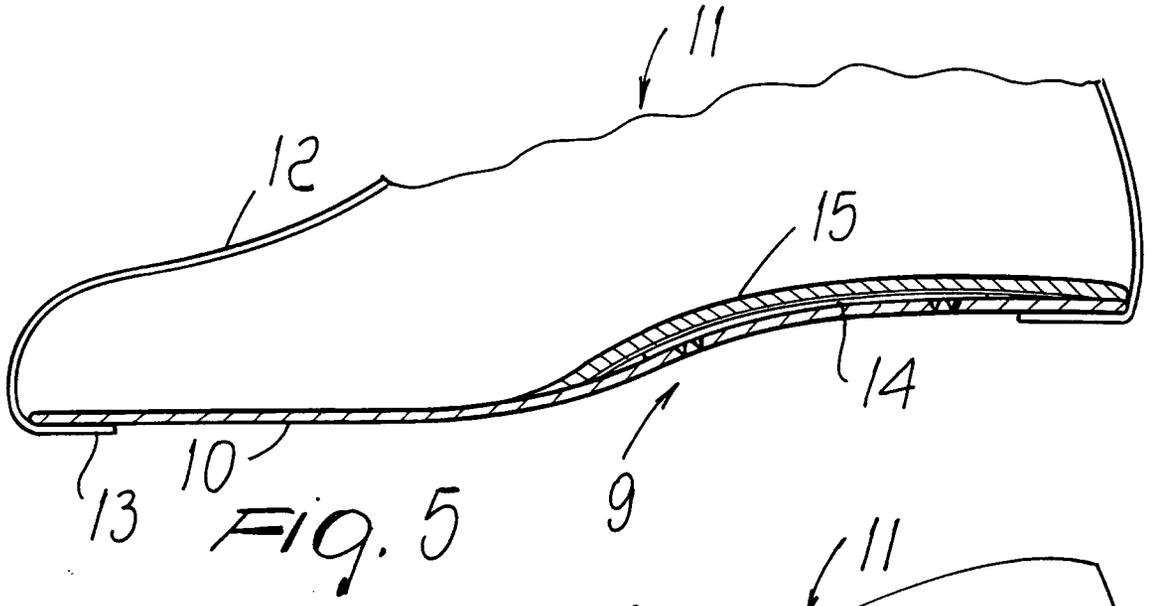

FIG. 5

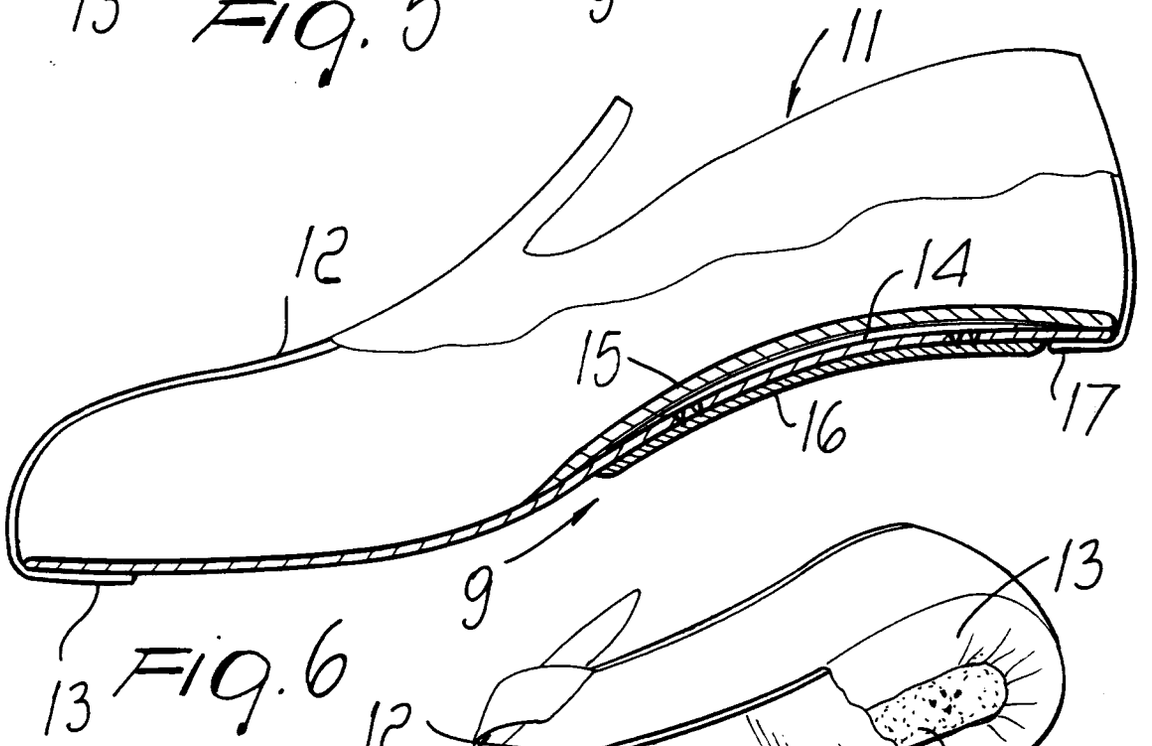

FIG. 6

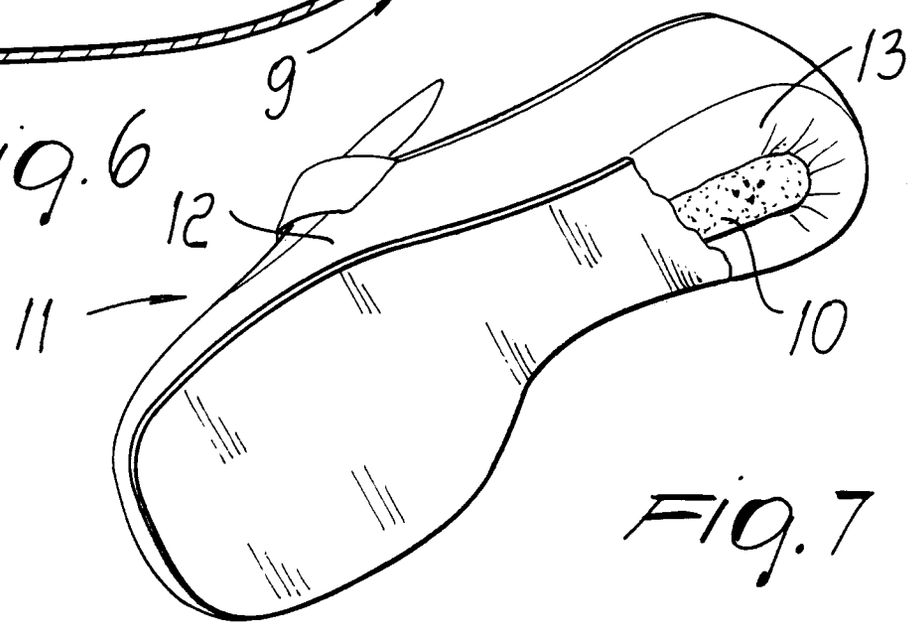

FIG. 7

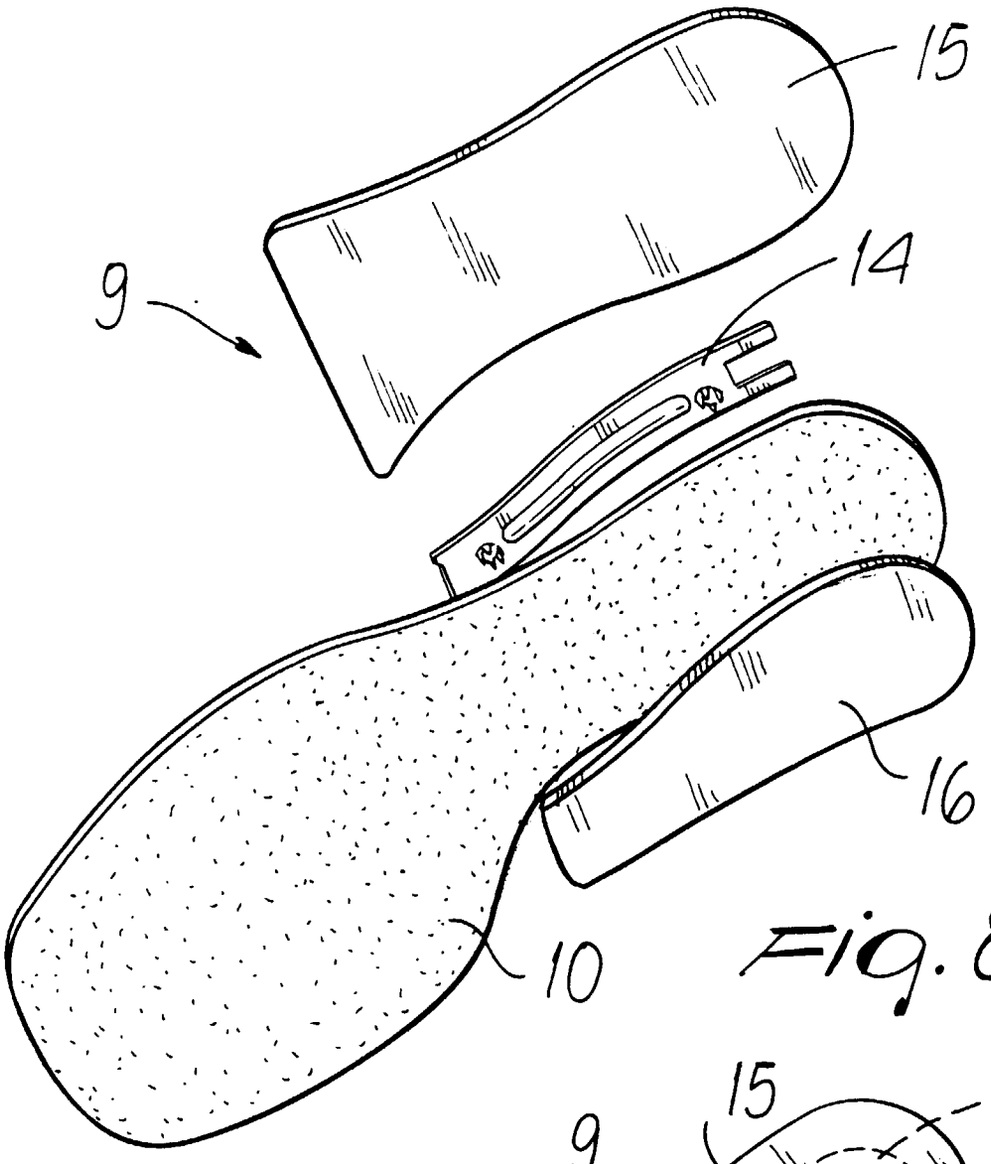

Fig. 8

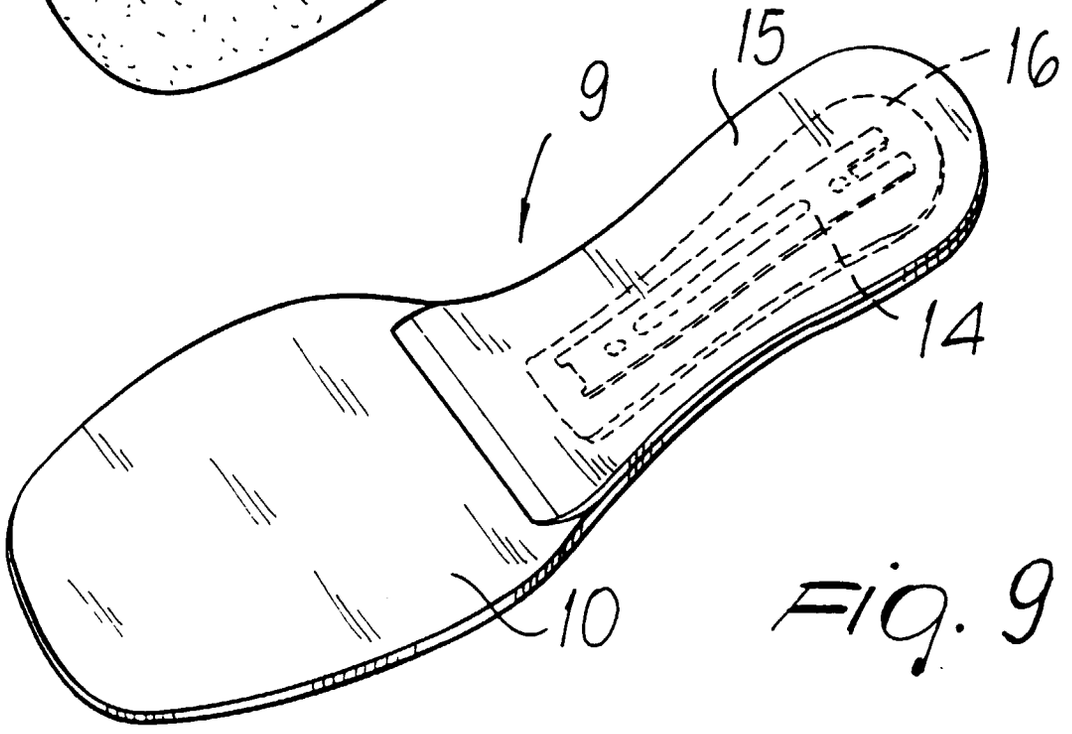

Fig. 9

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 11 9549

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	25 February 1999	Soederberg, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 98 11 9549

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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