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Colin(10) **Pub. No.: US 2014/0223781 A1**(43) **Pub. Date: Aug. 14, 2014**(54) **SHOE SOLE DEVICE AND SHOE
COMPRISING SUCH A SOLE DEVICE****Publication Classification**(76) Inventor: **Christian Colin**, Travanca-Feira (PT)(21) Appl. No.: **14/241,462**(22) PCT Filed: **Aug. 31, 2012**(86) PCT No.: **PCT/EP2012/066967**

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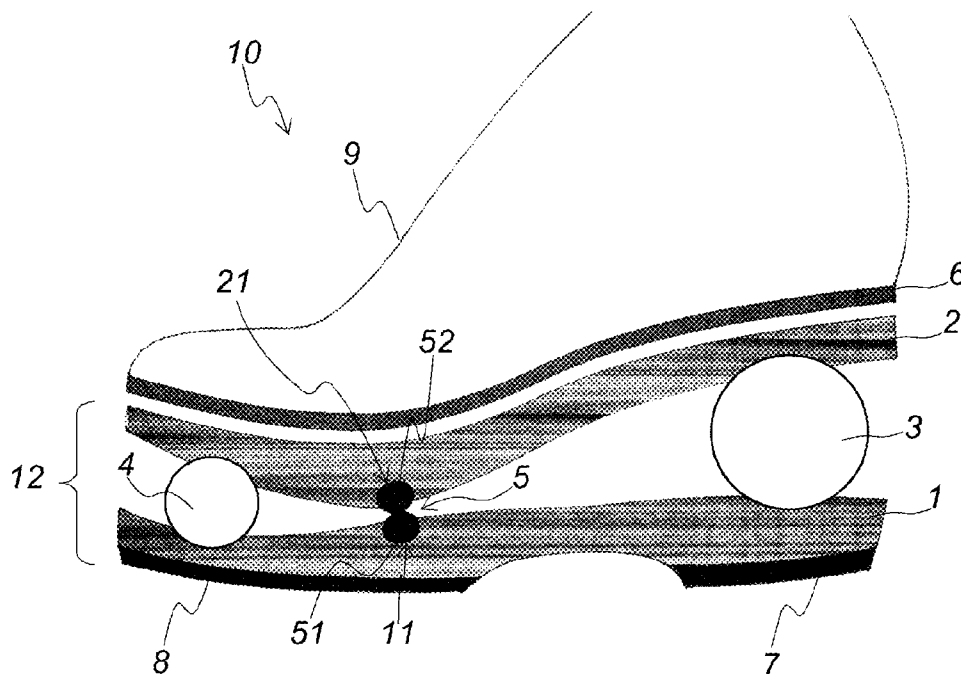
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(2013.01); *A43B 9/00* (2013.01)USPC **36/103**; 36/25 R; 36/28; 36/12

(57)

ABSTRACT

The invention relates to a shoe sole device comprising two superposed chassiss articulated relative to one another. For preference, movement-absorbing means, which notably absorb pivoting movements of the chassiss relative to one another are provided. The invention also covers a shoe having such a shoe sole device and an assembly rig for manufacturing such a shoe.



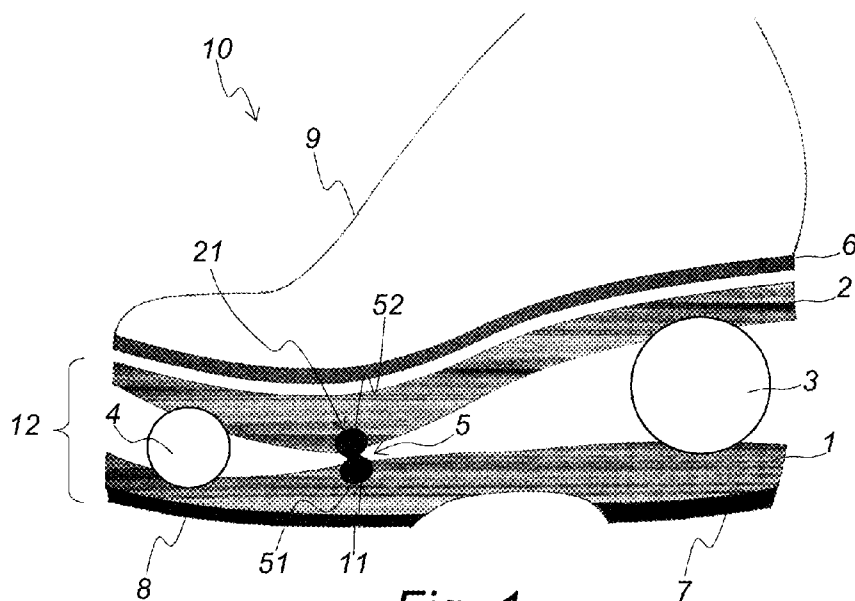


Fig. 1

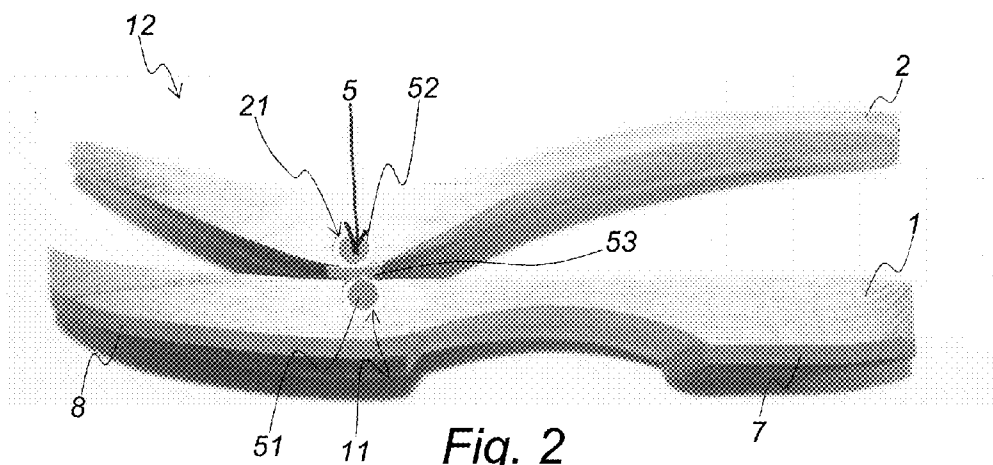


Fig. 2

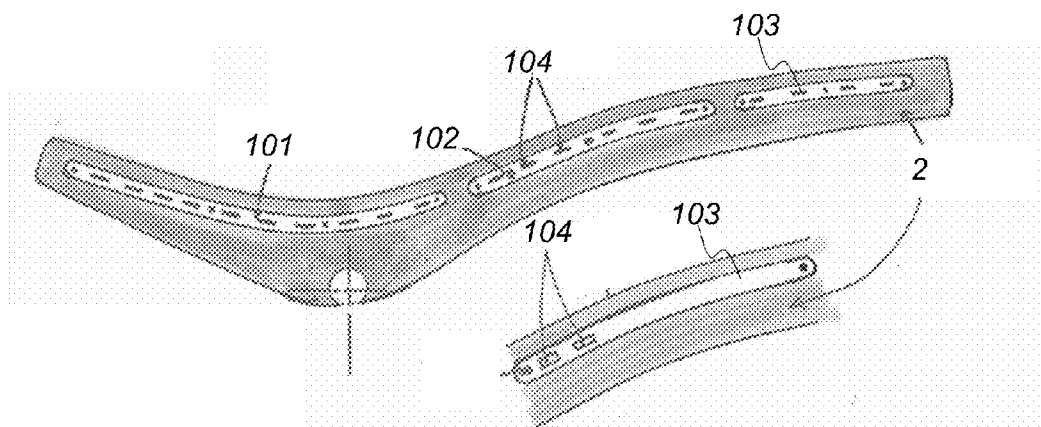


Fig. 3

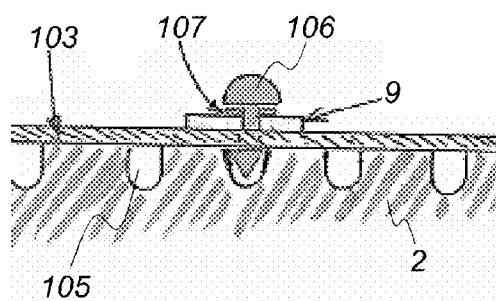


Fig. 4

SHOE SOLE DEVICE AND SHOE COMPRISING SUCH A SOLE DEVICE

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a sole device or assembly for a shoe and a shoe comprising this sole device or assembly.

[0002] A sole device for a shoe having a longitudinal slot is already known from Spanish utility Model ES 1041101. The longitudinal slot separates a rear upper portion and a rear lower portion of the sole. Due to the presence of the longitudinal slot, the sole is in a position to bend so that the rear upper portion can move toward or away from the lower rear portion. A V-folded metal plate is disposed in the slot between the upper rear and the lower rear portions of the sole.

[0003] Spanish utility model ES 1036287 discloses a similar sole for a shoe wherein the metal plate is relocated by a coil spring. Furthermore, the sole according to ES 1036287 consists of two frame member located one above the other which are fixed to each other at a front portion.

[0004] These soles do not however effectively improve wearer comfort.

SUMMARY OF THE INVENTION

[0005] The aim of the invention is therefore to provide a sole assembly and a shoe comprising a sole assembly having improved comfort compared to the prior art.

[0006] To this end, the invention provides a sole assembly for a shoe comprising two frame members located one above the other, and articulated with respect to each other.

[0007] Preferably, the sole assembly comprises one or more of the following features, taken alone or in combination:

[0008] the sole assembly comprises means for damping movement, in particular pivoting of the frame members relative to each other;

[0009] the movement damping means comprise two pieces of resilient material interposed between the two frame members located one above the other;

[0010] the pieces of resilient material are received in complementary housings in the form of recesses in at least one of the two frame members, preferably in the two frame members;

[0011] the two frame members are articulated at a pivot point disposed between the two pieces of resilient material.

[0012] the two frame members are articulated by means of a component forming two cylinders, each cylinder being received in a complementary housing formed in each one of the two frame members, at least one of the two cylinders being of circular section.

[0013] the component forming two cylinders is made of resilient material;

[0014] the component forming two cylinders also forms a tongue of resilient material between the two cylinders.

[0015] a first one of the two frame members has a cylindrical projection of circular cross-section and the other frame member has a housing complementary to the cylindrical projection of the first frame member, to allow the articulation the two frame members one relative to the other.

[0016] outsoles are fixed on one of the two frame members.

[0017] a first comfort padding is fixed on one of the two frame members, different, where appropriate, from the frame member to which outsoles are fixed.

[0018] The invention also provides a shoe comprising:

[0019] a sole assembly as described above, in any combinations thereof,

[0020] a shoe upper, and

[0021] means for securing the shoe upper onto the sole assembly.

[0022] Preferably, the means for securing the shoe upper onto the sole assembly are detachable, preferably manually.

[0023] Preferably, the means for securing the shoe upper onto the sole assembly comprise screws, preferably quarter-turn screws.

[0024] Preferably, a plate is fixed to one of two frame members, the plate having holes adapted to receive the screws.

[0025] The invention also provides a ready-to-assemble kit comprising:

[0026] a first and a second frame member,

[0027] means for articulating the first frame member relative to the second frame member when the two frame members are located one above the other,

[0028] means for damping movement of the frame members relative to each other,

[0029] a shoe upper, and

[0030] means for securing the shoe upper onto one of the first and second frame members.

[0031] Other features and advantages of the invention will become apparent on reading the following detailed description of embodiments of the invention, given by way of example only and with reference to the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] FIG. 1 shows diagrammatically a sectional view of a shoe.

[0033] FIG. 2 shows diagrammatically an example of a sole assembly that can be implemented in the shoe of FIG. 1.

[0034] FIG. 3 shows diagrammatically a detail of an exemplary sole assembly which can be implemented in the shoe of FIG. 1.

[0035] FIG. 4 shows diagrammatically a detail of the securing of a shoe upper on the sole assembly shown partially in FIG. 3.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

[0036] FIG. 1 shows a shoe 10 having a sole assembly 12 and a shoe upper 9.

[0037] As shown in FIG. 1, the sole assembly 12 comprises two frame members 1, 2, namely a lower frame member 1 and upper frame member 2. The two frame members 1 and 2 are located one above the other. That is to say that when the shoe 10 is worn, the upper frame member 2 is disposed above the lower frame member 1. The two frame members 1, 2 are substantially of the same length.

[0038] Outsoles 7, 8 may conventionally be mounted on the lower frame member 1. These outsoles 7, 8 are wear parts that can be relocated when worn, to extend the life of the shoe 10. The outsoles 7, 8 may also have a non-slip function. The outsoles 7, 8 are formed by inserts fixed on and below the lower frame member 1. These outsoles 7, 8 may especially be of natural or synthetic rubber. Outsoles 7, 8 can be adhesive bonded on the bottom frame member 1. According to a pre-

ferred embodiment, the outsoles are fixed to the bottom of bottom frame member **1** by means of pins integral with the outsoles and tightly received in holes of complementary shape formed in the lower frame member **1**.

[0039] Furthermore, a first anti-shock comfort padding **6** may be fixed to the upper frame member **2**.

[0040] The two upper **1** and lower **2** frame members are made of any material known to those skilled in the art as being suitable for the manufacture of a conventional sole. Thus, the lower frame member **1** and upper frame member **2** may in particular be made of wood or compressed chipboard derivatives thereof, of metal such as aluminum or other light alloys, of plastics material, of resin material or of compressed fibers. These materials have sufficient rigidity to ensure a secure fit and stability for the wearer of the sole in a shoe provided with the sole assembly. The choice of a plastics material allows the two lower and upper frame member to be produced by molding.

[0041] In one embodiment, the upper frame member **2** is made of metal by stamping. The upper frame member **2** has in this case a thickness of the order of a few tenths of a millimeter, particularly a thickness between 4 and 5 tenths of a millimeter. Such a frame member **2** is lightweight, and has high rigidity and ease of installation.

[0042] The two upper **1** and lower **2** frame members are also articulated relative to each other. Thus, the upper frame member **2** has at least one degree of freedom in rotation about an axis perpendicular to the plane of FIG. **1** relative to the lower frame member **1**. As illustrated in the drawings, the two frame members are articulated at the area for receiving that part of the foot corresponding to the base of the metatarsal bone.

[0043] The articulated mounting of the two frame members **1**, **2** relative to each other improves the comfort of the user, while ensuring a function of elevation of the wearer. Indeed, as a result of the wearer putting his or her weight forward, the rear of the upper frame member is raised, providing the wearer with the same effect as a heel, for example. The weight of such a sole assembly is also reduced relative to a conventional platform sole, which is solid. Furthermore, the degree of freedom between the lower frame member **1** and upper frame member **2** allows the upper frame member **2** to remain in contact with the foot of the wearer of the shoe **10** during walking.

[0044] The articulation of the frame members **1**, **2** is achieved in the example of FIG. **1**, by means of a component **5**. Component **5** comprises two cylinders **51**, **52**. Cylinder **51** is received in a complementary housing **11** formed in the lower frame member **1**. The other cylinder **52** is received in a complementary housing **21**. In FIG. **1**, the two cylinders **51**, **52** are of circular cross-section to ensure the articulation of the upper frame member **2** relative to the lower frame member **1**.

[0045] It should however be noted that by the term cylinder we mean a surface defined by a closed curve and a direction of extension. Thus, a cylinder is a priori of any section. It is sufficient a priori for one of the two cylinders **51**, **52** to be of circular cross-section to ensure the articulation of the upper frame member **2** relative to the lower frame member **1**.

[0046] The cylindrical shape also allows easy mounting of component **5** in the two housings **11**, **21** by introducing it with a translatory movement from one side of the two frame members.

[0047] The component **5** is preferably made of a synthetic rubber or natural rubber to permit cushioning of the movement of the two frame members one relative to the other.

[0048] In this case, the component **5** can, in the embodiment illustrated in FIG. **2**, also form a tongue **53** disposed between the lower frame member **1** and upper frame member **2**, to improve the cushioning provided by the component **5** between the two frame members **1**, **2**.

[0049] To limit the amount of movement of the upper frame member **2** relative to the lower frame member **1**, in the example of FIG. **1** means for damping/limiting movement, notably pivoting, of one frame member relative to the other are provided. In the example of FIG. **1**, these movement damping means are in the form of two pieces of resilient material **3**, **4** interposed between the lower frame member **1** and upper frame member **2**. The resilient material is for example of synthetic rubber or natural rubber. Obviously, other movement damping means may be implemented such as pouches of fluid, particularly viscous fluid. In addition to limiting the displacement of the upper frame member **2** relative to the lower frame member **1**, the movement damping means are able to damp the pivoting movements of the upper frame member **2** relative to the lower frame member **1**. For example, when the foot lands on the ground, the movement damping means—in this case the pieces of resilient material **3**, **4**—damp/limit the pivoting of the upper frame member **2** relative to the lower frame member **1**. This further increases comfort for the wearer.

[0050] The two pieces of resilient material **3**, **4** are here arranged one at each side of the articulation between the lower frame member **1** and upper frame member **2**, to facilitate assembly of the sole assembly **12** and ensure the holding in position of the two pieces of resilient material, deflection of the upper frame member **2** relative to the lower frame member **1** being limited at both sides by the pieces of resilient material.

[0051] It should be noted here that by choosing pieces of resilient material **3**, **4** of varying sizes, it is possible to change the height of the wearer's heel and thus it is possible to boost the height of the wearer of the shoe **10** to a greater or lesser degree.

[0052] To ensure the positioning of the pieces of resilient material, they are received in recesses of complementary shape formed respectively in the lower frame member **1** and/or upper frame member **2**. In view of this requirement and for ease of manufacture of sole assembly **12**, the pieces of resilient material **3**, **4** have a ball shape and are received in dome-shaped or spheroidal cuplike housings.

[0053] It should be noted that the sole assembly **12** as described above has the advantage of being able to be mounted/removed without special tools. This facilitates the replacement of components of the sole assembly **12**.

[0054] To assemble this sole assembly **12**, it is sufficient to introduce component **5** by sliding it into two suitable housings respectively of lower frame member **1** and upper frame member **2**. After this, one of the two pieces of resilient material, where appropriate in a recess of corresponding shape, is fitted. Fitting is facilitated by the absence of the second piece of resilient material, which allows the lower frame member **1** and upper frame member **2** to be pivoted one with respect to the other, in order to fit the piece of resilient material. A force is then exerted on the upper frame member **2** and/or on the lower frame member **1** at the piece of resilient material which

has already been fitted, to clear a sufficient space for fitting the second piece of resilient material.

[0055] Assembly of the sole may continue by securing the shoe upper **9** onto the sole assembly **12** to form a shoe. For this, means for securing the shoe upper on the sole assembly are implemented. The securing means for the shoe upper can in particular consist of staples, glue or nails.

[0056] According to a particularly advantageous embodiment, the securing means of the shoe upper on the sole assembly are attachable and detachable, preferably manually. This makes it possible to assemble a shoe without special tools. Furthermore, this may enable the sole assembly and/or the shoe upper to be replaced one independently of the other. Such securing means are, for example, snaps, a zipper or lacings.

[0057] FIGS. **3** and **4** illustrate an example of means for securing the shoe upper **9** of sole assembly **12**, more particularly on the upper frame member **2**.

[0058] According to this example, metal plates **101**, **102**, **103** are fixed to the upper frame member **2**. In this case, these metal plates **101**, **102**, **103** are nailed to the upper frame member **2**, the frame member **102** being made of wood. Of course, other securing means of the plates **101**, **102**, **103** onto the upper frame member can be considered such as for example glue. The plates **101**, **102**, **103** may also be attached by insert molding the upper frame member **102**, when the latter is made of plastic material, in particular EVA (Ethylene-vinyl acetate).

[0059] The plates **101**, **102**, **103** have holes **104** which are located opposite housing **105** formed in the upper frame member **2**. The holes **104** are adapted to receive screws **106**. Preferably, the screws **106** are quarter-turn screws to allow rapid assembly and dismantling.

[0060] These quarter-turn screws make it possible to trap or pinch flanges of shoe upper **9** between the metal plate **103** and the head of screw **106**. A washer **107** may be interposed between the head of the screw **106** and the shoe upper **9** to prevent unintended loosening of the shoe upper.

[0061] Of course, the present invention is not limited to the embodiments described above by way of example. The invention on the contrary covers many variations of these embodiments that are accessible to those skilled in the art.

[0062] For example, one of the two frame members of the sole assembly may include a projection (or protrusion or bead) of a circular-cylindrical shape or having at least a portion of circular section designed to be received in a housing of complementary shape formed in the other of the two frame members to permit articulation of the two frame members one relative to the other.

[0063] The invention also relates to a ready-to-assemble unit (or kit) comprising the necessary elements to produce the sole assembly as described above and to a ready-to-assemble kit comprising the elements necessary for producing a shoe comprising the sole assembly, a shoe upper and means for securing the shoe upper on the sole assembly.

[0064] Moreover, it should be noted that the securing of the shoe upper by means of releasable securing means may be performed on any type of sole, even if it does not have the configuration described above with reference to FIGS. **1** and **2**. In other words, there is provided a shoe comprising a sole, a shoe upper and means for securing the shoe upper on the sole that are detachable, preferably manually, and without special knowledge, to make it possible to replace the sole and/or the shoe upper independently of the other. The secur-

ing means are, however, preferably such as described with reference to FIGS. **3** and **4**, where upper frame member **2** is replaced by a sole, onto which there can be fixed a first comfort padding and/or a front insole and/or rear insole.

[0065] Finally, the two frame members can be articulated by means of a hinge or articulation device attached to the two frame members.

1. A sole assembly for a shoe comprising two frame members located one above the other, and articulated with respect to each other.

2. The sole assembly according to claim **1**, comprising means for damping movement, in particular pivoting of the frame members relative to each other.

3. The sole assembly according to claim **2**, wherein the movement damping means comprise two pieces of resilient material interposed between the two frame members located one above the other.

4. The sole assembly according to claim **3**, wherein the pieces of resilient material are received in complementary housings dug in at least one of the two frame members, preferably in the two frame members.

5. The sole assembly according to claim **3**, wherein the two frame members are articulated at a pivot point disposed between the two pieces of resilient material.

6. The sole assembly according to claim **1**, wherein the two frame members are articulated by means of a component forming two cylinders, each cylinder being received in a complementary housing formed in each one of the two frame members, at least one of the two cylinders being of circular section.

7. The sole assembly according to claim **6**, wherein the component forming two cylinders is made of resilient material.

8. The sole assembly according to claim **7**, wherein the component forming two cylinders also form a tongue of resilient material between the two cylinders.

9. The sole assembly according to claim **1**, wherein a first one of the two frame members has a cylindrical projection of circular cross-section and the other frame member has a housing complementary to the cylindrical projection of the first frame member, to allow the articulation the two frame members one relative to the other.

10. The sole assembly according to claim **1**, wherein outsoles are fixed on one of the two frame members.

11. The sole assembly according to claim **1**, wherein a first comfort padding is fixed on one of the two frame members, different, where appropriate, from the frame member to which outsoles are fixed.

12. A shoe comprising:

a sole assembly comprising two frame members located one above the other, and articulated with respect to each other,

a shoe upper, and

means for securing the shoe upper onto the sole assembly.

13. The shoe according to claim **12**, wherein the means for securing the shoe upper onto the sole assembly are detachable, preferably manually.

14. The shoe according to claim **13**, wherein the means for securing the shoe upper onto the sole assembly comprise screws, preferably quarter-turn screws.

15. The shoe according to claim **14**, wherein a plate is fixed to one of two frame members, the plate having holes adapted to receive the screws.

16. A ready-to-assemble kit comprising:
a first and a second frame member,
means for articulating the first frame member relative to the
second frame member when the two frame members are
located one above the other,
means for damping movement of the frame members rela-
tive to each other,
a shoe upper, and
means for securing the shoe upper onto one of the first and
second frame members.

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