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(71) Applicant: Rollerblade S.r.l.
31040 Trevignano (TV) (IT)

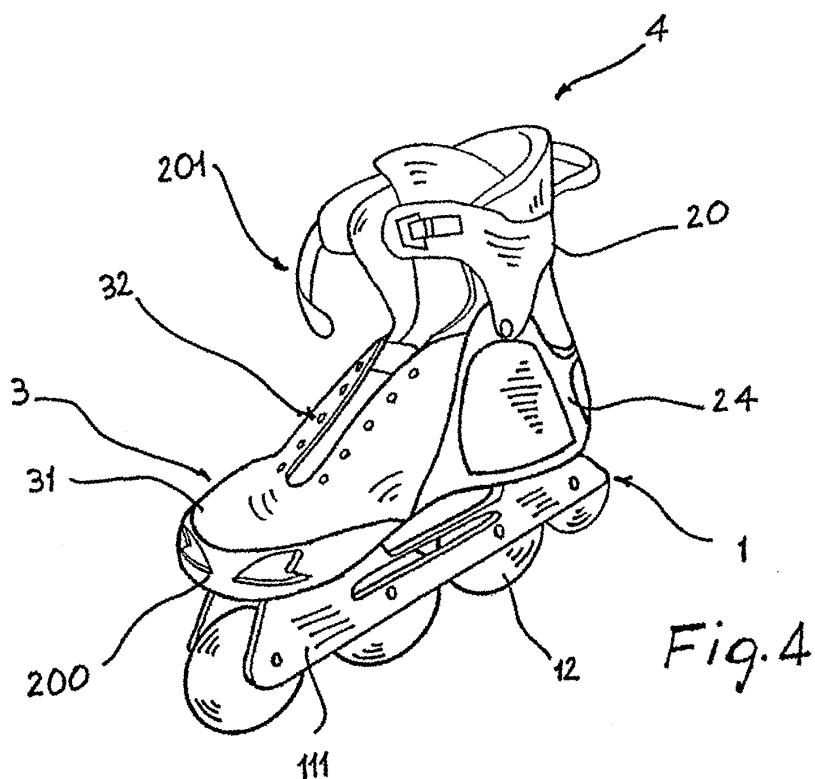
(72) Inventors:
• Caeran, Francesco
31044 Montebelluna (TV) (IT)
• Tormena, Andrea
31035 Crocetta del Montello (TV) (IT)

(74) Representative: Zanoli, Enrico et al
Zanoli & Giavarini S.r.l.,
Viale Bianca Maria, 35
20122 Milano (IT)

(54) Improved skate structure

(57) A skate structure comprising: a first shoe body (4) for accommodating the user's foot; a second shoe body (3) designed to accommodate the first shoe body; a rigid sole (2) designed to be joined to the second shoe body; a frame (1) comprising a support structure (11) having a top surface that joins to the rigid sole and two sidewall elements (111) for holding the skate's means

of movement (12). The rigid sole also has a rigid toe-piece (200) and two lateral extensions (24). The skate structure also comprises: first fastening means constituted by adhesive elements positioned between the second shoe body and the rigid toe-piece and between the second shoe body and the front portion of the rigid sole; second fastening means, at least partially constituted by screw fittings, joining the frame to the rigid sole.



EP 1 413 216 A1

Description

[0001] This invention relates to an improved skate structure, particularly an improved skate structure for roller-skates, and more particularly for roller-skates having a plurality of in-line wheels.

[0002] Roller-skates, particularly in-line skates, usually have a structure comprising a first unit constituted by a frame to which the means of movement are fixed, for example a plurality of in-line wheels, and a second unit comprising the shoe assembly that will hold the user's foot. These two units are generally joined to each other either directly or using additional intervening elements, such as a rigid sole for example. The various units and elements are then connected to each other using appropriate fastening means, resulting in a single structure. More particularly, the first unit is constituted by a frame made from a light, rigid material, such as aluminium or plastic, to the sidewall elements of which a plurality of wheels are fixed. The top section of the frame, which is generally constituted by a relatively flat surface, is designed for attachment of the rest of the skate structure. In modern versions of in-line skates, the second unit is normally constituted by a first shoe body with flexible upper, said shoe body being structured so as to accommodate the user's foot directly, or else designed to accommodate a second flexible shoe body that is normally detachable from said first shoe body. Fastening elements, usually constituted by a system of laces and corresponding slots, are usually only found on the first shoe body.

[0003] A rigid sole is normally placed between the two sub-units. In modern versions of in-line skates, this sole is constituted by a substantially flat first portion upon which the sole of the flexible first shoe body and consequently the sole of the user's foot rests, and by a second portion constituted by a cup structure placed on the rear half of the sole, in a position roughly corresponding to the heel and ankle area, to provide lateral support to the ankle and to hold the shoe body in place on the sole. A rigid leg section fitted with fasteners is also normally located in the area of the user's ankle.

[0004] A plurality of fastening means is therefore needed to join the various sub-units and components to each other. These fastening means normally comprise of a plurality of rivets for joining the flexible first shoe body to the rigid sole, the rivets preferably being placed at the tip of said shoe body and sole. Further fastening means are then needed to join together the frame, the rigid sole and the flexible first shoe body. These fastening means normally consist of a screw, the head of which is inside the flexible first shoe body and acts on the sole. The screw passes through the sole of the flexible first shoe body, through further holes on the flat portion of the rigid sole and on the flat surface of the top part of the frame, and is fixed in place by, for example, a nut placed under said flat surface.

[0005] Other known versions have all the various sub-

units and components joined to each other, for example using rivets.

[0006] The structures described above, while they serve their purpose, nevertheless have several disadvantages.

[0007] The assembly process proves to be relatively long and laborious. The shoe body with the flexible upper is actually fixed to the rigid sole by means of a series of rivets, which means that boring or provision of holes must be both on the rigid sole and on the sole of the shoe body. Assembly onto the frame requires further boring or provision of holes on the sole of the shoe body, to enable the screws holding the frame, rigid sole and flexible shoe body together to be inserted and fixed in place. The presence of screws and holes in the sole of the shoe body means that generally the relative position of the various sub-units cannot be changed. In those versions that use only rivets, it also becomes impossible to remove and adjust the position of the various constituent parts of the structure at a later date.

[0008] The use of a plurality of metallic elements, such as screws, rivets and similar components, together with the cup structure at the rear of the rigid sole also contribute to increasing the total weight of the skate.

[0009] From the above description, it is obvious that there exists the need for a skate structure, and particularly a roller-skate structure, with improved characteristics, and representing a valid alternative to the solutions described above.

[0010] The main task of this invention is to provide a skate structure, particularly a roller-skate structure, with improved characteristics.

[0011] As part of this task, one of the aims is to produce a skate structure that can be easily assembled in a short time.

[0012] Another important aim is to produce a skate structure requiring a minimal number of components.

[0013] A further aim is to produce a skate structure that is relatively lightweight.

[0014] An additional aim is to produce a skate structure that is easy for the user to use, while still offering high performance.

[0015] Last but not least, another aim of this invention is to produce a skate structure, particularly a roller-skate structure, and more particularly an in-line skate, that is highly reliable, relatively easy to manufacture and at competitive costs.

[0016] This task, together with these and other aims, which are better described below, are achieved by a skate structure, particularly a roller-skate, and more particularly an in-line skate, comprising: a first, detachable shoe body, for accommodating the user's foot; a second flexible shoe body, for accommodating said detachable first shoe body, and having an assembly sole and upper comprising soft lateral edges, first means of closure being provided on said second flexible shoe body; a rigid sole designed to be joined to said assembly sole; a frame comprising a support structure having a top sur-

face that joins with said rigid sole and two sidewall elements for holding the means of support for said skate's means of movement, particularly means of support for a plurality of wheels. The skate structure according to the invention is characterised in that said rigid sole is associated with a rigid toe-piece placed at the front tip of the sole, and two lateral extensions rising from the rear portion of said sole, and it is also characterised in that it comprises first and second fastening means, said first fastening means being constituted by adhesive elements placed at the interface between said second shoe body and at least a portion of the internal surface of said rigid toe-piece and at the interface between said second shoe body and the front portion of said second sole, said second fastening means being at least partially constituted by screw elements joining said frame to said rigid sole.

[0017] In this way, the skate structure according to the invention has a completely innovative configuration both in terms of its structure and in terms of the assembly sequence, which proves to be particularly easy and quick.

[0018] Further characteristics and advantages of the invention can be found in the description of preferred, but not exclusive, embodiments of the skate structure according to the invention, illustrated in the enclosed drawings, which are given purely for the purpose of example and are not limiting, where:

- figure 1 is a view of the various elements, disassembled, constituting a first embodiment of the skate structure according to the invention;
- figure 2 is a view of the various elements, disassembled, constituting a second embodiment of the skate structure according to the invention;
- figure 3 is a view of the various elements, disassembled, constituting a third embodiment of the skate structure according to the invention;
- figure 4 shows the skate structure constituted by the elements in figure 1, in the final assembled form;
- figure 5 shows the skate structure constituted by the elements in figure 3, in the final assembled form.

[0019] The skate structure according to the invention will be described with reference to an in-line roller-skate as shown in the mentioned figures, but without in any way wanting to limit its field of application.

[0020] With reference to the mentioned figures, the skate structure according to the invention, in this case an in-line roller-skate, comprises a first, detachable shoe body 4, for accommodating the user's foot. The shoe body 4 is normally inserted within a second, flexible shoe body 3, which comprises an assembly sole 33 and upper 31 comprising soft side edges. The first means of closure 32 are normally placed on said flexible second shoe body 3. These first means of closure are for example constituted by a plurality of holes and relative laces and/or velcro-type pull-fasteners and/or zips,

etc. The assembly sole 33 is normally joined to a rigid sole 2. The structure also comprises a frame 1 with a support structure 11 having a top surface that joins to the rigid sole 2 and two sidewall elements 111 for holding

5 the means of support for a plurality of wheels 12. In the versions shown in the mentioned figures, the top section of the frame is divided into two portions 112 and 113, at the front and rear respectively, but other forms of subdivision are obviously also possible.

10 **[0021]** The structure according to the invention also comprises a rigid toe-piece 200 associated with the front tip of the rigid sole 2; two lateral extensions 24 are also associated with the rigid sole, rising upwards from a rear section of said sole 2.

15 **[0022]** Assembly is carried out using fastening means that are appropriately selected and positioned. In particular, first fastening means, constituted by adhesive elements, not illustrated in the figure, are placed at the interface between the second shoe body 3 and at least 20 a portion of the internal surface of the rigid toe-piece 200, and at the interface between the assembly sole 33 of the second shoe body 3 and the front portion 21 of the sole 2. The rigid sole 2 is joined to the frame 1 using second fastening means, not shown in the figure, constituted at least in part by screw elements.

25 **[0023]** Preferably, it is also possible to use third fastening means, not shown in the figure, which join each of the said two lateral extensions 24 to the upper 31 of the flexible second shoe body 3. More preferably, the 30 join between the lateral extensions 24 and the upper 31 is made at the top edge of each of the said two lateral extensions.

35 **[0024]** For the purposes of this invention, the terms 'front', 'rear', 'top' and 'bottom' refer to normal conditions of skate use, where the term 'front' is used to define the end of the skate accommodating the user's toes, and the term 'rear' is used to define the end of the skate accommodating the user's heel; the terms 'top' and 'bottom' on the other hand, refer to relative positions, with 40 reference to the skate in a vertical position with respect to the ground, where the term 'bottom' is used to define those positions closer to the ground, and the term 'top' is used to define those positions closer to the user.

[0025] As can be seen from the attached figures, the 45 two lateral extensions 24 define a space designed to accommodate a rear portion of the flexible second shoe body 3. According to a preferred embodiment of the invention, illustrated in figure 1, the lateral extensions 24 are not produced in a solid body, but rather have openings of different possible sizes that help to lighten the weight of the structure, as well as allowing a saving in terms of materials and also of costs.

[0026] According to a particularly preferred embodiment of the invention, illustrated in figure 2, each of the 55 said two lateral extensions 24 comprises an arched segment having a first rear end, a second front end and an apex; the arched segment therefore comprises a first rear arm that joins the apex to said first rear end and a

second front arm that joins the apex to said second front end, thus creating an arched structure going from the rear portion to the front portion of the sole 2. At the apex of each lateral extension there is a hole 25 enabling said extensions 24 to be joined to the upper 31 using rivets, screws or similar components.

[0027] Preferably, as shown in figure 2, the two lateral extensions 24 are joined to each other at the rear, in a position corresponding to their rear arms, by a curved segment 26 in rigid material, which helps to hold the shoe body 3 in place and adds to the rigidity of the structure, without excessive increase in weight.

[0028] A particularly preferred embodiment of the roller-skate according to the invention, illustrated in figures 2 and 3, has the rigid sole 2, the rigid toe-piece 200 and the two lateral extensions 24 produced in a single body, for example by moulding a rigid plastic material.

[0029] Assembly of the various components constituting the skate structure according to the invention is also greatly facilitated by the appropriate choice of fastening means and their positioning. In particular, gluing made between the second shoe body 3 and the rigid sole 2 is preferably carried out in only one front area 21 of said sole 2 and shoe body 3. In practice, the first adhesive elements are preferably placed at the interface between the assembly sole 33 of the second shoe body 3 and the rigid sole 2 in an area roughly corresponding to the area of the phalanges and at least part of the metatarsus of the user's foot.

[0030] The rigid sole 2 preferably has a first and a second hole, 22 and 23, placed respectively in a front area and in a rear area of said sole. On the top surface of the support structure 11 of the frame 1 there is a corresponding pair of holes 13. The second fastening means, constituted preferably by a pair of screws, join the sole 2 to the frame 1, passing through said first and second holes, 22 and 23, on the sole, and said pair of corresponding holes 13 on the frame. In this case, the first fastening means are placed at the interface between the assembly sole 33 of the second shoe body 3 and the rigid sole 2 in front of the point at which said first hole 22 is positioned.

[0031] From the above description, it is apparent that only the rigid sole 2 is directly joined to the frame 1, thus allowing for greater flexibility for assembly operations. Actually, a different assembly sequence from the one described above can also be used, as it is possible to join first the sole 2 to the support structure 11 of the frame and then join the shoe body 3 to the frame/sole sub-unit by gluing the assembly sole 33 onto the rigid sole 2.

[0032] According to a preferred embodiment, illustrated in figures 2 and 3, at least one of said first and second holes 22 and 23 in the sole 2 is constituted by a long slot running longitudinal to the sole, enabling the relative position of the sole with respect to the frame to be adjusted during assembly. In the case shown in figures 2 and 3, the rear hole 23 is constituted by a long slot, but

other solutions where both holes 22 and 23 are constituted by slots are obviously possible.

[0033] According to an alternative embodiment, not shown in the figure, the top part of the support structure

5 11 of the frame 1 is divided by a longitudinal channel that extends along whole or part of the length of said top part. The term 'longitudinal' here is intended to describe the direction of the section joining the rear tip and the front tip of said support structure. Said channel may constitute an area through which the screw elements belonging to said second fastening means pass, in place of the holes 13.

[0034] The roller-skate structure according to the invention also comprises a collar 20, fitted with second

15 closure elements 201 and 202, for example a lever locking system, and preferably fixed to each of said two lateral extensions 24. Preferably the collar 20 is fixed to each of said two lateral extensions 24 at the position corresponding to the holes 25 for the passage of the

20 third fastening means. The third fastening means may for example be a pair of riveted pins, or similar elements, which also serve as an axis of rotation, allowing the collar 20 to rotate at least partially around said axis.

[0035] According to a particularly preferred version,

25 illustrated in figures 3 and 5, the first means of closure 32 comprise rigid edge elements having at least one side fixed to the upper 31 of the flexible second shoe body 3, and at least one side of said edge elements being also fitted with one or more fastening elements such as, for example, a plurality of holes for the passage of corresponding laces. Other fastening systems, for example zips or pulling systems, or combinations of them, are nevertheless possible.

[0036] It has been noted in practice that the skate

35 structure according to the invention fully performs its preset task and aims. The first, second and third fastening means ensure adequate operational flexibility during assembly, and at the same time ensure solidity, comfort, and a high performance level for the structure as a

40 whole. The particular shape of the various elements, and particularly the rigid sole and the relative lateral extensions and rigid toe-piece, makes it possible to create structures that are both rigid and light. The skate structure thus conceived may be subject to numerous changes and variants, all of which fall within the same inventive concept; in addition, all the components may be

45 constituted by other, technically equivalent elements. In practice, this means that the materials used and the sizes and contingent shapes may vary according to needs and to available techniques.

Claims

55 1. Skate structure comprising: a first, detachable shoe body (4), designed to accommodate the user's foot; a flexible, second shoe body (3), designed to hold said detachable first shoe body and having an as-

sembly sole (33) and an upper (31) comprising soft side edges, with first means of closure (32) being placed on said flexible second shoe body (3); a rigid sole (2) designed to be joined to the assembly sole (33); a frame (1) comprising a support structure (11) having a top surface that joins with said rigid sole (2) and two sidewall elements (111) for holding the means of support for said skate's means of movement (12), **characterised in that** said rigid sole (2) is associated with a rigid toe-piece (200) placed at the front tip and two lateral extensions (24) rising from the rear portion of said sole, and **characterised in that** it comprises first and second fastening means, the first fastening means being constituted by adhesive elements used at the interface between said second shoe body and at least a portion of the internal surface of said rigid toe-piece and at the interface between said second shoe body and the front portion of said second sole, the second fastening means being at least partially constituted by screw elements joining said frame (1) to said rigid sole (2).

2. Skate structure according to claim 1, **characterised in that** it comprises third fastening means joining said lateral extensions (24) to the upper (31) of said flexible second shoe body (3).

3. Skate structure according to claims 1 or 2, **characterised in that** said two lateral extensions (24) create a space designed to accommodate a rear portion of said flexible second shoe body (3).

4. Skate structure according to one or more of the previous claims, **characterised in that** each of said two lateral extensions (24) comprises a curved segment having a first rear end, a second front end, an apex, a first rear arm and a second front arm joining said apex to said first rear end and said second front end respectively, said third fastening means being in a position corresponding to said apex.

5. Skate structure according to one or more of the previous claims, **characterised in that** said two lateral extensions (24) are joined to each other at the rear by a curved segment in rigid material.

6. Skate structure according to one or more of the previous claims, **characterised in that** said rigid sole (2), said rigid toe-piece (200) and said two lateral extensions (24) are produced in a single body.

7. Skate structure according to one or more of the previous claims, **characterised in that** said first fastening means are placed at the interface between said second shoe body (3) and said rigid sole (2) in an area roughly corresponding to the area of the phalanges and at least part of the metatarsus of the user's foot.

8. Skate structure according to one or more of the previous claims, **characterised in that** said rigid sole (2) has a first (22) and second (23) hole respectively positioned in a front area (21) and a rear area of said sole (2), a pair of corresponding holes (13) being made on the top part of the support structure (11) of said frame (1), said second fastening means comprising a pair of screws joining said sole (2) to said frame (1) by passing through said first (22) and second (23) holes in the sole (2) and said pair of corresponding holes (13) on the frame.

15. Skate structure according to claim 8, **characterised in that** said first fastening means are placed at the interface between said second shoe body (13) and said rigid sole (2) in front of the point in which said first hole (22) is made in the sole (2).

20. Skate structure according to claims 8 or 9, **characterised in that** at least one of said first (22) and second (23) holes in the sole (2) is constituted by a long slot running longitudinal to the sole (2).

25. Skate structure according to one or more of the claims from 1 to 7, **characterised in that** said top part of said support structure (11) of said frame (1) has a longitudinal channel running along it.

30. Skate structure according to one or more of the previous claims, **characterised in that** it comprises a collar (20), said collar (20) being fitted with second means of closure (201,202) and being fixed to each of said two lateral extensions (24).

35. Skate structure according to claim 12, **characterised in that** said collar (20) is fixed to each of said two lateral extensions (24) in a position corresponding to said third fastening means, said third fastening means constituting an axis of partial rotation for said collar (20).

40. Skate structure according to one or more of the previous claims, **characterised in that** said second shoe body comprises first means of closure (32) comprising rigid edge elements having at least one side fixed to the upper (31) of said flexible second shoe body (3), said rigid edge elements being also fitted with one or more fastening elements.

45. Skate structure according to one or more of the previous claims, **characterised in that** said means of movement are constituted by a plurality of wheels (12), preferably a plurality of in-line wheels.

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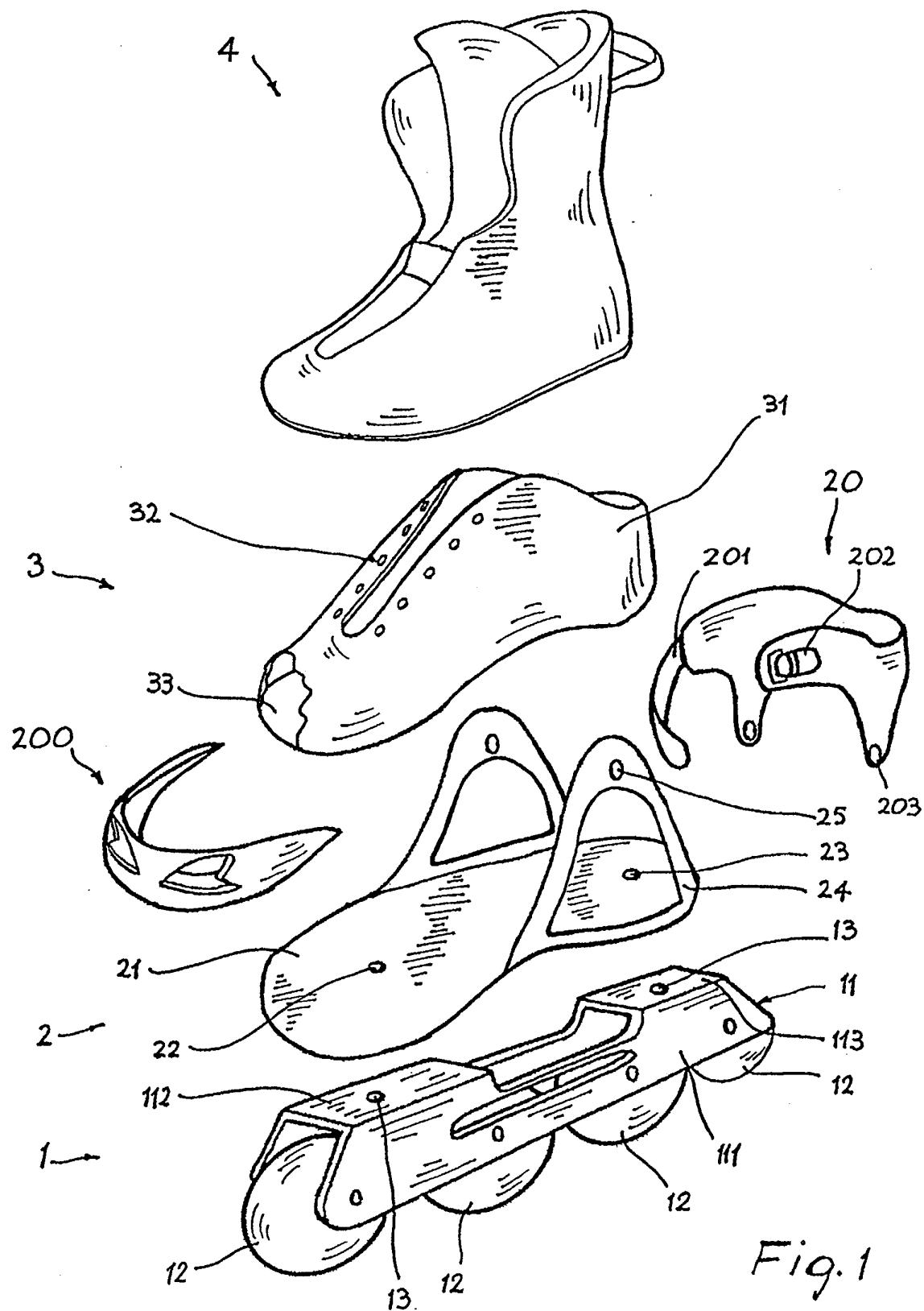


Fig. 1

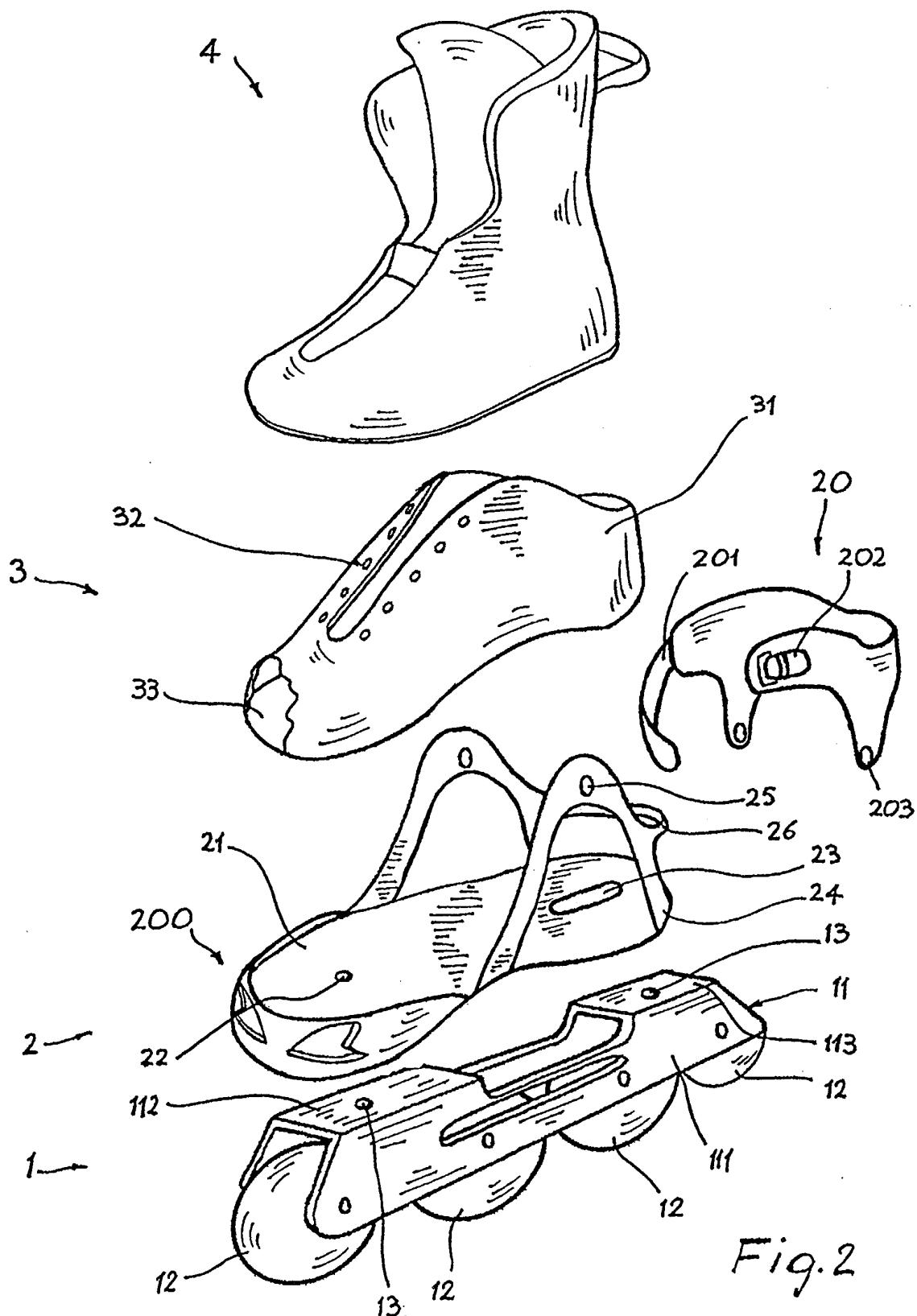


Fig. 2

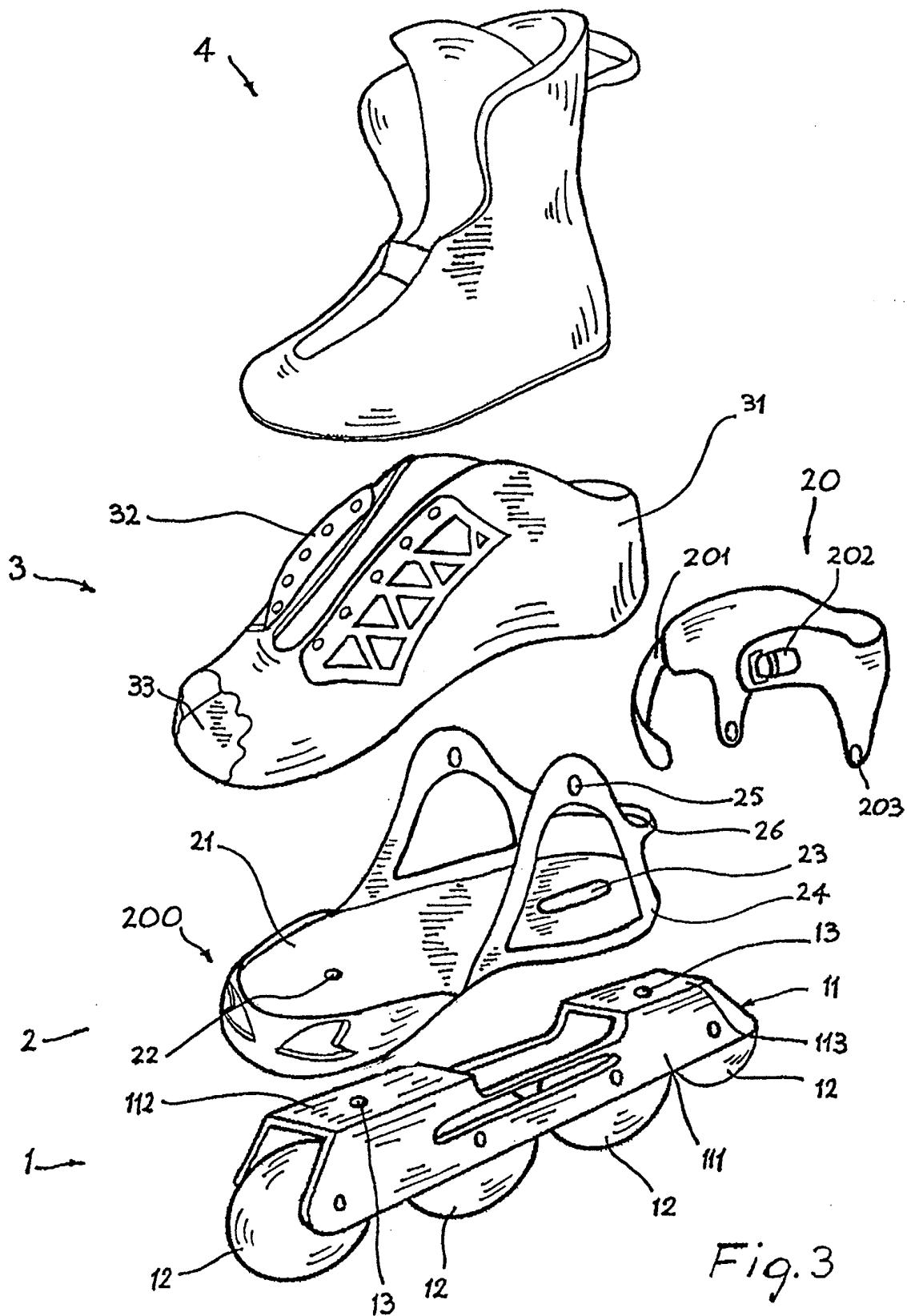
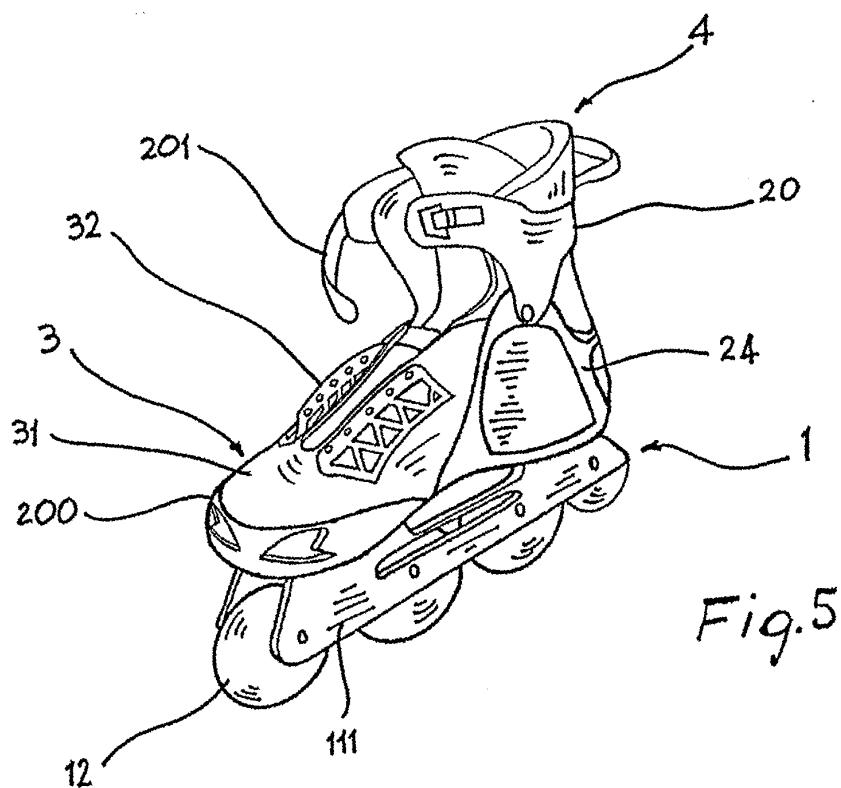
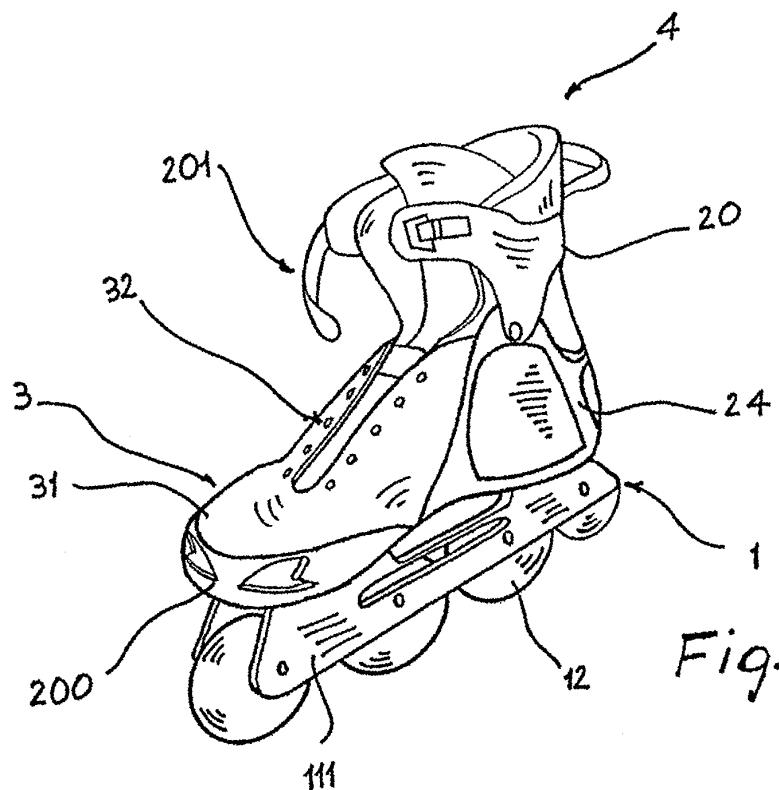


Fig. 3





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