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(54) Skate with in-line wheels

(57) A skate with in-line wheels, comprising a first front body, for supporting and locking the front part of the foot, and a second rear body, for supporting and locking at least the heel, the bodies having a first frame (209) and a second frame (213) for supporting a plurality of wheels (208,216). The first and second bodies and the first and second supporting frames are rotatably associated to each other to allow better transmission of lateral forces during sports practice.

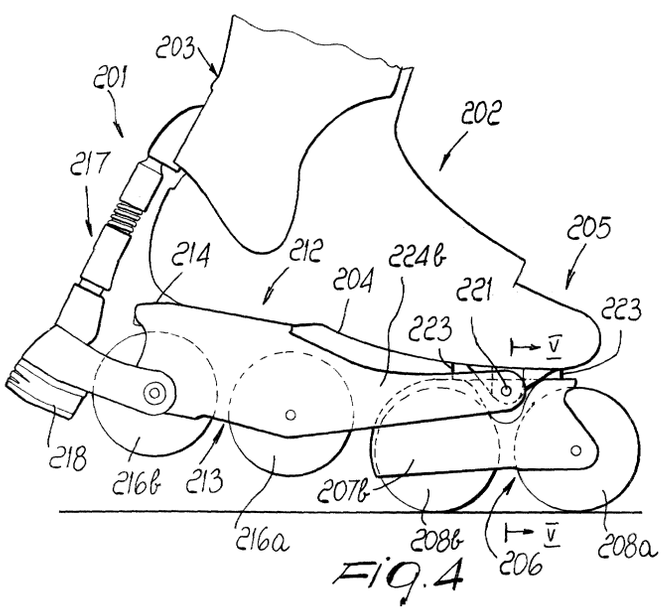

Fig.4

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Description

[0001] The present invention relates to a skate with in-line wheels.

[0002] Conventional in-line roller skates comprise a shoe comprising a quarter articulated to a shell, which has a rigid sole that is associated, in a downward region, with a usually U-shaped support or frame between the wings whereof wheels are pivoted. The wheels are thus arranged in line with respect to each other.

[0003] These conventional skates have some drawbacks: when skating, and particularly during thrusting, difficulties are in fact encountered in optimally and completely transferring the thrust imparted by the user, thus decreasing the effectiveness of the thrust and the comfort for the foot.

[0004] The user in fact tends to transmit forces mainly at the region of the foot sole lying below the metatarsal region, but the rigidity of the support and of the sole of the shoe instead force him, during thrusting, to fully rest the foot sole on the shoe sole, so that the transmitted forces are divided between the wheels that are pivoted at the front and the wheels that are pivoted at the rear, with a consequent loss of effectiveness in thrusting.

[0005] European Patent Application No. 95108085.2 filed May 26, 1995 discloses a roller skate with improved fit that is constituted by a first front body, for resting and locking the front part of the foot, and by a second rear body, for resting and locking at least the heel.

[0006] The first body and the second body are transversely rotationally associated to each other in a region that lies approximately above the pre-arch portion of the foot and in the interspace that lies between a first supporting frame and a second supporting frame for one or more wheels associated with said frames in a downward region.

[0007] Although this solution allows articulation of the shoe, it nonetheless has drawbacks: in fact, the rotation, stability, and overall rigidity of the skate are correlated only to the articulation point, which is not sufficient for their optimization.

[0008] These drawbacks are increased by the fact that during sports practice the skate is subjected, during periods of maximum thrusting, to continuous and often violent lateral stresses, as can occur for example when skating along a curve or during slalom skating or in particular during so-called "side-slip" braking.

[0009] The articulation point must therefore absorb all these applied stresses and at the same time ensure the rotation and rigidity of the shoe and good stability of the foot; however, these conditions cannot all be met simultaneously.

[0010] During skating, the foot is in fact subjected to considerable vibrations and lateral stresses that accordingly decrease the user's sensitivity in utilization and the lateral stability of the implement.

[0011] The user is also forced to increase the force in order to achieve optimum stability of the skate, with consequent tiring during exercise and reduction in comfort throughout sports practice.

[0012] A principal aim of the present invention is therefore to solve the described problems, eliminating the drawbacks of the cited prior art by providing a skate that allows the user to transmit forces in an optimum manner during thrusting, at the same time allowing a correct anatomical movement of the foot.

[0013] Within the scope of this aim, an important object is to provide a skate that allows to transmit efforts during thrusting selectively only at the front part of the foot, at the same time allowing to achieve optimum lateral support of the skate during all phases of sports practice.

[0014] Another object is to provide a skate having increased operating sensitivity and comfort, particularly during periods of maximum thrusting.

[0015] Another important object is to provide a skate that allows to achieve the necessary assurances of stability for the user throughout sports practice.

[0016] Another object is to provide a skate that can be produced at low costs and with conventional machines and equipment.

[0017] In accordance with the invention, there is provided a skate with in-line wheels as defined in the appended claims.

[0018] The characteristics and advantages of the invention will become apparent from the following detailed description of a particular embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a view of a skate according to the invention;
Figure 2 is a side view of the skate with in-line wheels in the inactive condition;
Figure 3 is a partially sectional top view, taken at the tip region of the shell;
Figure 4 is a side view of the skate during thrusting while skating;
Figure 5 is a sectional view, taken along the plane V-V of Figure 4;
Figure 6 is a side view of the skate with in-line wheels in the inactive condition;
Figure 7 is a sectional view, taken along the plane VII-VII of Figure 6;
Figure 8 is a side view of the skate during thrusting while skating;
Figure 9 is a sectional view, taken along the plane IX-IX of Figure 8;
Figure 10 is a partially sectional side view of still a further embodiment of the skate.

[0019] In Figure 1, the reference numeral 101 designates a skate constituted by a shell 102 with which a quarter, not shown, can be articulated at the malleolar region by means of appropriate studs or rivets.

[0020] The shell 102 is constituted by a first body

109a, which is U-shaped in transverse cross-section and is constituted by a first flat support 131a, from which two lateral shoulders protrude upwardly; said shoulders allow to contain the front part of a shoe 130 or the foot at the tip region 105.

[0021] The first body 109a has a first strap 132a the ends whereof are associable with the two lateral shoulders; said first band 132a allows to secure the shoe 130 or the foot.

[0022] The shell 102 has a second body 109b, which is constituted by a second flat support 131b, from which a heel cup protrudes perimetrically and upwardly and is adapted to contain at least the heel region 115 of the shoe 130.

[0023] The second body 109b has a second strap 132b the ends whereof are laterally associated with the heel cup; said strap provides securing at the foot instep region 133.

[0024] The first and second bodies 109a and 109b can be transversely and rotatably associated, at their ends which can be placed adjacent to each other, by means of a hinge-like articulation that comprises an adapted screw or a connecting pivot 134.

[0025] A first frame 110a and a second frame 110b are associated respectively with the first body 109a and with the second body 109b; both frames are U-shaped, and at least two first and second wheels 111a and 111b, 114a and 114b are respectively pivoted between the first and second wings, which protrude downwardly, of said frames.

[0026] The center distance of the second wings of the second frame 110b is smaller than the center distance of the first wings of the first frame 110a, so as to allow the partial insertion and adjacent arrangement of the second wings with respect to the first wings on an approximately parallel plane.

[0027] The first frame 110a and the second frame 110b have means 116 for mutual guiding and sliding.

[0028] Said means 116 are constituted by a pin 117 that is associated and blended, at right angles, with the tips of the first wings of the first frame 110a in a region that is intermediate between two of said first and second wheels that are adjacent to each other; the first pin 117 slides at a slot 118 that is formed on the second wings of the second frame 110b that are arranged adjacent to the first wings of the first frame 110a.

[0029] The slot 118 is arc-shaped, with its concavity directed at the tip region 105.

[0030] This solution allows to achieve the intended aim and objects.

[0031] With reference to Figures 2-4, the reference numeral 201 designates a skate constituted by a shell 202, to which it is possible to articulate a quarter 203 associated at the malleolar region by means of appropriate studs or rivets.

[0032] The shell 202 is formed monolithically, is preferably made of plastics, and has a lower region that forms a sole 204.

[0033] A first frame 206 is associated below the sole 204 in the metatarsal region 205 and is U-shaped in transverse cross-section; at least one pair of first wheels 208a and 208b is pivoted between the first wings 207a and 207b of said first frame, which protrude towards the ground.

[0034] The first frame 206 has a first base 209 for connecting the first wings 207a and 207b; said base is perforated, so as to form a seat for the positioning of a first tab 210 in said base, and said first tab protrudes below the sole 204 in the metatarsal region 205.

[0035] A pair of second tabs 211a and 211b also protrudes below the sole 204 so as to lie approximately parallel to the first tab; said second tabs are arranged externally with respect to the first wings 207a and 207b of the first frame.

[0036] A second frame 213 is associated below the sole 204, approximately at the heel region 212; said second frame, too, is U-shaped in transverse cross-section, forming a second base 214 for anchoring to the sole 204, two second wings 215a and 215b protruding from said second base, at least one pair of second wheels 216a and 216b being pivoted between said second wings.

[0037] An adapted brake 217 is advantageously associable at the quarter 203 and has a pad 218 that interacts with the ground when said cuff is rotated backwards.

[0038] A first hole 219 and second holes 220a, 220b are formed, along the same axis, respectively at the first tab 210 and at the second tabs 211a and 211b; said holes accommodate a pivot 221 that also passes at adapted third holes 222a and 222b formed at the first wings 207a and 207b of the first frame 206 proximate to the first base 209.

[0039] At least one means adapted to limit the oscillation of the second frame 213 and/or of the shell 202 is interposed between the lower surface of the sole 204 and the first base 209; the means is constituted by a flexible insert 223 that is preferably rectangular in plan view and has a hole which allows the insertion of the first tab 210.

[0040] The second frame 213 has two third tabs 224a and 224b that protrude from the second wings 215a and 215b towards the first frame 206 and have such a length and size as to be arranged laterally adjacent outside the second tabs 211a and 211b that protrude from the sole 204 and the ends of the first wings 207a and 207b of the first frame that are adjacent to the first base 209.

[0041] Advantageously, the profiles of the first wings and of the pair of third tabs have narrower portions that allow to contain the length of the pivot 221.

[0042] Said two third tabs 224a and 224b are slightly curved towards the sole 204, and are perforated at the tip in order to be pivoted to the pivot 221.

[0043] The operation of the invention is as follows: during thrusting, which is shown schematically in figure 10, the skater can lift the second frame 213 by the pres-

ence of the pair of third tabs 224a and 224b, localizing forces exclusively at the first frame 206 and therefore at the first wheels 208a and 208b.

[0044] Furthermore, use of the particular configuration of the second frame and of the pair of third tabs allows to shift the rotation point at the axis of the pivot 221 directly below the sole of the shell.

[0045] It has been observed that the invention has achieved the intended aim and objects, since it is adapted to transmit forces in an optimum manner during thrusting and at the same time allows a correct anatomical movement of the foot.

[0046] The presence of the pair of third tabs in fact allows, while having a monolithic shell, to lift the second frame, so that the user can transmit forces, during thrusting, selectively only at the front part of the foot, at the same time allowing to achieve optimum lateral containment and rigidity of the entire skate throughout sports practice.

[0047] With reference to Figures 6-9, the reference numeral 301 designates a skate constituted by a shell 302, whereto it is possible to articulate a quarter 203 associated at the malleolar region by means of appropriate studs or rivets.

[0048] The shell 302 is formed monolithically, is preferably made of plastics, and has a lower region that forms a sole 304.

[0049] A first frame 306 is associated below the sole 304 in the metatarsal region 305 and is U-shaped in transverse cross-section; at least one pair of first wheels 308a and 308b is pivoted between the first wings 307a and 307b of said first frame, which protrude towards the ground.

[0050] The first frame 306 has a first base 309 for interconnecting the first wings 307a and 307b; said base is perforated, so as to form a seat for the positioning of a first tab 310 in said base, and said first tab protrudes below the sole 304 in the metatarsal region 305.

[0051] A pair of second tabs 311a and 311b also protrudes below the sole 304 so as to lie approximately parallel to the first tab; said second tabs are arranged externally with respect to the first wings 307a and 307b of the first frame.

[0052] A second frame 313 is also associated below the sole 304, approximately at the heel region 312; said second frame, too, is U-shaped in transverse cross-section, forming a second base 314 for anchoring to the sole 304, two second wings 315 protruding from said second base; at least one pair of second wheels 316a and 316b is pivoted between said second wings.

[0053] An adapted brake 317 is advantageously associable at the quarter 303 and has a pad 318 which interacts with the ground when said cuff is rotated backwards.

[0054] A first hole 319 and second holes 320a, 320b are formed, along the same axis, respectively at the first tab 310 and at the second tabs 311a and 311b; said holes accommodate a pivot 21 that also passes at adapted third holes 322a and 322b formed at the first wings 307a and 307b of the first frame 306 proximate to the first base 309.

[0055] At least one means adapted to limit the oscillation of the second frame 313 and/or of the shell 302 is interposed between the lower surface of the sole 304 and the first base 309; said means is constituted by a flexible insert 323 which is preferably rectangular in plan view and has a hole that allows the insertion of the first tab 310.

[0056] The skate also has a rigid connecting element 324 that is adapted to connect the first frame, the second frame, and the shell one another; said connecting element is constituted by two profiles that are L-shaped and therefore have respective third wings 325 and fourth wings 326; the tips of said wings are pivoted respectively at the pivot 321 and at the pivoting axis of the second wheel 316a of the second frame 313 that is adjacent to the first frame 306, which is arranged in front.

[0057] Advantageously, the profiles constituting the connecting element are arranged outside the first and second frames.

[0058] It is also possible to advantageously provide narrower portions, adapted to contain the extension of the pivot 321, at the first frame and at the third wings 325.

[0059] The third wings 325 and the fourth wings 326 are thus arranged approximately parallel to the first wings 307a and 307b and to the second wings 315 of the respective first and second frames, so as to allow mutual sliding.

[0060] The elbow of the connecting element 324, which joins the third wing 325 and the fourth wing 326, is furthermore arranged approximately at the first wheel 308b of the first frame 306 that is adjacent to the second frame 313, where each profile is pivoted at the first wheel 308b and therefore between the first wings 307a and 307b of the first frame 306.

[0061] Additional means for limiting the oscillation of the second frame and/or of the shell are constituted by at least one lug 327 that protrudes at least from one of the first wings 307a and 307b in a region lying to the rear of the perimetric edge of the third wings 325 that is directed towards the heel region 312; said lug is arranged so as to abut against the perimetric edge of the third wings 325 in the inactive condition in which all the wheels rest on the ground.

[0062] The operation of the invention is as follows: during thrusting, which is shown schematically in figure 14, the skater can lift the second frame 313 by the presence of the connecting element 324, localizing forces exclusively at the first frame 306 and therefore at the first wheels 308a and 308b.

[0063] Furthermore, use of the L-shaped profile for the connecting element allows to shift the rotation point at the axis of the first wheel of the first frame and therefore in a point that is very close to the ground and is anatomically favorable for the rotation of the foot during

thrusting.

[0064] It has been observed that the invention has achieved the intended aim and objects, since it is adapted to transmit forces in an optimum manner during thrusting and at the same time allows a correct anatomical movement of the foot.

[0065] The connecting element in fact allows, while having a monolithic shell, to lift the second frame, so that the user can transmit forces, during thrusting, selectively only at the front part of the foot, at the same time allowing to achieve optimum lateral containment and rigidity of the entire skate throughout sports practice.

[0066] Figure 10 illustrates still a further embodiment, in which the numeral 501 designates a skate constituted by a shell 502.

[0067] The shell 502 is constituted by a first front body 509a, which is arranged proximate to the toe region 505 and adapted to surround it, and by a separate second rear body 509b, to which a quarter 503 can be articulated.

[0068] The first and second bodies 509a and 509b have, respectively, a first sole 504a and a second sole 504b which are transversely and rotatably associated with each other, at their ends that can be arranged mutually adjacent, by means of a hinge-like articulation that comprises an adapted transverse connecting screw or pivot 534.

[0069] The first and second bodies 509a and 509b have, respectively, a first flap 507a and a second flap 507b, which have such a shape as to allow their partial overlap, even in the inactive condition, and particularly the insertion of the first flap 507a in the second flap 507b.

[0070] A frame 510 is associated below the first body 509a and has a U-shaped transverse cross-section; at least one pair of first and second wheels, designated respectively by the reference numerals 511a and 511b, 514a and 514b, is pivoted between the first wings of said frame, which protrude downwardly.

[0071] The frame 510 is connected, in a downward region, to the first sole 504a of the first body 509a through the interposition of adapted connecting means, such as rivets or couplings, that are accommodated in a complementarily shaped seat 513 formed on said first sole 504a.

[0072] This solution, too, allows to achieve the intended aim and objects, since the second body can rise from the frame during thrusting, which becomes localized, i. e., entrusted to the front region.

[0073] The materials and the dimensions constituting the individual components of the skate according to the invention may be the most appropriate according to the specific requirements.

[0074] The disclosures of EP-0 778 058 are incorporated herein by reference.

[0075] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. Skate with in-line wheels characterized in that it comprises a first member (110a,206,306,504a) and a second member (110b,213,313,504b,510), at least one of said members being adapted to support a plurality of in-line wheels (111a, 111b,114a,114b, 208a,208b,216a,216b,308a,308b,316a,316b, 511a, 511b, 514a,514b), said first member being rotatably associated with said second member.

2. Skate according to claim 1, characterized in that it comprises a first front body, for the resting and locking of the front part of the foot, a second rear body, for the resting and locking of at least the heel, said bodies being rotatably associated to each other and having a first frame and a second frame for supporting one or more wheels, said bodies being transversely associated and comprising guiding and mutual sliding means.

3. Skate according to claim 2, characterized in that said first body is U-shaped in transverse cross-section and comprises a first flat support from which two lateral shoulders protrude upward, said shoulders allowing to contain the front part of a shoe or of the foot at the tip region, said first body having a first strap the ends whereof are associable with said two lateral shoulders so as to secure said shoe or said foot.

4. Skate according to claim 2, characterized in that said second body of said shell is constituted by a second flat support, from which a heel cup protrudes perimetrically upward and is adapted to contain at least the heel region of said shoe, said second body having a second strap, the ends whereof are laterally associated with said heel cup to secure said shoe or foot at the foot instep region.

5. Skate according to claim 2, characterized in that said first and second bodies are rotatably associated with each other, by means of a hinge-like articulation comprising an appropriate screw or a connecting pivot, at the ends that can be arranged adjacent to each other.

6. Skate according to claim 2, characterized in that said first and second frames are respectively associated with said first and second bodies, both of said frames being U-shaped, at least one pair of first and

second wheels being respectively pivoted between the first and second downward-protruding wings of said frames, said second wings of said second frame having a center distance that is smaller than the center distance of said first wings, so as to allow the partial insertion and mutually adjacent arrangement of said second wings with respect to said first wings along an approximately parallel plane.

7. Skate according to one or more of the preceding claims, characterized in that said guiding and sliding means are constituted by a pivot that is associated and blended at right angles with respect to the tips of said first wings of said first frame in a region that is intermediate between two of said first and second wheels that are adjacent to each other, said first pivot being slideable at a slot formed on said second wings that are adjacent to said first wings, said slot being curved so that its concavity is directed at said tip region.

8. Skate according to claim 1, characterized in that it comprises a monolithic shell (202), a first frame (206) and a second separate frame (213) associated in the front foot and heel regions, said second frame having tabs for the articulation to said first frame and shell, means (223) being provided to limit the oscillation of said second frame and/or shell.

9. Skate according to claim 8, characterized in that said first frame is U-shaped and forms a first base for connection to first wings, between which at least one pair of first wheels is pivoted, said base being perforated so as to form a seat for positioning therein a first tab that protrudes below the sole of said shell in the metatarsal region.

10. Skate according to claim 9, characterized in that two second tabs protrude below said sole, lie approximately parallel to said first tab, and are arranged outside said first wings of said first frame.

11. Skate according to claim 10, characterized in that a first hole and a second hole are formed respectively at said first tab and at said second tabs, along the same axis, and accommodate a pivot that also passes at adapted third holes formed at said first wings of said first frame proximate to said first base.

12. Skate according to one or more of the preceding claims, characterized in that said means, for limiting the oscillation of said shell and/or of a second frame, is associated below a sole approximately at the heel region and is interposed between the lower surface of said sole and said first base, said second frame being U-shaped and forming a second base for connection to second wings, between which at least one pair of second wheels is pivoted.

13. Skate according to claim 12, characterized in that said means is constituted by at least one flexible insert that preferably has, in plan view, a rectangular shape with a hole that allows the insertion of said first tab.

14. Skate according to one or more of the preceding claims, characterized in that said second frame has at least one pair of third tabs protruding from said second wings towards said first frame.

15. Skate according to claim 14, characterized in that said at least one pair of third tabs has such a length and size as to be arrangeable externally adjacent to said second tabs that protrude from said sole and to the ends of said first wings of said first frame that are adjacent to said first base.

16. Skate according to claim 15, characterized in that the profiles of said first wings and of said third pair of tabs have narrower regions that allow to contain the length of said pivot.

17. Skate according to claim 16, characterized in that said pair of third tabs is slightly curved towards said sole, said tabs being perforated at the tip in order to be pivoted to said pivot.

18. Skate according to claim 1, characterized in that it comprises a monolithic shell (302), a first frame (306) and a second separate frame (313) associated in the front foot and heel regions, said first and second frames and said shell being interconnected by means of a rigid connecting element (324), means (323) being provided to limit the oscillation of said second frame and/or shell.

19. Skate according to claim 18, characterized in that said first frame is U-shaped and forms a first base for connection to first wings, between which at least one pair of first wheels is pivoted, said base being perforated so as to form a seat for positioning therein a first tab that protrudes below the sole of said shell in the metatarsal region.

20. Skate according to claim 19, characterized in that two second tabs protrude below said sole, lie approximately parallel to said first tab, and are arranged outside said first wings of said first frame.

21. Skate according to claim 20, characterized in that a first hole and a second hole are formed respectively at said first tab and at said second tabs, along the same axis, and accommodate a pivot that also passes at adapted third holes formed at said first wings of said first frame proximate to said first base.

22. Skate according to one or more of the preceding

claims, characterized in that at least one means adapted to limit the oscillation of said shell and/or of a second frame that is associated below said sole approximately at the heel region is interposed between the lower surface of said sole and said first base, said second frame being U-shaped and forming a second base for connection to second wings, between which one pair of second wheels is pivoted.

23. Skate according to claim 22, characterized in that said means is constituted by at least one flexible insert that preferably has, in plan view, a rectangular shape with a hole that allows the insertion of said first tab.

24. Skate according to one or more of the preceding claims, characterized in that it comprises a rigid connecting element that is adapted to interconnect said first frame, said second frame, and said shell, said connecting element being constituted by a pair of profiles that are L-shaped and therefore have respective third and fourth wings, the tips whereof are respectively pivoted at said pivot and at the pivoting axis of the said second wheel that is adjacent to said first frame, which lies in front.

25. Skate according to claim 24, characterized in that said profiles that constitute said connecting element are arranged outside said first and second frames.

26. Skate according to claim 25, characterized in that narrower regions, adapted to contain the length of said pivot, are provided at said first frame and at said third wings.

27. Skate according to one or more of the preceding claims, characterized in that said third and fourth wings are arranged approximately parallel to said first and second wings of said first and second frames, so as to allow mutual sliding.

28. Skate according to one or more of the preceding claims, characterized in that said connecting element has an elbow that joins said third and fourth wings and is arranged approximately at the said first wheel of said first frame that is adjacent to said second frame, each one of said profiles being pivoted thereat at said first wheel and therefore between said first wings of said first frame.

29. Skate according to one or more of the preceding claims, characterized in that additional means, adapted to limit the oscillation of said second frame and/or shell, are constituted by at least one lug, which protrudes at least from one of said first wings in a region lying to the rear of the perimetric edge of said third wings that is directed towards the heel region, said lug being arranged so as to abut against said perimetric edge of said third wings in the inactive condition, in which all of said first and second wheels rest on the ground.

30. Skate according to claim 1, characterized in that it comprises a first front body (509a), for securing the front part of the foot, and by a second rear body (509b), for securing at least the heel, said bodies being rotatably associated to each other, a supporting frame (510) for said wheels being associated below said first body, said second body oscillating with respect to said underlying frame.

31. Skate according to claim 30, characterized in that said first and second bodies have, respectively, a first sole and a second sole which, at their ends that can be arranged adjacent to each other, are transversely and rotatably associated with each other by means of a hinge-like articulation that comprises an adapted screw or a transverse connecting pivot.

32. Skate according to claim 31, characterized in that said first and second bodies have, respectively, a first flap and a second flap having such a shape as to allow their partial overlap even when said skate is in the inactive condition, and particularly the insertion of said first flap in said second flap.

33. Skate according to claim 32, characterized in that said frame is associated below said first body and has a U-shaped transverse cross-section, at least one pair of first and second wheels being pivoted between the first wings of said frame, which protrude downwards, said frame being connected below said first sole of said first body through the interposition of adapted connecting means.

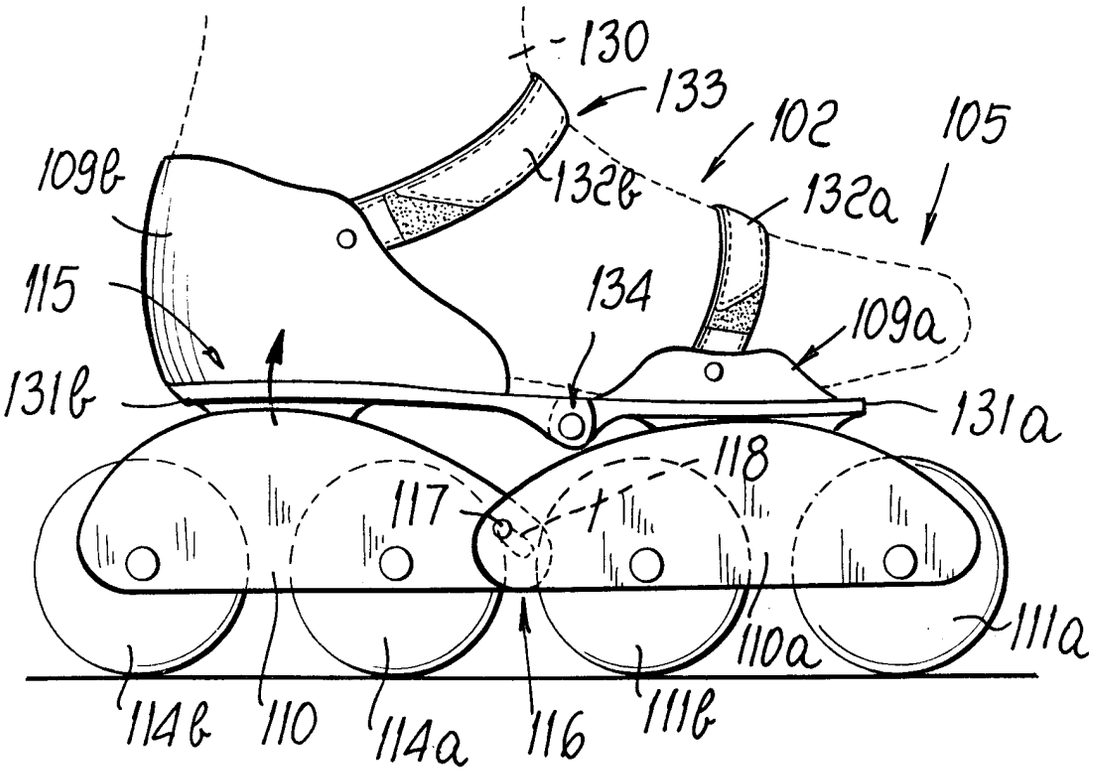
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Fig. 1

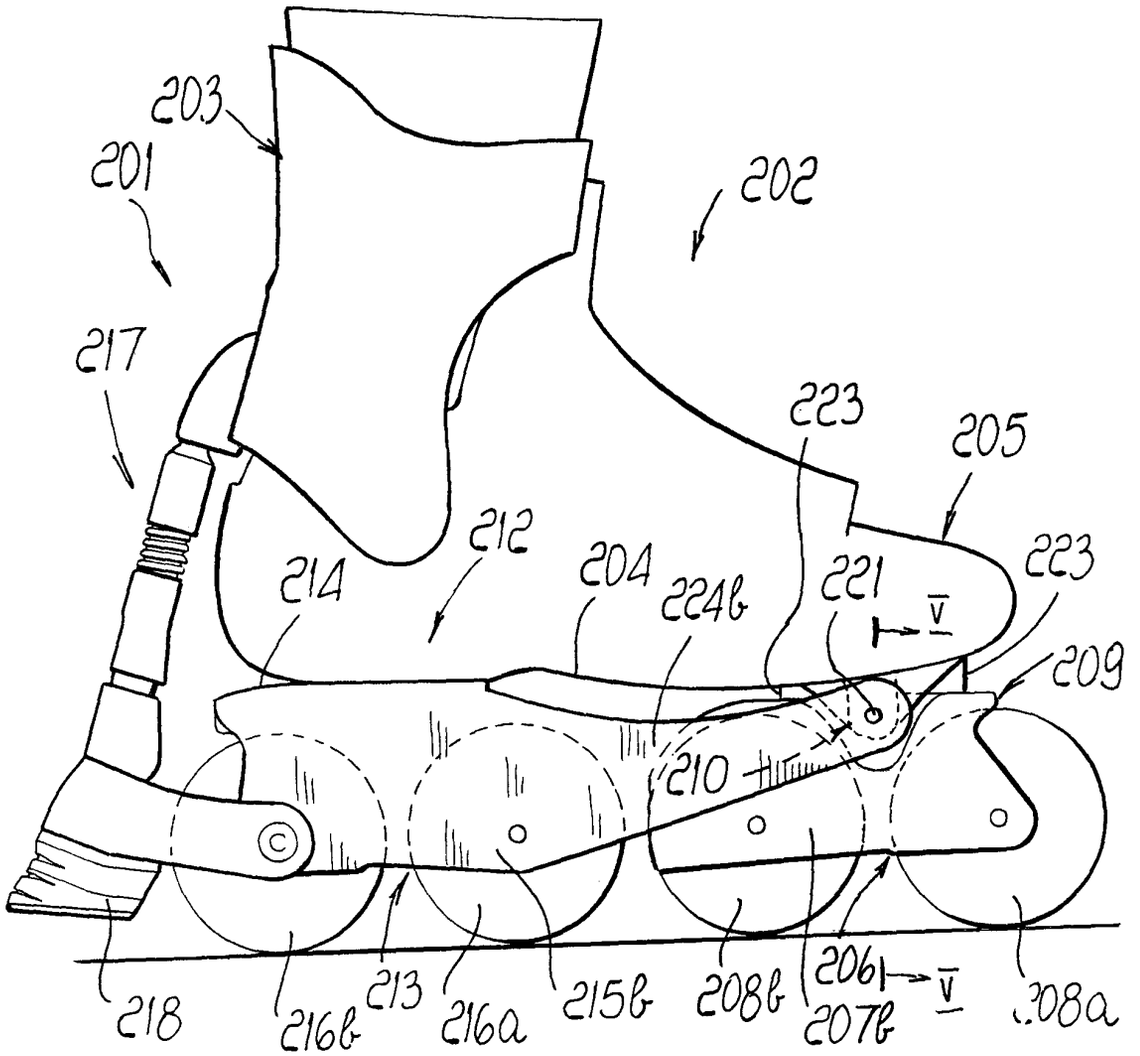
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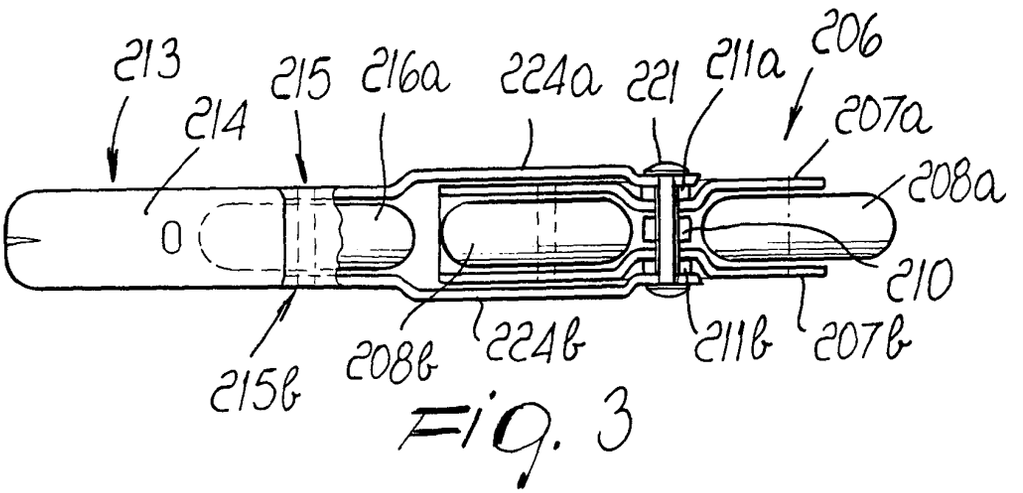
Fig. 2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207a
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215b
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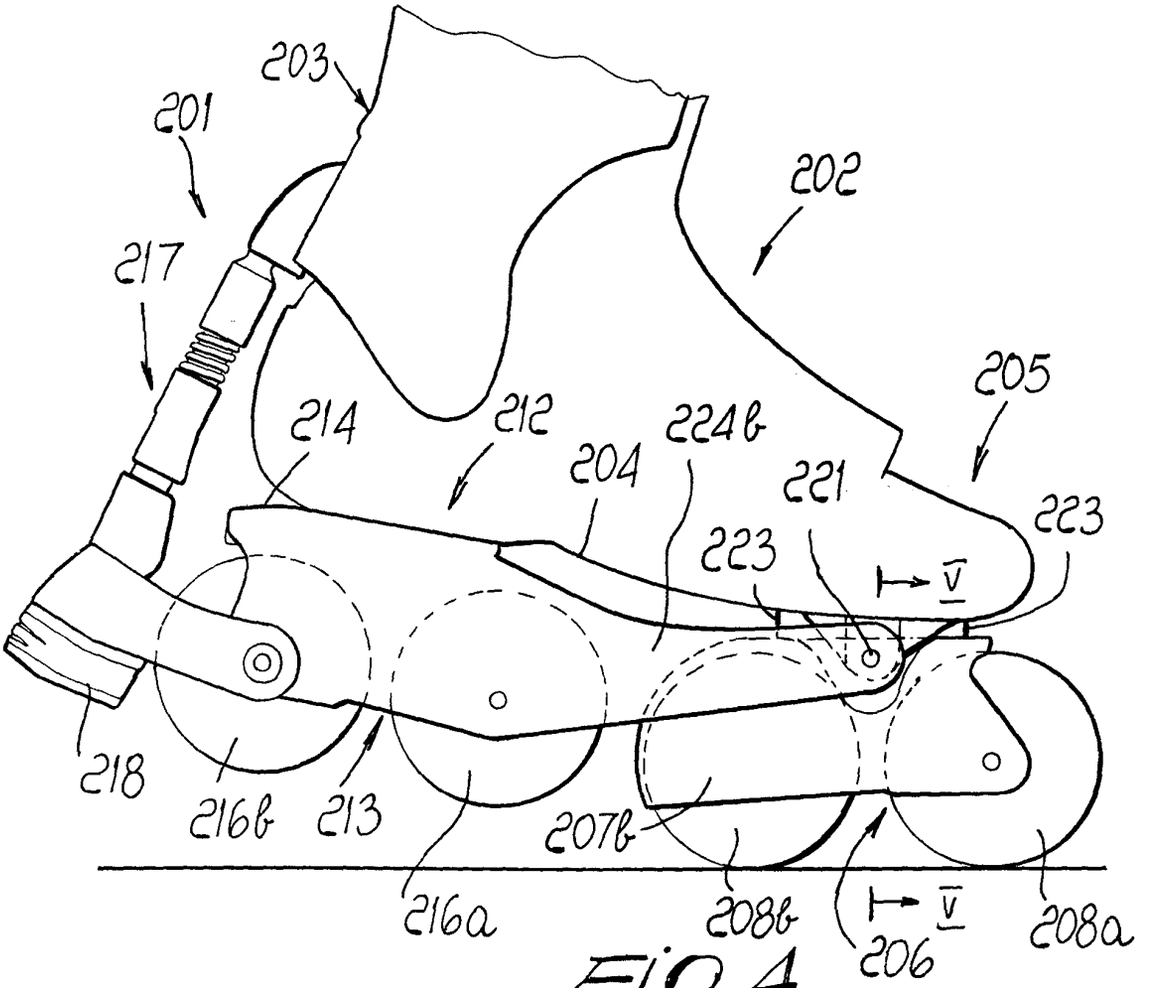
224b
211b
207b

Fig. 3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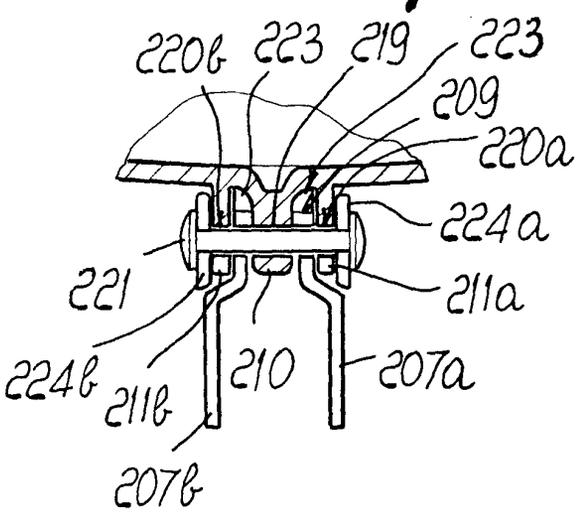
208a

Fig. 4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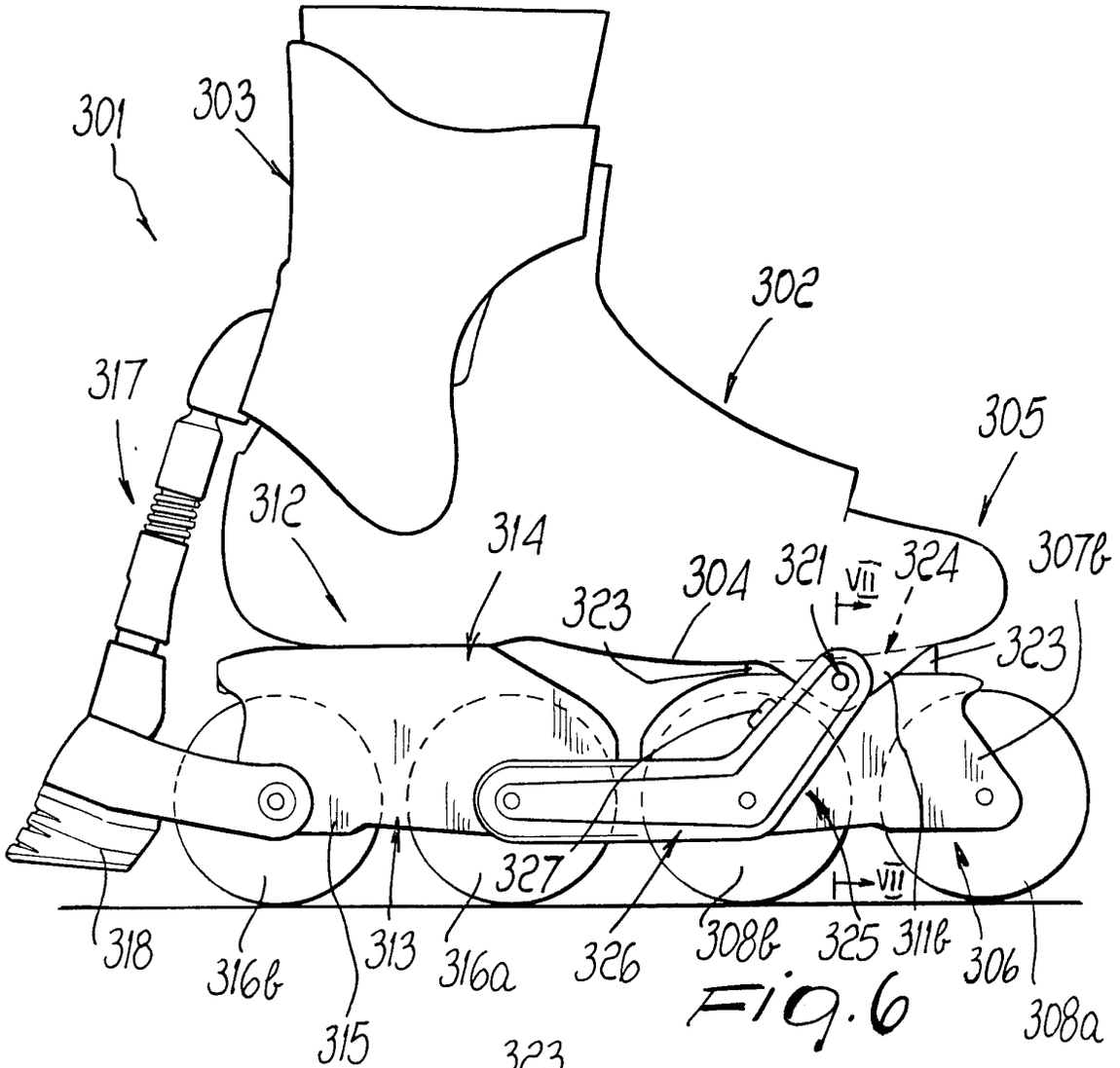
207b

Fig. 5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308b
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311b
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315
308a

Fig. 6

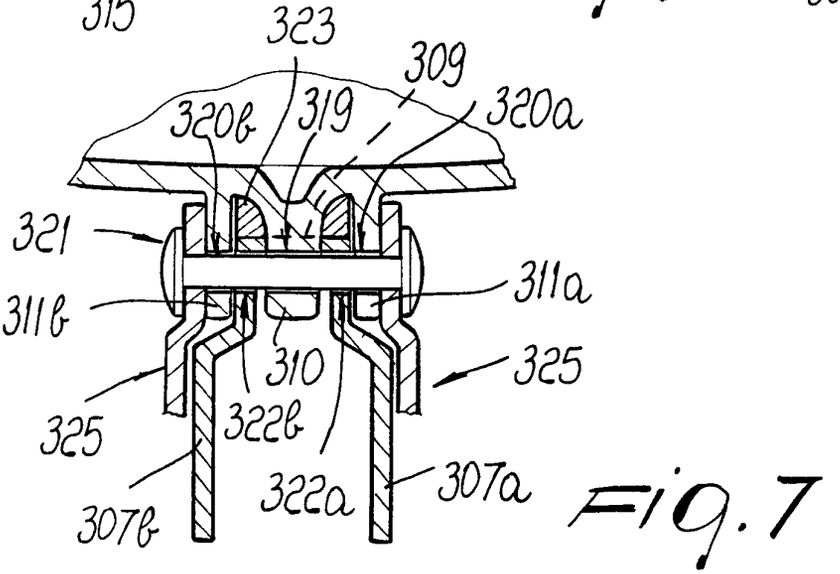
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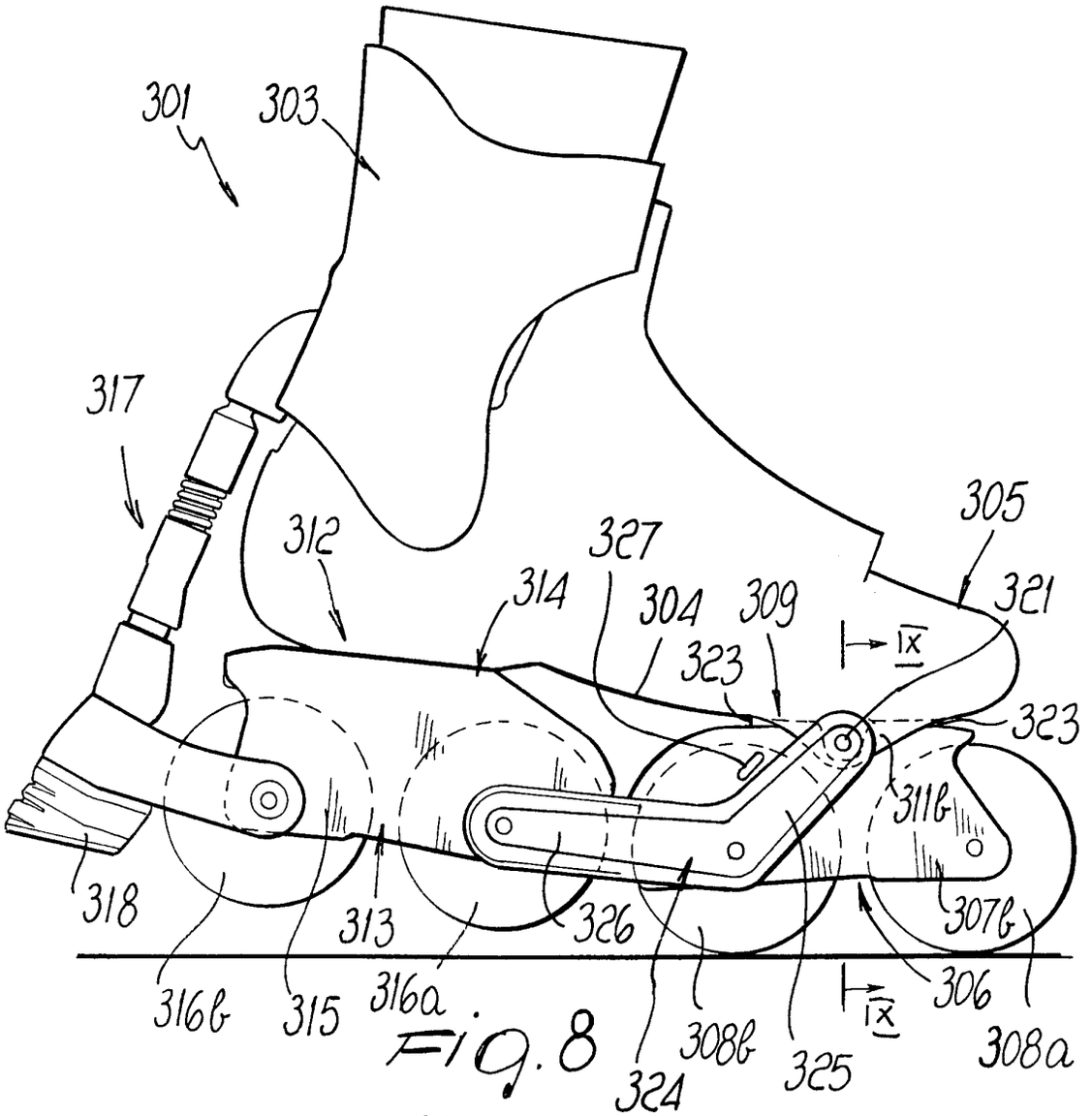
Fig. 7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308a
324

Fig. 8

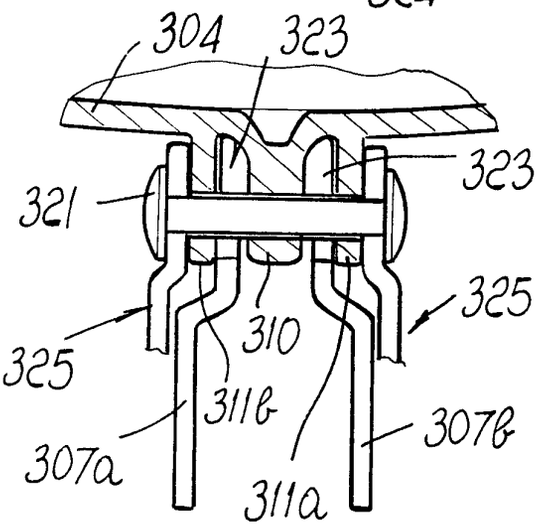
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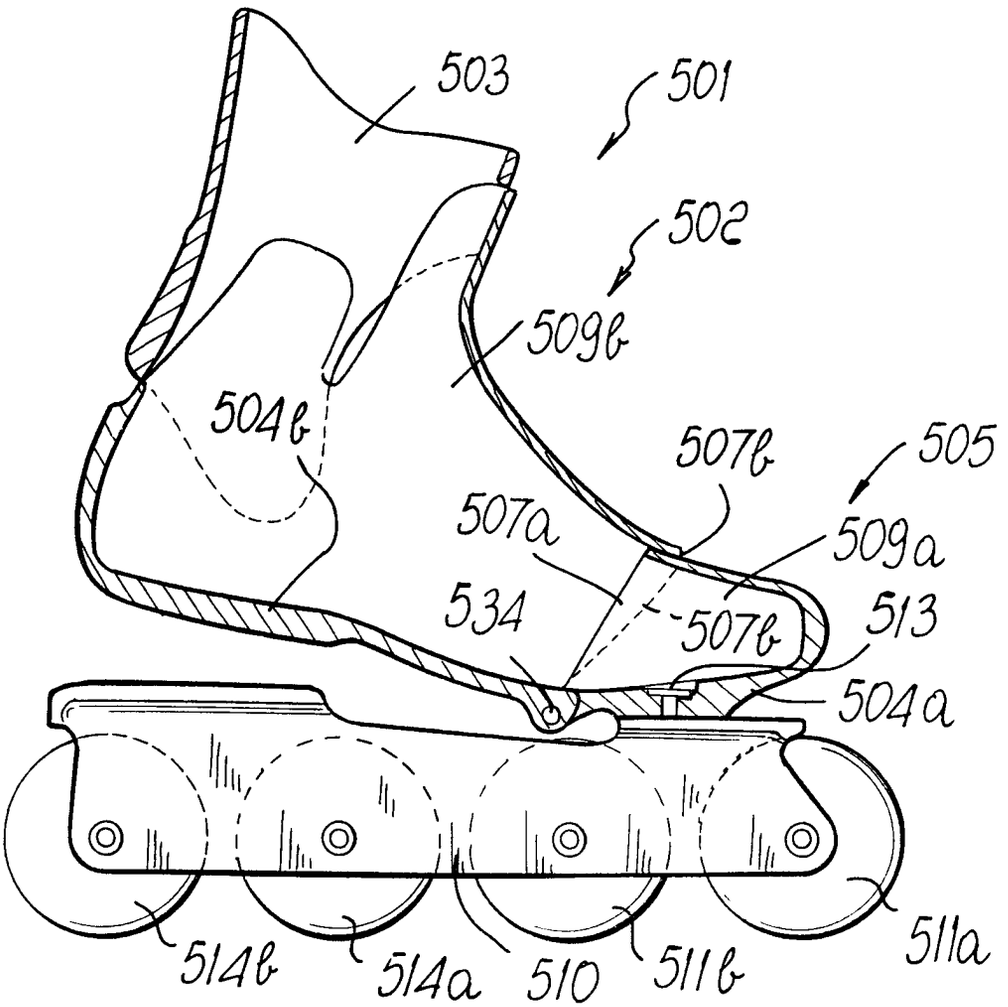
Fig. 9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504a
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514a
510
511b
511a

Fig. 10

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 20 4604

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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
MUNICH	26 July 2001	Lucas, P

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