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(54) **Skate with in-line wheels**

Einspuriger Rollschuh

Patin à roulettes alignées

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(73) Proprietor: **BENETTON GROUP S.p.A.**
31050 Ponzano Veneto (Treviso) (IT)

(72) Inventors:

- **Caeran, Francesco**
31044 Montebelluna (Treviso) (IT)
- **Gonella, Mario**
31015 Conegliano (Treviso) (IT)
- **Serafin, Renato**
31050 Veduggio (Treviso) (IT)

(74) Representative: **Modiano, Guido, Dr.-Ing. et al**
Modiano & Associati SpA
Via Meravigli, 16
20123 Milano (IT)

(56) References cited:

EP-A- 0 677 310 **EP-A- 0 686 412**
EP-A- 0 774 282 **US-A- 1 603 588**

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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] EP-A-0 686 412 (date of publication: 13.12.95) 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 con-

sequent tiring during exercise and reduction in comfort throughout sports practice.

[0012] EP-A-0 677 310 discloses an in-line skate with a frame 2 supporting a plurality of in-line wheels 6, and a braking device in the form of a body 7 supporting another in-line wheel and pivoted to the main frame 2 so that it can oscillate in contrast with adjustable springs 18. The body 7 comprises a wing 9 which brakes on the surface of the rear wheel of the frame 2 when the skate is tilted backwards.

[0013] US-A-1 603 588 discloses a roller skate with a front wheel support hinged to a rear wheel support on a suitable pivotal rivet 4.

[0014] 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.

[0015] 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.

[0016] Another object is to provide a skate having increased operating sensitivity and comfort, particularly during periods of maximum thrusting.

[0017] Another important object is to provide a skate that allows to achieve the necessary assurances of stability for the user throughout sports practice.

[0018] Another object is to provide a skate that can be produced at low costs and with conventional machines and equipment.

[0019] In accordance with the invention, there is provided a skate with in-line wheels as defined in the appended claims.

[0020] The particular 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 an exploded view of the skate, wherein, for the sake of clarity, the third tabs that protrude from the first body have been omitted;

figure 2 is a side view of the skate, in which all the wheels touch the ground;

figure 3 is a sectional view, taken along the plane III-III of figure 2;

figure 4 is a sectional view, taken along the plane IV-IV of figure 2;

figure 5 is a partially sectional bottom view of the skate;

figure 6 is a view, similar to figure 2, of the skate during thrusting;

figure 7 is a partially sectional side view of the skate with in-line wheels according to a further embodi-

ment;

figure 8 is a view of the skate of figure 7 in the thrusting step during sports practice.

[0021] With reference to the above figures, the reference numeral 1 designates a skate that is constituted by a first front body 2 that forms the tip 3 of a shell 4 that surrounds the front region of the foot and locks it, and has an upper longitudinal slot 5.

[0022] A first supporting frame 6 is associated below the first body 2 in the particular illustrated embodiment; said frame is substantially U-shaped, and at least two first in-line wheels 8 are rotatably associated between the first wings 7a and 7b of said frame 6.

[0023] The skate comprises a second rear body 9 that is constituted by a heel cup 10 that wraps around part of the leg and of the foot up to the vicinity of the foot flexing region: a cuff 12 that wraps around the tibial region is optionally but not necessarily pivoted laterally to said heel cup at an adapted pair of studs 11.

[0024] The second rear body 9 also has a longitudinal front opening 13 for the insertion of, for example, a soft innerboot or directly of the user's foot; the foot is secured by adapted levers 14 that transversely connect the flaps 15a and 15b of the second rear body 9.

[0025] An adapted brake 16 can be associated at the cuff 12 and has a pad 17 that interacts with the ground when said cuff is rotated backwards.

[0026] A second supporting frame 18 is associated below the heel region of the second body 9; in a transverse cross-section said frame is U-shaped, and second in-line wheels 20 are rotatably associated between the second wings 19a and 19b of said second frame.

[0027] The first body and the second body, as well as the first and second supporting frames, are transversely and rotatably associated together, and guiding and sliding means are provided on said first and second frames.

[0028] Rotary coupling is allowed by the presence of a plurality of first tabs 21 that protrude downward and axially with respect to the first body 2, both in the interspace lying between the two first wings 7a and 7b of the first frame 6 and outside the frame, and by a plurality of second tabs 22, which protrude downward and axially at the end of the second body 2 that is directed towards the first body 6, both in the interspace lying between the second wings 19a and 19b and in a region lying outside them.

[0029] The first and second tabs therefore have a comb-shaped configuration and can be arranged adjacent to each other when the first body 2 is joined axially to the second body 9.

[0030] Third tabs 23 protrude, at the end of the second body 9 that has the second tabs 22, below the second wings 19a and 19b and outside them.

[0031] Adapted first holes 27, second hole 28, third holes 29, fourth holes 30, and fifth holes 31 are formed, along the same axis 26, on the first, second, and third tabs, as well as on the first ends 24 and on the second

ends 25 of the first frame 6 and of the second frame 18; all of said holes form a seat for a first pivot 32.

[0032] Said first pivot 32 has a head 33 that abuts against one of the third tabs 23 and a stem that is internally threaded, at the other end, for coupling to a complementarily threaded first screw 34 that abuts at the other third tab 23.

[0033] The skate furthermore comprises guiding and sliding means provided on the first and on the second frames; said means are constituted by a second pivot 35 that passes at two sixth holes 36 formed at the ends of the first wings 7a and 7b that partially laterally wrap around the corresponding ends of the second wings 19a and 19b of the second frame 18.

[0034] The sliding of the first and second ends of the first and second frames is allowed by the presence of two adapted slots 37 that are formed on the ends of the second wings 19a and 19b; said slots have a curved shape that allows the second body 9 to rise from the ground during thrusting, when the first wheels 8 are in contact with said ground.

[0035] The two slots 37 are of course formed on the second wings 19a and 19b at the sixth holes 36 provided on the first wings 7a and 7b of the first frame 6.

[0036] A seventh hole 38 and an eighth hole 39 are advantageously formed, respectively on the first wings and on the second wings of the first and second frames, so that they are adjacent to the sixth holes 36 and to the pair of slots 37; said holes 38 and 39 have the same axis when both the first wheels 8 and the second wheels 20 interact with the ground and therefore when the skate is in a horizontal condition.

[0037] In this condition it is thus possible, by inserting a pin or pivot in the seventh hole 38 and in the eighth hole 39, to lock the sliding of the first and second frames, which therefore cannot rotate at the axis 26.

[0038] The first pivot 32 and the second pivot 35 of course act at the interspace between a first wheel 8 and a second wheel 20 that are adjacent to each other.

[0039] Use of the invention is thus as follows: once the first and second frames and the first and second bodies have been associated one another by means of the first pivot 32 and the second pivot 35, the skater can achieve optimum lateral thrusting, since the second body can rotate, rising from the ground, allowing to concentrate the forces on the first wheels 8, while lateral forces can still be transmitted by virtue of the partial overlap of the first and second wings of the first and second frames; the sliding of the second pivot 35 in the slot 37 allows to achieve guided lifting of the second frame 18 with respect to the first frame 6.

[0040] It has thus been observed that the invention has achieved the intended aim and objects, a skate having been obtained which allows the user to transmit forces in an optimum manner during thrusting, at the same time allowing a correct anatomical movement of the foot; during thrusting, said forces can be selectively concentrated exclusively at the front part of the foot, at the same

time allowing to achieve optimum lateral containment of the skate throughout sports practice.

[0041] The invention is of course susceptible of numerous modifications and variations, all of which are within the scope of the same inventive concept.

[0042] With reference to figures 7-8, the reference numeral 401 designates a skate constituted by a shell 402, to which it is possible to articulate a quarter 403 that is associated at the malleolar region by means of appropriate studs or rivets.

[0043] The shell 402 is formed monolithically, is preferably made of plastics, and has a lower region that forms a sole 404.

[0044] The shell 402 has, proximate to the tip region 405, an articulation 406 constituted by a slit that is formed on an approximately transverse plane starting from the vicinity of the sole 404; said slit forms a first flap 407a and a second flap 407b having such a shape as to allow their partial overlap, even in the inactive condition, and particularly the insertion of the first flap 407a in the second flap 407b.

[0045] During sports practice, while thrusting and flexing the foot, the mutual overlap of the first and second flaps 407a and 407b increases, thus facilitating the flexing of the foot.

[0046] The first and second flaps 407a and 407b have, proximate to the sole 404, a curved shape that is adapted to form a circular recess 408; said recess 408 allows to improve the flexibility, and therefore the overlap, of said first and second flaps 407a and 407b.

[0047] The articulation 406 forms, for the shell 402, a first front body 409a that is arranged at the tip region 405 starting from the flap 407a; said first body 409a allows to contain and secure the front part of the foot.

[0048] The articulation 406 also forms a second body 409b which, starting from the second flap 407b, allows to contain and secure the rear part of the user's foot.

[0049] A first frame 410a is associated in a downward region with the first body 409a: the transverse cross-section of said frame is U-shaped, and at least one pair of first wheels 411a and 411b is pivoted between the first wings of said frame, which protrude downwards.

[0050] The first frame 410a is constituted by a first flat base 412a for connecting the first wings, which is connected below the sole 404 through the interposition of adapted connecting means, such as rivets, that are accommodated in a complementarily shaped first seat 413a that is formed on the sole 404 that lies below the first body 409a.

[0051] The first wings of the first frame 410a protrude in the opposite direction with respect to the tip region 405.

[0052] A second frame 410b is also associated, in a downward region, with the second body 409b in the region of the heel 415; said second frame is U-shaped in a transverse cross-section, and at least one second pair of wheels 414a and 414b is pivoted between its second wings, which protrude below a second connecting base

412b.

[0053] The second base 412b is connected to the sole 404 through the interposition of adapted connecting means, such as rivets or couplings inserted at a complementarily shaped second seat 413b formed on the sole 404 at the heel region 415.

[0054] The second base 412b is preferably narrower than the first base 412a, so as to allow the partial insertion and adjacent arrangement, along approximately parallel planes, of the second wings of the second frame 410b with respect to the first wings of the first frame 410a.

[0055] The first and second frames 410a and 410b have means 416 for their mutual guiding and sliding.

[0056] Said means 416 are constituted by a pivot 417 that is associated and blended at right angles with respect to the tips of the first wings of the first frame 410a in a region that is intermediate between two of said first and second wheels that are adjacent to each other; the first pivot 417 slides at a slot 418 that is formed on the second wings of the second frame 410b that are adjacent to the first wings of the first frame 410a.

[0057] The slot 418 has a curved shape, the concavity whereof is directed at the tip region 405.

[0058] The pivot 417 can be arranged at the upper end of the slot 418 if the pair of first wheels 411a and 411b and the pair of second wheels 414a and 414b rest on the ground, generally designated by the reference numeral 419; during thrusting, instead, as shown in figure 8, the foot flexes, and the second body 409b and therefore the second frame 410b rise, forcing the sliding of the pivot 417 inside the slot 418 until it reaches the lower end of said slot, which constitutes a stroke limiter.

[0059] Advantageously, the first frame 410a and the second frame 410b have, on each one of said first and second wings, respectively a first hole 420a and a second hole 420b, which have the same axis in the inactive condition, are arranged above the means 416, and allow the insertion of a pivot or screw that allows to lock the skate 401 in the horizontal condition, so that the pair of first and second wheels 411a and 411b, 414a and 414b rest on the ground 419 so as to prevent, according to the user's requirements, the rotation of the skate 401.

[0060] A conventional brake 421 is associated with the skate 401 to the rear.

[0061] The operation of the skate is as follows: during thrusting, the flexing of the foot and the rise of the rear part thereof is allowed by the articulation 406 formed on the shell 402, which is provided by the mutual overlap of the first and second flaps 407a and 407b of the first and second bodies 409a and 409b.

[0062] The connection of the second body 409b to the second frame 410b allows the latter to rise with respect to the ground 419, whereas the sliding of the pivot 417 in the slot 418 allows guided lifting.

[0063] It has been observed that the invention has achieved the intended aim and objects, said invention being adapted to transmit forces in an optimum manner

during thrusting, at the same time allowing a correct anatomical movement of the foot; the articulation 406 provided on the shell 402 in fact allows to flex the foot naturally, producing more thrust for an equal physical effort.

[0064] The sliding and guiding means 416 allow to lift the second frame 410b so that the user can thus transmit forces, during thrusting, selectively and exclusively at the front region of the foot; at the same time, said means 416 allow to achieve optimum lateral containment and rigidity of the entire skate throughout sports practice.

[0065] 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.

[0066] 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 comprising a first member and a second member each comprising a respective frame (6,18;410a,410b) adapted to support a plurality of in-line wheels (8,20;411a,411b,414a, 414b), said first member being rotatably associated with said second member, the respective frames of said first and second members comprising a first wheel supporting frame (6;410a) and a second wheel supporting frame (18;410b) which are mutually interconnected by guiding and sliding means (35-37;416) for mutually connecting said first and second frames (6,18;410a,410b), and the skate further comprising locking means (38,39;420a,420b) provided on said first and second frames (6,18; 410a,410b) for allowing the skate to be selectively locked, in a horizontal condition so as to prevent the relative rotation between said first and second frames (6,18;410a,410b).
2. Skate according to claim 1, characterized in that said first and second members respectively comprise first and second bodies (2,9) and first and second frames (6,18), said frames being U-shaped and respectively having first and second wings (7a,7b, 19a,19b) protruding downwardly, a plurality of first tabs (21) protruding downwardly and axially with respect to said first body at first ends (24) of said first frame (6) that face second ends (25) of said second frame (18), said first tabs (21) protruding both externally and in an interspace that lies between said first wings (7a,7b) of said first frame (6).
3. Skate according to claim 2, characterized in that it comprises a plurality of second tabs (22) that protrude downwardly and axially at the end (25) of said second body (9) that is directed towards said first body (2), both externally and in the interspace that lies between said second wings (19a,19b).
4. Skate according to claim 3, characterized in that it comprises a plurality of third tabs (23) that protrude downwardly at the end (25) of said second body (9) having said second tabs (22), said third tabs (23) protruding externally with respect to said second wings (19a,19b).
5. Skate according to claim 4, characterized in that said first, second, and third tabs (21-23) have a comb-shaped configuration and can be arranged adjacent to each other when said first and second bodies (2,9) are joined axially.
6. Skate according to claim 5, characterized in that adapted first, second, third, fourth, and fifth holes (27-31) are formed on said first, second, and third tabs (21-23) and on said first and second ends (24,25) of said first and second frames (6,18), along the same axis (26), all of said holes constituting a seat for a first pivot (32).
7. Skate according to claim 6, characterized in that said first pivot (32) has a head (33), which abuts against one of said third tabs (23), and a stem, which is internally threaded at the other end for coupling to a complementarily threaded first screw (34) that abuts at the other one of said third tabs (23).
8. Skate according to one or more of the preceding claims, characterized in that said guiding and sliding means provided on said first and second frames are constituted by a second pivot (35) that passes at two sixth holes (36) formed at the ends of said first wings (7a,7b) that partially laterally wrap around the corresponding ends of said second wings (19a,19b) of said second frame (18).
9. Skate according to claim 8, characterized in that said guiding and sliding means further comprises two adapted slots (37) formed on the ends of said second wings (19a,19b), said slots (37) having an arc-like shape that allows said second body (9) to rise from the ground during thrusting, when said first wheels (8) are in contact with said ground.
10. Skate according to claim 9, characterized in that said two slots (37) are formed on said second wings (19a,19b) at said sixth holes (36) provided on said first wings (7a,7b) of said first frame (6).
11. Skate according to claim 10, characterized in that

said locking means comprises, respectively on said first and second wings (7a,7b,19a,19b) of said first and second frames (6,18), a seventh hole (38) and an eighth hole (39) that are adjacent to said sixth holes (36) and to said pair of slots (37) and have the same axis in the condition in which both said first wheels (8) and said second wheels (20) interact with the ground and therefore with the skate in a horizontal condition.

12. Skate according to claim 11, characterized in that said seventh and eighth holes (38,39) constitute a temporary seat for a pivot or a pin that is removable and allows to lock the mutual articulation of said first and second frames (6,18).

13. Skate according to claims 6 and 8, characterized in that said first and second pivots (32,35) act at the interspace that is provided between one of said first and second adjacent wheels (8,20).

14. Skate according to claim 1, characterized in that it comprises a monolithic shell (402) having, proximate to the sole (404) and in the tip region (405) of the foot, at least one articulation (406) that forms a first front body (409a), for securing the front part of the foot, and a second rear body (409b), for securing at least the heel, said bodies being provided, in a downward region, with said first frame (410a) and said second frame (410b) for supporting said wheels, wings of said frames being transversely and rotatably associated with each other, said guiding and sliding means (416) being provided on said first and second frames.

15. Skate according to claim 14, characterized in that said articulation (406), provided proximate to the tip region (405), is constituted by a slit that is formed on an approximately transverse plane starting from the vicinity of said sole (404), said slit forming at least a first flap (407a) and a second flap (407b) that have such a shape as to allow their partial mutual overlap even when said skate is inactive, and particularly the insertion of said first flap in said second flap.

16. Skate according to claim 15, characterized in that said first body (409a) is formed starting from said first flap (407a), so as to allow the containment and securing of said front part of the foot, and said second body (409b) is formed starting from said second flap (407b), so as to allow the containment and securing of the rear part of the foot.

17. Skate according to claim 16, characterized in that said first frame (410a) is associated below said first body (409a) and is U-shaped in a transverse cross-section, a pair of first wheels (411a,b) being pivoted

between the first wings of said first frame (410a), which protrude downwards, said first frame (410a) being constituted by a first flat base (412a) for connecting said first wings, said first base (412a) being connected below said sole (404) through the interposition of appropriate connecting means (413a).

18. Skate according to claim 17, characterized in that said first wings of said first frame (410a) protrude in the opposite direction with respect to said tip region (405).

19. Skate according to claim 18, characterized in that said second frame (410b) is associated in a downward region with said second body (409b), in the heel region (415), and is U-shaped in transverse cross-section, at least one second pair of wheels (414a,b) being pivoted between the second wings of said second frame (410b), which protrude below a second connecting base (412b), said second connecting base (412b) being connected to said sole (404) through the interposition of adapted connecting means (413b).

20. Skate according to claim 19, characterized in that said second base (412b) is narrower than said first base (412a), so as to allow the partial insertion and adjacent arrangement, on approximately parallel planes, of said second wings of said second frame (410b) with respect to said first wings of said first frame (410a).

21. Skate according to one or more of the preceding claims 14-20, characterized in that said guiding and sliding means (416) are constituted by a pivot (417) that is associated and blended at right angles with respect to the tips of said first wings of said first frame (410a) in a region that is intermediate between two of said first and second wheels (410,414) that are adjacent to each other, said first pivot (417) being slideable at a slot (418) that is formed on said second wings that are adjacent to said first wings.

22. Skate according to claim 21, characterized in that said slot (418) has a curved shape, with its concavity directed at said tip region (405), said pivot (417) being arrangeable at the upper end of said slot (418) if said pair of said first and second wheels (410,414) rests on said ground (419), said pivot (417) being furthermore slideable inside said slot (418) until it reaches the lower end, which constitutes a stroke limit, during thrusting.

23. Skate according to one or more of the preceding claims 14-22, characterized in that said first and second frames (410a,b) have, on each one of said first and second wings, said locking means comprising respectively a first hole (420a) and a second

hole (420b) having the same axis in the inactive condition of said skate, said first and second holes (420a,b) being arranged above said guiding and sliding means (416) and being adapted to allow the insertion of a pivot or screw that allows to lock said skate in the horizontal condition so as to prevent its rotation.

Patentansprüche

1. Rollschuh mit Inline-Rädern, der ein erstes Element und ein zweites Element umfasst, von denen jedes einen entsprechenden Rahmen (6, 18; 410a, 410b) umfasst, der angepasst ist, eine Vielzahl von Inline-Rädern (8, 20; 411a, 411b, 414a, 414b) zu halten, wobei das erste Element drehbar verbunden ist mit dem zweiten Element, die jeweiligen Rahmen von den ersten und zweiten Elementen, welche einen ersten Rad lagernden Rahmen (6; 410a) und einen zweiten Rad lagernden Rahmen (18; 410b) umfassen, welche gegenseitig verbunden sind durch Führungs- und Gleitvorrichtungen (35-37; 416), um den ersten und zweiten Rahmen (6, 18; 410a, 410b) gegenseitig zu verbinden, und wobei der Rollschuh des weiteren Verriegelungseinrichtungen (38, 39; 420a, 420b) umfasst, welche an den ersten und zweiten Rahmen (6, 18; 410a, 410b) bereitgestellt sind, um dem Rollschuh zu erlauben, in einer horizontalen Lage selektiv verriegelt zu werden, so dass eine relative Rotation zwischen den ersten und zweiten Rahmen (6, 18; 410a, 410b) verhindert wird.
2. Rollschuh nach Anspruch 1, **dadurch gekennzeichnet, dass** die ersten und zweiten Elemente jeweils erste und zweite Körper (2, 9) und erste und zweite Rahmen (6, 18) umfassen, wobei die Rahmen U-förmig ausgebildet sind und jeweils erste und zweite Flügel (7a, 7b, 19a, 19b) aufweisen, die nach unten vorstehen, wobei eine Vielzahl von ersten Nasen (21) nach unten und axial in Bezug auf den ersten Körper an ersten Enden (24) des ersten Rahmens (6) vorstehen, die zweiten Enden des zweiten Rahmens gegenüberliegen, wobei die ersten Nasen (21) sowohl extern als auch in einem Zwischenraum, der zwischen den ersten Flügeln (7a, 7b) des ersten Rahmens (6) liegt, vorstehen.
3. Rollschuh nach Anspruch 2, **dadurch gekennzeichnet, dass** eine Vielzahl von zweiten Nasen (22), die nach unten und axial an dem Ende (25) des zweiten Körpers (9), das auf dem ersten Körper (2) gerichtet ist, vorstehen und zwar sowohl extern als auch in dem Zwischenraum, der zwischen den zweiten Flügeln (19a, 19b) liegt.
4. Rollschuh nach Anspruch 3, **dadurch gekennzeichnet,**

zeichnet, dass er eine Vielzahl von dritten Nasen (23) umfasst, die nach unten an dem Ende (25) des zweiten Körpers (9), der die zweiten Nasen (22) aufweist, vorstehen, wobei die dritten Nasen (23) extern in Bezug auf die zweiten Flügel (19a, 19b) vorstehen.

5. Rollschuh nach Anspruch 4, **dadurch gekennzeichnet, dass** die ersten, zweiten und dritten Nasen (21-23) eine kammförmige Konfiguration aufweisen und benachbart zueinander angeordnet werden können, wenn die ersten und zweiten Körper (2, 9) axial verbunden sind.
6. Rollschuh nach Anspruch 5, **dadurch gekennzeichnet, dass** angepasste erste, zweite, dritte, vierte und fünfte Löcher (27-31) auf den ersten, zweiten und dritten Nasen (21-23) und auf den ersten und zweiten Enden (24, 25) der ersten und zweiten Rahmen (6, 18) ausgebildet sind, und zwar entlang der gleichen Achse (26), wobei alle Löcher einen Sitz für einen ersten Zapfen (32) bilden.
7. Rollschuh nach Anspruch 6, **dadurch gekennzeichnet, dass** der erste Zapfen (32) einen Kopf (33) aufweist, der gegen eine der dritten Nasen (23) anschlägt, sowie einen Schaft, der an dem anderen Ende ein Innengewinde aufweist, und zwar zum Verbinden mit einer Schraube (34) mit komplementärem Gewinde, die an einer anderen vom den dritten Nasen (23) anschlägt.
8. Rollschuh nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** er eine Führungs- und Gleitvorrichtung aufweist, die auf den ersten und zweiten Rahmen bereitgestellt ist und durch einen zweiten Zapfen (35) gebildet ist, der an zwei sechsten Löchern (36) durchgeht, die an den Enden der ersten Flügel (19a, 19b) ausgebildet sind, welche sich teilweise seitlich um die entsprechenden Enden der zweiten Flügel des zweiten Rahmens (18) herumlegen.
9. Rollschuh nach Anspruch 8, **dadurch gekennzeichnet, dass** die Führungs- und Gleitvorrichtung des weiteren zwei angepasste Schlitze (37) umfasst, die an den Enden der zweiten Flügel (19a, 19b) ausgebildet sind, wobei die Schlitze (37) eine bogenförmige Gestalt aufweisen, die es dem zweiten Körper (9) ermöglicht, sich vom Boden während des Vorschubs zu erheben, wenn die ersten Räder (8) in Kontakt mit dem Boden sind.
10. Rollschuh nach Anspruch 9, **dadurch gekennzeichnet, dass** die zwei Schlitze (37) an den zweiten Flügeln (19a, 19b) an den sechsten Löchern (36) ausgebildet sind, die auf den ersten Flügeln (7a, 7b) des ersten Rahmens (6) bereitgestellt sind.

11. Rollschuh nach Anspruch 10, **dadurch gekennzeichnet, dass** er auf den ersten bzw. zweiten Flügeln (7a, 7b; 19a, 19b) der ersten bzw. zweiten Rahmen (6, 18) ein siebtes Loch (38) und ein achtes Loch (39) umfasst, die benachbart zu den sechsten Löchern (36) und zu dem Paar von Schlitz (37) sind, und die gleiche Achse aufweisen, in dem Zustand, in dem sowohl die ersten Räder (8) als auch die zweiten Räder (20) mit dem Boden wechselwirken und somit mit dem Rollschuh in einem horizontalen Zustand.
12. Rollschuh nach Anspruch 11, **dadurch gekennzeichnet, dass** die siebten und achten Löcher (38, 39) einen temporären Sitz für einen Zapfen oder einen Stift bilden, der entferntbar ist und es ermöglicht, die gegenseitige Zapfenverbindung für den ersten und zweiten Rahmen (6, 18) zu verriegeln.
13. Rollschuh nach Ansprüchen 6 und 8, **dadurch gekennzeichnet, dass** die ersten und zweiten Zapfen (32, 35) an dem Zwischenraum wirken, der zwischen einem der ersten und zweiten benachbarten Rädern (8, 20) bereitgestellt ist.
14. Rollschuh nach Anspruch 1, **dadurch gekennzeichnet, dass** er umfasst: Eine monolithische Schale (402), die in der Nähe der Sohle (404) in den vorderen Bereich des Fußes wenigstens ein Gelenk (406) aufweist, dass einen ersten Vorderkörper (409a) bildet, zum Sichern des vorderen Teiles des Fußes, und einen zweiten Hinterkörper (409b), zum Sichern von wenigstens der Ferse, wobei die Körper im unteren Bereich mit dem ersten Rahmen (410a) und dem zweiten Rahmen (410b) zum Halten der Räder versehen sind, wobei die Flügel der Rahmen quer und drehbar miteinander verbunden sind, wobei die Führungs- und Gleitvorrichtung (416) auf den ersten und zweiten Rahmen bereitgestellt ist.
15. Rollschuh nach Anspruch 14, **dadurch gekennzeichnet, dass** das Gelenk (406), das in der Nähe des Spitzenbereichs (405) bereitgestellt ist, aus einem Schlitz gebildet ist, der an einer ungefähr quer verlaufenden Ebene gebildet ist, die in der Nähe der Sohle (404) beginnt, wobei der Schlitz wenigstens eine erste Klappe (407a) und eine zweite Klappe (407b) bildet, die eine solche Form haben, um ihre teilweise gegenseitige Überlappung zu ermöglichen, selbst wenn der Rollschuh inaktiv ist, und insbesondere dem Einsatz der ersten Klappe in die zweite Klappe.
16. Rollschuh nach Anspruch 15, **dadurch gekennzeichnet, dass** der erste Körper (409a), beginnend von der ersten Klappe (407a), ausgebildet ist, um die Aufnahme und das Sichern des Vorderteils des Fußes zu ermöglichen und der zweite Körper (409b), beginnend von der zweiten Klappe (407b), ausgebildet ist, um die Aufnahme und das Sichern des hinteren Teiles des Fußes zu ermöglichen.
17. Rollschuh nach Anspruch 16, **dadurch gekennzeichnet, dass** der erste Rahmen unterhalb des ersten Körpers (409a) angeordnet ist und U-förmig in einem transversalen Querschnitt ist, wobei ein Paar von ersten Rädern (411a, 411b) zwischen den ersten Flügeln des ersten Rahmens (410a), die nach unten vorstehen, gelagert sind, wobei der erste Rahmen (410a) aus einer ersten flachen Basis (412a) zum Verbinden der ersten Flügel gebildet ist, wobei die erste Basis (412a) unterhalb der Sohle (404) über den Einsatz von einer angepaßten Verbindungseinrichtung (413a) verbunden ist.
18. Rollschuh nach Anspruch 17, **dadurch gekennzeichnet, dass** die ersten Flügel des ersten Rahmens (410a) in die entgegengesetzte Richtung hinsichtlich des Spitzenbereichs (405) vorstehen.
19. Rollschuh nach Anspruch 18, **dadurch gekennzeichnet, dass** der zweite Rahmen (410b) in einem unteren Bereich mit dem zweiten Körper (409b) im ersten Fersenbereich (415) verbunden ist und U-förmig in einem transversalen Querschnitt ist, wobei wenigstens ein zweites Paar von Rädern (414a, 414b) zwischen den zweiten Flügeln des zweiten Rahmens (410b), die unterhalb einer zweiten Verbindungsbasis (412b) vorstehen, gelagert ist, wobei die zweite Verbindungsbasis (412b) mit der Sohle (404) über den Einsatz von einer angepassten Verbindungseinrichtung (413b) verbunden ist.
20. Rollschuh nach Anspruch 19, **dadurch gekennzeichnet, dass** die zweite Basis (412b) enger als die erste Basis (412a) ist, so dass das teilweise Einsetzen und die benachbarte Anordnung auf ungefähr parallelen Ebenen der zweiten Flügel des zweiten Rahmens (410b) hinsichtlich der ersten Flügel des ersten Rahmens (410a) ermöglicht wird.
21. Rollschuh nach einem oder mehreren der vorhergehenden Ansprüche 14-20, **dadurch gekennzeichnet, dass** die Führungs- und Gleitvorrichtung (416) aus einem Zapfen (417) gebildet ist, der in rechten Winkeln in Bezug auf die Spitzen der ersten Flügel des ersten Rahmens (410) angeordnet und zusammengeführt ist, und zwar in einem Bereich, der zwischen zwei der ersten und zweiten Rädern (410, 414) liegt, die miteinander benachbart sind, wobei der erste Zapfen (417) in einem Schlitz (418) verschiebbar ist, der auf den zweiten Flügeln gebildet ist, die benachbart zu den ersten Flügeln sind.
22. Rollschuh nach Anspruch 21, **dadurch gekennzeichnet,**

zeichnet, dass der Schlitz (418) eine gebogene Gestalt aufweist, wobei seine Konkavität auf den Spitzenbereich (405) gerichtet ist, wobei der Zapfen (417) an dem oberen Ende des Schlitzes (418) angeordnet werden kann, falls das Paar von ersten und zweiten Rädern (410, 414) auf dem Boden (419) aufliegt, wobei der Zapfen (417) ferner innerhalb des Schlitzes (418) verschiebbar ist, bis er das untere Ende erreicht, das einen Anschlagbereich während des Vorschubs bildet.

23. Rollschuh nach einem oder mehreren der vorhergehenden Ansprüche 14-22, **dadurch gekennzeichnet, dass** die ersten und zweiten Rahmen (410a, 410b) auf jedem von den ersten und zweiten Flügeln jeweils ein erstes (420a) und ein zweites Loch (420b) aufweisen, die die gleiche Achse in dem inaktiven Zustand des Rollschuhs aufweisen, wobei die ersten und zweiten Löcher (420a, 420b) oberhalb der Führungs- und Gleitvorrichtung (416) angeordnet und angepasst sind, den Einsatz von einem Zapfen oder einer Schraube zu ermöglichen, die es ermöglicht, den Rollschuh in dem horizontalen Zustand zu verriegeln, um seine Rotation zu verhindern.

Revendications

1. Patin avec des roues en ligne, caractérisé en comprenant un premier élément et un deuxième élément comprenant chacun un châssis respectif (6,18 ; 410a,410b) adaptés pour supporter une pluralité de roues en ligne (8,20 ; 411a,411b,414a, 414b), ledit premier élément étant associé audit deuxième élément de façon à pouvoir tourner, les châssis respectifs desdits premier et deuxième éléments comprenant un premier châssis de support de roues (6,410a) et un deuxième châssis de support de roues (18 ; 410b) qui sont mutuellement interconnectés par des moyens de guidage et de coulissement (35-37 ; 416) pour connecter mutuellement lesdits premier et deuxième châssis (6,18 ; 410a,410b), et le patin comportant en outre des moyens de verrouillage (38,39 ; 420a,420b) réalisés sur lesdits premier et deuxième châssis (6,18 ; 410a,410b) pour permettre au patin d'être sélectivement verrouillé dans une condition horizontale de façon à empêcher la rotation relative entre lesdits premier et deuxième châssis (6,18 ; 410a,410b).
2. Patin selon la revendication 1, caractérisé en ce que lesdits premier et deuxième éléments comprennent respectivement des premier et deuxième corps (2,9) et des premier et deuxième châssis (6,18), lesdits châssis étant en forme de U et comportant respectivement des premières et deuxièmes ailes (7a,7b, 19a, 19b) faisant saillie vers le bas,

une pluralité de premières pattes (21) faisant saillie vers le bas et axialement par rapport audit premier corps à des premières extrémités (24) dudit premier châssis (6) qui font face à des deuxièmes extrémités (25) dudit deuxième châssis (18), lesdites premières pattes (21) faisant saillie à la fois extérieurement et dans un espace intermédiaire qui se trouve entre lesdites premières ailes (7a,7b) dudit premier châssis (6).

3. Patin selon la revendication 2, caractérisé en ce qu'il comprend une pluralité de deuxièmes pattes (22) qui font saillie vers le bas et axialement à l'extrémité (25) dudit deuxième corps (9) qui est dirigée vers ledit premier corps (2), tout à la fois extérieurement et dans l'espace intermédiaire qui se trouve entre lesdites deuxièmes ailes (19a,19b).
4. Patin selon la revendication 3, caractérisé en ce qu'il comprend une pluralité de troisièmes pattes (23) qui font saillie vers le bas à l'extrémité (25) dudit deuxième corps (9) comportant lesdites deuxièmes pattes (22), lesdites troisièmes pattes (23) faisant saillie extérieurement par rapport auxdites deuxièmes ailes (19a,19b).
5. Patin selon la revendication 4, caractérisé en ce que lesdites premières, deuxièmes et troisièmes pattes (21-23) ont une configuration en forme de peigne et peuvent être disposées au voisinage les unes des autres lorsque lesdits premier et deuxième corps (2,9) sont réunis axialement.
6. Patin selon la revendication 5, caractérisé en ce que des premier, deuxième, troisième, quatrième et cinquième trous adaptés (27-31) sont formés sur lesdites premières, deuxièmes et troisièmes pattes et sur lesdites premières et deuxièmes extrémités desdits premier et deuxième châssis, le long du même axe (26), tous lesdits trous constituant un siège pour un premier pivot (32).
7. Patin selon la revendication 6, caractérisé en ce que ledit premier pivot (32) comporte une tête (33) qui bute contre l'une desdites troisièmes pattes (23), et une tige, qui est intérieurement filetée à l'autre extrémité pour le couplage avec une première vis filetée (34) de façon complémentaire qui bute contre l'autre desdites troisièmes pattes (23).
8. Patin selon l'une ou plusieurs des revendications précédentes, caractérisé en ce que lesdits moyens de guidage et de coulissement disposés sur lesdits premier et deuxième châssis sont constitués par un deuxième pivot (35) qui passe dans deux sixièmes trous (36) formés aux extrémités desdites premières ailes (7a,7b) qui entourent latéralement partiellement les extrémités correspondantes desdites

deuxièmes ailes (19a,19b) dudit deuxième châssis (18).

9. Patin selon l'une ou plusieurs des revendications précédentes, caractérisé en ce que lesdits moyens de guidage et de coulissement comprennent en outre deux fentes adaptées (37) formées sur les extrémités desdites deuxièmes ailes (19a,19b), lesdites fentes (37) ayant une forme en arc qui permet audit deuxième corps (9) de se soulever du sol durant la poussée, lorsque lesdites premières roues (8) sont en contact avec ledit sol.

10. Patin selon la revendication 9, caractérisé en ce que lesdites deux fentes (37) sont formées sur lesdites deuxièmes ailes (19a,19b) au niveau desdits sixièmes trous (36) pratiqués sur lesdites premières ailes (7a,7b) dudit premier châssis (6).

11. Patin selon la revendication 10, caractérisé en ce que lesdits moyens de verrouillage comprennent respectivement sur lesdites premières et deuxièmes ailes (7a,7b,19a,19b) desdits premier et deuxième châssis (6,18), un septième trou (38) et un huitième trou (39) qui sont adjacents auxdits sixièmes trous (36) et à ladite paire de fentes (37) et qui ont le même axe dans la condition dans laquelle lesdites premières roues (8) et lesdites deuxièmes roues (20) interagissent les unes et les autres avec le sol et, par conséquent, avec le patin, dans une condition horizontale.

12. Patin selon la revendication 11, caractérisé en ce que lesdits septième et huitième trous (38,39) constituent un siège temporaire pour un pivot ou une broche qui est amovible et qui permet de verrouiller l'articulation mutuelle desdits premier et deuxième châssis (6,18).

13. Patin selon les revendications 6 et 8, caractérisé en ce que lesdits premier et deuxième pivots (32,35) agissent au niveau de l'espace intermédiaire qui est présent entre l'une desdites premières et deuxièmes roues adjacentes (8,20).

14. Patin selon la revendication 1, caractérisé en ce qu'il comprend une coque monolithique (402) comportant, à proximité de la semelle (404) et dans la région avant du pied (405), au moins une articulation (406) qui forme un premier corps avant (409a), pour fixer la partie avant du pied, et un deuxième corps arrière (409b), pour fixer au moins le talon, lesdits corps étant pourvus, dans une région basse, d'un premier châssis (410a) et d'un deuxième châssis (410b) pour supporter lesdites roues, des ailes desdits châssis étant associées entre elles transversalement et de façon à pouvoir tourner, lesdits moyens de guidage et de coulissement (416) étant

disposés sur lesdits premier et deuxième châssis.

15. Patin selon la revendication 14, caractérisé en ce que ladite articulation (406), disposée à proximité de la région de pointe (405), est constituée par une fente qui est formée sur un plan approximativement transversal à partir du voisinage de ladite semelle (404), ladite fente formant au moins un premier volet (407a) et un deuxième volet (407b) qui ont une forme telle qu'elle permette leur chevauchement mutuel partiel même lorsque ledit patin est inactif, et, en particulier, l'insertion dudit premier volet dans ledit deuxième volet.

16. Patin selon la revendication 15, caractérisé en ce que ledit premier corps (409a) est formé à partir dudit premier volet (407a), de façon à permettre le logement et la fixation de ladite partie avant du pied, et ledit deuxième corps (409b) est formé en partant dudit deuxième volet (407b), de façon à permettre le logement et la fixation de la partie arrière du pied.

17. Patin selon la revendication 16, caractérisé en ce que ledit premier châssis (410a) est associé en dessous dudit premier corps (409a) et a une section transversale en forme de U, une paire de premières roues (411a,b) pivotant entre les premières ailes dudit premier châssis (410a), faisant saillie vers le bas, ledit premier châssis (410a) étant constitué par une première base plate (412a) pour raccorder lesdites premières ailes, ladite première base (412a) étant raccordée en dessous de ladite semelle (404) par l'interposition de moyens de raccordement appropriés (413a).

18. Patin selon la revendication 17, caractérisé en ce que lesdites premières ailes dudit premier châssis (410a) font saillie dans la direction opposée par rapport à ladite région de pointe (405).

19. Patin selon la revendication 18, caractérisé en ce que ledit deuxième châssis (410b) est associé dans une région basse audit deuxième corps (409b), dans la région de talon (415), et a une section transversale en forme de U, au moins une deuxième paire de roues (414a,b) pivotant entre les deuxièmes ailes dudit deuxième châssis (410b), faisant saillie en dessous d'une deuxième base de raccordement (412b), ladite deuxième base de raccordement (412b) étant raccordée à ladite semelle (404) par l'interposition de moyens de raccordement adaptés (413b).

20. Patin selon la revendication 19, caractérisé en ce que ladite deuxième base (412b) est plus étroite que ladite première base (412a), de façon à permettre l'insertion partielle et l'agencement adjacent, sur des plans approximativement parallèles, desdi-

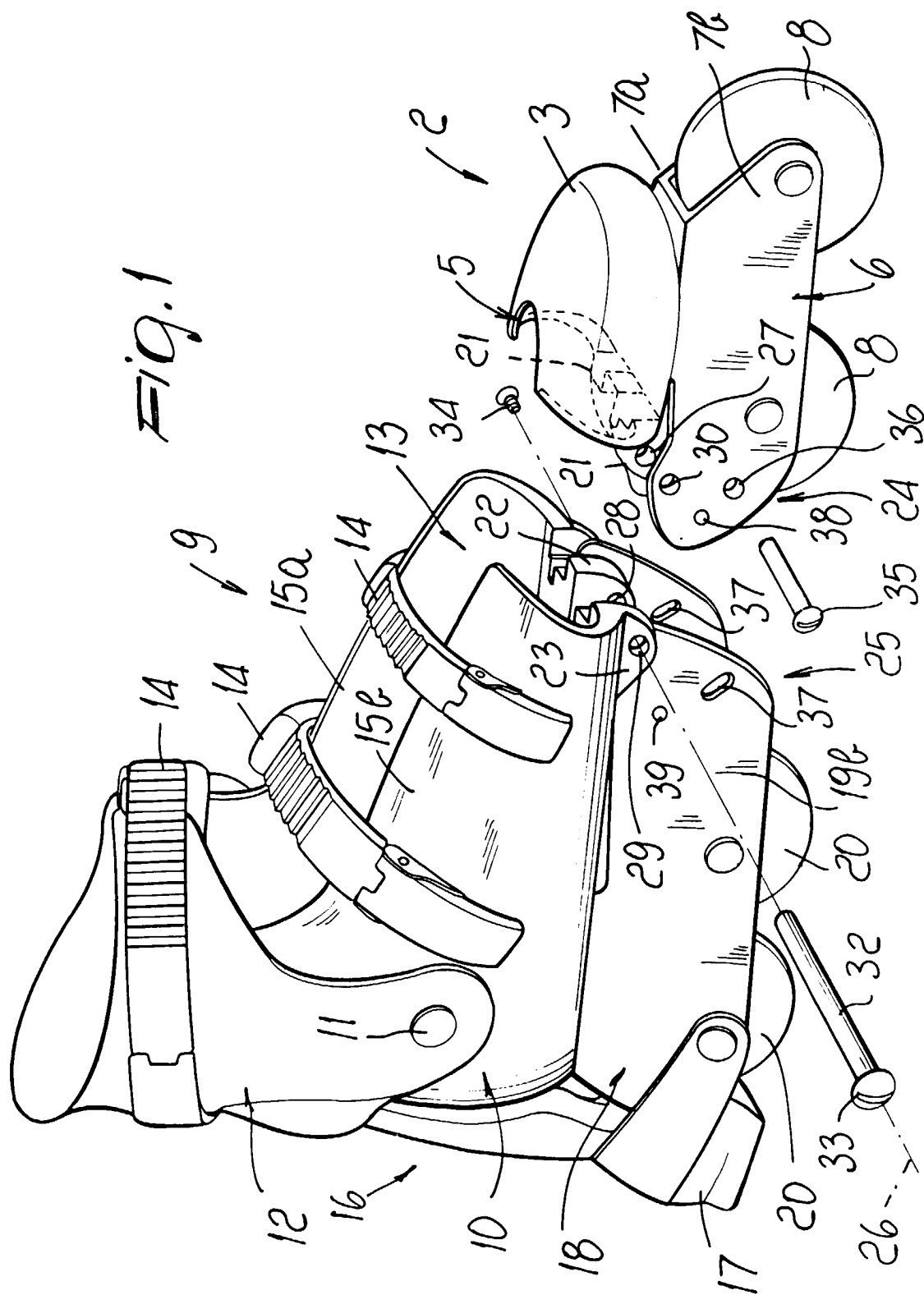
tes deuxièmes ailes dudit deuxième châssis (410b) par rapport auxdites premières ailes dudit premier châssis (410a).

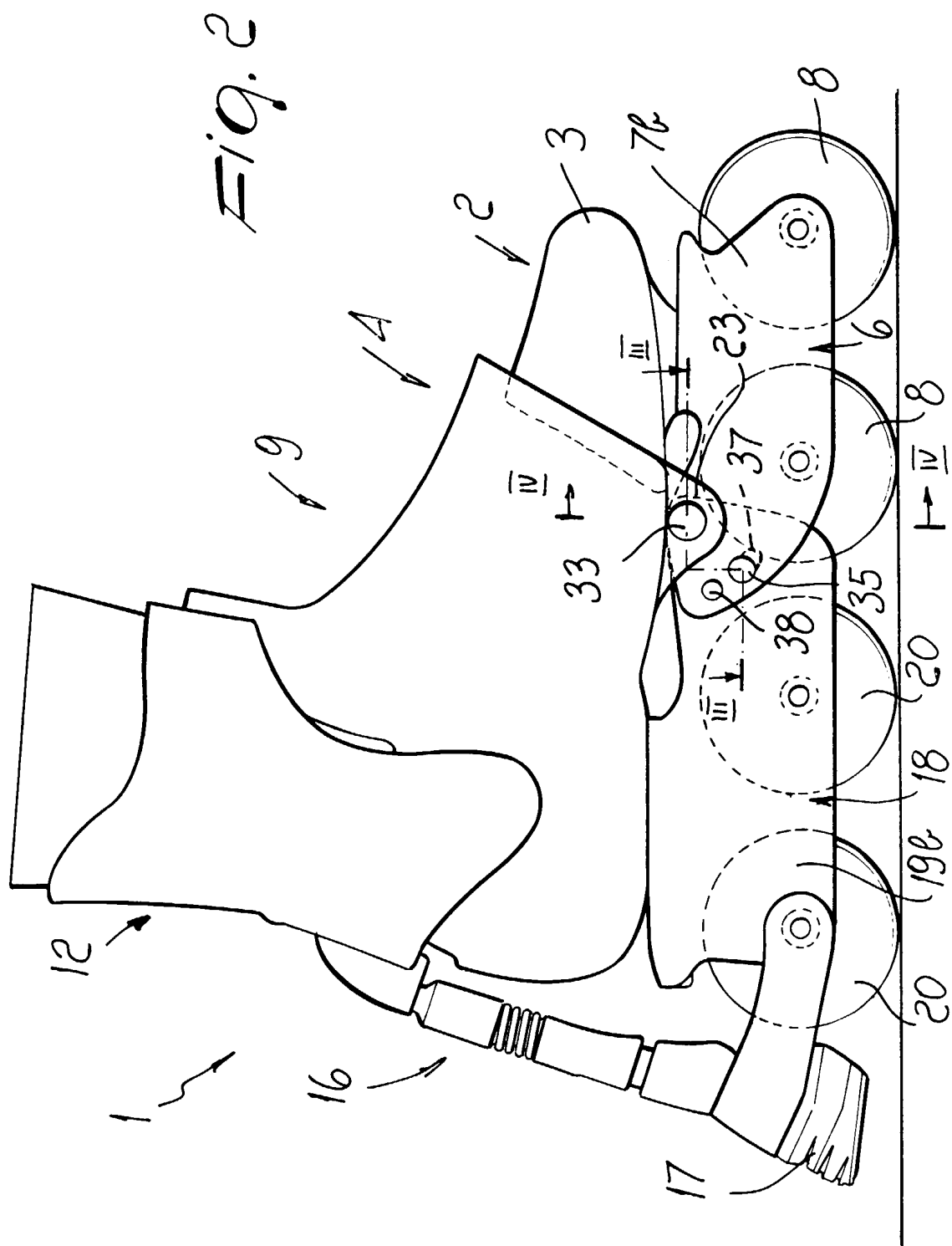
21. Patin selon l'une ou plusieurs des revendications précédentes 14-20, caractérisé en ce que lesdits moyens de guidage et de coulissement (416) sont constitués par un pivot (417) qui est associé et réuni à angle droit par rapport aux pointes desdites premières ailes dudit premier châssis (410a) dans une région qui est intermédiaire entre deux desdites premières et deuxièmes roues (410,414) qui sont adjacentes entre elles, ledit premier pivot (417) pouvant coulisser dans une fente (418) qui est formée sur lesdites deuxièmes ailes qui sont adjacentes auxdites premières ailes. 5 10 15
22. Patin selon la revendication 21, caractérisé en ce que ladite fente a une forme incurvée, avec sa concavité dirigée vers ladite région de pointe (405), ledit pivot (417) pouvant être agencé à l'extrémité supérieure de ladite fente (418) si ladite paire desdites premières et deuxièmes roues (410,414) repose sur ledit sol (419), ledit pivot pouvant de plus coulisser à l'intérieur de ladite fente (418) jusqu'à atteindre l'extrémité inférieure, qui constitue une limite de course, durant la poussée. 20 25
23. Patin selon l'une ou plusieurs des revendications précédentes 14-22, caractérisé en ce que lesdits premier et deuxième châssis (410a,b) comportent, sur chacune desdites premières et deuxièmes ailes, lesdits moyens de verrouillage comprenant respectivement, un premier trou (420a) et un deuxième trou (420b) ayant le même axe dans la condition inactive dudit patin, lesdits premier et deuxième trous (420a,b) étant disposés au-dessus desdits moyens de guidage et de coulissement (416) et étant adaptés pour permettre l'insertion d'un pivot ou d'une vis qui permet de verrouiller ledit patin dans la condition horizontale de façon à empêcher sa rotation. 30 35 40

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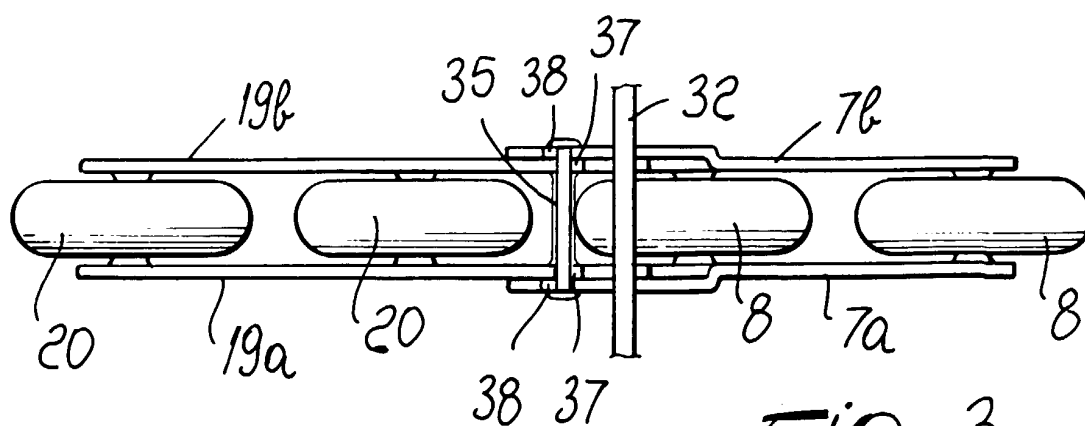


Fig. 3

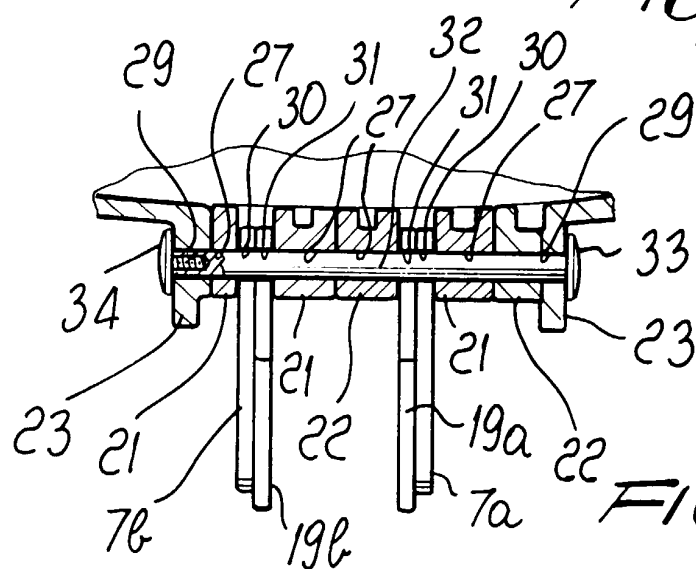


Fig. 4

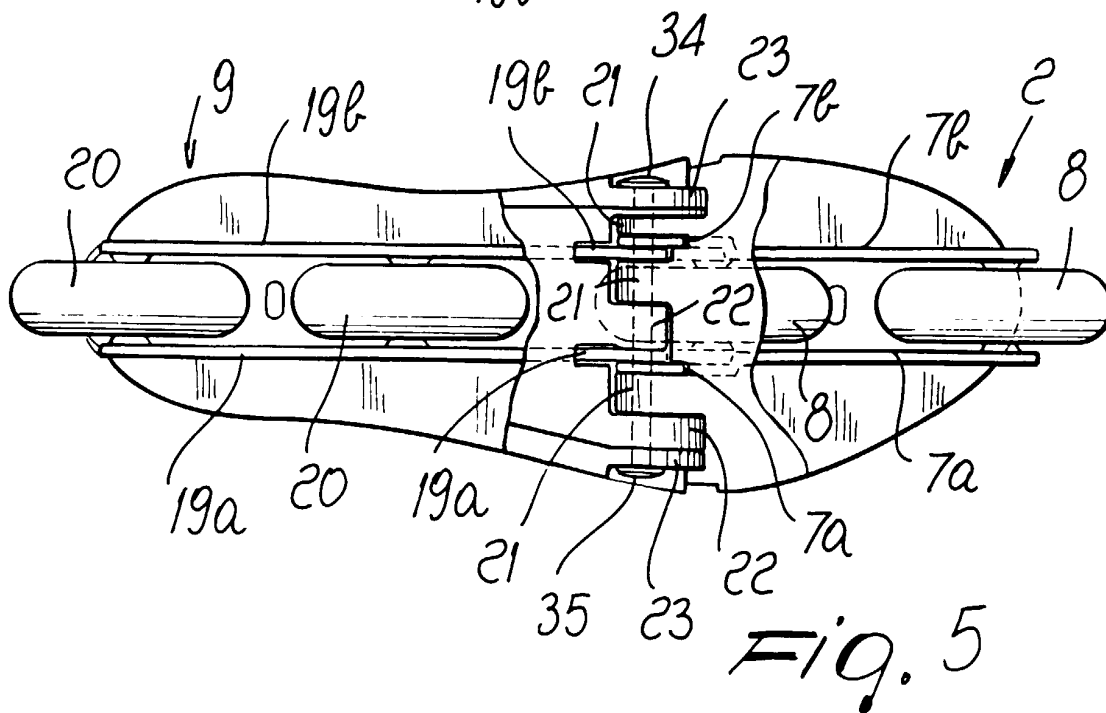


Fig. 5

