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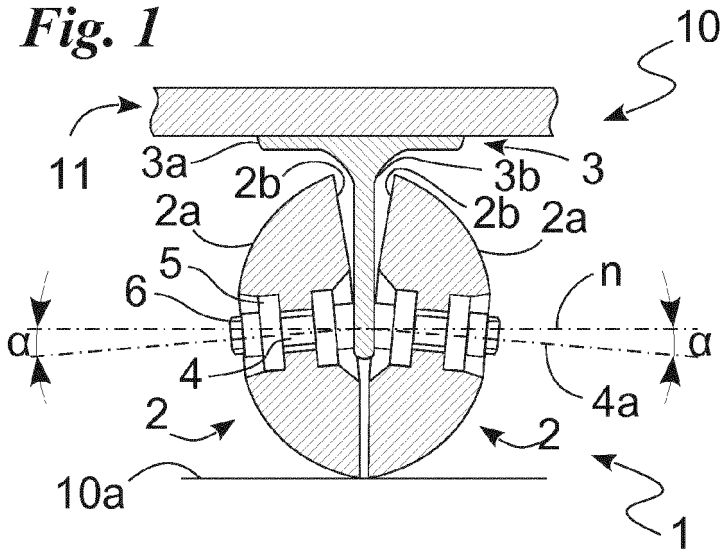
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(54) **A rolling device for a skate**

(57) A rolling device (1) is provided for skates (10) comprising at least two separate circular bodies (2), suitable for coming into contact with a support surface (10a) and having a cap shape with a substantially convex base (2b); a frame (3) suitable to support the circular bodies (2); at least two pins (4) defining, for the circular bodies (2), rotation axle shafts (4a) separate from each other.

Fig. 1



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Description

[0001] The present invention relates to a rolling device for skates of the type as recited in the preamble of Claim 1.

[0002] In particular the invention relates to a rolling device suitable to be connected to skateboards (boards which the athlete's feet are placed on and usually fitted with two pairs of wheels), to roller skates (pairs of attachment bodies to the feet each of which fitted with front and rear wheels), and rollerblades (pairs of attachment bodies to the feet each of which provided with wheels positioned in line) or other similar devices which will all be referred to below as skates.

[0003] As known, one of the most important parts of the skate is the rolling device, that is to say the assembly composed of one or more wheels and an attachment apparatus suitable for connecting said rolling device to an anchorage structure on the foot thereby constituting the skate.

[0004] The rolling devices currently known comprise two circular bodies, identifiable as wheels, and an attachment apparatus consisting of a coupling, usually T-shaped, suitable to permit the attachment of the circular bodies to the rest of the skate.

[0005] Two shafts are connected in a specular manner to the coupling, one for each rolling device, defining rotation axes coinciding with each other and parallel to the ground. In detail, the shafts are detachably connected to the coupling so as to permit a simultaneous rotation of the shafts in relation to the coupling facilitating the performance of manoeuvres by the athlete.

[0006] The prior art described above has several significant drawbacks.

[0007] A first significant drawback is the fact that the circular bodies, on account of the presence of the coupling, define contact zones with the ground distanced from each other and thus able to contrast any inclinations of the skate ordered by the athlete.

[0008] Another drawback is represented by the fact that, despite the presence of the detachable connection between the axes and coupling, the skates cannot adequately adapt to the athlete during the performance of manoeuvres.

[0009] A further drawback is that on account of the formation of contact zones distanced from each other, momentums are created which could lead to the skate, and in particular the coupling, breaking.

[0010] Another drawback, of no less importance, typical especially of skates with hemispherical circular bodies is the fact that they define limited circular body-ground contact zones and are thus subject to breakage.

[0011] In this situation the technical purpose of the present invention is to devise a rolling device for skates able to substantially overcome the drawbacks mentioned above.

[0012] Within the sphere of said technical purpose one important aim of the invention is to provide a device which enables the skate to adapt to the athlete in every manoeuvre.

[0013] Another important aim of the invention is therefore, to make a rolling device and thus a skate which is reliable and safe.

[0014] The technical purpose and specified aims are achieved by a skate as claimed in the appended Claim 1.

[0015] Preferred embodiments are described in the dependent claims.

[0016] The characteristics and advantages of the invention are clearly evident from the following detailed description of a preferred embodiment thereof, with reference to the accompanying drawings, in which:

Fig. 1 shows a rolling device for skates according to the invention; and
Fig. 2 and **3** show other rolling devices according to the invention

[0017] With reference to said drawings, reference numeral 1 globally denotes the rolling device for skates according to the invention.

[0018] Specifically a rolling device 1 is suitable to be connected to a skate **10** such as, for example, a skateboard, a roller skate, or a rollerblade. More in particular, the skate 10 may be identified as a roller skate.

[0019] It comprises at least one rolling device 1 suitable to permit the skate to move along a support surface **10a** such as, for example, that defined by a road, a pavement, a support structure **11**, suitable for connecting to the athlete's foot so as to enable said athlete to control the movement of the skate 1; and attachments, such as screws, glue or other means not shown in the drawing, suitable for connecting the rolling device 1 to the support structure 11 on the side opposite the athlete's foot. Preferably, the skate 10 has two rolling devices 1 connected to the support structure 11, one at the rear of the structure 20, that is to say at the heel of the foot, and one at the front of the support structure 11. The support structure 11 is substantially known and, for example is described in the patent WO9000428A1 from pg. 10, line 25 to pg. 17 line 10 and Figures 1, 3 and 9 or in the patent US4966377A from column 2 line 37 to column 3 line 56 and Figures 1-2.

[0020] The rolling device 1 comprises at least two separate circular bodies **2** suitable to come into contact with the support surface 10a, a frame **3**, suitable to support at least the separate circular bodies 2 and to be joined to the support structure 11, at least two pins **4** each suitable to connect one of the circular bodies 2 to the frame 3 defining for it a rotation axle shaft **4a,** bearings **5** or other similar elements suitable to permit the circular bodies 2 to rotate in relation to the pins 4 with reduced friction; and attachment means **6** suitable to connect, for example by means of a threaded coupling, each circular body 2 to its pin 4.

[0021] The frame 3 has a substantially T-shaped profile in which a coupling element **3a**, suitable to be firmly connected to the support structure 11, and at least one sup-

port **3b** can be identified, to which the pins 4 are laterally connected so as to position themselves between the circular bodies 2, as shown in Figures 1-3. The arrangement of the pins 4 in relation to the support 3b and the shape of the circular bodies 2 is such that, advantageously, the circular bodies 2 almost touch at the support surface 10a, that is on the opposite side to the coupling element 3a and thus, on the side opposite the support structure 11, while appropriately distanced from the support 3b.

[0022] Preferably, the shape of the outer profile **2a** of the circular bodies 2 and the arrangement of the rotation axle shafts 4a is such that the rolling device 1 defines, for the skate 10, a centre of rotation positioned on the opposite side of the support structure 11 to the rolling group. More preferably, the shape of the outer profile 2a and the arrangement of the rotation axle shafts 4a place the centre of rotation of the skate 10 substantially at the athlete's ankle.

[0023] To such purpose, the pins 4 are connected to the support 3b in such a way as to define the rotation axle shafts 4a substantially inclined to each other. In particular, the position of the pins 4 in relation to the support 3b is such that the rotation axle shafts 4a define, compared to the normal **n** to said support 3b, angles of inclination α substantially equal to each other.

[0024] In particular, the angles of inclination α are substantially less than 20°, more in particular, substantially less than 15°. Preferably, such angles of inclination α are substantially less than 10° and more preferably, substantially equal to 4°.

[0025] At the same time, the circular bodies 2 are a cap shape with an outer profile 2a, that is to say the profile suitable to come into at least partial contact with the support surface 10a, substantially hemispherical, or alternatively, substantially elliptical (Fig. 1) or polycentric (Fig. 2), in other words formed of circumferential arcs, in general of varying radius, having common tangent in the points where the curvature changes. In particular, the two circular bodies may have substantially identical outer profiles 2a or, alternatively, outer profiles 2a different from each other.

[0026] Advantageously the cap defined by the circular bodies 2 has a convex base **2b** and, specifically, a substantially convex truncated cone base, that is to say with the vertex substantially external to the cap (Figures 1-3) and, in detail, lying on the rotation axle shaft 4a. Preferably, the truncated cone base 2b of the circular bodies 2 has an angle at the vertex substantially at least equal to double the angle of inclination of the rotation axle shafts 4a.

[0027] The functioning of a rolling device and thus of a skate fitted with said device, described above in a structural sense, is as follows.

[0028] When the athlete moves along a straight section, the rolling device has both rotational bodies 2 in contact with the support surface 10a.

[0029] At the moment in which the athlete takes a curve and thus inclines the skate 10, the rolling device 1, thanks to the advantageous arrangement of the centre of rotation at the ankle, modifies the contact zone between the circular bodies 2 and the support surface 10a.

[0030] In particular, while the circular body 2 placed on the outer side of the curve substantially lifts off the ground, the circular body 2 placed on the inner side of the curve is practically flattened against the support surface 10a and thus, thanks to its particular shape, increases its contact zone ensuring optimal stability during the curve manoeuvre.

[0031] The invention achieves some important advantages.

[0032] A first important advantage is the fact that the skate 10, fitted with the rolling devices 1, is able to adapt optimally to the athlete at every manoeuvre.

[0033] In fact, thanks to the special arrangement of the axle shafts 4a and the shape of the circular bodies 2, the rolling device is able to constantly ensure an optimal contact zone with the surface 10a and, thus a particularly elevated sense of security and stability.

[0034] Such advantage is given by the fact that the aforesaid technical characteristics make it possible to define, between the circular bodies 2 and the support surface 1a, two contact zones particularly close to each other and thus optimal for the athlete.

[0035] Such elevated sense of security and stability is further increased by the shape of the outer profile 2a which always ensures an adequate contact zone with the surface 10a.

[0036] Moreover, such shape of the outer profile makes it possible to discharge the forces acting on the rolling device 1 and, in particular, to prevent them from concentrating in surfaces of limited size thus causing breakage, as occurs with the known rolling devices.

[0037] Another important advantage, given by the arrangement of the axle shafts 4a and by the convex shape of the base 2a, is the fact that the circular bodies 2 are appropriately distanced from the frame 3 thus preventing stones or other similar objects from getting stuck between the bodies 2 and the frame 3 preventing the correct rotation of the bodies 2 in relation to said frame 3. Modifications and variations may be made to the invention described herein without departing from the scope of the inventive concept. All the elements as described and claimed herein may be replaced with equivalent elements and the scope of the invention includes all other details, materials, shapes and dimensions.

Claims

1. Rolling device (1) for skates (10) comprising at least two separate circular bodies (2) suitable to come into contact with a support surface (10a), a frame (3) suitable to support said at least two circular bodies (2) **characterised in that** it comprises: at least two pins (4) defining, for said at least two circular bodies (2), rotation axle shafts (4a) separate from each other

and **in that** said at least two circular bodies (2) are a cap shape with a substantially convex base (2b).

2. Rolling device (1) as claimed in claim 1, wherein said base (2b) is substantially a truncated cone shape.

3. Rolling device (1) as claimed in one or more of the preceding claims, wherein said base (2b) has its vertex substantially lying on said rotation axes (4a).

4. Rolling device (1) as claimed in one or more of the preceding claims, wherein said at least two circular bodies (2) have a cap shape with a substantially elliptical outer profile.

5. Rolling device (1) as claimed in one or more of the claims 3-4, wherein said outer profile is substantially polycentric.

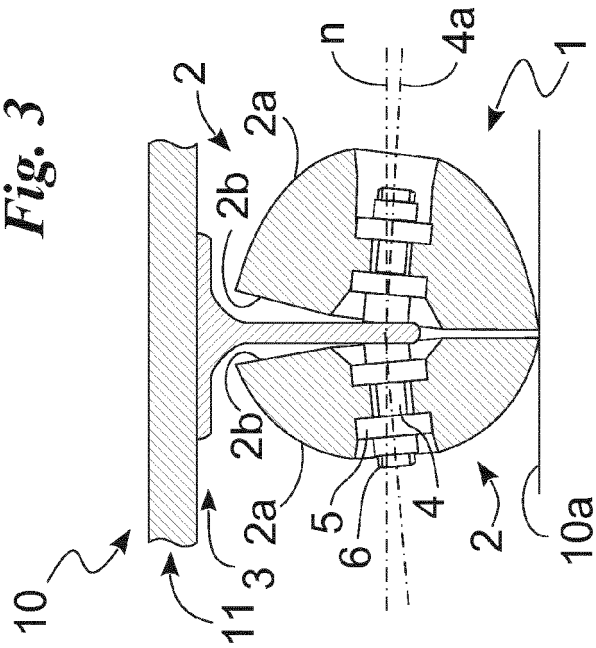
6. Rolling device (1) as claimed in one or more of the preceding claims, wherein said outer profiles (2a) of said at least two circular bodies (2) are substantially different from each other.

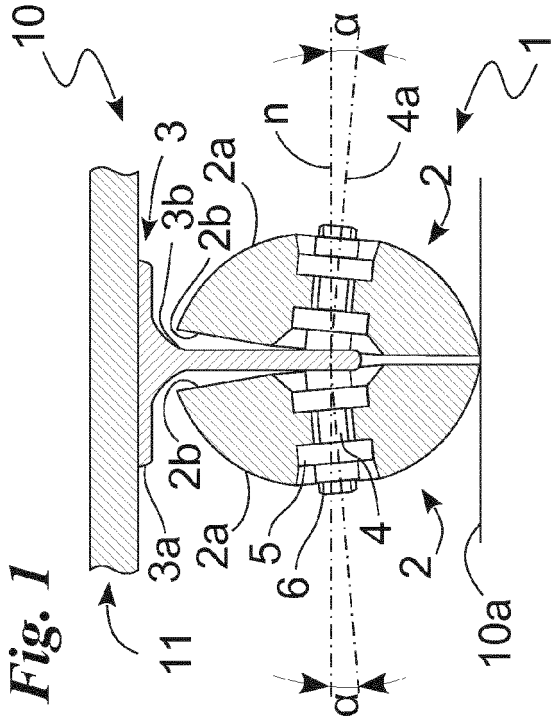
7. Rolling device (1) as claimed in one or more of the preceding claims, wherein said frame (3) comprises at least one support (3b) to which said pins (4) are laterally connected; and wherein the rotation axle shafts (4a) define, compared to the normal (n) to said support (3b), angles of inclination substantially less than 20°.

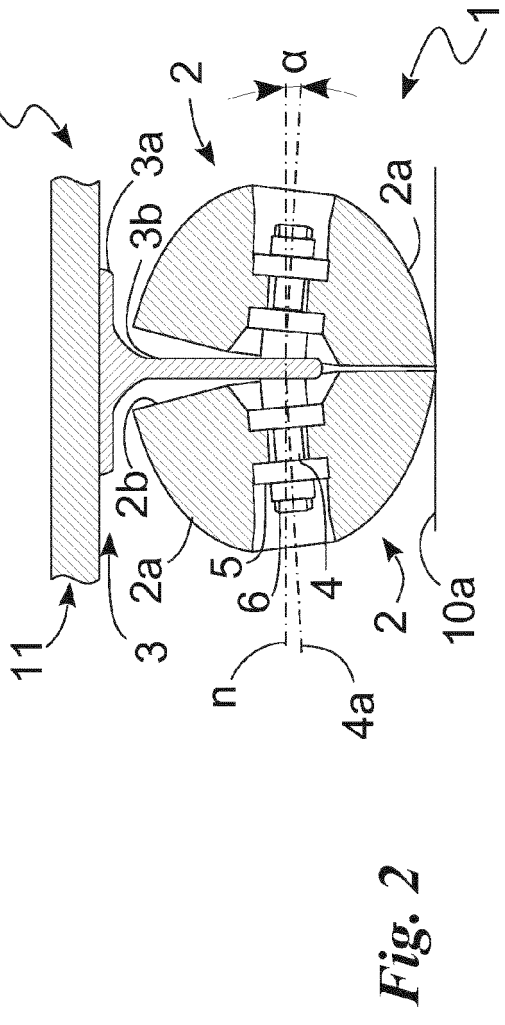
8. Rolling device (1) as claimed in the previous claim, wherein said angles of inclination (α) are substantially equal to 4°.

9. Rolling device (1) as claimed in one or more of the claims 7-8, wherein said angles of inclination (α) are substantially equal to each other.

10. Rolling device (1) as claimed in one or more of the claims 7-8, wherein said angles of inclination (α) are substantially different from each other.


Fig. 3
10
11
3
2
2a
2b
2b
2a
5
6
4
2
10a
n
4a
1


Fig. 1
10
3
3b
2b
2a
3a
2b
2a
5
6
4
2
10a
11
α
α
n
4a
2
1


Fig. 2
10
3a
3b
2a
2b
2a
5
6
4
2
10a
11
3
n
4a
α
2
1

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EUROPEAN SEARCH REPORT

Application Number
EP 13 18 5318

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 4 153 263 A (YOSHIMOTO KOICHI) 8 May 1979 (1979-05-08) * columns 2,3; figures 1,3,4 * -----	1-10	INV. A63C17/24 A63C17/00
X	AT 395 539 B (ZOUREK HORST ZOUREK HORST [ST]) 25 January 1993 (1993-01-25) * pages 2,3; figure 4 * -----	1-10	
X	US 4 212 479 A (YOSHIMOTO KOICHI [JP]) 15 July 1980 (1980-07-15) * columns 2,3; figures 2,3 * -----	1-10	
X	EP 0 780 144 A2 (NORDICA SPA [IT]) 25 June 1997 (1997-06-25) * figure 7 * -----	1	

TECHNICAL FIELDS SEARCHED (IPC)

A63C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	15 November 2013	Haller, E

CATEGORY OF CITED DOCUMENTS

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