



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
19.01.2005 Bulletin 2005/03

(51) Int Cl.7: **A63C 17/22**

(21) Application number: **04013580.8**

(22) Date of filing: **09.06.2004**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL HR LT LV MK

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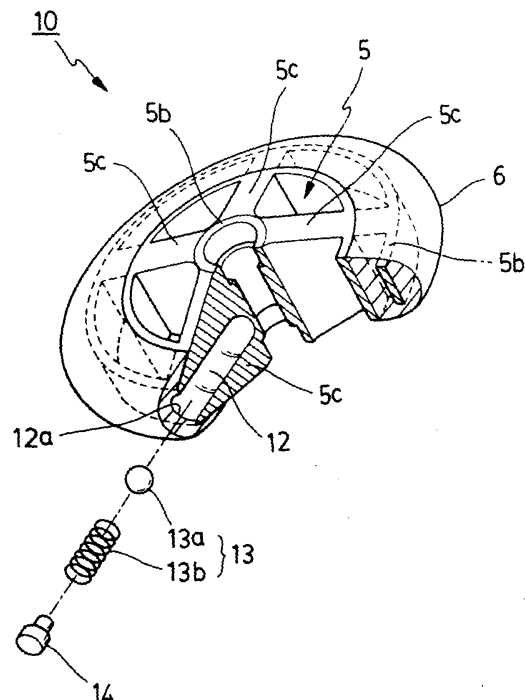
(30) Priority: **16.07.2003 US 620955**

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(54) **A wheel for in-line skates**

(57) A wheel(10) for in-line skates, which enables a user to achieve a higher speed in a short period of time on a surface, is disclosed. The wheel (10) includes a central hub(5) having an inner ring(5a), an outer rim(5b), and a connector (5c) extending between the inner ring (5a) and the outer rim(5b), a tire (6) surrounding the outer rim(5b), and a bearing assembly (7) fitted in the inner ring(5a). The central hub(5) includes a reception cavity (12) provided in the connector(5c), a weight (13a) received in the reception cavity(12) to be moved toward the outer rim portion(5b) by a centrifugal force of the wheel(10), and an elastic element(13b) for biasing the weight(13a).

FIG. 3



Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a wheel for in-line skates, and more particularly to a wheel for in-line skates which enables a user to improve an acceleration from standstill on a surface, in which the ability is estimated by a time period required to accelerate from a standstill to a certain speed or to travel from the standstill to a certain distance.

Description of the Prior Art

[0002] Referring to FIG. 1, a conventional in-line skate 1 an in-line skate 1 is generally comprised of a shoe or boot 2 adapted to receive a user's foot, a frame 3 fixedly attached to a bottom surface of the boot 2, and a series of wheels 4 rotatably supported to the frame 3. Referring to FIG. 2, each of the wheels 4 comprises a central hub 5, an annular tire 6 provided on an outer surface of the central hub 5, and a bearing assembly 7 fitted in the central hub 5.

[0003] In games played while wearing such an in-line skate 1, such as racing, aggressive inline skating, hockey and the like, it is advantageous for a user to achieve a high speed in a short time period. That is, the acceleration from standstill is a very important factor in determining a user's (skater's) competitive power.

[0004] Since the in-line skate 1 and the wheels 4 are not provided with means for improving a user's acceleration from a standstill, the acceleration which can be achieved on a surface, will depend on only a user's muscle power. The user's power has a certain limit and is gradually decreased with time, because the user's power is not obtained by a mechanical device.

[0005] Accordingly, although a user makes efforts to enhance his muscle power and to improve his skating skill over a long term, improvement of his accelerating ability from a standstill is negligible. As a result, it is expected that a user's acceleration from a standstill can be improved by wheels with an improved structure.

[0006] Recently, with the increase in popularity of in-line skates, a large number of patents relating to in-line skates, particularly to wheels of the in-line skate, have been proposed. Most of the patents relate to bearing assemblies 7 of the in-line skate, and some patents relate to the tire 6 of the in-line skate.

[0007] For example, U.S.A Patent Nos. 5,441,286, 5,964,469, 6,065,760 and 6,142,578, and Japanese Patent Laid-open No. 11-235411 propose structures of the bearing assemblies considering economical efficiency. U.S.A Patent Nos. 5,813,678, 5,893,569, 6,019,378 and the like propose structures of tires for achieving quick stop, referred to as a "hockey-stop". However, the wheels proposed in the above-mentioned

patents are not provided with means for improving a user's acceleration from a standstill, like the wheel 4 illustrated in FIG. 2.

5 SUMMARY OF THE INVENTION

[0008] Accordingly, the present invention has been made keeping in mind the above problems occurring in the prior art, and an object of the present invention is to provide a wheel for in-line skates which is provided with means for enabling a user to improve his acceleration from a standstill on a surface, and which can be constructed on the basis of a typical wheel of an in-line skate.

[0009] In order to accomplish the above object, the present invention provides a wheel for in-line skates comprising, a central hub including an inner ring portion, an outer rim portion disposed around the inner ring portion, and a connector extending between the inner ring portion and the outer rim portion, a tire surrounding the outer rim portion of the central hub, and a bearing assembly fitted in the inner ring portion of the central hub.

[0010] According to a characteristic of the present invention, the central hub includes a reception cavity provided in the connector, a weight received in the reception cavity and adapted to be moved from the inner ring portion to the outer rim portion of the central hub by a centrifugal force of the wheel, and an elastic element for biasing the weight to the inner ring portion.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The above and other objects, features and advantages of the present invention will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a side view showing a conventional in-line skate;

FIG. 2 is a perspective view showing a wheel of the in-line skate shown in FIG. 1, which is partly cut away;

FIG. 3 is a perspective view showing a wheel for an in-line skate according to a first embodiment of the present invention, which is partly cut away;

FIG. 4 is a front view of the wheel shown in FIG. 3, which is stopped; and

FIG. 5 is a front view of the wheel shown in FIG. 3, which is rotated.

DETAILED DESCRIPTION OF THE INVENTION

[0012] This invention will be described in further detail by way of example with reference to the accompanying drawings.

[0013] FIG. 3 shows a wheel 10 for in-line skates according to a preferred embodiment of the present inven-

tion. According to the embodiment, a wheel 10 for in-line skates includes a central hub 5 comprised of an inner ring portion 5a, an outer rim portion 5b concentrically disposed around the inner ring portion 5a, and spokes 5c radially extending and connected between the inner ring portion 5a and the outer rim portion 5b, and an annular tire 6 surrounding the outer rim portion 5b of the central hub 5.

[0014] The wheel 10 further includes a bearing assembly fitted in the inner ring portion 5a. Although the bearing assemblies having various structures are known, the most typical bearing assembly 7, as shown in FIG. 2, comprises left and right bearings 7a and 7a', a spacer interposed between the left and right bearings 7a and 7a', and an axle 7c penetrating the bearings 7a and 7a' and the spacer 7b. In this specification, since the present invention does not pertain to the bearing assembly, a detailed description thereof is omitted.

[0015] The central hub 5 is usually produced from plastic or metal material (aluminum) by a molding process, and the tire 6 is usually produced from elastic resin, specifically polyurethane, and is integrally molded with the central hub 5.

[0016] The central hub 5 is provided with means for increasing a turning force of the wheel 10. According to the embodiment, the central hub 5 of the wheel 10 includes reception cavities 12 radially provided in respective spokes 5c, and acceleration sets 13 received in the reception cavities 12 to increase a turning force of the wheel 10.

[0017] More specifically, each of the reception cavities 12 is formed such that an outer end of the reception cavity 12 is positioned at an outer surface of the outer rim portion 5b of the central hub 5 and opened thereat, and an inner end thereof is positioned near to the inner ring portion 5a. The opening 12a formed at the outer end of the reception cavity 12 is closed by a locking plug 14.

[0018] Although not illustrated in the drawings, the reception cavity 12 may be formed from the inner surface of the inner ring portion 5a to a position near to the outer surface of the outer rim portion 5b. Alternatively, the reception cavity 12 may be formed to have blind opposite ends without the locking plug 14.

[0019] Each of the acceleration set 13 comprises a weight 13a and an elastic element 13b. Preferably, the weight 12a is a metal ball, and the elastic element 13b is an elastic spring.

[0020] In the embodiment, when a rotation of the wheel 10 is stopped, the weight 13a is positioned near to the inner ring portion 5a by elasticity of the spring 13b (see FIG. 5). As the wheel 10 is rotated from the stopped position, the weight 13a is moved toward the outer rim portion 5b by a centrifugal force of the wheel 10 (see FIG. 6). When all the weights 13a are positioned near to the outer rim portion 5b, the wheel 10 has a moment of inertia increased in proportion to the total weight added to the outer rim portion 5b.

[0021] In other words, when the wheel 10 is rotated at a certain speed, the turning force of the wheel 10 is increased by the acceleration sets 13. Consequently, an in-line skate with the wheel 10 mounted thereon enables a user to achieve a higher speed in a short period of time by the increased turning force.

[0022] As described above, the present invention provides a wheel for in-line skates which is provided with means for increasing turning force received in a central hub 5, depending on its embodiment. By the means for increasing turning force, the wheel 10 enables a user to achieve at a high speed in a short period of time. Consequently, an acceleration from standstill, which can be achieved on a surface, is remarkably improved.

[0023] Although preferred embodiment of the present invention have been described for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Claims

1. A wheel (10) for in-line skates, comprising:

a central hub (5) including an inner ring portion (5a), an outer rim portion (5b) disposed around the inner ring portion (5a), and a connector (5c) extending between the inner ring portion (5a) and the outer rim portion (5b);
a tire (6) surrounding the outer rim portion (5b) of the central hub (5); and
a bearing assembly (7) fitted in the inner ring portion (5a) of the central hub (5);

wherein the central hub (5) includes a reception cavity (12) provided in the connector (5c), a weight (13a) received in the reception cavity (12) and adapted to be moved from the inner ring portion (5a) to the outer rim portion (5b) of the central hub (5) by a centrifugal force of the wheel, and an elastic element (13b) for biasing the weight (13a) to the inner ring portion (5a).

2. The wheel for in-line skates as set forth in claim 1, wherein the connector (5c) of the central hub (5) comprises a plurality of spokes radially extending from the inner ring (5a) portion to the outer rim portion (5b).

3. The wheel for in-line skates as set forth in claim 1, wherein the reception cavity (12) of the central hub (5) is formed such that an outer end of the reception cavity (12) is positioned at an outer surface of the outer rim portion (5b) and opened thereat, and an inner end thereof is positioned near to the inner ring portion (5a), and wherein the opening (12a) formed

at the outer end of the reception cavity (12) is closed by a locking plug (14).

4. The wheel for an in-line skate as set forth in claim 1, wherein the weight (13a) is made of metal, and the elastic element (13b) for biasing the weight (13a) is comprised of an elastic spring.

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FIG. 1

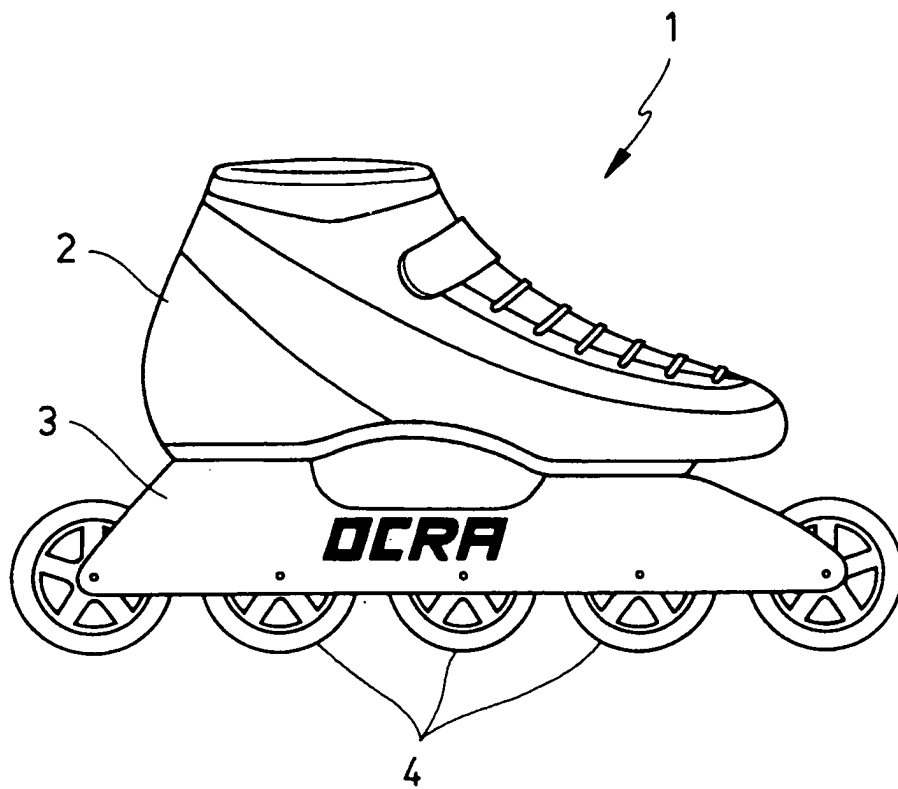


FIG. 2

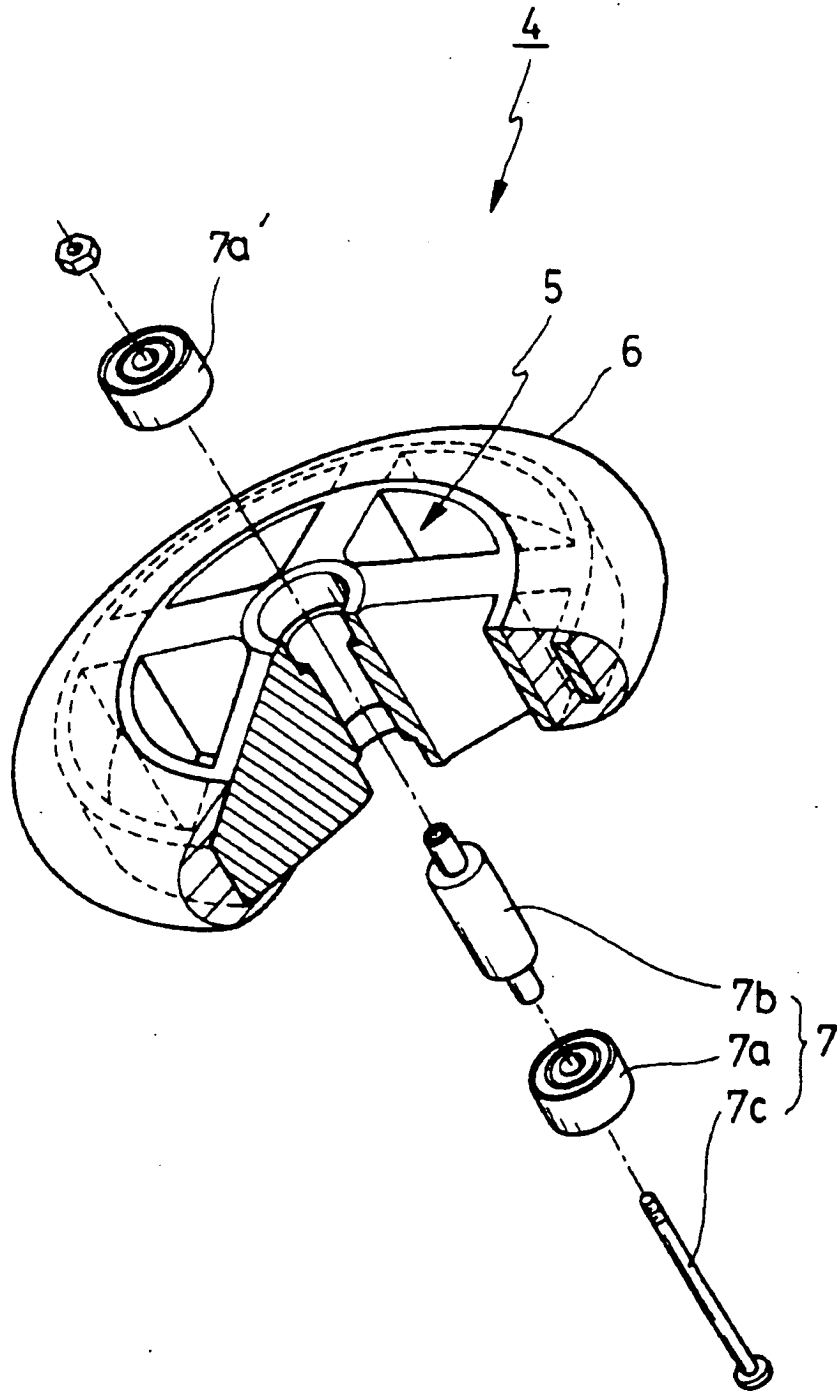


FIG. 3

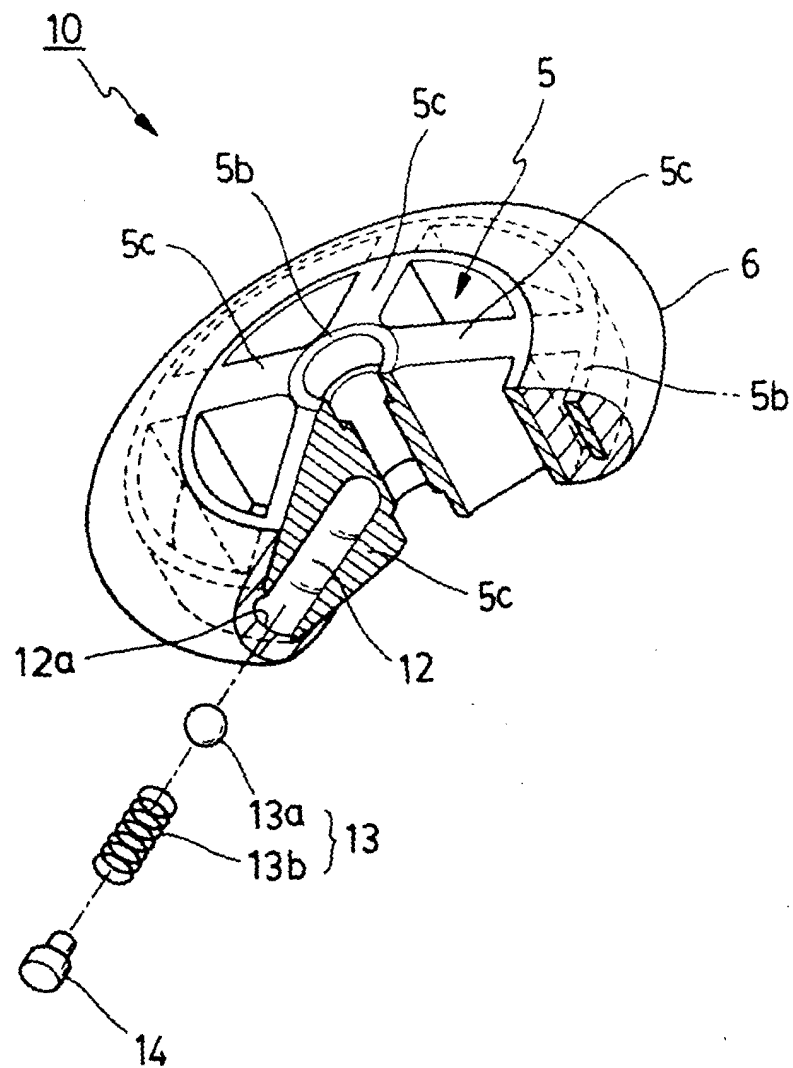


FIG. 4

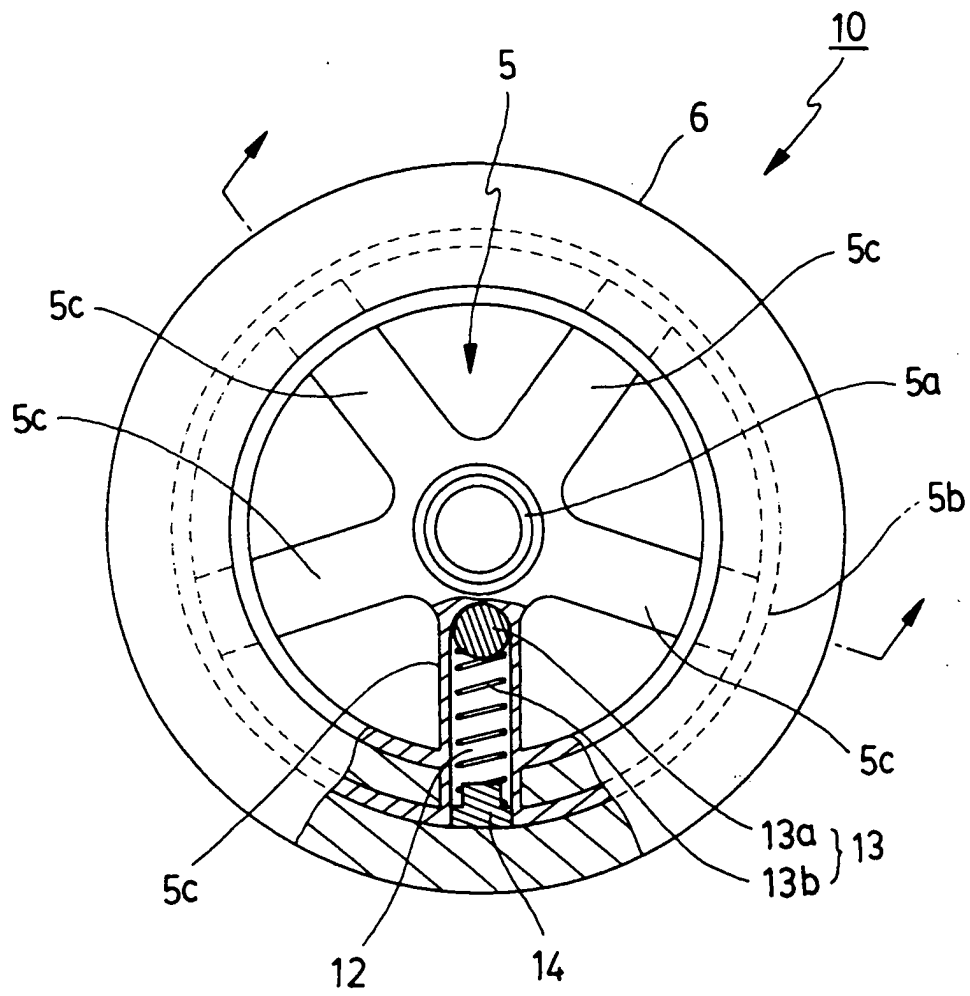
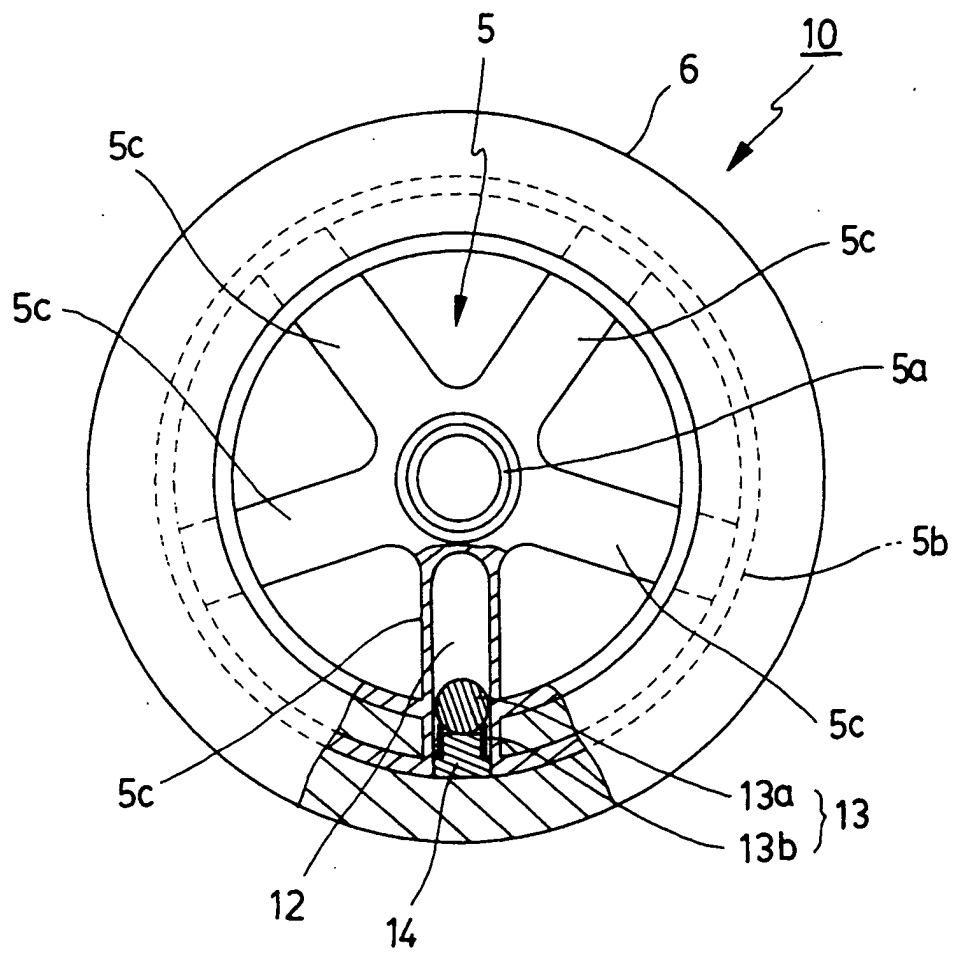


FIG. 5





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 01 3580

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 5 718 438 A (CHO) 17 February 1998 (1998-02-17) * column 7, paragraph 3; figure 7 *	1	A63C17/22
A	WO 00/04542 A (MATSUSHITA EL. IND.CO) 27 January 2000 (2000-01-27) * page 9, paragraph 4 - page 10, paragraph 1; figures 5,9 *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A63C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		30 September 2004	Steegman, R
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 01 3580

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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30-09-2004

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82