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(54) **A LATCHING DEVICE FOR A DETACHABLE SKATE CHASSIS OF A SNEAKER**

(57) The locking device for a detachable skate of sports shoe in accordance with the present invention mainly comprises a rotatable hook, an elastic member, a lever and an engaging wall. The rotatable hook is provided on the detachable skate being adapted to releasably engaging with the engaging wall provided under the sports shoes. The elastic member is provided to bias the rotatable hook and the lever is used to rotate the rotatable hook for assembling or disassembling by means of overcoming bias force of the elastic member.

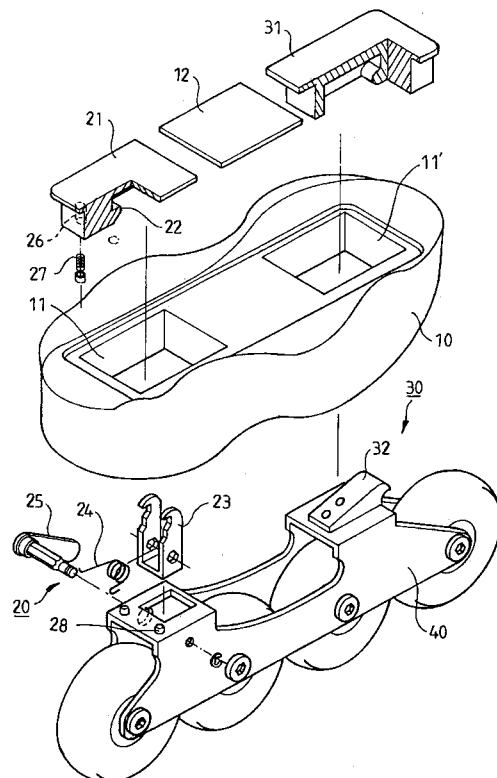


FIG. 1

Description

Background of the Invention

1. Field of the Invention

[0001] The present invention is related to a locking device for a detachable skate of sports shoe and more particularly to a detachable ice/roller skate utilizes a locking device convenient to pivotally engage with or to release from a sports shoe.

2. Description of the Related Art

[0002] The technology trend in skates manufacturing has been toward convertible shoe with a detachable ice/roller skate. Attaching the detachable ice/roller skate to the convertible shoe capable of converting from a shoe into an ice/roller skate at will is known in the art. Also, detaching the detachable ice/roller skate, of course, capable of converting an ice/roller skate into a shoe for walking is known in the art. Thus, a skater can avoid carrying additional footwear for walking or other physical activity when the skates are not in use or are not allowed. A need exists for improved the construction of convertible shoes and facilitating their operation. Currently, with increasing demand for conveniently locking convertible shoes have evolved over the years.

[0003] U.S. Pat. No. 2,998,260, issued on Aug. 29, 1961 to Meyer, discloses a skate shoe and interchangeable roller and ice skates therefor. The skate shoe includes the combination of mounting plate secured beneath the sole of the shoe. This mounting plate is provided with a plurality of headed studs and a lug. A skate has a top plate matching the mounting plate having a plurality of keyhole slots and a locking slot. The keyhole slots are capable of receiving the headed studs when the shoe is placed upon the skate for retaining the shoe assembled with the skate. The lug is capable of inserting into the locking slot so that a screw mount lug and a locking screw thereof is adjusted to abut against the lug to effectively lock the shoe in place upon the top plate of the skate.

[0004] U.S. Pat. No. 6,120,038, issued on Sep. 19, 2000 to Dong et al., discloses a skate having a shoe portion detachably secured to a plurality of longitudinally aligned skate wheels for traversing a surface. The shoe portion having a sole defining a toe end and a heel end. The skate further includes a frame having an upper surface and a lower surface attached to the wheels. The skate also includes a heel latch member rotatably attached to the frame for receiving and coupling to a heel binding attachment surface located in the heel end of the sole to the frame. A lever arm is attached to the heel latch member to selectively release or attach the shoe portion from the heel latch member. The heel latch member is rotatable about a vertical axis extending normal to the elongate direction of the frame. The heel latch

member is rotatable between a locked position, wherein the heel attachment member is nested therein, and an open position, wherein the frame is detachable from the shoe portion to convert the skate into a convention shoe.

5 However, the structure of the heel latch member of No. 6,120,038 is complicated manufacturing process and therefore increases mass production cost.

[0005] A variety of other roller skates are particularly disclosed in U.S. Pat. Nos. 4,333,249; 5,314,199; 5,340,132; 5,507,506; 6,065,759; 6,120,039; 6,164,669
10 for example.

[0006] The present invention intends to provide a locking device of the skate simply comprising of a rotatable hook actuated by an elastic member for conveniently engaging with or releasing from an engaging wall of the sports shoe. The locking device of the skate accomplishes both conveniently combining the skate with the sports shoe and simplifying the entire structure of the skate in such a way to mitigate and overcome the
15 above problem.

Summary of the Invention

[0007] The primary objective of this invention is to provide a pivotal device for a detachable skate of sports shoe, which allows pivotal movement of the detachable skate with respect to the sports shoe during assembling or disassembling operation.

[0008] The secondary objective of this invention is to provide a locking device for a detachable skate of sports shoe comprising of a rotatable hook actuated by an elastic member for conveniently engaging with or releasing from an engaging wall of the sports shoe.

[0009] The another objective of this invention is to provide a locking device for a detachable skate of sports shoe comprising of a rotatable hook engaging with the engaging wall of the sports shoe that accomplishes to simplify the entire structure of the skate.

[0010] The present invention is a locking device for a detachable skate of sports shoe. The locking device mainly comprises a rotatable hook, an elastic member, a lever and an engaging wall. The rotatable hook is provided on the detachable skate being adapted to releasably engaging with the engaging wall provided under the sports shoes. The elastic member is provided to bias the rotatable hook and the lever is used to rotate the rotatable hook for assembling or disassembling by means of overcoming bias force of the elastic member.

[0011] Other objectives, advantages and novel features of the invention will become more apparent from the following detailed description and the accompanying drawings.

Brief Description of the Drawings

[0012] The present invention will now be described in detail with reference to the accompanying drawings herein:

FIG. 1 is an exploded perspective view of the detachable skate of sports shoe in accordance with a first embodiment of the present invention;

FIG. 2 is a partial cross-sectional view of the detachable skate of sports shoe in assembled operation in accordance with the first embodiment of the present invention;

FIG. 3 is a partial cross-sectional view of the detachable skate of sports shoe in a locked position in accordance with the first embodiment of the present invention;

FIG. 4 is a partial cross-sectional view of the detachable skate of sports shoe in released operation in accordance with the first embodiment of the present invention; and

FIG. 5 is an exploded perspective view of the detachable skate of sports shoe in accordance with a second embodiment of the present invention.

Detailed Description of the Invention

[0013] Referring now to the drawings, there are two embodiments of the present invention shown therein, which include generally a primary sports shoe member and a secondary skate member.

[0014] Referring initially to FIG. 1 through 4, a sports shoe 1 in accordance with the first embodiment of the present invention generally includes a sole designated as numeral 10, a locking device designated as numeral 20, a pivotal device designated as numeral 30 and a skate designated as numeral 40. Much of the detailed internal structure of the sports shoe 1 is omitted. The sole 10 comprises two cavities 11 and 11' at its underside each having an appropriate opening so as to contain the locking device 20 and the pivotal device 30 respectively. A pad 12 is fixed between the locking device 20 and the pivotal device 30. In addition, the detachable skate 40 is preferable an in-line roller skate or an ice skate (not shown) and constructs a locking member of the locking device 20 and a pivotal member of the pivotal device 30 on an uppermost portion of a main frame. The main frame (not labeled) essentially comprises a toe end and heel end.

[0015] Construction of the locking device 20 shall be described in detail, referring now to FIGS. 1 and 2. The locking device 20 in accordance with a first embodiment of the present invention mainly includes a locking seat 21, a rotatable hook 23, an elastic member 24 and a lever 25. The locking seat 21 is mounted to the sole 10 in the cavity 11. The locking seat 21 comprises an engaging wall 22 formed with a protrusion. The rotatable hook 23 is projected upward from the heel end of the skate 40 being adapted to releasably engage with the engaging wall 22 of the locking seat 21 in the cavity 11.

The elastic member 24 is provided to bias the rotatable hook 23 and the lever 25 is used to rotate the rotatable hook 23 for disassembling by means of overcoming bias force of the elastic member 24. In addition, the locking seat 21 further comprises a pair of guiding holes 26 and elastic members 27 received therein. The heel end of the skate 40 further comprises a pair of guiding studs 28 being adapted to insert into the guiding holes 26 and thus biased by the elastic members 27.

[0016] The pivotal device 30 in accordance with the present invention allows pivotal movement of the skate 40 with respect to the sports shoe 1 during assembling or disassembling operation. Construction of the pivotal device 30 shall be described in detail, referring again to FIGS. 1 and 2. The pivotal device 30 in accordance with the first embodiment of the present invention mainly includes a pivotal seat 31 and a pivotal hook 32. The pivotal seat 31 is mounted to the sole 10 in the cavity 11'. The pivotal hook 32 is projected upward from the toe end of the skate 40 being adapted to releasably engage with the pivotal seat 31 in the cavity 11' while initially assembling.

[0017] Assembling operation of the skate 40 with the sole 10 is described in third steps, referring now to FIGS. 2 and 3. In first step, the pivotal hook 32 is inserted into the pivotal seat 31. In second step, the skate 40 is rotated a predetermined angle with respect to the pivotal device 30 and the guiding studs 28 is inserted into the guiding holes 26. In third step, the guiding stud 28 is inserted into the guiding hole 26 and the rotatable hook 23 is completely engaged with the engaging wall 22.

[0018] Locked situation of the locking device shall now be described with reference back to FIG. 2. In locked position, the pivotal hook 32 is engaged with the pivotal seat 31 at the toe end of the sole 10 and the rotatable hook 23 is engaged with the locking seat 21 at the heel end. The lever 25 is capable of actuating to unlock the locking device 20 for detaching the skate 40.

[0019] Releasing operation of the locking device 20 shall now be described with reference now to FIG. 4. In releasing operation, the lever 25 is rotated a predetermined angle in clockwise direction to thereby disengage the rotatable hook 23 with the engaging wall 22. As the rotatable hook 23 rotates a predetermined angular distance round its axis, it is disengaged with the engaging wall 22. In released situation, the heel end of the skate 40 is automatically released from the sole 10 by means of bias force of the elastic member 27. The rotatable hook 23 is reciprocated at an original position by means of bias force of the elastic member 25 while releasing the lever 25.

[0020] Referring to FIG. 5, reference numerals of the second embodiment have applied the identical numerals of the first embodiment. The sports shoe 1, the sole 10, the locking device 20, the pivotal device 30 and the skate 40 of the second embodiment have the similar configuration and same functions as the first embodiment and the detailed descriptions are omitted. The

locking device 20 and the pivotal device 30 in accordance with the first embodiment are provided on the heel and toe end of the sole 10 respectively. The positions of the locking device 20 and the pivotal device 30 in accordance with the second embodiment are inter-

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changed in comparison with those of the first embodiment.
[0021] In assembling operation, the pivotal hook 32 provided on the skate is inserted into the pivotal seat 31 provided in the cavity 11' at the heel end of the sole 10. In locked position, the pivotal hook 32 is engaged with the pivotal seat 31 at the heel end of the sole 10 and the rotatable hook 23 is engaged with the locking seat 21 at the toe end.

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[0022] Although the invention has been described in detail with reference to its presently preferred embodiment, it will be understood by one of ordinary skill in the art that various modifications can be made without departing from the spirit and the scope of the invention, as set forth in the appended claims.

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locking device further comprises a guiding hole and a second elastic member and a guiding stud; said second elastic member received in the guiding hole; said guiding hole and second elastic member are provided on said locking seat; said guiding hole provided on the skate to be inserted into said guiding hole and biased by said second elastic member.

5. The sports shoe as defined in claim 1, wherein said rotatable hook is projected upward from the skate.

6. The sports shoe as defined in claim 1, wherein said rotatable hook is projected upward from a heel end of the skate.

7. The sports shoe as defined in claim 1, wherein the skate is an in-line roller skate.

Claims

1. A sports shoe having a locking device of a detachable skate, including a sole pivot-connected to a skate and the locking device, **characterized in that:**

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the sole having a first cavity and a second cavity at its underside;

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a pivot-connected device provided in the first cavity and being adapted to pivotally connect the sports shoe to the skate;

the locking device provided in the second cavity and being adapted to connect the sports shoe to the skate;

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the locking device including a rotatable hook, a locking seat and a lever, said rotatable hook is provided on the skate, said locking seat includes an engaging wall mounted to the sole and is adapted to releaseably engage with said rotatable hook, rotating said lever permits assembling or disassembling said rotatable hook.

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2. The sports shoe as defined in claim 1, wherein the pivotal pivot-connecting device includes a fixed seat mounted to the sole and being adapted to pivotally connect to a fixed hook provided in the skate.

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3. The sports shoe as defined in claim 1, wherein the locking device further comprises a first elastic member provided to bias said rotatable hook, and said lever is used to rotate said rotatable hook by means of overcoming bias force of said first elastic member.

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4. The sports shoe as defined in claim 1, wherein the

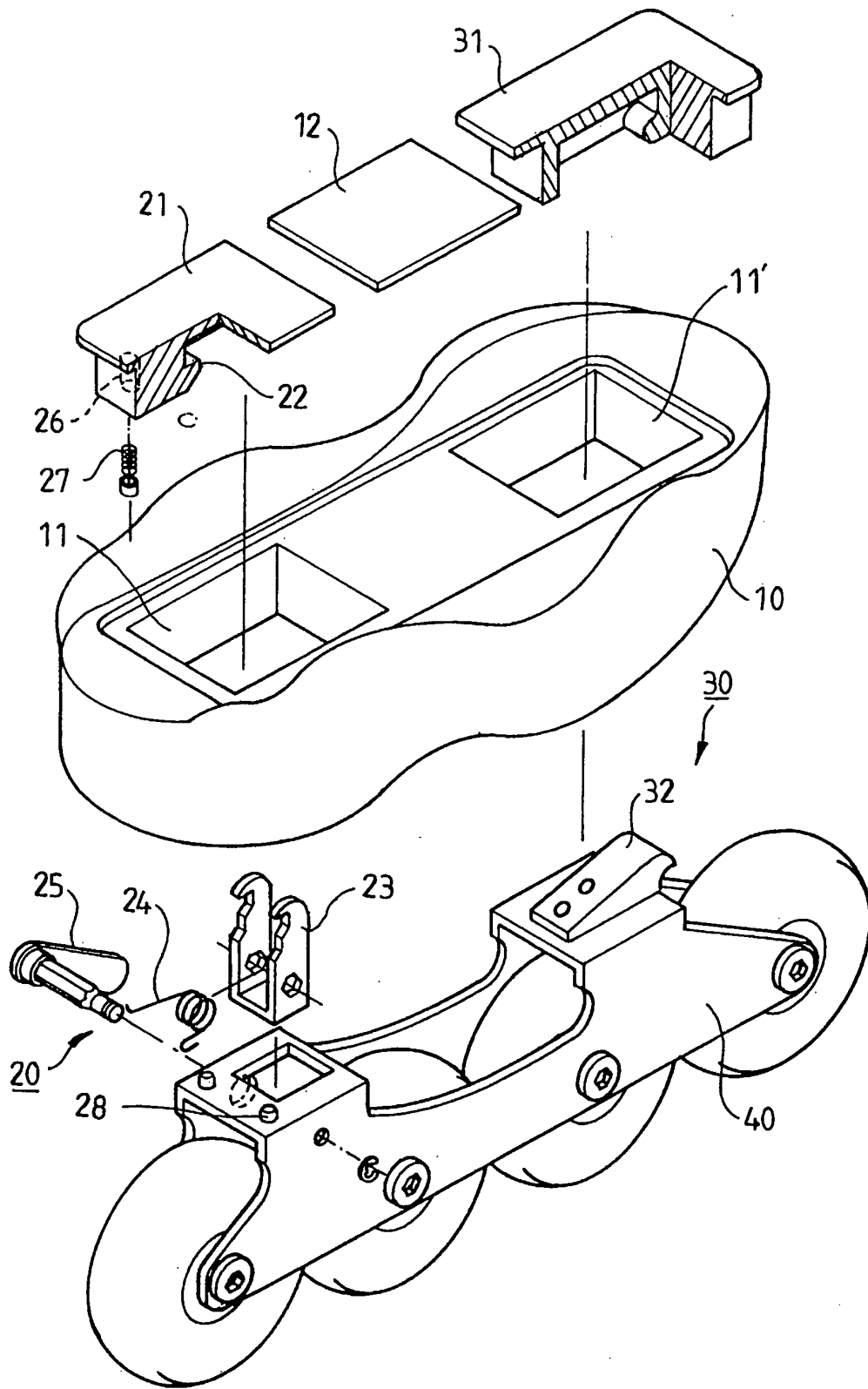


FIG. 1

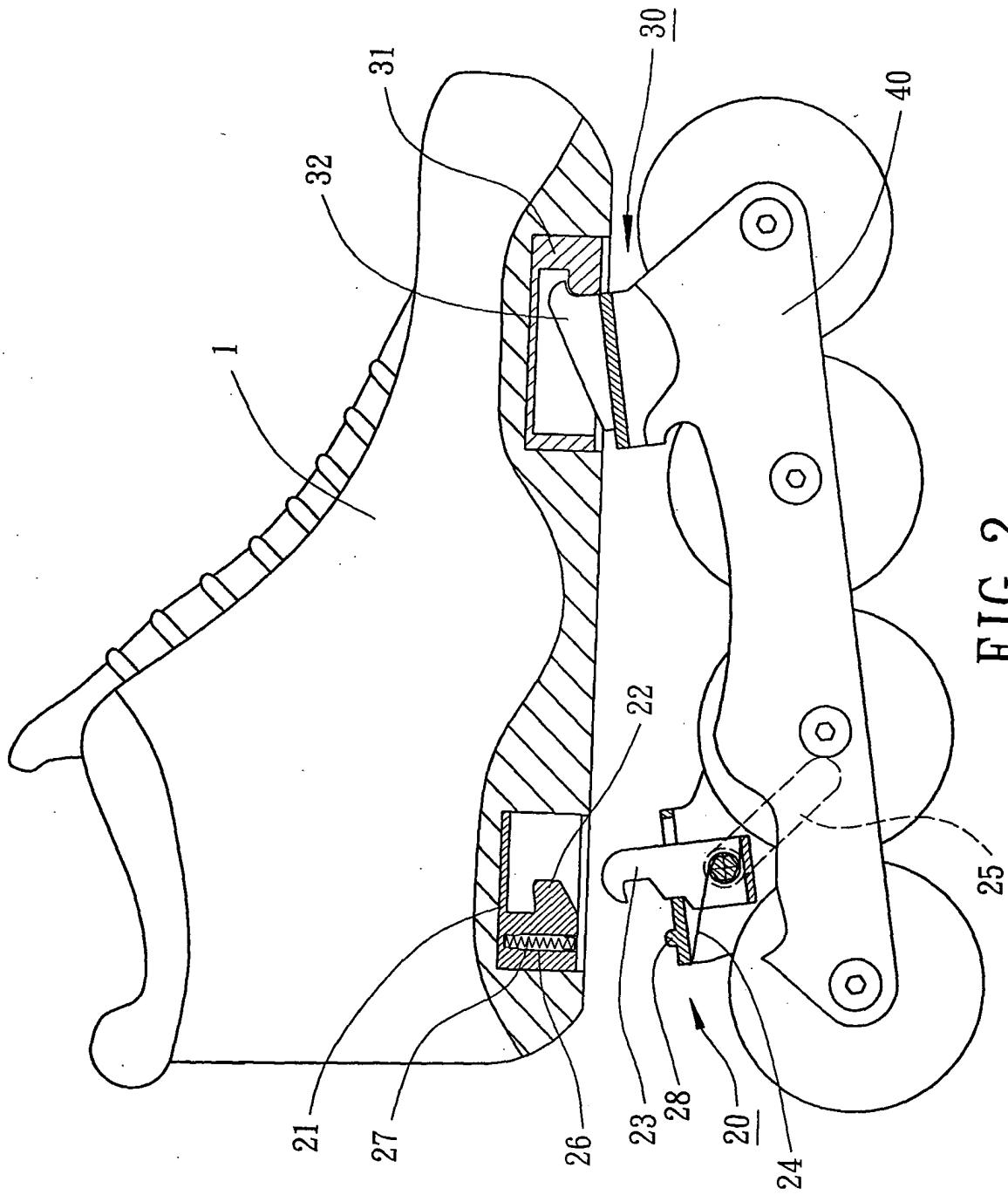


FIG. 2

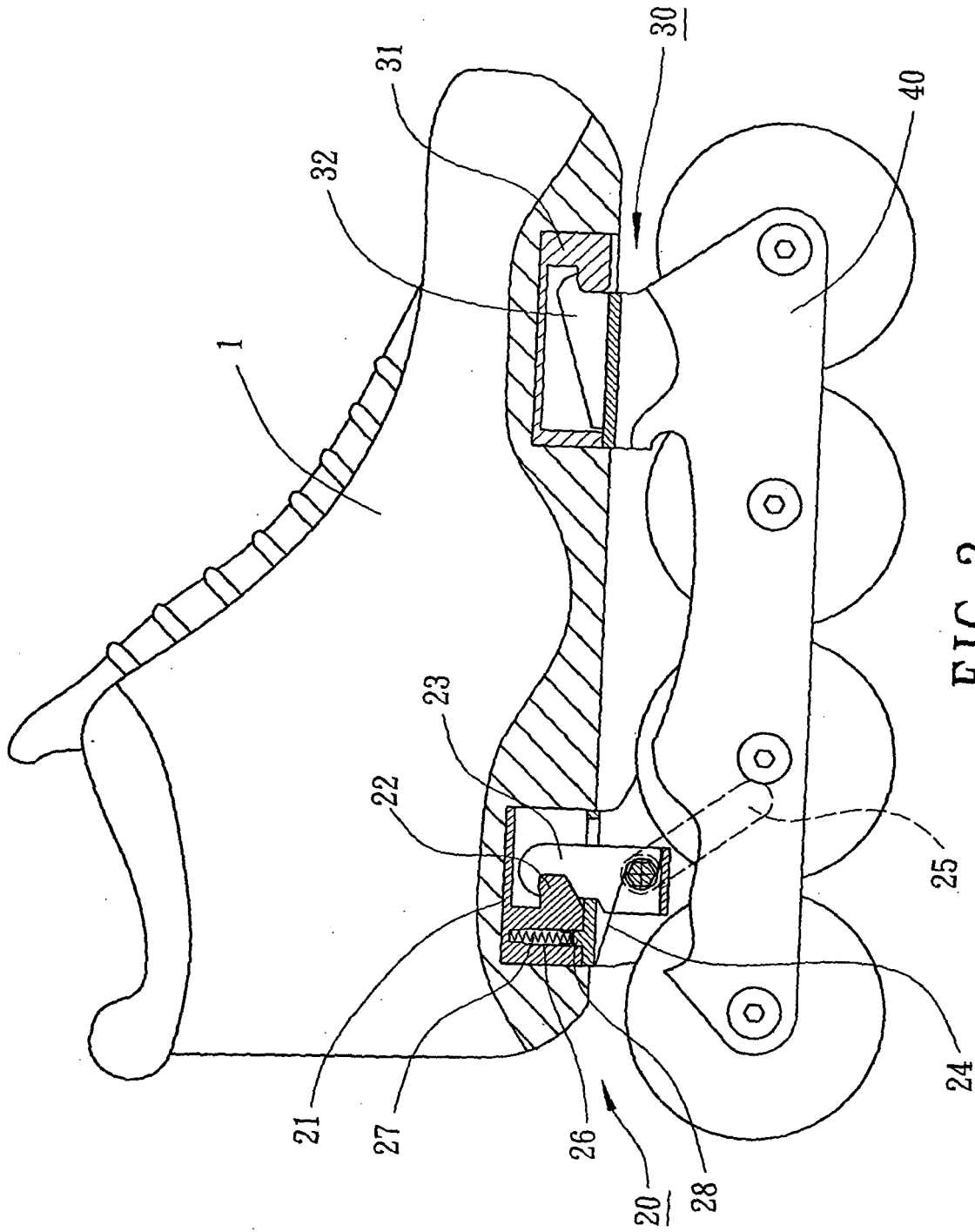


FIG. 3

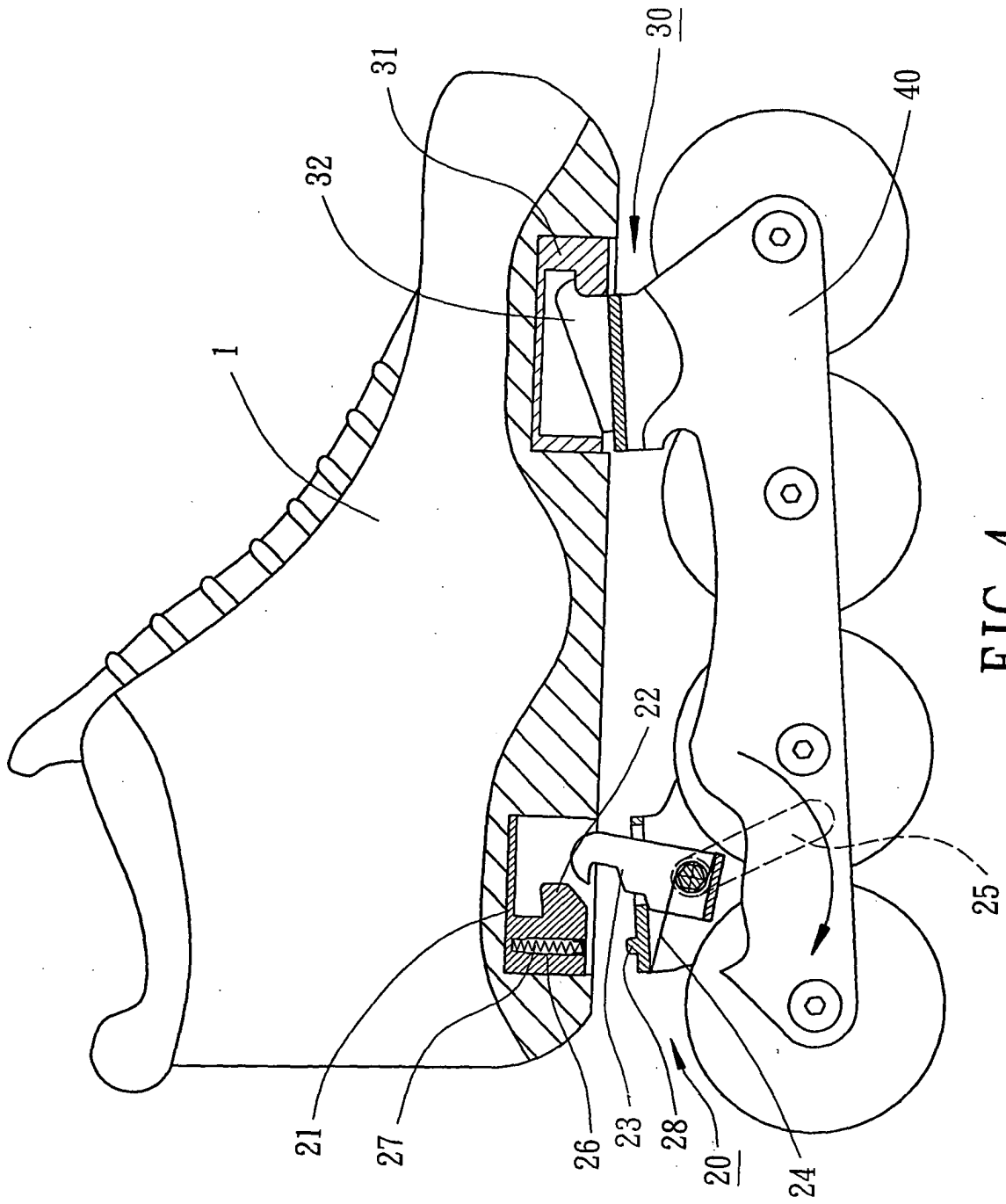


FIG. 4

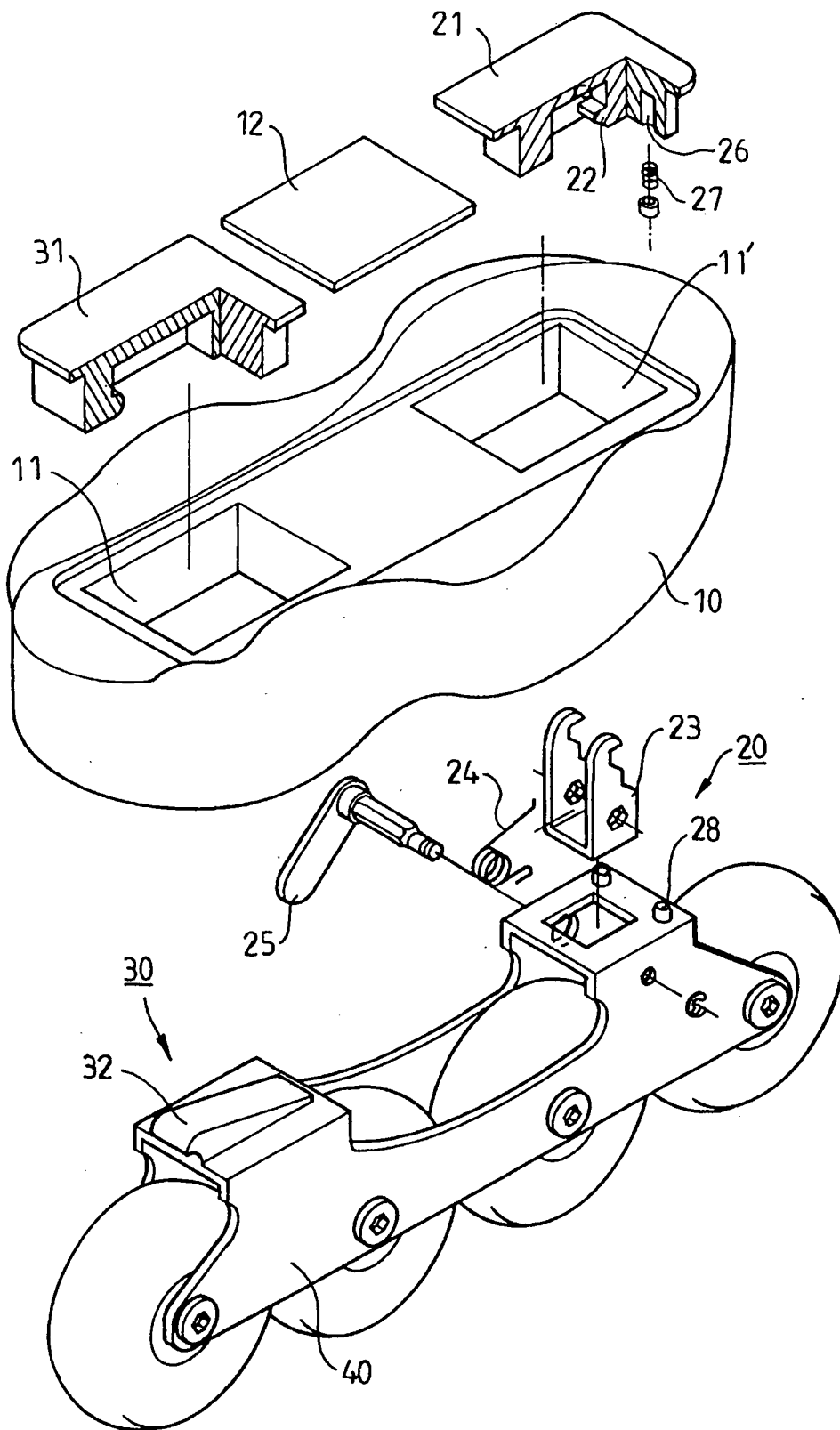



FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN03/00338

A. CLASSIFICATION OF SUBJECT MATTER		
IPC ⁷ : A63C17/18, 1/20 A43B3/24, 5/16 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) IPC ⁷ : A63C A43B3/24,3/00,5/16,5/00		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Chinese Patent Document		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) CNPAT, EPODOC, WPI, PAJ		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	CN,Y,2540801(Chang, Chuncheng)26.Mar.2003 (26.03.03) Whole Document	1-7
X	WO,A1,9902228(TRIPLE-L HANDELS GMBH)21.Jan.1999(21.01.99) Page5, Line29 -Page11, line36, figures 1-7	1-3,5-7
X	CN,Y,2316002(Lin,Kunhe)28.April 1999(28.04.99) Page 2, Figures1-5	1-3,5-7
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X	US,A,5797608(Gaston Haldemann)25.Aug. 1998 (25.08.98) Column 4, Line15-Column 6, Line 18, Figures5-15	1-3,5-7
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	
"L" document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family	
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search 18.July 2003(18.07.03)	Date of mailing of the international search report 31 JUL 2003 1.07.03	
Name and mailing address of the ISA/CN 6 Xitucheng Rd., Jimen Bridge, Haidian District, 100088 Beijing, China Facsimile No. 86-10-62019451	Authorized officer Zhao Jianjun Telephone No. 86-10-62093953	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN03/00338

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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Form PCT/ISA/210 (continuation of second sheet (1)) (July 1998)

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Information on patent family members

International application No.
PCT/CN03/00338

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