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(54) Replaceable wheel assembly in shoe sole

(57) A skating shoe includes a sole (1) having a recess (100) defined in an underside thereof and a frame (10) is fixedly received in the recess so that a wheel (20) is rotatably received between the first side wall and the second side wall of the frame. A slot (13) is defined through the first side wall and communicates with a recess in the first side wall in which one of two shafts (21) of the wheel is engaged. A release assembly (31) is located on an outside of the first side wall and includes a board (313) with a plate (311) extending from a first side of the board. The plate is inserted in the slot and is engaged with one of the shafts. An extension (312) extends from a second side of the board and can be accessed from outside of the sole, such that the wheel is disengaged from the recess by pushing the extension.

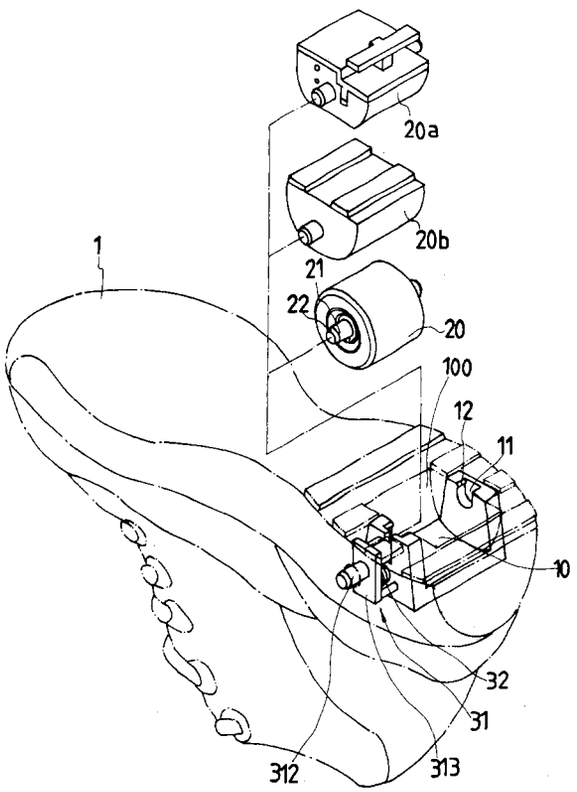

FIG. 4

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Description

[0001] The present invention relates to wheel assembly received in a shoe sole and a release assembly is received in a side of the wheel assembly and may easily remove the wheel assembly from the shoe sole.

[0002] A conventional shoe that includes wheel assemblies is disclosed in U.S. Patent Number 6,308,964B1 and generally includes wheel assemblies fixedly engaged with recesses defined in the shoe sole so that the wearer can skate as roller skates. Nevertheless, the wheel assemblies are fixed to the shoe sole and cannot be removed from the sole so that if the wearer does not want to use the wheel assemblies or if the wheel assemblies are to be replaced, it is difficult to remove the wheel assemblies from the sole. U.S. Patent Number 6,406,038B2 and U.S. Patent Number 6,450,509B2 respectively disclose a shoe with wheel assemblies wherein the wheel assemblies can be disengaged from the shoe sole if needed. However, this removal cannot be completed simply by hands, a proper tool is used to dig the wheel assemblies out from the recesses for receiving the wheel assemblies. Besides, the empty recesses may weaken the structural strength of the shoe sole.

[0003] The present invention intends to provide a replaceable wheel assembly that is easily removed from the recess of the sole by pushing a release assembly on a side of the wheel assembly.

[0004] In accordance with one aspect of the present invention, there is provided a skating shoe that has a sole with a recess in an underside thereof and a frame is fixedly received in the recess. The frame has a first side wall and a second side wall, and each of the first side wall and the second side wall has a notch defined in an inside thereof so that two shafts of a wheel are engaged with the notches. A slot is defined through the first side wall and communicates with the recess in the first side wall. A release assembly is located on an outside of the first side wall and includes a board and a plate which extends from a first side of the board. The plate is inserted in the slot and engaged with one of the shafts. An extension extends from a second side of the board and is accessed from outside of the sole.

[0005] The present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

IN THE DRAWINGS

[0006]

Fig. 1 is an exploded view to show the wheel assembly of the present invention;

Fig. 2 is a cross sectional view to show the wheel assembly and the release assembly in the sole;

Fig. 3 is a cross sectional view to show that the wheel assembly is dug out from the recess by pushing the release assembly;

Fig. 4 is an exploded view to show the wheel assembly of the present invention and a stuff piece and an electric generator for replacing the wheel, and

Fig. 5 shows the wheel is replaced with the stuff piece.

[0007] Referring to Figs. 1, 2 and 4, the skating shoe of the present invention comprises a sole 1 having a recess 100 defined in an underside thereof and a U-shaped frame 10 is fixedly received in the recess 100. The frame 10 has a first side wall and a second side wall, and each of the first side wall and the second side wall has a notch 11 defined in an inside thereof. A slot 13 is defined through the first side wall and communicates with the recess 100 in the first side wall. A recess 14 and two cavities 15 are respectively defined in an outside of the first side wall.

[0008] A wheel 20 is rotatably received between the first side wall and the second side wall of the frame 10. Two shafts 21 extend from two ends of the wheel 20 and each shaft 21 has a tapered annular surface 22. The two shafts 21 are respectively engaged with the two notches 11 of the frame 10. Each notch 11 has a narrow opening 12 so as to retain the shafts 21 in the notches 11.

[0009] A release assembly 31 is located on an outside of the first side wall and includes a board 313 and a plate 311 which extends from a first side of the board 313. The plate 311 is inserted in the slot 13 and has a tapered edge 3111 which is engaged with the tapered annular surface 22 of one of the two shafts 21 of the wheel 20. An extension 312 extends from a second side of the board 313 and can be accessed from outside of the sole 1. A spring 32 is biased between the board 313 and the first side wall of the frame 10. One end of the spring 32 is engaged with the recess 14 in the first side wall of the frame 10 and the other end of the spring 32 is mounted on a protrusion 314 on the first side of the board 313. Two positioning pins 315 extend from the first side of the board 313 and are engaged with two cavities 15.

[0010] As shown in Fig. 3, if the wearer wants to remove the wheel 20 out from the recess 100, he or she simply pushes the extension 312 outside of the sole 1 and the tapered edge 3111 pushes the tapered annular surface 22 of the shaft 21 outward so that the wheel 20 is easily removed. As shown in Fig. 5, a stuff piece 20b is easily engaged with the recess 100 as the way of the installation of the wheel 20. An electric generator 20a as disclosed in DE 202 14 586U1 can be used to be received in the recess 100.

[0011] While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the

scope of the present invention.

Claims

1. A skating shoe comprising:

   a sole having a recess defined in an underside thereof and a frame fixedly received in the recess, the frame having a first side wall and a second side wall, each of the first side wall and the second side wall having a notch defined in an inside thereof, a slot defined through the first side wall and communicating with the recess in the first side wall;
   a wheel rotatably received between the first side wall and the second side wall of the frame, two shafts extending from two ends of the wheel and respectively engaged with the two notches of the frame, and
   a release assembly located on an outside of the first side wall and including a board and a plate which extends from a first side of the board, the plate inserted in the slot and engaged with one of the shafts, an extension extending from a second side of the board and being accessed from outside of the sole.

2. The skating shoe as claimed in claim 1, wherein each shaft has a tapered annular surface and the plate of the release assembly has a tapered edge which is engaged with the tapered annular surface of one of the two shafts of the wheel.

3. The skating shoe as claimed in claim 1, wherein a spring is biased between the board and the first side wall of the frame.

4. The skating shoe as claimed in claim 1, wherein two positioning pins extend from the first side of the board and the first side wall of the frame includes two cavities for receiving the two positioning pins.

5. The skating shoe as claimed in claim 1 further comprising a stuff piece which is received in the recess when the wheel is removed from the recess.

6. The skating shoe as claimed in claim 1 further comprising an electric generator which is received in the recess when the wheel is removed from the recess.

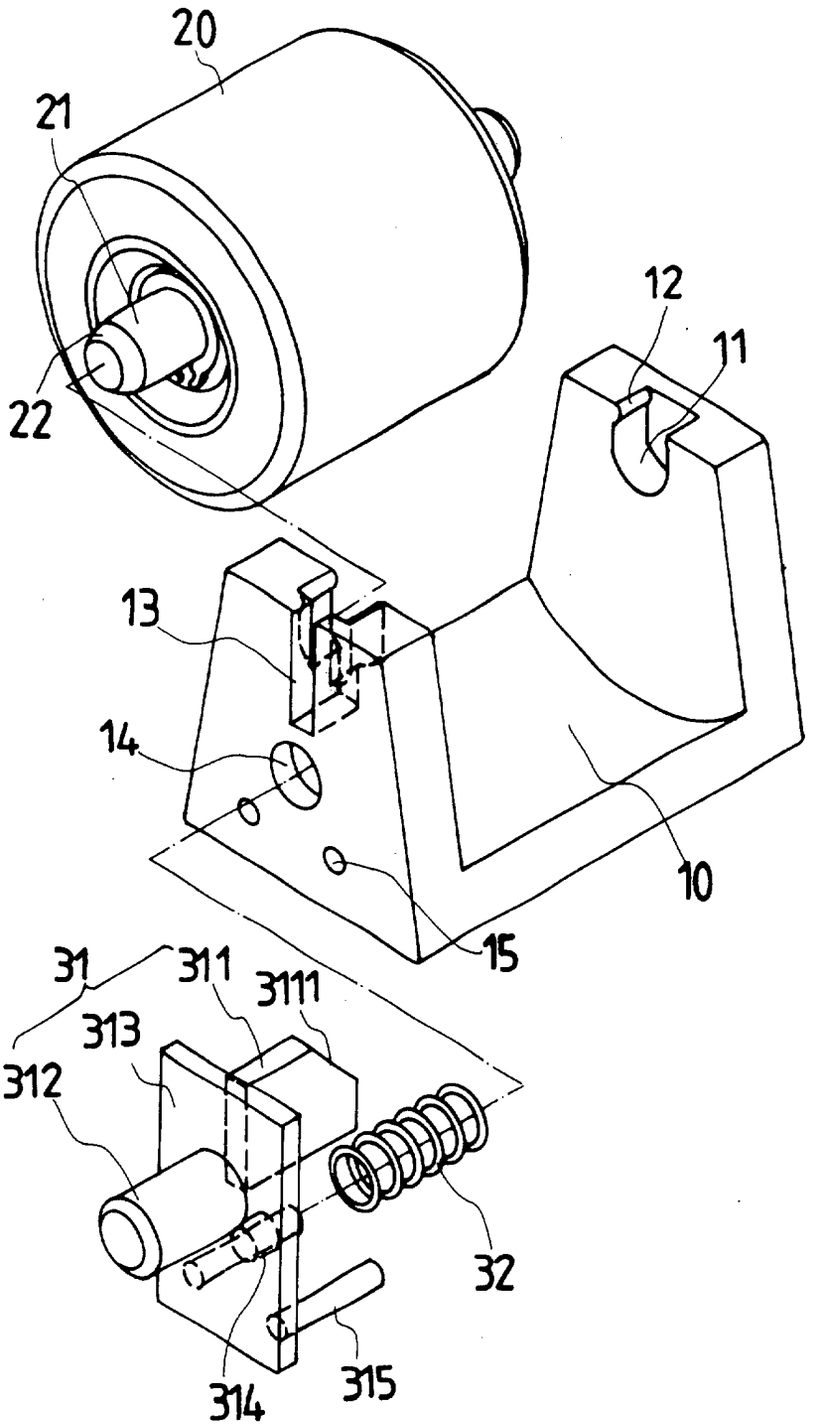

FIG. 1

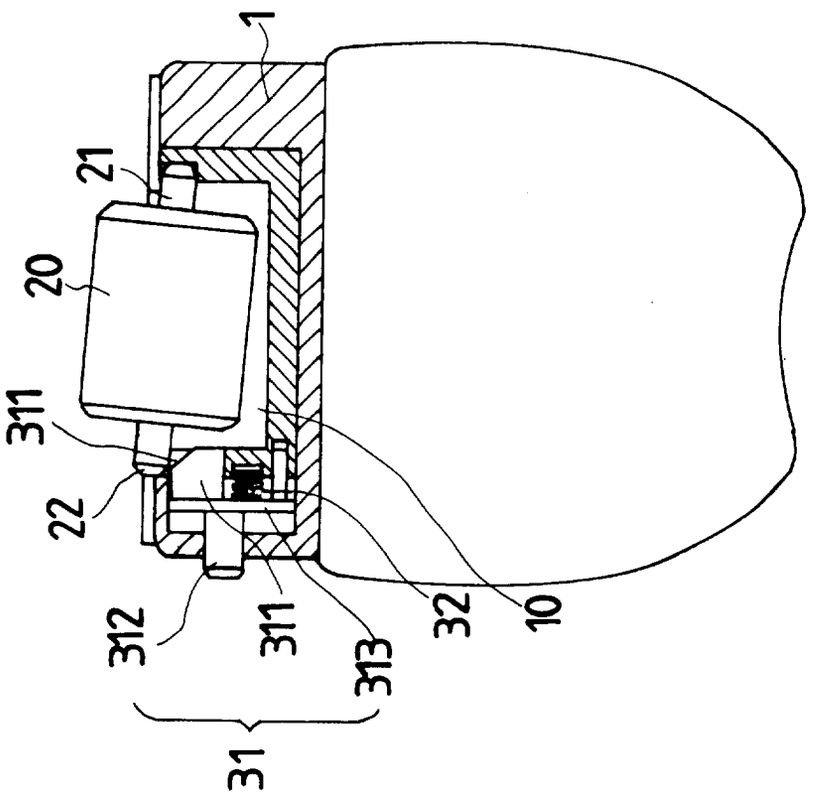

FIG. 3

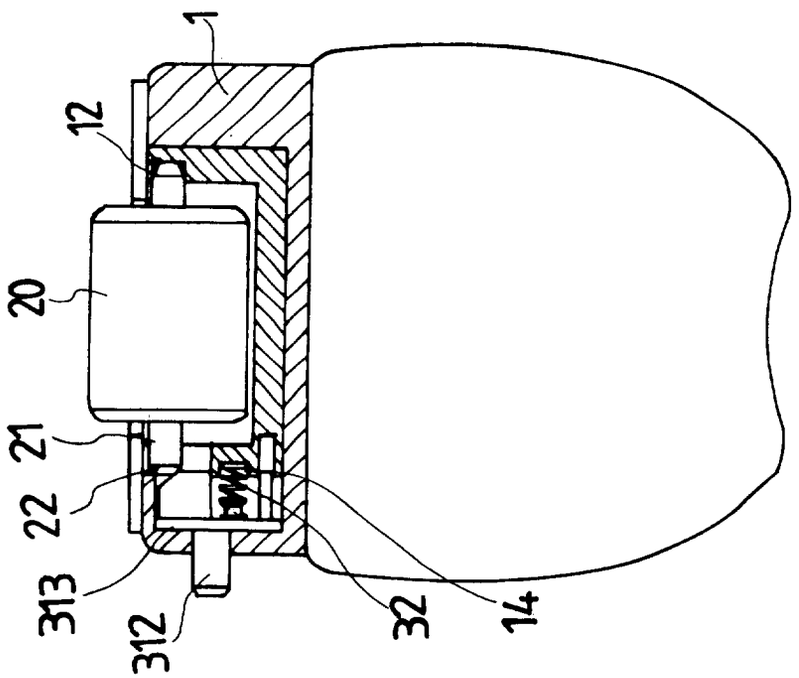

FIG. 2

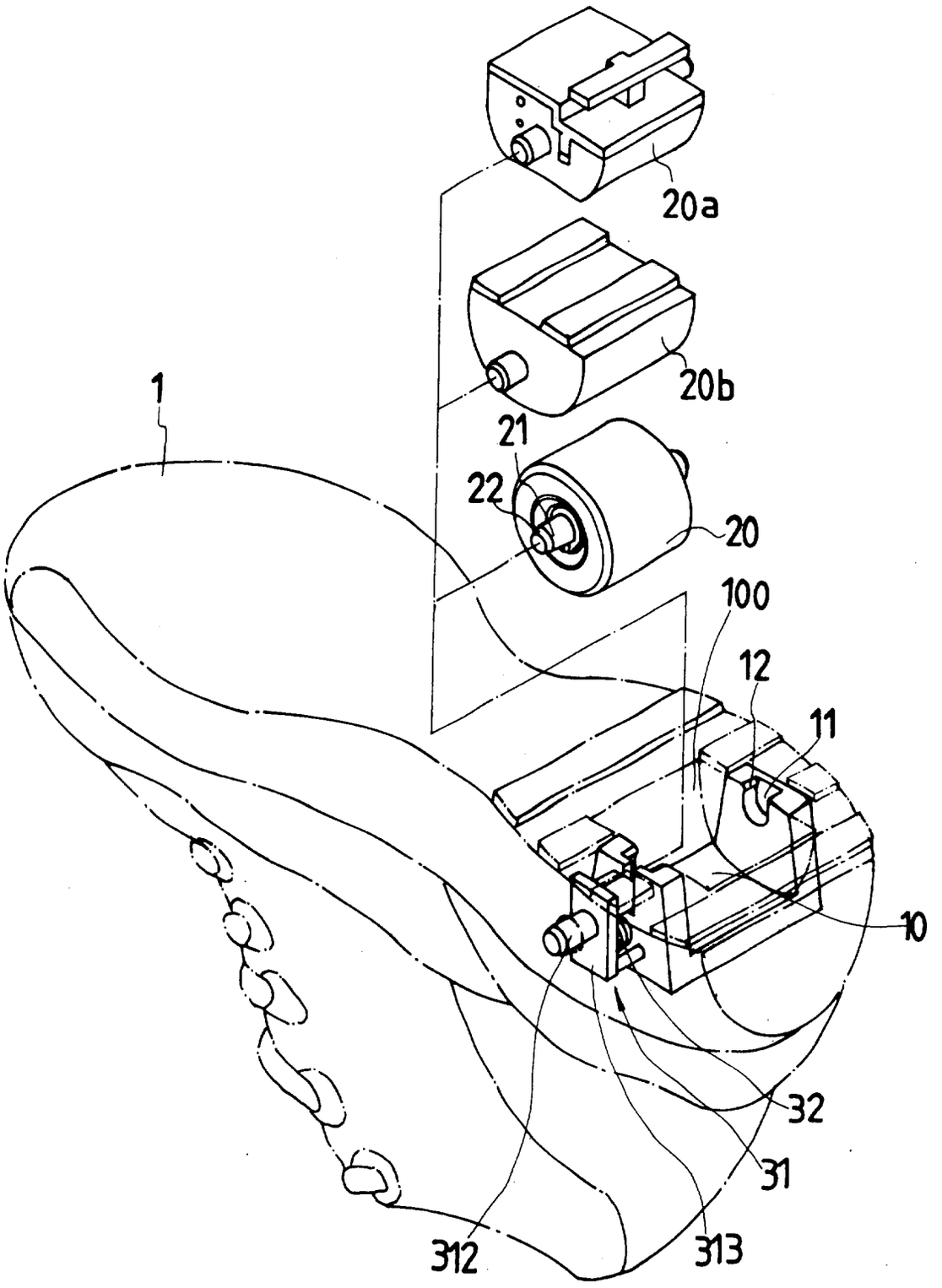

FIG. 4

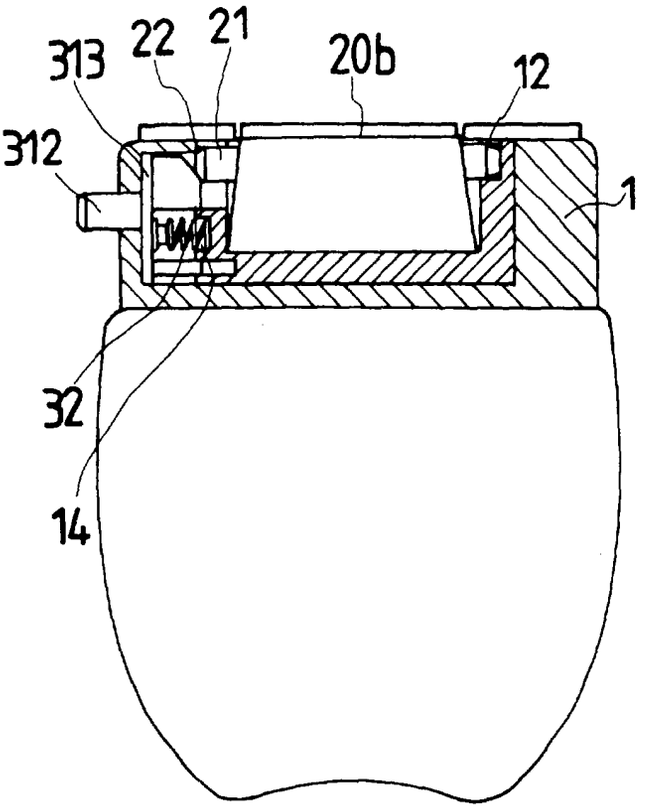

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 03 01 2084

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	2 October 2003	Brunie, F

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 03 01 2084

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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