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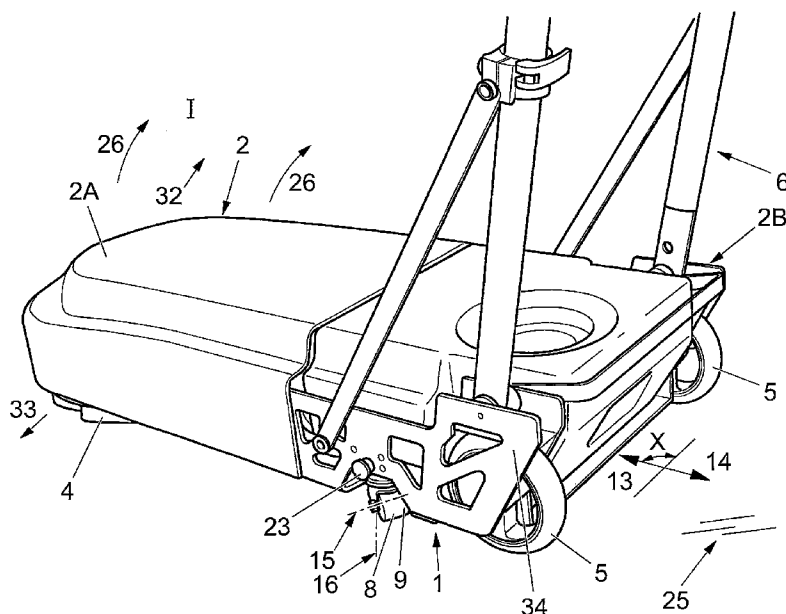
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(54) Title: DEVICE FOR A CLEANING MACHINE



(57) Abstract: The invention relates to a device for a cleaning machine (2), which comprises a rotatable scrubbing-brush (4) situated at the front portion (2A) of the machine, and a number of transport roller members (5) situated at the rear portion (2B) of the machine, as well as a manually actuatable handle (6) for the operation of the machine. According to the invention, runner members (8) are arranged between said scrubbing-brush (4) and transport roller members (5), and the respective tread (9) of which is situated on a lower level (10) in comparison with the tread (12) of said transport roller members (5) when the machine (2) is kept in a scrubbing-ready position (I) in order to allow running of the machine at an angle (X) to the transport direction (13, 14) thereof.

Device for a cleaning machine

5 The present invention relates to a device for a cleaning machine, which comprises a rotatable scrubbing-brush situated at the front portion of the machine, and a number of transport roller members situated at the rear portion of the machine, as well as a manually actuatable handle for the operation of the machine.

10 EP 1354548 A2 relates to a care machine (50) for floors (58) and that comprises double pairs of wheels (108; 110) and the front pair of wheels (108) of which is arranged to abut against a base (58) when the machine processes the base. See Figure 2.

15 It is not mentioned if said pair of wheels (108) is arranged to be rotatably mounted around a vertical axis also but only around a horizontal axis, which is shown in the drawings. For the elevation of the entire machine from the base (58), there is present the rear pair of wheels (110) mounted around a horizontal axis (120, 22). See Figure 3.

20 This known machine is constructed and arranged to function entirely differently than the machine including a device intended to be provided according to the present invention.

25 No pair of wheels at all that is turnably mounted around a vertical axis is present in this known machine. It could neither be regarded as obvious to a person skilled in the art having knowledge about the double parallel wheel shafts to arrange such a device having the front pair of wheels mounted around a vertical turning axis, so that the machine is allowed to be run at an angle to the normal transport direction thereof.

30 Known cleaning machines having a scrubbing function, and which then are arranged to be moved laterally or

at least at an angle to the normal transport direction of the machine, are arranged to rest on the scrubbing-brush during progressing cleaning with the machine. Upon transportation of the machine, when it is transported to and from, respectively, intended cleaning-area locations, it is arranged to be held in a backwardly turned position so that the scrubbing-brush is kept in an elevated position and then clears from the base. Thus, upon scrubbing with the machine, thereby the entire weight of the machine rests only on said rotatable scrubbing-brush, which entails that a considerable force has to be applied to the machine in order to prevent the frame thereof from rotating opposite to the active direction of rotation of said brush. If it is desired that the machine should move laterally, the handle of the machine has also to be actuated to turn so that the rotatable scrubbing-brush, which is mounted to be rotated around a vertically directed mounting axis, is turned laterally and then drives the machine in the direction that the handle is turned.

This may be cumbersome since the machine then seems to live its own life and determines itself in which direction it desires to move.

To scrub floors with such a scrubbing machine requires great strength and therefore it is desired to solve said problem so that the machine easily should be runnable also in the lateral direction.

Said object is attained by means of a device according to the present invention, which essentially is characterized in that, between said scrubbing-brush and transport roller members, runner members are arranged, in order to allow running of the machine at an angle to the transport direction thereof, and the respective tread of which is situated on a lower level in comparison with the tread of said transport roller members when the machine is kept in a scrubbing-ready

position, and that said respective runner member is formed of a wheel or a roll that is mounted rollable around a substantially horizontal roll axis and turnable around a substantially vertical turning axis.

5 The invention is described below in the form of a preferred embodiment example, reference being made to the accompanying drawings, in which

Fig. 1 shows in perspective a cleaning machine obliquely from behind, obliquely from above and obliquely from
10 the side,

Fig. 2 shows the cleaning machine straight from below,

Fig. 3 shows the rear portion of the cleaning machine as seen laterally,

15 Fig. 4 shows the machine with raised handle as seen laterally,

Figs. 5-7 show runner members in an exploded view and in an assembled state from different directions, and

Fig. 8 shows the frame of the machine including
20 frame side parts.

A device 1 for a cleaning machine 2, which comprises a scrubbing-brush 4 or similar scrubbing, dust or polishing brush situated at the front portion 2A of the machine and being rotatable around a vertical mounting axis 3, which
25 brush has connecting liquid-sealing members 50, which collect scrubbing water for the suction of the slops, and a number of transport roller members 5 situated at the rear portion 2B of the machine, as well as a manually actuatable handle 6 for the operation of the machine, is shown as examples in Figs. 1-4 in
30 the drawings.

According to the present invention, in the area 7 between said scrubbing-brush 4 and transport roller members 5, there are arranged a number of runner members 8, and the re-

spective tread 9 of which is arranged to be situated on a lower level 10 than the elevated level 11 on which the tread 12 of said transport roller members is situated when the machine 2 is kept in a scrubbing-ready position I in order to allow running
5 of the machine at an angle X to the transport direction 13, 14 thereof.

Said respective runner member 8 is formed of a wheel or a roll that is rollably mounted around a substantially horizontal roll axis 15 and turnable 360° around a substan-
10 tially vertical turning axis 16 in common line with the vertical centre plane 17 of the respective transport roller members.

The runner members 8, which are freely rotatable around said horizontal roll axis 15 and freely turnable around said vertical turning axis 16, are situated at the re-
15 spective side edge 18, 19 of the machine 2.

In order to provide efficient supporting of said runner members 8, the same are mounted held by L-shaped holders 20, which are connected with the side-edge frame 21, 22 of the machine arranged to extend vertically along the respec-
20 tive side A, B of the machine 2.

Said holders 20 are arranged in such a way that they, by means of height-adjustment members 23, 24 arranged at the respective runner member 8 in order to allow height adjustment of the runner members 8 as the scrubbing-brush 4 is worn
25 down, are able to adjust the level 10 of said runner members 8.

The level 10, on which the scrubbing-brush 4 and the runner members 8 operate, is normally the floor 25 that is intended to be scrubbed by means of the machine 2, while the level 11, on which said transport roller members 5, e.g., a
30 pair of laterally positioned wheels, are situated and arranged to rest in the scrubbing position I, is on a greater height than where the level 10 and the floor 25 are situated. Turning back of the machine 2 by means of the handle 6 makes that the

front portion 2A of the machine is tipped up in the direction of the arrow 26, so that the wheels 5 contact the floor 25 and that the machine then can be run freely with both the scrubbing-brush 4 and the runner members 8 held in an elevated position, free from the floor 25, to the desired location.

The respective runner member 8 is arranged to be freely rotatable around a substantially horizontal axis 15 arranged to extend between a pair of flanges 27 of said holder 20, which is turnably mounted around said vertical turning axis 16.

Said runner members 8 are arranged to be operable within a semicircular recess 28 of the base frame 29 of the machine at the respective side edges 30, 31 thereof opposite each other, and outside said recess 28, respectively, laterally of the machine 2.

The holders 20, which are formed of L-shaped flat irons, are articulately attached to the U-shaped roll holder 41 with the bottom flange 20A thereof via a swivel bolt 40 so that the parts can be mutually rotated, around the vertical axis 16 of said bolt in the mounted position on the machine 2. By means of bolts, not shown, received in holes 42 and grooves 43 in the chassis parts 21, 22, the holders 20 are clamped to the chassis.

Height adjustment of the runner members 8 is allowed by means of said height-adjustment members 23, 24. The same may be formed of spring-loaded actuation buttons, the tip portion 143 of which is arranged to be received in mating recesses 44 formed in a line closely together for the formation of a slot-shaped opening in the vertical flange 20B of the holder.

Thus, switching of the height setting of the runner members 8 is effected by extracting the button 23 so that the tip portion 143 thereof comes out of position from the

recess 44 and the holders 20 may then be brought optionally upward or downward to desired positions where the runner members 8 reach the base in a desired intended set position.

Next, when said buttons 23, 24 on both sides of
5 the machine are released, the tip-edge portions 143 can be inserted into the mating recesses 44 that are right opposite said tip portion 143, and then the holders 20 having runner members 8 supported thereby are clamped steadily, and that the same, after that, freely can roll on the base 25 on the appropriate
10 level 10 while the scrubbing is carried out with the machine.

By means of the handle 6, the machine 2 can easily be operated to be run in the intended direction 13, 14 and 32, 33, respectively. By the fact that the handle 6, which is formed of pair-wise arms and supporting joints 35 turnably
15 mounted at the rear portion 2B of the machine to the frame via pivot joints 34, and which can be turned between an upright scrubbing position I and a forwardly turned and backwardly turned horizontal transport and low-height-scrubbing position, respectively, the machine 2 can be used on locations that normally are difficult to get access to for scrubbing and is easy
20 to carry along or be run on the ground as a thin suitcase, respectively.

By means of clamping members 36, the handle 6 is locked in a desired set position.

25 Furthermore, the machine 2 works so that it both scrubs and sucks up the scrubbing water with one and the same machine 2. Before the scrubbing starts, liquid is sprayed out on the floor a certain time before the scrubbing-brush 4 is started to rotate, which makes that the floor 25 always is
30 processed with liquid and that dry scrubbing does not occur, which may damage the floor and the surface thereof.

The function of the invention should be clear from what has been described above and by means of the draw-

ings. By just holding the handle 6, now it is possible to readily bring the machine 2 to move in the desired direction, and thanks to said rotatably mounted runner members 8, the machine 2 can easily move in a desired lateral direction 32, 33 without
5 obstacle. By in such a way weighing down the handle 6 rearward, the scrubbing-brush 4 are raised, and said runner members 8 and the machine 2 then only roll on the two transport wheels 5 situated rearward and can in that connection easily be transported on the floor to an intended scrubbing location or storage
10 age location.

Naturally, the invention is not limited to the embodiments described above and shown in the accompanying drawings. Modifications are feasible, particularly as for the nature of the different parts, or by using an equivalent technique,
15 without departing from the protection area of the invention, such as it is defined in the claims.

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CLAIMS

5 1. Device (1) for a cleaning machine (2), which comprises a rotatable scrubbing-brush (4) situated at the front portion (2A) of the machine, and a number of transport roller members (5) situated at the rear portion (2B) of the machine, as well as a manually actuatable handle (6) for the operation
10 of the machine, **characterized in** that, between said scrubbing-brush (4) and transport roller members (5), runner members (8) are arranged, in order to allow running of the machine at an angle (X) to the transport direction (13, 14) thereof, and the respective tread (9) of which is situated on a lower level (10)
15 in comparison with the tread (12) of said transport roller members (5) when the machine (2) is kept in a scrubbing-ready position (I), and that said respective runner member (8) is formed of a wheel or a roll that is rollably mounted around a substantially horizontal roll axis (15) and turnable around a
20 substantially vertical turning axis (16).

2. Device according to claim 1, **characterized in** that said runner members (8) are turnable 360°.

25 3. Device according to any one of the preceding claims, **characterized in** that said turning axis (16) is substantially aligned with the vertical centre plane (17) of the respective transport roller members.

30 4. Device according to any one of the preceding claims, **characterized in** that the runner members (8) are freely rotatable around said horizontal roll axis (15).

5. Device according to claim 4, **characterized in** that the runner members (8) are freely turnable around said vertical turning axis (16).

5 6. Device according to any one of claims 1-5, **characterized in** that the runner members (8) are situated at the respective side edge (18, 19) of the machine (2).

7. Device according to claim 6, **characterized in**
10 that said runner members (8) are mounted in L-shaped holders (20) connected with the side-edge frame (21, 22) of the machine that extends vertically along the respective side (A, B) of the machine (2).

15 8. Device according to claim 7, **characterized in** that the runner member (8) is arranged to be freely rotatable around a substantially horizontal axis (15) that extends between flanges (26) of said holder (20), which is turnably mounted around said vertical turning axis (16).

20 9. Device according to any one of claims 1-8, **characterized in** that the runner members (8) are arranged to be operable within a semicircular recess (28) of the base frame (29) of the machine at the respective edges (30, 31) thereof
25 opposite each other, and outside said recess (28), respectively, laterally of the machine (2).

10. Device according to any one of claims 1-9, **characterized in** that height-adjustment members (23, 24) are
30 arranged at the respective runner member (8) in order to allow height adjustment of the runner members (8) as the scrubbing-brush (4) is worn down.

11. Device according to claim 10, **characterized in** that height adjustment of runner members (8) is arranged to be effected by means of said height-adjustment members (23, 24), which are formed of spring-loaded actuation buttons, the tip
5 portion (143) of which is arranged to be received in mating recesses (44) formed in a line closely together for the formation of a slot-shaped opening in the vertical flange (20B) of the holder.

10 12. Device according to claim 11, **characterized in** that switching of the height setting of the runner members (8) is arranged to be effected by extracting the button (23) so that the tip portion (143) thereof comes out of position from the recess (44) and the holders (20) are then brought option-
15 ally upward or downward to desired positions where the runner members (8) reach the base in a desired intended set position, and that, when said buttons (23, 24) on both sides of the machine are released, the tip-edge portions (143) can be inserted into the mating recesses (44) that are right opposite said tip
20 portion (143), and then the holders (20) having runner members (8) supported thereby are clamped, and that the same, after that, freely can roll on the base (25) on the appropriate level (10) while the scrubbing is carried out with the machine.

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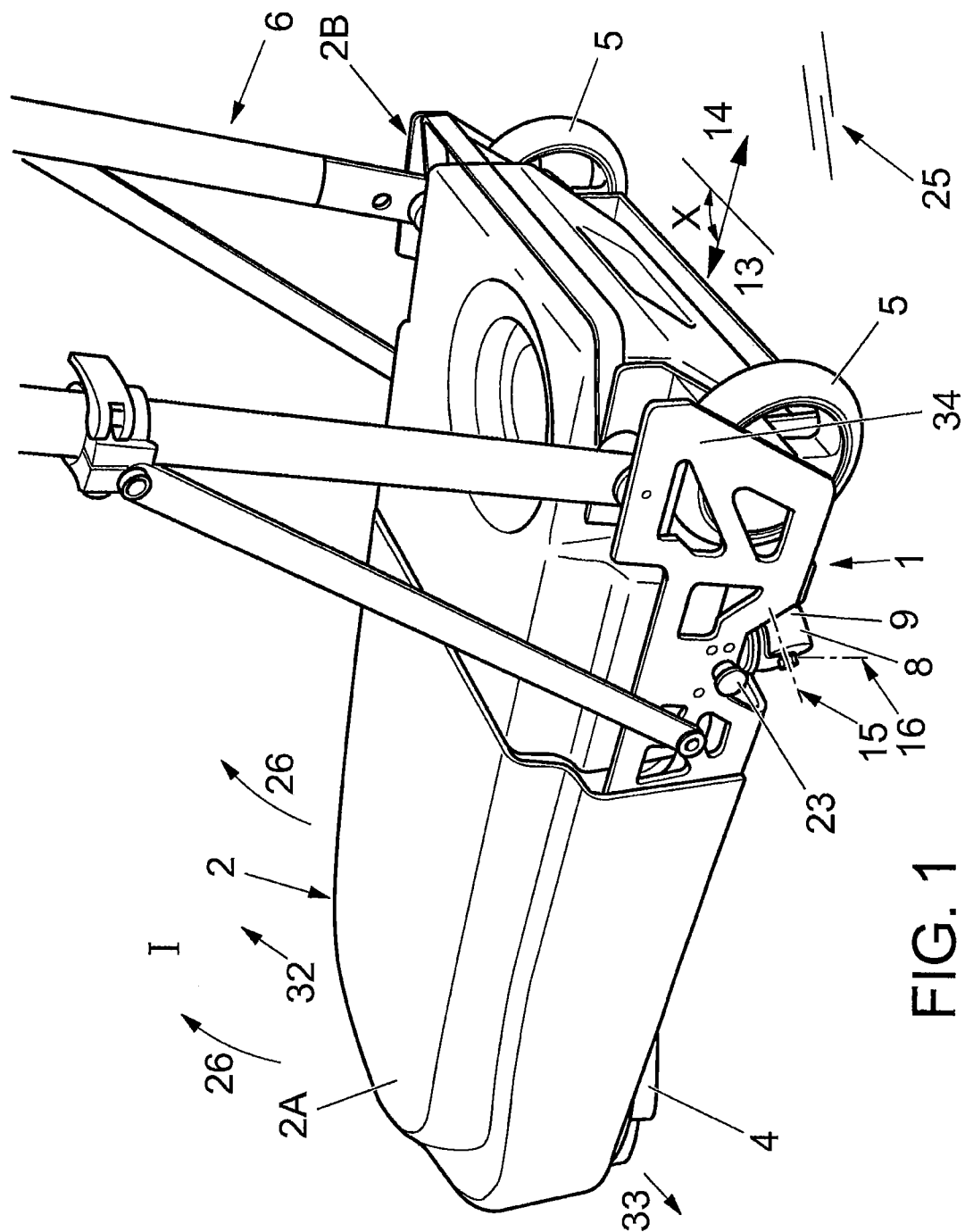


FIG. 1

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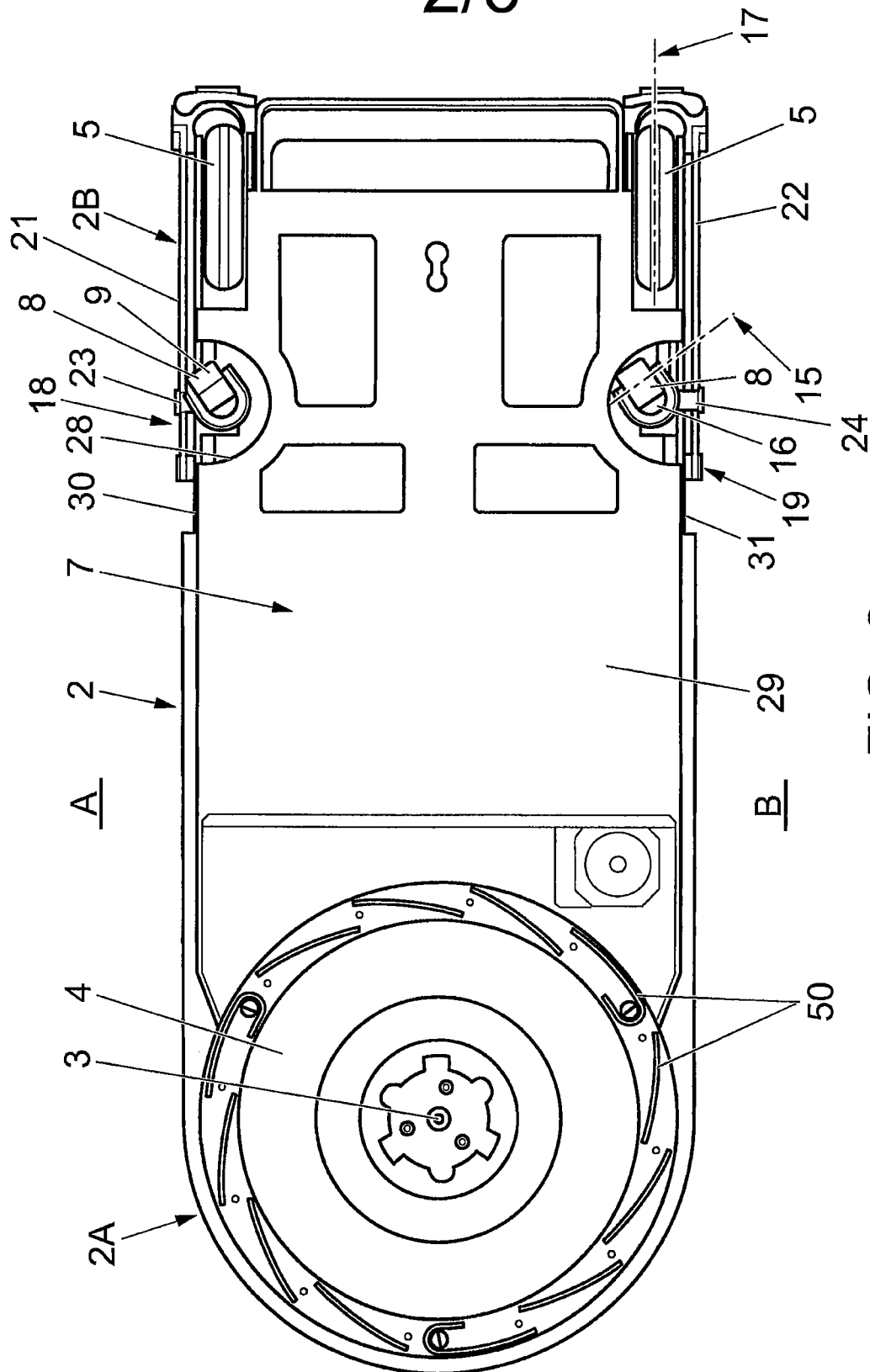


FIG. 2

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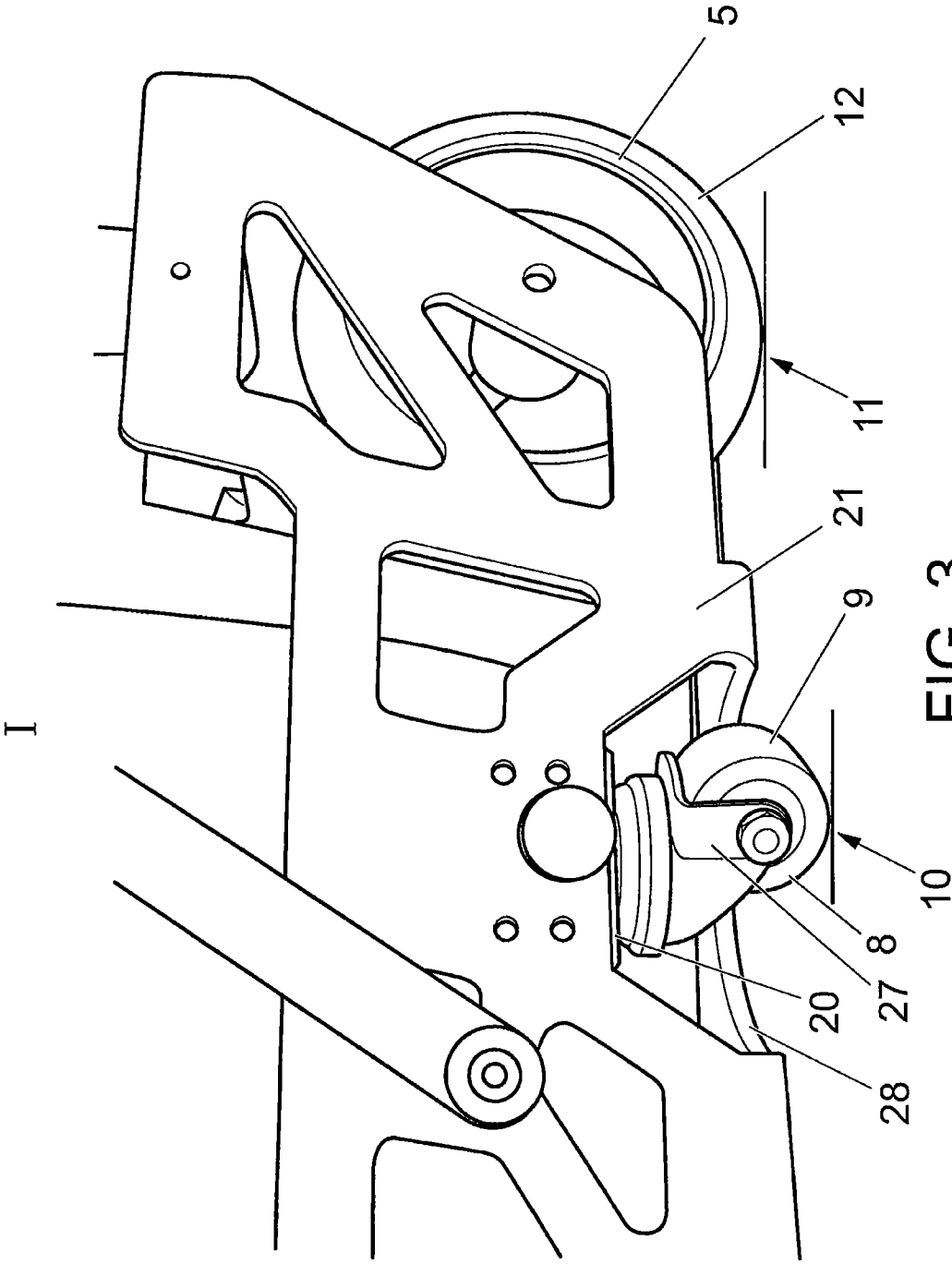


FIG. 3

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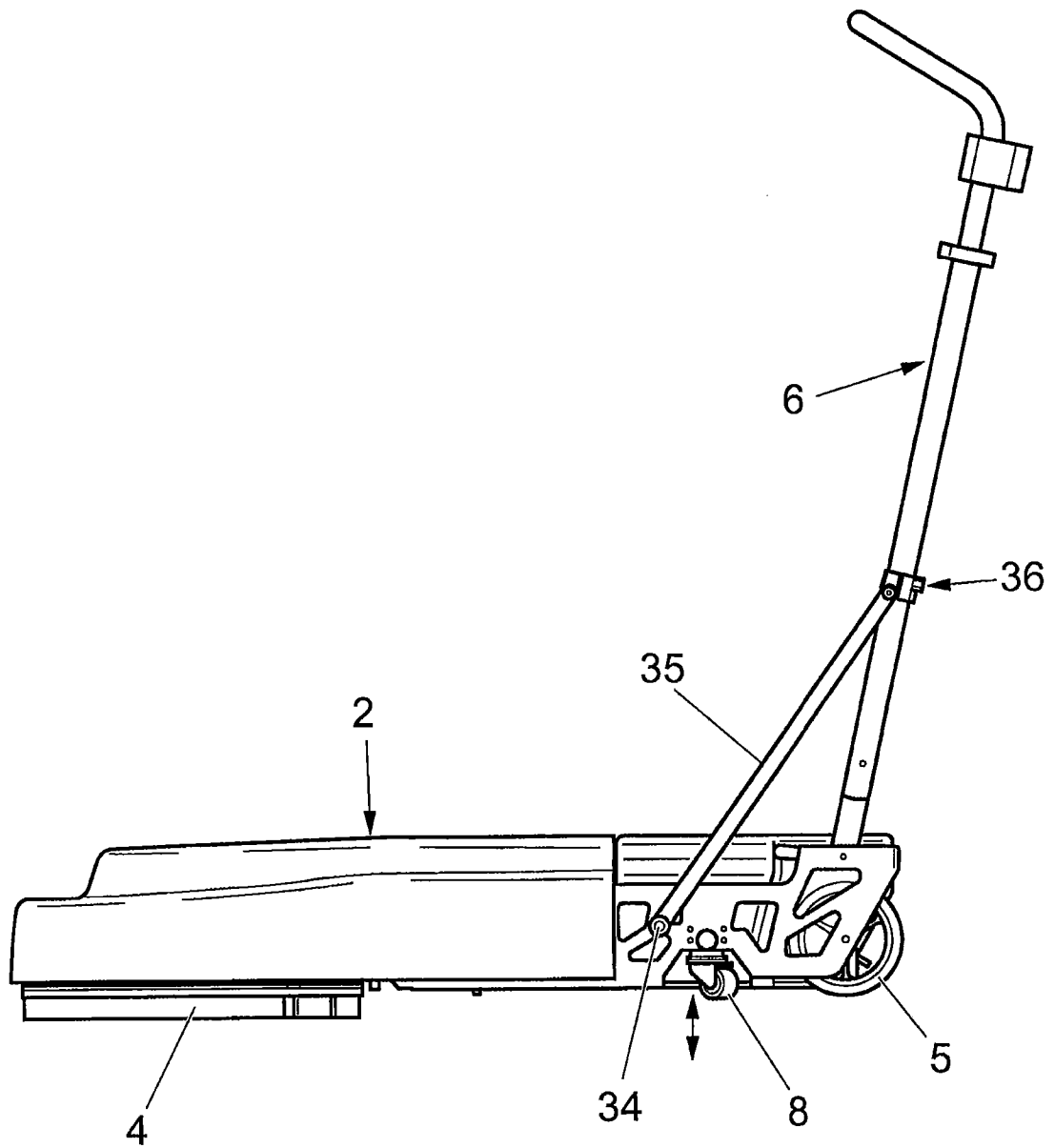


FIG. 4

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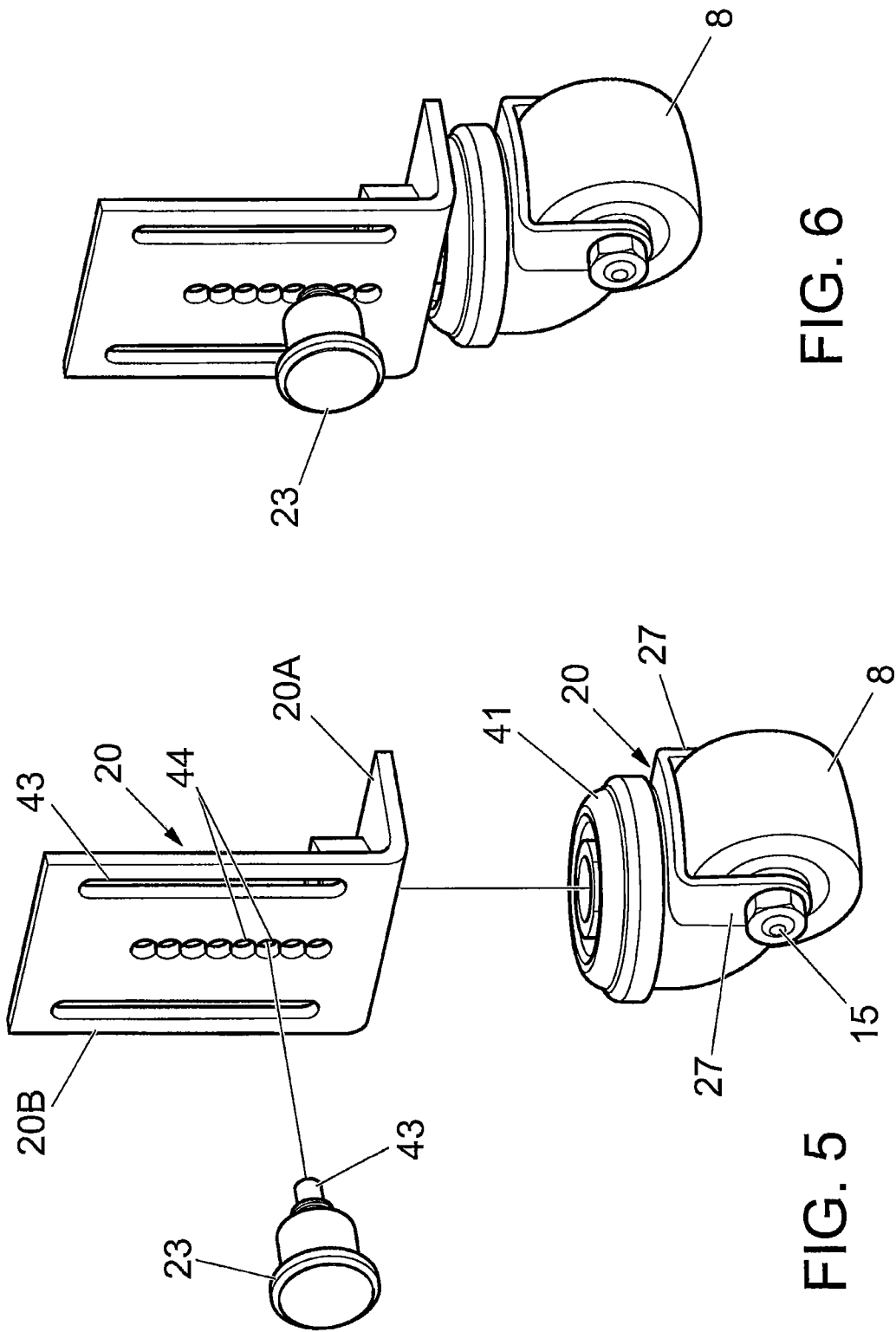


FIG. 6

FIG. 5

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FIG. 7

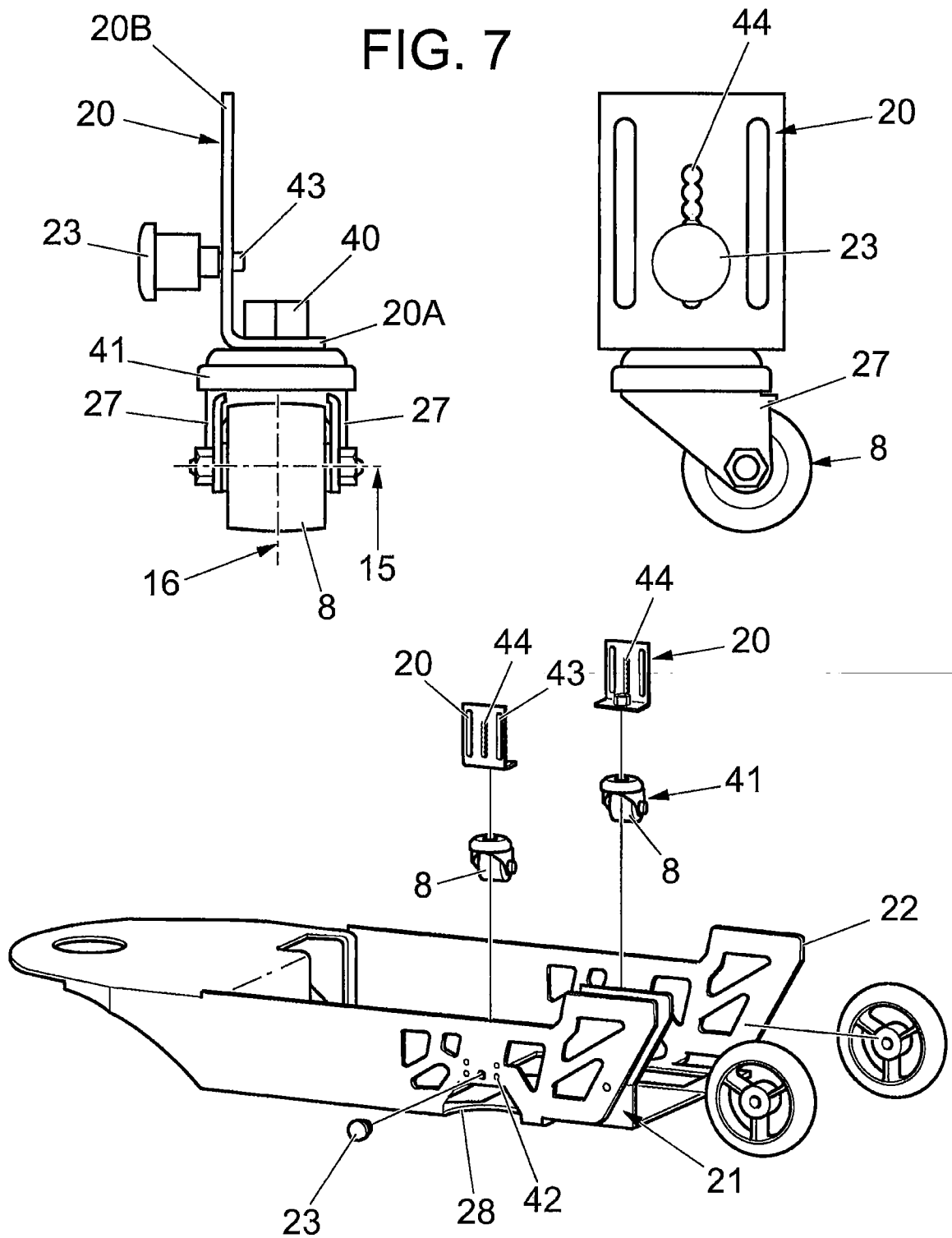


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE2007/050292

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

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: A47L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1354548 A2 (WINDSOR INDUSTRIES, INC.), 22 October 2003 (22.10.2003), figures 1-3, abstract -----	1-12

☐ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

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Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Jan-Axel Ylivainio/CN Telephone No. +46 8 782 25 00

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Cited literature, if any, will be enclosed in paper form.

INTERNATIONAL SEARCH REPORT
Information on patent family members

31/07/2007

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EP	1354548	A2	22/10/2003	JP	2004000561	A	08/01/2004
				US	20030192573	A	16/10/2003
