(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 466 854 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
13.10.2004 Bulletin 2004/42

(51) Int Cl.[7]: **B66B 9/08**

(21) Application number: **04251590.8**

(22) Date of filing: **19.03.2004**

(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

(30) Priority: **19.03.2003 GB 0306319**

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(54) Wheelchair lift access apparatus

(57) A bridge (4) comprises a floor (6) movable between a passive position (as shown), in which it allows pedestrian access to a flight of steps (2), and an active position, in which it is capable of bridging between a mobile platform (17) and a landing (1) at the top of the flight of steps (2).

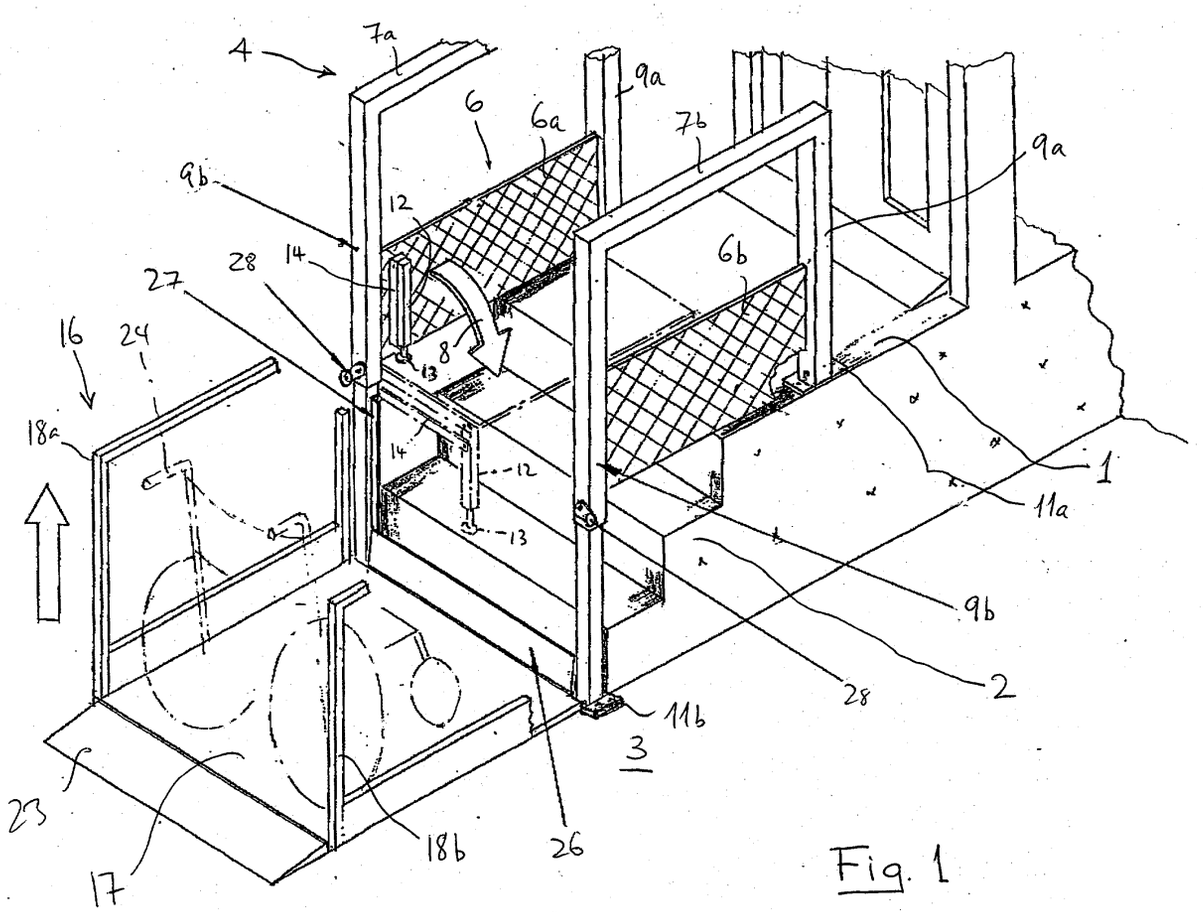

Fig. 1

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Description

[0001] This invention relates to apparatus for providing access to a landing at the top of a flight of steps.

[0002] Disabled people experience difficulty in negotiating flights of steps. Such people may find it difficult, painful, or impossible to climb steps and may, in particular, be confined to wheelchairs.

[0003] Stair lifts are available capable of carrying a wheelchair up a staircase, but the use of such a stair lift is precluded if the width of the staircase is restricted, which is typically the case with a low-rise flight of steps leading to the front or side door of a dwelling.

[0004] What is desired is apparatus which allows access to a landing by both able-bodied and disabled people.

[0005] The present invention provides apparatus for providing access to a landing at the top of a flight of steps, the apparatus comprising a bridge which comprises a floor movable between a passive position, in which it allows pedestrian access to the steps, and an active position, in which it is capable of bridging between the landing and a mobile platform.

[0006] The invention will be described further, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a fragmentary perspective view of apparatus for providing access to a landing;
Figure 2 is a view similar to Figure 1, showing the apparatus in another position; and
Figure 3 is a diagrammatic side view of the apparatus, showing the progressive steps in transferring a wheelchair from ground level to landing level.

[0007] The apparatus illustrated in Figures 1 to 3 allows access selectively by a wheelchair and by a pedestrian to a landing 1 at the top of a flight of steps 2 rising, for example 1 metre, from ground level 3. The apparatus comprises a bridge 4 including a floor 6 which is movable between a passive position (shown in Figure 1), in which it allows pedestrian access to the steps 2, and an active position (shown in Figure 2).

[0008] The floor 6 comprises two flooring sections 6a, 6b, which are pivotably mounted on respective lateral frames 7a,7b so as to be laterally movable between the passive and active positions, as indicated by the arrow 8 in Figure 1. Each lateral frame has a rear leg 9a mounted at an upper part of the flight of steps and a front leg 9b mounted at a lower part of the flight of steps. In the embodiment illustrated, the lower ends of the rear and front legs 9a,9b are connected (e.g. by bolting or welding) to plates 11a,11b fixed to the landing 1 and the ground level 3 respectively. To allow for use with landings of difference heights, the front legs 9 are telescopic so as to be adjustable in length. (Alternatively, or additionally the rear legs 9a could be telescopic.)

[0009] Each flooring section 6a,6b carries a supporting leg 12 which hangs from it and which has a telescopically adjustable foot 13 which rests on one of the steps 2 to support the flooring section 6a,6b in the active position, while the rear end of the flooring section rests on the landing 1. The leg 12 is connected to the flooring section 6a,6b and the associated lateral frame 7a,7b by a parallelogram mechanism 14 for controlling the movement of the supporting leg 12.

[0010] The bridge 4 is used in conjunction with an elevator 16 including a platform 17 which is movable in a vertical direction between a lower position (shown in Figure 1), in which it is substantially at ground level, and an upper position (shown in Figure 2), in which it is substantially at the same level as the landing 1 and the floor 6 in the active position. The platform is moved by any convenient lifting mechanism (for example a winch or an hydraulic ram). The platform 17 has two side frames 18a,18b and is guided in its vertical motion by comer posts 19 at the front ends of fixed side walls 21 for preventing animals and children from entering the space under the raised platform 17. For the same purpose, the front and rear ends of the space are covered by flexible blinds 22.

[0011] A hinged ramp 23 is provided at the front edge of the platform 17, to allow a wheelchair 24 to be moved onto the platform easily from ground level. As the platform begins to rise, the ramp 23 tilts upwards to form a stop for the rear wheels of the wheelchair, as shown in Figure 2. The elevator 16 also includes a wheel stop 26 at the rear end of the platform 17. The stop 26 is initially held upright by a flange 27 on one or both of the front legs 9b, until the platform 17 approaches its upper position, whereupon the stop 26 falls over the upper end of the flange 27 and forms a connecting surface between the platform 17 and the floor 6 in its active position, as shown in Figure 2.

[0012] The bridge 4 includes a mechanism for moving the floor 6 from the passive position (Figure 1) to the active position (Figure 2) automatically in response to arrival of the platform 17 at its upper position. In the embodiment illustrated, this mechanism comprises lever arms 28 which pivot with the flooring sections 6a,6b and which are engaged by abutments on the side frames 18a,18b as the platform 17 approaches its upper position, so that the lever arms 28 drive the flooring sections 6a,6b towards their active position. When the platform is lowered to its lower position, the floor 6 may be returned to its passive position manually or by springs (not shown).

[0013] The progressive steps in transferring a wheelchair from ground level 3 to the landing 1 are shown in Figure 3. The user rides the wheelchair 24 onto the platform 17 at its lower position, from ground level 3, and then activates the lifting mechanism of the elevator 16 to cause the platform 17 to rise to its upper position, substantially level with the landing 1. During this process, the floor 6 is automatically moved from its passive position to its active position. The user can then ride the

wheelchair 24 across the floor 6 and onto the landing 1. Subsequently, the user can return across the floor 6 to the platform 17 in its upper position and then operate the elevator 16 to cause the platform 17 to descend to the lower position, whereupon the user can ride the wheelchair 24 out of the elevator 16.

[0014] It will be appreciated that, when the platform 17 is in its lower position and the floor 6 is in its passive position, the flight of steps 2 is free for access by pedestrians.

[0015] Various modifications may be made in the apparatus. For example, the mechanism using lever arms 28 may be replaced by another mechanism which pivots the flooring sections 6a and 6b in dependence on the rising and falling of the platform 17. Such a mechanism may, for example, comprise cables and pulleys. Alternatively, if an hydraulic lifting mechanism is used in the elevator 16, a linked hydraulic actuating mechanism may be incorporated in the bridge 4 to move the floor 6 between the passive and active positions. Alternatively, the bridge 4 could incorporate one or more electric motors for driving the floor 6 between its active and passive positions, the motor or motors being under a control of a sensor which detects the presence of the platform 17.

[0016] The two flooring sections 6a, 6b could be replaced by a single flooring section pivotably mounted on a single lateral frame. The movement of the floor sections is not limited to simple pivoting movement about a fixed axis, but could be any convenient movement capable of moving the flooring sections between a passive position allowing pedestrian access to the steps and an active position bridging between the landing 1 and the platform 17 in its upper position.

Claims

1. Apparatus for providing access to a landing (1) at the top of a flight of steps (2), the apparatus comprising a bridge (4) which comprises a floor (6) movable between a passive position, in which it allows pedestrian access to the steps (2), and an active position, in which it is capable of bridging between the landing (1) and a mobile platform (17).

2. Apparatus as claimed in claim 1, in which the floor (6) comprises at least one flooring section (6a,6b) which is movable laterally between the passive and active positions.

3. Apparatus as claimed in claim 2, in which the at least one flooring section (6a,6b) is pivotably movable.

4. Apparatus as claimed in any preceding claim, in which the bridge (4) includes a mechanism for moving the floor (6) from the passive position to the active position.

5. Apparatus as claimed in claim 4, in which the mechanism automatically moves the floor (6) from the passive position to the active position in response to arrival of the platform.

6. Apparatus as claimed in any preceding claim, in which the bridge (4) includes at least one lateral frame (7a,7b) on which the floor (6) is mounted so as to be movable between the passive and active positions.

7. Apparatus as claimed in claim 6, in which the at least one lateral frame (7a,7b) has a rear leg (9a) for mounting at an upper part of the flight of steps (2) and a front leg (9b) for mounting at a lower part of the flight of steps (2).

8. Apparatus as claimed in claim 7, in which at least one of the said legs (9a,9b) is adjustable in length.

9. Apparatus as claimed in any preceding claim, including an elevator (16) having a platform (17) which is movable between a lower position and an upper position, the floor (6) when in its active position being capable of bridging between the platform (17) in its upper position and the landing (1).

10. Apparatus as claimed in claim 9, in which the elevator (16) includes a wheel stop (26) at the end of the platform (17) adjacent the bridge (4), the wheel stop (26) being movable, when the platform (17) approaches its upper position, to a position in which it forms a connecting surface between the platform (17) and the floor (6) in its active position.

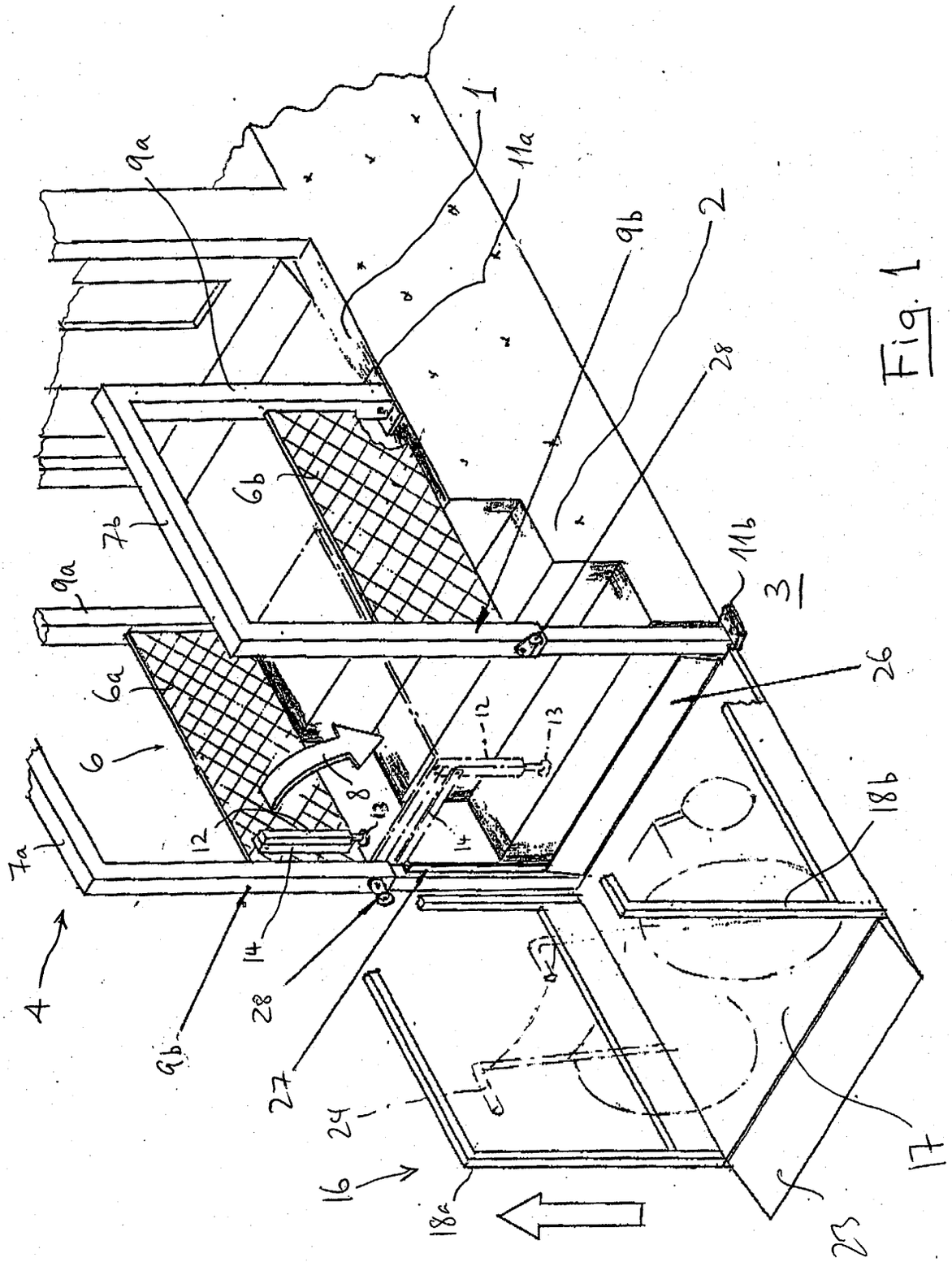
1
9a
11a
9b
2
28
6b
7b
9a
11b
3
6a
26
6
12
13
8
18b
7a
14
4
9b
28
27
24
16
18a
17
23

Fig. 1

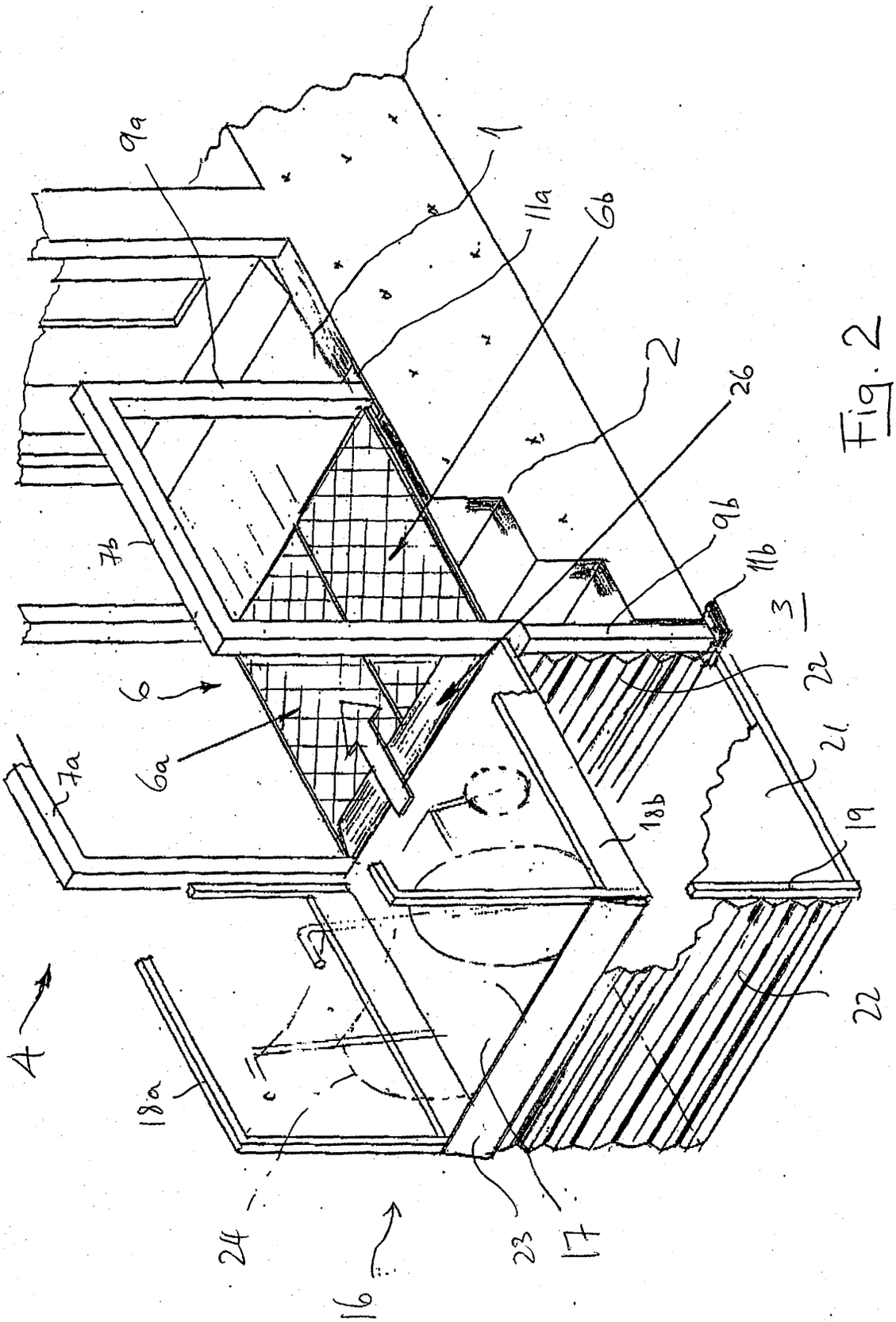

Fig. 2

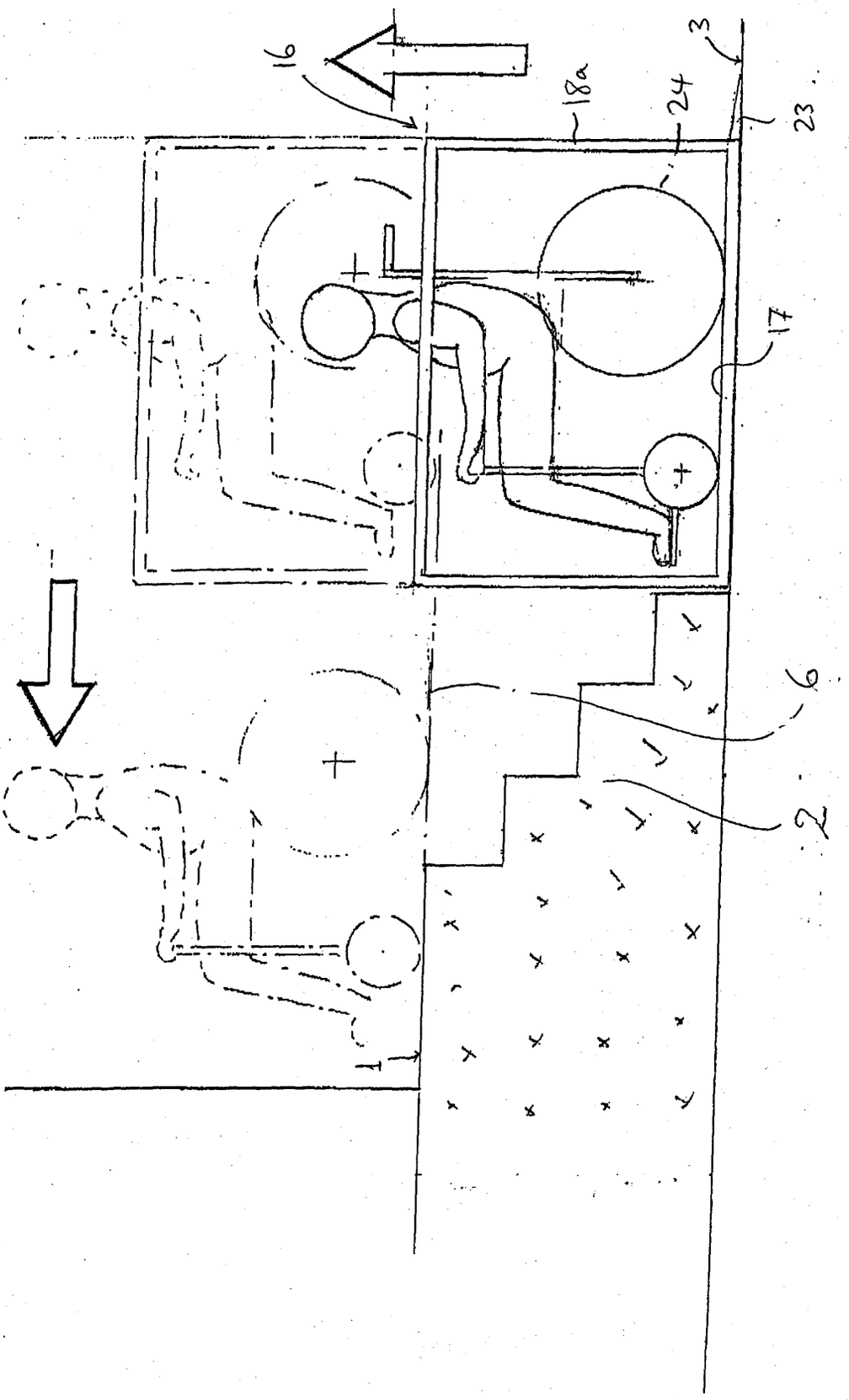

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 04 25 1590

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)
X	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 17, 5 June 2001 (2001-06-05) -& JP 06 040698 A (BAN HAJIME; NIN SENSHU), 15 February 1994 (1994-02-15) * abstract; figures 1-4 *	1-10	B66B9/08
X	US 2002/098077 A1 (BEECH WILLIAM EDWARD) 25 July 2002 (2002-07-25)	1-5,9,10	
A	* abstract; figures 1,3,5 *	6	
A	DE 31 06 316 A (RAMSAUER GEORG) 9 September 1982 (1982-09-09) * abstract; figures a,b *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B66B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	12 August 2004	Nelis, Y

CATEGORY OF CITED DOCUMENTS

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12-08-2004

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