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

(11) EP 1 106 561 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
13.06.2001 Bulletin 2001/24

(51) Int Cl.[7]: **B66B 17/12**

(21) Application number: **00126291.4**

(22) Date of filing: **01.12.2000**

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

(30) Priority: **03.12.1999 IT TO990217 U**

(71) Applicant: **PRIMAFASE S.r.l.**
10036 Settimo Torinese (IT)

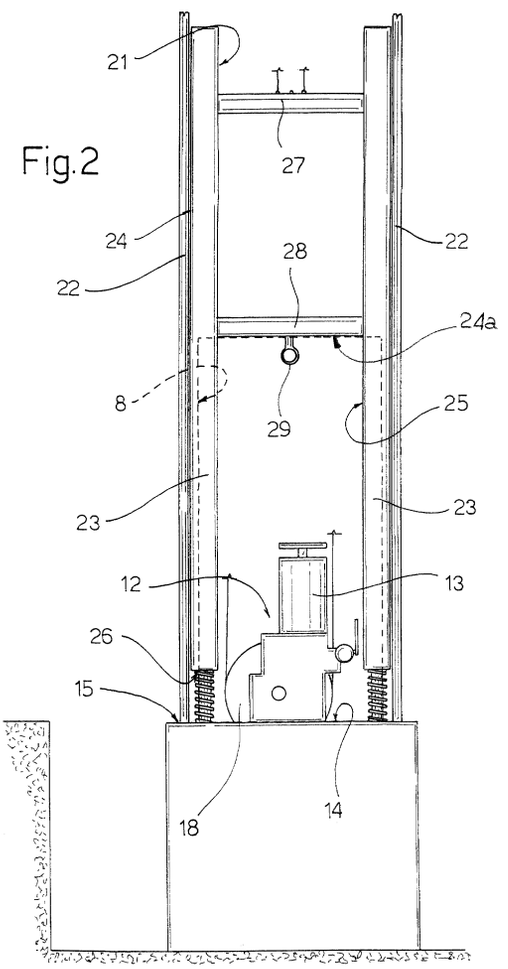
(72) Inventor: **Bagnaia, Antonio**
10020 Lauriano (IT)

(74) Representative: **Eccetto, Mauro et al**
Studio Torta S.r.l.,
Via Viotti, 9
10121 Torino (IT)

(54) Elevator counterweight shape

(57) An elevator (1) has a car (9) and a lift assembly (12) for lifting the car (9) and in turn having a motor reducer (13) housed in a motor compartment (14) of the elevator (1), a cable transmission (17) activated by the motor reducer (13), and a counterweight (21) movable vertically together with the car (9); the counterweight (21) being portal-shaped and having an opening (25) extending from a bottom lateral surface (26) of the counterweight (21) to permit access to the motor compartment (14) regardless of the vertical position of the counterweight (21).

Fig.2



EP 1 106 561 A2

Description

[0001] The present invention relates to an elevator car lift assembly.

[0002] As is known, in passenger elevators, to which the following description refers purely by way of example, the car is normally connected to a vertical rail and is moved along the rail by a lift assembly, which, in most applications, comprises an electric motor reducer housed in a motor compartment of the elevator, and a cable transmission interposed between the reducer and the car and comprising a drive pulley fitted to the motor reducer shaft, and a single counterweight fitted to slide along a rail parallel to the rail of the car.

[0003] In most applications, the counterweight rail is located on the opposite side of the car to the cable transmission, so that, in use, the counterweight, normally defined by a solid block, slides facing and adjacent to a lateral wall of the elevator shaft.

[0004] Though widely used, known elevators of the above type are far from satisfactory, mainly by failing to enable the motor compartment to be formed at the first-floor or first-stop-floor level of the elevator shaft, i.e. adjacent to a bottom portion of the car rail, as required by current standards governing safe access to the motor reducer and transmission. In fact, for the motor compartment to be formed in such a position, the access opening to the motor compartment must normally be formed through said lateral wall of the elevator shaft, thus preventing uninterrupted access to the motor compartment, as required by current standards, on account of the opening, as the car moves up and down, being closed by the moving counterweight adjacent to the lateral wall of the elevator shaft.

[0005] It is an object of the present invention to provide an elevator car lift assembly designed to provide a straightforward, low-cost solution to the above problem.

[0006] According to the present invention, there is provided an elevator car lift assembly; the assembly comprising a motor reducer; motion transmission means activated by said motor reducer and connected to a car; and a counterweight movable vertically and together with the car between two limit positions and defined at the bottom by a bottom surface; characterized in that said counterweight has a through opening extending from said bottom surface and defined by a top surface raised, in use, with respect to said motor reducer.

[0007] A non-limiting embodiment of the invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a schematic plan view of a car lift assembly in accordance with the teachings of the present invention;

Figure 2 shows a smaller-scale section, with parts removed for clarity, along line II-II in Figure 1.

[0008] Number 1 in Figure 1 indicates as a whole a passenger elevator housed inside an elevator shaft indicated by 2 and defined by a front wall 4, in which is formed a door 5 for access to elevator 1, by a back wall 6, and by a lateral wall 7 through which is formed a door 8 for access to elevator shaft 2.

[0009] With reference to Figure 1, elevator 1 comprises a car 9, which partly engages elevator shaft 2, is connected to a fixed vertical rail 10, and is moved along rail 10 to and from a bottom limit position by a lift assembly 12 housed in elevator shaft 2.

[0010] Lift assembly 12 comprises a known motor reducer 13 (shown schematically in the accompanying drawings) housed inside a motor compartment 14 of elevator 1 and accessible via door 8. In the example described, motor compartment 14 is formed at a bottom end portion of rail 10, on a level with the first floor 15, and in the space of elevator shaft 2 extending between wall 7 and car 9 when car 9 is in the bottom limit position.

[0011] With reference to Figure 1, lift assembly 12 also comprises a cable transmission 17 in turn comprising a number of cables wound about a friction pulley 18 fitted to the output shaft of motor reducer 13, and two idler wheels 19. The cables have respective end portions connected to a bracket 20 of car 9, and respective opposite end portions connected to a counterweight 21 connected to a fixed rail 22. Rail 22 extends vertically and parallel to rail 10, and is located adjacent to wall 7 and door 8 so that counterweight 21 slides, adjacent to wall 7, between two limit positions.

[0012] As shown in Figure 1 and particularly in Figure 2, counterweight 21 is defined by a portal-shaped plate body. More specifically, counterweight 21 comprises two parallel, transversely spaced bottom uprights 23, and a top portion 24 connecting the ends of uprights 23 and defined at the bottom by a surface 24a. Surface 24a extends over motor reducer 13 and defines, together with uprights 23, an opening 25. Opening 25 extends from a surface 26 defining the bottom of counterweight 21, and hence of uprights 23, and is located at door 8 when counterweight 21 is located in a bottom limit position in which counterweight 21 is at least partly housed inside motor compartment 14 and extends astride motor reducer 13. More specifically, opening 25 is the same height as door 8, and is of a width, measured in a direction perpendicular to rail 10, comparable with the width of door 8 and at any rate greater than the transverse dimension of motor reducer 13 measured in the same direction (Figure 2).

[0013] With reference to Figure 2, portion 24 comprises inner bracing in turn comprising an upper cross member 27 for attaching the cables, and a lower cross member 28 fitted integrally with a fastening member 29 projecting inside opening 25 and for fastening hoists or other devices for lifting components, including motor reducer 13, housed inside motor compartment 14.

[0014] As compared with known solutions, the particular design of counterweight 21 therefore enables ac-

cess to motor compartment 14 of elevator 1 regardless of the position of car 9 along rail 10 and, hence, regardless of the position of counterweight 21. That is, even when counterweight 21 is located inside motor compartment 14, i.e. at floor 15, opening 25 formed in counterweight 21 permits safe access to motor compartment 14 and the motor reducer, and enables any maintenance to be carried out and even manual operation of car 9.

[0015] Clearly, changes may be made to lift assembly 12 as described herein without, however, departing from the scope of the present invention. In particular, cable transmission 17 may be replaced with a different, e.g. hydraulic, transmission; and counterweight 21 may be formed otherwise than as described by way of example, providing access is permitted to motor compartment 14 regardless of the position of counterweight 21 along rail 22.

Claims

1. An elevator car lift assembly (12); the assembly (12) comprising a motor reducer (13); motion transmission means (17) activated by said motor reducer (13) and connected to a car (9); and a counterweight (21) movable vertically and together with the car (9) between two limit positions and defined at the bottom by a bottom surface (26); characterized in that said counterweight (21) has a through opening (25) extending from said bottom surface (26) and defined by a top surface (24a) raised, in use, with respect to said motor reducer (13).

2. An assembly as claimed in Claim 1, characterized in that said counterweight (21) is portal-shaped.

3. An assembly as claimed in Claim 1 or 2, characterized in that said counterweight (21) comprises a reinforcing frame comprising an intermediate cross member (28); said intermediate cross member (28) carrying a fastening member (29).

4. An assembly as claimed in Claim 3, characterized in that said intermediate cross member (28) defines said opening (25).

5. An assembly as claimed in Claim 3 or 4, characterized in that said fastening member (29) extends inside said opening (25).

6. An elevator comprising a car (9) and a lift assembly (12) for moving the car (9) to and from a bottom limit position; the assembly (12) comprising a motor reducer (13) housed inside a motor compartment (14) of the elevator (1) defined by said car (9) when the car (9) is in said bottom position, motion transmission means (17) activated by said motor reducer (13) and connected to the car (9), and a counterweight (21) movable vertically and together with the car (9) between two limit positions and defined at the bottom by a bottom surface (26); characterized in that said counterweight (21) has a through opening (25) extending from said bottom surface (26) and defined by a top surface (24a) raised, in use, with respect to said motor reducer (13) to permit access to said motor compartment (14) regardless of the vertical position of the counterweight (21).

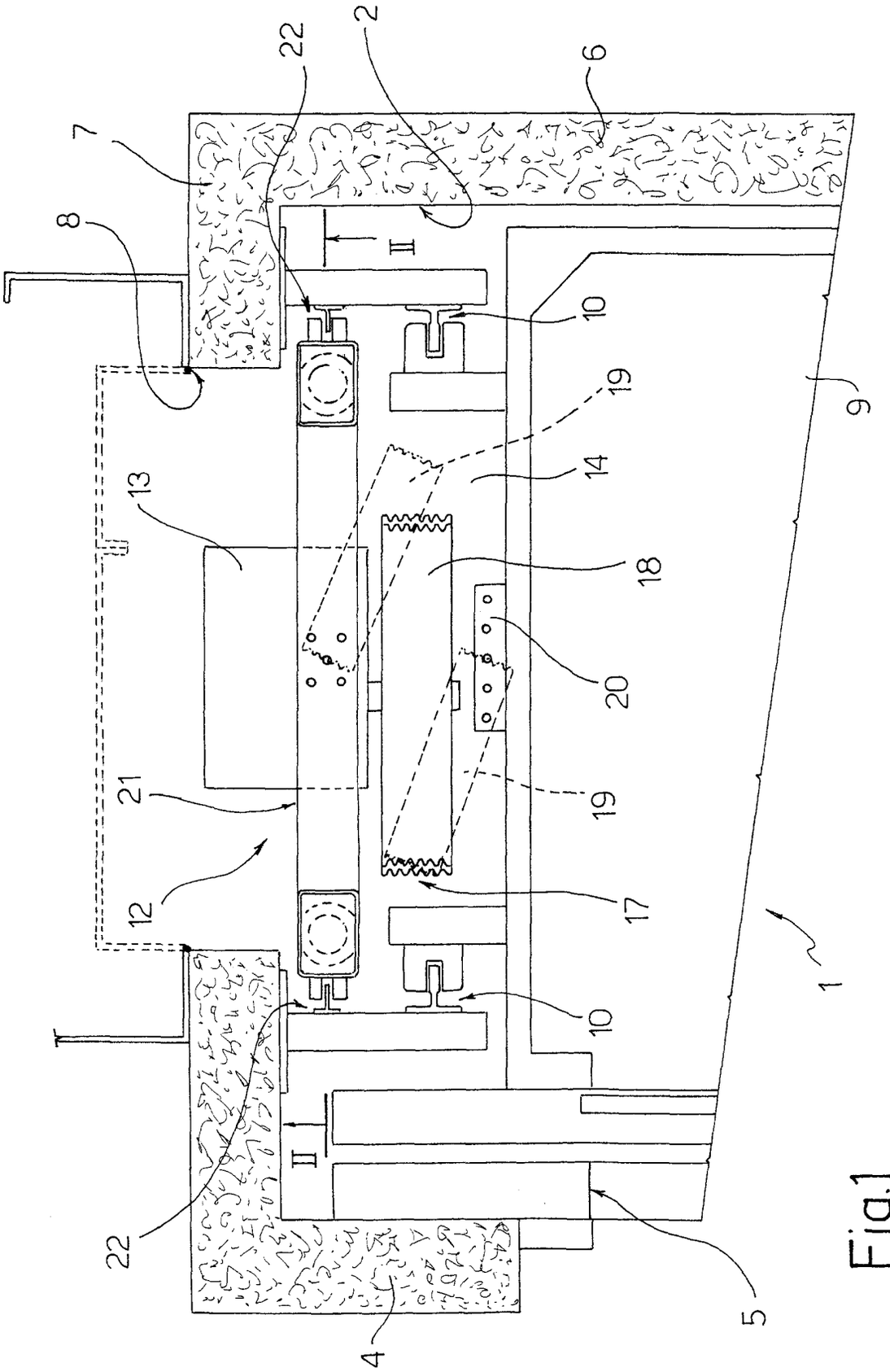


Fig.1

Fig.2