

(19)



(11)

EP 2 746 209 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
25.06.2014 Bulletin 2014/26

(51) Int Cl.:
B66B 7/02 (2006.01)
B66B 11/02 (2006.01)
B66B 7/04 (2006.01)

(21) Application number: **12199157.4**

(22) Date of filing: **21.12.2012**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(72) Inventor: **Haag, Mikael**
01650 Vantaa (FI)

(74) Representative: **Graf Glück Kritzenberger**
Hermann-Köhl-Strasse 2a
93049 Regensburg (DE)

(71) Applicant: **Kone Corporation**
00330 Helsinki (FI)

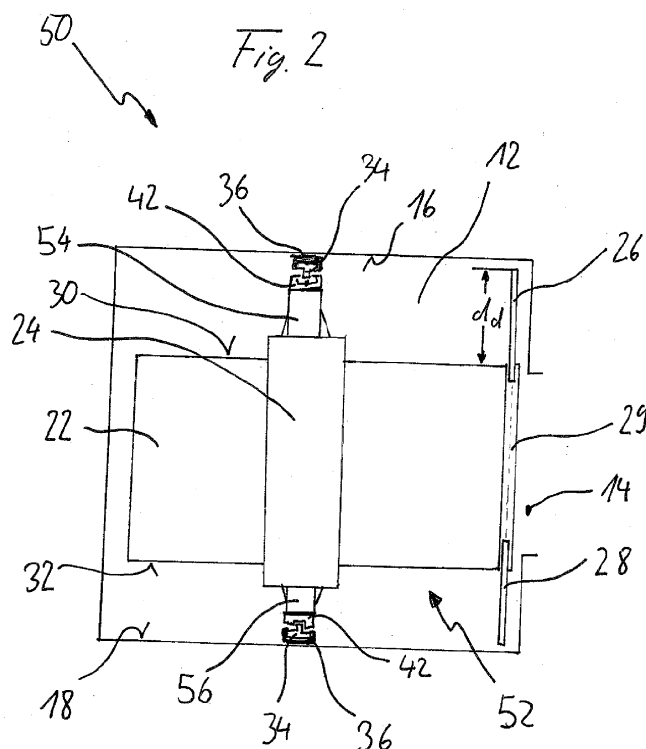
Remarks:

Amended claims in accordance with Rule 137(2) EPC.

(54) Mounting of guides for guide rails on an elevator car.

(57) The present invention relates to an elevator comprising at least one elevator car (52, 62) driving vertically in an elevator shaft (12), elevator guide rails (34) for guiding the elevator car in the elevator shaft and brackets (36) for mounting the guide rails to at least one wall (16, 18) of the elevator shaft. The elevator car comprises a car frame (24, 64) carrying guides (42) co-acting with the guide rails for guiding the elevator car along the shaft. According to the invention mounting extensions

(54, 56) are mounted between the guides (42) and the car frame (24) to close the distance between the guides and/or the guide rails or the width (w) of the car frame (64) is extended to close the distance between the guides and the guide rails. This solution allows an easy and inexpensive handling of the distance between the shaft wall(s) carrying the guide rails and the adjacent car wall (s) for guiding the elevator car in the elevator shaft.

**EP 2 746 209 A1**

Description

[0001] The present invention relates to an elevator comprising at least one elevator car driving vertically in an elevator shaft. The elevator comprises elevator guide rails for guiding the elevator car in the elevator shaft as well as brackets for mounting the guide rails to at least one wall of the elevator shaft, regularly on opposite sides of the elevator shaft. The elevator car comprises a car frame which carries guides co-acting with the guide rails for guiding the elevator car along the shaft and determining the position of the elevator car in the horizontal plane.

[0002] Nowadays, elevator cars have regularly automatic car doors which are sliding from a closed position in an open position. In the open position, the car doors exceed the outer walls of the elevator car. This leads to the fact that the distance between the shaft walls and the car frame has sometimes to be rather large. Currently, the brackets for mounting the elevator guide rails are fixed to horizontal supports which keep the guide rails in a distance from the elevator shaft wall as to co-act with the guides mounted at the car frame. This solutions necessitates a lot of mounting effort and a lot of mounting and support material, particularly in high elevator shafts.

[0003] It is object of the present invention to provide an elevator offering a reliable guide of the elevator car along the elevator shaft with less effort than before.

[0004] The object is solved with an elevator according to claim 1. Preferred embodiments of the invention are subject-matter of the dependent claims. The object is further solved with a method according to claim 10.

[0005] According to a first alternative of the invention, mounting extensions for the guides are mounted between the guides and the car frame having a horizontal extension which closes the distance between the guides and the guide rails.

[0006] In a second alternative of the invention, the car frame is extended in the horizontal direction by an amount as to close the distance between the guides mounted to the car frame and the guide rails mounted via brackets directly to the shaft wall.

[0007] By means of the invention, it is possible to mount the guide rails directly via brackets to the shaft wall. The known horizontal support extensions which have been used up to now to keep the guide rail in a distance from the shaft wall to close the distance between the guides and the guide rails have not to be used any longer. This known solution had the problem that the support extensions had to be mounted along the whole length of the elevator shaft so that keeping the guide rails in a distance from the shaft wall was involved with a high effort of material and installation work. With the invention this high effort is not needed any longer as the car guides are moved via a corresponding construction of the elevator car to the guide rails. This construction is the use of horizontal mounting extensions for keeping the guides apart from the car frame to close the distance between the guides and the guide rails or the use of a wider car frame,

i.e. a car frame having a width that is not necessary for the elevator cabin but which serves to close the distance between the guides and the guide rails. Both solutions can also be combined with each other. Accordingly, the car frame can be made a little wider and additionally mounting extensions can be used between the car frame and the guides, which mounting extensions do not need to have such large horizontal dimensions as if the mounting extensions are used without a wider car frame. Anyway, the inventive solutions only need a modification at the car frame and not along the whole elevator shaft. The invention is therefore highly beneficial with respect to the complete effort on material and installation work.

[0008] Thus, the mounting extensions have only to be provided at the car frame. Regularly, a car is guided with four guides at the guide rails whereby these guides are mostly located on opposite vertical sides of the elevator car frame in the upper as well as in the lower area. Now, only four mounting extensions are necessary to keep the guides in contact with the guide rails. It is even possible to provide only one mounting extension for the upper and lower car guide. In this case, only two mounting extensions, one on each of the opposite vertical sides of the car frame, are necessary.

[0009] It is therefore obvious that mounting the guides at a distance to the car frame to keep the guides in contact with the guide rails (which are directly mounted to the shaft wall) only needs an essentially reduced effort in material and installation work. But on the other hand, no more effort is necessary along the whole elevator shaft length to keep the guide rails in a distance from the elevator shaft wall.

[0010] Also the other alternative solution of the invention wherein the horizontal dimensions of the car frame are extended clearly reduces the total effort for keeping the guides in contact with the guide rails. In this case, the car frame is extended in the horizontal direction so that a gap remains between the vertical sides of the elevator car frame and the adjacent vertical walls of elevator car. The resulting distance between the outer walls of the car frame and the outer walls of the car can be for example between 10 cm and 1 m, particularly between 20 and 50 cm.

[0011] Preferably, the distance between the vertical sides of the car frames and the adjacent vertical walls of the elevator car is identical on both opposing sides. This keeps the weight of the elevator car centric within the car frame.

[0012] On the other hand, by having an essentially larger horizontal dimension (width) of the car frame than the elevator cabin, it is possible to exactly adjust the elevator cabin horizontally within the car frame for example as to exactly match a landing opening which might not be centric in the elevator shaft.

[0013] Preferably, the brackets for mounting the guide rails directly to the shaft walls have a depth of 30 cm at the most, particularly not more than 20 cm. With brackets of this small depth the guide rails are kept in a close

vicinity to the supporting elevator shaft wall, which reduces effort for the installation and alignment of the guide rails.

[0014] Preferably, the elevator car has slide doors which are exceeding the vertical car walls adjacent to the car frame when fully open. This specifies the type of elevator for which the invention is most preferable. In elevator cars with slide doors, the door vanes are extending far beyond the outer vertical walls of the elevator cabin adjacent to the vertical sides of the car frame. Accordingly, there must be sufficient room between the outer walls of the elevator cabin and the shaft walls so that the door vane can be opened within this room. Of course, this room is easily bridged by both solutions of the present invention or their combination.

[0015] According to the inventive method for constructing an elevator comprising at least one elevator car driving in an elevator shaft and further having elevator guide rails for guiding the elevator car in the elevator shaft and brackets for mounting the guide rails to at least one wall of the elevator shaft, wherein the elevator car comprises a car frame carrying guides co-acting with the guide rails for guiding with the elevator car, following steps are performed:

[0016] The elevator guide rails are mounted via brackets directly to the shaft wall(s), i.e. without the use of any horizontal support extensions which up to now served to close the distance between the guide rails and the guides of the elevator car. Instead, mounting extensions are mounted between the car frame and the guides to close said distance or the horizontal dimensions of the car frame are extended to close the distance between the guides and the guide rails. Alternatively or additionally the car frame can be made wider between the guide rails so as to bridge the distance between guides and guide rails. By this method, the distance for the guides and guide rails between the outer cabin walls/car frame and the adjacent shaft walls are closed with elements connected with the elevator car so that any mounting and installation effort in the shaft can be avoided. The statements made here with respect to the inventive method of course also hold true for the inventive elevator as described above.

[0017] The different preferred embodiments mentioned above can be combined with each other arbitrarily as long as this is technically feasible.

[0018] The invention is described hereinafter described with the aid of the schematic drawing.

Fig. 1 shows a prior art installation with support extensions for the guide rails,

Fig. 2 shows a horizontal cross-section of an elevator according to a first embodiment of the invention, and

Fig. 3 shows a horizontal cross-section of a second embodiment of the invention.

[0019] In the drawings identical or functional identical parts have the same reference numbers.

[0020] Fig. 1 shows an elevator 10 having an elevator shaft 12 with a landing opening 14 (on the right side in the drawing). The elevator shaft has two opposite shaft walls 16, 18 which support guide rails 34 as described hereinafter. In the elevator shaft 12, an elevator car 20 comprising a cabin 22 supported by a car frame 24 is guided vertically as to move between different floors of a building. On the side facing the landing opening 14, the elevator cabin 22 has two sliding doors 26, 28 which exceed the corresponding outer vertical walls 30, 32 of the elevator cabin 22 by the distance d_d . The doors 26, 28 are running horizontally slidable in corresponding guide tracks 29 of the elevator cabin 22. The guide rails 34 are mounted with brackets 36 to support extensions 38, 40 which are mounted to the corresponding opposite elevator shaft walls 16, 18. These support extensions 38, 40 serve to close the distance which is caused by the room necessary for allowing the sliding doors 26, 28 of the cabin 22 to be opened without bumping to the shaft walls 16, 18. The guide rails 34 co-act with roller guides 42 mounted to the car frame 24.

[0021] Via this arrangement, a reliable guide of the elevator car 20 in the elevator shaft 12 has been realized according to common knowledge, which anyway needed a lot of installation effort along the elevator shaft.

[0022] The invention now goes a different way.

[0023] Fig. 2 shows a horizontal section through an elevator 50 according to a first embodiment of the invention.

[0024] In this embodiment, instead of using support extensions, the guide rails 34 are mounted directly to the corresponding shaft walls 16, 18 via the brackets 36.

[0025] On the other side, the elevator car 52 has a car frame 24 on which mounting extensions 54, 56 are mounted, to which the guides, particularly roller guides 42, are mounted. Via these mounting extensions 54, 56, the distance d_d is bridged which is caused by the space in the elevator shaft 12 necessary for opening the slide doors 26, 28 of the elevator cabin 22.

[0026] In the embodiment of Fig. 3 the elevator 60 has an elevator car 62 which has a car frame 64. The width w of the car frame 64 between the opposite shaft walls 16, 18 carrying the guide rails 34 are extended. Thus between the vertical walls of the car frame 64 and the corresponding outer walls 30, 32 of the cabin 22, a distance d_1 or d_2 remains which is sufficient to keep the guides 42 in contact with the elevator guide rails 34. Also in this embodiment, the guide rails 34 are directly mounted via the brackets 36 to the shaft walls 16, 18 which saves a lot of construction material and effort along the shaft.

[0027] It shall be clear that the above embodiments should not restrict the invention which can be performed within the scope of following patent claims.

[0028] The above-mentioned embodiments may vary with respect to the drawings. Thus, the guides may be

slide guides or roller guides or combined guides. Furthermore, guide rails can be provided at another location than shown in the embodiments. Instead of two guide rails four guide rails may be provided at the opposite walls of the shaft. Instead of sliding doors 26, 28 with only two vanes, four vanes could be provided which open and close in a telescopic manner. The invention can of course also be provided with elevator cars which do not have any slide doors but for example a turning door or no separate car door. The car frame 64 can also be provided as a two-part frame which one part in the back area of the cabin 22 and the other part in the front area of the cabin 22 so that in this case four elevator guide rails 34 and a corresponding number of guides have to be provided with the elevator car. The opposite wall 16, 18 do not need to be exactly parallel but may have an inclination of 0 to 120 degrees.

Claims

1. Elevator comprising at least one elevator car (52, 62) driving vertically in an elevator shaft (12), elevator guide rails (34) for guiding the elevator car in the elevator shaft and brackets (36) for mounting the guide rails to at least one wall (16, 18) of the elevator shaft, wherein the elevator car comprises a car frame (24, 64) carrying guides (42) co-acting with the guide rails for guiding the elevator car along the shaft, whereby mounting extensions (54, 56) are mounted between the guides (42) and the car frame (24) to close the distance between the guides and the guide rails and/or the width (w) of the car frame (64) between the guide rails (34) is extended to close the distance between the guides and the guide rails.
2. Elevator according to claim 1, wherein width (w) of the car frame (64) is extended such that the width of the gap (d1, d2) between the vertical part of the car frame (64) and an adjacent cabin wall (30, 32) is between 10 cm and 100 cm.
3. Elevator according to claim 2, wherein width of the gap (d1, d2) is between 20 cm and 80 cm, preferably between 20 cm and 50 cm.
4. Elevator according to one of the preceding claims, wherein the width (d1, d2) of the gap between the car frame (64) and both adjacent vertical cabin walls (30, 32) is identical.
5. Elevator according to one of the preceding claims, wherein the guides (42) are roller guides.
6. Elevator according to one of the preceding claims, wherein the mounting extensions (54, 56) extend essentially horizontally and have length between 10

cm and 50 cm.

7. Elevator according to one of the preceding claims, wherein the brackets (36) have a depth of 30 cm at most, preferably 20 cm at most.
8. Elevator according to one of the preceding claims, wherein the elevator car (24, 52, 62) has slide doors (26, 28) exceeding the vertical car walls (30, 32) adjacent to the vertical car frame sides when open.
9. Elevator according to one of the preceding claims, wherein the guide rails (34) are mounted to opposite walls (16, 18) of the elevator shaft (12).
10. Method for guiding an elevator car (24, 52, 64) in an elevator shaft (12) via elevator guide rails (34), in which method brackets (36) are used for mounting the guide rails to two opposite walls (16, 18) of the elevator shaft, and in which method guides (42) co-acting with the guide rails are used in connection with the elevator car, which car comprises a car frame (24, 64) carrying the guides, in which method the elevator guide rails (34) are mounted via brackets (36) directly to the shaft wall (16, 18), and in which method mounting extensions (54, 56) are mounted between the car frame (24) and the guides (42) as to close the distance between the guides and the guide rails, and/or the width (w) of the car frame between the opposite shaft walls (16, 18) is extended as to close the distance between the guides and the guide rails.

Amended claims in accordance with Rule 137(2) EPC.

1. Elevator comprising at least one elevator car (52, 62) driving vertically in an elevator shaft (12), elevator guide rails (34) for guiding the elevator car in the elevator shaft and brackets (36) for mounting the guide rails to at least one wall (16, 18) of the elevator shaft, wherein the elevator car comprises a car frame (24, 64) carrying guides (42) co-acting with the guide rails for guiding the elevator car along the shaft, whereby the width (w) of the car frame (64) between the guide rails (34) is extended to close the distance between the guides and the guide rails, **characterized in that** the width (w) of the car frame (64) is extended such that the width of the gap (d1, d2) between the vertical part of the car frame (64) and an adjacent cabin wall (30, 32) is between 10 cm and 100 cm.
2. Elevator according to claim 1, wherein width of the gap (d1, d2) is between 20 cm and 80 cm, preferably between 20 cm and 50 cm.

3. Elevator according to one of the preceding claims, wherein the width (d1, d2) of the gap between the car frame (64) and both adjacent vertical cabin walls (30, 32) is identical.

5

4. Elevator according to one of the preceding claims, wherein the guides (42) are roller guides.

5. Elevator according to one of the preceding claims, wherein the mounting extensions (54, 56) extend essentially horizontally and have length between 10 cm and 50 cm.

10

6. Elevator according to one of the preceding claims, wherein the brackets (36) have a depth of 30 cm at most, preferably 20 cm at most.

15

7. Elevator according to one of the preceding claims, wherein the elevator car (24, 52, 62) has slide doors (26, 28) exceeding the vertical car walls (30, 32) adjacent to the vertical car frame sides when open.

20

8. Elevator according to one of the preceding claims, wherein the guide rails (34) are mounted to opposite walls (16, 18) of the elevator shaft (12).

25

30

35

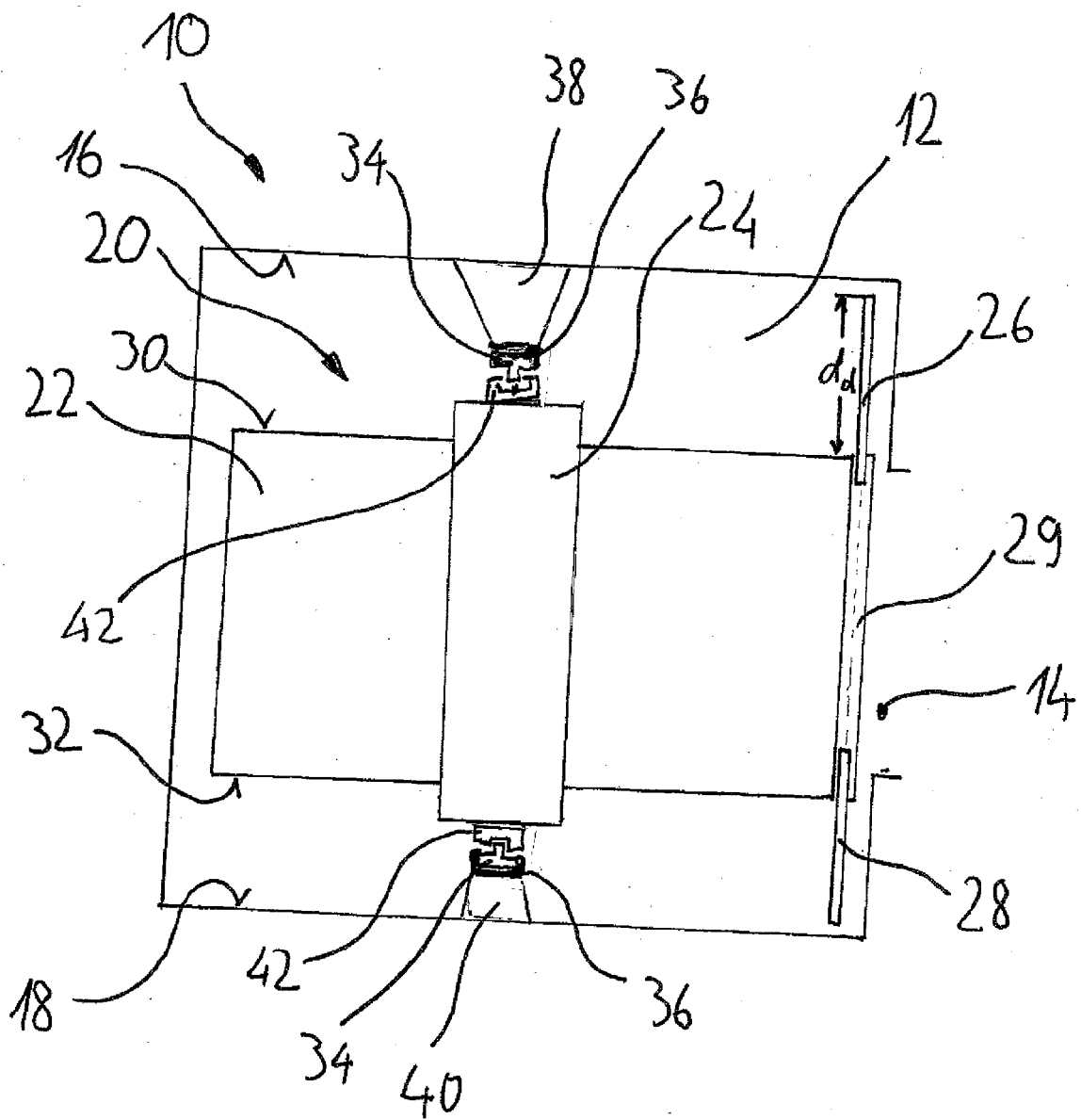
40

45

50

55

Fig. 1 (prior art)



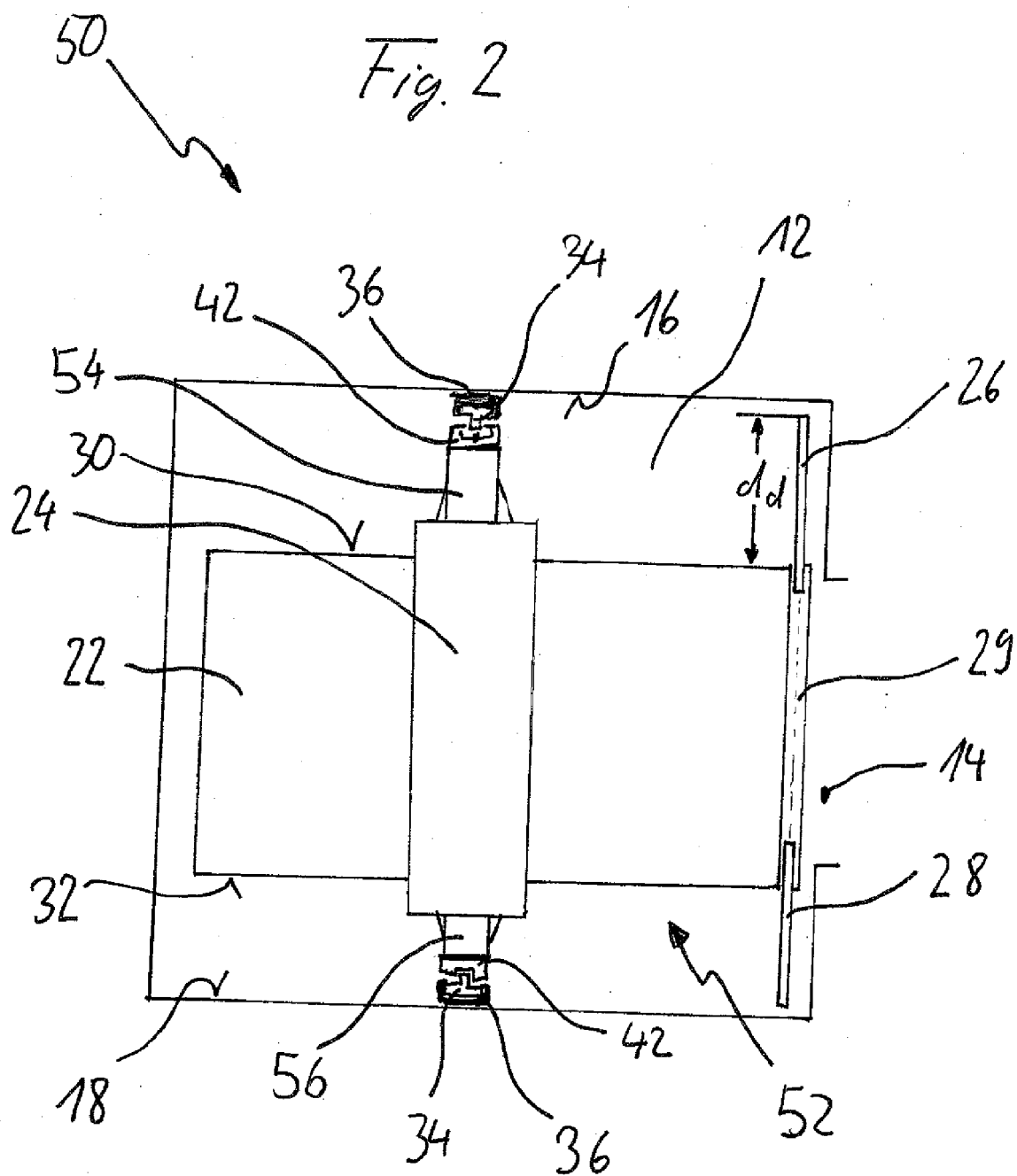
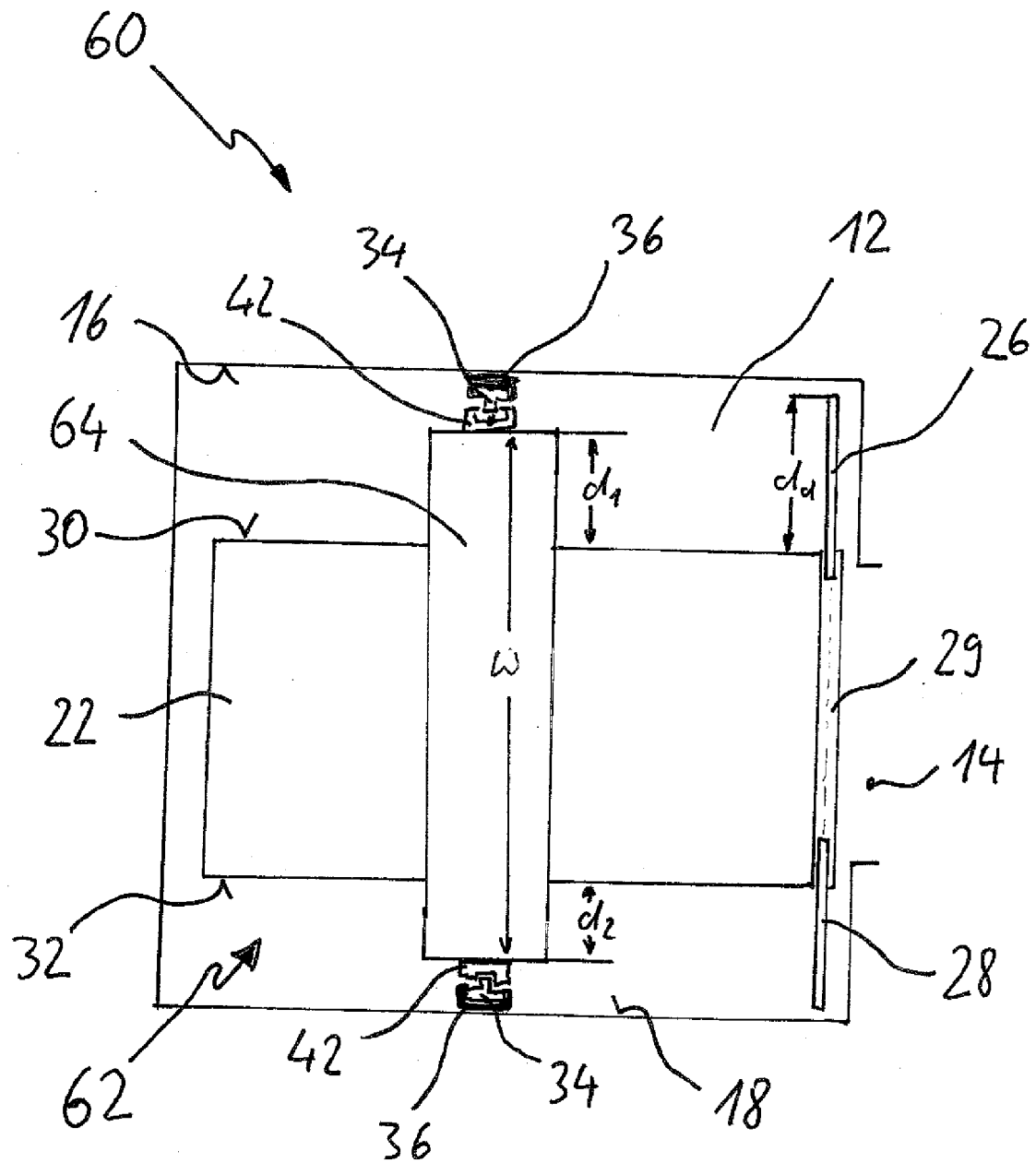


Fig. 3





Europäisches
Patentamt
European
Patent Office
Office européen
des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 12 19 9157

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	JP 2001 063937 A (KAJIMA CORP) 13 March 2001 (2001-03-13) * abstract; figures 1,2 * * paragraph [0014] * * the whole document *	1,4-10	INV. B66B7/02 B66B7/04 B66B11/02
X	US 1 076 273 A (DUNLAP GARLAND [US]) 21 October 1913 (1913-10-21) * page 1; figures 1,2 *	1,4-10	
X	US 4 047 597 A (OKURA MASAATSU ET AL) 13 September 1977 (1977-09-13) * abstract; figures 1-3 * * the whole document *	1,4-10	
X	US 5 749 444 A (SKALSKI CLEMENT A [US]) 12 May 1998 (1998-05-12) * abstract * * figure 5 * * column 1, lines 17-29 * * column 5, lines 47-53 * * column 9, line 51 - column 10, line 13 *	1 2,3	
A	EP 1 894 876 A1 (INVENTIO AG [CH]) 5 March 2008 (2008-03-05) * abstract; figure 1 * * paragraphs [0024], [0025] *	1-10	TECHNICAL FIELDS SEARCHED (IPC) B66B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 9 July 2013	Examiner Piekarski, Adam
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

1
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 12 19 9157

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-07-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2001063937 A	13-03-2001	JP 3727204 B2 JP 2001063937 A	14-12-2005 13-03-2001
US 1076273 A	21-10-1913	NONE	
US 4047597 A	13-09-1977	GB 1538045 A HK 1782 A JP S5181336 A PH 14767 A US 4047597 A	10-01-1979 22-01-1982 16-07-1976 09-12-1981 13-09-1977
US 5749444 A	12-05-1998	JP H09165161 A US 5749444 A	24-06-1997 12-05-1998
EP 1894876 A1	05-03-2008	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82