

(19)



(11)

EP 2 138 443 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

30.12.2009 Bulletin 2009/53

(51) Int Cl.:

B66B 13/28 (2006.01)

(21) Application number: **08381020.0**

(22) Date of filing: **04.06.2008**

(84) Designated Contracting States:

**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT
RO SE SI SK TR**

Designated Extension States:

AL BA MK RS

(71) Applicant: **Mac Puar, S.A.**

41092 Sevilla (ES)

(72) Inventor: **Conchello Moreno, José Angel**
41092 Sevilla (ES)

(74) Representative: **Esteban Perez-Serrano, Maria**
Isabel
C/ Explanda 8, 4º
28040 Madrid (ES)

(54) **Folding skirt for a lift cabin**

(57) Skirt, which when fixed to the support part of the footplate of a cabin touches the mechanical limit stop, which may be the lift pit, and which unfolds when elevation commences, and is specially designed for lift shafts with a pit of reduced height dimension, being provided for this purpose with two guide elements joined to the cabin and on the guide elements of the guiding devices articulation hinges of the slats are mounted; the connec-

tion of the guiding devices is made by means of yokes and intermediate parts interposed between said yokes and the support part of the cabin footplate; in addition it is provided with a smooth means of contact of the skirt with the lift pit floor as well as means which indicate the correct unfolding of the skirt.

EP 2 138 443 A1

Description

OBJECT OF THE INVENTION

[0001] The object of this invention is a folding skirt for a lift cabin which, when extended, covers the full width of the floor entries which it faces.

[0002] The invention of a folding skirt for a lift cabin is characterised by its special configuration, design and the interrelated elements which make up the skirt, so that a skirt is obtained which may be folded when it reaches a mechanical limit, which may be the floor of the lift shaft, and which folds on itself when the lift begins to move upwards, remaining extended until the lift returns to the lower floor once more.

[0003] The invention is also characterised by the fact that the skirt is provided with means which enable it to smoothly fold and unfold, and by the fact that it is provided with a position detector which ensures that the skirt functions correctly.

[0004] Therefore, this invention is circumscribed by the scope of lift apparatus and in particular lift cabin skirts or toe guards which seek to cover the full width of the entry to the floors.

BACKGROUND TO THE INVENTION

[0005] To date, lift regulations require that the lift cabin footplate is provided with a cabin toe guard or skirt which extends over the total width of the floor entries with which it is faced, so that in the event that the lift stops between two floors, when the floor door opens to the cabin, the shaft which would be between the cabin and the floor is protected or covered by said toe guard or skirt.

[0006] The manner in which the total width of the floor entries is covered is by means of a vertical flat part, which is sufficiently robust and is placed on the lower part of the cabin.

[0007] Nevertheless, at times due to the conditions of the lift shaft, particularly in existing buildings, the height between the lowest floor and the base of the pit is insufficient place a skirt with the regulatory dimensions unless the skirt collides with the floor of the pit.

[0008] In order to resolve the problem raised, a folding skirt has been developed which folds when it touches a mechanical limit stop, which may be the base of the shaft, and which then, when the cabin begins to rise the skirt unfolds.

DESCRIPTION OF THE INVENTION

[0009] The invention of the folding skirt for lift cabins consists of a toe guard or skirt fixed to the footplate of a lift cabin, which is provided with the particularity that it folds like a concertina when the skirt enters into contact with a mechanical limit stop, which may be the base or floor of the pit, unfolding once more when the elevation process begins, remaining extended until it returns once

more to the lower floor and contacts with the mechanical limit stop which may be the floor of the lift pit.

[0010] Lift pit is understood to be the lower space of the lift shaft beneath the level of the lowest floor.

[0011] In order to carry out that process, the folding skirt consists of two guiding devices fixed to the lift cabin, and from which their respective guide elements emerge which are mounted on connection rods between these guide elements of the guiding devices and the articulation hinges between the blades of the skirt.

[0012] The attachment of the guiding devices to the lift cabin is made by means of yokes fixed to a yoke support part which in turn is fixed to a support of a lift cabin footplate by means of a lateral support part.

[0013] The rods slide vertically on the guide elements of the guiding devices in such a way that they permit the skirt to extend and fold up. In order to improve the sliding of the rods on the guide elements of the guiding devices, above and below the rods slide shoes are arranged which may be nylon bushings.

[0014] The skirt extends or unfolds through the action of gravity and folds through contact with the mechanical stop, with the unfolding softened or amortised by means of a shock absorbing device. Furthermore, said shock absorbing device could be used to help to extend the skirt if the weight or friction does not permit it to unfold on itself.

[0015] In addition the folding of the skirt is amortised by the action of the shock absorbing devices.

[0016] The guiding device and the shock absorbing device may be the same device, this would be the case in which the guiding device carries out a shock absorbing action. Furthermore, the guiding device and the shock absorbing means may also be different elements working jointly.

[0017] As guiding devices, hydraulic or pneumatic cylinders, bars, telescopic rods or grooved telescopic bars may be used.

[0018] In order to avoid the noise of the skirt when it touches the mechanical limit stop, which may be the base of the lift pit, shock absorbing limits have been incorporated in the final slat thus the contact of the final slat with the lift pit is made in a fairly smooth manner.

[0019] In addition, and in order to be sure of the correct operation of the folding and unfolding of the folding skirt, the skirt is provided with an unfolding position detector which ensures that the skirt functions correctly, so that when the folding skirt is completely extended, an actuation plate stops acting on a contact or vice versa.

DESCRIPTION OF THE DRAWINGS

[0020] In order to complete the description below and to assist in a better comprehension of its characteristics, the present descriptive report is accompanied by a set of plans with figures representing in an illustrative but not restrictive way the most significant details of the invention.

Figure 1 shows a general view of the folding skirt which is the object of the fully unfolded invention, where the main components may be observed.

Figure 2 is a detailed view of the connection between a rod and the skirt slats.

Figure 3 shows a detail of the connection of the skirt arrangement to the cabin.

Figure 4 shows a detail of the connection between the yoke -support footplate-yoke.

Figure 5 shows a detail of the lower part of the skirt, indicating the limits, such as the connection of an end of a guide element of the guiding device with the lower part of the skirt.

Figure 6, shows a detailed view of the contact used to control the correct extension of the skirt.

PREFERRED EMBODIMENT OF THE INVENTION

[0021] In the light of the figures below, a preferred embodiment of the proposed invention is described.

[0022] Figure 1 shows a folding skirt such as that which is the object of the invention in completely unfolded position. Said folding skirt unfolds through action of gravity and unfolds on contact with the mechanical limit stop, being provided for this purpose with two guiding devices (1).

[0023] Thus the unfolding of the folding skirt is smoothed by the action of either shock absorbing devices or by the shock absorbing action of the guiding devices, with these shock absorbing devices having the possibility of assisting unfolding in the event that the action of gravity is not sufficient to do so.

[0024] In addition, the shock absorbing devices (1) have an amortising action on the folding action of the folding skirt.

[0025] The guiding device of the shock absorbing device may be the same device fulfilling both functions, as in the case of a pneumatic cylinder.

[0026] Furthermore, the guiding device (1) and the shock absorbing device may be different elements, such as, for example, in the event that the guiding device is a rod and the shock absorber a spring.

[0027] In the embodiment shown in figure 1, the two guiding devices (1) are shown which would be joined to the lift cabin, consisting in addition of a series of articulated slats (6) which are joined at the end of their articulations or hinges (7) to rods (5, arranged on each of the guide elements (9) of the guiding devices, and where the first of the slats is joined to a support part (2) of the cabin footplate by means of screws (4).

[0028] Figure 2 shows a detail of the rod (5) connection to the articulation hinges of the slats (6). Said rods (5) run along the guide elements (9) with their upper and

lower parts being provided with bushings or slide shoes (8) which improve sliding in the folding and unfolding of the skirt. Furthermore, the length of the hinges (7) is greater than the width of the slats (6) in order to facilitate the articulated connection between the rods (5) and the hinges (7). Furthermore, the rods (5) are provided with a certain width so that they maintain a distance between the slats once the skirt is completely folded or compressed.

[0029] Figures 3 and 4 show the means by which the guiding devices (1) are attached to the support part (2) of the cabin footplate, which is made by means of a yoke (3), arranged at the end of each spring and which is attached to a yoke (12) which in turn is attached to the support part (2) of the cabin footplate by means of a lateral support part (11) of the cabin.

[0030] In addition, figure 3 shows once more how the first of the slats (6) of the skirt is fixed on the support part (2) by means of connection screws (4).

[0031] Figure 5 shows the lower part of the skirt, which is provided with a lower part (14) which on its lower face is provided with stops (15) for the purpose of avoiding noise when the skirt touches the mechanical limit stop which may be the bottom of the pit.

[0032] Furthermore, said lower part (14) is provided at its ends with overhanging projections, or horizontal flaps (16) with a series of perforations where the end (10) of each of the spring (2) rods (9) are fixed.

[0033] Finally, figure 6 shows how information is obtained on the correct unfolding of the skirt. To do so on one of the slats, preferably the last to be unfolded, an actuation plate (13) is arranged which acts on a contact (17) mounted on the lower part (14) of the skirt.

[0034] The essential nature of this invention is not altered by any variations in materials, form, size and arrangement of its component elements, which are described in a non-restrictive manner, with this being sufficient to proceed to its reproduction by an expert.

Claims

1. Folding skirt for a lift cabin **characterised in that** the folding skirt comprises two guiding devices (1) fixed to the lift cabin, and from which respective guide elements (9) emerge on which connection rods (5) are mounted between the guide elements (9) of the guiding devices and articulation hinges (7) between the slats (6) of the skirt, with the first of the slats attached to a support part (2) of the cabin footplate, in such a way that the whole arrangement permits the folding in concertina form of the skirt when the skirt contacts a mechanical limit stop, unfolding once more when the cabin elevation procedure commences, remaining extended until it returns to the lower floor and contacts with the mechanical limit.
2. Folding skirt for a lift cabin according to claim 1, **char-**

acterised in that the unfolding of the folding skirt is carried out through the action of gravity.

3. Folding skirt for a lift cabin according to claim 1, **characterised in that** the guide device includes a shock absorbing action. 5
4. Folding skirt for a lift cabin according to claim 1, **characterised in that** the guiding device is provided with a shock absorbing action. 10
5. Folding skirt for lift cabin according to claims 3 or 4 **characterised in that** the folding skirt unfolds through the action of gravity is amortised by the action of shock absorbing devices or by the shock absorbing action of the guide means. 15
6. Folding skirt for lift cabin according to claims 3 or 4 **characterised in that** the unfolding of the folding skirt, when the action of gravity is not sufficient, is carried out by the action of shock absorbing devices or by the shock absorbing action of the guiding devices. 20
7. Folding skirt for lift cabin according to claims 3 or 4 **characterised in that** the folding is amortised by the action of shock absorbing devices or by the shock absorbing action of the guiding means (1). 25
8. Folding skirt for a lift cabin according to claim 1, **characterised in that** the rods (5) run along the guide elements (9), with the upper and lower part therefore being provided with slide shoes or bushings (8). 30
9. Folding skirt for a lift cabin according to claim 1, **characterised in that** the length of the hinges (7) is greater than the width of the slats (6) in order to facilitate the articulated connection between the rods (5) and the hinges (7). 35
10. Folding skirt for a lift cabin according to claim 1, **characterised in that** attachment of the guiding devices (1) to the support part (2) of the cabin footplate is made by means of a yoke (3), arranged at the end of each spring and which is attached to a yoke (12) support part which in turn is fixed to the support part (2) of the cabin footplate by means of a lateral support part (11) of the cabin. 40
11. Folding skirt for a lift cabin according to claim 1, **characterised in that** the lower part of the skirt is provided with a lower part (14) which on its lower face is provided with shock absorbing stops (15). 50
12. Folding skirt for a lift cabin according to claim 11, **characterised in that** said lower part (14) is provided at its ends with overhanging projections, or horizontal flaps (16) with a series of perforations where 55

the end (10) of each of the spring (1) rods (9) are fixed.

13. Folding skirt for a lift cabin according to claim 1, **characterised in that** in order to obtain information on the correct unfolding of the skirt, on one of the slats, preferably the last slat to unfold, an actuation plate (13) is arranged on which a contact (17) acts mounted on the lower part (14) of the skirt.
14. Folding skirt for a lift cabin according to claim 1, **characterised in that** the mechanical limit stop which starts the folding of the skirt is the actual floor of the lift shaft.
15. Folding skirt for a lift cabin according to claim 1, **characterised in that** the guiding devices are hydraulic or pneumatic cylinders.
16. Folding skirt for a lift cabin according to claim 1, **characterised in that** the guiding devices are telescopic rods.
17. Folding skirt for a lift cabin according to claim 1, **characterised in that** the guiding devices are telescopic grooved bars.

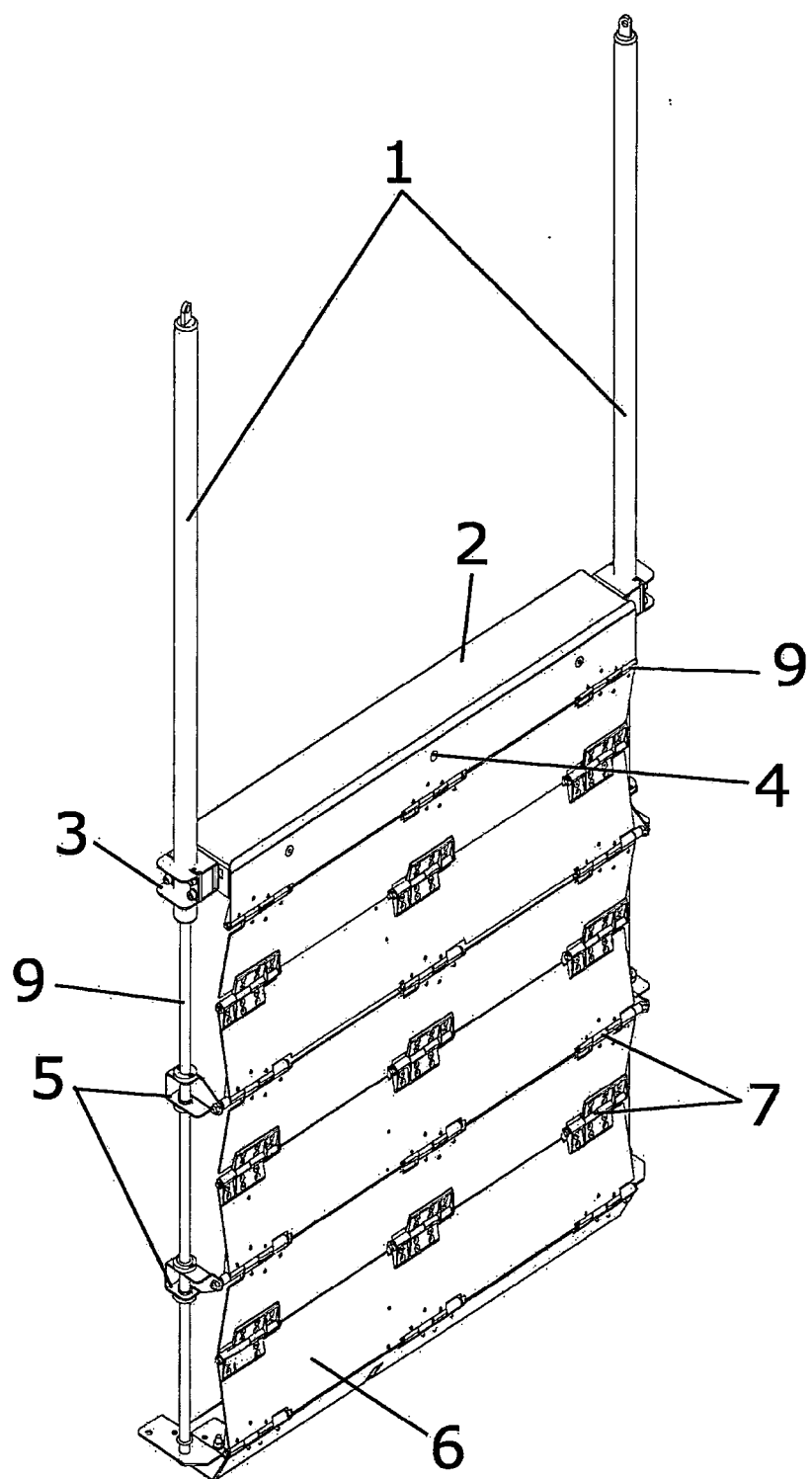
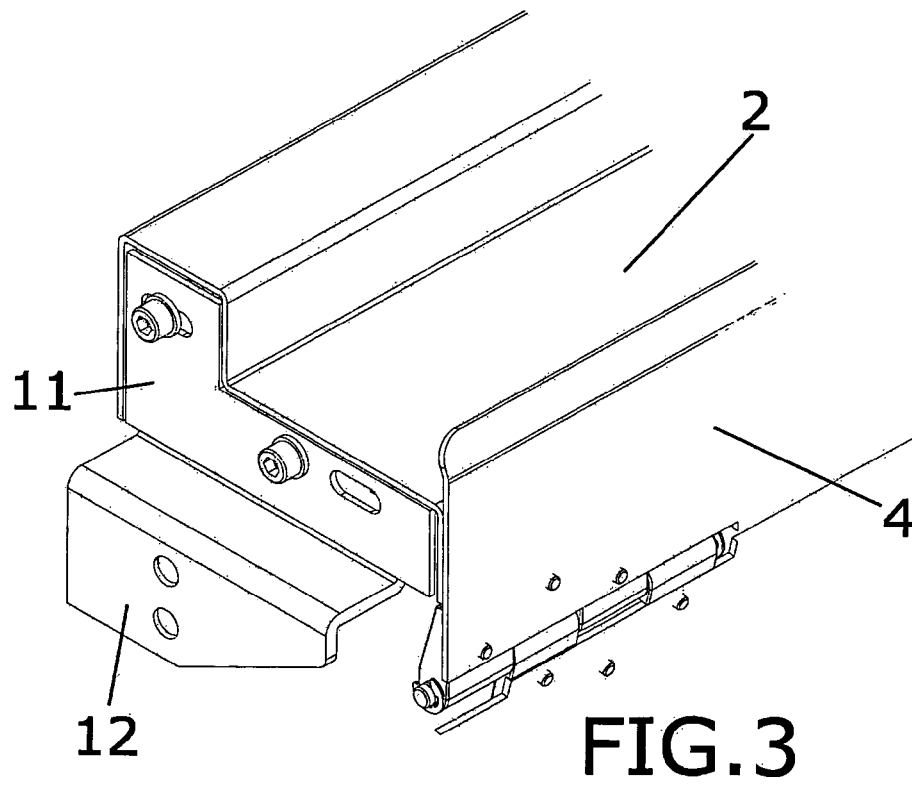
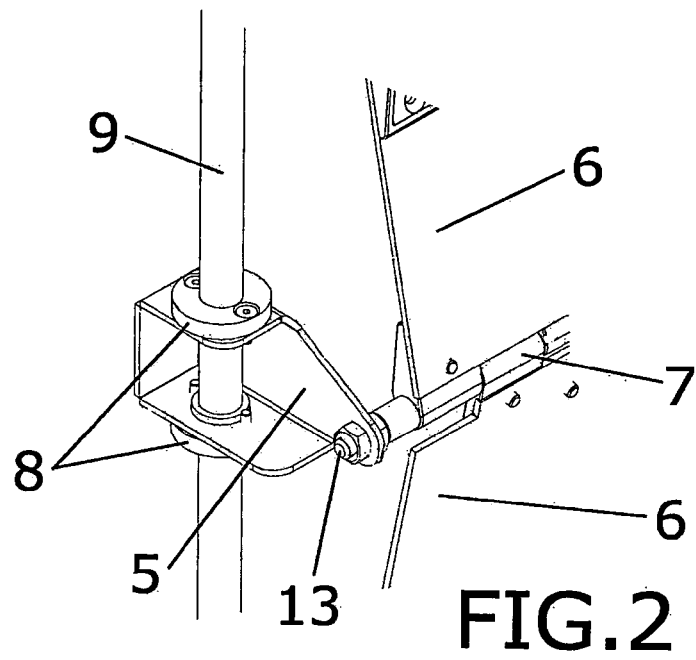
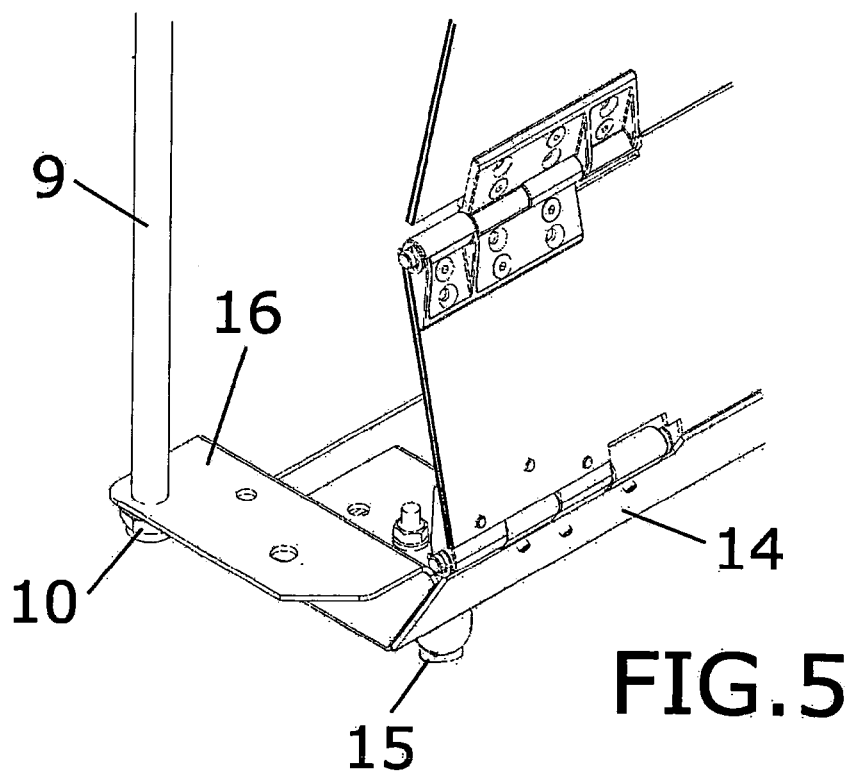
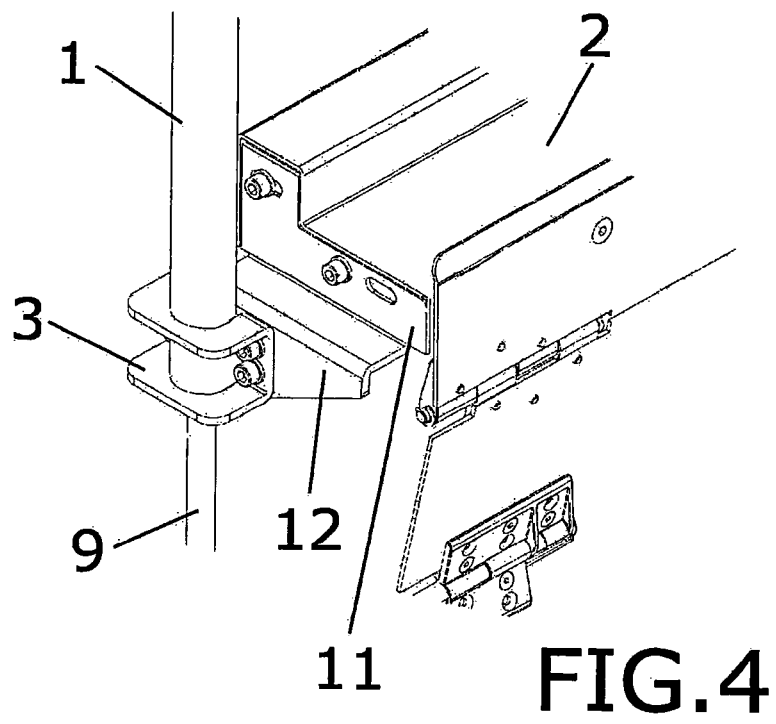
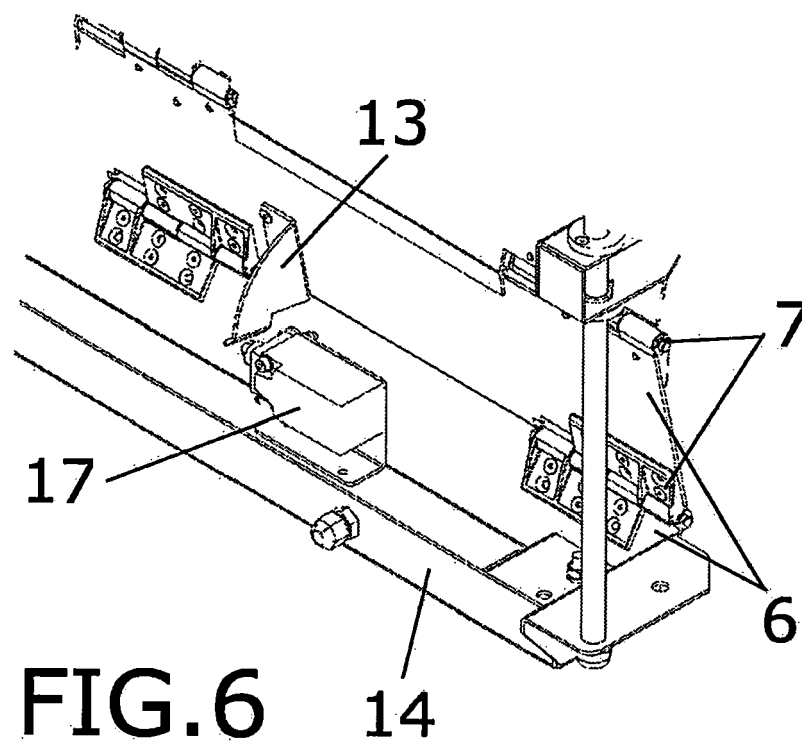


FIG.1









EUROPEAN SEARCH REPORT

Application Number
EP 08 38 1020

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	FI 117 627 B1 (KONE CORP [FI]) 29 December 2006 (2006-12-29)	1-8, 11-17	INV. B66B13/28
A	* figures 1,2,3,5 *	9-10	
A	DE 203 13 911 U1 (OELSMEIER INGO [DE]) 13 November 2003 (2003-11-13) * abstract; figure s *	1-17	
A	US 5 655 628 A (LIN WEN-TSUNG [TW]) 12 August 1997 (1997-08-12) * figures 3a,3b,3c *	1-17	
A	JP 11 049463 A (MITSUBISHI ELECTRIC BILL TECH) 23 February 1999 (1999-02-23) * abstract; figure 6 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			B66B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		19 November 2009	Nelis, Yves
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 08 38 1020

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.

19-11-2009

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FI 117627	B1	29-12-2006	NONE	
DE 20313911	U1	13-11-2003	NONE	
US 5655628	A	12-08-1997	NONE	
JP 11049463	A	23-02-1999	JP 3714776 B2	09-11-2005