

(19)



(11)

EP 2 607 285 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
02.11.2016 Bulletin 2016/44

(51) Int Cl.:
B66B 13/08 (2006.01)

(21) Application number: **12197195.6**

(22) Date of filing: **14.12.2012**

(54) **Six-panel automatic door of a lift**

Automatische Lifttür mit sechs Türblättern

Porte automatique à six panneaux d'un ascenseur

(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**

(30) Priority: **21.12.2011 CZ 201125369 U**

(43) Date of publication of application:
26.06.2013 Bulletin 2013/26

(73) Proprietor: **Vymyslický - Vytahy spol. s r.o.
68601 Uherske Hradiste (CZ)**

(72) Inventor: **Vymyslický, Radislav
68712 Bílovice (CZ)**

(74) Representative: **Musil, Dobroslav et al
Zabrdovicka 801/11
615 00 Brno (CZ)**

(56) References cited:
**WO-A2-2006/027411 JP-A- 2002 362 865
US-A- 5 878 846**

EP 2 607 285 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

Technical Field

[0001] The invention relates to a six-panel automatic door of a lift comprising on each side of the entrance opening trio of panels hung on tracks by means of travelling wheels and coupled to a drive, whereas the door of lift comprises four parallel tracks, whereas the two rear pairs of panels are each hung on one track and each panel of the front pair of panels is hung on an independent track.

Background Art

[0002] Six-panel automatic elevator doors currently known include on each side of the entrance opening trio of panels placed one after another and movable towards the opposite trio of panels. In principle, by that three rows of panel pairs moving against each other are made up, as there is in every row one panel placed on each side of the entrance opening. Such six-panel automatic elevator door further includes trio of tracks located in the upper part of the construction, whereas there is a pair of counter-moving panels hung on each track by means of their travelling wheels, and both panels of every pair of panels move within a common plane given by their common track and abutting against each other with their frontal areas in the closed position of the door. The panels are coupled to a drive controlled by the controlling unit of the elevator.

[0003] The disadvantage of such arrangements including trio of counter-moving pairs of panels is its real non-utility for entrance openings of lifts narrower than 1400 mm, because for narrow entrance openings of lifts it would be necessary to use narrower panels and in particular shorter tracks with possible shorter mutual distances of the travelling wheels of each panel, resulting in insufficient stiffness of the movable mounting of the panels, or in lower resistance of displacement of the panel when running against an obstacle, for example when a person or an object, such as a pram etc., enters the door during its closing movement. The possible displacement of the panel results in damage of the lift and impossibility of its subsequent use. On the other hand, the advantage of six-panel automatic elevator doors rests in the shorter tracks and thus in the quicker opening of the door etc.

[0004] From JP 2002 362865 a six-panel automatic door of a lift is known, said door comprising on each side of the entrance opening of lift a trio panels hung on tracks by means of travelling wheels and coupled to a drive. The lift door comprises four parallel tracks, whereas the two rear pairs of panels are each hung on one track and each panel of the front pair of panels is hung on an independent track.

[0005] WO 2006/027411 discloses a solution for a three-panel automatic door of a lift, where each panel

travels along an independent track, whereby one track is created on the outer side of the first rail having a C-shaped profile, the second track is created on the inner side of the first rail having a C-shaped profile and the third track is created on the inner side of the second rail having a C-shaped profile.

[0006] The goal of the technical solution is to allow safe use of six-panel automatic doors of a lift also for lifts having entrance openings width 1400 mm and narrower, starting from 600 mm.

Principle of the Invention

[0007] The goal of the invention is achieved by means of a six-panel automatic door of a lift, the principle of which rests on the fact that two tracks are created on one rail formed as space longitudinal profile in principle of C-shape, whereas on the outer side of the C-shaped profile the first track is created and on the inner side of the C-shaped profile the second track is created.

[0008] This solution allows use of longer carrying plates with longer mutual distance of the travelling wheels, by means of which sufficient stiffness of the door system is provided, as well as higher resistance to displacement, reliability etc. Thus the six-panel automatic door of lift can be used also for lifts having entrance openings narrower than 1400 mm or, more accurately, with elevators having entrance openings width from 600 mm.

Description of the Drawings

[0009] The invention is schematically represented in the drawings, where Fig. 1 shows a front view of the arrangement of the travelling mechanism of the six-panel automatic door of lift with combined rails, Fig. 2 shows a cross-view of the arrangement of the travelling mechanism of the six-panel automatic door of lift with combined rails and Fig. 3 shows a side-view of the arrangement of the travelling mechanism of the six-panel automatic door of lift with combined rails.

Examples of Embodiment

[0010] The six-panel automatic door of a lift includes on each side of the entrance opening trio of non-represented panels movable on the travelling mechanism towards the centre of the entrance opening of the lift and back. The individual panels are equipped with a set of travelling wheels 10 and are placed on rails 2 in a way adjustable towards the centre of the entrance opening and back. In the represented example of embodiment the panels are fixed on carrying plates 1, which are equipped with a set of travelling wheels 10 placed on rails 2.

[0011] In the exemplary embodiment in Fig. 1 to 3 the six-panel automatic door of a lift includes two parallel rails 2, whereas each rail 2 is equipped with a pair of tracks. In the represented exemplary embodiment the

rails 2 are formed as space longitudinal profiles in principle of C-shape, whereas on the outer side of the C-shaped profile the first track 20 is created and on the inner side of the C-shaped profile the second track 21 is created.

[0012] The two rear pairs of panels, i.e. of carrying plates 1 = 11, are each hung on a single track, and thus the panels of each of those pairs move directly against each other in one plane.

[0013] Each panel, i.e. each carrying plate 1 = 12, the front pair of panels, i.e. the front pair of carrying plates 1 = 12, is hung on an individual track. The front pair of panels thus occupies two tracks.

[0014] In the exemplary embodiment represented in Fig. 1 to 3 each front pair of panels, of the carrying plates 1 = 12, is hung on an independent track of a common rail 2, whereas one of the carrying plates 1 = 12 having its end cranked for joining the door panel into the plane of the straight end of the other carrying plate 1 = 12, so that the panels of this front pair of carrying plates 1 = 12 hung on them move in one plane directly against each other. The use of independent tracks for the front pair of carrying plates 1 = 12 allows their travelling wheels 10 to be shifted away from each other farther than with an arrangement using only trio of tracks according to the prior art, by which a sufficient stiffness of the door system is guaranteed, as well as their resistance to displacement, reliability etc., which allows six-panel automatic doors of a lift to be used also for lifts having their entrance openings narrower than 1400 mm, respectively with openings varying from 600 mm to 1400 mm.

[0015] In another non-represented exemplary embodiment is the embodiment according to Fig. 1 to 3 modified by merely a modification of the end of one of the carrying plates 1 = 12 of the front pair of panels, so both carrying plates 1 = 12 are straight, so that the panels of this front pair of carrying plates hung on them move in two parallel planes next to each other and can thus overlap each other in the central part of the entrance opening of the lift.

[0016] In another non-represented exemplary embodiment the ends of both carrying plates 1 = 12 of the front pair of panels are shaped so that both carrying plates 1 = 12 are bent, thus the panels of this front pair of carrying plates 1 = 12 hung on them move either in two parallel planes next to each other and can overlap each other in the central part of the entrance opening of the lift, or move in a single plane directly against each other.

[0017] In another non-represented exemplary embodiment two of the four tracks are formed by independent rails 2 and the remaining two pairs of tracks are formed on a single common rail 2 according to the embodiment in Fig. 1 to 3.

List of Reference Marks

[0018]

1 carrying plate

10 travelling wheel
11 carrying plate of rear panel
12 carrying plate of front panel
2 rail
5 20 first track
21 second track

Claims

1. Six-panel automatic door of a lift comprising on each side of the entrance opening of the lift a trio of panels hung on tracks by means of travelling wheels and coupled to a drive, whereas the door of the lift comprises four parallel tracks, whereas the two rear pairs of panels are each hung on one track and each panel of the front pair of panels is hung on an independent track, **characterized by that** two tracks are created on one rail (2) formed as space longitudinal profile of C-shape, whereas on the outer side of the C-shaped profile the first track (20) is created and on the inner side of the C-shaped profile the second track (21) is created.
2. Six-panel automatic door of a lift according to claim 1, **characterized by that** two tracks are formed on two independent rails (2) and two tracks are formed on one common rail (2).
3. Six-panel automatic door of a lift according to any of the claims 1 or 2, **characterized by that** the front pairs of panels are arranged in one plane directly against each other.
4. Six-panel automatic door of a lift according to any of the claims 1 or 2, **characterized by that** the front pairs of panels are arranged in two parallel planes next to each other, and they overlap each other in the central part of the entrance opening of the lift.

Patentansprüche

1. Automatische Sechspaneelaufzugstür, die auf jeder Seite der Eingangsöffnung des Aufzugs ein Trio der Paneele aufweist, die durch die Laufräder auf den Fahrbahnen aufgehängt sind und mit einem Antrieb verkoppelt sind, wobei die Aufzugstür vier parallel laufende Fahrbahnen aufweist, wobei die hinteren zwei Paare der Paneele auf solche Weise aufgehängt sind, dass jedes Paar auf einer Fahrbahn aufgehängt ist und jedes Paneel des vorderen Paares der Paneele auf einer selbstständigen Fahrbahn aufgehängt ist, **dadurch gekennzeichnet, dass** zwei Bahnen auf einer Fahrleiste (2) gebildet sind, die als Raumlängsprofil der "C"-Form gebildet ist, wobei auf der Außenseite von diesem "C"-Profil die erste Fahrbahn (20) gebildet ist und auf der inneren Seite von

diesem "C"-Profil die zweite Fahrbahn (21) gebildet ist.

2. Automatische Sechspaneelaufzugstür nach dem Anspruch 1, **dadurch gekennzeichnet, dass** zwei Fahrbahnen auf zwei selbstständigen Fahrleisten (2) gebildet sind und zwei Bahnen auf einer gemeinsamen Fahrleiste (2) gebildet sind. 5
3. Automatische Sechspaneelaufzugstür nach einem der Ansprüche 1 oder 2, **dadurch gekennzeichnet, dass** die vorderen Paare der Paneele in einer Ebene direkt gegenüberliegend angeordnet sind. 10
4. Automatische Sechspaneelaufzugstür nach einem der Ansprüche 1 oder 2, **dadurch gekennzeichnet, dass** die vorderen Paare der Paneele in zwei parallel laufenden Ebenen nebeneinander angeordnet sind und sich in dem mittleren Teil der Eingangsöffnung des Aufzuges überlappen. 15 20

caractérisé en ce que les paires avant de panneaux sont disposées dans deux plans parallèles les uns à côté des autres et au milieu de l'ouverture d'entrée de l'ascenseur elles se recouvrent.

Revendications

1. Porte automatique à six panneaux de l'ascenseur, qui comprend sur chaque côté de l'ouverture d'entrée de l'ascenseur le trio des panneaux qui sont suspendus par les roues de roulement sur les chemins de roulement et qui sont accouplés à l'entraînement, tandis que la porte de l'ascenseur comprend quatre voies de circulation parallèles, tandis que les deux paires arrière de panneaux sont accrochées chaque paire sur un chemin de roulement et chaque panneau de la paire avant de panneaux est suspendu sur un chemin de roulement séparé, **caractérisé en ce que** deux chemins sont formés sur un rail de roulement (2) réalisée comme le profil longitudinal spatial sous la forme "C", tandis que sur le côté extérieur du profil "C" la première chemin de roulement (20) est réalisé et sur le côté intérieur du profil "C" la deuxième chemin de roulement (21) est réalisée. 25 30 35 40
2. Porte automatique à six panneaux de l'ascenseur selon la revendication 1, **caractérisé en ce que** les deux chemins de roulement sont formés sur deux rails de roulement indépendants (2) et les deux chemins sont réalisées sur un rail de roulement commun (2). 45 50
3. Porte automatique à six panneaux de l'ascenseur selon l'une quelconque des revendications 1 ou 2, **caractérisé en ce que** les paires avant de panneaux sont disposées dans un plan directement les uns contre les autres. 55
4. Porte automatique à six panneaux de l'ascenseur selon l'une quelconque des revendications 1 ou 2,

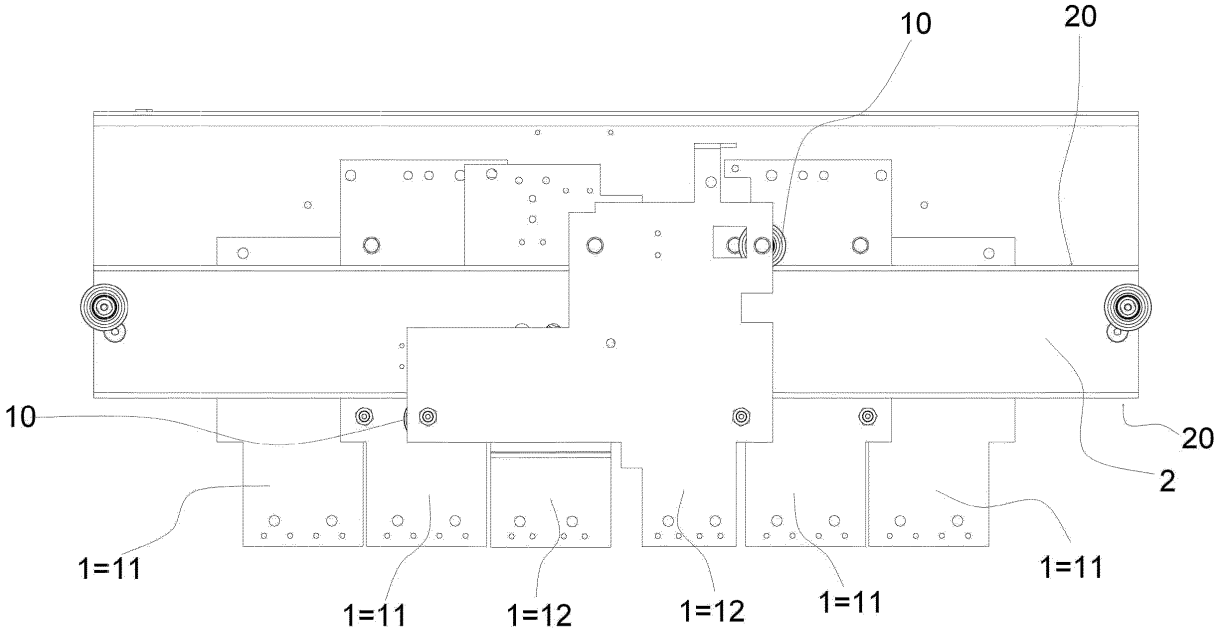


Fig. 1

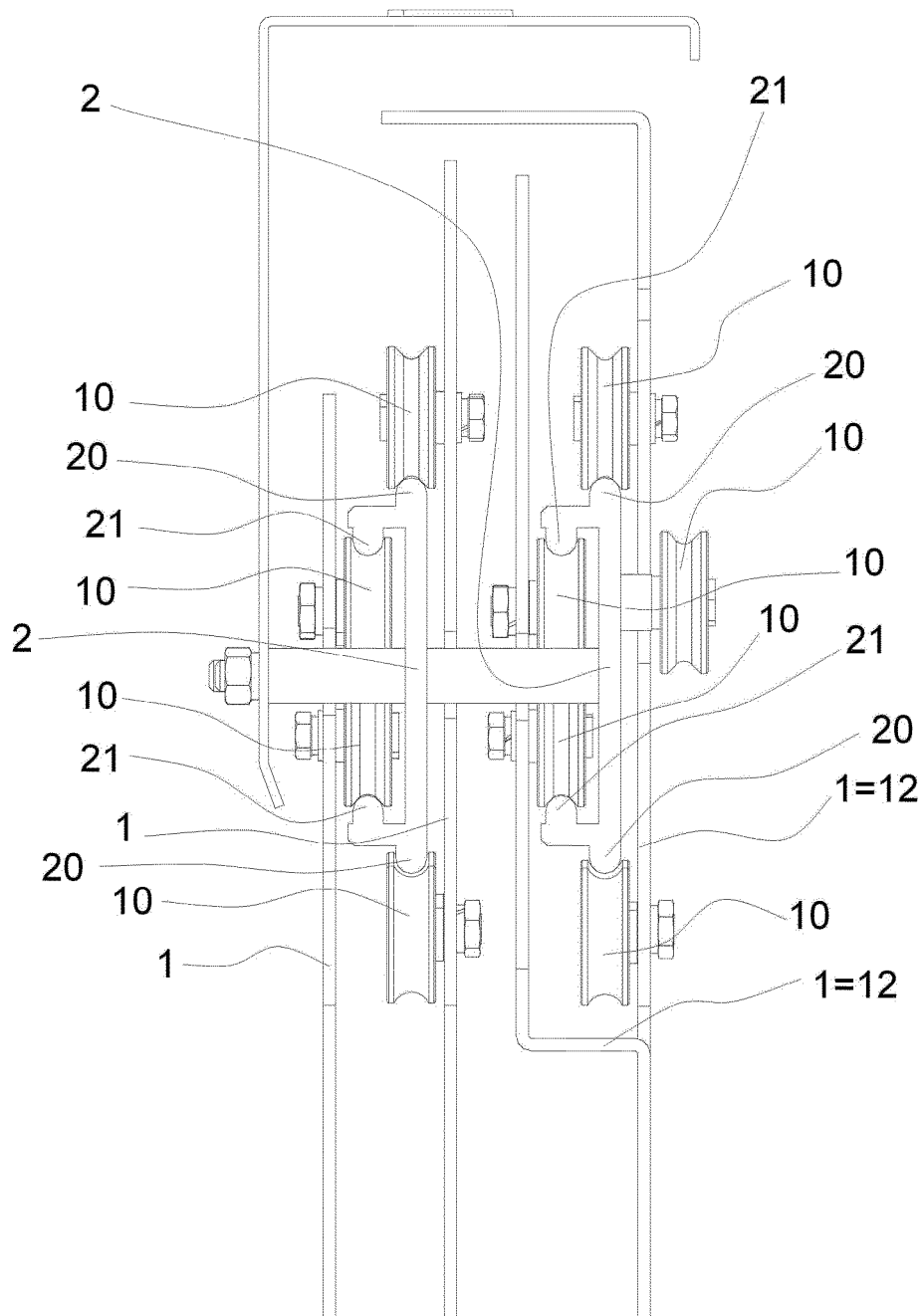


Fig. 2

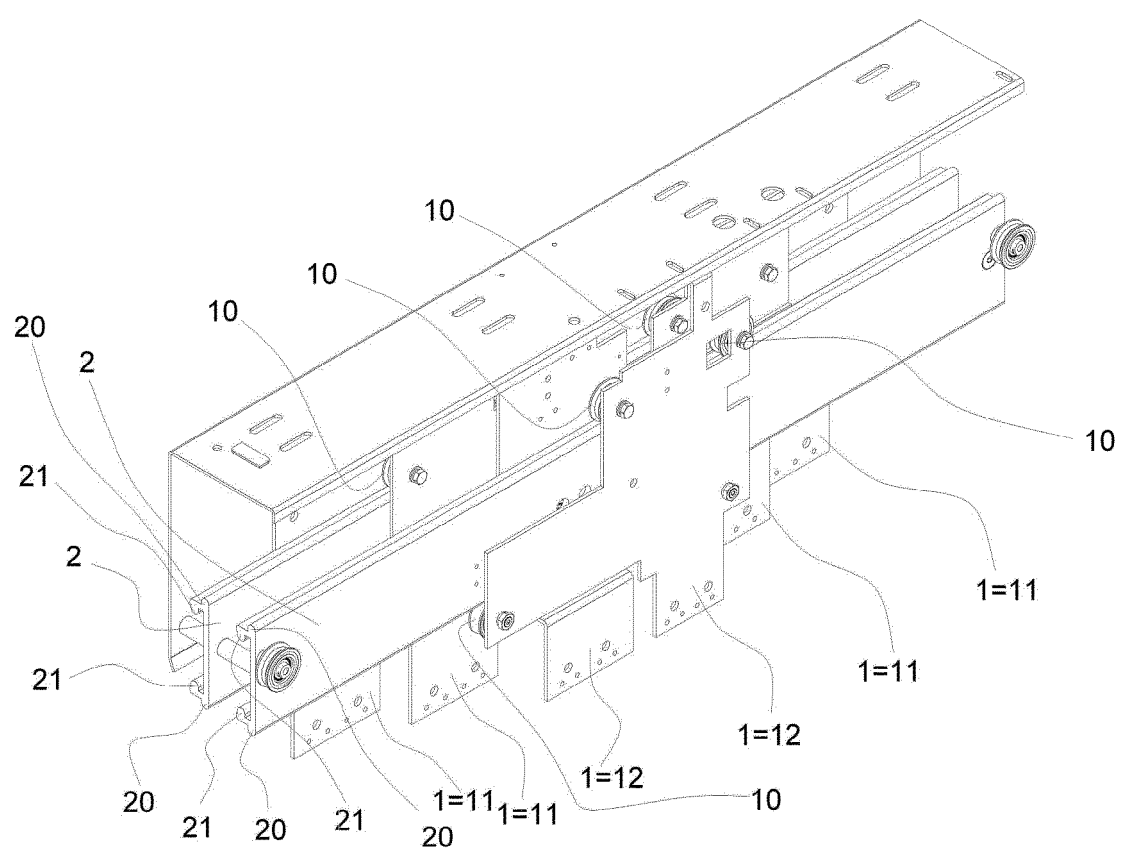


Fig. 3

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- JP 2002362865 A [0004]
- WO 2006027411 A [0005]