



(11) Publication number : **0 608 125 A1**

(12) **EUROPEAN PATENT APPLICATION**

(21) Application number : **94300393.9**

(51) Int. Cl.⁵ : **B66B 23/22**

(22) Date of filing : **19.01.94**

(30) Priority : **22.01.93 US 7418**

(43) Date of publication of application :
27.07.94 Bulletin 94/30

(84) Designated Contracting States :
AT DE FR GB

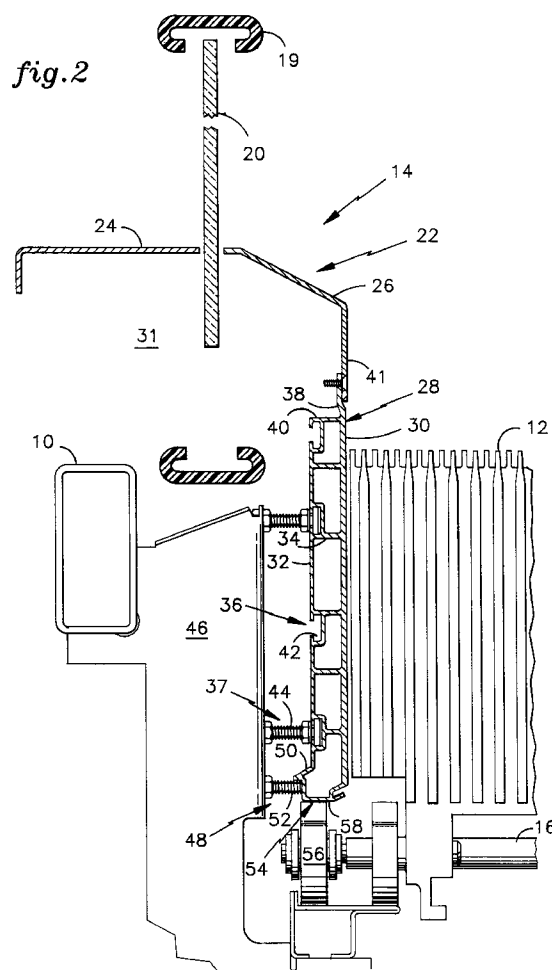
(71) Applicant : **OTIS ELEVATOR COMPANY**
10 Farm Springs
Farmington, CT 06032 (US)

(72) Inventor : **Wente, Gerald**
Meinserstrasse 2
D-3255 Pohle (DE)
Inventor : **Adrian, Willy**
Hauptstrasse 33
D-3063 Obernkirchen (DE)

(74) Representative : **Leale, Robin George**
FRANK B. DEHN & CO.
Imperial House
15-19 Kingsway
London WC2B 6UZ (GB)

(54) **Escalator balustrade skirt panel.**

(57) A one piece escalator balustrade skirt panel (28) is provided for an escalator having a plurality of moving steps (12). The skirt panel comprises a front surface (30), a back surface (32), a plurality of ribs (34), and a maintaining apparatus (36) for maintaining the skirt panel in close proximity to the steps. The ribs are positioned between and integrally attached to the front and back surfaces.



This invention relates to escalators in general, and escalator balustrades in particular.

Escalators, moving walkways, and other people moving devices efficiently move a large volume of pedestrian traffic from one point to another. Passengers step on moving steps (or belts, or pallets) and are transported along at a constant rate of speed. For safety reasons, passenger handrails are provided, traveling in the same direction and speed as the steps. A balustrade assembly supports and guides one of the handrails on each side of the steps.

Each balustrade assembly includes a balustrade panel which extends up from a base to support the handrail. Externally, the base consists of an outer decking, an inner profile, and a skirt panel. The outer decking encloses the mechanics on the side of the balustrade panel opposite the moving steps. The inner profile encloses the mechanics adjacent the moving steps. The inner profile also provides a transition section between the balustrade panel and the skirt panel.

The skirt panel lies in close proximity to, but out of contact with, the moving steps. Because of the proximity to the moving steps, the skirt panel must be a rigid panel to prevent pinching between the panel and the steps. Skirt panels typically are fabrications of structural members and sheet metal. The sheet metal provides the face in close proximity to the steps and the structural members add rigidity to the fabrication. It is known in the art that the hardware necessary to locate and hold the skirt panel relative to the steps may be incorporated into the structural members. For example, if bolts with "T"-shaped heads are used to locate and position the skirt panel, mating "C"-shaped channels would be formed in the structural members. Alternatively, mounting hardware independent of the structural members may be used to mount the fabricated skirt panel; e.g. independent "C"-shaped channels or nuts attached to the structural members. These fabricated panels may be created as one piece assemblies or as multiple sub-assemblies.

There are several disadvantages to fabricated skirt panels. First, to provide the rigidity necessary, the structural members and the sheet metal faces must be attached by weld or by fasteners. Either way, the exposed panel face is marred by heat discoloration or by fasteners. Second, creating a fabrication adds manufacturing steps, and therefore time and expense to the manufacturing process. Third, in the case of a fabrication consisting of sub-assemblies, all of the sub-assemblies must be aligned and assembled during manufacturing. In sum, fabricated skirt panels have several disadvantages which negatively affect the manufacturing process.

According to the present invention there is provided a one piece balustrade skirt panel for an escalator or the like having a plurality of moving steps or

the like, said panel comprising a front surface, a back surface, a plurality of ribs positioned between and integrally formed with said front and back surfaces, and maintaining means for maintaining said skirt panel in close proximity to the said steps.

Preferably the skirt panel is formed of homogeneous material.

Preferably an adjustable positioning means is provided for positioning the skirt panel in a plane perpendicular to the steps.

Preferably a guide means is provided for guiding the moving steps.

An advantage of the present invention is that a one piece skirt panel is provided. The one piece design eliminates the need to assemble several sections of skirt panel together, thereby simplifying both manufacturing and assembly.

Another advantage of the present invention is the strength of the surface and rib construction. The surface and rib construction minimizes deflection of the skirt panel away from the steps. The surface and rib construction also eliminates the need to attach stiffening members to the back surface and therefore any unsightly attachment deformations as well.

Another advantage of the present invention is the facility to incorporate peripheral brackets and other hardware. Incorporating the peripheral hardware and brackets minimizes the number of pieces in the balustrade assembly. As a result, both assembly and maintenance of the balustrade assembly are facilitated.

An embodiment of the invention will now be described by way of example and with reference to the accompanying drawings, in which:-

FIG. 1 shows a perspective view of an escalator partially cut away, having a pair of balustrade assemblies with a plurality of moving steps therebetween;

FIG. 2 is a cross-sectional view of a balustrade assembly; and

FIG. 3 is the cross-sectional view shown in FIG. 2, with the addition of a face panel attached to the skirt panel.

Referring to FIG. 1, an escalator is shown having a frame 10, a plurality of moving steps 12, and a pair of balustrade assemblies 14. The steps 12 are connected to a step chain 16 which is driven around a circuitous path by an electric drive motor 18. On each side of the balustrade assembly which minimizes deflection of the skirt panel away from the steps.

It is a still further object of the present invention to provide a one piece skirt panel for an escalator balustrade assembly which incorporates numerous peripheral brackets, thereby minimizing the number of pieces in the balustrade assembly.

It is a still further object of the present invention to minimize or eliminate marring of the exposed skirt panel surface.

According to the present invention, a one piece

escalator balustrade skirt panel is provided for an escalator having a plurality of moving steps. The skirt panel comprises a front surface, a back surface, a plurality of ribs, and maintaining means for maintaining the skirt panel in close proximity to the steps. The ribs are positioned between and integrally formed with the front and back surfaces.

According to one aspect of the present invention, the skirt panel comprises a formed homogenous material.

According to another aspect of the present invention, an adjustable positioning means is provided for positioning the skirt panel in a plane perpendicular to the steps.

According to a further aspect of the present invention, a guide means is provided for guiding the moving steps.

An advantage of the present invention is that a one piece skirt panel is provided. The one piece design eliminates the need to assemble several sections of skirt panel together, thereby simplifying both manufacturing and assembly.

Another advantage of the present invention is the strength of the surface and rib construction. The most rib 40. The flange 38 is offset to permit the inner profile 26 to attach to the flange 38 with the outer surface 41 of the inner profile 26 flush with the front surface 30. A mating bolt assembly 37 maintains the panel in close proximity to the moving steps 12. In one embodiment, the mating bolt assembly 37 includes a plurality of "C-shaped" channels 42 integrally formed in the back surface 32 of the skirt panel 28 during the extrusion process. "T-shaped" bolts 44 are received within the C-channels 42 and rotated to prevent relative motion between the bolts 44 and the channels 42. The bolts 44 are fixed to mounting hardware 46 conventionally attached to the frame 10 of the escalator, thereby rigidly fixing the skirt panel 28 to the frame 10. A person of skill in the art will recognize that C-channels and T-bolts are an example of a mating male and female maintaining means 36 and that other mating geometries may be used alternatively.

The skirt panel 28 further comprises a lip 50 integrally formed in the skirt panel 28 structure during the extrusion process. The lip 50 and a bolt 52 act as an adjustable positioning means 48 to position the skirt panel in the plane perpendicular to the steps 12. The lip 50 extends outwardly from the back surface 32 of the skirt panel 28. The bolt 52 conventionally attaches to either the frame 10 or to a bracket 46 attached to the frame 10. When the skirt panel 28 is properly positioned in the plane perpendicular to the steps 12, the bolt 52 is adjusted under the lip 50 extending out from the back surface 32 of the skirt panel 28, thereby enabling the lip 50 and skirt panel 28 to rest on the bolt 52. The bolt 52 prevents the skirt panel 28 from moving below that point.

The skirt panel 28 further comprises a surface 58

which acts as a guide means 54 for guiding rollers 56 attached to the moving steps 12. The flat surface 58 is integrally formed in the skirt panel 28 between the front 30 and back 32 surfaces. The flat surface 58 connects the edges of the front 30 and back 32 surfaces opposite the flange 38 attached to the inner profile 26. The flat surface 58 serves as an upthrust track to limit the distance the rollers 56 can travel from a step chain guide track 61 attached to the frame 10.

Referring to FIG.3, in one embodiment a face panel 60 is attached to the front surface 30 of the skirt panel 28. A tab 62 attached to the face panel 60 is received within a slot 64 formed in the front surface 30 of the skirt panel 28 adjacent the flat surface 58. The opening 66 of the slot 64 is flush with the plane of the front surface 30. The remainder of the face panel 64 is glued to the front surface 30. The face panel 64, comprised of decorative material such as brass, stainless steel, colored hardened plastics, or others, serves as both a cosmetic panel and a wear panel.

A person of skill in the art will recognize that the balustrade skirt panel 28 described heretofore as an escalator balustrade skirt panel, may also be described as a moving walkway balustrade skirt panel, or any other people moving device balustrade skirt panel. In the case of a moving walkway (not shown), the skirt panel 28 would be adjacent to a moving belt (or pallet; neither is shown) rather than the moving steps 12 of an escalator.

It will thus be seen that the present invention at least in its preferred forms, provides a low cost one piece skirt panel for an escalator balustrade assembly which facilitates assembly and maintenance; and furthermore provides such a skirt panel which minimizes deflection of the skirt panel away from the steps; and furthermore provides such a skirt panel which incorporates numerous peripheral brackets, thereby minimizing the number of pieces in the balustrade assembly; and furthermore provides arrangements which minimize or eliminate marring of the exposed skirt panel surface.

Claims

1. A one piece balustrade skirt panel (28) for an escalator or the like having a plurality of moving steps or the like, said panel comprising a front surface (30), a back surface (32), a plurality of ribs (34) positioned between and integrally formed with said front and back surfaces, and maintaining means (36) for maintaining said skirt panel in close proximity to the said steps (12).
2. A skirt panel (28) according to claim 1, which panel is formed of homogenous material.

3. A skirt panel (28) according to claim 1 or 2, wherein said maintaining means (36) comprises a plurality of channels (42) integrally formed in said skirt panel, and means (44) cooperating with said channels for adjustably securing said skirt panel to a frame member (46) of the escalator. 5
4. A skirt panel according to claim 1, which panel further comprises adjustable positioning means (50,52) for positioning the panel in a plane perpendicular to the said steps (12). 10
5. A skirt panel according to claim 4, wherein said adjustable positioning means comprises a lip (50) integrally formed with and extending out from the said back surface (32) of the panel, and a bolt (52) adjustably attached to a frame member (46) of the escalator and in register with said lip, thereby supporting and permitting adjustment of said skirt panel in a plane perpendicular to the steps (12). 15 20
6. A skirt panel (28) according to any preceding claim, which panel further comprises guide means (56,58) for guiding the moving steps (12). 25
7. A skirt panel according to claim 6, wherein said guide means comprises an upthrust track (58) positioned parallel to a roller track (61) attached to a frame member (46) of the escalator, wherein a plurality of rollers (56) attached to the movable steps (12) traverse between the roller track and said upthrust track. 30
8. A skirt panel (28) according to any preceding claim, further comprising a face panel (60) attached to said front surface (30) of said skirt panel. 35

40

45

50

55

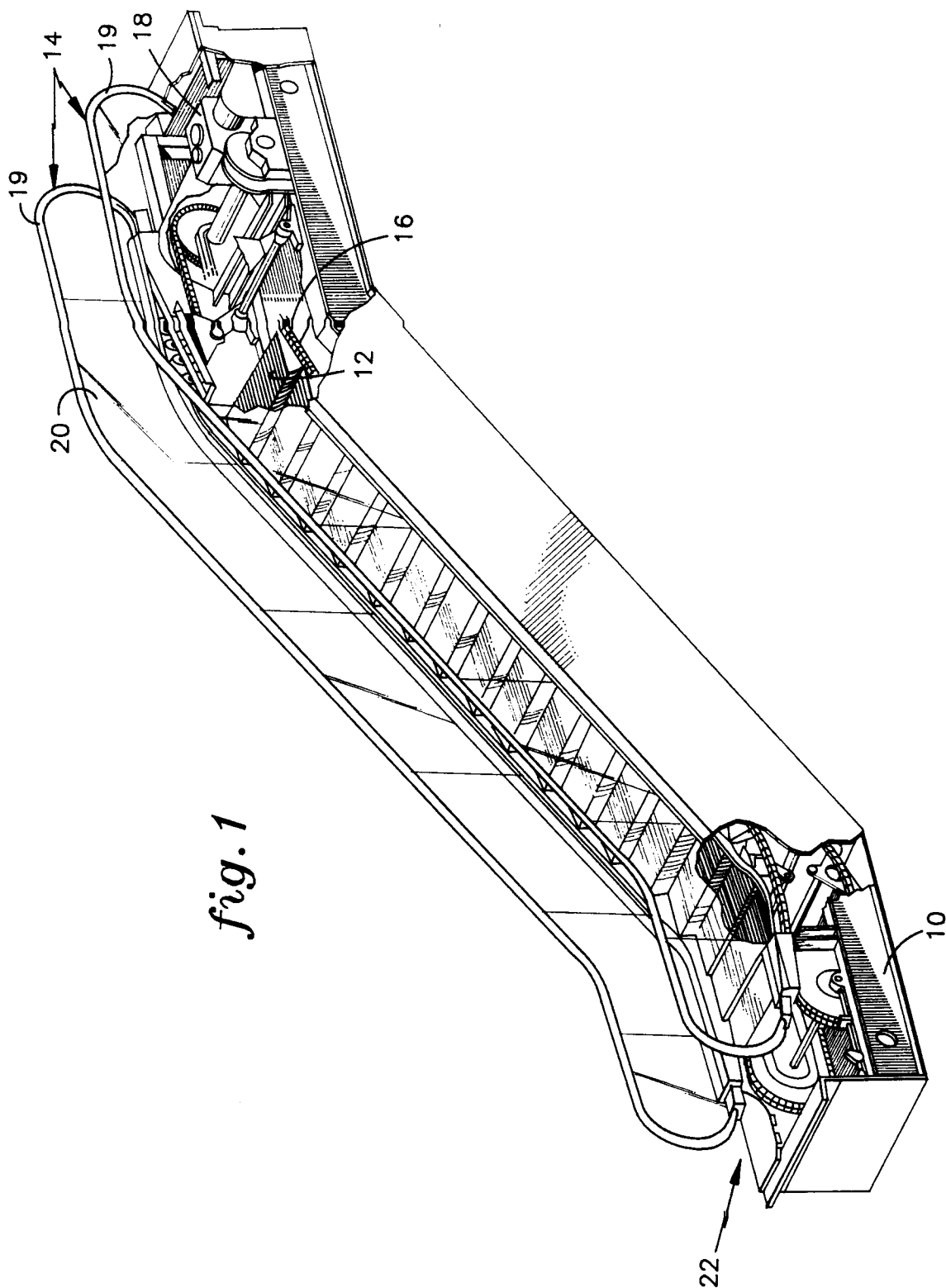


fig.2

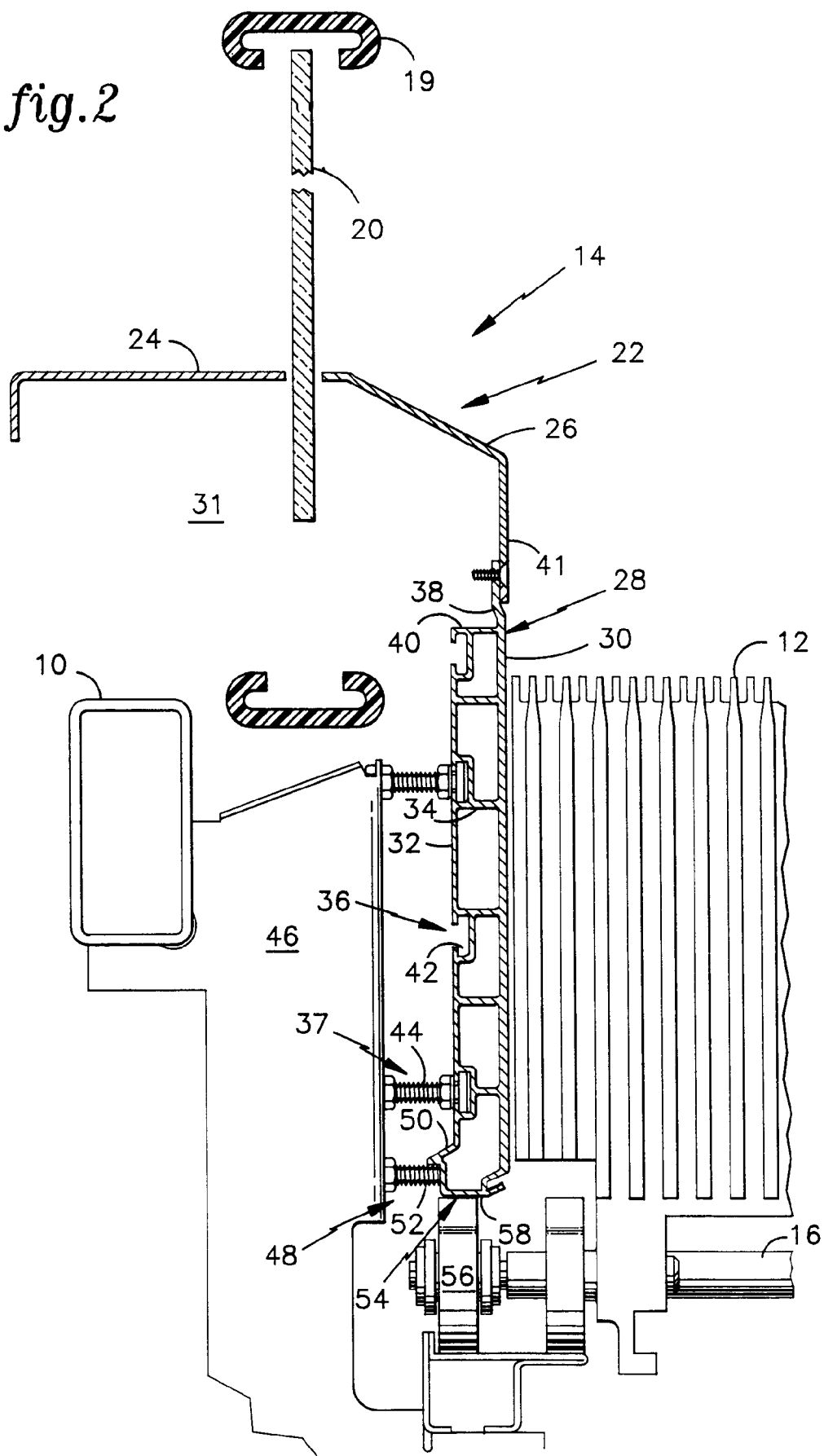
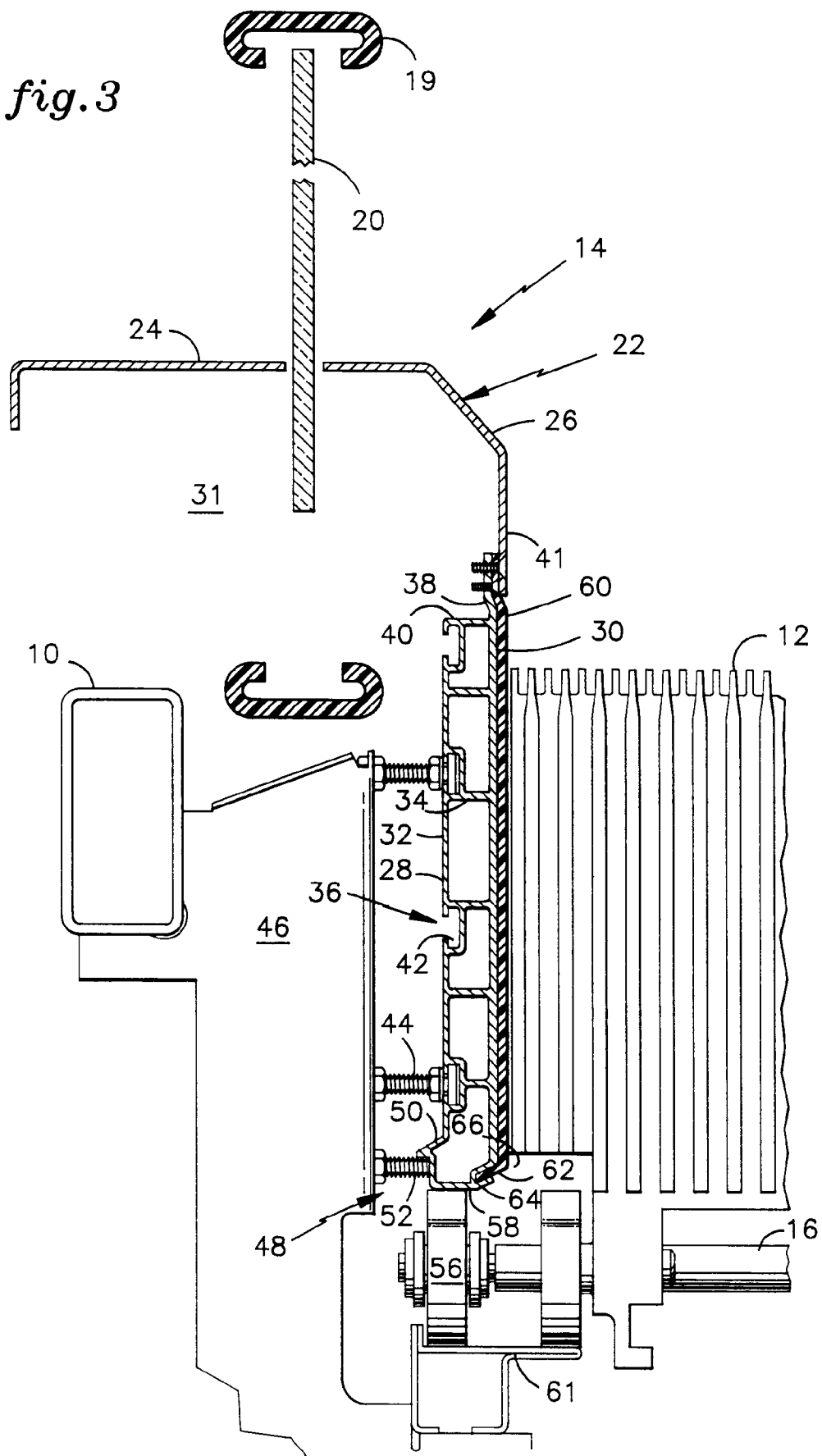


fig.3





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 30 0393

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.5)
A	US-A-2 785 286 (LICHTGARN) * column 2, line 17 - line 56 * * figure 2 * ---	1	B66B23/22
A	US-A-5 029 690 (NGUYEN) * column 2, line 48 - line 59 * * claim 3; figures 2,4 * ---	1,3	
A	FR-A-2 467 813 (THYSSEN AUFZUGE GMBH) * figure * ---	1	
A	FR-A-1 450 416 (OTIS ELEVATOR COMPANY) * page 2, paragraph 3 * * figure 3 * -----	1,8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			B66B E04C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 20 April 1994	Examiner Salvador, D
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			

EPO FORM 1503 03.92 (P04C01)