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# Datasheet for the decision of 30 January 2015

**Case Number:** T 0473/11 - 3.2.06

**Application Number:** 99965302.5

**Publication Number:** 1140690

**IPC:** B66B13/08

**Language of the proceedings:** EN

**Title of invention:**
ELEVATOR DOOR SYSTEM

**Patent Proprietor:**
Otis Elevator Company

**Opponent:**
TECNOLAMA, S.A.

**Headword:**

**Relevant legal provisions:**
EPC Art. 56
RPBA Art. 13(1)

**Keyword:**
Inventive step - (yes)
Late-filed argument - admitted (no)

**Decisions cited:**

**Catchword:**

Europäisches Patentamt
European Patent Office
Office européen des brevets

**Beschwerdekammern**
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**Case Number: T 0473/11 - 3.2.06**

# D E C I S I O N
## of Technical Board of Appeal 3.2.06
## of 30 January 2015

| | |
|---|---|
| **Appellant:** (Opponent) | TECNOLAMA, S.A.<br>Ctra. Constanti, Km. 3<br>43206 Reus (ES) |
| **Representative:** | Bondia Pons, Àgueda<br>Sugranes<br>Calle Provenza, 304<br>08008 Barcelona (ES) |
| **Respondent:** (Patent Proprietor) | Otis Elevator Company<br>Intellectual Property Dept.,<br>10 Farm Springs<br>Farmington, CT 06032-2568 (US) |
| **Representative:** | Leckey, David Herbert<br>Dehns<br>St Bride's House<br>10 Salisbury Square<br>London<br>EC4Y 8JD (GB) |
| **Decision under appeal:** | **Interlocutory decision of the Opposition Division of the European Patent Office posted on 23 December 2010 concerning maintenance of the European Patent No. 1140690 in amended form.** |

**Composition of the Board:**

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|---|---|
| **Chairman** | M. Harrison |
| **Members:** | T. Rosenblatt |
| | W. Sekretaruk |

## Summary of Facts and Submissions

I. In its interlocutory decision dated 23 December 2010 the opposition division found that European patent No. 1 140 690 in an amended form met the requirements of the EPC. The patent is based on European patent application No. 99965302.5 (filed originally as PCT/US1999/30052).

II. Claim 1 considered allowable by the opposition division reads:

"An elevator door system (10) comprising an elevator car (12) having a front face (14) defining a door opening (16);
at least one elevator door (18) coupled to the front face of the elevator car (12) for movement between an open position exposing the door opening and a closed position covering at least a portion of the door opening (16);
at least one drive motor (34) drivingly coupled between the car (12) and the door (18) for moving the door between the open and closed positions, said motor (34) being disposed on a front portion of the elevator car vertically between a lower edge and an upper edge of the elevator car (12),
characterized in that:
the drive motor (34) is a flat, rotary motor having an axis of rotation perpendicular to the plane of the elevator door (18); and
the drive motor is disposed laterally adjacent one side of the opening (16) and further includes a first sheave (36),
and wherein the door system comprises a second sheave (38) disposed laterally adjacent the other side of the door opening,

a rope (40) forming a closed loop about the first and second drive sheaves, and
wherein the door (18) further includes an attachment (56) for securing the door (18) to the rope (40)."

III. The appellant (opponent) filed an appeal against this decision, requesting that the patent be revoked based on the objection that the subject-matter of claim 1 did not involve an inventive step.

IV. Reference was made to the following documents:

D2: JP-A-06/329375,
D3/D4: price list and catalogue of Fermator elevator door systems,
D5: Table of Contents and Chapter 1 of the book "Axial flux permanent magnet brushless machines", 2004,
D6: Declaration of Eng. J.C. Pujolràs Baró and Dr. R. Bargalló Perpiña,
D7: JP-A-8259152,
D8: US-A-5 701 973,
D9: EP-A-0 631 970,
D10: US-A-5 837 948,
D11: US-A-5 783 895,
D14: CA-A-2 259 933,
D16: JP-A-8104486.

V. In a communication sent in preparation for oral proceedings, the Board informed the parties of its preliminary opinion, in accordance with which inventive step would have to be discussed starting from D8 which appeared to represent the closest prior art, and that it might also be a matter of discussion whether the subject-matter of claim 1 was obvious when starting from D7 as the closest prior art. The Board also added that

D14 did not appear to be a particularly appropriate starting point for the problem/solution approach.

VI. Oral proceedings before the Board of Appeal were held on 30 January 2015.

VII. The appellant requested that the decision under appeal be set aside and the patent be revoked.

VIII. The respondent (patent proprietor) requested that the appeal be dismissed.

IX. The appellant's case can be summarised as follows:

The opposition division's interpretation of the expression "flat motor" was incorrect. The contribution of the vague term "flat" to the assessment of inventive step should be carefully considered.

In its written submissions the appellant raised several objections concerning inventive step of the subject-matter of claim 1 underlying the impugned decision. These were based on starting from D14 as the closest prior art and combining this with the teaching of any of D7, D3, D4 or D16 and/or common general knowledge of the skilled person; or based on D7 as the closest prior art in combination with common general knowledge or with D14, or based on D8 as the closest prior art in combination with either D14, or D3 and D4, or D7 or D16 and common general knowledge of the skilled person.

During the oral proceedings, the appellant also argued that when starting from D8 as the closest prior art, the subject-matter of claim 1 was obvious in view of the teaching of D16 in relation to the prior art disclosed in Figure 5 and paragraphs [0002] and [0005] thereof,

and in combination with common general knowledge of the skilled person. The subject-matter of claim 1 was also obvious when starting from D7 as the closest prior art in combination with the skilled person's common general knowledge. Furthermore, the appellant contended that the problem identified in the patent in suit was not solved since essential features were missing from the claim. Therefore, the subject-matter of claim 1 was not inventive when starting from D2 or D3 as the closest prior art, because D2 and D3 disclosed flat motors used in drive arrangements for the doors or elevator cars, but which would not be able to solve the problem underlying the invention.

X. The respondent's arguments may be summarised as follows:

The expression "flat motor" meant that the motor's radial extension was substantially or significantly larger than its axial extension, as could be derived from the description which mentioned pancake and disc-shape types of motors.

Starting from D8 and based on the distinguishing technical features of claim 1, the problem to be solved was to save space in a simple and effective manner. D8 would not lead the skilled person to change the orientation of the motor axis or to use a flat motor instead of the known one. None of D14, D3, D4 or D7 disclosed a flat motor. D5 was printed after the filing of the patent in suit and, since it mentioned being the first book of its kind, it could not be considered to be common general knowledge at the time of filing the patent application. The affidavit D6 did not refer to the use of flat motors in elevators or elevator doors, merely to flat motors in general. Figure 5 of D16 disclosed a prior art drive arrangement which served as

the starting point of the invention disclosed therein. All that could be derived from Figure 5 was that the drive arrangement had a motor, the axis of which was orientated perpendicular to the plane of the doors. In the context of this arrangement, no hint could be found to the underlying problem and its solution according to claim 1, rather D16 suggested that starting from the arrangement of Figure 5 some other problems were solved by other drive arrangements disclosed therein.

The disclosure in Figures 2 and 8 of D7 was unclear. In particular, there was no unambiguous disclosure in regard to the position of the motor with respect to the elevator car's top edge. Also, the motor was not a flat motor. Neither D7 nor any other document on file taught the use of flat motors in drive arrangements for moving elevator doors. The only evidence on file for the use of flat motors in elevators related to motors for driving the elevator car (see D9, D10, D11), which motors were however of entirely different dimensions. Moreover, even if the skilled person started from D7 as the closest prior art and sought a solution to the problem of saving space in the elevator car in an efficient manner, there was no teaching of the solution provided by claim 1. D8 would only direct the skilled person to a different solution.

## Reasons for the Decision

1. For the purposes of its decision, the Board finds it necessary to give an interpretation to the expression "flat, rotary motor".

1.1 According to the impugned decision, the opposition division interpreted the expression "flat[,rotary]

motor" in the context of the patent in suit as being "a motor of overall dimensions small enough to be reasonably mountable inside the elevator car without impairing the space required for the users". Although the appellant agreed with the opposition division to the extent that the technical effect to be achieved by the use of the flat motor should be considered when construing the expression, it criticised the division's interpretation as being a vague statement, at least because it was considered by the appellant as being subjective to decide which motor could be considered as reasonably mountable inside the elevator car without impairing an unspecified space.

The respondent in turn argued that, in the light of the description, the expression would be understood to define a motor which had a radial extension significantly larger than its axial dimension.

1.2 The Board however does not agree with either of the above interpretations. There is in particular no reason to construe the expression "flat, rotary motor" in view of a technical effect to be achieved, as no such technical effect is defined in the claim. Also, the more limited interpretation adopted by the respondent cannot be followed. The patent does not comprise any corresponding definition of the expression "flat, rotary motor", nor are there any relative or absolute dimensions disclosed (as also argued by the appellant). Although the patent indeed mentions pancake or disc-shape motors as examples for flat rotary motors, the motor embodiments disclosed in the patent also encompass motors with shapes in which the radial extension cannot be considered to be significantly or substantially larger than its axial extension. In particular, the motor shown in Figures 10a and 10b comprises an axially

extending driving sheave as an integral part of the motor assembly. The Board considers that its axial extension equates to the entire length of the motor assembly shown in Figure 10b. The radial extension at the side of the sheave's flange covering the ring magnet 512 is larger than that axial length, but cannot be understood to be substantially larger than the radial extension. Although it is acknowledged that the drawing is only schematic in nature, it serves to illustrate that it is not clear when the relationship between radial and axial extensions can be considered either "considerable", "significant" or "substantial".

1.3 The Board thus understands the expression "flat, rotary motor" as meaning only that the radial extension of the rotary motor is larger than, without necessarily being substantially or significantly larger than, its extension along the axis of rotation.

1.4 The expression "flat, rotary motor" is thus found simply to be somewhat broad, rather than being in some way vague or unclear. The outcome of the present case therefore does not depend on the answers to be given by the Enlarged Board of Appeal on the questions referred to it and pending under G 3/14.

2. Article 56 EPC

2.1 The patent in suit is directed to the problem of saving the space which is required in conventional elevators for the installation of the motor of the door driving system on top of the elevator car (see paragraphs [0002, 0003, 0005] of the patent specification). According to the patent, this problem is considered to be solved essentially by the installation of the motor on a front portion of the elevator car between the car's upper and

lower edges and by the use of a flat, rotary motor (see paragraphs [0007, 0008, 0018]). Claim 1 as found allowable by the opposition division defines the corresponding technical features and additionally specifies that the doors are driven by a belt (rope) drive arrangement in which the motor is mounted to the elevator car and the doors are moved by means of a rope to which they are attached.

2.2 The appellant raised several objections under Article 56 EPC, starting from different documents as representing the closest prior art.

The Board considers however that among the documents referred to by the appellant for this purpose (D7, D8, D14), the closest prior art to the subject-matter of claim 1 for the purposes of assessing inventive step is represented by D8, for the following reasons.

2.2.1 The elevator door system disclosed in D8 employs a belt drive in which the motor 34 is mounted in a stationary manner to the front of the elevator car between its upper and lower edges (cf. Figures 1 to 3) and the doors are attached to and driven by the belt (44). The axis of motor 34 is however parallel to the door plane and requires therefore a right-angle gearbox 24 to transmit torque in a plane parallel to the door plane. Its position is not adjacent one side but is centrally located over the door opening. Also, the motor is not a flat motor since its axial length is clearly greater than its radial dimension. Compared to the other documents referred to by the appellant, D8 has nevertheless the greatest number of features in common with claim 1 and moreover is the only document on file which addresses a similar problem to that given in the patent in suit, namely to provide a linear belt door

operator for an elevator system that can be mounted in a space between an elevator cab fascia and a sill edge plane (column 2, lines 52-55).

2.2.2 Document D7 comprises an English abstract, accompanied by a drawing and the corresponding Japanese patent or patent application. A translation into one of the EPO's official languages was not submitted, so its disclosure to the Board and the respondent is limited to what can be unambiguously inferred from the English abstract and the accompanying Figures of the Japanese document. According to the English abstract, the invention underlying D7 is directed to quietly opening and closing an elevator door without causing slippage between a pulley and the rope drive transmission body. There is no evidence that particular space requirements are to be met or that the positions of the motor with respect to the front or top wall of an elevator car are of any specific significance. Although the elevator door drive device shown in D7 has a number of features in common with the elevator door system of amended claim 1 found allowable by the opposition division, its disclosure is at best ambiguous with respect to the relative position of the motor and the upper edge of an elevator car. The Board finds that D7 does not even unambiguously disclose an elevator car door. The term "elevator door" used in the abstract could quite plausibly refer to a landing door. A car or cabin is not mentioned in the English abstract nor is it clearly depicted in any of the Figures. But even under the assumption that the door drive system of D7 were indeed intended for an elevator car, neither Figure 2 nor Figure 8 (to which the appellant referred as allegedly representing prior art for the invention disclosed in D7) unambiguously discloses the position of the door drive motor with respect to the upper edge or front portion of any such

car. The Board does not accept the appellant's argument that Figure 2 at least implicitly discloses the position of the car's top edge. The short horizontal element shown in that Figure to the right of the door panel's 3 upper edge might constitute a portion of the elevator car or it might not. Even if this element were considered to belong to a car, the shape of any such car would anyway be entirely obscure: the depicted element could simply extend horizontally straight to the right, as was also held by the opposition division in point 3.2 of the Reasons of the impugned decision, or it could continue in a step of undefined width and height, having an upper horizontal wall segment not necessarily above the motor 22. The appellant's allegation that Japanese elevator cars had a well known standard shape with a stepped fascia is not supported by any evidence; this allegation had notably already been contested by the respondent in its reply to the appeal grounds. Even if the appellant's assumption were correct in this regard, it would anyway still not be clear at which height the top of the car is situated relative to the position of the motor shown in Figure 2 of D7. The appellant's further argument according to which a skilled person would have implicitly understood from Figure 2 that the car's imaginary fascia had the shape exemplarily shown for the elevator car of Figure 2 of D8 has also not been substantiated by any evidence. The Board thus finds, as also argued by the respondent, that D8 discloses a specific structure of an elevator car and its door drive system and cannot be considered as evidence for the common general knowledge of the shape of elevator cars, let alone be used to interpret the disclosure of D7. As regards Figure 8 of D7, it does not provide any further information concerning the position of the motor relative to the top edge of an (alleged) elevator car in Figure 2. Without any translation of those parts of D7,

in particular paragraph [0002] of the Japanese text, which the appellant considered relevant in this context and to which it referred for the first time during the oral proceedings before the Board, the Board and the respondent are left only to speculate as to what is actually shown in Figure 8. What relationship exists between the device of Figure 8 and the different arrangements shown in the remaining Figures of D7 cannot be derived from the drawings alone.

The Board thus concludes that the subject-matter of claim 1 is not distinguished from the door drive system of D7 only by the single feature "flat motor" (as was argued by the appellant), but by many more features.

Due to the lack of any unambiguous disclosure in regard to the relationship of a door drive system to an elevator car as such, D7 is clearly a less appropriate starting point than D8 for the assessment of inventive step, particularly when using a problem/solution approach. When starting from D7, the formulation of a technical problem which relates in some way to the position of such drive arrangement relative to a portion of an elevator car becomes entirely artificial and cannot thus be regarded as an objective technical problem. Thus, when starting from D7 as the closest prior art, the Board cannot conclude, based on the arguments submitted by the appellant, that the subject-matter of claim 1 would lack an inventive step when considering the teachings of D8 and/or the knowledge of the skilled person, since all the appellant's arguments are based on a recognition of features in D7 which are not unambiguously disclosed. The same applies when considering the appellant's objection to lack of inventive step when starting from D7 and combining this with the teaching of D14. Further, as explained below,

D14 relates to an entirely different type of drive mechanism for elevators, which is not readily compatible with that of D7, such that the subject-matter of claim 1 cannot be arrived at starting from D7 without applying an entirely hindsight approach.

2.2.3 The elevator door system disclosed in D14 is of entirely different construction to the drive system defined by claim 1, since it comprises a friction drive system in which motorised driving rollers (which cannot be considered to be flat within the meaning adopted above, see item 1.3 above), are attached to the door leafs to be moved and run on stationary rails. Again, the Board does not find that an elevator car is unambiguously disclosed. The invention of D14 is also not directed to the problems mentioned in the patent in suit. The problems to be solved when starting from D14 as prior art given by the appellant, i.e. to provide an alternative mechanical arrangement while saving space above the cabin, is not an objective technical problem, due to the further features which are lacking from D14, which the appellant has not addressed in formulating its perceived problem. Arriving at the subject-matter of claim 1 starting from D14 would require a complete re-design of the door drive system which the Board concludes can by no means be considered obvious for a skilled person in view of the door systems known from D3, D4, D7 or D16 and cited by the appellant in this regard. The appellant did not provide any argument as to why the skilled person would receive an indication from these documents to set about such a re-design and use the entirely different rope drive systems disclosed therein in place of the friction drive system of D14, nor can the Board find any such pointers in that direction. It is also evident from the foregoing that D14 is a less suitable starting point than D8 for the

assessment of inventive step and indeed, the appellant did not add anything to this particular attack during oral proceedings.

2.3 As already mentioned the subject-matter of claim 1 is distinguished over the door drive system known from D8 by the features that the drive motor is a flat motor which has an axis of rotation perpendicular to the elevator door plane and is disposed laterally adjacent one side of the opening (16). This is also acknowledged by both parties.

2.4 These features essentially avoid the use of the right-angle gear box used in the system of D8. The lateral placement of the motor constitutes an alternative to the central placement of the drive motor in D8.

2.5 Starting from this known elevator door system, an objective technical problem can therefore be seen in providing a simpler drive arrangement which is adapted to the given space requirements, as also argued by the appellant.

2.6 The appellant could not convince the Board that the combination of features according to claim 1 was rendered obvious by the available prior art or the common general knowledge of the skilled person.

2.6.1 D16 and in particular Figure 5 thereof in combination with paragraphs [0002] and [0005], upon which the appellant primarily relied in its argument during the oral proceedings, do not contain any teaching in regard to the objective technical problem or to the above identified distinguishing features. Figure 5 and the cited paragraphs, although indeed showing a motor having an axis perpendicular to the door plane and positioned

laterally adjacent the side of an elevator car's door opening, do not contain anything more than a description of the prior art from which the invention underlying D16 actually departs. The skilled person would not have considered this part of D16 as offering a solution to the objective problem, in particular since no significance is attached to the features under consideration, when having regard to solving the problem of finding a simpler construction or reducing space requirements. Also the door drive system according to the invention of D16, when starting from that in Figure 5, finally ends up with a motor having its axis parallel to the door plane so as to solve these problems. There is moreover no teaching in D16 suggesting the use of a flat motor as defined in claim 1.

2.6.2 It is undisputed that flat motors were generally known to the skilled person at the filing date of the patent in suit. The appellant also submitted D5 and D6 to substantiate this argument. Irrespective of the fact that D5 was published in 2004 after the (international) filing date of the application underlying the patent in suit in 1999, so that it does not constitute prior art according to Article 54(2) EPC, it also does not mention elevator door drive systems, to which claim 1 relates. Neither do the declarations of D6 mention the use of flat motors in such systems.

Substituting the motor gearbox in D8 for a flat motor cannot be done without hindsight. A flat motor would have required a certain radial dimension in order to maintain the required torque which would otherwise be reduced by simply making the motor shorter. The appellant did not provide any evidence that such motors appropriate for the particular drive system in D8 were commonly known.

The only evidence on file for the use of flat motors in elevators is with respect to the hoisting machinery (see D9, D10, D11), i.e. the motors moving the elevator car in the elevator shaft. Due to the torque requirements and the resulting size, such motors are clearly not appropriate for installation in the reduced space foreseen in the door drive system of D8, as also pointed out by the respondent.

2.6.3 None of documents D7, D8, D14 or D16 shows a flat motor either. Only from document D4, which is a catalogue of elevator door systems, is a motor known which has an axial dimension lower than its radial dimension and which would therefore be considered to fall under the definition "flat, rotary motor". However this motor is installed on the top of the elevator car, and there is nothing in D4 (or the accompanying price list D3), apart from impermissible use of hindsight, which would have led the skilled person to install this motor instead of the motor/gearbox arrangement of D8.

2.7 The Board thus finds that in the light of the available prior art and taking into account common general knowledge of the skilled person, the subject-matter of claim 1 is not obvious and hence is considered to involve an inventive step (Article 56 EPC).

3. Close to the end of the oral proceedings before the Board, the appellant raised for the first time a further objection under Article 56 EPC based on D2 and D3. The appellant did not provide a problem/solution approach, even when prompted to do so by the Board. Rather the appellant argued that the technical problem mentioned in the patent would itself not be solved because not all essential features were defined in claim 1, so that the

claimed subject-matter could not be considered inventive. The appellant argued essentially that when considering D2 and D3, in general, the skilled person would recognise that not all flat motors would solve the problem underlying the patent, such that inventive step should be denied.

This new line of attack constitutes an amendment to the appellant's case. Its admittance underlies the discretion of the Board according to the criteria set out in Article 13(1) of the Rules of Procedure of the Boards of Appeal (RPBA). The Board considers that this new attack, besides coming as a complete surprise for the respondent and the Board at such a late stage of the procedure, also lacks sufficient relevance to the issue of Article 56 EPC. Article 56 EPC does not stipulate that claimed subject-matter must solve the technical problem indicated in the description of the patent and that otherwise it cannot be considered to involve an inventive step. Rather for the fulfilment of this requirement it has to be assessed whether the claimed combination of features is obvious to a skilled person having regard to the state of the art. The standard approach applied by the Boards of Appeal for this examination is the problem/solution approach. The appellant did not put forward any reason nor can the Board find such reason why this approach should not be followed here. Whether the motors in D2 and/or D3 might not be suitable for use in the particular context of claim 1 could not be understood by the Board as having any relevance to the issue of inventive step to be decided. Even if the appellant would have been correct in arguing that the problem mentioned in the patent was not solved by the features of claim 1, the appellant did not demonstrate then why, when starting from D2 or D3 or from other prior art, the subject-matter of claim 1

would lack an inventive step. The Board therefore exercised its discretion according to Article 13(1) RPBA not to admit this new line of attack into the proceedings.

## Order

## For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

Ms N. Schneider M. Harrison

Decision electronically authenticated