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Veröffentlichungs-Nr. / Publication No / N<sup>o</sup> de la publication : 0 048 847

Bezeichnung der Erfindung: Self-powered elevator using a linear electric  
Title of invention: motor as counterweight

Titre de l'invention :

Klassifikation / Classification / Classement : B66B 11/04

**ENTSCHEIDUNG / DECISION**

vom / of / du 12 January 1990

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent /  
Titulaire du brevet :

OTIS ELEVATOR COMPANY

Einsprechender / Opponent / Opposant :

I) INVENTIO AG  
II) Thyssen Aufzüge GmbH

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Article 56

Schlagwort / Keyword / Mot clé : "Inventive step (yes)"

**Leitsatz / Headnote / Sommaire**

Europäisches  
Patentamt

Beschwerdekammern

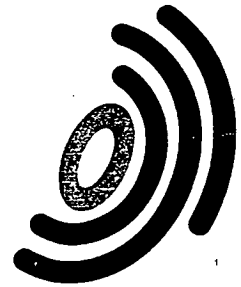
Case Number : T 327/87 - 3.2.1

European Patent  
Office

Boards of Appeal

Office européen  
des brevets

Chambres de recours



**D E C I S I O N**  
of the Technical Board of Appeal 3.2.1  
of 12 January 1990

**Appellant I :** INVENTIO AG  
(Opponent I) CH-6052 Hergiswil NW (CH)

**Appellant II :** Thyssen Aufzüge GmbH  
(Opponent II) Bernhäuser Straße  
D-7303 Neuhausen a.d.F. (DE)

**Representative :** Hoeger, Stellrecht & Partner  
Uhlandstrasse 14c  
D-7000 Stuttgart 1 (DE)

**Respondent :** OTIS ELEVATOR COMPANY  
(Proprietor of the patent) One Financial Plaza  
Hartford, CT 06101 (US)

**Representative :** Henkel, Feiler, Hänzel & Partner  
Möhlstrasse 37  
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**Decision under appeal :** Decision of the Opposition Division of the European  
Patent Office dated 7 May 1987, posted  
13 July 1987 rejecting the opposition  
filed against European patent No. 0 048 847  
pursuant to Article 102(2) EPC.

**Composition of the Board :**

**Chairman :** P. Delbecque  
**Members :** F. Brösamle  
O. Bossung

## Summary of Facts and Submissions

- I. European patent No. 0 048 847 was granted with four claims on the basis of European patent application 81 107 066.3 on 31 July 1985.

Claim 1 as granted reads as follows:

"An elevator system comprising an elevator car (1; 1') a counterweight (6; 6') and a shaftway in which the car and the counterweight move, rails (2; 2'/7; 7') extending the length of the shaftway, a stator of a linear induction motor (8; 8') carried on the counterweight, means for powering the motor, a sheave (4, 5; 4') at the top of the shaft, a rope (3; 3') guided over the sheave for connecting the car and the counterweight, and the rails additionally functioning as the motor armature, characterized by a battery (9; 9'), an inverter (10; 10') powered by the battery for providing power for the motor armature, means (11; 11') for charging the battery, and the inverter and battery being housed in the counterweight (6; 6')."

This Claim 1 is followed by dependent Claims 2 to 4.

- II. The patent was opposed on 18 January 1986 by INVENTIO AG (Opponent I/Appellant I) and on 26 April 1986 by Thyssen Aufzüge GmbH (Opponent II/Appellant II). The Opponents requested revocation of the patent on the grounds of Articles 56 and 100 EPC in the light of the following documents:

(D1) FR-A-1 359 951,  
(D2) FR-A-2 082 962,  
(D3) DE-A-2 002 081,

- (D4) DHF-Deutsche Hebe-und Fördertechnik, Sonderheft zur Hannover Messe 1969; April 1969; Seiten V-IX,
- (D5) Technische Überwachung, Band 9 (1978), No. 10; Seiten 336-340,
- (D6) Fördern und Heben, No. 5 (1968); Seiten 311-318.

III. By its decision dated 13 July 1987 the Opposition Division rejected the oppositions pursuant to Article 102(2) EPC.

IV. Opponent I (Appellant I) appealed against this decision on 28 August 1987 and reasoned his appeal at the same time. The appeal fee was paid on 29 August 1987.

Appellant I argues in his Statement of Grounds of Appeal that the subject-matter of Claim 1 is not based on an inventive step; in this Statement of the Grounds of Appeal the Appellant I strongly contradicts the statement of the Opposition Division in the contested decision, see page 5, lines 10/11, that a motor for an elevator system powered by a battery would not be known and files "Anlagen 1, 2, 3 and 4" to support his opinion:

- (D7) FR-A-321 692, (Annex 1)
- (D8) DE-C-2 752 108, (Annex 2)
- (D9) DE-B-1 210 947, (Annex 3)
- (D10) GB-A-2 017 346. (Annex 4)

It is argued that a linear motor is electrically analogous to an asynchronous motor so that the combination of the documents D1/D3 with the documents D7 to D10 directly leads a skilled person to the subject-matter of Claim 1. The Appellant I furthermore points to the fact that the object of the attacked patent as presented in column 2 of that patent is obvious and that this object is basically already solved by a linear motor per se and that the advantages presented as deriving from the subject-matter

of Claim 1 are not achieved or form part of the prior art respectively (see weight-reduction of the elevator system, lighter power supply cable and so on).

- V. Opponent II (Appellant II) also appealed against the decision of the Opposition Division, see letter of 7 September 1987, received on 10 September 1987, whereby the appeal fee was paid on the latter date. The Statement of Grounds of Appeal of the Appellant II was received on 13 November 1987. He points in substance to the fact that, in principle, two possibilities are present, a power supply with a cable or a power supply with a battery.

From (D11) DE-A-2 343 461 (cited in the search report) - see last sentence on page 3 - it is clear for the Appellant II that the power supply is not problematic in combination with an elevator with a linear motor.

With the newly introduced document (D12) DE-A-2 538 568, the Appellant II intended to support his opinion that mobiles can be battery-driven, whereby no substantial difference between an elevator and mobiles operating in the horizontal plane is seen.

It is felt that the choice of a battery as the power supply of a linear motor of an elevator is within the normal skills of a practitioner. To provide the battery in this context on the counterweight is felt to be a logical consequence if such a power supply is chosen, since any practitioner would closely house the power supply in form of a battery, the battery charger and the inverter near the linear motor, that is on the counterweight of the elevator. The Appellant II sees no substantial difference between the battery driven motors of D4 to D6 and the drive system according to Claim 1 so that overall an

inventive activity for achieving the subject-matter of Claim 1 cannot be accepted.

VI. In his reply to the statements of the Appellants, the Respondent (Proprietor) cited further documents all mentioned in the Search Report and comes to the conclusion that Claim 1 is not obvious from the prior art, since the key features of Claim 1

(a) use of a battery powering the elevator car;

(b) to house this battery on the counterweight

are not obvious from the prior art. Furthermore, he points to the elimination of any heavy power cable and to the reduction of counterweight masses, since the battery and the inverter reduce the masses of the counterweight leading to a reduction of the overall weight of the elevator system.

VII. With the communication of 18 September 1989 the Board gave its provisional opinion of the present case as to the relevance of the object of the invention as set out in the attacked patent specification.

VIII. Oral proceedings were held on 12 January 1990, whereby all involved parties requested German as the language to be used. During the oral proceedings no completely new arguments arose except the question if from the wording of granted Claim 1 it can be excluded that a further power supply is present, that is in addition to that one of the battery.

Whereas the Appellants I and II maintained their requests to set aside the impugned decision and to revoke the patent, the Respondent requested by way of

- (a) main request to dismiss the appeals and by way of
- (b) an auxiliary request to further clarify granted Claim 1 in that in column 4, line 28 of the attacked patent No. 0 048 857 before "power" "the" is inserted.

#### Reasons for the Decision

- 1. The appeals are admissible.
- 2. The claims of the patent in the Board's assessment are not open to formal objections.
  - 2.1 Claim 1 is a combination of Claims 1 and 3 as originally filed. Claims 2 to 4 correspond to Claims 4 to 6 as originally filed. Claims 1 to 4 are therefore not open to objections under Article 123(2) EPC.

As the granted claims are maintained unamended they also meet the requirements of Article 123(3) EPC.

- 2.2 During the oral proceedings the question was discussed if the wording of Claim 1 clearly excludes the possibility that, in addition to the battery, power from a mains power-supply is fed to the linear motor.

In this context, it has to be observed that in the case that a claim per se is open to interpretation, this claim has to be interpreted in the light of the description and the drawings, Article 69(1) EPC. Following these principles, in the Board's assessment there can be no doubt that the battery is the only power-supply of the

linear motor. For the Board there was, therefore, no necessity to discuss Claim 1 pursuant to the auxiliary petition, since the main request was already clear enough, at least in the light of the description and the drawings. To summarise, Claim 1 in the following is interpreted in the sense that the battery is the only power-supply of the linear motor of the elevator system.

3. The subject-matter of Claim 1 is novel. Novelty has, in fact, not been disputed by the Appellants and the Board so that no further discussion is necessary insofar since no document is available, which discloses an elevator system where a battery, means for charging the battery and an inverter - all housed in the counterweight - and where the battery is the means for providing power for the motor armature of a linear motor, Article 54 EPC.
4. The assessment of inventive step leads to the following result:
  - 4.1 The nearest prior art is reflected by D1 or D3. During the oral proceedings, more emphasis was put to D3 so that D3 should be dealt with as far as Rule 29(1) EPC is concerned.

From D3 an elevator system is known in which a linear induction motor "3" is carried on the counterweight "9" (Figure 4). It is clear for a person skilled in the art, since D3 does not disclose any other possibility, that the induction coils of the linear motor are linked to a mains-power-supply via a flexible cable. D3 does, therefore, not teach the use of a battery housed in the counterweight as the only means for providing power for the motor armature as contained in the characterising clause of Claim 1. Due



to the absence of a battery in D3, it is also obvious that a means for charging the battery and an inverter are not existent in the elevator system of D3.

From the foregoing results that Claim 1 is correctly delimited over the nearest prior art reflected by document D3, Rule 29(1)(a) and (b) EPC.

- 4.2 Due to the "normal" power supply of the induction coils "3" in document D3, a flexible cable has to be provided for from the mains-power-supply to the counterweight and induction coils of the linear induction motor respectively. The objectively remaining object to be solved by the invention is to overcome the deficiencies of the known elevator system in this respect.

The posing of the object of the invention is not considered inventive in itself as it can be expected from a person skilled in the art to recognise the deficiencies of the known device according to D3 and to try to find a solution to overcome them.

- 4.3 The Board is, however, convinced that the solution of the object of the invention laid down in granted Claim 1, and based on the characterising features that

- (a) a battery and an inverter powered by the battery provide the power for the motor armature;
- (b) means are provided for charging the battery and
- (c) the battery and the inverter are housed in the counterweight

is the result of inventive activity.

- 4.4 In the Board's view, the prior art documents D1 to D6 and D7 to D12 in combination with the knowledge of a practitioner do not lead in an obvious way to the subject-matter of Claim 1.

None of the documents to be considered discloses a battery as the only means for providing power for the motor armature. The advantages of this solution of the above object are thus not known from the prior art, i.e. that the battery replaces any further mains-power-supply for activating the motor armature and acts as a buffer for storing energy so that the elevator system during his functioning is independent from a mains-power-supply. The above feature (a) of the characterising clause of Claim 1 is thus the essential feature of the claimed solution to the object of the invention, whereas feature (b) is a feature which is more or less indispensable if the practitioner has chosen feature (a), since any battery system has to be recharged. Of relevance is, however, the housing of the battery and the inverter in the counterweight, which is only one possibility among others, see feature (c) of Claim 1.

- 4.5 The prior art documents make use of batteries for specific purposes. According to D4 to D6 the batteries are located in the cabine and not in the counterweight as claimed and they are used for the secondary purposes like the provision of light, for the door drives or for the control systems of the elevator systems, but not as the only power-supply for the main drive system of the elevator. In this context, D4 to D6 make it clear that even for these above-mentioned purposes it had to be evaluated if a cable power supply could not involve advantages over the battery power supply.

4.6 Documents D7 to D12 were cited by the Appellants after the time limit for giving notice of opposition. With their citation, the argument of the Opposition Division in the impugned decision, that it would not be known that a battery provides power to the motor for an elevator system, should be contested.

The Board does, therefore, not apply Article 114(2) EPC and deals with the documents D7 to D12 in the following, (Article 114(1) EPC), since D7 to D12 prove that this broad statement in the impugned decision cannot be upheld.

Document D7 is not more relevant than documents D1 and D3 since it is already known from the latter documents to house the drive means in the counterweight of the elevator system. From D7, the features (a) to (c) of Claim 1 are, however, not known.

Document D8, in the opinion of Appellant I, should prove that an asynchronous motor is equivalent to a linear motor. In the Board's view D8 is, however, irrelevant, since it does not directly relate to features (a) to (c) of Claim 1.

Document D9 discloses per se the possibility to make use of a battery for emergency purposes if the normal power supply fails, and to drive a rotating, not a linear motor. The battery supplies energy in addition to the normal power supply to the motor, if for instance a locomotion starts. D9 does, however, not teach that the battery is the only power supply of the main drive.

The teaching of D10 is quite similar to that one of D9 as again a battery "5" via an inverter supplies power to the drive motor "1" when a power failure leaves a cable

operated lift stranded between two floors so that the next floor can even then be reached.

Document D11 does not disclose a battery as the means for supplying power to a linear induction motor either, since in this document no attention is paid to the power supply at all, see single claim line 4 where it is only stated that a power supply is guaranteed. From this text, in the Board's opinion, it cannot be concluded that a practitioner confronted with the object of the present invention is pushed to features (a) to (c) of Claim 1. If the power supply in D11 is not dealt with in detail, it must follow that it is, in this context, of no importance.

Document D12 is of relevance for recharging a battery but not relevant for features (a) and (c) of Claim 1, whereby D12 already deals with a general technical field apart from elevator systems.

- 4.7 From the foregoing results that D1 to D6 and D7 to D12 fail to render obvious the subject-matter of Claim 1, since the essential features of Claim 1, i.e. features (a) and (c), are not known from these prior art documents.

The subject-matter of Claim also involves an inventive step, therefore, and granted Claim 1 is valid. It is therefore not necessary to deal with the auxiliary request of the Respondent.

- 4.8 The arguments brought forward by the Appellants are not convincing and cannot draw into doubt the patentability of the subject-matter of Claim 1.

Since no battery-power-supply being the only power supply for the main drive of an elevator system or a similar

system could be demonstrated to be part of the prior art, the combination of the cited documents does not directly lead to the claimed subject-matter. In this context, it has to be stated that the subject-matter of Claim 1 is not only based on the fact to house the battery on the counterweight, but it is primarily important to choose a battery as the only power supplying means for the linear motor.

The use of a battery as the only power supplying means per se does not implicate its arrangement on the counterweight, which statement is also true for the inverter, which need not be housed on the counterweight, since again it could be housed apart of it.

The above considerations show that features (a) to (c) of Claim 1 constitute a choice between a multitude of given possibilities so that no one-way situation is present for a practitioner confronted with the above object to be solved. The argument that Claim 1 only combines a multitude of known features denies these considerations.

The argument that the advantages of the features (a) to (c) of Claim 1 could be foreseen is not convincing, since assessment of inventive step has to consider, if there exists an obvious lead from the prior art to the subject-matter of Claim 1 without ex-post-facto analysis.

It is, therefore, also not the question of dimensioning a battery, see D4 to D6, in order to obtain a power supply for a main drive system of the elevator system, since this approach is a typical ex-post argument and does not necessarily lead to the subject-matter of Claim 1, which is based on more features than a battery drive per se.

5. The dependent Claims 2 to 4 are likewise valid in combination with valid Claim 1.
  
6. Since the patent is defended in its granted form (main request) and the claims considered to be valid, the fact that the object of the invention, as set out in column 2, lines 42 to 49 of the attacked patent No. 0 048 847, may not be the objectively remaining object, does not influence the validity of the attacked patent as a whole, and the Board has no power to amend the patent insofar.

Order

For these reasons, it is decided that:

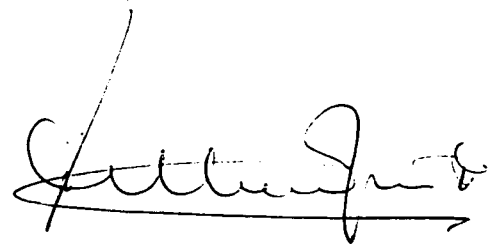
The Appeals are dismissed.

The Registrar:



S. Fabiani

The Chairman:



P. Delbecque

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21.7.90 The