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**Datasheet for the decision
of 5 February 2008**

Case Number: T 1864/06 - 3.2.06

Application Number: 99107460.0

Publication Number: 0953538

IPC: B66B 11/08

Language of the proceedings: EN

Title of invention:
Traction type elevator

Patentee:
KABUSHIKI KAISHA TOSHIBA

Opponent:
INVENTIO AG

Headword:
-

Relevant legal provisions:
EPC Art. 56

Relevant legal provisions (EPC 1973):

Keyword:
"Novelty (yes)"
"Inventive step (no)"

Decisions cited:
-

Catchword:
-



Case Number: T 1864/06 - 3.2.06

D E C I S I O N
of the Technical Board of Appeal 3.2.06
of 5 February 2008

Appellant:
(Opponent)

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Respondent:
(Patent Proprietor)

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Decision under appeal:

Decision of the Opposition Division of the
European Patent Office posted 17 October 2006
rejecting the opposition filed against European
patent No. 0953538 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: P. Alting Van Geusau
Members: G. Pricolo
R. Menapace

Summary of Facts and Submissions

I. The appeal stems from the decision of the Opposition Division posted on 17 October 2006 to reject the opposition filed against European patent No. 953 538 granted in respect of European patent application No. 99 107 460.0.

II. Independent claims 1 and 12 as granted read as follows:

"1. An elevator apparatus comprising: a pair of elevator guide rails (9a, 9b; 9a, 9c) disposed in an elevator shaft (3); an elevator car (4) for rising and falling along the elevator guide rails in the elevator shaft; balance weight guide rails (10a, 10b) disposed in an elevator shaft; at least one suspension rope (7) having one end fixed to the elevator car and another end fixed to the balance weight; and at least one driving unit (2) for driving a traction sheave (1) about which the suspension rope is wound and positioned between an inner wall of the elevator shaft and a space occupied by the elevator car rising and falling in the elevator shaft, the end of the suspension rope being fixed to the elevator car in a position below the ceiling of the elevator car; characterized in that and the driving unit is a "flat and thin"-type driving unit."

"12. An elevator apparatus comprising: a pair of elevator guide rails disposed in an elevator shaft; an elevator car for rising and falling along the elevator guide rails in the elevator shaft; weight guide rails disposed in an elevator shaft; at least one balance weight for rising and falling along the weight guide

rails in the elevator shaft; at least one suspension rope having one end fixed to the elevator car in a position below the ceiling of the elevator car and another end fixed to the balance weight; and at least one driving unit for driving a traction sheave about which the suspension rope is wound; characterized in that the driving unit is disposed in a pit of the elevator shaft; and the suspension rope is wound about the traction sheave and through respective turning sheaves which are positioned at the top of the elevator shaft."

III. The Opposition Division did not admit (Article 114(2) EPC) the fresh ground of opposition under Article 100(c) EPC raised by the opponent during the oral proceedings because it considered this ground not prima facie relevant. The Opposition Division considered that the European patent disclosed the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art and that the claimed subject-matter was novel and inventive over the available prior art including:

D2: DE-U-1 684 760;

D4: EP-B1-631 967;

D5: EP-B1-631 968;

D6: JP-A-7 117 957.

IV. The appellant (opponent) lodged an appeal against this decision, received at the EPO on 12 December 2006, and

simultaneously paid the appeal fee. The statement setting out the grounds of appeal was received at the EPO on 14 February 2007.

V. In an annex to the summons for oral proceedings pursuant to Article 11(1) Rules of Procedure of the boards of appeal the Board expressed its preliminary opinion according to which it appeared that the opposition division correctly exercised its discretion to disregard the late-filed ground of opposition. The Board further stated that the subject-matter of claim 1 appeared to be novel over D6 since the latter did not disclose a drive unit of the "flat and thin"-type, that D6 could be regarded as the closest prior art for the elevator of claim 1, and D5 as the closest prior art for the elevator of claim 12.

VI. Oral proceedings, at the end of which the decision of the Board was announced, took place on 5 February 2008.

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

The respondent (patent proprietor) requested that the appeal be dismissed or, as first auxiliary request, that the patent be maintained with the claims 1 to 11 as granted, or, as second auxiliary request, that the patent be maintained with granted claim 12.

VII. The arguments submitted by the appellant in support of its request and which are relevant to the present decision can be summarized as follows:

D6 disclosed an elevator having all the features recited in the preamble of claim 1 of the patent in suit. The feature of the characterizing portion, according to which the driving unit was a "flat and thin"-type driving unit, was known from document D4 for the same purpose as the patent in suit of reducing the space occupied by the driving unit in the elevator shaft. Accordingly, the skilled person would consider replacing the driving unit of the elevator according to D6 by a "flat and thin"-type driving unit according to D4 when looking for a solution to the problem of reducing the space occupied by the driving unit in the elevator shaft. The adaptation of the elevator of D6 required to accommodate the driving unit of a different type as known from D4 did not require inventive skills and therefore the skilled person would arrive at the subject-matter of claim 1 in an obvious manner.

The subject-matter of claim 12 was obvious in the light of the teachings of D5 and D2. D5 disclosed that the drive machinery was fixed to the floor of the elevator shaft. For security reasons all elevator shafts included a pit, i.e. the portion of the shaft underlying the lowest position reached by the floor of the elevator car. Therefore, at least part of the drive machinery of D5 was necessarily disposed in the pit of the elevator shaft. In any event, it would be obvious to provide a pit for containing the whole drive machinery: the skilled person would immediately notice that this was a convenient arrangement. According to D5, the suspension rope was fixed to the ceiling of the elevator car and not in a position below the ceiling as required by claim 12 of the patent in suit. This feature was however disclosed by D2 for the same

purpose as the patent in suit of using the elevator path in a more efficient manner.

The respondent's reply can be summarized as follows:

The problem underlying the patent in suit was not only concerned with reducing the space required by the elevator, but also with driving the elevator car at high speed. In order to reduce the space required by the elevator, D4 taught the provision of a "flat and thin"-type motor in combination with a suspension rope arrangement having a 2:1 roping ratio, the rope passing under the elevator by means of diverting pulleys. When applying the teaching of D4 to D6 in order to solve the problem of reducing the space required by the elevator, the skilled person would take the whole combination of features disclosed by D4 rather than picking out the single feature relating to the motor. Accordingly, he would provide a "flat and thin"-type motor and a 2:1 roping ratio, thereby arriving at an object different from that claimed in claim 1, which did not solve the problem of driving the elevator car at high speed. In any event, even if the skilled person would consider replacing the driving unit according to D6 by a "flat and thin"-type driving unit according to D4, the required modifications of the elevator apparatus of D6 were not obvious for a skilled person.

As regards claim 12, document D5 did not disclose that the elevator shaft included a pit. Moreover, none of the cited documents disclosed a driving unit provided in a pit of the elevator shaft. Accordingly, this feature of claim 12, which contributed to a more efficient utilization of the upper area of the elevator

path, could not be regarded as being obvious. Furthermore, D2 taught that a reduction of space occupied at the top of the elevator shaft could be achieved by fixing the suspension rope to the elevator car in a position below the ceiling of the elevator car and by providing diverting pulleys fixed to the walls of the elevator shaft, the latter feature not being compatible with the construction shown in D5.

Reasons for the Decision

1. *Ground of appeal under Article 100(c) EPC.*

In the communication pursuant to Article 11(1) RPBA annexed to the summons to oral proceedings, the Board gave the reasons why in its preliminary opinion the Opposition Division correctly exercised its discretion in disregarding the late-filed ground of opposition under Article 100(c) EPC. During the oral proceedings the appellant did not comment on this view and simply relied on its written submissions. The Board therefore does not see any reason to deviate from its provisional opinion. The appeal being allowed on other grounds (see below), it is not necessary to reproduce here the reasons given in the communication.

2. *Novelty - claim 1 as granted*

The appellant submitted that the subject-matter of claim 1 as granted lacked novelty over D1 and D6 in particular because the drive units disclosed by these documents could be regarded as being of the "flat and thin"-type.

The Board agrees with the appellant's view that this term is vague. In particular, it does not constitute an indication of a standard class of drive units for elevators. However, the Board considers that the skilled reader would not regard the drive units shown in D1 and D6 as being of the "flat and thin"-type. The drive units according to these documents have a generically cylindrical shape. For a cylinder to be regarded as flat and thin, the dimension along its axis (distance between base and top surfaces) should be small compared to its diameter. Since the drive units according to D1 and D6 have a major dimension along their axis, they are not flat and thin. Therefore, the subject-matter of claim 1 must be regarded as novel over D1 and D6.

3. *Inventive step - claim 1 as granted*

3.1 The problem underlying the patent in suit is to provide an elevator apparatus which is equipped with no machine room, so that it is possible to restrict the height of an elevator path from increasing and also drive an elevator car at high speed (see par. [0010] of the patent in suit).

3.2 Document D6, which is acknowledged in the patent in suit (see par. [0009]) as disclosing an elevator apparatus according to the preamble of claim 1, is undisputedly considered to represent the closest prior art. It discloses (see Figs. 1 and 2) an elevator apparatus with no machine room, and it is concerned with the problem of providing an elevator device requiring little space above the upper end of the elevator shaft (see the abstract, "Purpose").

Using the wording of claim 1 of the patent in suit, D6 discloses (see Figs. 1 and 6) an elevator apparatus comprising: a pair of elevator guide rails (5) disposed in an elevator path; an elevator car (4) for rising and falling along the elevator guide rails in the elevator path; balance weight guide rails (7) disposed in an elevator path; at least one suspension rope (8) having one end fixed to the elevator car and another end fixed to the balance weight; and at least one driving unit (18) for driving a traction sheave about which the suspension rope is wound and positioned between an inner wall of the elevator shaft and a space occupied by the elevator car rising and falling in the elevator shaft, the end of the suspension rope being fixed to the elevator car in a position below the ceiling of the elevator car.

3.3 As explained above, D6 does not disclose a driving unit of the "flat and thin"-type.

In accordance with the disclosure of the patent in suit, the capacity of the elevator apparatus to drive the elevator car at high speed is due to the provision of a 1:1 roping ratio (see par. [0007]; [0028]; [0038]). This allows the elevator car to be driven at the same speed as the suspension rope. Since a 1:1 roping ratio is already provided in D6 (see Figs. 1 and 2), and driving units of the "flat and thin"-type are not in general faster than driving units of the generically cylindrical-type as the motor shown in D6, the distinguishing feature does not contribute to increasing the speed of the elevator car, contrary to the respondent's opinion. Therefore, the technical

effect of the distinguishing feature only consists in reducing the space occupied by the driving unit (see col. 7, lines 7 to 16 of the patent in suit).

Therefore, the objective technical problem solved starting from D6 is to reduce the space occupied by the driving unit.

- 3.4 In order to solve this problem, the skilled person would turn to document D4 which relates to the same technical field of elevators and deals with the same problem (see col. 1, lines 37 to 46: "elevator ... for which the space requirement ... is substantially limited to the space required by the elevator car and counterweight..."). According to the teaching of D4 to solve this problem (see col. 1, lines 46 to 48), a machine unit of a "flat construction type" is used (see claim 1, see also Figs. 1 and 6), which machine unit undisputedly corresponds to a driving unit of the "flat and thin"-type in accordance with the patent in suit.

The respondent submitted that the solution to this problem in accordance with the teaching of D4 resided in the provision of a flat machine unit **in combination** with a roping arrangement in which the rope passed under the elevator by means of diverting pulleys and provided a 2:1 roping ratio. The Board accepts that D4 discloses these features in combination and that both contribute to space saving (see col. 3, line 53 to col. 2, line 4 and col. 4, lines 15 to 19). However, the skilled person faced with the above-mentioned objective technical problem would recognize that each of these features gives a separate contribution to space saving. Whilst the provision of a machine unit of

a flat construction type allows all essential parts of the machine unit to be placed between the shaft space needed by the elevator car and/or its overhead extension and a wall of the shaft (see D4, col. 4, lines 1 to 4), the provision of suspension ropes passing under the car by means of diverting pulleys allows to place the machine unit below the level which the top of the elevator car reaches at the high extremity of its path (see D4, col. 4, lines 15 to 19). The skilled person would recognize that the space saving achieved by the latter feature is already achieved in D6 by fixing the suspension rope to the floor of the elevator car. He would therefore recognize that he could solve the problem posed only by replacing the drive unit of D6 by a machine unit of flat construction-type, i.e. a driving unit of the "flat and thin"-type.

Contrary to the respondent's view, the Board considers that the replacement of the drive unit of D6 by a machine unit according to D4 is a matter of normal design procedure for a person skilled in the art which does not require inventive skills. Although the provision of a flat construction-type driving unit in the space between the path of the elevator car and the wall of the elevator shaft requires a roping arrangement different than that shown in Fig. 1 of D6, the skilled person is generally aware of how to modify the path of an elevator rope, in particular by the use of diverting pulleys, such as to meet the imposed design constraints. Moreover, the respondent has not mentioned any specific aspects which might objectively represent a difficulty when replacing the drive unit of D6 by one according to D4.

3.5 Therefore, the skilled person would arrive at the subject-matter of claim 1 without the exercise of inventive skills. Consequently, the subject-matter of claim 1 as granted does not involve an inventive step (Article 56 EPC).

4. *Inventive step - claim 12 as granted*

4.1 The Board agrees with the view of the Opposition Division and of the parties according to which document D5 represents the closest prior art in respect of the elevator apparatus according to claim 12. D5 discloses (see Fig. 1) an elevator apparatus with no machine room, and is concerned with the problem of restricting the height of the elevator path (see col. 1, lines 30 to 37).

Using the wording of claim 12, this document discloses an elevator apparatus comprising (see Fig. 1): a pair of elevator guide rails (10) disposed in an elevator shaft; an elevator car (1) for rising and falling along the elevator guide rails in the elevator shaft; weight guide rails (11) disposed in an elevator shaft; at least one balance weight (2) for rising and falling along the weight guide rails in the elevator shaft; at least one suspension rope (3) having one end fixed to the elevator car and another end fixed to the balance weight; and at least one driving unit (6) for driving a traction sheave (7) about which the suspension rope is wound; the suspension rope being wound about the traction sheave (7) and through respective turning sheaves (4, 5) which are positioned at the top of the elevator shaft.

4.2 The respondent submitted that D5 does not disclose the feature of claim 12 according to which the driving unit is disposed in a pit of the elevator shaft. The Board agrees with the respondent's view, expressed during the oral proceedings, that the pit of the elevator shaft is a portion of the elevator shaft below the level which the bottom of the elevator car reaches at the low extremity of its path. However, the Board also agrees with the appellant's view that for safety reasons there is always such a portion. Therefore there is always a "pit" in the elevator shaft. Since D5 discloses that the drive machine unit (6) is fixed to the floor of the elevator shaft (see col. 3, lines 29, 30), it also discloses that the driving unit is, at least in part, disposed in a "pit" of the elevator shaft.

Therefore, the subject-matter of claim 12 differs from the elevator apparatus according to D5 only in that one end of the suspension rope is fixed to the elevator car in a position below the ceiling of the elevator car.

4.3 By means of the distinguishing feature the diverting pulleys (4,5) on top of the elevator shaft do not need to be installed in the path of the elevator car. Accordingly, the upper area of the elevator path can be effectively utilized (see col. 5, lines 11 to 17 of the patent in suit).

Therefore, the objective technical problem solved starting from D5 is to utilize the elevator path in a more effective manner.

4.4 The skilled person faced with this problem would consider document D2 because it relates to the same problem (see page 1, first paragraph). D2 discloses that the elevator path can be effectively utilized when no construction parts are disposed between the ceiling of the elevator car and the ceiling of the elevator shaft (see page 3, 3rd full paragraph). According to the teaching of D2, as stated in claim 1, this is achieved by fixing one end of the suspension rope to the bottom of the elevator car (see page 3, 2nd full paragraph), whereby the diverting pulleys (h, f) are placed on the side walls of the elevator shaft (see Fig. 2). The skilled person would therefore consider it as obvious to correspondingly modify the elevator according to D5, by fixing one end of the suspension rope (3) to the bottom of the elevator car (1), i.e. in a position below the ceiling of the elevator car. This requires, in accordance with the teaching of D2, that the diverting pulleys (4, 5) of the elevator according to D5 are placed on a side wall of the elevator shaft.

D2, as pointed out by the respondent, discloses that the suspension rope is fixed at both sides of the elevator car, whereby diverting pulleys (h, h, f, f) are provided on both side walls of the elevator shaft. The skilled person would recognize that such a symmetrical configuration is neither necessary for the solution of the above-mentioned problem nor for the correct functioning of the elevator according to D5. Accordingly, when implementing the teaching of D2 in the elevator according to D5 he would not consider substantial modifications of the roping arrangement shown in Fig. 1 of D5 other than fixing the suspension

rope to the bottom of the elevator car and placing the diverting pulleys on a side wall of the elevator shaft.

- 4.5 Therefore, the skilled person would arrive at the subject-matter of claim 12 without the exercise of inventive skills. Consequently the subject-matter of claim 12 as granted does not involve an inventive step (Article 56 EPC).
- 4.6 For the sake of completeness, the Board notes that this conclusion does not change even with the assumption that claim 12 requires the **whole** driving unit to be placed in a pit of the elevator shaft. It would be obvious for the skilled person to provide the whole drive machinery in a pit, i.e. not only below the path of the counterweight 2 but also below the path of the elevator car 1 as shown in Fig. 1 of D5, because he would obviously remark (see the indication on col. 3, lines 22 to 35, of D5, according to which the drive machinery is within the shaft space extension required by the counterweight on its path and only parts inessential to the invention are outside) that such measure allows the use of a larger drive machinery, e.g. of the conventional type which does not make use of a flat motor as shown in Fig. 1 of D5 (it is noted that claim 12 does not require a driving unit of the "flat and thin"-type as claim 1 of the patent as granted).
5. Considering that the respondent's main request includes claims 1 and 12 as granted, that the first auxiliary includes claim 1 as granted, and that the second auxiliary request includes claim 12 as granted, it follows from the above that none of the respondent's requests is allowable.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:

D. Meyfarth

P. Alting van Geusau