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Datasheet for the decision of 4 December 2012

Case Number: T 1125/08 - 3.4.03

Application Number: 01100689.7

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IPC: G07D 7/12, G07D 7/20

Language of the proceedings: EN

Title of invention:
Paper sheet discriminating device

Patentee:
Glory Ltd.

Opponent:
GIESECKE & DEVRIENT GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 101(2), second sentence

Relevant legal provisions (EPC 1973):
EPC Art. 84, 100(a)(b)(c), 114(1)

Keyword:
"Suffciency of disclosure (yes)"
"Added subject-matter (no)"
"Novelty, inventive step (yes)"

Decisions cited:
G 0010/91, G 0007/93

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1125/08 - 3.4.03

D E C I S I O N
of the Technical Board of Appeal 3.4.03
of 4 December 2012

Appellant: (Patent Proprietor)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 4 April 2008 revoking European patent No. 1120753 pursuant to Article 101(3)(b) EPC.

Composition of the Board:

Chairman: G. Eliasson
Members: R. Q. Bekkering
T. Karamanli

Summary of Facts and Submissions

I. This is an appeal against the revocation of EP 1 120 753 for insufficiency of disclosure, Article 100(b) EPC 1973 and lack of an inventive step, Articles 100(a) and 56 EPC 1973, over documents

E1: DE 196 40 671 C1

E4: EP 0 403 983 B

II. At the oral proceedings before the board, the appellant patent proprietor requested that the decision under appeal be set aside and the opposition be rejected.

The auxiliary requests on file were withdrawn

III. The respondent opponent requested the dismissal of the appeal.

IV. Claim 1 of the patent as granted reads as follows:

"*A paper sheet discriminating device comprising a light source (20) for irradiating a paper sheet (1) with light of at least two wavelengths, and a photo sensor (30) for receiving light transmitted through said paper sheet, said device performing the discrimination of said paper sheet in response to signals received from said photo sensor (30),* ***characterized in that*** *said paper sheet discriminating device further includes reference value setting means (101) which, at the time of initially setting a light receiving adjustment reference value, adjusts a light emission quantity of said light source (20) such that*

the output of said photo sensor (30) becomes a given value when a reference medium is set between said light source (20) and said photo sensor (30) and also stores the output value of said photo sensor (30) when it directly receives light from said adjusted light source (20) as an adjustment reference value in a memory part, and adjustment means (102) which, right before starting the discrimination, adjusts the light emission quantity of said light source (20) such that the output value of said photo sensor (30) when it directly receives light from said light source (20) is made to agree with the stored adjustment reference value."

V. The appellant patent proprietor argued as follows:

The opposition division unduly raised of their own motion an objection under Article 100(b) and Article 83 EPC. The patent contained sufficient information, in particular regarding the transmittance of the reference object, to allow a person skilled in the art to carry out the invention.

Furthermore, the subject-matter of claim 1 as granted did not extend beyond the content of the application as filed (Article 100(c) EPC). In particular, it did not constitute an undisclosed intermediate generalisation.

The subject-matter of claim 1 as granted, moreover, was novel and involved an inventive step. Document E1 concerned measurement objects such as bottles and did not concern the discrimination of paper sheets such as bills. Moreover, the device differed in that *inter alia*, following the adjustment of the light emission quantity of the light source such that the output of the photo

sensor became a given value when a reference medium was set between the light source and the photo sensor, no storing of the output value of that photo sensor when it directly received light from the adjusted light source as an adjustment reference value in a memory part took place. The subject-matter of claim 1 as granted was, thus, new over document E1.

Document E4 was not filed within the opposition period. Document E4, although it concerned the discrimination of paper sheets such as bank notes, relied on the calculation of correction factors as part of the calibration process and did not provide a calibration involving any adjustment of the quantity of light emitted by the light source. The document was, thus, not prima facie relevant. Accordingly, the opposition division erred in admitting the document into the proceedings.

In any case, the subject-matter of claim 1 as granted was new over document E4.

Moreover, there was nothing suggesting modifying either E1 or E4 so as to arrive at the subject-matter of claim 1. Accordingly, the subject-matter of claim 1 as granted also involved an inventive step.

VI. The respondent opponent essentially argued as follows:

Claim 1 as granted failed to define the transmittance of the reference medium, considered essential to the performance of the invention. The opposition division duly raised of their own motion a corresponding objection under Article 100(b) and Article 83 EPC.

Furthermore, the subject-matter of claim 1 as granted extended beyond the content of the application as filed (Article 100(c) EPC). In particular, the adjustment of the quantity of light emitted by the light source in claim 1 as granted was only disclosed in the application as originally filed in the context of a light source with light of two wavelengths, a white reference medium and all drive mechanisms of the device being stopped during the adjustment so as to eliminate the influence of noises. The subject-matter of claim 1 as granted, thus, constituted an undisclosed intermediate generalisation.

The subject-matter of claim 1 as granted, moreover, did not involve an inventive step over documents E1 and E4. In the device known from document E1 the light emission quantity of the light source was adjusted such that the output of the photo sensor became a given value when a reference medium was set between the light source and the photo sensor. Moreover, the output value of the photo sensor when it directly received light from the adjusted light source was stored as an adjustment reference value in a memory part. Accordingly, the subject-matter of claim 1 as granted only differed from E1 in that a paper sheet was discriminated. It was, however, obvious to a person skilled in the art to apply the teaching of E1 to paper sheets.
Document E4 concerned the discrimination of paper sheets such as bank notes. In document E4, the calibration was performed by calculating correction factors. It was, however, obvious to use an adjustment of the amount of light emitted by the light source

instead, all the more as this solution was known from document E1.

Reasons for the Decision

1. The appeal is admissible.

2. *Ground for opposition under Article 100(b) EPC 1973*

2.1 According to the decision under appeal, "*the patent does not fulfil the requirements of Article 83 EPC*". "*This objection was raised by the opposition division of its own motion (Article 114(1) EPC)*" (cf decision, Grounds 2).

The appellant argued that the opposition division had unduly raised of their own motion an objection under "*Art. 100(b) EPC and Art. 83 EPC*".

2.2 The introduction of grounds for opposition by the opposition division of its own motion lies at the discretion of the opposition division.

According to established jurisprudence of the boards of appeal, if the way in which a department of first instance has exercised its discretion on a procedural matter is challenged in an appeal, it is not the function of a board of appeal to review all the facts and circumstances of the case as if it were in the place of the department of first instance, and to decide whether or not it would have exercised such discretion in the same way as the department of first instance. A board of appeal should only overrule the

way in which a department of first instance has exercised its discretion if the board concludes it has done so according to the wrong principles, or without taking into account the right principles, or in an unreasonable way (cf G 7/93 (OJ EPO 1994, 775), Reasons, point 2.6; Case Law of the Boards of Appeal of the EPO, sixth edition, VII.E.6.6)

According to decision G 10/91 of the Enlarged Board of Appeal (OJ EPO 1993, 420), the applicable principle is that the consideration of such grounds should only take place before the opposition division in cases where, *prima facie*, there are clear reasons to believe that such grounds are relevant and would in whole or in part prejudice the maintenance of the patent (cf Reasons, point 16).

In the present case the opposition division succinctly argued that claim 1 as granted failed to define a feature considered essential to the performance of the invention. Hence, it exercised its discretion according to the right principles and in a reasonable way.

2.3 In the decision under appeal it is argued that "*the skilled person would understand that the transmittance of the reference medium is intended to be comparable to that of the paper to be discriminated by inspecting, in particular, figure 12 ("reference medium present" and "effective range of discrimination") which illustrates the solution provided by the invention to the problems of non linearity and differences between devices*" (cf Reasons 2.1). Moreover, "*According to claim 1 of the main request, during initial calibration a reference medium of any transmittance may be used, including a*

transparent medium or other media with substantially higher transmission than that of the paper sheets to be discriminated, i.e. above the range of linearity of the characteristic curve (to the right of the diagram in figures 1 to 3, 10 and 12). However, the use of a reference medium with high transmittance would not solve the underlying problem of the non-linearity of the characteristics of the device. If the initial calibration is performed with a reference medium whose transmittance is substantially higher than that of a typical sheet to be discriminated, the sensor output for such sheets will differ from device to device (as is readily seen e.g. from figure 1), and hence the initial calibration will be useless. Therefore, with the wording of claim 1 of the main request, the person skilled in the art does not know how to solve the problem underlying the disputed patent over the whole scope of the claim (i.e. over the whole range of transmittance of the reference medium)" (cf Grounds 2.2).

2.4 It is noted that according to the patent, the reference medium is more specifically a "*white*" reference medium (cf patent, paragraphs [0006], [0012] and [0026]).

Although a further specification of the reference medium in claim 1, in particular a limitation to a "*white*" reference medium as disclosed in the description, would lead to the device more accurately taking account of non-linearities of the photo sensor, or in fact put more correctly, of deviations of the photo sensor output from the output of a reference device in the measurement range for discrimination, the device would also work otherwise, so that a further

specification of the reference medium in claim 1 is not considered indispensable.

It is moreover noted that the objection as to the absence of a further specification of the reference medium (either "*having a transmittance comparable to that of the paper sheet*" or being "*white*") in claim 1 is considered in fact an objection under Article 84 EPC 1973, rather than Article 100(b) EPC 1973, the former, however, not being a ground for opposition.

Accordingly, the patent is considered to disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art. The ground for opposition mentioned in Article 100(b) EPC 1973 is, therefore, not considered to prejudice the maintenance of the patent as granted.

3. *Ground for opposition under Article 100(c) EPC 1973*

3.1 The respondent argued that the subject-matter of claim 1 as granted extended beyond the content of the application as filed (Article 100(c) EPC 1973). In particular, with respect to claim 1 as originally filed, claim 1 as granted contained further limitations regarding the adjustment of the quantity of light emitted by the light source for calibrating the device. However, this adjustment was only disclosed in the application as originally filed in the context of a light source with light of two wavelengths and a white reference medium. Moreover, according to the application as originally filed, all drive mechanisms of the device were stopped during the adjustment so as to eliminate the influence of noises (cf application as

published, paragraphs [0005], [0011], [0012], [0025] and [0032]). Claim 1 as granted, however, had been extended to a light source with light of at least two wavelengths. Moreover, the limitations had been omitted that the reference medium was white and that that all drive mechanisms were stopped during the adjustment so as to eliminate the influence of noises. Accordingly, the subject-matter of claim 1 as amended constituted an undisclosed intermediate generalisation and, thus, extended beyond the content of the application as filed (Article 100(c) EPC 1973).

3.2 However, as argued by the appellant and held in the decision under appeal, a person skilled in the art would understand from reading the application as originally filed that stopping all drive mechanisms, although being expedient as the influence of noises is eliminated, is not essential to the performance of the invention in that some level of noise would generally be tolerable during discrimination. Similarly, the skilled person would understand from reading the application that the reference medium being "*white*" is preferable, but not essential to the performance of the invention. Finally, regarding the light source, the application also discloses the use of eg three colour lights as the light source, or generally of a "*plural-wavelength*" light source (cf application as published, paragraphs [0031] and [0032]). Although the adjustment of the light source has been explained in the context of a two-wavelength light source, it is clear from the application that it can analogously be applied to a light source emitting light of more wavelengths.

Accordingly, the subject-matter of claim 1 as amended does not constitute an undisclosed intermediate generalisation and, thus, does not extend beyond the content of the application as filed.

The ground for opposition mentioned in Article 100(c) EPC 1973 is, therefore, not considered to prejudice the maintenance of the patent as granted.

4. *Grounds for opposition under Articles 100(a) and 54(1) or 56 EPC 1973*

4.1 Claim 1 as granted (itemised by the board) reads:

A paper sheet discriminating device comprising

(a) a light source (20) for irradiating a paper sheet (1) with light of at least two wavelengths, and a photo sensor (30) for receiving light transmitted through said paper sheet, said device performing the discrimination of said paper sheet in response to signals received from said photo sensor (30), **characterized in that** said paper sheet discriminating device further includes

(b) reference value setting means (101) which, at the time of initially setting a light receiving adjustment reference value,

(b1) adjusts a light emission quantity of said light source (20) such that the output of said photo sensor (30) becomes a given value when a reference medium is set between said light source (20) and said photo sensor (30) and also

(b2) stores the output value of said photo sensor (30) when it directly receives light from said adjusted light source (20) as an adjustment reference value in a memory part, and

(c) adjustment means (102) which, right before starting the discrimination, adjusts the light emission quantity of said light source (20) such that the output value of said photo sensor (30) when it directly receives light from said light source (20) is made to agree with the stored adjustment reference value.

4.2 Document E1

4.2.1 Document E1 discloses, using the terminology of claim 1 as granted, an object discriminating device comprising:

- a light source (17, 18, 19) for irradiating an object with light of at least two wavelengths, and
- a photo sensor (27) for receiving light transmitted through said object,
- said device performing the discrimination of said object in response to signals received from said photo sensor (27) (cf figure with corresponding description).

Accordingly, document E1 discloses feature (a) of claim 1 as defined above.

4.2.2 Moreover, document E1 discloses features (b) and (b1) above (cf column 3, lines 22 to 55).

In particular, E1 discloses that said object discriminating device further includes reference value setting means (25) which, at the time of initially setting a light receiving adjustment reference value, adjusts a light emission quantity of said light source (17, 18, 19) such that the output of said photo sensor (27) becomes a given value when a reference medium (transparent object) is set between said light source (17, 18, 19) and said photo sensor (27) (cf column 3, lines 22 to 55; figure).

4.2.3 Furthermore, document E1, in column 3, line 56 to column 4, line 1, discloses feature (b2), however, since a photo sensor (40) is used here which is distinct from the photo sensor (27) used in the proceeding calibration procedure, except for the feature of (b2) that the output value of said photo sensor is stored.

In particular, E1 discloses that the reference value setting means (25), at the time of initially setting a light receiving adjustment reference value, also stores the output value of a photo sensor (40) when it directly receives light from said adjusted light source (17, 18, 19) as an adjustment reference value in a memory part (46) (cf column 3, line 56 to column 4, line 1).

4.2.4 Finally, document E1, in column 4, lines 4 to 11, discloses feature (c).

In particular, E1 discloses adjustment means (25) which, right before starting the discrimination, adjusts the light emission quantity of said light source (17, 18,

19) such that the output value of said photo sensor (40) when it directly receives light from said light source (17, 18, 19) is made to agree with the stored adjustment reference value (column 4, lines 2 to 11).

4.2.5 Accordingly, the subject-matter of claim 1 as granted differs from E1 in that

- the object to be discriminated is a paper sheet, and
- a different photo sensor (40) is used for storing the adjustment reference value and for adjusting the light emission quantity.

4.2.6 The appellant sees a further difference in the claimed feature that "*after calibration, the light emission quantity of the light source is adjusted right before starting the discrimination*".

It is, however, noted that in E1 the adjustment of the light emission quantity (as described in column 4, lines 2 to 11) completes the calibration and is typically followed by discrimination. In particular, according to E1, the calibration procedure may be repeated from time to time (column 4, lines 24 to 26). The light emission power is kept constant between calibrations (column 4, lines 11 to 13). Moreover, according to E1 the calibration may be started each time the measurement head is raised (column 4, lines 19 to 36). In document E1, the light emission quantity of the light source is, thus, adjusted "*right before starting the discrimination*" as per claim 1.

Incidentally it is noted in this respect that claim 1 does not define the adjustment to take place right before each discrimination measurement.

4.2.7 According to the decision under appeal, E1 disclosed an initial calibration step eg with a transparent reference object and "*would then continue to store in the ROM the target value for no measurement object (column 3, lines 44-49)*" (Reasons 4.1).

However, claim 1 as granted, requires, in accordance with feature (b2) above, the reference value setting means to store the output value of said photo sensor (30) when it directly receives light from said adjusted light source (20) as an adjustment reference value in a memory part.

The passage of E1 referred to above (column 3, lines 44 to 49) merely provides for reference values ("*Sollwerte*") being constants pre-stored in a ROM and does not disclose that the reference value setting means "*stores the output value of said photo sensor (30) when it directly receives light from said adjusted light source (20) as an adjustment reference value in a memory part*" (feature (b2) above), ie stores the outcome of an actual measurement. The "*Sollwerte*" in this passage of E1 rather correspond to the "*given value*" in feature (b1) of claim 1.

Moreover, the respondent argued that, since according to E1, instead of using a transparent reference object, the calibration could also be performed with no reference object (column 3, lines 32 to 37), E1 provided for an adjustment of the light source in

accordance with feature (b1) of claim 1 as granted with no object as reference medium. Moreover, since reference values ("*Sollwerte*") were stored in E1, feature (b2) of claim 1 as granted was also realised in E1.

However, the fact that E1 indicates that the calibration can also be performed with no reference object, does not alter the fact that claim 1 as granted requires in feature (b1) a reference medium to be present between the light source and the photo sensor, and in feature (b2) no reference medium to be present. Furthermore, as discussed above, there is no storing of the output value of the photo sensor (27) when it directly receives light from the adjusted light source in E1.

Accordingly, the subject-matter of claim 1 as granted is new over document E1 (Article 54(1) EPC 1973).

4.2.8 Moreover, there is nothing suggesting modifying the calibration process of E1 so as to comprise, after a step of adjusting the light emission quantity of the light source such that the output of the photo sensor (27) becomes a given value when a reference medium is set between the light source and the photo sensor, a step of storing the output value of the photo sensor when it directly receives light from the adjusted light source as an adjustment reference value in a memory part, as per features (b1) and (b2) of claim 1 as granted.

It also noted that in E1 a step of storing the output value of a photo sensor when it directly receives light

from the adjusted light source as an adjustment reference value in a memory part is disclosed, however with respect to photo sensor (40), rather than photo sensor (27) used for adjusting the quantity of light emitted by the light source reference with a reference medium set between the light source and the photo sensor. There is, however, also nothing suggesting modifying the device of E1 so as to transfer the function of photo sensor (40) to photo sensor (27).

Accordingly, the subject-matter of claim 1 as granted involves an inventive step over document E1 (Article 56 EPC 1973).

4.3 *Admission of document E4 into the proceedings by the opposition division*

4.3.1 According to the appellant, document E4 primarily described the normalization of a signal by using reference level data, but not a calibration process. In these circumstances, document E4 was clearly not *prima facie* highly relevant as stated by the opposition division in the appealed decision. Due to the fact that document E4 was not filed within the opposition period, the opposition division made a mistake to admit this document into the proceedings. The appellant explicitly contested its admissibility on the one hand and its *prima facie* relevance on the other hand and requested in its statement setting out the grounds of appeal that the introduction of document E4 into the first-instance proceedings be reversed.

4.3.2 Document E4 was cited by the opponent in its letter of 9 February 2007, after expiry of the opposition period,

about a month before oral proceedings before the opposition division were held.

In the decision under appeal it is held that "*The document E4 [...] is prima facie highly relevant and none of the parties contested its admissibility. Therefore the document is admitted into the proceedings*" (cf Reasons 9).

Although arguably the appellant could have contested the admission of document E4 into the first-instance proceedings already in the proceedings before the opposition division, the board considers it appropriate to take the appellant's request into account and not to make use of its power to hold it inadmissible under Article 12(4) RPBA.

However, it is noted that the admission of document E4 laid at the discretion of the opposition division. As discussed above (point 2.2), a board of appeal should only overrule the way in which a department of first instance has exercised its discretion if the board concludes it has done so according to the wrong principles, or without taking into account the right principles, or in an unreasonable way. Clearly, in the judgment of the opposition division document E4 was highly relevant, the subject-matter of claim 1 according to the auxiliary request of the patent proprietor having been found in the decision under appeal to lack an inventive step with respect to E4 as closest prior art in combination with E1 (cf Reasons 9.1). Hence, the opposition division exercised its discretion according to the right principles and in a reasonable way.

4.4 *Document E4*

4.4.1 Document E4 discloses a paper sheet discriminating device in which

- initially the photo sensor output receiving light from a reference paper sheet (ie white paper) (T10P) is determined, and
- the photo sensor output directly receiving light (T10W) is determined and the value T10P/T10W is stored,
- then, the current photo sensor output directly receiving light (T11W) is determined, a corrected reference level (T11P=T10PxT11W/T10W) is calculated,
- standard pattern data (Tx) is read from the memory, corrected standard pattern data (Tx/T11P) is calculated and stored,
- the photo sensor output receiving light from a pattern sheet to be discriminated (T11a) is determined, a corrected value is calculated (T11a/T11P) and collated with the corrected standard pattern data (Tx/T11P) (cf figures 10, 11 and corresponding text in the description).

Accordingly, document E4, contrary to the appellant's view, concerns a calibration process and is clearly relevant to the subject-matter of the patent in suit. In fact, since E4 concerns the discrimination of paper sheets, in particular the validation of bank notes, and makes use of a reference paper having no particular pattern as reference medium for the calibration, like the patent in suit, it provides closer prior art than document E1.

However, in document E4 there is no adjustment of the quantity of light emitted by the light source as part of the calibration process.

Accordingly, the subject-matter of claim 1 as granted is new over document E4 (Article 54(1) EPC 1973).

4.4.2 The respondent essentially argued that the sole difference between the subject-matter of claim 1 and document E4 was that a correction of the light emission quantity of the light source was used instead of correction factors for the photo sensor output signals. As argued in the decision under appeal, this was an obvious alternative known from E1.

However, as essentially argued by the appellant, taking the objective problem to be solved relative to E4 to be finding an alternative calibration process, there is no reason why the skilled person would refer to document E1. Document E1 is not concerned with discriminating paper sheets. Moreover, the calibration process of E4 hinges on measuring, in addition to the amount of light in the absence of any object, the amount of transmitted light through a reference paper having no particular pattern, eg a white paper, and, thus, through a reference object having a reduced transmittance. This latter notion is entirely absent from document E1. Where a reference object is mentioned in E1, it is transparent in the example given, or no reference object is present, such that the light path is not interrupted (column 3, lines 32 to 37).

Moreover, even if the skilled person were to refer to E1 in search for an alterative to the teaching of document E4, he would have to derive from E1 that adjusting the light emission quantity would be a suitable alternative to calculating corrections as is done in E4, yet disregard the particular implementation of adjusting the light emission quantity as part of the calibration process in E1, and then modify the entire set-up of E4 replacing all correction calculations by suitable adjustments of the quantity of light emitted by the light source. This is considered to go beyond what would be obvious to the skilled person.

Accordingly, the subject-matter of claim 1 as granted, having regard to the state of the art, is not obvious to a person skilled in the art and, thus, involves an inventive step, Article 56 EPC 1973.

4.4.3 The grounds for opposition of lack of novelty and lack of an inventive step mentioned in Article 100(a) EPC 1973 are, therefore, not considered to prejudice the maintenance of the patent as granted.

5. Accordingly, none of the grounds for opposition invoked prejudice the maintenance of the patent as granted. Therefore, in accordance with Article 101(2), second sentence, EPC, the opposition must be rejected.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside

2. The opposition is rejected.

Registrar Chair

S. Sánchez Chiquero G. Eliasson