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Datasheet for the decision of 19 October 2017

Case Number: T 1074/12 - 3.4.03

Application Number: 03009068.2

Publication Number: 1357522

IPC: G07D7/12

Language of the proceedings: EN

Title of invention:
Paper quality discriminating machine

Patent Proprietor:
Hitachi-Omron Terminal Solutions, Corp.

Opponent:
Giesecke+Devrient Currency Technology GmbH

Headword:

Relevant legal provisions:
EPC 1973 Art. 56
EPC R. 99(2), 101(1)

Keyword:
Admissibility of appeal - (yes)
Inventive step - main request (no) - auxiliary request (no)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

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Case Number: T 1074/12 - 3.4.03

D E C I S I O N
of Technical Board of Appeal 3.4.03
of 19 October 2017

Appellant: (Opponent)	Giesecke+Devrient Currency Technology GmbH Prinzregentenstraße 159 81677 München (DE)
Respondent: (Patent Proprietor)	Hitachi-Omron Terminal Solutions, Corp. 6-3, Osaki 1-chome, Shinagawa-ku, Tokyo (JP)
Representative:	Strehl Schübel-Hopf & Partner Maximilianstrasse 54 80538 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 20 February 2012 concerning maintenance of the European Patent No. 1357522 in amended form.**

Composition of the Board:

Chairman	G. Eliasson
Members:	T. M. Häusser
	C. Heath

Summary of Facts and Submissions

I. The appeal of the opponent concerns the interlocutory decision of the opposition division to maintain the European patent EP-B-1357522 as amended during the opposition proceedings (Article 101(3)(a) EPC).

II. The opposition had been filed against the patent as a whole. Grounds of opposition were insufficiency of the disclosure and lack of novelty and inventive step (Articles 100(a) and (b), 54(1) and (2), and 56 EPC 1973).

III. Reference is made to the following document:

D9: GB 2 355 522 A.

IV. Oral proceedings took place before the board in the absence of the respondent (proprietor), of which the board had been informed beforehand.

At the oral proceedings the appellant (opponent) requested that the decision under appeal be set aside and the patent be revoked.

The respondent had requested in writing that the appeal be dismissed (main request) or that the patent be maintained on the basis of amended claims 1 to 4 as filed with letter dated 12 November 2012 (auxiliary request).

V. The wording of respective independent claim 1 of the main and auxiliary requests is as follows (board's labelling "a)", "b)", "b)'"):

Main request:

"1. A paper material identifying machine comprising:

an irradiation module (15) for irradiating plural kinds of irradiation light of different wavebands to a paper to be identified, wherein the irradiation light includes short-wavelength light within the ultraviolet light range and long-wavelength light within the visible light or the infrared light range;

a detecting module (14) for detecting a plurality of absorbances of the paper corresponding to the plural kinds of the irradiation light; and

an identification module (11) for identifying the paper based on an evaluation value,

characterized in that

a) each absorbance corresponds to the ratio of the light intensity transmitted or reflected by the paper and the intensity of the irradiation light,

the evaluation value is adapted to identify the material of the paper and is calculated in accordance with a prescribed arithmetic expression including the plurality of absorbances, and

b) the spectrum of the short-wavelength light distributes within the range of 370±10 nm and has a center wavelength at 370 nm."

Auxiliary request:

Claim 1 of the auxiliary request differs from claim 1 of the main request in that feature b) is replaced by the following feature:

b)' "the spectrum of the short-wavelength light distributes within the range of 370±10 nm and the center wavelength of the spectrum is 370 nm."

VI. The parties argued essentially as follows:

(a) Admissibility of the appeal

The *respondent* argued that the appellant had merely repeated the line of arguments presented during the opposition proceedings but failed to explain why the opposition division's reasoning in the contested decision was believed to be wrong in relation to the issues of sufficiency of the disclosure and inventive step. The appeal was therefore inadmissible.

The *appellant* argued that it could be understood from the letter setting out the grounds of appeal why the contested decision should be set aside, even if arguments were repeated. The appeal was therefore admissible.

(b) Inventive step

The *appellant* started from document D9 as the closest state of the art and regarded features (a) and (b) as the distinguishing features of the subject-matter of claim 1 of the main request. These two features solved different partial problems. Concerning feature (a) the appellant agreed with the opposition division in that this feature did not involve an inventive step. Feature (b) would be interpreted by the skilled person to imply that a significant part of the spectrum of the short-wavelength light was in the claimed range. The partial objective problem corresponding to that feature was to optimize the machine for the identification of particular banknotes. It belonged to the standard skills of the skilled person to adapt paper identification machines to given banknotes. The skilled person would perform a spectral analysis of the banknotes and other paper materials and would select a favourable

wavelength range. The "blue LED" disclosed in document D9 could then be selected accordingly so that it transmitted in the selected wavelength range. The skilled person would thus be led to feature (b). The same arguments applied to the auxiliary request. Therefore, the subject-matter of claim 1 of the main and auxiliary requests did not involve an inventive step.

The *respondent* also started from document D9 as the closest state of the art. The distinguishing features (a) and (b) solved the common technical problem of improving the reliability of the paper material identifying machine. In particular, feature (a) allowed the elimination of artifacts resulting from a deteriorated or unstable light source. Feature (b) would be interpreted by the skilled person to the effect that the spectrum of the short-wavelength light spread within the claimed range and allowed the detection of absorbances peculiar to a binder adhering to the fabric of the paper material. Feature (b) and the resulting technical effect was of a level of complexity which was too uncommon to consider it as the result of routine measures taken by the person skilled in the art. Therefore the claimed subject-matter involved an inventive step.

Reasons for the Decision

1. Admissibility of the appeal

1.1 The respondent argued that the appellant had merely repeated the line of arguments presented during the opposition proceedings but failed to explain why the opposition division's reasoning in the contested decision was believed to be wrong in relation to the

issues of sufficiency of the disclosure and inventive step.

1.2 According to Rule 99(2) EPC the appellant has to indicate the reasons for setting aside the decision impugned, or the extent to which it is to be amended, and the facts and evidence on which the appeal is based. If the statement setting out the grounds of appeal does not comply with this provision the appeal has to be rejected as inadmissible (Rule 101(1) EPC).

1.3 In the present case the opposition division decided in the decision under appeal that auxiliary request 3 underlying the decision satisfied the requirements of the EPC. In particular, the opposition division held that the invention was sufficiently disclosed, that the feature as amended during the opposition procedure was clear, that the requirements of Article 123(2) and (3) EPC were met, and that the claimed subject-matter involved an inventive step (see points 2, 11, 12, and 13 of the Reasons).

1.4 In the letter setting out the grounds of appeal the appellant set forth the factual and legal reasons why the decision under appeal should be set aside. Specifically, the appellant argued that the invention was insufficiently disclosed with respect to *inter alia* the determination of the paper material using transmission measurements, that the added feature (a) was unclear and contravened Article 123(2) and (3) EPC, and that the claimed subject-matter lacked inventive step over the documents D1, D8, and D9 cited in the decision (see points 3 to 6 of the letter).

The fact that some arguments were already presented during the opposition procedure is not detrimental to the admissibility of the appeal.

1.5 Consequently, the appeal is admissible.

2. Main request - inventive step

2.1 Closest state of the art

In the decision under appeal the opposition division assessed inventive step starting from document D9 as the closest state of the art. Both parties regarded this document as the closest state of the art as well. Indeed, document D9 discloses subject-matter that is conceived for the same purpose as the claimed invention, namely for providing a paper material identifying machine, and has the most relevant technical features in common with it, as detailed below. Document D9 is therefore considered the closest state of the art.

2.2 Distinguishing features

2.2.1 The opposition division held in the impugned decision that the subject-matter of claim 1 differed from the paper material identifying machine of document D9 in comprising features a) and b). There is no dispute between the parties concerning this issue.

2.2.2 Indeed, document D9 discloses (see page 1, paragraph 1: page 5, paragraph 1; page 11, paragraph 3 - page 12, paragraph 3; page 13, paragraph 3 - page 14, paragraph 3; Figures 2 and 3) an apparatus for verifying the authenticity of banknotes and cheques with a blue light source (preferably comprising an ultraviolet light source) and a red light source (preferably comprising

an infra-red light source). More specifically the apparatus comprises a banknote validator circuit with a microprocessor 10 which is arranged to output control signals and to receive a measurement reading. The microprocessor 10 is connected via a blue select line 12 to an ultra-bright blue LED 20 and via an infra-red select line 16 to an infra-red LED 22, both LEDs being provided in an illumination and sensing region 24.

In use, the microprocessor 10 activates the blue and infra-red select lines 12 and 16 alternatively, such that they are never both activated at the same time. Two light sensors 26 and 28 are also provided in the illumination and sensing region 24. One light sensor 26 is positioned to sense reflected light from a banknote being authenticated and the other sensor 28 to sense light transmitted through the banknote. The digital representations of the sensor signals are passed onto the microprocessor 10 for use in a verification algorithm being implemented in the microprocessor 10.

In particular, the infra-red LED 22 is activated first by a control signal from the microprocessor 10. The readings of the reflected light sensor 26 and the transmitted light sensor 28 are taken and their digital representations (IR_R and IR_T respectively) are stored in the memory 39 connected to the microprocessor 10. Then the infra-red LED 22 is deactivated and the blue LED 20 is activated. The reflected light sensor 26 and the transmitted light sensor 28 are both read and the digitised readings (B_R and B_T respectively) are stored in the memory 39. Using the stored digitised results, a reflection result (R_R) and a transmission result (T_T) are calculated, for example by dividing the infrared reading by the blue reading for both reflected and transmitted light sensors, i.e. $R_R=IR_R/B_R$ and $T_T=IR_T/B_T$.

These measurements are repeated for different parts of the banknote to obtain a trace of calculated values of R_R and T_T of reflected results and transmitted results. The next step in this verification of the banknote is for the trace of the reflected results and the trace of the transmitted results to be compared with those of an authentic banknote 50. If both measured traces are within predefined tolerance limits then the banknote 50 is accepted. Otherwise the banknote is rejected (page 15, 3rd paragraph - page 16, last paragraph).

Using the wording of claim 1, document D1 discloses therefore a paper material identifying machine (apparatus for verifying the authenticity of banknotes and cheques) comprising:

an irradiation module (blue LED 20 and red LED 22) for irradiating plural kinds of irradiation light of different wavebands to a paper to be identified, wherein the irradiation light includes short-wavelength light (ultraviolet light) within the ultraviolet light range and long-wavelength light (infra-red light) within the visible light or the infrared light range;

a detecting module (sensors 26, 28) for detecting a plurality of absorbances of the paper corresponding to the plural kinds of the irradiation light; and

an identification module (microprocessor 10 with verification algorithm) for identifying the paper based on an evaluation value,

the evaluation value is adapted to identify the material of the paper and is calculated in accordance with a prescribed arithmetic expression including the plurality of absorbances (e.g. the ratio of the sensor readings).

2.2.3 The board agrees with the appellant in that feature (b) would be constructed by the skilled person to mean that

a significant part of the spectrum of the short-wavelength light is in the claimed range. In document D9 there is no disclosure regarding the spectrum of the ultraviolet light being in this range or regarding the normalization of the sensor readings by the irradiation light.

Hence, the board consents with the parties that the subject-matter of claim 1 of the main request differs from the paper material identifying machine of document D9 in comprising features a) and b).

2.3 Objective technical problem

2.3.1 In the decision under appeal the opposition division held that features (a) and (b) were technically unrelated and could be assessed separately. The effect of feature (a) was to alleviate light source fluctuations, while feature (b) led to improved discrimination of paper materials (see point 13.3 of the Reasons).

2.3.2 The respondent argued that the distinguishing features (a) and (b) solved the common technical problem of improving the reliability of the paper material identifying machine. In particular, feature (b) allowed the detection of absorbances of a binder adhering to the paper material.

2.3.3 Concerning feature (a) both parties essentially agree to the technical effect as defined by the opposition division. Indeed, by dividing the detected values of the intensity of the transmitted or reflected light by the intensity of the irradiation light the detected values are effectively normalized so that they are independent of the irradiation light intensity and

hence spurious effects of light source fluctuations are in fact alleviated.

2.3.4 As far as feature (b) is concerned the board notes that in paragraph [0005] of the patent specification the choice of the wavebands used according to the invention is described as follows:

> *"The wavebands of the irradiated light may be arbitrary set according to the purpose of identifying the paper material, that is, what kind of paper material is to be identified. The present invention is thus applicable to discriminate genuine from counterfeit about* [sic] *banknotes and other prescribed sheets. In those cases, the wavebands may be selected so that the absorbance of genuine paper material significantly differs from that of any other paper materials since it is only required to judge as to whether or not the identified paper is genuine material.*
>
> *The irradiated light preferably includes short-wavelength light within the ultraviolet light range and long-wavelength light within the visible light or the infrared light range. It is because the short-wavelength light tends to make the absorbance of each paper material typically distinctive, and the long-wavelength light tends to make the absorbance less sensitive to the environmental factors, such as humidity, and deterioration of paper. The combination of both types of the light thus improves the stabilization as well as the accuracy for identifying the paper material. In particular, it is preferable that the center wavelength of the short-wavelength light is in the*

range of 370±10 nm, and the long-wavelength light is in the range of 420 to 1000 nm."

It is thus evident that the appropriate choice of wavelengths of the short-wavelength light depends not only on which paper material is to be identified but also on the reference paper materials from which the desired paper material is to be discriminated. Hence, the short-wavelength spectrum as claimed in feature (b) does not *generally* improve the discrimination of paper materials as held by the opposition division.

Concerning the particular paper material which is aimed to be identified it is mentioned in paragraph [0045] of the patent specification that a center wavelength of around 370nm of the short-wavelength light is adapted to the detection of paper material comprising a "binder that adheres fabric composing a sheet". However, it is noted that in claim 1 of the main request it is merely defined with respect to the identification of the paper material that the paper material identifying machine comprises an "identification module [...] for identifying the paper based on an evaluation value", the latter being "adapted to identify the material of the paper". Hence, the claimed machine is not limited to any type of identifiable paper or to any type of reference paper from which it is to be discriminated. It is evident to the board that the claimed spectrum of the short-wavelength light is also adapted to the identification of other paper material which does not comprise the cited binder. This can be deduced, for example, from Figure 6 of the patent specification, which shows the relationship between the wavelength of the irradiated light and the reflective absorbances for various paper materials. On the other hand, it may well be poorly adapted to the discrimination of paper

material comprising the binder from certain reference paper materials.

The board does not see any other part of the patent specification from which an advantage of the claimed short-wavelength spectrum could be deduced. In particular, Figure 6 of the patent specification merely illustrates the expediency of using irradiation light of different wavebands, namely in the ultraviolet light range and the visible/infrared light range, for identifying a paper material. However, no particular advantage of using the specific short-wavelength spectrum of feature (b) can be deduced from that Figure.

In view of the above the board considers that it is the technical effect of feature (b) that the paper material identifying machine is adapted to the identification of a particular paper material.

2.3.5 The board does not see any functional interdependence between features (a) and (b). Rather, the two features are considered to achieve their respective technical effects as described above without mutually influencing each other. It is therefore appropriate to formulate the technical problem to be solved as partial problems corresponding to features (a) and (b), respectively. The objective technical problem is therefore to (A) alleviate spurious effects of light source fluctuations; and (B) adapt the paper material identifying machine to the identification of a particular paper material.

2.4 Obviousness

2.4.1 In relation to feature (a) the opposition held in the contested decision that normalization was a measure

well-known to the skilled person in view of his common general knowledge and that it was therefore obvious for the skilled person to solve partial problem (A) of alleviating spurious effects of light source fluctuations by means of feature (a) according to which each absorbance corresponds to the ratio of the transmitted/reflected light intensity and the intensity of the irradiation light (see points 4.3 and 13.3 of the Reasons).

The respondent did not provide any arguments countering the above assessment of the opposition division concerning obviousness of feature (a), while the appellant agreed with the reasoning cited above. The board agrees with the opposition division in this respect as well and concludes that providing the subject-matter of feature (a) in order to solve partial problem (A) lacks inventive step.

2.4.2 Concerning feature (b) the respondent argued that the claimed subject-matter was of a level of complexity which was too uncommon to consider it as the result of routine measures taken by the person skilled in the art.

The board is of the opinion that consideration of partial problem (B) belongs to the skilled person's normal course of action of adapting the paper material identifying machine of document D9, the document representing the closest state of the art, to the particular circumstances of a concrete application of the machine, in particular regarding the desired identification of specific paper material with respect to given reference paper materials, e. g. for verifying the authenticity of specific security documents such as banknotes or

cheques (see document D9, page 1, paragraph 1; page 2 paragraph 3).

In order to solve the posed problem the skilled person would investigate the intensities of the light reflected off and transmitted through the specific identifiable paper material and the given reference paper materials for various wavelengths and would analyse the results, e. g. by using charts of the type of Figure 6 in the specification of the opposed patent. He would thus be led to selecting - for certain choices of identifiable paper material and reference paper - the claimed center wavelength 370 nm of the short-wavelength light. By adapting the "blue LED 20" of document D9 accordingly the skilled person would inevitably be led to the claimed spectrum of short-wavelength light, since LEDs have narrow emission spectra.

The board is therefore of the opinion that it is obvious for the skilled person in view of his common general knowledge to solve partial problem (B) of adapting the paper material identifying machine to the identification of a particular paper material by means of feature (b) according to which the spectrum of the short-wavelength light distributes within the range of 370±10 nm and has a center wavelength at 370 nm.

2.4.3 For the above reasons the subject-matter of claim 1 of the main request does not involve an inventive step (Article 52(1) EPC and Article 56 EPC 1973).

3. Auxiliary request - inventive step

Claim 1 of the auxiliary request differs from claim 1 of the main request merely in that "the spectrum of the

short-wavelength light ... has a center wavelength at 370 nm" (see feature (b)) is replaced by "the center wavelength of the spectrum is 370 nm" (see feature (b)'). The respondent effected this amendment in order to avert potential objections under Article 84 EPC 1973 and Article 123(2) EPC. However, the board considers that the amendment is merely a rewording of the claim without altering the claimed subject-matter, i. e. the subject-matter of claim 1 of the auxiliary request is identical to that of claim 1 of the main request.

Therefore, for the reasons provided under point 2 above, the subject-matter of claim 1 of the auxiliary request does not involve an inventive step (Article 52(1) EPC and Article 56 EPC 1973), either.

4. Conclusion

Since the subject-matter of claim 1 of the main request and of claim 1 of the auxiliary request does not involve an inventive step the patent has to be revoked (Article 101(3)(b) EPC and Article 111(1) EPC 1973).

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:

S. Sánchez Chiquero G. Eliasson

Decision electronically authenticated