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Datasheet for the decision of 9 November 2007

Case Number: T 1349/04 - 3.4.03

Application Number: 94920841.7

Publication Number: 0679279

IPC: G07D 7/00

Language of the proceedings: EN

Title of invention:
Detection of counterfeit objects

Patentee:
MEI, Inc.

Opponent:
DE LA RUE INTERNATIONAL LIMITED

Headword:
-

Relevant legal provisions:
EPC Art. 52(1), 56

Keyword:
"Inventive step (no)"

Decisions cited:
-

Catchword:
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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1349/04 - 3.4.03

D E C I S I O N
of the Technical Board of Appeal 3.4.03
of 9 November 2007

Appellant: (Opponent)
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Decision under appeal:
Interlocutory decision of the Opposition Division of the European Patent Office posted 22 September 2004 concerning maintenance of European patent No. 0679279 in amended form.

Composition of the Board:

Chairman: R. G. O'Connell
Members: R. Bekkering
T. Bokor

Summary of Facts and Submissions

I. This is an appeal by the opponent as sole appellant against the maintenance of EP 679 279 in amended form.

II. Oral proceedings before the board took place in the forewarned absence of the respondent proprietor.

III. The appellant opponent requested the revocation of the patent in its entirety.

The respondent proprietor requested in writing that the patent be maintained in the amended form allowed by the opposition division in its interlocutory decision, ie the dismissal of the appeal.

IV. Claim 1 reads as follows:

"*1. Apparatus for detecting counterfeit objects, the apparatus comprising:*
means (2; 104) for illuminating a test object with ultraviolet light;
detector means (3,5; 105,106) for detecting
(i) reflected light from said object having a first wavelength within a first wavelength band,
(ii) fluorescent light from said object having a second wavelength within a second wavelength band different from said first wavelength band, said second wavelength band including wavelengths at which counterfeit objects may fluoresce when exposed to said ultraviolet light, and (iii) a reference light level from the illuminating means, said reference light level being dependent on the intensity of light in said first wavelength band

but not the intensity of light in said second wavelength band,
the detector means being operable to provide a measurement output dependent upon the detected reflected light and the detected fluorescent light; and decision means (4,7 to 13; 122,124,142,146,148,152) for deciding whether said object is counterfeit or not and providing an appropriate indication, the decision means being responsive to the detected reflected light and the detected fluorescent light and including comparison means (4; 142) for performing a comparison of at least the detected reflected light with the detected reference light level;
characterised in that the detector means is arranged such that the detected reference light level depends on the intensity of the light emitted by the illuminating means but does not depend on the test object."

Independent claim 13 reads as follows:

"*13. A method for determining the genuineness of a test object using counterfeit detection apparatus (17; 58; 100), the method comprising illuminating the test object with ultraviolet light and determining genuineness on the basis of the fluorescence of the test object and the ultraviolet light reflected therefrom, characterised in that the testing operation initially involves the manual positioning of the detection apparatus and test object relative to each other, and in that the genuineness decision uses an ultraviolet reflective measurement having a magnitude which is determined by the absolute reflectivity of the test object and not by its fluorescence or the*

relationship between the reflected light and a reference light level dependent on the test object."

V. The following documents *inter alia* were cited:

D5: WO-A-90 07165

D9: US-A-4 275 299

D8: "Silicon Photodiodes, Physics and Technology", APP Note no. 02, April 1982, UDT Sensors Inc., page 1

D12: "Photodiode Technology, A primer on Photodiode Technology", published at http://www.centrovision.com/tech2.htm, 03/08/2005, pages 1 to 12

VI. The appellant opponent submitted that the subject-matter of claim 1 albeit new did not involve an inventive step over D5 and D9 for essentially the following reasons:

Document D5 disclosed an apparatus for detecting counterfeit objects such as banknotes with all the features of claim 1 except for the feature of *"said reference light level being dependent on the intensity of light in said first wavelength band but not the intensity of light in said second wavelength band".*

In particular, in the apparatus of D5, in addition to the fluorescence of the test object under UV light exposure being detected, reflected UV light would inevitably also be detected, as the Si photodiodes used would be sensitive to reflected light as well.

Contrary to what was held in the appealed decision, the skilled person would consider simplifying the arrangement providing the reference signal for taking account of UV lamp fluctuations and ageing.

Document D9 provided a simpler arrangement, avoiding the need for a reference object providing a fluorescent response, by directly monitoring the UV lamp light. The skilled person would adopt this solution thereby arriving at the subject-matter of claim 1 without resorting to inventive skills.

VII. The respondent proprietor traversed the opponent's contention on inventive step, arguing in substance as follows:

Document D5 was only intended to detect fluorescent light from the test object and not any reflected UV light. The sensitivity of the Si photodiodes used dropped significantly with decreasing wavelength in particular as the wavelength approached UV and was, furthermore, influenced by its housing. Sensitivity in the UV range required selection of appropriate photodiodes.
Furthermore, the photodiode output would be swamped by the fluorescence making the UV effects unnoticeable. Finally, the circuit of which the photodiodes formed part inevitably comprised components influenced by noise and having threshold characteristics, limited signal resolution etc. The implication of the opponent's argument that any signal from the photodiode, no matter how tiny, would influence the response of the circuit, had to be wrong.

Document D9, introduced by the appellant opponent on appeal, was cited belatedly and of no particular relevance, and should therefore not be admitted into the proceedings.

Moreover, it was not clear why documents D5 and D9 would be combined in the first instance – D5 related to fluorescence measurements on banknotes, whereas D9 appeared to be concerned with some (unspecified) types of documents on which marks had been applied using fluorescent ink. Even disregarding this, it had to be emphasised that D5 explicitly required the use of a reference level dependent upon the fluorescence of a reference object. Regardless of the Opponent's comments, to use a reference light level which was dependent on UV light rather than fluorescent light would be contrary to the teachings of D5.

Reasons for the Decision

1. The appeal is admissible.

2. *Novelty*

2.1 Novelty, which is not contested, follows from the discussion of inventive step below.

3. *Inventive step*

3.1 *Difference relative to closest prior art D5*

Document D5 discloses an apparatus for detecting counterfeit objects such as banknotes representing the closest prior art (see page 1, first paragraph).

The apparatus of document D5 comprises an ultra violet lamp (9) for illuminating the banknote, silicon photodiodes (11,12) for detecting light coming from the banknote and for detecting a reference light level relating to the UV lamp, and logic circuitry (5) for comparing the detected light coming from the banknote with the detected reference light level, for deciding whether the banknote is counterfeit or not and providing an appropriate indication (see figures 2a to 2c and corresponding description; page 4, lines 13 to 18 and lines 32, 33; page 5, line 33 to page 6, line 19).

When exposing the banknote to UV light, fluorescence may occur depending eg on the properties of the banknote paper. The emitted fluorescent light will reach the Si photodiode and be detected. Furthermore, UV light from the lamp reflected at the banknote will reach the Si photodiode as well.

The responsivity of ordinary silicon photodiodes in the UV lamp spectrum, in particular compared to that at neighbouring wavelengths at which fluorescence of eg counterfeit banknote paper is typically detected (ie 400 to 500 nm (see patent, paragraph [0004]), is not

negligible (see eg document D8, page 1, "General discussion"; document D12, pages 4 and 5).

Furthermore, the standard glass package window used for Si photodiodes does not affect the responsivity in the UV range (see eg document D12, page 5, "Spectral Response").

Hence, absent any special means in document D5 filtering out or otherwise eliminating reflected UV light, inevitably the Si photodiodes will provide a measurement output dependent upon the detected reflected UV light as well, albeit to a lesser extent than upon the detected fluorescent light.

Moreover, as this output of the photodiodes is provided to the logic circuitry for deciding whether the object is counterfeit based on a comparison with the reference light level, these decision means are responsive to both detected reflective and fluorescent light and the incorporated comparison means perform a comparison between the detected reflective and fluorescent light with the detected reference light level, as per claim 1.

The respondent's contention that the reflected light signal would be swamped by the fluorescent light signal and vanish due to noise, threshold characteristics and limited signal resolution of the logic circuitry, is unfounded, as the reflected light signal will not be insignificant since a considerable part of the light reaching the photodiode will be reflected light from the UV lamp.

Nevertheless, the reference light level in document D5, which serves to take account of lamp intensity drift, is provided by shining the light from the UV lamp onto a reference and detecting the emitted (fluorescent) light with a photodiode (see page 5, line 33 to page 6, line 5).

In contrast, the reference light level in claim 1, serving the same purpose of taking account of lamp intensity drift (patent, paragraph [0017]), is specified as being dependent on the intensity of UV light and not the intensity of fluorescent light.

Accordingly, the board accepts the contention of the appellant opponent and confirms the finding of the opposition division in the decision under appeal that the subject-matter of claim 1 is distinguished from D5 solely by the feature "*said reference light level being dependent on the intensity of light in said first wavelength band but not the intensity of light in said second wavelength band*" inappropriately contained in the preamble of the claim.

3.2 *Objective technical problem relative to D5*

The reference light level arrangement of document D5 requires among other things a reference made of a UV stabilised material such as phosphor coated glass. The sole function of this relatively complicated arrangement is to monitor the performance of the lamp. Hence, based on the above difference, the objective problem to be solved relative to document D5 is that of simplifying the monitoring of the performance of the lamp.

3.3 *Obviousness of the problem and the claimed solution*

3.3.1 In the judgement of the board, the formulation of this problem is obvious given that simplification is a constant objective for the skilled person.

3.3.2 The argument of the opposition division in the decision under appeal at 3.5 and of the respondent proprietor on appeal, that it would be "contrary to the teaching of document D5" to modify the apparatus and method disclosed, does not persuade the board. Insofar as many routine modifications of the prior art could be described as being contrary to - in the sense of being inconsistent with - the teaching of the latter, this is not a tenable reasoning in general. If what was meant was that D5 teaches away from the claimed solution, the board's judgement is that D5 cannot be read in this way.

3.3.3 On the board's reading, the sentence bridging pages 5 and 6, relied upon by the opposition division and the respondent proprietor in this context, stating that "*it is important that the reference 13 is made from a material that is UV stablised such as phosphur* (sic*) coated glass*", does not teach that the reference, and thereby the whole reference light level setup, is indispensable, but rather suggests that problems may occur if the reference is not UV stabilised and, thus, if anything, hints at potential difficulties with the proposed solution.

3.3.4 *An aside - admissibility of D9*

Since the above distinguishing feature over document D5 was introduced in the claim during the oral proceedings before the opposition division and document D9 is filed responsive to these amendments, procedural fairness mandates that the document be admitted into the proceedings.

3.3.5 *Problem addressed by D9*

Document D9 discloses an apparatus for detecting counterfeit documents by detecting fluorescent light emitted when exposing the documents to UV light from a lamp (see column 1, lines 13 to 17). The document is also concerned with the problem of lamp intensity drifting in the context of a fluorescent light measurement (see column 1, lines 38 to 42 and column 3, lines 45 to 48). Hence the person skilled in the art in search of a solution to the problem identified at 3.3 above would study D9.

3.3.6 *Solution taught in D9*

The simple solution proposed in D9 is the arrangement of a photo-voltaic cell (30) directly exposed to the light of the UV lamp (1), providing the reference light level (see column 3, lines 48 to 62 and figure 1).

3.3.7 *Combination of D5 and D9*

A study of D9 would accordingly lead the skilled person to adopt in the apparatus of document D5 the simple arrangement proposed by document D9 exposing the

photodiode, for the purpose of generating a reference light level, to UV light from the lamp rather than to fluorescent light, thereby arriving at the subject-matter of claim 1.

3.3.8 *Conclusion on inventive step*

For the above reasons the subject-matter of claim 1 is obvious to the skilled person and, therefore, lacks an inventive step within the meaning of Article 56 EPC.

4. *Other considerations*

Independent claim 13, directed to method for determining the genuineness of a test object using counterfeit detecting apparatus, is not a straight counterpart to claim 1 as *inter alia* it does not define the reference light level and, therefore would have required a separate consideration of its inventive merits - which it was not given in the decision under appeal. However, as claim 1 is not allowable, consideration of this issue here would be otiose.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

Registrar | Chair

S. Sánchez Chiquero | R. G. O'Connell