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D E C I S I O N
of 2 September 2004

Case Number: T 0644/01 - 3.4.3

Application Number: 94923035.3

Publication Number: 0708947

IPC: G07D 7/00

Language of the proceedings: EN

Title of invention:

Chemical solution to detect the counterfeit of paper currency

Patentee:

Pifferi, Pier Giorgio

Opponent:

Dri Mark Products Inc.

Headword:

Iodine solution/PIFFERI

Relevant legal provisions:

EPC Art. 56

Keyword:

"Inventive step (yes)"

"Claimed teaching -not a result of routine trials with a reasonable expectation of success"

Decisions cited:

-

Catchword:

-



Case Number: T 0644/01 - 3.4.3

D E C I S I O N
of the Technical Board of Appeal 3.4.3
of 2 September 2004

Appellant:
(Opponent)

Dri Mark Products Inc.
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Port Washington
NY 11050 (US)

Representative:

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Respondent:
(Proprietor of the patent)

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Representative:

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Wittelsbacherstrasse 5
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Decision under appeal:

Decision of the Opposition Division of the
European Patent Office posted 23 March 2001
rejecting the opposition filed against European
patent No. 0708947 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: R. K. Shukla
Members: G. L. Eliasson
J. P. B. Seitz

Summary of Facts and Submissions

I. The opposition against European Patent No. 0 708 947 was rejected under Article 102(2) EPC in a decision of the opposition division dated 23 March 2001.

II. Claim 1 as granted has the following wording:

"1. A chemical solution to detect the counterfeit of paper currency characterised in that the solute is a metallic iodine of high purity, at a concentration varying from 0.005 to 3.0 grams per litre, dissolved at a temperature of 20°C in an amber coloured flask, in the absence of sunlight, by stirring in a non-oxidant atmosphere in a solvent belonging to or selected from the classes of: alcohols; polyalcohols; ketones; esters of said alcohols or said polyalcohols with formic or acetic or propionic or lactic acid; ethers of said alcohols or said polyalcohols of methyl, ethyl, propyl, butyl alcohols; mixture of components selected from the said different classes in any volumetric ratio; said solvent being mixed, at a temperature of 20°C, with distilled water in a volumetric ratio varying from 99 percent of water to the volume of saturation of the said solvent with distilled water, at a temperature of 20°C."

III. The patent in suit was opposed by the appellant (opponent) on the ground of lack of novelty and inventive step (Article 100(a) together with 52(1), 54, and 56 EPC) having regard to the following prior art document:

D1: US-A-5 063 163.

IV. The appellant (opponent) filed the notice of appeal on 23 May 2001, paying the appeal fee the same day. A statement of the grounds of appeal was filed on 23 July 2001.

V. In response to a communication of the Board accompanying summons to oral proceedings, the appellant (opponent) declared that he would not attend the oral proceedings and maintained his request that the decision under appeal be set aside and that European Patent No. 0 708 947 be revoked.

VI. During the oral proceedings held on 2 September 2004, the respondent (patent proprietor) requested that the appeal be dismissed.

VII. In the decision under appeal, the opposition division reasoned essentially as follows:

(a) The subject matter of claim 1 differs from that of document D1 in that the content of metallic iodine content in the chemical solutions is lower than that disclosed in document D1.

The objective problem addressed by the claimed invention was to provide a chemical solution for the detection of counterfeit banknotes which does not leave a permanent mark on genuine banknotes, since the solutions of document D1 can leave a permanent mark on genuine currency.

(b) The same problem is apparently discussed in document D1 which suggests either the use of hydrogen peroxide in the solution, which oxidises iodine, or simple sublimation of the iodine for removing a permanent mark on genuine currency. Therefore, there was no incentive in document D1 for the skilled person to adopt the measure of claim 1 instead of the measures suggested in document D1 to seek yet a further solution to those of document D1.

VIII. The appellant (opponent) presented essentially the following arguments in support of his request:

The object of the patent in suit is the provision of a chemical solution to test for counterfeit currency such that there is no unsightly mark on genuine currency after deployment of the test.

The solution proposed by the patent in suit is merely to use iodine in a solvent at a lower concentration than that disclosed in document D1. It is submitted that the problem of permanent marking in genuine paper is a problem that is addressed in document D1 which uses an oxidising agent (hydrogen peroxide) to bleach the mark.

In the patent in suit, it is stated that the solution proposed by document D1 does not solve the problem of permanent marking of genuine currency. If this is true, it would be evident that the solutions suggested in document D1 would not be sufficient to deal with the problem. In this case, the skilled person would have every reason to look for an alternative solution to

this problem, contrary to the opinion of the opposition division.

Given this incentive, the skilled person would consider the alternative of reducing the amount of iodine, since the reduction of the amount of iodine in the solution would reduce the amount of iodine deposited on the paper. The only other alternative would be to increase the amount of oxidising agent, hydrogen peroxide, which is a potentially harmful agent to the user and the paper to be tested. Once the step of reducing the amount of iodine has been taken, an oxidising agent, which in document D1 is taught as an optional component, is no longer required.

IX. The respondent (patent proprietor) presented essentially the following arguments:

- (a) The solution according to claim 1 differs from that disclosed in document D1 in three respects: Firstly, the concentration of iodine lies between 0.005 to 3.0 g/l, whereas document D1 discloses an iodine concentration between 5.0 to 20 g/l. Secondly, the claimed solution uses high purity metallic iodine in order to reduce risk of undesired chemical reactions with contaminants. Thirdly, the preparation of the solution as specified in claim 1 aims at minimizing oxidation and other unwanted chemical reactions in the iodine solution. Document D1, on the other hand, is silent with respect to the purity of iodine used for preparing the solution, and does not discuss the issue of oxidation. Instead, the fact that document D1 suggests the addition of peroxide

for bleaching the golden-brown stain on genuine banknotes indicates that oxidation of the test solution was not considered a problem.

- (b) The solution according to document D1 produces a light-brown stain on genuine banknotes which remains for a long time (cf. D1, column 2, line 60 to column 3, line 5). In contrast, the solution according to claim 1 does not produce any coloured stains on genuine banknotes. This difference in performance was illustrated at the oral proceedings before the Board comparing a pen of the type "Smart Money Counterfeit Detector Pen" made by the appellant, Dri-Mark Products Inc., which according to the inscription on the pen contains a solution produced according to document D1 (US patent No. 5.063.163), with a pen of the type "Money tester" containing a solution according to the patent in suit with an iodine concentration of 2.6 g/l. The pen containing a solution according to document D1 produced a golden-brown mark on a genuine 5 Euro banknote which remained for at least two hours, whereas the solution according to the present invention did not leave any stain on the same banknote. On ordinary paper, both solutions produced dark, permanent marks.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is therefore admissible.

2. *Inventive step*

The only contested issue in the present appeal is that of inventive step.

- 2.1 Document D1 discloses a method for the detection of counterfeit paper currency, which operates on the principle that genuine banknotes do not contain any starch, whereas counterfeit banknotes may contain traces of starch. The detection is carried out by applying a test solution containing iodine on a test area of a banknote using e.g. a pen-like writing instrument or a dropper. On a counterfeit banknote, the test area turns bluish-black, whereas in case of a genuine banknote, the test area is stained golden-brown (cf. D1, abstract; column 2, line 15 to column 3, line 13). According to document D1, the golden-brown stain on genuine banknotes disappears after a duration in the range of several hours to a few days due to iodine sublimation or oxidation when hydrogen peroxide is included in the solution (cf. column 2, line 60 to column 3, line 5). The bluish-black coloured stain on counterfeit currency is however permanent (cf. column 3, lines 3 to 5).

The test solution disclosed in document D1 comprises elemental (i.e. metallic) iodine, a solvent which is preferably an alcohol, carbon disulphide, chloroform, carbon tetrachloride or glycerol and an alkaline iodide solution, such as NaI or KI, in water (cf. column 2, lines 15 to 27). As a particular example, the solution contains about 0.5% to 2.0% iodine, about 48.0% to about 49.5% water, and about 44% to about 50% alcohol by volume of the reagent solution. Optionally, the

solution may contain up to 6% of a bleaching agent, such as hydrogen peroxide, by volume of the solution.

- 2.2 It is undisputed that document D1 does not disclose the concentration of metallic iodine in the range from 0.005 to 3.0 g/l as specified in claim 1. Document D1 discloses a concentration of iodine in the range between 0.5% and 2.0% (5.0 to 20.0 g/l) iodine which is outside of and above the claimed range.

The patent proprietor argued that the process conditions defined in claim 1 for dissolving metallic iodine of high purity and preparing the test solution help prevent undesirable chemical reactions, such as oxidation, from taking place in the test solution (cf. item IX(a) above). Document D1, on the other hand, does not give any details about the conditions under which the test solution is prepared.

- 2.3 The chemical solution known from document D1 has the disadvantage that in some cases, a light-brown or yellowish stain remains on genuine paper currency, even when hydrogen peroxide is added to the solution (cf. D1, column 2, lines 53 to 59).

- 2.4 Thus, as stated in the decision under appeal, the problem addressed by the patent in suit relates to finding a chemical solution for detecting counterfeit paper currency which does not leave a permanent mark on genuine banknotes.

That the test solution according to claim 1 solves the above technical problem was demonstrated by the patent proprietor at the oral proceedings before the Board;

the test solution as claimed did not produce any visible stain at all on a genuine banknote, whereas on ordinary paper, the same test solution produced a dark, permanent mark (cf. item IX(b) above).

- 2.5 The opponent argued that document D1 addressed the above problem of finding a chemical solution which does not leave a permanent mark on genuine banknotes. Therefore, if it turned out that the measures taught in document D1 for avoiding permanent marks on genuine banknotes were inadequate, the skilled person would as a matter of routine seek to reduce the iodine content in the chemical solution (cf. item VIII above).

- 2.6 The above argument fails to convince the Board for the following reasons:

Document D1 mentions that the golden-brown stains on genuine banknotes will remain for a duration ranging from a several hours to a few days, and that the duration depends upon the "strength of the solution". Thus, document D1 does not contain any suggestion that stains from the test solution on genuine currency could be avoided entirely. On the contrary, since document D1 suggests the addition of peroxides as a remedy to this problem, it suggests that these golden-brown stains are to be regarded as an inevitable drawback in exchange for having reliable detection of counterfeit currency. The patent in suit on the other hand teaches that it is indeed possible to produce a test solution which does not produce any visible stain on genuine banknotes, not even for a short period of time, and that this result can be achieved through the seemingly simple measures of reducing the iodine content substantially and

controlling carefully the process for mixing the test solution. In the Board's view this teaching is surprising in relation to document D1.

Furthermore, document D1 discloses a range of 0.5% to 2.0% (5.0 g/l to 20 g/l) for iodine concentration which is considerably higher than the range of 0.005 to 3.0 g/l specified in claim 1. Since iodine is the active component in the test solution of document D1 for detecting starch in counterfeit currency, the skilled person would be reluctant to reduce the iodine concentration significantly below that disclosed in document D1, as the resulting test solution may not be capable of detecting counterfeit currency reliably. Since the claimed range of 0.005 to 3.0 g/l represents a large reduction of the iodine concentration with respect to that taught in document D1 (at least 40% reduction), this range cannot be regarded as the one which a person skilled in the art would arrive at by routine trials with a reasonable expectation of detecting counterfeit currency.

- 2.7 For the above reasons, the subject matter of claim 1 involves an inventive step within the meaning of Article 56.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

D. Meyfarth

R. K. Shukla