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Datasheet for the decision of 27 November 2007

Case Number: T 1271/05 - 3.4.01

Application Number: 99914808.3

Publication Number: 1073993

IPC: G06K 19/02

Language of the proceedings: EN

Title of invention:
Substrate which is made from paper and is provided with an integrated circuit

Patentee:
VHP Veiligheidspapierfabriek Ugchelen B.V., et al

Opponent I: DE LA RUE INTERNATIONAL LIMITED
Opponent II: GIESECKE & DEVRIENT GmbH

Headword:
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Relevant legal provisions (EPC 1973):
EPC Art. 56, 84, 69

Keyword:
"Inventive step (no; main request and auxiliary requests I, II, X and XI)"
"Clarity (no; auxiliary requests III to IX and XII)"
"Application constitutes its own dictionary (no)"
"Plurality of independent 'partial problems'"

Decisions cited:
T 0422/93, T 0056/04

Catchword:
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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1271/05 - 3.4.01

D E C I S I O N
of the Technical Board of Appeal 3.4.01
of 27 November 2007

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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 15 July 2005 revoking European patent No. 1073993 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: H. Wolfrum
Members: P. Fontenay
G. Weiss

Summary of Facts and Submissions

I. The appeal lies from the decision of the Opposition Division dispatched on 15 July 2005 revoking the patent.

II. The appellants (Patent proprietors: VHP Veiligheidspapierfabriek Ugchelen B.V. and Koninklijke Philips Electronics N.V.) filed an appeal against said decision and paid the corresponding appeal fee on 15 September 2005.

The appellants request that the contested decision be set aside and the European patent be maintained in amended form according to a main request or one of auxiliary requests I to XII, filed by facsimile on 26 October 2007 as a reaction to a communication of the Board of Appeal issued under Article 11(1) of the Rules of Procedure of the Boards of Appeal (RPBA).

III. The respondents (opponent I and opponent II) are parties to the procedure as of right (Article 107 EPC). They both request that the appeal be dismissed.

IV. All parties have requested to be heard during oral proceedings.

Such oral proceedings before the Board took place on 27 November 2007.

V. The following documents, referred to by the parties, were of particular interest during the appeal procedure:

E1: EP-A-0 788 075;

E2: Philips Press Information, 8 December 1997, "New plastic circuits are flexible enough to be folded in half";

E4: Physics World, March 1995, pages 52-57, "Polymer electronics - fact or fantasy?";

E5: Design Engineering, May 1995, pages 47, 48, "The first all-polymer field effect transistor";

E7: Internet Disclosure of EETimes, News of 11 September 1997, "IEDM sees novel materials, devices", three pages;

E8: IEDM, 1997, pages 331-336, "Polymeric Integrated Circuits and Light-Emitting Diodes";

E9: DE-A-196 01 358;

E10: DE-A-196 30 648;

D1: L'Onde Électrique, July/August 1994, Vol. 74, N° 4, pages 18-24, "Evaluation des performances de circuits logiques réalisés à partir de transistors MIS organiques";

D2: Science, Vol. 270, 10 November 1995, pages 972-974, "Logic Gates Made from Polymer Transistors and Their Use in Ring Oscillators";

D8: WO-A-97/21184;

D9: US-A-4 472 627.

VI. Claim 1 according to the main request reads as follows:

"Security paper, comprising a substrate which is made from paper which substrate comprises more than one security feature, at least one of which is an integrated circuit, wherein the integrated circuit (3; 3') is flexible and comprises a semiconductive organic polymer."

Claims 1 according to auxiliary requests I and II are identical and differ from claim 1 according to the main request in that they specify that, in addition to the at least one integrated circuit, the substrate comprises "*at least one customary security feature being a watermark, a security thread, an optically active element, a special chemical or a microprint*".

Claims 1 according to auxiliary requests III, IV and V are identical and read: "Security paper, comprising a substrate which is made from paper which substrate comprises an optically active element (7), which optically active element is connected to at least one integrated circuit (3'), wherein the integrated circuit (3; 3') is flexible and comprises a semiconductive organic polymer, the optically active element (7) providing conductive parts (8) for readout and current supply of the integrated circuit (3')."

Auxiliary requests VI to IX differ from auxiliary request III in that claim 1 further recites that the conductive parts serve specifically for capacitive readout and current supply of the integrated circuit and are protected by a chemically inert, electrically non-conductive layer (auxiliary requests VI to IX), in

that said conductive parts are further separated by a non-conductive strip (auxiliary requests VIII and IX) and in that the integrated circuit is arranged beneath the optically active element (auxiliary request IX).

Claims 1 according to auxiliary requests X and XI are identical and read: "*Security paper, comprising a substrate which is made from paper which substrate comprises an optically active element (7) being selected from the group comprising foils, patches, holograms and kinegrams, which optically active element is connected to at least one integrated circuit (3'), wherein the integrated circuit (3; 3') is flexible and comprises a semiconductive organic polymer, the optically active element (7) providing conductive parts (8) separated by a non-conductive strip (9), for capacitive readout and current supply of the integrated circuit (3'), the conductive parts (8) being protected by a chemically inert, electrically non-conductive layer.*"

Claim 1 according to auxiliary request XII differs from claim 1 according to auxiliary request III by reciting that the substrate also comprises a security thread.

Reasons for the Decision

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

2. *Main request - inventive step (Article 56 EPC)*

2.1 The parties concur with the finding that both documents E9 or E10 can be considered to illustrate the closest prior art.

E9 discloses a security paper comprising a substrate which is made from paper and which is provided with at least one integrated circuit (see E9, column 1, lines 3,4; column 2, lines 7-13 and 21-23; claim 1). The substrate disclosed in E9 (see column 4, line 68 - column 5, line 5) further comprises a security thread which constitutes one of the alternative security features recited in paragraph [0033] of the patent specification.

A similar security paper is disclosed in E10 (see E10, column 1, lines 3-14; column 2, lines 7-13; column 2, line 53 - column 3, line 6).

2.2 The subject-matter of independent claim 1 differs from these known security papers in that the integrated circuit is flexible and comprises a semiconductive organic polymer.

2.3 The technical effect achieved by these features is a less complicated structure of increased flexibility of the paper substrate.

The security papers disclosed in E9 or E10 share common drawbacks deriving essentially from the need to reinforce the integrated circuit which, due to the crystalline and therefore brittle structure of the silicon chip, would otherwise be easily damaged. In particular, the provision of a supporting layer in E9 (cf. E9, column 2, lines 24-38; column 3, lines 14-20)

or of a tough mass intended to improve the stability and durability of the silicon chip in E10 (cf. E10, column 1, lines 50-53) leads to a thick and bulky construction. Moreover, the need to reinforce the chip contributes to further increase the manufacturing costs of the final product (cf. column 1, lines 18-29 of the patent specification).

The problem to be solved by the present patent resides therefore in simplifying a manufacturing process in terms of costs while minimizing the effect of the chip on the mechanical characteristics of the substrate it is embedded in.

2.4 The use of polymeric integrated circuits was already known as such before the priority date of the present application, as is substantiated by various publications (cf. D1, D2, E1, E2, E4, E5, E7, E8). In particular documents D1 (cf. section 1: "introduction"), E2, E4 (cf. page 57, section "Future applications", first paragraph) and E8 (cf. page 331, left column) establish that a major advantage of polymeric integrated circuits resides in their mechanical flexibility and their reduced cost.

The question to be answered, in present case, is therefore whether it would have been obvious to combine the teaching of documents E9 or E10, pertaining to the field of security papers, with knowledge obtained from the technical field of integrated circuits. It follows that one of the key issues to be decided resides in the identification of the skilled person or on the question whether the skilled person would in fact be a team of skilled persons.

2.5 Relying on decision T 422/93 (OJ EPO 1997, 25) the appellants defended the view that the skilled person is the one practising in the paper manufacturing industry and would not have any specific skills relating to integrated circuits. This decision stated (see point 2 of the headnote; point 3.6.1 of the Reasons): "Since the technical problem addressed by an invention must be so formulated as not to anticipate the solution, the skilled person to be considered cannot be the appropriate expert in the technical field to which the proposed solution belongs if this technical field is different to the one considered when formulating the technical problem". It would thus be wrong, in the light of this decision, to consider the skilled person to be an expert in the field of integrated circuits, which corresponded to the field to which the solution belonged, when deciding on the inventive merits of the invention. In the present case, the skilled person worked in the field of paper manufacturing, to which documents E9 and E10 belonged, and did not have any incentive to consult someone in such a remote area as electronics industry when tackling the problem which was associated with the known security papers, namely that, due to the bulky and inflexible structure of the embedding, the safety feature provided by the IC became too conspicuous to a counterfeiter.

2.6 The Board is not convinced by the conclusions reached by the appellants in that, in the present case, the formulation of the problem to be solved by the claimed invention would not lead to the field of integrated circuits. In fact, the approach taken by the appellants as regards the problem to be solved and the technical

field from which a solution would be expected suggests that the skilled person would conceive solutions which implied that the integrated circuit is abandoned and replaced by another security feature. However, this approach ignores the facts that invention and pertinent prior art relate to the field of security papers and that the proper skilled person would not renounce to the security level provided by the presence of an integrated circuit. The appellants' position is at odds with the teaching of documents E9 and E10, according to which an integrated circuit embedded in the security paper constitutes an indispensable characteristic for establishing a certain level of security. Since the problem identified above (cf. point 2.3) actually reflects this aspect of the invention, the Board does not see any basis for a different formulation of the objective technical problem underlying the patent in suit with respect to E9 or E10.

The Board further notes that decision T 422/93 emphasizes under point 3 of its headnote that: "The appropriate skilled person's basic knowledge does not include that of a specialist in the different technical field to which the proposed solution belongs if the closest prior art gives no indication that the solution is to be sought in this other technical field". This statement also implies *a contrario* that the skilled person's knowledge includes that of an expert in a different technical field if the closest prior art contains an indication leading to that second technical field, as is the case for the present patent. Alternatively, such an indication could also, according

to the circumstances, imply that said knowledge would correspond to the knowledge of a group of experts.

As stressed by respondent II, although the paper manufacturing industry and the integrated circuit industry constitute remote fields, the closest prior art, as disclosed in documents E9 or E10, provides evidence that it was already known before the priority date of the present application to integrate IC chips in security papers. In particular, the paragraph bridging columns 3 and 4 in E9 and the paragraph column 1, lines 11-21 in E10 contain direct references to the field of the integrated circuits and to the fact that the knowledge of the expert in that field is indeed essential in order to take advantage of the various possibilities offered by such chips.

Consequently, documents E9 and E10 would directly lead the expert in the industry of security papers to consider the contribution which could be expected from an expert in the IC chip industry in order to solve a problem associated with the incorporation of an integrated circuit in a security paper. The Board fully concurs with the analysis put forward by respondent II, in this respect, that the skilled person or the skilled team has to be determined in view of the developments actually achieved in a specific field at the priority date of the application as illustrated by the closest prior art.

To conclude, since the closest prior art provides evidence that the technical fields of security paper manufacturing and integrated circuits have come in contact and since the problem identified above in

relation with the closest prior art is directly related to the integration of an integrated circuit in a security paper, it is therefore justified to consider that the skilled person is in fact a team of experts specialised, respectively, in the manufacturing of security papers and in the field of integrated circuits.

2.7 The specialist in integrated circuits would be aware in the course of his normal professional activity of the developments achieved in relation with polymeric integrated circuits. The team of experts would have therefore immediately realised, on the basis of the information already available at that time (cf. in particular documents D1, E2, E4 and E8), that the replacement of a crystalline IC in a security paper by a flexible one would have saved manufacturing costs, *inter alia*, by making the need for a rigid supporting structure superfluous, but also would have minimized the effects that the presence of the chip have on the characteristics of the substrate.

It follows that the subject-matter of claim 1 according to the main request is obvious in view of the available prior art and that it does not, therefore, meet the requirements of Article 56 EPC.

3. *Auxiliary requests I and II - inventive step (Article 56 EPC)*

Document E9 discloses that the substrate further comprises a customary security feature in the form of a security thread (cf. E9, column 4, line 68 - column 5, line 5). A similar measure is disclosed in E10 (cf.

E10, figure 1; column 2, line 53 - column 3, line 3) which suggests to incorporate the chip in the security thread.

Since the additional customary security feature constitutes the only difference between claims 1 of auxiliary requests I and II and claim 1 of the main request, it follows from the finding that either E9 or E10, considered as closest prior art for the subject-matter of claim 1 according to the main request, disclose this additional feature that the analysis made above under section 2 applies *mutatis mutandis* to the subject-matter of claim 1 of both auxiliary requests I and II, which is therefore also not inventive in the sense of Article 56 EPC.

4. *Auxiliary requests III to V - clarity (Article 84 EPC)*

4.1 The respondents objected to the term "optically active element" in claim 1 which, in their view, was unclear in the context of the claim. It would, in particular, not be possible to establish whether a security thread would fall under the wording of the claim or not. Respondent I emphasized that the patent specification did not help, since it did not provide an unambiguous explanation of the meaning of this term. In particular, paragraph [0019] in the patent specification, recited a list of optically active elements which was not exclusive of any other arrangement able to produce an optical effect, the nature of which was not even specified. The reference, for example, to foils as possible optically active elements even suggested that the mere reflection of light could justify the

qualification of "optically active element" for any kind of reflector.

4.2 For the appellants, an optically active element would have a recognised meaning in the field of security papers and would encompass any element visually perceivable by the user of the security paper. Moreover, the patent considered in its entirety made a clear distinction between an optically active element and a security thread; particular reference was made in this respect to paragraphs [0019] and [0033] in the patent specification. Applying the principle according to which a patent constituted its own dictionary, it would thus be excluded, in the appellants's view, that the term "optically active element" in claim 1 could also be equated with a security thread as put forward by the respondents.

4.3 The Board cannot concur with the view defended by the appellants. Firstly, the Board notes that the appellants did not provide any evidence supporting the allegation that the concept of an optically active element would have a recognised meaning in the field of security papers. Secondly, while it is acknowledged that the description indeed makes a distinction between an optically active element and, for example, a security thread, nothing in the wording of the claim seems to reflect this distinction. Moreover, since the provisions of Article 69 EPC only apply to the definition of the extent of protection, i.e. essentially before national courts in the post-grant phase, a distinction between various terms made in the description of a patent has no impact on the interpretation of the claim if such a distinction is

not clear from the wording of the claim alone (cf. decision T 56/04; point 2.12 of the Reasons).

The Board is aware of the jurisprudence which acknowledges that an exception to this principle may exist in situations in which a patent description would provide unambiguous definitions of certain terms and would also make clear that such definitions apply throughout the complete application, so that, when interpreting the wording of claims, the patent specification would constitute its own dictionary. The Board notes, however, that in the present case the patent description does not give any clear statement which could be identified as a definition.

Finally, the Board also sees a contradiction in the argumentation put forward by the appellants in that an optically active element would be constituted of an element providing a visually perceivable effect, but that the security threads foreseen by documents E9 and E10, which do provide such a visually perceivable effect, would not constitute optically active elements within the meaning of claim 1.

For these reasons, the Board concludes that the reference in claims 1 of auxiliary requests III to V to an optically active element contravenes the requirements of Article 84 EPC. In particular, the purpose, underlying Article 84 EPC, of allowing a skilled reader to identify beyond reasonable doubt what falls under the wording of a claim is not achieved.

5. *Auxiliary requests VI to IX and XII - clarity (Article 84 EPC)*

Claims 1 according to auxiliary requests VI to IX and XII also include the feature of an optically active element without further specifying the meaning of this term.

Thus these claims do not comply with the requirements of Article 84 EPC having regard to clarity for the reasons given in the previous section.

6. *Auxiliary requests X and XI*

6.1 Clarity (Article 84 EPC)

Claims 1 according to auxiliary requests X and XI are identical and specify that the optically active element is selected from the group comprising foils, patches, holograms and kinegrams.

In the view of the Board the list of concrete items forming an optically active element would permit the skilled reader to appreciate whether an element would fall under the term "optically active element". In particular, the Board is of the opinion that a security thread would not fall under the definition of a foil or patch, even if such a thread could possibly be obtained from such a foil. The Board does not agree, in this respect, with the analysis developed by respondent II that the reference in paragraph [0019] of the patent specification to "optically active elements of this nature" would refer to the security threads evoked in the previous paragraph [0017] and would thus establish

an ambiguity between both concepts. In fact, as put forward by the appellants, the reference to the "optically active elements of this nature" in paragraph [0019] relates apparently to the directly preceding sentence mentioning as concrete examples foils, patches, holograms and kinegrams.

For these reasons, claims 1 of auxiliary requests X and XI are considered to comply with the requirements of Article 84 EPC.

6.2 Inventive step (Article 56 EPC)

6.2.1 In addition to the feature of the integrated circuit being flexible and comprising a semiconductive organic polymer, the security paper according to claims 1 of auxiliary requests X and XI differs from the security paper disclosed in E9 in that:

- the substrate comprises an optically active element being selected from the group of foils, patches, holograms, and kinegrams,

- the optically active element provides conductive parts, separated by a non-conductive strip, for capacitive readout and current supply of the integrated circuit,

- the conductive parts are protected by a chemically inert, electrically non-conductive layer.

It is disclosed in E9 to take advantage of the metallic security thread in order to enable communication

between the integrated circuit and external reading means (cf. E9, column 4, line 68 - column 5, line 5).

6.2.2 The Board cannot accept the view put forward by the appellants, according to which the various features recited in claim 1 as to the optically active element and the structure and function of its conductive parts would all cooperate so as to provide, in combination, optimal protection against damage and counterfeiting.

Whilst it is acknowledged that the features concerning the provision of the non-conductive strip between the conductive parts of the optically active element and of the chemically inert, electrically non-conductive layer indeed cooperate in order to permit a capacitive readout and current supply of the integrated circuit, the Board, in fact, associates with the features additionally introduced in claim 1 two separate effects: on the one hand, an optimisation of the functionalities offered by the security paper by making use of an optically active element in order to communicate with the integrated circuit and, on the other hand, the capability of establishing a contactless communication between the integrated circuit and the outside world. In this context, the patent specification does not provide any information as to additional effects which would result from the association of said additional features with the provision of an integrated circuit which is flexible and comprises a semiconductive organic polymer.

The Board, therefore, identifies in the distinguishing features recited above under section 6.2.1 three different aspects which have, in the absence of any

apparent functional relationships existing between them, to be analysed separately as to their inventive merits.

6.2.3 Concerning the feature of the flexible integrated circuit, the analysis made above under section 1 in relation with claim 1 of the main request applies *mutatis mutandis* to claims 1 of auxiliary requests X and XI.

6.2.4 Concerning the feature of an optically active element being selected from the group comprising foils, patches, holograms and kinegrams and being connected to an integrated circuit, the Board is not convinced by the view expressed by the appellants that this association could justify an inventive step. In fact, as stressed by respondent II, a comparison of the embodiment disclosed in relation to figure 7 with that of figure 8 in the patent in suit shows that the conductive parts 8 of the optically active element 7 may well be replaced by the metallised portions 4 of a security thread 2 in order to provide the same effect; i.e. to permit the transfer of information and energy to the integrated circuit. This finding shows that the association of the optically active element with the integrated circuit as such does not provide any additional effects to those already obtained by the combination of a security thread with the IC chip.

Particular attention is drawn, in this respect, to document D8 which discloses holograms for use as security and anti-counterfeiting components for security papers such as e.g. currencies (cf. D8, page 1, lines 4-6). Document D8 suggests, more

specifically, to provide the hologram with a conductive pattern (cf. D8, page 6, lines 10-23; page 9, lines 4-10; page 19, lines 3-11), which pattern may also be used for an integrated circuit, structurally associated with the pattern, to communicate with systems external to the integrated circuit (cf. D8, page 19, lines 12-31).

Furthermore it is known from the prior art to provide security papers, e.g. banknotes, with a plurality of security features in order to increase the level of security, as acknowledged in the present patent description in paragraph [0033] (see also E9, column 1, lines 13-17). The integration of optically active elements such as foils, patches, holograms and kinegrams, which constitute as such known security features (cf. D8, page 1, lines 9-13; D9, column 1, lines 35-41) in a security paper as disclosed in E9 would only further increase the security level without providing any unexpected effect.

Moreover, E9 further teaches to take advantage of available security features to allow communication between the chip and the external world, since the idea of integrating the chip into the security thread arises from the finding that such a thread is already available in currencies. It would therefore not require any inventive skills to take advantage of the presence of metallic structures of foils, patches, holograms or kinegrams in the security paper to enable readout and current supply.

Since the association of the flexible integrated circuit with the optically active element recited in

claim 1 does not provide any additional effect to those which are obtained from the known association of a metal thread with the integrated circuit, the Board cannot identify in the claimed alternative juxtaposition of features any inventive merit.

6.2.5 Finally, it is noted that the possibility of a capacitive readout and current supply of the integrated circuit is also foreseen in document E9 (cf. E9, column 2, lines 43-65; claims 2 and 3). No inventive merit can therefore be identified in the selection of this type of communication between the integrated circuit and the outside world. In this context, the claimed provision of the non-conductive strip and the protective layer constitute indispensable measures for a capacitive coupling to be operative.

Consequently, neither the selection of a capacitive coupling nor the structural limitations associated with this selection, which appear to constitute a direct and necessary consequence of this choice, can justify an inventive step of the claimed subject-matter.

6.2.6 For the reasons given above, the subject-matter of claim 1 according to auxiliary requests X and XI does not meet the requirements of Article 56 EPC.

7. In consequence, none of the requests filed by the appellants has been found allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar | The Chairman

R. Schumacher | H. Wolfrum