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Datasheet for the decision of 1 February 2021

Case Number: T 1127/17 - 3.2.07

Application Number: 09741019.5

Publication Number: 2350384

IPC: D21F1/44, D21H21/40

Language of the proceedings: EN

Title of invention:
METHOD FOR PRODUCING A WATERMARK ELEMENT, WATERMARK ELEMENT, AND ALSO APPLICATIONS

Patent Proprietor:
Arjowiggins Security B.V.

Opponent:
Giesecke & Devrient GmbH

Headword:

Relevant legal provisions:
EPC Art. 100(a), 56
RPBA Art. 12(4)

Keyword:
Late-filed document - admitted (yes)
Inventive step - (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

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Case Number: T 1127/17 - 3.2.07

D E C I S I O N
of Technical Board of Appeal 3.2.07
of 1 February 2021

Appellant: (Opponent)	Giesecke & Devrient GmbH Patent und Lizenzen Prinzregentenstrasse 159 81677 München (DE)
Representative:	Zeuner Summerer Stütz Patent- und Rechtsanwälte Partnerschaft Nußbaumstraße 8 80336 München (DE)
Respondent: (Patent Proprietor)	Arjowiggins Security B.V. Hoenderloseweg 84 7339 GJ Ugchelen (NL)
Representative:	EP&C P.O. Box 3241 2280 GE Rijswijk (NL)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 9 March 2017 rejecting the opposition filed against European patent No. 2350384 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	I. Beckedorf
Members:	A. Cano Palmero
	A. Beckman

Summary of Facts and Submissions

I. The opponent (appellant) lodged an appeal in the prescribed form and within the prescribed time limit against the decision of the opposition division rejecting the opposition which had been filed against European patent No. 2 350 384.

II. The opposition was directed against the patent in its entirety on the ground for opposition pursuant to Article 100(a) EPC (inventive step).

III. In the present decision reference is made to the following documents:

E1: WO 2008/071325 A1;
E1': DE 10 2006 058 513.5 (priority document of E1);
E2: US 2001/018113 A1;
E3: WO 2007/028485 A2 and
E7: S. Dhar et al, "A review of laser drilling and its Techniques", Proceedings: International Conference on Advances in Mechanical Engineering-2006 (AME 2006).

IV. In preparation for oral proceedings, scheduled upon the parties' requests, the Board communicated its preliminary assessment of the case to the parties by means of a communication pursuant to Article 15(1) RPBA 2020. The Board indicated that the appeal was likely to be dismissed.

V. Oral proceedings before the Board took place by videoconference on 1 February 2021. At the conclusion of the proceedings the decision was announced. Further

details of the proceedings can be found in the minutes thereof.

VI. The lines of arguments of the parties, which are focused on the inventive step of the subject-matter of claims 1, 6, 7 and 8 as granted, are dealt with in detail in the reasons for the decision.

VII. The final requests of the parties are as follows,

for the appellant:

that the decision under appeal be set aside and that the patent be revoked;

for the respondent (patent proprietor):

that the appeal be dismissed, *i.e.* that the patent be maintained as granted (main request),
or, in the alternative,
when setting aside the decision under appeal, that the patent be maintained in amended form according to one of the set of claims filed as auxiliary requests 1 to 6 with the reply to the statement setting out the grounds of appeal.

VIII. Independent **claim 1** according to the patent as granted reads as follows:

"Method for producing a watermark element (10) for forming a shadow watermark image in a substrate by means of dewatering of a fibrous suspension, wherein the watermark element (10) comprises a body with a relief side (12) having a relief (14) and a dewatering side (16) positioned opposite the relief side, perforations (18) being provided at least in the relief

(14), a perforation (18) comprising a channel (20) with a channel inlet (21) at the relief side (12) and a channel outlet (22) at the dewatering side (16), which method includes the steps of forming perforations in the body and introducing the relief in the intended relief side, the perforations (18) being formed in such a way that the dewatering capacity, expressed as the open surface area of the channel inlet(s) per unit of surface area of the relief, is dependent on the height (h) of the channel inlet (21) with respect to the dewatering side (16), it being the case that the higher the height, the lower the dewatering capacity, **characterized in that** the perforations in the body are formed in a mechanical manner by a mechanical machining process."

IX. Independent **claim 6** according to the patent as granted reads as follows:

"Watermark element (10) for forming a shadow watermark image in a substrate by means of dewatering of a fibrous suspension, wherein the watermark element (10) comprises a, preferably plate-shaped, body with a relief side (12) having a relief (14) and a dewatering side (16) positioned opposite the relief side, perforations (18) being provided at least in the relief (14), a perforation (18) comprising a channel (20) with a channel inlet (21) at the relief side (12) and a channel outlet (22) at the dewatering side (16), the perforations (18) being designed in such a way that the dewatering capacity, expressed as the open surface area of the channel inlet(s) per unit of surface area of the relief, is dependent on the height (h) of the channel inlet (21) with respect to the dewatering side (16), it being the case that the higher the height, the lower the dewatering capacity, wherein the perforations (18)

have a channel (20) which as a whole tapers conically from the channel outlet (22) in the direction of the channel inlet (21)."

X. Independent **claim 7** according to the patent as granted reads as follows:

"Watermark element (10) for forming a shadow watermark image in a substrate by means of dewatering of a fibrous suspension, wherein the watermark element (10) comprises a, preferably plate-shaped,body with a relief side (12) having a relief (14) and a dewatering side (16) positioned opposite the relief side, perforations (18) being provided at least in the relief (14), a perforation (18) comprising a channel (20) with a channel inlet (21) at the relief side (12) and a channel outlet (22) at the dewatering side (16), the perforations (18) being designed in such a way that the dewatering capacity, expressed as the open surface area of the channel inlet(s) per unit of surface area of the relief, is dependent on the height (h) of the channel inlet (21) with respect to the dewatering side (16), it being the case that the higher the height, the lower the dewatering capacity, **characterized in that** the perforations (18) comprise a channel (20) having a cross section (c) which is constant over the length, the cross section in a plane parallel to the dewatering side being dependent on the height (h) of the channel inlet (21) with respect to the dewatering side (16)."

XI. Independent **claim 8** according to the patent as granted reads as follows:

"Watermark element (10) for forming a shadow watermark image in a substrate by means of dewatering of a fibrous suspension, wherein the watermark element (10)

comprises a, preferably plate-shaped, body with a relief side (12) having a relief (14) and a dewatering side (16) positioned opposite the relief side, perforations (18) being provided at least in the relief (14), a perforation (18) comprising a channel (20) with a channel inlet (21) at the relief side (12) and a channel outlet (22) at the dewatering side (16), the perforations (18) being designed in such a way that the dewatering capacity, expressed as the open surface area of the channel inlet(s) per unit of surface area of the relief, is dependent on the height (h) of the channel inlet (21) with respect to the dewatering side (16), it being the case that the higher the height, the lower the dewatering capacity, **characterized in that** the perforations (18) comprise a channel (20') having a cross section which is constant over the length, and the perforation density is dependent on the height (h) in the relief with respect to the dewatering side (16)."

XII. As the auxiliary requests do not form part of this decision, it is not necessary to reproduce them here.

Reasons for the Decision

1. *Transitional provisions - Revised Rules of Procedure of the Boards of Appeal (RPBA 2020)*

The appeal proceedings are governed by the revised version of the Rules of Procedure which came into effect on 1 January 2020 (Articles 24 and 25(1) RPBA 2020), except for Article 12(4) to (6) RPBA 2020 instead of which Article 12(4) RPBA 2007 remain applicable (Article 25(2) RPBA 2020).

2. *Admittance of document E1' - Article 12(4) RPBA 2007*

2.1 Document E1' was submitted by the appellant for the first time in appeal proceedings with the statement setting out the grounds of appeal.

2.2 The respondent requests not to admit document E1' in the appeal proceedings, since this document had been filed by the appellant allegedly in support of a fresh novelty objection, which had been withdrawn during the course of the proceedings.

2.3 The Board is not convinced by this argument. Quite apart from the fact that E1' has also been used by the appellant in their attacks on inventive step of the claims as granted, it is undisputed that E1' corresponds to the priority document of E1 (which had been admissibly filed in the opposition proceedings) and that the content and disclosure of both documents are equivalent. The factual framework of the case is thus not extended by the introduction of E1'. In view of this, the Board sees no reason not to admit document E1' in the sense of Article 12(4) RPBA 2007.

3. *Claim 1 of the patent as granted - Inventive step - Articles 100(a) and 56 EPC*

3.1 The appellant argues that the subject-matter of claim 1 of the patent as granted lacks an inventive step in view of the disclosure of E1/E1' in combination with the common general knowledge, depicted *inter alia* by E7, or in combination with the teaching of E2.

3.2 It is uncontested that E1/E1' represents the closest prior art and that the subject-matter of claim 1 of the patent as granted differs from the known method of E1/

E1' in that the perforations in the body are formed in a **mechanical machining process.**

3.3 The appellant disagrees with the objective technical problem formulated by the opposition division and by the respondent, namely to provide a method for improving the accuracy of the channel inlet dimension of the perforation in relation to the channel height. According to the appellant, it is apparent for the skilled person, specially in view of document E7, that laser drilling methods are, on the contrary, more precise an can be further applied to a larger range of materials (see table 1 of E7). Mechanical hole drilling is presented as an outdated technology and laser hole drilling outperforms the other perforating technologies because the process is non-contact and flexible (see page 5, right column "Future of Laser Drilling").

3.3.1 Since laser drilling already delivers more preciseness than mechanical drilling, the objective technical problem cannot be construed as providing a method with more accuracy. Therefore, the appellant is of the view that the objective technical problem must be rather seen as providing an alternative drilling technique.

3.3.2 According to the appellant, in E1/E1' the use of a laser in the drilling process is not presented as compulsory but rather as one of the possibilities for carrying out the perforations in the watermark element. The skilled person, through the teaching of E7 or E2, paragraph [0070], is aware of other well-known alternative drilling methods such as chemical etching, water-jet cutting or mechanical drilling. In particular, it is also well-known that drilling methods such as mechanical drilling have a lower economic impact and involve a less complicated technology when

compares to laser drilling. The skilled person, confronted with the problem of seeking an alternative drilling method which does not require an expensive and complicated technology, would replace the laser drilling of the known method of E1/E1' by a mechanical machining drilling, thereby arriving at the subject-matter of claim 1 without exercising an inventive skill.

3.4 The Board cannot share the appellant's view for the following reasons.

3.4.1 The Board, substantially following the findings in points II.2.3.2 and II.2.3.3 of the decision under appeal, is not persuaded by the objective technical problem formulated by the appellant. Indeed, E1/E1' is directed to the manufacturing of watermark elements with tapered perforations as depicted in Figure 3b. In order to achieve these tapered perforations the drilling is performed by a laser beam, which involves physical processes that deliver this preferred result, see E1, page 12, line 24, to page 13, line 25. Although it is acknowledged that laser drilling is presented as a preferred way for carrying out the process, no other drilling method that could deliver such desired tapered perforations is apparent from E1/E1'. Therefore, the motivation for seeking an alternative process is not evident apparent.

3.4.2 Apart from this, while it can be acknowledged that the skilled person, starting from E1/E1' might be aware of other drilling techniques from his common general knowledge or from E2 or E7, there is no hint or indication, even when looking for alternative processes, that could possibly motivate the skilled person to abandon the laser drilling technique, perform

extensive modifications to the known process of E1/E1' and replace it with an (according to the appellant in view of E7) outdated technology such as mechanical drilling, which moreover is less accurate and applicable to certain materials only in order to solve the problem posed by the appellant.

3.4.3 In contrast, the Board notes that laser drilling techniques such as in E1/E1', inevitably involve geometric defects in the perforation wall (see Figure 2 of E7 and paragraph [0010] of the patent in suit). As correctly argued by the respondent, the mechanical machining process according to claim 1 as granted enables a drilling of perforations in which the accuracy of the channel inlet dimension of the perforation in relation to the channel height is improved. This solves the objective technical problem of providing highly detailed (*i.e.* high resolution) watermark elements and a method for producing such watermark elements (see paragraph [0011] of the patent in suit).

3.4.4 E1/E1' is silent on this problem and as already discussed above, the skilled person would be rather tought away from replacing the laser drilling with a mechanical drilling.

3.5 Therefore, the Board concludes that the skilled person, starting from E1/E1' would only arrive at the subject-matter of claim 1 of the patent in suit when exercising an inventive skill.

4. *Claim 6 of the patent as granted - Inventive step - Articles 100(a) and 56 EPC*

4.1 The appellant is of the view, that Figure 3b of E1 and specially Figure 3b of E1' shows the disputed last feature of claim 6 as granted that the perforations have a channel which as a whole tapers **conically** from the channel outlet in the direction of the channel inlet. According to the appellant's view, the patent in suit acknowledges in paragraph [0010] that the shape of the perforations obtained by laser drilling, also referring explicitly to E1 and E1' are "more or less conical" and "the longer the channel the more this conical shape decreases". Therefore, in view of the description, the exact geometric definition of conical given by the opposition division should not be used when interpreting the subject-matter of claim 6. Since the tapered perforations illustrated in Figure 3b of E1' show rectilinear and curved lateral surfaces and are obtained by laser drilling, they fall within the interpretation of "as a whole tapers conically" in the sense of claim 6. It follows that E1/E1' indicates all features of claim 6 as granted and its subject-matter lacks an inventive step in the sense of Article 56 EPC.

4.2 The Board is not convinced by the argumentation of the appellant and is of the view that the feature that the perforations have a channel which as a whole tapers **conically** from the channel outlet in the direction of the channel inlet cannot be directly and unambiguously derived from E1 or E1'.

4.3 The Board notes in the first place that the term "conically" is an unambiguous geometric definition that is clear in itself. According to the established case law, clear terms shall be interpreted without any

reference to the content of the description. Furthermore, an alleged discrepancy between the claims and the description is not a valid reason to ignore the clear linguistic structure of a claim and to interpret it differently than from its clear meaning (see Case Law of the Boards of Appeal, 9th edition 2019, II.A. 6.3.1, third paragraph).

4.4 In this sense, the decision under appeal correctly sets out in point II.1, page 5, that *(emphasis added by the Board)* "A cone is considered to be a **three dimensional geometric shape** that tapers [...] from a flat base [...] to a point called the apex (*or vertex*) and is formed by a set of (*generating*) lines connecting the apex (*or vertex*) to all of the points on the base. Consequently, the cross-section of a cone cannot be non-linear as alleged by the opponent." As acknowledged by the appellant, Figure 3b of E1' (and of E1) shows perforations with at least partly curved lateral surfaces, so that they cannot be part of a three dimensional shape in form of a cone.

4.5 Therefore, the Board concludes that the subject-matter of claim 6 of the contested patent differs from the watermark element of E1/E1' at least in that perforations have a channel which as a whole tapers **conically** from the channel outlet in the direction of the channel inlet.

4.6 The conical form of the perforations delivers a direct lineal dependency between the height of the perforations and the dewatering capacity; in this way the dewatering capacity can be more easily designed and influenced in a targeted manner, which results in highly detailed watermarking process.

4.7 The objective problem to be solved therefore can be seen as to provide highly detailed (*i.e.* high resolution) watermark elements and a method for producing such watermark elements.

4.8 The appellant argues (see point 4.2 of the statement setting out the grounds of appeal) that E1/E1' shows perforations in which a general tapering in the longitudinal direction is present, not necessarily a non-linear one. The skilled person when providing perforations with a laser punching method such as in E1/E1' would automatically produce them in a conical form, unless special measures for producing more complex perforations were required. Therefore, a watermark element with conical perforations is obvious for the skilled person in view of E1/E1'.

4.9 The Board disagrees. As already discussed, E1/E1' does not directly and unambiguously disclose, especially not in Figure 3b, tapering perforations with a conical shape but rather with a curvilinear cross-section. This is also confirmed by Figure 2 of document E7, which details that the walls of laser drilled holes, while being tapered, also present defects such as barrelling and recast layers that deviate them from a conical shape. It follows that the laser technique employed in E1/E1' is not in place to deliver perforations which taper conically.

4.10 Additionally, document E1/E1' gives no hint to improve the overall shape of the perforation channel or the relationship between its inlet dimension and the height of the perforation in order to solve the problem posed. Therefore, the skilled person, departing from E1/E1', would have no motivation to change the shape of the perforations, which would imply, as discussed above, a

dedicated, non-obvious, switch of the drilling process. Starting from E1/E1', the skilled person would thus only arrive at the subject-matter of claim 6 as granted as a result of an *ex post facto* analysis.

5. *Claims 7 and 8 of the patent as granted - Inventive step - Articles 100(a) and 56 EPC*

5.1 It is uncontested that E1/E1' represents the closest prior art and that the subject-matters of claim 7 and 8 as granted differs from the known watermark element in that:
the perforations comprise a channel having a constant cross section over the length in a plane parallel to the dewatering side being dependent on the height of the channel inlet with respect to the dewatering side (claim 7)
and in that
the perforations comprise a channel having a constant cross section over the length, and that the perforation density is dependent on the height in the relief with respect to the dewatering side (claim 8).

5.2 The appellant argues that the provision of perforations with a constant section with conventional means is an obvious measure and also known from for example document E3. Furthermore, in view of page 5, lines 14-22, and page 13, lines 21-25, of E1 the skilled person is aware of providing perforations with smaller diameters at the sections of the watermark element with greater thickness or providing a different perforation density.

5.3 The Board disagrees. The perforations in E1/E1' are tapered as a result of the drilling method with a laser beam and it is the objective of this disclosure to

achieve such tapering perforations. The existence of a smaller diameter by greater thickness is a direct geometrical consequence of this tapering. The skilled person, starting from E1/E1', is aware of the advantages provided by the tapered perforations (see page 13, lines 15-25) and would have therefore no motivation to switch from these advantageous tapered perforations to cylindrical ones, let alone with a dependency between cross section and height of the channel as in claim 7 or with a dependency between perforation density and height of the channel as in claim 8. Therefore, the skilled person, starting from E1/E1' would only introduce the perforations with constant cross section from his general knowledge or from E3 as the result of an *ex post facto* analysis and therefore arriving at the subject-matter of claims 7 and 8 when exercising an inventive skill.

5.4 The points 5.1 to 5.3 above correspond to the preliminary opinion of the Board, which has been neither commented nor contested by the appellant in writing or at the oral proceedings. Under these circumstances, the Board - having once again taken into consideration all the relevant aspects put forward in the parties' written submissions - sees no reason to deviate from its above-mentioned preliminary opinion and confirms it.

6. In **conclusion**, the Board finds that the arguments relied upon by the appellant to demonstrate the incorrectness of the decision under appeal with respect to inventive step of the subject-matter of granted claims 1, 6, 7 and 8 are not convincing and the appeal therefore has to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

G. Nachtigall I. Beckedorf

Decision electronically authenticated