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**Datasheet for the decision
of 4 May 2020**

Case Number: T 0372/15 - 3.4.03

Application Number: 02251567.0

Publication Number: 1239329

IPC: G03F7/095, B41C1/10, G03F7/34,
G03F7/36, G03F7/09, G03F7/11,
G03F1/00

Language of the proceedings: EN

Title of invention:
A process for making a flexographic printing plate and a
photosensitive element for use in the process

Patent Proprietor:
E. I. du Pont de Nemours and Company

Opponent:
Jenkins, Peter David (opposition withdrawn)

Headword:

Relevant legal provisions:
EPC Art. 56, 100(a), 100(b), 100(c)

Keyword:

Inventive step - (yes) - reasonable expectation of success (no)
- technical prejudice in the art (yes)

Decisions cited:

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 0372/15 - 3.4.03

D E C I S I O N
of Technical Board of Appeal 3.4.03
of 4 May 2020

Appellant: E. I. du Pont de Nemours and Company
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 12 December
2014 revoking European patent No. 1239329
pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman G. Eliasson
Members: A. Böhm-Pélissier
C. Heath

Summary of Facts and Submissions

- I. The appeal is against the decision of the Opposition Division revoking European patent No. 1 239 329 on the grounds that the Main Request, the Second and Third Auxiliary Request did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Articles 100(b) EPC) and that the First Auxiliary Request lacked inventive step (Articles 100(a), 52(1) and 56 EPC). The Fourth Auxiliary Request was not admitted to the proceedings as prima facie the requirements of Article 123(2) EPC were not met.
- II. The opposition was based on Article 100 (a) and (b) EPC. In reply to the appeal, the Respondent - Opponent (hereafter "Opponent") also raised objections that the Main Request before it contained subject-matter going beyond the content of the originally filed application (Articles 100 (c) and 123(2) EPC).
- III. The Appellant - Patent Proprietor (hereafter "Appellant") requests that the decision under appeal be set aside and that the patent be maintained based on the following version:
- description, pages 1-30, filed with letter dated 10 February 2020;
claims 1-33 of the Main Request as filed with the statement of grounds;
No Drawings.

or alternatively on the basis of the First to Eighth Auxiliary Requests, all filed with the statement of grounds of appeal.

IV. In its reply to the appeal, the Opponent requested that the appeal be dismissed or be held inadmissible and that none of the Requests and newly filed documents D18-D22 be admitted into the appeal proceedings.

V. With a subsequent letter dated 17 July 2017, the Opponent withdrew the opposition and is, hence, no longer party to the appeal proceedings.

VI. Reference is made to the following documents cited in the decision under appeal:

D2 = WO 98/13730

D5 = EP 0 741 330

D7 = US 5 925 500

D12 = EP 0 665 471

D13 = CONVERTING MAGAZINE, 1 January 2000
(2000-01-01), page 14

D14 = DU PONT CYREL FAST UPDATE, vol. 1, no. 1, 1 June 1999 (1999-06-01)

D15 = PACKAGING PRINTING MAGAZINE, 1 March 2000
(2000-03-01), pages 39-45

VII. Documents D18-D22 were introduced by the Appellant with the statement of grounds.

VIII. **Claim 1** of the Main Request reads (Board's labelling):

(A) A process for making a flexographic printing plate comprising:

(B) 1) providing a photosensitive element comprising:
at least one photopolymerizable layer on a support

comprising an elastomeric binder, at least one monomer and a photoinitiator, and

(C) at least one thermally removable layer disposed above the photopolymerizable layer, the thermally removable layer being an actinic radiation opaque layer comprising

(i) at least one infrared absorbing material,

(ii) a radiation opaque material,

wherein (i) and (ii) can be the same or different,

(D) and at least one binder having a softening or melting temperature less than 190°C;

(E) wherein the infrared absorbing material and radiation opaque material are selected from carbon black, graphite, metal, and metal alloys functioning as both the infrared absorbing material and the radiation opaque material;

(F) 2) image-wise exposing the photopolymerizable layer to actinic radiation forming polymerized portions and unpolymerized portions; and

(G) 3) thermally treating the element of step 2) by heating to a temperature sufficient to remove the thermally removable layer and to remove the unpolymerized portions of the photopolymerizable layer and form a relief.

IX. The following reasons of the opposition division in the appealed decision are of relevance for the present decision:

(a) The claimed step of removing the unpolymerized portions of the photopolymerizable layer (step G) comprised embodiments without an absorbent, whereas in the patent as a whole all enabling embodiments comprised an absorbent. In order to construe an enabling embodiment of the invention without using an absorbent, the skilled person would have to

experiment. Hence the main request contravenes Article 83 EPC.

- (b) Starting from document D5, a skilled person faced with the problem of shortening the processing time would get the idea to try a thermal treatment including an absorbent from D2 or D14 and would try this on the process of D5 without exercising any inventive activity, as there was a reasonable expectation to success. It was in particular noted that in many examples in D5 the infrared sensitive cover layer was inherently meltable.

X. The arguments of the Appellant - Proprietor can be summarized as follows:

- (a) Regarding Articles 83 and 100(b)EPC - Sufficiency of disclosure:

- (i) The Appellant argued that the skilled person is readily able to carry out different ways of the final step in claim 1 of the Main Request (Feature (G)) based on the teaching of the patent in suit and the common general knowledge.
- (ii) Column 2, line 7 of D7 mentioned that an "air knife" could be used to remove the liquefied material in a thermal process. Air knives were not uncommon in the art and are widely used in a variety of manufacturing processes. The Opponent had not demonstrated that it would represent an undue burden for the skilled person to modify the methodologies described and exemplified in the opposed patent to use an

air knife in place of an absorbent material using the common general knowledge.

- (iii) Furthermore, other methodologies such as mechanical brushing were known in the flexographic art, for instance as disclosed on page 10, lines 23-25 of D5. Page 16, lines 30-32 of the opposed patent also mentioned that the plate of Control 1 was developed using a brush.

(b) Regarding Articles 56 and 100 (a) EPC - inventive step in favour of Feature (G):

- (i) The skilled person could not have a prima facie expectation that thermally developing any of the photopolymerisable layers disclosed in D5 would yield a usable flexographic printing element.
- (ii) Even if the skilled person was minded to modify the photopolymerisable layer of D5 to use a known thermally developable layer, that would potentially undermine the incompatibility requirement of the infrared ablatable layer, which would require the skilled person to conduct yet further experiments to ensure this remained in place and the advantages of D5 were retained. This type of open ended research project pointed away from thermally developing the D5 elements as being an obvious step with a predictable and expected outcome.

- (iii) The essential feature of the digital layer in the plate of D5 was that it was substantially incompatible with the underlying photopolymerisable layer (see page 7, lines 30-34 and claim 1 of D5). Other binders beyond Macromelt 6900 were also disclosed, but nothing in D5 pointed the skilled person to choose Example 1 over Examples 8 or 9 of D5. D5 did not actually indicate that Macromelt 6900 was inherently meltable or has a melt viscosity suitable for thermal development, and neither did D7 which was the only other document that disclosed this polymer in a digital layer.

- (iv) The thermally removable layer in claim 1 implicitly required a significant amount of a non-meltable particulate material, e.g carbon black, graphite, metal or metal alloy.

Reasons for the Decision

1. Admissibility of the appeal and the requests

1.1 Admissibility of the Appeal

The Appeal is admissible.

1.2 Claims

- 1.2.1 In its reply to the appeal, the former Opponent objected against admitting the Appellants requests for being late filed and for introducing lack of clarity.

1.2.2 Since the Main Request corresponds to the Second Auxiliary Request of the opposition proceedings (optional features b) and c) have been removed, syntactical reformulation of a feature) the board cannot identify the present Main Request as a substantial amendment that would introduce any new issues. For the reasons given below, it is not necessary to decide on the auxiliary requests.

1.2.3 As to the clarity objections see section 4. below.

1.2.4 Consequently, the Main Request is admitted into the procedure.

1.3 Documents D18-D22

In its reply to the appeal, the former Opponent objected to admitting documents D18-D22 for being late filed. The Board is of the opinion that the subject matter of claim 1 of the Main Request involves an inventive step over the cited prior art (see section section 6.5 below). It is therefore not necessary to decide on the admissibility of documents D18-D22.

2. The Claimed Invention

2.1 The claimed invention relates to a process for making a flexographic printing plate where a relief is formed on the plate by thermally treating the plate for removing the unpolymerized portions of the photopolymerizable

layer instead of using the commonly used wet etching process.

2.2 The thermally removable layer comprises a material such as carbon black, graphite, metal or metal alloy acting as both the infrared absorbing material and radiation opaque material to provide an actinic radiation opaque layer. These materials are all non-meltable and prima facie would not melt and flow during a thermal development step.

2.3 It was found by the inventors that nevertheless thermal development with these materials is possible resulting in a less time consuming process for the preparation of an improved flexographic printing element.

3. Article 123(2) EPC - added subject-matter

3.1 The Board does not see an infringement of Article 123(2) EPC for the Main Request. The newly added Feature (E) has a basis in the application as filed on page 15, lines 35-37.

3.2 With the submission dated 10 February 2020, the description was adapted to the new claims and the relevant prior art was discussed therein.

4. Article 84 EPC - clarity

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4.1 The former Opponent has argued that it was inconsistent and not possible for the at least one infrared absorbing material and the radiation opaque material to

be different if one of carbon black, graphite, metal, and metal alloys (or, as the skilled person would understand, the combination thereof) acted as both the infrared absorbing material and the radiation opaque material. The skilled person would not be able to ascertain from the claims whether or not the at least one infrared absorbing material and the radiation opaque material could be different from the claims.

4.2 The Board however is of the opinion that there is no ambiguity and it is a well-known feature in the art that dark inorganic pigments function as both infrared absorbing material and radiation-opaque material. Support and examples therefore are provided in D5 (last paragraph of page 5 and page 6) and in the description (paragraph [0042]).

4.3 The board considers therefore that claim 1 of the Main Request meets the requirement of Article 84 EPC, because the claims define the matter for which protection is sought in a clear and concise manner and are supported by the description.

4.4

5. **Article 83 EPC - sufficient disclosure of the invention**

The Board agrees with the Appellant that the skilled person can reproduce the invention across a range of embodiments without undue burden, in particular that step (P) could be carried out without the use of an absorbent (see X(a) above). The burden of proof would have been upon the former Opponent to establish on the balance of probabilities that a skilled reader of the patent, using his common general knowledge, would be

unable to carry out the invention. However, the Opponent had not provided such evidence.

6. Article 56 EPC - inventive step

6.1 Closest prior art

6.1.1 In its decision regarding lack of inventive step of the Second Auxiliary request, the Opposition Division considered document D5 as the closest prior art and concluded that the obvious combination of D5 with D12 rendered the subject matter of claim 1 of the Second Auxiliary Request then on file (corresponding to the current Main request) obvious.

6.1.2 D5 deals with the production of flexographic printing plates using digital imaging (see D5, page 3 line 44). D5 is from the same inventor and the same company as the patent in suit. D5 has the most features in common with claim 1 of the main request. Both the Appellant and the Respondent have not offered an alternative prior art.

6.1.3 The board agrees with the Opposition Division that D5 represents the closest prior art to the subject matter of claim 1.

6.2 Difference

6.2.1 D5 discloses a process for making a flexographic printing plate comprising Features (A)-(M) and (F) of claim 1 (see for instance claim 11 of D5, Example 1 on page 11, lines 1-44). Newly added Feature (E) is disclosed on page 5, line 40ff. The patent in suit

deals with a very similar flexographic printing plate, only fabricated using a different process.

- 6.2.2 Therefore, the subject matter of claim 1 only differs from the process disclosed in D5 in that a thermal treatment step according to feature (G) is defined in the independent claim, whereas in D5 the last treating step in order to remove the removable layer and the unpolymerised portions of the photo polymerisable layer to form a relief is performed using at least one solvent. There was no disagreement between Appellant and former Opponent about the disclosure of D5 and the difference to claim 1 of the present Main Request.

6.3 Effect

- 6.3.1 The effect of the differing Feature (G) is a less time consuming process for the preparation of a flexographic printing element. Good stability is also noted in paragraph [0081] of the opposed patent. The actual disclosure of paragraph [0081] of the opposed patent is "*[0081] The photosensitive printing elements of the present invention can be uniformly post-exposed to ensure that the photopolymerization process is complete and that the element will remain stable during printing and storage. This post-exposure step can utilize the same radiation source as the main overall exposure*" [emphasis added by the board].

- 6.3.2 The Board agrees with the opinion of the former Opponent that from this paragraph it can only be derived that the printing plate (element) remains stable during printing and storage. An improvement in wear, i.e. that the photopolymerization process produces better relief plates than any other process,

e.g. the process disclosed in D5, is not derivable from this passage.

6.4 Problem

The Board agrees with the Opposition Division that the objective problem to be solved can only be formulated as how to reduce the process time.

6.5 Obviousness

6.5.1 The former opponent noted that at the time of filing of the patent in suit there already existed a motivation to reduce process time in the processing of flexographic printing plates (see D13, page 14, last lines; D14, page 1, second and third column, and page 3, last paragraph; D15, last page). Especially D14 mentioned the gain in process time by developing a flexographic plate using a dry thermal process instead of using solvents, and disclosed the removal of non-exposed portions of the relief layer by heating and contact with an absorbent.

6.5.2 D14 also linked this method to digitally imaged plates. Thus, each of these documents mentioned the strive and benefits of thermal dry processing in flexo printing plate production. The Board notes that these documents however do not provide any further details about the processes.

6.5.3 The former Opponent further argued that regardless of documents D13-D15, D2 disclosed the fabrication of a multilayer flexographic printing plate using a thermal treatment. On page 2 of this document it was discussed that solvent wash developing was time consuming and a thermal development using an absorbent material was

much faster. On pages 13 and 16 an additional layer above the photosensitive layer was also removed by the thermal treatment and the materials were compliant with the materials disclosed in D5.

- 6.5.4 The Board notes that D2 however does not mention digitally imaged plates as disclosed in D5, which is the starting point for solving the problem mentioned above.
- 6.5.5 The Board notes that D5 as a whole and in particular the examples 1-8 are dedicated to a process where
- (a) only solvents are used to remove the photosensitive layer and
 - (b) the plates are digitally imaged.

Although in D5 the photopolymerisable layer is indicated as containing an elastomeric binder and the photoinitiator and monomer are in line with some other thermal flexographic art, D5 as a whole makes no reference to the melt flow properties of these materials, nor is there any indication that once photohardened, they are resistant to heat. For instance, page 10, lines 1-2 indicates that the solvent development following exposure is typically carried out at room temperature.

- 6.5.6 Flexographic printing itself is generally an ambient temperature process, so there is no actual requirement of flexographic printing plates to be able to tolerate the temperatures which occur during thermal development.
- 6.5.7 The Board notes that D5 itself explicitly cautions that high temperatures (above 60°C) should be avoided,

because they can lead to shrinkage and give rise to registration problems (see page 10, lines 28-29).

- 6.5.8 The thermally removable layer in claim 1 requires a significant amount of a non-meltable particulate material, e.g carbon black, graphite, metal or metal alloy. The Opposition Division held that similar layers such as the Examples disclosed in D5 were mainly made out of a material which inherently was meltable.
- 6.5.9 The Board however is of the opinion that it is prima facie counter-intuitive to the skilled person to apply thermal heating to these layers: Adding significant amounts of non meltable particulate material (such as carbon black) to a meltable polymer would prima facie negatively affect its capability of being thermally developed. Paragraph [0092] of the opposed patent mentions that the thermal developability of these layers is surprising, and there is nothing in any of the prior art documents that would call this claim into question.
- 6.5.10 The Board notes that the examples in D5 are exclusively dedicated to the use of solvents for removing the photoresistive layer. The Board is therefore of the opinion that starting from D5 and absent hindsight knowledge of the present invention, the skilled person would first chose any of examples 1-9 as the most suitable starting point for solving the aforementioned problem.
- 6.5.11 From the common general knowledge, the skilled person cannot expect that Example 1 is thermally developable, because the properties of the photopolymerisable layer when exposed to heat are unknown, the melt flow properties of Macromelt 6900 are unknown and the effect

that 33 wt% of carbon black, an inherently non-meltable material, on those melt flow properties is also unknown. In addition and as discussed above, D5 explicitly cautions that high temperatures (above 60°C) should be avoided, because they can lead to shrinkage and give rise to registration problems.

6.5.12 Therefore, the Board is of the opinion that even after having read any of D13-D15, especially D14, the skilled person would not have considered thermal treatment using an absorbent instead of solvents.

6.5.13 Therefore, although the skilled person *could* have tried thermally developing the element of Example 1 of D5, there is no incentive in that the skilled person *would* actually do this. Examples 8 or 9 of D5 may also be seen as a more promising starting point. In view of the above factors, in the event the skilled person even ended up contemplating thermally developing any of the plates disclosed in D5, there is no meaningful reasonable expectation of success.

6.5.14 Consequently, contrary to the finding of the opposition division, the Board is of the opinion that, since the layers in D5 are optimised for solvent removal, the skilled person would assume that they could not be removed thermally. There is no pointer to this in D5.

6.5.15 The disclosure of D5 even explicitly points away from this, because high temperatures above 60°C should be avoided. The Board is therefore of the opinion that in order to solve the problem mentioned above the skilled person would with a reasonable expectation to success try other means such as modifying the composition of the layers or solvents, or applying physical means for accelerating the removal of the photosensitive layer

such as ultrasonic vibrations, air knives etc. The latter is suggested on page 10, lines 23-25 of D5.

6.5.16 The skilled person would therefore try to achieve the aforementioned objectives by improving and optimizing these measures instead of applying thermal treatment.

6.6 Consequently, the Board considers the subject-matter of claim 1 inventive and compliant with Articles 56, 52(1) and 100(a) EPC. There are no other independent claims. All other claims depend upon claim 1. Consequently, the subject-matter of claims 1-33 is inventive.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to maintain the patent in the following version:

description, pages 1-30, filed with letter dated 10 February 2020;
claims 1-33 of the Main Request as filed with the statement of grounds;
No Drawings.

The Registrar:

The Chairman:



S. Sánchez Chiquero

G. Eliasson

Decision electronically authenticated