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**Datasheet for the decision
of 26 March 2019**

Case Number: T 0624/14 - 3.4.02

Application Number: 09014247.2

Publication Number: 2157457

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E01F9/00, B44F1/02, B44F1/04,
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Language of the proceedings: EN

Title of invention:
Retroreflective sheet having printed layer

Patent Proprietor:
Nippon Carbide Kogyo Kabushiki Kaisha

Opponent:
3M Deutschland GmbH

Headword:

Relevant legal provisions:
EPC Art. 76(1), 54(1), 56, 104(1)
RPBA Art. 13(1), 16

Keyword:

Amendments - intermediate generalisation (no)

Novelty - main request (yes)

Late-filed document - admitted (yes)

Remittal to the department of first instance - (yes)

Apportionment of costs - (no)

Decisions cited:

G 0001/15, T 1058/15

Catchword:



Beschwerdekammern
Boards of Appeal
Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 0624/14 - 3.4.02

D E C I S I O N
of Technical Board of Appeal 3.4.02
of 26 March 2019

Appellant:

(Opponent)

3M Deutschland GmbH
Carl-Schurz-Strasse 1
41453 Neuss (DE)

Representative:

Vossius & Partner
Patentanwälte Rechtsanwälte mbB
Siebertstrasse 3
81675 München (DE)

Respondent:

(Patent Proprietor)

Nippon Carbide Kogyo Kabushiki Kaisha
11-19, Konan 2-chome
Minato-ku
Tokyo 108-8466 (JP)

Representative:

Hoffmann Eitle
Patent- und Rechtsanwälte PartmbB
Arabellastraße 30
81925 München (DE)

Decision under appeal:

**Interlocutory decision of the Opposition
Division of the European Patent Office posted on
5 February 2014 concerning maintenance of the
European Patent No. 2157457 in amended form.**

Composition of the Board:

Chairman R. Bekkering
Members: C. Kallinger
G. Decker

Summary of Facts and Submissions

- I. The appellant (opponent) lodged an appeal against the interlocutory decision of the opposition division finding that, on the basis of the first auxiliary request filed during the oral proceedings on 11 December 2013, the patent as amended met the requirements of the EPC. The appellant requested in the statement of grounds of appeal that the interlocutory decision be set aside and the patent be revoked in its entirety.
- II. The respondent (patent proprietor) requested in its reply to the appellant's statement of grounds of appeal that the appeal be dismissed.
- III. The following documents were listed in the opposition division's decision and were also referred to by the appellant and/or respondent:

Patent literature

D1: WO 98/47129 A1
D3: WO 99/37470 A1
D20: EP 1081511 (EP family member of D20')
D20': WO 99/54760, published 28 October 1999
D28: WO 2001/077721 A1
D28': English translation of WO 2001/077721 A1

Prior use: Newfoundland license plate

D4: Declaration by Mr David D. Johnson

Prior use: German license plate

- D5: Photograph of German vehicle license plate
- D6: Photograph of vehicle inspection sticker
- D7: Registration cost invoice
- D8: Declaration by Mr David D. Johnson

Prior use: Indiana license plate

- D9: Photograph of Indiana vehicle license plate
- D10: Photograph of validation sticker on Indiana vehicle license plate
- D11: Excerpt from the homepage
<http://www.in.aov/bmv/2411.htm>
- D12: Declaration by Mr Christopher M. Favo
- D13: Declaration by Mr David D. Johnson

Revocation action Ni 46/11 of EP1193511 (parent application of the opposed patent) before the German Federal Patent Court (BPatG)

- D21: Minutes of the hearing, dated 27 September 2012
- D22: Set of claims related to the revocation action, indicated as Auxiliary request 10
- D23: Set of claims related to the revocation action, indicated as Auxiliary request 11
- D24: Communication from the BPatG, dated 13 August 2012
- D32: Decision of the BPatG, dated 27 September 2012

NPL documents documenting common general knowledge

- D25: A. Leutert, "Allgemeine Fachkunde der Drucktechnik", Baden-Verlag, Baden, 1993, pages 417-420 and 440-443
- D26: D. Blatner and S. Roth, "Real World Scanning and Halftones", Pechpit Press, Berkeley, 1993, pages 3-50
- D30: H. Kipphan, "Handbuch der Printmedien", Heidelberg, Springer, page 95
- D33: "The Screen Printing Handbook", 3rd edition, Japan Association of Screen Printing, 1978, pages 16-23 including pages translated into English

Cited but not admitted in opposition proceedings

- D31: Experimental results on weatherability

IV. In reply to a communication from the board pursuant to Article 15(1) RPBA, the appellant filed the following documents with a letter dated 21 February 2019:

- D34: Decision dated 27 September 2018 of the BPatG in revocation action Ni 41/16 concerning EP1746444 (another divisional application of the parent application of the opposed patent)
- D35: DIN 6171, Teil 1, "Aufsichtsfarben für Verkehrszeichen", pages 1-8, March 1989
- D36: DE 2118822

V. In reply to the communication from the board pursuant to Article 15(1) RPBA, the respondent filed the following document with a letter dated 26 February 2019:

D30a: H. Kipphan, "Handbuch der Printmedien",
Heidelberg, Springer, pages 95-99

VI. Oral proceedings were held on 26 March 2019.

VII. The parties' final requests were as follows:

The appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked. It did not object to a remittal of the case to the department of first instance. It further requested that the respondent's request for apportionment of costs be refused.

The respondent (patent proprietor) requested as a main request that the appeal be dismissed. As an auxiliary measure, it requested that the decision under appeal be set aside, that the case be remitted to the department of first instance for further prosecution, and that the costs it had incurred by the respondent for the oral proceedings before the board be paid by the appellant. As a further auxiliary measure, the respondent requested that the decision under appeal be set aside and that the patent be maintained as amended on the basis of the claims according to auxiliary requests 1 to 7 filed with the letter dated 30 October 2014.

VIII. Claims

Independent claims 1 and 2 according to the patent as maintained in amended form correspond to claims 1 and 2 of the main request as annexed to the reply to the grounds of appeal dated 30 October 2014 and read as follows.

"1. Retroreflective sheeting having a printed layer (2) the sheeting comprising at least a reflective element layer (5) made up of a large number of reflective elements (4) and a holding body layer (3) and a surface protective layer (1) provided on said reflective element layer (5), said printed layer (2) being provided on the lateral faces of said reflective elements (4) or between said holding body layer (3) and said surface protective layer (1) or on said surface protective layer (1), characterized in that said printed layer (2) is formed of a discrete repetitive pattern of unit patterns, said unit patterns each have an area of 0.15 mm² to 30 mm² and the unit patterns are arranged at such intervals that non-printed areas between them have a minimum width of 0.2 mm to 200 mm."

"2.[Preamble as claim 1] characterized in that said printed layer (2) is formed of a discrete repetitive pattern of unit patterns, said unit patterns each have an area of 0.15 mm² to 30 mm² and the unit patterns are formed of a shape selected from ellipses, squares and rectangles, geometric patterns composed of straight lines or curved lines, and combinations of two or more of these shapes."

Reasons for the Decision

1. Main request

1.1 Terminology

In this decision, the features defining the properties of the unit patterns will be referred to as area ("each have an area of 0.15 mm² to 30 mm²"), distance ("the unit patterns are arranged at such intervals that non-printed areas between them have a minimum width of 0.2 mm to 200 mm") and shape ("formed of a shape selected from ellipses, squares and rectangles, geometric patterns composed of straight lines or curved lines, and combinations of two or more of these shapes.")

1.2 Amendments, Article 76(1) EPC

The appellant argued that in claims 1 and 2 the added features relating to the unit pattern interval and shape were taken out of context of the originally disclosed subject-matter and thus constituted an intermediate generalisation violating the requirements of Article 76(1) EPC.

The respondent argued that the features which the appellant asserted as essential (and missing in the amendments) were only disclosed as preferred and that therefore the requirements of Article 76(1) EPC were met.

The respondent further requested that this ground of opposition not be allowed into the appeal proceedings

because it had not been raised during the oral proceedings before the opposition division.

The board allows this objection raised by the appellant, as it is directed to an amended claim. In such a case, the opposition division as well as the board are entitled under Article 101(3)(a) EPC to fully examine amended claims as to their compatibility with the requirements of the EPC (see Case Law of the Boards of Appeal, 8th edition 2016, sections IV.D.3.4.3, IV.D.4.2.1, IV.E.3.2.1 c) last paragraph).

With respect to the requirements of Article 76(1) EPC, the board concludes that the introduction of the respective features relating to the unit pattern interval and unit pattern shape does not constitute an inadmissible intermediate generalisation because the parent application D28/D28' discloses them as preferable and without any further restrictions (see D28': page 7, lines 6 to 9 and lines 16 to 19).

Therefore, their introduction into independent claims 1 and 2 does not extend the subject-matter beyond the content of the parent application, and thus the requirements of Article 76(1) EPC are met.

1.3 Novelty

The appellant brought forward novelty objections based on each of the documents D1, D3 and D28 as well as on alleged public prior uses based on a Newfoundland vehicle license plate (document D4), a German vehicle license plate (documents D5 to D8) and a license plate sticker from Indiana (documents D9 to D13).

1.3.1 Novelty - Document D1

The board is of the opinion that the subject-matter of independent claims 1 and 2 is novel with respect to document D1.

Holding body layer

The respondent argued that, contrary to the opposition division's interpretation, the backing sheet could not be interpreted as a holding body layer and that therefore D1 did not disclose a *"holding body layer"*.

The board agrees with this interpretation of the backing sheet because it interprets the feature in claim 1 that the *"reflective element layer"* is "made up of a large number of reflective elements (4) and a holding body layer (3)" (emphasis added) in the sense of "consisting of", i.e. that the components that form the reflective element layer are limited to the ones listed. D1 discloses that the *"reflective sheeting 8 consists of prismatic lenses that are formed in a transparent, synthetic resin"* (see page 6, lines 14 and 15). When the backing sheet (2) in D1 is interpreted as a holding layer, there would be another layer (the resin layer) present. This is, however, ruled out by the claimed restriction to a *"holding body layer"* and a *"large number of reflective elements"* only.

However, the board is of the opinion that D1 discloses a *"reflective element layer (5) made up of a large number of reflective elements (4) and a holding body layer (3)"*. The feature *"holding"* is interpreted in its general meaning as "providing structural support". This is consistent with the disclosure of the patent, which states that the *"holding body layer [...] holds the reflective elements (4)"* (see paragraph [0019]).

D1 discloses that the *"reflective sheeting 8 consists of prismatic lenses that are formed in a transparent, synthetic resin"* (see page 6, lines 14 and 15).

Therefore, the reflective elements (here: prismatic lenses) are held (given structural support) by the resin layer, which is therefore interpreted as a *"holding body layer"* within the meaning of the patent.

The board therefore comes to the conclusion that D1 discloses the layer structure as claimed in independent claims 1 and 2.

Discrete unit pattern: area and distance

The appellant argued that D1 directly and unambiguously disclosed a *"discrete repetitive pattern of unit patterns"* with the area, distance and shape of the unit patterns as claimed. It argued in particular that the white screen was composed of printed dots (page 7, lines 30 to 37: *"dots cover 5% of the covered area"*) and that by using the disclosed resolution of 30 screen (page 4, lines 3 to 6: *"a coarser dot structure than is conventional for instance a resolution of in the range from 30 screen to 45 screen"*) for the printing of the white screen, the dots had an area of 0.72 mm² and a distance of 2.54 mm (see calculations presented in the grounds of appeal and during the oral proceedings) and thus the area and distance fell within the claimed ranges.

The board is not convinced by this line of argument, since the passage of D1 relating to the printing of the white screen (page 7, lines 30 to 37) discloses that the *"fifth colour being white and being composed of a white line colour at 5% intensity that is to say the dots cover 5% of the covered area"* (emphasis added).

The respondent's argument that this passage had to be interpreted such that the white screen comprised lines that were made up of dots is considered persuasive. Therefore, the claimed feature of a "*discrete repetitive pattern of unit patterns*" is not directly and unambiguously disclosed in document D1.

Furthermore, even if a discrete unit pattern were disclosed, D1 does not disclose the claimed area for the unit pattern.

Firstly, the passage disclosing the screen values of 30 to 45 screen (page 4, lines 3 to 6) relates to the printing of the image via a four colour process. This is also clear from the dependency of the claims in D1, where claim 10 (claiming screen values for the four colour process) is directly dependent on claim 6 (directed at the printing of the image) but not dependent on claims 7 to 9 (directed at the printing of the white screen). Therefore, D1 does not disclose screen values for the printing of the white screen.

Secondly, even if the disclosed screen values were applied to the printing of the white screen, they would not result in areas of the printed unit pattern which would fall within the claimed range. As demonstrated by the respondent in its reply to the board's communication and during the oral proceedings, even if discrete patterns were printed with the values disclosed in D1, i.e. 30 screen and a coverage of 5%, the resulting values for the area would be below the claimed lower limit.

As can be seen from the sketches presented by the appellant in its grounds of appeal and figure 1.4-29 of D30a, discrete units printed with the values disclosed

in D1 (5% coverage and 30 screen) via amplitude modulated halftone printing would have an area below the claimed lower limit: a screen value of 30 corresponds to a width of an individual screen cell of 0.847 mm. For a 5% coverage, the area of an individually printed unit is 5% of the area of an individual screen size, i.e. 0.036 mm², and thus below the claimed lower limit.

Furthermore, as argued by the respondent with reference to the skilled person's knowledge as documented by document D30a (figures 1.4-29, 1.4-30 and 1.4-36), a frequency modulated halftone printing would result in even smaller areas for the unit patterns: figures 1.4-29 and 1.4-36 show that in the case of frequency modulation, the area of the individually printed units is determined by the resolution of the printer which is measured in dots per inch (dpi). In the examples of figure 1.4-36 this resolution is 600 dpi and 1200 dpi, resulting in an area of individually printed units of 0.0018 mm² and 0.00056 mm², respectively.

The board therefore comes to the conclusion that, even if the parameters disclosed in D1 related to the printing of the white screen, the skilled person would not arrive at an area for the printed unit pattern falling within the claimed range.

During the oral proceedings, the appellant argued that it was not even necessary for the skilled person to consider frequency vs amplitude modulation, as the value of 30 screen disclosed in D1 had to be interpreted as a resolution for the smallest possible structure and that therefore a resolution of 30 units/inch resulted in an area of 0.72 mm² for the printed dots.

The respondent argued that the oral submissions of the appellant, abandoning for the first time the question of a certain modulation selection (i.e. amplitude vs frequency modulation) when printing the white screen layer, constituted a presentation of new facts. The respondent therefore requested that these submissions be disregarded.

The board is of the opinion that the oral submissions made by the appellant do not constitute new facts but concern new arguments. Therefore, the board does not disregard these submissions.

However, the board is of the opinion that the screen values disclosed in D1 correspond to what is disclosed in D30a (figures 1.4-29 and 1.4-36) as screen width ("*Rasterweite*") and not to the resolution actually used for printing, expressed in dots per inch.

Therefore, for the same reasons as given above for the calculations of the area in case of amplitude or frequency modulated halftone printing, the skilled person, even in applying the teaching of D1 to the printing of the white screen, would not inevitably arrive at an area for the printed unit pattern falling within the claimed range.

The board therefore comes to the conclusion that D1 does not - explicitly or implicitly - directly and unambiguously disclose the features of the characterising portion, i.e. that *"said printed layer (2) is formed of a discrete repetitive pattern of unit patterns, said unit patterns each have an area of 0.15 mm² to 30 mm² and the unit patterns are arranged at*

such intervals that non-printed areas between them have a minimum width of 0.2 mm to 200 mm."

The subject-matter of independent claims 1 and 2 is therefore novel within the meaning of Article 54(1) EPC with respect to the prior-art document D1.

1.3.2 Novelty - Document D3

The board is of the opinion that the subject-matter of independent claims 1 and 2 is novel with respect to document D3 and follows, in essence, the interpretation of D3 given by the opposition division in section 7 of its decision.

The respondent argued that D3 did not disclose a *"reflective element layer (5) made up of a large number of reflective elements (4) and a holding body layer (3)"* because neither the substrate 96 nor the adhesive 97 could be interpreted as a holding layer as claimed.

The board agrees with this interpretation because it interprets the feature *"made up"* as limiting the composition of the *"reflective element layer"* to the listed elements, i.e. to a *"holding body layer"* and a *"large number of reflective elements"* (see section 1.3.1 above). Therefore, when interpreting the substrate 96 as *"holding body layer"*, the presence of one or two additional layers, like the metallic layer 98 and the adhesive 97, renders the subject-matter of claims 1 and 2 novel with respect to the disclosed structure.

However, the board is of the opinion that D3 nevertheless discloses a *"holding body layer"* within the meaning of the claims. D3 discloses a metallic

layer 98 which is in direct contact with the reflecting elements 64. Therefore, the reflective elements (here: reflective prisms 64) are held (given structural support) by the layer 98, which is therefore interpreted as a "*holding body layer*" within the meaning of the patent.

The claimed layer structure does not therefore differ from the layer structure disclosed in D3.

The respondent further argued that D3 did not disclose a "*discrete repetitive pattern of unit patterns*" because it disclosed (page 3, line 36) "*lines or dots*" arranged "*either repeating or random*", and that a particular choice from these two lists could not take away the novelty but that this was instead a question of inventive step.

The board disagrees with this argument. Firstly, this disclosure, although based on two (very limited) lists, comprises only four possible combinations, which, in the board's view, are all directly and unambiguously derivable. Secondly, D3 contains even further disclosures that the repetitive pattern consists of discrete units (see page 10, lines 3 to 5, or page 11, lines 10 to 16).

The appellant argued that D3 disclosed a "*discrete repetitive pattern of unit patterns*" with the area, distance and shape of the unit patterns as claimed. Document D3 disclosed a pattern of dots in order to enhance whiteness (page 3, lines 33 to 36), and the pattern could be "*of any shape or size depending upon the desired pattern or optical properties required*" (page 10, lines 3 to 5). The appellant further argued, based on the concept of selection inventions, that this

disclosure implied a range for the value of the area which the skilled person would seriously consider and in view of which, contrary to the opposition division's decision, the claimed sub-range did not fulfil the criteria for a selection invention.

The board is not convinced by this argument for several reasons. The concept of selection inventions is based on a broader numerical range known from the prior art from which the selection of a sub-range is considered novel if certain criteria are met (see Case Law of the Boards of Appeal, 8th edition 2016, section I.C.6.3). In the board's view, the prior-art disclosure of "*any size*" is not to be seen as a numerical range from which a sub-range is selected, since the mere disclosure of "*any size*", even with the hint that the choice depends on "*the desired pattern or optical properties*", does not imply any numerical restriction (e.g. a lower and/or upper limit). Therefore, for the examination of novelty, the board rather assesses what is directly and unambiguously derivable from document D3 and whether this disclosure falls within the claimed ranges. As D3 has no explicit disclosure of the claimed values for area or distance, the question is whether the claimed values are implicitly disclosed in D3. The appellant only provided arguments based on the absence of a selection invention and did not provide any arguments as to why the area and distance of the printed unit patterns disclosed in D3 would inevitably fall within the terms of the claim when the teaching of D3 is carried out. As the board cannot see any reasons why this would be the case, it concludes that the claimed ranges for area and distance do not follow directly and unambiguously from the disclosure of D3.

The subject-matter of independent claims 1 and 2 is therefore novel within the meaning of Article 54(1) EPC with respect to the prior-art document D3.

1.3.3 Novelty - Document D28

The board is of the opinion that the subject-matter of independent claims 1 and 2 is novel with respect to document D28.

The present patent is based on a divisional application which is based on European (parent) patent applications 06022662.8 and 01919810.0, both claiming priority of D29, i.e. the date of priority of 10 April 2000.

The appellant based the novelty attack on document D28 (which is the WO publication of the priority document D29) on the argument that this document was a "poisonous parent application". The basic argument is that claim 1 was denied the priority date of D29 because, with respect to the minimum width of the non-printed areas, D29 was limited to a specific disclosure of 2 mm, whereas the current application claimed a range of 0.2 mm to 200 mm. With no priority for this broader range, however, claim 1 lacked novelty with respect to the specific disclosure of D28.

The respondent argued, in essence, that claim 1 enjoyed the priority date of D29 for the part already disclosed therein and that D28, for this part of the claim, was therefore not prior art within the meaning of Article 54(3) EPC.

Since the time of filing of these arguments, the question relating to possible "poisonous divisionals"

has been answered by the Enlarged Board of Appeal in its decision G 1/15 (OJ EPO 2017, 82).

The board therefore agrees with the reasoning of the opposition division and the respondent, which is in line with G 1/15 for the concept of "partial priorities". According to G 1/15: *"Under the EPC, entitlement to partial priority may not be refused for a claim encompassing alternative subject-matter by virtue of one or more generic expressions or otherwise (generic 'OR'-claim) provided that said alternative subject-matter has been disclosed for the first time, directly, or at least implicitly, unambiguously and in an enabling manner in the priority document. No other substantive conditions or limitations apply in this respect."*

In applying this conclusion of the Enlarged Board of Appeal in the current case, claim 1 of the main request enjoys a partial priority for the part disclosed in D29, i.e. where the width of the non-printed areas is 2 mm. Therefore, D28 cannot take away the novelty for this part because it is not prior art within the meaning of Article 54(3) EPC. The remaining (broader) range for the width of the non-printed areas does not enjoy a right of priority, but it is also not disclosed in D29.

The same argument applies to the feature relating to the shapes of the unit pattern in independent claim 2.

Independent claims 1 and 2 are therefore novel within the meaning of Article 54(1) EPC with respect to the prior-art document D28.

1.3.4 Novelty - Public prior uses

In the grounds of appeal, the appellant argued a lack of novelty based on the following three public prior uses: a Newfoundland vehicle license plate (D4), a German vehicle license plate (D5 to D8) and a license plate sticker from Indiana (D9 to D13).

The respondent questioned the public availability and the content of the prior uses. The respondent argued in particular that it was not in a position to confirm the correctness or validity of the measurements (see D4, D5 and D9, which were all declarations of Mr David D. Johnson, an employee of the appellant) performed by the appellant, as the appellant failed to present samples of the prior-use products, although such samples had been requested with a letter dated 9 July 2012 during the opposition procedure. The opposition division had voiced the same opinion in the summons to oral proceedings, i.e. that the verification of the appellant's measurements was not possible by visual inspection during oral proceedings.

The board accepts the respondent's line of argument that the evidence provided by the appellant, in particular the declarations D4, D8 and D13 which try to prove that the internal structure of the alleged prior uses is as claimed in the patent, is not sufficient. In general, the principle of free evaluation of evidence is applied. In cases of prior public use in which the evidence lies entirely within the sphere of the appellant, the standard of proof is "beyond any reasonable doubt" rather than the "balance of probabilities".

In the present case, the analysis of the specific prior-use products (see documents D4, D8 and D13), on which the determination of the content (here: the internal structure) and hence the appellant's line of argument completely relies, was performed by an employee of the appellant, and thus lies solely in the appellant's sphere. During the opposition proceedings, the respondent had voiced doubts concerning the credibility of the appellant's measurements and asked to be provided with the concrete prior-use products used for the measurements in order to perform its own analysis. In addition, in the summons to oral proceedings, the opposition division had voiced similar doubts in stating that a simple visual inspection (e.g. during oral proceedings) would not suffice to determine the internal structure of the analysed license plates. It was then up to the appellant to dispel these doubts by providing the samples on which the analysis of documents D4, D8 and D13 had been performed. As the appellant has not provided these samples, there remains reasonable doubt as to the correctness and content of the analysis performed by the employee of the appellant.

The board therefore comes to the conclusion that the alleged prior use is not proven beyond any reasonable doubt.

Furthermore, even if the content of documents D4, D8 and D13 were taken as is, the alleged prior uses also differ from the claimed subject-matter in respect of the following features:

(a) Newfoundland license plate (D4)

The opposition division (see section 11.2.1 of the decision) found that D4 (figures D and E) disclosed a layer interposed between the protective layer and the bead holding layer, and that therefore the layer structure was not comparable to the claimed structure.

The board agrees with this finding, as it interprets the feature that the *"reflective element layer"* is *"made up of a large number of reflective elements (4) and a holding body layer (3)"* in the sense of "consisting of", i.e. that the components that form the reflective element layer are limited to the ones listed. D4 discloses two separate layers (labelled *"bead holding layer"* in figures D and E) of which the first at least partially surrounds the reflective elements (here: beads) and the second is located adjacent to the first. The structure of D4 differs from the claimed structure in that it comprises an additional layer.

Therefore, D4 does not take away the novelty of the subject-matter of claims 1 and 2.

(b) German license plate (D5 to D8)

The opposition division (see section 11.2.2 of the decision) found that D8 showed that the area between the yellow stars was printed in blue (see figure at point 38) and that therefore D8 failed to disclose a discrete repetitive pattern of unit patterns as required by claims 1 and 2.

The board agrees with this interpretation and thus shares the opposition division's view that the alleged

prior use does not take away the novelty of the subject-matter of claims 1 and 2.

(c) Indiana license plate sticker (D9 to D13)

The opposition division (see section 11.2.3 of the decision) found that D13 showed that the printed area had no non-printed areas (see "yellow region" and "black printed region" in the figure at point 43) and that therefore D13 failed to disclose a discrete repetitive pattern of unit patterns as required by claims 1 and 2.

The board agrees with this interpretation and thus shares the opposition division's view that the alleged prior use, even if its public availability were sufficiently proven, does not take away the novelty of the subject-matter of claims 1 and 2.

1.4 Inventive step

The appellant brought forward inventive-step objections based on the following combinations:

- Document D3 and common general knowledge
- Document D20/D20' and common general knowledge
- Document D1 and common general knowledge
- Documents D3 and D1
- D20/D20' and D1
- D20/D20' and D35

1.4.1 Inventive step - D3 and common general knowledge

The board is of opinion that the subject-matter of independent claims 1 and 2 involves an inventive step with respect to the combination of D3 and common general knowledge.

According to the board's conclusion as given under section 1.3.2 above, D3 does not disclose the claimed ranges for area and distance.

The board is of the opinion that the claimed ranges for the dot area and distance would not be chosen by the skilled person based solely on their common general knowledge in the area of halftone printing.

The appellant argued that, although D3 failed to mention specific values for the area, D3 clearly taught the use of a repeating pattern of dots in order to enhance whiteness (see page 3, lines 33 to 36). Starting from this disclosure, the skilled person would, based on common general knowledge, choose an appropriate size for the dots. As the typical viewing distance of the involved products (signs, license plates) was rather large, the chosen dot area would be as large as possible.

The board is not convinced by this argument because the documents relating to the common general knowledge in the area of printing halftones either favour the choice of higher screen resolutions (see D25, page 441, fourth paragraph or D26, page 34, line 1 to 2) or disclose values above 50 LPI (see D26, pages 34 to 36). Therefore, neither the common general knowledge nor D3 provide a hint towards the use of larger dot sizes, i.e. lower screen resolutions.

The board therefore comes to the conclusion that the combination of document D3 with common general knowledge does not lead the skilled person to the claimed subject-matter, and that the subject-matter of claims 1 and 2 thus involves an inventive step within the meaning of Article 56 EPC.

1.4.2 Inventive step - D20/D20' and common general knowledge

The board is of the opinion that the subject-matter of independent claims 1 and 2 involves an inventive step with respect to the combination of D20/D20' and common general knowledge.

D20/D20' discloses (see figure 13 and paragraphs [0113] to [0115]) a retroreflective sheeting having a printed layer (5), the sheeting comprising at least a reflective element layer made up of a large number of reflective elements (1) and a holding body layer (2), and a surface protective layer (4) provided on said reflective element layer. Said printed layer is provided between said holding body layer and said surface protective layer (1) such that, as seen in the direction of incident light (10), the order of arrangement is the surface protective layer (4), the printed layer (5), the holding body layer (2) and the reflective elements (1).

D20/D20' also discloses that the printed layer is used for *"coloring a sheeting"* (see paragraph [0113]) and can be realised by *"screen printing, or ink jet printing"* (see paragraph [0115]).

In comparison to claim 1, D20/D20' fails to disclose the features of the characterising portion, i.e. that *"said printed layer (2) is formed of a discrete repetitive pattern of unit patterns, said unit patterns each have an area of 0.15 mm² to 30 mm² and the unit patterns are arranged at such intervals that non-printed areas between them have a minimum width of 0.2 mm to 200 mm."*

In comparison to claim 2, D20/D20' fails to disclose the features of the characterising portion, i.e. *"that said printed layer (2) is formed of a discrete repetitive pattern of unit patterns, said unit patterns each have an area of 0.15 mm² to 30 mm² and the unit patterns are formed of a shape selected from ellipses, squares and rectangles, geometric patterns composed of straight lines or curved lines, and combinations of two or more of these shapes."*

For the same reasons as given under section 1.4.1 above, the board is not convinced that the choice of area and distance within the claimed ranges is within the skilled person's knowledge. In particular, the board cannot see a hint in the common general knowledge for choosing screen values and coverages which would result in the dot areas and distances as claimed.

1.4.3 Inventive step - D1 and common general knowledge

The board is of the opinion that the subject-matter of independent claims 1 and 2 involves an inventive step with respect to the combination of D1 and common general knowledge.

According to the board's view given under section 1.3.1 above, independent claims 1 and 2 differ from document D1 in the features of the characterising portions, i.e. claim 1 in that *"said printed layer (2) is formed of a discrete repetitive pattern of unit patterns, said unit patterns each have an area of 0.15 mm² to 30 mm² and the unit patterns are arranged at such intervals that non-printed areas between them have a minimum width of 0.2 mm to 200 mm"*, and claim 2 in that *"said printed layer (2) is formed of a discrete repetitive pattern of unit patterns, said unit patterns each have an area of*

0.15 mm² to 30 mm² and the unit patterns are formed of a shape selected from ellipses, squares and rectangles, geometric patterns composed of straight lines or curved lines, and combinations of two or more of these shapes."

The respondent argued that D1 disclosed the screen values for the four colour printing of the image only and that the skilled person would not use these screen values for the printing of the white screen.

The board is however not convinced by this argument. Although D1 discloses the print parameters for the printing of the image, the board is of the opinion that the skilled person, in the absence of explicit parameters for the printing of the white screen, would consider the parameters disclosed for the image printing also for the print of the white screen.

In its grounds of appeal, the appellant had argued that D1 disclosed a preferred coverage of 5% for the white coating (page 4, lines 1 to 2) and screen values of 30 to 45 screen (page 4, lines 3 to 6). The appellant, with reference to document D30, had compared the areas of individually printed screen cells of amplitude modulated vs frequency modulated halftone printing and argued that the skilled person would *"inevitably choose frequency modulation rather than amplitude modulation"* when aiming at a coarser dot structure in the context of road signs, for example, which are usually read from a large distance. In addition, using the disclosed resolution of 30 screen and a coverage of 5% in frequency modulated halftone printing, the appellant had calculated for the individually printed screen cells an area of 0.72 mm² and a distance of 2.54 mm falling within the claimed ranges.

The board is not convinced by this argument because the respondent has convincingly demonstrated in its reply to the summons to oral proceedings and during the oral proceedings that the appellant's calculations with respect to frequency modulation are not correct. With reference to D30a (figures 1.4-29 and 1.4-30 and 1.4-36), the respondent argued that frequency modulation necessarily resulted in smaller areas for the individual unit patterns than in an amplitude modulated pattern (see also section 1.3.1 above). A less than 100% coverage within a screen cell is realised by a corresponding number of individually printed dots (see figure 1.4-29: 5% coverage realised via two dots covering 5% of the screen cell). Therefore, even if the skilled person were to choose frequency modulation for the printing of the white screen via dots, such dots would have an area below the claimed lower limit of 0.15 mm^2 .

During the oral proceedings, the appellant also argued that the skilled person needed no hint in the prior art but would, based on their common general knowledge, realise the white screen (which is used for balancing the day and night time appearances of the image) by the printing of discrete units with an area and a distance that would fall within the claimed ranges. According to the appellant, the claimed ranges were very broad and would not achieve any unexpected effect that could justify the presence of an inventive step. The appellant further argued that the claimed structure, contrary to the statements in the patent and the arguments of the respondent, did not improve weatherability or delamination, and that these problems were "made up" in the patent instead of being real problems present at the time of filing. Therefore, in

the absence of any proven technical effect, an inventive step was missing.

The board is not convinced by this line of argument. The passages of the patent referred to by the respondent (paragraphs [0027] and [0028]) explicitly attribute the technical effect brought forward by the respondent to the claimed structure and parameter ranges.

Furthermore, the board is of the opinion that these ranges, although broad, are not within the common general knowledge of the skilled person. None of the cited prior-art documents demonstrating common general knowledge in the area of halftone printing discloses or hints at screen values which, when applied, would result in individually printed unit patterns with an area or distance falling within the claimed ranges. The board therefore comes to the conclusion that the combination of document D1 with common general knowledge does not lead the skilled person to the claimed subject-matter, and that the subject-matter of claims 1 and 2 thus involves an inventive step within the meaning of Article 56 EPC.

1.4.4 Inventive step - D3 and D1

The board is of the opinion that the subject-matter of independent claims 1 and 2 involves an inventive step with respect to the combination of D3 and D1.

According to the board's view given under section 1.3.2 above, claims 1 and 2 differ from D3 in the claimed ranges for area and distance and the claimed shapes.

As discussed above in sections 1.3.1 and 1.4.3, the board is of the opinion that D1 neither directly

discloses nor hints at a printed layer that *"is formed of a discrete repetitive pattern of unit patterns, said unit patterns each have an area of 0.15 mm² to 30 mm² and the unit patterns are arranged at such intervals that non-printed areas between them have a minimum width of 0.2 mm to 200 mm."*

The board therefore comes to the conclusion that the combination of documents D3 and D1 also cannot lead the skilled person to the claimed subject-matter, and that the subject-matter of claims 1 and 2 thus involves an inventive step within the meaning of Article 56 EPC.

1.4.5 Inventive step - D20/D20' and D1

The board is of the preliminary opinion that the subject-matter of independent claims 1 and 2 involves an inventive step with respect to the combination of D20/D20' and D1.

As discussed in section 1.4.2 above, D20/D20' fails to disclose the features of the characterising portions of independent claims 1 and 2, in particular the claimed range for the area of the unit patterns.

As discussed above in sections 1.3.1 and 1.4.3, the board is of the opinion that D1 neither directly discloses nor hints at a printed layer that *"is formed of a discrete repetitive pattern of unit patterns, said unit patterns each have an area of 0.15 mm² to 30 mm² and the unit patterns are arranged at such intervals that non-printed areas between them have a minimum width of 0.2 mm to 200 mm."*

The board therefore comes to the conclusion that the combination of documents D20/D20' and D1 also does not

lead the skilled person to the claimed subject-matter, and that the subject-matter of claims 1 and 2 thus involves an inventive step within the meaning of Article 56 EPC.

1.4.6 Inventive step - Admissibility of document D35

With its reply to the summons to oral proceedings, the appellant submitted document D35. The appellant argued that this document was *prima facie* highly relevant for the assessment of inventive step because it was a DIN norm showing the common general knowledge in the area of colouring of traffic signs and disclosed in figure 1 the claimed area and distances for the printed discrete unit pattern. The appellant argued further with reference to D34 that the German Federal Patent Court (BPatG) had based the revocation of a closely related patent (EP1746444, a divisional application of the same parent application of the current patent) on lack of inventive step involving D35. The document was submitted at this late stage (one month before the oral proceedings) because the reasoned decision (D34) of the German Federal Patent Court, which documented the high relevance of D35, had only then become available.

Furthermore, there was no need to file it directly after the summons to oral proceedings because the board's preliminary opinion was in the appellant's favour. The appellant argued further that the respondent could not be surprised by this document as it was already discussed at length during the national proceedings before the German Federal Patent Court.

The respondent requested that document D35 not be admitted into the proceedings because it was late filed. The respondent argued that D35 was not *prima*

facie relevant as the disclosure in figure 1 related to grey and thus could not be relevant for the details for printing a "*light screen of white*" as disclosed in D1. The respondent argued further that the document could have been filed earlier, for instance during the first-instance proceedings, where also other DIN norms were cited, or, at the latest in April 2018, the time of its filing in the national proceedings. With reference to decision T 1058/15, the respondent argued that even highly relevant documents should not be admitted at such a late stage of the appeal proceedings.

The board is of the opinion that document D35 is *prima facie* highly relevant for the assessment of inventive step as it relates to the colouring of traffic signs with reflective coatings and seems to disclose (see figure 1) discrete unit patterns falling within the claimed ranges for area and distance. Although this document has been late filed, the board exercises its discretion under Article 13(1) RPBA and admits document D35 into the proceedings.

2. Request for remittal to the department of first instance

The respondent requested, as an auxiliary measure, to remit the case to the department of first instance.

The appellant did not object to a remittal to the department of first instance.

Accordingly, the board decides to remit the case to the department of first instance for further prosecution (Article 111(1), second sentence, EPC) so that the

prima facie highly relevant document D35 can be examined at two levels of jurisdiction and the parties are not deprived of the possibility of a subsequent review.

3. Costs

The respondent requested a different apportionment of costs, namely that the costs it had incurred for the oral proceedings before the board be paid by the appellant because the appellant deliberately withheld document D35 until shortly before the oral proceedings.

The appellant requested to dismiss the respondent's request for a different apportionment of costs because the late filing of document D35 was occasioned by the issuance of the written decision of the German Federal Patent Court and thus did not constitute an abuse of procedure.

The board is of the opinion that a different apportionment of cost is not equitable under Articles 104(1) EPC and 16 RPBA. Although document D35 was late filed, the respondent already knew the document from the national revocation proceedings. Furthermore, the board does not see the late filing as an abuse of procedure because the document was filed shortly after the written decision of the German Federal Patent Court had been issued. Moreover, the oral proceedings were not rendered superfluous by the late filing of document D35 but were still necessary in order to deal with the remaining issues raised in appeal which accounted for a large part of the proceedings.

Therefore, the respondent's request for a different apportionment of costs is refused.

Order

For these reasons it is decided that:

- I. The decision under appeal is set aside.
- II. The case is remitted to the department of first instance for further prosecution.
- III. The request for apportionment of costs is refused.

The Registrar:

The Chairman:



M. Kiehl

R. Bekkering

Decision electronically authenticated