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**Datasheet for the decision  
of 19 December 2023**

**Case Number:** T 1192/20 - 3.2.05

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**Language of the proceedings:** EN

**Title of invention:**  
Security device and method of manufacture

**Patent Proprietor:**  
De La Rue International Limited

**Opponent:**  
Giesecke+Devrient Currency Technology GmbH

**Relevant legal provisions:**  
EPC Art. 84, 54, 56, 123(2)  
RPBA 2020 Art. 13(1)

**Keyword:**

Claim construction

Claims - clarity - main request (yes)

Novelty - main request (yes)

Inventive step - main request (yes)

Amendment to appeal case - justification by party (no)

**Decisions cited:**

T 0728/98



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Case Number: T 1192/20 - 3.2.05

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.05**  
**of 19 December 2023**

**Appellant:** Giesecke+Devrient Currency Technology GmbH  
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**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
20 March 2020 concerning maintenance of the  
European Patent No. 3024662 in amended form.**

**Composition of the Board:**

**Chairman** P. Lanz  
**Members:** M. Holz  
A. Bacchin

## **Summary of Facts and Submissions**

- I. The opponent lodged an appeal against the interlocutory decision by the opposition division finding that, account being taken of the amendments made by the patent proprietor during the opposition proceedings according to auxiliary request 1, European patent No. 3 024 662 (the patent) and the invention to which it related met the requirements of the EPC.
- II. Both parties requested oral proceedings as an auxiliary measure. The board summoned the parties to oral proceedings scheduled on 11 May 2023.
- III. In a communication pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal of the European Patent Office (RPBA, see OJ EPO 2019, A63 and OJ EPO 2021, A35) of 3 April 2023, the board expressed its preliminary opinion on the case and explained that, in view of this preliminary opinion, the appeal was likely to be dismissed.
- IV. By letter of 2 May 2023, the appellant informed the board that it would not be attending the oral proceedings scheduled for 11 May 2023. The oral proceedings before the board were then cancelled.
- V. The following documents submitted during the opposition proceedings are relevant to this decision:

D1: WO 2011/015384 A1  
D2: US 2011/0261464 A1  
D9: WO 2011/051669 A1

By letter of 10 October 2022, the opponent (appellant) submitted the following document:

D10: WO 2014/085290 A1

VI. Final requests

The opponent (appellant) requests that the decision under appeal be set aside and that the patent be revoked.

The patent proprietor (respondent) requests that the appeal be dismissed (main request) or, as an auxiliary measure, that the decision under appeal be set aside and the patent be maintained as amended according to one of the first to ninth auxiliary requests submitted with the reply to the appellant's statement of grounds of appeal.

VII. Claim 1 of auxiliary request 1 on which the decision under appeal is based (corresponding to the respondent's main request in the appeal proceedings) reads (the feature references employed by the board are included in square brackets):

"**[1a]** A security device (10) comprising:

**[1b]** an array of focusing elements (14), each focusing element being adapted to focus light in any direction in the plane of the security device, the focusing elements being arranged on a regular two-dimensional grid; and

**[1c]** an array of elongate image elements (17, 18) overlapping the array of focusing elements, **[1d]** configured such that each focusing element can direct light from any one of a respective set of at least two

*elongate image elements to the viewer, in dependence on the viewing angle;*

**[1e1]** *wherein in a first region of the security device, the elongate image elements extend along a first direction and have a one dimensional periodicity orthogonal to the first direction, and [1e2] in a second region of the security device, the elongate image elements extend along a second direction which is different to the first direction and have a one-dimensional periodicity orthogonal to the second direction, [1e3] wherein the corresponding periodicities of the array of elongate image elements and the array of focusing elements are substantially matched."*

Claim 14 of auxiliary request 1 on which the decision under appeal is based reads:

**"[14a]** *A method of manufacturing a security device (10), the method comprising:*

**[14b]** *providing an array of focusing elements (14), each focusing element being adapted to focus light in any direction in the plane of the security device, the focusing elements being arranged on a regular two-dimensional grid; and*

**[14c]** *overlapping an array of elongate image elements (17, 18) with the array of focusing elements, [14d] the array of elongate image elements being configured such that each focusing element can direct light from any one of a respective set of at least two elongate image elements to the viewer, in dependence on the viewing angle;*

**[14e1]** *wherein in a first region of the security device, the elongate image elements extend along a first direction and have a one-dimensional periodicity orthogonal to the first direction, and [14e2] in a*

*second region of the security device, the elongate image elements extend along a second direction which is different to the first direction and have a one-dimensional periodicity orthogonal to the second direction, [14e3] wherein the corresponding periodicities of the array of elongate image elements and the array of focusing elements are substantially matched."*

VIII. The parties' relevant submissions can be summarised as follows.

(a) *Claim interpretation*

(i) *Appellant*

The skilled person understood the expression "substantially matched" (see features 1e3 and 14e3) in a broad sense, i.e. as also encompassing embodiments in which the periodicities were not equal. The skilled person considered the periodicities to be matched if they stood in a certain special relationship causing a desired technical effect. A desired technical effect must always be observable. For example, the side length of a square was matched to the diagonal length of the square since both lengths would change when the square was enlarged or reduced. From paragraph [0011] of the patent, it followed that claim 1 also encompassed embodiments in which the periodicities were not equal. The patent deliberately used the broader term "matched" for the periodicities. In other instances, the patent expressed that two quantities were "equal" if this was necessary or desired (see paragraph [0032] of the patent). This showed that, in the context of the patent, the term "matched" was to be considered broader than the term "equal".

(ii) *Respondent*

The skilled person considered the periodicities of the arrays to be matched if they were equal. The broad interpretation suggested by the appellant was nonsensical, unclear and not supported by the patent. The matching in the claim concerned two optical components, i.e. image elements and focusing elements. Some kind of observable effect would always be produced when any array of elongate image elements overlapped an array of focusing elements, as explicitly required in the claim. Therefore, the appellant's interpretation of "substantially matched" rendered this feature of the claim redundant, this pointing to it being incorrect.

Paragraph [0011] of the patent did not refer to the focusing elements collectively producing a synthetic magnification but to a lenticular device. It was evident from paragraph [0005] that lenticular devices did not involve synthetic magnification. Paragraph [0011] instead said that it was possible that the focusing elements did not individually magnify the underlying image elements.

(b) *Main request (Auxiliary request 1 on which the decision under appeal is based) - Clarity (Article 84 EPC)*

(i) *Appellant*

The wording "substantially matched" (see features 1e3 and 14e3) resulted from a post-grant amendment and gave rise to a lack of clarity. This was one of the cases discussed in the Guidelines for Examination, F-IV,



4.7.2 where the expression "substantially" was considered vague and unclear. There was no criterion according to which the person skilled in the art of security elements could decide whether two periodicities were substantially matched or not. In principle, it would be possible to determine the substantial matching of periodicities by the absence of a magnifying effect. The patent, however, made clear in paragraph [0011] that the absence of a magnifying effect was not mandatory, so this criterion was not applicable. The question whether the periodicities were the same or deviated by a small amount was crucial for assessing the technical effect as it differentiated a security device that was a lens tilt image (for equal periodicities) from a Moiré magnifying device (for slightly different periodicities).

Decision T 728/98 related to a case similar to the case in hand. In decision T 728/98, the board held that the claim could not be considered clear as the claim comprised an unclear feature ("substantially pure") for which no generally accepted meaning existed in the relevant art. According to that decision, this applied all the more since the unclear feature was essential for delimiting the subject-matter claimed from the prior art. This was also the case for "substantially matched" in claims 1 and 14.

(ii) *Respondent*

The skilled person understood from the expression "substantially matched" that a deviation from an exact match of the periodicities within the size of typical manufacturing tolerances was permitted. The requirements of Article 84 EPC were thus met.

(c) *Main request (Auxiliary request 1 on which the decision under appeal is based) - Unallowable amendment (Article 123(2) EPC)*

(i) *Appellant*

The requirements of Article 123(2) EPC were not met for claims 1 and 14. Raising this objection with the letter of 11 May 2021 was justified as it was a direct reaction to the respondent's claim interpretation set out for the first time on page 4, fifth paragraph of the respondent's reply. This interpretation implied that the term "matched" required that the periodicities be equal and that the device operate as a lenticular device without synthetic magnification. Under this interpretation, isolating the feature that the periodicities be substantially matched (see features 1e3 and 14e3) from the passage on page 5, lines 1 to 3 of the application as filed constituted an unallowable intermediate generalisation. This view was unaffected by the passage on page 17, lines 22 to 31 of the application as filed. This passage was related to lenses or mirrors arranged in an orthogonal grid pattern and only concerned the individual relative orientation of the focusing elements with respect to the elongate image elements. The passage, however, did not relate to the relative orientation of an entire grid of focusing elements with respect to the elongate image elements. Filing document D10 by letter of 10 October 2022 was justified since the respondent, in its letter of 10 August 2022, had referred to page 5, lines 3 to 6 of the application as filed. This passage could only be understood in view of document D10 cited in this passage. Document D10 was highly relevant for understanding the term "substantially matched".

(ii) *Respondent*

The objection under Article 123(2) EPC should have been raised earlier. The board should exercise its discretion under Article 13(1) RPBA and not admit this objection. The claims of auxiliary request 1 on which the decision under appeal was based had been filed in response to the notice of opposition. The opponent had had ample opportunity to raise this objection at an earlier stage. Furthermore, it had been made clear that the respondent considered that the alleged feature distinguished the invention from Moiré devices already in the response to the notice of opposition.

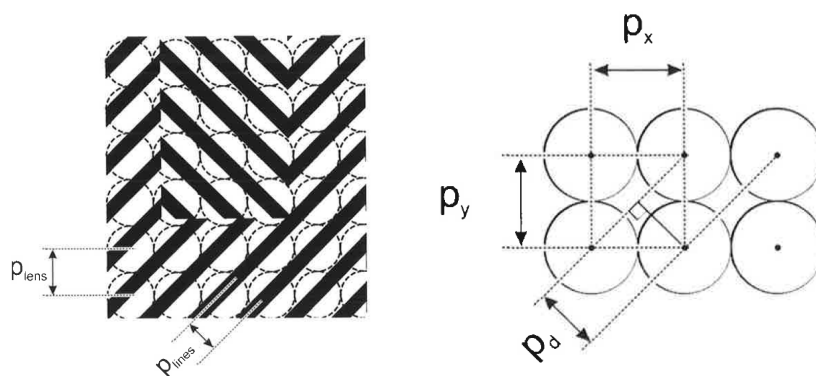
The requirements of Article 123(2) EPC were met. Features 1e3 and 14e3 found support on page 5, lines 1 to 6 of the application as filed. This passage referred to a case in which "it is desired to arrange the focusing element array at a slanted angle to the image element array", i.e. where the orientation was not matched. Page 12, line 32, to page 13, line 4 of the application as filed discussed the form of the focusing element grid but said nothing of matching the periodicities or the orientations. This was precisely why it was clear that these were not related features. This section indicated that an orthogonal grid was merely preferable and did not specify that this was in any way linked to periodicity or orientation. Document D10 should not be admitted into the appeal proceedings since it was extremely late filed and there were no reasons justifying it being filed at such a late stage. Document D10 was not *prima facie* relevant for interpreting the term "substantially matched".

(d) *Main request (Auxiliary request 1 on which the decision under appeal is based) - Novelty in view of document D1 (Article 54 EPC)*

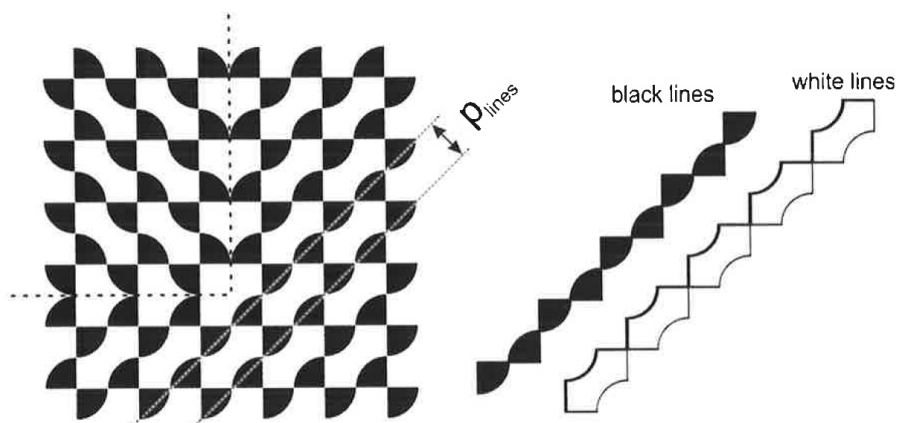
(i) *Appellant*

The subject-matter of claims 1 and 14 was not new in view of the embodiments illustrated in Figures 8 and 9 of document D1, respectively.

The lens grid shown in Figure 8 of document D1 did not have substantially the same periodicity as the line grid. However, the periodicities were substantially matched as required by feature 1e3 since the distance  $p_d$  (see figures reproduced below) of adjacent lenses in diagonal direction of 0.2135 mm (derived from a grid constant of 0.302 mm) substantially corresponded to the periodicity  $p_{lines}$  of the line grid of 0.22 mm as they only differed by 3%.



The black sector-shaped areas in Figure 9 formed an elongate image element, as did the white areas (see figures reproduced below):



$p_{lines}$  represented the periodicity of the black line pattern, which was equal to the distance  $p_d$  of adjacent lenses in the diagonal direction.

(ii) *Respondent*

The subject-matter of claims 1 and 14 was new in view of document D1. Figure 8 of document D1 did not disclose that the corresponding periodicities of the array of elongate image elements and the array of focusing elements were substantially matched to one another (see features 1e3 and 14e3). The skilled person would not consider the quarter circles shown in Figure 9 to be linked together as part of the same single image element since this was not an element of any one image. Even if the view was taken that the skilled person could accept these as being part of the same image element to form elongate diagonal lines in the way suggested by the appellant, these lines did not have one-dimensional periodicity along a direction orthogonal to their direction of extension, as required by claim 1. The two lines that the appellant had selected to demonstrate  $p_{lines}$  were mirrored relative to one another such that the lines were not repeating. Even if the periodicity  $p_{lines}$  suggested by the

appellants was accepted, the periodicities did not substantially match one another when properly compared.

(e) *Main request (Auxiliary request 1 on which the decision under appeal is based) - Inventive step (Article 56 EPC)*

(i) *Appellant*

The subject-matter of claims 1 and 14 did not involve an inventive step in view of the combination of documents D9 and D2. All features of claim 1 were disclosed in the embodiment shown in Figure 4 of document D9, except for feature 1b. The objective technical problem was to provide a security device allowing a simpler manufacturing and alignment of the lens array. Document D2 suggested solving this technical problem by using a microlens array with spherical lenses. In discussing the lens shapes that could be used, document D2 mentioned in paragraph [0009] that instead of elongated cylindrical lenses, spherical lenses (fly's eye lenses) could be used and that the latter had a number of benefits over cylindrical lenses. In particular, spherical lenses allowed an image to be interlaced not only in the horizontal direction but also in the vertical direction, diagonally and in any combination of these directions. This was confirmed by the description of the embodiment of Figure 8 of document D2 in paragraph [0046]. Spherical lenses had the advantage that they offered more possibilities for the animation direction, such as vertical, horizontal and/or diagonal, while cylindrical lenses were limited to animations in only one direction. The embodiment of Figure 8 of document D2 showed a web 800 having an

image 104 for use as labels, where in this type of application, the long edges of the labels were often in the machine or web direction. As illustrated by document D2, if a lenticular lens array was used, the array could only be extruded in the machine or web direction, thus requiring image 104 to be printed cross-web. However, if a fly's eye lens was used, it allowed image 104 to be printed in either the machine or cross-web direction to give ultimate flexibility in the fabrication of labels. Document D2 thus taught the skilled person that the use of spherical lens arrays also provided advantages even when the images under consideration were not bidirectional but were interlaced in only one direction at a time. The skilled person was thus prompted by document D2 to use spherical lenses also in the context of Figure 4 of document D9 since the same lenses could be used for both lenticular devices A and B. On the one hand, this simplified the production since no special lenses with different north-south and east-west orientations in some areas had to be provided. On the other hand, the rotational symmetry of the lenses also simplified the alignment of the lenses and the image elements to each other. All these advantages were addressed and explained. The skilled person would thus arrive at the subject-matter of claim 1 of the patent without exercising an inventive step.

The subject-matter of claims 1 and 14 did not involve an inventive step in view of document D1. It followed from Figures 8 and 9, together with the general disclosure on pages 14 and 15 of document D1, that a grid of unmodulated lines (as shown in Figure 8) was to be formed with a grid spacing determined by the grid constant of the lens grid (see page 15, lines 14 and 15). The skilled person thus learned that the line grid

of Figure 8 could be formed in the same manner and thus with a periodicity not only corresponding but being substantially equal to the distance between adjacent lenses in the diagonal direction (as in Figure 8).

(ii) *Respondent*

Document D9 did not disclose feature 1b. The formulation of the objective technical problem suggested by the appellant was inappropriate. By highlighting the lens grid in the problem set, the appellant included a pointer to the claimed solution. The objective technical problem was to facilitate the manufacture of the device of document D9. Document D2 did not disclose that fly's eye lenses had any significance in facilitating the manufacture of a security device. Document D2 disclosed that fly's eye lenses permitted "additional animated effects", i.e. that they increased the complexity of the optically variable effect and hence increased security. Therefore, the skilled person would not be motivated to implement the teachings of document D2 as they would not expect this to move them any closer to a solution to the objective technical problem. That is, the skilled person would have no reason to expect that the fly's eye lens would in any way assist them in facilitating the manufacture of the device in document D9. Paragraph [0046] of document D2 noted that where a lenticular lens array was used, the image 104 should be printed cross-web. In contrast, when a fly's eye lens was used, this provided more flexibility, allowing printing in either the machine direction or the cross-web direction. In document D9, the production of the device was not subject to a restriction of only being able to print in one direction. Document D9 printed image elements in both directions with the lens



array it already used. Therefore, the fly's eye lens would not increase the flexibility in how the image could be printed in document D9. Hence, this did not lead the skilled person to adapt document D9 to facilitate the manufacture of its device.

The course of action set out by the appellant regarding document D1 would not be obvious to the skilled person. The pitch mismatch was essential to the operation of the disclosed device in Figure 8 of document D1. There was no reason, without hindsight knowledge of the current invention, why the skilled person would adapt the Figure 8 embodiment of document D1 to remove the pitch mismatch as this would destroy the effect produced in the device of document D1. The embodiment of Figure 9 of document D1 was clearly using an array of image elements with two-dimensional periodicity and thus accordingly used a two-dimensional array of focusing elements. Any change to this to use elongate image elements having one-dimensional periodicity would only be made in combination with a change to a corresponding one-dimensional focusing element array. This would lead to a device as disclosed in document D9, meaning that D9 was a more appropriate starting point than Figure 9 of document D1.

## **Reasons for the Decision**

### **1. Decision in written procedure**

Both parties requested oral proceedings as an auxiliary measure. In a communication under Article 15(1) RPBA dated 3 April 2023, the board expressed its preliminary opinion on the case and explained that, in view of this preliminary opinion, the appeal was likely to be dismissed. By letter of 2 May 2023, the appellant

announced that it would not be attending the oral proceedings scheduled for 11 May 2023, not submitting any counter-arguments to the board's preliminary opinion. In this situation, holding the oral proceedings in the absence of the appellant would serve no purpose. The oral proceedings before the board were therefore cancelled.

By deciding not to attend the oral proceedings, the appellant effectively chose not to avail itself of the opportunity to present its observations and counter-arguments orally but instead to rely on its written submissions. As the case is ready for decision on the basis of the written submissions, the board issues this decision by written procedure in accordance with Article 12(8) RPBA and Article 15(3) RPBA (see "Case Law of the Boards of Appeal", 10th edition 2022 (Case Law), III.B.2.7.3), while observing the right to be heard.

## 2. **Claim interpretation**

The parties have different views on how the skilled person interprets the expression "substantially matched" in features 1e3 and 14e3.

It is common ground between the parties that the skilled person considers the periodicities of the arrays to be matched if the periodicities are equal.

However, the appellant submits that the skilled person understood this expression in a broader sense, i.e. as also encompassing embodiments in which the periodicities were not equal. The skilled person considered the periodicities to be matched if they

stood in a certain special relationship causing a "desired technical effect". A desired technical effect must always be observable. For example, the side length of a square was matched to the diagonal length of the square since both lengths would change when the square was enlarged or reduced.

The respondent rejects the broad interpretation suggested by the appellant since it was technically nonsensical, unclear and not supported by the patent.

The board is not convinced that the skilled person understands the expression "substantially matched" in the context of claims 1 and 14 in the broad sense suggested by the appellant.

Firstly, the appellant has not provided any basis for the allegation that the relevant skilled person would understand the expression "substantially matched" as suggested. The issue in hand hinges on how a person skilled in the art of security elements understands the expression "substantially matched" in claims 1 and 14. This understanding may be different from a lay understanding or from the use of this expression in other technical fields.

Secondly, there is no basis for this broader interpretation in the patent.

The appellant infers from paragraph [0011] of the patent ("*The focusing elements preferably do not perform any magnification*", see column 3, lines 12 and 13) that claim 1 also encompassed embodiments in which the periodicities were not equal.

The board is not convinced by the appellant's view for several reasons. Even if the description of the patent suggested that the expression "substantially matched" was to be understood in a broader sense (i.e. covering alternatives other than "equal"), this would not necessarily imply that the broad interpretation suggested by the appellant correctly represented the skilled person's technical understanding of this expression.

Moreover, the cited passage from paragraph [0011] does not refer to the matching of the periodicities. This passage therefore cannot affect the skilled person's interpretation of the term "substantially matched" in features 1e3 and 14e3. The cited passage can instead be understood as referring to the focusing elements preferably not performing any magnification individually, as submitted by the respondent. The cited passage therefore does not allow the conclusion that the term "matched" is to be understood in a broader sense, let alone in the broader sense suggested by the appellant.

This also applies in view of the appellant's reference to the use of the word "equal" in paragraph [0032] of the patent. Even if assuming that the skilled person derived from this passage that the word "matched" in features 1e3 and 14e3 had to be construed broader than the term "equal", this would not indicate that the broader interpretation suggested by the appellant is correct.

Thirdly, the broader interpretation suggested by the appellant seems unclear and technically unreasonable, as also set out by the respondent. What makes a technical effect a "desired" technical effect does not

seem evident. It is, for example, not evident whose desire should be pertinent, at what point in time this desire should be present and if the desire should be based on technical considerations. It also seems unclear whether each and every observable effect can be considered a desired technical effect. Moreover, it is not evident if a "desired technical effect" or "observable effect" must be a technical effect that goes beyond the technical effect that is achieved by the other claim features (i.e. features 1a to 1e2 of claim 1 and 14a to 14e2 of claim 14, respectively) alone, i.e. if features 1e3 and 14e3 must be considered redundant, as submitted by the respondent.

The wording of the claims should typically be given its broadest *technically* sensible meaning understood by the skilled reader (see also Case Law, II.A.6.1). The board notes that the requirement that the claims should be given the broadest technical meaning may also lead to a narrower claim construction if this is the understanding that makes technical sense for the skilled person. In the case at hand, the broader interpretation of "substantially matched", in view of the above lack of clarity, is not technically sensible in claims 1 and 14. The appellant has not convincingly demonstrated that the skilled person would even have considered this broader interpretation.

The appellant has not convincingly shown that the skilled person would understand features 1e3 and 14e3 to mean that the periodicities are substantially matched whenever these periodicities stand in a certain, special relationship to each other causing a desired technical effect (or observable effect). Nor has the appellant convincingly shown that the skilled person would understand the periodicity of a one-

dimensional array and the periodicity of a two-dimensional array to be matched just because the periodicity of the one-dimensional array equals the distance between diagonally adjacent nodes of the two-dimensional array.

For these reasons, the board does not accept the broader interpretation submitted by the appellant.

**3. Main request (Auxiliary request 1 on which the decision under appeal is based) - Clarity (Article 84 EPC)**

The appellant takes the view that the wording "substantially matched" (see features 1e3 and 14e3), resulting from a post-grant amendment, gave rise to a lack of clarity. In its view, this was one of the cases discussed in the Guidelines for Examination, F-IV, 4.7.2 where the expression "substantially" was vague and unclear. The respondent disagrees and submits that the skilled person understood from this expression that a deviation from an exact match of the periodicities within the size of typical manufacturing tolerances was permitted.

Although the board is not bound by the Guidelines for Examination, it concurs with the respondent's view. The term "substantially" in features 1e3 and 14e3 can be understood as requiring that the cited periodicities match within the technical tolerance of the method used to manufacture the claimed device. This interpretation is unaffected by the fact that variations of the periodicities within the manufacturing tolerances may, in turn, also affect the numerical ratio of these periodicities. The patent does not suggest that the term "substantially" extends the range of what is to be

considered "matched" beyond the manufacturing tolerances of the claimed security device.

The appellant refers to paragraph [0011] of the patent relating to the presence of a magnification effect. This passage, however, does not have a bearing on the technical meaning of the term "substantially" as used in feature 1e3 and 14e3. This passage does not refer to a magnification effect that is due to the periodicities matching only "substantially" but to the focusing elements preferably not performing any magnification.

Similarly, paragraph [0004] of the patent, relating to Moiré magnifier devices, does not suggest a certain understanding of the term "substantially matched" in claims 1 and 14 either, let alone indicate that the term "substantially" should be construed in a particular way, extending beyond the relevant manufacturing tolerances.

Decision T 728/98, cited by the appellant, concerned a patent application in the pharmaceutical field. Claim 1 of the main request on which that decision was based includes the feature "[a] *substantially pure piperidine derivative compound*". The board in that decision considered that the wording "*substantially pure*" was unclear.

The findings of the board in decision T 728/98 on the understanding of the averagely skilled person in the pharmaceutical art of the term "*substantially pure piperidine derivative compound*", however, have no bearing on the question in hand of how a person skilled in the art of security documents understands the term "substantially matched" in claims 1 and 14 of the patent in suit. This also applies in view of the fact

that features 1e3 and 14e3 are relevant to the delimitation of the claimed subject-matter with respect to the cited prior art (see discussion below).

The requirements of Article 84 EPC are thus met for the subject-matter of claims 1 and 14 of auxiliary request 1 on which the decision under appeal is based.

4. **Main request (Auxiliary request 1 on which the decision under appeal is based) - Unallowable amendment (Article 123(2) EPC)**

In points 3 and 6 of its letter of 11 May 2021, the appellant raises an objection under Article 123(2) EPC against claims 1 and 14. According to the appellant, the submission of this objection at this stage of the appeal proceedings was justified as it was a direct reaction to the respondent's claim interpretation set out for the first time on page 4, fifth paragraph of the respondent's reply. This interpretation implied that the term "matched" was to be interpreted as requiring that the periodicities be equal, and that the device operated as a lenticular device without synthetic magnification. If this interpretation was employed, isolating the feature that the periodicities were substantially matched (see features 1e3 and 14e3) from the passage on page 5, lines 1 to 3 of the application as filed would constitute an unallowable intermediate generalisation.

The board does not find that the claim interpretation set out on page 4, fifth paragraph of the respondent's reply to the appellant's statement of grounds of appeal was submitted for the first time with the respondent's reply, as suggested by the appellant. On pages 1 and 2



of its letter of 18 November 2019, the respondent already submitted that the skilled person understood claim 1 as granted as requiring that the focusing elements and sets of image elements have the same pitch (see page 2, second paragraph). In its reply to the appellant's statement of grounds of appeal, the respondent takes the same view for claim 1 of auxiliary request 1 on which the decision under appeal is based. Moreover, the respondent repeatedly indicated in the context of novelty and inventive step for the claims as granted that the device was a lenticular device (see, for example, the paragraph bridging pages 3 and 4 of the respondent's letter of 18 November 2019, and page 2, second paragraph and page 3, third paragraph of the respondent's response to the notice of opposition dated 16 January 2019). From its submissions, it was evident that it considered the device of claim 1 as granted to be a lenticular device. In the appeal proceedings, the respondent takes the same view on the device of claim 1 of auxiliary request 1 on which the decision under appeal is based.

The respondent's claim interpretation has thus not changed in this regard compared to what it submitted in the first-instance proceedings. The objection under Article 123(2) EPC was therefore not raised in due time since it could (and should) have been raised in the first-instance proceedings.

Moreover, even if this objection had been filed in due time, it would not have been a legitimate reaction to the respondent's claim interpretation. The passage on page 5, lines 1 to 3 of the application as filed refers to conventional lenticular devices. The above claim interpretation employed by the respondent, however,

does not imply that the respondent considers the claimed device a conventional lenticular device.

It is undisputed that raising the objection under Article 123(2) EPC at this stage of the appeal proceedings is an amendment to the appellant's appeal case. In accordance with Article 13(1) RPBA, "*[a]ny amendment to a party's appeal case after it has filed its grounds of appeal or reply is subject to the party's justification for its amendment and may be admitted only at the discretion of the Board.*"

For the reasons set out below, the appellant's submissions on the objection under Article 123(2) EPC are complex and not *prima facie* convincing.

The appellant takes the view that, when employing the respondent's claim interpretation, isolating the feature that the periodicities were substantially matched (see features 1e3 and 14e3) from the passage on page 5, lines 1 to 3 of the application as filed constituted an unallowable intermediate generalisation.

However, page 17, lines 28 to 31 of the application as filed discloses that "*[w]here the focusing elements 14 are capable of focusing light in any direction in the X-Y plane (such as spherical and aspherical lenses), there is no limitation on the orientation of the elongate image elements relative to the lenses*". While the passage on page 5, lines 1 to 3 refers to "*the (one-dimensional) periodicity and orientation of the image element array and focusing element array being substantially matched*" (underlining added), the skilled person understands from the passage on page 17, lines 28 to 31 that the orientation matching is a feature that may be dispensed with where the focusing elements

are capable of focusing light in any direction in the X-Y plane. The latter is implied by feature 1b (see also feature 14b). Hence, on a *prima facie* basis, the omission of the orientation matching in features 1e3 and 14e3 does not constitute an unallowable intermediate generalisation.

Unlike the appellant, the board does not find that the passage on page 17, lines 28 to 31 of the application as filed concerns the individual orientation of the focusing elements. This passage generally refers to the "*orientation of the elongate image elements relative to the lenses*". However, the immediately preceding sentence discloses that neither direction  $D_1$  nor  $D_2$  need be aligned with the orthogonal directions of the grid in which focusing elements 14 are arranged but could take any relative orientation provided that the focusing elements 14 are capable of focusing light in the direction perpendicular to the elongate direction of the underlying image elements. The skilled person understands that the passage on page 17, lines 28 to 31 refers to the same orientation.

While page 17 of the application as filed concerns an embodiment in which the lenses (or mirrors) are arranged in a regular orthogonal grid pattern (as submitted by the appellant), the passage on page 12, line 32 to page 13, line 4 (cited by the respondent) discloses that the grid does not necessarily have to be orthogonal. The statement on page 17, lines 28 to 31 does not explicitly refer to orthogonal grids either. Whether this statement would be understood by the skilled person as only being applicable for orthogonal grids anyway would require further investigation. Moreover, even if it was found that the statement on page 17, lines 28 to 31 was understood by the skilled

person as only applying to orthogonal grids, this in itself would not allow the conclusion that claims 1 and 14 involved an unallowable intermediate generalisation. It would still need to be examined whether the feature that the periodicities of the image element array and focusing element array are substantially matched and the feature that the orientation of the image element array and focusing element array (on page 5, lines 1 to 3) are substantially matched are inextricably linked (see also Case Law, II.E.1.9.1).

The parties also disagree on how the passage on page 5, lines 3 to 6 is to be interpreted and how this affects the skilled person's understanding of the preceding sentence. During the appeal proceedings, the appellant filed document D10 (cited on page 5, line 6 of the application as filed). Document D10 had not been submitted or discussed during the opposition proceedings. The respondent requests that document D10 not be admitted into the appeal proceedings since it was extremely late filed and there were no reasons justifying its filing at such a late stage. Moreover, the parties disagree on whether document D10 was *prima facie* relevant for the interpretation of the term "substantially matched".

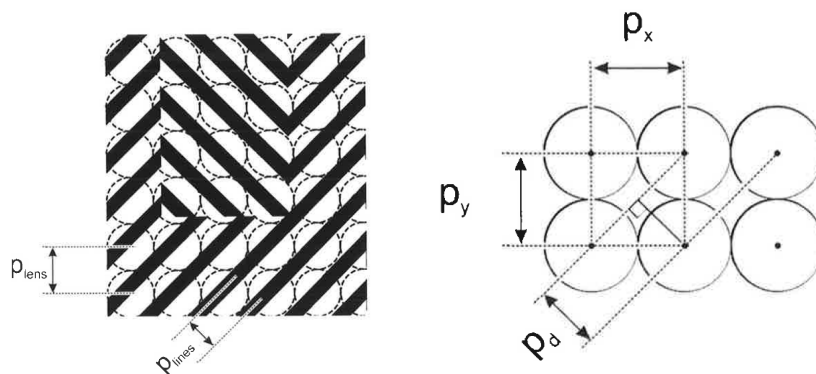
The above issues are complex and would require additional investigations that would contravene the principle of procedural economy. The board therefore exercised its discretion under Article 13(1) RPBA and did not admit the objection under Article 123(2) EPC into the appeal proceedings.

5. **Main request (Auxiliary request 1 on which the decision under appeal is based) - Novelty in view of document D1 (Article 54 EPC)**

The appellant is of the opinion that the subject-matter of claims 1 and 14 was not new in view of the embodiments illustrated in Figures 8 and 9 of document D1, respectively.

5.1 *Embodiment shown in Figure 8 of document D1*

The appellant submits a modified version of Figure 8 of document D1 reproduced below as well as an additional drawing:



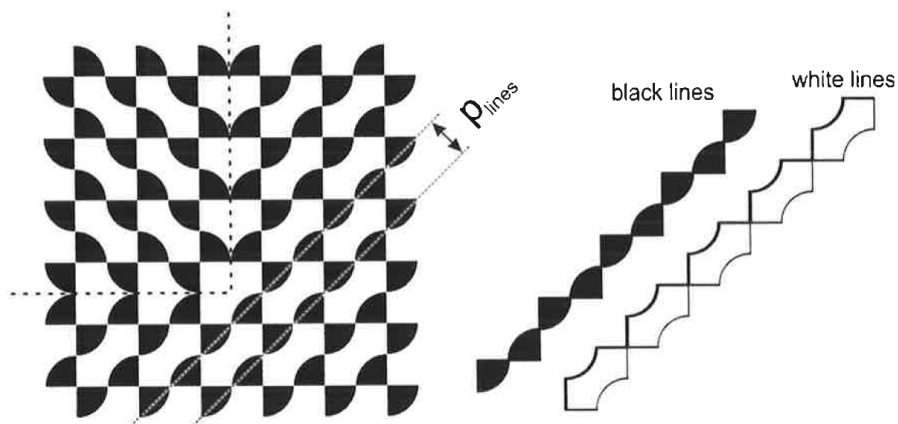
The appellant acknowledges that the lens grid in Figure 8 of document D1 does not have substantially the same periodicity as the line grid (see point 4.1 of its letter of 11 May 2021). However, in its view, the periodicities are substantially matched as required by feature 1e3 since the distance  $p_d$  of adjacent lenses in diagonal direction of 0.2135 mm (derived from a grid constant of 0.302 mm) substantially corresponded to the periodicity  $p_{lines}$  of the line grid of 0.22 mm as they only differed by 3%.

As indicated in point 2. above, the board is not convinced by the appellant's broader interpretation of the expression "substantially matched". The appellant's assertion that the distance  $p_d$  of adjacent lenses in the diagonal direction substantially corresponded to the periodicity  $p_{lines}$  of the line grid does not allow the conclusion that the skilled person would consider the periodicities "substantially matched".

Feature 1e3 is thus not disclosed in the embodiment shown in Figure 8 of document D1.

5.2 *Embodiment shown in Figure 9 of document D1*

Regarding Figure 9 of document D1, the appellant submits the following modified version of Figure 9:



In the appellant's view, the black sector-shaped areas in Figure 9 form an elongate image element (shown on the right-hand side of the above figure), as do the white areas. According to the appellant,  $p_{lines}$  represented the periodicity of the black line pattern, which was equal to the distance  $p_d$  of adjacent lenses in the diagonal direction.

As set out above, the board is not convinced that the skilled person would understand the periodicity of a one-dimensional array and the periodicity of a two-dimensional array to be matched just because the periodicity of the one-dimensional array equals the distance between diagonally adjacent nodes of the two-dimensional array. The presence of a desired technical effect (or an observable effect) is not sufficient either for concluding that the periodicities are substantially matched.

The respondent also submits that the parameter  $p_{\text{lines}}$  introduced by the appellant was not the periodicity of the line grid. The board shares this view. However, even if the periodicity of the line grid was equal to the distance between adjacent lenses in the diagonal direction, and even if this gave rise to an observable effect, this would not allow the conclusion that the skilled person considered that the periodicities of the lens grid and the line grid matched as required by feature 1e3.

Feature 1e3 is thus not disclosed in the embodiment shown in Figure 9 of document D1.

### 5.3 *Conclusion on novelty*

The subject-matter of claim 1 is new over the embodiments shown in Figures 8 and 9 of document D1, respectively, since at least feature 1e3 is not disclosed in these embodiments. The subject-matter of claim 14 is new in view of these embodiments, too, since at least feature 14e3 is not disclosed in these embodiments for, *mutatis mutandis*, the same reasons.

6. **Main request (Auxiliary request 1 on which the decision under appeal is based) - Inventive step (Article 56 EPC)**

6.1 *Combination of documents D9 and D2*

The appellant holds that the subject-matter of claims 1 and 14 did not involve an inventive step in view of the combination of documents D9 and D2. All features of claim 1 were disclosed in the embodiment shown in Figure 4 of document D9, except for feature 1b. The objective technical problem was to provide a security device allowing a simpler manufacturing and alignment of the lens array.

The respondent agrees that document D9 did not disclose feature 1b. However, in the respondent's view, the formulation of the objective technical problem suggested by the appellant was inappropriate. By highlighting the lens grid in the problem set, the appellant included a pointer to the claimed solution. In the respondent's view, the objective technical problem was to facilitate the manufacture of the device of document D9.

The board agrees that at least feature 1b is not disclosed in the embodiment shown in Figure 4 of document D9. Even if the formulation of the objective technical problem suggested by the appellant was accepted, the subject-matter of claim 1 would not have been obvious to the skilled person in view of a combination of documents D9 and D2 for the following reasons.

Document D2 discloses the use of fly's eye or "integral" lens arrays formed from a web or sheet



including a plurality of domes or semi-circular structures (see paragraph [0009] cited by the appellant). According to document D2, there are a number of benefits to using a fly's eye lens as opposed to a lenticular lens as it allowed not only interlacing an image from left to right (horizontal direction), but also up and down (vertical direction), diagonally, or any combination of these to give additional animated effects. Similarly, according to paragraph [0046] of document D2, fly's eye lens arrays create more opportunities for the animation direction, such as vertical, horizontal and/or diagonal.

These benefits are, however, substantially different from the objective technical problem suggested by the appellant (i.e. to provide a security device allowing a simpler manufacturing and alignment of the lens array). When starting from document D9 and trying to solve the above objective technical problem, the skilled person would not be prompted by these passages of document D2 to use fly's eye lens arrays for the security device of document D9.

The appellant also refers to paragraph [0046] of document D2 which sets out, with reference to the embodiment shown in Figure 8 of document D2, that a lenticular lens array can only be extruded in the machine or web direction, thus requiring the image to be printed cross-web. However, a fly's eye lens allowed the image to be printed in either the machine or cross-web direction to give ultimate flexibility in the fabrication of labels.

This advantage (i.e. allowing the image to be printed in different directions) is also substantially different from the objective technical problem

suggested by the appellant. Moreover, it is not evident that, in the embodiment of Figure 4 of document D9, the image could only be printed in one direction. To the contrary, the image strips in lenticular device A are orthogonal to those in lenticular device B, as also set out by the appellant on page 16, last paragraph of the statement of grounds of appeal. Therefore, the problem discussed in paragraph [0046] of document D2 does not arise in this embodiment of document D9. The cited passage of paragraph [0046] therefore does not prompt the skilled person to use fly's eye lens arrays in the embodiment shown in Figure 4 of document D9.

Nor would the skilled person have used fly's eye lenses in the embodiment of Figure 4 of document D9 just because fly's eye lenses are described in document D2 as having some advantages over lenticular lens arrays. Such considerations do not properly take into account the above objective technical problem. In accordance with established case law, the point is not whether the skilled person could have arrived at the invention by modifying the prior art but rather whether, in expectation of the advantages actually achieved (i.e. in light of the technical problem addressed), they would have done so because of a prompting in the prior art (see Case Law, I.D.5.). As set out above, the appellant has not convincingly shown that the skilled person would have found this prompting in the prior art. Moreover, even if the above objective technical problem could be solved by incorporating a spherical lens array in the embodiment shown in Figure 4 of document D9, as also submitted by the appellant, this does not indicate that this solution would be obvious to the skilled person.

The cited passages of document D2 do not suggest using fly's eye lens arrays for solving the above objective technical problem suggested by the appellant. Consequently, the subject-matter of claim 1 involves an inventive step in view of the combination of documents D9 and D2.

The same applies *mutatis mutandis* to the subject-matter of claim 14. Feature 14e3 is not disclosed in the embodiment shown in Figure 4 of document D9, and it is not obvious to the skilled person starting from document D9 and trying to solve the above objective technical problem suggested by the appellant in view of document D2.

## 6.2 *Document D1 as the closest prior art*

The appellant sets out that the subject-matter of claims 1 and 14 did not involve an inventive step in view of document D1. It followed from Figures 8 and 9, together with the general disclosure on pages 14 and 15 of document D1, that a grid of unmodulated lines (as shown in Figure 8) was to be formed with a grid spacing determined by the grid constant of the lens grid (see page 15, lines 14 and 15). The skilled person thus learned that they could form the line grid of Figure 8 in the same manner and thus with a periodicity not only corresponding to but being substantially equal to the distance between adjacent lenses in the diagonal direction (as in Figure 8).

As indicated above, the board is not convinced that the skilled person would consider the two periodicities "substantially matched" just because the periodicity of the (one-dimensional) array of elongate image elements is (substantially) equal to the distance between

adjacent lenses in the diagonal direction. Therefore, even if it was assumed that the course of action suggested by the appellant was obvious to the skilled person, this would not render the subject-matter of claims 1 and 14 obvious in view of document D1.

7. **Conclusions**

Since the requirements of the EPC are met for respondent's auxiliary request 1 on which the decision under appeal is based (corresponding to the appellant's main request in the appeal proceedings), the appeal had to be dismissed.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:



N. Schneider

P. Lanz

Decision electronically authenticated