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Datasheet for the decision of 6 May 2025

Case Number: T 0599/23 - 3.2.05

Application Number: 07829916.1

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IPC: B42D25/00, G02B5/18

Language of the proceedings: EN

Title of invention:
Display body and labeled article

Patent Proprietor:
Toppan Printing Co., Ltd.

Opponent:
Giesecke+Devrient Currency Technology GmbH

Relevant legal provisions:
EPC Art. 123(2)

Keyword:
Added subject-matter (yes)

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Boards of Appeal

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Case Number: T 0599/23 - 3.2.05

D E C I S I O N
of Technical Board of Appeal 3.2.05
of 6 May 2025

Appellant: (Opponent)	Giesecke+Devrient Currency Technology GmbH Prinzregentenstraße 159 81677 München (DE)
Representative:	Patentanwälte Geyer, Fehners & Partner mbB Perhamerstrasse 31 80687 München (DE)
Respondent: (Patent Proprietor)	Toppan Printing Co., Ltd. 5-1, 1-chome Taito Taito-ku, Tokyo 110-0016 (JP)
Representative:	TBK Bavariaring 4-6 80336 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 10 March 2023 concerning maintenance of the European Patent No. 2077459 in amended form.**

Composition of the Board:

Chairman	P. Lanz
Members:	O. Randl
	F. Blumer

Summary of Facts and Submissions

I. The opponent filed an appeal against the opposition division's decision on the version in which European patent No. 2 077 459 (the patent) can be maintained in amended form.

II. The opposition division was of the opinion that the patent proprietor's auxiliary request 2 satisfied the requirements of the EPC.

III. The oral proceedings before the board took place on 6 May 2025.

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

V. The respondent (patent proprietor) requested that the appeal be dismissed (main request) or that oral proceedings be held (auxiliary request 1).

Former auxiliary requests 2 to 32 were withdrawn at the end of the oral proceedings before the board.

VI. Claim 1 of the request which the opposition division found allowable reads (the feature references used by the board have been inserted in square brackets):

"1. [**1**] A display (10) comprising:
[**2**] a first interface section (12a) provided with a relief-type diffraction grating constituted by a plurality of grooves (14a);
[**3**] a second interface section (12b) constituted by a plurality of regions each including a plurality of

recesses or projections (14b) arranged one-dimensionally or two-dimensionally;
[**4**] a light transmission layer (11) with a main surface including the first and second interface sections (12a, 12b); and
[**5**] a reflection layer (13) covering the main surface of the light transmission layer, wherein
[**6**] one part of the plural regions and another part of the plural regions are different from each other in center-to-center distances of the plural recesses or projections,
[**7**] the minimum center-to-center distance of the plural grooves is equal to or larger than the minimum wavelength of the visible light,
[**8**] a distance between centers of the grooves is within a range of 0.5 µm to 2 µm, a depth of the grooves is within a range of 0.05 µm to 1 µm, and
[**9**] the center-to-center distance of the plural recesses or projections is smaller than the minimum wavelength of the visible light, and
[**12**] a depth of the plural recesses or a height of the plural projections is larger than the depth of the grooves,
characterized in that
[**10**] the first interface section is formed by arranging a plurality of first pixels, the plural first pixels including two or more pixels different from each other in at least one of spatial frequency, azimuth angle, and depth of the plural grooves, and ratio of an area of the diffraction grating to that of the first pixel, and [**11**] the second interface section is formed by arranging a plurality of second pixels, the plural second pixels including two or more pixels different from each other in at least shapes of the plural recesses or projections."

VII. The parties' arguments on whether the combination of features 6 and 11 complies with Article 123(2) EPC may be summarised as follows.

(i) Appellant (opponent)

Features 6 and 11 in combination stipulate that the second interface section be divided into pixels which have different centre-to-centre distances and different shapes. This combination is not disclosed in the original application. The original claims do not refer to it. None of the embodiments shows a second interface section whose pixels differ in the centre-to-centre distances and at the same time in the shapes. The embodiment of Fig. 7 shows variation in neither aspect. In the embodiment according to Fig. 20, the centre-to-centre distance is greater in the second region (pixels PX52 to PX56) than in the first region (pixels forming the number "9"). During the oral proceedings before the board, the appellant argued that Fig. 20, which is schematic, does not explicitly disclose feature 6. However, the shape of the projections does not vary. The opposition division's reasoning is unfounded. The first paragraph on page 21, the second paragraph on page 25, and the paragraph bridging pages 31 and 32 of the application as filed do not directly and unambiguously disclose any variation of the shape in combination with a variation of the centre-to-centre distance. The first paragraph on page 21 and the second paragraph on page 25 of the application as filed dis close, with reference to the embodiment of Fig. 7, that the pixels may differ "*in at least one of the shape, the depth or the height, the center-to-center distance, and the arrangement pattern of the recesses or projections*". In Fig. 7, there are no differences between the distances between the centres or between

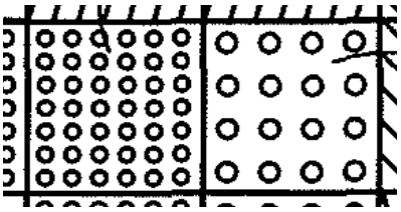
the shapes of the protrusions/recesses. To reach the claimed combination, the person skilled in the art would have had to select from the same list twice. The patent does not provide a reason why the skilled person should select exactly the claimed combination or what advantage this would have brought – especially not in combination with the embodiment of Fig. 20. In the paragraph bridging pages 31 and 32 of the application as filed, only the optical effect of the variation of the shape of the projections or recesses is explained. There is no connection with the centre-to-centre distance. The opposition division also referred to the embodiment of Fig. 13. However, in Fig. 13, only the size of the projections varies. Moreover, Fig. 13 shows a second interface section 12b and not the structure of individual pixels. The passage from page 34, line 24 to page 35, line 17 refers to Figs. 19A and 19B, which do not contain any pixelation. The paragraph bridging pages 34 and 35 explains that the structures of Figs. 19A and 19B can be employed for the embodiments of Figs. 17 and 18, which have no pixelation. Furthermore, the projections/recesses in Figs. 19A and 19B differ only in their centre-to-centre distance and not in their shape. Decision T 1374/07 found that selecting two components from a list is equivalent to selecting one component from each of two identical lists. In line with decision T 727/00, point 1 of the Reasons, the combination of one item from each of two lists of features, which was not supported by any indication in the application as originally filed, resulted in subject-matter which, although conceptually covered by the original application, was not disclosed in that individualised form. In accordance with T 1621/16, amendments based on an arbitrary multiple selection from lists generally constitute an extension when they are based on lists of non-converging alternatives.

Although these decisions belong to the technical field of chemistry, their application to other fields is warranted when the elements of the list have a common effect. There are complex interactions between the shapes, the depth or the height, the centre-to-centre distance and the arrangement pattern of the recesses or projections. The passage extending from page 31, line 23 to page 33, line 19 mentions these parameters but does not present them as being independent from each other. The two-list principle is therefore applicable to the selection from the list disclosed on page 21, lines 1 to 9, all the more as the alternatives are not convergent. Page 19, lines 14 to 18 and the paragraph bridging pages 31 and 32 explain the optical effect of varying the shape of the elevations/recesses. This effect is disclosed for a variation of the forward tapered shape and not for a variation of a general shape. The paragraph bridging pages 25 and 26 and the one on page 32, lines 3 to 18, explain the optical effects involved: the variation of the shape of the elevations or recesses determines the angle dependence, and the variation of their centre-to-centre distance determines the grey value. There being no common technical effect, the alternatives are non-converging alternatives.

(ii) Respondent (patent proprietor)

The opposition division's conclusion is correct. The combination of features 6 and 11 was part of the original claims. This can also be derived from the description in the "Best Mode for Carrying Out the Invention" section with reference to Figs. 1 and 2 (and 3 to 5). These embodiments refer to a display having a first and a second interface section. For the sake of explanation, the second interface section is formed of

uniformly arranged and shaped recesses or projections, but variations are mentioned on page 22, lines 10 to 12 and in the passage from page 32, line 3 to page 33, line 19. Embodiments are disclosed on page 34, lines 19 to 23 and in the passage from page 34, line 24 to page 35, line 4. The projections shown in Figs. 19A and 19B and Fig. 20 differ from each other in, among other things, their centre-to-centre distances (see page 35, lines 11 to 13) and their shapes. Fig. 20 clearly discloses a variation of the centre-to-centre distances between, say pixels PX42 and PX52 (see page 41, lines 8 to 11, in combination with page 21, lines 1 to 11). This figure is admittedly schematic, but the skilled person would have understood that the centre-to-centre distances of the recesses or projections vary. The chosen representation of the pixels provides more information than hatching could. The skilled person would have had to pick only one of the other parameters from the list given in the description. Consequently, the case law on multiple selections from lists is not applicable. The appellant's argument on lack of convergence is not relevant because, as is disclosed in the passage from page 31, line 23 to page 33, line 19, all the parameters contribute to the grey-scale image. The term "shape" of a recess/projection must not be unduly restricted. The combination of features 6 and 11 is not only supported by the embodiment of Fig. 20. Even if the projections illustrated in Figs. 19A and 19B were considered not to differ from each other in shape, the variation of shape is directly disclosed in page 39, lines 14 to 27, page 40, lines 25 to 27, and page 41, lines 3 to 11 of the original description.



Extract from Fig. 20
(pixels PX42 and PX52)

Reasons for the Decision

1. Main request: compliance with Article 123(2) EPC

1.1 The appellant raised several objections based on Article 123(2) EPC. Below, the board will address only one objection, which it considers well founded.

1.2 The appellant argues that the combination of features 6 and 11 has no basis in the application as filed. The opposition division considered this objection in section 14.1, on page 7 of the decision under appeal. It found the embodiment of Fig. 20 to disclose feature 6. It then referred to page 41, lines 8 to 11, of the application as filed according to which the display could be modified "in the same manner" as the display of Fig. 7. The opposition division then referred to three passages of the application as filed.

Page 21, lines 1 to 9, of the application as filed discloses that when the second interface section is formed, the pixels can be made to differ from each other "*in at least one of the shape, the depth or the height, the center-to-center distance, and the arrangement pattern of the recesses or projections*" (underlining by the board).

Page 25, lines 2 to 9, of the application as filed describes the embodiment of Fig. 7 and states that "*although the second interface section 12b is constituted by the pixels of one type, the second interface section 12b may be constituted by a plurality of types of pixels which are different from each other in at least one of the shapes, the depth or the height, the center-to-center distance, and the arrangement pattern of the recesses or projections 14b*" (underlining by the board).

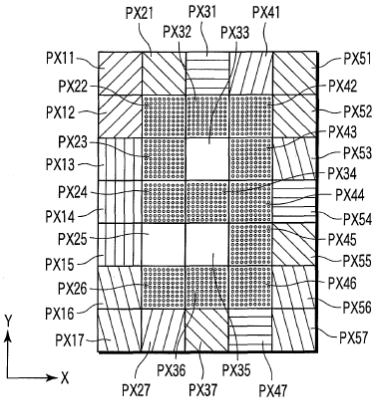


FIG.7

The paragraph bridging pages 31 and 32 of the application as filed explains that differences in shape can be used to display a grey-scale image.

According to the opposition division, the skilled person would have derived from these three passages:

> "*that there is a general teaching in the patent ... to not only vary the period of the recesses and projections ...from pixel to pixel but also to vary their shape ... from pixel to pixel in order to vary the image grey level. Figure 13 also shows an example combining variable period and shape variation for the recesses and projections.*" (Underlining in the original.)

1.3 The appellant contests that the passages quoted directly and unambiguously disclose the combination of features 6 and 11. The skilled person would have had to select from the same list twice to obtain the combination. There was no incentive for the skilled person

to select the specific combination of centre-to-centre distance and shape and no reason why the skilled person would have combined the features in the embodiment of Fig. 20. The appellant also criticises the opposition division's reference to Fig. 13 because this embodiment shows no variation of shape; only the size of the projections varies.

1.4 The application as filed undoubtedly contains a general teaching that the reflectance can be varied by providing that part of the pixels have recesses or projections that differ "*in at least one of the shape, the depth or the height, the centre-to-centre distance and the arrangement pattern*" (see page 21, lines 1 to 9, for the embodiment of Fig. 1 and page 25, lines 2 to 9, for the embodiment of Fig. 7). These passages explicitly teach that more than one difference can be provided.

It can be easily shown that there are 15 ways to select at least one element from a list of four elements:

$$\binom{4}{1}+\binom{4}{2}+\binom{4}{3}+\binom{4}{4}=4+6+4+1=15$$

Consequently, the combination of parameters that is claimed (i.e. centre-to-centre distance and shape) is one among 15 possible combinations encompassed by the disclosure of page 21, lines 1 to 9, and page 25, lines 2 to 9.

Moreover, the original application does not contain any clear-cut pointer towards the combination chosen.

- Fig. 7 shows an embodiment with a plurality of pixels arranged in a matrix form (see page 22,

lines 10 to 12), but there is no variation of pixels.

- Fig. 13 only discloses a pattern that can be employed (see page 5, lines 21 to 24).
- Figs. 19A and 19B show examples of structures that can be employed for two regions of the second interface section of the display shown in Figs. 17 and 18 (see page 6, lines 15 to 22), which appears not to comprise pixels (see the paragraph bridging pages 34 and 35). Differences in the centre-to-centre distances are disclosed, but the recesses or protections all appear to have the same (forward tapered) shape (see page 35, lines 8 to 13).
- Fig. 20 illustrates an embodiment in which the pixels are varied, as a comparison of, e.g. pixels PX42 and PX51 shows:

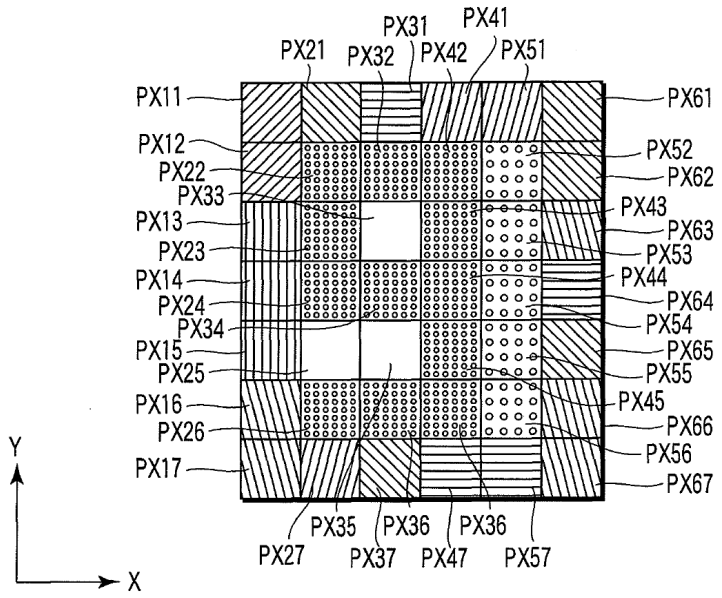


FIG.20

However, the nature of the difference is not disclosed in the corresponding part of the description. It is possible that the circles drawn in these pixels are meant to correspond to

protrusions or recesses - in which case, a variation of the distances between the centres would be disclosed - but this is not certain, nor is there an unambiguous disclosure of a change of shape (see page 39, line 14 to page 41, line 11).

- From page 31, line 23 to page 33, line 19, the optical effect of the shape of the recesses or projections (page 31, line 23 to page 32, line 2), their centre-to-centre distance (page 32, lines 3 to 18), their depth or height (page 32, line 19 to page 33, line 3) and size ratios (page 33, lines 4 to 19) are discussed. Combinations of these differences are not mentioned.

Consequently, it is not apparent to the board that the skilled person reading the application as filed would have considered it to contain any teaching according to which a combination of features 6 and 11 is envisaged, let alone desired.

It follows that the claimed combination of features has no direct and unambiguous basis in the application as originally filed.

Consequently, claim 1 fails to comply with the requirements of Article 123(2) EPC, and the patent cannot be maintained on the basis of the main request. Thus, the decision under appeal must be set aside.

2. Auxiliary requests

All the auxiliary requests for the maintenance of the patent in amended form were withdrawn. Therefore, the finding that the respondent's main request is unallowable leads to the conclusion that the patent must be revoked.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

N. Schneider P. Lanz

Decision electronically authenticated