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**Datasheet for the decision  
of 22 November 2022**

**Case Number:** T 1922/19 - 3.4.03  
**Application Number:** 14860719.5  
**Publication Number:** 3070705  
**IPC:** G09G3/36, G02F1/133, G09G3/20,  
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**Language of the proceedings:** EN

**Title of invention:**  
DISPLAY DEVICE AND DISPLAY METHOD

**Applicant:**  
Eizo Nanao Corporation

**Relevant legal provisions:**  
EPC Art. 52(1), 54(1), 54(2), 56  
RPBA Art. 12(4)  
RPBA 2020 Art. 13(2), 25(2)

**Keyword:**  
Novelty - main and third auxiliary requests (no)  
Inventive step - seventh and eighth auxiliary requests - (no)  
Late-filed first, second, fourth and fifth auxiliary requests  
- admitted (no)  
Examination procedure - sixth auxiliary request - correct  
exercise of discretion (yes)  
Remittal - (no)  
Reimbursement of appeal fee - (no)



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Case Number: T 1922/19 - 3.4.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.4.03**  
**of 22 November 2022**

**Appellant:** Eizo Nanao Corporation  
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**Representative:** Isarpatent  
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**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 15 February  
2019 refusing European patent application No.  
14860719.5 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman** M. Stenger  
**Members:** M. Ley  
K. Kerber-Zubrzycka

## Summary of Facts and Submissions

I. The appeal is against the decision of the examining division to refuse European patent application No. 14 860 719 pursuant to Article 97(2) EPC.

II. The examining division cited the following document:

D3 US 2004/041760 A1

and held that the subject-matter of claims 1 and 4 according to the main request lacked novelty (Articles 52(1), 54(1) and (2) EPC) over the disclosure of D3 or did not involve an inventive step (Article 56 EPC) over the combination of the third embodiment of D3 with first and second embodiments of D3.

The examining division further held that the subject-matter of claims 1 and 4 of the first auxiliary request did not involve an inventive step (Article 56 EPC) over the combination of the third embodiment of D3 with first and second embodiments of D3.

The examining division used its discretion under Rule 116 and Rule 137(3) EPC not to admit late-filed second auxiliary request into the proceedings, as the subject-matter of claims 1 and 4 of said auxiliary request *prima facie* did not involve an inventive step (Article 56 EPC).

III. The appellant requests that the decision be set aside and that the case be remitted to the examining division "for revision of its decision" or that a European patent be granted on the basis of a main request or of one of first to eighth auxiliary requests.

The main request, the third and sixth auxiliary requests correspond to the requests underlying the contested decision and were filed with the statement setting out the grounds of appeal.

The seventh and eighth auxiliary requests were filed (as third and fourth auxiliary requests) with the statement setting out the grounds of appeal and the first, second, fourth and fifth auxiliary requests were filed with the appellant's letter dated 20 October 2022.

The appellant also requests that the appeal fee be refunded.

IV. Claim 1 according to the **main** request has the following wording:

*1. A display device that comprises a display panel and a backlight for the display panel, the display device comprising:*

*1.1 control means configured to output a control signal for controlling illumination and extinction of the backlight, to the backlight; and*

*1.2 update means configured to update at least a first sub-frame and a second sub-frame in each predetermined period in order to change one image displayed on a screen of the display panel, wherein*

*1.3 the control means outputs a control signal for controlling the backlight so that the backlight starts to illuminate at some point in time from the start of update of the second sub-frame in one period until the finish of the update and ends illumination at the time point when the update means starts to update the first sub-frame in a period subsequent to the one period or after the time point; wherein*

1.41 the first sub-frame is a sub-frame which comes first in each predetermined period, and

1.42 the second sub-frame is a sub-frame which comes last in each predetermined period; and wherein

1.5 the control means outputs a control signal for controlling the backlight so that the backlight ends illumination after a fixed time has elapsed since the first sub-frame update start time point; wherein

1.6 the update means updates a plurality of sub-frames comprising the first sub-frame and the second sub-frame in the respective predetermined periods,

when  $T_g > 0$ , the control means outputs a control signal so that  $T_g > T_e$ ,

$T_g$  represents a time represented by a formula  $\{T_d - [T_c - (T_a + T_b)]\}$ ,

$T_a$  represents a time period from a start time point ( $t_0$ ) [sic] of the response of a first pixel line of the display panel to a start time point ( $t_1$ ) of the response of a last pixel line of the display panel,

$T_b$  represents a time for a change in a gradation value which changes from a predetermined gradation value of the display panel to another gradation value of the display panel,

$T_c$  represents the predetermined period,

$T_d$  represents a time from the time point when the backlight starts to illuminate after the update means starts to update the second sub-frame in one period to the time point when the update means starts to update the first sub-frame in a period subsequent to the one period, and

$T_e$  represents a time from the time point when the update means starts to update the first sub-frame in a period subsequent to the one period to the time point when the backlight ends illumination.

Claim 1 according to the **first** auxiliary request corresponds to claim 1 according to the main request with the following additional feature: *wherein  $T_b$  ends ( $t_3$ ) [sic] within the second sub-frame (A2).*

Claim 1 according to the **second** auxiliary request corresponds to claim 1 according to the main request with the following additional feature: *wherein  $T_b$  ends between the start ( $t_2$ ) of the update of the second subframe and the finish ( $t_3$ ) of the update of the second sub-frame.*

Claim 1 according to **third** auxiliary request has the following wording (additions and deletions with respect to claim 1 of the main request underlined and in strike-through, respectively, by the board):

1. A display device that comprises a display panel and a backlight for the display panel, the display device comprising:

1.1 control means configured to output a control signal for controlling illumination and extinction of the backlight, to the backlight; and

1.2 update means configured to update at least a first sub-frame (A1) and a second sub-frame (A2) in each predetermined period (T) in order to change one image displayed on a screen of the display panel, wherein, in a present period (T), a sub-frame update start time point of the first sub-frame (A1) is  $t_0$ , a sub-frame update end time point of the first sub-frame (A1) is  $t_1$ , a sub-frame update start time point of the second sub-frame (A2) is  $t_2$ , a sub-frame update end time point of the second sub-frame (A2) is  $t_3$  and a sub-frame update start time point of a first sub-frame (B1) in a following predetermined period (T) is  $t_4$ , and wherein the sub-frames (A1, A2, B1) are separated by a time interval  $t_2-t_1$  and  $t_3-t_4$ , respectively, and wherein

1.3 the control means outputs a control signal for controlling the backlight so that the backlight starts to illuminate at some point in time from the start of update of the second sub-frame in one period until the finish of the update and ends illumination at the time point when the update means starts to update the first sub-frame in a period subsequent to the one period or after the time point; wherein

1.41 the first sub-frame is a sub-frame which comes first in each predetermined period, and

1.42 the second sub-frame is a sub-frame which comes last in each predetermined period; and

wherein

1.5 the control means outputs a control signal for controlling the backlight so that the backlight ends illumination after a fixed time has elapsed since the first sub-frame update start time point; wherein

1.6 the update means updates a plurality of sub-frames comprising the first sub-frame and the second sub-frame in the respective predetermined periods,

when  $T_g > 0$ , the control means outputs a control signal so that  $T_g > T_e$ ,

$T_g$  represents a time represented by a formula  $\{T_d - [T_c - (T_a + T_b)]\}$ ,

$T_a$  represents a time period from a start time point  $(t_0)$  of the response of a first pixel line of the display panel to a start time point  $(t_1)$  of the response of a last pixel line of the display panel, wherein the start time point of the first pixel line is  $t_0$  and the start time point of the response of the last pixel line is  $t_1$ ;

$T_b$  represents a time for a change in a gradation value which changes from a predetermined gradation value of the display panel to another gradation value of the display panel, wherein  $T_b$  is the time interval  $t_6 - t_1$

from  $t_1$  to a time point  $t_6$  when a response of the last pixel line is finished

$T_c$  represents the predetermined period  $(T)$  with  $T_c > (T_a + T_b)$ ,

$T_d$  represents a time interval  $t_4 - t_5$  from the time point  $t_5$  when the backlight starts to illuminate after the update means starts to update the second sub-frame in one period to the time point  $t_4$  when the update means starts to update the first sub-frame in a period subsequent to the one period, wherein  $t_5 < t_6$ ,

$T_e$  represents a time interval from the time point  $t_4$  when the update means starts to update the first sub-frame in a period subsequent to the one period to the time point when the backlight ends illumination; and wherein  $T_g$  represents the time interval  $t_6 - t_5$ .

Claim 1 according to the **fourth** auxiliary request corresponds to claim 1 according to the third auxiliary request with the following additional feature: *wherein the time point  $t_6$  is before the sub-frame update end time point  $(t_3)$  of the second sub-frame (A2).*

Claim 1 according to the **fifth** auxiliary request corresponds to claim 1 according to the third auxiliary request with the following additional feature: *wherein the time point  $t_6$  is between the sub-frame update start time point  $(t_2)$  of the second sub-frame (A2) and the sub-frame update end time point  $(t_3)$  of the second sub-frame (A2).*

Claim 1 according to the **sixth** auxiliary request corresponds to claim 1 according to the third auxiliary request, wherein the following feature is added before feature 1.3:



*1.21 the update means is adapted to write the same data (A) twice by updating the two sub-frames in the predetermined period (T);*

Claim 1 according to the **seventh** auxiliary request corresponds to claim 1 according to the sixth auxiliary request, wherein feature 1.2 is amended as follows (additions and deletions with respect to claim 1 of the third auxiliary request underlined and in strike-through, respectively, by the board):

*1.2 update means configured to update at least a first sub-frame (A1) and a second sub-frame (A2) in each predetermined period (T) in order to change one image displayed on a screen of the display panel, wherein, in a present period (T), a sub-frame update start time point of the first sub-frame (A1) is  $t_0$ , a sub-frame update end time point of the first sub-frame (A1) is  $t_1$ , a sub-frame update start time point of the second sub-frame (A2) is  $t_2$ , a sub-frame update end time point of the second sub-frame (A2) is  $t_3$  and a sub-frame update start time point of a first sub-frame (B1) in a following predetermined period (T) is  $t_4$ , and wherein the [sic] in the present period the first and second sub-frames (A1, A2, ~~B1~~) each of a period of  $T/2$  are separated by a time interval  $t_2-t_1$  and the second subframe (A1) [sic] of the present period T is separated by a time interval  $t_3-t_4$  from the first subframe (B1) in the next period, respectively, and wherein*

Claim 1 according to the **eighth** auxiliary request corresponds to claim 1 according to the seventh auxiliary request, with the additional specification wherein  $t_6 < t_3$ .

V. The appellant's arguments can be summarized as follows:

- Neither figure 9 nor figure 10 of D3 disclosed or rendered obvious the subject-matter of the independent claims. The embodiments of figures 9 and 10 of D3 could not be combined.
- The first, second, fourth and fifth auxiliary requests should be admitted into the appeal proceedings as they were filed as a reaction on the board's preliminary opinion provided in its communication dated 7 June 2022.
- The sixth auxiliary request should have been admitted by the examining division and, thus, should be admitted into the appeal proceedings and considered by the board.

### **Reasons for the Decision**

1. The appeal is admissible.
2. The invention concerns a transmission type display such as a liquid crystal display (LCD) or a micro-electro-mechanical system (MEMS) display including a backlight disposed on the back of the display panel.

Blinking backlight control is used, which *involves blinking a backlight in synchronization with a vertical synchronization signal when the field of a video signal on the display panel ends and preventing the display of images in the backlight extinction period to reduce overlaps between images, see paragraph [0003] of the application.*

In a transmission type display such as an LCD, the time required for the liquid crystal state to make a transition from a transparent ("white") state to a non-

transparent ("black") state is referred to as a response time  $T_b$ , see e.g. paragraphs [0013], [0035], [0039] or [0056] of the application.

The invention addresses two unwanted phenomena, namely "ghost" and "leading edge".

"Ghost" occurs when the backlight starts to illuminate before the liquid crystal state of the previous frame makes a complete transition to the liquid crystal state of the current frame. The liquid crystal state of the previous frame then reflects on the display image, see e.g. paragraphs [0005], [0014] and [0032] of the application. Figures 4 to 7 and paragraphs [0033] to [0042] of the application provide explanations about "ghost".

"Leading edge" occurs when the backlight illumination end time point is delayed with respect to a vertical synchronization signal and the period in which the current frame is illuminated by the backlight overlaps the period in which the liquid crystal state of the current frame is being changed to the liquid crystal state of the subsequent frame. The liquid crystal state of the subsequent frame then reflects on the display image, see paragraphs [0005] and [0043] of the application. "Leading edge" is further explained in figures 8 and 9 and paragraphs [0044] to [0046] of the application.

According to the application, the undesired effects of "ghosting" and "leading edge" can be reduced by using the specific operation according to claim 1 of the main request (see paragraphs [0047] to [0060] and figures 10 to 12 of the application).

**Main request**

3. Novelty - Article 52(1), 54(1) and (2) EPC

3.1 The appellant argued that figure 8 and paragraphs [0108], [0109] of D3 showed a two-frame drive sequence with each frame not being divided into further sub-frames. Only the "second write" procedure ("WRITE DATA 2") was divided into sub-frames of "opposite polarities". As they didn't come first and last in a period, the two WRITE DATA operations could be read on features 1.41 and 1.42 of claim 1. With respect to figure 9 of D3, the "second write" ("WRITE DATA 2") was not provided with sub-frames, see paragraph [0110].

Moreover, figures 8 and 9 did not disclose the formula of feature 1.6, see also the calculations made on page 14 of the statement setting out the grounds of appeal using annotated figures on pages 12 and 13. D3 did not define when the last pixel line ( $R_n$ ) finished changing so that it could not be defined where  $t_6$  exactly was. It seemed that  $t_6 > t_3$  in D3 (contrary to what was implicit to a two sub-frame scenario) so that the claimed relation between  $T_g$  and  $T_e$  could not be established. The formula according to feature 1.6 only applied "to a two-sub-frame-scenario in which the entire period was divided into two sub-frames of equal length separated by a holding time".

3.2 The board shares the examining division's view that claim 1 according to the main request lacks novelty over D3. The reasons are the following:

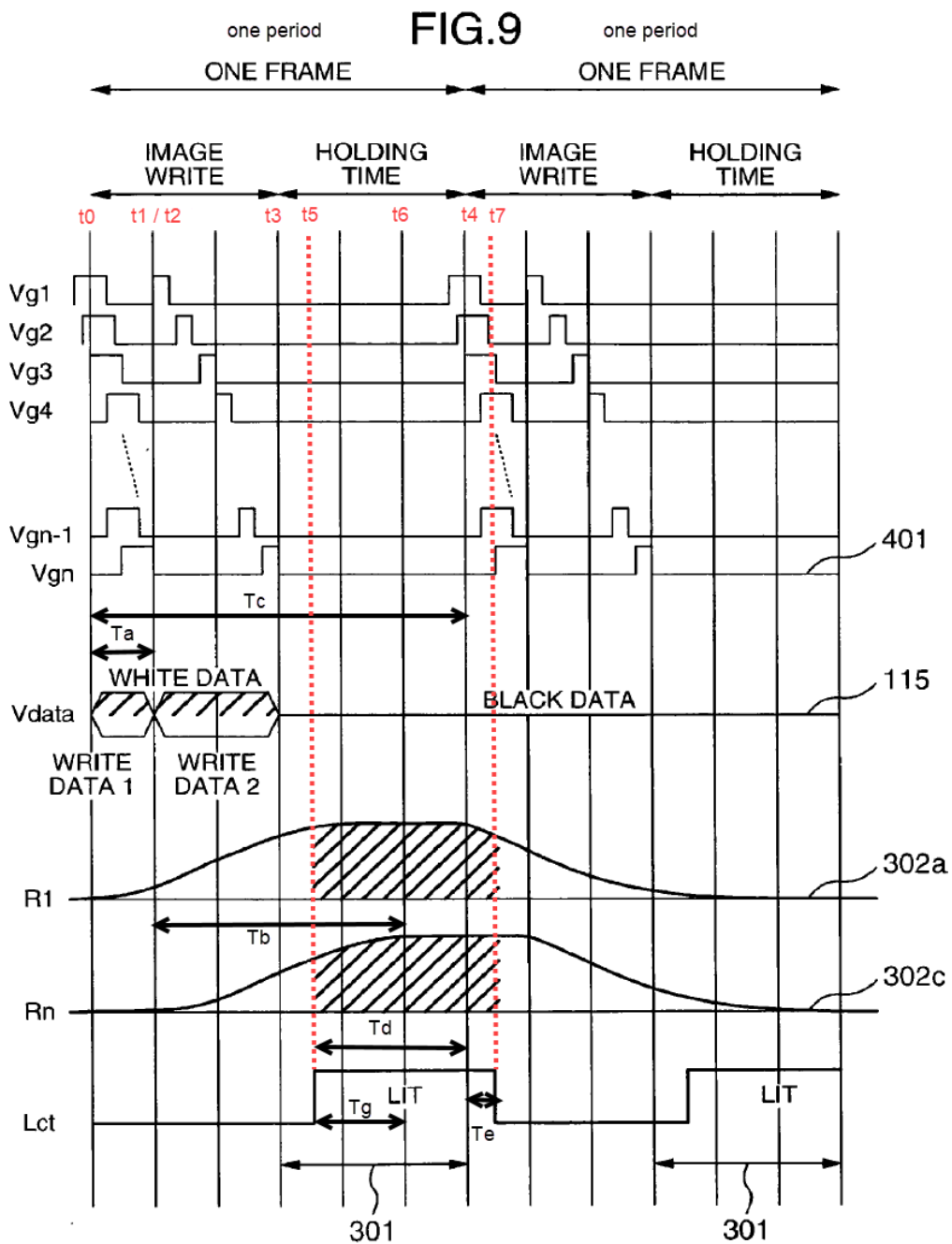
3.2.1 According to paragraphs [0018], [0030] and [0031], figures 5, 6 and 11 of the application, each frame comprises two or more sub-frames, wherein each row of

the display panel is consecutively selected (from the first to the last line, see e.g. paragraphs [0035], [0039], [0045] and [0056] of the application) and image data is written in each sub-frame. Image data (A', A1, B1) written during a first sub-frame might be different from the image data (A2, B2) written during a second sub-frame, see figure 3 of the application. A frame might also have sub-parts without any frame update (see figure 11 of the application, first sub-frame from t0 to t1 without any update from t1 to t2, second sub-frame from t2 to t3 without any update from t3 to t4, see also paragraphs [0034], [0044], [0048] and [0055] of the application). In other words, a frame might possibly contain "holding time". The wording of claim 1 according to the main request does not require that the first and second sub-frames have the same time length. The wording of claim 1 does not exclude that a subframe is further divided into e.g. two sub-parts, wherein in each sub-part image data is written.

Turning now to document D3, figures 8 and 9 disclose that during the operations "WRITE DATA 1" and "WRITE DATA 2" each row of the display panel is selected by applying a voltage (Vg1, ..., Vgn) to the respective transistor gates (see D3, figure 2). Image data is then written by applying the desired voltage to the respective drain lines (Vd1, ..., Vd4, ...) by data driver 107, see also paragraphs [0108] to [0110] in combination with paragraphs [0089] to [0091], "Furthermore, the image data write period is divided into a first write for writing a rough image by write data 1 into all the pixels and a second write for rewriting at least some of the pixels by write data 2 so as to realize a high-resolution image display.". Thus, the frame shown in figure 9 of D3 is divided into two sub-frames within the meaning of claim 1: the first

sub-frame corresponds to the "WRITE IMAGE 1" operation and the second sub-frame includes the "WRITE IMAGE 2" operation. The "Holding time" is not excluded by the wording of claim 1 as set out above. A similar division can be made for the subsequent frame in figure 9 of D3.

3.2.2 In consideration of section 3.2.1 above, the board is of the view that figure 9 can be annotated as follows:



From a comparison with the appellant's annotated figure 9 (see the statement setting out the grounds of appeal, page 12), the board shares the appellant's view on time periods  $T_a$  ( $t_0$  to  $t_1$ ),  $T_c$  ( $t_0$  to  $t_4$ ),  $T_e$  (from  $t_4$  to  $t_7$ ) and  $T_d$  ( $t_5$  to  $t_4$ ). The board also shares the appellant's view that  $T_b$  starts at  $t_1$  (which is close to  $t_2$  in figure 9 of D3), because this is the start time point of the response of a last pixel line ( $R_n$ ). The skilled person would understand that the second sub-frame ("WRITE DATA 2") will not immediately follow the first sub-frame ("WRITE DATA 1"), but there will be a short time period  $t_2 - t_1$  close to, but not identical to zero.

Regarding  $t_6$  and thus  $T_b$  ( $t_6-t_1$ ), claim 1 defines that  $T_b$  represents a time for a change in a gradation value which changes from a predetermined gradation value of the display panel to another gradation value of the display panel.  $T_b$  is thus the time interval  $t_6-t_1$  from  $t_1$  to a time point  $t_6$  when a response of the last pixel line is finished, see also claim 1 according to the third auxiliary request.

Figure 9 of D3 explicitly shows the response  $R_n$  of a pixel of the last pixel line starting at  $t_1$ , i.e. immediately after the update of the first sub-frame ("WRITE DATA 1"). The response (from "white" to "black" or "black" to "white") is finished at  $t_6$  as indicated in the annotated figure 9 above. The response is "finished" when it takes its highest value, see also figures 5, 6 and 11 and paragraphs [0035] and [0039] of the present application.

Thus, in the example of figure 9 of D3,  $T_a \approx 1$  unit,  $T_b \approx 4$  units,  $T_c \approx 6$  units,  $T_d \approx 2.5$  units,  $T_e \approx 0.5$  unit.

$T_g$  is thus  $2.5 - [6 - (1 + 4)] \approx 1,5$  units  $> T_e$ . As can also be seen on the annotated figure 9 above,  $T_g \approx 1.5$  units. It should be noted that the formula of feature 1.6 is the definition of  $T_g$  and not a condition that  $T_g$  has to fulfil; claim 1 only requires  $T_g > T_e$ .

The board notes that claim 1 does not require that the illumination starts during the second sub-frame (i.e. between  $t_2$  and  $t_3$ ). The appellant's argument that claim 1 of the main request implicitly required  $t_6 < t_3$  is not accepted, because the wording of claim 1 does not require that time  $T_b$  ends at time point  $t_6$  within the second sub-frame (i.e. between  $t_2$  and  $t_3$ ).

- 3.2.3 In other words, using the wording of claim 1 according to the main request, D3 discloses
1. A display device (figure 4, [0001], "liquid crystal display") that comprises a display panel (figure 2, [0081], "display unit") and a backlight (figure 4, [0099], "light source 108") for the display panel, the display device comprising:
    - 1.1 control means (figure 4, "timing controller 104") configured to output a control signal ([0099], 117) for controlling illumination and extinction of the backlight (108), to the backlight ([0099], "The liquid crystal display unit includes a periodically switching light source 108 and its flashing is controlled by the control signal 117 (Lct) of the light source input from the timing controller 104."); and
    - 1.2 update means (figure 4, [0099], "drain driver 107") configured to update at least a first sub-frame (figures 5, 7 to 9, "WRITE DATS 1", from  $t_0$  to  $t_1/t_2$  in annotated figure 9) and a second sub-frame ("WRITE DATA 2", from  $t_1/t_2$  to  $t_3$  in annotated figure 9) in each predetermined period ("one frame", from  $t_0$  to  $t_4$  in annotated figure 9) in order to change one image



displayed on a screen of the display panel ([0089], [0107] to [0110], figures 8 and 9), wherein

1.3 the control means (104) outputs a control signal (Lct) for controlling the backlight (108) so that the backlight (108) starts to illuminate at some point in time (figures 8 and 9, "LIT" when Lct is "high"; t5 in the annotated figure 9) from the start of update of the second sub-frame (t1/t2 in annotated figure 9) in one period until the finish of the update (i.e. after the response of the last line Rn is finished) and ends illumination at the time point (t7 in annotated figure 9) when the update means starts to update the first sub-frame in a period subsequent to the one period or after the time point (figures 8 and 9); wherein

1.4.1 the first sub-frame is a sub-frame which comes first in each predetermined period (figures 8 and 9), and

1.4.2 the second sub-frame is a sub-frame which comes last in each predetermined period (figures 8 and 9); and wherein

1.5 the control means (104) outputs a control signal (Lct) for controlling the backlight (108) so that the backlight (108) ends illumination (figures 8 and 9, "LIT") after a fixed time (Te in annotated figure 9) has elapsed since the first sub-frame update start time point (figures 8, 9, [0110], t4 in annotated figure 9); wherein

1.6 the update means updates a plurality of sub-frames comprising the first sub-frame and the second sub-frame in the respective predetermined periods (figures 8 and 9),

when  $T_g > 0$  (1.5 units in annotated figure 9), the control means outputs a control signal so that  $T_g > T_e$ ,  $T_g$  represents a time represented by a formula  $\{T_d - [T_c - (T_a + T_b)]\}$ ,

Ta represents a time period from a start time point (t0 in annotated figure 9) of the response (R1) of a first pixel line of the display panel to a start time point (t1/t2 in annotated figure 9) of the response (Rn) of a last pixel line of the display panel (figures 8 and 9), Tb represents a time for a change in a gradation value which changes from a predetermined gradation value of the display panel to another gradation value of the display panel (see section 3.2.2 above), Tc represents the predetermined period ("one frame"), Td represents a time from the time point (t5 in annotated figure 9) when the backlight starts to illuminate after the update means starts to update the second sub-frame (t2 in annotated figure 2) in one period to the time point (t4 in annotated figure 9) when the update means starts to update the first sub-frame in a period subsequent to the one period (figure 9), and Te represents a time (0.5 units in figure 9) from the time point (t4 in annotated figure 9) when the update means starts to update the first sub-frame in a period subsequent to the one period to the time point (t7 in annotated figure 9) when the backlight ends illumination.

Therefore, the subject-matter of claim 1 according to the main request lacks novelty (Articles 52(1), 54(1) and (2) EPC) over the second embodiment of D3 as shown in figures 8 and 9 and described in paragraphs [0105] to [0116].

For the same reasons, *mutatis mutandis*, the subject-matter of method claim 4 according to the main request lacks novelty.

### **First and second auxiliary requests**

4. Admission- Article 13(2) RPBA 2020

4.1 The first and second auxiliary requests were filed with letter dated 20 October 2022, which is after the notification of the board's summons to oral proceedings dated 28 February 2022.

According to Article 13(2) RPBA 2020, any amendment to a party's appeal case made after notification of a summons to oral proceedings shall, in principle, not be taken into account unless there are exceptional circumstances, which have been justified with cogent reasons by the party concerned.

4.2 The appellant argued that the late filed requests essentially addressed the issue raised by the board in the paragraph bridging pages 6 and 7 of the board's communication ("claim 1 does not require that time  $T_b$  ends at time point  $t_6$  within the second subframe (i.e. between  $t_2$  and  $t_3$ )."). The aforementioned technical teaching was "important to avoid ghost or afterimage phenomena" and was "definitely novel" over figures 9 and 10 of D3.

Since the new claims immediately remedied all the novelty and inventive step objections, they should be admitted. The amendments were "clearly in response to the issues raised by the board in the Summons Opinion" and the amendments were "simple and easy to understand" since they directly addressed "an issue raised in detail in the Summons Opinion". Adding features to claim 1 according to the second auxiliary request, in particular, was a reaction to the objections raised

against the first auxiliary request filed with the statement setting out the grounds of appeal.

- 4.3 In its communication pursuant to Article 15(1) RPBA 2020, the board informed the appellant about its provisional view that the subject-matter of claims 1 and 4 according to the main request and to the first auxiliary then on file lacked novelty over the embodiment of figures 8 and 9 of D3 and that the subject-matter of claims 1 and 4 according to the first auxiliary request then on file did not involve an inventive step over the embodiment of figure 10 of D3 in view of figure 9 of D3.

These objections, however, were not raised for the first time by the board, but correspond to the objections raised by the examining division in the impugned decision. The passage bridging pages 6 and 7 of the board's communication merely addressed the appellant's allegation that the feature  $t_6 < t_3$  (or  $t_2 < t_6 < t_3$ ) was implicitly claimed, see the statement setting out the grounds of appeal, page 14, penultimate and last paragraph, page 15, second paragraph or page 17, second paragraph.

The appellant submitted that it was important for solving the technical problem of reducing "ghost" and "avoiding afterimages" that  $T_b$  ends between the start ( $t_2$ ) of the update of the second subframe and the finish ( $t_3$ ) of the update of the second sub-frame, i.e. that it ends within the second sub-frame (A2). These allegedly important features essentially correspond to the amendments made to claim 1 of the first and second auxiliary requests. In this case, however, the appellant should have filed the claims according to the first and second auxiliary requests at the earliest

possible instance in the appeal proceedings, i.e. with the statement setting out the grounds of appeal, and should not have waited until shortly before the oral proceedings.

The board is thus not convinced that there are exceptional circumstances, which have been justified with cogent reasons by the appellant.

The first and second auxiliary requests are therefore not admitted into the appeal proceedings (Article 13(2) RPBA 2020).

### **Third auxiliary request**

#### 5. Novelty - Article 52(1), 54(1) and (2)

In the wording of claim 1 of the third auxiliary request, D3 further discloses (see figure 9 and the related description of D3 and the annotations made by the board to figure 9 above) that:

- in a present period (figure 9, "one frame"), a sub-frame update start time point of the first sub-frame is  $t_0$  (see annotated figure 9), a sub-frame update end time point of the first sub-frame is  $t_1$  (see annotated figure 9), a sub-frame update start time point of the second sub-frame is  $t_2$  (see annotated figure 9), a sub-frame update end time point of the second sub-frame is  $t_3$  (see annotated figure 9) and a sub-frame update start time point of a first sub-frame in a following predetermined period is  $t_4$  (see annotated figure 9), and wherein the sub-frames are separated by a time interval  $t_2-t_1$  and  $t_3-t_4$ , respectively;

- the start time point of the first pixel line (R1) is  $t_0$  and the start time point of the response (Rn) of the last pixel line is  $t_1$  (see annotated figure 9);
- $T_b$  is the time interval  $t_6 - t_1$  from  $t_1$  to a time point  $t_6$  when a response of the last pixel line is finished (see section 3.2.2 above);
- $T_c > T_a + T_b$  (see annotated figure 9, the predetermined period is "one frame");
- $T_d$  represents a time interval  $t_4 - t_5$  from the time point  $t_5$  when the backlight starts to illuminate after the update means starts to update the second sub-frame in one period to the time point  $t_4$  when the update means starts to update the first sub-frame in a period subsequent to the one period, wherein  $t_5 < t_6$  (see annotated figure 9), and
- $T_e$  represents a time interval from the time point  $t_4$  when the update means starts to update the first sub-frame in a period subsequent to the one period to the time point when the backlight ends illumination (see annotated figure 9); and
- $T_g$  represents the time interval  $t_6 - t_5$  (see annotated figure 9).

Hence, the subject-matter of claim 1 according to the third auxiliary request lacks novelty (Articles 52(1), 54(1) and (2) EPC) over the second embodiment of D3 shown in figure 9. The board has the same view on the corresponding method claim 4, *mutatis mutandis*.

#### **Fourth and fifth auxiliary requests**

6. Admission - Article 13(2) RPBA 2020

The fourth and fifth auxiliary requests were filed with the appellant's letter dated 20 October 2022.

The amendments made to both requests concern the feature t3<t6 and thus substantively correspond to the amendments made to the first and second auxiliary requests. The appellant justified their late filing by the reasons already given for the first and second auxiliary requests.

For the reasons provided in section 4.3 above, the board is not convinced that there are exceptional circumstances, which have been justified with cogent reasons by the appellant.

The fourth and fifth auxiliary requests are therefore not admitted into the appeal proceedings (Article 13(2) RPBA 2020).

#### **Sixth auxiliary request**

7. Admission - Articles 12(4) RPBA 2007, 25(2) RPBA 2020

7.1 According to Article 12(4) RPBA 2007, which is to be applied in the present case according to Article 25(2) RPBA 2020, the board has the power to hold inadmissible facts, evidence or requests which could have been presented or were not admitted in the first instance proceedings.

7.2 The sixth auxiliary request was filed as second auxiliary request during the oral proceedings before the examining division.

The appellant only argued that the examining division should have admitted and discussed the sixth auxiliary request.

7.3 The examining division used their discretion under Rule 116 and 137(3) EPC not to admit the late-filed second auxiliary request, because its claimed subject-matter *prima facie* did not involve an inventive step (Article 56 EPC) for the reasons given for the first auxiliary request; the additional feature being known from D3.

Once an examining division has exercised such discretion, a board of appeal should only overrule it if it comes to the conclusion either that the examining division did not exercise its discretion in accordance with the right principles or that it exercised its discretion in an unreasonable way and had thus exceeded the proper limit of its discretion (see G 7/93, reasons 2.6).

7.4 In the present case, an inventive activity of the claimed subject-matter of the first auxiliary request then on file with respect to the third embodiment shown in figure 10 of D3 was discussed during oral proceedings. The appellant had the opportunity to provide its arguments why the claimed subject-matter according to the second auxiliary request did involve an inventive step. The examining division came to the conclusion that *prima facie* an inventive step could not be acknowledged. The board shares this view.

7.5 Hence, the examining division exercised its discretion in a correct way. The board sees no reasons to overturn the decision not to admit the sixth auxiliary request into the appeal proceedings.

The sixth auxiliary request is therefore not admitted into the appeal proceedings (Article 12(4) RPBA 2007, Article 25(2) RPBA 2020).



**Seventh and eight auxiliary requests - Admission**

8. The seventh and eight auxiliary requests were filed as third and fourth auxiliary requests with the statement setting out the grounds of appeal.

In the annex to the summons to attend oral proceedings, the examining division focused on the embodiment of figure 10 of D3. Only during the oral proceedings, the discussion turned to the embodiments shown in figures 8 and 9, see e.g. page 3 of the minutes, first paragraph.

Although it would have been preferable to file said third and fourth auxiliary requests already during the first instance oral proceedings, the board accepts that they can be considered as a reply to arguments provided during the oral proceedings and in the impugned decision.

Therefore, the board decided to consider both the seventh and eighth auxiliary requests in the appeal proceedings.

**Seventh auxiliary request**

9. Inventive step - Article 56 EPC

- 9.1 According to the appellant, the embodiment shown in figure 10 of D3 was "the actual two-sub-frame-scenario with two sub-frames A1, A2 comparable to the scenario in Figure 11 of the present application", see page 16 of the statement setting out the grounds of appeal.

It was not clear at all how the timings which were shown only for the two succeeding write periods in figures 8 and 9 of D3 could be "equalised or

transferred to a scenario which has two succeeding sub-frames separated by a holding time". According to the appellant, figure 9 of D3 showed one single sub-frame. An embodiment only having a single sub-frame could give no teaching what to do when two sub-frames succeeded each other with a holding time in between, namely in a scenario where the problem of ghost phenomena occurred when the last line finished changing (at t6) before (at t3) the end of the second sub-frame writing.

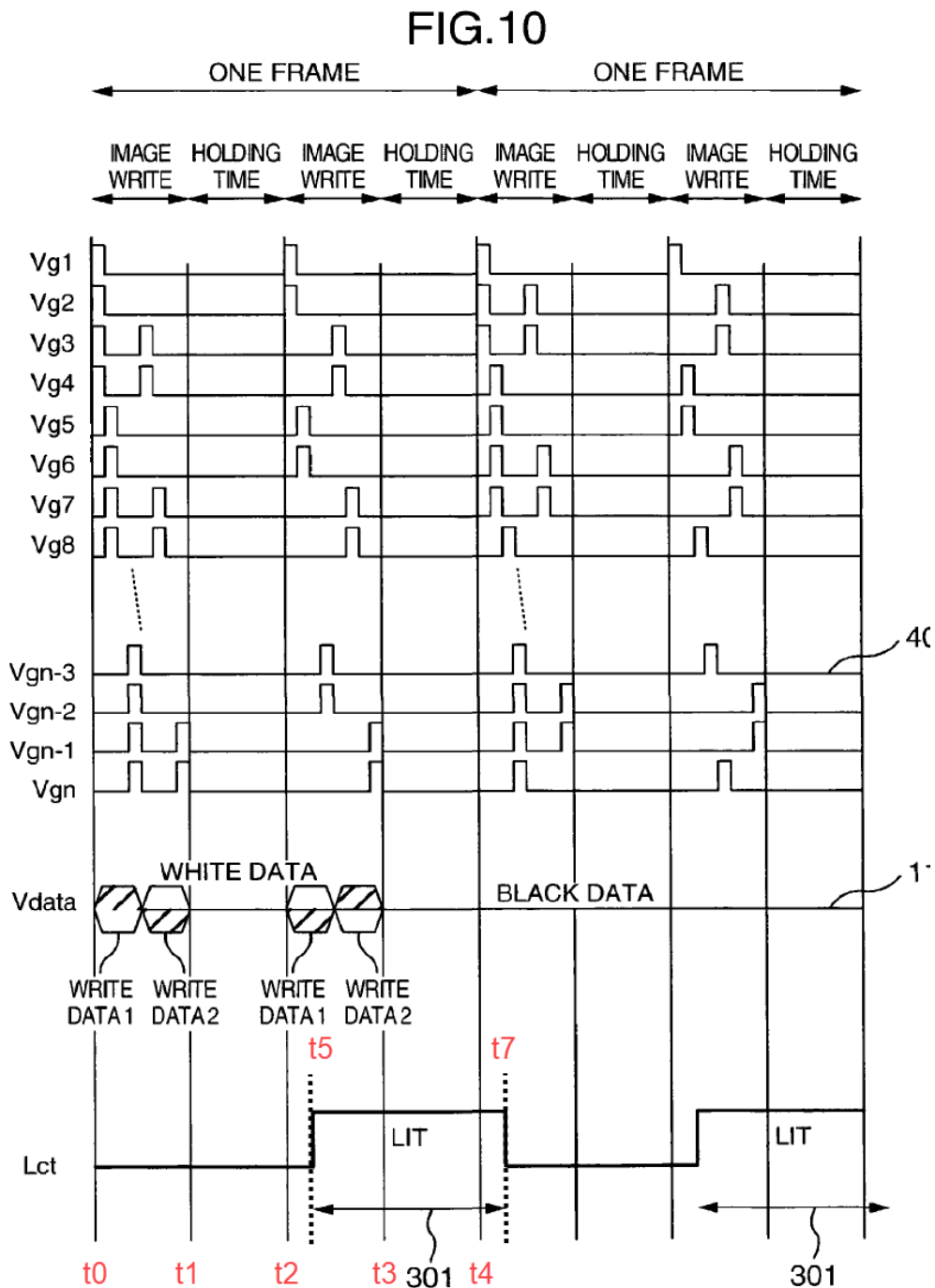
Contrary to the examining division's opinion on page 12 in the last paragraph, the combination of the third embodiment and the second embodiment of D3 was neither possible nor did it lead to the relationship stated in the seventh auxiliary request.

- 9.2 The board notes that claim 1 according to the seventh auxiliary request requires *inter alia* that "in the present period the first and second sub-frames (A1, A2) each of a period of  $T/2$  are separated by a time interval  $t_2-t_1$  and the second subframe (A1) [sic] of the present period  $T$  is separated by a time interval  $t_3-t_4$  from the first subframe (B1) in the next period, respectively".

Figure 9 of D3 does not disclose that the first and second sub-frames are "each of a period of  $T/2$ ". As this feature is, however, disclosed in figure 10 of D3, the board considers that the third embodiment of D3 (figure 10, paragraphs [0117] to [0125]) is the most promising starting point for the assessment of inventive step.

- 9.3 In agreement with the annotation of figure 10 on page 16 of the statement setting out the grounds of appeal,

figure 10 of D3 can be annotated as follows ( $T_a=t_1-t_0$ ,  $T_b=t_6-t_1$ ,  $T_c=t_4-t_0$ ,  $T_d=t_4-t_5$  and  $T_e=t_7-t_4$ ):



9.4 In agreement with section 3.2.1 above, first paragraph, figure 10 of D3 discloses that during the operations "WRITE DATA 1", "WRITE DATA 2" during the time periods

t0 to t1 and t2 to t3 (see annotated figure 10), each row of the display panel is selected by applying a voltage ( $V_{g1}$ , ...,  $V_{gn}$ ) to the respective transistor gates (see D3, figure 2). Image data is then written by applying the desired voltage to the respective drain lines ( $V_{d1}$ , ...,  $V_{d4}$ , ...) by data driver 107, see also paragraphs [0117], [0122] and [0123] in combination with paragraphs [0089] to [0091] and paragraphs [0108] to [0110] of D3.

Thus, the drive sequence shown in figure 10 of D3 includes two subframes within the meaning of claim 1: a first sub-frame from t0 to t1 and a second sub-frame from t2 to t3, see annotated figure 10. The wording of claim 1 does not exclude that a given sub-frame is further divided in temporal sub-parts (e.g. further divided into "WRITE DATA 1" and "WRITE DATA 2" in figure 10).

Both sub-frames are separated by a time interval  $t_2-t_1$  and the second sub-frame of the present period T ("One frame") is separated by a time interval  $t_4-t_3$  from the first subframe in the next period (the "one frame" on the right).

9.5 The wording of claim 1 does not require that both sub-frames are of the same length  $T/2$ , contrary to the appellant's argument on page 4 of the statement setting out the ground of appeal, last paragraph, because the duration of a frame would then be  $T/2 + T/2 + t_2-t_1 + t_4-t_3 > T$ . Paragraph [0030] of the application only states that the period of each sub-frame ( $A_1$ ,  $A_2$ ,  $B_1$ ,  $B_2$ , figure 3 of the application) is  $T/2$ .

In other words, claim 1 requires  $t_2-t_0 = t_4-t_2 = T/2$ , whereas the duration of the first sub-frame  $T_a = t_1-t_0$

might be different from the duration of the second subframe  $t_3-t_2$ , see also figure 3 and paragraph [0030] of the application.

Hence, figure 10 of D3 discloses that the first and second sub-frames are "each of a period of  $T/2$ " within the meaning of claim 1.

- 9.6 Claim 1 according to the seventh auxiliary request also requires that the update means is adapted to write the same data twice by updating the two sub-frames in the predetermined period.

It was not contested by the appellant that this feature is disclosed in paragraphs [0122] and [0123] of D3 ("Furthermore, among the second write, the write performed twice at the latter half for reaching in-frame AC writes the same image data as the first and the second write at the first half. Accordingly, there is no danger of generation of flicker or burn-in image.").

- 9.7 As also pointed out by the examining division, the response of the last line of pixels is not shown in figure 10. Time point  $t_6$  and the time period  $T_b$  ( $t_6 - t_1$ ) are thus not explicitly shown in figure 10.

In view of the embodiment shown in figure 9 of D3, the skilled person understands that the response time of the last line of pixels ( $R_n$ ) must necessarily end within one frame. Otherwise, the response (from "white" to "black" or "black" to "white") would be too slow to use the device of D3 as an LCD display. The board therefore is of the opinion that  $t_6 < t_4$  in figure 10, which also implies that  $T_c > T_a + T_b$  (since  $T_c = t_4 - t_0$  and  $T_a + T_b = t_6 - t_0$ ).

However, as figure 10 does not disclose the responses of the first and last line of pixels (R1, Rn), two cases are principally possible for t6: t1<t6<t5 (t6 outside the time period "LIT" during which the backlight is activated) or t5<t6<t4 (t6 within "LIT").

In other words, Tg being defined by  $Tg = \{Td - (Tc - (Ta + Tb))\} = \{(t4 - t5) - [(t4 - t0) - (t1 - t0 + t6 - t1)]\} = t6 - t5$ , it cannot be established from figure 10 whether Tg is larger than 0 or not, i.e. whether t6>t5 or t6<t5, and whether Tg is larger than Te = t7-t4, see also page 8 of the contested decision, last paragraph.

- 9.8 It follows from the above that, in the wording of claim 1 of the seventh auxiliary request, D3 discloses:
1. A display device (figure 4, [0001], "liquid crystal display") that comprises a display panel (figure 2, [0081], "display unit") and a backlight (figure 4, [0099], "light source 108") for the display panel, the display device comprising:
    - 1.1 control means (figure 4, "timing controller 104") configured to output a control signal ([0099], 117) for controlling illumination and extinction of the backlight (108), to the backlight ([0099]); and
    - 1.2 update means (figure 4, [0099], "drain driver 107") configured to update at least a first sub-frame and a second sub-frame (see annotated figure 10, first sub-frame from t0 to t1, second sub-frame from t2 to t3, see section 9.4 above) in each predetermined period ("one frame" from t0 to t4 in annotated figure 10) in order to change one image displayed on a screen of the display panel ([0089] to [0091], [0117], [0122] and [0123]), wherein, in a present period ("one frame", figure 10), a sub-frame update start time point of the first sub-frame is t0 (annotated figure 10), a sub-frame update end time point of the first sub-frame is

t1 (annotated figure 10), a sub-frame update start time point of the second sub-frame is t2 (annotated figure 10), a sub-frame update end time point of the second sub-frame is t3 (annotated figure 10) and a sub-frame update start time point of a first sub-frame in a following predetermined period is t4 (annotated figure 10), and wherein in the present period the first and second sub-frames each of a period of  $T/2$  are separated by a time interval  $t2-t1$  and the second subframe of the present period  $T$  is separated by a time interval  $t3-t4$  from the first subframe in the next period (see sections 9.4 and 9.5 above), respectively,

1.21 the update means is adapted to write the same data twice by updating the two sub-frames in the predetermined period (see section 9.6 above);

1.3 the control means (104) outputs a control signal (Lct) for controlling the backlight (108) so that the backlight (108) starts to illuminate at some point in time (figure 10, "LIT" when Lct is "high", t5 in annotated figure 10) from the start of update of the second sub-frame (t2 in annotated figure 10) in one period until the finish of the update (i.e. after the response of the last line  $R_n$  is finished) and ends illumination at the time point (t7 in annotated figure 10) when the update means starts to update the first sub-frame in a period subsequent to the one period or after the time point (figure 10); wherein

1.41 the first sub-frame is a sub-frame which comes first in each predetermined period (figure 10), and

1.42 the second sub-frame is a sub-frame which comes last in each predetermined period (figure 10); and wherein

1.5 the control means (104) outputs a control signal (Lct) for controlling the backlight (108) so that the backlight (108) ends illumination (figure 10, "LIT") after a fixed time ( $T_e = t7-t4$ ) has elapsed since the

first sub-frame update start time point ( $t_4$  in annotated figure 10); wherein

1.6 the update means updates a plurality of sub-frames comprising the first sub-frame and the second sub-frame in the respective predetermined periods (figure 10), ~~when  $T_g > 0$ , the control means outputs a control signal so that  $T_g > T_e$ ,~~

$T_g$  represents a time represented by a formula

$\{T_d - [T_c - (T_a + T_b)]\}$ ,

$T_a$  represents a time period from a start time point ( $t_0$  in annotated figure 10) of the response ( $R_1$ ) of a first pixel line of the display panel to a start time point ( $t_1$ ) of the response of a last pixel line ( $R_n$ ) of the display panel, wherein the start time point of the first pixel line is  $t_0$  and the start time point of the response of the last pixel line is  $t_1$  (annotated figure 10);

$T_b$  represents a time for a change in a gradation value which changes from a predetermined gradation value of the display panel to another gradation value of the display panel, wherein  $T_b$  is the time interval  $t_6 - t_1$  from  $t_1$  to a time point  $t_6$  when a response of the last pixel line is finished ( $t_6$  is not shown in figure 10, see section 9.7 above),

$T_c$  represents the predetermined period ("one frame", figure 10) with  $T_c > (T_a + T_b)$  (see section 9.7 above),

$T_d$  represents a time interval  $t_4 - t_5$  from the time point  $t_5$  when the backlight starts to illuminate after the update means starts to update the second sub-frame in one period ( $t_2$  in figure 10,  $t_2 < t_5$ ) to the time point  $t_4$  when the update means starts to update the first sub-frame in a period subsequent to the one period (see annotated figure 10), ~~wherein  $t_5 < t_6$ , and~~

$T_e$  represents a time interval from the time point  $t_4$  (annotated figure 10) when the update means starts to update the first sub-frame in a period subsequent to



the one period to the time point ( $t_7$ , see annotated figure 10) when the backlight ends illumination; and wherein  $T_g$  represents the time interval  $t_6-t_5$ .

9.9 The subject-matter of claim 1 according to the seventh auxiliary request therefore differs from the third embodiment of D3 by  $T_g = t_6-t_5 > 0$  (or  $t_5 < t_6$ ) and by  $T_g > T_e$ .

9.10 It was the appellant's view that the objective technical problem addressed by the distinguishing technical features is to avoid "ghost".

The board however notes that selecting  $t_6$  (and thus  $T_b$ ) such that  $t_6 > t_5$  implies that the backlight is illuminated before the response of the last pixel line is finished. According to the application (paragraphs [0005], [0014], [0032] to [0042], figures 4 to 7), to the common general knowledge of the skilled person and to the disclosure of D3 ([0017] to [0019]), an increase of "ghost" would be the result thereof. In other words, it cannot be said that selecting  $T_g = t_6 - t_5 > 0$  solves the problem of reducing "ghost" in the device known from D3.

Moreover, the board finds it questionable whether any technical problem is solved by selecting  $T_g$  such that it just exceeds  $T_e$ , e.g. by only 0.01 ms.

It follows that the objective technical problem is to be formulated in a less ambitious way as to select a value for the response time  $T_b$  of a pixel of the embodiment of figure 10 of D3.

9.11 As pointed out by the examining division, paragraph [0102] of D3 states that considering a liquid crystal

response delay in the next frame, the light source is lit after elapse of a predetermined time (such as 2 to 3 ms) after the write data 2 is written and the light source is extinguished after elapse of a predetermined time after the write start of the next frame. Figures 7 to 9 disclose that the light source is lit on shortly before the response (R1) of the first line of pixels is finished and also shortly before the response (Rn) of the last line of pixels is finished. Figures 7 to 9 thus already suggest that  $t_5$  should be smaller than  $t_6$ .

- 9.12 Paragraphs [0009], [0024] and [0025] of D3 disclose that an LCD normally has a frame frequency of 60 Hz (frame period of 16.7 ms) or of 120 Hz (frame period of 8.33 ms), see also paragraph [0028] of the application.

While the driving sequences in figures 9 and 10 of D3 are different, there is no indication in D3 of a difference in frame frequency. The board is convinced that the skilled person confronted with document D3 would understand that the same frame frequency and, thus, the same duration  $T_c$  of one frame (e.g. 16.7 ms) is used for the methods shown in figures 9 and 10 of D3. As a consequence, the time units used in figure 9 to divide  $T_c$  into six sub-sections are not identical to the time units used in figure 10 to divide the same  $T_c$  into four sub-sections.

- 9.13 Confronted with the objective technical problem defined above, the skilled person would have known that selecting a value for the response time  $T_b$  is equivalent to selecting the pixel capacitance 208 (e.g. its material) between pixel electrode 210 and common electrode 204.

It would have been obvious for the skilled person to use the same display panel with the same pixels, having consequently the same response time  $T_b$ , in both embodiments of figures 9 and 10 of D3.

When doing so, the skilled person would have arrived at a device having both distinguishing features. According to figure 9, the response time  $T_b \approx 2/3 T_c$  ( $T_b \approx 4$  units and  $T_c \approx 6$  units in figure 9). Using the same display panel in the method of figure 10, this corresponds to  $T_b \approx 2/3 T_c \approx 2.66$  units in figure 10 ( $T_c = 4$  units in figure 10,  $2/3 \times T_c = 2/3 \times 4 = 2.66$  units in figure 10). As  $t_6 = T_b + t_1 \approx 3.66$  units and  $t_5 < t_3$  ( $t_3 \approx 3$  units,  $t_5 \approx 2.25$  units in figure 10), it follows that  $t_5 < t_6$  or  $T_g = t_6 - t_5 > 0$ . Moreover, in figure 10,  $T_e \approx 0.25$  units and  $T_g = t_6 - t_5 > T_e$  ( $T_g \approx 3.66 - 2.25 = 1.41$  units). This is essentially reflected in the appellant's annotated part of figure 10 on page 4 of its letter dated 20 October 2022.

- 9.14 For the above reasons, it would therefore have been obvious for the skilled person to arrange the control unit such that  $t_5 < t_6$ , i.e.  $T_g > 0$  and  $T_g > T_e$ .

Hence, the subject-matter of claims 1 and 4 (*mutatis mutandis*) of the seventh auxiliary request does not involve an inventive step (Article 56 EPC) over the embodiment shown in figure 10 of D3.

#### **Eighth auxiliary request**

10. Inventive step - Article 56 EPC

- 10.1 The independent claims of the eighth auxiliary request correspond to those of the seventh auxiliary request, with the additional definition "wherein  $t_6 < t_3$ ". The

board accepts that this feature is disclosed in figure 11 of the application as originally filed. Insofar, the board does not agree with the examining division's findings during the oral proceedings with respect to the first auxiliary request filed prior to said oral proceedings.

- 10.2 In the statement setting out the grounds of appeal, the appellant only argued that the timing relationship  $t_6 < t_3$  was not disclosed in D3 without however explaining why selecting specifically this relationship would solve a technical problem.

In its letter dated 20 October 2022 and during oral proceedings, the appellant argued that  $t_6 < t_3$  implied that "afterimages" were avoided. If the rewriting of pixels in the next frame (sub-frame) started before the rewriting of pixels was "finished, this resulted "in a generation of an afterimage from the previous frame".

The objective technical problem was "avoiding afterimages with a reverse timing relationship". Although this problem was not mentioned in the application as originally filed, it was derivable for the skilled person from figure 11 of the application.

Said problem was not mentioned in D3 and there was no incentive for the skilled person to modify the response time  $T_b$  such that  $t_6 < t_3$ . Even applying the teaching of figure 9 of D3 to the method of figure 10 of D3, the skilled person would not arrive at  $t_6 < t_3$ .

- 10.3 The board is not convinced by the appellant's arguments.

A technical problem of "avoiding afterimages with a reverse timing relationship" is neither explicitly mentioned in the application as originally filed, nor can it be associated with  $t_3$  and  $t_6$ . Contrary to the appellant's statement on page 2, last paragraph of its letter dated 20 October 2022, it is only figure 11 that shows  $t_3 < t_6$  as this relation between  $t_6$  and  $t_3$  cannot be derived from paragraphs [0035] or [0039] of the application. It is questionable whether any technical problem could be derived by the skilled person using its common general knowledge from figure 11.

The appellant's statement about "afterimages" in the letter dated 20 October 2022, page 4, second paragraph, second sentence, concerns the starting of the next frame (at time  $t_4$ ) and the end time point ( $t_3$ ) of the second subframe (from  $t_2$  to  $t_3$ ) and therefore appears to imply that "afterimages" are generated when  $t_4 < t_3$ . Hence, the board is not convinced that the distinguishing feature ( $t_6 < t_3$ ) is associated to the problem of "avoiding afterimages".

The board notes that the application is silent on how the display panel could be modified so that the time response  $T_b$  is made smaller and so that the time point  $t_6$  (when a response of the last pixel line of the first sub-frame is finished) becomes smaller than the end time point  $t_3$  of the second sub-frame. Instead, figure 11 of the application clearly suggests that  $t_6 < t_3$  is achieved by increasing the end time point  $t_3$  by approaching  $t_3$  to  $t_4$ , i.e. by reducing the holding time interval  $t_4 - t_3$ .

The appellant's statements made during oral proceedings as well as page 2, third paragraph ("important to avoid ghost or afterimage phenomena") suggest that "avoiding

ghostimages" was equivalent to "ghost". However, increasing  $t_3$  (i.e. the end time point of the second sub-frame) in D3 such that  $t_6 < t_3$  implies that the overlap between the updating of the second sub-frame and the backlight illumination increases. According to the application (paragraphs [0005], [0014], [0032] to [0042], figures 4 to 7), "ghost" would thus be enhanced, see also page 5, point "b)" roughly in the middle of page 5 of the statement setting out the grounds of appeal. As mentioned there, each of the figures 3, 5, 6 and 11 "show that the ghost phenomena is generated when the last line change end timing [ $t_6$ ] is before the end of data write A2 [ $t_3$ ]." In other words, it cannot be said that selecting  $t_6 < t_3$  would necessarily reduce "ghost" for the device known from D3.

The board further opines that the application is silent about any synergistic effect of  $t_6 < t_3$  with the other distinguishing features (see section 9.9 above).

In other words, the wording of claim 1 at least encompasses embodiments for which no reduction in "ghost" is achieved when  $t_6 < t_3$ .

In view of the above, the objective technical problem associated with  $t_6 < t_3$  is not more than selecting an alternative end point  $t_3$  of the second sub-frame in figure 10 of D3. Selecting  $t_6 < t_3$  is a straightforward choice between obvious alternatives with known advantages and disadvantages. The board is of the view that it would be obvious to select  $t_3$  in figure 10 of D3 such that  $t_5 < t_6 < t_3$ , e.g. when the issue of "ghost" is not so important for a skilled person.

Hence, the subject-matter of claims 1 and 4 (*mutatis mutandis*) of the eighth auxiliary request does not involve an inventive step (Article 56 EPC) over the embodiment shown in figure 10 of D3.

11. As a side note, for the reasons given for the seventh and eighth auxiliary requests, the subject-matter of the independent claims of each higher ranking request (including those not admitted into the appeal proceedings) does not involve an inventive step (Article 56 EPC) over the embodiment of figure 10 of D3, either.

**Request for the remittal of the case to the examining division**

12. In view of the above, the board does not see any special reasons to remit the case to the examining division.

**Request for the reimbursement of the appeal fee**

13. The board notes that the appellant requests that the the appeal fee be reimbursed without, however, providing any arguments why a reimbursement should be granted.

From the minutes of the oral proceedings before the examining division, the board takes the view that the appellant had the opportunity to be heard on the grounds and evidence leading to the impugned decision. In particular, a lack of novelty over the second embodiment of D3 (figure 9) and a lack of inventive step over a combination of the third embodiment of D3 (figure 10) in combination with the first and second embodiments of D3 (figures 7 to 9) was discussed, see e.g. page 3, first and second paragraphs of the

minutes. It thus cannot be said that the "novelty attack" based on figure 9 of D3 appeared for the first time in the impugned decision and came as a "complete surprise", as argued by the appellant in section 2.1 of the statement setting out the grounds of appeal.

The requirements of Article 113(1) EPC are thus fulfilled.

In any case, for the appeal fee to be reimbursed under Rule 103(1)(a) EPC, the appeal must be allowable, which is not the case. Hence, the appeal fee is not to be reimbursed.

#### **Conclusion**

14. As no allowable request is on file, the appeal must fail.

#### **Order**

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

The appeal is dismissed.



The Registrar:

The Chairman:



S. Sánchez Chiquero

M. Stenger

Decision electronically authenticated