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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte KYOUNG-MAN KIM

Appeal 2019-001204
Application 14/744,068
Technology Center 2600

Before ROBERT E. NAPPI, SCOTT E. BAIN, and
MICHAEL T. CYGAN, *Administrative Patent Judges*.

CYGAN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1–7 and 9–21. Appeal Br. 14. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Samsung Electronics Co., Ltd. Appeal Br. 1.

CLAIMED SUBJECT MATTER

The claimed invention generally relates to a semiconductor device having a first memory that stores first and second layer image data portions used to generate first and second frame images on a display device, and a second memory that stores a change map. Spec. ¶ 4. The change map includes information on a first unit element required to be changed among a plurality of unit elements for outputting a second frame image. *Id.* ¶ 5. The desired advantage is to reduce operating power consumption. *Id.* ¶ 3.

Independent claim 1 is illustrative, with the disputed portion of the claim italicized for emphasis:

1. A semiconductor device comprising:

a first memory that stores a first layer image data portion and a second layer image data portion among a plurality of layer image data portions used to generate a first frame image and a second frame image on a display device, wherein the first layer image data portion includes a first plurality of unit elements and the second layer image data portion includes a second plurality of unit elements;

a second memory that stores a change map wherein the change map identifies one or more designated unit elements which are required to be changed between the first frame image and the second frame image among the first plurality of unit elements;

a display controller that generates positional information associated with the first layer image data portion in response to the change map as the first frame image changes to the second frame image on the display device, wherein the positional information is associated with the one or more designated unit elements which are required to be changed between the first frame image and the second frame image, and reads only at least some part of the first layer image data portion, wherein the positional information and the at least some part of the first layer image data portion are provided as partial image data;

an interface that receives the partial image data and generates a command for updating the one or more designated unit elements among the first plurality of unit elements of the first layer image data portion during generation of the second frame image.

Appeal Br. 15 (Claims App.).

Independent claim 13 recites a semiconductor device that includes the disputed limitation of claim 1. *Id.* at 17. Independent claim 16 recites a semiconductor device that lacks the dispute limitation, and reads as follows:

16. A semiconductor device, comprising:
a frame buffer that buffers image data to be provided to a display panel;
a frame buffer updater that, when an image output to be provided to the display panel is changed from a first frame image to a second frame image, receives image data associated with one or more designated unit elements requiring change among a plurality of unit elements of the second frame image, and further receives positional information associated with the one or more designated unit elements, and in response thereto updates the image data stored in the frame buffer in accordance with the received image data associated with the one or more designated unit elements and the positional information associated with the one or more designated unit elements; and
a driver configured to output an image signal based on the updated image data stored in the frame buffer to the display panel.

Id. at 18. Dependent claims 2–7, 9–12, 14–15, and 17–21 each incorporate the limitations of their respective independent claims. *Id.* at 15–19. The application was originally filed without a claim 8, which was later added and subsequently renumbered as claim 21. *See* Final Act. 2 (Apr. 21, 2017); Applicant’s Response to the Final Rejection 8 (Jan. 6, 2017).

REFERENCES

Name	Reference	Date
Shimada et al. (Shimada)	US 2009/0115798 A1	May 7, 2009
Kim	US 2010/0134477 A1	June 3, 2010
Inada et al. (Inada)	US 2011/0221780 A1	Sept. 15, 2011
MacInnis et al. (MacInnis)	US 2011/0280307 A1	Nov. 17, 2011
Ohba et al. (Ohba)	US 2015/0123993 A1	May 7, 2015

REJECTIONS

Claims 1–6, 9–10, 16–18, 20, and 21 are rejected under AIA 35 U.S.C. § 103 as being obvious over the combined teachings and suggestions of Inada and Kim.

Claim 7 is rejected under AIA 35 U.S.C. § 103 as being obvious over the combined teachings and suggestions of Inada, Kim, and Shimada.

Claims 11, 12 and 19 are rejected under AIA 35 U.S.C. § 103 as being obvious over the combined teachings and suggestions of Inada, Kim, and MacInnis.

Claims 13 and 15 are rejected under AIA 35 U.S.C. § 103 as being obvious over the combined teachings and suggestions of Ohba and Kim.

Claim 14 is rejected under AIA 35 U.S.C. § 103 as being obvious over the combined teachings and suggestions of Ohba, Kim, and MacInnis.

OPINION

With respect to claim 1, Appellant disputes that the Inada and Kim combination fails to teach or suggest the recitation:

A second memory that stores a change map wherein the change map identifies one or more designated unit elements which are

required to be changed between a first frame image and a second frame image among a first plurality of unit elements.

Appeal Br. 6.

With respect to that limitation of claim 1, the Examiner finds Inada to teach a second memory that stores a change map, in the form of deriving the amount of change in a displayed image and deriving frame coordinates therefrom, where the frame coordinates are used to load data into the main memory. Final Act. 5 (citing Inada ¶ 45). The Examiner determines Inada to lack a teaching or suggestion of the change map identifying one or more designated unit elements that are required to be changed between a first frame image and a second frame image from among the first plurality of unit elements, and determines that Kim teaches or suggests these features. *Id.* at 7. The Examiner finds Kim to teach a masking portion that verifies whether or not an image of the frame has an irrelevance region (such as a caption or logo), such that the gray level of the image should not include data from the irrelevance region, where the gray level information is transferred to a histogram analyzing portion. *Id.* (citing Kim ¶¶ 51, 53). The Examiner characterizes the masking portion as having the same purpose as the claimed invention, in that it transforms/changes only desired frames to second frames. Ans. 6.

Appellant argues that Kim's gray level information is used to determine if the device should be in a power consumption mode, in which the backlight power and luminance is reduced. Appeal Br. 6–7. Appellant characterizes Kim's masking portion as determining which pixels to exclude from the power consumption mode determination. *Id.* at 7. Appellant characterizes Kim's use of a histogram in Kim as determining whether enough of the non-excluded pixels exceed a gray level threshold such that

the device should be in a power consumption mode. *Id.* Appellant argues that no part of Kim determines which unit elements of an image are required to be changed between a first and second frame image. *Id.* at 7. Rather, Appellant characterizes Kim as only determining whether the displayed image data (second image data) for a frame will be the same as the received image data (first image data), without identifying which elements change or do not change. *Id.* at 8. Appellant further argues that only the second frame image data is displayed in Kim, rather the more specifically claimed determination of change “between a first frame image and a second frame image.” Reply Br. 3–4 (emphasis omitted).

We find Appellant’s arguments persuasive. To the extent that the Examiner relies upon Kim’s histogram as a change map of “elements that are required to be changed between the first image and the second frame image” (Ans. 6) Kim’s histogram instead is directed to determining the number of pixels at each possible gray level. Kim Fig. 6A, 6B. The histogram does not indicate any individual elements; i.e., pixels, that are required to be changed between the first and second frame images; i.e., between RGB1 and RGB2. Kim Fig. 2. Furthermore, when Kim’s histogram analysis indicates that the power consumption mode should be “OFF,” no change is made to any pixel of RGB1. Although a histogram analysis that indicates the power consumption mode should be “ON” will cause the data of RGB1 to be converted to RGB2, there is no indication that the histogram functions as a map of elements that are required to be changed from RGB1 to RGB2.

To the extent that the Examiner relies upon the masking portion to result in “transform[ing]/chang[ing] only desired frames to second frames,” the claim requires that the map indicate change to desired, individual

elements, not individual frames. Accordingly, we do not agree with the Examiner that the combination of Inada and Kim teaches a “change map” as recited in claim 1, and therefore we do not sustain the Examiner’s rejection of claim 1. Consequently, we also do not sustain the Examiner’s rejection of claims 2–6, 9–10, and 21 depending therefrom.

With respect to claims 7, 11–12, and 19, the Examiner has rejected the claims over the base combination of Inada and Kim, further in view of either Shimada (claim 7) or MacInnis (claims 11–12 and 19). However, because the combination of Inada and Kim does not teach or suggest the claimed “change map,” and the Examiner does not find either Shimada or MacInnis to provide the missing teaching or suggestion, we do not sustain the Examiner’s rejection of claims 7, 11–12, and 19.

With respect to independent claim 13, the Examiner’s rejection is based upon the combination of Ohba and Kim. Final Act. 15–18. The Examiner finds Ohba not to teach the claimed “change map,” which the Examiner finds taught by Kim for the same reasons as set forth in the rejection of claim 1. *Id.* at 17. Consequently, because the Examiner has not shown Kim to teach the claimed change map as detailed in the discussion of claim 1, we do not agree that the combination of Ohba and Kim teaches the claimed “change map,” and we do not sustain the rejection of claim 13, or the rejection of claim 15 depending therefrom.

Claim 14 is rejected over Ohba and Kim, further in view of MacInnis. However, because the combination of Ohba and Kim does not teach or suggest the claimed “change map,” and the Examiner does not find MacInnis to provide the missing teaching or suggestion, we do not sustain the Examiner’s rejection of claim 14.

With respect to claim 16, Appellant contends that the Examiner has not explained how the combination of Inada and Kim teaches or suggests the recited limitations, including the “frame buffer,” the “frame buffer updater,” and the “driver.” Appeal Br. 11–12; Reply Br. 7–9. The Examiner determines that the claimed “frame buffer” is taught by Inada’s frame memory for buffering data to be displayed on the display device. Ans. 7–8 (citing Inada ¶ 46). The Examiner further determines that the claimed “frame buffer updater” is taught by Inada’s main memory and buffer memory, which are storage devices that are formed as random access memories and a ‘frame buffer updater.’” *Id.* at 8 (citing Inada ¶¶ 51, 56). The Examiner further relies upon Kim’s masking portion supplying a signal indicating the type of image to the storing portion as having similar functionality as the first memory and second memory in claim 1, which the Examiner states to be addressed as for claim 1 because claim 16 is broader than claim 1. *Id.*

Appellant argues that the Examiner errs in describing claim 16 as broader than claim 1, because it contains limitations, such as a “driver configured to output an image signal based on the updated image data stored in the frame buffer to the display panel.” Reply Br. 8 (emphases omitted). Appellant contends that the Examiner has not addressed the specific limitations of claim 16, including the claimed driver, and instead addresses limitations of claim 1 that do not appear in claim 16, such as a “first memory” and “second memory.” *Id.* Appellant further argues that Inada’s main memory and buffer memory do not update the image data store in the frame buffer as set forth in claim 16. *Id.* at 8–9.

We agree with the Appellant that the Examiner has not explained how Inada's main memory and buffer memory update the image data store in the frame buffer, and we discern no discussion of how the combination of Inada and Kim is considered teach or suggest the recited "driver." Final Act. 14–15; Ans. 7–8. To the extent that the Examiner relies on the reasoning presented in the rejection of claim 1 to reject claim 16, the rejection of claim 1 does not mention any of the limitations of claim 16 (frame buffer, frame buffer updater, driver). Accordingly, reference to the rejection of claim 1 does not provide a reasoned explanation of how Inada and Kim teach or suggest the limitations of claim 16. Because the Examiner has not provided a reasoned explanation of how each of the limitations of claim 16 are taught or suggested by the combination of Inada and Kim, we agree with the Appellant that the Examiner has not set forth a prima facie case of obviousness. Consequently, we do not sustain the Examiner's obviousness rejection of claim 16, or claims 17–18 and 20 depending therefrom.

Claim 19 depends from claim 16 and is rejected over the base combination of Inada and Kim, further in view of MacInnis. Final Act. 21–22. However, because the combination of Inada and Kim does not teach or suggest the claimed "frame buffer," "frame buffer updater," and "driver," and because the Examiner does not find MacInnis to provide the missing teachings or suggestions, we do not sustain the Examiner's rejection of claim 19.

CONCLUSION

For the above-described reasons, we reverse the Examiner's rejection of claims 1–6 and 9–21 as being obvious under 35 U.S.C. § 103.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	References/Grounds	Affirmed	Reversed
1-6, 9-10, 16-18, 20-21	103	Inada, Kim		1-6, 9-10, 16-18, 20-21
7	103	Inada, Kim, Shimada		7
11-12, 19	103	Inada, Kim, MacInnis		11-12, 19
13, 15	103	Ohba, Kim		13, 15
14	103	Ohba, Kim, MacInnis		14
Overall Outcome				1-7, 9-21

REVERSED