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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* KAZUHIRO OCHI and AKIRA TAKEUCHI

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Appeal 2019-001450  
Application 15/115,268  
Technology Center 2800

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Before DONNA M. PRAISS, MICHELLE N. ANKENBRAND, and  
JEFFREY R. SNAY, *Administrative Patent Judges*.

ANKENBRAND, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant<sup>1</sup> appeals under 35 U.S.C. § 134(a) from the Examiner's  
decision<sup>2</sup> finally rejecting claims 1–8. We have jurisdiction under 35 U.S.C.  
§ 6(b).

We AFFIRM.

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<sup>1</sup> Appellant states the real parties in interest are Kazuhiro Ochi, the first  
named inventor, and MIMAKI ENGINEERING CO. LTD. Appeal Brief,  
filed August 2, 2018 (“Appeal Br.”) 1.

<sup>2</sup> Non-Final Action, mailed April 3, 2018 (“Non-Final Act.”).

## STATEMENT OF THE CASE

### *Background*

The subject matter on appeal “relates to an inkjet printing apparatus, a program, and a recording medium.” Specification, filed July 29, 2016 (“Spec.”) ¶ 1. According to the Specification, an inkjet printer can eject ink and radiate ultraviolet light on an outward direction and on a homeward direction. *Id.* ¶ 4. However, the diameter of formed ink dots are different if the outward direction and the homeward direction have a difference in the time between ink ejection and irradiation. *Id.* ¶ 5. The Specification states that such a difference in ink dot diameter deteriorates image quality. *Id.*

The Specification discloses an inkjet printing apparatus including, among other things, an irradiation control means configured to perform control for selecting an irradiation element for the homeward way that has a distance from a certain nozzle smaller than a distance for an irradiating element having a maximum distance difference with respect to the distance between the certain nozzle and an irradiating element selected for the outward way. *Id.* ¶ 7. The Specification states that such an apparatus makes it possible to reduce the time difference from ink ejection to irradiation between the outward way and homeward way, which makes it possible to suppress variation in dot diameter. *Id.* ¶ 8.

Of the appealed claims, claim 1 is independent. Claim 1 is representative of the subject matter on appeal, and reproduced below:

1. An inkjet printing apparatus comprising:
  - a head configured to eject ink which hardens if being subjected to irradiation with light, onto a recording medium;
  - a plurality of irradiators configured to irradiate the ink ejected from the head, with light; and

an irradiation controller configured to control light irradiation of the plurality of irradiators,

wherein the head is configured to relatively reciprocate in a scan direction with respect to a mounting table for mounting the recording medium,

the plurality of irradiators is disposed, such that the plurality of irradiators is aligned in the scan direction and the head is disposed between at least two of the irradiators, and is configured to relatively reciprocate in the scan direction with respect to the mounting table, together with the head,

on each of the plurality of irradiators, a plurality of irradiating elements is mounted, such that at least two irradiating elements of the plurality of irradiating elements are disposed at different distances from each other from at least one nozzle of the nozzles of the head in the scan direction,

the irradiation controller is configured to perform control to select a first irradiating element to irradiate the ink ejected from a certain nozzle with light when the head is reciprocating in a first direction away from an initial position, whereas other unselected irradiating elements in between the first irradiating element and the certain nozzle do not irradiate light, and a distance between the first irradiating element and the certain nozzle is defined as a first distance  $X_1$ ;

the irradiation controller is then configured to perform control to select a second irradiating element to irradiate the ink ejected from the certain nozzle with light when the head is reciprocating in a second direction opposite to the first direction, whereas other unselected irradiating elements in between the second irradiating element and the certain nozzle do not irradiate light, and a distance between the second irradiating element and the certain nozzle is defined as a second distance  $X_2$ , and a distance difference ( $X_2$  minus  $X_1$ ) between the second distance  $X_2$  and the first distance  $X_1$  is smaller than a maximum distance difference ( $X_3$  minus  $X_1$ ) between a third distance  $X_3$  and the first distance  $X_1$ , such that the third distance  $X_3$  is a distance between another irradiating element

that do not irradiate light and the certain nozzle when the head is reciprocating in the second direction.

Appeal Br. 13–14 (Claims App’x).

*The Reference*

Usuda

US 8,746,824 B2

June 10, 2014

*The Rejections*

The Examiner maintains the following rejections on appeal:

1. Claims 1 and 5 are rejected under 35 U.S.C. § 112(b) as indefinite; and
2. Claims 1–8 are rejected under 35 U.S.C § 102(a)(1) as anticipated by Usuda.

Non-Final Act. 2–7.

OPINION

*Indefiniteness rejection*

In rejecting claims 1 and 5, the Examiner concludes the limitation “unselected irradiating elements in between the second irradiating element and the certain nozzle do not irradiate light” recited in claim 1 is indefinite because Appellant’s invention (for example, the portion of the apparatus in Figure 2) does not appear to contain irradiating elements in between the second irradiating element and a certain nozzle. Non-Final Act. 2. The Examiner further explains in the Answer that the intended meaning of the claim language is not clear “given the fact that such an ‘other irradiating element’ could exist only in a fraction of the configurations possible according to Appellant’s specification and could not exist at all in the embodiment of Appellant’s figure 2.” Examiner’s Answer, dated October 4, 2018 (“Ans.”) 2–3.

After having considered the evidence presented in this appeal and each of Appellant's contentions, we are persuaded that Appellant identifies reversible error with respect to the Examiner's rejection of claims 1 and 5 under 35 U.S.C. § 112(b). Because claim 5 depends from claim 1, we need only address independent claim 1. We reverse the Examiner's rejection for the reasons explained below.

Appellant asserts that Figure 2 depicts one embodiment and that the first irradiating element and second irradiating element may be altered within the scope of claim 1 in order to fulfill the distance difference conditions recited in claim 1. Appeal Br. 5–6. We reproduce Appellant's Figure 2 below.

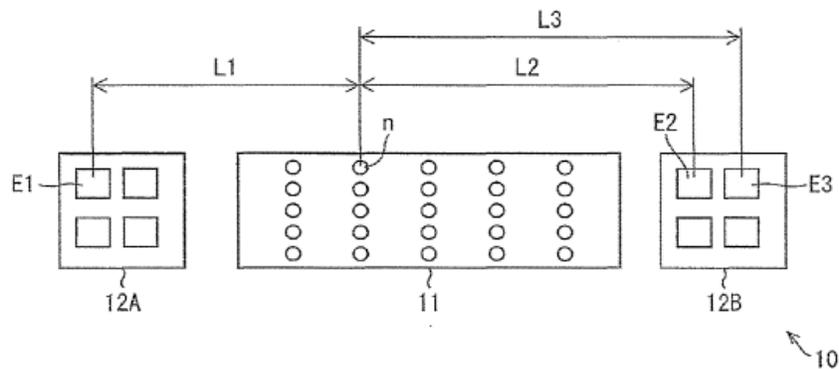
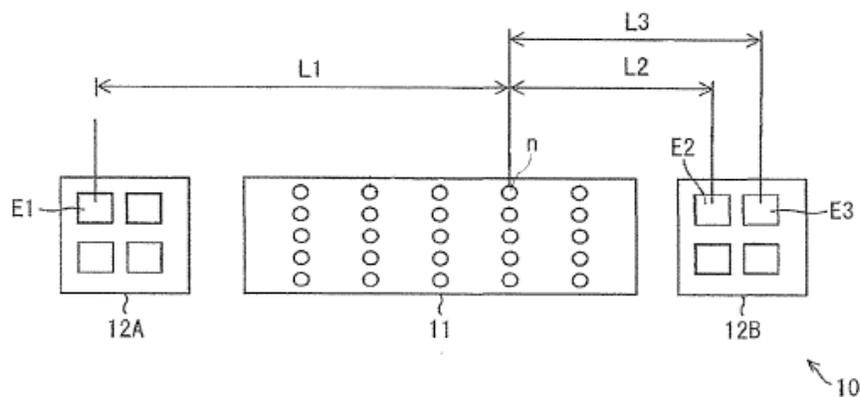


FIG. 2

Figure 2 is a view that schematically illustrates the structure of carriage 10, which is included in printing apparatus 1. Spec. ¶ 15. Carriage 10 includes head 11, which has nozzles *n* formed therein for ejecting ink, and two irradiating units, 12A and 12B, for irradiating ultraviolet light onto ink ejected from head 11. *Id.* ¶¶ 22–23, 25. Each of irradiating units 12A and 12B has a plurality of irradiating elements, e.g., E1, E2, E3. *Id.* ¶ 27. As depicted in Figure 2, the distances of irradiating elements E1, E2, and E3

from selected or certain nozzle  $n$  are  $L1$ ,  $L2$ , and  $L3$ , respectively, and the distances differ (distance  $L1$  is shorter than distance  $L2$ , and distance  $L2$  is shorter than distance  $L3$ ). *Id.* ¶ 29. In the Figure 2 embodiment, the distance difference between  $L3$  (the distance from irradiating element  $E3$  to nozzle  $n$ ) and  $L1$  (the distance from irradiating element  $E1$  to nozzle  $n$ ) is larger than the distance difference between  $L2$  (the distance from irradiating element  $E2$  to nozzle  $n$ ) and  $L1$  (the distance from irradiating element to nozzle  $n$ ). *Id.* ¶ 35. In other words,  $L3$  minus  $L1$  is larger than  $L2$  minus  $L1$ . Thus,  $E2$  would be selected as the second irradiating element. *See* Appeal Br. 13–14 (claim 1). In this embodiment, there are no irradiating elements between the second irradiating element and the certain nozzle.

To illustrate that the irradiating elements may be altered in other embodiments that claims 1 and 5 encompass, Appellant modifies Figure 2 to select nozzle  $n$  in a near right position and  $E1$  as the first irradiating element. Appeal Br. 6. We reproduce Appellant’s Modified Figure 2 below.



*Modified FIG. 2*

Like Figure 2, Modified Figure 2 is a view that schematically illustrates the structure of carriage 10, which is included in printing apparatus 1. In Modified Figure 2, selected or certain nozzle  $n$  is different than in

unmodified Figure 2, resulting in different distances (L1, L2, L3) between irradiating elements (E1, E2, E3) and nozzle n than in Figure 2. *See id.* Appellant asserts that, in Modified Figure 2, the selected second irradiating element must be E3 and not E2, because L1 minus L2 is larger than L3 minus L1. *Id.* In other words, irradiating element E3 satisfies the condition recited in claim 1 that “a distance difference (L1 minus L3) between the second distance L3 and the first distance L1 is smaller than a maximum distance difference (L1 minus L2).” *Id.* Appellant contends that, in this example, irradiating element E2 is unselected, is between second irradiating element E3 and the certain nozzle, and does not irradiate light. *Id.*

Appellant’s arguments are persuasive. Claim 1 recites “whereas other unselected irradiating elements in between the second irradiating element and the certain nozzle do not irradiate light.” The Examiner appears to construe this limitation as requiring that there are always unselected irradiating elements between the second irradiating element and the certain nozzle. *See* Final Act. 2; Ans. 3. However, we determine that the limitation contains conditional language. That is, the claim does not require unselected irradiating elements in between the second irradiating element and the certain nozzle, but if there are such unselected irradiating elements, then the unselected irradiating elements do not irradiate light. Thus, we agree with Appellant that one of ordinary skill in the art would be able to understand the meaning of claim 1.

Accordingly, we reverse the Examiner’s rejection of claims 1 and 5 under § 112(b).

*Anticipation rejection*

The Examiner rejects claims 1–8 as anticipated by Usuda. Non-Final Act. 3–7. As to claim 1, the Examiner finds Usuda discloses an inkjet printing apparatus comprising, among other things, a head, a plurality of irradiators, and an irradiation controller. Non-Final Act. 3–4. The Examiner finds Usuda’s irradiation controller is configured to perform control to, among other things, select a first irradiating element to irradiate ink ejected from a certain nozzle when the head is reciprocating in a first direction away from an initial position. *Id.* at 4–5. The Examiner also finds the irradiation controller is configured to perform control to select a second irradiating element based upon the distance conditions claim 1 recites. *Id.* at 5.

Appellant contends Usuda does not teach selecting irradiating elements based upon the distance differences recited in claim 1. Appeal Br. 8. Specifically, Appellant argues that Usuda merely detects a fault in a light emitting element, enters a fault mode in which the row of the light emitting element is turned off, and performs recording with the remaining light emitting element rows. *Id.* at 8, 10–11. Appellant also argues that Usuda discloses a partially-in-use mode in which one or a combination of three light emitting element rows can be used, but the rows are not selected based on a distance difference. *Id.* at 9.

Appellant’s arguments are unpersuasive. “A patent applicant is free to recite features of an apparatus either structurally or functionally.” *In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir. 1997); *In re Swinehart*, 439 F.2d 210, 212 (CCPA 1971) (“there is nothing intrinsically wrong with the use of [functional language] in drafting patent claims”). In order to be accorded patentable weight, however, functional language in an apparatus claim must

limit the claim in terms of structure that provides functionality not inherent in the prior art. *Schreiber*, 128 F.3d at 1477–78; MPEP § 2114. Further, a claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (BPAI 1987).

Here, claim 1 recites, among other things, an “irradiation controller.” Usuda discloses control unit 21 that, in a fault mode, stops using the light emitting element row in which the fault is detected and changes the row used to another light emitting element row. Usuda 10:33–37, 12:57–62. Further, as Appellant notes, Usuda also discloses a partially-in-use mode in which control unit 21 selects one or two light emitting element rows from the three light emitting element rows. *Id.* at 10:12–18. Therefore, Usuda discloses an irradiation controller.

Claim 1 also recites that the irradiation controller “is configured to perform control to select a first irradiating element to irradiate the ink ejected from a certain nozzle with light when the head is reciprocating in a first direction away from an initial position,” and “a distance between the first irradiating element and the certain nozzle is defined as a first distance X1.” And claim 1 recites that the irradiation controller also is “configured to select a second irradiating element to irradiate the ink ejected from the certain nozzle with light when the head is reciprocating in a second direction opposite to the first direction,” whereas “other unselected irradiating elements in between the second irradiating element and the certain nozzle do not irradiate light, and a distance between the second irradiating element and

the certain nozzle is defined as a second distance  $X_2$ ,” and a distance difference between the second distance and the first distance is smaller than a maximum distance difference.

The “configured to” language of claim 1 regards the irradiation controller’s functions. Appellant does not persuasively argue that these functions limit claim 1’s structure beyond that which the Examiner finds in Usuda. We, therefore, do not accord the functions patentable weight over the structure described in Usuda. *See Schreiber*, 128 F.3d at 1477–78.

The question is whether Usuda’s apparatus is capable of performing the recited selections. *See id.* at 1478 (explaining that where there is reason to conclude that the structure of the prior art is inherently capable of performing the recited function, the burden shifts to the applicant to show that the recited function patentably distinguishes the claimed structure from the prior art structure). Here, the Examiner has a reasonable basis for finding that Usuda’s apparatus is capable of performing the selections. As noted above, Usuda discloses a fault mode in which control unit 21 turns off one row of light emitting elements containing a fault and selects or uses a different row of light emitting elements that has the recited distance difference. Usuda 10:33–37, 12:57–62; *see* Non-Final Act. 4–5 (explaining how Usuda’s apparatus can carry out the recited selections with reference to Usuda’s Figure 3). When Usuda’s apparatus selects or uses a different row of light emitting elements in the fault mode, there are unselected light emitting elements between the first light emitting element and the certain nozzle and between the second light emitting element and the certain nozzle that do not irradiate light. Usuda 10:33–37, 12:57–62, Fig. 3. And the second row of irradiating elements has the distance difference recited in

claim 1. Usuda Fig. 3. Usuda's apparatus also is capable of performing the recited selections in the partially-in-use mode. Usuda 10:12–25.

Appellant appears to argue that claim 1 requires the irradiation controller to select an irradiation element on the basis of whether the irradiating element has a distance difference that meets certain criteria. Appeal Br. 10–11. We disagree. Claim 1 recites that an irradiation controller is configured to select a second irradiating element and the second irradiating element has the claimed distance difference due to the second irradiating element being positioned a distance from a certain nozzle that more closely matches a distance between a first irradiating element and the certain nozzle than the maximum distance difference recited by claim 1. For the reasons noted above and those the Examiner provides, Usuda's control unit 21 is configured to select a second irradiating element having such a position and distance difference.

Appellant also asserts that Usuda's apparatus can result in light emitting elements having a smaller distance difference being turned off due to a fault, which results in the selection of light emitting elements with a larger distance difference. Appeal Br. 8. Appellant argues that in light of the many possibilities that can occur, the Examiner has chosen specific rows of Usuda's light emitting elements in an act of impermissible hindsight. *Id.* at 8–9.

Appellant's arguments are unpersuasive. First, we note that hindsight is not relevant to anticipation. *Cf. Seachange Int'l, Inc. v. C-Cor, Inc.*, 413 F.3d 1361, 1380 (Fed. Cir. 2005). Further, it is not necessary for a reference to disclose specific examples of the claimed subject to anticipate. Rather, to anticipate, one skilled in the art must be able to “at once envisage” the

claimed subject matter in the prior art disclosure. *In re Petering*, 301 F.2d 676, 681 (CCPA 1962). Here, we find that one of ordinary skill in the art would at once envisage specific rows that Usuda's fault and partially-in-use modes select. As we explain above, in Usuda's fault mode, control unit 21 stops using a light emitting element row in which the fault is detected and changes the row used to another light emitting element row. Usuda 10:33–37, 12:57–62. Given that Usuda discloses only three rows of light emitting elements (i.e., rows 39A, 39B, and 39C of light emitting elements 19A or 19B in Usuda's Fig. 3) and one row is turned off when a fault occurs in that row (e.g., row 39A), only two rows are left to select from for use (e.g., row 39B or 39C). Thus, one of ordinary skill in the art can easily envisage two specific scenarios after a row of light emitting elements is turned off due to a fault and Usuda's control unit 21 selects another individual row. *Id.* at 10:33–37. Similarly, an ordinarily skilled artisan can at once envisage the limited scenarios in which Usuda's partially-in-use mode selects one of the three rows (i.e., one of rows 39A, 39B, and 39C) for a given set of light emitting elements (i.e., 19A or 19B). *Id.* at 10:12–18.

Accordingly, we affirm the Examiner's rejection of claim 1 under 35 U.S.C. § 102(a)(1) as anticipated by Usuda. Appellant does not argue claims 2–8 separately from claim 1. Appeal Br. 8–11. Thus, we also affirm the Examiner's rejection of claims 2–8 under 35 U.S.C. § 102(a)(1) as anticipated by Usuda.

#### CONCLUSION

The Examiner's rejection of claims 1 and 5 under 35 U.S.C. § 112(b) is reversed and the Examiner's rejection of claims 1–8 under 35 U.S.C. § 102(a)(1) is affirmed.

Appeal 2019-001450  
Application 15/115,268

In summary:

<b>Claim(s) Rejected</b>	<b>35 U.S.C. §</b>	<b>References/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1, 5	112(b)			1, 5
1-8	102(a)(1)	Usuda	1-8	
<b>Overall Outcome</b>			1-8	

#### TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED