

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HARALD WINDEL and JUNMING ZHANG

Appeal No. 1999-1565
Application No. 08/494,227

HEARD: May 9, 2001

Before SMITH, FLEMING, and DIXON, *Administrative Patent Judges*.

FLEMING, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1-14, all of the claims pending in the present application.

The invention relates to an ink printer head composed of

plural individual edge shooter ink printer modules (figure 1,

item numbered 1) disposed in side-by-side contact. Each module is composed of plural adjacent stacked plates (figure 1, items numbered 11-14) with some of the plates containing plural ink chambers (figure 1, items numbered 16 and 17) with an opening at the front of the assembly (specification, page 6, lines 2-4). Plural plate shaped piezoelectric actuators (figure 1, item number 15) eject ink from the ink chamber adjacent to the piezoelectric actuator. An adapter plate (figure 1, item numbered 2; specification, page 6, lines 5-6) is disposed in contact with the front of the assembly of plates and has a number of openings (figure 1, items numbered 21 and 22) corresponding to the number of ink chamber openings. A nozzle plate (figure 1, item numbered 3) is in contact with the front surface of the adapter plate and has a plurality of nozzle apertures (figure 1, item number 31) in columns, with one column allocated to each ink printer module (specification, page 6, lines 25-26). The nozzle apertures are arranged equidistantly from one another in each column

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(specification, page 6, lines 25-26), and from column to column are offset such that no nozzle aperture aligns with a nozzle aperture in a direction orthogonal to the column direction, and all nozzle apertures are equidistantly arranged in the column direction (specification, page 6, lines 26 through page 7, line 2). The adapter plate openings and the nozzle openings are aligned with ink chamber openings (specification, page 7, lines 3-11).

Independent claim 1, which is the sole independent claim rejected, is reproduced as follows:

1. An ink printer head comprising:

a plurality of individual edge shooter ink printer modules successively disposed in side-by-side contact and forming an assembly having a front face, each of said ink printer modules comprising a plurality of stacked module plates with some of said module plates on each module respectively containing a plurality of ink chambers and each ink chamber having an associated ink chamber opening disposed in said front face of said assembly so that said front face of said assembly has a number of said ink chamber openings, said assembly including a plurality of plate-shaped piezoelectric actuators, each ink chamber having one of said piezoelectric actuators adjacent thereto for ejecting ink from the ink chamber adjacent to the piezoelectric actuator through the associated ink chamber opening, each of said ink printer modules having a first column of said ink chamber openings and a second column of said ink chamber openings spaced from said first column of ink chamber openings, each of said ink chamber openings having a first dimension in a column direction extending along each of said columns;

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an adapter plate disposed adjacent and in contact with said front face of said assembly and having a plurality of openings corresponding in number to said number of ink chamber openings in said front face of said assembly, said adapter plate having a front face;

a nozzle plate disposed adjacent and in contact with said front face of said adapter plate and having a plurality of nozzle apertures, said nozzle apertures being disposed in said nozzle plate in columns with one column allocated to each ink printer module, the nozzle apertures in respectively said columns being disposed equidistantly from each other in said column direction and said nozzle apertures being offset from column-to-column so that no nozzle aperture is aligned with another nozzle aperture in a direction orthogonal to said column direction, said apertures having a second dimension; and

each opening in said adapter plate having a first region having said first dimension and a second region having said second dimension and said nozzle openings being disposed in said adapter plate with said first regions in registry with said ink chamber openings in said front face of said assembly and said second regions in registry with said nozzle apertures.

The Examiner relies on the following references:

| | | |
|--------------------------------------------------------------|--------------|----------|
| Pond et al. (Pond) 1991 | 5,057,854 | Oct. 15, |
| Kattner 1982 | DE 3 117 028 | Nov. 18, |
| Suzuki et al. (Suzuki) 1992 (European Patent Application) | EP 486 256 | May 20, |

Claims 1, 3, 4, 6-10, 12 and 13 stand rejected under
35 U.S.C. § 103 as being unpatentable over Kattner and Suzuki.

Claims 2, 5, 11, and 14 stand rejected under 35 U.S.C. §

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103 as being unpatentable over Kattner and Suzuki and Pond.¹

Rather than reiterate the arguments of Appellants and the Examiner, reference is made to the Brief² and the Examiner's Answer³ for the respective details thereof.

OPINION

We will not sustain the rejections of claims 1, 3, 4, 6-10, 12 and 13 under 35 U.S.C. § 103.

The Examiner has failed to set forth a *prima facie* case. It is the burden of the Examiner to establish why one having ordinary skill in the art would have been led to the claimed invention by the express teachings or suggestions found in the prior art, or by implications contained in such teachings or suggestions. *In re Sernaker*, 702 F.2d 989, 995, 217 USPQ 1, 6 (Fed. Cir. 1983). The Federal Circuit states

¹ In the final rejection (Paper No., 15) the Examiner objected under 35 U.S.C. § 132 to the amendment received November 26, 1997, because it introduces new matter into the disclosure. As Appellants canceled the requisite material by an amendment received November 2, 1998, and this amendment was entered as noted by the Advisory Action mailed November 24, 1998, this matter is no longer at issue.

² The Brief was received December 24, 1998.

³ The Examiner's Answer was mailed March 15, 1999.

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that "[t]he mere fact that the prior art may be modified in the manner suggested by Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." ***In re Fritch***, 972 F.2d 1260, 1266 n.14, 23 USPQ2d 1780, 1783-84 n. 14 (Fed. Cir. 1992), ***citing In re Gordon***, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). It is further established that "[s]uch a suggestion may come from the nature of the problem to be solved, leading inventors to look to references relating to possible solutions to that problem." ***Pro-Mold & Tool Co. v. Great Lakes Plastics***, 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996) ***citing In re Rinehart***, 531 F.2d 1048, 1054, 189 USPQ 143, 149 (CCPA 1976) (considering the problem to be solved in a determination of obviousness). The Federal Circuit reasons in ***Para-Ordnance Mfg. v. SGS Importers Int'l Inc.***, 73 F.3d 1085, 1088-89, 37 USPQ2d 1237, 1239-40 (Fed. Cir. 1995), that for the determination of obviousness, the court must answer whether one of ordinary skill in the art who sets out to solve the problem and who had before him in his workshop the prior art, would have reasonably expected to use the solution that is claimed by Appellants. However,

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"[o]bviousness may not be established using hindsight or in view of the teachings or suggestions of the invention." **Par Ordnance Mfg. v. SGS Importers Int'l**, 73 F.3d at 1087, 37 USPQ2d at 1239, **citing W. L. Gore & Assocs., Inc. v. Garlock, Inc.**, 721 F.2d at 1551, 1553, 220 USPQ at 311, 312-13. In addition, our reviewing court requires the PTO to make specific findings on a suggestion to combine prior art references. **In re Dembiczak**, 175 F.3d 994, 1000-01, 50 USPQ2d 1614, 1617-19 (Fed. Cir. 1999).

On page 7 of the Appeal Brief (hereinafter "brief"), Appellants assert that plate type actuators (such as those of Suzuki) by their very nature are more compact, or capable of being more compact, than a printhead employing tubular piezoelectric elements which surround the ink channel. In addition, as the Kattner printhead structure is driven by the space limitations imposed by the tubular piezoelectric elements it would not be physically possible to bring the nozzle openings of the ink channels any closer together than the spacings imposed by the outer diameter of the piezoelectric tubes surrounding the channels. Thus, Appellants contend that Kattner uses the channel plate to

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lessen the size of a printhead having widely spaced piezoelectric tube drivers, and that if one employs a planar, plate-like structure such as in Suzuki, the nozzle openings are then already much more closely spaced together than is possible in Kattner, and therefore the reason for using the plate 4 of the Kattner reference is eliminated. Appellants thereby submit that the Examiner's position in combining the references in this regard was based upon Appellants' disclosure.

Appellants further argue (brief, page 8) that one skilled in this art would have had no motivation or inducement to consult prior art which is known to be less compact than the Suzuki structure.

Lastly, Appellants assert (brief, pages 8 and 9) that modifying Kattner in view of Suzuki, as presented by the Examiner in his rejection, involves more leaps of the imagination than modifying Suzuki in view of Kattner, as Kattner is directed to tubular piezoactuators as opposed to plate shaped piezoactuators. Appellants then submit that it is incumbent on the Examiner to demonstrate that incorporating

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the structure of one reference into another would be feasible, rather than merely a conceptual combination, and that tubular piezogenerators and plate shaped piezoactuators are so unlike that an artisan would not proceed in the manner set forth by the Examiner.

In the rejection⁴ the Examiner stated that it would have been obvious to one having ordinary skill in the art to have a plurality of printer modules comprising module plates, plate shaped piezoelectric actuators and columns of nozzles in the Kattner head, as taught by Suzuki, for the purpose of providing a novel ink-jet printing head which can be compact and simply constructed at low cost.

In the answer⁵ the Examiner asserts that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference, nor that the claimed invention must be expressly suggested in any one or all of the references, but that combination of the teaching of the references would have suggested the claimed invention to one skilled in the art.

⁴ Answer, page 3.

⁵ At pages 5-6.

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The Federal Circuit states that "[t]he mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." **In re Fritch**, 972 F.2d 1260, 1266 n.14, 23 USPQ2d 1780, 1783-84 n.14 (Fed. Cir. 1992), **citing In re Gordon**, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). "Obviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor." **Para-Ordnance**, 73 F.3d at 1087, 37 USPQ2d at 1239, **citing W. L. Gore & Assocs.**, 721 F.2d at 1551, 1553, 220 USPQ at 311, 312-13. In addition, our reviewing court requires the PTO to make specific findings on a suggestion to combine prior art references. **In re Dembiczak**, 175 F.3d 994, 1000-01, 50 USPQ2d 1614, 1617-19 (Fed. Cir. 1999).

As pointed out by our reviewing court, we must first determine the scope of the claim. "[T]he name of the game is the claim." **In re Hiniker Co.**, 150 F.3d 1362, 1369, 47 USPQ2d 1523, 1529 (Fed. Cir. 1998).

Turning first to Appellants' claim 1, we note that the

claim calls for an adapter plate⁶ and a nozzle plate⁷ disposed adjacent and in contact with the front face of the adapter plate, with the adapter plate openings⁸ in registry with ink chamber openings in the front face of the assembly and the nozzle apertures.

We agree with Appellants that the Suzuki plate type actuators are more compact than a printhead employing tubular piezoelectric elements which surround the ink channel. In addition, in Kattner it is apparent that the spacings imposed by the outer diameter of the piezoelectric tubes surrounding the channels limit size minimization of the head. Thus, Examiner's assertion that the channel plate 4 Kattner is used to provide a more compact head is correct, however the assertion that it would therefore fulfill the compact ink jet head objective of Suzuki, is not well taken. We find as Appellants contend, that if one employs the Suzuki planar plate-like structure, the nozzle openings are then already much more closely spaced together than is possible in Kattner,

⁶ Line 18

⁷ Line 22

⁸ Lines 31-36

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and therefore the reason for using the plate 4 of the Kattner reference is eliminated.

One important indicium of non-obviousness is "teaching away" from the claimed invention by the prior art. ***In re Dow Chemical Co.***, 837 F.2d 469, 473, 5 USPQ2d 1529, 1532 (Fed. Cir. 1988), ***In re Bell***, 991 F.2d 781, 784, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993). Here, Suzuki⁹ teaches away from using a channel plate by teaching that a disadvantageous pressure loss occurs where long passages are formed between the pressure chambers and the ink output orifices, and that the head is more compactly designed as the ink jet drop can be directly ejected from the pressure chamber through the orifice.¹⁰ Thus, the addition of channel plate between the core and orifice plate of Suzuki would increase the ink passage length and further decrease the pressure.

We are not inclined to dispense with proof by evidence when the proposition at issue is not supported by a teaching in a prior art reference or shown to be common knowledge of unquestionable demonstration. Our reviewing court requires

⁹ Column 1, lines 54-57; column 8, lines 24-27

¹⁰ 36 of figure 3

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this evidence in order to establish a **prima facie** case. **In re Piasecki**, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984); **In re Knapp-Monarch Co.**, 296 F.2d 230, 232, 132 USPQ 6, 8 (CCPA 1961); **In re Cofer**, 354 F.2d 664, 668, 148 USPQ 268, 271-72 (CCPA 1966). Furthermore, our reviewing court states in **In re Piasecki**, 745 F.2d at 1471-72, 223 USPQ 785 at 787-88 (Fed. Cir. 1984) the following:

The Supreme Court in **Graham v. John Deere Co.**, 383 U.S. 1 (1966), focused on the procedural and evidentiary processes in reaching a conclusion under Section 103. As adapted to ex parte procedure, Graham is interpreted as continuing to place the "burden of proof on the Patent Office which requires it to produce the factual basis for its rejection of an application under section 102 and 103". **Citing In re Warner**, 379 F.2d 1011, 1020, 154 USPQ 173, 177 (CCPA 1967).

Therefore, we will not sustain the rejection of claims 1, 3, 4, 6-10, 12 and 13 under 35 U.S.C. § 103 as being unpatentable over Kattner when taken with Suzuki.

In addition, we will not sustain the rejection of claims 2, 5, 11 and 14 under 35 U.S.C. § 103 as being unpatentable over Kattner when taken with Suzuki and Pond, as Pond does not provide the adapter plate claim limitations found absent in the above analysis of the parent claims, and the Examiner has

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only applied Pond to the specific limitations added by these dependent claims. We have not sustained the rejection of claims 1-14 under 35 U.S.C. § 103. Accordingly, the Examiner's decision is reversed.

REVERSED

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| JERRY SMITH |) | |
| Administrative Patent Judge |) | |
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| |) | BOARD OF PATENT |
| MICHAEL R. FLEMING |) | APPEALS AND |
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| JOSEPH L. DIXON |) | |
| Administrative Patent Judge |) | |

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