

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BRUCE COWGER

Appeal No. 1998-3131
Application No. 08/192,224

ON BRIEF

Before KRASS, FLEMING, and BARRY, Administrative Patent Judges.
BARRY, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the rejection of claims 1-9, 14, and 15. We reverse.

BACKGROUND

The invention at issue in this appeal relates to ink-jet printers. Pens used with ink-jet printers include print heads that eject minute droplets of ink through nozzles. An ink supply reservoir is associated with the pen. Certain print

heads, known as drop-on-demand type, employ thermal or piezoelectric mechanisms that are responsive to control signals for expanding or compressing, respectively, small volumes of ink near each print head nozzle to eject drops therefrom onto print media.

The ink supplied from the pen reservoir flows in a single path toward the print head and out a nozzle. When nozzles are not ejecting drops, there is substantially no flow of supply ink near the nozzle. When the printer is activated, but between printing operations, the flow of supply ink is generally still with respect to the entire print head.

The print heads of the inventive ink-jet pens are supplied with ink circulated to and from the print head. Passageways defined by the pen are oriented in fluid communication with the firing chambers of the print head and so that ink circulates near the chambers no matter whether the print head is activated for ejecting ink drops.

Such ink circulation helps the removal of air from ink. Where more than one print head is employed, moreover, such circulation across all the print heads evenly distributes heat so that the entire array of print heads operates at substantially the same temperature. When used with color inks, circulation helps to prevent changes in the relative concentrations of dye and solvents.

Claim 1, which is representative for our purposes, follows:

1. An ink circulation system for an ink-jet printer, comprising:

a pen body shaped to define a first location to which is mounted a print head that is operable to expel ink;

a first ink circulation passageway defined by the shape of the pen body, the passageway being in fluid communication with the print head;

a flexible circuit attached to the print head and shaped to define with the pen body a part of the first ink circulation passageway; and

circulation means for continuously moving ink into and out of the first ink circulation passageway thereby to place moving ink in fluid communication

with the print head irrespective of whether the print head is simultaneously operating to expel ink.

The references relied on in rejecting the claims follow:

Barbero et al. (Barbero)	4,432,003	Feb.
14, 1984		
Hoisington et al. (Hoisington)	4,814,786	Mar. 21,
1989		
Chan et al. (Chan)	5,016,023	May 14,
1991		
Nozawa et al. (Nozawa)	5,291,215	Mar. 1,
1994		
	(filed Sep. 26,	
1991).		

Claims 1-6 and 9 stand rejected under 35 U.S.C. § 103 as obvious over Chan in view of Barbero. Claims 7, 8, 14, and 15 stand rejected under § 103 as obvious over Chan in view of Barbero further in view of Hoisington. Claims 1-5 also stand rejected under § 103 as obvious over Chan in view of Nozawa. Rather than repeat the arguments of the appellant or examiner in toto, we refer the reader to the briefs and answer for the respective details thereof.

OPINION

In deciding this appeal, we considered the subject matter on appeal and the rejection advanced by the examiner. Furthermore, we duly considered the arguments and evidence of the appellant and examiner. After considering the record, we are persuaded that the examiner erred in rejecting claims 1-9, 14, and 15. Accordingly, we reverse.

We begin by noting the following principles from In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993).

In rejecting claims under 35 U.S.C. Section 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).... "A prima facie case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art." In re Bell, 991 F.2d 781, 782, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993) (quoting In re Rinehart, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976)).

With these principles in mind, we consider the examiner's rejections and appellant's arguments regarding the following claims:

- claims 1-9 and 14
- claim 15.

Claims 1-9 and 14

The examiner asserts, "Chan teaches thin 'film transducer substrates (16) includes a plurality of heater resistor transducer elements (20) spaced around an elongated ink feed slot (22)' (Fig. 1, col. 2, lines 58-60, col. 3, lines 34-37) to meet the limitation of a flexible circuit (substrate 16/Chan)" (Examiner's Answer at 6.) The appellant argues, "Item 16 in Chan is *not* a flexible circuit." (Reply Br. at 3.)

Claims 1-9 specify in pertinent part the following limitations: "a flexible circuit attached to the print head and shaped to define with the pen body a part of the first ink circulation passageway" Similarly, claim 14 specifies in pertinent part the following limitations: "a flexible circuit member covering the print head and shaped to define with the body and the print head, part of the ink passageway"

Accordingly, claims 1-9 and 14 require a flexible circuit attached to a print head.

The examiner fails to show a suggestion of the limitations in the prior art. "Obviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor." Para-Ordnance Mfg. v. SGS Importers Int'l, 73 F.3d 1085, 1087, 37 USPQ2d 1237, 1239 (Fed. Cir. 1995), cert. denied, 519 U.S. 822 (1996)(citing W.L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1551, 1553, 220 USPQ 303, 311, 312-13 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984)). "It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious." In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992) (citing In re Gorman, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991)). "The 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." Id. at 1266,

23 USPQ2d at 1784 (citing In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984)).

Here, although Chan discloses "an underlying thin film substrate and barrier layer portion **16**," col. 2, ll. 53-54, the portion is not flexible. To the contrary, it is rigid. Specifically, "[t]he substrate and barrier layer portion **16** of the thin film printhead **12** will typically consist in layer sequence of a glass or silicon substrate underlayer, a SiO₂ surface barrier layer, a tantalum-aluminum resistor layer, an aluminum conductive trace material, a silicon nitride and silicon carbide composite passivation layer, and a polyimide barrier layer such as a VACREL polymer made by the DuPont Company." Col. 3, ll. 8-15. The examiner fails to allege, let alone show, that the addition of Barbero, Hoisington, or Nozawa cures the deficiency of Chan.

Because Chan teaches a rigid substrate and barrier layer portion, we are not persuaded that teachings from the applied

prior art would appear to have suggested the claimed limitations of "a flexible circuit attached to the print head and shaped to define with the pen body a part of the first ink circulation passageway" or "a flexible circuit member covering the print head and shaped to define with the body and the print head, part of the ink passageway" The examiner fails to establish a prima facie case of obviousness. Therefore, we reverse the rejection of claims 1-6 and 9 as obvious over Chan in view of Barbero; the rejection of claims 7, 8, and 14 as obvious over Chan in view of Barbero further in view of Hoisington; and the rejection of claim 1-5 as obvious over Chan in view of Nozawa. Next, we address claim 15.

Claim 15

The examiner asserts, "the alignment features on the body for aligning the printhead is taught by Chan et al.'s sunken receptacles which can be varied and controlled in order to receive the printheads (col. 6, lines 32-66)." (Examiner's Answer at 7.) The appellant argues, "[t]he Examiner has not referred to a feature of any device in Chan, Barbero or

Hoisington that teaches or suggests ... a recess including equivalent alignment features." (Appeal Br. at 9.)

Claim 15 specifies in pertinent part the following limitations: "a print head mounted within the recess and shaped to define at least one ink passageway along a substantial length of the print head and wherein the recess has long side edges and the body is shaped to define alignment features for aligning the print head in the recess spaced from the long side edges of the recess" Accordingly, the claim requires alignment features for aligning a print head in a recess.

The examiner fails to show a suggestion of the limitations in the prior art. Here, although Chan discloses "a plurality of rectangular sunken receptacles in a central area," col. 6 l. 37, the receptacles do not include alignment features. The reference merely teaches that "every other receptacle in a row will receive a printhead and the alternate remaining intermediate receptacles will receive an IC package

or other desired on-board (on-preform) component in a high density planar packing arrangement." Id. at 11. 44-48. The examiner fails to allege, let alone show, that the addition of Barbero or Hoisington cures the deficiency of Chan.

Because Chan teaches no alignment features, we are not persuaded that teachings from the applied prior art would appear to have suggested the claimed limitations of "a print head mounted within the recess and shaped to define at least one ink passageway along a substantial length of the print head and wherein the recess has long side edges and the body is shaped to define alignment features for aligning the print head in the recess spaced from the long side edges of the recess" The examiner fails to establish a prima facie case of obviousness. Therefore, we reverse the rejection of claim 15 as obvious over Chan in view of Barbero further in view of Hoisington.

CONCLUSION

In summary, the rejections of claims 1-9, 14, and 15 under 35 U.S.C. § 103 are reversed.

REVERSED

ERROL A. KRASS)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
MICHAEL R. FLEMING)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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LANCE LEONARD BARRY)	
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