

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 29

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TOSHIO AMANO, HISAYOSHI FUJIMOTO, YASUSHI EMA,
YASUHISA FUJII, and NOBUHISA ISHIDA

Appeal No. 1999-1560
Application No. 08/974,108

HEARD: May 23, 2001

Before HAIRSTON, GROSS, and BLANKENSHIP, Administrative Patent Judges.
GROSS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 through 20, which are all of the claims pending in this application.

Appellants' invention relates to an ink jet printing head. A main frame supports a head assembly having pressure chambers filled with ink and corresponding piezoelectric elements. Each chamber's volume varies with a voltage applied to the associated piezoelectric element. A hollow portion in the center of the main frame, a

flexible cable with electrodes for driving the piezoelectric elements, and a flexible member keeping the piezoelectric elements and the flexible cable in contact have an oval shape. Claim 1 is illustrative of the claimed invention, and it reads as follows:

1. An ink jet printing head comprising:

a head assembly, including:

an ink conduit plate,

pressure chambers arrayed on the ink conduit plate, each pressure chamber having an ink inlet at a first end of the pressure chamber and a nozzle at a second end of the pressure chamber,

an ink conduit connected to the ink inlet of each pressure chamber,

a diaphragm disposed over and covering an end of each pressure chamber, and

a plurality of piezoelectric elements attached to the diaphragm in one-to-one correspondence with the pressure chambers, wherein each piezoelectric element is operable to move a portion of the diaphragm to vary a capacity of a pressure chamber corresponding to the piezoelectric element to draw ink through the ink inlet and to expel ink through the nozzle;

the ink jet printing head further comprising:

a main frame having a first surface that supports the head assembly, a second surface, and a hollow portion that is oval in shape at a center of the main frame;

a flexible cable that is oval in shape and positioned in the hollow portion of the main frame, the flexible cable including a group of electrodes for applying a drive voltage to the piezoelectric elements;

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We have carefully considered the claims, the applied prior art references, and the respective positions articulated by appellants and the examiner. As a consequence of our review, we will reverse the obviousness rejections of claims 1 through 20.

All of appellants' arguments are directed to whether or not it would have been obvious to make the circular elements of Shimizu (i.e., the hollow portion of the main frame, the flexible cable, and the flexible member) an oval shape. Accordingly, we will limit our discussion to the modification to an oval shape for Shimizu's circular elements.

The examiner states (Answer, page 4),

It is noted that applicants have not presented any criticality, within the specification, of an oval cable and an oval member which presents that the particular configuration of the cable and member is significant or anything more than one of numerous configurations a person of ordinary skill in the art would find obvious for the purpose of providing a more efficient an [sic] ink jet head....

Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have used oval cables and oval members in Shimizu et al. for the purpose of providing a more efficient an [sic] ink jet head.

The examiner (Answer, page 6) dismisses appellants' declaration under 37 CFR § 1.132 as "lack[ing] technical validity," since it includes

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no test results or statistical data comparing Shimizu's device to the claimed device. Further, the examiner (Answer, pages 6-7) explains that the test for obviousness is "what the references as a whole would have suggested to one of ordinary skill in the art," and, therefore, "it is not necessary that the reference(s) actually suggest, expressly or in so many word, [sic] the changes or improvements that the appellants have made."

First, we note that for a rejection under 35 U.S.C. § 103, the examiner is required to provide a reason from some teaching, suggestion or implication in the prior art as a whole, or knowledge generally available to one of ordinary skill in the art, why one having ordinary skill in the pertinent art would have been led to modify the prior art to arrive at the claimed invention. Uniroyal, Inc. v. Rudkin-Wiley, 837 F.2d 1044, 1052, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988), cert. denied, 488 U.S. 825 (1988). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). Furthermore, "[o]bviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor." Para-Ordnance Mfg., Inc. v. SGS Importers Int'l, Inc., 73 F.3d 1085, 1087,

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37 USPQ2d 1237, 1239 (Fed. Cir. 1995), citing W.L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1551, 1553, 220 USPQ 303, 311, 312-13 (Fed. Cir. 1983). Here the examiner has provided no prior art which would have suggested the desirability of using an oval shape for the various elements of Shimizu. The only suggestion of an oval shape comes from appellants' specification. Thus, the examiner has failed to establish a prima facie case of obviousness.

Second, as to the examiner's contention that appellants have failed to show criticality in the specification, we disagree. The examiner apparently overlooked appellants' statements in the specification that (1) the oval shape "assures precise, reliable and easy positioning of the main frame, head assembly and flexible cable," (see page 5), (2) "[t]he oval flexible cable 16 is precisely fitted into the oval hollow portion 14a Thus, the electrodes 16a are easily positioned in such a manner as to precisely correspond to the piezoelectric elements 40 on a one-to-one basis," (see page 19) and (3) "[a]ll of the hollow opening 14a, flexible cable 16, flexible member 18 and rimmed window 22a have the same oval shape, so that the main frame 14, flexible cable 16, flexible member 18 and sub-frame 22 can be precisely and easily positioned with respect to one another. Therefore, the ink jet printing head can be

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automatically assembled," (see page 23). In other words, appellants have indicated in the specification that the oval shape is critical to the positioning and, thus, to automating the assembly of the various elements.

Furthermore, appellants' declaration asserts additional reasons for the oval shape such as better uniformity in the distances between the pressure chambers and the nozzles and easy adjustment of the balance of the ink conduit. Although test results and evidence of unexpected results are two types of secondary considerations, we find no basis for the examiner's requirement that a declaration include evidence of unexpected results or test results comparing the prior art to the claimed invention. Thus, even had the examiner set forth a prima facie case of obviousness, appellants have established the criticality for the oval shape. Consequently, we cannot sustain the rejection of claims 1, 2, and 4 through 20.

Regarding the rejection of claim 3 over Shimizu in view of Matsumoto, Matsumoto fails to overcome the deficiencies of Shimizu. Therefore, we must reverse the rejection of claim 3.

CONCLUSION

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The decision of the examiner rejecting claims 1 through 20
under 35 U.S.C. § 103 is reversed.

REVERSED

KENNETH W. HAIRSTON)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
ANITA PELLMAN GROSS)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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HOWARD B. BLANKENSHIP)	
Administrative Patent Judge)	

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