Paper No. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TSUTOMU MASHIZUME and TETSUSHI TAKAHASHI

Appeal No. 2000-0710
Application 08/788,959

ON BRIEF

Before URYNOWICZ, RUGGIERO, and BARRY, Administrative Patent Judges.

URYNOWICZ, Administrative Patent Judge.

Decision on Appeal

This appeal is from the final rejection of claims 1, 3-9, and 20-22, all of the claims pending in the application.

The invention pertains to a recording head. Claim 1 is illustrative and reads as follows:

1. An ink jet recording head comprising:

a nozzle for jetting ink;

an ink chamber communicating with said nozzle;

a diaphragm for pressurizing ink in said ink chamber;

a piezoelectric thin film on said diaphragm; and

an electrode for applying an electric field to said piezoelectric thin film,

wherein said piezoelectric thin film and said electrode are patterned to the same shape and without a pattern shift between said piezoelectric thin film and said electrode.

The references relied upon by the examiner are:

Rittberg	DE 2,256,667 (German Patent Document)	Jun. 06, 1974
Fujii	JP 5-286131 (Japanese Patent Application)	Nov. 02, 1993

Claims 1, 3-9 and 20-22 stand rejected under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements.

Claims 1, 4 and 22 stand rejected under 35 U.S.C. § 102(b) as anticipated by JP 5-286131 (Fujii)[1].

Claims 3, 5-9, 20 and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fujii in view of DE 2,256,667 (Rittberg)[2].

The respective positions of the examiner and the appellants with regard to the propriety of these rejections are set forth in

1. The examiner's answer erroneously includes claim 2 and 10 in this rejection. Claim 2 was cancelled in the amendment filed January 27, 1999 (Paper No. 16) and claim 10 was cancelled in the amendment filed August 3, 1998 (Paper No. 14).
2. In the examiner's response to the reply brief (Paper No. 24), it was acknowledged that claim 21 was inadvertently omitted from this

the final rejection and the examiner's answer (Paper Nos. 15 and 22, respectively) and the appellants' brief and reply brief (Paper Nos. 21 and 23, respectively).

Appellants' Invention

A summary of the invention is set forth at pages 2 and 3 of the brief.

The Rejection under 35 U.S.C. § 112, Second Paragraph

Claims 1, 3-9 and 20-22

After consideration of the positions and arguments presented by both the examiner and the appellants, we have concluded that this rejection should be sustained. We agree in general with the comments made by the examiner; we add the following discussion for emphasis.

The disclosed invention is a unitary structure, not a kit or package of ready to assemble parts. There are few positive recitations of structural cooperation among the elements listed in the claims and, consequently, the claims are incomplete. In re Collier, 397 F.2d 1003, 158 USPQ 266 (CCPA 1968). For example, in claim 1 the only structural relationship defined is that of "a piezoelectric thin film on said diaphragm". Recitations associated with other claimed elements are functional only.

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rejection.

We will not read subject matter of the specification into the claims as broadly suggested to us by appellants at page 3, lines 17-19, of the brief. Before an application is granted, there is no reason to read into a claim the limitations of the specification. Limitations are not to be read into the claims from the specification. In re Van Geuns, 988 F.2d 1181, 1184, 26 USPQ2d 1057, 1059 (Fed. Cir. 1993).

The Rejection under 35 U.S.C. § 102(b)

Claims 1, 4 and 22

We will consider the rejection of these claims, and claims 3, 5-9, 20 and 21, over the prior art even though the claims have been found unpatentable under 35 U.S.C. § 112, second paragraph, as incomplete. The claims recite specific elements and we will determine whether or not these elements and their structural relationships, to the extent claimed, are taught by the prior art relied on by the examiner.

We will not sustain this rejection.

The sole point of contention with respect to these claims is to be found with respect to the recitation in claim 1 which reads "… without a pattern shift between said piezoelectric thin film and said electrode." Appellants' specification indicates that

this language is intended to mean that the edges of piezoelectric layer PZ and upper electrode UE are in alignment, unlike in conventional ink jet recording heads wherein a pattern shift or misalignment exists between the PZT layer and the upper electrode. The alignment between layers in appellants' device is attributed to the fact that the two layers of the recording head in question are formed by a dry etching system to etch layers 4 and 5 (Figs. 6 and 7) in batch, that is, in the same step. Such being the case, we do not agree with the examiner that the above claim recitation does not further limit the final structure of the claimed invention.

At page 10, the translated Fujii reference teaches etching to form the PZT element 4. However, the examiner has not established that misalignment of layer edges was a problem recognized in the prior art, and Fujii does not teach simultaneous etching of a PZT layer and an upper conductive layer to produce a PZT layer and an upper electrode layer whose edges are aligned, that is, without a pattern shift between the piezo-electric thin film and the upper electrode as required by the claims. Accordingly, the rejection of claims 1, 4 and 22 as anticipated by Fujii cannot be sustained.[3]

3. We note that at page 5, lines 1 and 2, Rittberg teaches simultaneous etching of a PZT layer and an upper conductive layer. The

The Rejection under 35 U.S.C. § 103(a)

Claims 3, 5-9, 20 and 21

We will sustain this rejection.

Appellants' have not argued that it would not have been obvious for one of ordinary skill in the art to combine the teachings of Fujii and Rittberg at the time the invention was made.

Appellants' only argument with respect to claims 6 and 20 appears at page 9 of the brief. Here, appellants argue that Rittberg does not teach or suggest a common electrode having different thicknesses, as recited in claims 6 and 20. In the specification at page 18, appellants teach that reduced thickness areas allow a large displacement of the diaphragm layer VP into the ink chamber IT so as to increase the volume of ink jetted via orifice NH for printing. See Fig. 12.

We have not found this argument persuasive. In the sentence bridging pages 1 and 2, Rittberg teaches that it was known in the art of ink jet recording heads to place a metal membrane or cover positioned over fluid-filled chambers for reducing the size of the chambers for ink jetting. The reference teaches different

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PZT projections and upper electrodes 13 would be expected to have aligned edge layers just as taught by appellants. However, there is no outstanding rejection of claims 1, 4 and 22 as obvious over Fujii in view of Rittberg for us to consider.

thicknesses in such a cover layer which increases layer displacement and reduces chamber size. In this regard, in Fig. 2, Rittberg teaches decreased cross sections 27 in the common chamber cover plate or layer 25 above fluid chambers 29[4]. The reduced sections 27 would have increased the flexibility of the layer 25 for reducing the size of the ink chambers so as to eject more ink for printing. The reduced sections 27 of the common metal layer 25 in an area not attached to the piezoelectric thin film are thinner than the portions of the common electrode in the areas attached to the piezoelectric thin film, as defined in claims 6 and 20. See especially, the two left-most reduced sections 27 in Fig. 2 of Rittberg.

With respect to dependent claim 21, it is argued that neither reference teaches or suggests a diaphragm that consists of a common electrode. This position is not persuasive because cover plate 25 in Rittberg is a metal diaphragm common to fluid chambers 29 and the upper electrodes.

Dependent claims 3, 5, 8 and 9 are not specifically argued by appellants.

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4. The cover plate or layer is not labeled in Fig. 2 of Rittberg but it is clear from the specification that it is the layer directly above the fluid chambers 29.

Summary

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

STANLEY M. URYNOWICZ, JR. Administrative Patent Judge	)	
JOSEPH F. RUGGIERO Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
LANCE LEONARD BARRY Administrative Patent Judge	)	

smu/vsh

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