

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 76

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KOUJI OKADA

Appeal No. 1997-3956
Application 08/583,960

ON BRIEF

Before KRASS, FLEMING and RUGGIERO, **Administrative Patent Judges.**

FLEMING, **Administrative Patent Judge.**

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claim 6, the only claim pending in the present application. Claims 1-5 and 7 have been canceled.

The invention relates to an A/D converter for converting

an analog signal into a digital signal. On page 9, Appellant discloses that Figure 3 is a circuit diagram showing a 6-bit A/D converter according to one embodiment of the present invention. On pages 10 through 17, Appellant discloses a first embodiment of the 6-bit A/D converter. In particular, Appellant discloses on page 15 that four capacitors having the same capacitance are connected in series. The potential difference of the middle-level region is applied to both ends of the series circuit of capacitors C1 to C4 bias switches SE and FF. The applied voltage is divided by four by the capacitors C1 to C4. On page 22 of the specification, Appellant discloses that capacitors C1 to C4 may be replaced with four resistors having the same resistance. In this case, the series-connected resistors are connected in parallel to the resistor R1 so that the replaced resistor should have a sufficiently large resistance to avoid influencing the resistance of the string resistance R1.

The only claim in the present application, claim 6, is reproduced as follows:

6. An A/D converter comprising:

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upper comparison voltage generating means for dividing a reference voltage into a plurality of large-level regions with first voltage-dividing elements and outputting voltages at boundaries of the individual large-level regions as upper comparison voltages;

a plurality of upper comparators comparing an analog input voltage with said upper comparison voltages;

upper determining means for determining, from output signals of said upper comparators, to which one of said large-level regions said analog input voltage belongs, wherein said determining means includes first converting means for outputting a predetermined upper digital code in accordance with said determined large-level region;

middle comparison voltage generating means for dividing said large-level region to which the analog input voltage is determined to belong by said upper determining means, into a plurality of middle-level regions with second voltage-dividing elements and outputting voltages at boundaries of said middle-level regions as middle comparison voltages, the second voltage-dividing elements being commonly used with the first voltage-dividing elements;

a plurality of middle comparators comparing said analog input voltage with said middle comparison voltages;

middle determining means for determining, from output signals of said middle comparators, to which one of said middle-level regions said analog input voltage belongs, wherein said determining means includes second converting means for outputting a predetermined middle digital code corresponding to said determined middle-level region;

lower comparison voltage generating means for dividing said middle-level region to which the analog input voltage is determined to belong by said middle determining means, into a plurality of small-level regions with third voltage-dividing

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elements and outputting voltages at boundaries of said small-level regions as lower comparison voltages;

switching means for selectively connecting the lower comparison voltage generating means in parallel to the determined middle-level region by the middle determining means;

a plurality of lower comparators comparing said analog input voltage with said lower comparison voltages; and

lower determining means for determining, from output signals of said lower comparators, to which one of said small-level regions said analog input voltage belongs, wherein said determining means further includes a converting means for outputting a predetermined lower digital code in accordance with said determined small-level region, wherein [sic;]

said third voltage-dividing elements including one of a capacitor string comprising a plurality of series-connected capacitors and a resistor string comprising a plurality of series-connected resistors, each resistor of the resistor string having a high resistance sufficient to avoid influencing the determined regions of the second voltage-dividing elements.

The Examiner relies on the following references:

Yamada et al. (Yamada)	4,542,370	Sept. 17, 1985
Tsuji et al. (Tsuji)	4,893,124	Jan. 9, 1990
Yahagi et al. (Yahagi)	5,247,301	Sept. 21, 1993

Claim 6 stands rejected under 35 U.S.C. § 103 as being unpatentable over Tsuji in view of Yamada. In addition, claim 6 stands rejected under 35 U.S.C. § 103 as being unpatentable over Yahagi in view of Yamada.

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Rather than reiterate the arguments of Appellant and Examiner, reference is made to the brief¹ and answer for further details thereof.

OPINION

We will not sustain the rejection of claim 6 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). "Additionally, when determining obviousness, the claimed invention should be considered as a whole; there is no legally recognizable 'heart' of the invention." **Para-Ordinance Mfg. v. SGS Importers Int'l, Inc.**, 73 F.3d 1085,

¹ Appellant filed a reply brief on October 6, 1997. Examiner responded with a letter dated December 19, 1997 stating that the reply brief has not been entered into the record and therefore is not for our consideration.

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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, 1548, 220 USPQ 303, 309 (Fed. Cir. 1983), **cert. denied**, 469 U.S. 851 (1984).

In regard to the rejection of claim 6 under 35 U.S.C. § 103 as being unpatentable over Tsuji in view of Yamada, Appellant argues on page 5 that Tsuji fails to teach "said third voltage dividing elements including one of a capacitor string comprising a plurality of series-connected capacitors and a resistor string comprising a plurality of series-connected resistors, each resistor of the resistor string having a high resistance sufficient to avoid influencing the determined regions of the second voltage dividing elements" as recited in claim 6. Appellant further argues on page 6 of the brief, that Yamada discloses capacitor elements for an A/D converter, however, Yamada fails to disclose the function of the capacitor elements as the same function as claimed in claim 6.

On page 3 of the answer, the Examiner admits that Tsuji does not disclose specific construction of the referenced

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voltage generators but argues that resistive and capacitive voltage dividers are typical fare. The Examiner argues that it would have been obvious to use either resistors or capacitors in the Tsuji system. The Examiner further argues that it is common to use the reference voltage generators of the stages subsequent to the upper stage to often subdivide a coarse interval of the first reference generator. The Examiner argues further that this interval subdivision is typically accomplished by supplying a particular step to the later stage voltage dividing element constituting some form of common use. However, the Examiner has provided no evidence in the record to support the Examiner's assertion. The Federal Circuit states that "[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." **In re Fritch**, 972 F.2d 1260, 1266 n.14, 23 USPQ 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

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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, Inc., 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. Inc. v. SGS Importers Int'l Inc.**, 73 F.3d 1085, 1088-89, 37 USPQ2d 1237, 1239-40 (Fed. Cir. 1995), **cert. denied**, 519 U.S. 822 (1996), 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 been reasonably expected to use the solution that is claimed by the Appellant. However, "[o]bviousness may not be established using hindsight or

in view of the teachings or suggestions of the invention."

Para-Ordnance MFG. v. SGS Inporters Int'l, 73 F.3d at 1087, 37

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USPQ2d at 1239, **citing W. L. Gore & Assocs., Inc. v. Garlock, Inc.**, 721 F.2d at 1551, 1553, 220 USPQ at 311, 312-313. 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).

We fail to find that the Examiner has provided evidence as to why one of ordinary skill in art would have been led to provide an upper comparison voltage generating means for dividing reference voltage into a plurality of large level regions with first voltage-dividing elements, a middle comparison voltage generating means for dividing said large level regions to which the analog input voltage is determined to belong by said upper determining means, into a plurality of middle-level regions with second voltage-dividing elements, and a third voltage dividing element including one of the capacitor string comprising a plurality of series-connected capacitors and resistor string comprising a plurality of series-connected resistors, each resistor of the resistor string having a high resistance sufficient to avoid

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influencing determined regions of the second voltage elements.

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 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 1472, 223 USPQ at 788 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).

In regard to the rejection based upon Yahagi in view of Yamada, Appellant argues that neither Yahagi nor Yamada

teaches a third voltage dividing element which includes one capacitor string and a resistor string wherein the resistor string has a high resistance sufficient to avoid influencing the determining region of second voltage providing element. Appellants argue that this suppresses a direct current flow into the third voltage-dividing element thereby avoiding influencing of the reference voltage.

The Examiner states on page 4 that Yahagi discloses a three stage ADC in Figure 7. The Examiner further states that the first reference voltage generator is shared by the upper string and medium stage. A second reference voltage generator supplies the lower stage with the particular step level as determined by the medium encoder output. The Examiner admits that Yahagi does not disclose the makeup of the reference voltage generators as claimed by Appellant. Examiner argues that resistive or capacitive dividers can be interchangeably used as taught by Yamada.

As we pointed out above we fail to find any evidence in Yamada of a teaching or suggestion of providing Appellant's claimed upper comparison voltage generating means for dividing a reference voltage, no comparison voltage generating means

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for dividing said large-level region into a plurality of middle-level regions the second voltage-dividing elements and or comparison voltage generating means for dividing said middle-level regions into a plurality of small-level regions with third voltage dividing elements wherein said third voltage dividing elements include one of a capacitor string comprising a plurality of series-connected capacitors and a resistor string comprising a plurality of series-connected resistors, each resistor of the resistor string having a high resistance sufficient to avoid influencing the determined regions of the second voltage-dividing elements.

We have not sustained the rejection of claim 6 under 35 U.S.C. § 103.

Finally, the Examiner's decision is reversed.

37 CFR § 1.196B

A new ground of rejection of claim 6 is entered under 35 CFR 1.196(b). The specification is objected to under 35 U.S.C.

§ 112, first paragraph, as failing to provide an adequate written description of the invention. Claim 6 is rejected under 35 U.S.C. § 112, first paragraph, for the reasons set

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forth in objection to the specification.

"The function of the description requirement [of the first paragraph of 35 U.S.C. § 112] is to ensure that the inventor had possession, as of the filing date of the application relied on, of the specific subject matter later claimed by him." **In re Wertheim**, 541 F.2d 257, 262, 191 USPQ 90, 96 (CCPA 1976). "It is not necessary that the application describe the claim limitations exactly, . . . but only so clearly that persons of ordinary skill in the art will recognize from the disclosure that Appellant's invented processes including those limitations." **Wertheim**, 541 F.2d at 262, 191 USPQ at 96, **citing In re Smythe**, 480 F.2d 1376, 1382, 178 USPQ 279, 284 (CCPA 1973). Furthermore, the Federal Circuit points out that "[i]t is not necessary that the claimed subject matter be described identically, but the disclosure originally filed must convey to those skilled in the art that applicant had invented the subject matter later claimed." **In re Wilder**, 736 F.2d 1516, 1520, 222 USPQ 369, 372 (Fed. Cir. 1984), **cert. denied**, 469 U.S. 1209 (1985), **citing In re Kaslow**, 707 F.2d 1366, 1375, 217 USPQ 1089, 1096

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(Fed. Cir. 1983).

Appellant's claim 6 recites "said third voltage-dividing element including one of a capacitor string comprising a plurality of series-connected capacitors and a resistor string comprising a plurality series-connected resistors, each resistor of the resistor string having a high resistance sufficient to avoid influencing the determined regions of the second voltage-dividing elements." In the appeal brief on page 3, Appellant states that the capacitor string as claimed is shown as C1 to C4 shown in Figure 3 and disclosed on page 5, line 13, in the Appellant's specification. Appellant further states that the resistive string comprising a plurality of series-connected resistors is shown as R1 in Figure 3 and disclosed on page 11, line 3.

We find that the disclosure as originally filed does not provide a description of the R1 resistor string having resistors of this resistor string having a high resistance sufficient to avoid influencing the determined region of the second-voltage element as claimed in Appellant's claim 6. We note that the specification as pointed to by the Appellant on

page 11 only states that Figure 3 shows a high reference voltage VRH and a low reference voltage VRL are divided by the resistor string formed by 16 series-connected resistors R1. Those resistors R1 have the same resistance. The specification does not disclose that the resistance must be sufficient to avoid influencing the determined regions of the second voltage-dividing element.

We further note that on page 22 of the specification that Appellant discloses that the present invention is not limited to the above described embodiments that may be modified in various manners as follows. Appellant further discloses that the capacitors R1 to R4 may be replaced by four resistors having the same resistance. Appellant does disclose that the series-connected resistors are connected and parallel to the resistors R1, so that the replaced resistors could have a sufficiently large resistance to avoid influencing resistant R1. However, the specification does not describe that the resistor value for R1 should be sufficiently large to avoid influencing the determined regions of the second voltage-dividing elements.

In view of the above rationale we find that claim 6 is

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unpatentable over 35 U.S.C. § 112, first paragraph.

This decision contains a new ground of rejection pursuant to 37 CFR 1.196(b).

This decision contains a new ground of rejection pursuant to 37 CFR § 1.196(b) (amended effective Dec. 1, 1997, by final rule notice, 62 Fed. Reg. 53,131, 53,197 (Oct. 10, 1997), 1203 Off. Gaz. Pat. & Trademark Office 63, 122 (Oct. 21, 1997)).

37 CFR

§ 1.196(b) provides that, "A new ground of rejection shall not be considered final for purposes of judicial review."

37 CFR § 1.196(b) also provides that the Appellant, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of proceedings (§ 1.197(c)) as to the rejected claims:

(1) Submit an appropriate amendment of the claims so rejected or a showing of facts relating to the claims so rejected, or both, and have the matter reconsidered by the Examiner, in which event the application will be remanded to the Examiner. . . .

(2) Request that the application be reheard under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. . . .

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REVERSED, 37 CFR 1.196(b)

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Administrative Patent Judge)	
)	
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MICHAEL R. FLEMING)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
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