

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(2) is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SCOTT W. CAMERON

Appeal No. 1996-2199
Application 08/191,060¹

HEARD: October 4, 1999

Before JERRY SMITH, BARRETT and BARRY, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134
from the examiner's rejection of claims 1, 2, 4-11, 13, 15-21,

¹ Application for patent filed February 2, 1994. According to appellant, this application is a continuation of Application 07/937,530, filed August 28, 1992 (abandoned).

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23, 24 and 26-29, which constitute all the claims remaining in the application. An amendment after final rejection was filed on April 20, 1995 and was entered by the examiner.

The disclosed invention pertains to a controller circuit incorporated into the same substrate as a driver circuit for a polyphase DC motor such as that used in modern computer disk drives. A temperature sensor monitors the temperature of the substrate. The controller adjusts the speed of the motor based on the temperature of the substrate using a hysteresis relationship between the measured temperature and the speed of the motor.

Representative claim 1 is reproduced as follows:

1. An integrated circuit fabricated on a semiconductor substrate for providing drive signals to a polyphase dc motor, comprising:

a driver for sequentially supplying drive currents to drive coils of the motor;

a commutation controller for commutatively selecting, at first and second frequencies, the drive coils to which the drive currents are sequentially supplied by the driver, said first frequency being higher than said second frequency;

a temperature sensing element fabricated in said substrate to indicate the temperature of said substrate;

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for the rejection. We have, likewise, reviewed and taken into consideration, in reaching our decision, the appellant's arguments set forth in the briefs along with the examiner's rationale in support of the rejection and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in claims 1, 2, 4-6, 8-11, 13, 15-17, 19-21, 23, 24 and 26-29. We reach the opposite conclusion with respect to claims 7 and 18. Accordingly, we affirm-in-part.

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been

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led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). 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).

In response to a rejection made under 35 U.S.C. § 103, an applicant must present arguments and/or evidence which successfully rebut the examiner's case for obviousness or which demonstrate that a prima facie case of obviousness has not been established. For purposes of deciding this appeal,

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only those arguments actually made by appellant have been considered in this decision. Arguments which appellant could have made but chose not to make in the brief have not been considered [see 37 CFR § 1.192(a)].

We consider the rejection first with respect to claims 1, 2 and 4-9 which nominally stand or fall together [brief, page 4]. With respect to representative, independent claim 1, the examiner essentially determines that Ohi specifically teaches all the features of claim 1 except for the semiconductor substrate and the use of the motor in a computer disk drive environment. The examiner asserts that semiconductor drive circuits on a substrate were well known and that brushless DC motors such as taught by Ohi were known to be used in computer disk drives [answer, pages 3-4].

Appellant argues that the relationship between temperature and frequency control as recited in claim 1 sets forth a hysteresis relationship which is not taught or suggested by Ohi [brief, pages 8-10]. The examiner responds that this hysteresis relationship does not appear within the claimed invention [answer, pages 5-6].

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We agree with the examiner that the invention as recited in claim 1 does not require that a hysteresis relationship exist between temperature and frequency. Using the language of claim 1 and Figure 5 of Ohi, we read claim 1 on Ohi as follows: the first frequency is 30 Khz, the second frequency is 20 Khz (for example), the first temperature is 70°C (corresponding to the 20 Khz frequency), and the second temperature is 40°C (corresponding to the 30 Khz frequency). With these assigned values for the two frequencies and the threshold temperatures, we find that the temperature measuring circuit of claim 1 is met by the operation of the Ohi circuit. We note that Ohi's flow charts in Figures 3 and 4 indicate that the Ohi control process is a continuous process which continuously adjusts frequency as a function of temperature regardless of the direction in which the temperature might be changing.

Although we agree with the examiner that claim 1 does not require a hysteresis relationship between temperature and frequency, claim 7 specifically recites that the comparator have a hysteresis characteristic between the first and second

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temperatures. We interpret this claim language as requiring that the plot of temperature versus frequency between the two predetermined temperatures and the two frequencies take the form of a conventional hysteresis loop. It is clear from Ohi's Figure 5 that no portion of Ohi's controller operates with a hysteresis characteristic. Therefore, Ohi does not teach or suggest this argued limitation of claim 7.

The examiner never specifically addressed this limitation of claim 7 except to assert that Ohi operated in the same manner as the claimed invention or to assert that hysteresis was not claimed. Since hysteresis is claimed in claim 7 and the examiner has never addressed how Ohi teaches this claimed characteristic of the controller, we find that the examiner has failed to establish a prima facie case of the obviousness of claim 7.

In summary, even though appellant has nominally grouped claims 1, 2 and 4-9 together, we find that appellant's hysteresis argument only applies to dependent claim 7. Therefore, we sustain the examiner's rejection with respect to claims 1, 2,

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4-6, 8 and 9, but we do not sustain the rejection with respect to claim 7.

Dependent claim 28 is argued separately by appellant. Claim 28 recites that a disk read signal must be present before control at the first frequency is authorized as the temperature falls below the second threshold. Appellant argues that Ohi does not disclose that the motor is for a disk drive so that there is no suggestion of using a disk read signal in the selection of frequency operation [brief, pages 11-12].

The examiner has taken the position that it was known to the artisan that motors such as disclosed by Ohi were known to be used in the control of disk drives. We agree that the artisan would have appreciated that the Ohi controller circuit pertained to the control of disk drive motors. Thus, we find that the broad use of the Ohi controller in a disk drive control environment would have been obvious to the artisan.

We note

that the first frequency in Ohi (30KHz) corresponds to operation of the motor under normal circumstances or in the

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usual ON condition. The ON condition for a disk drive motor is whenever a disk access has to be accomplished. A disk access operation in a disk drive system is nothing more than a disk read signal. Therefore, we interpret claim 28 as reciting nothing more than that the frequency of the disk drive system is controlled only when the system is in the ON condition. It would have been obvious to the artisan to control the Ohi motor in a disk drive system only when a disk read or disk access command is present. We now consider the rejection with respect to claims 10, 11, 13 and 15-20 which nominally stand or fall together [brief, page 4]. With respect to representative, independent claim 10, the examiner has essentially applied the teachings of Ohi in the same manner discussed above with respect to claim 1. Appellant makes arguments similar to those considered above with respect to claim 1. Appellant also argues that Ohi does not teach producing a warm signal and a hot signal and inactivating the warm signal in the manner recited in claim 10 [brief, pages 12-13].

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We interpret Figure 5 of Ohi as teaching that a warm signal is produced whenever the temperature of the circuit exceeds 40°C and a hot signal is produced whenever the temperature exceeds 120°C. A regular signal is produced for temperatures below 40°C. Since only one signal can be applied to the motor at any time, it would have been obvious to the artisan that Ohi inactivates the warm signal in order to apply the regular signal.

Dependent claim 18 recites the hysteresis characteristic of the comparators in the same manner as discussed above with respect to claim 7. For reasons discussed above, even though appellant has nominally grouped claims 10, 11, 13 and 15-20 together, we find that appellant's hysteresis argument only applies to dependent claim 18. Therefore, we sustain the examiner's rejection with respect to claims 10, 11, 13, 15-17, 19 and 20, but we do not sustain the rejection with respect to claim 18.

Dependent claim 29 is argued separately by appellant. This claim is similar to claim 28 which was considered above.

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We sustain the rejection of claim 29 for basically the same reasons discussed above with respect to claim 28.

Claims 21 and 23 are argued separately by appellant as a single group. Appellant argues that Ohi does not teach the step of increasing the frequency of the motor after the motor has been initially slowed [brief, pages 15-16]. We view Figure 5 of Ohi as being time independent so that the order of decreasing and increasing frequency is simply a function of what happens to temperature. Ohi's Figure 3 confirms that the speed control circuit operates irrespective of the direction that the temperatures are changing. Appellant also argues that Ohi does not teach the claimed demand for use of the disk drive in determining speed selection. We consider a demand for use signal to be the same as the disk read signal discussed above. Therefore, we sustain the rejection of claims 21 and 23.

Claims 24 and 27 are argued separately by appellant as a single group. These claims recite features which we have considered above with respect to other claims. We sustain the

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rejection of claims 24 and 27 for reasons discussed above with respect to these other claims.

Claim 26 is argued separately by appellant. This claim recites features which we have considered above with respect to other claims. We sustain the rejection of claims 26 for reasons discussed above with respect to these other claims.

In summary, we have sustained the examiner's rejection of the claims with respect to claims 1, 2, 4-6, 8-11, 13, 15-17, 19-21, 23, 24 and 26-29, but we have not sustained the rejection with respect to claims 7 and 18. Therefore, the decision of the examiner rejecting claims 1, 2, 4-11, 13, 15-21, 23, 24 and 26-29 is affirmed-in-part.

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

AFFIRMED-IN-PART

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	JERRY SMITH)	
	Administrative Patent Judge)	
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	LEE E. BARRETT)	BOARD OF
PATENT	Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
)	
	LANCE LEONARD BARRY)	
	Administrative Patent Judge)	

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Richard K. Robinson
SGS-Thomson Microelectronics, Inc.
1310 Electronics Drive
Carrollton, TX 75006