

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte IKUO KANO

Appeal No. 1997-4445
Application 08/305,076¹

HEARD: February 8, 2000

Before BARRETT, FLEMING, and BARRY, Administrative Patent Judges.

BARRETT, Administrative Patent Judge.

¹ Application for patent filed September 13, 1994, entitled "Floppy Disk Drive With PWM Control," which claims the foreign filing priority benefit under 35 U.S.C. § 119 of Japanese Patent Application 05-242455, filed September 29, 1993.

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DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 6-14.

We affirm-in-part and enter a new ground of rejection.

BACKGROUND

The invention is directed to a floppy disk drive which is capable of suppressing voltage of a counter electromotive force generated by self-induction of an internal coil of a stepping motor, reducing the noises generated in a power line, and thereby preventing irregular rotation of the stepping motor.

Claim 6 is reproduced below.

6. A floppy disk drive apparatus comprising:

a head carriage for carrying a head for magnetically recording data on a floppy disk;

a stepping motor for moving said head carriage in a radial direction with respect to said floppy disk;

an exciting current supplying circuit for supplying an exciting current to said stepping motor to cause said stepping motor to rotate by a predetermined rotation angle in accordance with a step signal applied to said exciting current supplying circuit; and

a control circuit for controlling said exciting current supplying circuit, when the exciting current supplied to said stepping motor is cut off at a termination of an enable excitation time interval

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beginning from application of said step signal, (i) to increase the exciting current to a first predetermined value during a first exciting time period, (ii) subsequently to reduce the exciting current to a second predetermined value during a second exciting time period and (iii) further to decrease the exciting current to zero during a third exciting time period.

The Examiner relies on the admitted prior art (APA) in Figures 1-4, and the specification at pages 1-4 and 6-10.

Claims 6-14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by the APA.

We refer to the Final Rejection (Paper No. 7), the Examiner's Answer (Paper No. 14) (pages referred to as "EA__"), and the Supplemental Examiner's Answer (Paper No. 18) for a statement of the Examiner's position and to the Appeal Brief (Paper No. 13) (pages referred to as "Br__") and the Reply Brief (Paper No. 17) for Appellant's arguments thereagainst.

OPINION

Claim interpretation

The claims require interpretation. "[T]he name of the game is the claim." In re Hiniker Co., 150 F.3d 1362, 1369, 47 USPQ2d 1523, 1529 (Fed. Cir. 1998).

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Claim 6 recites "controlling said exciting current supplying circuit, when the exciting current supplied to said stepping motor is cut off at a termination of an enable excitation time interval beginning from application of said step signal [to perform function (i), (ii) and (iii) during first, second, and third "exciting time periods," respectively]" (emphasis added). The "enable excitation time interval" refers to the time interval when signal +STACT is enabled. As noted at oral hearing, the underlined limitation is intended to refer to the interval (see the modified copy of Figure 6 on the next page) including a first time period 6(i) and a second time period 6(ii) before the enable signal is terminated and a third time period 6(iii) after the enable signal is terminated (the exciting current is cut off).

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including the three time periods 7(i), 7(ii), and 7(iii) when the enable signal is first restored.

Claim 8 recites "controlling said exciting current supplying circuit, when the exciting current is applied to said stepping motor during an enable excitation time interval beginning from application of said step signal [to perform functions (i), (ii), and (iii)]" (emphasis added). As noted at oral hearing, the underlined limitation is intended to refer to the interval (see the modified copy of Figure 6) including the three time periods 8(i), 8(ii), and 8(iii) between the time the enable signal +STACT is restored and the time it is terminated.

Against this background of what is intended to be claimed, we begin our claim interpretation.

The first interpretation involves the "exciting time period" limitations in functions (i), (ii), and (iii) of claims 6-8. This language does not clearly refer to the "enable excitation time interval," but the limitations seem related. We interpret an "exciting time period" to refer to a time period during which the exciting current enable signal is ON. This is consistent with the arguments in the brief (e.g.,

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Br6: "time period tc is not an exciting time period, since it occurs after the end of the exciting current enable signal").

The second interpretation involves the limitation in claim 6 about "(iii) further to decrease the exciting current to zero during a third exciting time period" (emphasis added). This limitation is misdescriptive under 35 U.S.C. § 112, second paragraph, because the current in Figure 6 clearly decreases to zero after the termination of the exciting current enable signal during a time period which is not an exciting time period just as the exciting current in the APA of Figure 1 decreases to zero during non-exciting time period tc. See Br6: "time period tc is not an exciting time period, since it occurs after the end of the exciting current enable signal." A new ground of rejection is entered infra.

The third interpretation involves the limitation in claim 6 about controlling the exciting current supply circuit "when the exciting current supplied to said stepping motor is cut off at a termination of an enable excitation time interval beginning from application of said step signal." This limitation is misdescriptive under 35 U.S.C. § 112, second paragraph, because the term "when" indicates the three

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exciting time periods of limitations (i)-(iii) take place after the termination of the enable excitation time interval. However, the time first two time periods of (i) and (ii) take place before the enable signal is terminated. A new ground of rejection is entered infra.

The fourth interpretation involves the functions (i)-(iii) in claims 6-8. The claims are open ended and the limitations do not preclude other time periods from occurring in between the first, second, and third exciting time periods. That is, limitations (i)-(iii) do not expressly tie the end of one time period to the beginning of the next time period. This will be important in discussing the anticipation rejection.

The fifth interpretation involves the following limitation in claim 6: "when the exciting current supplied to said stepping motor is cut off at a termination of an enable excitation time interval beginning from application of said step signal." As interpreted in the third interpretation above, this time period is intended to include two exciting time intervals before the termination of the enable signal and a non-exciting time interval after the termination of the

enable signal. Consistent with the fourth interpretation above, we interpret that this time period is not limited to the last three time periods in Figure 6, but reads on any two exciting time periods within the enable signal interval and a non-exciting time period after termination of the enable signal interval when the current goes to zero.

The sixth interpretation involves the following limitation in claim 7: "when the exciting current of said stepping motor is restored during an enable excitation time interval beginning from application of said step signal." Consistent with the fourth interpretation above, we interpret that this time period is not limited to the first three time periods in Figure 6, but reads on any three exciting time periods within the enable signal interval.

The seventh interpretation involves the following limitation in claim 8: "when the exciting current is applied to said stepping motor during an enable excitation time interval beginning from application of said step signal." Consistent with the fourth interpretation above, we interpret that this time period is not limited to the last three time periods in the enable signal interval in Figure 6, but reads

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on any three exciting time periods within the enable signal interval.

Anticipation

"Anticipation is established only when a single prior art reference discloses, expressly or under principles of inherency, each and every element of a claimed invention." RCA Corp. v. Applied Digital Data Systems, Inc., 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984).

We do not agree with the Examiner's reliance on time interval td in the APA of Figure 3. During the time interval td, the exciting current enable signal (and, thus, the exciting current) is being repeatedly turned on and off (specification, page 10, lines 3-4). As we interpret the claims, it is not an "exciting time period" when the enable signal is turned off. While it is true that the exciting current is reduced at the time td (specification, page 9, line 25), it does not happen during an "exciting time period" because the current only decreases when the enable signal is turned off.

Nevertheless, we find that claims 6-8, as properly interpreted, are anticipated by the APA of Figures 1 and 3.

It is easier to discuss Figure 1, which is the same as Figure 3 except for the chopping interval t_d . In the following analysis we employ our interpretation that the first, second, and third exciting time periods in functions (i), (ii), and (iii) do not have to be sequential because the open-ended nature of the claims does not preclude other time periods in between the ones recited. We also use our interpretations that claims 6-8 are not limited to the portions of the waveform which were intended.

With respect to claim 6, assuming the misdescriptiveness problem was fixed: (i) the exciting current is increased to a first predetermined value during a "first exciting time period" t_a ; (ii) the exciting current is reduced to a second predetermined value during a "second exciting time period" at the end of t_a when the substep signal is received (note that it takes a finite amount of time for the exciting current to drop at the end of time t_a --this finding is consistent with claim 7, function (iii) wherein the third exciting time period refers to a similar vertical drop of short time duration at the end of the first PWM cycle in Figure 6); and (iii) the exciting current is reduced to zero during a third time period

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tc after the enable excitation time interval terminates
(claim 6 does not preclude intervening time interval tb). The
rejection of claim 6 is sustained.

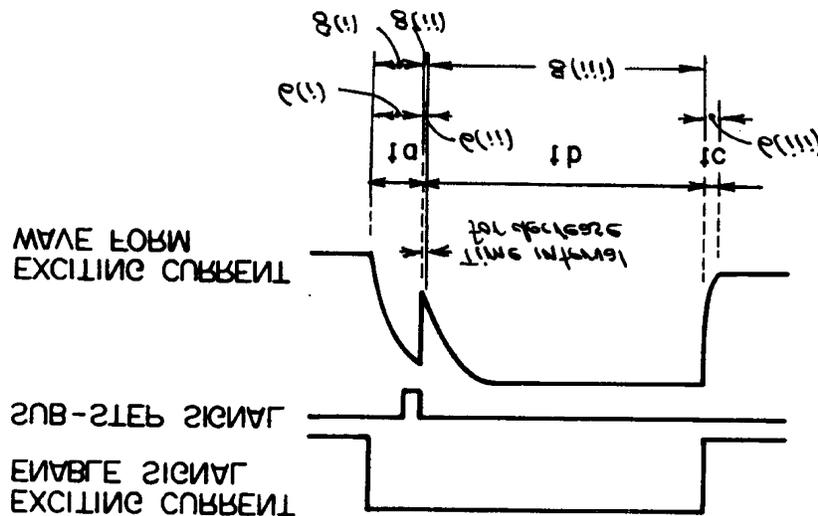


FIG. 1

With respect to claim 7: (i) the exciting current is increased to a first predetermined value during a "first exciting time period" t_a ; and (ii) the exciting current is reduced to a second predetermined value during a "second exciting time period" at the end of t_a when the substep signal is received (as discussed in more detail in connection with claim 6). However, the exciting current is not reduced to zero during a third exciting time period as recited by (iii), which recitation does not appear to be in error like that in claim 6. The current does not decrease to zero in the short time period at the end of t_a . Time period t_c is after the

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exciting time period terminates. The current is reduced to zero during time period t_d in Figure 3 only during a non-exciting time period. Thus, the anticipation rejection of claims 7, 10, and 13 is reversed.

With respect to claim 8: (i) the exciting current is increased to a first predetermined value during a "first exciting time period" t_a ; (ii) the exciting current is reduced to a second predetermined value during a "second exciting time period" at the end of t_a when the substep signal is received (as discussed in more detail in connection with claim 6); and (iii) the exciting current is increased to a third predetermined value during a "third exciting time period" t_b . In fact, no special interpretations are required for claim 8 to read on the APA. The anticipation rejection of claim 8 is sustained.

The APA does not disclose "applying a pulse width modulation control signal to said exciting current supplying circuit during said second exciting time period" as recited in claims 9-11. The Examiner's finding that chopping interval t_d in Figure 3 corresponds to pulse width modulation control is erroneous because that interval is not an "exciting time

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period" as we have interpreted that term. Accordingly, the anticipation rejection of claims 9-11, and claims 12-14 which further depend therefrom, is reversed.

NEW GROUND OF REJECTION UNDER 37 CFR § 1.196(b)

Claims 6, 9, and 12 are rejected under 35 U.S.C. § 112, second paragraph, as misdescriptive. As discussed in the "Claim interpretation" section, the limitation in claim 6 about "(iii) further to decrease the exciting current to zero during a third exciting time period" (emphasis added) is misdescriptive because the current in Figure 6 clearly decreases to zero after the termination of the exciting current enable signal during a time period which is not an exciting time period. Also, the limitation in claim 6 about controlling the exciting current supply circuit "when the exciting current supplied to said stepping motor is cut off at a termination of an enable excitation time interval beginning from application of said step signal" is misdescriptive because the term "when" indicates the three exciting time periods of limitations (i)-(iii) take place after the termination of the enable excitation time interval, whereas the first two time periods of (i) and (ii) take place before

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the enable signal is terminated. Claims 9 and 12 are rejected
because they depend from claim 6.

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CONCLUSION

The rejection of claims 6 and 8 under 35 U.S.C. § 102(b) is sustained. The rejection of claims 7 and 9-14 under § 102(b) is reversed.

A new ground of rejection has been entered as to claims 6, 9, and 12 under 35 U.S.C. § 112, second paragraph.

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. . . .

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

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 -- 37 CFR § 1.196(b)

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