Paper No. 33

UNITED STATES PATENT AND TRADEMARK OFFICE

_____

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

_____

Ex parte HAE-JOONG LEE and MYUNG-CHAN JEONG

_____

Appeal No. 1998-1819
Application No. 08/364,972

_____

HEARD: AUGUST 14, 2001

_____

Before RUGGIERO, LALL, and BLANKENSHIP, Administrative Patent Judges.

BLANKENSHIP, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1-4, 7-12, 21, and 22.

We reverse.

BACKGROUND

The invention is directed to a method and apparatus for providing impact resistance to a hard disk drive. In particular, the invention serves to maintain a constant flying height of the magnetic head over the disk. Representative claim 1 is reproduced below.

> 1. A method of providing axial control and outside impact resistance for a hard disk drive to maintain a normal flying height of a head by controlling a suspension of said hard disk drive, said method comprising the steps of:
>
> sensing one of a tensive state and a compressive state of said suspension, said tensive state of said suspension indicating that a flying height of said head is greater than said normal flying height, said compressive state of said suspension indicating that said flying height of said head is less than said normal flying height;
>
> generating a value indicative of an increase in reverse tensive force necessary for application to said suspension to return said head to said normal flying height when said tensive state of said suspension is sensed in said sensing step; and
>
> generating a value indicative of an increase in reverse compressive force necessary for application to said suspension to return said head to said normal flying height when said compressive state of said suspension is sensed in said sensing step.

The examiner relies on the following references:

Sakamoto et al. (Sakamoto)	4,172,265	Oct. 23, 1979
Rynne et al. (Rynne)	4,950,936	Aug. 21, 1990
Good et al. (Good)	5,377,058	Dec. 27, 1994

Claims 1-4 , 7, 10-12, 21, and 22 stand rejected under 35 U.S.C. § 103 as being unpatentable over Good and Sakamoto. Claims 3, 4, 7, 21, and 22 were rejected over the applied combination in a new ground of rejection set forth in the Examiner's Answer.

Claims 8 and 9 stand rejected under 35 U.S.C. § 103 as being unpatentable over Good, Sakamoto, and Rynne.

A rejection of claim 21 under 35 U.S.C. § 112, second paragraph was entered as a new ground of rejection in the Answer, but withdrawn by the examiner upon entry of appellants' amendment to the claim, filed Dec. 29, 1997.

Claims 5, 6, 13-20, and 23, subject to a restriction requirement, have been withdrawn from consideration.[1]

We refer to the Final Rejection (Paper No. 15) and the Examiner's Answer (Paper No. 23) for a statement of the examiner's position and to the Brief (Paper No. 22) and the Reply Brief (Paper No. 25) for appellants' position with respect to the claims which stand rejected.

OPINION

[1] The cover sheet of the Final Rejection and appellants' "Status of Claims" section in the Brief and Reply Brief, respectively, indicate that claims 15-20 have been rejected. However, no rejection has been entered against the claims, and appellants did not reproduce claims 15-20 in the appendix of claims on appeal. The Final Rejection, at page 2, appears to state the correct status of claims 15-20, i.e., that the claims have been withdrawn from consideration.

According to the statement of the rejection applied against instant claim 1 (Answer at 3-4), Good reveals a method of fly height servo control of a read/write suspension. Although Good does not disclose sensing tension and compression in the suspension, Sakamoto is deemed to disclose a strain gauge 15 (Fig. 5) that provides a deflection signal, enabling the system to track head position relative to the rest position.

Appellants argue, inter alia, that the combination is not well founded because Sakamoto teaches tracking, rather than controlling flying height of a head. (Brief at 8.) Additionally, appellants allege there is no teaching that the device of Good would necessarily be improved by applying the teachings of Sakamoto. (Id. at 9.) Appellants further allege (id. at 10) that the artisan would recognize that the "resistive wire" of Sakamoto could not measure compression.

Good teaches adjusting fly height of read/write heads in multiple disk drives. The reference discloses that the read signal for the fly height servo is picked up off the data channel, and sampled by digitizing switching circuitry in Harmonic Ratio Fly height detector (HRF) 28. See Good, Figs. 1, 5, and col. 3, ll 45-59. Circumferential variation in fly height is corrected in real time by a PID controller. Radial variation in fly height is corrected by feeding forward a correction from profile storage controller 32 during track seek operations. Id. at col. 4, ll 1-9. A radial correction value for each head at each cylinder position is determined during a calibration procedure. Id. at ll 19-28. Fly height correction

is effected by piezoelectric film 40 (Fig.2) bonded to suspension arm 12, which bends arm 12 when a correction signal is applied. Id. at col. 5, ll. 20-30.

Sakamoto discloses a head tracking system for a rotary magnetic head in a magnetic video tape recorder, which generates a deflection signal corresponding to the deflection of the head from a rest position. The reference describes, in columns 1 and 2, prior art methods of imparting a small oscillatory motion to the magnetic head via its supporting element, which is typically a piezo-electric element or "bi-morph leaf." The oscillatory motion is induced by applying a suitable drive signal which causes the transducer to oscillate transversely about its normal oblique scanning path (e.g., Fig. 2). The deviations from the path take the form of an amplitude modulation of the envelope of the reproduced signals. An amplitude modulation detector provides a tracking error signal, which is used in properly aligning the head transducer with the center of the track.

Mechanical vibrations of the bi-morph leaf were known to cause problems in tracking control. Sakamoto teaches, to overcome unwanted frequency components due to mechanical vibrations, securing a strain gauge 15 (Fig. 4) to bi-morph leaf 2. Deflection of bi-morph leaf 2 thus generates a deflection signal indicating the extent and direction of deflection of head 1 from its rest position. Sakamoto, col. 5, ll. 20-24 and 44-67. The reference goes on to describe circuitry for compensating for the unwanted frequencies by means of the deflection signal, so that the tracking control system may maintain the head at the optimum tracking position.

We do not find appellants' arguments regarding the alleged deficiencies of the "resistive wire" of Sakamoto to be convincing. For one thing, Sakamoto at column 6, lines 18 through 22 makes clear that the strain gauge is not limited to the type employing a "resistance wire." For another, Sakamoto discloses that direction of deflection of head 1 from its rest position is sensed, which suggests that strain gauge 15 responds differently to tension and to compression. With no evidence provided in support of the position, we consider appellants' argument to be untenable.

However, we are in ultimate agreement with appellants that the combined teachings of the references fail to establish prima facie obviousness of the subject matter of instant claim 1. Sakamoto is directed to a problem different from adjustment of fly height; namely, overcoming mechanical vibrations which degrade tracking control, the tracking control being effected by inducing an oscillatory motion in the supporting arm of a transducer. Absent impermissible hindsight, we do not see how the teachings of Sakamoto would have commended themselves to an artisan designing fly height servo control systems.

Moreover, appellants' arguments with respect to the lack of a rationale for the proposed combination are well taken. The rejection asserts (Answer at 4) that the reason for the combination would have been to provide more accurate tracking of the position of a magnetic transducer. There is no factual support in the record for the position that the servo system of Good would be improved by replacing or supplementing the HRF height detector apparatus with a strain gauge, nor that the artisan would have recognized any

improvement prospectively. While Good's system might indeed be improved if one were to apply the teachings of Sakamoto, such an assumption would be mere speculation. Rejections under section 103 cannot be founded on speculation.

We therefore do not sustain the rejection of claim 1, nor claims 2 and 21, depending from 1, under 35 U.S.C. § 103 over Good and Sakamoto. Instant claims 3 and 7 add phase delay compensation to the combination, which includes sensing one of a tensive and a compressive state of the suspension. Aside from the fact that the rejection falls short for the reasons we have identified with respect to claim 1, we agree with appellants that the deemed "inherency" (Answer at 6) of phase delay compensation represents misallocation of the burdens in the patent examination process. Our reviewing court has set out clear standards for establishing inherency, which have not been met in the instant case.

> To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." "Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient."

In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted).

We do not sustain the rejection of independent claims 3 and 7, nor of claims 4, 10-12, and 22, each depending from claim 3 or 7. We also reverse the rejection of dependent

claims 8 and 9. Rynne does not remedy the deficiencies with respect to Good and Sakamoto as applied against base claim 7.

CONCLUSION

The section 103 rejections of claims 1-4 , 7-12, 21, and 22 are reversed.

REVERSED

JOSEPH F. RUGGIERO Administrative Patent Judge	)
	) BOARD OF PATENT
PARSHOTAM S. LALL Administrative Patent Judge	) APPEALS) AND) INTERFERENCES
HOWARD B. BLANKENSHIP Administrative Patent Judge	)

ROBERT E BUSHNELL ATTORNEY-AT-LAW
1522 K STREET, NW
SUITE 300
WASHINGTON , DC 20005-1202