

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 26

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte R. LARRY COMSTOCK, NAUM V. GITIS,  
and ROBERT L. SMITH

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Appeal No. 97-2035  
Application 08/161,234<sup>1</sup>

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ON BRIEF

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

LEE, Administrative Patent Judge.

**DECISION ON APPEAL**

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 1-15. No claim has been allowed.

**References relied on by the Examiner**

Coughlin et al. 1987 (Coughlin)	4,700,248	Oct. 13,
Kubo et al. (Kubo)	5,198,934	Mar. 30,
1993		

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<sup>1</sup> Application for patent filed December 2, 1993.

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Shiroishi	Japanese Kokai 61-206917	Sep.
13, 1986 Abo	Japanese Kokai 1-199364	Aug.
10, 1989 Kume	Japanese Kokai 2-239420	Sep.
21, 1990 Horiuchi	Japanese Kokai H2-244419	
Sep. 28, 1990		
Tsuchiya	Japanese Kokai 3-214478	Sep. 19, 1991

#### **The Rejections on Appeal**

Claims 1-4, 6, 9-13, and 15 stand rejected under 35 U.S.C. § 103 as being unpatentable over either Kume, Shiroishi, or Tsuchiya.

Claims 5 and 14 are rejected under 35 U.S.C. § 103 as being unpatentable over either Kume, Shiroishi, or Tsuchiya in view of Kubo et al.

Claims 7 and 8 are rejected under 35 U.S.C. § 103 as being unpatentable over Kume, Shiroishi, or Tsuchiya, in view of Coughlin.

In the examiner's answer, a new ground of rejection was added. Claims 1, 2, 6, 9 and 10 stand rejected under 35 U.S.C. § 103 as being unpatentable over Horiuchi.

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In a supplemental examiner's answer (Paper No. 23), the examiner cited and additionally relied on the Japanese reference Abo to show a claim feature which the examiner had regarded as well known in the art. While we recognize that it is inappropriate and improper to cite and rely on a reference without expressly including it in the stated grounds of rejection, since an applicant can be deprived of a fair opportunity to respond, see, e.g., In re Hoch, 428 F.2d 1341, 1342, n.3, 166 USPQ 406, 407 n.1 (CCPA 1970), under the facts of this case the applicants have had an opportunity to address Abo and did in fact address the merits of Abo in a supplemental reply brief (Paper No. 23). The applicants even expressly stated what they regard as being taught by Abo, i.e., "the new reference simply discloses a path from the disk to the housing of the drive" (Paper No. 23, at page 2). Accordingly, a summary reversal of the rejections is not necessary here and we regard each of the above-noted grounds of rejection as being further supplemented by the addition of Abo.

**The Invention**

The invention is directed to a magnetic disk storage system having increased reliability due to a reduction of electrostatic charge accumulation on the slider head assembly (independent claims 1 and 15), and a method for reducing debris accumulation in a magnetic disk storage system (independent claim 9). Key to each of these independent claims is an electrically conducting path connecting the conductive coating on the slider head assembly with the electrically conductive storage disk. Representative claims 1 and 9 are reproduced below:

1. A magnetic disk storage system with increased reliability by the reduction of electrostatic charge accumulation on the magnetic disk storage system's slider head assembly due to triboelectric effects, the disk storage system comprising:

a) an electrically conductive storage disk with a magnetic recording surface that is in contact with a slider/head assembly load-bearing conductive surface when at rest, the disk rotating and in contact with or in close proximity to a slider/head assembly magnetic transducer when writing data to or reading data from the disk;

b) the slider/head assembly including:

i) a slider with a load-bearing surface that is in contact with the magnetic

recording surface at least when the disk is at rest;

ii) a magnetic transducer mounted in the slider for writing and reading data to and from the magnetic recording surface of the electrically conductive storage disk; and

iii) an electrically conductive coating applied to at least one surface of the slider for facilitating the discharge of electrostatic charge on the slider; and

c) an electrically conducting path connected to the slider/head assembly electrically conductive coating and to the electrically conductive storage disk for discharging triboelectrically generated charge on the slider head assembly.

9. A method for reducing debris accumulation in a magnetic disk storage system comprising a disk having an electrically conductive base with a magnetic recording surface, and a slider/head assembly including a magnetic transducer in close proximity to the magnetic recording surface when writing data to or reading data from the disk and having a load-bearing surface in contact with the magnetic recording surface when the disk is not rotating, the method comprising the following steps:

a) forming an electrically conductive surface area on the slider/head assembly except in the proximity of the magnetic transducer; and

b) electrically connecting the electrically conductive surface to the electrically conducting disk base for discharging triboelectrically generated static charges on the slider/head assembly.

**Opinion**

We sustain the rejection of claims 1-3, 6 and 9-12 under 35 U.S.C. § 103 as being unpatentable over Kume or Shiroishi, in view of Abo.

We do not sustain the rejection of claims 4, 13 and 15 under 35 U.S.C. 103 as being unpatentable over Kume or Shiroishi in view of Abo.

We do not sustain the rejection of claims 1-4, 6, 9-13 and 15 under 35 U.S.C. § 103 as being unpatentable over Tsuchiya in view of Abo.

We do not sustain the rejection of claims 7 and 8 under 35 U.S.C. § 103 as being unpatentable over Kume, Shiroishi, or Tsuchiya in view of Abo and further in view of Coughlin.

We sustain the rejection of claims 5 and 14 under 35 U.S.C. § 103 as being unpatentable over Kume or Shiroishi, in view of Abo and further in view of Kubo.

We do not sustain the rejection of claims 5 and 14 under 35 U.S.C. § 103 as being unpatentable over Tsuchiya in view of Abo and further in view of Kubo.

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We sustain the rejection of claims 1, 2, 6, 9 and 10 under 35 U.S.C. § 103 as being unpatentable over Horiuchi in view of Abo.

Our affirmance of any prior art rejection is based solely on the arguments made by the appellants in their briefs. Arguments which could have been raised but which were not raised are not before us, are not at issue, and are considered waived.

The rejection of claims 1-4, 6, 9-13 and 15 over Kume, Shiroishi, or Tsuchiya, in view of Abo

The examiner finds that each of Kume, Shiroishi, and Tsuchiya discloses conductive coatings formed on their respective slider except in the vicinity of the magnetic transducers. (Answer at 3). The examiner further finds that conductive disks are old and well known. (Answer at 3). These findings are not disputed by the applicants. The applicants disagree with the examiner's conclusion that it would have been obvious to one with ordinary skill in the art "to discharge the built up electrical charge on the slider through connecting the slider to the disk." However, for reasons

discussed below, the rejections have not been shown to be without merit.

According to the examiner, one with ordinary skill in the art would have been motivated to connect the slider to the disk "because the disk would act as a ground, allowing the slider to discharge" (Answer at 4). Missing from this rationale is the necessary teaching that the disk is electrically connected to ground. In the supplemental examiner's answer, however, the examiner made the finding that an "electrical connection between a spindle and disk/base is old and well known in the art," and cited Abo<sup>2</sup> to support the key finding. In the reply to the supplemental examiner's answer, the applicants do not argue against the examiner's finding that an electrical connection between the disk and the base through the spindle was well known, and acknowledges that Abo discloses a path from the disk to the housing of the drive.

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<sup>2</sup> In the supplemental answer, the examiner evidently mis-identified Abo as 1-199354 when in fact the reference provided has the serial number 1-199364.

Both Kume and Shiroishi discuss an objective of discharging the accumulated charge on the slider and Shiroishi specifically discusses electrically grounding the slider. (Kume at 4; Shiroishi at 3). However, it appears that Tsuchiya does not. The examiner has not pointed to any portion of Tsuchiya which teaches discharging the slider or grounding the slider.

With additional reliance on Abo, the examiner has set forth a prima facie case of obviousness with respect to the rejection based on Kume, and the rejection based on Shiroishi, but not with respect to the rejection based on Tsuchiya. The applicants have not successfully rebutted the prima facie case of obviousness. It is not necessary that Abo itself disclose a closed path from the slider to the disk. That reference has been relied on only to support the examiner's finding that an electrical connection from the disk to the base through the spindle was well known.

The examiner is correct that given the objective of discharging or grounding the slider, as taught by Kume or Shiroishi, it would have been obvious to one with ordinary skill in the art to connect the slider to the disk because it

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was known that the disk can be grounded to the base through the spindle.

Claims 4 and 15, however, additionally recite that the slider's conductive coating has a tapered thickness beginning in the proximity of the transducer and increasing thickness toward the leading edge facing into the direction of disk rotation. The applicants argue that none of the references disclose or suggest this feature as recited in claims 4 and 15. (Brief at 10 and 11). The examiner addressed the appellants' remarks by stating:

The examiner maintains that the tapering of the conductive coating would have been within the common knowledge of one of ordinary skill in the art at the time the invention was made. Because most all sliders "fly" with a slight angle with respect to the disk, tapering the coating would help prevent contact between the disk and the slider at the rear of the slider. (Answer at 8).

The examiner's reasoning is conclusory. The examiner has provided no evidence to support the assertion that tapering the coating on the surface of the slider would have been within the common knowledge of one having ordinary skill in the art. On this record, tapering the coating is a feature suggested only by the applicants' own disclosure.

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Claim 13 depends from claim 9 and recites the additional step of tapering the slider's load-bearing surface with its narrow end facing into the relative motion of the magnetic recording disk for deflecting magnetic disk surface debris. The examiner has not addressed how the claimed invention including this particular feature would have been rendered obvious on the basis of the teachings of the combination of Kume, Shiroishi, or Tsuchiya, and Abo. A prima facie case of obviousness has not been set forth and thus the rejection of claim 13 cannot be sustained.

For the foregoing reasons, we sustain the rejection of claims 1-3, 6 and 9-12 as being unpatentable over Kume or Shiroishi, in view of Abo. We do not sustain the rejection of claims 4, 13 and 15 as being unpatentable over Kume or Shiroishi, in view of Abo. Furthermore, we do not sustain the rejection of claims 1-4, 6, 9-13, and 15 as being unpatentable over Tsuchiya in view of Abo.

The rejection of claims 5 and 14 over Kume, Shiroishi, or Tsuchiya, in light of Abo and Kubo

Claims 5 and 14 recite a solid self-lubricating coating on the conductive surface of the slider. The examiner relied

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upon Kubo to teach this feature. The applicants make no argument about the manner in which the examiner applied the teachings from Kubo. Accordingly, we sustain the rejection of claims 5 and 14 as being unpatentable over Kume or Shiroishi, in view of Abo and Kubo. Because Tsuchiya fails to teach all of the features of independent claims 1 and 9, upon which claims 5 and 14 depend on respectively, we do not sustain the rejection of claims 5 and 14 as being unpatentable over Tsuchiya in view of Abo and Kubo.

The rejection of claims 7 and 8 over  
Kume, Shiroishi, Tsuchiya, in light of Abo and Coughlin

Dependent claim 7 recites that the load-bearing surface is tapered with its narrow end facing into the relative motion of the magnetic recording disk for the deflection of magnetic disk surface debris. Claim 8 depends on claim 7 and recites that the tapered surface has a uniform taper. The examiner relied on Coughlin to teach those features of claims 7 and 8.

Coughlin shows in Figures 1 and 2 a head assembly with a contoured load-bearing surface 20 with a pair of angled pressure relief slots 26 and 28 formed in the surface 20. It is the section formed between slots 26 and 28 that the

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examiner maintains is the tapered load bearing surface. We disagree. The entire contoured face 20, including the portions surrounding the angled slots, constitutes the load-bearing surface in Coughlin. Note that in column 4, lines 41-44, of Coughlin, it is stated: "It is this surface 20 of assembly 10 that is adapted to confront the rotating recording surface of the disk and interact with the air bearing layer to provide assembly 10 with its flying characteristics." Moreover, it is not seen how the tapered slots of Coughlin can be used to carry out their intended functions as the load-bearing surface without the presence of the load bearing surface portions surrounding them. In our view, the load bearing surface of Coughlin cannot reasonably be regarded as solely the portion between the slots. Accordingly, Coughlin's load bearing surface is not tapered "with its narrow end facing into the relative motion of the magnetic recording disk" as is recited in claim 7. Both ends appear to have the same width. In any event, even if it is assumed for purposes of argument that only the angled-slots section constitutes the load bearing surface, the presence of the outer portions of contour face 20 would seem to keep the tapered load bearing

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surface from being able to deflect surface debris as is recited in claim 7.

Accordingly, we reverse the rejection of claims 7 and 8 as being unpatentable over Kume, Shiroishi or Tsuchiya in view of Abo and Coughlin.

The rejection of claims  
1, 2, 6, 9 and 10 over Horiuchi and Abo

The examiner correctly found that Horiuchi discloses an assembly in which the slider has a conductive coating and is grounded to the base of the housing. The examiner concludes that because the spindle of the disk would be at the same potential as the housing, it would have been obvious to one with ordinary skill in the art, alternatively, to connect to slider to the disk. In rebuttal, the applicants argue that spindles are not necessarily electrically connected to either the base or the disk. In a supplemental examiner's answer, the examiner specifically found that an electrical connection from the disk to the housing through the spindle was well known in the art and cited Abo to support that finding. In response to the citation to Abo, the applicants do not argue that the electrical connection from the disk to the housing

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through the spindle was not well known, but simply argues that Abo does not disclose a closed path from the slider to the disk.

The applicants' argument is misplaced. Abo was relied on by the examiner only to support the factual finding that an electrical connection from the disk to the housing through the spindle was well known. Abo itself does not have to illustrate every feature of the applicants' claimed invention. The rejection is based on the combination of Horiuchi and Abo.

Horiuchi discloses grounding the slider to the housing. We agree with the examiner's reasoning that in light of the known connection from the disk to the housing through the spindle, it would have been obvious to connect the slider to the disk, as an alternative connection of the slider to the housing. The connection of the slider to the disk necessarily completes an electrically conducting path between the slider and the disk.

To the extent that some magnetic drive assemblies may not have an electrical connection between the disk and the housing through the spindle, it should be noted that the applicants'

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claims are so broad that they do not exclude those assemblies which do have such an electrical connection, such as Abo.

Accordingly, we sustain the rejection of claims 1, 2, 6, 9 and 10 as being unpatentable over Horiuchi and Abo.

### **Conclusion**

The rejection of claims 1-3, 6 and 9-12 under 35 U.S.C. § 103 as being unpatentable over Kume, or Shiroishi, in view of Abo, is affirmed.

The rejection of claims 4, 13 and 15 under 35 U.S.C. § 103 as being unpatentable over Kume, or Shiroishi, in view of Abo, is reversed.

The rejection of claims 1-4, 6, 9-13 and 15 under 35 U.S.C. § 103 as being unpatentable over Tsuchiya in view of Abo, is reversed.

The rejection of claims 5 and 14 under 35 U.S.C. § 103 as being unpatentable over Kume, or Shiroishi, in view of Abo and Kubo is affirmed.

The rejection of claims 5 and 14 under 35 U.S.C. § 103 as being unpatentable over Tsuchiya in view of Abo and Kubo is reversed.

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The rejection of claims 7 and 8 under 35 U.S.C. § 103 as being unpatentable over Kume, Shiroishi, or Tsuchiya in view of Abo and Coughlin is reversed.

The rejection of claims 1, 2, 6, 9 and 10 under 35 U.S.C. § 103 as being unpatentable over Horiuchi and Abo is affirmed.

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	)	APPEALS AND
Administrative Patent Judge	)	INTERFERENCES
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JAMESON LEE	)	
Administrative Patent Judge	)	

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Christopher J. Kulish  
SHERIDAN ROSS & McINTOSH  
1700 Lincoln Street  
Suite 3500  
Denver, Colorado 80203