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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 26

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte NOBUYUKI KITAZAKI,
YOSHIAKI SONOBE,
and MASAYUKI KANAMARU

Appeal No. 1997-0678
Application 08/406,768[1]

ON BRIEF

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

BARRETT, Administrative Patent Judge.

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[1] Application for patent filed March 17, 1995, entitled "Magnetic Disk And Magnetic Disk Apparatus Having An Annular Start-Stop Area With A Radial Downslope," which is a continuation of Application 08/084,674, filed June 29, 1993, now abandoned.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 11 and 13.

We reverse.

BACKGROUND

The invention relates to a magnetic disk and a magnetic disk apparatus using the magnetic disk. A conventional magnetic disk apparatus uses a disk with a flat surface and a head with a crown-shaped surface to prevent damage due to contact between a head positioned in a start-stop area on the disk surface and the disk surface when the magnetic disk starts to rotate. It is difficult to form the crown-shaped surface because of the high hardness of the head. The invention uses a radial downslope on the disk from an inner radius to an outer radius which provides a virtual crown on the disk. The specification discloses that the start-stop area is given a radial downslope "to form the head positioned to the start-stop area into a virtual crown shape so that when the magnetic disk starts to rotate, the head can rapidly take off from the start-stop area in order to prevent deterioration from being caused on the disk surface due to contact between

the disk and the head" (specification, page 2, lines 26-32). The specification further discloses that the virtual crown caused by a downslope from an inner to an outer radius of the disk makes the flying height for the head approximately constant regardless of any position in the radial direction of the disk because the virtual crown becomes smaller at greater radii which compensates for the greater speed at the outer radii; however, this function is not claimed.

Claim 11 is reproduced below.

> 11. A magnetic disk for use within a rotating magnetic disk drive device, said magnetic disk having a surface for recording data, wherein:
>
> a first annular portion of said disk surface is a start-stop area for resting a transducer head when said magnetic disk drive is not in use;
>
> a second annular portion of said disk surface is a data storage area for recording data;
>
> said annular start-stop area has a radial downslope from an inner part of said annular start-stop area to an outer part of said start-stop area such that the thickness of said magnetic disk decreases from said inner part of said annular start-stop area to said outer part of said annular start-stop area, and wherein said inner part of said annular start-stop area corresponds to an inner area of said disk; and
>
> said second annular portion has no radial downslope.

The Examiner relies on the following prior art:

Pollard et al. (Pollard) 5,012,371 April 30, 1991

Mizuno et al. (Mizuno) 57-064331 April 19, 1982
(Japanese Kokai)

Claims 11 and 13 stand rejected under 35 U.S.C. § 103 as being unpatentable over Pollard and Mizuno. The Examiner finds that Pollard discloses a conventional disk drive having a start-stop area, parking zone 32, but does not disclose the start-stop area having a radial downslope. The Examiner finds that "Mizuno et al shows in figure 2c an inner area of magnetic recording disk 40 having a thickness that decreases from an inner part to and [sic] an outer part of disk 40" (Examiner's Answer, page 4). The Examiner concludes (Examiner's Answer, page 5):

> It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the annular start-stop area of the disk, i.e. the inner area of the disk, of Pollard et al so that the thickness decreased from the inner part of the inner area of the disk to an outer part of the inner area of the disk as taught by Mizuno et al.
>
> The rationale is as follows: One of ordinary skill in the art would have been motivated to modify a disk so that the thickness decreased from the inner part of the inner area of the disk to an outer part of the inner area of the disk to "improve the flatness and also to decrease the weight inertial moment, by constituting a disk so that its thickness is made gradually thinner toward the

outside circumference." See the Abstract of Mizuno et al.

We refer to the Final Rejection (Paper No. 15) (pages referred to as "FR__") and the Examiner's Answer (Paper No. 22) (pages referred to as "EA__") for a statement of the Examiner's position and to the Appeal Brief (Paper No. 21) (pages referred to as "Br__") for a statement of Appellants' arguments thereagainst.

OPINION

The issue is whether the combination of Pollard and Mizuno would have made obvious a magnetic disk having an annular start-stop area with a radial downslope and a second annular data storage area which has no radial downslope.

Pollard discloses an annular start-stop area, parking zone 32, at the inner area of the disk, where the disk has a flat surface. Mizuno discloses a magnetic recording disk "whose thickness is made thinner gradually toward the outer rim, thereby obtaining a disk with excellent surface qualities, low weight, and a small moment of inertia" (translation, page 3); thus, the whole surface of the disk in Mizuno has a downslope. We do not doubt that one of ordinary skill in the art of designing magnetic disks would have been

motivated to make the whole magnetic disk surface of Pollard, that is, both the start-stop area and the data storage area, with a radial downslope toward its outer edge to achieve the advantages taught by Mizuno.

The question is whether one of ordinary skill would have been led to make the start-stop area with a radial downslope and the data storage area without a radial downslope when Mizuno teaches making the whole surface with a radial downslope. This is essentially Appellants' third argument (Br9, Sec. C). The Examiner's response (EA8-9) does not answer this key question, but merely concludes that the combination of references renders the claimed subject matter obvious. The Examiner concludes that it would have been obvious to modify the start-stop area in Pollard to have a radial downslope (EA5), but does not explain why the data storage area should remain flat when Mizuno shows the whole surface with a radial downslope. We find no teaching or suggestion in Mizuno of making only part of the disk with a decreasing thickness. In the absence of some teaching or suggestion in the references or some convincing line of reasoning by the Examiner, we conclude that the Examiner has

failed to establish a prima facie case of obviousness. Therefore, the rejection of claims 11 and 13 is reversed.

We do not agree with Appellants' argument (Br5-7, Sec. A) that, as a general proposition, the references must teach a solution to the same problem. Cf. In re Dillon, 919 F.2d 688, 692-94, 16 USPQ2d 1897, 1901-02 (Fed. Cir. 1990) (in banc) (holding that an invention may be obvious for reasons the inventor did not contemplate). The downslope on the disk in Mizuno inherently creates a virtual crown which allows the magnetic head to quickly take off from a start-stop area positioned as shown by Pollard. Furthermore, the function of allowing the head to take off quickly is not recited in the claims, so only the structure is important. However, it is probably necessary in this case that there be some recognition of Appellants' problem in order to make just the start-stop area with a radial downslope since Mizuno teaches making the whole surface with a radial downslope for different reasons.

We also do not agree with Appellants' arguments (Br7-9, Sec. B) that the intended function of the references is destroyed if their teachings are combined. Putting a radial downslope on the start-stop area of Pollard does not destroy

the start-stop area teaching. While putting a radial downslope only on the start-stop area would not greatly decrease the moment of inertia, the moment of inertia would decrease because the magnetic disk would be uniformly thinner from the outer edge of the start-stop area to the outer edge of the disk. Thus, we find no inconsistency in the combination. However, Mizuno does not disclose making only a portion of the disk with a downslope.

CONCLUSION

The rejection of claims 11 and 13 is reversed.

REVERSED

JERRY SMITH)
Administrative Patent Judge)
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) BOARD OF PATENT
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