

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SEAN CHANG

Appeal No. 2007-1243
Application No. 10/336,018
Technology Center 2100

Decided: May 17, 2007

Before LANCE LEONARD BARRY, MAHSHID D. SAADAT, and ROBERT E.
NAPPI *Administrative Patent Judges*.

NAPPI, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 of the final rejection of claims 1 through 25. For the reasons stated *infra* we affirm-in-part the Examiner's rejection of these claims.

INVENTION

The invention is directed to an anti vibration method for rotating disks. A holder is attached to the disk which contains a curable fluid, when the disk is rotated the fluid flows to the perimeter of the disk and distributes itself to counteract the unbalance in the disk. The fluid is then cured in this location, thus balancing the disk. See page 3 of Appellant's specification. Claim 1 is representative of the invention and reproduced below:

1. An anti-vibration method of rotating disks for eliminating vibration of a rotating disk resulting from unbalance, comprising steps of:
 - forming a holder on the rotating disk;
 - filling a selected amount of a curable fluid in the holder;
 - rotating the rotating disk by a motor until the rotating disk reaching balance such that the fluid flows towards the perimeter direction of the rotating disk due to a vibration force resulting from the rotation of the rotating disk, the fluid being retained by a side wall of the holder without escaping, the rotating disk being spaced from the motor; and
 - curing the curable fluid.

REFERENCES

The references relied upon by the Examiner are:

Goodrich	3,696,688	Oct. 10, 1972
Hung	6,747,803 B2	Jun. 8, 2004 (filed Aug. 12, 2002)

REJECTIONS AT ISSUE

Claims 1 through 6, and 13 through 23 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Hung. The Examiner's rejection is set forth on page 4 of the Answer. Claims 7 through 12 stand rejected under 35 U.S.C.

§ 103(a) as being unpatentable over Hung in view of Goodrich. The Examiner's rejection is set forth on page 5 of the Answer. Claims 1 through 6, 13 through 18, 24, and 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Appellant's admitted prior art in view of Hung. The Examiner's rejection is set forth on page 6 of the Answer. Throughout the opinion we make reference to the Brief (filed August 15, 2005), and the Answer (mailed April 19, 2006) for the respective details thereof.

ISSUES

Appellant contends that the Examiner's rejection of claims 1 through 6, and 13 through 23¹ based upon Hung is in error. Appellant argues that the Examiner has not shown that Hung teaches that the disk is rotated until it reaches balance and then the fluid is cured. Further, Appellant argues that because Hung's groove is not closed the fluid would fly off of the disk.

The Examiner contends that the rejection is proper and finds that Hung uses UV glue (glue that is cured by UV light) to balance the disk. The Examiner reasons that:

It would be useless and waste of money if the operator uses this relatively expensive [*sic*, expensive] UV glue to cure it in the unbalanced disc before pinpointing where the unbalanced location is on the disc. If the operator knows the exact location to place the glue before the disc is rotated, then one would not use UV glue in this case. One would use inexpensive glue that would cure on the spot when exposed to air, for example. Therefore, there is reason when one uses UV glue in the unbalanced disc to balance the disc. It

¹ We note that Appellant separately addresses three groups of claims 1-6, and 24; 13-16, 18, and 25; and claims 19-23. Appellant in addressing the groups consisting of claims 13-16, 18 and 25; and claims 19-23, states "[t]he above distinction between claim 1 and Hung also applies to independent claim 13 [and 19] and its dependent claims." Br. 12. We do not consider this a separate argument under 37 C.F.R. § 41.37(c)(1)(vii), and we group the claims together.

is to cure the glue when the balance state is achieved during the rotation of the disc. (Emphasis added.)

Examiner's Answer 6.

Thus, the first issue for us to consider is whether Hung anticipates or makes obvious in light of Appellant's admitted prior art² rotating a disk with curable fluid in a holder, until the disk reaches balance and curing the fluid.

Appellant contends that the Examiner's rejection of claims 1 through 12 under 35 U.S.C. § 103(a) is in error. Appellant asserts that the rejection is in error for the same reasons discussed with respect to the rejection of claim 1. Appellant further argues that Goodrich discloses a housing with balls, wherein the balls move in opposition of the eccentric mass to balance it. The housing also has a lubricant to dampen the movement of the balls and to reduce the effect that the balls tend to bunch up. Thus, Appellant argues that to introduce glue would destroy the purpose of Goodrich's device which relies upon the movement of the balls.

The Examiner contends, at page 6 of the Answer, that the rejection under 35 U.S.C. § 103(a) is proper and states that:

[T]he usage of the balls as taught by Goodrich in the curable fluid of Hung would have been obvious to a person of ordinary skill in the art in order to provide a better damping device which can reduce vibration caused by a higher amplitude of vibration during a higher rotational speed.

² Appellant's Brief does not distinguish between the Examiner's rejection of claims 1 through 6, and 13 through 23 under 35 U.S.C. § 102(e) in view of Hung, and the Examiner's Rejection of 1 through 6, 13 through 18, 24 and 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Appellant's admitted prior art in view of Hung.

FINDINGS OF FACT

1. Hung teaches a color wheel with a balancing groove. Hung Abstract.
2. This groove is used to receive a balancing substance such as UV glue (glue that is cured by UV light). Hung, col. 2, ll. 12-14.
3. Conventional to the art is balancing the color wheel by drilling holes or adding adhesive materials at specific locations on the wheel. Adding adhesive has the disadvantage of interfering to the mechanism or interfering with the optical path. Drilling holes has the disadvantage of introducing metal powder which may interfere with the bearings. Hung col. 1, ll. 10-16.
4. Hung's patent is to solve the above mentioned problems with balancing a color wheel by using a groove to contain the curable fluid. Hung col. 1, ll. 19-27.
5. Hung does not discuss the curable fluid flowing to counteract the out of balance condition of the color while the color wheel is rotating. Further, one skilled in the art would readily recognize that the methods of drilling holes or adding adhesive can not be accomplished while the color wheel is rotating.
6. Appellant's admitted prior art also discusses conventional approaches to balancing a color wheel by drilling holes or adding adhesive materials at specific locations on the ring. Specification 2.
7. Appellant's admitted prior art states that the locations on the color wheel to add or remove mass are determined by rotating the color wheel and monitoring the imbalance by sensors such as accelerometers. During this type of test the system is mounted on a suspended surface to avoid outside interference with the measurements. Specification 1, 2.

8. Appellant's admitted prior art does not disclose the fluid flowing to counteract the out of balance condition of the color while the color wheel is rotating. Further, one skilled in the art would readily recognize that the methods of drilling holes or adding adhesive can not be accomplished while the color wheel is rotating.

9. From both Hung and Appellant's admitted prior art, one skilled in the art would recognize that the efforts to balance the disk involve relatively permanent adjustments to the disk. Similarly, one would recognize that the eccentricity of the disk which causes the imbalance is also relatively permanent so that when the adjustments are made the disk is balanced.

10. Goodrich teaches an automatic balancer for rotating masses. Goodrich Abstract.

11. The balancer comprises a casing containing metal balls in an annular race. Goodrich col. 1, ll. 53-58.

12. In operation the balancer is concentrically mounted to a rotating object, during rotation the balls position themselves to oppose the eccentric mass, thus reducing vibration. Goodrich col. 2, ll. 25-29.

13. The casing is filled with lubricant which dampens the movement of balls. Goodrich, col. 2, ll. 6-8.

14. Goodrich identifies that one of the problems with prior art devices is that they were not precision made and at high speeds the balls tended to bunch up creating worse vibrations. Goodrich, col. 1, ll. 8-15.

15. From this disclosure we find that one skilled in the art would recognize that the precision manufacturing is the solution to the ball bunching problem and the lubricant is to provide dampening.

16. From Goodrich's disclosure, one skilled in the art would recognize that since the mass of the balls is free to move, the device does not provide a permanent balance to the rotating object but rather rebalances the rotating object each time the object is spun.

PRINCIPLES OF LAW

To establish a prima facie case of obviousness, the references being combined do not need to explicitly suggest combining their teachings. *In re Kahn*, 441 F.3d 977, 987-88, 78 USPQ2d 1329, 1337-38 (Fed. Cir. 2006) (“the teaching, motivation, or suggestion may be implicit from the prior art as a whole, rather than expressly stated in the references”). “The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art.” *Id.* at 987-88, 78 USPQ2d at 1336 (quoting *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1316-17 (Fed. Cir. 2000)).

ANALYSIS

Independent claim 1 recites “rotating the rotating disk by a motor until the rotating disk reaching balance such that the fluid flows towards the perimeter direction of the rotating disk due to a vibration force resulting from the rotation of the rotating disk, the fluid being retained by a side wall of the holder without escaping, the rotating disk being spaced from the motor” and “curing the fluid”. Independent claim 13 contains a similar limitation which recites a motor rotating the disk, and the fluid being cured after balance is attained. Independent claim 19 contains a limitation directed to a holder which contains a curable fluid, where the fluid flows to the side walls to balance the rotating disk. Thus, the scope of

independent claims 1, 13, and 19, includes a rotating body (disk) with a side that holds a fluid, wherein the disk is balanced by allowing the fluid to flow to the perimeter while the disk is rotated and reduce the vibration of the disk.

As discussed *supra*, we find that Hung teaches a disk with a groove (the groove has a side wall) which accepts curable fluid. Fact 2. Both Hung and Appellant's admitted prior art identify that conventional methods of adding or removing mass occur while the disk is stationary and do not discuss rotating the disk to allow the fluid to reduce vibration. Facts 5 and 8. While the Examiner's rationale concerning why Hung uses UV cured glue seems logical, we do not find that the evidence presented by Hung or Appellant's admitted prior art teach or suggest that rotating the disk to allow the fluid to reduce vibration. Facts 5 and 8. However, as discussed *infra* we find that Goodrich does provide such a teaching and suggestion. Thus, we find that the Examiner's anticipation rejection based upon Hung and the Examiner's obviousness rejection based upon Hung and Appellant's admitted prior art are not supported based upon Hung and Appellant's prior art and we accordingly will not sustain these rejections.

Independent claim 7 recites a holder which contains a curable fluid and balls. Independent claim 7 further recites "rotating the rotating disk by a motor until the rotating disk reaching balance such that the fluid and the ball flows towards the perimeter direction of the rotating disk due to a vibration force resulting from the rotation of the rotating disk, the fluid and the ball being retained by a side wall of the holder without escaping, the rotating disk being spaced from the motor; and curing the curable fluid." Thus, similar to independent claims 1, 13 and 19, the scope of claim 7 includes rotating body (disk) with a disk with a side that holds a fluid, wherein the disk is balanced by allowing the fluid to flow to the

perimeter while the disk is rotated and reduce the vibration of the disk. In addition the scope of claim 7 also includes round balls in the holder.

As discussed *supra*, Goodrich teaches a holder for balancing rotating masses which includes a holder and ball shaped masses and a fluid. Fact 11. The device balances the rotating mass by rotating the object and the balls and fluid flow to oppose the eccentric mass and reduce vibrations of the rotating object. Fact 12. It is readily apparent from reading the disclosure of Goodrich that the device operates each time the rotating object is used, i.e. it does not provide a permanent balance but rebalances with each operation of the object. Fact 16. As discussed *supra*, Hung teaches a device for balancing rotating objects where in the balancing procedure permanently balances the rotating object by adding or removing mass in a permanent manner, i.e. placing UV glue in a location to oppose the eccentric mass and curing it. We consider that one skilled in the art viewing Goodrich and Hung would recognize that Hung's teaching of curing UV glue, and to Goodrich's system of rotating a holder with balls and fluid to counter act vibration could be combined to allow Goodrich's device to permanently balance the rotating object. Goodrich states that the purpose of the fluid (lubricant) in the holder with the balls is to dampen the movement of the balls. Hung's UV glue would provide this function during initial operation and then by curing, adhere the balls in the appropriate location to counteract the rotating object's eccentric mass permanently. Thus, we find ample evidence to support the Examiner's rejection based upon Hung and Goodrich. Further, applying this rationale we now reject Appellant's independent claims 1, 7, and 19 under 35 U.S.C. § 103(a). We leave it to the Examiner and the Appellant to determine if the claims dependent upon independent claims 1, 7 and 19 are similarly obvious.

CONCLUSION

In summary we will not sustain the Examiner's rejection, of claims 1 through 6, and 13 through 23 under 35 U.S.C. § 102(e) as being anticipated by Hung or the Examiner's rejection of claims 1 through 6, 13 through 18, 24, and 25 under 35 U.S.C. § 103(a) as being unpatentable over Appellant's admitted prior art in view of Hung. However, we sustain the Examiner's rejection of claims 7 through 12 under 35 U.S.C. § 103(a) as being unpatentable over Hung in view of Goodrich. In accordance with 37 CFR § 41.50(b) we also now reject independent claim 1, 7, and 19 under 35 U.S.C. § 103(a) as being unpatentable over Hung in view of Goodrich. The decision of the Examiner is affirmed-in-part.

This decision contains a new ground of rejection pursuant to 37 CFR § 41.50(b) (effective September 13, 2004, 69 Fed. Reg. 49960 (August 12, 2004), 1286 Off. Gaz. Pat. Office 21 (September 7, 2004)). 37 CFR § 41.50(b) provides "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review."

37 CFR § 41.50(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 the appeal as to the rejected claims:

(1) *Reopen prosecution*. Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner. . . .

(2) *Request rehearing*. Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

Appeal 2007-1243
Application 10/336,018

AFFIRMED-IN-PART

37 CFR § 41.50(b)

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