

1 The opinion in support of the decision being entered today was *not* written
2 for publication and is *not* binding precedent of the Board
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7 UNITED STATES PATENT AND TRADEMARK OFFICE
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10 BEFORE THE BOARD OF PATENT APPEALS
11 AND INTERFERENCES
12 _____
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14 *Ex parte* MING GAO YAO
15 _____
16

17 Appeal 2007-0592
18 Application 10/263,001
19 Technology Center 2600
20 _____
21

22 Decided: May 15, 2007
23 _____
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27 *Before:* JOSEPH L. DIXON, LANCE LEONARD BARRY, and
28 ALLEN R. MACDONALD, *Administrative Patent Judges.*
29

30 MACDONALD, *Administrative Patent Judge.*
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33
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35 DECISION ON APPEAL
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STATEMENT OF CASE

2 Appellant appeals under 35 U.S.C. § 134 from a final rejection of
3 claims 1-3, 5-12, and 14-16. We have jurisdiction under 35 U.S.C. § 6(b).

4 Appellant invented a system and actuator for preventing particle
5 generation by a micro-actuator. (Specification 2 and 5). The micro-actuator
6 is “U” shaped. (Specification 2; Figures 2 and 4-6).

7 Representative independent claim 1 under appeal reads as follows:

8 1. An actuator, comprising:

an actuator element having a generally 'U'-shaped structure, the
actuator including a support frame of a first material; and

13 a coating at least partially encapsulating the actuator element to
14 prevent particle generation, the coating comprising a second material.

16 The Examiner rejected claims 1-3, 5-12, and 14-16 under 35 U.S.C.
17 § 102(e).

18 The prior art relied upon by the Examiner in rejecting the claims on
19 appeal is:

20 Kurano US 6,617,762 B2 Sep. 9, 2003
21 (Filed Aug. 2, 2001)

23 Appellant contends that the claimed subject matter is not anticipated
24 by Kurano. More specifically, Appellant contends that “the micro-actuator
25 used by Kurano is not U-shaped.” (Br. 4). Appellant further contends that
26 the Examiner misidentifies element 17 (a flexible substrate) as the
27 microactuator because “a ‘microactuator’ is not the equivalent of a ‘flexible
28 substrate’.” (Reply Br. 2). Lastly, Appellant contends the embodiments

described in Kurano describe “a ‘flexible substrate’ 17 that resemble a sideways “H” bearing a centralized pivot point (*e.g.* Figure 11) as opposed to a proper U-shaped actuator as described in embodiments of the present application.” (Reply Br. 3-4).

5 The Examiner contends that Kurano describes “an actuator element
6 having a generally ‘U’-shaped structure” as required by Appellant’s claims 1
7 and 8. Specifically, Kurano teaches the feature as the right half of the “H”
8 structure 17 of Figure 11. (Answer 4 and Addendum A2).

9 We affirm.

ISSUE

Has Appellant shown that the Examiner has failed to establish that Kurano describes “an actuator element having a generally ‘U’-shaped structure” as required by claims 1 and 8?

FINDINGS OF FACT

16 Appellant invented a system and actuator for preventing particle
17 generation by a micro-actuator. (Specification 2 and 5). The micro-actuator
18 is “U” shaped. (Specification 2; Figures 2 and 4-6).

19 Appellant describes (Specification 3) the problem in the art as
20 follows:

21 Since the [piezoelectric Lead Zirconate Titanate] PZT is an
22 anisotropic structure, meaning the Weiss domains will increase
23 the alignment proportionally, and since the top surface of the
24 PZT is a soft, electric material (i.e., gold or platinum), the PZT
25 does not generate any particles during this deformation.
26 However, as the Zirconia support frame is a hard material
27 lacking the Weiss domain properties, the inner force present
28 during deformation generates particles. Particle generation is

1 particularly heavy on the inside surface of the ‘U’ shaped
2 micro-actuator where the interior forces are strongest. Particles
3 generated on the ‘U’ shaped micro-actuator may interfere with
4 the operation of the actuator.

5 (Specification 3).

6 Appellant’s Figure 3 describes:

7 [O]ne embodiment of a hard disk drive head gimbal assembly (HGA)
8 with a ‘U’-shaped microactuator. In one embodiment, a slider 302 is
9 bonded at two points 304 to a ‘U’-shaped micro-actuator 306. In a
10 further embodiment, the ‘U’-shaped micro-actuator has a piezoelectric
11 Lead Zirconate Titanate (PZT) beam (arm) 308 on each side of a
12 Zirconia support frame (actuator base) 310.

13 (Specification 5).

14 Appellant’s Figure 4 illustrates “one embodiment of the ‘U’ shaped
15 micro-actuator 306. A support frame 310 supports two piezoelectric Lead
16 Zirconate Titanate (PZT) beams 308.” (Specification 5).

17 In one embodiment of Appellant’s invention, “an encapsulation
18 coating is applied to the ‘U’ shaped micro-actuator to prevent particle
19 generation.” (Specification 6).

20 In a further embodiment of Appellant’s invention, “the encapsulation
21 coating is made of a soft and tenacious material, such as gold, platinum,
22 epoxy resin, etc. The encapsulation coating can be applied to the support
23 frame 310 with any of a variety of techniques including printing, spraying,
24 sputtering, electric plating, electricless plating, or chemical vapor
25 deposition.” (Specification 6).

26 Appellant admits that the prior art includes “a ‘U’ shaped micro-
27 actuator.” (Specification 2; Figures 1 and 2).

1 Appellant further admits that “[t]he ‘U’-shaped micro-actuator may
2 have a piezoelectric Lead Zirconate Titanate (PZT) beam (arm) on each side
3 of a Zirconia support frame (actuator base)” and “[d]uring excitation of the
4 PZT, the PZT beam will deform, further causing the Zirconia support frame
5 to deform.” (Specification 2-3).

6 The prior art Kurano patent describes that “[o]n both sides of the
7 connect spring 13, the microactuator devices 2 described in conjunction with
8 FIG. 2 are arranged. A combination of the base plate 3, the support spring 5,
9 the connect spring 13, and the microactuator devices 2 forms the above-
10 mentioned suspension.” (Col. 6, ll. 16-20; apparatus shown in Fig. 9).

11 The prior art Kurano patent describes that “to connect the
12 microactuator devices 2 between the base plate 3 and the support spring 5, a
13 flexible substrate 17 having an H shape in plan view is used.” (Col. 6,
14 ll. 61-63; apparatus shown in Fig. 11).

15 The prior art Kurano patent further describes that:
16 the microactuator devices 2 are coated with a coating film 16
17 collectively with portions of the base plate 3 and the support spring 5
18 which are adjacent to the microactuator devices 2. For example, the
19 coating film 16 can be obtained by vapor deposition of a coating
20 material “diX (Registered Trademark)” manufactured by Daisan
21 Kasei, Ltd. Thus, a thin and compact coating film of about 10 µm
22 thick can be formed even if the microactuator devices 2, the base plate
23 3, and the support spring 5 have uneven surfaces.

24
25 (Col. 6, ll. 37-46).

26 ALLEN – do you want to skip this line?

27 The prior art Kurano patent further describes that “[t]he coating film
28 16 serves to prevent fall of the released particles from the microactuator
29 devices 2. Therefore, the recording medium used in the disk recording

1 apparatus is prevented from being damaged by the released particles.” (Col.
2 6, ll. 47-51).

3

4 PRINCIPLES OF LAW

5 On appeal, Appellants bear the burden of showing that the Examiner
6 has not established a legally sufficient basis for anticipation based on the
7 Kurano patent. Appellants may sustain this burden by showing that the prior
8 art reference relied upon by the Examiner fails to disclose an element of the
9 claim. It is axiomatic that anticipation of a claim under § 102 can be found
10 only if the prior art reference discloses every element of the claim. *See In re*
11 *King*, 801 F.2d 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1986) and
12 *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730
13 F.2d 1452, 1458, 221 USPQ 481, 485 (Fed. Cir. 1984).

14

15 ANALYSIS

16 The Examiner correctly shows where all the claimed elements appear
17 in the Kurano prior art reference.

18 First, contrary to Appellant’s contentions, Kurano’s flexible substrate
19 17 is part of Kurano’s microactuator just as Appellant’s support frame
20 (actuator base) 310 forms part of Appellant’s ‘U’-shaped micro-actuator
21 306. Therefore, Appellant has not established that the Examiner erred with
22 respect to this contention.

23 Second, contrary to Appellant’s contentions, the right half of
24 Kurano’s “H” shaped structure 17 in Figure 11 is “generally ‘U’-shaped” as
25 required by claims 1 and 8. The fact that Appellant’s preferred
26 embodiments show what Appellant describes as “a *proper* U-shaped”

1 actuator is irrelevant as Appellant claims “a *generally* ‘U’-shaped” actuator.
2 Additionally, we note that in Kurano’s Figure 9, base plate 3 and devices 2
3 form what Appellant calls “a *proper* U-shaped” actuator. Therefore,
4 Appellant has not established that the Examiner erred with respect to this
5 contention.

6

7 REJECTION OF CLAIMS 4 AND 13 UNDER 37 C.F.R. § 41.50(b)

8 We make the following new grounds of rejection using our authority
9 under 37 C.F.R. § 41.50(b).

10 Claims 4 and 13 are rejected under 35 U.S.C. 103(a) as being
11 unpatentable over Kurano in view of Appellant’s admitted prior art (AAPA).

12 The Supreme Court in *Graham v. John Deere*, 383 U.S. 1, 17-18, 148
13 USPQ 459, 467 (1966), stated that three factual inquiries underpin any
14 determination of obviousness:

15 Under § 103, the scope and content of the prior art are to be
16 determined; differences between the prior art and the claims at
17 issue are to be ascertained; and the level of ordinary skill in the
18 pertinent art resolved. Against this background, the
19 obviousness or nonobviousness of the subject matter is
20 determined. Such secondary considerations as commercial
21 success, long felt but unsolved needs, failure of others, etc.,
22 might be utilized to give light to the circumstances surrounding
23 the origin of the subject matter sought to be patented. As
24 indicia of obviousness or nonobviousness, these inquiries may
25 have relevancy.

26 The Supreme Court reaffirmed and relied upon the *Graham* three
27 pronged test in its consideration and determination of obviousness in the fact
28 situation presented in *KSR Int'l. v. Teleflex Inc.*, 550 U.S. ___, 82 USPQ2d
29 1385, 1391 (Apr. 30, 2007). The Court stated:

1 While the sequence of these [Graham] questions might be
2 reordered in any particular case, the factors continue to define
3 the inquiry that controls. If a court, or patent examiner,
4 conducts this analysis and concludes the claimed subject matter
5 was obvious, the claim is invalid under § 103.

6 *KSR*, 550 U.S. ___, 82 USPQ2d at 1391. Further, the Court stated:

7 To facilitate review, this analysis should be made explicit. *See*
8 *In re Kahn*, 441 F.3d 977, 988 [78 USPQ2d 1329] (CA Fed.
9 2006) (“[R]ejections on obviousness grounds cannot be
10 sustained by mere conclusory statements; instead, there must be
11 some articulated reasoning with some rational underpinning to
12 support the legal conclusion of obviousness”). As our
13 precedents make clear, however, the analysis need not seek out
14 precise teachings directed to the specific subject matter of the
15 challenged claim, for a court can take account of the inferences
16 and creative steps that a person of ordinary skill in the art
17 would employ.

18 *KSR*, 550 U.S. ___, 82 USPQ2d at 1396. Additionally, the Court stated:

19 When a work is available in one field of endeavor, design
20 incentives and other market forces can prompt variations of it,
21 either in the same field or a different one. If a person of
22 ordinary skill can implement a predictable variation, § 103
23 likely bars its patentability. For the same reason, if a technique
24 has been used to improve one device, and a person of ordinary
25 skill in the art would recognize that it would improve similar
26 devices in the same way, using the technique is obvious unless
27 its actual application is beyond his or her skill.

28 *KSR*, 550 U.S. ___, 82 USPQ2d at 1396.

29 As we have already determined, Kurano teaches all the features of
30 claims 4 and 13 except that Kurano’s support frame is not shown to be of
31 Zirconia. However, AAPA teaches that it is known in the art to make the
32 support frame from Zirconia. (Specification 3: 1). The level of skill in the
33 art is shown by Kurano to include the knowledge of how to manufacture

1 micro-actuator devices (e.g., Kurano's Background of the Invention). Based
2 on the scope and content of the prior art, the differences between the prior
3 art and the claims, and the level of ordinary skill in the pertinent art, we
4 conclude that using Zirconia as the support frame (Appellant's claimed first
5 material) in the Kurano device would have been obvious at the time of
6 Appellant's invention.

7 We note that Appellant has labeled this section of the Specification as
8 "Background Information" rather than Prior Art. However, Appellant has
9 labeled as "Prior Art" the figures corresponding to this section of the
10 Specification. Therefore, until such time as the Appellant positively states
11 that it is not prior art, we treat as admitted prior art the entire contents of the
12 "Background Information" section of the Specification.

13 37 C.F.R. § 41.50(b) provides that, "[a] new ground of rejection
14 pursuant to this paragraph shall not be considered final for judicial review."

15 37 C.F.R. § 41.50(b) also provides that the Appellant, *WITHIN TWO*
16 *MONTHS FROM THE DATE OF THE DECISION*, must exercise one of the
17 following two options with respect to the new ground of rejection to avoid
18 termination of the appeal (37 C.F.R. § 1.197(b)) as to the rejected claims:

19 (1) *Reopen prosecution*. Submit an appropriate amendment of the
20 claims so rejected or new evidence relating to the claims so rejected,
21 or both, and have the matter reconsidered by the examiner, in which
22 event the proceeding will be remanded to the examiner ...
23

24 (2) *Request Rehearing*. Request that the proceeding be reheard under
25 [37 C.F.R.] § 41.52 by the Board upon the same record ...
26

1 CONCLUSION OF LAW

2 (1) Appellant has failed to establish that the Examiner erred in
3 rejecting claims 1-3, 5-12, and 14-16 as being unpatentable under
4 35 U.S.C. § 102(e) over Kurano.

5 (2) Claims 4 and 13 fail to meet the requirements of 35 U.S.C. § 103.

6 (3) Claims 1-16 are not patentable.

7 DECISION

9 The Examiner's rejection of claims 1-3, 5-12, and 14-16 is affirmed.

10 No time period for taking any subsequent action in connection with
11 this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

13 AFFIRMED

14 37 C.F.R. § 41.50(b)

20 tdl/ce

25 MORGAN LEWIS & BOCKIUS LLP
26 1111 PENNSYLVANIA AVENUE NW
27 WASHINGTON DC 20004