

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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 Akihiro Iino, Masao Kasuga, and Makoto Suzuki

Appeal No. 2005-2767
Application No. 09/369,090

ON BRIEF

Before THOMAS, KRASS, and GROSS, Administrative Patent Judges.
KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1, 2, 4, 6, 7, and 9.

The invention pertains to ultrasonic motors. In particular, the instant invention is said to improve the vibration efficiency of such motors, resulting in a reduced loss factor, by using a support member to serve the dual function of supporting the piezoelectric element and transmitting the drive signal from the conductor pattern to the piezoelectric vibrator. In order to further reduce vibration loss, a support member is provided on a substrate for fixedly mechanically supporting the piezoelectric vibrator on the substrate at a point corresponding to a node of vibration of the piezoelectric vibrator.

Independent claim 1 is reproduced as follows:

An ultrasonic motor, comprising:

a movable member disposed to undergo movement in response to a drive force;

a substrate having a conductor pattern for conveying a drive signal from a drive circuit;

a piezoelectric vibrator provided on the substrate for undergoing oscillating movement in response to the drive signal so as to contact the movable member and generate the drive force to drive the movable member; and

a support member provided on the substrate for mechanically fixedly supporting the piezoelectric vibrator at a point corresponding to a node of vibration of the piezoelectric vibrator on the substrate and transmitting the drive signal from the conductor pattern to electrodes of the piezoelectric vibrator so that no conductor wires extend from the substrate to connect the drive circuit and the piezoelectric vibrator.

The examiner relies on the following references:

Katsuma et al. (Katsuma)	4,513,219	Apr. 23, 1985 (filed Nov. 16, 1983)
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Miyazawa et al. (Miyazawa)	5,247,220	Sep. 21, 1993 (filed Oct. 22, 1990)
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Claims 1, 7, and 9 stand rejected under 35 U.S.C. §102 (b) as anticipated by either Katsuma or Miyazawa.

Claim 2 stands rejected under 35 U.S.C. § 102 (b) as anticipated by Katsuma.

Claims 4 and 6 stand rejected under 35 U.S.C. § 103 as unpatentable over Katsuma or Miyazawa.¹

¹Page 7 of the answer indicates that the rejection of claims 4 and 6 are based on Katsuma or

Reference is made to the briefs and answer for the respective positions of appellants and the examiner.

OPINION

With regard to independent claim 1, the examiner asserts that the subject matter of this claim is anticipated by either one of Katsuma or Miyazawa.

With regard to Katsuma, the examiner points to Figure 7, column 3, lines 45-50, and column 8, lines 3-38, for a disclosure of the claimed subject matter. In particular, the examiner indicates that element 9 is a movable member in an ultrasonic motor disposed to undergo movement in response to a drive force; that element 51 is a substrate having a conductor pattern for conveying a drive signal from a drive circuit; and that elements 2 and 3 constitute a piezoelectric vibrator provided on the substrate for undergoing oscillating movement in response to the drive signal so as to contact the movable member and generate the drive force to drive the movable member. The examiner interprets vibration member 32 and piezoelectric element 3 of Katsuma as the claimed "piezoelectric vibrator."

"Miyama" but the explanation which follows the statement of the rejection makes it clear that this is a typographical error and the examiner intended to base the rejection on "Katsuma or Miyazawa."

As for a support member provided on the substrate for mechanically fixedly supporting the piezoelectric vibrator at a point corresponding to a node of vibration of the piezoelectric vibrator on the substrate and transmitting the drive signal from the conductor pattern to electrodes of the piezoelectric vibrator so that no conductor wires extend from the substrate to connect the drive circuit and the piezoelectric vibrator, the examiner identifies element 4 in Figure 7 of Katsuma. It is the examiner's position that absorber 4 is an elastic, anisotropic conductive support member that covers the entire back of the piezoelectric vibrator, so that it must support the vibrator at a point corresponding to a node, as claimed. The examiner explains that since the stator "produces standing waves which are combined to produce a traveling wave it is clear that nodes exist in the stator at any time it is operating" (answer-page 6).

Appellants argue that Katsuma does not disclose or suggest a piezoelectric element having the supporting structure required by the claim 1. Further, argue appellants, Katsuma does not disclose or suggest a substrate having a conductor pattern for conveying a drive signal from a drive circuit, a piezoelectric vibrator provided on the substrate, and a support member for supporting the piezoelectric vibrator and transmitting the drive signal to the piezoelectric vibrator, as in claim 1.

In addition, appellants point out that the absorber 4 of Katsuma does not support the piezoelectric vibrator “at a point corresponding to a node of vibration of the piezoelectric vibrator, as required by claim 1.

We have reviewed the Katsuma reference, as well as the arguments of appellants and the examiner, and we conclude therefrom, that the examiner has established a prima facie case of anticipation which has not been successfully rebutted by appellants. Accordingly, we will sustain the rejection of claims 1, 7, and 9 under 35 U.S.C. §102 (b) as anticipated by Katsuma.

As we view Figure 7 of Katsuma, we find a motor with a movable member 9 which undergoes movement in response to a drive force applied at the patterned electrodes which form part of wiring plate 51, which may also be thought of as a “substrate,” as claimed. A piezoelectric vibrator (vibrating member 2) is provided “on the substrate” 51, albeit not *directly* on the substrate, but the claims do not require a *direct* connection. Thus, as did the examiner, we view intervening elements 3, 4, and 50, as not being precluded by the instant claim language. The vibrating member 2 (or a combination of vibrating member 2 and vibration source 3) undergoes oscillating movement in response to the drive signal applied to the patterned electrodes, so as to contact the movable member 9 and generate the drive force to drive the movable member 9. The examiner points to absorber 4 as the claimed “support member” provided on the substrate for mechanically fixedly supporting the piezoelectric vibrator.

Contrary to appellants' view, absorber 4 clearly is provided on substrate 51, and does support the piezoelectric vibrator (either element 2 or 3, or a combination thereof), since elements 2 and 3 are situated atop element 4.

While appellants contend that absorber 4 does not support the piezoelectric vibrator "at a point corresponding to a node of vibration of the piezoelectric vibrator," as required by the claim, the examiner explains, and we agree, that since the "entire bottom of the stator of Katsuma is supported, any nodal line would be supported, thus meeting the claim language. The claim language does not stipulate that the vibrator is supported *only* at the nodal line" (answer-page 8, emphasis ours). Other than to argue (reply brief-page 5) that Katsuma's element 4 performs no supporting function and therefore the absorber does not support the piezoelectric vibrator at a point corresponding to a node of vibration of the piezoelectric vibrator, appellants offer no explanation as to any error in the examiner's interpretation of how absorber 4 does, indeed, support the piezoelectric vibrator at a point corresponding to a node of vibration of the piezoelectric vibrator.

Since we find the examiner's rationale to be reasonable, appellants' arguments to be unpersuasive, and no evidence convincing us of any error in the examiner's rationale, we will sustain the rejection of claims 1, 7, and 9 under 35 U.S.C. §102 (b) over Katsuma.

Turning now to the rejection of these claims under 35 U.S.C. §102 (b) as anticipated by Miyazawa, we refer to pages 4-6 of the answer for the examiner's application of Miyazawa's Figure 44 to the instant claim language.

Appellants argue that elements 46 and 2e-27 do not correspond to the support member claimed because 46 denotes a conductor having a conducting member 46a for coupling circuit pattern 47a of the substrate to the electrode pattern 3a-27 of the piezoelectric vibrator (referring to column 18, lines 61-64). It is appellants' position that conductor 46 does not provide any support function, and certainly not the claimed function of "mechanically fixedly supporting the piezoelectric vibrator...on the substrate."

Appellants point out that even if screw 6-27, flange portion 2e-27 of stator 2-27, and the base plate 4-27 in Miyazawa are, together, somehow considered to be a "support member," for supporting the piezoelectric vibrator on the substrate 47 this "support member" would still not function to transmit the drive signal from the conductor pattern to electrodes of the piezoelectric vibrator, since, in Miyazawa, the transmitting function is performed by conductor 46 and conductor member 46a which do not provide any support function.

We have carefully reviewed the evidence before us and we agree with the appellants that the examiner has not established a prima facie case of anticipation with regard to Miyazawa disclosing the instant claimed subject matter. In particular, we have reviewed Figure 44 of the reference, as directed by the examiner, and we cannot find

any basis for concluding that conductor 46 and conducting member 46a and/or the flange portion of stator 2-27 constitute a “support member provided on the substrate for mechanically fixedly supporting the piezoelectric vibrator at a point corresponding to a node of vibration of the piezoelectric vibrator,” as claimed, and the examiner, in our view, has not sufficiently explained how these elements of Miyazawa correspond to the instant claimed subject matter. Accordingly, we will not sustain the rejection of claims 1, 7, and 9 under 35 U.S.C. §102 (b) based on Miyazawa. Moreover, because it is not clear to us how Miyazawa is interpreted to disclose the subject matter of independent claim 1, we also will not sustain the rejection of claims 4 and 6 under 35 U.S.C. §103 as unpatentable over Miyazawa.

Turning to the rejection of claim 2, this claim also stands rejected under 35 U.S.C. §102 (b) as anticipated by Katsuma. It adds the limitation that the support member has “sufficient elasticity to elastically urge the piezoelectric vibrator against a moving member to drive the moving member in response to oscillating movement of the piezoelectric vibrator.”

The examiner again refers to Figure 7 of Katsuma and finds that since absorber 4 is elastic (referring to column 8, lines 4-8, but really disclosed at line 9) and the moving member 9 must contact the piezoelectric vibrator structure (3, 9) to have an operable device, absorber 4 must inherently have “sufficient elasticity” to elastically urge the piezoelectric vibrator against a moving member, as claimed. We agree.

Appellants' argument that absorber 4 does not correspond to a support member for performing the corresponding functions recited in claim 1, has been considered and disposed of supra with regard to claim 1. For those reasons, we are unconvinced that absorber 4 is not a "support member," as claimed. The elastic "urge" of Katsuma may be by more than one component, i.e., all of the components of Figure 7 of the reference contribute to this "urging" of the piezoelectric vibrator against the moving member 9, but the absorber 4 appears to be one of those components and, as such, meets the claim language requiring the support member to have sufficient elasticity to "urge" the piezoelectric vibrator against a moving member to drive the member.

Accordingly, we will sustain the rejection of claim 2 under 35 U.S.C. §102 (b) over Katsuma.

With regard to claims 4 (the support member comprises part of the substrate) and 6 (the piezoelectric vibrator is mounted on the support member), the rejection of these claims under 35 U.S.C. §103 over Katsuma is sustained.

As explained by the examiner, although the elements of the claimed structure are taught as being separate in Katsuma, it would have been obvious to make these parts integral with the substrate since making separate parts integral is considered to be within the skill of the artisan.

We agree with the examiner that while Katsuma discloses absorber 4 to be separate from the substrate 51, the skilled artisan would have found it obvious to integrate elements 51 and 4 into one unit as, generally, artisans recognize the obviousness of making separate parts integral and integral parts separate, unless there is something in the prior art which suggests against such an integration and/or separation. Appellants continue to argue (reply brief-pages 11-12) that absorber 4 of Katsuma may not be considered to be the claimed “support means.” For the reasons supra, we do not find this argument to be persuasive of non-obviousness.

Accordingly, we will sustain the rejection of claims 4 and 6 under 35 U.S.C. §103 over Katsuma.

We have sustained the rejection of claims 1, 2, 7, and 9 under 35 U.S.C. §102 (b) as anticipated by Katsuma, but we have not sustained the rejection of claims 1, 7, and 9 under 35 U.S.C. §102 (b) as anticipated by Miyazawa. Moreover, we have sustained the rejection of claims 4 and 6 under 35 U.S.C. §103 based on Katsuma but we have not sustained the rejection of these claims under 35 U.S.C. §103 based on Miyazawa.

The examiner's decision is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(iv) (effective Sept. 13, 2004; 69 Fed. Reg. 49960 (Aug. 12, 2004); 1286 Off. Gaz. Pat. Office 21 (Sept. 7, 2004)).

AFFIRMED

JAMES D. THOMAS)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
ERROL A. KRASS)	APPEALS
Administrative Patent Judge)	AND
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ANITA PELLMAN GROSS)	
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Appeal No. 2005-2767
Application No. 09/369,090

12

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