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Datasheet for the decision of 7 December 2018

Case Number: T 0990/14 - 3.5.05

Application Number: 01939443.6

Publication Number: 1303853

IPC: G09G5/00

Language of the proceedings: EN

Title of invention:
HAPTIC DEVICES USING ELECTROACTIVE POLYMERS

Applicant:
Immersion Corporation

Headword:
Haptic device using electrostrictive polymers actuators/ IMMERSION

Relevant legal provisions:
EPC Art. 56

Keyword:

Decisions cited:

Catchword:

Europäisches Patentamt
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Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 0990/14 - 3.5.05

D E C I S I O N
of Technical Board of Appeal 3.5.05
of 7 December 2018

Appellant: (Applicant)	Immersion Corporation 801 Fox Lane San Jose, CA 95131 (US)
Representative:	Robson, Aidan John Reddie & Grose LLP The White Chapel Building 10 Whitechapel High Street London E1 8QS (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 12 December 2013 refusing European patent application No. 01939443.6 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chair	A. Ritzka
Members:	P. Cretaine
	F. Blumer

Summary of Facts and Submissions

I. This appeal is against the decision of the examining division, posted on 12 December 2013, refusing European patent application No. 01 939 443.6. The main request and the auxiliary request were refused for non-compliance with the requirements of Article 123(2) EPC. The main request was also refused for lack of inventive step (Article 56 EPC) having regard to the disclosure of

D1: WO 98/24183 as closest prior art in combination with

D3: R. Pelrine et al.: "Electrostriction of polymer films for microactuators", IEEE The Tenth Annual International Workshop on Micro Electro Mechanical Systems, Nagoya, JP, 26 to 30 January 1997, pages 238 to 243, or

D8: R. Kornbluh et al.: "Electrostrictive Polymer Artificial Muscle Actuators", IEEE International Conference on Robotics and Automation, Leuven, BE, 16 to 20 May 1998, Vol. 3, pages 2147 to 2154.

The decision also cited document

D10: M. Lind et al.: "Linear Motion Miniature Actuators", 2nd Tampere International Conference on Machine Automation, 15 to 18 September 1998,

as relevant prior art.

II. Notice of appeal was received on 12 February 2014, and the appeal fee was paid on the same day. The statement setting out the grounds of appeal was received on

14 April 2014. The appellant requested that the decision be set aside and that a patent be granted based on the claims of the sole request submitted with the statement setting out the grounds of appeal.

III. A summons to oral proceedings was issued on 5 September 2018. In a communication pursuant to Article 15(1) RPBA issued on 11 September 2018, the board gave its preliminary opinion that the request met the requirements of Article 123(2) EPC but that the subject-matter of the independent claims did not involve an inventive step (Article 56 EPC) having regard to the disclosure of D1 as closest prior art in combination with D8. The board also mentioned that an inventive step objection could also have been raised based on the combinations of D1 with D3 or D1 with D10.

IV. By letter dated 7 November 2018, the appellant filed first and second auxiliary requests.

V. Oral proceedings were held on 7 December 2018, during which the appellant withdrew the first and second auxiliary requests. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request as filed with the statement setting out the grounds of appeal dated 14 April 2014.

VI. Claim 1 according to the main request reads as follows:

" A computer interface apparatus for providing haptic feedback, comprising:
a sensor (112) configured to detect a movement of at least a portion of the apparatus when manipulated by a user, the sensor configured to output sensor signals

that include information representative of the movement;
a processor (100, 110) configured to generate associated input signals based on the output sensor signals; and
an actuator (18) coupled to the apparatus and configured to deform based on the associated input signals to thereby output a haptic feedback force;
the apparatus being characterised in that the actuator (18) is an electrorestrictive electroactive polymer actuator."

The request comprises a further independent claim directed to a corresponding method (claim 11).

Reasons for the Decision

1. Admissibility of the appeal

The appeal complies with Articles 106 to 108 EPC (see point II above) and is therefore admissible.

2. Article 123(2) EPC

The board is satisfied that the amendments to the claims find support in the application documents as originally filed. In particular, the board holds that the objection of the examining division raised in point 3 of the Reasons has been overcome by replacing the wording "in association with a user input" by "when manipulated by a user", based on, for instance, the passage in page 12, lines 30 to 31 of the originally filed description.

3. Article 56 EPC

3.1 Prior art

It was common ground in the written and oral submissions that D1 represents the closest prior art to the subject-matter of the claims. With respect to claim 1 on which the refusal decision was based, claim 1 has been slightly amended to state that the sensor is configured to detect a movement of at least a portion of the apparatus when manipulated by a user. This feature is disclosed in D1 (see, for instance, page 7, lines 7 and 8: "based on the user's manipulation of the mouse"). All the features of the preamble of claim 1 are therefore already disclosed in D1.

The only difference between the subject-matter of claim 1 and the disclosure of D1 is thus that the actuator is an electrorestrictive electroactive polymer actuator.

3.2 The technical effect of this distinguishing feature is that the interface apparatus does not need to be equipped with a conventional actuator, such as a motor, and its controller electronics.

The examining division has regarded the objective technical problem as providing the apparatus with an alternative actuator.

However, since it was known at the priority date that existing technologies for haptic devices had a high manufacturing cost which was due to the inclusion of actuators and their controllers, the board agrees with the appellant that, based on the above-mentioned technical effect, the problem to be solved by the

invention is to provide a haptic feedback device which is lower in cost to manufacture while still offering to the user an effective haptic feedback. This problem is also clearly defined in the description (see from page 1, line 32, to page 2, line 5, and page 3, lines 4 to 6.

3.3 In the written and oral proceedings, the appellant plausibly argued that the skilled person, trying to solve the above-mentioned problem, would not have combined the teaching of D1 with any of the prior-art documents D8, D3 and D10 for the following reasons.

D8 discusses the performance of electrostrictive polymer artificial muscle actuators (EPAM) with respect to electromagnetic, electrostatic, piezolectric, and magnetostrictive actuators in a variety of applications (see the abstract). D8, in Table 1 on page 2148, compares a number of different characteristics of various actuator types. It does not, in fact, propose that each can be substituted for the other. Indeed, a detailed study of Table 1 shows that an electrostrictive polymer actuator actually perform less well than some of the actuator types proposed, in particular an electromagnetic voice coil actuator as used by the device of D1. Indeed, D8 states (see page 2148, left-hand column, second paragraph) that "EPAM technology does not provide the best performance according to any one metric". Further, the only mention of a cost comparison in D8 is in the passage bridging the pages 2153 and 2154, which states that the cost of an EPAM actuator would be lower than the cost of a piezoelectric motor. However, D1 uses electromagnetic voice coils actuators. The skilled person would thus not be incited by the performance and cost comparisons shown in D8 to use an electrostrictive polymer actuator

instead of an electromagnetic voice coil in the device of D1.

D3 investigates electrostrictive polymers as a means of microactuation. D3 compares the performances of various polymers (see Table I) but is silent about any advantages over electromagnetic voice coils actuators. Further, the applications of these electrostrictive polymers to actuators, which are listed in page 242, right-hand column, do not mention mouse devices of the kind described in D1. Moreover, the only passage of D3 dealing with cost comparison is in the last paragraph on page 242, right-hand column. The cost comparison is, however, limited to a comparison between displays using electrostrictive polymers and silicon-based displays. D3 is thus silent about any cost advantage in respect of electromagnetic voice coils of the kind used in D1. The skilled person would thus not be incited by the performance and cost comparisons shown in D3 to use an electrostrictive polymer actuator instead of an electromagnetic voice coil in the device of D1.

D10 gives an overview of different actuator technologies, in particular voice coil actuators (see chapter 2.3), which are the kind of actuators used in D1, and electrostrictive actuators (see chapter 5). D10 does not, however, go into details with respect to the performance of the respective actuators, let alone with respect to a comparison of these performances. Further, D1 is silent about the cost issue. The skilled person would thus not be incited by the teaching of D10 to use an electrostrictive polymer actuator instead of an electromagnetic voice coil in the device of D1.

3.4 For these reasons, the board judges that the subject-matter of claim 1 and the corresponding method

claim 11 involves an inventive step, having regard to the prior art on file (Article 56 EPC). Claims 2 to 10 and 12 to 15 are dependent claims and, as such, also meet the requirement of Article 56 EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the examining division with the order to grant a patent on the basis of the main request (claims 1 to 15) as filed with the statement setting out the grounds of appeal dated 14 April 2014 and a description and drawings yet to be adapted.

The Registrar: The Chair:

K. Götz-Wein A. Ritzka

Decision electronically authenticated