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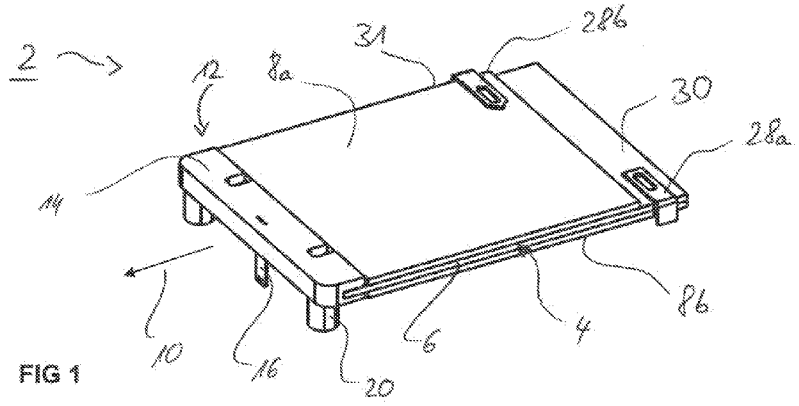


FIG 1

(57) Abstract: Bending transducer (2) for deflecting a pumping diaphragm in a diaphragm pump, which transducer has a layered structure (4) comprises a carrier (6), which carrier extends in the longitudinal direction up to a deflecting end (12) and on which there is an applied piezoelectric layer (8a, b), which piezoelectric layer is contacted via electrical contact elements (28a, b), wherein a link holder (14) is fastened to the deflecting end (12) and wherein an actuator (16) is held in the link holder (14), wherein, in the final mounted state in the diaphragm pump, the actuator (16) is connectable to the diaphragm.

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A. CLASSIFICATION OF SUBJECT MATTER
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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 2 333 340 Al (DEBIOTECH SA [CH]) 15 June 2011 (2011-06-15) paragraphs [0026] - [0030] figure 2	1,5,16
A	DE 197 06 513 Al (INST MI KR0 UND INFORMATIONSTEC [DE] HAHN SCHICKARD GES [DE]) 20 August 1998 (1998-08-20) page 5, line 56 - page 6, line 2 figure 4	1,16

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	STEHR M ET AL: "The VAMP - a new device for handling liquids or gases" , SENSORS AND ACTUATORS A, ELSEVIER SEQUOIA S.A. , LAUSANNE, CH, vol . 57, no. 2, 1 November 1996 (1996-11-01) , pages 153-157 , XP026893078, ISSN: 0924-4247 , DOI: 10. 1016/50924-4247 (97)80106-9 [retrieved on 1996-11-01] the whole document ---	1,16

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2333340 A1	15-06-2011	CN 102667158 A	12-09-2012
		EP 2333340 A1	15-06-2011
		EP 2510236 A1	17-10-2012
		US 2012237375 A1	20-09-2012
		WO 2011070468 A1	16-06-2011
DE 19706513 A1	20-08-1998	NONE	