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61/291,732 31 December 2009 (31.12.2009) US(71) Applicant (for all designated States except US):
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HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP,
KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD,
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[Continued on next page]

(54) Title: ULTRASOUND COUPLING DEVICE

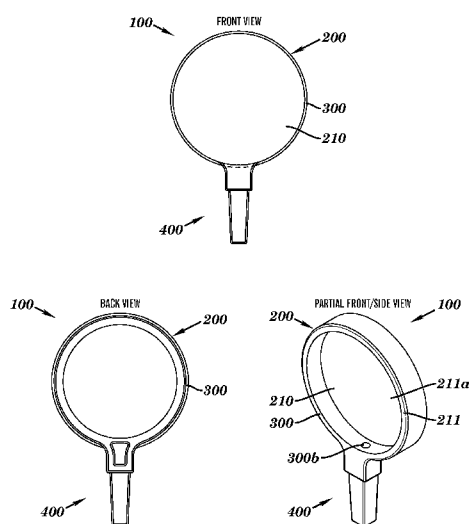


FIG. 1

(57) Abstract: The present invention relates to an ultrasound coupling
device for use with various ultrasound transducers, systems, and applica-
tions. The coupling device includes a coupling compartment comprising
a chamber having a continuous side wall and an opening on a first end.
The continuous side wall is configured to hold a low-profile ultrasound
transducer within the chamber so that a front ultrasound emitting surface
of the low-profile ultrasound transducer faces outward toward the cham-
ber opening. The front ultrasound emitting surface is configured to con-
trol the direction and wave pattern of ultrasonic energy emitted from the
transducer. The continuous side wall is also configured to hold a quantity
of an ultrasound conductive medium within the chamber and is operative
to keep the ultrasound conductive medium in simultaneous contact with a
surface of a subject and with at least a portion of the front ultrasound
emitting surface of the transducer. The present invention also relates to
an ultrasound apparatus, kit, and methods of using the ultrasound cou-
pling device, apparatus, and kit.



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22 December 2011

A. CLASSIFICATION OF SUBJECT MATTER***A61N 7/00(2006.01)i, A61B 8/00(2006.01)i***

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A61N 7/00; A61B 8/12; A61B 18/14; A61M 37/00; A61H 1/00; A61B 8/14; A61B 8/00; A61N 7/02

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: ultrasound transducer, coupling, direction, wave pattern, drug, deliver, semi-permeable.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4,787,888 A (FOX) 29 November 1988 See the abstract; figures 1 and 3-6; col.1, line 59 - col.2, line 19, col.3, line 60 - col.4, line 19, col.5, lines 2-42, and col.6, line 65 - col.7, line 5; and claims 1-16.	1-19,30
Y	US 2008-0195003 A1 (SLIWA et al.) 14 August 2008 See the abstract; figure 1; and paragraphs [0052-0059] and [0065].	1-19,30
A	US 2005-0215901 A1 (ANDERSON et al.) 29 September 2005 See the abstract; figures 1, 6A-6B, 6D-6E, 10A-11G, and 13A-13E; and paragraphs [0067-0072].	1-19,30
A	US 2006-0184070 A1 (HANSMANN et al.) 17 August 2006 See the abstract; figures 4C-4D; paragraphs [0037-0038], [0043], and [0046-0047]; and claims 1, 3, and 6-8.	1-19,30
A	US 2009-0112133 A1 (DEISSEROTH et al.) 30 April 2009 See the abstract; figures 1-4B; and paragraphs [0028], [0034], [0039], and [0043-0045].	1-19,30



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

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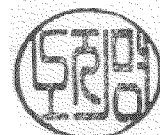
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2011/020052

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2005-0165393 A1 (EPPSTEIN) 28 July 2005 See the abstract; figures 28 and 31-34B; and paragraphs [0236], [0277], [0282], and [0300-0307].	1-19,30
A	US 2008-0200810 A1 (BUCHALTER) 21 August 2008 See the abstract; figures 1-4; paragraphs [0002], [0034-0042], and [0044]; and claims 1-8 and 17-18.	1-19,30

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2011/020052**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 20-29
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 20-29 pertain to methods for treatment of the human body by therapy and thus relate to a subject matter which this International Searching Authority is not required, under Article 17(2)(a)(i) of the PCT and Rule 39.1(iv) of the Regulations under the PCT, to search.
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/020052

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