

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
5 February 2009 (05.02.2009)

PCT

(10) International Publication Number
WO 2009/017554 A3

(51) International Patent Classification:

B63C 11/22 (2006.01)

(21) International Application Number:

PCT/US2008/007994

(22) International Filing Date: 26 June 2008 (26.06.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/937,161 26 June 2007 (26.06.2007) US

60/967,631 6 September 2007 (06.09.2007) US

61/007,793 13 December 2007 (13.12.2007) US

(71) Applicant and

(72) Inventor: HALLIDAY, Christopher, I. [US/US]; 900 Spring City Road, Phoenixville, PA 19460 (US).

(74) Agent: HALLIDAY, Christopher, I.; 900 Spring City Road, Phoenixville, PA 19460 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA,

CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, 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, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR ALTERING AND/OR MINIMIZING UNDERWATER NOISE

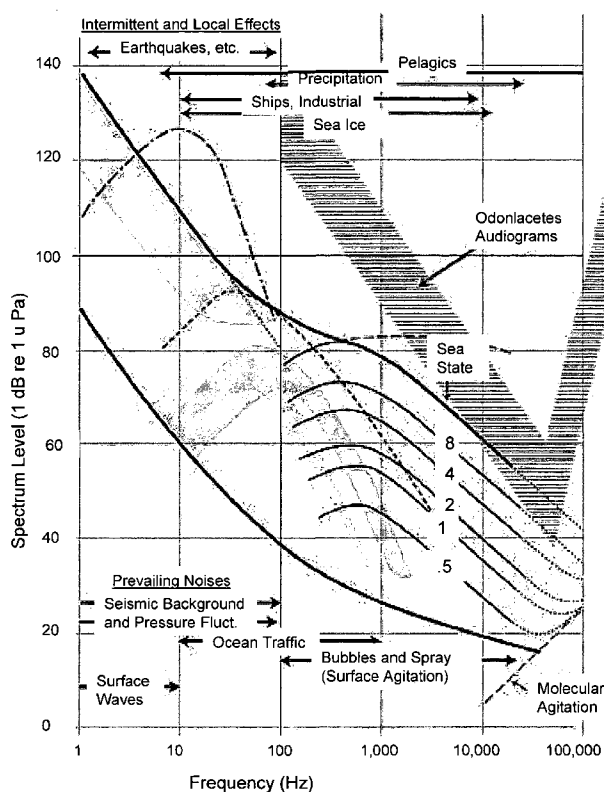


Fig. 1

(57) Abstract: To reduce or eliminate the startle response in aquatic life, embodiments of the present invention alter the sound produced by a diver's exhaled bubbles by adjusting up or down the frequency of the sound produced by the bubbles.

WO 2009/017554 A3



(88) Date of publication of the international search report:

2 April 2009

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2008/007994

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B63C 11/22 (2009.01)

USPC - 128/201.27

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)

IPC(8) - B63C 11/22, 11/24 (2009.01)

USPC - 128/201.27

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)

PatBase

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 7-309292 A (KUROKAWA) 28 November 1995 (28.11.1995) entire document	1-8
A	US 6,983,746 B2 (MORGAN et al) 10 January 2006 (10.01.2006) entire document	1-8
A	US 4,527,657 A (PAYNE) 09 July 1985 (09.07.1985) entire document	1-8
A	US 6,644,307 B2 (MORGAN et al) 11 November 2003 (11.11.2003) entire document	1-8

☐ Further documents are listed in the continuation of Box C.


* 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 another 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

Date of the actual completion of the international search

05 January 2009

Date of mailing of the international search report

21 JAN 2009

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450

Facsimile No. 571-273-3201

Authorized officer:

Blaine R. Copenheaver

PCT Helpdesk: 571-272-4300

PCT OSP: 571-272-7774