

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
7 August 2003 (07.08.2003)

PCT

(10) International Publication Number
WO 03/064064 A1

(51) International Patent Classification⁷: **B06B 3/00**,
B08B 3/12, 3/02

[SV/US]; 11435 Homeway Drive, Garden Grove, CA
92641 (US).

(21) International Application Number: PCT/US03/00439

(74) Agent: **ALTMAN, Daniel, E.**; Knobbe, Martens, Olson &
Bear, LLP, 2040 Main Street, 14th Floor, Irvine, CA 92614
(US).

(22) International Filing Date: 7 January 2003 (07.01.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/059,682 29 January 2002 (29.01.2002) US

(71) Applicant (for all designated States except US):
VERTEQ, INC. [US/US]; 1241 East Dyer Road, Suite
100, Santa Ana, CA 92705-6033 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ (utility model), CZ, DE (utility model), DE, DK (utility
model), DK, DM, DZ, EC, EE (utility model), EE, ES, FI
(utility model), FI, GB, GD, GE, GH, GM, HR, HU, ID,
IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT,
LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ,
OM, PH, PL, PT, RO, RU, SD, SE, SG, SK (utility model),
SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC,
VN, YU, ZA, ZM, ZW.

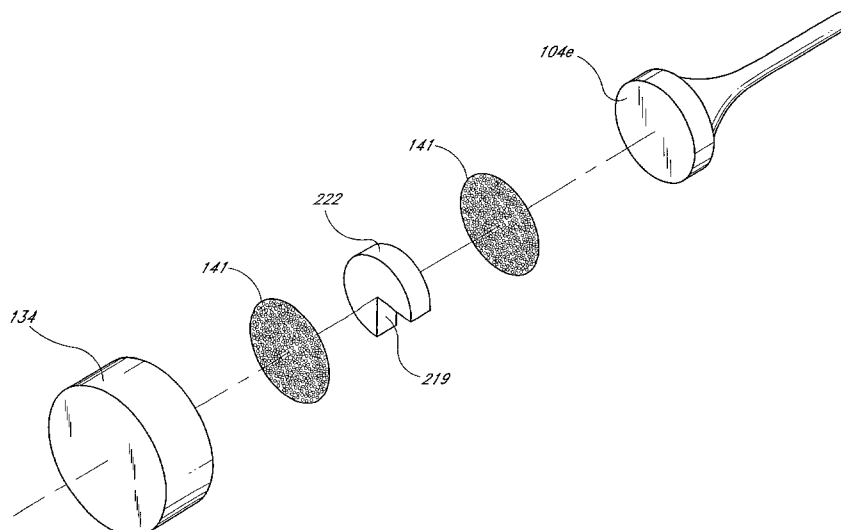
(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

(72) Inventor; and

(75) Inventor/Applicant (for US only): **BRAN, Mario, E.**

[Continued on next page]

(54) Title: MEGASONIC PROBE ENERGY DIRECTOR



(57) Abstract: A megasonic cleaning apparatus configured to provide effective cleaning of a substrate without causing damage to the substrate is provided. The apparatus includes a megasonic probe, a transducer configured to energize the probe, and a heat transfer element disposed between the transducer and the probe. The heat transfer element may be configured to direct the sonic energy from the transducer toward specific areas of the probe so as to reduce the effect of normal-incident waves relative to shallow-angle waves. Alternatively, a rear end face of the probe may be configured for this purpose. Another embodiment provides a coupler disposed between the heat transfer element and the rear end face of the probe for directing the sonic energy from the transducer toward specific areas of the probe.



WO 03/064064 A1



ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

Published:

— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.