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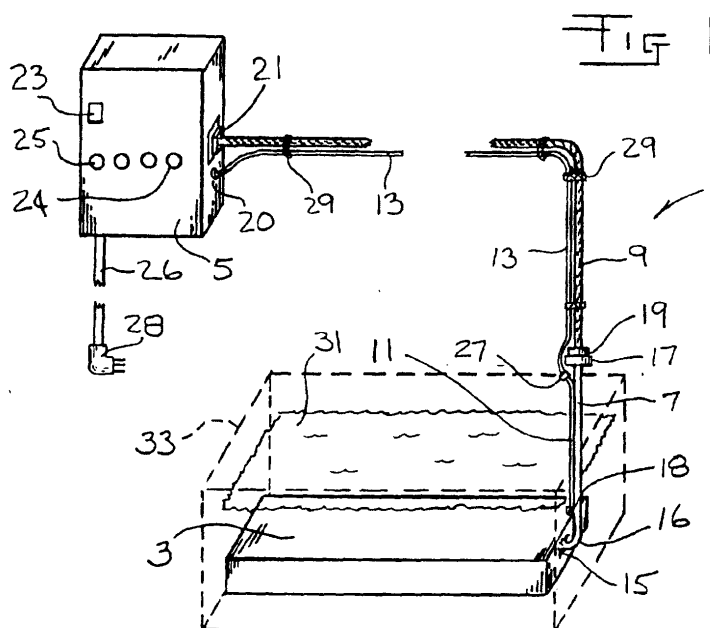
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(54) Ultrasonic cleaning system

(57) A portable ultrasonic cleaning system (1), comprising an ultrasonic transducer (49) contained within a submersible housing (3) to be removably placed in a liquid (31) in a bath (33) for receiving items (36) to be cleaned, a controller (5) for operating the transducer, a tubular conduit (7) attached to the housing and extending from the housing out of the liquid bath to a flexible electrical cable (9) attached to the controller. The clean-

ing system may employ a submersible low liquid level sensor (18), either as a separate submersible item in the liquid bath, or as an integral part of the transducer hardware. The low liquid level sensor may be mechanically mounted to the tubular conduit leading to the transducer housing, or it may be mounted on the housing itself. The cleaning system is especially adapted for cleaning kitchen ware.



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EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US 3 985 344 A (MCCORD JAMES W) 12 October 1976 * column 3, line 9 - line 13; claim 7; figure 1 *	1,5,6	A47L15/13
Y	EP 0 396 363 A (PEDZIWIATR EDWARD ANTHONY) 7 November 1990 * column 7, line 8 - line 54; figure 4 *	1,5,10	
Y	DATABASE WPI Section PQ, Week 9512 Derwent Publications Ltd., London, GB; Class P43, AN 95-086801 XP002098763 & JP 07 014814 A (FUJI FILM MICRO DEVICE KK), 17 January 1995 * abstract; figures *	1,5,10	
A	DE 90 02 289 U (MEYER DIETER) 3 May 1990 * the whole document *	1	
D,A	US 5 218 980 A (EVANS DAVID H) 15 June 1993 * figure 3 *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A	US 4 442 852 A (LORD C DENNIS) 17 April 1984 * figure 1 *	2	A47L D06F B08B
A	US 5 452 594 A (KIM JUNG C ET AL) 26 September 1995 * figures 1,2 *	2	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 1 April 1999	Examiner Debard, M
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03/82 (P04/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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01-04-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3985344 A	12-10-1976	DE 2624369 A	09-12-1976
		FR 2313140 A	31-12-1976
		GB 1530407 A	01-11-1978
EP 0396363 A	07-11-1990	CA 2014706 A	01-11-1990
		JP 3131375 A	04-06-1991
DE 9002289 U	03-05-1990	NONE	
US 5218980 A	15-06-1993	AU 2923692 A	03-05-1993
		CA 2098178 A	10-04-1993
		EP 0562106 A	29-09-1993
		JP 6503498 T	21-04-1994
		WO 9306947 A	15-04-1993
US 4442852 A	17-04-1984	NONE	
US 5452594 A	26-09-1995	KR 9613394 B	04-10-1996
		JP 7068075 A	14-03-1995