



- (51) **International Patent Classification:**
B08B 3/12 (2006.01) *D06F 19/00* (2006.01)
D06F 7/04 (2006.01)
- (21) **International Application Number:** PCT/IN2014/000786
- (22) **International Filing Date:** 19 December 2014 (19.12.2014)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:** 4005/MUM/2013 20 December 2013 (20.12.2013) IN
- (71) **Applicant:** GODREJ & BOYCE MFG CO LIMITED [IN/IN]; Pirojshanagar, Vikhroli (West), Mumbai 400079, Maharashtra (IN).
- (72) **Inventors:** PANSE, Shantanu Avinash; Godref & Boyce Mfg Co Limited, Pirojshanagar, Vikhroli (West), Mumbai 400079, Maharashtra (IN). RAO, Ashok Heroji; Godref & Boyce Mfg Co Limited, Pirojshanagar, Vikhroli (West), Mumbai 400079, Maharashtra (IN).
- (74) **Agents:** MADAN, Jose, A. et al.; Khaitan & Co, Advocates, Notaries, Patent & Trademark Attorneys, One Indiabulls Centre, 13th Flr, 841 Senapati Bapat Marg, Mumbai 400013 Maharashtra (IN).

- (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, BN, BR, BW, BY, BZ, CA, CH, CL, 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, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- of inventorship (Rule 4.17(iv))

[Continued on next page]

(54) **Title:** ULTRASONIC METHOD AND DEVICE FOR REMOVING STAINS ON CLOTHES

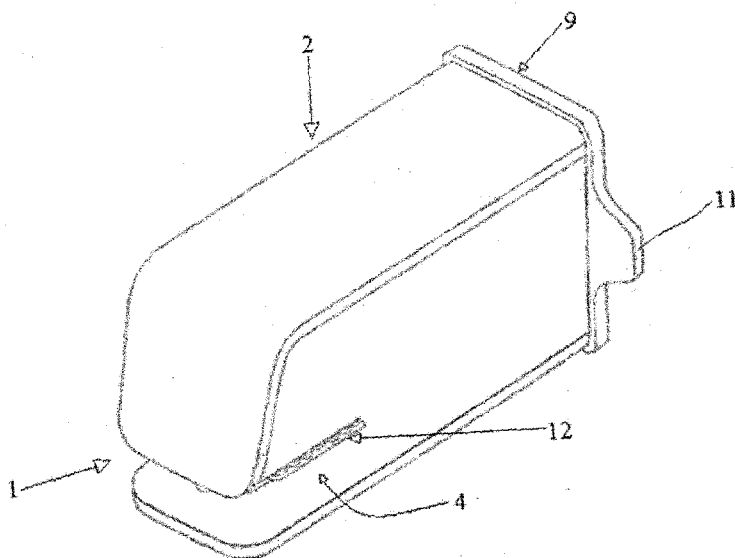


Fig 1

(57) **Abstract:** The method comprises wetting the stained area of the clothes with water, applying detergent at the stained area of the clothes and applying ultrasonic vibrations at the stained area of the clothes at a frequency range of 48 to 52 kHz with simultaneous application of water. The device (1) comprises a housing (2) bifurcated into a top portion (3) and a base portion (4) by a stained cloth access slot (5) extending horizontally in the housing. A cloth rest (12) is located on the base portion exposed in the access slot. An ultrasonic horn (17) is located in the top portion with the lower end thereof extending into the access slot and disposed above the cloth rest. The top portion has a water flow passage (19) opening to the cloth rest at the outlet end thereof. An ultrasonic generator (31) capable of generating ultrasonic vibrations in the frequency range of 48 - 52 kHz is connected to the ultrasonic horn through an ultrasonic drive.





Published:

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

28 January 2016

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IN14/00786

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B08B 3/12, D06F 7/04, 19/00 (2015.01)

CPC - B08B 3/12, D06F 7/04, 19/00

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) Classification(s): B08B 3/12, 7/02; D06B 13/00; D06F 7/04, 19/00 (2015.01)

CPC Classification(s): B08B 3/12; B08B 7/028; D06B 13/00; D06F 7/04, 19/00

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)

PatSeer (US, EP, WO, JP, DE, GB, CN, FR, KR, ES, AU, IN, CA, INPADOC Data); Google/Google Scholar; ProQuest; EBSCO host;
KEYWORDS: ultrasonic, water, continual, simultaneous, concurrent, same time, fluid, liquid, clothes, stain, spray, mist, soap, detergent, cleaning agent

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/0155965 A1 (HORTEL T et al.) 24 October 2002; figure 1; paragraphs [0008], [0014], [0019]	1
A	CN 203462293 U (WUXI LITTLE SWAN CO LTD) 05 March 2014; entire document	1
A	US 2004/0250844 A1 (KUMAZAKI M) 16 December 2004; entire document	1
A	US 2005/0150066 A1 (LIN D) 14 July 2005; entire document	1
E, X	WO 2015/155787 A2 (GODREJ & BOYCE MFG CO LIMITED) 15 October 2015; entire document	1

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 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

23 October 2015 (23.10.2015)

Date of mailing of the international search report

27 NOV 2015

Name and mailing address of the ISA/

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

Facsimile No. 571-273-8300

Authorized officer

Shane Thomas

PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IN14/00786

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.:
because they relate to subject matter not required to be searched by this Authority, namely:

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:

-Please See Supplemental Page-

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 additional fees, this Authority did not invite payment of additional fees.
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.:
Group I: claim 1;

- 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/IN14/00786

-Continued from Box No. III Observations where unity of invention is lacking-

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I: claim 1 is directed toward an ultrasonic method for removing stains on clothes, comprising: wetting the stained area of the clothes with water.

Group II: claims 2-10 are directed toward an ultrasonic-device for removing stains on clothes, comprising a housing bifurcated into a top portion and a base portion.

The inventions listed as Groups I-II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons.

The special technical features of Group I include wetting the stained area of the clothes with water, applying detergent at the stained area of the clothes and applying ultrasonic vibrations at the stained area of the clothes at a frequency range of 48 to 52 kHz with simultaneous application of water (which is not present in Group II).

The special technical features of Group II include an ultrasonic-device for removing stains on clothes, comprising a housing bifurcated into a top portion and a base portion by a stained cloth access slot extending horizontally in the housing, a cloth rest located on the base portion exposed in the access slot, an ultrasonic horn located in the top portion with the lower end thereof extending into the access slot and disposed above the cloth rest, the top portion having a water flow passage connected to a water supply at the inlet end thereof through an electrically operated valve and opening to the cloth rest at the outlet end thereof, a cloth sensor disposed for sensing presence of cloth in the access slot, a status indicator for indicating the operational status of the ultrasonic device, an ultrasonic generator capable of generating ultrasonic vibrations in the frequency range of 48 - 52 kHz connected to the ultrasonic horn through an ultrasonic drive, a controller connected to the ultrasonic generator, cloth sensor, electrically operated valve and status indicator, the ultrasonic drive being connected to the controller and a AC to DC converter connected to the controller, electrically operated valve, ultrasonic generator and ultrasonic drive (which is not present in Group I).

The common technical features of Groups I-II include an ultrasonic method for removing stains on clothes, comprising water and ultrasonic vibrations at a frequency range of 48 to 52 kHz.

These common technical features are disclosed by US 2002/0155965 A1 (HORTEL): an ultrasonic method for removing stains on clothes, comprising water (garment stain removal product and process using water and ultrasound; abstract) and ultrasonic vibrations at a frequency range of 48 to 52 kHz (see paragraph [0008]).

Because the common technical features are disclosed by HORTEL, the inventions are not so linked as to form a single general inventive concept. Therefore, Groups I-II lack unity.