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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/033,823	09/22/2020	10779923	SMTX-001-T1	9793

80709 7590 09/02/2020
Steven R. Lazar
SRL Patents
234 Broadway
Arlington, MA 02474

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Solmetex LLC, Northborough, MA
Nicholas Mozzicato, Acton, MA;
Richard Goulston, Stuart, FL;
Robin Schofield, Lancaster, MA;
Michael Toole, Norton, MA;

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to document:
Doc code: IDS
/CHL/

PTO/SB/08a (01-10)

Approved for use through 07/31/2012. OMB 0651-0031

Doc description: Information Disclosure Statement (IDS) Filed

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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8/4/2020

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	16033823
	Filing Date	2018-07-12
	First Named Inventor	Mozzicato
	Art Unit	3772
	Examiner Name	Lucchesi, Nicholas D.
	Attorney Docket Number	SMTX-001-US-T1

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
/N.D.L/	1	20180098831			2018-04-12 Mozzicato et al.	Whole document

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)

Application Number	16033823
Filing Date	2018-07-12
First Named Inventor	Mozzicato
Art Unit	TBA
Examiner Name	TBA
Attorney Docket Number	SMTX-001-US-T1

/N.D.L/	9	6946069		2005-09-20	Chilibeck	
/N.D.L/	10	5613851		1997-03-25	Trawoeger	
/N.D.L/	11	5795159		1998-08-18	Ralls	
/N.D.L/ 12 Change(s) applied to document, /DM/ 8/12/2020					Nonnenmacher	
					Quen-Dental	
/N.D.L/	13	5018971		1991-05-28	Trawoeger	
/N.D.L/	14	4097381		1978-06-27	Ritzler	
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/N.D.L/	16	7767079		2010-08-03	Darcy	
/N.D.L/	17	6790038		2004-09-14	Hubner	
/N.D.L/	18	7166214		2007-01-23	Armstrong	

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Doc code: IDS

PTO/SB/08a (01-10)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 07/31/2012. OMB 0651-0031

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Filing Date	2018-07-12
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Art Unit	TBA
Examiner Name	TBA
Attorney Docket Number	SMTX-001-US-T1

U.S.PATENTS

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Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
/N.D.L/	1	6592769		2003-07-15	Erickson	
/N.D.L/	2	6409803		2002-06-25	Tremel	
/N.D.L/	3	6592754		2003-07-15	Chilibeck	
/N.D.L/	4	6692636		2004-02-17	Chilibeck	
/N.D.L/	5	7306460		2007-12-11	Hubner	
/N.D.L/	6	4753632		1988-06-28	Hofmann, et al. Querr Dental	
Change(s) applied to document, /D.M./ 8/13/2020	7	5330641		1994-07-19	Cattani	
/N.D.L/	8	5797742		1998-08-25	Fraker	

Notice of References Cited	Application/Control No. 16/033,823		Applicant(s)/Patent Under Reexamination MOZZICATO ET AL.	
	Examiner NICHOLAS LUCCHESI		Art Unit 3732	Page 1 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-54,414 A	05-1866	Name not available Sangster	B01D11/043	210/511
*	B	US-1,032,879 A	07-1912	Name not available Carlton	B60H1/00485	137/559
*	C	US-2,467,547 A	04-1949	BIRNBAUM SAMUEL L	E03C1/284	210/532.1
*	D	US-4,326,952 A	04-1982	Blake; Gene J.	A61C17/046	210/243
*	E	US-4,385,891 A	05-1983	Ligotti; Eugene F.	A61C17/046	210/249
*	F	US-4,599,170 A	07-1986	Friedman; Denis R.	B01D29/05	210/223
*	G	US-4,761,235 A	08-1988	Haentjens; Kathleen S.	E03C1/266	210/532.1
*	H	US-4,957,621 A	09-1990	Rohloff; Pete	B01D21/0003	210/171
*	I	US-5,114,578 A	05-1992	Sundstrom; Gustaf F.	A61C17/046	210/256
*	J	US-5,484,282 A	01-1996	Trawoger; Werner	A61C17/046	433/92
*	K	US-6,149,812 A	11-2000	Erickson; Roger T.	A61C17/046	210/521
*	L	US-2003/0003417 A1	01-2003	Hubner, Henry	A61C17/046	433/92
*	M	US-2004/0259052 A1	12-2004	Hubner, Henry	A61C17/046	433/92

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.



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16/033,823	07/12/2018	Nicholas Mozzicato	SMTX-001-T1	9793
80709	7590	08/10/2020	EXAMINER	
Steven R. Lazar			LUCCHESI, NICHOLAS D	
SRL Patents			ART UNIT	PAPER NUMBER
234 Broadway			3772	
Arlington, MA 02474			NOTIFICATION DATE	DELIVERY MODE
			08/10/2020	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

srlpatents@aol.com

Corrected Notice of Allowability	Application No. 16/033,823	Applicant(s) Mozzicato et al.	
	Examiner NICHOLAS D LUCCHESI	Art Unit 3772	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to IDS of 1/26/19.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 13-19 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some *c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)	5. ☐ Examiner's Amendment/Comment
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 1/26/19.	6. ☐ Examiner's Statement of Reasons for Allowance
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.	7. ☐ Other _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.	

/NICHOLAS D LUCCHESI/ Primary Examiner, Art Unit 3772	
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Doc code: IDS

PTO/SB/08a (01-10)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 07/31/2012. OMB 0651-0031

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	First Named Inventor	Mozzicato
	Art Unit	3772
	Examiner Name	Lucchesi, Nicholas D.
	Attorney Docket Number	SMTX-001-US-T1

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	16033823
Filing Date	2018-07-12
First Named Inventor	Mozzicato
Art Unit	3772
Examiner Name	Lucchesi, Nicholas D.
Attorney Docket Number	SMTX-001-US-T1

/N.D.L/ 1	ASME USAS B17-1 "Keys and Key Seats"; American Society of Mechanical Engineers, USA Standard, 1967 (Reaffirmed 2013)
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EXAMINER SIGNATURE

Examiner Signature	/NICHOLAS D LUCCHESI/	Date Considered	04/29/2019
--------------------	-----------------------	-----------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)

Application Number	16033823
Filing Date	2018-07-12
First Named Inventor	Mozzicato
Art Unit	3772
Examiner Name	Lucchesi, Nicholas D.
Attorney Docket Number	SMTX-001-US-T1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Steven R. Lazar/	Date (YYYY-MM-DD)	2019-01-26
Name/Print	Steven R. Lazar	Registration Number	32,618

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PART B—FEE(S) TRANSMITTAL

Complete and send this form, together with the applicable fee(s), to: Mail

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 P.O. Box 1450
 Alexandria, Virginia 22314-1450
 (571)-273-2885

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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, EFS-Web transmitted, or facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Steven R Lazar	(Depositor's Name)
/Steven R. Lazar/	(S-signature)
7/31/2020	(Date)

Steven R. Lazar
 SRL Patents
 234 Broadway
 Arlington, MA 02474

APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO
16/033,823	07/12/2018	Mozzicato	SMTX-001-T1	9793

TITLE OF INVENTION:

APPLN: TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	Small	\$500	0	0	\$500	10/29/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS

1. Change of correspondence address or indication of "Fee Address" (37CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
- (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered attorney or agent. If no name is listed, no name will be printed

1.
2.
3.

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

1a. NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Solmetex, L.L.C.

Northborough, MA (US)

Please check the appropriate assignee categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☒ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies

4b. Payment of Fees(s): (Please first reapply and previously paid fee shown above)

- ☐ A check is enclosed
- ☐ Payment by credit card. Form PTO-2038 is attached
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number (enclose an extra copy of this form)

5. Change of Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Steven R. Lazar/

Date 7/31/2020

Typed or printed name Steven R. Lazar

Registration No. 32,618

12/414

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal				
Application Number:		16033823		
Filing Date:		12-Jul-2018		
Title of Invention:		DETACHABLE RECYCLING CONTAINER		
First Named Inventor/Applicant Name:		Nicholas Mozzicato		
Filer:		Steven R. Lazar		
Attorney Docket Number:		SMTX-001-T1		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	2501	1	500	500

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				500

Electronic Acknowledgement Receipt

EFS ID:	40170017
Application Number:	16033823
International Application Number:	
Confirmation Number:	9793
Title of Invention:	DETACHABLE RECYCLING CONTAINER
First Named Inventor/Applicant Name:	Nicholas Mozzicato
Customer Number:	80709
Filer:	Steven R. Lazar
Filer Authorized By:	
Attorney Docket Number:	SMTX-001-T1
Receipt Date:	01-AUG-2020
Filing Date:	12-JUL-2018
Time Stamp:	08:24:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 500
RAM confirmation Number	E202081926468275
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	SMTX-001-T1-ptol85b.pdf	125108	no	2
			969088e8519eaa207de1ec8c00ae9c4204976f30		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30237	no	2
			0dde88ace3844ba51f5a68eb5c25427cd91345e6		
Warnings:					
Information:					
Total Files Size (in bytes):			155345		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

80709 7590 07/29/2020
Steven R. Lazar
SRL Patents
234 Broadway
Arlington, MA 02474

EXAMINER	
LUCCHESI, NICHOLAS D	
ART UNIT	PAPER NUMBER
3772	

DATE MAILED: 07/29/2020

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/033,823	07/12/2018	Nicholas Mozzicato	SMTX-001-T1	9793

TITLE OF INVENTION: DETACHABLE RECYCLING CONTAINER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$500	\$0.00	\$0.00	\$500	10/29/2020

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

80709 7590 07/29/2020
Steven R. Lazar
SRL Patents
234 Broadway
Arlington, MA 02474

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/033,823	07/12/2018	Nicholas Mozzicato	SMTX-001-T1	9793

TITLE OF INVENTION: DETACHABLE RECYCLING CONTAINER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$500	\$0.00	\$0.00	\$500	10/29/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
LUCCHESI, NICHOLAS D	3772	433-092000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

1 _____

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/033,823	07/12/2018	Nicholas Mozzicato	SMTX-001-T1	9793
80709	7590	07/29/2020	EXAMINER	
Steven R. Lazar			LUCCHESI, NICHOLAS D	
SRL Patents			ART UNIT	
234 Broadway			PAPER NUMBER	
Arlington, MA 02474			3772	

DATE MAILED: 07/29/2020

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 16/033,823	Applicant(s) Mozzicato et al.	
	Examiner NICHOLAS D LUCCHESI	Art Unit 3772	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to terminal disclaimer filed 6/17/20.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 13-19. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some *c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)	5. ☐ Examiner's Amendment/Comment
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.	6. ☐ Examiner's Statement of Reasons for Allowance
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.	7. ☐ Other _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.	

/NICHOLAS D LUCCHESI/ Primary Examiner, Art Unit 3772	
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<i>Search Notes</i> 	Application/Control No. 16/033,823	Applicant(s)/Patent Under Reexamination Mozzicato et al.
	Examiner NICHOLAS D LUCCHESI	Art Unit 3772

CPC - Searched*		
Symbol	Date	Examiner
A61C 17/046, 17/14, 5/66, 2202/00: B01D 17/00, 21/0012, 21/0018	9/30/2018	NL
Search updated	09/26/2019	NL
Search updated	05/10/2020	NL
search updated	07/20/2020	NL

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Search updated	9/30/2018	NL
Inventor Search; search updated	09/26/2019	NL
Search updated	05/10/2020	NL
search updated	07/20/2020	NL

/NICHOLAS D LUCCHESI/ Primary Examiner, Art Unit 3772	
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<i>Search Notes</i> 	Application/Control No. 16/033,823	Applicant(s)/Patent Under Reexamination Mozzicato et al.
	Examiner NICHOLAS D LUCCHESI	Art Unit 3772

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
A61C	17/046, 17/14, 5/66, 2202/00	07/20/2020	NL
B01D	17/00, 21/0012, 21/0018	07/20/2020	NL

/NICHOLAS D LUCCHESI/ Primary Examiner, Art Unit 3772	
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Issue Classification 	Application/Control No. 16/033,823	Applicant(s)/Patent Under Reexamination Mozzicato et al.
	Examiner NICHOLAS D LUCCHESI	Art Unit 3772

CPC						
Symbol					Type	Version
A61C	/	17	/	065	F	2019-05-01
B65D	/	43	/	0231	I	2013-01-01
A61M	/	2205	/	125	A	2013-01-01
A61M	/	1	/	0056	A	2013-01-01
B65D	/	2543	/	00092	A	2013-01-01
A61M	/	2205	/	7545	A	2013-01-01

CPC Combination Sets					
Symbol				Type	Set
	/		/		

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 7	
/NICHOLAS D LUCCHESI/ Primary Examiner, Art Unit 3772 (Primary Examiner) _____ (Date) _____		20 July 2020 (Date)	O.G. Print Claim(s) 1
			O.G. Print Figure 1

Issue Classification 	Application/Control No. 16/033,823	Applicant(s)/Patent Under Reexamination Mozzicato et al.
	Examiner NICHOLAS D LUCCHESI	Art Unit 3772

INTERNATIONAL CLASSIFICATION			
CLAIMED			
A61C	/	17	/ 06
NON-CLAIMED			
/	/		

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	7	
/NICHOLAS D LUCCHESI/ Primary Examiner, Art Unit 3772	20 July 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

<i>Issue Classification</i> 	Application/Control No. 16/033,823	Applicant(s)/Patent Under Reexamination Mozzicato et al.
	Examiner NICHOLAS D LUCCHESI	Art Unit 3772

☐ Claims renumbered in the same order as presented by applicant
 ☐ CPA
 ☐ T.D.
 ☐ R.1.47

CLAIMS															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
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	2		11												
	3		12												
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	6	3	15												
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	9	4	18												

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 7	
/NICHOLAS D LUCCHESI/ Primary Examiner, Art Unit 3772 (Primary Examiner) _____ (Date) 20 July 2020		O.G. Print Claim(s) 1	O.G. Print Figure 1



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BIB DATA SHEET

CONFIRMATION NO. 9793

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.	
16/033,823	07/12/2018	433	3772	SMTX-001-T1	
APPLICANTS Solmetex LLC, Northborough, MA INVENTORS Nicholas Mozzicato, Acton, MA; Richard Goulston, Stuart, FL; Robin Schofield, Lancaster, MA; Michael Toole, Norton, MA; ** CONTINUING DATA ***** This application is a CIP of 15/730,828 10/12/2017 PAT 10646313 which claims benefit of 62/414,712 10/29/2016 and claims benefit of 62/406,990 10/12/2016 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** ** SMALL ENTITY ** 07/26/2018					
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and /NICHOLAS D LUCCHESI/ Acknowledged Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY MA	SHEETS DRAWINGS 6	TOTAL CLAIMS 4	INDEPENDENT CLAIMS 1
ADDRESS Steven R. Lazar SRL Patents 234 Broadway Arlington, MA 02474 UNITED STATES					
TITLE Detachable Recycling Container					
FILING FEE RECEIVED 865	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:				
		☐ All Fees			
		☐ 1.16 Fees (Filing)			
		☐ 1.17 Fees (Processing Ext. of time)			
		☐ 1.18 Fees (Issue)			
		☐ Other _____			
		☐ Credit			

EAST Search History

EAST Search History (Prior Art)

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L4	265	A61C2202/00.cpc.	US-PGPUB; USPAT	OR	OFF	2020/07/20 13:58
L5	967	B01D17/00.cpc.	US-PGPUB; USPAT	OR	OFF	2020/07/20 13:58
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L9	474	B01D21/0018.cpc.	US-PGPUB; USPAT	OR	OFF	2020/07/20 13:58
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L12	8	L11 and (recycle or recycling)	US-PGPUB; USPAT	OR	OFF	2020/07/20 13:58
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L104	126	A61C5/66.cpc.	US-PGPUB	OR	OFF	2020/07/20 14:12
L105	162	A61C2202/00.cpc.	US-PGPUB	OR	OFF	2020/07/20 14:12
L106	239	B01D17/00.cpc.	US-PGPUB	OR	OFF	2020/07/20 14:12
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7/20/2020 2:14:49 PM

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Application Number * 16/033,823 *	Application/Control No. 16/033,823	Applicant(s)/Patent under Reexamination Mozzicato et al.	
	Examiner LUCCHESI, NICHOLAS D	Art Unit 3772	
Document Code - DISQ		Internal Document - DO NOT MAIL	

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed: <u>17 June 2020</u>	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:
/LAWANA R HIXON/ Technology Center: <u>OPLC</u> Telephone: <u>(571)272-6074</u> _____

**TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING
REJECTION OVER A "PRIOR" PATENT**

Docket Number (Optional)

142-SCARK-CIP-CONT2

In re Application of: NicholasMOZZICATO et al.

Application No.: 16/033,823

Filed: July 2, 2018

For: DENTAL AMALGAM SEPARATION AND RECYCLING SYSTEM

The applicant, Solmetex, L.C., owner of 100% percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. US 10,646,313 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

expires for failure to pay a maintenance fee;

is held unenforceable;

is found invalid by a court of competent jurisdiction;

is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;

has all claims canceled by a reexamination certificate;

is reissued; or

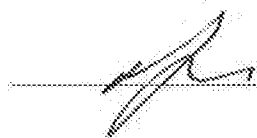
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☒ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☐ The undersigned is an attorney or agent of record. Reg. No. _____



Signature

6-17-20

Date

NicholasMOZZICATO

Typed or printed name

Chief Executive Officer

Title

508-466-3284

Telephone Number

- ☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Patent Application Fee Transmittal

Application Number:	16033823			
Filing Date:	12-Jul-2018			
Title of Invention:	Detachable Recycling Container			
First Named Inventor/Applicant Name:	Nicholas Mozzicato			
Filer:	Steven R. Lazar			
Attorney Docket Number:	SMTX-001-T1			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
STATUTORY OR TERMINAL DISCLAIMER	2814	1	160	160
Total in USD (\$)				160

Electronic Acknowledgement Receipt

EFS ID:	39747355
Application Number:	16033823
International Application Number:	
Confirmation Number:	9793
Title of Invention:	Detachable Recycling Container
First Named Inventor/Applicant Name:	Nicholas Mozzicato
Customer Number:	80709
Filer:	Steven R. Lazar
Filer Authorized By:	
Attorney Docket Number:	SMTX-001-T1
Receipt Date:	17-JUN-2020
Filing Date:	12-JUL-2018
Time Stamp:	14:51:41
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 160
RAM confirmation Number	E20206GE53311085
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	SMTX-T1-Response_OA-6-17-2020.pdf	62755	no	3
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Warnings:					
Information:					
2		SMTX-T1-6-17-Response.pdf	226041	yes	3
			1723e8f2285b47d07e266ac004993884c179daf8		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Assignee showing of ownership per 37 CFR 3.73		1	2	
	Terminal Disclaimer Filed		3	3	
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30227	no	2
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Warnings:					
Information:					
Total Files Size (in bytes):			319023		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

STATEMENT UNDER 37 CFR 3.73(c)Applicant/Patent Owner: Solmetex L.L.C.Application No./Patent No.: 16/033,823 Filed/Issue Date: March 30, 2018Titled: DENTAL AMALGAM SEPARATION AND RECYCLING SYSTEMSolmetex L.L.C., a Limited liability corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose one of options 1, 2, 3 or 4 below):

1. ☒ The assignee of the entire right, title, and interest.
2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):
- ☐ The extent (by percentage) of its ownership interest is ____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.
- ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose one of options A or B below):

- A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.
- B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Robin Schofield To: Solmetex L.L.C.The document was recorded in the United States Patent and Trademark Office at
Reel 052298, Frame 0256, or for which a copy thereof is attached.2. From: Michael Toole and Richard Coulston To: Solmetex L.L.C.The document was recorded in the United States Patent and Trademark Office at
Reel 052297, Frame 0697, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

STATEMENT UNDER 37 CFR 3.73(c)3. From: NicholaMozzicato To: SolmetexL.L.C.The document was recorded in the United States Patent and Trademark Office at
Reel 052299, Frame 0507, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.☐ Additional documents in the chain of title are listed on a supplemental sheet(s).☐ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

X

Signature

NicholaMozzicato

Printed or Typed Name

Date

6-17-20
Chief Executive Officer

Title or Registration Number

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
MOZZICATTO	:	Examiner: LUCCHESI, Nicholas
	)	
Application No.: 16/033,823	:	Group Art Unit: 3772
	)	
Filed: July 12, 2018	:	Confirmation No.: 9793
	)	
For: DENTAL AMALGAM SEPARATION AND	:	
RECYCLING SYSTEM	)	
	:	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO OFFICE ACTION

Sir:

In response to the Final Office Action, mailed on May 14, 2020, Applicants respond as follows:

1. Submission of Terminal Disclaimer and Statement Under 37 CFR §3.73;
2. Remarks begin on page 2.

Applicant hereby claims small entity status under 37 CFR §1.27.

REMARKS

The claims are 13 through 19, unchanged, as set forth in Applicants' communication of April 2, 2020.

In the Office Action mailed on May 14, 2020, claim 13 was provisionally rejected on the ground of non-statutory double patenting as being unpatentable over claim 13 of co-pending 15/730,828, which has subsequently issued as United States Patent 10,646,313. Claim 13 was found to be allowable upon the filing of a terminal disclaimer; claims 14-19 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form, including all of the limitations of the base claim and any intervening claims.

In response to the double patenting rejection, Applicants submit the terminal disclaimer signed by Nicholas Mozzicato, who is the CEO of the Applicant/Assignee Solmetex, L.L.C., together with a Statement Under 37 C.F.R. §3.73, showing the chain of title establishing the ownership interest of Applicant/Assignee Solmetex, L.L.C. Applicants also submit the required fee under 37 C.F.R. §1.20(d).

Accordingly, the non-statutory double patenting rejection has been overcome and should be withdrawn.

CONCLUSION

In light of the above comments and amendments, and the terminal disclaimer submitted herewith, all of the stated grounds of objection to the application and rejection of the claims have been overcome, and the new should be found allowable.

Applicant hereby claims small entity status under 37 CFR §1.27. If any fees are due, the Examiner is requested to contact Applicants' undersigned representative. Applicant's undersigned representative may be reached by telephone at 617-966-2374. All correspondence should continue to be directed to the listed address.

Respectfully submitted,

/Steven R. Lazar/

Steven R. Lazar
Attorney for Applicants
Registration No. 32,618

SRL Patents
234 Broadway
Arlington, MA 02474
June 17, 2020



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/033,823	07/12/2018	Nicholas Mozzicato	SMTX-001-T1	9793
80709	7590	05/14/2020	EXAMINER	
Steven R. Lazar			LUCCHESI, NICHOLAS D	
SRL Patents			ART UNIT	PAPER NUMBER
234 Broadway			3772	
Arlington, MA 02474			NOTIFICATION DATE	DELIVERY MODE
			05/14/2020	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

srlpatents@aol.com

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(I)(1) - 706.02(I)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

Claim 13 is provisionally rejected on the ground of nonstatutory double patenting as being unpatentable over claim 13 of copending Application No. 15/730,828 (reference application). Although the claims at issue are not identical, they are not patentably distinct from each other because the claim in the instant application is broader than the claim in the copending reference application. Thus, the claim of the copending application “anticipates” the claim in the instant application.

This is a provisional nonstatutory double patenting rejection because the patentably indistinct claims have not in fact been patented.

Allowable Subject Matter

Claim 13 would be allowable upon the timely filing of a properly executed terminal disclaimer.

Claims 14-19 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICHOLAS D LUCCHESI whose telephone number is (571)272-4977. The examiner can normally be reached on M-F 800-430.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cris Rodriguez can be reached on 571-272-4964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <https://ppair-my.uspto.gov/pair/PrivatePair>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NICHOLAS D LUCCHESI/
Primary Examiner, Art Unit 3772

Search Notes 	Application/Control No. 16/033,823	Applicant(s)/Patent Under Reexamination Mozzicato et al.
	Examiner NICHOLAS D LUCCHESI	Art Unit 3772

CPC - Searched*		
Symbol	Date	Examiner
A61C 17/046, 17/14, 5/66, 2202/00: B01D 17/00, 21/0012, 21/0018	9/30/2018	NL
Search updated	09/26/2019	NL
Search updated	05/10/2020	NL

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Search updated	9/30/2018	NL
Inventor Search; search updated	09/26/2019	NL
Search updated	05/10/2020	NL

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/NICHOLAS D LUCCHESI/ Primary Examiner, Art Unit 3772	
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EAST Search History

EAST Search History (Prior Art)

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L96	8	mozzicato adj2 nicholas.in.	US-PGPUB; USPAT	OR	OFF	2020/05/10 22:54
L97	9	goulston adj2 richard.in.	US-PGPUB; USPAT	OR	OFF	2020/05/10 22:54
L98	2	schofield adj2 robin.in.	US-PGPUB; USPAT	OR	OFF	2020/05/10 22:54
L99	5	toole adj2 michael.in.	US-PGPUB; USPAT	OR	OFF	2020/05/10 22:54
L100	10	dental and amalgam and separator and adaptor	US-PGPUB; USPAT	OR	OFF	2020/05/10 22:54
L101	23	("20010047956" "20050016913" "20060065594" "20100264074" "20140154641" "4097381" "4753632" "5018971" "5330641" "5421996" "5613851" "5795159" "5797742" "6409803" "6592754" "6592769" "6692636" "6790038" "6946069" "7166214" "7306460" "7767079" "8636837").PN.	US-PGPUB; USPAT	OR	OFF	2020/05/10 22:54

L102	1	("20180098831").PN.	US- PGPUB; USPAT	OR	OFF	2020/05/10 23:10
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EAST Search History (Interference)

<This search history is empty>

5/10/2020 11:52:16 PM

C:\Users\nlucchesi\Documents\EAST\Workspaces\16033823.wsp

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)

Approved for use through 07/31/2012. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)

Application Number	16033823
Filing Date	2018-07-12
First Named Inventor	Mozzicato
Art Unit	3772
Examiner Name	Lucchesi, Nicholas D.
Attorney Docket Number	SMTX-001-US-T1

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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/N.D.L/	1	20180098831			2018-04-12	Whole document

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.				T ⁵

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	16033823
Filing Date	2018-07-12
First Named Inventor	Mozzicato
Art Unit	3772
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Attorney Docket Number	SMTX-001-US-T1

/N.D.L./	1	Solmetex NxT Hg-5 Series Brochure - accessed from www.solmetex.com/hg5-series-products/#hg5 on 3/30/2020
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EXAMINER SIGNATURE

Examiner Signature	/NICHOLAS D LUCCHESI/	Date Considered	05/10/2020
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	16033823
Filing Date	2018-07-12
First Named Inventor	Mozzicato
Art Unit	3772
Examiner Name	Lucchesi, Nicholas D.
Attorney Docket Number	SMTX-001-US-T1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Steven R. Lazar/	Date (YYYY-MM-DD)	2020-03-30
Name/Print	Steven R. Lazar	Registration Number	32,618

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/033,823	Filing Date 07/12/2018	☐ To be Mailed
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ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE (\$)	FEE (\$)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 = *		x \$50 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 = *		x \$230 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED - PART II

	(Column 1)		(Column 2)	(Column 3)	RATE (\$)	ADDITIONAL FEE (\$)
AMENDMENT	04/02/2020		CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total (37 CFR 1.16(i))	* 7	Minus	** 20	= 0	x \$50 = 0
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 3	= 0	x \$230 = 0
	☐ Application Size Fee (37 CFR 1.16(s))					
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
TOTAL ADD'L FEE						0
AMENDMENT			CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total (37 CFR 1.16(i))	*	Minus	**	=	x \$0 =
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x \$0 =
	☐ Application Size Fee (37 CFR 1.16(s))					
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
TOTAL ADD'L FEE						
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.						LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".						/JAMES ELLIOTT/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".						
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.						

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	16033823
	Filing Date	2018-07-12
	First Named Inventor	Mozzicato
	Art Unit	3772
	Examiner Name	Lucchesi, Nicholas D.
	Attorney Docket Number	SMTX-001-US-T1

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	1	20180098831			2018-04-12	Whole document

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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²ⁱ	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		16033823
	Filing Date		2018-07-12
	First Named Inventor	Mozzicato	
	Art Unit	3772	
	Examiner Name	Lucchesi, Nicholas D.	
	Attorney Docket Number	SMTX-001-US-T1	

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Examiner Signature			Date Considered
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<small> ¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached. </small>			

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STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	16033823
Filing Date	2018-07-12
First Named Inventor	Mozzicato
Art Unit	3772
Examiner Name	Lucchesi, Nicholas D.
Attorney Docket Number	SMTX-001-US-T1

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See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Steven R. Lazar/	Date (YYYY-MM-DD)	2020-03-30
Name/Print	Steven R. Lazar	Registration Number	32,618

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
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Electronic Patent Application Fee Transmittal				
Application Number:		16033823		
Filing Date:		12-Jul-2018		
Title of Invention:		Detachable Recycling Container		
First Named Inventor/Applicant Name:		Nicholas Mozzicato		
Filer:		Steven R. Lazar		
Attorney Docket Number:		SMTX-001-T1		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 3 months with \$0 paid	2253	1	700	700
Miscellaneous:				
RCE- 1ST REQUEST	2801	1	650	650
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	120	120
Total in USD (\$)				1470

Electronic Acknowledgement Receipt

EFS ID:	39043812
Application Number:	16033823
International Application Number:	
Confirmation Number:	9793
Title of Invention:	Detachable Recycling Container
First Named Inventor/Applicant Name:	Nicholas Mozzicato
Customer Number:	80709
Filer:	Steven R. Lazar
Filer Authorized By:	
Attorney Docket Number:	SMTX-001-T1
Receipt Date:	02-APR-2020
Filing Date:	12-JUL-2018
Time Stamp:	12:58:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 1470
RAM confirmation Number	E202042C59181672
Deposit Account	
Authorized User	

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File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	SMTX-T001-RCE_Transmittal.pdf	697690	no	3
			fd9905dbe56b74be7ace3a80c818fcd3dfcfb49b		
Warnings:					
Information:					
2		SMTX-T1-RCE_and_Response_Final_OA-4-2-2020.pdf	115416 4ae26219b8256329a280a05b1e01b53c17b6bdb4	yes	12
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Request for Continued Examination (RCE)		1	1	
	Amendment Submitted/Entered with Filing of CPA/RCE		2	3	
	Claims		4	5	
	Extension of Time		6	6	
	Information Disclosure Statement (IDS) Form (SB08)		7	7	
	Applicant Arguments/Remarks Made in an Amendment		8	11	
	Applicant Arguments/Remarks Made in an Amendment		12	12	
Warnings:					
Information:					
3	Drawings-only black and white line drawings	X-SMTX-T1-Revised_Drawings_3-30-2020.pdf	2069050 ff706140ca99ef7dcdeb147185519ae4e020f90e	no	26
Warnings:					
Information:					

4	Information Disclosure Statement (IDS) Form (SB08)	SMTX-001-US-T1-IDS3.pdf	612270 2a72c0510ff7a4f0b55c996a615ebb9981c764b4	no	4
Warnings:					
Information:					
5	Miscellaneous Incoming Letter	Hg5-BROCHURE.pdf	433179 63aa332f5a1517cb6ab75ca82aab51187f65cb7d	no	5
Warnings:					
Information:					
6	Fee Worksheet (SB06)	fee-info.pdf	33883 4b9630da85968278f22788e59819e144a365ae47	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			3961488		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL **(Submitted Only via EFS-Web)**

Application Number	16/033,823	Filing Date	2018-07-12	Docket Number (if applicable)	SMTX-T1-US	Art Unit	3772
First Named Inventor	MOZZICATO, Nick			Examiner Name	LUCCHESI, Nicholas		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.

Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☐ Other _____

☒ Enclosed

☒ Amendment/Reply

☒ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☒ Other

Replacement Drawings

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
 (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☐ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No _____

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

Signature of Registered U.S. Patent Practitioner			
Signature	Steven R. Lazar/	Date (YYYY-MM-DD)	2020-03-31
Name	Steven R. Lazar	Registration Number	32618

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	:	Examiner: LUCCHESI, Nicholas
MOZZICATTO	)	
	:	Group Art Unit: 3772
Application No.: 16/033,823	)	
	:	Confirmation No.: 9793
Filed: July 12, 2018	)	
	:	
For: DENTAL AMALGAM SEPARATION AND	)	
RECYCLING SYSTEM	:	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**REQUEST FOR CONTINUING EXAMINATION AND
RESPONSE TO FINAL OFFICE ACTION**

Sir:

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application. In response to the Final Office Action, mailed on October 2, 2019, a petition for a three-month extension of time for response being filed along herewith, Applicant responds as follows:

1. Amendments to the Specification appear on page 2.
2. Amendment to the Drawings appears on page 3. Applicant further submits herewith a set of Replacement Drawings
3. Claim Amendments begin on page 4.
4. Petition for a 3 Month Extension of Time appears on page 6.
5. Information Disclosure Statement appears on page 7, and in the accompanying form PTO/SB/08a.
6. Remarks begin on page 8.

AMENDMENTS TO THE CLAIMS:

Claims 1 to 12: CANCELED

Add NEW claims 13 to 19:

13 (NEW). A detachable container comprising one or more keyways suitable for attachment with a dental amalgam separation system comprising one or more corresponding keys,
said detachable container having an outside top mating surface comprising a container effluent inlet port of a first height and a container effluent outlet port of a second height, wherein the first height is different from the second height; and wherein said detachable container further comprises one or more keyways cast into said outside top mating surface; wherein, upon alignment of the one or more keyways with the one or more corresponding keys present on the dental amalgam separation system, the detachable container will detachably engage with the dental amalgam separation system, allowing for a leak-proof detachable connection.

14 (NEW). The detachable container of claim 13, further comprising:

a cap for covering the outside top mating surface and having an inside surface with a first circular wall and a second circular wall, the first circular wall having a height selected to engage an upper surface of the detachable container effluent inlet port and the second circular wall having a height selected to engage an upper surface of the detachable container effluent outlet port.

15 (NEW). The detachable container of claim 14, wherein

the detachable container further comprises a threaded exterior peripheral edge, and the cap further comprises a threaded interior peripheral edge suitable for engaging with the threaded external peripheral edge on the detachable container, wherein engagement of the

threaded interior peripheral edge of the cap to the threaded exterior edge of the detachable container forms a secure seal of the cap and the container.

16 (NEW). The detachable container of claim 13, further comprising

a circular sidewall extending from the outside top mating surface and defining an interior chamber for the detachable container, the interior chamber being capable of supporting a partial vacuum when the detachable container effluent inlet port and detachable container effluent outlet port are sealed.

17 (NEW). The detachable container of claim 13, wherein, said corresponding dental amalgam separation system comprises an air-water separator tank, said air-water separator tank comprising an air-water separator effluent outlet port, wherein, upon engagement of the detachable container with the corresponding dental amalgam separation system, the air-water separator effluent port engages with the detachable container effluent inlet port, allowing effluent to pass through the air-water separator tank, whereby dental amalgam particles are collected in the detachable container by sedimentation.

18 (NEW). The detachable container of claim 15, further comprising a first plug for said detachable container effluent inlet port; and a second plug for said detachable container effluent outlet port.

19 (NEW). The detachable container of claim 17, wherein said air-water separator tank comprises one or more corresponding keys, such that, upon engagement of the detachable container to the corresponding dental amalgam separation system, the keyways cast into the outside top mating surface of the detachable container are aligned with the corresponding keys of the air-water separator tank.

PETITION FOR THREE-MONTH EXTENSION OF TIME TO RESPOND

This is a request under the provisions of 37 C.F.R. §1.136(a) to extend the period for filing a reply to the FINAL OFFICE ACTION, mailed on October 2, 2019, in the above-identified application from January 2, 2020 until April 2, 2020. The requested extension and fee are as follows: Three months (37 C.F.R. §1.17(a)(3), small entity fee in the amount of \$700.00. Applicant claims small entity status under 37 C.F.R. §1.27. Applicant's undersigned representative may be reached by telephone at 617-966-2374. All correspondence should continue to be directed to the listed address.

Respectfully submitted,

/Steven R. Lazar/

Steven R. Lazar
Attorney for Applicant
Registration No. 32,618

INFORMATION DISCLOSURE STATEMENT

Applicant submits herewith a supplemental Information Disclosure Statement in order to bring to the Examiner's attention the existence of co-owned patent application serial number: 15/730,828, filed on October 12, 2017. The present application claims priority from the co-owned patent application, and additionally claims common priority from the same earlier filings. The co-owned patent application published on April 12, 2018. Applicant received a notice of allowance on January 23, 2020. Applicant specifically wishes to bring to the Examiner's attention the claims that have been allowed in the co-owned patent application. Those allowed claims recite a dental amalgam separation system for removing and collecting particles from a dental liquid effluent, one element of which is a detachable collection container, as recited in the present claims.

Applicant submits that the claims are patentably distinct in that the present invention relates to the detachable collection container itself, which can be used with or without concomitant use of the dental amalgam separation system claimed in the co-owned patent application. For example, the detachable container of the present invention, once it has been used for the collection of dental amalgam and/or other waste product, can be capped and shipped for appropriate disposal. If required and proper, Applicant will submit a Terminal Disclaimer.

REPLACEMENT SHEET

1/26

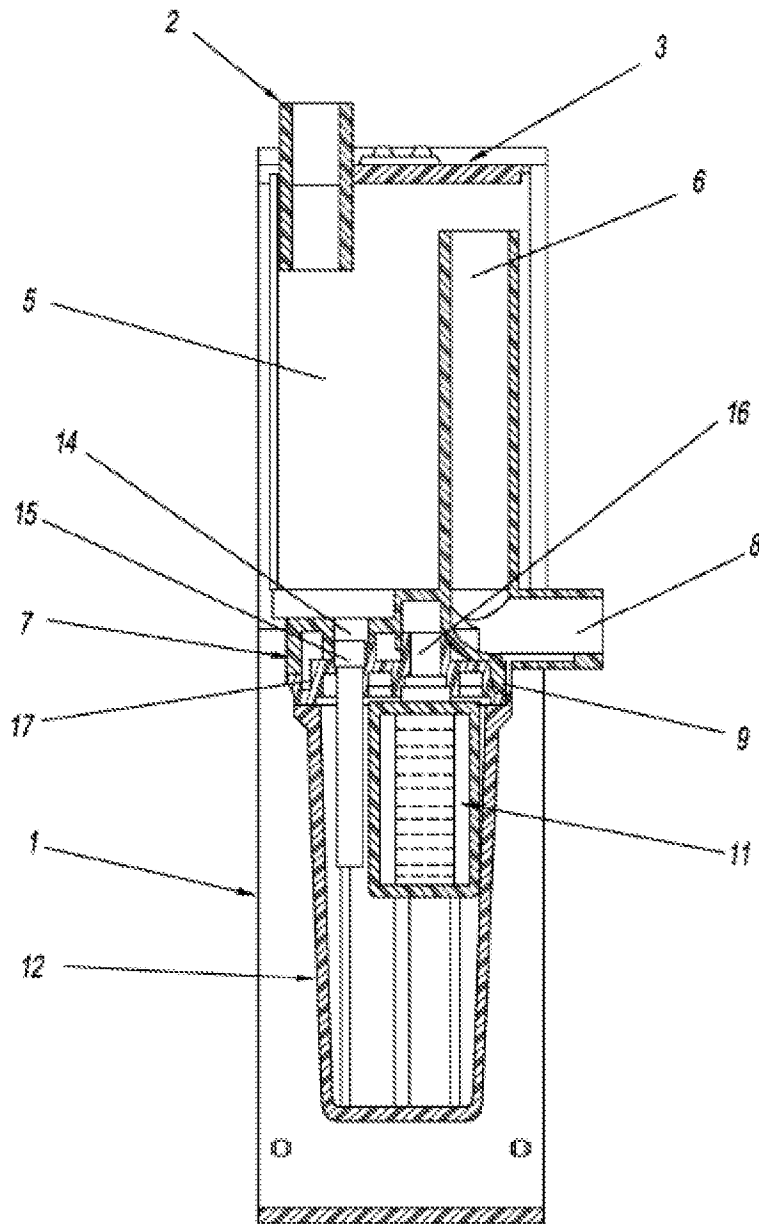


FIGURE 1

REPLACEMENT SHEET

2/26

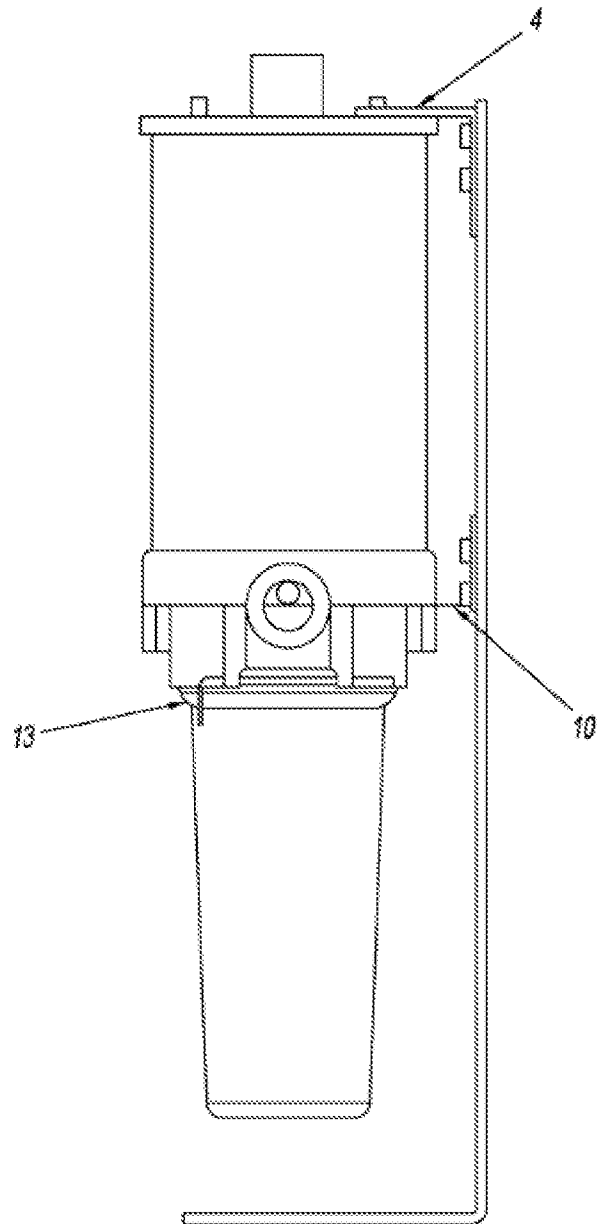


FIGURE 2

REPLACEMENT SHEET

3/26

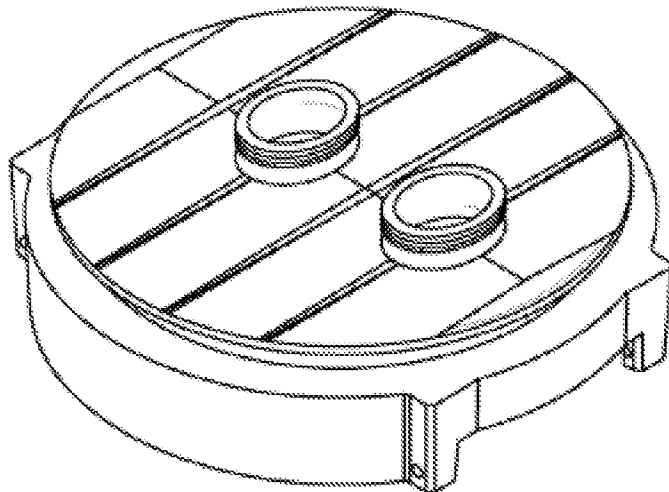


FIGURE 3A

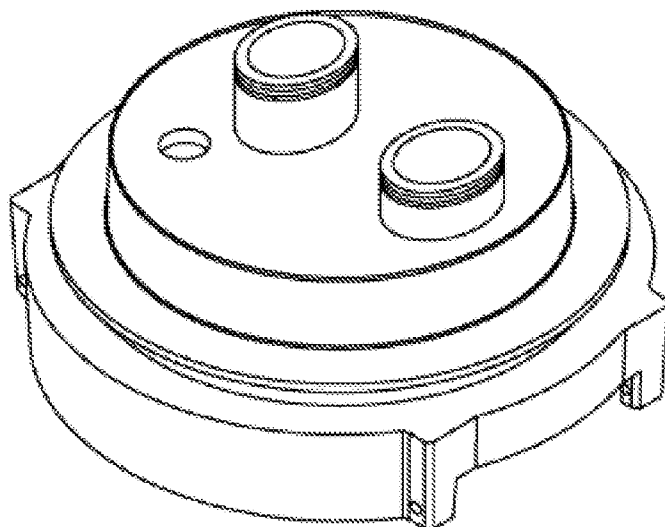


FIGURE 3B

REPLACEMENT SHEET

4/26

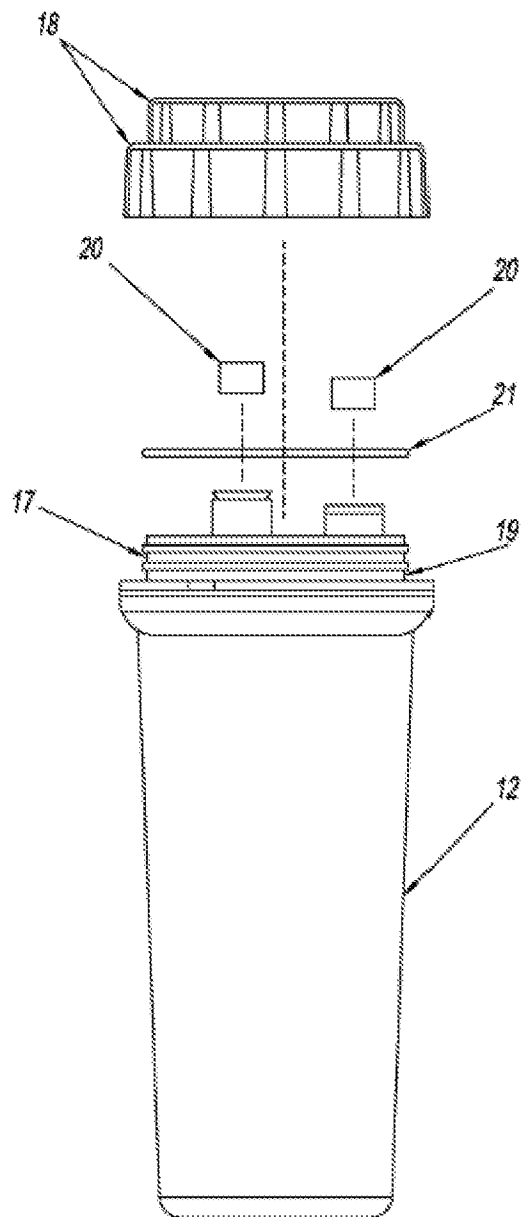


FIGURE 4A

REPLACEMENT SHEET

5/26

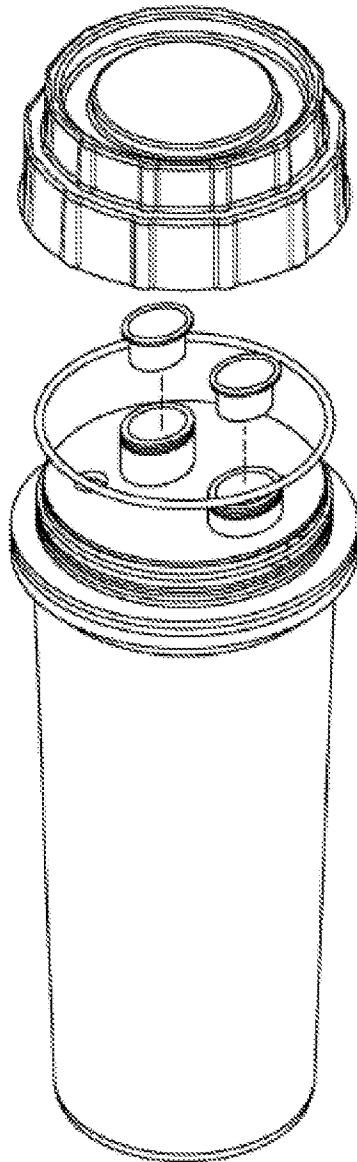


FIGURE 4B

REPLACEMENT SHEET

6/26

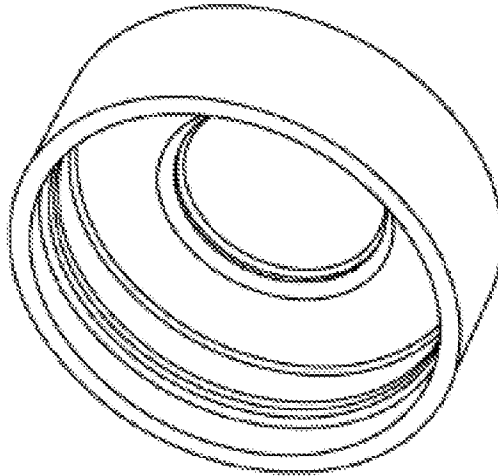


FIGURE 5A

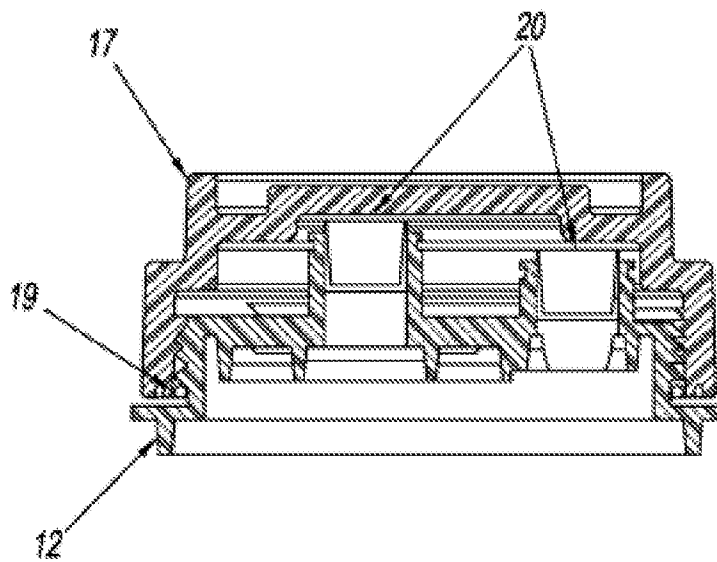


FIGURE 5B

REPLACEMENT SHEET

7/26

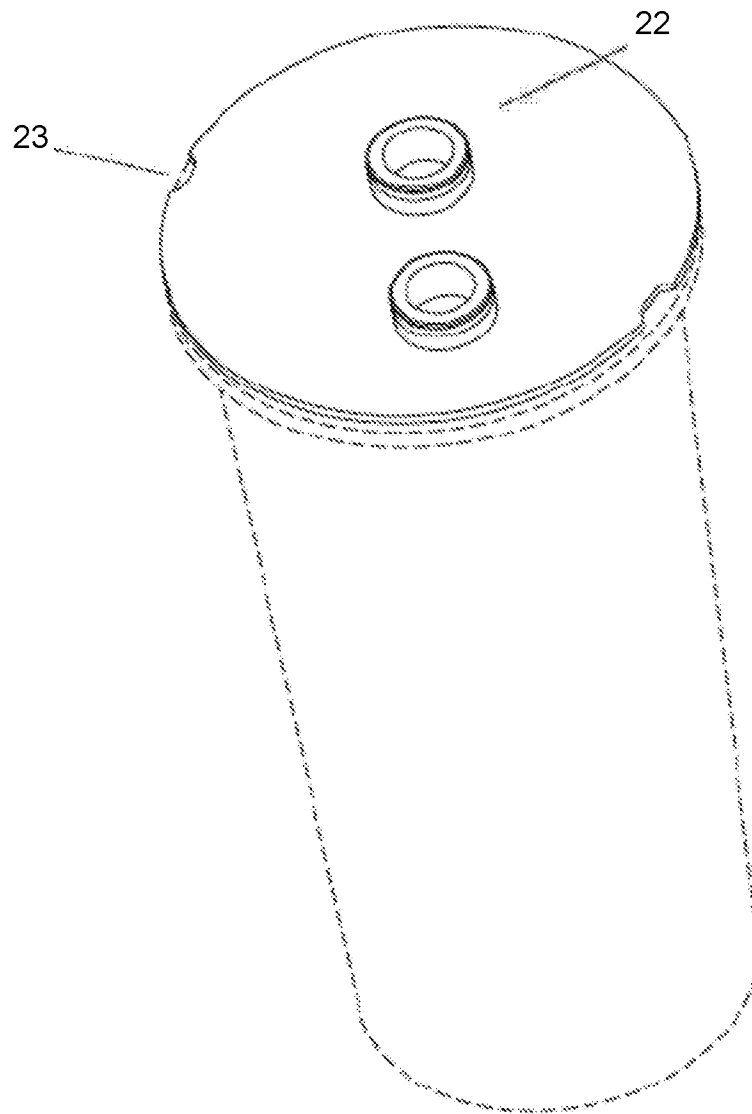


FIGURE 6A

REPLACEMENT SHEET

8/26

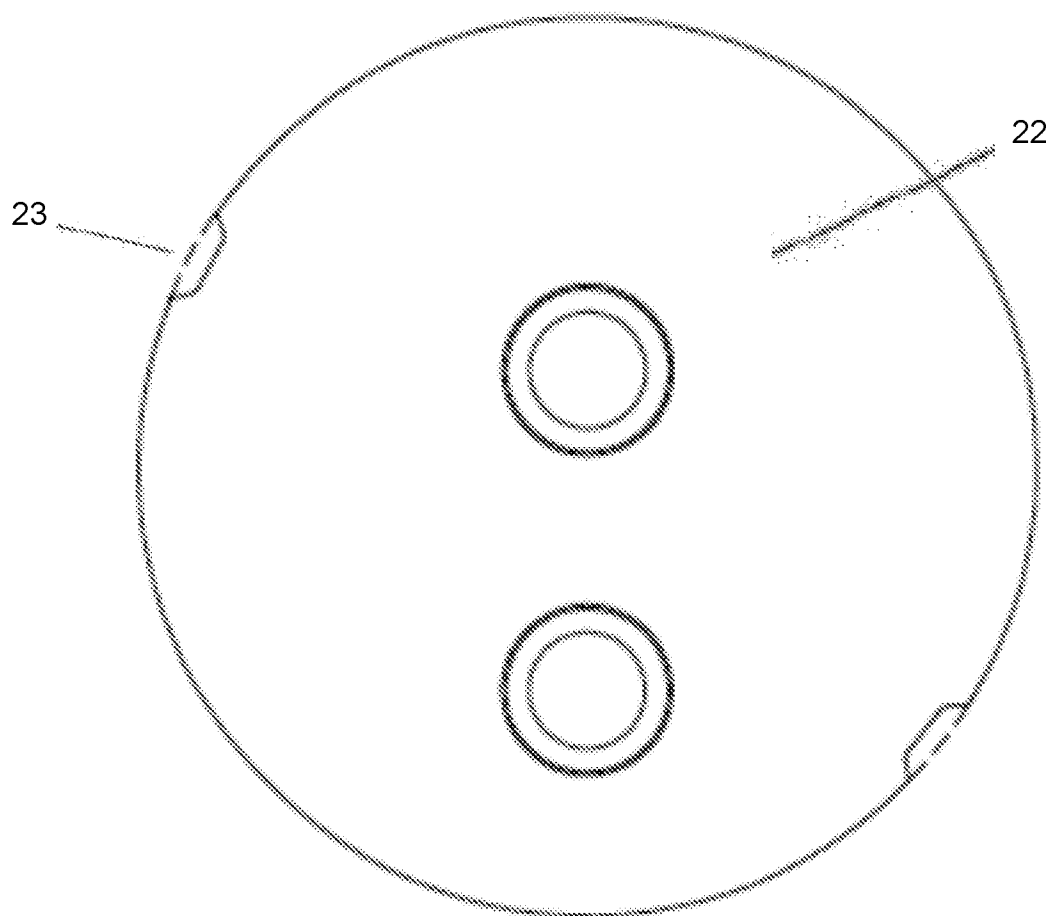


FIGURE 6B

REPLACEMENT SHEET

9/26

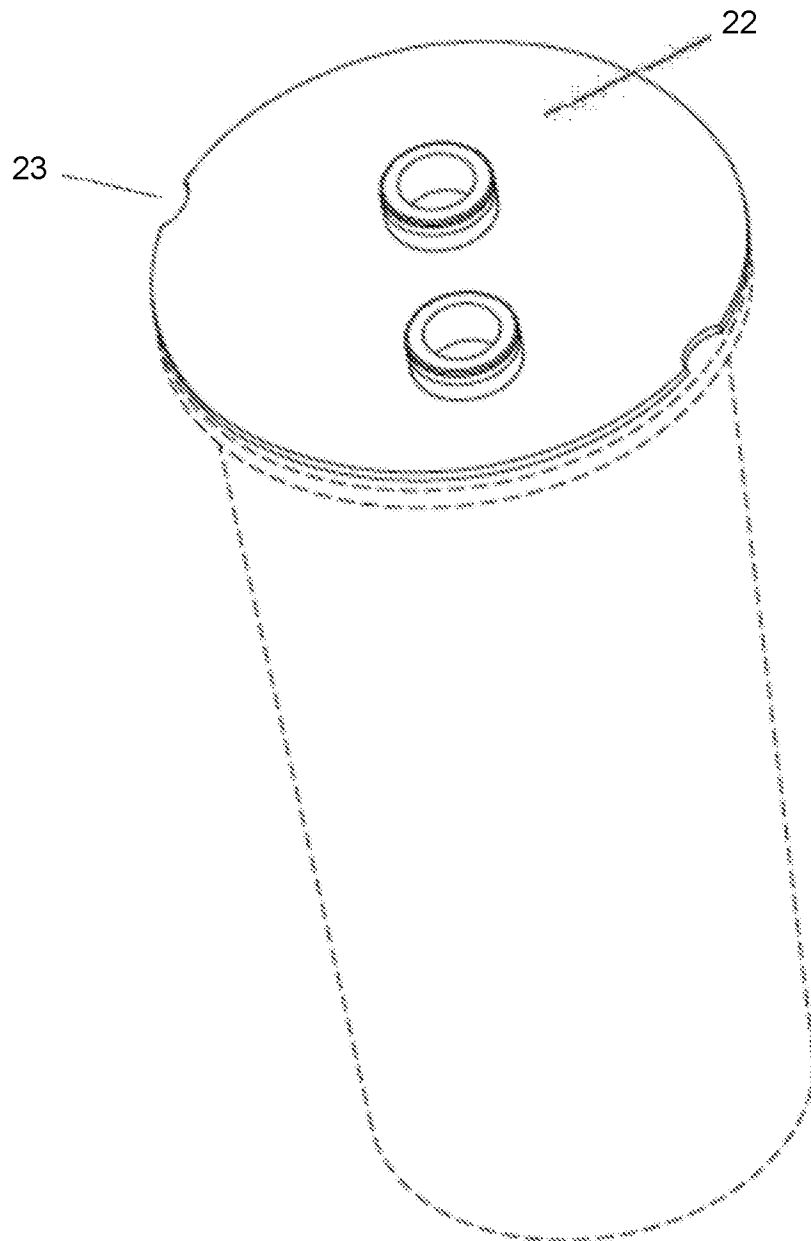


FIGURE 7A

REPLACEMENT SHEET

10/26

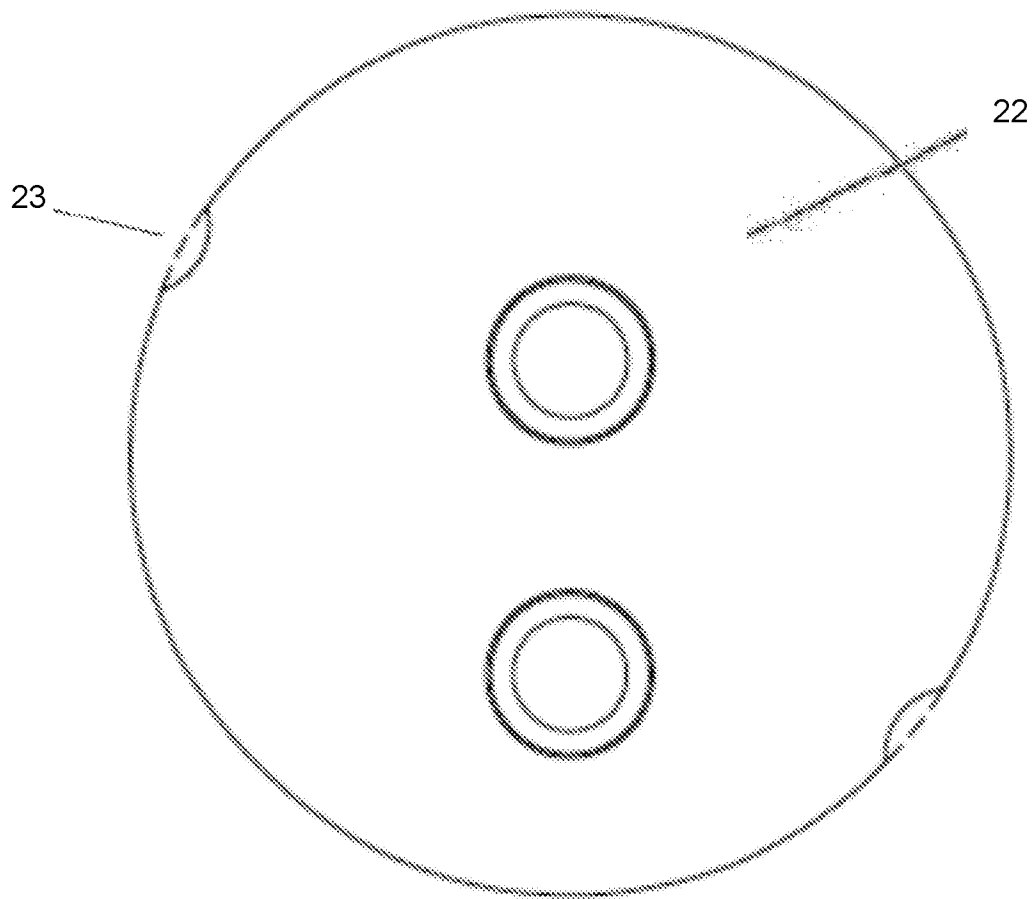


FIGURE 7B

REPLACEMENT SHEET

11/26

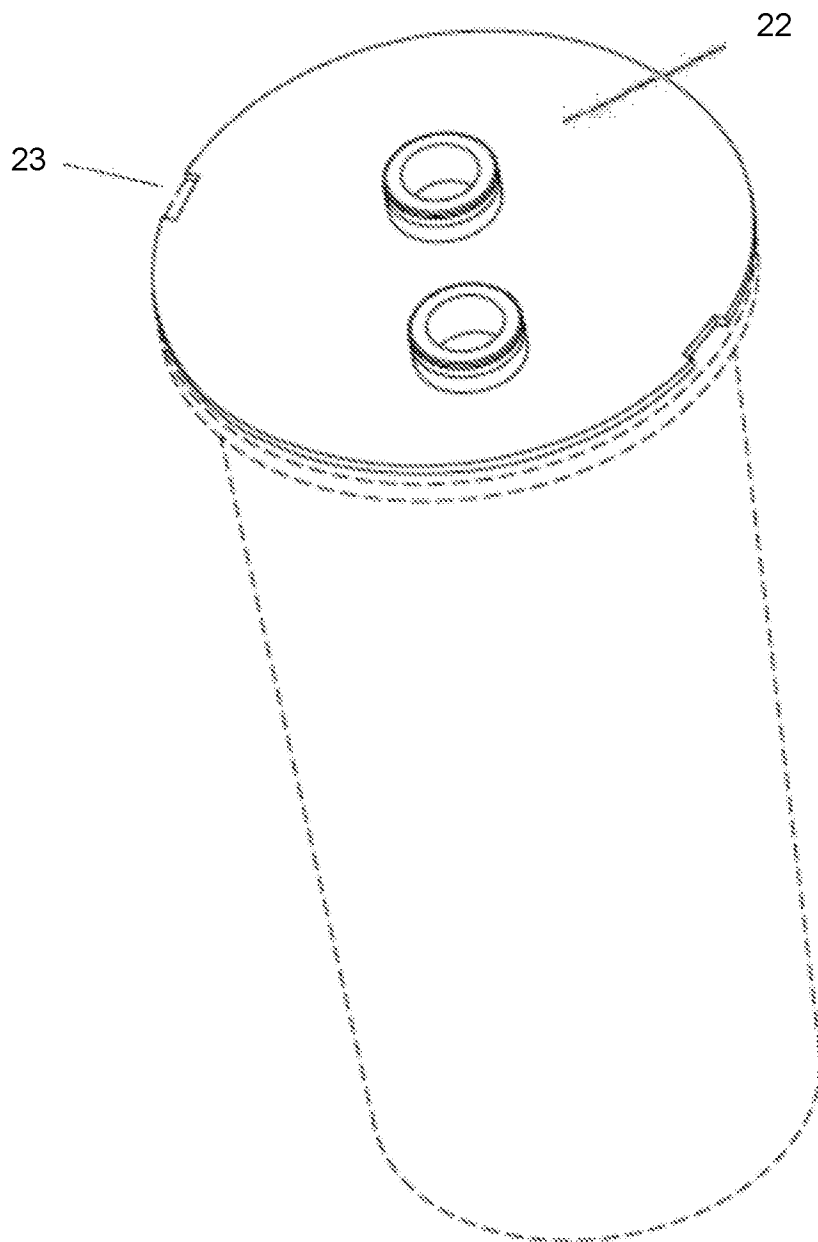


FIGURE 8A

REPLACEMENT SHEET

12/26

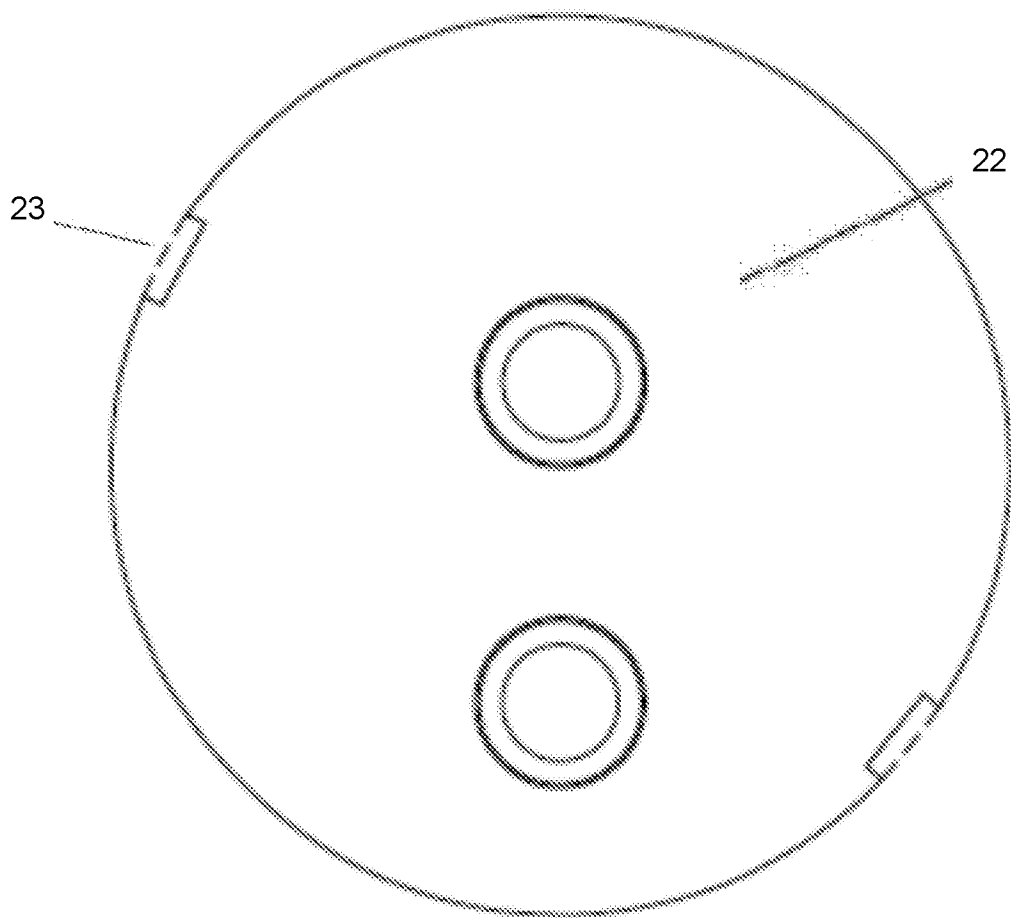


FIGURE 8B

REPLACEMENT SHEET

13/26

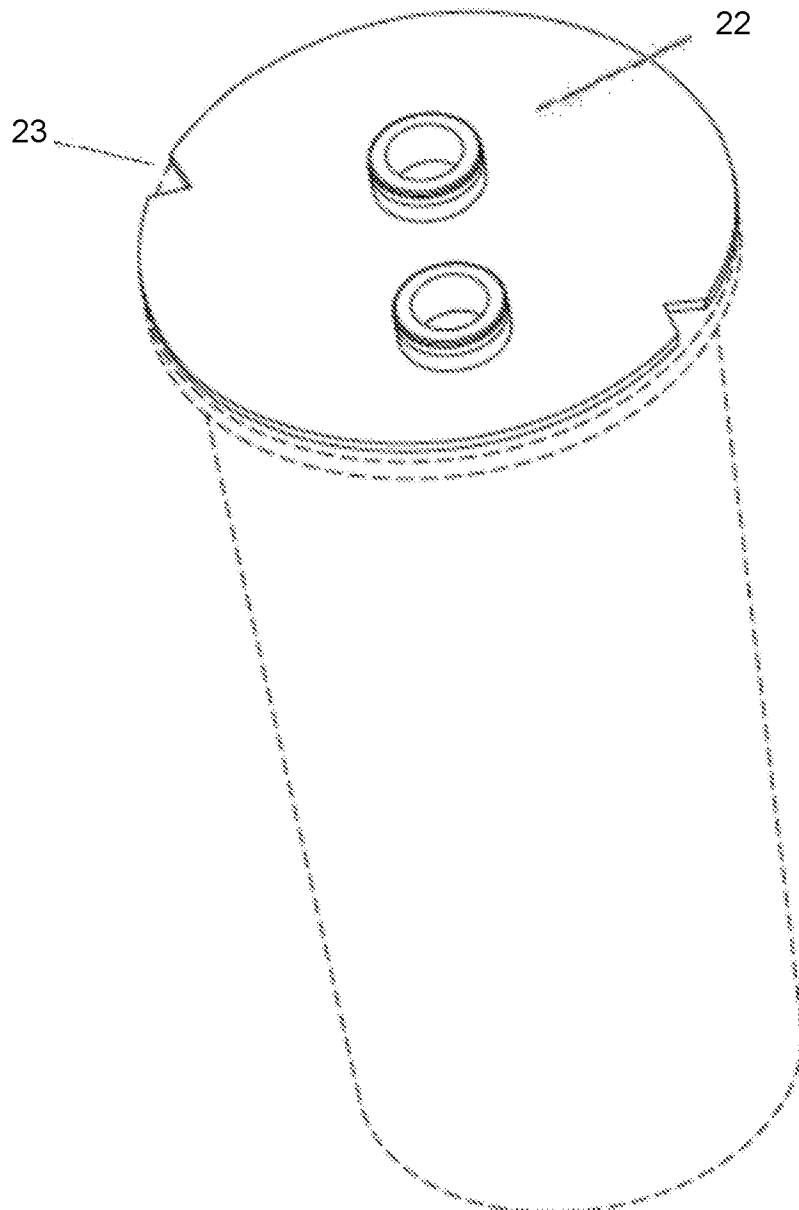


FIGURE 9A

REPLACEMENT SHEET

14/26

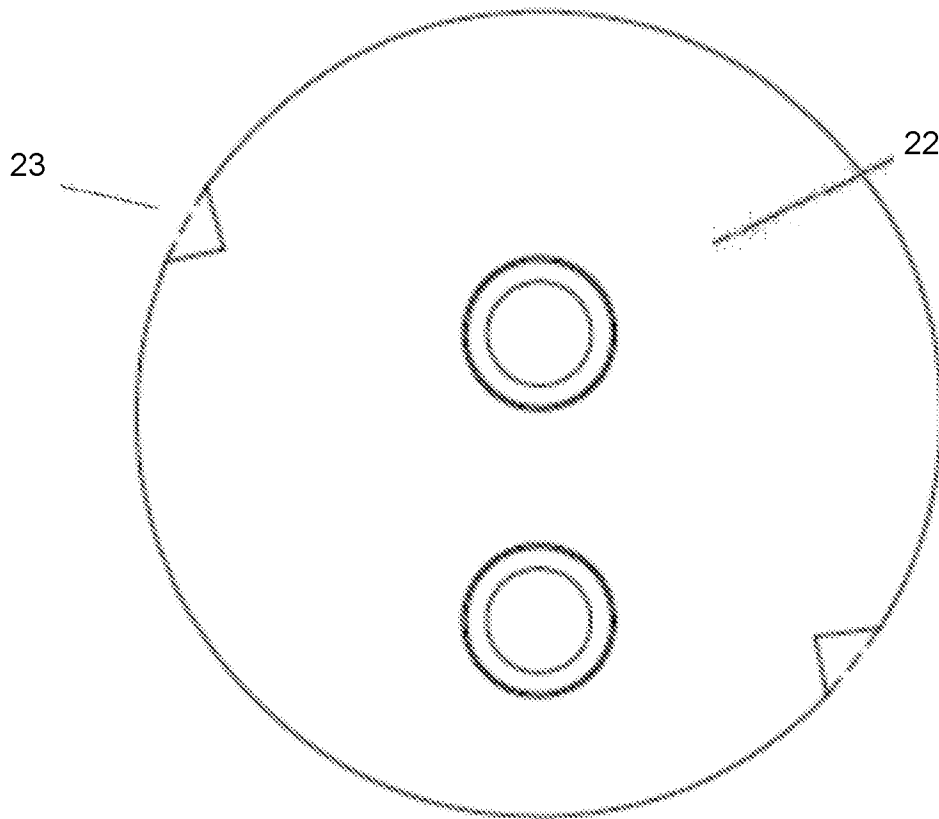


FIGURE 9B

REPLACEMENT SHEET

15/26

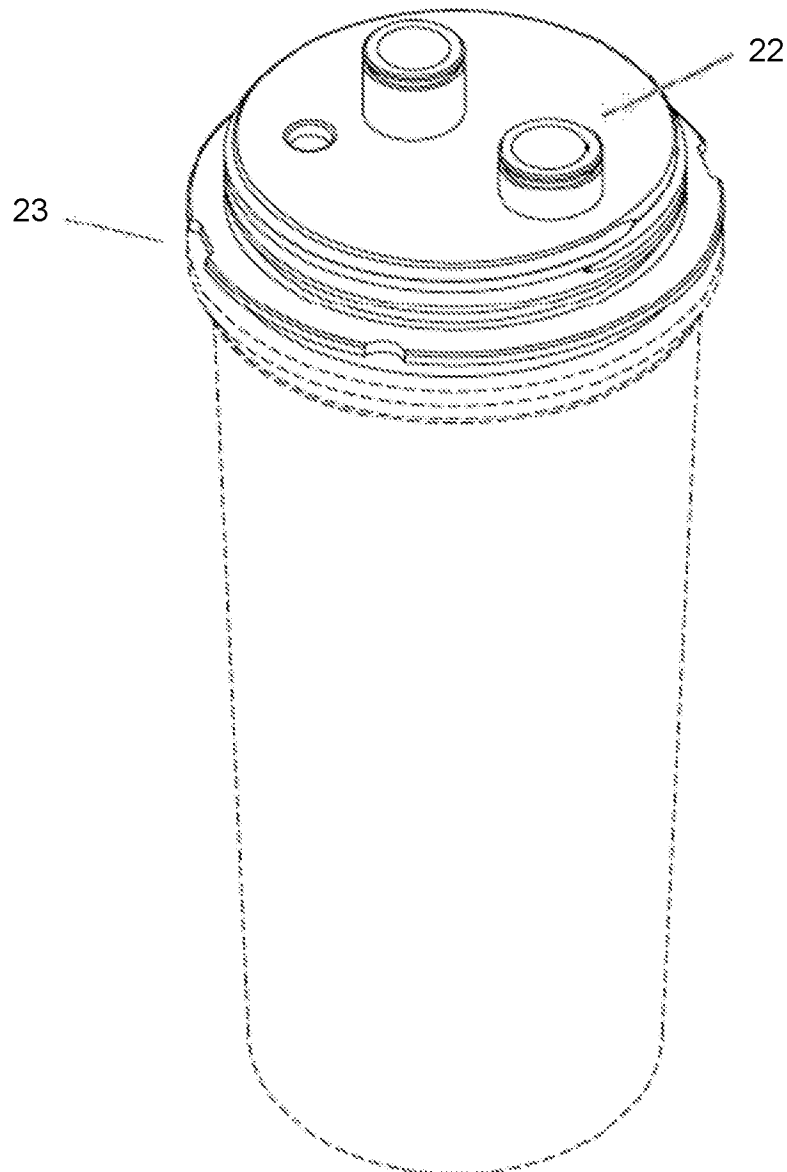


FIGURE 10A

REPLACEMENT SHEET

16/26

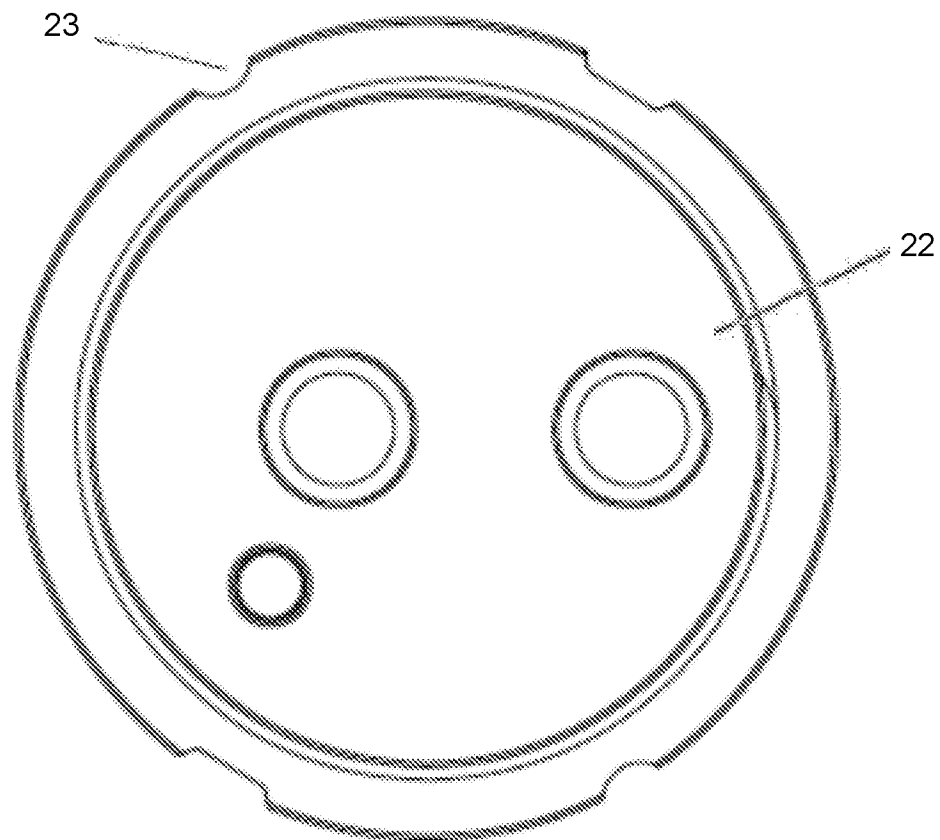


FIGURE 10B

REPLACEMENT SHEET

17/26

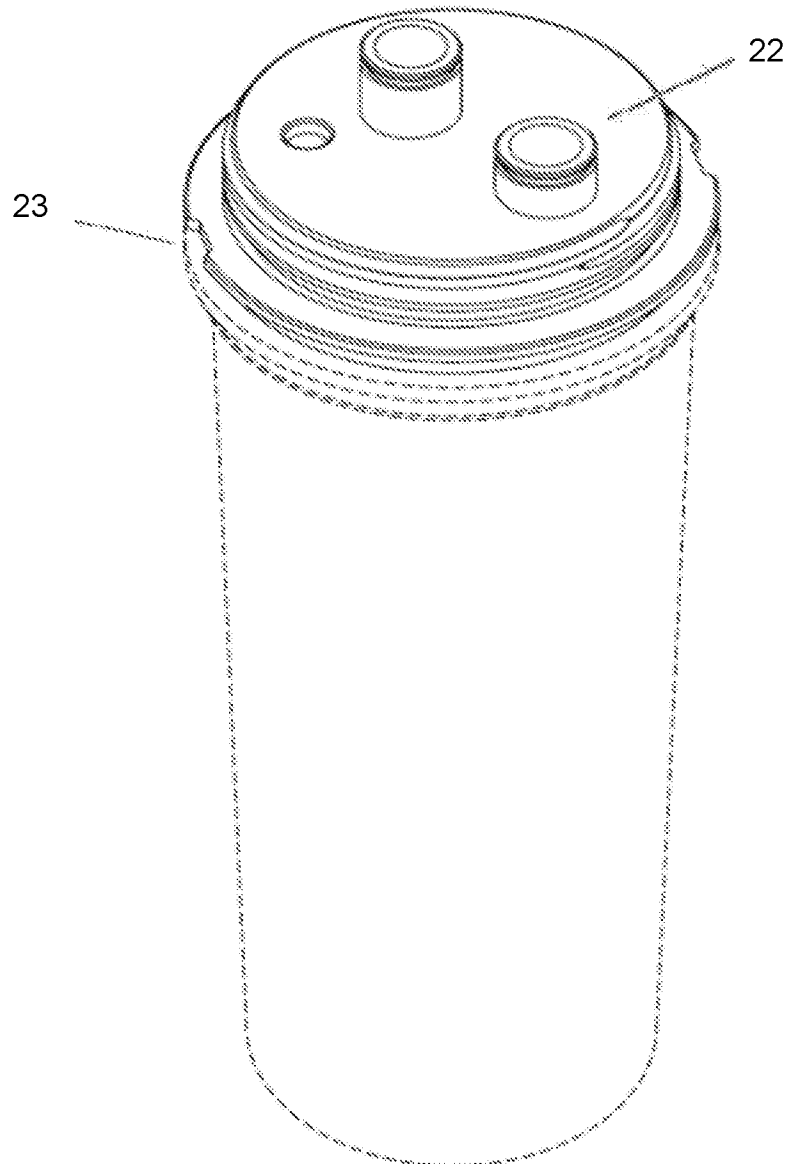


FIGURE 11A

REPLACEMENT SHEET

18/26

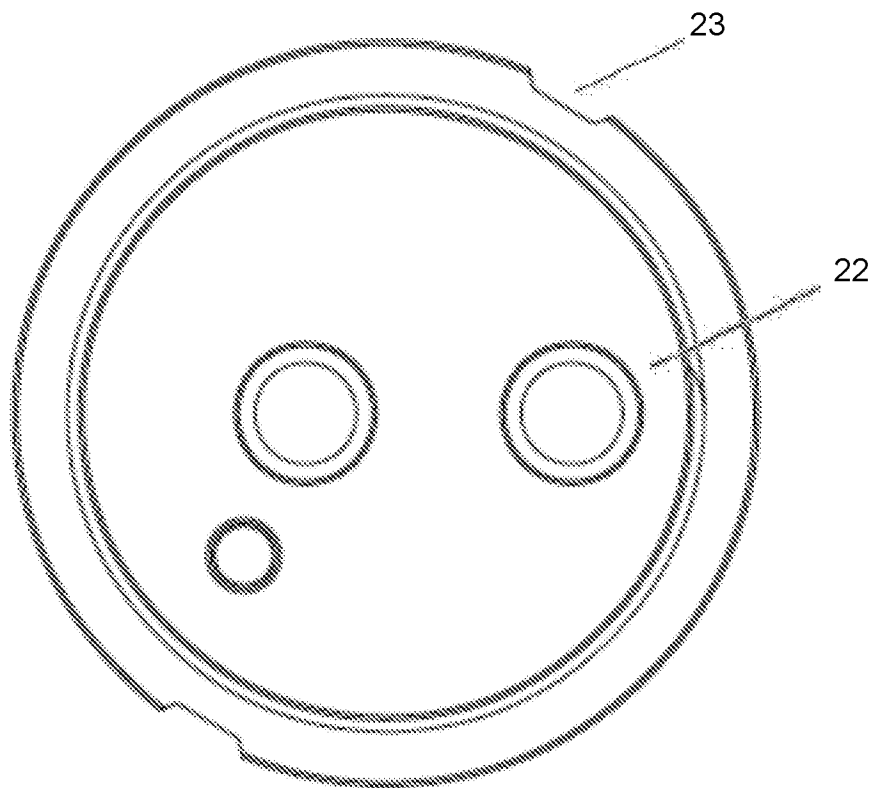


FIGURE 11B

REPLACEMENT SHEET

19/26

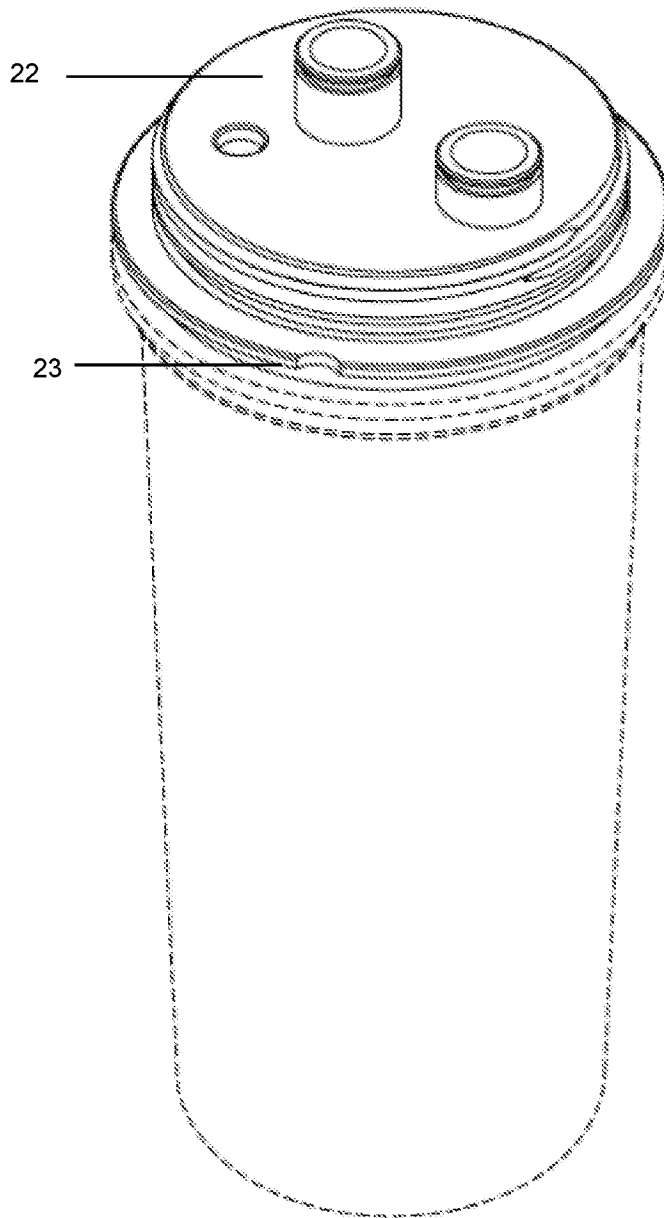


FIGURE 12A

REPLACEMENT SHEET

20/26

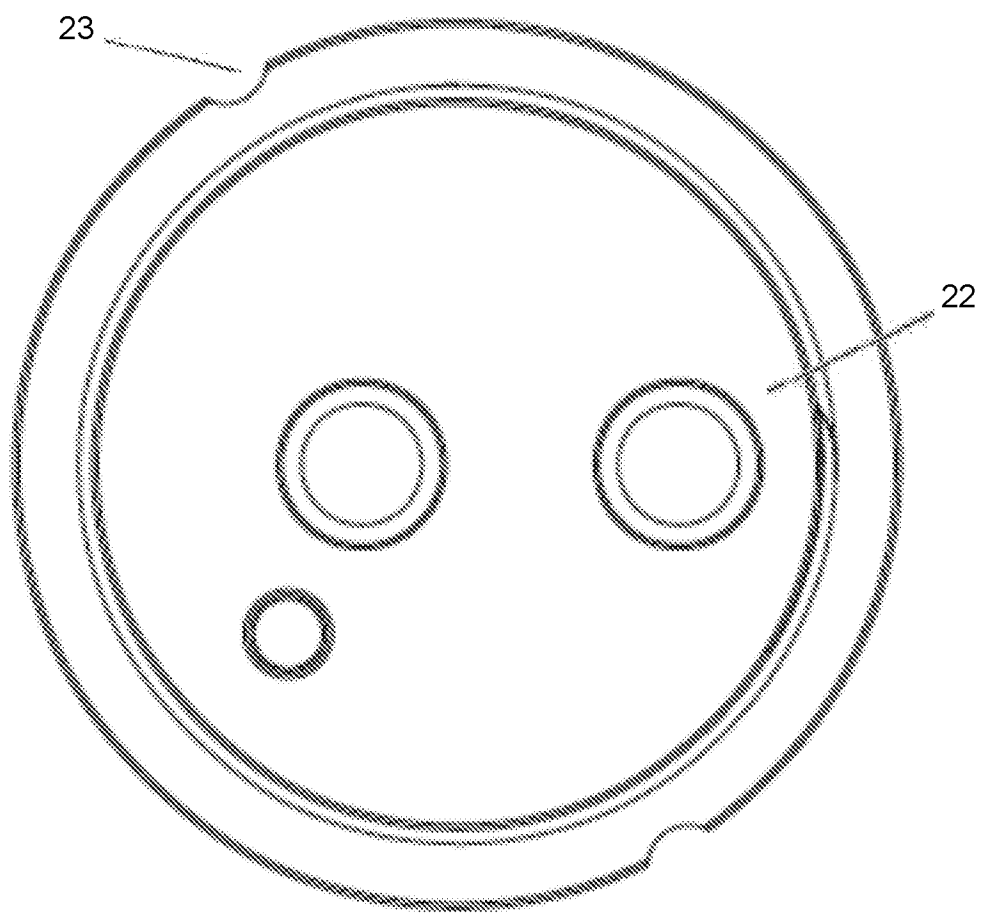


FIGURE 12B

REPLACEMENT SHEET

21/26

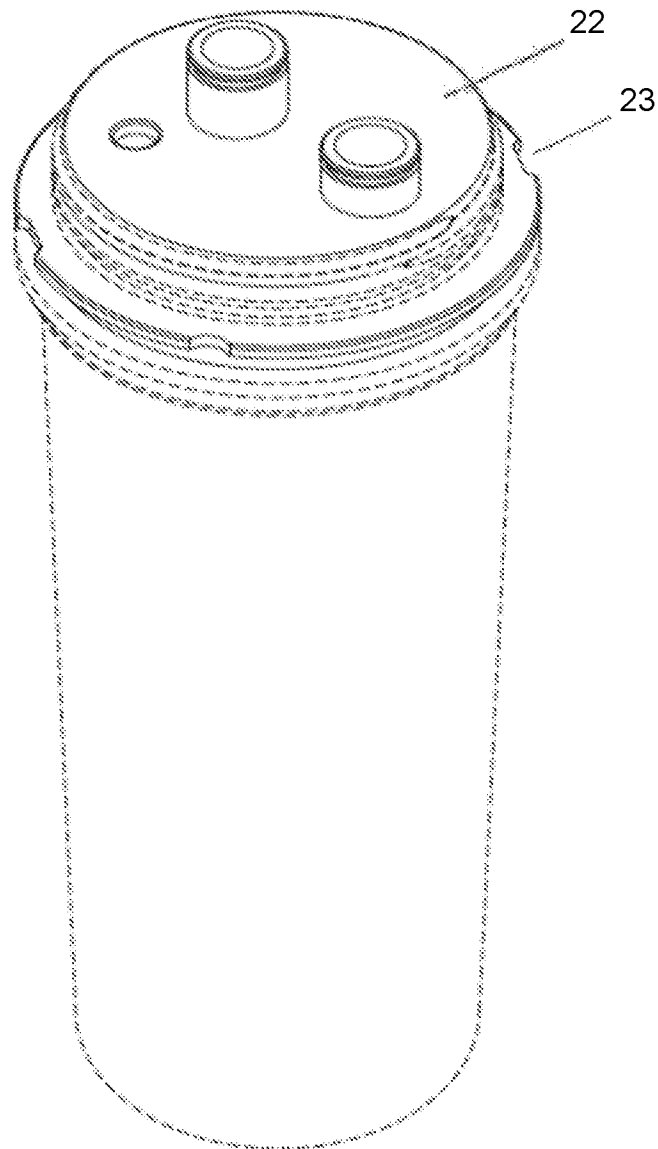


FIGURE 13A

REPLACEMENT SHEET

22/26

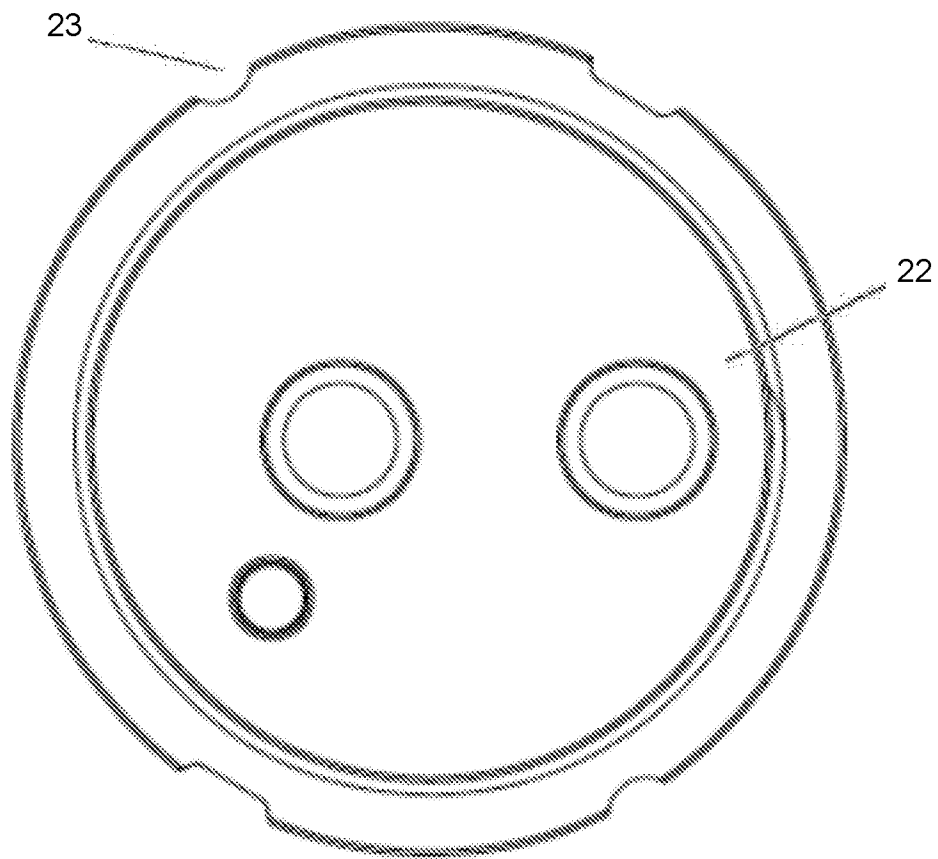


FIGURE 13B

REPLACEMENT SHEET
23/26

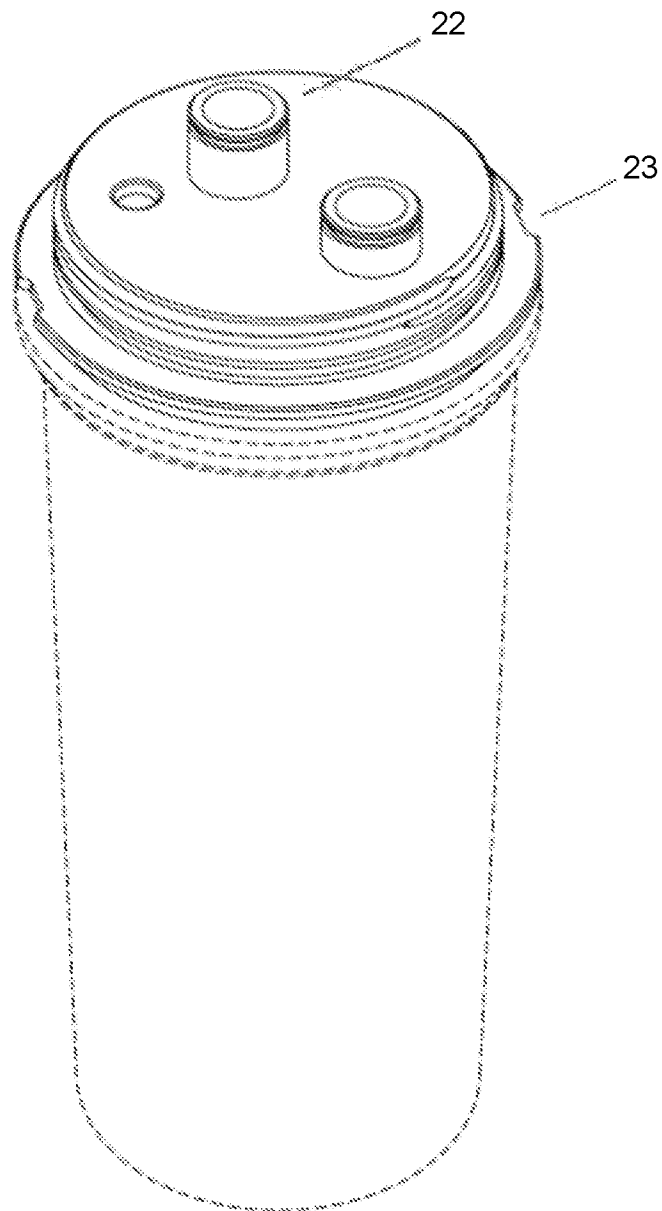


FIGURE 14A

REPLACEMENT SHEET

24/26

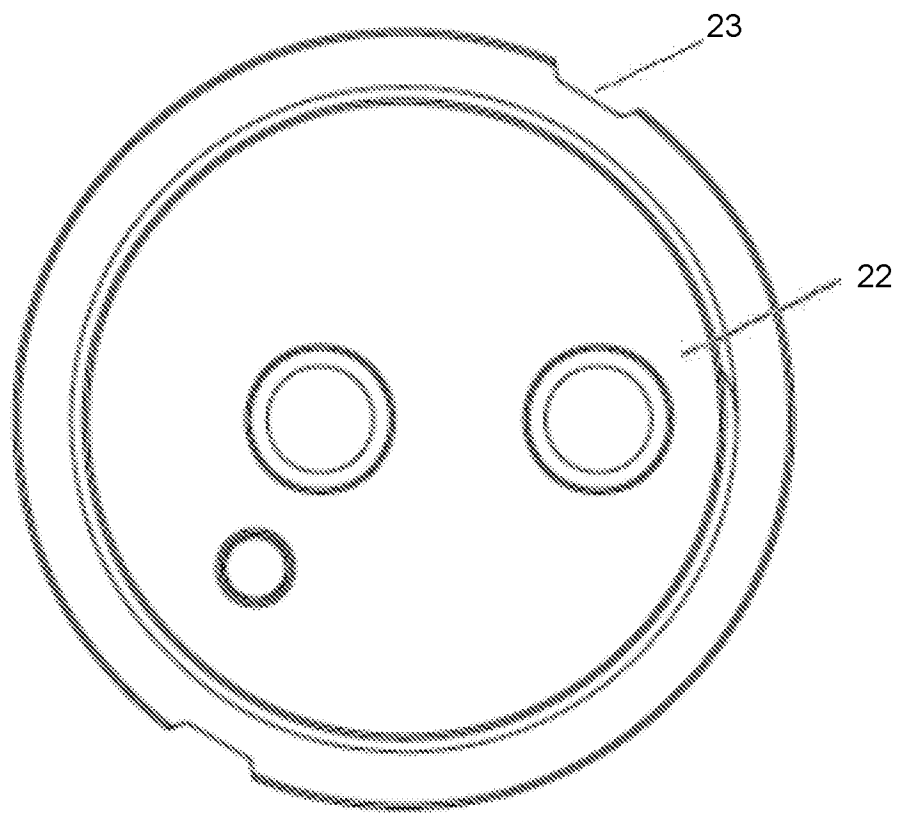


FIGURE 14B

REPLACEMENT SHEET

25/26

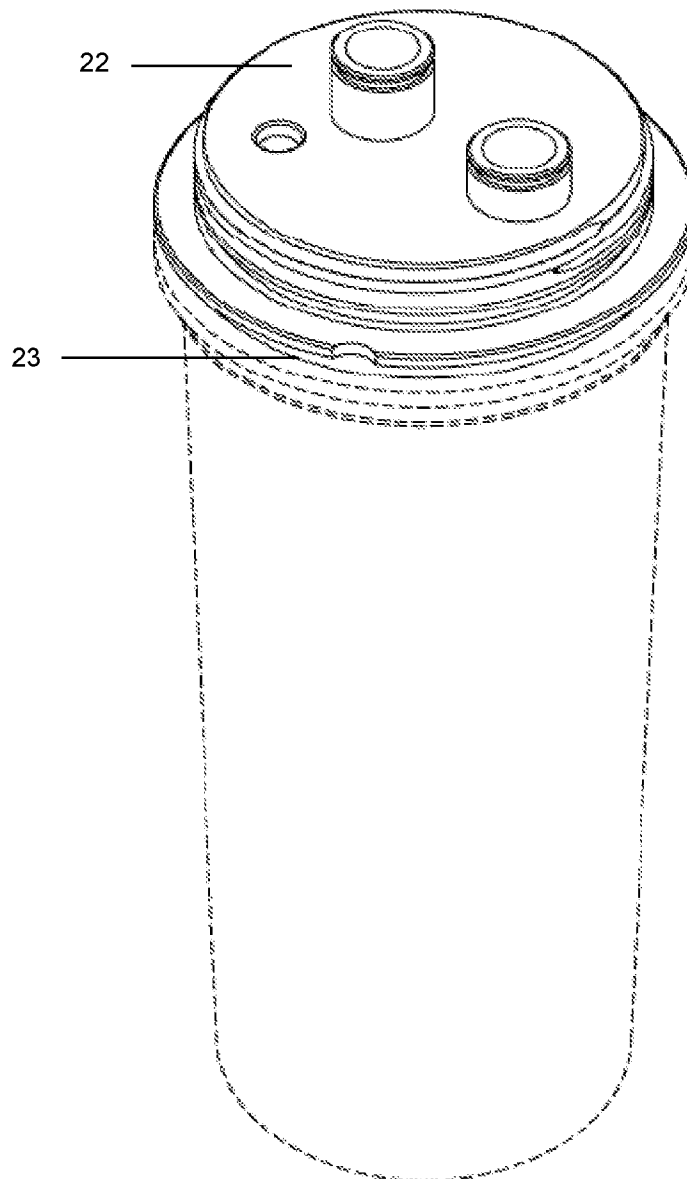


FIGURE 15A

REPLACEMENT SHEET

26/26

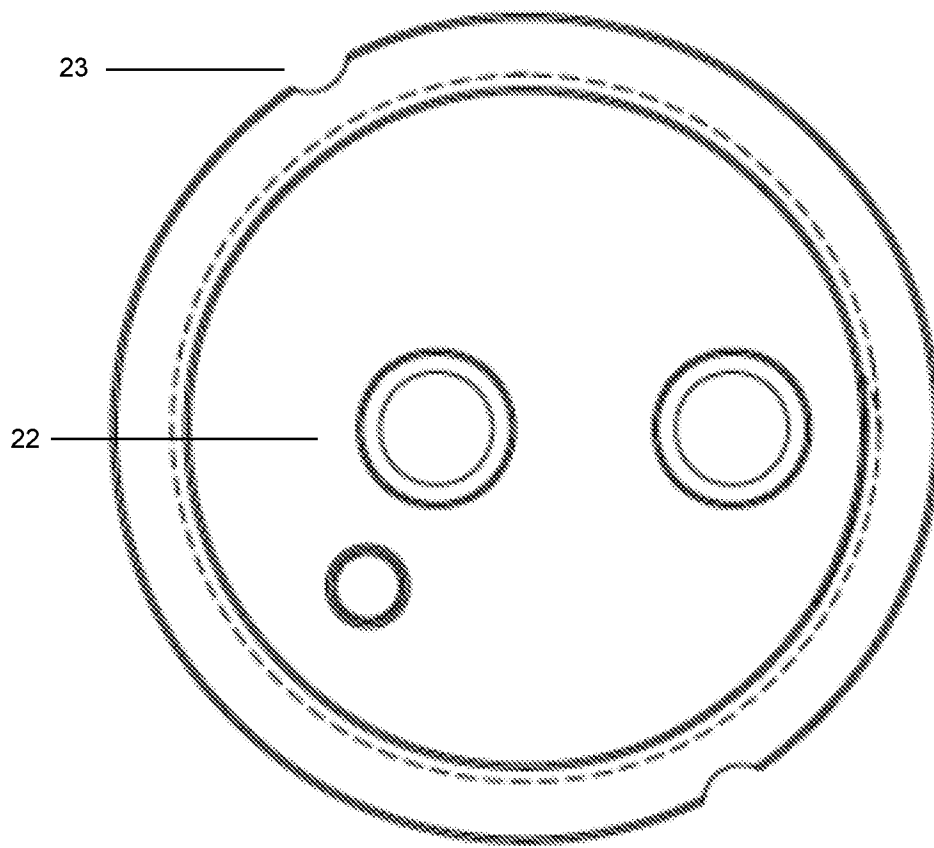


FIGURE 15B

AMENDMENTS TO THE SPECIFICATION:

Please replace paragraph 101 with the following paragraph:

- - **[101] Figures 6 through Figure 15** illustrate several representative embodiments of the present invention, and indicate the inlet and outlet ports (22) on the top mating surface, and irregular keyways (23) cast into the outer top mating surface. - -

AMENDMENTS TO THE DRAWINGS:

Please replace the prior set of Figures 1 through 15 with the set of replacement drawings, submitted herewith, and designated as “REPLACEMENT SHEETS.”

REMARKS

In order to maintain pendency, because the six-month deadline for response to the final rejection is set to expire on April 2, 2020, Applicant is filing this Request for Continuing Examination.

The claims are 13 through 19. Claims 1 to 12 have been canceled. New claims 13 through 19 find support in the original claims, and throughout the specification. For example, new claim 13 finds particular support in paragraph [0030] of the original specification; new claim 14 finds support in paragraph [0031] of the original specification; new claim 15 finds support in paragraph [0032] of the original specification; new claim 16 finds support in paragraph [0033] of the original specification; and new claim 17 finds support in paragraphs [0021-24, and 0068-0069] of the original specification; new claim 18 finds support in paragraph [0027] of the original specification; and new claim 19 finds support in paragraphs [0030] and [0035] of the original specification. No new matter has been introduced.

The claims recite a detachable container, suitable for attachment with a dental amalgam separator comprising one or more corresponding keys. The detachable container includes a novel combination of features: (1) an effluent inlet port and an effluent outlet port of two different heights; and (2) one or more keyways cast into said outside top mating surface. The effluent inlet port, effluent outlet port and keyways are designed so that, upon alignment of the one or more keyways on the top mating surface of the collection container with the one or more corresponding keys present on a dental amalgam separation system, the detachable container will detachably engage with the dental amalgam separator, allowing for a leak-proof, detachable connection.

This combination of features provides for the secure engagement of the detachable container to a corresponding dental amalgam separation system in a unique orientation, such that the effluent outlet port of the dental amalgam separation system will securely engage with the effluent inlet port of detachable container and allow the passage of effluent into the detachable container for collection. As described in the specification, the combination of the ports and keyways assists the user in aligning and attaching the container to the corresponding dental amalgam separation system, so that the detachable container can be securely engaged, even if the system is located in an inconvenient

location, where it may be difficult to reach, or out of sight line, so that it is difficult to align the container visually.

While the detachable container of the invention is designed for use with a corresponding dental amalgam separation system, the detachable container is an independent apparatus, capable of being used independently. For example, after the detachable container is used for collection of amalgam, the container can be detached and the inlet and outlet ports sealed, for example, with first and second plugs and/or a shipping cap. The sealed container, now filled with effluent, can be appropriately handled --- for example, stored or shipped for recycling or disposal. The original detachable container can be replaced with a second detachable container, which may be a new and previously unused container, or a previously used and recycled container, and the replacement container can be attached to the dental amalgam system for further collection. In this manner, the detachable container of the invention provides dental offices with a much needed means for efficiently collecting and appropriately disposing of dental amalgam.

Applicant is presently marketing the detachable container of the invention in connection with its “NXT” generation of dental amalgam separators. The detachable container is sold as a stand-alone product, as “**NXT Hg5 Collection Container with Recycle Kit** - compatible with the NXT Hg5 Amalgam Separators (standard, mini and high volume). This is shown at page 4 of the accompanying brochure, which has been downloaded from the Solmetex.com website.

The Office Action Rejection:

In the Final Office Action mailed on October 2, 2019, it was asserted that the term “irregular keyways” was not adequately described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention, and more specifically, that the irregular keyways are not sufficiently described in the specification with regard to the drawings. The specification/drawings fails to identify the keyways with reference numerals that correspond to that particular feature in the drawings.”

This ground of rejection is traversed, and it is submitted that the final rejection should be withdrawn, for the following reasons.

In the presently submitted claims, the term “keyways” is used with reference to its function of allowing the detachable container to mate securely and detachably engage with a compatible dental amalgam separation system. Thus, newly submitted claim 13 recites: a detachable container comprising one or more keyways suitable for attachment with a dental amalgam separation system comprising one or more corresponding keys:

A detachable container comprising one or more container keyways suitable for attachment with a dental amalgam separation system comprising one or more corresponding keys ... wherein, upon alignment of the one or more container keyways with the one or more corresponding keys present on the dental amalgam separation system, the detachable container will detachably engage with the dental amalgam separator, allowing for a leak-proof detachable connection.

Similarly, newly submitted claim 19 recites a detachable container comprising one or more container keyways suitable for attachment with a dental amalgam separation system comprises an air-water separator tank:

... wherein said air-water separator tank comprises one or more corresponding keys, such that, upon engagement of the detachable container to the corresponding dental amalgam separation system, the keyways cast into the outside top mating surface of the detachable container are aligned with the corresponding keys of the air-water separator tank.

Applicant submits that the term “keyways” is sufficiently disclosed in the specification to meet the standards of 35 U.S.C. §112. As demonstrated in Applicant’s submission mailed on July 3, 2019, and as herein argued and submitted, the term “keyway” is well understood by those skilled in the art, similar to the term “keyseat,” to indicate an axially located groove in a shaft or hub. Further, the term ‘keyway’ is well understood to refer to a groove that is shaped so that it is capable of engaging with a reciprocal key. As evidenced by the declaration of one of the co-inventors, Robin Schofield, filed on January 4, 2019 [the “Schofield Declaration”] the term “keyways” is regularly used in mechanical engineering, and is readily understood by one skilled in the art [Schofield Declaration at Paragraph 6].

The Schofield Declaration further states that the present application uses the term “keyway” in its usual meaning in the field of mechanical engineering, and that the term is sufficiently described at paragraph [0030] of the specification to allow one skilled in the art to understand the meaning of the term [Schofield Declaration at Paragraphs 8 and 9].

Paragraph 9 sets forth the relevant description:

... said detachable container further comprises one or more irregular keyways cast into said outside top mating surface; said air-water separation tank comprising one or more corresponding irregular keys, such that when the irregular keyways of the detachable container are aligned with the corresponding irregular keys of the air-water separation tank, said detachable container is capable of mating securely with said air-water separation tank.

See Paragraph 9 of the Schofield Declaration.

Thus, the skilled artisan would have a well-founded understanding of the meaning of the term “keyways” as used in the claims. In light of the common usage of the terms “keys” and “keyways” in the field, the skilled artisan would understand the nature of the keyways present on the detachable container without the need to refer to drawings, and such drawings are not reasonably necessary for the understanding of the invention. Without acquiescing to the rejection, and solely in the interest of expediting prosecution, the Applicant submits herewith replacement drawings, including clearer versions of Figures 1 and 2, the originals of which were blurry, and identification of the container effluent inlet and outlet ports as feature [22], and identification of the keyway as feature [23] in Figures 6 through 15. In light of their well-understood meaning in the art, the inlet and outlet “ports” and “keyways” would have been readily identifiable in the Figures by one skilled in the art, and no new matter has been introduced thereby.

Applicant notes that the Examiner has not maintained the rejection of original claims 1 and 4 under 35 U.S.C. §102. Accordingly, the claims are deemed free of the cited prior art. Applicant submits that the present claims are distinguished by the recited combination of inlet and outlet ports of differing heights, and keyways cast into said outside top mating surface, and therefore should be deemed free of the prior art.

CONCLUSION

In light of the above comments and amendments, and the evidence introduced into the record with this submission and the declaration of the co-inventor, Robin Schofield, it is submitted that all of the stated grounds of objection to the application and rejection of the claims have been overcome, and the new claims should be found allowable.

Applicant hereby claims small entity status under 37 CFR §1.27. If any fees are due, the Examiner is requested to contact Applicant's undersigned representative. Applicant's undersigned representative may be reached by telephone at 617-966-2374. All correspondence should continue to be directed to the listed address.

Respectfully submitted,

/Steven R. Lazar/

Steven R. Lazar
Attorney for Applicant
Registration No. 32,618

SRL Patents
234 Broadway
Arlington, MA 02474
April 2, 2020

SCORE Placeholder Sheet for IFW Content

Application Number: 16033823

Document Date: 04/02/2020

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/033,823	07/12/2018	Nicholas Mozzicato	SMTX-001-T1	9793
80709	7590	10/02/2019	EXAMINER	
Steven R. Lazar			LUCCHESI, NICHOLAS D	
SRL Patents			ART UNIT	PAPER NUMBER
234 Broadway			3772	
Arlington, MA 02474			NOTIFICATION DATE	DELIVERY MODE
			10/02/2019	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

srlpatents@aol.com

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Specification

The disclosure is objected to because of the following informalities:

The specification lacks reference numerals, including ones that correspond to the keyways, in newly presented drawing figures 6A-15B. Both the specification and drawings must be amended to include such reference numerals.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112(a):

(a) **IN GENERAL.**—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 6-12 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not

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described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Specifically, the irregular keyways recited in the claims are not sufficiently described in the specification with regard to the drawings. The specification/drawings fails to identify the keyways with reference numerals that correspond to that particular feature in the drawings.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICHOLAS D LUCCHESI whose telephone number is (571)272-4977. The examiner can normally be reached on M-F 800-430.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cris Rodriguez can be reached on 571-272-4964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NICHOLAS D LUCCHESI/
Primary Examiner, Art Unit 3772

<i>Search Notes</i> 	Application/Control No. 16/033,823	Applicant(s)/Patent Under Reexamination Mozzicato et al.
	Examiner NICHOLAS D LUCCHESI	Art Unit 3772

CPC - Searched*		
Symbol	Date	Examiner
A61C 17/046, 17/14, 5/66, 2202/00: B01D 17/00, 21/0012, 21/0018	9/30/2018	NL
Search updated	09/26/2019	NL

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Search updated	9/30/2018	NL
Inventor Search; search updated	09/26/2019	NL

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/NICHOLAS D LUCCHESI/ Primary Examiner, Art Unit 3772	
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EAST Search History

EAST Search History (Prior Art)

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EAST Search History (I nterference)

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 16/033,823		Filing Date 07/12/2018		☐ To be Mailed		
ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO										
APPLICATION AS FILED - PART I										
		(Column 1)	(Column 2)							
FOR		NUMBER FILED	NUMBER EXTRA	RATE (\$)		FEE (\$)				
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A	N/A	N/A						
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))		N/A	N/A	N/A						
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A	N/A	N/A						
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =	*	x \$50 =						
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =	*	x \$230 =						
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).								
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))										
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL						
APPLICATION AS AMENDED - PART II										
		(Column 1)	(Column 2)	(Column 3)						
AMENDMENT	07/03/2019	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))	* 7	Minus	** 20	= 0	x \$50 =		0		
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 3	= 0	x \$230 =		0		
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE		0		
		(Column 1)	(Column 2)	(Column 3)						
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)		
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						TOTAL ADD'L FEE				
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.						LIE				
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".						/TERRY BRYANT/				
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".										
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	:	Examiner: LUCCHESI, Nicholas
MOZZICATTO	)	
	:	Group Art Unit: 3772
Application No.: 16/033,823	)	
	:	Confirmation No.: 9793
Filed: July 12, 2018	)	
	:	
For: DENTAL AMALGAM SEPARATION AND	)	
RECYCLING SYSTEM	:	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO COMMUNICATION OF MAY 3, 2019

Sir:

In response to the Communication, mailed on May 3, 2019, Applicant responds as follows:

1. Applicant submits the following
2. Claim Amendments begin on page 2.
3. Remarks begin on page 4.

AMENDMENTS TO THE CLAIMS:

Claims 1 to 5: CANCELED

Add NEW claims 6 to 12:

6 (NEW). A detachable container suitable for attachment with a corresponding dental amalgam separation system, said detachable container having an outside top mating surface comprising a detachable container effluent inlet port of a first height and a detachable container effluent outlet port of a second height, wherein the first height is different from the second height; and wherein said detachable container further comprises one or more irregular keyways cast into said outside top mating surface.

7 (NEW). The detachable container of claim 6, further comprising:

a cap for covering the outside top mating surface and having an inside surface with a first circular wall and a second circular wall, the first circular wall having a height selected to engage an upper surface of one of the detachable container effluent inlet port or the detachable container effluent outlet port, and the second circular wall having a height selected to engage an upper surface of the other of the detachable container effluent inlet port or the detachable container effluent outlet port.

8 (NEW). The detachable container of claim 7, wherein

the detachable container further comprises a threaded exterior peripheral edge, and the cap further comprises a threaded interior peripheral edge suitable for engaging with the threaded external peripheral edge on the detachable container, wherein engagement of the threaded interior peripheral edge of the cap to the threaded exterior edge of the detachable container forms a secure seal of the cap and the container.

9 (NEW). The detachable container of claim 6, further comprising

a circular sidewall extending from the outside top mating surface and defining an interior chamber for the detachable container, the interior chamber being capable of supporting a partial vacuum when the detachable container effluent inlet port and detachable container effluent outlet port are sealed.

10 (NEW). The detachable container of claim 6, wherein, upon attachment to a corresponding dental amalgam separation system comprising an air-water separator tank, said air-water separator tank comprising an air-water separator effluent outlet port, the air-water separator effluent port connects with the detachable container effluent inlet port, allowing effluent to pass from the air-water separator tank into the detachable container.

11 (NEW). The detachable container of claim 8, further comprising a first plug for said detachable container effluent inlet port; and a second plug for said detachable container effluent outlet port.

12 (NEW). The detachable container of claim 10, wherein, upon attachment to a corresponding dental amalgam separation system comprising an air-water separator tank, said air-water separator tank comprising one or more irregular keys, the irregular keyways cast into the outside top mating surface of the detachable container are aligned with the irregular keys of the air-water separator tank.

REMARKS

The claims are 6 through 12. Claims 1 to 5 have been canceled. New claims 6 through 12 find support in the original claims. Additionally, new claim 6 finds support in paragraph [0030] of the original specification; new claim 7 finds support in paragraph [0031] of the original specification; new claim 8 finds support in paragraph [0032] of the original specification; new claim 9 finds support in paragraph [0033] of the original specification; and new claim 10 finds support in paragraphs [0021-24] of the original specification; new claim 11 finds support in paragraph [0027] of the original specification; and new claim 12 finds support in paragraphs [0030] and [0035] of the original specification. No new matter has been introduced.

The new claims recite a detachable container, suitable for attachment with a corresponding dental amalgam separation system. The detachable container includes a novel combination of features:

- (1) an effluent inlet port and an effluent outlet port of two different heights; and
- (2) one or more irregular keyways cast into said outside top mating surface.

This combination of features provides for the secure attachment of the detachable container to a corresponding dental amalgam separation system in a unique orientation, such that the effluent outlet port of the dental amalgam separation system will securely connect with the effluent inlet port of detachable container and allow the passage of effluent into the detachable container for collection. The combination of the ports and keyways assists the user in correctly aligning and attaching the container to the corresponding dental amalgam separation system, even if the system is located in an inconvenient location, where it may be difficult to reach or out of sight so that it is difficult to align the container visually.

While the detachable container of the invention is designed for use with a corresponding dental amalgam separation system, the detachable container is an independent apparatus that is capable of being used independently. For example, after the detachable container is used for the collection of effluent, the container can be detached and the inlet and outlet ports sealed, for example with a plug and/or a shipping cap. The sealed container, now filled with effluent, can be appropriately handled --- for example, stored or shipped for recycling or disposal. The original detachable container can now be replaced with a second detachable container, which may be new and previously unused, or recycled, and can be attached to the dental amalgam system for further collection. In this manner, the detachable container of the invention provides dental offices with a needed means for collecting and appropriately disposing of dental amalgam.

Applicant is presently marketing the detachable container of the invention in connection with its “NXT” generation of dental amalgam separators, as “**NXT Hg5 Collection Container with Recycle Kit - Item #NXT-HG5-002CR**” Compatible with the NXT Hg5 Amalgam Separators (standard, mini and high volume). This is shown in the accompanying brochure, and has been a very successful product.

In the Action mailed on May 3, 2019, it was stated that the term “irregular keyways” was not adequately disclosed. This objection is traversed. As attested to in the declaration of one of the co-inventors, Robin Schofield filed on January 4, 2019 [the “Schofield Declaration”] the term ‘keyways’ is well-known in the art, as demonstrated by the standards published by the American Society of Mechanical Engineers, “ASME B17.1-1967 (R2013) Keys and Keyseats,”¹

2.2. Keyseat - An axially located rectangular groove in a shaft or hub. This may also be written as shaft keyseat or hub keyseat when describing the exact application. *Hub keyseat has been sometimes referred to as a keyway.*

The term “keyway” is further defined in the Collins English Dictionary as follows:

noun (Mechanical engineering: Machinery and components) A **keyway** is a longitudinal slot cut into a component to accept a key that engages with a similar slot on a mating component ...

As further stated at Paragraph 8 of the Schofield Declaration, the term “irregular” used in conjunction with “keyway” would reasonably be understood by one skilled in the art to indicate that the keyway is not predictably located or shaped, *so that one would need to know the shape of the keyway in order to design a component with the reciprocal or corresponding key that would engage with the keyway.* As stated in the application:

... said detachable container further comprises one or more irregular keyways cast into said outside top mating surface; said air-water separation tank comprising one or more corresponding irregular keys, such that when the irregular keyways of the detachable container are aligned with the corresponding irregular keys of the air-water separation tank, said detachable container is capable of mating securely with said air-water separation tank.

Paragraphs 12 to 17 of the Schofield Declaration provide evidence that the Haentjens reference does not anticipate Applicants’ claimed invention, setting forth significant differences between the detachable container of the present invention and the Haentjens reference.

¹ Inadvertently, in the Schofield Declaration and in their response filed on January 4, 2019, Applicants incorrectly identified this document as “ASME B17.1-1967 (R2013) Keys and *Keyways*.” Note that the document was correctly identified in the Information Disclosure Statement filed on January 26, 2019 as “ASME B17.1-1967 (R2013) Keys and *Key Seats*.” Further, the document itself acknowledges on page 1, cited above, that ‘hub keyseat is sometimes referred to as a ‘keyway.’

Accordingly, Haentjens does not anticipate the invention recited in Applicants' claims and the rejection under 35 U.S.C. §102 over Haentjens should be withdrawn.

For the above reasons, Applicant submits that the new claims are fully supported by the original specification and drawings, and are novel and unobvious over the prior art. It is further submitted that the new claims overcome both the rejections under 35 U.S.C. §112(b), and the previous rejection of claims 1 and 4 rejections under 35 U.S.C. §102, for anticipation over Haentjens.

CONCLUSION

In light of the above comments and amendments, and the evidence introduced into the record with the declaration of the co-inventor, Robin Schofield, it is believed that all of the stated grounds of objection to the application and rejection of the claims have been overcome, and the new claims should be found allowable.

The Communication mailed on May 3, 2019, provided an additional 2-month period for reply, and this response is therefore believed to be timely filed, with no fees due in connection with this filing. Applicant hereby claims small entity status under 37 CFR §1.27. If any fees are due, the Examiner is requested to contact Applicants' undersigned representative. Applicant's undersigned representative may be reached by telephone at 617-966-2374. All correspondence should continue to be directed to the listed address.

Respectfully submitted,

/Steven R. Lazar/

Steven R. Lazar
Attorney for Applicants
Registration No. 32,618

SRL Patents
234 Broadway
Arlington, MA 02474
July 3, 2019

Electronic Acknowledgement Receipt

EFS ID:	36488446
Application Number:	16033823
International Application Number:	
Confirmation Number:	9793
Title of Invention:	Detachable Recycling Container
First Named Inventor/Applicant Name:	Nicholas Mozzicato
Customer Number:	80709
Filer:	Steven R. Lazar
Filer Authorized By:	
Attorney Docket Number:	SMTX-001-T1
Receipt Date:	03-JUL-2019
Filing Date:	12-JUL-2018
Time Stamp:	10:18:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Final_SMTX-T1- Response_07-03-2019.pdf	122920	yes	6
			945c441e68de16eec11451dd002ab9f4b70e24ef		

Multipart Description/PDF files in .zip description					
Document Description			Start	End	
Amendment/Req. Reconsideration-After Non-Final Reject			1	1	
Claims			2	3	
Applicant Arguments/Remarks Made in an Amendment			4	6	
Warnings:					
Information:					
2	Non Patent Literature	NXTCCREP_071717_Brochure.pdf	892020	no	8
			1b0fcaed82a27512d22394bb7b9e9cb1ab21233b		
Warnings:					
Information:					
3	Non Patent Literature	Hg5_Brochure.pdf	286608	no	2
			874f873b2fd96c68805ec99036de240608a088c5		
Warnings:					
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Total Files Size (in bytes):			1301548		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/033,823	07/12/2018	Nicholas Mozzicato	SMTX-001-T1	9793
80709	7590	05/03/2019	EXAMINER	
Steven R. Lazar SRL Patents 234 Broadway Arlington, MA 02474			LUCCHESI, NICHOLAS D	
			ART UNIT	PAPER NUMBER
			3772	
			NOTIFICATION DATE	DELIVERY MODE
			05/03/2019	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

srlpatents@aol.com

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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR/ PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
16/033,823	07/12/2018	Mozzicato et al.	SMTX-001-T1

Steven R. Lazar SRL Patents 234 Broadway Arlington, MA 02474		EXAMINER	
		NICHOLAS D LUCCHESI	
		ART UNIT	PAPER
		3772	20190429

DATE MAILED: _____

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner for Patents

See attached communication.

/NICHOLAS D LUCCHESI/
Primary Examiner, Art Unit 3772

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Response to Amendment

The reply filed on 1/4/19 is not fully responsive to the prior Office action because of the following omission(s) or matter(s):

Applicant's response appears to address the issue as to the presence of the claimed "irregular keyways". However, the inclusion of the additional drawings as well as the additional disclosure of the specification is still inadequate in providing a clear understanding of how the "irregular keyways" cooperate with the claimed "irregular keys", as the "irregular keys" are not shown in the drawings, much less are not shown as how they would cooperate with the "irregular keyways" shown in the additional drawings submitted. Furthermore, the declaration and accompanying supporting documents do not adequately address how the keyways shown (as in the amended drawings) can be considered "irregular" in light of applicant's explanation of the definition of "irregular". Applicant includes in his definition shapes such as semicircular, but it is unclear how a semicircular shape can be considered to be an "irregular" shaped square or rectangle.

See 37 CFR 1.111. Since the above-mentioned reply appears to be bona fide, applicant is given a TIME PERIOD of **TWO (2) MONTHS** from the mailing date of this notice within which to supply the omission or correction in order to avoid abandonment. EXTENSIONS OF THIS TIME PERIOD MAY BE GRANTED UNDER 37 CFR 1.136(a).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICHOLAS D LUCCHESI whose telephone number is (571)272-4977. The examiner can normally be reached on M-F 800-430.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cris Rodriguez can be reached on 571-272-4964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NICHOLAS D LUCCHESI/
Primary Examiner, Art Unit 3772

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	16033823
	Filing Date	2018-07-12
	First Named Inventor	Mozzicato
	Art Unit	3772
	Examiner Name	Lucchesi, Nicholas D.
	Attorney Docket Number	SMTX-001-US-T1

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		16033823
	Filing Date		2018-07-12
	First Named Inventor	Mozzicato	
	Art Unit	3772	
	Examiner Name	Lucchesi, Nicholas D.	
	Attorney Docket Number	SMTX-001-US-T1	

1	ASME USAS B17-1 "Keys and Key Seats"; American Society of Mechanical Engineers, USA Standard, 1967 (Reaffirmed 2013)
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If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	16033823
Filing Date	2018-07-12
First Named Inventor	Mozzicato
Art Unit	3772
Examiner Name	Lucchesi, Nicholas D.
Attorney Docket Number	SMTX-001-US-T1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Steven R. Lazar/	Date (YYYY-MM-DD)	2019-01-26
Name/Print	Steven R. Lazar	Registration Number	32,618

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	16033823			
Filing Date:	12-Jul-2018			
Title of Invention:	Detachable Recycling Container			
First Named Inventor/Applicant Name:	Nicholas Mozzicato			
Filer:	Steven R. Lazar			
Attorney Docket Number:	SMTX-001-T1			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	120	120
Total in USD (\$)				120

Electronic Acknowledgement Receipt

EFS ID:	34970273
Application Number:	16033823
International Application Number:	
Confirmation Number:	9793
Title of Invention:	Detachable Recycling Container
First Named Inventor/Applicant Name:	Nicholas Mozzicato
Customer Number:	80709
Filer:	Steven R. Lazar
Filer Authorized By:	
Attorney Docket Number:	SMTX-001-T1
Receipt Date:	26-JAN-2019
Filing Date:	12-JUL-2018
Time Stamp:	15:28:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 120
RAM confirmation Number	012819INTEFSW15291001
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

150/414

Solmetex Ex. 2003

DRNA v. Solmetex - PGR2023-00555

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	SMTX-001-US-T1-IDS2.pdf	612304	no	4
			a60e4cfc8fdb714b096bfff81dac0067df014a64		
Warnings:					
Information:					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
2	Non Patent Literature	ASME_B17-1_1967_R2013.pdf	1273461	no	18
			95a624a0e92b9e8b3d516eb399c2d02f27fb09d6		
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30181	no	2
			8d025c462cc08e51c8825be554ef9da34fafc46d		
Warnings:					
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Total Files Size (in bytes):			1915946		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

AMENDMENTS TO THE CLAIMS:

Amend the **Claims as follows:**

1 (Presently Amended). A detachable container suitable for mating securely with an air-water separation tank, said detachable container having an outside top mating surface comprising an inlet port and an outlet port; [of a first height and a second height respectively, wherein the first height is different from the second height; and] wherein said detachable container further comprises one or more irregular keyways cast into said outside top mating surface;

wherein said air-water separation tank comprises [ing] one or more corresponding irregular keys, such that when the irregular keyways of the detachable container are aligned with the corresponding irregular keys of the air-water separation tank, said detachable container is capable of mating securely with said air-water separation tank.

2 (Presently Amended). The detachable container of claim **5**[1], further comprising
a cap for covering the outside top mating surface and having an inside surface with a first circular wall and a second circular wall, the first circular wall having a height selected to engage an upper surface of one of the inlet port or the outlet port and the second circular wall having a height selected to engage an upper surface of the other of the inlet port or the outlet port.

3 (Original). The detachable container of claim 2, wherein
the cap has a threaded exterior peripheral edge for engaging with a threaded peripheral edge on the detachable container, and threaded engagement of the cap to the detachable container secures the first and second circular walls into engagement with the inlet port and outlet port for sealing the inlet port and the outlet port.

4 (Original). The detachable container of claim 1, further comprising
a circular sidewall extending from the outside top mating surface and defining an interior chamber for the detachable container, the interior chamber being capable of supporting a partial vacuum when the inlet port and outlet port are sealed.

5 (New). The detachable container of claim 1, wherein the inlet port is of a first height and the outlet port is of a second, and wherein the first height is different from the second height;

REMARKS

The claims are 1 through 5. Applicant submits this response to the Office Action, which was mailed on October 4, 2018. Claim 1 has been amended to eliminate the recitation that the inlet port and outlet port must be of different heights. This is an optional feature, as the present invention as demonstrated in Figures 6 through 15, which have been incorporated from the priority document 29/577,701. These Figures include embodiments in which the inlet port and outlet port are of the same height, as well as those embodiments where the heights differ. This optional feature of the invention is claimed in new claim 5. Claim 2 has been amended to depend from new claim 5.

No new matter has been introduced.

Objections to the Drawings:

The drawings were objected to under 37 CFR §1.83(a), as failing to show every feature of the invention specified in the claims. The Office Action asserted that the drawings failed to show the “irregular keyways” that are recited in the claims.

Applicants do not agree with the above objection. However, in the interest of expedited prosecution of this Track One application, Applicants have added Figures 6 through 15, which explicitly set forth several embodiments of the invention in which the “irregular keyways” are clearly illustrated. The meaning of the term “irregular keyways” is further discussed below.

As noted above, Figures 6 through 15 have been incorporated into the specification drawing upon patent application serial number 29/577,701, to which the present application claims priority. Accordingly, no new matter is introduced by the incorporation of these drawings into the present application.

Claim Rejections Under 35 U.S.C. §112:

The claims are rejected under 35 U.S.C. §112(b), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventors regard as the invention. It is asserted that claim 1 is indefinite in its use of the terms “irregular keyways.” The Office Action asserts that it is unclear what the “irregular keyways are,” and assumes that the “irregular keyways” refers to the irregular shape of the inlet and outlet port. This ground of rejection is traversed for the following reasons.

The terms “keys” and “keyways” are well defined in the field of mechanical engineering. For example, the American Society of Mechanical Engineering (ASME) provides guidelines and

standards for Keys and Keyways at “ASME B17.1-1967 (R2013) Keys and Keyways.” The ASME provides this guidance to the industry for a common understanding of the terms. Additionally, Applicants submit the Declaration Under Rule 132 of Robin Schofield, one of the inventors of the present application (“Schofield Declaration”). At paragraphs 6 through 10, the Schofield Declaration explains that the terms “keyways” is regularly used in the field of mechanical engineering and would be readily understood by one of ordinary skill in the art.

Moreover, as demonstrated by paragraphs 7 and 8 of the Schofield Declaration, the term ‘standard’ keys and keyways are nearly always square or rectangular. Hence a keyway that is not uniformly square or rectangular, would be considered an ‘irregular keyway.’ Paragraph 8 of the Schofield Declaration demonstrates that the term ‘irregular’ would similarly be used to describe a keyway that is not predictably shaped [e.g., square or rectangular] or located [e.g., symmetrical].

For the above reasons, it is submitted that the term “irregular keyways,” as used in the application and in the claims, would be readily understood by one of ordinary skill in the art and is not indefinite. Thus, this ground of rejection should be withdrawn.

Additionally, Applicants refer to Figures 6 through 15, which have been incorporated into the specification by reference from earlier priority filings. These figures illustrate several embodiments of the present invention, in which the outside of the top mating surface has been cast with “irregular keyways.” These Figures provide additional context for the term “irregular keyways,” such that the meaning will be readily understood by one skilled in the art.

In the Office Action, the Examiner took the position that the “irregular keyways” would be assumed to be the irregular shape of the inlet and outlet ports. However, the inlet and outlet ports and the irregular keyways are clearly defined as separate elements of Applicants’ claimed detachable container. In light of the clear language of the specification and claims, as well as the remarks herein, and the evidence provided in the ASME Guidance and Schofield Declaration, it is submitted that the stated assumption is untenable and should be withdrawn.

Claim Rejections Under 35 U.S.C. §102:

Claims 1 and 4 are rejected under 35 U.S.C. §102(a)(1), as being anticipated by Haentjens, United States Patent 4,761,235. It is asserted that Haentjens discloses a detachable container for mating securely with an air water separation tank. This ground of rejection is traversed for the following reasons.

In order for a cited prior art document to ‘anticipate’ a claim, that cited prior art document must reasonably disclose every element of the invention that is recited in the claim. As stated in the Manual of Patent Examining Procedures, at ¶2131: “A claim is anticipated only if each and

every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” As set forth below, Applicants submit that the Haentjens document fails to describe each and every element of the claims.

Applicants note that the alleged detachable ‘container’ of Haentjens resides in **element (22)** - which is illustrated in **Figure 2** of Haentjens. Putting aside many other factors, including that Haentjens relates to an under-sink garbage disposal, rather than a dental amalgam separation system and air-water separation tank, it is clear that the **container (22)** of Haentjens does not have inlet or outlet ports on its top surface. In fact, the detachable **container (22)** of **Figure 2** is shown to have only one ‘**central opening**’ (52). Any “inlet” or “outlet” described in Haentjens, such as the ‘inlet’ (34), the ‘inlet passage’ or ‘inlet conduit’ (42), ‘outlet’ (16), ‘separator outlet’ (24), or ‘outlet passage’ (44), all shown in **Figure 1**, but NOT in **Figure 2**, form part of the pipework of the ‘separator’ (20) which is integrally connected to the ‘garbage grinder’ (12) through the ‘connector’ (32). Thus, in Haentjens, the inlet and outlets clearly are not present on the detachable container, a necessary element recited in the claims.

Moreover, the container [22] of Haentjens lacks ‘irregular keyways’ that are recited as an element of the present invention. At most, Haentjens describes that the **central opening [52]** of the container extends up and connects by a ‘**threaded fastener**’ [48] to the lower outlet of the separator. The ‘threaded fastener’ is stated preferentially to be a wing nut. There is no indication that this ‘threaded fastener’ could reasonably comprise an ‘irregular keyway’ as in the present invention. For at least the above reasons, the container of Haentjens lacks several elements recited in the present claims.

The Schofield Declaration provides additional evidence that the Haentjens reference does not anticipate Applicants’ claimed invention, setting forth significant differences between the detachable container of the present invention and the Haentjens reference. Accordingly, Haentjens does not anticipate the invention recited in Applicants’ claims and this ground of rejection under 35 U.S.C. §102 over Haentjens should be withdrawn.

Allowable Subject Matter:

The Examiner found that Claims 2 and 3 would be allowable if rewritten to overcome the rejections under 35 U.S.C. §112(b), set forth in the Office action, and to include all of the limitations of the base claim and any intervening claims. Applicant appreciates the Examiner's careful review and helpful comments pointing out allowable subject matter.

As presently amended and as described above, it is believed that the rejections under 35 U.S.C. §112(b), and rejection of claims 1 and 4 rejections under 35 U.S.C. §102, for anticipation over Haentjens, have been overcome, and rewriting of the claims 2 and 3 is not necessary. However, should these rejections be maintained, Applicants reserve their right to rewrite these claims as suggested in order to receive allowance.

CONCLUSION

In light of the above comments and amendments, and the evidence introduced into the record in the form of the American Society of Mechanical Engineering (ASME) provides guidelines and standards for Keys and Keyways, as well as the declaration of the co-inventor, Robin Schofield, it is believed that all of the stated objections to the application and rejections of the claims have been overcome, and the claims, as amended, should be found allowable.

Applicant hereby claims small entity status under 37 CFR §1.27. If any additional fees are due, the Examiner is requested to contact Applicants' undersigned representative. Applicant's undersigned representative may be reached by telephone at 617-966-2374. All correspondence should continue to be directed to the listed address.

Respectfully submitted,

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DETACHABLE CONTAINER**RELATED APPLICATIONS**

[001] This patent application is a continuation of patent application serial number 15/730,828, filed on October 12, 2017; which claims priority from provisional patent application serial number 62/414,712, filed on October 29, 2016; and provisional patent application serial number 62/406,990, filed on October 12, 2016. This application further claims priority from patent application serial number 29/667,212, filed October 19, 2018, which is a continuation of serial number 29/585,659, filed on November 28, 2016, now patent number D835,778. This patent application further claims priority from patent application serial number 29/585,674, filed on November 28, 2016. This patent application further claims priority from patent application serial number 29/672,887, filed on December 10, 2018, which is a continuation of patent application serial number 29/585,668, filed on November 28, 2016, now patent number D835,779. This patent application further claims priority from patent application serial number 29/577,701, filed on September 14, 2016. This patent application further claims priority from patent application serial number 29/567,544, filed on June 9, 2016. This patent application further claims priority from patent application serial number 29/671,943, filed on November 30, 2018, which is a continuation of patent application serial number 29/565,622, filed on May 23, 2016, now issued patent D835,264.

FIELD OF THE INVENTION

[002] This invention relates to systems and apparatus suitable to remove particles from effluent waste, and particularly, to remove amalgam and other metallic particles and other abrasive solids from dental office suction effluent. The system also comprises a self-contained detachable container to facilitate customer regulatory compliance and environmental safeguards.

BACKGROUND OF THE INVENTION

[003] Dental amalgam is a dental filling material used to fill cavities caused by tooth decay. It has been used for more than 150 years in hundreds of millions of patients around the world.

[004] Dental amalgam is a mixture of metals, consisting of liquid (elemental) mercury and a powdered alloy composed of silver, tin, and copper. Approximately 50% of dental amalgam is elemental mercury by weight. The chemical properties of elemental mercury allow it to react with and bind together the silver/copper/tin alloy particles to form an amalgam. See <http://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/DentalProducts/DentalAmalgam/ucm171094.htm>, accessed September 9, 2016.

[005] Amalgam is used less often than in the past, mostly because tooth-colored materials now can be used. However, the newer materials can't be used for all dental situations, amalgam is less costly than newer materials and it lasts longer, especially in teeth that undergo a lot of pressure and wear from chewing.

[006] Better dental health overall coupled with increased demand for more modern alternatives such as resin composite fillings (which match the tooth color), as well as public concern about the mercury content of dental amalgam, have resulted in a steady decline in dental amalgam use in developed countries, though overall amalgam use continues to rise worldwide. Stein, PS; Sullivan, J; Haubenreich, JE; Osborne, PB (2005). "Composite resin in medicine and dentistry". *Journal of long-term effects of medical implants*. 15 (6): 641–54. doi:10.1615/jlongtermeffmedimplants. v15.i6.70. PMID 16393132.

[007] Although amalgams are less frequently used in developed countries for new dental fillings than in the past, amalgams continue to make up a portion of the particle component of dental office effluent mainly because of the fact that old fillings made of amalgams are drilled out and removed in the effluent waste when new fillings are effected to replace the old. Further, as noted above, even under current dental practice, an amalgam is preferred for some tooth filling situations.

[008] Because mercury is a poison that can accumulate in living tissues and can pose a health hazard to species in a food chain exposed to mercury-containing compounds, and since

humans are inevitably at the end of the food chain, it follows that effluent containing amalgams can pose a health hazard to the community at large. Also, certain metals such as silver are commercially valuable if recovered in quantity. For those reasons, it is desirable to devise systems, apparatus and processes for removing amalgams from dental office effluent and efficiently recycling those amalgams.

[009] In addition to removing amalgams, other matter disposed into dental office suction effluent includes aluminum oxides used in air abrasion treatments and other solid waste material. These solid materials tend to wear out or damage vacuum pumps and other equipment downstream of the dental chair suction apparatus, and also constitute effluent water contaminants. Therefore, it is desirable for the apparatus to remove solid abrasive material and other particulate waste from the dental office suction effluent.

[0010] The World Health Organization also points out that amalgam separators, installed in the waste water lines of many dental offices, dramatically decrease the release of mercury into the public sewer system. However, critics say that the separators are still not mandatory in some states of the United States. "Purchasing, installing and operating dental amalgam separators: Practical issues". The Journal of the American Dental Association. 134 (8): 1054–65. doi:10.14219/jada.archive.2003.0319. PMID 12956345. Recently, the EPA has enacted nation-wide regulations requiring amalgam separators in dental offices.

[0011] Previously known apparatus for removing amalgam particles from dental office suction effluent are known to include a collecting tank for collecting a day's accumulation of suction effluent from one or more sources of such waste. The waste is sucked from the dental chair suction apparatus and into the collecting tank by a vacuum pump. When the vacuum pump is turned off, an outlet valve is opened and the accumulated waste is deposited into a separation device intended to separate metal particles from the effluent liquid. Flow into the separation device is induced by the head of fluid in the collecting tank. Particles passing through the separation device are separated from the waste by gravity and settle to the bottom of the separation device. The flow rate is dependent on the head inside the collecting tank; as the head diminishes, the flow rate also diminishes. The changes in flow rate are undesirable because the particle separation rate is affected, and the system becomes prone to plugging when the flow rate decreases. Another drawback to such systems are that, since

the waste can be deposited only when the vacuum pump is off, waste is usually moved to the separation device at the end of the day. As a result, the collecting tank and separation device tend to be undesirably large and the whole process is time consuming.

[0012] Another known apparatus is a centrifuge type system that separates heavier metal particles from effluent liquid by collecting the particles at the peripheral wall of the centrifuge. This apparatus does not effectively separate lighter particles, and is expensive to purchase and operate due to the complexity of its mechanical parts.

[0013] Yet another known apparatus uses a dedicated mechanical pump to suction waste liquids through a separator device. Again, a dedicated pump can be expensive to purchase and to maintain, and can be undesirably space-consuming.

[0014] Such known systems can become quite complex, unwieldy and expensive, as for example that disclosed in U.S. Pat. No. 5,885,076 granted 23 Mar. 1999. It teaches the use of sedimentation, co-precipitation and filtration in an expensive complicated apparatus that is probably economical, if at all, only for relatively large installations such as a military base dental complex.

[0015] U.S. Pat. No. 6,692,636 and U.S. Pat. No. 6,592,754 are patents that disclose systems for removing amalgam from dental office suction effluent.

[0016] After collecting the amalgam and other solid waste the dentist is left with the problem of what to do with the waste. Either the dentist has to deal with his own hazardous waste or he can send his collected material to a recycler. In either case, the "collection container" needs to be disposable and easily replaceable.

[0017] Existing recycling programs generally require the provision of bulky shipping materials and the delivery of those materials to the dentist for every full container. If such materials are not provided and the materials are not properly recycled a large part of the benefit of collecting the amalgam waste can be lost. It is important that the waste is recycled under federal guidelines in order to make sure the full benefits of amalgam separation are achieved.

[0018] Additionally, containers for collection, such as dental amalgam recycling systems, can be compromised by incorrect installation or misalignment, which can cause O-rings to deform and/or seal irregularly, and result in leakage.

SUMMARY OF THE INVENTION

[0019] The present invention overcomes many of the shortcomings of the prior technology and achieves further advantages that will be apparent after reviewing the following detailed description.

[0020] In one aspect, the invention comprises a dental amalgam recycling system for recycling particles from a dental liquid effluent drawn from a suctioning device. In certain embodiments, the dental amalgam recycling system of the invention comprises:

[0021] (a) an air-water separator tank for receiving said effluent, said air-water separator tank having an air-water separator tank inlet in fluid communication with said suctioning device, an air-water separator tank liquid effluent outlet and an air-water separator tank air outlet;

[0022] (b) a detachable recycling container, said recycling container acting primarily under the influence of gravity to cause settlement of said particles; said recycling container having a recycling container effluent inlet port connected to said air-water separator tank liquid effluent outlet and said recycling container further having an effluent outlet port;

[0023] (c) wherein the air-water separator tank also includes an internal suction conduit;

[0024] (d) wherein the recycling container comprises threads;

[0025] (e) wherein the recycling container effluent inlet port and the recycling container outlet port of a first height and a second height, respectively, the first height being different from the second height (i.e., are not the same height).

[0026] In certain embodiments, the dental amalgam recycling system further comprises (f) a threaded shipping cap, wherein the threads of the shipping cap and the threads of the recycling container are complementary such that, when the shipping cap is fitted in place, the shipping cap forms a tight seal with said recycling container.

[0027] While in use, the dental amalgam recycling system is functionally associated with a vacuum pump having a vacuum pump inlet. The vacuum pump is typically a pre-existing part of the dental office facility. In particular embodiments, the dental amalgam recycling system is physically connected with a vacuum pump via a suction conduit in the air-water

separator. In certain preferred embodiments, the suction conduit is an internal suction conduit within the air-water separator.

[0028] In certain embodiments, the dental amalgam recycling system of the invention further comprise a first plug for said recycling container inlet port and a second plug for said recycling container effluent outlet port. Said first and second plugs may be held tightly in place by said threaded shipping cap when said shipping cap is fitted in place.

[0029] In certain embodiments, the dental amalgam recycling system of the invention further comprise an O-ring that provides an air and effluent tight seal when said shipping cap is fitted in place.

[0030] In certain embodiments, the invention comprises a container, useful as a dental amalgam recycling container, comprising threads for attachment of a shipping cap. In certain embodiments, the dental amalgam recycling container further comprises two plugs held in place by said shipping cap and an O-ring fitted in an O-ring groove to prevent leaks. The dental amalgam recycling containers of the present invention may further comprise a two tier cap that enables people with hands of different sizes to grip the cap and tighten to achieve a very tight seal.

[0031] Thus in certain embodiments the present invention comprises a detachable container suitable for mating securely with an air-water separation tank, said detachable container having an outside top mating surface comprising an inlet port and an outlet port of a first height and a second height, respectively, wherein the first height is different from the second height; and wherein said detachable container further comprises one or more irregular keyways cast into said outside top mating surface; said air-water separation tank comprising one or more corresponding irregular keys, such that when the irregular keyways of the detachable container are aligned with the corresponding irregular keys of the air-water separation tank, said detachable container is capable of mating securely with said air-water separation tank.

[0032] In certain embodiments, the detachable container further comprises a cap for covering the outside top mating surface and having an inside surface with a first circular wall and a second circular wall, the first circular wall having a height selected to engage an upper

surface of one of the inlet port or the outlet port and the second circular wall having a height selected to engage an upper surface of the other of the inlet port or the outlet port.

[0033] In certain embodiments, the cap has a threaded interior peripheral edge for engaging with a threaded exterior peripheral edge on the detachable container, and threaded engagement of the cap to the detachable container secures the first and second circular walls into engagement with the inlet port and outlet port for sealing the inlet port and the outlet port.

[0034] In certain embodiments, the cap further comprises a circular sidewall extending from the outside top mating surface and defining an interior chamber for the detachable container, the interior chamber being capable of supporting a partial vacuum when the inlet port and outlet port are sealed.

[0035] In certain embodiments, the invention comprises an adapter for an air-water separator tank, wherein the adapter enables a recycling container without compatible effluent ports to attach to an air-water separator tank. Said air-water separator tank may comprise, for example, a component of a dental amalgam recycling system, as described above. In certain embodiments, the adapter may comprise threads. In alternative embodiments, the adaptor may be without threads.

[0036] As described above, the potential for leakage exists in a collection canister such as a recycling container used in the dental amalgam recycling systems described herein. Such leakage may occur, for example, due to incorrect installation, or due to misalignment of a container and its intended mating partner, such as the air-water separation tank or its intended cap, such as a threaded shipping cap, which may cause O-rings to deform and/or seal irregularly. In order to address this problem and/or reduce the potential for leakage, a collection canister, such as a recycling container used in a dental amalgam recycling system, may have one or more irregular 'keyways' cast into its outside top mating surface, and the intended mating partner, such as the air-water separation tank, or the shipping cap, may have one or more corresponding 'key(s)' be cast into its mating surface, such that the key(s) and keyway(s) must be aligned in order for the collection canister (e.g., the recycling container) and its mating partner (e.g., the air-water separation tank; or the shipping cap) to mate properly. This key/keyway system can help ensure even pressure across the entire

circumference of the O-ring surface on each port. Similarly, such key(s) and keyway(s) may be used to ensure proper replacement of the container and/or the air-water separation tank, such that incorrect replacement can be avoided or minimized.

BRIEF DESCRIPTION OF THE DRAWINGS

[0037] FIG. 1 is a schematic front view of an embodiment of particle removal and recycling apparatus according to the invention, for particular use in a dental office.

[0038] FIG. 2 is a schematic side view of an embodiment of particle removal and recycling apparatus according to the invention, for particular use in a dental office.

[0039] FIG. 3 a is a schematic view of an embodiment of a universal adapter for fitting various different sized recycling containers to the air-water separator of the present invention.

[0040] FIG. 3 b is a schematic view of an alternative embodiment of a universal adapter for fitting various different sized recycling containers to the air-water separator of the present invention.

[0041] FIG. 4 a is a schematic view of an embodiment of a recycling container and cap system of the invention.

[0042] Fig. 4 b is a schematic perspective depiction of an embodiment of a recycling container and cap system of the invention.

[0043] FIG. 5 a is a schematic inside view of an embodiment of a recycling cap for the recycling containers of the invention.

[0044] Fig. 5 b is a schematic depiction of a recycling cap according to the invention fitting on a partial view of a recycling container according to the invention.

[0045] 1-Backplate

[0046] 2-Waste Inlet (from dental practice)

[0047] 3-Air/water Separator Top

[0048] 4-Top Support Bracket

[0049] 5-Air/Water Separation Tank

[0050] 6-Suction tube

[0051] 7-Air/Water Separator Base

- [0052] 8-Outlet Tube (to vacuum system)
- [0053] 9-Recycling Container Top
- [0054] 10-Lower Support Bracket
- [0055] 11-Restrictor
- [0056] 12-Detachable Recycling Container
- [0057] 13-Retaining Pins (2)
- [0058] 14- air-water separator tank effluent outlet port
- [0059] 15- recycling container inlet port
- [0060] 16- recycling container outlet port
- [0061] 17- recycling container threads
- [0062] 18- two tier recycling cap
- [0063] 19- O-ring groove
- [0064] 20- cap plugs
- [0065] 21- O-ring
- [0066] Figure 6A is a schematic view of a first embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.
- [0067] Figure 6B is a schematic view of the same embodiment, viewing the top of the container from directly above.
- [0068] Figure 7A is a schematic view of a second embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.
- [0069] Figure 7B is a schematic view of the same embodiment, viewing the top of the container from directly above.
- [0070] Figure 8A is a schematic view of a third embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.
- [0071] Figure 8B is a schematic view of the same embodiment, viewing the top of the container from directly above.
- [0072] Figure 9A is a schematic view of a fourth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.
- [0073] Figure 9B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0074] Figure 10A is a schematic view of a fourth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0075] Figure 10B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0076] Figure 11A is a schematic view of a fifth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0077] Figure 11B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0078] Figure 12A is a schematic view of a sixth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0079] Figure 12B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0080] Figure 13A is a schematic view of a seventh embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0081] Figure 13B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0082] Figure 14A is a schematic view of a eighth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0083] Figure 14B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0084] Figure 15A is a schematic view of a ninth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0085] Figure 15B is a schematic view of the same embodiment, viewing the top of the container from directly above.

DETAILED DESCRIPTION WITH REFERENCE TO THE DRAWINGS

[0086] According to one aspect of the instant invention, an apparatus is provided for removing and recycling metal-containing particles and other waste particles from effluent, particularly effluent from a dental office. While herein the term “metal particles” may

frequently be employed, it is contemplated that the apparatus is capable of separating other solid particles from effluent liquid.

[0087] According to one aspect of the invention, an apparatus for removing metal particles and other solid particles from liquid suction effluent can be installed in a dental office using a pre-existing suction/vacuum pump system. The apparatus may share a common vacuum pump with conventional dental chair suction apparatus, without interrupting the use of suction equipment at the dental chairs.

[0088] Removal of solid particles from liquid suction effluent is effected by sedimentation.

[0089] In accordance with a one embodiment of the invention, the dental office suction effluent is passed from dental chair suction equipment outlets to an air water separator tank via a suitable inlet port for the tank. The air-water separator tank in turn passes effluent into a sedimentary deposit tank, closed on all sides when in use and preferably readily detachable for emptying or replacement.

[0090] In certain aspects of the instant invention the sedimentary deposit tank has a secondary function as a recycling container. In another aspect of the invention this recycling container can have features built in to make recycling easier and to reduce the amount of packaging and waste in the recycling system.

[0091] In another embodiment of the invention designed to minimize the space required to install the amalgam recycling system the air-water suction tube is internalized – within the air-water separator tank.

[0092] **Figure 1** and **Figure 2** shows two views of the separation apparatus according to the present invention in detail. Effluent from the dental chairs and a quantity of air are sucked through a suction apparatus exhaust conduit, through an air-water separator tank inlet **2**, and thence into an air-water separator tank **5**. The liquid effluent passes out of the air-water separator tank **5** via air-water separator tank outlet port **14**, while air passes downstream via the air suction tube **6** while maintaining constant vacuum upstream of amalgam separator.

[0093] The air-water separator tank effluent outlet port **14** passes effluent by gravity out of the air-water separator tank **5** and into the detachable recycling container **12** through

the recycling container inlet port **15** for target particle separation by sedimentation. Solids settle and accumulate in the bottom of Recycle container **12**. Liquid content of waste flows primarily by gravity, although intermittently assisted by vacuum through Restrictor **11** which slows the flow rate of liquid to assist in sedimentation process and ultimately “clean” effluent discharge through the recycling container outlet port **16**.

[0094] Outlet ports **16** and inlet port **15** can be a variety of shapes and sizes, square, oval (as depicted), round or even more unusual shapes like a star. Preferred ports are those that provide a tight seal, allow for easy removal, and do not break. Oval or round are preferred embodiments. Round are most preferred.

[0095] A vacuum at the outlet tube **8** is generated when the vacuum pump is operating, thereby sucking air out of the air-water separator tank **5** via suction tube **6** while maintaining vacuum upstream of amalgam separator apparatus. Effluent from the recycling container **12** passes through the restrictor **11** where remaining non-settable fine particles are removed from the effluent and into the recycling container outlet port **16** to be discharged from the apparatus via common outlet tube **8**. Matter sucked by the vacuum pump, generally free of removed solids, is discharged via vacuum pump into a municipal drain of the public sewage system.

[0096] The system is provided with a simple back plate **1** for easy dental office placement as well as removable retaining pins **13** to ensure the recycling container does not detach from the air-water separation tank **5** when there is no vacuum in the system.

[0097] In certain embodiments, the recycling container ports **16** and **15** may be different heights in order to aid in alignment of the detachable recycling container **12** in the air-water separator base **7**. In a preferred embodiment, the outlet port **16** engages before the inlet port **15** while during removal the inlet port **15** disengages first. This causes a small volume of fluid to be pulled out of the collection container back into air-water separator tank **5** creating head space and eliminating upward force of vacuum which eases removal of recycle container **12** by operator. Existing devices require rocking, wiggling or applying extensive down force for removal of recycle container **12**.

[0098] In one preferred embodiment of the invention designed to minimize recycling costs and waste, the recycling container/sedimentary deposit tank has threads **17** built into the container to enable the addition of a liquid tight top for shipping.

[0099] **Figure 3** shows a schematic diagram of an adapter according to the invention to enable the use of recycling containers from a variety of sources that are lacking in correctly shaped ports **16** and **15** or otherwise are unable to fit the air-water separator tank **5** according to the invention due to shape differences.

[00100] **Figure 4 a** shows a schematic diagram of the recycling container and cap system (see **Figure 5** for more cap **18** detail) according to the present invention. The cap **18** is a two tier shape to allow for a tight grip by both a big and smaller hand in order to achieve a strong seal as required by the invention. An O-ring **21** is provided and fits into an O-ring groove on the recycling container **12**. Plugs **20** are used to provide a first leak proof seal for the recycling container **12**. These plugs **20** are held in place by the cap **18** when the cap is threaded onto the recycling container as depicted in **Figure 5b**.

[00101] **Figures 6 through Figure 15** show several embodiments of the present invention, which include the inlet port and outlet port on the top mating surface, and irregular keyways cast into the outer top mating surface.

[00102] Generally, under present practice, the dental staff will not be able to remove deposited sediment from the recycle container nor remove accumulated particle residues from the restrictor unit themselves. Thus, it is desirable that such removal be done by a competent effluent residue processing facility. Therefore, under present practice, it is expected to be preferred that the recycling container with its enclosed restrictor unit be removed when full, or periodically replaced by fresh tanks from time to time as required. The spent tank with an accumulation of metallic and other particles can then be sent to a processing facility for proper disposal of the targeted metallic particles, such as mercury, and recovery of precious metals such as silver.

[00103] Although the sedimentary deposit process is effective to remove a satisfactorily high proportion of the target particles desired to be removed from the effluent, the recycling container desirably includes an outlet restrictor right in the chamber to catch any floating materials as well as any other materials that did not settle out.

[00104] If the recycle container is not changed as required or filled beyond normal capacity, waste liquid from dental practice may back up into air water separator tank. Should this occur, effluent overflows through the air suction tube and into the outlet port and is discharged into the vacuum pump draw line and thence eventually into the municipal drain. However, it is desirable that the system should operate in such a manner as to avoid having the air-water separator tank become completely full, since effluent exiting through the air outlet port will contain particles that will not be separated by the separator. If, however, such a by-pass condition occurs at no time will the suction generated by the vacuum pump be lost or interrupted at the dental office.

[00105] In a further embodiment of the invention oriented towards large-scale institutional applications, in which many dental chairs or other sources of effluent are connected to the same suction and drain services, several parallel-connected recycling containers and associated apparatus, each such composite apparatus including a air-water separator tank and preferably one, or alternatively two attached recycling containers, may be operated in parallel to provide sufficient treatment capacity for large effluent volumes.

[00106] All publications, web-sites, patents and patent applications cited in the specification are hereby incorporated herein by reference in their entirety for the disclosure for which they are cited.

[00107] Having read the above specification, other alternatives and variants of the above described methods and apparatus suitable for practicing the methods will occur to those skilled in the technology. Such alternatives, modifications and variants fall within the scope of the present invention.

[00108] The invention as described above also includes the following non-limiting claims, which describe particular embodiments of the invention.

Claims

1. (Presently Amended) A detachable container suitable for mating securely with an air-water separation tank, said detachable container having an outside top mating surface comprising an inlet port and an outlet port ~~[of a first height and a second height respectively, wherein the first height is different from the second height]~~; and wherein said detachable container further comprises one or more irregular keyways cast into said outside top mating surface;

said air-water separation tank comprising one or more corresponding irregular keys, such that when the irregular keyways of the detachable container are aligned with the corresponding irregular keys of the air-water separation tank, said detachable container is capable of mating securely with said air-water separation tank.

2 (Presently Amended). The detachable container of claim 5 ~~[4]~~, further comprising

a cap for covering the outside top mating surface and having an inside surface with a first circular wall and a second circular wall, the first circular wall having a height selected to engage an upper surface of one of the inlet port or the outlet port and the second circular wall having a height selected to engage an upper surface of the other of the inlet port or the outlet port.

3. (Original) The detachable container of claim 2, wherein

the cap has a threaded exterior peripheral edge for engaging with a threaded peripheral edge on the detachable container, and threaded engagement of the cap to the detachable container secures the first and second circular walls into engagement with the inlet port and outlet port for sealing the inlet port and the outlet port.

4 (Original). The detachable container of claim 1, further comprising

a circular sidewall extending from the outside top mating surface and defining an interior chamber for the detachable container, the interior chamber being capable of supporting a partial vacuum when the inlet port and outlet port are sealed.

5 (New). The detachable container of claim 1, wherein the inlet port is of a first height and the outlet port is of a second height respectively, and wherein the first height is different from the second height.

ABSTRACT

The present invention provides dental amalgam recycling systems, useful for recycling particles from a dental liquid effluent drawn, for example, from a suctioning device.

Figure 2

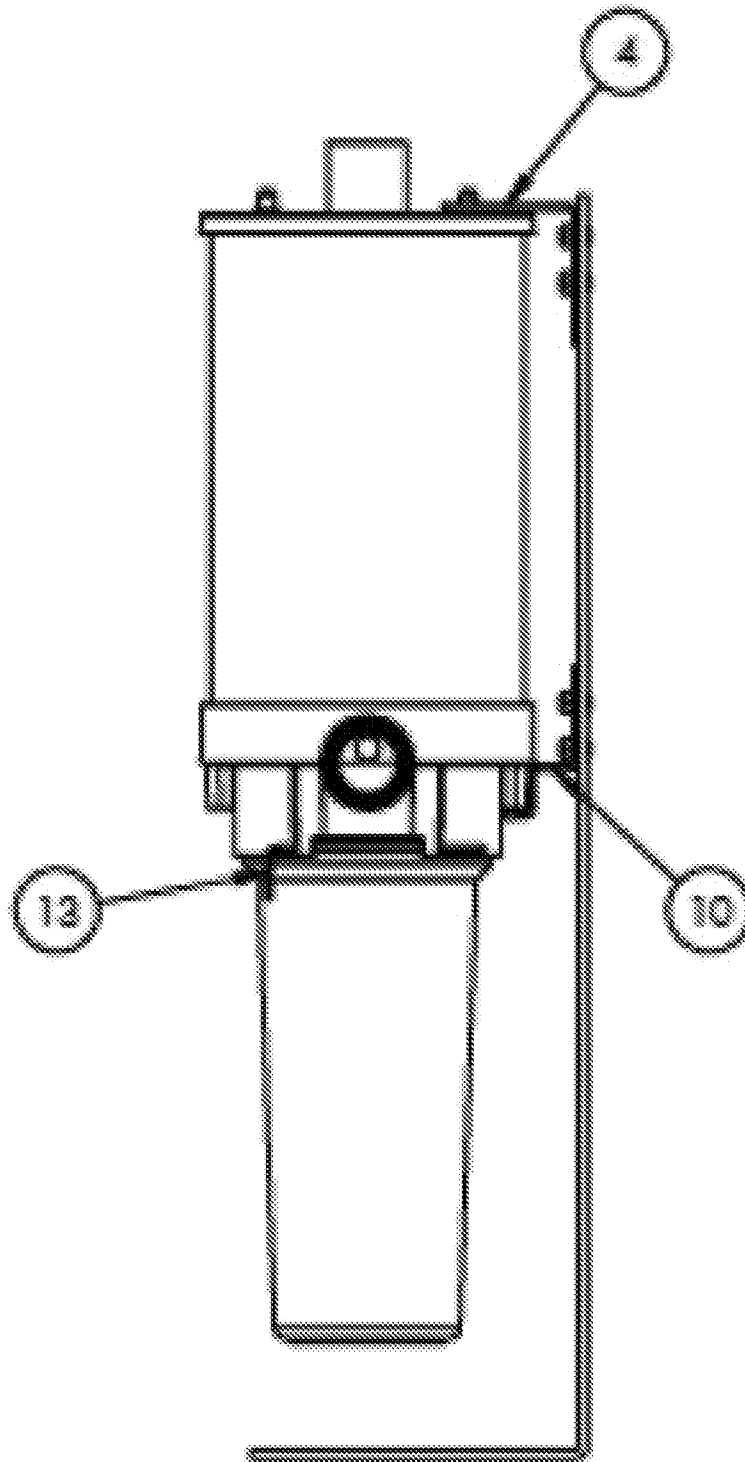


Figure 3a.

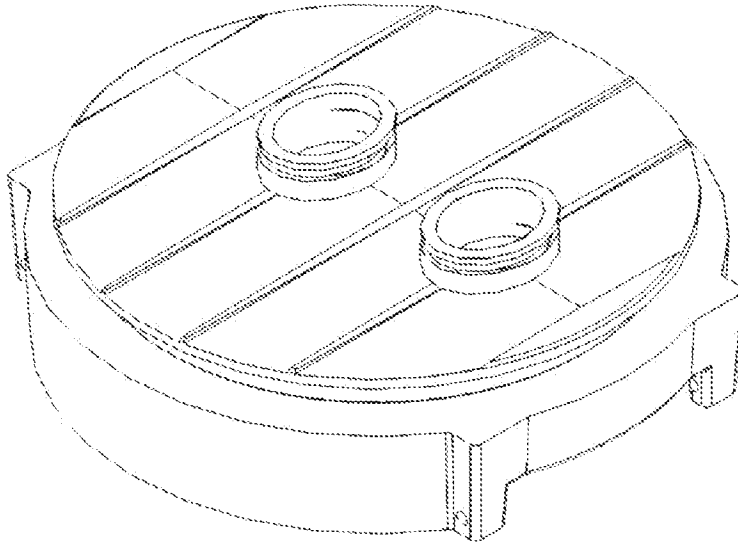


Figure 3b.

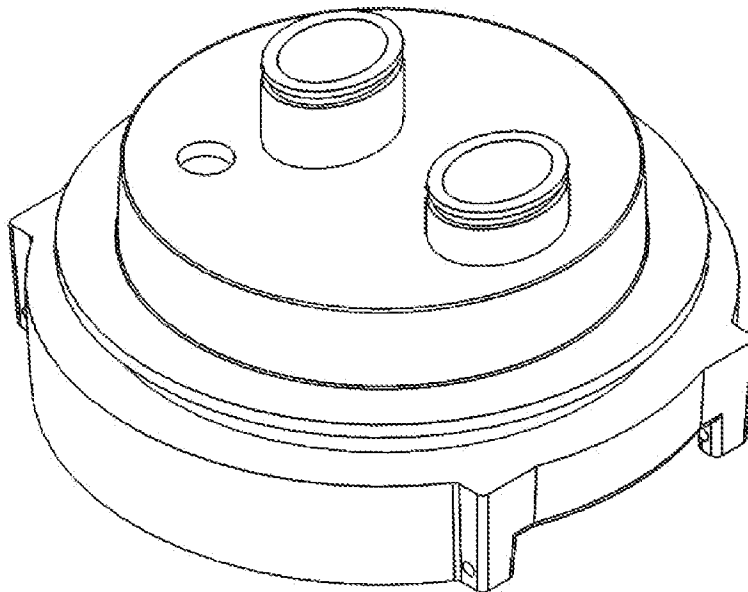


Figure 4a

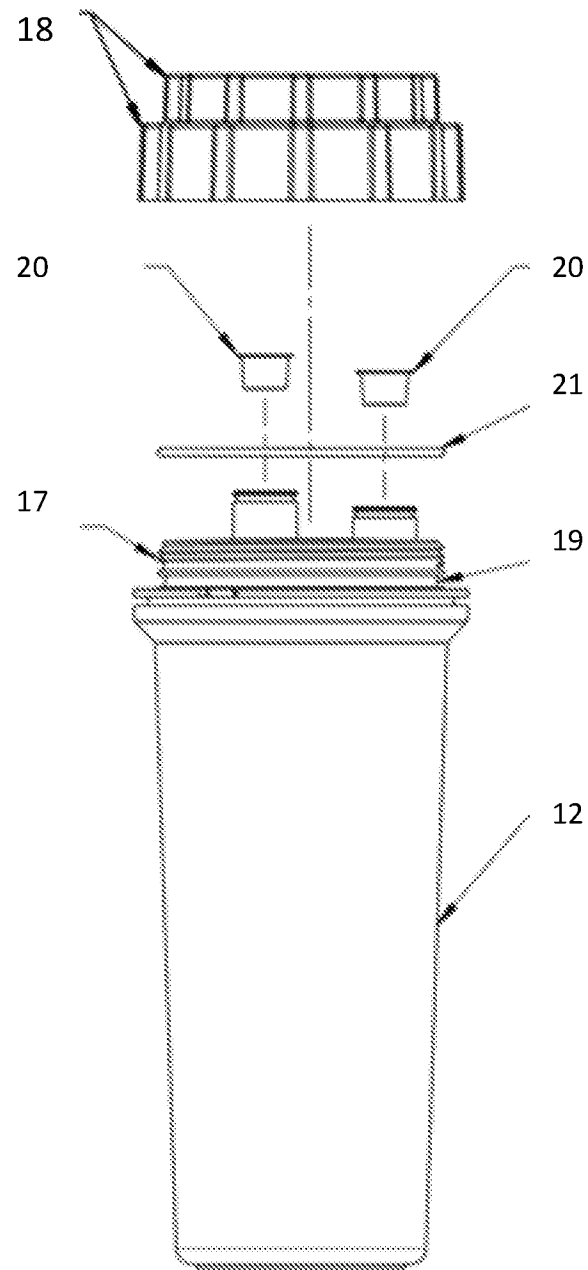


Figure 4b

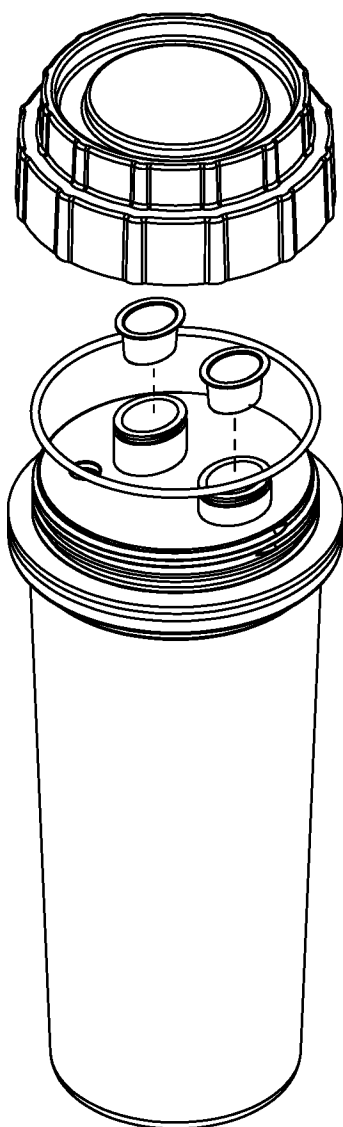


Figure 5a

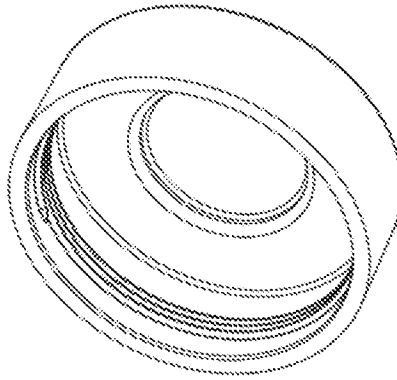
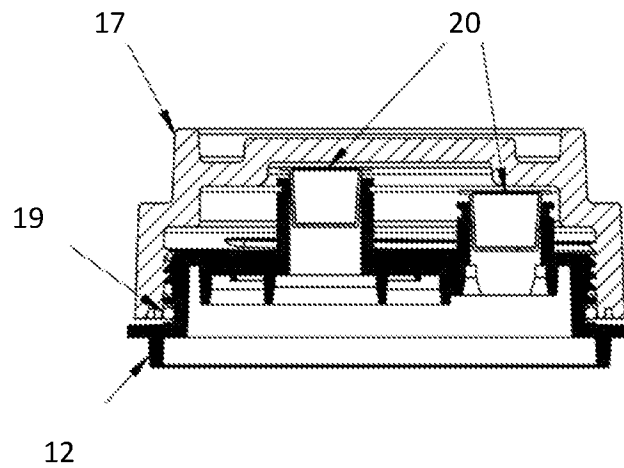
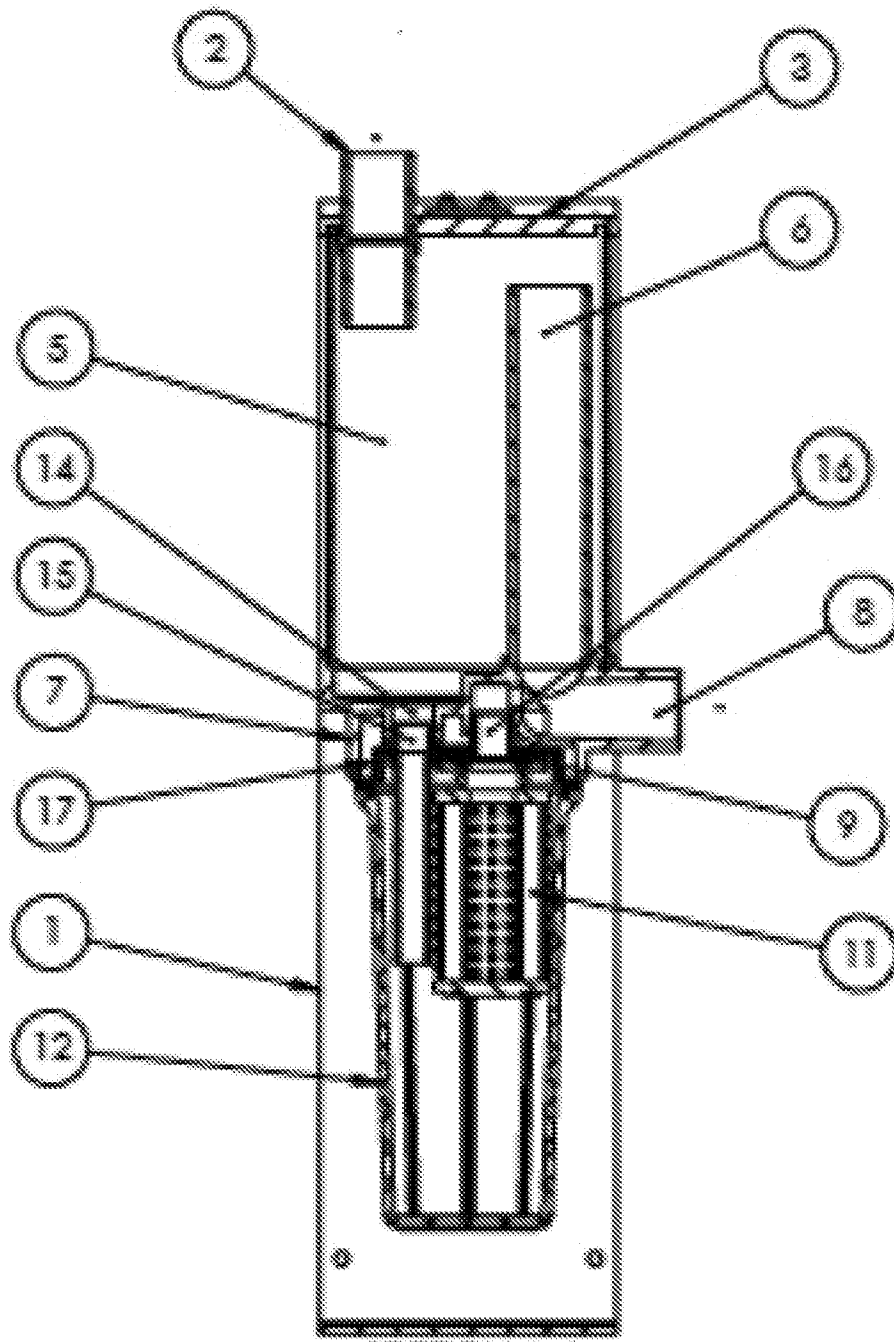


Figure 5b



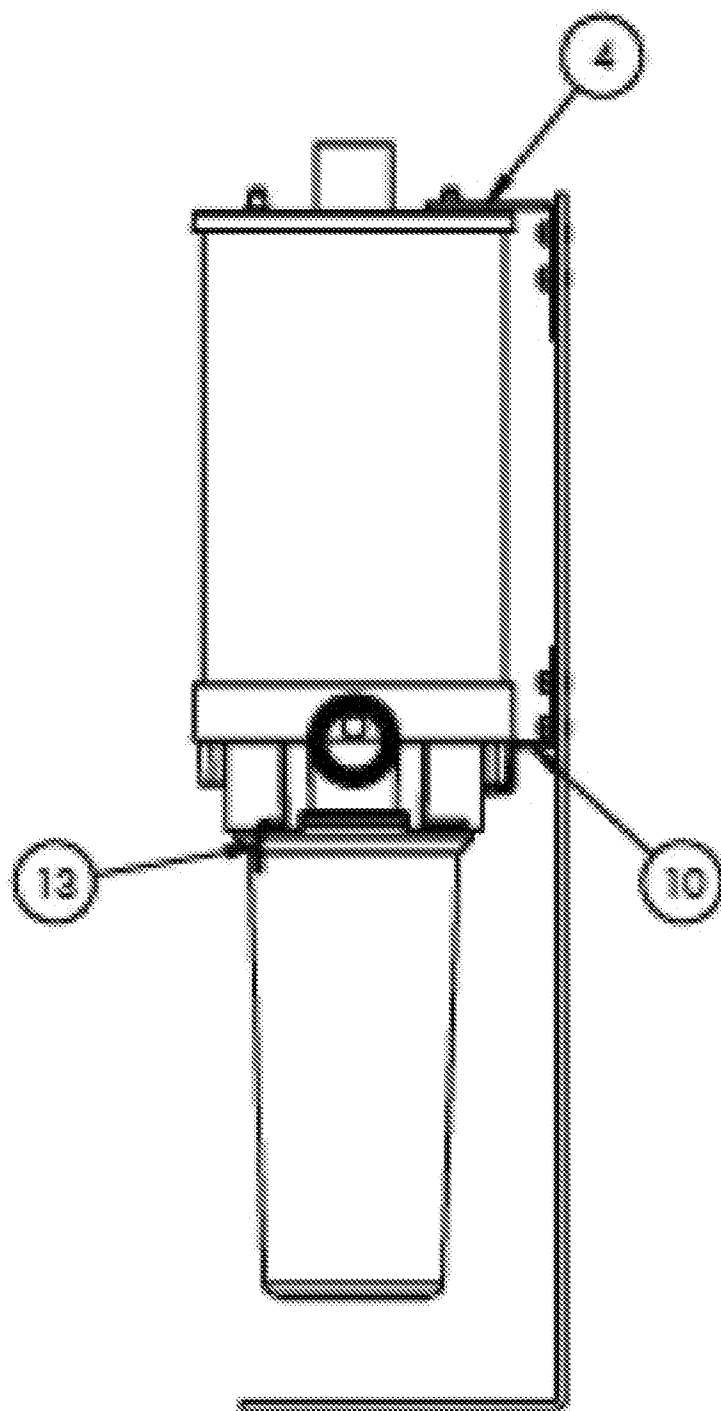
REPLACEMENT SHEET

Figure 1



REPLACEMENT SHEET

Figure 2



REPLACEMENT SHEET

Figure 3a

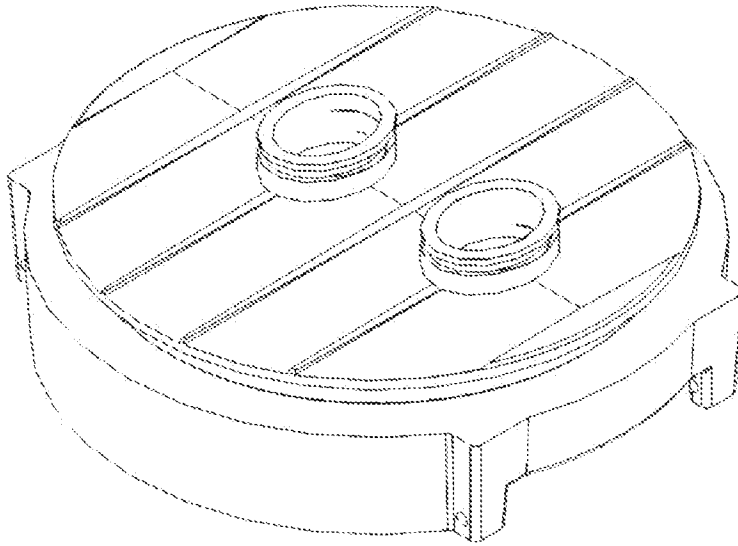
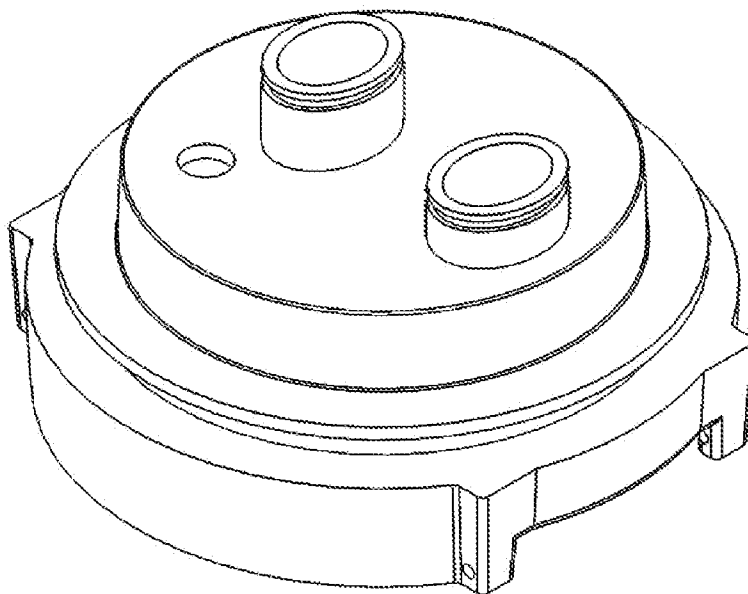
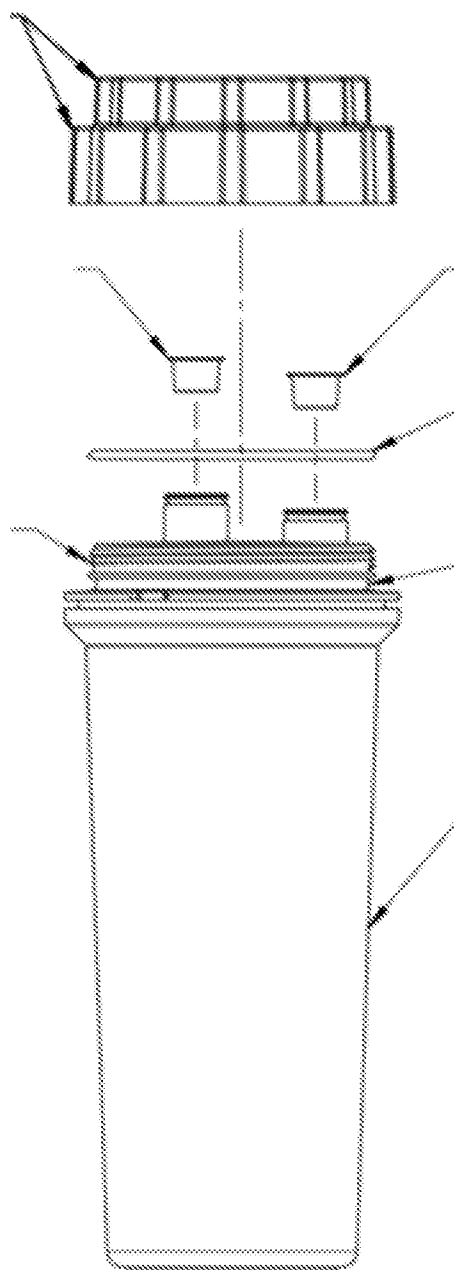


Figure 3b



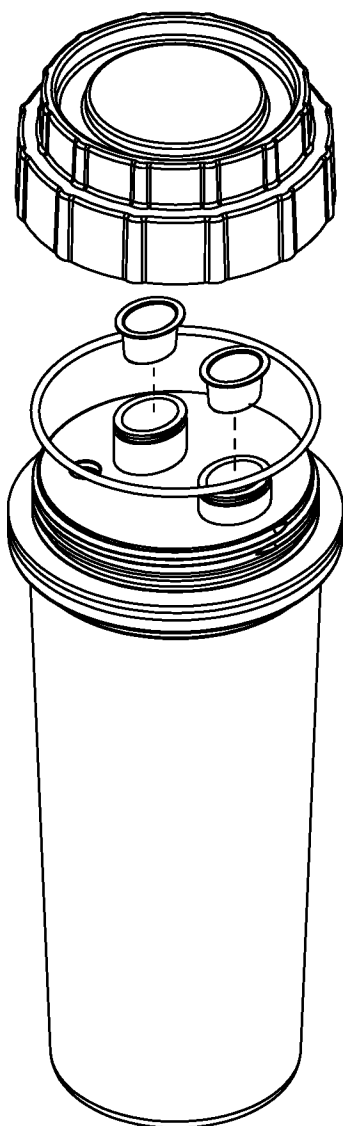
REPLACEMENT SHEET

Figure 4a



REPLACEMENT SHEET

Figure 4b



REPLACEMENT SHEET

Figure 5a

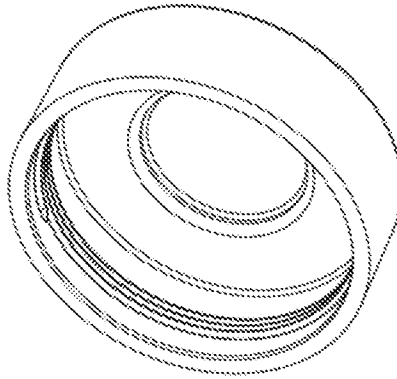
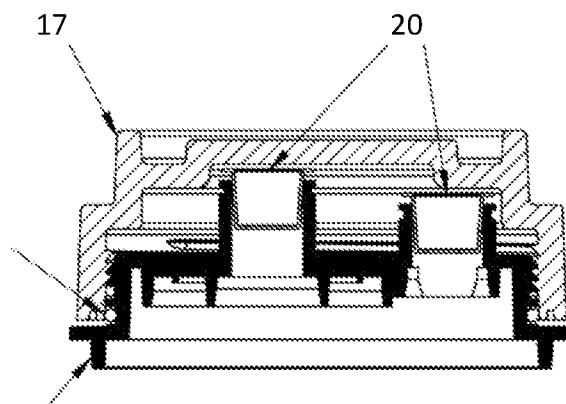


Figure 5b



NEW SHEET

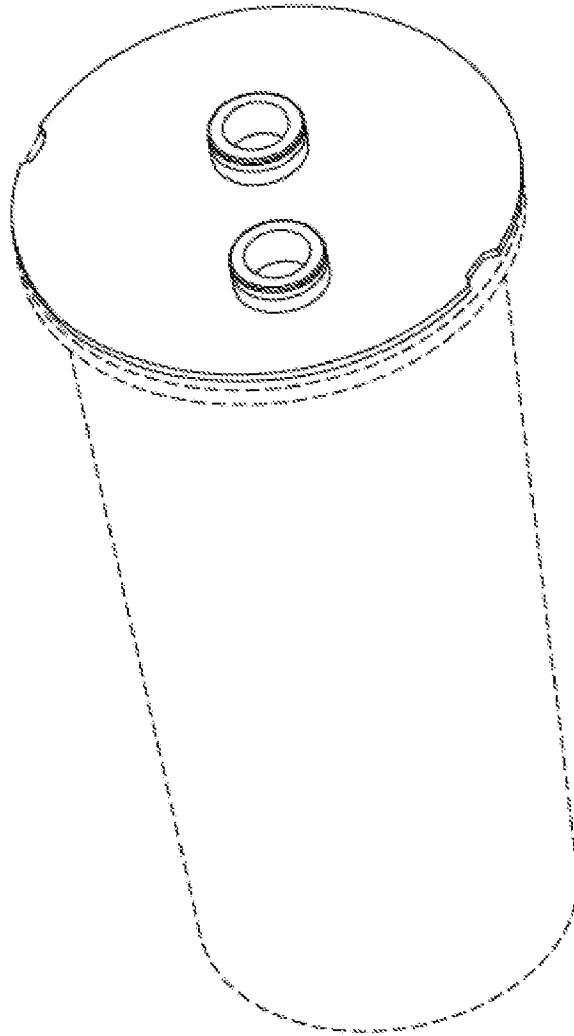


FIGURE 6A

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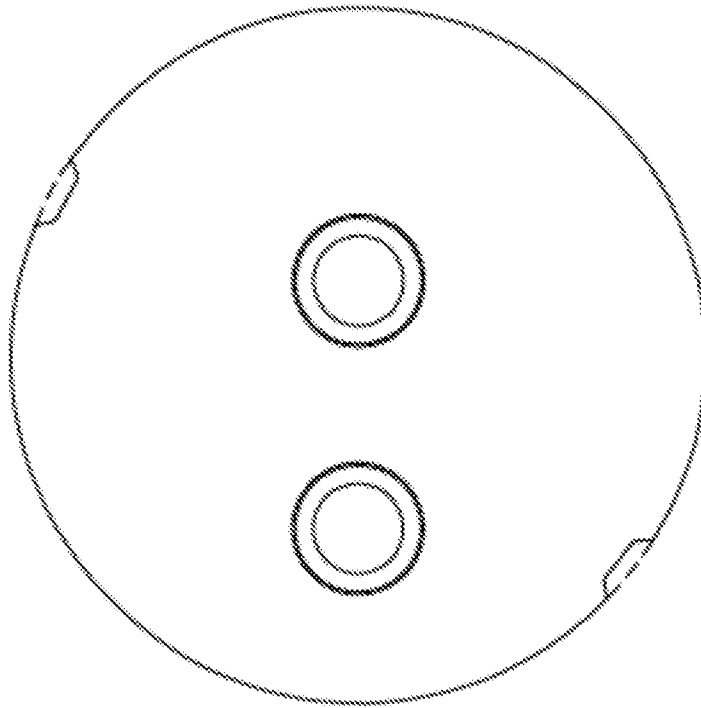


FIGURE 6B

NEW SHEET

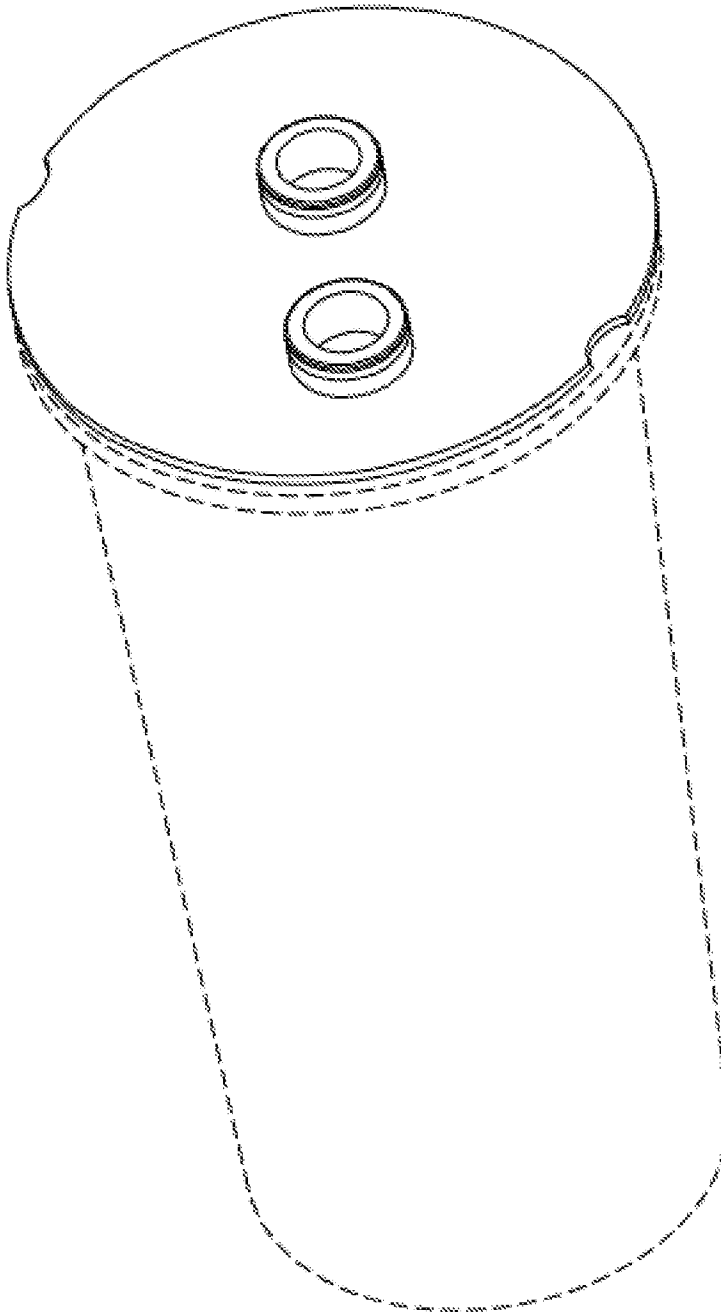


FIGURE 7A

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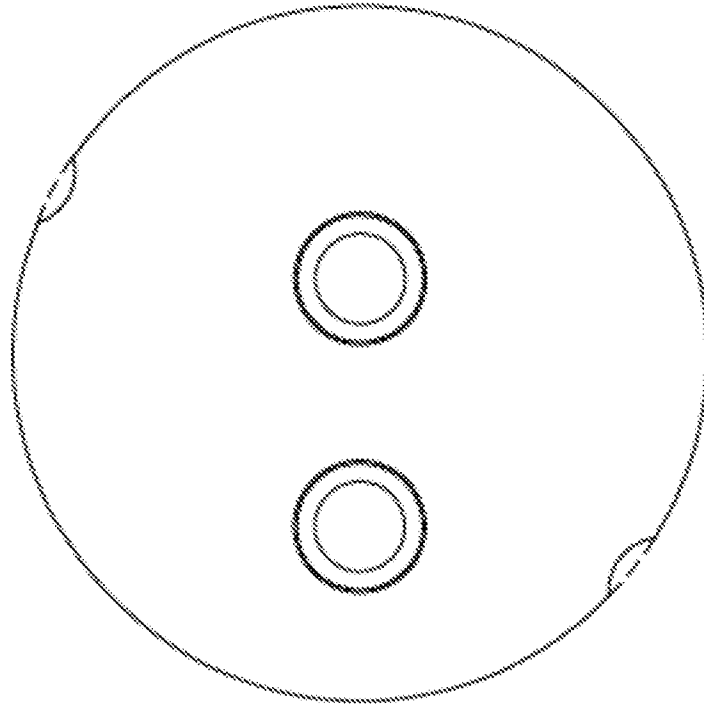


FIGURE 7B

NEW SHEET

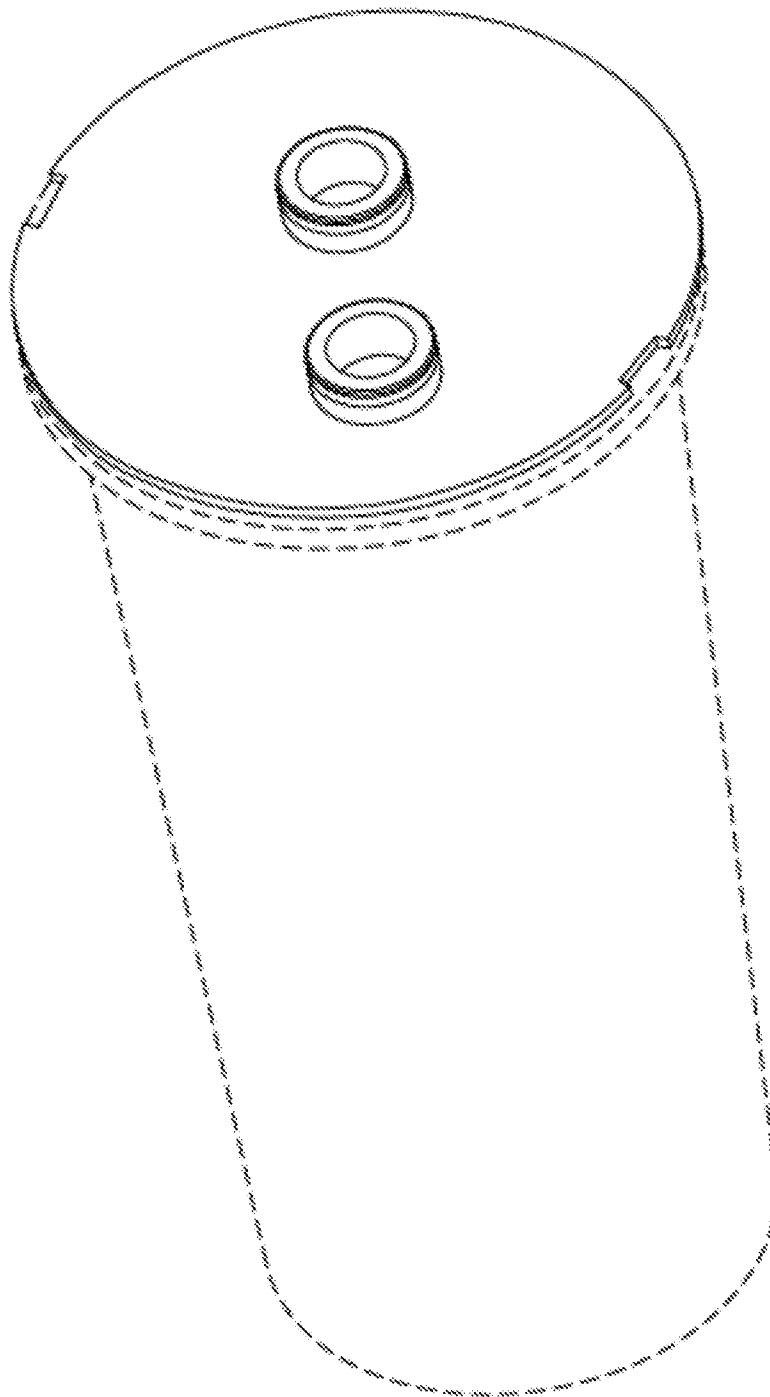


FIGURE 8A

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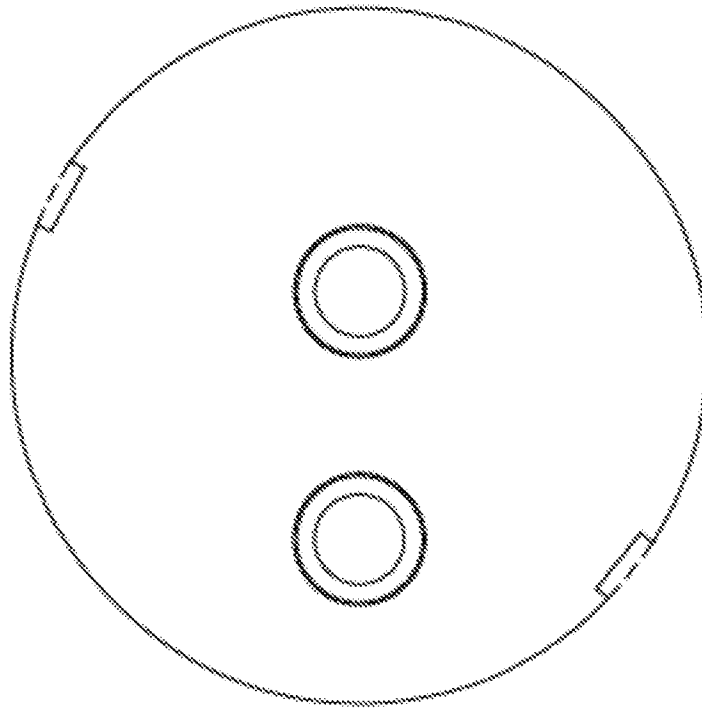


FIGURE 8B

NEW SHEET

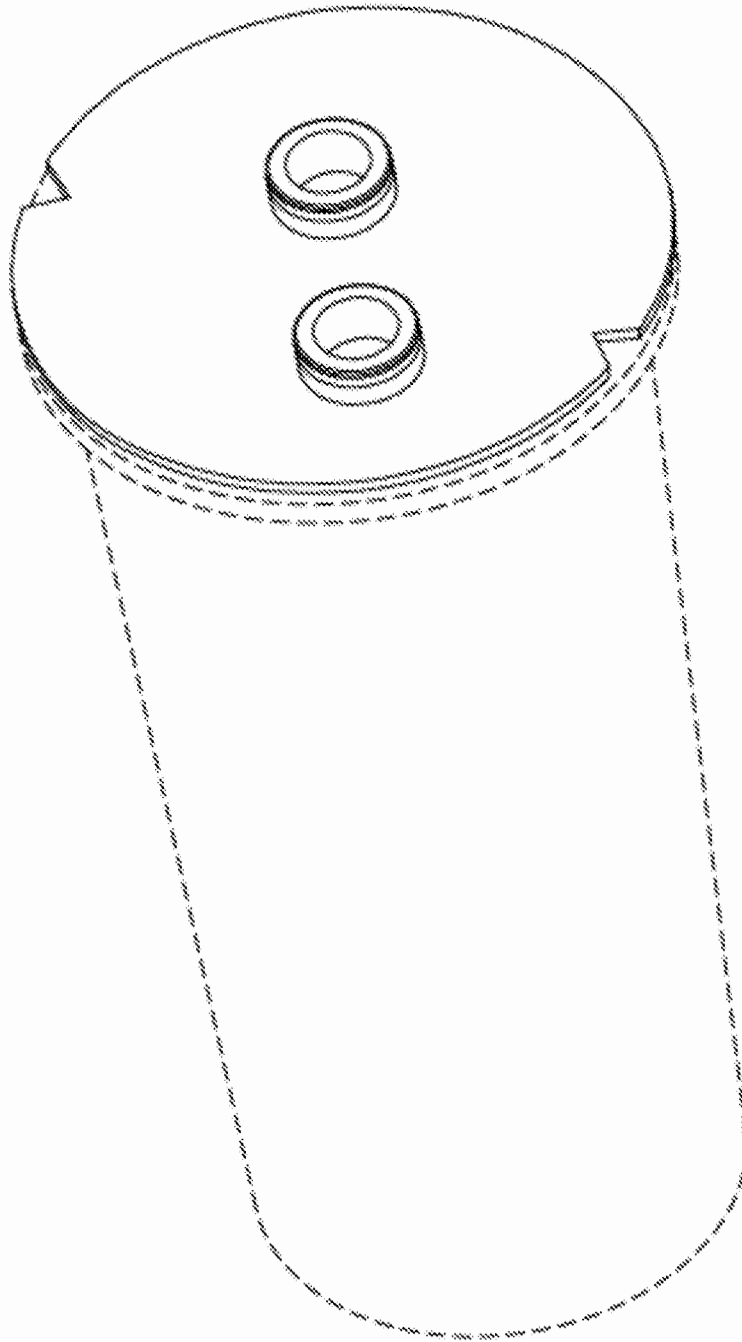


FIGURE 9A

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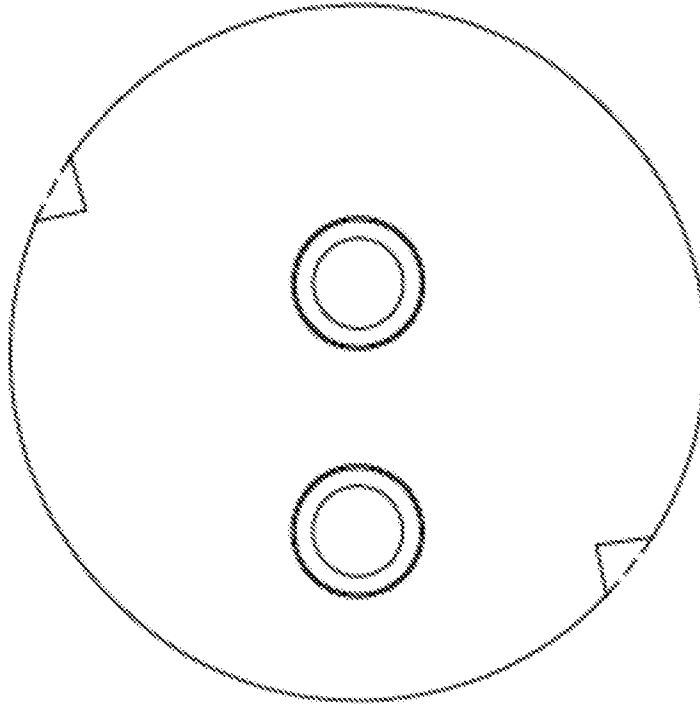


FIGURE 9B

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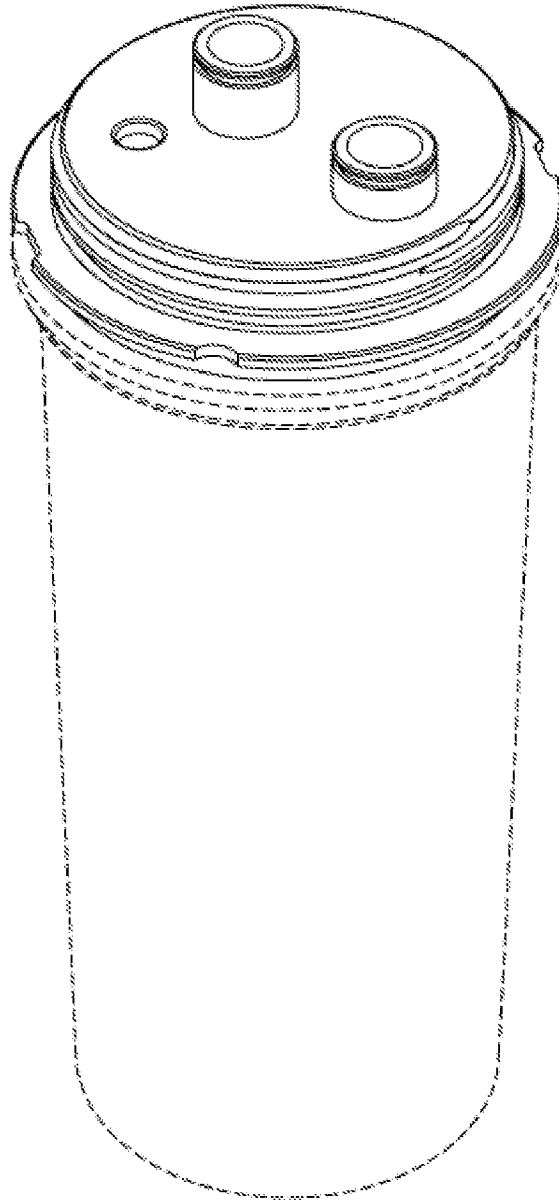


FIGURE 10A

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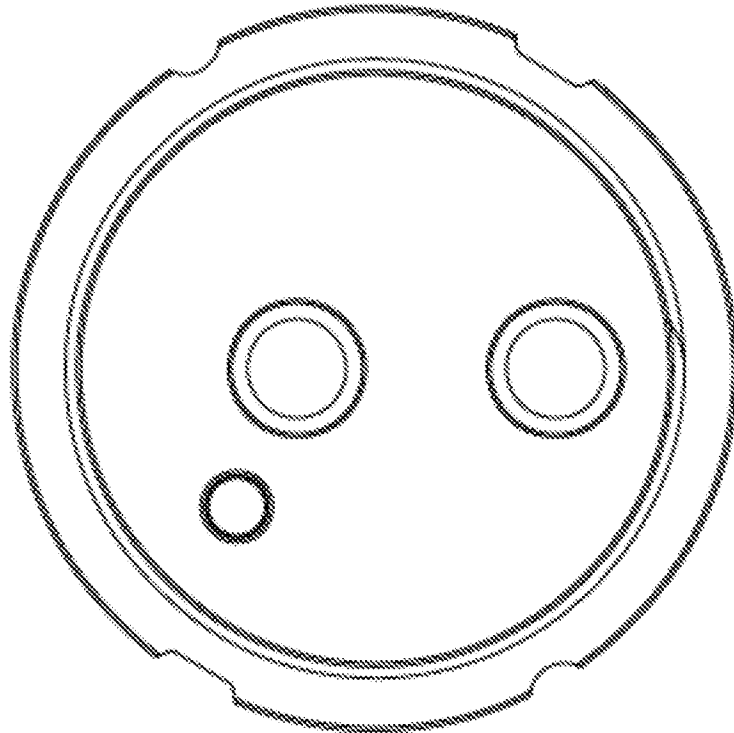


FIGURE 10B

NEW SHEET

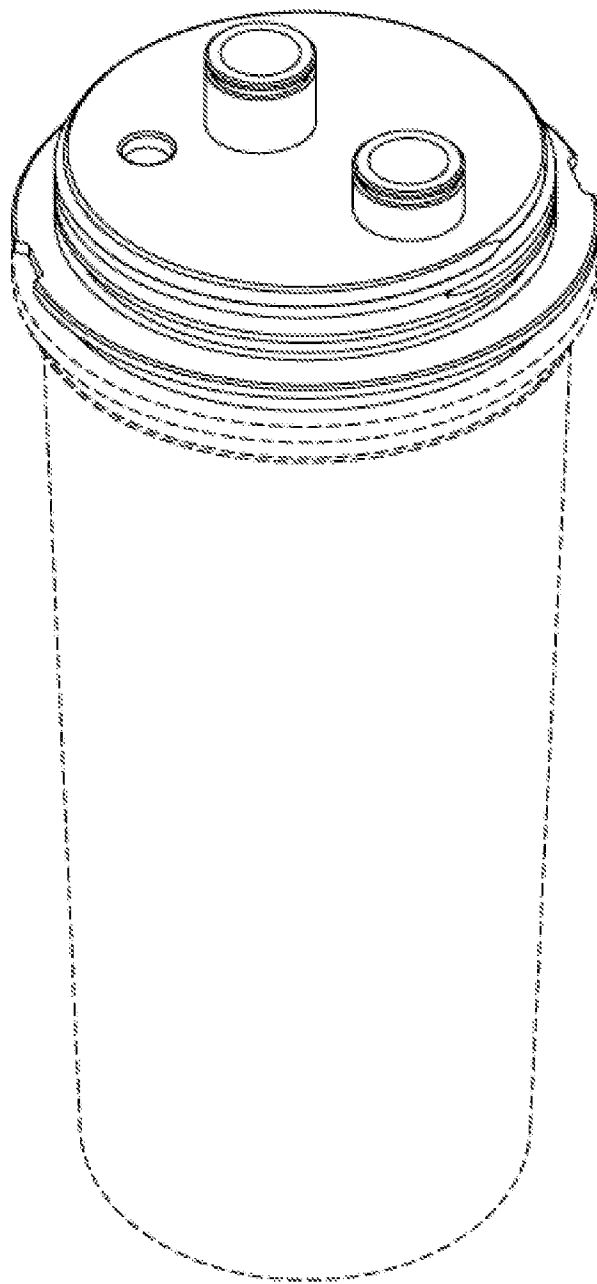


FIGURE 11A

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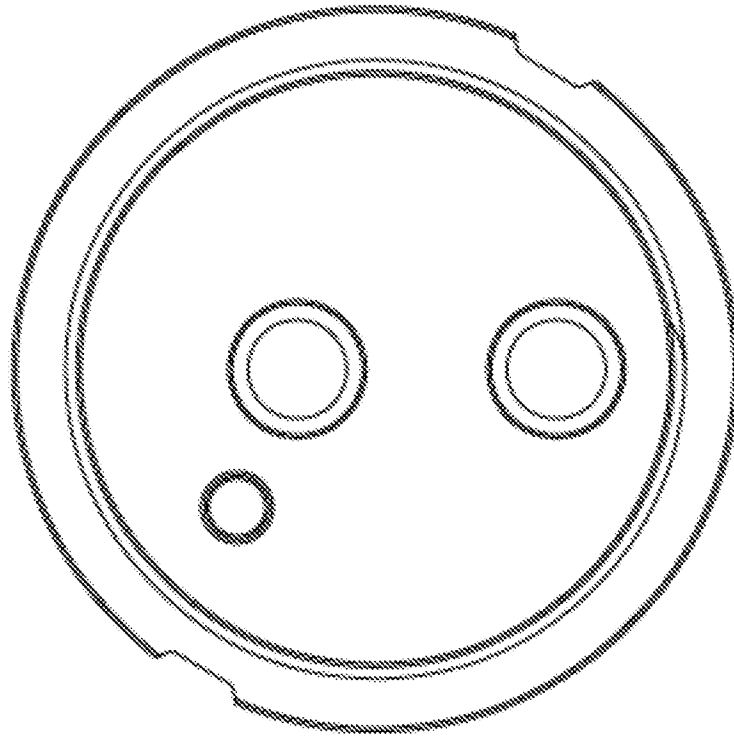


FIGURE 11B

NEW SHEET

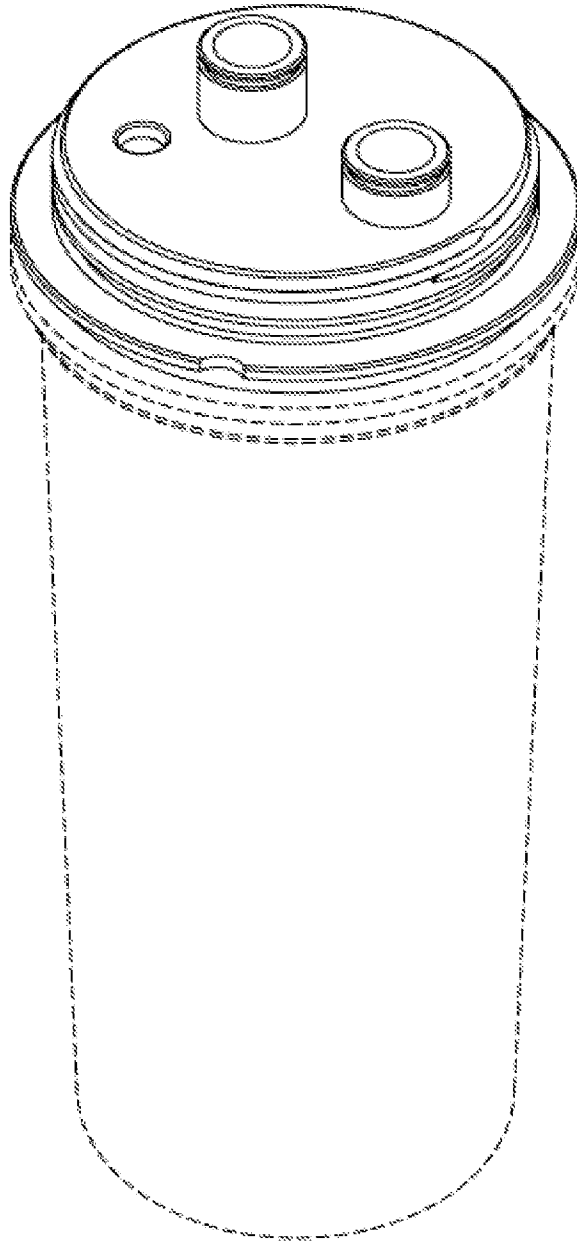


FIGURE 12A

NEW SHEET

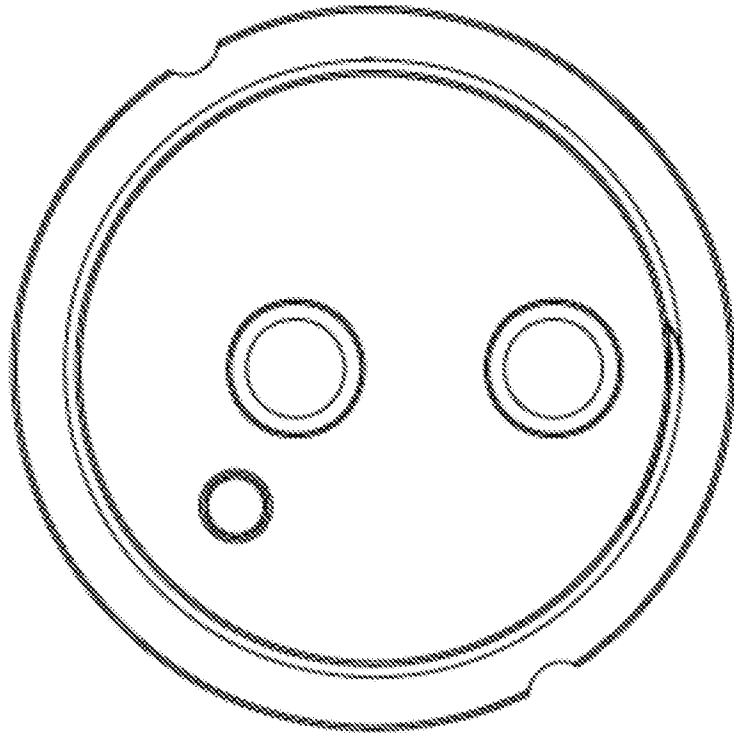


FIGURE 12B

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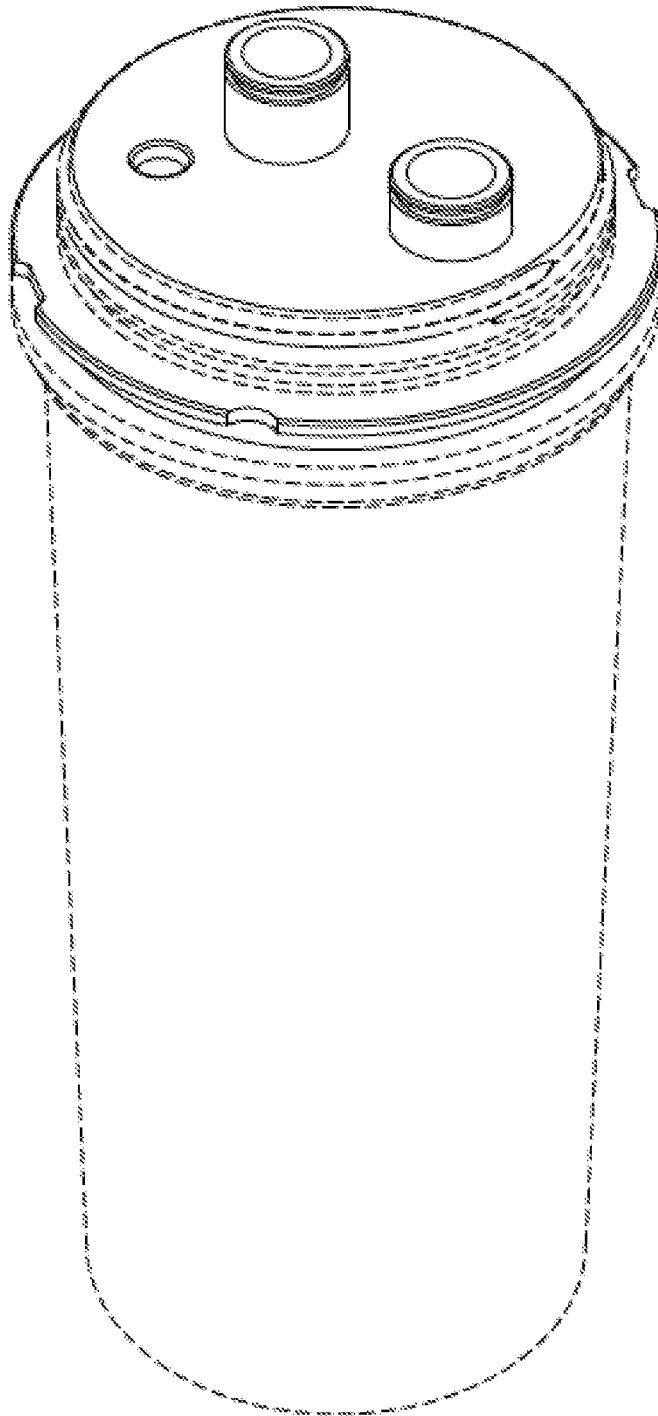


FIGURE 13A

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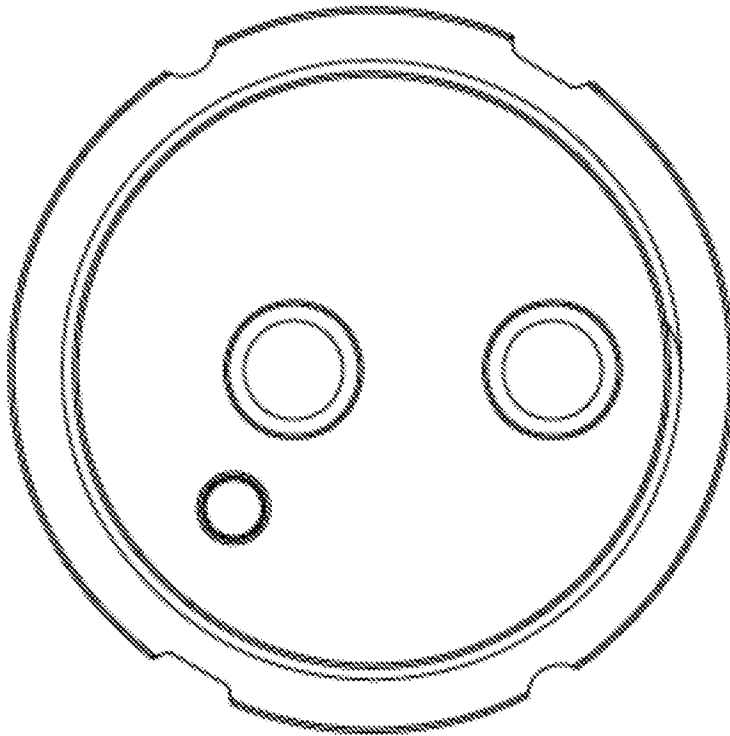


FIGURE 13B

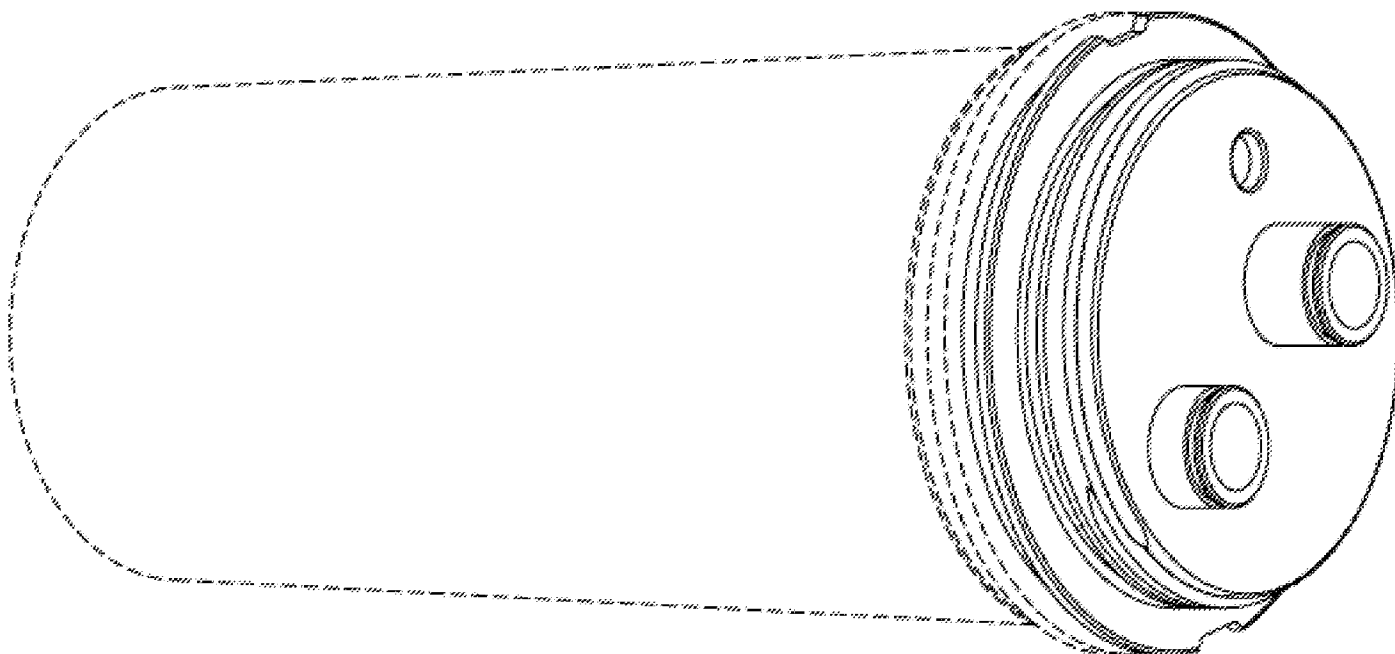


FIGURE 14A

NEW SHEET

NEW SHEET

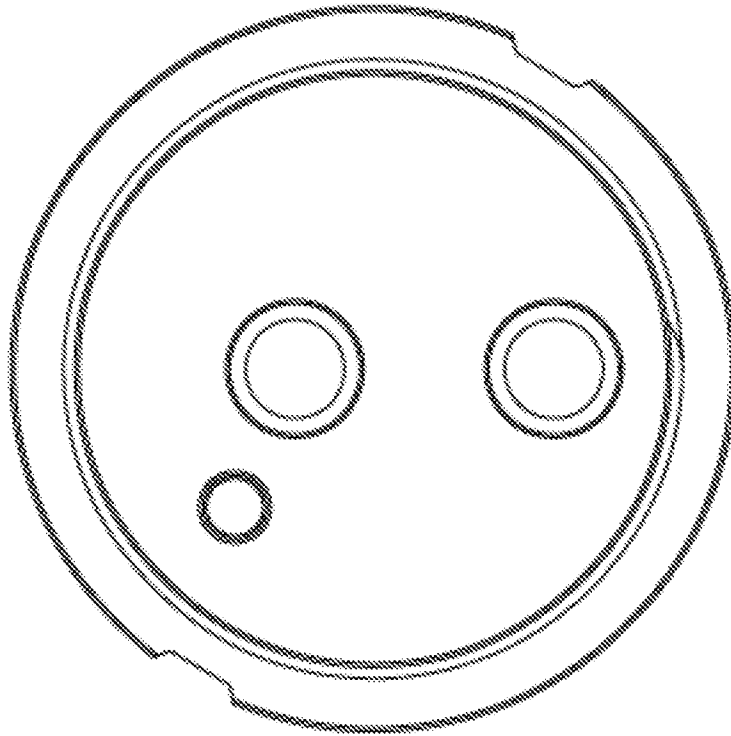


FIGURE 14B

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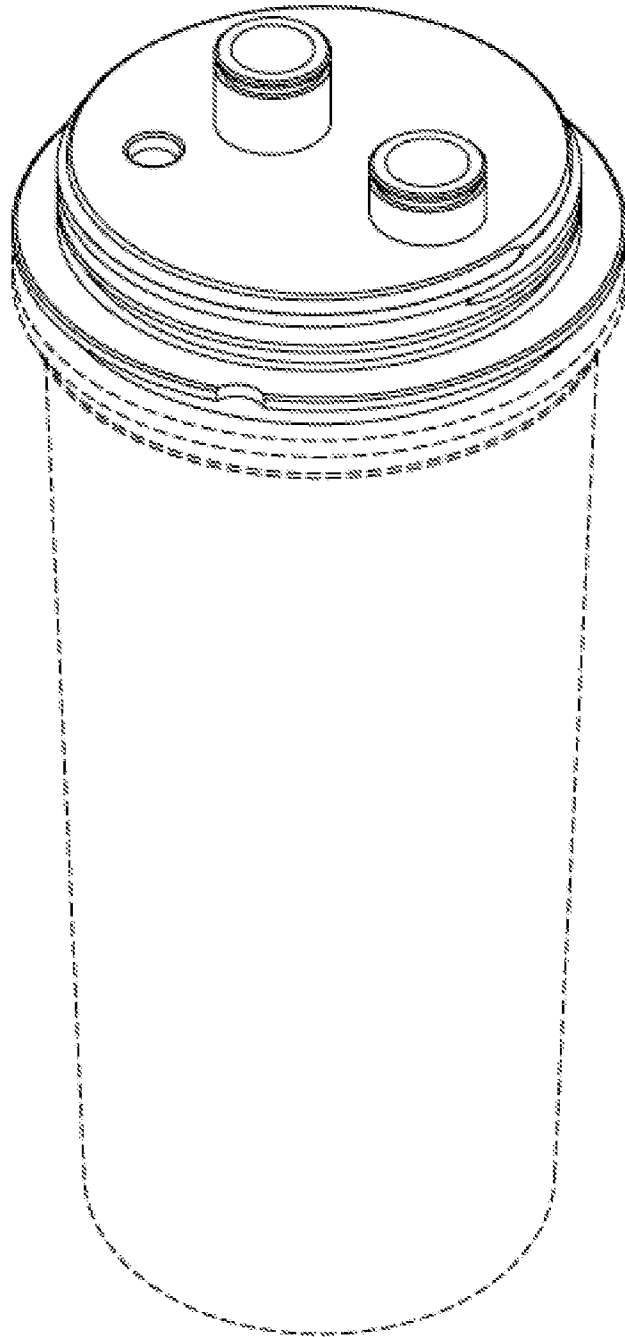


FIGURE 15A

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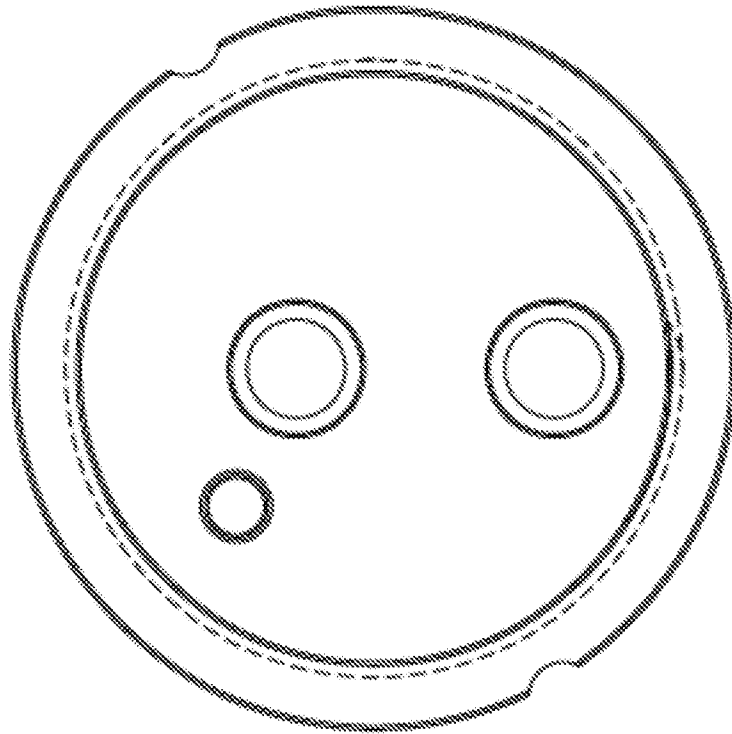


FIGURE 15B

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
MOZZICATTO	)	Examiner: LUCCHESI, Nicholas
	)	
Application No.: 15/730,828	)	Group Art Unit: 3772
	)	
Filed: October 12, 2017	)	Confirmation No.: 9793
	)	
For: DENTAL AMALGAM SEPARATION AND	)	
RECYCLING SYSTEM	)	

DECLARATION UNDER 37 C.F.R. 1.132

I, Robin Schofield, do hereby make the following declaration.

1. I am a co-inventor in the above-referenced application.
2. I have the following degrees and professional certifications:

Bachelor of Science Degree: _Industrial Engineering; Merrimack College

Associates Degree: _Mechanical Design Eng.; Wentworth Institute of Technology

Undergraduate Certificate: _Wastewater Treatment; _University of Massachusetts

Undergraduate Certificate: _Water Treatment; _University of Massachusetts

3. I have over 35 years of professional experience in the field of mechanical design engineering and Project Engineering Management, predominantly in the field of liquid filtration and separation process systems.
4. I am familiar with the claims pending therein, as well as the Office Action mailed on October 4, 2018, in the above application, and the arguments stated therein.

5. I understand that, as presently amended, the invention comprises:

1. A detachable container suitable for mating securely with an air-water separation tank, said detachable container having an outside top mating surface comprising an inlet port and an outlet port; wherein said detachable container further comprises one or more irregular keyways cast into said outside top mating surface;
wherein said air-water separation tank comprises one or more corresponding irregular keys, such that when the irregular keyways of the detachable container are aligned with the corresponding irregular keys on the air-water separation tank, said detachable container is capable of mating securely with said air-water separation tank.

6. In the Office Action, the claims are rejected under 35 USC §112(b), as being indefinite in its use of the term “irregular keyways.” I disagree with this statement. In my experience, the term “keyways” is regularly used in the field of mechanical engineering and is readily understood by one of ordinary skill in the art.

7. The American Society of Mechanical Engineering (ASME) provides guidelines and standards on its website, including one for Keys and Keyways at “ASME B17.1-1967 (R2013) Keys and Keyways,” which provides guidance to the industry for a common understanding of the terms. In my experience, ‘standard’ keys and keyways are nearly always square or rectangular. Hence, in my understanding, any keyway that is not uniformly square or rectangular, such as a slanted rectangle, or rhombus, triangle or a semicircle, would be considered to be an ‘irregular’ keyway.

8. As a further example, the Collins English Dictionary defines “keyway” as:

noun (Mechanical engineering: Machinery and components) A **keyway** is a longitudinal slot cut into a component to accept a key that engages with a similar slot on a mating component ...

The Collins English Dictionary defines “irregular” as:

adjective Something that is **irregular** is not smooth or straight, or does not form a regular pattern.

The above definitions are consistent with the definition of the term “irregular keyways” as described in paragraphs 6 and 7 above. Thus, in my experience and opinion, the present application uses the term “keyway” in its usual meaning in the field of mechanical engineering, and uses the term “irregular” in both its technical and usual meaning to indicate that the keyway is not

predictably located or shaped, so that one would necessarily need to know the shape of the keyway in order to design a component with reciprocal keys that would engage the keyway.

9. As stated in the application:

... said detachable container further comprises one or more irregular keyways cast into said outside top mating surface; said air-water separation tank comprising one or more corresponding irregular keys, such that when the irregular keyways of the detachable container are aligned with the corresponding irregular keys of the air-water separation tank, said detachable container is capable of mating securely with said air-water separation tank.

Application at paragraph [0030].

10. Additionally, I refer to Figures 6 through 15, which have been incorporated by reference into the present application, illustrating several embodiments of the present invention. In each of these embodiments, a detachable container is shown to comprise irregular keyways along the outside of the top mating surface. As shown in these Figures, the keyways may be in various shapes, including, but not limited to, slanted rectangles, semi-circles, rectangles, triangles. Moreover, as shown in the drawings, the placement of the keyways around the top mating surface does not need to be symmetrically aligned with the inlet and outlet ports that are present on the top surface of the container. Thus, one skilled in the art, being familiar with the terms “irregular” and “keyways” as described above, and having read the application and figures, would reasonably have understood the meaning of the term “irregular keyways” as used in the claims of the present application.

11. For at least the above reasons, in my opinion, the Office Action is incorrect in its assertion that the term “irregular keyways” is indefinite. Rather, the term “irregular keyways” is capable of being readily understood by one of ordinary skill in the art.

12. In the Office Action, claims 1 and 4 are further rejected under 35 USC §102(a)(1) as being anticipated by US Patent 4,761,235 (“Haentjens ‘235”). It has been explained to me by the representative for the applicant herein that, in order for a cited prior art document to ‘anticipate’ a claim, that cited prior art document must reasonably disclose every element of the invention that is recited in the claim. As stated in the Manual of Patent Examining Procedures, at ¶2131: “A claim

is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.”

13. In my opinion, the Office Action is incorrect in its assertion that Haentjens anticipates the present invention of claims 1 and 4. Haentjens describes a waste collection device for garbage grinder, essentially a trap that sits underneath a home garbage disposal and accumulates waste. In my experience and professional opinion, one skilled in the art of dental amalgam separators would not look to the art of home garbage disposal units for ideas regarding the design of dental amalgam separators. This is because the two fields are very different in their most basic elements. For example, dental amalgam separators generally use vacuums to provide the medium for transport of dental amalgam waste. In contrast, home garbage disposal units use heavy grinding motors and the flushing action of water from a faucet to provide the medium for transport of home garbage waste. For at least the above reasons, one skilled in the art would not have considered the Haentjens waste collection device to be relevant prior art applicable to the present invention.

14. Even if the home garbage disposal of Haentjens is considered to be relevant prior art, it does not anticipate the invention of claims 1 and 4. As is clearly shown in **Figure 2** of Haentjens, only the waste accumulation container [22] is detachable, while the rest of the disposal shown in **Figure 1** remains in place under the sink. However, this detachable waste accumulation container [22] is distinct from, and lacks several recited elements of, Applicants’ claimed invention. For example, the waste accumulation container [22] of **Figure 2** is not disclosed to have a top mating surface with either an inlet port and an outlet port. Rather the waste collection device of Haentjens is disclosed only to have a “central opening [52]” in a top surface [54] of the container [22]” [column 3, lines 8-10].

15. As is evident from **Figure 2**, the ‘outlet [16]’ of the garbage grinder [12], the ‘outlet [24]’ of the waste collection device [18] and the ‘outlet passage [44]’ of the waste separator [20] do not comprise elements of the detachable waste accumulation container [22]. Rather, these ‘outlets’ are part of the waste collection system that remain in place when the detachable waste accumulation container [22] is removed. Similarly, the ‘inlet [34]’ of the waste separator [20], and ‘inlet conduit [42]’ or ‘inlet passage [42]’ of the waste separator [20] do not comprise elements of the detachable waste accumulation container [22] shown in **Figure 2**. Rather, these inlets are part of the waste

collection system that remain in place when the detachable waste accumulation container [22] is removed.

16. Moreover, the detachable waste accumulation container [22] of Haentjens is not disclosed to have any keyways cast into an outside top mating surface. Because these elements recited in the present claims are entirely missing from the detachable waste accumulation container disclosed in Haentjens, the claimed invention is not anticipated by Haentjens.

17. For at least the above reasons, it is my opinion that the present invention is not anticipated by the waste collection container for a garbage grinder that is disclosed by Haentjens.

18. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 101, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: JANUARY 3, 2019

By: Robin B. Schofield
Robin Schofield

Electronic Acknowledgement Receipt

EFS ID:	34767643
Application Number:	16033823
International Application Number:	
Confirmation Number:	9793
Title of Invention:	Detachable Recycling Container
First Named Inventor/Applicant Name:	Nicholas Mozzicato
Customer Number:	80709
Filer:	Steven R. Lazar
Filer Authorized By:	
Attorney Docket Number:	SMTX-001-T1
Receipt Date:	04-JAN-2019
Filing Date:	12-JUL-2018
Time Stamp:	16:35:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		SMTX-T1- Response_01-04-2019.pdf	124457	yes	11
			8d12b4cb9985e92390ca69a44471bf4f7a 48260		

	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	6	
	Claims		7	7	
	Applicant Arguments/Remarks Made in an Amendment		8	11	
Warnings:					
Information:					
2	Specification	SMTX-001-T1-Substitute_Spec-CLEAN.pdf	615317	no	23
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	:	Examiner: LUCCHESI, Nicholas
MOZZICATTO	)	
	:	Group Art Unit: 3772
Application No.: 16/033,823	)	
	:	Confirmation No.: 9793
Filed: July 12, 2018	)	
	:	
For: DENTAL AMALGAM SEPARATION AND	)	
RECYCLING SYSTEM	:	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO OFFICE ACTION

Sir:

In response to the Office Action, mailed on October 4, 2018, Applicant responds as follows:

1. Applicant submits the following
2. Amendments begin on page 7.
3. Remarks begin on page 8.

IN THE SPECIFICATION:

Applicant submits herewith substantial amendments to the specification, which Applicant considers may render the application difficult to consider. Hence, in addition to setting forth the amendments below, Applicant is submitting herewith a substitute specification, in both marked and unmarked form, as specified in 37 C.F.R. §1.125

On page 1, after the Title, and before “FIELD OF THE INVENTION,” please insert the following paragraph:

- - RELATED APPLICATIONS

[0001] This patent application is a continuation of patent application serial number 15/730,828, filed on October 12, 2017; which claims priority from provisional patent application serial number 62/414,712, filed on October 29, 2016; and provisional patent application serial number 62/406,990, filed on October 12, 2016. This application further claims priority from patent application serial number 29/667,212, filed October 19, 2018, which is a continuation of serial number 29/585,659, filed on November 28, 2016, now patent number D835,778. This patent application further claims priority from patent application serial number 29/585,674, filed on November 28, 2016. This patent application further claims priority from patent application serial number 29/672,887, filed on December 10, 2018, which is a continuation of patent application serial number 29/585,668, filed on November 28, 2016, now patent number D835,779. This patent application further claims priority from patent application serial number 29/577,701, filed on September 14, 2016. This patent application further claims priority from patent application serial number 29/567,544, filed on June 9, 2016. This patent application further claims priority from patent application serial number 29/671,943, filed on November 30, 2018, which is a continuation

of patent application serial number 29/555,622, filed on May 23, 2016, now issued patent D835,264. - -

On page 9, after paragraph [064], which is re-numbered as paragraph [065], please add the following paragraphs:

-- [0066] Figure 6A is a schematic view of a first embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0067] Figure 6B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0068] Figure 7A is a schematic view of a second embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0069] Figure 7B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0070] Figure 8A is a schematic view of a third embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0071] Figure 8B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0072] Figure 9A is a schematic view of a fourth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0073] Figure 9B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0074] Figure 10A is a schematic view of a fourth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0075] Figure 10B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0076] Figure 11A is a schematic view of a fifth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0077] Figure 11B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0078] Figure 12A is a schematic view of a sixth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0079] Figure 12B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0080] Figure 13A is a schematic view of a seventh embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0081] Figure 13B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0082] Figure 14A is a schematic view of a eighth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0083] Figure 14B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0084] Figure 15A is a schematic view of a ninth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0085] Figure 15B is a schematic view of the same embodiment, viewing the top of the container from directly above. - -

On page 13, after paragraph [0100], add the following:

-- [0101] **Figures 6 through Figure 15** show several embodiments of the diagram of the present invention, which include the inlet port and outlet port on the top mating surface, and irregular keyways cast into the outer top mating surface. --

Addition of the above results in a difference in pagination and paragraph numbers throughout the entire application. For this reason, Applicants submit herewith a substitute specification in which the above text has been added, and the pagination and paragraph numbering has been changed.

No new matter is introduced as a result of the above amendments.

AMENDMENTS TO THE FIGURES:

Please add new Figures 6 through 15.

A new complete set of replacement drawings has been submitted, with the drawings indicated to be “Replacement Sheet” or “New Sheet” as applicable. New Figures 6 through 15 have been incorporated from earlier file patent application serial number 29/577,701, filed on September 14, 2016, to which the present application claims priority.

No new matter is introduced as a result of the above amendments and new drawings.

DETACHABLE CONTAINER**RELATED APPLICATIONS**

[001] This patent application is a continuation of patent application serial number 15/730,828, filed on October 12, 2017; which claims priority from provisional patent application serial number 62/414,712, filed on October 29, 2016; and provisional patent application serial number 62/406,990, filed on October 12, 2016. This application further claims priority from patent application serial number 29/667,212, filed October 19, 2018, which is a continuation of serial number 29/585,659, filed on November 28, 2016, now patent number D835,778. This patent application further claims priority from patent application serial number 29/585,674, filed on November 28, 2016. This patent application further claims priority from patent application serial number 29/672,887, filed on December 10, 2018, which is a continuation of patent application serial number 29/585,668, filed on November 28, 2016, now patent number D835,779. This patent application further claims priority from patent application serial number 29/577,701, filed on September 14, 2016. This patent application further claims priority from patent application serial number 29/567,544, filed on June 9, 2016. This patent application further claims priority from patent application serial number 29/671,943, filed on November 30, 2018, which is a continuation of patent application serial number 29/565,622, filed on May 23, 2016, now issued patent D835,264.

FIELD OF THE INVENTION

[002] This invention relates to systems and apparatus suitable to remove particles from effluent waste, and particularly, to remove amalgam and other metallic particles and other abrasive solids from dental office suction effluent. The system also comprises a self-contained detachable container to facilitate customer regulatory compliance and environmental safeguards.

BACKGROUND OF THE INVENTION

[003] Dental amalgam is a dental filling material used to fill cavities caused by tooth decay. It has been used for more than 150 years in hundreds of millions of patients around the world.

[004] Dental amalgam is a mixture of metals, consisting of liquid (elemental) mercury and a powdered alloy composed of silver, tin, and copper. Approximately 50% of dental amalgam is elemental mercury by weight. The chemical properties of elemental mercury allow it to react with and bind together the silver/copper/tin alloy particles to form an amalgam. See <http://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/DentalProducts/DentalAmalgam/ucm171094.htm>, accessed September 9, 2016.

[005] Amalgam is used less often than in the past, mostly because tooth-colored materials now can be used. However, the newer materials can't be used for all dental situations, amalgam is less costly than newer materials and it lasts longer, especially in teeth that undergo a lot of pressure and wear from chewing.

[006] Better dental health overall coupled with increased demand for more modern alternatives such as resin composite fillings (which match the tooth color), as well as public concern about the mercury content of dental amalgam, have resulted in a steady decline in dental amalgam use in developed countries, though overall amalgam use continues to rise worldwide. Stein, PS; Sullivan, J; Haubenreich, JE; Osborne, PB (2005). "Composite resin in medicine and dentistry". *Journal of long-term effects of medical implants*. 15 (6): 641–54. doi:10.1615/jlongtermeffmedimplants. v15.i6.70. PMID 16393132.

[007] Although amalgams are less frequently used in developed countries for new dental fillings than in the past, amalgams continue to make up a portion of the particle component of dental office effluent mainly because of the fact that old fillings made of amalgams are drilled out and removed in the effluent waste when new fillings are effected to replace the old. Further, as noted above, even under current dental practice, an amalgam is preferred for some tooth filling situations.

[008] Because mercury is a poison that can accumulate in living tissues and can pose a health hazard to species in a food chain exposed to mercury-containing compounds, and since

humans are inevitably at the end of the food chain, it follows that effluent containing amalgams can pose a health hazard to the community at large. Also, certain metals such as silver are commercially valuable if recovered in quantity. For those reasons, it is desirable to devise systems, apparatus and processes for removing amalgams from dental office effluent and efficiently recycling those amalgams.

[009] In addition to removing amalgams, other matter disposed into dental office suction effluent includes aluminum oxides used in air abrasion treatments and other solid waste material. These solid materials tend to wear out or damage vacuum pumps and other equipment downstream of the dental chair suction apparatus, and also constitute effluent water contaminants. Therefore, it is desirable for the apparatus to remove solid abrasive material and other particulate waste from the dental office suction effluent.

[0010] The World Health Organization also points out that amalgam separators, installed in the waste water lines of many dental offices, dramatically decrease the release of mercury into the public sewer system. However, critics say that the separators are still not mandatory in some states of the United States. "Purchasing, installing and operating dental amalgam separators: Practical issues". The Journal of the American Dental Association. 134 (8): 1054–65. doi:10.14219/jada.archive.2003.0319. PMID 12956345. Recently, the EPA has enacted nation-wide regulations requiring amalgam separators in dental offices.

[0011] Previously known apparatus for removing amalgam particles from dental office suction effluent are known to include a collecting tank for collecting a day's accumulation of suction effluent from one or more sources of such waste. The waste is sucked from the dental chair suction apparatus and into the collecting tank by a vacuum pump. When the vacuum pump is turned off, an outlet valve is opened and the accumulated waste is deposited into a separation device intended to separate metal particles from the effluent liquid. Flow into the separation device is induced by the head of fluid in the collecting tank. Particles passing through the separation device are separated from the waste by gravity and settle to the bottom of the separation device. The flow rate is dependent on the head inside the collecting tank; as the head diminishes, the flow rate also diminishes. The changes in flow rate are undesirable because the particle separation rate is affected, and the system becomes prone to plugging when the flow rate decreases. Another drawback to such systems are that, since

the waste can be deposited only when the vacuum pump is off, waste is usually moved to the separation device at the end of the day. As a result, the collecting tank and separation device tend to be undesirably large and the whole process is time consuming.

[0012] Another known apparatus is a centrifuge type system that separates heavier metal particles from effluent liquid by collecting the particles at the peripheral wall of the centrifuge. This apparatus does not effectively separate lighter particles, and is expensive to purchase and operate due to the complexity of its mechanical parts.

[0013] Yet another known apparatus uses a dedicated mechanical pump to suction waste liquids through a separator device. Again, a dedicated pump can be expensive to purchase and to maintain, and can be undesirably space-consuming.

[0014] Such known systems can become quite complex, unwieldy and expensive, as for example that disclosed in U.S. Pat. No. 5,885,076 granted 23 Mar. 1999. It teaches the use of sedimentation, co-precipitation and filtration in an expensive complicated apparatus that is probably economical, if at all, only for relatively large installations such as a military base dental complex.

[0015] U.S. Pat. No. 6,692,636 and U.S. Pat. No. 6,592,754 are patents that disclose systems for removing amalgam from dental office suction effluent.

[0016] After collecting the amalgam and other solid waste the dentist is left with the problem of what to do with the waste. Either the dentist has to deal with his own hazardous waste or he can send his collected material to a recycler. In either case, the "collection container" needs to be disposable and easily replaceable.

[0017] Existing recycling programs generally require the provision of bulky shipping materials and the delivery of those materials to the dentist for every full container. If such materials are not provided and the materials are not properly recycled a large part of the benefit of collecting the amalgam waste can be lost. It is important that the waste is recycled under federal guidelines in order to make sure the full benefits of amalgam separation are achieved.

[0018] Additionally, containers for collection, such as dental amalgam recycling systems, can be compromised by incorrect installation or misalignment, which can cause O-rings to deform and/or seal irregularly, and result in leakage.

SUMMARY OF THE INVENTION

[0019] The present invention overcomes many of the shortcomings of the prior technology and achieves further advantages that will be apparent after reviewing the following detailed description.

[0020] In one aspect, the invention comprises a dental amalgam recycling system for recycling particles from a dental liquid effluent drawn from a suctioning device. In certain embodiments, the dental amalgam recycling system of the invention comprises:

[0021] (a) an air-water separator tank for receiving said effluent, said air-water separator tank having an air-water separator tank inlet in fluid communication with said suctioning device, an air-water separator tank liquid effluent outlet and an air-water separator tank air outlet;

[0022] (b) a detachable recycling container, said recycling container acting primarily under the influence of gravity to cause settlement of said particles; said recycling container having a recycling container effluent inlet port connected to said air-water separator tank liquid effluent outlet and said recycling container further having an effluent outlet port;

[0023] (c) wherein the air-water separator tank also includes an internal suction conduit;

[0024] (d) wherein the recycling container comprises threads;

[0025] (e) wherein the recycling container effluent inlet port and the recycling container outlet port of a first height and a second height, respectively, the first height being different from the second height (i.e., are not the same height).

[0026] In certain embodiments, the dental amalgam recycling system further comprises (f) a threaded shipping cap, wherein the threads of the shipping cap and the threads of the recycling container are complementary such that, when the shipping cap is fitted in place, the shipping cap forms a tight seal with said recycling container.

[0027] While in use, the dental amalgam recycling system is functionally associated with a vacuum pump having a vacuum pump inlet. The vacuum pump is typically a pre-existing part of the dental office facility. In particular embodiments, the dental amalgam recycling system is physically connected with a vacuum pump via a suction conduit in the air-water

separator. In certain preferred embodiments, the suction conduit is an internal suction conduit within the air-water separator.

[0028] In certain embodiments, the dental amalgam recycling system of the invention further comprise a first plug for said recycling container inlet port and a second plug for said recycling container effluent outlet port. Said first and second plugs may be held tightly in place by said threaded shipping cap when said shipping cap is fitted in place.

[0029] In certain embodiments, the dental amalgam recycling system of the invention further comprise an O-ring that provides an air and effluent tight seal when said shipping cap is fitted in place.

[0030] In certain embodiments, the invention comprises a container, useful as a dental amalgam recycling container, comprising threads for attachment of a shipping cap. In certain embodiments, the dental amalgam recycling container further comprises two plugs held in place by said shipping cap and an O-ring fitted in an O-ring groove to prevent leaks. The dental amalgam recycling containers of the present invention may further comprise a two tier cap that enables people with hands of different sizes to grip the cap and tighten to achieve a very tight seal.

[0031] Thus in certain embodiments the present invention comprises a detachable container suitable for mating securely with an air-water separation tank, said detachable container having an outside top mating surface comprising an inlet port and an outlet port of a first height and a second height, respectively, wherein the first height is different from the second height; and wherein said detachable container further comprises one or more irregular keyways cast into said outside top mating surface; said air-water separation tank comprising one or more corresponding irregular keys, such that when the irregular keyways of the detachable container are aligned with the corresponding irregular keys of the air-water separation tank, said detachable container is capable of mating securely with said air-water separation tank.

[0032] In certain embodiments, the detachable container further comprises a cap for covering the outside top mating surface and having an inside surface with a first circular wall and a second circular wall, the first circular wall having a height selected to engage an upper

surface of one of the inlet port or the outlet port and the second circular wall having a height selected to engage an upper surface of the other of the inlet port or the outlet port.

[0033] In certain embodiments, the cap has a threaded interior peripheral edge for engaging with a threaded exterior peripheral edge on the detachable container, and threaded engagement of the cap to the detachable container secures the first and second circular walls into engagement with the inlet port and outlet port for sealing the inlet port and the outlet port.

[0034] In certain embodiments, the cap further comprises a circular sidewall extending from the outside top mating surface and defining an interior chamber for the detachable container, the interior chamber being capable of supporting a partial vacuum when the inlet port and outlet port are sealed.

[0035] In certain embodiments, the invention comprises an adapter for an air-water separator tank, wherein the adapter enables a recycling container without compatible effluent ports to attach to an air-water separator tank. Said air-water separator tank may comprise, for example, a component of a dental amalgam recycling system, as described above. In certain embodiments, the adapter may comprise threads. In alternative embodiments, the adaptor may be without threads.

[0036] As described above, the potential for leakage exists in a collection canister such as a recycling container used in the dental amalgam recycling systems described herein. Such leakage may occur, for example, due to incorrect installation, or due to misalignment of a container and its intended mating partner, such as the air-water separation tank or its intended cap, such as a threaded shipping cap, which may cause O-rings to deform and/or seal irregularly. In order to address this problem and/or reduce the potential for leakage, a collection canister, such as a recycling container used in a dental amalgam recycling system, may have one or more irregular 'keyways' cast into its outside top mating surface, and the intended mating partner, such as the air-water separation tank, or the shipping cap, may have one or more corresponding 'key(s)' be cast into its mating surface, such that the key(s) and keyway(s) must be aligned in order for the collection canister (e.g., the recycling container) and its mating partner (e.g., the air-water separation tank; or the shipping cap) to mate properly. This key/keyway system can help ensure even pressure across the entire

circumference of the O-ring surface on each port. Similarly, such key(s) and keyway(s) may be used to ensure proper replacement of the container and/or the air-water separation tank, such that incorrect replacement can be avoided or minimized.

BRIEF DESCRIPTION OF THE DRAWINGS

[0037] FIG. 1 is a schematic front view of an embodiment of particle removal and recycling apparatus according to the invention, for particular use in a dental office.

[0038] FIG. 2 is a schematic side view of an embodiment of particle removal and recycling apparatus according to the invention, for particular use in a dental office.

[0039] FIG. 3 a is a schematic view of an embodiment of a universal adapter for fitting various different sized recycling containers to the air-water separator of the present invention.

[0040] FIG. 3 b is a schematic view of an alternative embodiment of a universal adapter for fitting various different sized recycling containers to the air-water separator of the present invention.

[0041] FIG. 4 a is a schematic view of an embodiment of a recycling container and cap system of the invention.

[0042] Fig. 4 b is a schematic perspective depiction of an embodiment of a recycling container and cap system of the invention.

[0043] FIG. 5 a is a schematic inside view of an embodiment of a recycling cap for the recycling containers of the invention.

[0044] Fig. 5 b is a schematic depiction of a recycling cap according to the invention fitting on a partial view of a recycling container according to the invention.

[0045] 1-Backplate

[0046] 2-Waste Inlet (from dental practice)

[0047] 3-Air/water Separator Top

[0048] 4-Top Support Bracket

[0049] 5-Air/Water Separation Tank

[0050] 6-Suction tube

[0051] 7-Air/Water Separator Base

- [0052] 8-Outlet Tube (to vacuum system)
- [0053] 9-Recycling Container Top
- [0054] 10-Lower Support Bracket
- [0055] 11-Restrictor
- [0056] 12-Detachable Recycling Container
- [0057] 13-Retaining Pins (2)
- [0058] 14- air-water separator tank effluent outlet port
- [0059] 15- recycling container inlet port
- [0060] 16- recycling container outlet port
- [0061] 17- recycling container threads
- [0062] 18- two tier recycling cap
- [0063] 19- O-ring groove
- [0064] 20- cap plugs
- [0065] 21- O-ring
- [0066] Figure 6A is a schematic view of a first embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.
- [0067] Figure 6B is a schematic view of the same embodiment, viewing the top of the container from directly above.
- [0068] Figure 7A is a schematic view of a second embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.
- [0069] Figure 7B is a schematic view of the same embodiment, viewing the top of the container from directly above.
- [0070] Figure 8A is a schematic view of a third embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.
- [0071] Figure 8B is a schematic view of the same embodiment, viewing the top of the container from directly above.
- [0072] Figure 9A is a schematic view of a fourth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.
- [0073] Figure 9B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0074] Figure 10A is a schematic view of a fourth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0075] Figure 10B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0076] Figure 11A is a schematic view of a fifth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0077] Figure 11B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0078] Figure 12A is a schematic view of a sixth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0079] Figure 12B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0080] Figure 13A is a schematic view of a seventh embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0081] Figure 13B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0082] Figure 14A is a schematic view of a eighth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0083] Figure 14B is a schematic view of the same embodiment, viewing the top of the container from directly above.

[0084] Figure 15A is a schematic view of a ninth embodiment of a detachable container according to the present invention, viewing the top of the container at an angle.

[0085] Figure 15B is a schematic view of the same embodiment, viewing the top of the container from directly above.

DETAILED DESCRIPTION WITH REFERENCE TO THE DRAWINGS

[0086] According to one aspect of the instant invention, an apparatus is provided for removing and recycling metal-containing particles and other waste particles from effluent, particularly effluent from a dental office. While herein the term “metal particles” may

frequently be employed, it is contemplated that the apparatus is capable of separating other solid particles from effluent liquid.

[0087] According to one aspect of the invention, an apparatus for removing metal particles and other solid particles from liquid suction effluent can be installed in a dental office using a pre-existing suction/vacuum pump system. The apparatus may share a common vacuum pump with conventional dental chair suction apparatus, without interrupting the use of suction equipment at the dental chairs.

[0088] Removal of solid particles from liquid suction effluent is effected by sedimentation.

[0089] In accordance with a one embodiment of the invention, the dental office suction effluent is passed from dental chair suction equipment outlets to an air water separator tank via a suitable inlet port for the tank. The air-water separator tank in turn passes effluent into a sedimentary deposit tank, closed on all sides when in use and preferably readily detachable for emptying or replacement.

[0090] In certain aspects of the instant invention the sedimentary deposit tank has a secondary function as a recycling container. In another aspect of the invention this recycling container can have features built in to make recycling easier and to reduce the amount of packaging and waste in the recycling system.

[0091] In another embodiment of the invention designed to minimize the space required to install the amalgam recycling system the air-water suction tube is internalized – within the air-water separator tank.

[0092] **Figure 1** and **Figure 2** shows two views of the separation apparatus according to the present invention in detail. Effluent from the dental chairs and a quantity of air are sucked through a suction apparatus exhaust conduit, through an air-water separator tank inlet **2**, and thence into an air-water separator tank **5**. The liquid effluent passes out of the air-water separator tank **5** via air-water separator tank outlet port **14**, while air passes downstream via the air suction tube **6** while maintaining constant vacuum upstream of amalgam separator.

[0093] The air-water separator tank effluent outlet port **14** passes effluent by gravity out of the air-water separator tank **5** and into the detachable recycling container **12** through

the recycling container inlet port **15** for target particle separation by sedimentation. Solids settle and accumulate in the bottom of Recycle container **12**. Liquid content of waste flows primarily by gravity, although intermittently assisted by vacuum through Restrictor **11** which slows the flow rate of liquid to assist in sedimentation process and ultimately “clean” effluent discharge through the recycling container outlet port **16**.

[0094] Outlet ports **16** and inlet port **15** can be a variety of shapes and sizes, square, oval (as depicted), round or even more unusual shapes like a star. Preferred ports are those that provide a tight seal, allow for easy removal, and do not break. Oval or round are preferred embodiments. Round are most preferred.

[0095] A vacuum at the outlet tube **8** is generated when the vacuum pump is operating, thereby sucking air out of the air-water separator tank **5** via suction tube **6** while maintaining vacuum upstream of amalgam separator apparatus. Effluent from the recycling container **12** passes through the restrictor **11** where remaining non-settable fine particles are removed from the effluent and into the recycling container outlet port **16** to be discharged from the apparatus via common outlet tube **8**. Matter sucked by the vacuum pump, generally free of removed solids, is discharged via vacuum pump into a municipal drain of the public sewage system.

[0096] The system is provided with a simple back plate **1** for easy dental office placement as well as removable retaining pins **13** to ensure the recycling container does not detach from the air-water separation tank **5** when there is no vacuum in the system.

[0097] In certain embodiments, the recycling container ports **16** and **15** may be different heights in order to aid in alignment of the detachable recycling container **12** in the air-water separator base **7**. In a preferred embodiment, the outlet port **16** engages before the inlet port **15** while during removal the inlet port **15** disengages first. This causes a small volume of fluid to be pulled out of the collection container back into air-water separator tank **5** creating head space and eliminating upward force of vacuum which eases removal of recycle container **12** by operator. Existing devices require rocking, wiggling or applying extensive down force for removal of recycle container **12**.

[0098] In one preferred embodiment of the invention designed to minimize recycling costs and waste, the recycling container/sedimentary deposit tank has threads **17** built into the container to enable the addition of a liquid tight top for shipping.

[0099] **Figure 3** shows a schematic diagram of an adapter according to the invention to enable the use of recycling containers from a variety of sources that are lacking in correctly shaped ports **16** and **15** or otherwise are unable to fit the air-water separator tank **5** according to the invention due to shape differences.

[00100] **Figure 4 a** shows a schematic diagram of the recycling container and cap system (see **Figure 5** for more cap **18** detail) according to the present invention. The cap **18** is a two tier shape to allow for a tight grip by both a big and smaller hand in order to achieve a strong seal as required by the invention. An O-ring **21** is provided and fits into an O-ring groove on the recycling container **12**. Plugs **20** are used to provide a first leak proof seal for the recycling container **12**. These plugs **20** are held in place by the cap **18** when the cap is threaded onto the recycling container as depicted in **Figure 5b**.

[00101] **Figures 6 through Figure 15** show several embodiments of the present invention, which include the inlet port and outlet port on the top mating surface, and irregular keyways cast into the outer top mating surface.

[00102] Generally, under present practice, the dental staff will not be able to remove deposited sediment from the recycle container nor remove accumulated particle residues from the restrictor unit themselves. Thus, it is desirable that such removal be done by a competent effluent residue processing facility. Therefore, under present practice, it is expected to be preferred that the recycling container with its enclosed restrictor unit be removed when full, or periodically replaced by fresh tanks from time to time as required. The spent tank with an accumulation of metallic and other particles can then be sent to a processing facility for proper disposal of the targeted metallic particles, such as mercury, and recovery of precious metals such as silver.

[00103] Although the sedimentary deposit process is effective to remove a satisfactorily high proportion of the target particles desired to be removed from the effluent, the recycling container desirably includes an outlet restrictor right in the chamber to catch any floating materials as well as any other materials that did not settle out.

[00104] If the recycle container is not changed as required or filled beyond normal capacity, waste liquid from dental practice may back up into air water separator tank. Should this occur, effluent overflows through the air suction tube and into the outlet port and is discharged into the vacuum pump draw line and thence eventually into the municipal drain. However, it is desirable that the system should operate in such a manner as to avoid having the air-water separator tank become completely full, since effluent exiting through the air outlet port will contain particles that will not be separated by the separator. If, however, such a by-pass condition occurs at no time will the suction generated by the vacuum pump be lost or interrupted at the dental office.

[00105] In a further embodiment of the invention oriented towards large-scale institutional applications, in which many dental chairs or other sources of effluent are connected to the same suction and drain services, several parallel-connected recycling containers and associated apparatus, each such composite apparatus including a air-water separator tank and preferably one, or alternatively two attached recycling containers, may be operated in parallel to provide sufficient treatment capacity for large effluent volumes.

[00106] All publications, web-sites, patents and patent applications cited in the specification are hereby incorporated herein by reference in their entirety for the disclosure for which they are cited.

[00107] Having read the above specification, other alternatives and variants of the above described methods and apparatus suitable for practicing the methods will occur to those skilled in the technology. Such alternatives, modifications and variants fall within the scope of the present invention.

[00108] The invention as described above also includes the following non-limiting claims, which describe particular embodiments of the invention.

Claims

1. (Presently Amended) A detachable container suitable for mating securely with an air-water separation tank, said detachable container having an outside top mating surface comprising an inlet port and an outlet port ~~[of a first height and a second height respectively, wherein the first height is different from the second height]~~; and wherein said detachable container further comprises one or more irregular keyways cast into said outside top mating surface;

said air-water separation tank comprising one or more corresponding irregular keys, such that when the irregular keyways of the detachable container are aligned with the corresponding irregular keys of the air-water separation tank, said detachable container is capable of mating securely with said air-water separation tank.

2 (Presently Amended). The detachable container of claim 5 ~~[4]~~, further comprising

a cap for covering the outside top mating surface and having an inside surface with a first circular wall and a second circular wall, the first circular wall having a height selected to engage an upper surface of one of the inlet port or the outlet port and the second circular wall having a height selected to engage an upper surface of the other of the inlet port or the outlet port.

3. (Original) The detachable container of claim 2, wherein

the cap has a threaded exterior peripheral edge for engaging with a threaded peripheral edge on the detachable container, and threaded engagement of the cap to the detachable container secures the first and second circular walls into engagement with the inlet port and outlet port for sealing the inlet port and the outlet port.

4 (Original). The detachable container of claim 1, further comprising

a circular sidewall extending from the outside top mating surface and defining an interior chamber for the detachable container, the interior chamber being capable of supporting a partial vacuum when the inlet port and outlet port are sealed.

5 (New). The detachable container of claim 1, wherein the inlet port is of a first height and the outlet port is of a second height respectively, and wherein the first height is different from the second height.

ABSTRACT

The present invention provides dental amalgam recycling systems, useful for recycling particles from a dental liquid effluent drawn, for example, from a suctioning device.

Figure 1

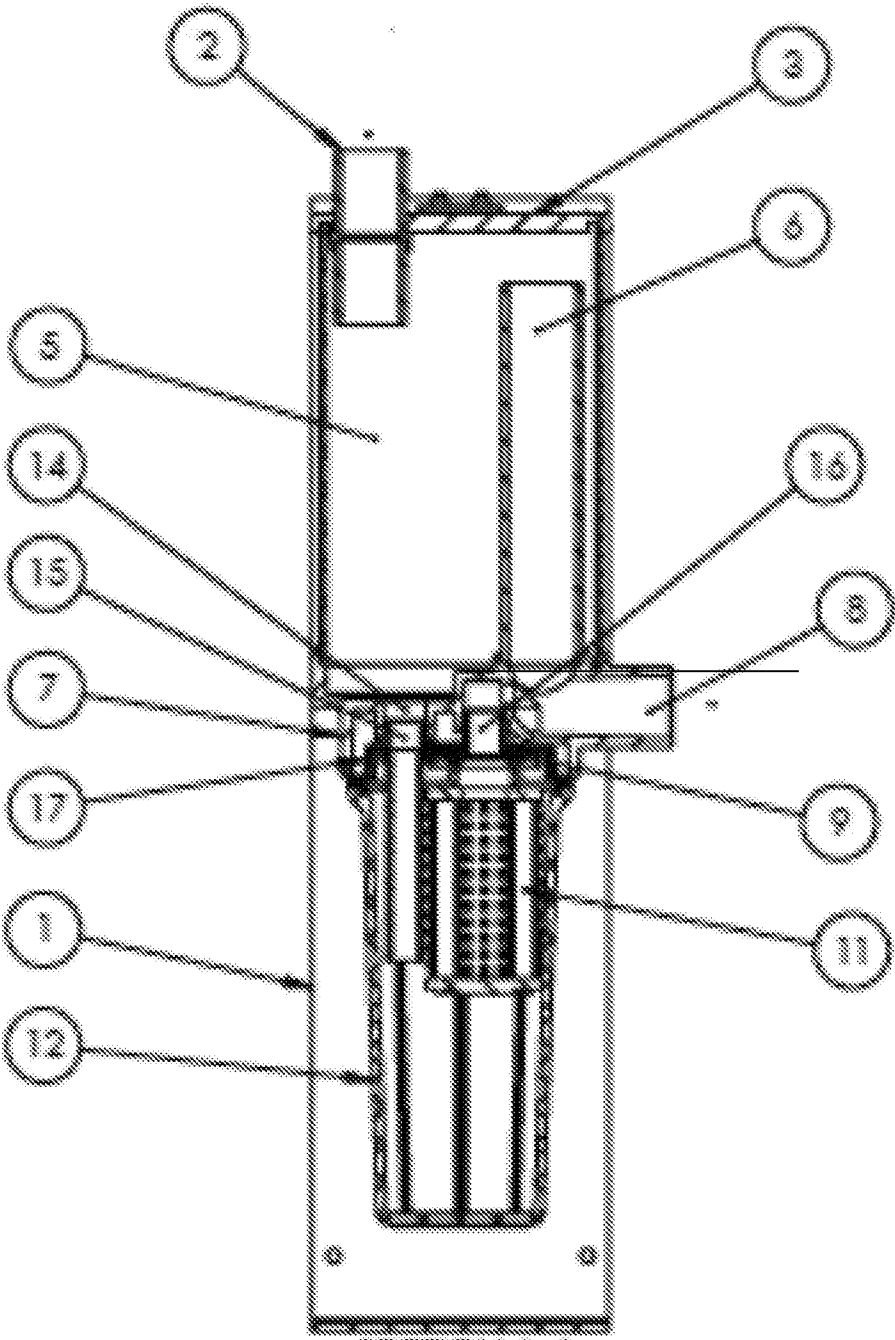


Figure 2

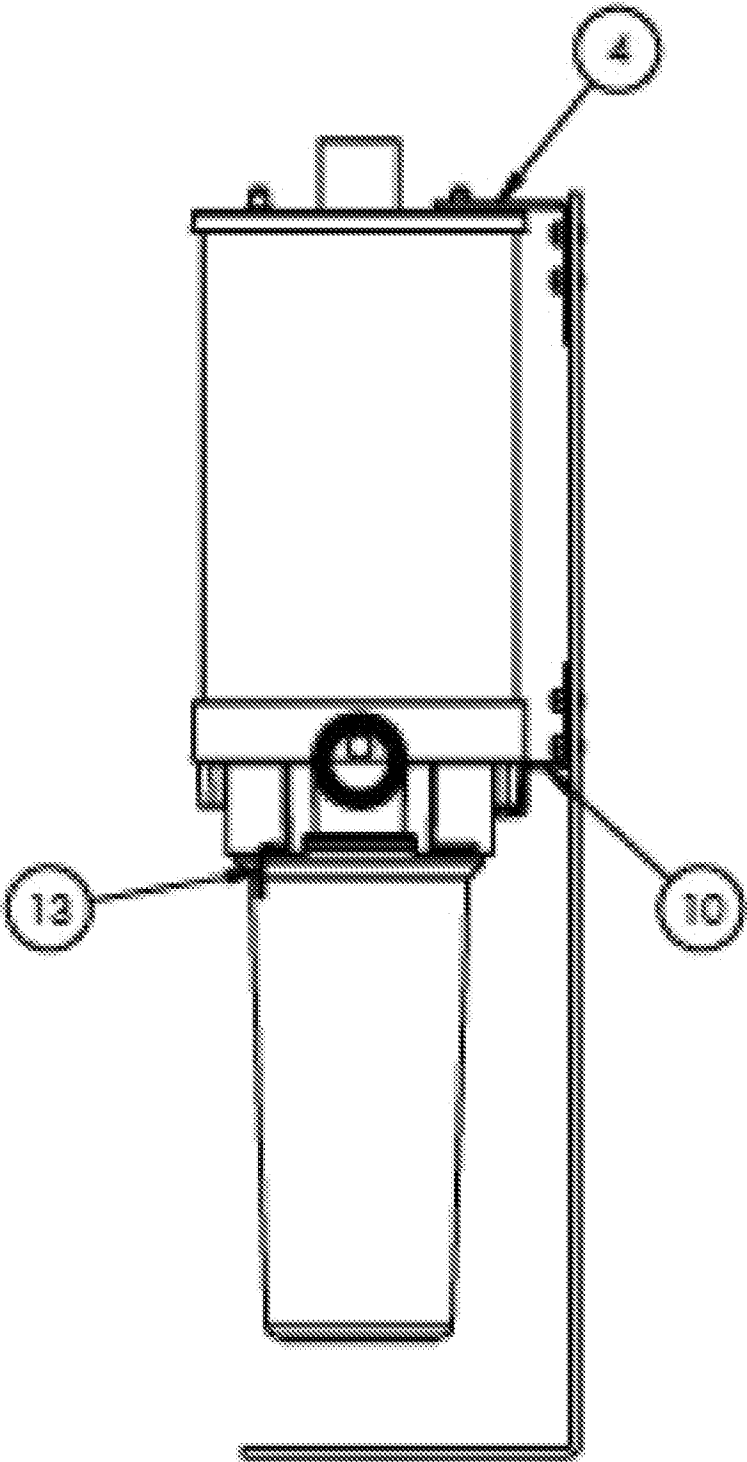


Figure 3a.

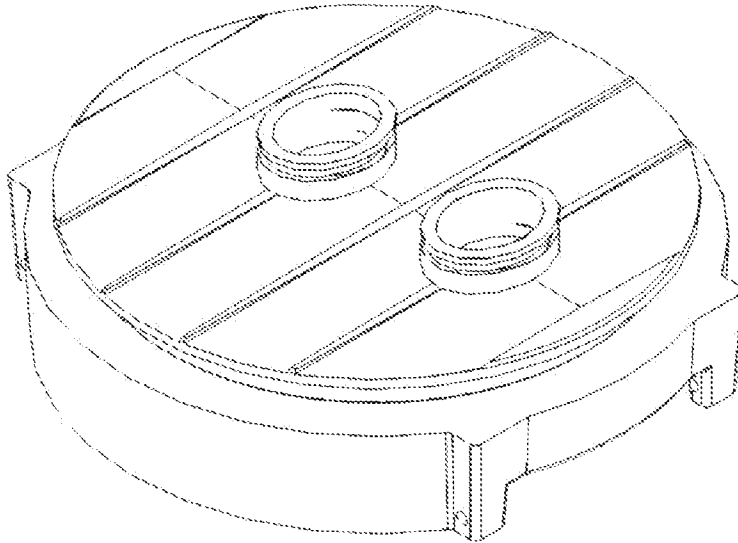


Figure 3b.

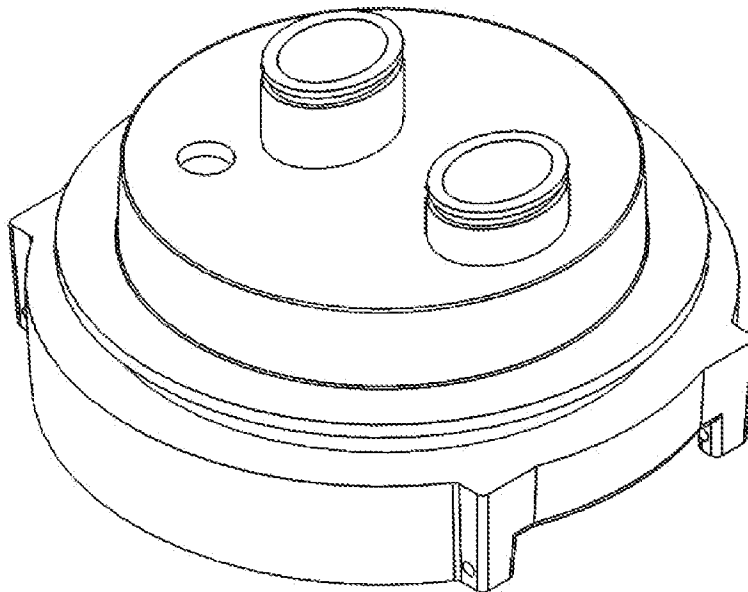


Figure 4a

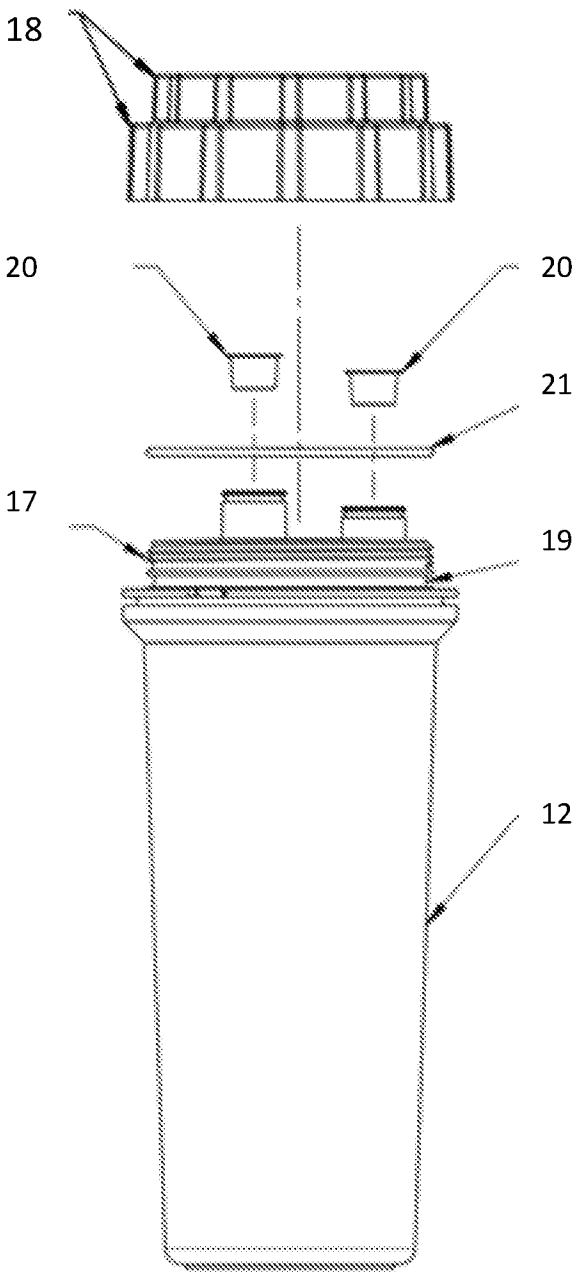


Figure 4b

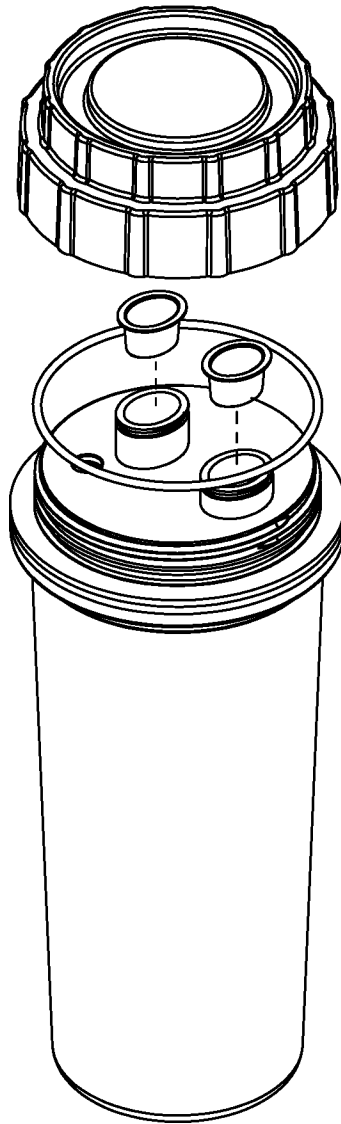


Figure 5a

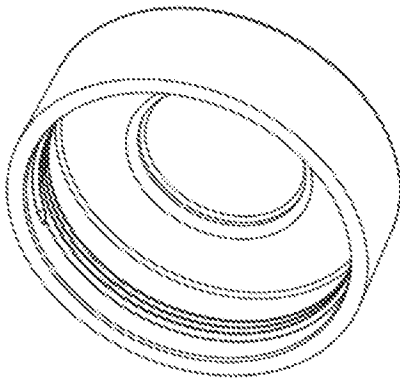
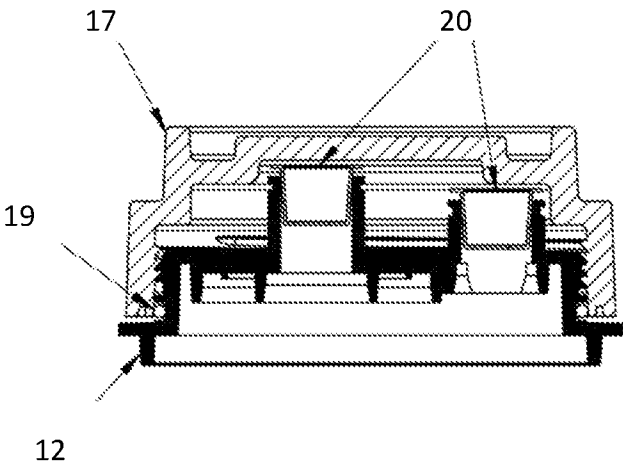


Figure 5b





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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/033,823	07/12/2018	Nicholas Mozzicato	SMTX-001-T1

CONFIRMATION NO. 9793

80709
Steven R. Lazar
SRL Patents
234 Broadway
Arlington, MA 02474

PUBLICATION NOTICE



Title: Detachable Recycling Container

Publication No. US-2018-0338822-A1

Publication Date: 11/29/2018

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <https://portal.uspto.gov/pair/PublicPair>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/033,823	07/12/2018	Nicholas Mozzicato	SMTX-001-T1	9793
80709	7590	10/04/2018	EXAMINER	
Steven R. Lazar SRL Patents 234 Broadway Arlington, MA 02474			LUCCHESI, NICHOLAS D	
			ART UNIT	PAPER NUMBER
			3772	
			NOTIFICATION DATE	DELIVERY MODE
			10/04/2018	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

srlpatents@aol.com

Office Action Summary	Application No. 16/033,823	Applicant(s) MOZZICATO ET AL.	
	Examiner NICHOLAS LUCCHESI	Art Unit 3732	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7/12/18.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

- 5) ☒ Claim(s) 1-4 is/are pending in the application.
5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1-4 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some** c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date 9/27/18
- 3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 4) ☐ Other: ____.

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “irregular keyways” must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. If the “irregular keyways” are the shape of the inlet and outlet ports, separate reference numerals should be added to the drawings (and to the specification) to identify the “irregular keyways”.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of 35 U.S.C. 112(b):

(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Claim 1, lines 4 and 5 are unclear. It is unclear as to what exactly the “irregular keyways are”. It appears, from paragraph 73 of the specification, that the shape of the inlet and outlet ports are the “irregular keyways”, although this paragraph of the specification does not specifically refer to these shapes (oval, star, etc.) as being the “irregular keyways”. For purposes of this action, the “irregular keyways” will be assumed to be the irregular shape of the inlet and outlet ports.

Claim Rejections - 35 USC § 102

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

Claims 1 and 4 are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Haentjens '235.

With regard to claim 1, Haentjens discloses a detachable container 18 (fig.1) for mating securely with an air water separation tank 22. The detachable container 18 having an outside top mating surface comprising an inlet port 34 and an outlet port 24 of a first height and a second height respectively. The first height of port 34 is different from the second height of port 24. The detachable container 18 further comprises one or more corresponding irregular keyways 47 (note flange 47) cast into the outside top mating surface. Note how the keyway 47 aligns with an irregular key 56 (see fig. 2 and fig. 1) of the tank 22, so that the container 18 can mate with the tank 22.

With regard to claim 4, note circular sidewall 20 extending from the top mating surface which defines an interior chamber 42 for the container 18, the interior chamber

Art Unit: 3732

capable of supporting a partial vacuum when the inlet port 24 and outlet port 34 are sealed.

Allowable Subject Matter

Claims 2 and 3 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICHOLAS LUCCHESI whose telephone number is (571)272-4977. The examiner can normally be reached on M-F 7:30-5:00 1st Fri Off.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cris Rodriguez can be reached on 571-272-4964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NICHOLAS LUCCHESI/
Primary Examiner, Art Unit 3732

Notice of References Cited	Application/Control No. 16/033,823		Applicant(s)/Patent Under Reexamination MOZZICATO ET AL.	
	Examiner NICHOLAS LUCCHESI		Art Unit 3732	Page 1 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-54,414 A	05-1866	Name not available	B01D11/043	210/511
*	B	US-1,032,879 A	07-1912	Name not available	B60H1/00485	137/559
*	C	US-2,467,547 A	04-1949	BIRNBAUM SAMUEL L	E03C1/284	210/532.1
*	D	US-4,326,952 A	04-1982	Blake; Gene J.	A61C17/046	210/243
*	E	US-4,385,891 A	05-1983	Ligotti; Eugene F.	A61C17/046	210/249
*	F	US-4,599,170 A	07-1986	Friedman; Denis R.	B01D29/05	210/223
*	G	US-4,761,235 A	08-1988	Haentjens; Kathleen S.	E03C1/266	210/532.1
*	H	US-4,957,621 A	09-1990	Rohloff; Pete	B01D21/0003	210/171
*	I	US-5,114,578 A	05-1992	Sundstrom; Gustaf F.	A61C17/046	210/256
*	J	US-5,484,282 A	01-1996	Trawoger; Werner	A61C17/046	433/92
*	K	US-6,149,812 A	11-2000	Erickson; Roger T.	A61C17/046	210/521
*	L	US-2003/0003417 A1	01-2003	Hubner, Henry	A61C17/046	433/92
*	M	US-2004/0259052 A1	12-2004	Hubner, Henry	A61C17/046	433/92

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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Notice of References Cited	Application/Control No. 16/033,823		Applicant(s)/Patent Under Reexamination MOZZICATO ET AL.	
	Examiner NICHOLAS LUCCHESI		Art Unit 3732	Page 2 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-7,156,214 B2	01-2007	Pradel; Robert	F16F9/466	188/300
*	B	US-7,182,599 B2	02-2007	Stone; Mark E.	A61C17/046	210/420
*	C	US-8,393,898 B2	03-2013	McCary; Charles	A61C17/046	210/446
*	D	US-9,332,969 B2	05-2016	Han; Steve	A61B10/0096	1/1
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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	161	A61C17/04\6.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L2	141	A61C17/14.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L3	325	A61C5/66.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L4	229	A61C2202/00.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L5	918	B01D17/00.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L6	0	B01D21/0006cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L7	526	B01D21/0006.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L8	1311	B01D21/0012.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L9	447	B01D21/0018.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L10	3584	L1 or L2 or L3 or L4 or L5 or L6 or L7 or L8 or L9	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L11	57	L10 and dental and amalgam and separator	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L12	23	L11 and (recycle or recycling)	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L13	14	L12 and (cap or lid)	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L14	3	L13 and (threads or threaded)	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
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L16	1	"6409803".pn.	US-PGPUB;	OR	OFF	2018/09/30 00:30

			USPAT			
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L18	1	"6592769".pn.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L19	1	"20100264074".pn.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
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L22	2	goulston adj2 richard.in.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L23	1	schofield adj2 robin.in.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L24	3	toole adj2 michael.in.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L25	9	dental and amalgam and separator and adaptor	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L26	161	A61C17/0416.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L27	141	A61C17/14.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L28	325	A61C5/66.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L29	229	A61C2202/00.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L30	918	B01D17/00.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L31	0	B01D21/0006cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L32	526	B01D21/0006.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L33	1311	B01D21/0012.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L34	447	B01D21/0018.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L35	3584	L26 or L27 or L28 or L29 or L30 or L31 or L32	US-	OR	OFF	2018/09/30

		or L33 or L34	PGPUB; USPAT			00:30
L36	57	L35 and dental and amalgam and separator	US- PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L37	23	L36 and (recycle or recycling)	US- PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L38	14	L37 and (cap or lid)	US- PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L39	3	L38 and (threads or threaded)	US- PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L40	1	"7156214".pn.	US- PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L41	1	"6409803".pn.	US- PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L42	1	"7156214".pn.	US- PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L43	1	"6592769".pn.	US- PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L44	1	"20100264074".pn.	US- PGPUB; USPAT	OR	OFF	2018/09/30 00:30
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L47	2	goulston adj2 richard.in.	US- PGPUB; USPAT	OR	OFF	2018/09/30 00:30
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L49	3	toole adj2 michael.in.	US- PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L50	9	dental and amalgam and separator and adaptor	US- PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L51	161	A61C17/04\6.cpc.	US- PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L52	141	A61C17/14.cpc.	US- PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L53	325	A61C5/66.cpc.	US- PGPUB; USPAT	OR	OFF	2018/09/30 00:30

L54	229	A61C2202/00.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L55	918	B01D17/00.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L56	0	B01D21/0006cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L57	526	B01D21/0006.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L58	1311	B01D21/0012.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
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L63	14	L62 and (cap or lid)	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L64	3	L63 and (threads or threaded)	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L65	1	"7156214".pn.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L66	1	"6409803".pn.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L67	1	"7156214".pn.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
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L72	2	goulston adj2 richard.in.	US-PGPUB;	OR	OFF	2018/09/30 00:30

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L73	1	schofield adj2 robin.in.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L74	3	toole adj2 michael.in.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L75	9	dental and amalgam and separator and adaptor	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
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L77	141	A61C17/14.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L78	325	A61C5/66.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L79	229	A61C2202/00.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L80	918	B01D17/00.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L81	0	B01D21/0006cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L82	526	B01D21/0006.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L83	1311	B01D21/0012.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L84	447	B01D21/0018.cpc.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L85	3584	L76 or L77 or L78 or L79 or L80 or L81 or L82 or L83 or L84	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L86	57	L85 and dental and amalgam and separator	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L87	23	L86 and (recycle or recycling)	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L88	14	L87 and (cap or lid)	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L89	3	L88 and (threads or threaded)	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L90	1	"7156214".pn.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L91	1	"6409803".pn.	US-PGPUB;	OR	OFF	2018/09/30 00:30

			USPAT			
L92	1	"7156214".pn.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L93	1	"6592769".pn.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L94	1	"20100264074".pn.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L95	15	("0054414" "1032879" "2467547" "4326952" "4385891" "4761235" "4957621" "5114578").PN. OR ("6592769").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/30 00:30
L96	1	mozzicato adj2 nicholas.in.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L97	2	goulston adj2 richard.in.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L98	1	schofield adj2 robin.in.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L99	3	toole adj2 michael.in.	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
L100	9	dental and amalgam and separator and adaptor	US-PGPUB; USPAT	OR	OFF	2018/09/30 00:30
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9/ 30/ 2018 12:37:31 AM
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Search Notes 	Application/Control No. 16033823	Applicant(s)/Patent Under Reexamination MOZZICATO ET AL.
	Examiner NICHOLAS LUCCHESI	Art Unit 3732

CPC- SEARCHED		
Symbol	Date	Examiner
A61C 17/046, 17/14, 5/66, 2202/00: B01D 17/00, 21/0012, 21/0018	9/30/2018	NL

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
Search updated	9/30/2018	NL

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

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Doc code: IDS

PTO/SB/08a (01-10)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 07/31/2012. OMB 0651-0031

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Application Number	16033823
Filing Date	2018-07-12
First Named Inventor	Mozzicato
Art Unit	TBA
Examiner Name	TBA
Attorney Docket Number	SMTX-001-US-T1

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Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
/N.D.L/	1	6592769		2003-07-15	Erickson	
/N.D.L/	2	6409803		2002-06-25	Tremel	
/N.D.L/	3	6592754		2003-07-15	Chilibeck	
/N.D.L/	4	6692636		2004-02-17	Chilibeck	
/N.D.L/	5	7306460		2007-12-11	Hubner	
/N.D.L/	6	4753632		1988-06-28	Duerr Dental	
/N.D.L/	7	5330641		1994-07-19	Cattani	
/N.D.L/	8	5797742		1998-08-25	Fraker	

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Examiner Name	TBA
Attorney Docket Number	SMTX-001-US-T1

/N.D.L/	9	6946069		2005-09-20	Chilibeck	
/N.D.L/	10	5613851		1997-03-25	Trawoeger	
/N.D.L/	11	5795159		1998-08-18	Ralls	
/N.D.L/	12	8636837		2014-01-28	Duerr Dental	
/N.D.L/	13	5018971		1991-05-28	Trawoeger	
/N.D.L/	14	4097381		1978-06-27	Ritzler	
/N.D.L/	15	5421996		1995-06-06	Trawoeger	
/N.D.L/	16	7767079		2010-08-03	Darcy	
/N.D.L/	17	6790038		2004-09-14	Hubner	
/N.D.L/	18	7166214		2007-01-23	Armstrong	

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/N.D.L./	1	20100264074		2010-10-21	Darcy	
/N.D.L./	2	20060065594		2006-03-30	Armstrong	
/N.D.L./	3	20050016913		2005-01-27	Giesel	
/N.D.L./	4	20010047956		2001-12-06	Albiston	
/N.D.L./	5	20140154641		2014-06-05	Bogen	

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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ⁵
/N.D.L./	1	EP1366728	EP		2003-12-03	Bartocci		
/N.D.L./	2	CA2442513	CA		2005-03-23	Barrett		
/N.D.L./	3	WO2018006106	WO		2018-01-11	Ghazaryan		

**INFORMATION DISCLOSURE
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Examiner Name	TBA	
Attorney Docket Number	SMTX-001-US-T1	

/N.D.L./	4	WO1994016643	WO	1994-08-04	Trawoeger		
/N.D.L./	5	WO1983002720	WO	1983-08-18	Horn-Lassen		

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
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Examiner Signature	/NICHOLAS D LUCCHESI/	Date Considered	09/29/2018
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	16033823
Filing Date	2018-07-12
First Named Inventor	Mozzicato
Art Unit	TBA
Examiner Name	TBA
Attorney Docket Number	SMTX-001-US-T1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

- ☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
- ☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Steven R. Lazar/	Date (YYYY-MM-DD)	2018-07-15
Name/Print	Steven R. Lazar	Registration Number	32,618

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		16033823
	Filing Date		2018-07-12
	First Named Inventor	Mozzicato	
	Art Unit	TBA	
	Examiner Name	TBA	
	Attorney Docket Number	SMTX-001-US-T1	

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Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6592769		2003-07-15	Erickson	
	2	6409803		2002-06-25	Tremel	
	3	6592754		2003-07-15	Chilibeck	
	4	6692636		2004-02-17	Chilibeck	
	5	7306460		2007-12-11	Hubner	
	6	4753632		1988-06-28	Duerr Dental	
	7	5330641		1994-07-19	Cattani	
	8	5797742		1998-08-25	Fraker	

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9	6946069		2005-09-20	Chilibeck	
10	5613851		1997-03-25	Trawoeger	
11	5795159		1998-08-18	Ralls	
12	8636837		2014-01-28	Duerr Dental	
13	5018971		1991-05-28	Trawoeger	
14	4097381		1978-06-27	Ritzler	
15	5421996		1995-06-06	Trawoeger	
16	7767079		2010-08-03	Darcy	
17	6790038		2004-09-14	Hubner	
18	7166214		2007-01-23	Armstrong	

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	1	20100264074		2010-10-21	Darcy	
	2	20060065594		2006-03-30	Armstrong	
	3	20050016913		2005-01-27	Giesel	
	4	20010047956		2001-12-06	Albiston	
	5	20140154641		2014-06-05	Bogen	

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	1	EP1366728	EP		2003-12-03	Bartocci		
	2	CA2442513	CA		2005-03-23	Barrett		
	3	WO2018006106	WO		2018-01-11	Ghazaryan		

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4	WO1994016643	WO	1994-08-04	Trawoeger		
5	WO1983002720	WO	1983-08-18	Horn-Lassen		

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Filing Date	2018-07-12
First Named Inventor	Mozzicato
Art Unit	TBA
Examiner Name	TBA
Attorney Docket Number	SMTX-001-US-T1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Steven R. Lazar/	Date (YYYY-MM-DD)	2018-07-15
Name/Print	Steven R. Lazar	Registration Number	32,618

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(11)

EP 1 366 728 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
28.06.2006 Bulletin 2006/26

(51) Int Cl.:
A61C 17/06^(2006.01) A61C 17/14^(2006.01)

(21) Application number: **03010773.4**

(22) Date of filing: **14.05.2003**

(54) Surgical draining apparatus, in particular for a dental surgery

Chirurgische Entleerungsvorrichtung, insbesondere für eine Zahnarztpraxis

Dispositif de vidage chirurgical, en particulier pour un cabinet dentaire

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR**

(30) Priority: **27.05.2002 IT PC20020016**

(43) Date of publication of application:
03.12.2003 Bulletin 2003/49

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Description

[0001] This invention relates to a surgical suction unit designed in particular, but not solely, for use in dental surgeries, which said unit comprises a liquid-ring suction pump associated with a liquid recirculation unit, the latter unit being fitted with a heat exchanger designed to cool the liquid returned into circulation, systems for collection of heavy metal amalgam particles, and a tank designed to collect liquids for recirculation in the pump.

[0002] The unit according to the invention combines the advantages of known liquid-ring systems (high negative pressure values achievable, ability to discharge aspirated fluids continuously), but is not subject to their limitations, especially high water consumption.

[0003] Units designed to aspirate and remove "surgical" fluids and liquids are used in numerous medical applications, and in particular in dental surgeries.

[0004] Units in which a suction pump is connected via pipes to cannulae or other suction devices used at the point of operation are known for this purpose.

[0005] The known systems are substantially divided into three main categories: liquid-ring units, air-ring units and wet-ring units.

[0006] "Liquid-ring" systems involve the use of a centrifugal pump with an impeller immersed in a ring of liquid. An air/liquid separator is located at the pump outlet.

[0007] A unit of this kind is described, for example, in German patent DE 3101954.

[0008] Liquid-ring units offer the advantage that a high negative pressure value can be achieved by the pump which, by creating a high suction speed in the suction cannulae, keeps the operating area and all conveyor pipes clean, even in the presence of large spillages.

[0009] Another advantage is their ability to discharge the aspirated fluids continuously, said fluids being discharged non-stop at positive pressure into the air/liquid separator.

[0010] However, liquid-ring units present the drawback of requiring very high water consumption to maintain the liquid ring around the impeller, and this problem is liable to become increasingly serious in future.

[0011] "Air-ring" systems, which have represented the alternative to the liquid-ring system for decades, comprise a centrifugal air-ring pump to generate the vacuum, and an air/liquid separator installed between the suction points in the operating area and the pump.

[0012] The separator, which operates in the part of the circuit in negative pressure, accumulates the aspirated fluids up to a maximum capacity level, after which it must be discharged, and the pump has to be shut down.

[0013] The system consequently presents the considerable drawback of noncontinuous operation, as well as slow air suction, which constitutes an intrinsic limitation of air-ring pumps.

[0014] A further limitation is the need for regular maintenance of the separator vessel, which requires frequent manual cleaning, with the risk of microbiological contamination of the operators.

ination of the operators.

[0015] The "wet-ring" system, which constitutes a development on air-ring devices, involves the use of a centrifugal air-ring pump combined with a motor-driven centrifugal separator of the liquids conveyed by the current.

[0016] The "wet-ring" system involves the use of a centrifugal air-ring pump combined with a motor-driven centrifugal separator which separates the liquids conveyed by the vacuum current and the solid particles of amalgam, consisting of heavy metals such as mercury, tin, silver, copper, zinc, palladium, indium, etc..

[0017] Some of these units include separate motors for the pump and the liquid and amalgam separator, involving increased costs, energy consumption, size and noise levels.

[0018] In other cases, a single motor is installed.

[0019] However, the problem of low head of air-ring pumps still remains in this version; this means a low transport speed of the fluids in the pipes, stagnation and undrained deposits in the ducts, which requires the suction unit to be over-dimensioned and makes it more complicated to manufacture the vacuum pipes. Moreover, considerable infiltrations of moisture take place, especially in the parts constituting the air-ring pump, leading to problems of condensation, microbiological pollution and chemical aggression in a part of the unit which cannot be washed or sanitised unless it is dismantled.

[0020] A liquid-ring system has also been proposed wherein the pump is connected to a tank which separates the air from the circulating fluids by means of a pipe that recirculates the accumulated liquid.

[0021] However, this system presents the drawback of overheating the liquid, which is continually recirculated by the pump until it reaches such a temperature as to considerably reduce the performance of the pump and the entire system, thus forcing the designer to over-dimension all the components of the installation.

[0022] A further limitation of this system is that the amalgams are separated in decantation vessels located in the suction section upstream of the pump, and this system is unable to retain the smaller particles that travel at high speed, which are deposited in the liquid collection tank and conveyed from there to the outlet filter, which is thus often clogged, so that periodic maintenance of the system is required.

[0023] These drawbacks and limitations are overcome by a surgical suction unit according to the characterising part of the annexed claims.

[0024] The invention will now be described in detail, by way of example but not of limitation, by reference to the annexed figures, wherein:

- figure 1 is a simplified diagram of the suction unit according to the invention;
- figure 2 shows separation devices located at the pump outlet, in cross-section;
- figure 2a shows a variation on the devices illustrated in figure 2;

- figures 3a to 3d schematically illustrate different embodiments of the devices which input the fluids into the pump;
- figure 4 is a view of a unit according to the invention.

[0025] The apparatus according to the invention (see figure 1) substantially consists of three units: an input unit shown as 1, a liquid-ring pump 2 which circulates the fluids, and a unit indicated as 3, which separates the amalgams and liquids from the air.

[0026] The separation unit also comprises a liquid collection tank 4, connected to pump inlet 7 via a pipe 5, to which a heat exchanger 6 is fitted.

[0027] The surgical fluids, air and liquids from the various uses are conveyed from there, through pipes 8, to input unit 1, then to pump 2, and from there to separation unit 3.

[0028] The liquids are then recirculated after suitable cooling, and the surplus is discharged through outlet pipe 9.

[0029] Input unit 1 and separator unit 3 will now be described in more detail.

[0030] Input unit 1 (see figure 3a) comprises a connector 10 connected to pipes which lead to the various points of use, a filter 11 designed to separate the coarser solid parts, and a pipe 12 downstream of the filter, which leads to pump inlet 7.

[0031] Pipe 12 is connected to a well 14 for input of environmental air. Well 14 also leads to a pipe 15 connected to the water network, to which a solenoid valve 16 or the like is fitted, allowing a certain quantity of top-up water to be introduced into the well when necessary if the unit is emptied for maintenance purposes. This solution creates a physical separation between the water network and the device, in order to eliminate all risk of bacterial contamination of the water network.

[0032] A valve of known type 13 is fitted to the connector that leads from well 14 to pump inlet pipe 12, enabling the vacuum in suction pipes 10 leading to the point of use to be regulated.

[0033] Separator unit 3, illustrated in detail in figure 2, is installed downstream of the pump.

[0034] Number 19 indicates the pipe leading from the outlet of pump 2, from which water mixed with air and the particles aspirated at the various points of use arrives.

[0035] Pipe 19 leads to a separator device 20 consisting, for example, of a cyclone or other similar device of known type in which the heavier parts, especially amalgams, are separated after a reduction in the speed of the fluids conveyed from the pump; said parts then drop downwards and are collected on the bottom of a removable tank 21, located below cyclone 20. When tank 21 is full, the accumulated liquids spill over the overfall that separates it from the next tank 25 and flow into that tank, while the heavier parts are deposited on the bottom of tank 21. The air and the lighter parts exit from the upper part of the cyclone, guided by a shaped partition or wall 22, and are conveyed to a second separator shown as

23. This separator is constituted by a set of concentric tubular elements 24 that force the air to perform a series of sudden reversals of the direction of motion, as shown by the arrows in figure 2. These sudden reversals of motion aid the separation of the liquids into aerosols, which collect in a second tank 25, also removable, located under separator 23.

[0036] The air exits from separator 23 through an outlet pipe 26 leading to the exterior; a bacterial filter 27 can be fitted to said pipe if the air is to be recirculated into the premises.

[0037] The filter is shown in figure 2a, which illustrates a separator complex similar to the previous one but fitted with said filter.

[0038] Tank 25, in which liquids from which the solid particles have been almost entirely removed collect, is fitted with an overfall 28 from which the liquid in the upper part of the tank is conveyed to an outlet pipe 29. Sensors 50 of known type detect the level of the solid parts in tank 21 and of the liquids in tanks 21 and 25.

[0039] Recirculation pipe 5, leading to the pump inlet, is connected to a connection 30 in the bottom of tank 25.

[0040] The system operates as follows.

[0041] When pump 2 is switched on, a strong negative pressure is created in pipe 12, as a result of which air is aspirated through pipes 10 leading to the points of use, which said air draws surgical liquids and the various solid particles with it.

[0042] This mixture of fluids and solids is conveyed to the pump, from which it is conveyed to the set of separation units 3.

[0043] By suitably regulating valve 13, suction pipe 12 leading to pump inlet 7 can be placed in communication with well 14 through which environmental air is aspirated, thus allowing the vacuum created by suction in pipes 10 to be regulated as required.

[0044] The necessary amount of water can be introduced into the well when the liquids in the unit need to be topped up; said water flows down into the well and is also aspirated by the pump.

[0045] The configuration illustrated allows physical separation between the water network and the unit, so as to eliminate all risk of countercurrent bacterial migration and prevent contamination of said network.

[0046] Alternatively, as shown in figures 3b, 3c and 3d, a tank of sanitising liquid 6 could be connected to pipe 12 and the pump inlet.

[0047] Sanitising liquid tank 6 can be screwed directly to the body of input unit 1 as illustrated in figure 3b, or may be constituted by a separate can which is always connected to the input unit via suitable pipes fitted with valve devices of known type as illustrated in figure 3d; alternatively, it can be conveyed to the point of input of water from the network, as illustrated in figure 3c.

[0048] In the last two cases a filter, shown as no. 40, can be fitted to the inlet of environmental air suction well 14.

[0049] The fluids and solid particles aspirated by the

pump are then expelled under positive pressure and conveyed to separator unit 3, through pipe 19 (fig. 2).

[0050] Here, the fluids enter cyclone 20, in which their flow rate suddenly slows; the heavier solid parts, especially amalgams of heavy metals, then spill downwards and collect on the bottom of removable tank 21.

[0051] Alternatively, a motor-driven cyclone of known type could be installed instead of cyclone 20; in this case the complex will be configured differently.

[0052] The air, with part of the nebulised liquids, is deviated by wall 22, and conveyed to separator device 23. Here, the abrupt reversals of the direction of motion and variations in speed undergone by the fluid current in order to pass into the cavity between the various tubular elements 24 leads to detachment of the residues, which fall to the bottom and collect in collection tank 25.

[0053] The air, free of liquids and solid particles, can then be conveyed to the exterior through pipe 26, or returned into the premises after being passed through filter 27.

[0054] The liquids arriving from the overfall of tank 21, with the finer solid particles, collect in tank 25, where they are drawn through connector 30 and conveyed along recirculation pipe 5.

[0055] Next, the liquids are cooled in heat exchanger 6, sent back to the inlet of the pump 7, and returned into circulation.

[0056] Any surplus liquid spills over overfall 28 and can be discharged along pipe 29.

[0057] The system described offers numerous advantages compared with the currently known systems.

[0058] The use of a liquid-ring pump as vacuum generator allows high vacuum values to be obtained, with a suitable transport speed of the fluids aspirated through the suction pipes leading from the cannulae; it ensures that all the aspirated fluids pass through the pump, with the advantage of safe transport through a single pipe which can be washed and sanitised without being dismantled, while the discharge of liquids under positive pressure downstream of the pump facilitates their separation and discharge. The characteristics of the input unit ensure effective protection of the water network against contamination because either there is no connection between the two circuits, so transmigration of pollutant microbial colonies in countercurrent is impossible, or the sanitising liquid keeps the pressurised running water input connection sterile.

[0059] The fact that liquids are recovered and recirculated after separation aids aggregation of the microparticles not removed during earlier stages and the formation of larger, heavier precipitates which escape the Brownian motion of suspensions, and are deposited sooner or later in collection tank 21.

[0060] The fact that a heat exchanger cools the liquid returned into circulation maintains constant pump efficiency, and prevents the formation of internal scaling due to precipitation of the salts in the circulating liquids.

[0061] Improvements in the most significant aspects

of sanitary applications are thus achieved at the same time, namely:

- no water consumption for continuous operation;
- a high level of hygiene without maintenance;
- recovery of heavy metals;
- high performance and constant efficiency in continuous service;
- energy saving;
- low noise levels;
- a highly reliable system which is simple to manufacture.

[0062] An expert in the field could devise various modifications and variations, all of which should be deemed to fall within the ambit of this invention.

Claims

1. Surgical suction unit for dental surgeries, **characterised in that** it includes:

- a liquid-ring suction pump (2);
- an input unit (1), upstream of said pump (2), connectable to the various points of use;
- a separator unit (3), downstream of said pump (2), which said separator unit comprises first means (20) designed to separate the solid and liquid particles from the fluids received from the pump, and second means (23) designed to separate the remaining liquids from the air;
- a first tank (21) designed to collect said solid and liquid parts;
- a second tank (25) designed to collect said liquids; and
- means (5) designed to place said second tank in communication with the pump inlet.

2. Surgical suction unit as claimed in claim 1, **characterised in that** an overfall is created between said first and second tanks (21, 25) which allows the liquid present in said first tank to flow into the adjacent tank.

3. Surgical suction unit as claimed in claim 2, **characterised in that** means (6) are installed along the route (5) that connects said liquid and particle collection tank (25) with the inlet of pump (2) to cool said liquid.

4. Surgical suction unit as claimed in claim 1, **characterised in that** said separation means (3) comprise first devices (20) designed to separate the solids and liquids from the air flow and second devices (23) designed to separate the liquids into aerosols, which said first and second devices are arranged in series.

5. Surgical suction unit as claimed in claim 4, **characterised in that**

terised in that said separator (23) which separates the liquids in aerosol form from the expelled air comprises a plurality of concentric pipes (24) with different cross-sectional shapes, designed to impose abrupt reversals and variations of motion on the air flow for the purpose of recovering the condensed liquids.

6. Surgical suction unit as claimed in claim 4 or 5, **characterised in that** it includes tanks (21, 25) for collection of the solids and liquids associated with said first and second separation devices (20, 23) respectively, which said tanks are connected by an overfall. 10
7. Surgical suction unit as claimed in each of the preceding claims, **characterised in that** it includes an inlet unit (1) for the fluids aspirated by the pump, which is fitted with a well (14) communicating with pipe (12) that conveys the aspirated fluids to the pump, means (15, 16) designed to pour water from the water network into said well being fitted. 15 20
8. Surgical suction unit as claimed in claim 7, **characterised in that** it includes adjustable valve means (13) designed to place said well (14) in communication with said aspirated fluid supply pipe (12) to regulate the degree of vacuum in the pipes. 25
9. Surgical suction unit as claimed in each of the preceding claims, **characterised in that** it includes a tank of sanitising liquid (6) connected to the inlet pipe leading to pump (2). 30
10. Surgical suction unit as claimed in each of the preceding claims, **characterised in that** it includes, at the outlet of said pump (2), means (20) designed to slow the speed of the fluids conveyed by the pump to allow separation of the liquids and heavy parts, and means (23), downstream of the preceding ones, designed to separate the liquids in aerosol form from the airflow, each of which separator means is associated with the corresponding collection tank (21, 25), which said tanks are arranged in series and connected by an overfall, a pipe (5) designed to draw liquid from the bottom of said second tank (25) and convey it to the inlet of pump (2) being fitted. 35 40 45
11. Surgical suction unit as claimed in claim 9, **characterised in that** means (6) designed to cool the liquid conveyed to pump (2) are fitted on said pipe (5). 50
12. Surgical suction unit as claimed in claim 10, **characterised in that** said tanks (21, 25) are removable.
13. Surgical suction unit as claimed in claim 11, **characterised in that** it includes level gauges (50) for the solid parts in tank (21) and the liquids in tank (25). 55

Patentansprüche

1. Chirurgisches Absauggerät für Zahnarztpraxen, **gekennzeichnet durch** die Tatsache, dass Folgendes vorgesehen ist:
 - eine Absaugpumpe (2) des Typs eines flüssigen Rings;
 - eine Eingangssperre (1) vor besagter Pumpe (2), anschließbar an den verschiedenen Verwendungspunkten;
 - eine Trenngruppe (3) nach besagter Pumpe (2), wobei besagte Trenngruppe erste Mittel (20) besitzt, die geeignet sind, die festen und flüssigen Teilchen aus den von der Pumpe kommenden Flüssigkeiten abzuscheiden, und zweite Mittel (23), die geeignet sind, die verbleibende Flüssigkeit aus der Luft auszuscheiden;
 - ein erster Auffangbehälter (21) für besagte feste und flüssige Teilchen;
 - ein zweiter Auffangbehälter (25) für die besagte Flüssigkeit; und
 - Mittel (5), die geeignet sind, den besagten zweiten Behälter mit dem Pumpeneingang in Verbindung zu bringen.
2. Chirurgisches Absauggerät gemäß Anspruch 1, charakterisiert durch die Tatsache, dass ein Überlaufwehr zwischen besagtem ersten und zweiten Behälter (21, 25) vorgesehen ist, das geeignet ist, der im ersten Behälter vorhandenen Flüssigkeit zu erlauben, in den benachbarten Behälter zu gelangen.
3. Chirurgisches Absauggerät gemäß Anspruch 2, charakterisiert durch die Tatsache, dass Mittel (6) vorgesehen sind längs der Strecke (5), die den besagten Auffangbehälter (25) für die Flüssigkeiten und die Teilchen mit dem Eingang der Pumpe (2) verbindet, die geeignet sind, besagte Flüssigkeit abzukühlen.
4. Chirurgisches Absauggerät gemäß Anspruch 1, charakterisiert durch die Tatsache, dass besagte Trennmittel (3) erste Vorrichtungen (20) umfassen, die geeignet sind, die festen und die flüssigen Teilchen vom Luftfluss zu trennen, und ferner zweite Vorrichtungen (23), die geeignet sind, die Flüssigkeiten in Aerosol auszuscheiden, wobei besagte erste und zweite Vorrichtungen sind in Serien angelegt sind.
5. Chirurgisches Absauggerät gemäß Anspruch 4, charakterisiert durch die Tatsache, dass besagter Ausscheider (23) der Flüssigkeiten aus der ausgestoßenen Luft in Aerosol eine Mehrzahl von konzentrischen Schläuchen (24) mit verschiedenen Durchmesser umfasst, die geeignet sind, für die Rückgewinnung der kondensierten Flüssigkeiten dem Luft-

fluss plötzliche Umkehrungen und Variationen aufzuzwingen.

6. Chirurgisches Absauggerät gemäß Anspruch 4 oder 5, charakterisiert durch die Tatsache, dass Auffangbehälter (21, 25) für die festen und die flüssigen Teilchen vorgesehen sind, die jeweils mit besagten ersten und zweiten Trennvorrichtungen (20, 23) in Verbindung stehen, da die Behälter durch ein Überlaufwehr verbunden sind.
7. Chirurgisches Absauggerät gemäß jedem der vorhergehenden Ansprüche, charakterisiert durch die Tatsache, dass eine Eingangssperre

(1) für die von der Pumpe abgesaugten Flüssigkeiten vorgesehen ist, die eine Auffanggrube (14) vorsieht, die mit der Zuführleitung (12) zur Pumpe der angesaugten Flüssigkeiten in Verbindung steht, denn es sind Mittel (15, 16) vorgesehen, die geeignet sind, Wasser aus dem Wassernetz in besagte Auffanggrube einzubringen.

8. Chirurgisches Absauggerät gemäß Anspruch 7, charakterisiert durch die Tatsache, dass regulierbare Ventile (13) vorgesehen sind, die geeignet sind, besagte Auffanggrube (14) mit besagter Zuführleitung (12) der angesaugten Flüssigkeiten in Verbindung zu setzen, um die Vakuummenge in den Leitungen zu regulieren.

9. Chirurgisches Absauggerät gemäß jedem der vorhergehenden Ansprüche, charakterisiert durch die Tatsache, dass ein Behälter mit Desinfektionsflüssigkeit (6) vorgesehen ist, der mit der Eingangsleitung zur Pumpe verbunden ist (2).

10. Chirurgisches Absauggerät gemäß jedem der vorhergehenden Ansprüche, charakterisiert durch die Tatsache, dass am Ausgang besagter Pumpe (2) Mittel (20) vorgesehen sind, die geeignet sind, die Geschwindigkeit der aus der Pumpe kommenden Flüssigkeit zu verlangsamen, um die Trennung der Flüssigkeiten und der schweren Teilchen zu erlauben, und ferner Mittel (23) vor den vorherigen, die geeignet sind, die Flüssigkeiten aus dem Luftfluss in Aerosol abzuscheiden, denn jedes der besagten Mittel ist mit einem entsprechenden Auffangbehälter (21, 25) assoziiert, wobei besagte Behälter in einer Reihe angebracht und an ein Überlaufwehr angeschlossen sind und wobei eine Leitung (5) vorgesehen ist, die geeignet ist, Flüssigkeit vom Boden des besagten zweiten Behälters (25) zu entnehmen und zum Eingang der Pumpe (2) zu leiten.

11. Chirurgisches Absauggerät gemäß Anspruch 9, charakterisiert durch die Tatsache, dass auf besag-

ter Leitung (5) Mittel (6) vorgesehen sind, die geeignet sind, die zur Pumpe (2) geleitete Flüssigkeit abzukühlen.

12. Chirurgisches Absauggerät gemäß Anspruch 10, charakterisiert durch die Tatsache, dass besagte Behälter (21, 25) entfernbar sind.

13. Chirurgisches Absauggerät gemäß Anspruch 11, charakterisiert durch die Tatsache, dass Niveaumanzeiger (50) für die festen Teile im Behälter (21) und für die Flüssigkeiten im Behälter (25) vorgesehen sind.

Revendications

1. Appareil d'aspiration chirurgical pour cabinets dentaires, **caractérisé par le fait qu'il prévoit :**

- une pompe d'aspiration (2) du type à anneau liquide;
- un bloc d'entrée (1), en amont de ladite pompe (2), pouvant être relié à différents points d'utilisation;
- un groupe séparateur (3), en aval de ladite pompe (2), ledit groupe séparateur comprenant des premiers dispositifs (20) en mesure de séparer les particules solides et liquides des fluides provenant de la pompe et des seconds dispositifs (23) en mesure de séparer les liquides résiduels de l'air;
- un premier réservoir (21) contenant lesdites particules solides et liquides;
- un second réservoir (25) contenant lesdits liquides et
- les dispositifs permettant (5) de mettre en communication ledit second réservoir avec l'entrée de la pompe.

2. Appareil d'aspiration chirurgical selon la revendication n° 1, **caractérisé par le fait qu'il prévoit un déversoir** entre lesdits premier et second réservoir (21, 25) en mesure de permettre au liquide présent dans ledit premier réservoir de passer dans le réservoir adjacent.

3. Appareil d'aspiration chirurgical selon la revendication n° 2, **caractérisé par le fait qu'il prévoit, le long du parcours (5) qui relie ledit réservoir (25) contenant des liquides et des particules avec l'entrée de la pompe (2), des dispositifs (6) en mesure de refroidir ledit liquide.**

4. Appareil d'aspiration chirurgical selon la revendication n° 1, **caractérisé par le fait que** lesdits dispositifs de séparation (3) comprennent des premiers dispositifs (20) en mesure de séparer les solides et

les liquides du flux d'air et des seconds dispositifs (23) en mesure de séparer les liquides en aérosol, lesdits premiers et seconds dispositifs étant disposés en série.

5. Appareil d'aspiration chirurgicale selon la revendication n° 4, **caractérisé par le fait que** ledit séparateur (23) des liquides en aérosol de l'air expulsé comprend plusieurs tuyaux concentriques (24) de différentes sections, en mesure d'imposer de brusques inversions et variations du flux d'air pour la récupération des liquides condensés. 5
6. Appareil d'aspiration chirurgicale selon les revendications n° 4 ou 5, **caractérisé par le fait qu'il** prévoit des réservoirs (21, 25) contenant des solides et des liquides respectivement associés auxdits premiers et seconds dispositifs de séparation (20, 23), lesdits réservoirs étant reliés par un déversoir. 15
7. Appareil d'aspiration chirurgicale selon toutes les revendications précédentes, **caractérisé par le fait qu'il** prévoit un bloc (1) d'entrée des fluides aspirés par la pompe, qui présente un puisard (14) en communication avec le conduit (12) d'adduction à la pompe des fluides aspirés, sachant que sont prévus des dispositifs (15, 16) en mesure de verser de l'eau provenant du réseau d'alimentation dans ledit puisard. 20
8. Appareil d'aspiration chirurgicale selon la revendication n° 7, **caractérisé par le fait qu'il** prévoit des dispositifs valvulaires réglables (13) en mesure de mettre en communication ledit puisard (14) avec ledit conduit (12) d'adduction des fluides aspirés de façon à régler le degré de vide dans les conduits. 25
9. Appareil d'aspiration chirurgicale selon toutes les revendications précédentes, **caractérisé par le fait qu'il** prévoit un réservoir de liquide désinfectant (6) relié au conduit d'entrée de la pompe (2). 30
10. Appareil d'aspiration chirurgicale selon toutes les revendications précédentes, **caractérisé par le fait qu'il** prévoit, à la sortie de ladite pompe (2) des dispositifs (20) en mesure de ralentir la vitesse des fluides en provenance de la pompe de façon à permettre la séparation des liquides et des particules plus lourdes, et des dispositifs (23) en aval des précédents, en mesure de séparer les liquides en aérosol du flux d'air, chacun desdits dispositifs séparateurs étant associé à un réservoir correspondant (21, 25), lesdits réservoirs étant disposés en série et reliés par un déversoir, sachant qu'il est prévu un conduit (5) en mesure de prélever le liquide dans le fond dudit second réservoir (25) et de le diriger vers l'entrée de la pompe (2). 35 40 45 50 55

11. Appareil d'aspiration chirurgicale selon la revendication n° 9, **caractérisé par le fait qu'il** prévoit, sur ledit conduit (5), des dispositifs (6) en mesure de refroidir le liquide véhiculé vers la pompe (2).

12. Appareil d'aspiration chirurgicale selon la revendication n° 10, **caractérisé par le fait que** lesdits réservoirs (21, 25) sont amovibles.

13. Appareil d'aspiration chirurgicale selon la revendication n° 11, **caractérisé par le fait qu'il** prévoit des indicateurs de niveau (50) des particules solides présentes dans le réservoir (21) et des liquides présents dans le réservoir (25).

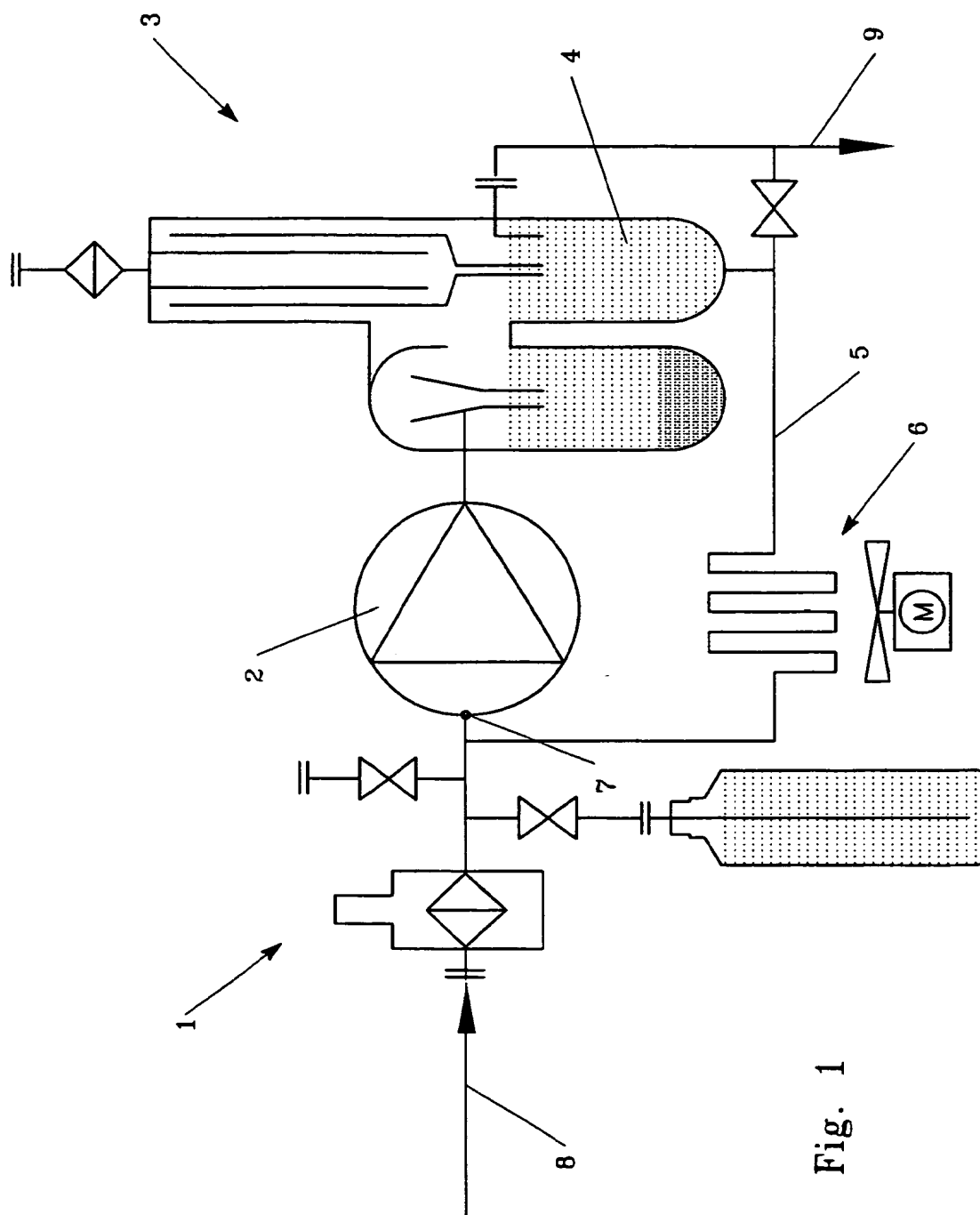


Fig. 1

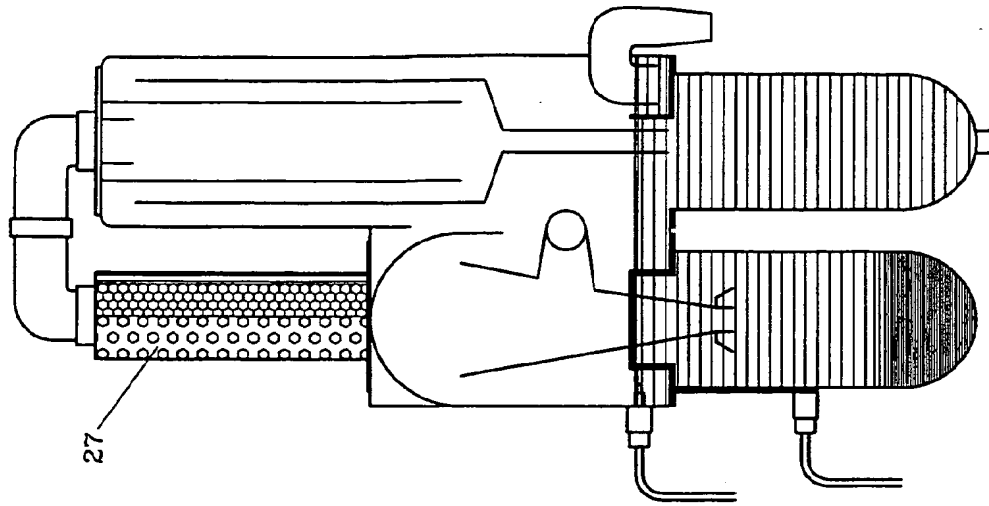


Fig. 2a

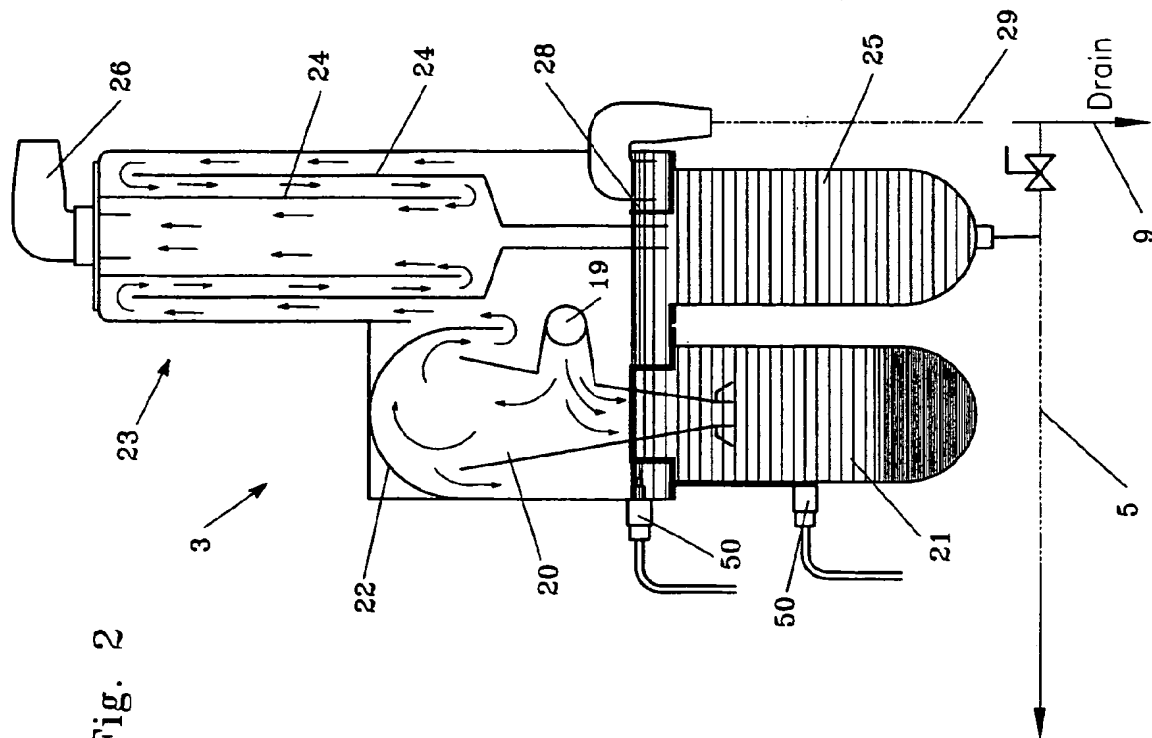


Fig. 2

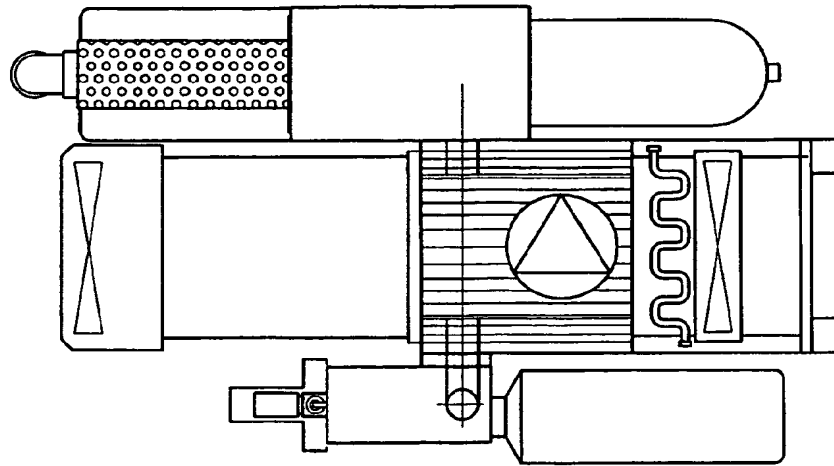


Fig. 4

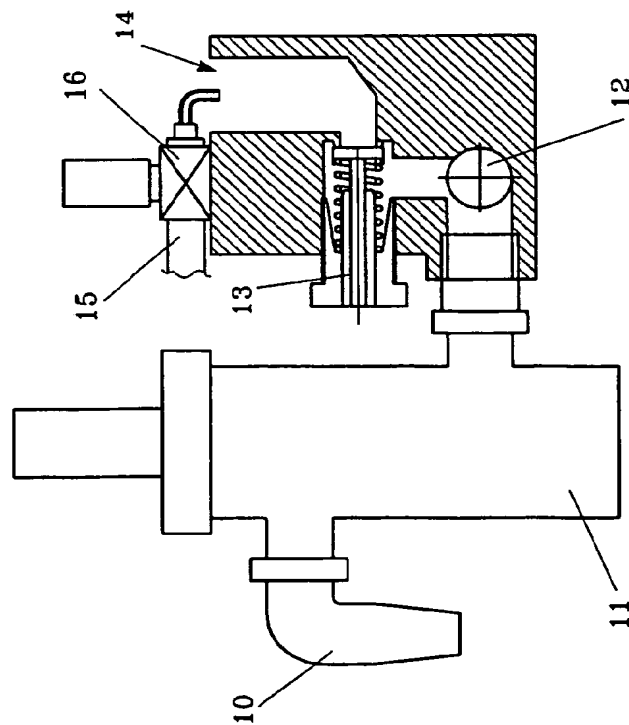


Fig. 3a

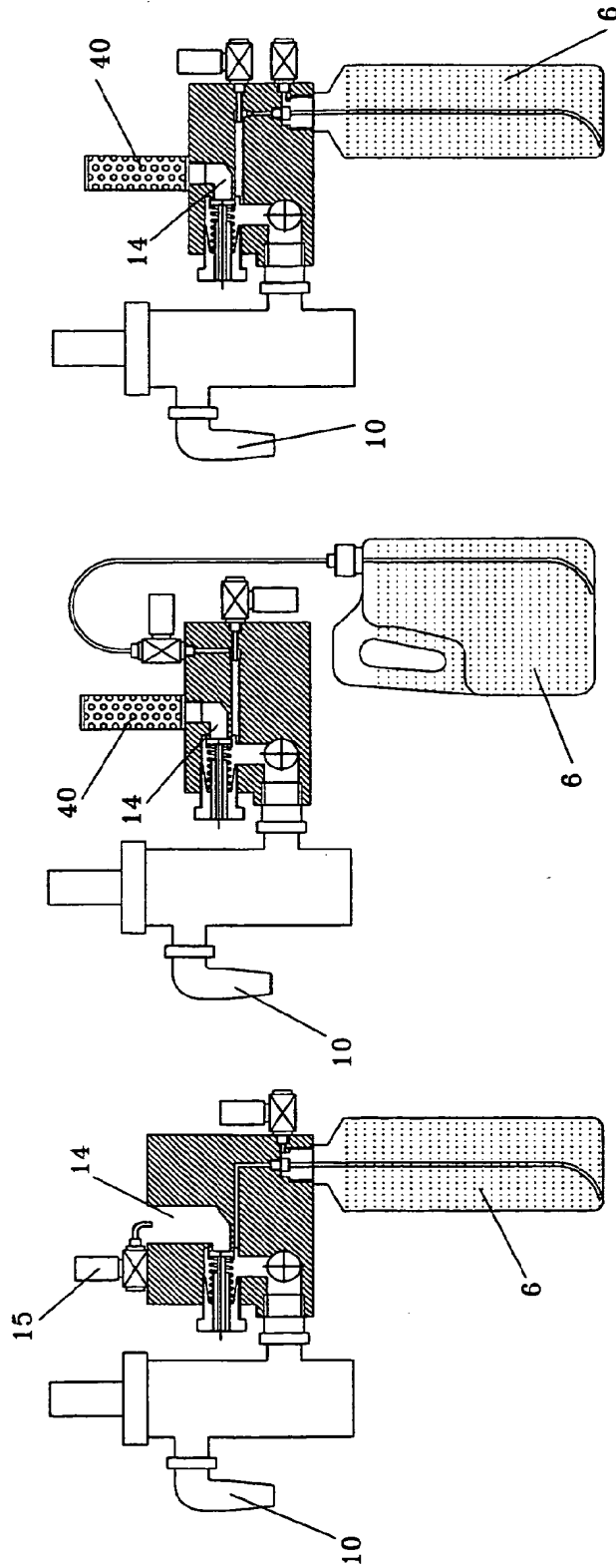


Fig. 3c

Fig. 3d

Fig. 3b

(12)

(21) 2 442 513

(51) Int. Cl. 7: **A61C 19/00**

(22) 23.09.2003

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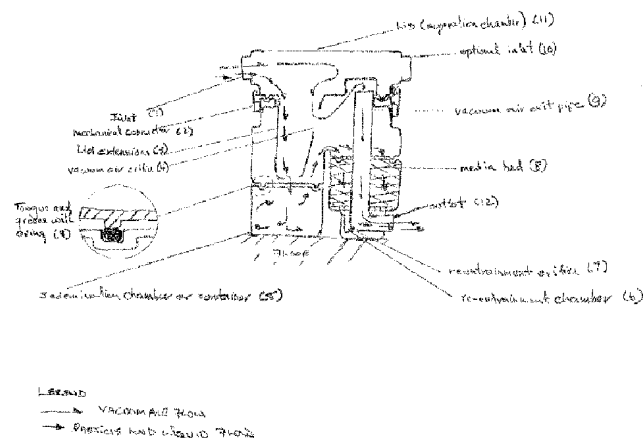
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(54) SEPARATEUR D'AMALGAME

(54) AMALGAM SEPARATOR

(57)

An amalgam separation and collection apparatus for the collecting and separation of amalgam in a dental vacuum waste stream. The apparatus has four primary chambers. The separation chamber is the connection point for the incoming waste flow and once the waste flow has entered the apparatus, the separation chamber allows the division of waste stream into vacuum air and water particle amalgam. The vacuum air is permitted to flow through the unit via vacuum exhaust tube and is unobstructed. The water/amalgam mixture is deposited from the separation chamber into the sedimentation chamber. Separation by sedimentation occurs in this chamber causing the larger amalgam particles to settle to the container base while the cleaner water raises and water falls under gravity into the filtration chamber. The wastewater with trace amalgam passes through a heavy metal removal bed in the filtration chamber. The purified amalgam free water collects in water re-entrainment chamber located at the base of the filtration chamber. The collected water is introduced to the vacuum air via an orifice in the vacuum exhaust tubing. A tube is connected to dental office vacuum pump permitting function. The amalgam waste is retained in two removable chambers namely the sedimentation and filtration chambers.





(22) Date de dépôt/Filing Date: 2003/09/23

(41) Mise à la disp. pub./Open to Public Insp.: 2005/03/23

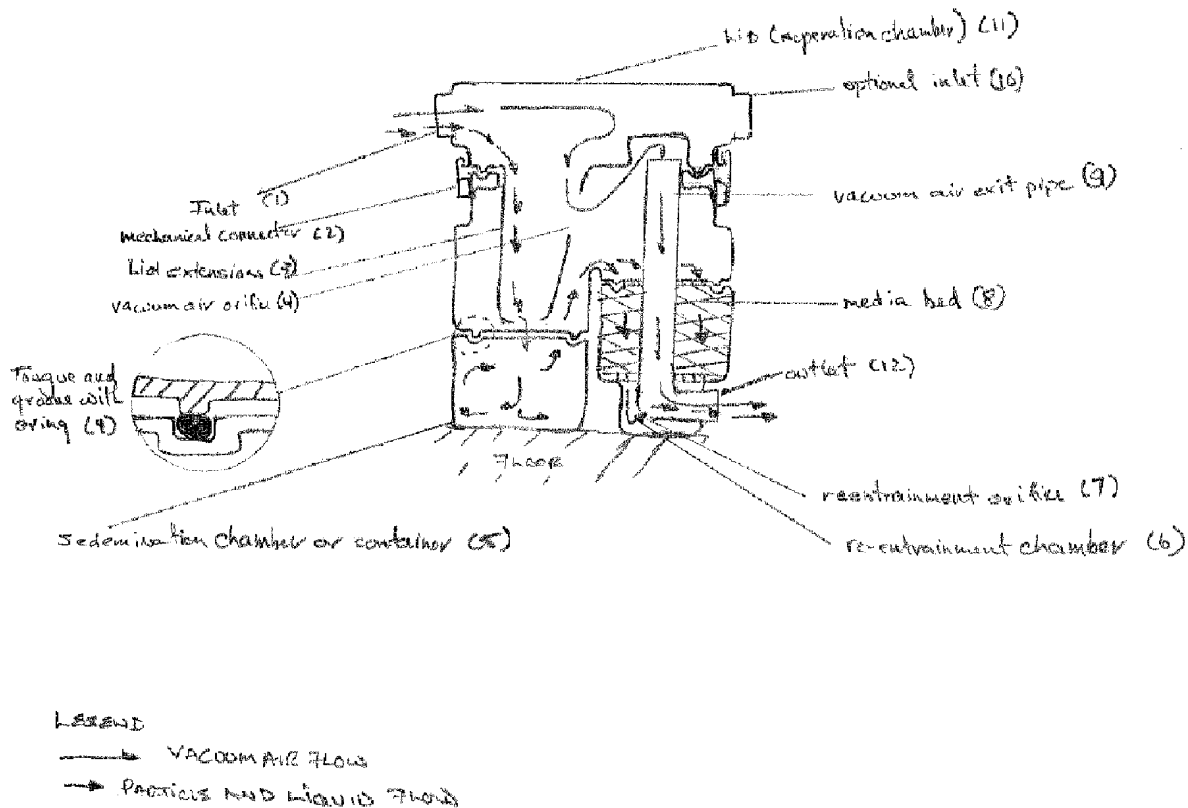
(51) Cl.Int.⁷/Int.Cl.⁷ A61C 19/00

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(54) Title: AMALGAM SEPARATOR



(57) **Abrégé/Abstract:**

An amalgam separation and collection apparatus for the collecting and separation of amalgam in a dental vacuum waste stream. The apparatus has four primary chambers. The separation chamber is the connection point for the incoming waste flow and once



(57) Abrégé(suite)/Abstract(continued):

the waste flow has entered the apparatus, the separation chamber allows the division of waste stream into vacuum air and water particle amalgam. The vacuum air is permitted to flow through the unit via vacuum exhaust tube and is unobstructed. The water/amalgam mixture is deposited from the separation chamber into the sedimentation chamber. Separation by sedimentation occurs in this chamber causing the larger amalgam particles to settle to the container base while the cleaner water raises and water falls under gravity into the filtration chamber. The wastewater with trace amalgam passes through a heavy metal removal bed in the filtration chamber. The purified amalgam free water collects in water re-entrainment chamber located of the base of the filtration chamber. The collected water is introduced to the vacuum air via an orifice in the vacuum exhaust tubing. A tube is connected to dental office vacuum pump permitting function. The amalgam waste is retained in two removable chambers namely the sedimentation and filtration chambers.

Abstract

An amalgam separation and collection apparatus for the collecting and separation of amalgam in a dental vacuum waste stream. The apparatus has four primary chambers. The separation chamber is the connection point for the incoming waste flow and once the waste flow has entered the apparatus, the separation chamber allows the division of waste stream into vacuum air and water particle amalgam. The vacuum air is permitted to flow through the unit via vacuum exhaust tube and is unobstructed. The water/amalgam mixture is deposited from the separation chamber into the sedimentation chamber. Separation by sedimentation occurs in this chamber causing the larger amalgam particles to settle to the container base while the cleaner water raises and water falls under gravity into the filtration chamber. The wastewater with trace amalgam passes through a heavy metal removal bed in the filtration chamber. The purified amalgam free water collects in water re-entrainment chamber located of the base of the filtration chamber. The collected water is introduced to the vacuum air via an orifice in the vacuum exhaust tubing. A tube is connected to dental office vacuum pump permitting function. The amalgam waste is retained in two removable chambers namely the sedimentation and filtration chambers.

Description

Technical Field and Background

The present invention is a dental apparatus which is for the collecting of solid material from a vacuum line which is commonly used to remove solid and liquid from a patient's oral cavity during a procedure. The mixture of air, solids and liquid located in the vacuum line contains a high percentage of heavy metals primarily mercury, lead and copper. The untreated disposal of heavy metals offers a possible source of environmental pollution.

Various devices have been attempted to separate amalgam solids from liquid waste stream with limited success. This is primarily due to the difficulties in several areas: 1) removal of dissolved heavy metal such as mercury; 2) difficulty in service thus resulting in costly specialized personnel; 3) difficulty in removal of the amalgam or waste from the separator; 4) difficulty in transportation of waste for the purpose of disposal or recycling; 5) high cost due to material choices for the conventional manufacturing of a device which must withstand vacuum forces; 6) usually there is a large vacuum drop due to the device separation.

The present invention fulfills these needs and provides the related advantages.

Summary of Invention

The current invention collects solids and purifies liquid while permitting the unobstructed flow of vacuum air through the unit. This function ensures the environment is protected from possible pollution while not obstructing the volume or flow to the vacuum air and thus ensuring acceptable vacuum to ensure the dental procedures is not obstructed.

In preferred embodiment of the present invention the apparatus is a container which has several parts. Each part forms a chamber in which one function of liquid and solid purification occurs. All parts connect to a body to form a complete container or apparatus. The apparatus is connected to the patient from a tube extending from the oral cavity to the inlet of the apparatus. A second tube connects from the outlet of the apparatus to the vacuum pump as found in a dental office.

The inlet part receives the suspended mixture of particles liquid and air. The mixture is separated within the lid which has a sufficient void capacity to act as a separation chamber. The separation permit's the vacuum to separate and flow via an orifice in the lid to an exit tube. The liquid and particles flow down an extension of the lid and into the sedimentation chamber. The sedimentation chamber is a separate container secured to the body of the apparatus mechanically. The sedimentation chamber has an o-ring and tongue and grove to form a liquid seal. The sedimentation chamber is removable. Particles within the mixture settle in the sedimentation chamber. The lean liquid is located at the upper portion of the container due to the force of gravity on the particles. The cleaner liquid over flows and passes through a media bed located in the filtration container. The filtration container is located at the base of the apparatus and is attached to the body mechanically. The filtration chamber is house in a container and contains an media bed designed for the removal of heavy metals suspended in liquid. The media bed is supported in the container by a support mesh located at the top and base of the media bed. The liquid and suspended metal pass through the media bed under gravity and collect in the re-entrainment chamber. The re-entrainment chamber is an area located in the filtration chamber below the media bed. The outlet of the unit connects the purified liquid to the vacuum pump at the location. Vacuum air and purified water are recombined at this point prior to existing the apparatus.

This is accomplished by means of an orifice located in the exit pipe were it passes through the re-entrainment chamber.

These and other aspects of the invention will become evident upon viewing the attached drawing and reviewing the detailed description.

Description of Drawing

1. Top view of apparatus with vacuum shown in dotted lines.
2. Side view of apparatus with vacuum shown in dotted lines.
3. Cross sectional view showing internal exit pipe and airing attachment.

Detailed Description of Invention

As previously mentioned, the present invention is an apparatus for the collecting and separating of amalgam solids from a mixture of solids, liquids and air present in a dental vacuum stream.

The present invention is represented in Fig. 1, Fig. 2 and Fig. 3.

Fig. 1 - Top View

A top view of the invention in Fig 1 shows the connection of the dental vacuum tube at patient (4) to the apparatus inlet (1). The connection of the outlet in shadow (5) to the typical dental vacuum pump (3). The mixture stream typically enters through an inlet at the top of the apparatus and exists via an outlet of the bottom or base of the apparatus.

Fig. 2 - Side View

A side view of the invention is represented in Fig 2. The lid (9) also functions as the inlet (1) and liquid, particle and air separation chambers. A mechanical connection (2) and o-ring seal (8) is used to connect the lid (9), sedimentation chamber (3) and filtration chamber (6) to the body (9). The seal is liquid and vacuum tight. The sedimentation chamber (3) and the filtration chamber (6) may be disconnected from the body (7) by releasing the mechanical connection (2). Thus enabling cleaning, recycling, replacement or disposal without specialized staff or equipment. The outlet (2) can be clearly seen and referenced in Fig 1.

Fig. 3 - Cross Section

In the preferred embodiment, the dental mixture enters the invention through the inlet(1) or the optional inlet (10). Both inlet are located in the lid which also functions as a separation chamber (11). In this chamber, the liquid and particles are directed towards the sedimentation zone (5) via an extension of the lid (3). The air is permitted to flow out of the apparatus unobstructed by passing through an orifice in the lid extension (4) thus preventing vacuum pressure reduction and continuing through a vacuum air exit pipe (9) and out the outlet (12).

The liquid and particle is collected in sedimentation zone (5). The heavy

particles collect at the base of the sedimentation zone due to gravity. The liquid with dissolved heavy metals rises and over flows into the media bed (8). The liquid passes through the media bed assisted by gravity and collects in the re-entrainment chamber (6). The purified water is then re-entrained with the vacuum air via on an orifice (7) located in the vacuum air exit pipe (8). The purified water (air mixture exit's the apparatus via outlet (12) and continues to the vacuum pump.

The apparatus including lid, body, sedimentation chamber and filtration chamber is rotationally moulded thus reducing production cost.

From the foregoing, it will be appreciated that although the embodiment of the invention have been described various modification may be made without deviating from the spirit of the invention. According the invention is only limited by the claims.

I claim

1. An amalgam collection and separation apparatus used to collect and purify the total mixture of liquid and solid particles found in a dental vacuum stream comprising of:

- a container having a lid which incorporates a chamber to allow separation of liquid and air in the waste stream and has interconnection orifice. A sedimentation chamber which allows the settling of heavy particles in the liquid waste stream. A filtration chamber which incorporates a media bed for the removal of fine and dissolved particles in the liquid waste stream. The filtration chamber also incorporates a water re-entrained area at its base for the reintroduction of purified wastewater to the vacuum air stream.

A body which incorporates a vacuum air exit pipe which permit the flow of vacuum air through the unit and re-entrainment of vacuum air and water prior to exiting the apparatus.

2. The apparatus of claim 1 where the container has a lid portion which houses the inlet, a body portion comprising the mid section, a sedimentation container which mounts to the body at the bottom and a filtration container which also mounts to the body at the bottom and has an outlet connection.

3. Apparatus as in Claim 1 where the containers are manufactured by rotational molding.

4. An apparatus in Claim 1 where the lid is removable.

5. Apparatus as in Claim 1 where the apparatus has no moving internal

parts.

6. An apparatus in Claim 2 where the lid also function to separate liquid and gas streams through functioning as a separation chamber.

7. An apparatus in Claim 2 where the lid has an extended portion used to direct the liquid and particle waste into the unit bottom containers.

8. An apparatus in Claim 1 where the containers mounted to the body at the bottom are removable.

9. An apparatus as outlined in Claim 1 where one of the containers is used for the collection of large particle waste thus acting as a sedimentation chamber.

10. An apparatus as in Claim 1 where one container is used to hold a media bed thus acting as a filtration chamber.

11. An apparatus in Claim 1 where the media bed is activated carbon.

12. An apparatus as in Claim 8 where the base of the filtration container also functions as a purified water re-entrainment chamber whereby water can be re-introduced to the vacuum stream.

13. The apparatus of Claim 1 further incorporate a tongue and grove housing an o-ring seal which connects the lid sedimentation containers and filtration containers to the body forming a liquid tight seal.

14. The apparatus in Claim 1 where the individual container which function as chambers are connected together using a mechanical device designed to compress the o-ring resulting in a liquid tight seal.

15. A method of collecting and separating a mixture of particles and liquid from a patient under going a dental procedure the method of collection, separation and purification comprising the following steps:

Connection of the a collection apparatus to a vacuum source. The apparatus has an inlet which connects the apparatus to the patient via a tube. The apparatus has five primary parts: 1) lid which functions as a separation chamber; 2) body which houses the vacuum air exit pipe and to which all other components are attached; 3) collection container which function as a sedimentation chamber; 4) a filtration chamber which contains activated carbon and has a liquid containment area at its base.

Solid particles and liquid are drawn from the patient into the separation chamber where vacuum air or gas is separated from liquid and particles.

Liquid and particles flow down an extended portion of the separation chamber and collects in the sedimentation chamber.

The separated vacuum air flows down the exit pipe and connects to the vacuum pump.

The collected liquid in the sedimentation chamber water falls into the filtration chamber and flows through a media bed. This is performed by gravity.

The purified liquid collects in a re-entrainment zone at the base of the filtration zone.

The purified liquid is re-entrained with the vacuum air via a small orifice located in the exit pipe within the re-entrainment zone.

16. An apparatus as in Claim 2 where separation chamber can one or more inlet connections.

17. The apparatus of Claim 2 has removable sedimentation and filtration chambers.

18. The apparatus in Claim 2 where the removable sedimentation and filtration chambers may act as shipping containers for the purpose of collection, shipping, disposal and/or recycling.

19. The apparatus in Claim 2 where the outlet is located at the bottom of the filtration container.

FIG 1

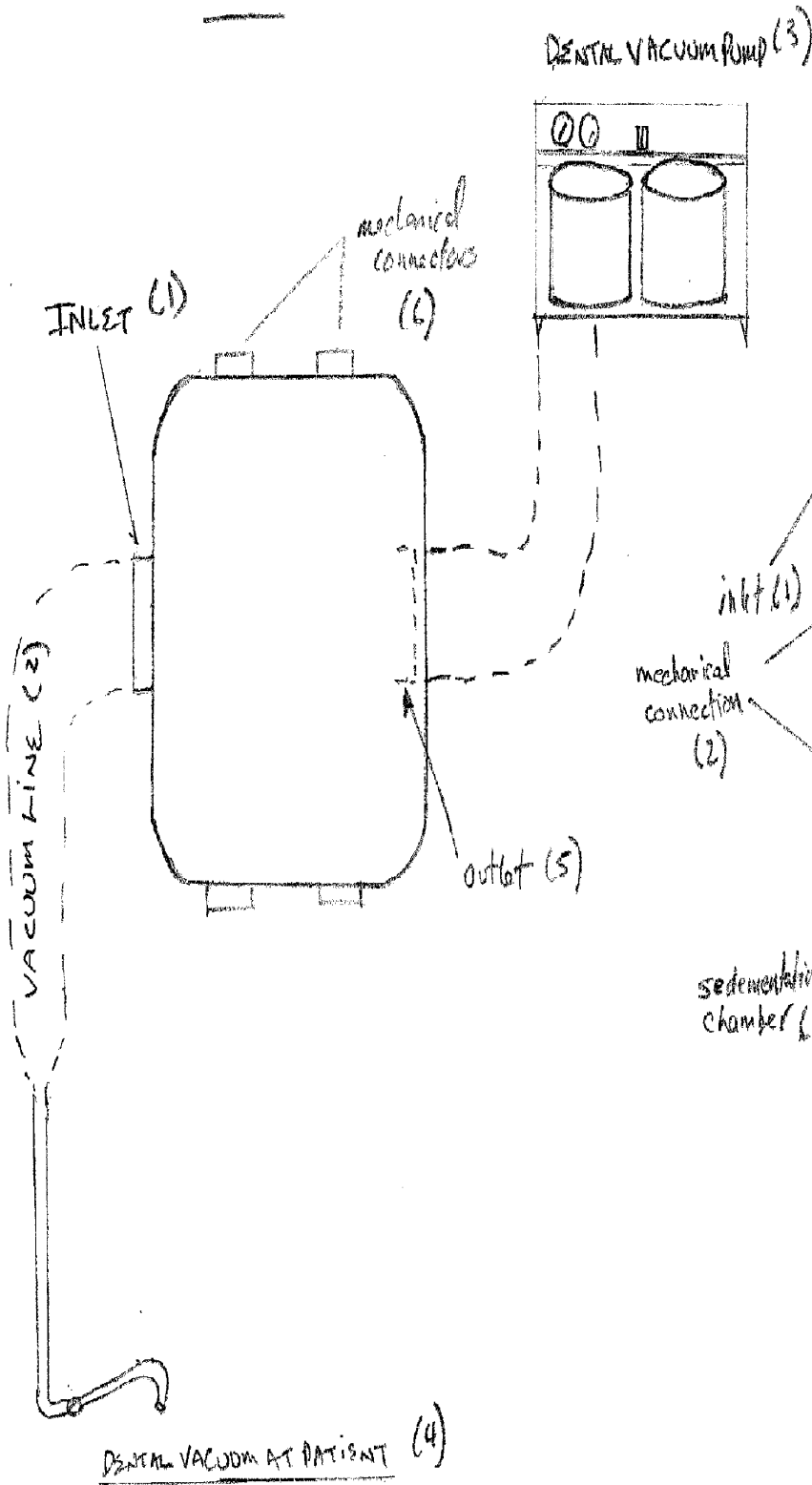
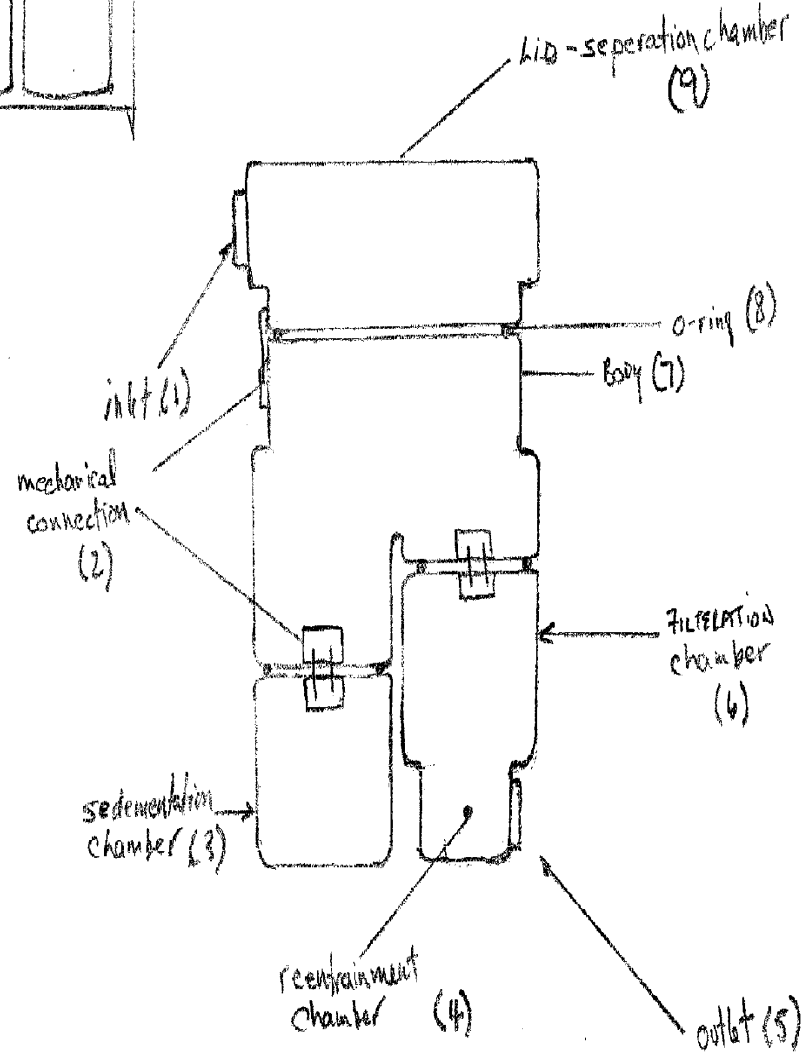


FIG 2

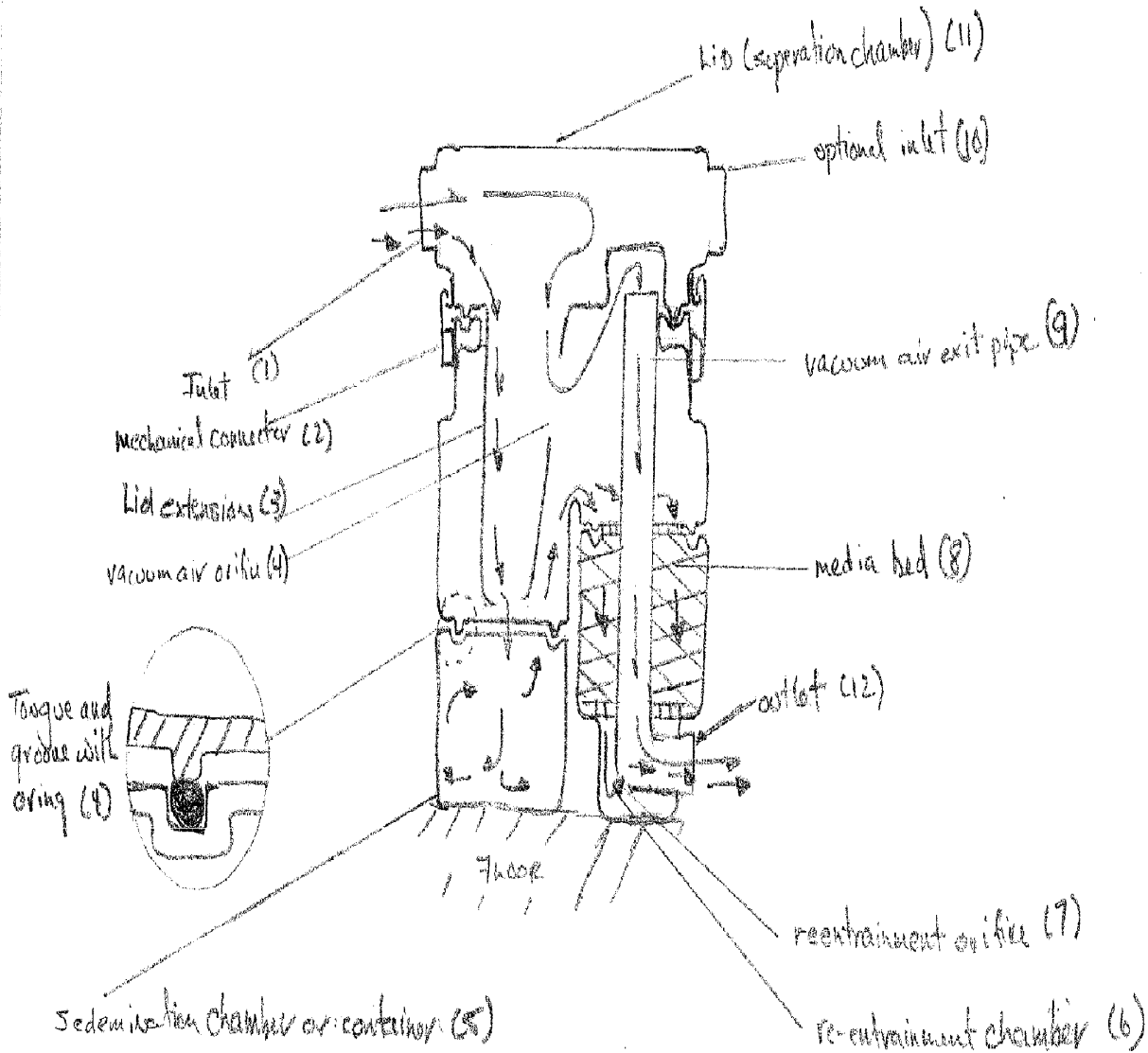


DRAWING

AMALGAM SEPARATOR TOP & SIDE VIEW

Fig 3

CA 02442513 2003-09-23



LEGEND

- VACUUM AIR FLOW
- PARTICLE AND LIQUID FLOW

296/414

DESIGNER

AMALGAM SEPARATOR CROSS SECTION

PICKARD BARNETT

Solmetex Ex. 2003

DRNA v. Solmetex - PGR2023-00555



(51) International Patent Classification:
A61C 17/06 (2006.01)

(21) International Application Number:
PCT/AM2017/000003

(22) International Filing Date:
29 May 2017 (29.05.2017)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
AM20160061 07 July 2016 (07.07.2016) AM

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(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, DJ, 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, KH, KN, KP, KR, KW, 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).

Published:

— with international search report (Art. 21(3))

(54) Title: FILTER FOR SUCTION SYSTEM OF DENTAL UNIT

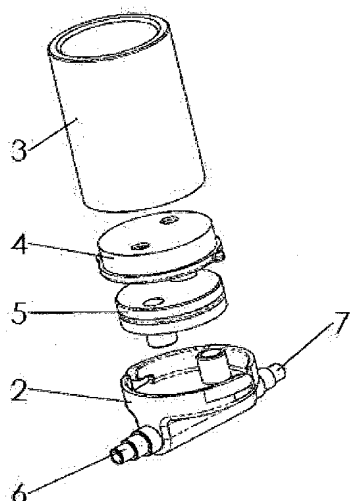


Fig.2

(57) Abstract: The invention relates to the sphere of medical devices, in particular to dental units and can be used in their suction systems. Filter for suction system of dental unit has a connecting module which has inlet and outlet hoses of content moved from suction system, single use filter consisting of the container receiving the content from suction system, rigidly attached covering in it and lock-fixer with a possibility of rotation installed in the covering. On the inner surface of module there is made a pipy projection concatenated with the output of module and a hole concatenated with the input of module, which are provided for attaching the filter to the module. Fixed notches are made on the side face of module. On the inner surface of covering are made inlet and with preventing mesh outlet holes and fixing projections on the outer surface of covering with a possibility of fixation in the fixing notches on side face of connecting module. The lock-fixer of covering has inlet and outlet pipy projections. The safety of filter system servicing is ensured, service time is reduced.

Filter for suction system of dental unit

Technical field

The invention relates to the sphere of medical devices, in particular to dental units and can be used in their suction systems.

Background art

There are various filters (1-4) which are located in hydro blocks of dental devices or are built in separate suction systems. Those filters have inlet and outlet hoses, a covering to which mesh filter is attached. On that mesh with the help of inlet hose a content solid substance (pieces of tooth, filling, amalgam, blood clot and etc.) moved from suction system is collected which is arising during dental treatment.

The main deficiency of those filters is that at the end of each working day it is necessary to open the covering, remove the mesh filter, empty it, then wash, disinfect and place back. It's unpleasant, dirty, dangerous and time-consuming procedure.

By technicity the filter (5) of dental device suction system is much closer to the invention, which has a connecting module to which is attached the container receiving contents from suction system arising during dental treatment. A filter which has a preventing mesh is placed in the receiving container. The outlet hose is attached to the connecting module, from suction system moved content inlet hose is attached at the bottom of container.

During dental treatment the content of suction system is moved to the receiving container. The solid substance with the help of mesh filter remains in the container.

The deficiency of this filter is also that at the end of each working day it is necessary to disconnect the receiving container with filter from connecting module, empty, then wash, disinfect and again bring to working state.

Disclosure of invention

Object of the invention is to ensure the safety of dental device solid substance filter service and shorten its service time.

Essence of an invention is that in the filter of dental device suction system, which has a connecting module with its outlet hose, inlet hose, mesh filter and receiving container, according to the invention the inlet hose is attached to the input of connecting module, on the inner surface of connecting module there is made a pipy projection concatenated with the output of module and a hole concatenated with the input of module, on the side face of module there are made fixed notches and the filter additionally has a covering rigidly attached to the receiving container and installed in the covering lock-fixer with a possibility of rotation with its inlet and outlet pipy projections, on the outer surface of covering there are made

projections with a possibility of fixation in the notches of module and on the inner surface of covering are made inlet and outlet holes moreover the mesh filter is placed on the hole of outlet covering.

Description of drawings

Essence of an invention is shown on the graphics depicted on the pictures from 1 to 6 where on the picture 1 the general view of dental device suction system filter in operation is shown on the picture 2 – structural diagram of filter on the picture 3 – connecting module diagram of filter on the picture 4 – covering diagram of filter on the picture 5 – lock-fixer diagram installed in the covering with a possibility of rotation on the picture 6 – view of the container receiving the contents moved from the suction system of filter

Best mode for carrying out the invention

The filter of dental device suction system has a connecting module (1) and a filter which consists of the container (2) receiving the content from suction system, covering (4) and installed in it lock-fixer (5) with a possibility of rotation.

The connecting module (2) is fixed at the hose of dental device hydro block suction system.

The connecting module (2) has inlet (6) and outlet (7) hoses of content moved from suction system which may have variable outer diameter 6mm, 8mm, 10mm and it gives them an opportunity to connect both to large and small hoses of suction systems. The inlet (6) hose is attached to the input of connecting module (2), outlet (7) hose to the output.

On the inner surface of connecting module (2) is made a hole (8) concatenated with the input of module and a pipe projection (9) concatenated with the output of module, which are provided for attaching the filter to the module (2).

There are made fixed notches (10) on the side face of connecting module (2) through which the filter is fixed to the module.

The lock-fixer (5) with a possibility of rotation installed in the filter covering (4) has inlet (11) and outlet (12) pipe projections.

Inlet (13) and outlet (14) holes are made on the inner surface of filter covering (4), moreover a preventing mesh (15) is placed on the outlet hole with the help of which the solid substance remains in the container (3).

On the outer surface of covering (4) fixing projections (16) are made with a possibility of fixation in the fixing notches (10) on side face of connecting module (2).

Filter covering (4) is rigidly attached with glue to the container (3) receiving content from suction system.

The connecting module (2) is designed for multiple use. It is made of polystyrene.

The filter is designed for single use. All parts of filter are made of polypropylene.

The suggested filter operates as follows:

When filter is attached to the connecting module (2), the lock-fixer rotates, the inlet (13) and outlet (14) holes of content moved from suction system of covering are opened and the filter is brought to operating position.

At the end of working day it is necessary to disconnect the filter from connecting module (2), during removal the lock-fixer is rotating closing the inlet (13) and outlet (14) holes of content moved from suction system of covering, whereby the filter is brought to non-operating state, in such a way non dropping of hard substance collected on preventing mesh which is installed on outlet hole of covering and non dropping of content of receiving container is ensured.

It is necessary to throw away the used filter, and new filter is attached to the connecting module (2).

The replacement of used filter with new one takes from 10 up to 20 minutes, thus the servicing of the filter becomes short and most importantly safe as the medical staff does not communicate with the content of filter.

Sources of information

Sirona. C8+Solo, C8+Solo Cart/Side delivery, C8+Cart Stand alone, C8+Side delivery Stand alone. Instruction manual, section 10. Care and cleaning performed by the practice staff manuals.sirona.com/home.HomeDmsDocument.download.html?id=147

Operation manual. Dental devices DIPLOMAT ADEPT DA 370 DIPLOMAT ADEPT DA 380. http://www.eurmed.sk/fileadmin/eurmed/produkty/Diplomat_dental/da370_da380/subory/RU_DA370-DA380_CART_2013_06.pdf

Instruction on care. KaVo Primus® 1058 S/TM/C

Methods of preparation in accordance with the standard DIN EN ISO 17664.

2.6 Module processing of the patient

2.5.4 The preparation of strainer insert of suction hoses

file:///D:/Users/USER/Downloads/PA_1058_20131129_15_RU.PDF

FONA-2000L Dental device. Instruction manual. 5. Care, cleaning and servicing

www.dentex.ru/upload/iblock/67a/67a917fc2fbc571e021d1539d70d6388.pdf

Usage guidelines. Instruction/Installation/ Technical manual. Adaptable model ST-D520, ST-D530, ST-D307 – the closest comparison

www.medteh.info/_ld/18/1838_____ST-D307-520.doc

Applicant A. Ghazaryan

Claims

5

Filter for suction system of dental unit, which has connecting module with its outlet hose, inlet hose, mesh filter and receiving container is characterized in that the inlet hose is attached to the input of connecting module, on the inner surface of connecting module there is made a pipy projection concatenated with the output of module and a hole concatenated with the input of module, on the side face of module there are made fixed notches and the filter additionally has a covering rigidly attached to the receiving container and installed in the covering a lock-fixer with a possibility of rotation with its inlet and outlet pipy projections, on the outer surface of covering there are made projections with a possibility of fixation in the notches of module and on the inner surface of covering are made inlet and outlet holes moreover the mesh filter is placed on the hole of outlet covering.

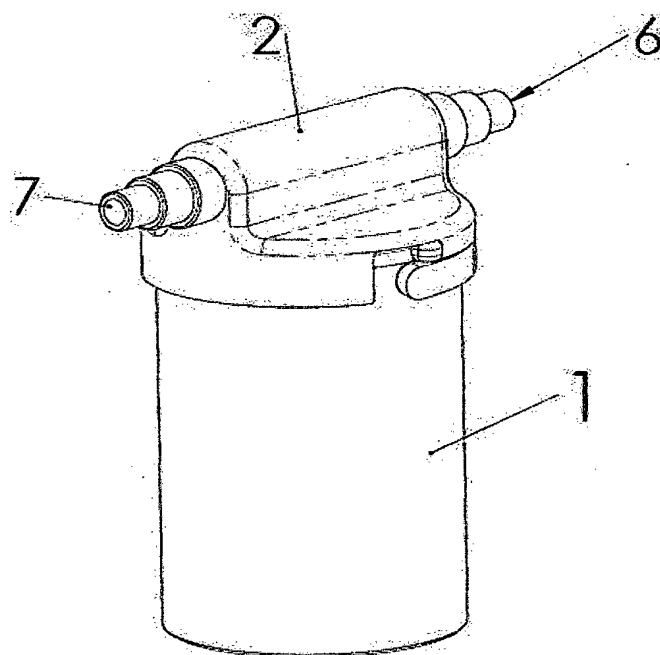


Fig.1

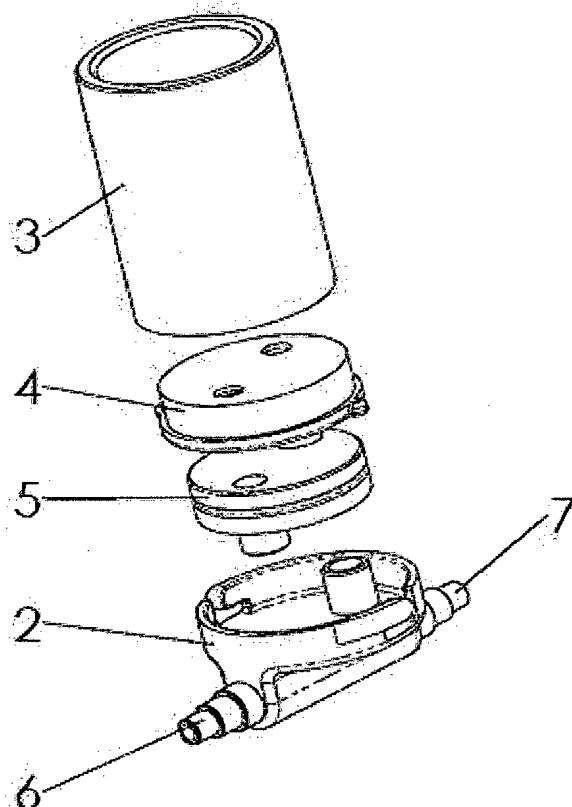


Fig.2

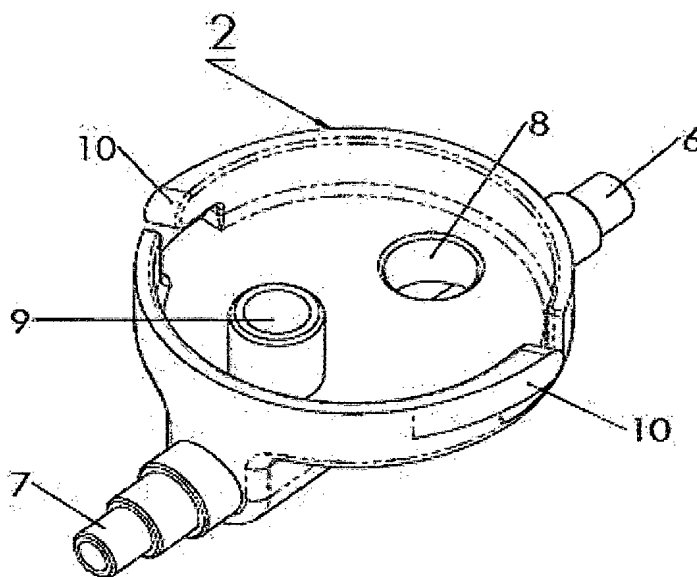


Fig.3

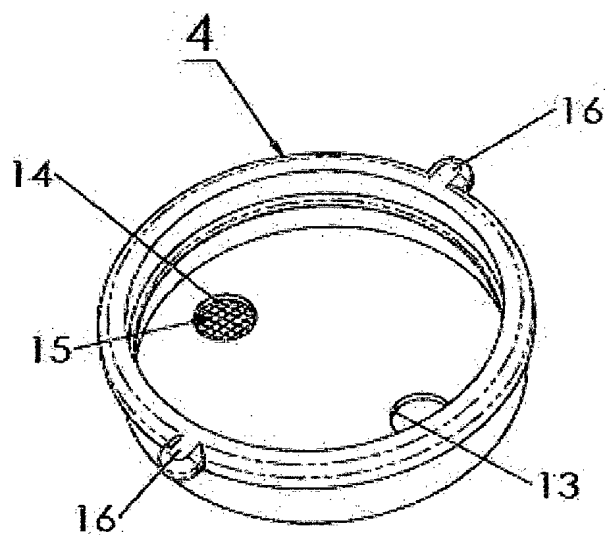


Fig.4

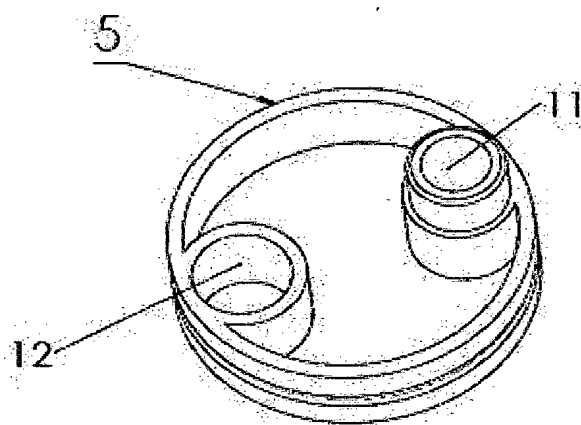


Fig.5

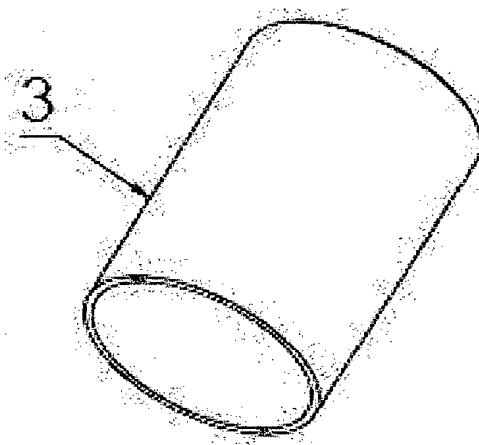


Fig.6

INTERNATIONAL SEARCH REPORT

International application No

PCT/AM2017/000003

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61C17/06
ADD.

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)
A61C B01D

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)

EPO-Internal, WPI Data, COMPENDEX, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 700 412 A (MANUEL JOHN L [US]) 20 October 1987 (1987-10-20) column 2, line 8 - column 3, line 41 figures 1-4	1
A	----- US 5 336 406 A (STANFORD RALPH F [US] ET AL) 9 August 1994 (1994-08-09) column 2, line 45 - column 6, line 44 figures 1-8	1
A	----- US 3 777 403 A (RITCHIE J) 11 December 1973 (1973-12-11) column 1, line 53 - column 2, line 57 figure 1 ----- -/--	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

9 August 2017

Date of mailing of the international search report

21/08/2017

Name and mailing address of the ISA/

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Fax: (+31-70) 340-3016

Authorized officer

Pisseloup, Arnaud

INTERNATIONAL SEARCH REPORT

International application No

PCT/AM2017/000003

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 83/02720 A1 (HORN LASSEN HANS; BUCHHORN AKSEL JOHAN) 18 August 1983 (1983-08-18) page 5, line 5 - page 8, line 14 figures 1,2 -----	1
A	KR 101 300 050 B1 (CHOI WOO HYUN [KR]) 29 August 2013 (2013-08-29) paragraphs [0014] - [0030] figures 1-5 -----	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AM2017/000003

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.: 1(partially)
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:
see FURTHER INFORMATION sheet PCT/ISA/210

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 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.:

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 1(partially)

The claim is not clear as to which features belong to the subject-matter of the invention, and in particular the wording "which has connecting module with its outlet hose, inlet hose, mesh filter and receiving container" is such that it is not clear whether the features listed after the conjunction are features that come in addition of the connecting module or they are comprised in the connecting module.

The feature "lock-fixer" has no well recognized meaning, such that the claim is not clear.

Furthermore, from the wording "a lock-fixer with a possibility of rotation with its inlet and outlet pipy projections", it is also unclear which technical features are required for the lock-fixer to rotate, such that it would not be obvious for the skilled person to make the lock-fixer and consequently the claimed invention (Art. 5 PCT).

In addition, the partial absence of articles in front of some technical features, like for instance in the wording "the input of connecting module" or "placed on the hole of outlet covering", is such that it is not clear if they refer to a previously define feature or to an additional new feature.

For all the above mentioned reasons, the subject-matter of claim 1 is not in compliance with the clarity requirement of Article 6 PCT. The non-compliance with the substantive provisions is to such an extent, that the search was performed taking into consideration the non-compliance in determining the extent of the search (PCT Guidelines, 9.19 and 9.24).

The extent of the search was consequently carried out on the basis of the description and figures, such that the filter (assembly) of the claimed subject-matter is resumed only to the following list of technical features:

a filter (assembly) of
a dental device suction system comprising:
(i) a fixed connection module
having an inlet and outlet ports, a side, an upper and an inner surfaces,
and
(ii) a container,
(iii) a filter covering having an inner and outer
surfaces, and
(iv) a lock-fixer having an inlet and an outlet pipy
projections (note that on figure 5, the outlet 12 consist of a hole and
has no pipy projection),
wherein the inner surface of the connection
module comprises a hole concatenated with the input port and a pipy
projection concatenated with the output port,
wherein the side surface
of the connection module comprises fixed notches,
wherein the inner
surface of the filter covering comprises an inlet and outlet holes,

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

wherein a preventing mesh is present on the outlet hole,
wherein the
outer surface of the filter covering comprises fixing projections for
being inserted in the notches of the connection module.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guidelines C-IV, 7.2), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/AM2017/000003

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4700412	A	20-10-1987	NONE	
US 5336406	A	09-08-1994	US 5336406 A	09-08-1994
			US 5456830 A	10-10-1995
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US 3777403	A	11-12-1973	NONE	
WO 8302720	A1	18-08-1983	AT 388906 B	25-09-1989
			CH 664702 A5	31-03-1988
			DE 3332122 C2	07-01-1993
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			DK 50582 A	06-08-1983
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			WO 8302720 A1	18-08-1983
KR 101300050	B1	29-08-2013	NONE	

PCT
 WELTORGANISATION FÜR GEISTIGES EIGENTUM
 Internationales Büro
 INTERNATIONALE ANMELDUNG VERÖFFENTLICHT NACH DEM VERTRAG ÜBER DIE
 INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)

(51) Internationale Patentklassifikation ⁵ : A61C 17/06	A1	(11) Internationale Veröffentlichungsnummer: WO 94/16643 (43) Internationales Veröffentlichungsdatum: 4. August 1994 (04.08.94)
(21) Internationales Aktenzeichen: PCT/AT93/00199 (22) Internationales Anmeldedatum: 27. December 1993 (27.12.93) (30) Prioritätsdaten: A 96/93 22. Januar 1993 (22.01.93) AT (71)(72) Anmelder und Erfinder: TRAWÖGER, Werner [AT/AT]; Huebe 26, A-6173 Oberperfuss (AT). PREGENZER, Bruno [AT/AT]; Huebe 30, A-6173 Oberperfuss (AT). (74) Anwälte: TORGLER, Paul usw.; Wilhelm-Greilstrasse 16, A-6020 Innsbruck (AT).	(81) Bestimmungsstaaten: AU, CA, JP, US, europäisches Patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Veröffentlicht <i>Mit internationalem Recherchenbericht.</i>	

(54) Title: DENTAL TRAP

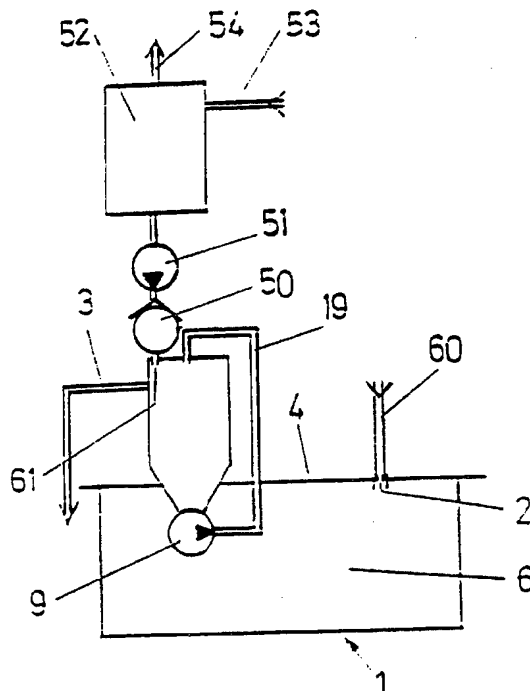
(54) Bezeichnung: ZAHNÄRZTLICHER ABSCHIEDER

(57) Abstract

Solids from two separately supplied (60, 61) mixtures of solids and liquids are collected together in a dental trap with a collecting basin (6) which may be removed from a centrifuge (5). The first mixture is taken from a suction air separator (52) under negative pressure and is brought into the centrifuge (5). The mixture of solids and liquids flows out of a spittoon under the effect of gravity and is directly brought into the collecting basin (6). Residual liquid which accumulates above the solids is conveyed into the centrifuge (5) by means of an arrangement (9, 16, 19) provided with an inlet (61) for the first mixture, an outlet (3) for the separated liquid and a solids discharge (12) that leads into the collecting basin (6).

(57) Zusammenfassung

In einem zahnärztlichen Abscheider mit einem von einer Zentrifuge (5) abnehmbaren Sammelbehälter (6) werden gemeinsam Feststoffe aus zwei getrennt zugeführten (60, 61) Feststoff-Flüssigkeitsgemischen gesammelt. Das erste Gemisch wird aus einer unter Unterdruck stehenden Saugluftabscheideeinrichtung (52) ausgetragen und in die Zentrifuge (5) eingebracht. Das Feststoff-Flüssigkeitsgemisch fließt aus einer Speischale durch Schwerkraft ab und wird unmittelbar in den Sammelbehälter (6) eingebracht. Sich oberhalb der Feststoffe sammelnde Restflüssigkeit wird mittels einer Einrichtung (9, 16, 19) in die Zentrifuge (5) überführt, die einen Einlaß (61) für das erste Gemisch, einen Auslaß (3) für die abgetrennte Flüssigkeit und einen in den Sammelbehälter (6) führenden Feststoffablauf (12) aufweist.



LEDIGLICH ZUR INFORMATION

Codes zur Identifizierung von PCT-Vertragsstaaten auf den Kopfbögen der Schriften, die internationale Anmeldungen gemäss dem PCT veröffentlichen.

AT	Österreich	GA	Gabon	MR	Mauretanien
AU	Australien	GB	Vereinigtes Königreich	MW	Malawi
BB	Barbados	GE	Georgien	NE	Niger
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DK	Dänemark	MD	Republik Moldau	UA	Ukraine
ES	Spanien	MG	Madagaskar	US	Vereinigte Staaten von Amerika
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FR	Frankreich	MN	Mongolei	VN	Vietnam

Zahnärztlicher Abscheider

Die Erfindung betrifft einen zahnärztlichen Abscheider mit einem abnehmbaren Sammelbehälter zum gemeinsamen Sammeln von Feststoffen, die aus einem ersten Feststoff-Flüssigkeitsgemisch, das aus einer unter Unterdruck stehenden Saugluftabscheideeinrichtung ausge-
5 tragen wird, und aus einem zweiten Feststoff-Flüssigkeitsgemisch abgetrennt werden, das aus einer Speischale durch Schwerkraft abfließt, mit einer Vollmantelzentrifuge, die einen Einlaß für das aus dem Unterdruck auszutragende erste Feststoff-Flüssigkeitsgemisch, einen Auslaß für die abgetrennte Flüssigkeit,
10 und einen Feststoffablauf aufweist, durch den nach jeder Zentrifugierphase unter Schwerkrafteinwirkung Feststoffe mit einem Restflüssigkeitsanteil in den Sammelbehälter abfließen, mit einem Einlaß für das Speischalengemisch und mit einer Einrichtung zur Überführung der sich im Sammelbehälter oberhalb der Feststoffe sammelnden Flüssigkeit zum Einlaß der Zentri-
15 fuge.
20

Ein derartiger Abscheider ist beispielsweise in der EP-A 432 142 beschrieben. Dort sind auf einer gemeinsamen Antriebswelle eine Pumpe und ein Zentrifugenbehälter
25 vorgesehen, wobei das erste Feststoff-Flüssigkeitsgemisch gegen den Saugluftunterdruck in eine zwischen der Pumpe und dem Zentrifugenbehälter ausgebildete Gemischeinlaßkammer eingebracht wird. In die unter Normaldruck stehende Gemischeinlaßkammer mündet auch
30 der Ablauf der Speischale, sodaß also die beiden Gemische vereinigt und durch die Zentrifuge in Flüssigkeit und Feststoffe getrennt werden. Vom Sammelbehälter unter der Zentrifuge wird überstehende Restflüssigkeit, die einen Feststoffanteil enthält, wieder zur Zentrifuge zurückgeführt. Da der Speischalenablauf frei in
35 die Zentrifugenkammer öffnet, werden die Geräusche der

laufenden Zentrifuge über das in den Raum offene Ablaufrohr durch die Speischale nach außen übertragen. Da die Zentrifuge durch das offene Ablaufrohr Luft ansaugt, werden die gurgelnden Geräusche noch verstärkt
5 und wirken sich störend und belästigend am Arbeitsplatz aus.

Die Erfindung hat es sich nun zur Aufgabe gestellt, bei einem Abscheider der eingangs genannten Art die Geräuschentwicklung zu verringern, und löst dies dadurch, daß der Einlaß für das Speischalengemisch dem Sammelbehälter zugeordnet ist.
10

Die Zentrifuge ist somit hinsichtlich des ersten Gemisches vor und hinsichtlich des zweiten Gemisches nach dem Sammelbehälter angeordnet, da aus dem ersten Gemisch alle Feststoffe die Zentrifuge passieren und dann in den Sammelbehälter gelangen, während aus dem zweiten Gemisch nur der nicht sedimentierte Teil der Feststoffe
15 in die Zentrifuge befördert wird. Die Geräuschentwicklung ist wesentlich geringer, da über den offenen Speischalenablauf keine Luft angesaugt wird.
20

In einer ersten Ausführung ist vorgesehen, daß der Abscheider einen mit Durchtrittsöffnungen versehenen Montagegrundkörper aufweist, auf dem das Zentrifugengehäuse angeordnet ist, und an dem der Sammelbehälter nach unten abnehmbar gehalten ist, wobei der Einlaß für das Speischalengemisch im Montagegrundkörper angeordnet
25 ist.
30

Diese Ausführung erleichtert nicht nur die Montage des Abscheiders insbesondere bei der Nachrüstung bereits bestehender Arbeitsplätze, da die Montagegrundkörper
35 entsprechend den jeweils örtlichen Gegebenheiten ausgebildet sein können, sondern erlaubt es auch, die Dimen-

sionen, vor allem Länge und Breite des Absetzbehälters unabhängig von den Maßen des Zentrifugengehäuses zu wählen, an die der Absetzbehälter bei direktem Anbau an die Zentrifuge gebunden ist.

5

Für eine räumlich sehr kompakte Ausführung kann vorgesehen sein, daß sich das Zentrifugengehäuse zum Montagegrundkörper hin verjüngt und der Einlaß für das Speischalengemisch in dem von der Verjüngung des Zentrifugengehäuses ausgesparten Bereich des Montagegrundkörpers vorgesehen ist. Als Einlaß ist bevorzugt ein um eine zum Montagegrundkörper senkrechte Achse schwenkbares Winkelstück für einen in beliebige Richtung verdrehbaren Anschluß im ausgesparten Bereich angeordnet.

15 Eine Pumpe der Überführungseinrichtung für die Restflüssigkeit ist vorzugsweise coaxial unterhalb der Zentrifuge vorgesehen und kann einen eigenen Antriebsmotor aufweisen. Pumpe und Zentrifuge können aber auch von einem gemeinsamen, dazwischenliegenden Antriebsmotor betrieben werden, da bei laufender Pumpe auch die Zentrifuge arbeiten muß.

20

Nachstehend wird nun die Erfindung an Hand der Figuren der beiliegenden Zeichnungen näher beschrieben, ohne darauf beschränkt zu sein.

25

Die Fig. 1 zeigt schematisch eine Abscheideeinrichtung zur Trennung von Saugluft, Feststoffen und Flüssigkeit, und die Fig. 2 einen Vertikalschnitt durch einen erfindungsgemäßen Abscheider.

30

Eine Abscheideeinrichtung besteht aus einer Luftabscheidevorrichtung 52 mit einer Zuflußleitung 53, für ein aus dem Mund eines Patienten abgesaugten ersten Feststoff-Flüssigkeitgemisch und einer wegführenden Reinluftleitung 54, sowie einem Abscheider 1 zur Tren-

35

nung der Feststoffe von der Flüssigkeit. Der Abscheider 1 liegt außerhalb des Unterdrucksystems, d.h. zwischen der Luftabscheidevorrichtung 52 und einem Gemischeinlaß 61 für das erste Feststoff-Flüssigkeitsgemisch ist eine
5 Pumpe 51 und an deren Rückseite ein Rückschlagventil 50 vorgesehen. Der Abscheider 1 setzt sich aus einer Vollmantelzentrifuge 5 und einem unter der Zentrifuge 5 angeordneten Sammelbehälter 6 zur Sedimentation von Feststoffen zusammen. Beide sind an einem Montagegrundkörper 4
10 angeordnet, der an einem zahnärztlichen Stuhl od.dgl. befestigbar ist, wobei der Sammelbehälter 6, wie aus Fig. 2 näher ersichtlich ist, vom Montagegrundkörper 4 nach unten abnehmbar gehalten ist. Am Sammelbehälter 6 ist ein Einlaß 2 für ein von einer Spei-
15 schale kommendes, zweites Feststoff-Flüssigkeitsgemisch vorgesehen. Der Einlaß 2 ist daher von der Zentrifuge 5 räumlich getrennt, sodaß die Übertragung von Zentrifugengeräuschen über die Speischalenleitung 60 verringert ist.

20 Der Montagegrundkörper 4 ist mit Befestigungsbohrungen versehen, die insbesondere an einem eigenen Adapterteil 27 vorgesehen sind. Je nach den gegebenen Einbauverhältnissen sind dann entsprechende Adapterteile 27 vor-
25 handen, mit denen der Montagegrundkörper 4 versehen werden kann. Weitere Durchtrittsöffnungen im Montagegrundkörper 4 sind: eine Öffnung zur Aufnahme des Motors 7 der Zentrifuge 5 und einer Pumpe 9, eine Öffnung zum Einsetzen des Feststoffablaufes 12 der Zentrifuge
30 5, eine Öffnung zur Durchführung einer nur schematisch gezeigten Verbindungsleitung 19 zwischen der Pumpe 9 und der Zentrifuge 5, Öffnungen für Befestigungsschrauben zur gemeinsamen Fixierung des Zentrifugengehäuses 8 und des Pumpengehäuses 13, sowie der Einlaß 2 für das
35 von der Speischale kommende zweite Feststoff-Flüssigkeitsgemisch 60.

Das auf dem Montagegrundkörper 4 fixierte Zentrifugengehäuse 8 ist im unteren Teil verjüngt, wobei der Motor 7 zentral angeordnet ist, und enthält darüber zwei in-

5 einander angeordnete Zentrifugenbehälter 28 der Vollmantelzentrifuge 5. In den inneren Zentrifugenbehälter 28 mündet der Einlaß 10 für das von der Pumpe 9 über die Verbindungsleitung 19 aus dem Sammelbehälter 6

10 hochgeförderte Gemisch und der äußere Zentrifugenbehälter 28 weist eine Übertrittsöffnung 11 auf, über die gereinigte Flüssigkeit in den Flüssigkeitsauslaß 3 gelangt. Feststoffe fließen mit Restflüssigkeit bei Stillstand der Zentrifuge 5 aufgrund der Schwerkraft

15 nach unten und gelangen über den exzentrisch angeordneten Feststoffablauf 12 in den Sammelbehälter 6. In den Einlaß 2 für das Speischalengemisch 60 ist drehbar ein nicht gezeigtes Winkelanschlußstück eingesetzt. Sowohl der Einlaß 2 als auch der Anschluß 16 für die Verbindungsleitung 19 liegen in der durch die Verjüngung des

20 Zentrifugengehäuses 8 bedingten Aussparung 20, also innerhalb des von der Zentrifuge 5 benötigten Raumes, so daß eine äußerst kompakte, platzsparende Ausführung gegeben ist.

25 Ein nach unten offene Nut 29 des Montagegrundkörpers 4 dient dem Einschub des Sammelbehälters 6. Dieser ist mittels eines bügelförmigen Verriegelungselementes 70 fixiert, das um eine Achse 75 an der Außenwand der Nut 29 schwenkbar gelagert ist. Das Verriegelungselement 70

30 weist zwei seitlich außerhalb des Sammelbehälters 6 sich erstreckende Schwenkarme 71 und einen diese verbindenden Quersteg 72 auf. Jedem Schwenkarm 71 ist ein dazu parallel verlaufender Steg 77 zugeordnet, der in der Schließstellung in eine Tasche 68 des Sammelbehälters 6 eingreift. Der Sammelbehälter 6 ist aus licht-

35 durchlässigem Kunststoff gefertigt und weist an seiner

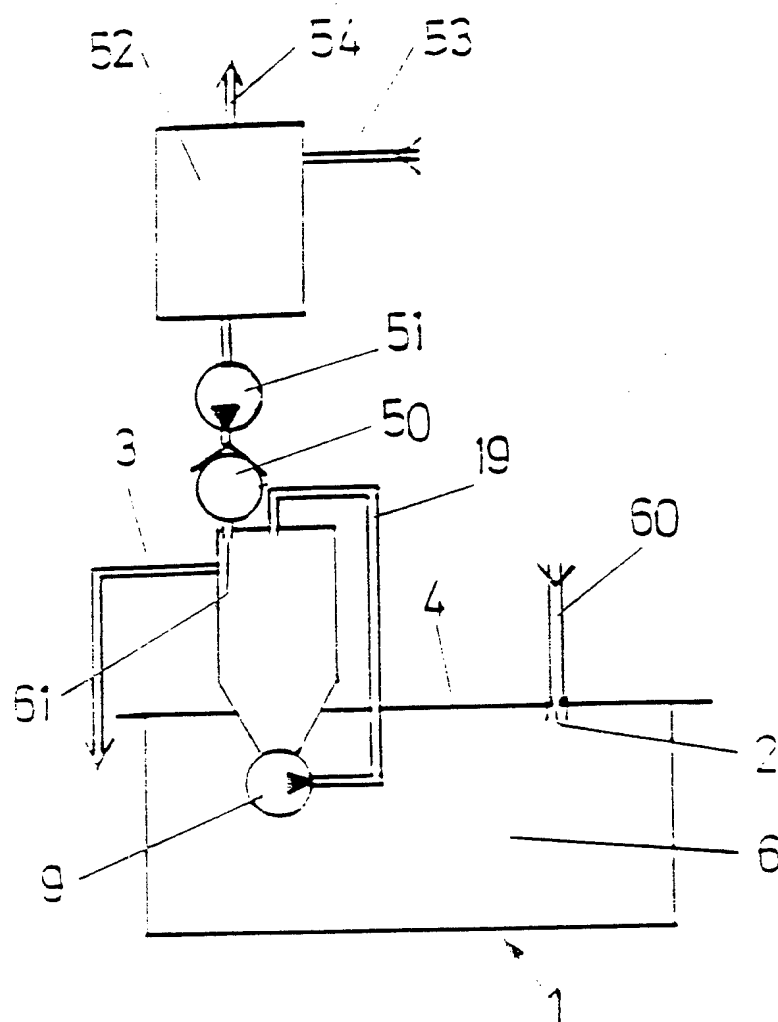
zum Quersteg 72 weisenden Wandung eine vorstehende Längsrippe 66 auf. Der Quersteg 72 ist mit parallel zu den Seitenwänden der Längsrippe 66 abstehenden Laschen 73 versehen, an denen eine Sensoreinrichtung 74 ausgebildet ist. Diese umfaßt zumindest eine, im gezeigten Ausführungsbeispiel zwei Lichtschranken, wobei jeder Lichtstrahl die Längsrippe 66 durchdringt und der Messung der Sedimentationshöhe der Feststoffe dient. Die untere Lichtschranke reagiert bei 95 % der maximalen Füllhöhe durch ein Warnsignal, während bei Ansprechen der zweiten, die maximale Füllhöhe anzeigenden oberen Lichtschranke der Abscheider, vorzugsweise die gesamte Absauganlage, außer Betrieb gesetzt wird. Für den Wechsel des Sammelbehälters 6 wird das Verriegelungselement 70 hochgeschwenkt, sodaß die Stege 77 den Sammelbehälter 6 freigeben, der dann nach unten abgenommen werden kann. Die Sensoreinrichtung 74 könnte noch weitere Sensorelemente umfassen, die beispielsweise jene beiden Niveaus der sich über den Feststoffen sammelnden Flüssigkeit erfassen, an denen der Motor 7 ein- und ausgeschaltet wird.

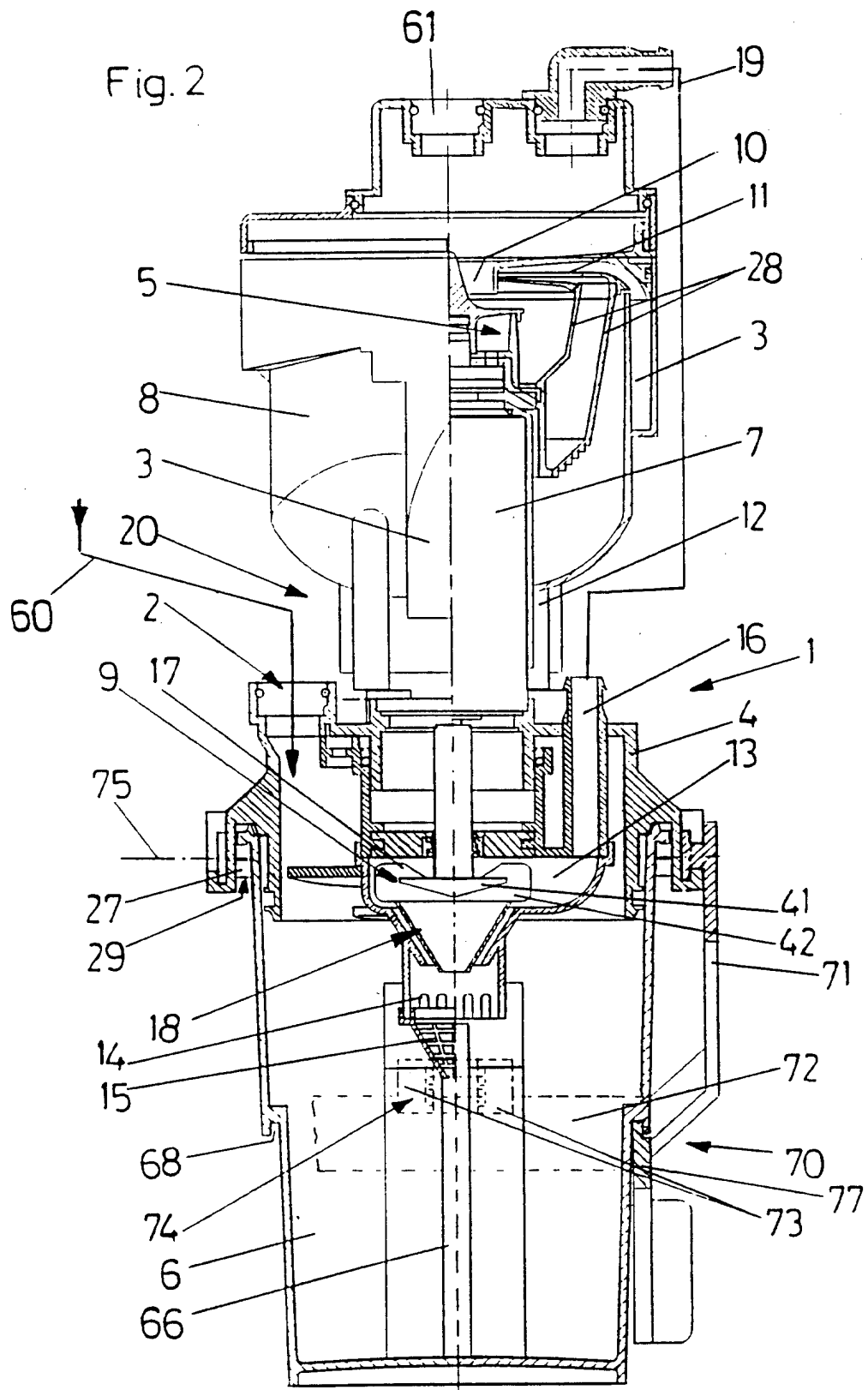
Das Pumpengehäuse 13 ist an der Unterseite des Montagegrundkörpers 4 befestigt, und am hochstehenden Anschluß 16 kann nach der Befestigung von Pumpe 9 und Zentrifuge 5 die Verbindungsleitung 19 montiert werden. Vom Pumpengehäuse 13 nach unten ragt ein zentrales Ansaugrohr 14, das im obersten Teil sich konisch verjüngt, im Mittelteil zylindrisch ausgebildet ist, und im untersten Teil umfangsseitige Durchbrechungen aufweist. Ein Schutzsieb 15 ist zumindest an der Seite des Einlasses 2 des Speischalengemischs los am Ansaugrohr 14 fixiert. Die Pumpe 9 weist ein Flügelrad 17 auf, das eine Nabe 41, von dieser radial abstehende Flügel 42 und einen nach unten in den konischen Teil des Ansaugrohres 14 ragenden Hohlkegelstumpf 18 umfaßt.

P a t e n t a n s p r ü c h e :

1. Zahnärztlicher Abscheider mit einem abnehmbaren
Sammelbehälter (6) zum gemeinsamen Sammeln von Fest-
stoffen, die aus einem ersten Feststoff-Flüs-
sigkeitsgemisch, das aus einer unter Unterdruck ste-
henden Saugluftabscheideeinrichtung (52) ausgetragen
wird, und aus einem zweiten Feststoff-Flüs-
sigkeitsgemisch abgetrennt werden, das aus einer
Speischale durch Schwerkraft abfließt, mit einer
Vollmantelzentrifuge (5), die einen Einlaß (61) für
das aus dem Unterdruck auszutragende erste Fest-
stoff-Flüssigkeitsgemisch, einen Auslaß (3) für die
abgetrennte Flüssigkeit, und einen Feststoffablauf
(12) aufweist, durch den nach jeder Zentrifugier-
phase unter Schwerkrafteinwirkung Feststoffe mit
einem Restflüssigkeitsanteil in den Sammelbehälter
(6) abfließen, mit einem Einlaß (2) für das Spei-
schalengemisch und mit einer Einrichtung (9,16,19)
zur Überführung der sich im Sammelbehälter (6) ober-
halb der Feststoffe sammelnden Flüssigkeit zum Ein-
laß (61) der Zentrifuge (5), dadurch gekennzeichnet,
daß der Einlaß (2) für das Speischalengemisch dem
Sammelbehälter (6) zugeordnet ist.
2. Abscheider nach Anspruch 1, dadurch gekennzeichnet,
daß er einen mit Durchtrittsöffnungen versehenen
Montagegrundkörper (4) aufweist, auf dem das Zentri-
fugengehäuse (8) angeordnet ist, und an dem der Sam-
melbehälter (6) nach unten abnehmbar gehalten ist,
wobei der Einlaß (2) für das Speischalengemisch im
Montagegrundkörper (4) angeordnet ist.
3. Abscheider nach Anspruch 2, dadurch gekennzeichnet,
daß der Einlaß (2) für das Speischalengemisch an
einem um eine zum Montagegrundkörper (4) senkrechte
Achse schwenkbaren Winkelstück ausgebildet ist.

Fig. 1





A. CLASSIFICATION OF SUBJECT MATTER
IPC 5 A61C17/06

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 5 A61C

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 practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP,A,0 432 142 (TRAWÖGER) 12 June 1991 cited in the application see abstract; figure 1 ---	1-3
Y	WO,A,92 18062 (TRAWÖGER) 29 October 1992 see the whole document ---	1-3
A	EP,A,0 400 431 (DÜRR DENTAL) 5 December 1990 see claim 1; figures 1,2,4 ---	1
A	EP,A,0 300 439 (DÜRR DENTAL) 25 January 1989 see abstract; figures 1,2 -----	1

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

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Date of the actual completion of the international search

14 April 1994

Date of mailing of the international search report

22.04.94

Name and mailing address of the ISA

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Authorized officer

Kousouretas, I

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internat Application No

PCT/AT 93/00199

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
EP-A-0432142	12-06-91	WO-A-	8603669	03-07-86
		AU-A-	5311886	22-07-86
		CA-A-	1293455	24-12-91
		DE-A-	3584636	12-12-91
		DE-U-	8536837	10-12-87
		DE-U-	8590187	10-12-87
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		DE-D-	59002975	11-11-93
		ES-T-	2045639	16-01-94

EP-A-0300439	25-01-89	DE-A-	3724247	02-02-89
		DE-D-	3885524	16-12-93

A. KLASSIFIZIERUNG DES ANMELDUNGSGEGENSTANDES
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IPK 5 A61C

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Während der internationalen Recherche konsultierte elektronische Datenbank (Name der Datenbank und evtl. verwendete Suchbegriffe)

C. ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
Y	EP,A,0 432 142 (TRAWÖGER) 12. Juni 1991 in der Anmeldung erwähnt siehe Zusammenfassung; Abbildung 1 ---	1-3
Y	WO,A,92 18062 (TRAWÖGER) 29. Oktober 1992 siehe das ganze Dokument ---	1-3
A	EP,A,0 400 431 (DÜRR DENTAL) 5. Dezember 1990 siehe Anspruch 1; Abbildungen 1,2,4 ---	1
A	EP,A,0 300 439 (DÜRR DENTAL) 25. Januar 1989 siehe Zusammenfassung; Abbildungen 1,2 -----	1

☐ Weitere Veröffentlichungen sind der Fortsetzung von Feld C zu entnehmen

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Datum des Abschlusses der internationalen Recherche

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Absendedatum des internationalen Recherchenberichts

22.04.94

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Bevollmächtigter Bediensteter

Kousouretas, I

INTERNATIONALER RECHERCHENBERICHT

Angaben zu Veröffentlichungen, die zur selben Patentfamilie gehören

Internat. Aktenzeichen

PCT/AT 93/00199

Im Recherchenbericht angeführtes Patentdokument	Datum der Veröffentlichung	Mitglied(er) der Patentfamilie	Datum der Veröffentlichung
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		EP-A- 0441410	14-08-91
		US-A- 5018971	28-05-91
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		ES-T- 2045639	16-01-94
EP-A-0300439	25-01-89	DE-A- 3724247	02-02-89
		DE-D- 3885524	16-12-93

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification³ :A61C 17/04; B01D 35/02
G03C 11/24

A1

(11) International Publication Number:

WO 83/ 02720

(43) International Publication Date:

18 August 1983 (18.08.83)

(21) International Application Number: PCT/DK83/00011

(22) International Filing Date: 31 January 1983 (31.01.83)

(31) Priority Application Number: 505/82

(32) Priority Date: 5 February 1982 (05.02.82)

(33) Priority Country: DK

(71)(72) Applicant and Inventor: HORN-LASSEN, Hans
[DK/DK]; 12D, Klampenborgvej, DK-2930 Klampenborg (DK).(72) Inventor: BUCHHORN, Aksel, Johan; 2A Laerkevej,
DK-4300 Holbaek (DK).(74) Agent: BUDDE, SCHOU & CO.; 4, H.C. Andersens
Boulevard, DK-1553 Copenhagen V (DK).(81) Designated States: AT, BE (European patent), CH, DE,
DE (Auxiliary utility model), FI, FR (European patent), GB, LU, NL, NO, SE.

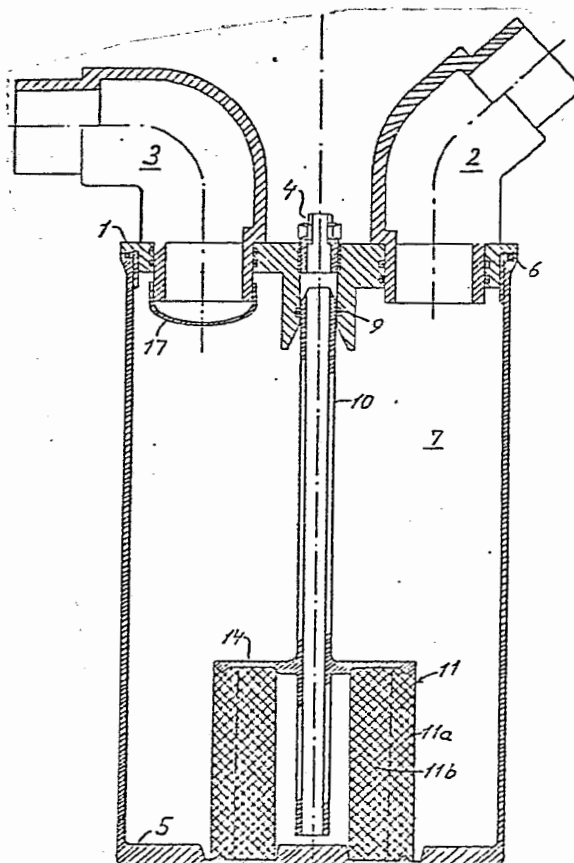
Published

With international search report.

(54) Title: A DEVICE FOR SEPARATING WASTE PRODUCTS FROM A FLOW OF LIQUID AND GAS

(57) Abstract

The apparatus, which is designed for collection of mercury waste products and other waste products which are sucked from a rinse basin or by a mouth suction device at a dental clinic, has a head (1) which is stationary at the dentist's chair, and which through connections (2, 3, 4) and appertaining hoses are connected permanently to the rinse basin, a suction source, and an injector or suction pump respectively which, from the bottom of a tank (7) under the head (1), can suck filtered water to a sewer. Impurities are separated from the air current under its strong change of direction and possibly by passage through a sieve (17) or a filter. At the bottom of the tank there is a filter cartridge (11) separating waste products from the liquid which from the outside of the cartridge is drawn through it and up through a suction tube (10). The apparatus can be used with different kinds of filter cartridges (11) and with screens (17) selected as required or filter cartridges at the connection (3) and possibly also at the connection (2). It ensures effective separation of cleaned air, liquid, and impurities and allows active suction of cleaned liquid by the use of a small liquid tank placed close to the source of pollution.



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- 1 -

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A Device for Separating Waste Products from a Flow of Liquid and Gas.

The invention relates to an apparatus for separation of waste products from a flow of liquid and gas, e.g. at dental clinics or photographic establishments, and of the kind which has a tank the inner space of which is connected at its upper end to at least one inlet connection for sucked-in liquid and gas, and to an outlet connection for evacuated gas, while the lower end of the space is connected to a discharge connection for liquid.

Because of the ever growing efforts to avoid pollution of the environment, there is a great need for a simple way of trapping toxic and/or costly waste products carried along in a flow of liquid and gas such as is the case at e.g. dental clinics where liquid and gas are sucked from a rinse basin and/or a mouth suction device into a fixed separation tank, or in some cases into a detachable collecting tank from which the liquid is carried on to a drain after waste products have been separated by sedimentation.

However, cleaning of the apparatuses and collection and dispatch of the waste products are unpleasant and risky work, and endeavours have, therefore, been made to show many different solutions to the related problems.

From the description of DK-PS No. 138,927 a dental apparatus of the said kind is known which, for the purpose of facilitating cleaning work, has a removable liquid collecting tank. Furthermore, the apparatus has a removable sieve for detention of solids in the liquid sucked from the patient's mouth, and this sieve can also be removed and cleaned.

Cleaning of this apparatus as well as of the other known apparatuses where the discharge line is connected to a separation tank is, however, still rather unpleasant work which may involve a certain risk of infection. Besides, these known apparatuses are not built up so that they

- 2 -

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can be arranged in a simple and cheap way for removal of the waste products encountered in every single case and for cleaning of the waste water to the exact extent required in the actual case.

5

It can be mentioned that apparatuses are also known in which air, liquid, and waste products are sucked through a cyclone where air and liquid are separated whereafter solids in the liquid are deposited in a disposable tank which can be removed and closed with a lid.

10

It is, however, impossible by the use of a cyclone to obtain effective separation of the smallest waste particles, including finely ground amalgam, e.g. sludge from drilling of teeth, and the method is relatively expensive. Furthermore, it is rather difficult to clean the cyclone, and the apparatus is unsuitable in connection with ejector suction devices and rinse fountains of old types.

15

It is the object of the present invention to show an apparatus of the said kind which, even if it is of a simple design, renders the unpleasant cleaning of separation tanks now required superfluous and which can give a more effective and safe separation and collection of waste products than corresponding known apparatuses, and an apparatus with a great flexibility as regards degree of cleaning and the kind of waste products.

20

25

The apparatus according to the invention is characteristic in that inlet connection, outlet connection, and discharge connection for liquid are placed on a common head which has devices for tight-fitting connection to the mouth rim of the tank wall, and in that the interior of a filter cartridge placed in the lower part of the tank space, is connected to the discharge connection for liquid through a suction tube.

30

In such an apparatus the polluting substances can be removed effectively in the tank, i.e. as close to the pollution source as possible, which is an obvious advantage. Among other things, cleaning of the air line system from suction device to separation tank is made superfluous, and

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gradual reduction of the air suction capacity is thus also avoided. The tank with collected waste products can easily be designed so that it can be removed from the head, sealed, and sent to a regeneration or destruction plant without inconvenience to the personnel. The filter cartridge employed can be adapted to the kind of waste particles and to the degree of cleaning required, and the same applies to a sieve or filter cartridge which can easily be placed in front of the outlet connection where the gas flows away from the tank. This flexibility has the effect that not only is the apparatus suitable for use at dental clinics, but also in other enterprises and for separation of many different substances such as amalgam, mercury, and particles or chips of e.g. silver and gold as well as fine-grained sludge from grinding and drilling processes of many kinds.

A very effective separation between cleaned air, cleaned liquid, and impurities can also according to the invention be obtained by the tank containing an interchangeable sieve placed between the mouth of the head inlet connection for liquid and gas and the outlet connection for gas and which extends towards the tank bottom.

The air is cleaned effectively of impurities, partly during passage through the sieve and partly by the strong deflection of the air flow between the inlet connection and the outlet connection, and the liquid is cleaned effectively both by sedimentation and by filtration through the filter cartridge, whose fraction is not disturbed by air carried along in the liquid.

The screen can, according to the invention, be a tube which is open at both ends and placed under the suction connection of the head. Hence the pressure drop through the sieve is reduced, and it is subjected to a certain self-cleaning effect.

However, the sieve can also, according to the invention, be a bag under the inlet connection of the head so that additional filtration is obtained.

Even if a tubular or a bag-shaped sieve is prefer-

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ed, the tank may, however, also be designed with a sieve wall extending from the head and towards the bottom and separating the inlet connection for liquid and gas from the outlet connection to the vacuum source. It will thus be
5 seen that there are many possible ways of varying the degree of cleaning of both liquid and gas. The tank can in a known way be equipped with level control devices which, e.g. by the use of electrodes, start liquid suction through the discharge connection when the liquid in the tank has reach-
10 ed a certain level. Alternatively, liquid suction can be controlled electrically in connection with the control system for the air suction motor or with a manually operated electric switch.

The necessary seals can easily be provided by
15 O-rings or in a similar way, and the tank can be fixed to the circumference by an axial flange on the head by means of a snap lock mechanism or a threaded section.

According to the invention the tank can form an interchangeable disposable tank which immediately under the
20 head has a cover with openings which are flush with the openings in the head connections, since the discharge connection for liquid is arranged as a tight-fitting releasable connection to the suction tube from the filter cartridge passing through the cover. Such a tank can, without
25 risk of pollution and infection owing to spillage, be removed easily from the permanent head at a dentist's chair.

Normally, it will, however, suffice to use a tank open at the top, since the tank is only open during replacement, and replacement of filter cartridge and sieves
30 will in some cases not be necessary whenever the tank is replaced. Besides, it has appeared that the toxins introduced in the tank during ordinary dental treatment kill bacteria to such an extent that even after lengthy standing the contents of the tank will emit no obnoxious smell which may
35 render replacement work unpleasant.

The invention is explained in greater detail in the following in connection with the drawing where



- 5 -

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Figure 1 shows an axial section through a first embodiment of the tank according to the invention, and

Figure 2 shows an axial section through another embodiment of the tank according to the invention.

5

Figure 1 shows a preferred simple embodiment of the apparatus according to the invention. The apparatus shown has a head 1 which can be fixed to or at a dentist's chair and which has through-going bores with appertaining connections, viz. one or more inlet connections 2 which via hose connections can be connected to a rinse basin and a mouth suction device, an outlet connection 3 which can be connected to a vacuum source, and a discharge connection 4 which can be connected to an injector or suction pump for suction of filtered water to a sewer or possibly to a collecting tank. The connection 2 can be equipped with branch connections for connection to rinse basin and mouth suction device respectively, or either of these sources of pollution can be connected to a separate connection 2 in the head.

20

A tank 7 with a closed bottom 5 has a gasket 6 in its mouth rim facing upwards, by means of which gasket it closes tightly against the head 1 to which it is fixed, for example, by a threaded section or a snap lock 8 (Fig. 2) or in another suitable way. For example, the tank can be a cup of elastic material with a rim which can be snapped over a bead on an axial flange of the head 1.

The upper end of a suction tube 10 is fixed to the head under the discharge connection 4 by means of a seal ring 9, and this tube almost reaches the tank bottom where it is surrounded by a filter cartridge 11 which is in close contact with the tank bottom 5. For example, the filter cartridge 11 can be glued to the bottom or fixed to it in some other suitable way as indicated in Figure 2. Tightness can also be obtained with an O-ring 12. The filter cartridge is tightly connected to the suction pipe 10 through a jacket 14.

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However, the filter cartridge can also simply be

- 6 -

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closed at the bottom, or it can be ensured in some other way that there is only connection between the outer and inner sides of the cartridge through the filter element. The liquid which flows from the inlet connection 2 to the bottom of the tank, and which from the discharge connection 4 is sucked up through the tube 10, can be cleaned more or less depending on the pores of the filter cartridge 11. As indicated in Figure 1, it can be divided into a coarse filter 11a and an inner filter 11b with finer pores so that clogging up of the filter is delayed which is important since a filter cartridge with a pore size sufficient for obtainment of the filtration fineness yielded by the apparatus according to the invention, is clogged up on the surface very soon unless, like in an embodiment according to the invention, it is surrounded by a cartridge with a larger pore size which provides a certain volume for absorption of the large particles, which thus delay clogging up of the inner cartridge.

The air which enters through connection 2 and is sucked off through connection 3, is cleaned of impurities by the strong deflection in the tank and, if desired, by passage of a sieve 17 or a filter placed under the outlet connection 3. The mesh size of this sieve, or the filter, can also be varied with due regard to the kind of waste products and the degree of cleaning required.

The embodiment of the apparatus according to the invention shown in Figure 2 differs from the embodiment described above by a suspended tubular sieve being mounted in close connection with the lower side of the head 1, which sieve can detain waste products from the liquid-gas mixture entering through inlet connection 2.

To prepare the apparatus for operation, the tank 7 is placed under the stationary head 1 whose connections are connected permanently to a rinse basin, a vacuum suction source, and an injector or suction pump respectively.

During its use, air, mucus, water, and impurities are sucked in through the inlet connection 2. Impurities

- 7 -

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are separated off in the sieve 13 and/or by the strong change in the air direction, before it flows to the suction source through connection 3 while the liquid flows to the bottom of the tank, and waste products such as amalgam waste
5 are filtered off by the filter cartridge 11 before the liquid is drawn up through suction tube 10.

By means of an electrode 16 or a corresponding detection device such as a probe extending into the tank, or by electric control in connection with the air suction
10 motor, it is ensured that the liquid in the tank 7 does not rise above a prefixed level 15 since the liquid suction through the discharge connection 4 is started when the liquid surface has risen to this level. The tank filled with waste is separated from the lid 1 by the snap lock
15 mechanism 8 and is closed with an appertaining tight-fitting lid and sent to a plant where its contents are destroyed and/or recovered. It will be understood that the apparatus with head 1 and filter cartridge 11 and a sieve 17, 13 if any, and an appertaining tank 7 can be made at a relativ-
20 ely low price and can work without replacement for a prolonged period. Furthermore, the apparatus according to the invention is suitable for use in connection with most existing suction apparatuses at dental clinics.

The apparatus according to the invention can be
25 made in many other ways than the one described in the foregoing. For example, as shown in dotted lines in Figure 2, a fixed tight-fitting cover 9 with openings flush with the bores of the head 1 for connections 2, 3, 4 can be placed at the top of the collecting tank 7. In that case the
30 screen 13 and possibly also the suction tube 10 can be fixed to the cover 9 so that they are removed together with the collecting tank.

However, the tank can also be designed with a removable cover 9 and an interchangeable filter 13 placed
35 on it. In either of the embodiments shown the filter cartridge 11 and the jacket 14 can be arranged for replacement on the suction tube 10.

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It can be seen that the invention has produced a cleaning-convenient apparatus of a simple design and usable for safe collection of waste products of many different kinds, including especially the very smallest particles in the waste which it has hitherto been impossible to detain to the same degree. It is thus assumed that at least 98% of liquid-suspended particles of the size 0.3 μ or larger can be caught in the filter cartridge 11, and that 99.95% of particles in the suction air of a size larger than 0.2 μ can be detained in a corresponding filter cartridge 17 in front of the outlet connection 3. The apparatus can easily be arranged individually for the degree of cleaning wanted or required in every single case.

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Patent Claims:

1. An apparatus for separation of waste products from a flow of liquid and gas e.g. at dental clinics or photographic establishments, and of the kind which has a tank (7), the inner space of which is connected at its upper end to at least one inlet connection (2) for sucked-in liquid and gas, and with an outlet connection (3) for evacuated gas, while the lower end of the space is connected to a discharge connection for liquid, c h a r a c t e r i z e d in that the inlet connection (2), the outlet connection (3), and the discharge connection (4) for liquid are placed on a common head (1) with devices (8) for tight-fitting connection with the mouth rim of the tank wall, and in that the interior of a filter cartridge (11) placed in the lower part of the tank space is connected via a suction tube (10) to the discharge connection (4) for liquid.

2. An apparatus as claimed in claim 1, c h a r a c t e r i z e d in that a filter sieve (17) or a filter cartridge is placed under the outlet connection (3) for gas of head (1).

3. An apparatus as claimed in claims 1-2, c h a r a c t e r i z e d in that the filter cartridge (11) is tubular and that the extreme end of the tube wall forms a coarse filter (11a) while the inner part of the wall consists of a material (11b) with finer pores.

4. An apparatus as claimed in each of the preceding claims, c h a r a c t e r i z e d in that the tank (7) contains an interchangeable sieve (13) placed between the mouth of the inlet connection (2) of head (1) for liquid and gas and the outlet connection (3) for gas and which extends towards the bottom of the tank (7).

5. An apparatus as claimed in claim 4, c h a r a c t e r i z e d in that the sieve (13) is a tube which is open at both ends and placed under the inlet connection (2) of head (1).

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6. An apparatus as claimed in claim 4, c h a r -
a c t e r i z e d in that the sieve (13) is a bag under
the inlet connection (2) of head (1).

5 7. An apparatus as claimed in each of the pre-
ceding claims, c h a r a c t e r i z e d in that the
collecting tank (7) is fixed to the circumference of an
axial flange on head (1) by the use of a snap lock mechan-
ism (8) or a threaded section.

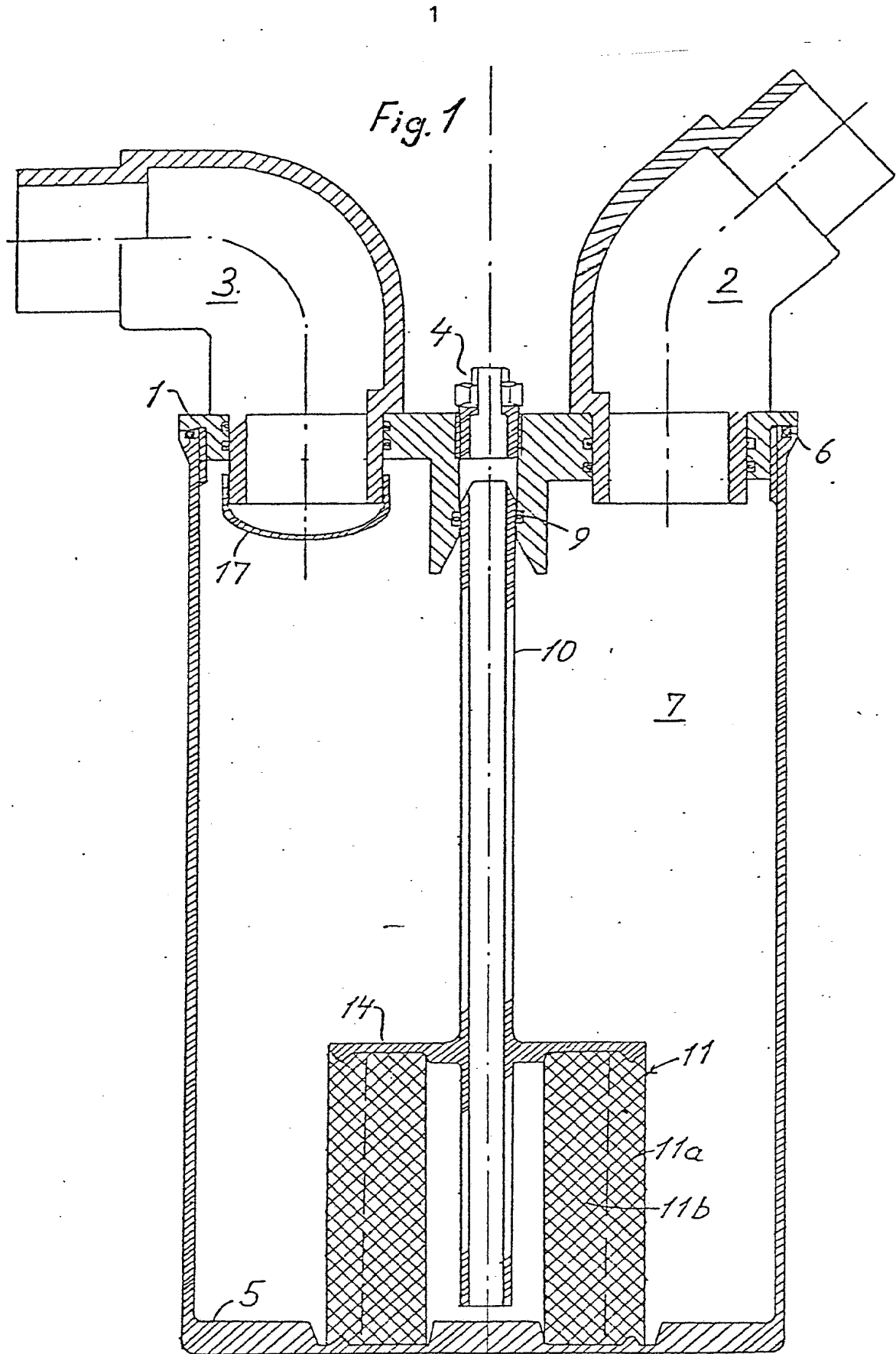
10 8. An apparatus as claimed in each of the pre-
ceding claims, c h a r a c t e r i z e d in that the
filter cartridge (11) is interchangeable on the suction
tube (10).

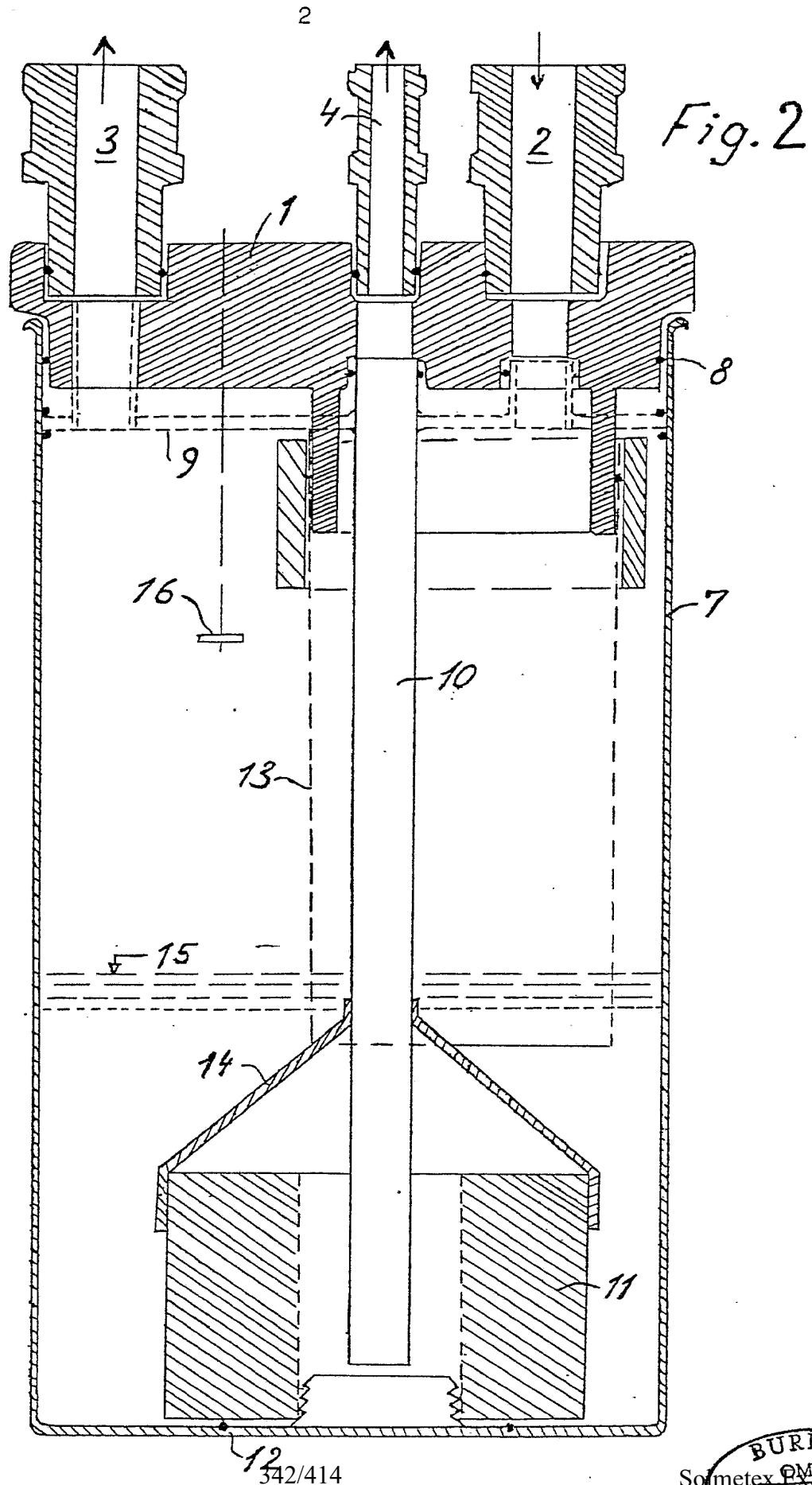
15 9. An apparatus as claimed in each of the pre-
ceding claims, c h a r a c t e r i z e d in that the
suction tube (10) from the filter cartridge (11) is re-
leasably connected to head (1).

20 10. An apparatus as claimed in each of the pre-
ceding claims, c h a r a c t e r i z e d in that the
tank (7) forms an interchangeable disposable tank which
immediately under the head (1) has a cover (9) with open-
ings flush with the openings in the connections (2, 3, 4)
of the head and that the discharge connection (4) for
liquid is arranged for a tight-fitting releasable con-
nection with the suction tube (10) passing through the
25 cover from the filter cartridge (11).

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INTERNATIONAL SEARCH REPORT

International Application No PCT/DK83/00011

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ¹

According to International Patent Classification (IPC) or to both National Classification and IPC 3

A 61 C 17/04, B 01 D 35/02, G 03 C 11/24

II. FIELDS SEARCHED

Minimum Documentation Searched ⁴

Classification System	Classification Symbols
IPC 3	A 61 C 17/04, A 61 M 1/00, B 01 D 27/04,08, G 03 C 11/24, B 01 D 35/02
US C1	32:33; 210:311, 406, 416, 422-423, 435-438, 459-460

Documentation Searched other than Minimum Documentation
to the Extent that such Documents are Included in the Fields Searched ⁴

SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴

Category ⁵	Citation of Document, ¹⁴ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸
Y	DE, B2, 2 459 881 (SIEMENS AG) 24 June 1976 & DK, C, 138 927	
Y	DE, A1, 2 934 915 (LANG) 19 March 1981	
Y	GB, A, 1 299 677 (PENNWALT CORP) 2 August 1971	
Y	US, A, 3 482 313 (STRAM) 9 December 1969	
Y	US, A, 2 997 180 (LOVEDAY) 22 August 1961	
A	SE, B, 333 249 (EASTMAN KODAK COMPANY) 1 July 1968	

⁵ Special categories of cited documents: ¹⁶

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

"E" earlier document 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

"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.

"Z" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search ¹

1983-05-11

Date of Mailing of this International Search Report ¹

1983-05-20

International Searching Authority ¹

Swedish Patent Office

Signature of Authorized Officer ¹⁰

343/114 Johan Auby

Solmetex Ex. 2003

Electronic Patent Application Fee Transmittal

Application Number:	16033823			
Filing Date:	12-Jul-2018			
Title of Invention:	Detachable Recycling Container			
First Named Inventor/Applicant Name:	Nicholas Mozzicato			
Filer:	Steven R. Lazar			
Attorney Docket Number:	SMTX-001-T1			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	120	120
Total in USD (\$)				120

Electronic Acknowledgement Receipt

EFS ID:	33849658
Application Number:	16033823
International Application Number:	
Confirmation Number:	9793
Title of Invention:	Detachable Recycling Container
First Named Inventor/Applicant Name:	Nicholas Mozzicato
Customer Number:	80709
Filer:	Steven R. Lazar
Filer Authorized By:	
Attorney Docket Number:	SMTX-001-T1
Receipt Date:	27-SEP-2018
Filing Date:	12-JUL-2018
Time Stamp:	14:52:21
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 120
RAM confirmation Number	092818INTEFSW14532100
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

346/414

Solmetex Ex. 2003

DRNA v. Solmetex - PGR2023-00555

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	SMTX-001-US-T1-IDS.pdf	613139	no	6
			772edc81f5157315ebccbde837a1cd6ed84f0261		
Warnings:					
Information:					
2	Foreign Reference	EP1366728B1.pdf	594424	no	11
			6aed41c09d751c45f66816ccd62056a42997698f		
Warnings:					
Information:					
3	Foreign Reference	CA2442513A1.pdf	523628	no	13
			32fd13e4377aa63756e3d7390ef0f584d7ccb087		
Warnings:					
Information:					
4	Foreign Reference	WO2018006106A1.pdf	515694	no	17
			97e37d218865e687953eaeef8dc5ecce4d649156b9		
Warnings:					
Information:					
5	Foreign Reference	WO9416643A1.pdf	646991	no	15
			4d9f3a2f557e041786392421f2cd7c71e434832c		
Warnings:					
Information:					
6	Foreign Reference	WO8302720A1.pdf	776796	no	15
			92260c677d0772cab2f0ec85d158059da5ac716f		
Warnings:					
Information:					

7	Fee Worksheet (SB06)	fee-info.pdf	30180	no	2
			44385af1abae8df5b7d6d2a517f62ccf86289bb5		
Warnings:					
Information:					
Total Files Size (in bytes):				3700852	
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/033,823	07/12/2018	Nicholas Mozzicato	SMTX-001-T1	9793
80709	7590	09/11/2018	EXAMINER	
Steven R. Lazar SRL Patents 234 Broadway Arlington, MA 02474			ART UNIT	PAPER NUMBER
			3732	
			NOTIFICATION DATE	DELIVERY MODE
			09/11/2018	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

srlpatents@aol.com



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Doc Code:
TRACK1.GRANT

**Decision Granting Request for
Prioritized Examination
(Track I or After RCE)**

Application No.: 16/033,823

1. THE REQUEST FILED July 12, 2018 IS **GRANTED**.

The above-identified application has met the requirements for prioritized examination

- A. ☒ for an original nonprovisional application (Track I).
B. ☐ for an application undergoing continued examination (RCE).

2. **The above-identified application will undergo prioritized examination.** The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:

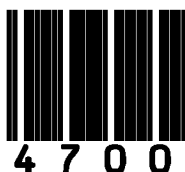
- A. filing a **petition for extension of time** to extend the time period for filing a reply;
B. filing an **amendment to amend the application to contain more than four independent claims, more than thirty total claims**, or a multiple dependent claim;
C. filing a **request for continued examination**;
D. filing a notice of appeal;
E. filing a request for suspension of action;
F. mailing of a notice of allowance;
G. mailing of a final Office action;
H. completion of examination as defined in 37 CFR 41.102; or
I. abandonment of the application.

Telephone inquiries with regards to this decision should be directed to April M. Wise at (571) 272-1642. In his/her absence, calls may be directed to JoAnne Burke at (571) 272-4584.

/JoAnne L Burke/
[Signature]

Paralegal Specialist, Office of Petitions
(Title)

Office of Petitions: Routing Sheet



Application No.

This application is being forwarded to your office for further processing. A decision has been rendered on a petition filed in this application, as indicated below. For details of this decision, please see the document PET.OP.DEC filed on the same date as this document.

☒ **GRANTED**

☐ **DISMISSED**

☐ **DENIED**

Office of Petitions: Decision Count Sheet

Mailing Month

9

Application No.

16033823



For US serial numbers: enter number only, no slashes or commas. Ex: 10123456

For PCT: enter "51+single digit of year of filing+last 5 numbers", Ex. for PCT/US05/12345, enter 51512345

Deciding Official:

WISE, APRIL M.

Count (1) - Palm Credit

16033823

Decision:

GRANT

FINANCE WORK NEEDED

☐ Select Check Box for YES

Decision Type:

643 - Track One request



Notes:

Count (2)

Decision:

n/a

FINANCE WORK NEEDED

☐ Select Check Box for YES

Decision Type:

NONE

Notes:

Count (3)

Decision:

n/a

FINANCE WORK NEEDED

☐ Select Check Box for YES

Decision Type:

NONE

Notes:

Initials of Approving Official (if required)

If more than 3 decisions, attach
2nd count sheet & mark this box

Printed on: 9/6/2018

Office of Petitions Internal Document - Ver. 5.0

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 16/033,823			
APPLICATION AS FILED - PART I									
(Column 1)		(Column 2)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY			
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)		
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	75		N/A			
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	330		N/A			
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	380		N/A			
TOTAL CLAIMS (37 CFR 1.16(j))	4	minus 20 = *	x 50 =	0.00	OR				
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1	minus 3 = *	x 230 =	0.00					
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00					
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00					
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	785		TOTAL			
APPLICATION AS AMENDED - PART II									
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)	
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =		
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =		
	Application Size Fee (37 CFR 1.16(s))					OR			
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR			
			TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE			
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)	
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =		
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =		
	Application Size Fee (37 CFR 1.16(s))					OR			
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR			
			TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE			
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.									



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
16/033,823	07/12/2018	1778	865	SMTX-001-T1	4	1

CONFIRMATION NO. 9793
UPDATED FILING RECEIPT

80709
Steven R. Lazar
SRL Patents
234 Broadway
Arlington, MA 02474



Date Mailed: 08/23/2018

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Nicholas Mozzicato, Acton, MA;
Richard Goulston, Stuart, FL;
Robin Schofield, Lancaster, MA;
Michael Toole, Norton, MA;

Applicant(s)

Solmetex LLC, Northborough, MA

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CIP of 15/730,828 10/12/2017
which claims benefit of 62/414,712 10/29/2016
and claims benefit of 62/406,990 10/12/2016

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 07/26/2018

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/033,823**

Projected Publication Date: 11/29/2018

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Detachable Recycling Container

Preliminary Class

210

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/033,823	07/12/2018	Nicholas Mozzicato	SMTX-001-T1

CONFIRMATION NO. 9793

80709
Steven R. Lazar
SRL Patents
234 Broadway
Arlington, MA 02474

INFORMAL NOTICE



Date Mailed: 08/23/2018

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
Nicholas Mozzicato

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/dgela/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	:	Examiner: TBA
MOZZICATTO	)	
	:	Group Art Unit TBA
Application No.: 16/033,823	)	
	:	Confirmation No. 9793
Filed: July 12, 2018	)	
	:	
For: DETACHABLE CONTAINER	)	
	:	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO NOTICE TO FILE MISSING PARTS

Sir:

In response to the Notice to File Missing Parts, mailed on July 30, 2018

Applicant responds as follows:

1. Applicant submits herewith the executed declaration of the inventors Nicholas Mozzicatto; Robert Schofield, Richard Goulston and Michael Toole

and

2. The small entity surcharge in the amount of \$ 80.00.

Remarks begin on page 2.

REMARKS

Applicant submits this response to the Notice to File Missing Parts, which was mailed on July 30, 2018.

With submission herewith the executed oath or declaration of the inventors, the and the small entity surcharge of \$ 80.00, it is believed that all requirements for this provisional patent application have been satisfied.

Applicant's undersigned representative may be reached by telephone at 617-966-2374. All correspondence should continue to be directed to the listed address.

Respectfully submitted,

/Steven R. Lazar/

Steven R. Lazar
Attorney for Applicants
Registration No. 32,618

SRL Patents
234 Broadway
Arlington, MA 02474
August 21, 2018

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of
Invention

Detachable Container

As the below named inventor, I hereby declare that:

This declaration
is directed to:

☐

The attached application, or

☒

United States application or PCT international application number 16033823

filed on July 12, 2018

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

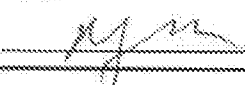
WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Nick Mozzicato

Date (Optional): 8-13-18

Signature: 

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN
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LEGAL NAME OF INVENTOR

Inventor: Richard Goulston

Date (Optional) : _____

Signature: _____

Richard Goulston

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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LEGAL NAME OF INVENTOR

Inventor: Robin Schofield

Date (Optional):

07/27/2018

Signature:

Robin B. Schofield

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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Title of
Invention

Detachable Container

As the below named inventor, I hereby declare that:

This declaration
is directed to:

☐

The attached application, or

☒

United States application or PCT international application number 16033823

filed on July 12, 2018

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

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LEGAL NAME OF INVENTOR

Inventor: Michael Toole

Date (Optional):

8/15/18

Signature: 

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	16033823			
Filing Date:	12-Jul-2018			
Title of Invention:	Detachable Recycling Container			
First Named Inventor/Applicant Name:	Nicholas Mozzicato			
Filer:	Steven R. Lazar			
Attorney Docket Number:	SMTX-001-T1			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
LATE FILING FEE FOR OATH OR DECLARATION	2051	1	80	80
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				80

Electronic Acknowledgement Receipt

EFS ID:	33487556
Application Number:	16033823
International Application Number:	
Confirmation Number:	9793
Title of Invention:	Detachable Recycling Container
First Named Inventor/Applicant Name:	Nicholas Mozzicato
Customer Number:	80709
Filer:	Steven R. Lazar
Filer Authorized By:	
Attorney Docket Number:	SMTX-001-T1
Receipt Date:	21-AUG-2018
Filing Date:	12-JUL-2018
Time Stamp:	14:31:42
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$80
RAM confirmation Number	082218INTEFSW14322500
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

368/414

Solmetex Ex. 2003

DRNA v. Solmetex - PGR2023-00555

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	Solmetex-001-T1-Response_to_NTFMP.pdf	59405	no	2
			c33a67fc99f00116600729275270a54709e0e6d7		
Warnings:					
Information:					
2	Oath or Declaration filed	Mozzicato_declaration_signed.pdf	86993	no	1
			530cc0872026f098d3c2e6ca5513c127273bb0d1d		
Warnings:					
Information:					
3	Oath or Declaration filed	Goulston_declaration_signed.pdf	130611	no	1
			6e567e1d4eea0d9f42fc2565b9e0d9ece01b9d92		
Warnings:					
Information:					
4	Oath or Declaration filed	Schofield_declaration_signed.pdf	163580	no	2
			6a486c548f63c916a9e80fd0e693d3955302abe2		
Warnings:					
Information:					
5	Oath or Declaration filed	Toole_declaration_signed.pdf	177141	no	2
			fb996b1c5a21f0d2dd257830a1605b39d9064540		
Warnings:					
Information:					
6	Fee Worksheet (SB06)	fee-info.pdf	30309	no	2
			f2034aecea40a2cde6411a1c5b76eeb488ffed1		
Warnings:					
Information:					

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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COMMISSIONER FOR PATENTS
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ALEXANDRIA VA 22313-1451

PRESORTED
FIRST-CLASS MAIL
U.S. POSTAGE PAID
POSTEDIGITAL
NNNNN

Steven R. Lazar
SRL Patents
234 Broadway
Arlington, MA 02474



**Courtesy Reminder for
Application Serial No: 16/033,823**

Attorney Docket No: SMTX-001-T1
Customer Number: 80709
Date of Electronic Notification: 07/30/2018

This is a courtesy reminder that new correspondence is available for this application. If you have not done so already, please review the correspondence. The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

An email notification regarding the correspondence was sent to the following email address(es) associated with your customer number:
srlpatents@aol.com

To view your correspondence online or update your email addresses, please visit us anytime at **<https://sportal.uspto.gov/secure/myportal/privatepair>**. If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov or call 1-866-217-9197.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
16/033,823	07/12/2018	1778	785	SMTX-001-T1	4	1

CONFIRMATION NO. 9793

FILING RECEIPT



0000000101283442

80709
Steven R. Lazar
SRL Patents
234 Broadway
Arlington, MA 02474

Date Mailed: 07/30/2018

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Nicholas Mozzicato, Acton, MA;
Richard Goulston, Stuart, FL;
Robin Schofield, Lancaster, MA;
Michael Toole, Norton, MA;

Applicant(s)

Solmetex LLC, Northborough, MA

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CIP of 15/730,828 10/12/2017
which claims benefit of 62/414,712 10/29/2016
and claims benefit of 62/406,990 10/12/2016

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 07/26/2018

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/033,823**

Projected Publication Date: 11/08/2018

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Detachable Recycling Container

Preliminary Class

210

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 16/033,823			
APPLICATION AS FILED - PART I									
(Column 1)		(Column 2)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY			
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)		
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	75		N/A			
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	330		N/A			
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	380		N/A			
TOTAL CLAIMS (37 CFR 1.16(j))	4	minus 20 = *	x 50 =	0.00	OR				
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1	minus 3 = *	x 230 =	0.00					
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00					
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00					
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	785		TOTAL			
APPLICATION AS AMENDED - PART II									
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)	
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =		
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =		
	Application Size Fee (37 CFR 1.16(s))					OR			
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR			
			TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE			
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)	
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =		
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =		
	Application Size Fee (37 CFR 1.16(s))					OR			
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR			
			TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE			
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.									



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/033,823	07/12/2018	Nicholas Mozzicato	SMTX-001-T1

CONFIRMATION NO. 9793

FORMALITIES LETTER



80709
Steven R. Lazar
SRL Patents
234 Broadway
Arlington, MA 02474

Date Mailed: 07/30/2018

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing.

Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.

The surcharge is due for any one of:

- late submission of the basic filing fee, search fee, or examination fee,
- late submission of inventor's oath or declaration,
- filing an application that does not contain at least one claim on filing, or
- submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. Small entity discount is in effect. If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- \$ 80 surcharge.
- \$(0) previous unapplied payment amount.
- \$ 80 TOTAL FEE BALANCE DUE.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):

page 1 of 2

Nicholas Mozzicato
Richard Goulston
Robin Schofield
Michael Toole

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice".
<https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/zabaha/



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE	REQUEST ID
16/033,823	07/12/2018	Solmetex LLC	SMTX-001-T1	67999

Acknowledgement of Change to Small Entity Status

The entity status change request below filed through Private PAIR on 07/19/2018 has been accepted.

CERTIFICATIONS:

Change of Entity Status:

× Applicant asserting small entity status. See 37 CFR 1.27.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

This portion must be completed by the signatory or signatories making the entity status change in accordance with 37 CFR 1.4(d)(4).

Signature:	/Steven R. Lazar/
Name:	Steven R. Lazar
Registration Number:	32618

**CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION
UNDER 37 CFR 1.102(e) (Page 1 of 1)**

First Named Inventor:	Mozzicatto	Nonprovisional Application Number (if known):	TBA
Title of Invention:	Detachable Container		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently \$0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.
2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.
3. The applicable box is checked below:

I. ☒ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)

- i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.
---OR---
(b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.
- ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, or the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.

II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)

- i. A request for continued examination has been filed with, or prior to, this form.
- ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
- iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
- iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
- v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature /Steven R. Lazar/	Date 07/12/2018
Name (Print/Typed) Steven R. Lazar	Practitioner Registration Number 32618
Note: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.*	
☐ *Total of _____ forms are submitted.	

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	SMTX-001-T1
		Application Number	
Title of Invention	Detachable Recycling Container		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2:

☐	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
--------------------------	---

Inventor Information:

Inventor	1				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Nicholas		Mozzicato		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Acton	State/Province	MA	Country of Residence	US

Mailing Address of Inventor:

Address 1	19 Preston Way				
Address 2					
City	Acton	State/Province	MA		
Postal Code	01720	Country	US		

Inventor	2				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Richard		Goulston		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Stuart	State/Province	FL	Country of Residence	US

Mailing Address of Inventor:

Address 1	415 NW North River Drive				
Address 2					
City	Stuart	State/Province	FL		
Postal Code	34994	Country	US		

Inventor	3				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Robin		Schofield		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	SMTX-001-T1
		Application Number	
Title of Invention	Detachable Recycling Container		

City	Lancaster	State/Province	MA	Country of Residence	US
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Mailing Address of Inventor:

Address 1	164 Old Country Road				
Address 2					
City	Lancaster	State/Province	MA		
Postal Code	01523	Country	US		
Inventor	4				Remove
Legal Name					

Prefix	Given Name	Middle Name	Family Name	Suffix
	Michael		Toole	

Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Norton	State/Province	MA	Country of Residence	US

Mailing Address of Inventor:

Address 1	12 Bryson Drive				
Address 2					
City	Norton	State/Province	MA		
Postal Code	02766	Country	US		
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button. Add					

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence Information of this application.			
Customer Number	80709		
Email Address	srlpatents@aol.com	Add Email	Remove Email

Application Information:

Title of the Invention	Detachable Recycling Container		
Attorney Docket Number	SMTX-001-T1	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	6	Suggested Figure for Publication (if any)	1

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	SMTX-001-T1
		Application Number	
Title of Invention	Detachable Recycling Container		

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not be** the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	80709		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation in part of	15730828	2017-10-12

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	SMTX-001-T1
		Application Number	
Title of Invention	Detachable Recycling Container		
Prior Application Status	<input type="text"/>	<input type="button" value="Remove"/>	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
15730828	Claims benefit of provisional	62414712	2016-10-29
Prior Application Status	<input type="text"/>	<input type="button" value="Remove"/>	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
15730828	Claims benefit of provisional	62406990	2016-10-12
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			<input type="button" value="Add"/>

Foreign Priority Information:

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Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	SMTX-001-T1
		Application Number	
Title of Invention	Detachable Recycling Container		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

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The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	SMTX-001-T1
		Application Number	
Title of Invention	Detachable Recycling Container		

Applicant Information:

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Applicant	1	Remove
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Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
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If the Applicant is an Organization check here. ☒		
Organization Name	Solmetex LLC	
Mailing Address Information For Applicant:		
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	SMTX-001-T1
		Application Number	
Title of Invention	Detachable Recycling Container		

Assignee	1			
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City	<input type="text"/>	State/Province	<input type="text"/>	
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See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Steven R. Lazar/		Date (YYYY-MM-DD)	2018-07-12
First Name	Steven	Last Name	Lazar	Registration Number
				32618
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	SMTX-001-T1
		Application Number	
Title of Invention	Detachable Recycling Container		

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DETACHABLE CONTAINER**FIELD OF THE INVENTION**

[001] This invention relates to systems and apparatus suitable to remove particles from effluent waste, and particularly, to remove amalgam and other metallic particles and other abrasive solids from dental office suction effluent. The system also comprises a self-contained detachable container to facilitate customer regulatory compliance and environmental safeguards.

BACKGROUND OF THE INVENTION

[002] Dental amalgam is a dental filling material used to fill cavities caused by tooth decay. It has been used for more than 150 years in hundreds of millions of patients around the world.

[003] Dental amalgam is a mixture of metals, consisting of liquid (elemental) mercury and a powdered alloy composed of silver, tin, and copper. Approximately 50% of dental amalgam is elemental mercury by weight. The chemical properties of elemental mercury allow it to react with and bind together the silver/copper/tin alloy particles to form an amalgam. See <http://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/DentalProducts/DentalAmalgam/ucm171094.htm>, accessed September 9, 2016.

[004] Amalgam is used less often than in the past, mostly because tooth-colored materials now can be used. However, the newer materials can't be used for all dental situations, amalgam is less costly than newer materials and it lasts longer, especially in teeth that undergo a lot of pressure and wear from chewing.

[005] Better dental health overall coupled with increased demand for more modern alternatives such as resin composite fillings (which match the tooth color), as well as public concern about the mercury content of dental amalgam, have resulted in a steady decline in dental amalgam use in developed countries, though overall amalgam use continues to rise worldwide. Stein, PS; Sullivan, J; Haubenreich, JE; Osborne, PB (2005). "Composite resin in medicine and dentistry". *Journal of long-term effects of medical implants*. 15 (6): 641–54. doi:10.1615/jlongtermeffmedimplants. v15.i6.70. PMID 16393132.

[006] Although amalgams are less frequently used in developed countries for new dental fillings than in the past, amalgams continue to make up a portion of the particle component of dental office effluent mainly because of the fact that old fillings made of amalgams are drilled out and removed in the effluent waste when new fillings are effected to replace the old. Further, as noted above, even under current dental practice, an amalgam is preferred for some tooth filling situations.

[007] Because mercury is a poison that can accumulate in living tissues and can pose a health hazard to species in a food chain exposed to mercury-containing compounds, and since humans are inevitably at the end of the food chain, it follows that effluent containing amalgams can pose a health hazard to the community at large. Also, certain metals such as silver are commercially valuable if recovered in quantity. For those reasons, it is desirable to devise systems, apparatus and processes for removing amalgams from dental office effluent and efficiently recycling those amalgams.

[008] In addition to removing amalgams, other matter disposed into dental office suction effluent includes aluminum oxides used in air abrasion treatments and other solid waste material. These solid materials tend to wear out or damage vacuum pumps and other equipment downstream of the dental chair suction apparatus, and also constitute effluent water contaminants. Therefore, it is desirable for the apparatus to remove solid abrasive material and other particulate waste from the dental office suction effluent.

[009] The World Health Organization also points out that amalgam separators, installed in the waste water lines of many dental offices, dramatically decrease the release of mercury into the public sewer system. However, critics say that the separators are still not mandatory in some states of the United States. "Purchasing, installing and operating dental amalgam separators: Practical issues". The Journal of the American Dental Association. 134 (8): 1054–65. doi:10.14219/jada.archive.2003.0319. PMID 12956345. Recently, the EPA has enacted nation-wide regulations requiring amalgam separators in dental offices.

[0010] Previously known apparatus for removing amalgam particles from dental office suction effluent are known to include a collecting tank for collecting a day's accumulation of suction effluent from one or more sources of such waste. The waste is sucked from the dental chair suction apparatus and into the collecting tank by a vacuum pump. When the vacuum

pump is turned off, an outlet valve is opened and the accumulated waste is deposited into a separation device intended to separate metal particles from the effluent liquid. Flow into the separation device is induced by the head of fluid in the collecting tank. Particles passing through the separation device are separated from the waste by gravity and settle to the bottom of the separation device. The flow rate is dependent on the head inside the collecting tank; as the head diminishes, the flow rate also diminishes. The changes in flow rate are undesirable because the particle separation rate is affected, and the system becomes prone to plugging when the flow rate decreases. Another drawback to such systems are that, since the waste can be deposited only when the vacuum pump is off, waste is usually moved to the separation device at the end of the day. As a result, the collecting tank and separation device tend to be undesirably large and the whole process is time consuming.

[0011] Another known apparatus is a centrifuge type system that separates heavier metal particles from effluent liquid by collecting the particles at the peripheral wall of the centrifuge. This apparatus does not effectively separate lighter particles, and is expensive to purchase and operate due to the complexity of its mechanical parts.

[0012] Yet another known apparatus uses a dedicated mechanical pump to suction waste liquids through a separator device. Again, a dedicated pump can be expensive to purchase and to maintain, and can be undesirably space-consuming.

[0013] Such known systems can become quite complex, unwieldy and expensive, as for example that disclosed in U.S. Pat. No. 5,885,076 granted 23 Mar. 1999. It teaches the use of sedimentation, co-precipitation and filtration in an expensive complicated apparatus that is probably economical, if at all, only for relatively large installations such as a military base dental complex.

[0014] U.S. Pat. No. 6,692,636 and U.S. Pat. No. 6,592,754 are patents that disclose systems for removing amalgam from dental office suction effluent.

[0015] After collecting the amalgam and other solid waste the dentist is left with the problem of what to do with the waste. Either the dentist has to deal with his own hazardous waste or he can send his collected material to a recycler. In either case, the "collection container" needs to be disposable and easily replaceable.

[0016] Existing recycling programs generally require the provision of bulky shipping materials and the delivery of those materials to the dentist for every full container. If such materials are not provided and the materials are not properly recycled a large part of the benefit of collecting the amalgam waste can be lost. It is important that the waste is recycled under federal guidelines in order to make sure the full benefits of amalgam separation are achieved.

[0017] Additionally, containers for collection, such as dental amalgam recycling systems, can be compromised by incorrect installation or misalignment, which can cause O-rings to deform and/or seal irregularly, and result in leakage.

SUMMARY OF THE INVENTION

[0018] The present invention overcomes many of the shortcomings of the prior technology and achieves further advantages that will be apparent after reviewing the following detailed description.

[0019] In one aspect, the invention comprises a dental amalgam recycling system for recycling particles from a dental liquid effluent drawn from a suctioning device. In certain embodiments, the dental amalgam recycling system of the invention comprises:

[0020] (a) an air-water separator tank for receiving said effluent, said air-water separator tank having an air-water separator tank inlet in fluid communication with said suctioning device, an air-water separator tank liquid effluent outlet and an air-water separator tank air outlet;

[0021] (b) a detachable recycling container, said recycling container acting primarily under the influence of gravity to cause settlement of said particles; said recycling container having a recycling container effluent inlet port connected to said air-water separator tank liquid effluent outlet and said recycling container further having an effluent outlet port;

[0022] (c) wherein the air-water separator tank also includes an internal suction conduit;

[0023] (d) wherein the recycling container comprises threads;

[0024] (e) wherein the recycling container effluent inlet port and the recycling container outlet port of a first height and a second height, respectively, the first height being different from the second height (i.e, are not the same height).

[0025] In certain embodiments, the dental amalgam recycling system further comprises (f) a threaded shipping cap, wherein the threads of the shipping cap and the threads of the recycling container are complementary such that, when the shipping cap is fitted in place, the shipping cap forms a tight seal with said recycling container.

[0026] While in use, the dental amalgam recycling system is functionally associated with a vacuum pump having a vacuum pump inlet. The vacuum pump is typically a pre-existing part of the dental office facility. In particular embodiments, the dental amalgam recycling system is physically connected with a vacuum pump via a suction conduit in the air-water separator. In certain preferred embodiments, the suction conduit is an internal suction conduit within the air-water separator.

[0027] In certain embodiments, the dental amalgam recycling system of the invention further comprise a first plug for said recycling container inlet port and a second plug for said recycling container effluent outlet port. Said first and second plugs may be held tightly in place by said threaded shipping cap when said shipping cap is fitted in place.

[0028] In certain embodiments, the dental amalgam recycling system of the invention further comprise an O-ring that provides an air and effluent tight seal when said shipping cap is fitted in place.

[0029] In certain embodiments, the invention comprises a container, useful as a dental amalgam recycling container, comprising threads for attachment of a shipping cap. In certain embodiments, the dental amalgam recycling container further comprises two plugs held in place by said shipping cap and an O-ring fitted in an O-ring groove to prevent leaks. The dental amalgam recycling containers of the present invention may further comprise a two tier cap that enables people with hands of different sizes to grip the cap and tighten to achieve a very tight seal.

[0030] Thus in certain embodiments the present invention comprises a detachable container suitable for mating securely with an air-water separation tank, said detachable container having an outside top mating surface comprising an inlet port and an outlet port of

a first height and a second height, respectively, wherein the first height is different from the second height; and wherein said detachable container further comprises one or more irregular keyways cast into said outside top mating surface; said air-water separation tank comprising one or more corresponding irregular keys, such that when the irregular keyways of the detachable container are aligned with the corresponding irregular keys of the air-water separation tank, said detachable container is capable of mating securely with said air-water separation tank.

[0031] In certain embodiments, the detachable container further comprises a cap for covering the outside top mating surface and having an inside surface with a first circular wall and a second circular wall, the first circular wall having a height selected to engage an upper surface of one of the inlet port or the outlet port and the second circular wall having a height selected to engage an upper surface of the other of the inlet port or the outlet port.

[0032] In certain embodiments, the cap has a threaded interior peripheral edge for engaging with a threaded exterior peripheral edge on the detachable container, and threaded engagement of the cap to the detachable container secures the first and second circular walls into engagement with the inlet port and outlet port for sealing the inlet port and the outlet port.

[0033] In certain embodiments, the cap further comprises a circular sidewall extending from the outside top mating surface and defining an interior chamber for the detachable container, the interior chamber being capable of supporting a partial vacuum when the inlet port and outlet port are sealed.

[0034] In certain embodiments, the invention comprises an adapter for an air-water separator tank, wherein the adapter enables a recycling container without compatible effluent ports to attach to an air-water separator tank. Said air-water separator tank may comprise, for example, a component of a dental amalgam recycling system, as described above. In certain embodiments, the adapter may comprise threads. In alternative embodiments, the adaptor may be without threads.

[0035] As described above, the potential for leakage exists in a collection canister such as a recycling container used in the dental amalgam recycling systems described herein. Such leakage may occur, for example, due to incorrect installation, or due to misalignment of a

container and its intended mating partner, such as the air-water separation tank or its intended cap, such as a threaded shipping cap, which may cause O-rings to deform and/or seal irregularly. In order to address this problem and/or reduce the potential for leakage, a collection canister, such as a recycling container used in a dental amalgam recycling system, may have one or more irregular 'keyways' cast into its outside top mating surface, and the intended mating partner, such as the air-water separation tank, or the shipping cap, may have one or more corresponding 'key(s)' be cast into its mating surface, such that the key(s) and keyway(s) must be aligned in order for the collection canister (e.g., the recycling container) and its mating partner (e.g., the air-water separation tank; or the shipping cap) to mate properly. This key/keyway system can help ensure even pressure across the entire circumference of the O-ring surface on each port. Similarly, such key(s) and keyway(s) may be used to ensure proper replacement of the container and/or the air-water separation tank, such that incorrect replacement can be avoided or minimized.

BRIEF DESCRIPTION OF THE DRAWINGS

[0036] FIG. 1 is a schematic front view of an embodiment of particle removal and recycling apparatus according to the invention, for particular use in a dental office.

[0037] FIG. 2 is a schematic side view of an embodiment of particle removal and recycling apparatus according to the invention, for particular use in a dental office.

[0038] FIG. 3 a is a schematic view of an embodiment of a universal adapter for fitting various different sized recycling containers to the air-water separator of the present invention.

[0039] FIG. 3 b is a schematic view of an alternative embodiment of a universal adapter for fitting various different sized recycling containers to the air-water separator of the present invention.

[0040] FIG. 4 a is a schematic view of an embodiment of a recycling container and cap system of the invention.

[0041] FIG. 4 b is a schematic perspective depiction of an embodiment of a recycling container and cap system of the invention.

[0042] FIG. 5 a is a schematic inside view of an embodiment of a recycling cap for the recycling containers of the invention.

[0043] Fig. 5 b is a schematic depiction of a recycling cap according to the invention fitting on a partial view of a recycling container according to the invention.

[0044] 1-Backplate

[0045] 2-Waste Inlet (from dental practice)

[0046] 3-Air/water Separator Top

[0047] 4-Top Support Bracket

[0048] 5-Air/Water Separation Tank

[0049] 6-Suction tube

[0050] 7-Air/Water Separator Base

[0051] 8-Outlet Tube (to vacuum system)

[0052] 9-Recycling Container Top

[0053] 10-Lower Support Bracket

[0054] 11-Restrictor

[0055] 12-Detachable Recycling Container

[0056] 13-Retaining Pins (2)

[0057] 14- air-water separator tank effluent outlet port

[0058] 15- recycling container inlet port

[0059] 16- recycling container outlet port

[0060] 17- recycling container threads

[0061] 18- two tier recycling cap

[0062] 19- O-ring groove

[0063] 20- cap plugs

[0064] 21- O-ring

DETAILED DESCRIPTION WITH REFERENCE TO THE DRAWINGS

[0065] According to one aspect of the instant invention, an apparatus is provided for removing and recycling metal-containing particles and other waste particles from effluent, particularly effluent from a dental office. While herein the term “metal particles” may

frequently be employed, it is contemplated that the apparatus is capable of separating other solid particles from effluent liquid.

[0066] According to one aspect of the invention, an apparatus for removing metal particles and other solid particles from liquid suction effluent can be installed in a dental office using a pre-existing suction/vacuum pump system. The apparatus may share a common vacuum pump with conventional dental chair suction apparatus, without interrupting the use of suction equipment at the dental chairs.

[0067] Removal of solid particles from liquid suction effluent is effected by sedimentation.

[0068] In accordance with a one embodiment of the invention, the dental office suction effluent is passed from dental chair suction equipment outlets to an air water separator tank via a suitable inlet port for the tank. The air-water separator tank in turn passes effluent into a sedimentary deposit tank, closed on all sides when in use and preferably readily detachable for emptying or replacement.

[0069] In certain aspects of the instant invention the sedimentary deposit tank has a secondary function as a recycling container. In another aspect of the invention this recycling container can have features built in to make recycling easier and to reduce the amount of packaging and waste in the recycling system.

[0070] In another embodiment of the invention designed to minimize the space required to install the amalgam recycling system the air-water suction tube is internalized – within the air-water separator tank.

[0071] **Figure 1** and **Figure 2** shows two views of the separation apparatus according to the present invention in detail. Effluent from the dental chairs and a quantity of air are sucked through a suction apparatus exhaust conduit, through an air-water separator tank inlet **2**, and thence into an air-water separator tank **5**. The liquid effluent passes out of the air-water separator tank **5** via air-water separator tank outlet port **14**, while air passes downstream via the air suction tube **6** while maintaining constant vacuum upstream of amalgam separator.

[0072] The air-water separator tank effluent outlet port **14** passes effluent by gravity out of the air-water separator tank **5** and into the detachable recycling container **12** through

the recycling container inlet port **15** for target particle separation by sedimentation. Solids settle and accumulate in the bottom of Recycle container **12**. Liquid content of waste flows primarily by gravity, although intermittently assisted by vacuum through Restrictor **11** which slows the flow rate of liquid to assist in sedimentation process and ultimately “clean” effluent discharge through the recycling container outlet port **16**.

[0073] Outlet ports **16** and inlet port **15** can be a variety of shapes and sizes, square, oval (as depicted), round or even more unusual shapes like a star. Preferred ports are those that provide a tight seal, allow for easy removal, and do not break. Oval or round are preferred embodiments. Round are most preferred.

[0074] A vacuum at the outlet tube **8** is generated when the vacuum pump is operating, thereby sucking air out of the air-water separator tank **5** via suction tube **6** while maintaining vacuum upstream of amalgam separator apparatus. Effluent from the recycling container **12** passes through the restrictor **11** where remaining non-settable fine particles are removed from the effluent and into the recycling container outlet port **16** to be discharged from the apparatus via common outlet tube **8**. Matter sucked by the vacuum pump, generally free of removed solids, is discharged via vacuum pump into a municipal drain of the public sewage system.

[0075] The system is provided with a simple back plate **1** for easy dental office placement as well as removable retaining pins **13** to ensure the recycling container does not detach from the air-water separation tank **5** when there is no vacuum in the system.

[0076] In certain embodiments, the recycling container ports **16** and **15** may be different heights in order to aid in alignment of the detachable recycling container **12** in the air-water separator base **7**. In a preferred embodiment, the outlet port **16** engages before the inlet port **15** while during removal the inlet port **15** disengages first. This causes a small volume of fluid to be pulled out of the collection container back into air-water separator tank **5** creating head space and eliminating upward force of vacuum which eases removal of recycle container **12** by operator. Existing devices require rocking, wiggling or applying extensive down force for removal of recycle container **12**.

[0077] In one preferred embodiment of the invention designed to minimize recycling costs and waste, the recycling container/sedimentary deposit tank has threads **17** built into the container to enable the addition of a liquid tight top for shipping.

[0078] **Figure 3** shows a schematic diagram of an adapter according to the invention to enable the use of recycling containers from a variety of sources that are lacking in correctly shaped ports **16** and **15** or otherwise are unable to fit the air-water separator tank **5** according to the invention due to shape differences.

[0079] **Figure 4 a** shows a schematic diagram of the recycling container and cap system (see **Figure 5** for more cap **18** detail) according to the present invention. The cap **18** is a two tier shape to allow for a tight grip by both a big and smaller hand in order to achieve a strong seal as required by the invention. An O-ring **21** is provided and fits into an O-ring groove on the recycling container **12**. Plugs **20** are used to provide a first leak proof seal for the recycling container **12**. These plugs **20** are held in place by the cap **18** when the cap is threaded onto the recycling container as depicted in **Figure 5b**.

[0080] Generally, under present practice, the dental staff will not be able to remove deposited sediment from the recycle container nor remove accumulated particle residues from the restrictor unit themselves. Thus, it is desirable that such removal be done by a competent effluent residue processing facility. Therefore, under present practice, it is expected to be preferred that the recycling container with its enclosed restrictor unit be removed when full, or periodically replaced by fresh tanks from time to time as required. The spent tank with an accumulation of metallic and other particles can then be sent to a processing facility for proper disposal of the targeted metallic particles, such as mercury, and recovery of precious metals such as silver.

[0081] Although the sedimentary deposit process is effective to remove a satisfactorily high proportion of the target particles desired to be removed from the effluent, the recycling container desirably includes an outlet restrictor right in the chamber to catch any floating materials as well as any other materials that did not settle out.

[0082] If the recycle container is not changed as required or filled beyond normal capacity, waste liquid from dental practice may back up into air water separator tank. Should this occur, effluent overflows through the air suction tube and into the outlet port and is

discharged into the vacuum pump draw line and thence eventually into the municipal drain. However, it is desirable that the system should operate in such a manner as to avoid having the air-water separator tank become completely full, since effluent exiting through the air outlet port will contain particles that will not be separated by the separator. If, however, such a by-pass condition occurs at no time will the suction generated by the vacuum pump be lost or interrupted at the dental office.

[0083] In a further embodiment of the invention oriented towards large-scale institutional applications, in which many dental chairs or other sources of effluent are connected to the same suction and drain services, several parallel-connected recycling containers and associated apparatus, each such composite apparatus including a air-water separator tank and preferably one, or alternatively two attached recycling containers, may be operated in parallel to provide sufficient treatment capacity for large effluent volumes.

[0084] All publications, web-sites, patents and patent applications cited in the specification are hereby incorporated herein by reference in their entirety for the disclosure for which they are cited.

[0085] Having read the above specification, other alternatives and variants of the above described methods and apparatus suitable for practicing the methods will occur to those skilled in the technology. Such alternatives, modifications and variants fall within the scope of the present invention.

[0086] The invention as described above also includes the following non-limiting claims, which describe particular embodiments of the invention.

Claims

1. A detachable container suitable for mating securely with an air-water separation tank, said detachable container having an outside top mating surface comprising an inlet port and an outlet port of a first height and a second height respectively, wherein the first height is different from the second height; and wherein said detachable container further comprises one or more irregular keyways cast into said outside top mating surface;

said air-water separation tank comprising one or more corresponding irregular keys, such that when the irregular keyways of the detachable container are aligned with the corresponding irregular keys of the air-water separation tank, said detachable container is capable of mating securely with said air-water separation tank.

2. The detachable container of claim 1, further comprising

a cap for covering the outside top mating surface and having an inside surface with a first circular wall and a second circular wall, the first circular wall having a height selected to engage an upper surface of one of the inlet port or the outlet port and the second circular wall having a height selected to engage an upper surface of the other of the inlet port or the outlet port.

3. The detachable container of claim 2, wherein

the cap has a threaded exterior peripheral edge for engaging with a threaded peripheral edge on the detachable container, and threaded engagement of the cap to the detachable container secures the first and second circular walls into engagement with the inlet port and outlet port for sealing the inlet port and the outlet port.

4. The detachable container of claim 1, further comprising

a circular sidewall extending from the outside top mating surface and defining an interior chamber for the detachable container, the interior chamber being capable of supporting a partial vacuum when the inlet port and outlet port are sealed.

ABSTRACT

The present invention provides dental amalgam recycling systems, useful for recycling particles from a dental liquid effluent drawn, for example, from a suctioning device.

Figure 1

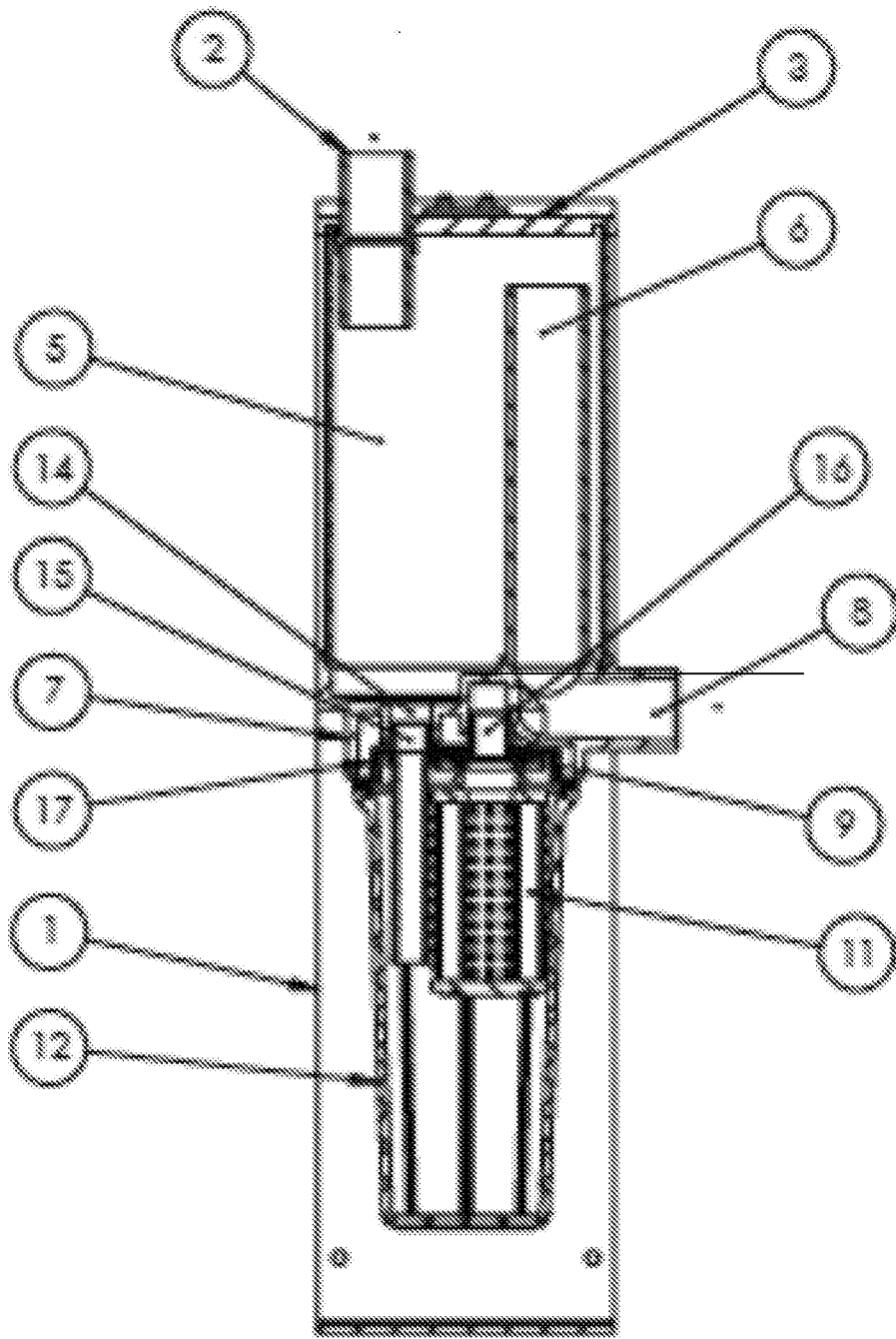


Figure 2

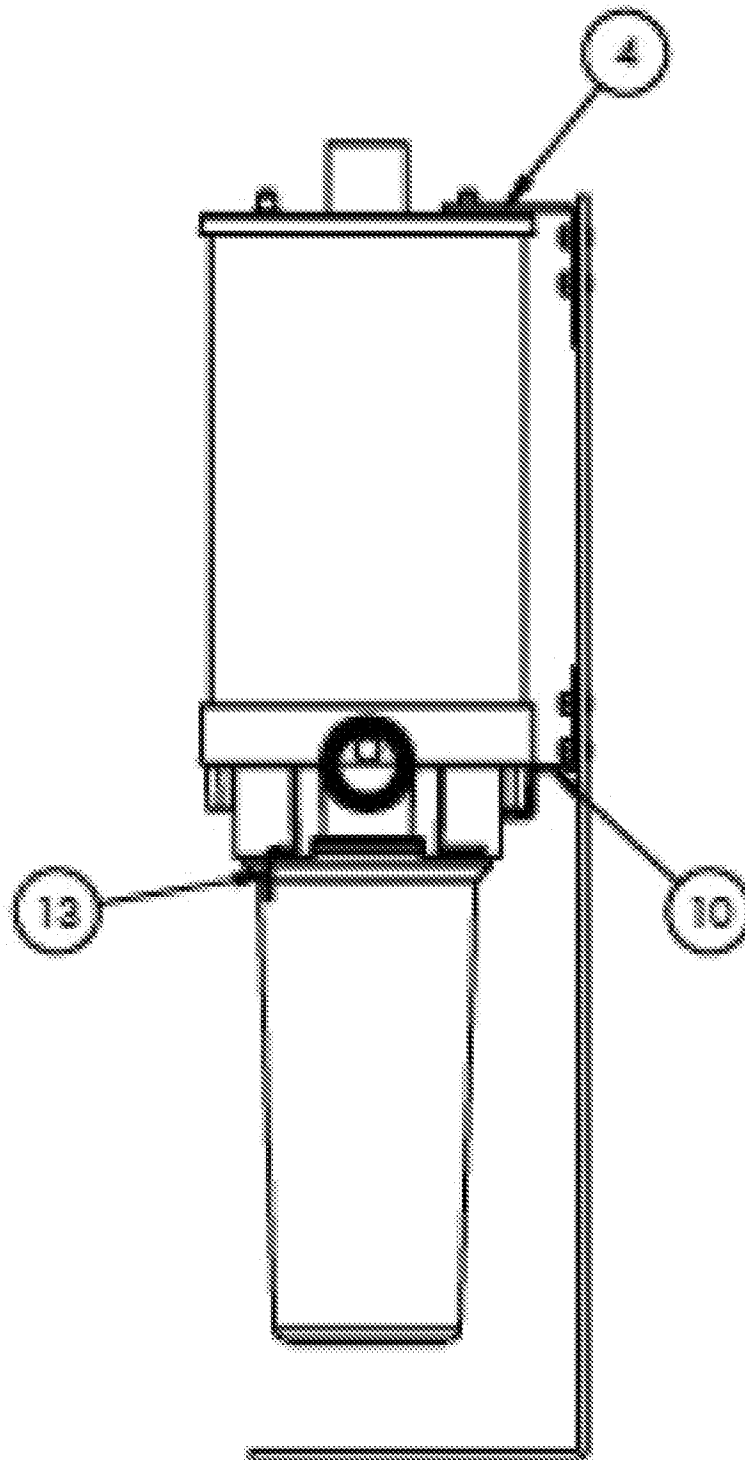


Figure 3a.

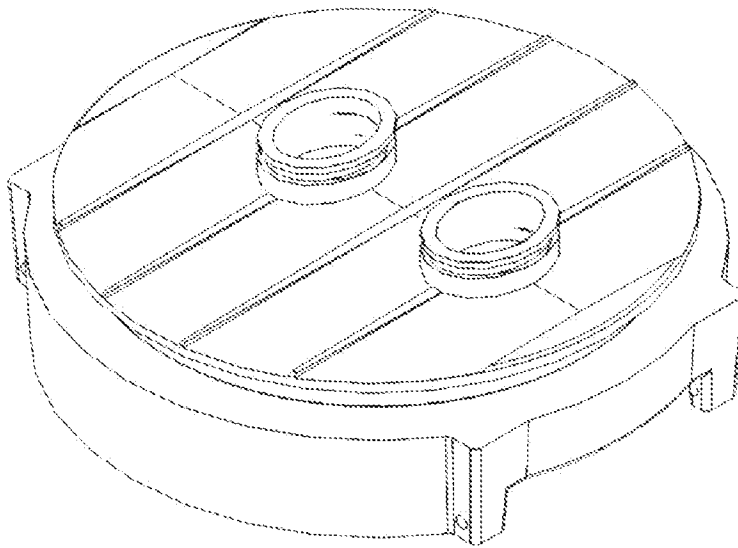


Figure 3b.

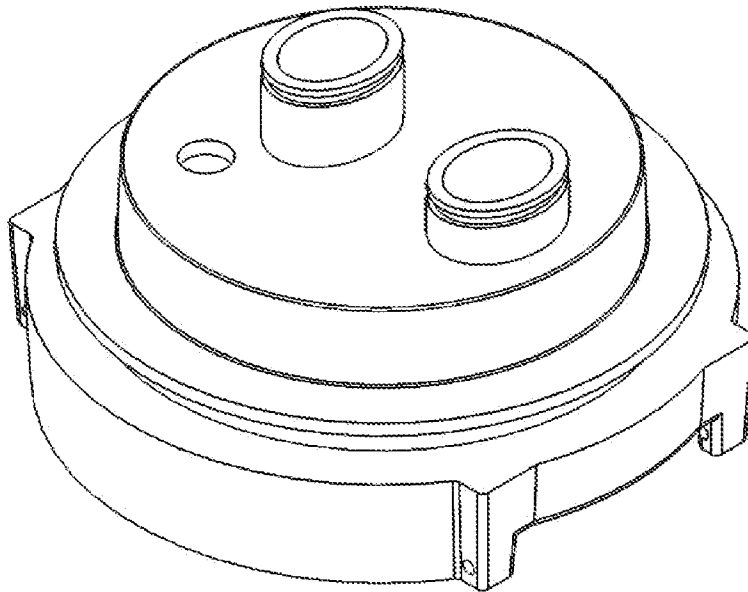


Figure 4a

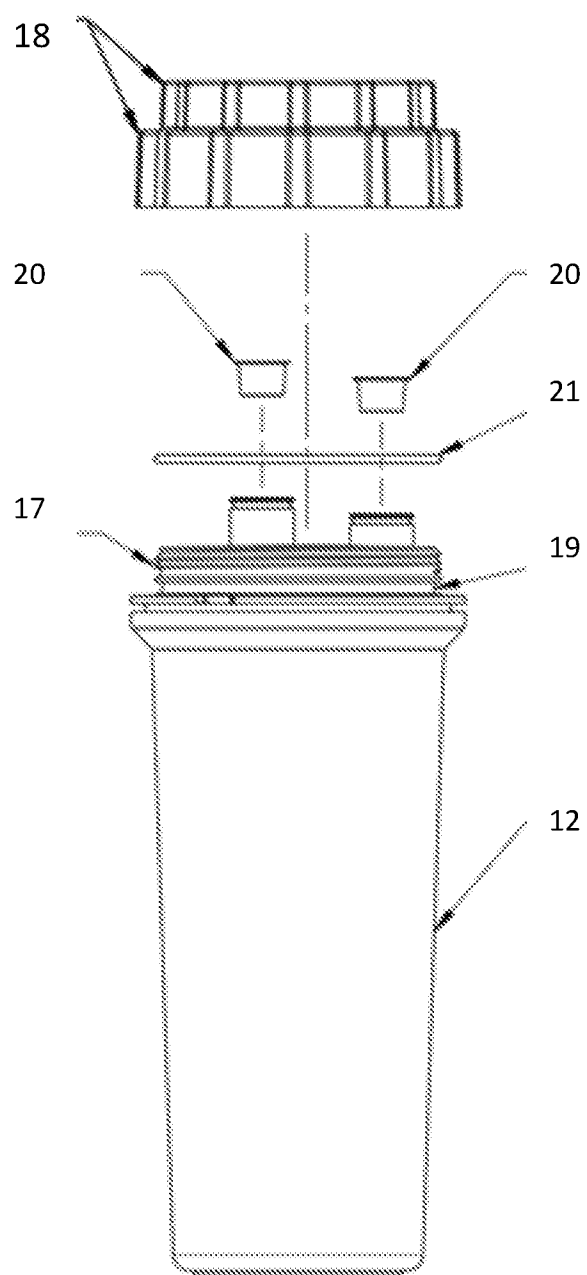


Figure 4b

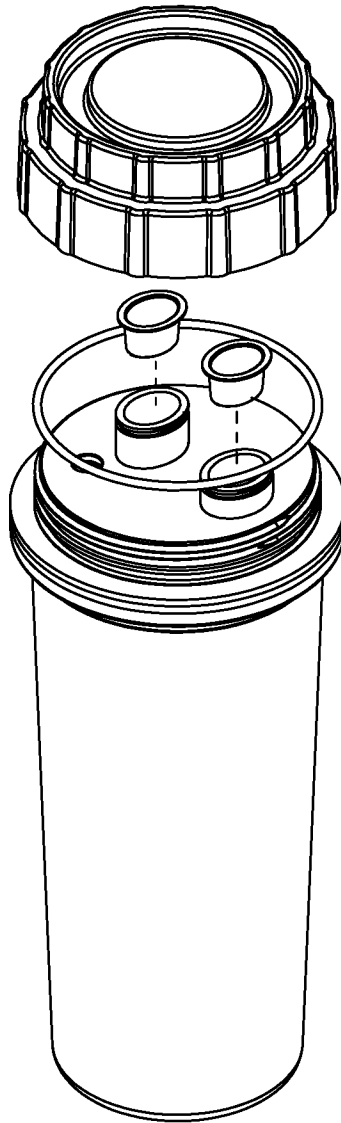


Figure 5a

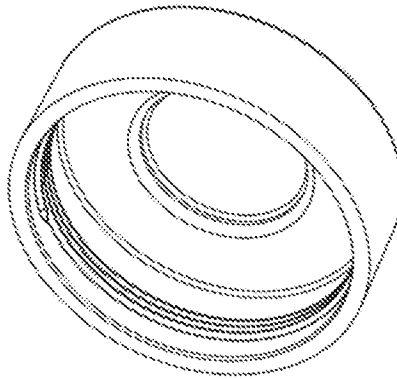
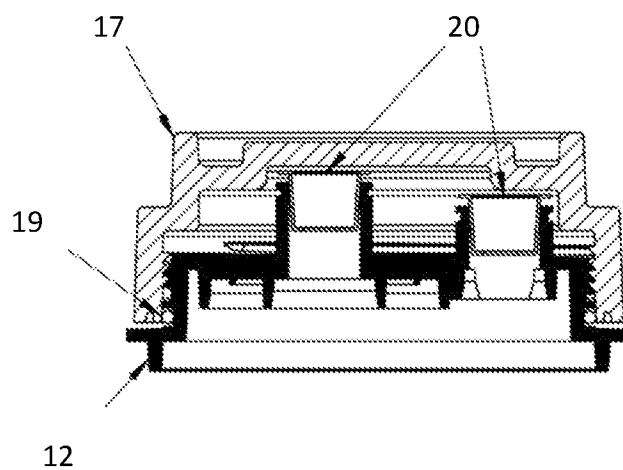


Figure 5b



Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		Detachable Container		
First Named Inventor/Applicant Name:		Nick Mozzicato		
Filer:		Steven R. Lazar		
Attorney Docket Number:		SMTX-US-001-T1		
Filed as Small Entity				
Filing Fees for Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	75	75
UTILITY SEARCH FEE	2111	1	330	330
UTILITY EXAMINATION FEE	2311	1	380	380
REQUEST FOR PRIORITIZED EXAMINATION	2817	1	2000	2000
Pages:				
Claims:				
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
PROCESSING FEE, EXCEPT PROV. APPLS.	2830	1	70	70
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				2855

Electronic Acknowledgement Receipt

EFS ID:	33163258
Application Number:	16033823
International Application Number:	
Confirmation Number:	9793
Title of Invention:	Detachable Container
First Named Inventor/Applicant Name:	Nick Mozzicato
Customer Number:	80709
Filer:	Steven R. Lazar
Filer Authorized By:	
Attorney Docket Number:	SMTX-US-001-T1
Receipt Date:	12-JUL-2018
Filing Date:	
Time Stamp:	15:50:00
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$2855
RAM confirmation Number	071318INTEFSW15513900
Deposit Account	
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			03c46bb3b7ee65b3d88432259aa034eb91804fba		
Warnings:					
Information:					
2	Application Data Sheet	SMTX-001-T1-ADS.pdf	1823560	no	9
			cd3739805acb317dc8e055b7a9c4a487bb5fb948		
Warnings:					
Information:					
3		SMTX-001-T1-Spec.pdf	598272	yes	20
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	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	12	
	Claims		13	13	
	Abstract		14	14	
	Drawings-only black and white line drawings		15	20	
Warnings:					
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4	Fee Worksheet (SB06)	fee-info.pdf	40025	no	2
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