



DELEGATURA PROPIEDAD INDUSTRIAL
División de Nuevas Creaciones

SOLICITUD
PATENTE DE INVENCION

ENTRADA EN FASE NACIONAL

21 EXPEDIENTE No

03-45357

54 TITULO

BOMBA DOSIFICADORA PARA SURTIDORES DE LIQUIDO

51 CLASIFICACION INTERNACIONAL

A7K 5/12

71 SOLICITANTE

KIMBERLY - CLARK WORLDWIDE INC

DOMICILIO

NEENAH WISCONSIN ESTADOS UNIDOS DE AMERICA

74 APODERADO

RAMIRO CASTRO DUQUE

22 SANTAFE DE BOGOTA, D C

Industria y Comercio
SUPERINTENDENCIA

SUPLEMINSTIKIN I CAMECLO
 kodicecion : 000553/ 0000000 Folio: 00
 fecha univ: 2000-00-00 1/11/00 in
 trans : 011 PCI-PUKIN 375 FINE NICK 411 PRESENIOL
 Dependencia: 2000 DIVISION DE MANTEN LIMACIONES

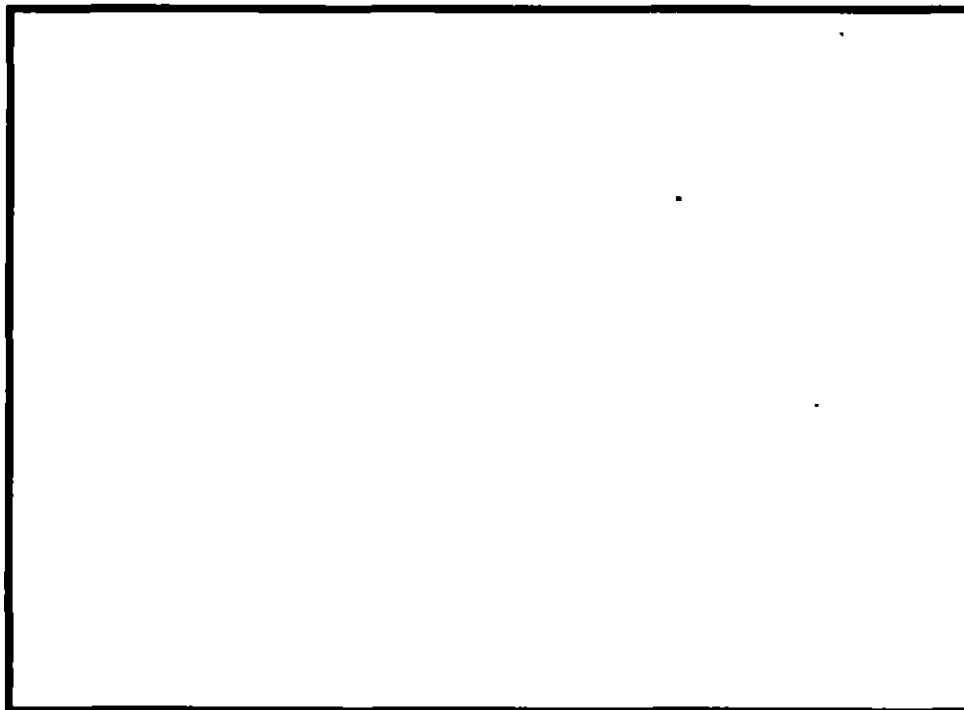
1		SOLICITUD DE:	
☒ Patente de Invención.		☐ Patente de Modelo de Utilidad.	
☐ Capítulo I.		☒ Capítulo II.	
2	Nombre: KIMBERLY - CLARK WORLDWIDE, INC. Dirección: 401 North Lake Street, Neenah, Wisconsin 54957-0349 Nacionalidad o Domicilio: Estados Unidos Lugar de Constitución: Estados Unidos Teléfono: Fax: E-mail		IDENTIFICACION C.C. ☐ NIT ☐ C.E. ☐ Otro ☐ Cual _____ Número _____
3	Nombre: RAMIRO CASTRO DUQUE Dirección: Cra. 7 No. 16-56 Piso 9 Teléfono: 380-2200 Fax: 380-2700 E-mail:		IDENTIFICACION C.C. ☒ NIT ☐ C.E. ☐ Otro ☐ Cual _____ Número <u>170.322</u> TP <u>1003</u>
4	Nombre: Richard P. Lewis, Cleary E. Mahaffey Dirección: 3429 Woodrun Trail, Marietta, GA 30062, US; 4970 Chastworth Lane, Suwanee, GA 30024, Estados Unidos de América, Respectivamente Nacionalidad o Domicilio: Estados Unidos de América		
5	PCT (86) Solicitud Internacional No. <u>PCT/US01/48975</u> Fecha <u>17-12-2001</u> Publicación Internacional No. <u>WO 02/054926 A1</u> Fecha <u>18-07-2002</u>		
6	Título (54): <u>BOMBA DOSIFICADORA PARA SURTIDORES DE LIQUIDO</u>		
7	Clasificación Internacional (51) <u>A47L 5/12 ; B65D 47/39</u>		
8	Prioridad SI ☒ NO ☐	(33) País de Origen <u>US</u>	(32) Fecha <u>18-12-2000</u>
			(31) Número de Solicitud <u>09/741.497</u>
9	Comprobante de pago No. <u>03-28.726</u> Fecha <u>28-05-2003</u>		

10

ANEXOS

- ☒ Comprobante de pago de la tasa de presentación de la solicitud. \$400.000
- ☐ Comprobante de pago por reivindicación de prioridad.
- ☐ Documento que acredite la existencia y representación legal cuando el solicitante sea persona jurídica.
- ☒ Poderes, si fuere el caso. Protocolo No. 17397
- ☐ Documento de cesión del inventor al solicitante o a su causante.
- ☐ Declaraciones
- ☒ Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos)
- ☒ Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicaciones, dibujos)
- ☐ Copia del examen preliminar efectuado por la IPEA.
- ☐ Traducción del examen preliminar efectuado por la IPEA.
- ☐ De ser el caso, copia del contrato de acceso.
- ☐ De ser el caso, documento que acredite la licencia o autorización de uso de conocimientos tradicionales de las comunidades indígenas.
- ☐ De ser el caso, certificado de depósito del material biológico.
- ☐ Arte final 12x12.
- ☐ De ser el caso, información sobre otras solicitudes de patente o títulos obtenidos en el extranjero por el mismo titular o su causante, relacionadas parcial o totalmente con la invención de esta solicitud.
- ☐ Otros

11 FIGURA CARACTERÍSTICA:



12 Solicito la concesión de la patente,

NOMBRE: RAMIRO CASTRO DUQUE

FIRMA:

C.C. 470.322 de Bogotá T.P. 1003 del C.S.J.

Instrucciones para la presentación de los anexos, ver reverso de esta página.

M

SUPERINDUSTRIA Y COMERCIO

Radicacion : 60005-01-01 00000000 Folios: 05
 Fecha emitida : 2003-04-24 17:11:15
 NIT : 800. Trámite : 011 ACT-PATENTE 379 Mod. Mod. 411 PRESENTA
 Dependencias : 2400 DIVISION DE MARCAS COMERCIALES

RECIBO OFICIAL DE CAJA : 03 - 28,726
 FECHA : ABRIL 24 DE 2003

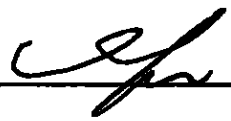
***** C O N S I G N A C I O N *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PAGO	Vr. PAGO
BRIGARD & CASTRO LTDA	CONSIGNACION	BANCO POPULAR	050-00110-6	7392588	24/04/2003	17,550,000.00

***** C O N C E P T O *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-01	SOLICITUDES	
1		TRAMITES DE SOL. DE PATENTE DE IN	400,000.00
		TOTAL :	\$ 400,000.00

SON: CUATROCIENTOS MIL PESOS

RESPONSABLE : 

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

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(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
18 July 2002 (18.07.2002)

PCT

(10) International Publication Number
WO 02/054926 A1

(51) International Patent Classification:
B65D 47/34

A47K 5/12

(74) Agent: DORITY & MANNING, P.A.; P.O. Box 1449,
One Liberty Square, 55 Beattie Place, Suite 1600,
Greenville, SC 29602 (US).

(21) International Application Number: PCT/US01/48975

(22) International Filing Date:
17 December 2001 (17.12.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/741,497 19 December 2000 (19.12.2000) US

(71) Applicant: KIMBERLY-CLARK WORLDWIDE,
INC. [US/US]; 401 North Lake Street, Neenah, WI 54956
(US).

(72) Inventors: LEWIS, Richard, P.; 3429 Woodrun Trail,
Marietta, GA 30062 (US). MAHAFFEY, Cleary, E.; 4970
Chatsworth Lane, Suwanee, GA 30024 (US).

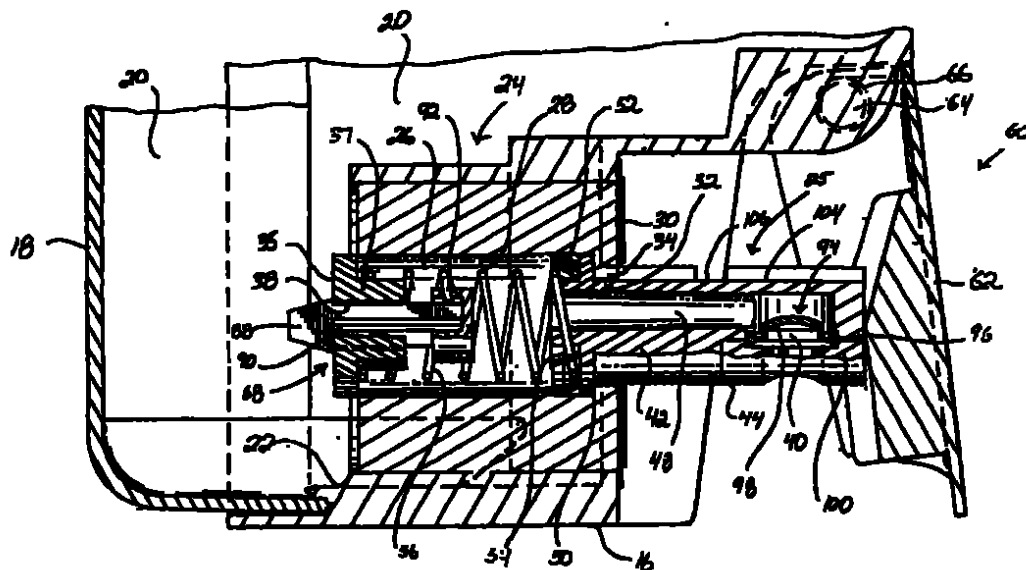
(81) Designated States (national): AI, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, PH, PL, PT, RO, RU,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

(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR,
GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent
(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,
NE, SN, TD, TG).

Published:
— with international search report

[Continued on next page]

(54) Title: DOSING PUMP FOR LIQUID DISPENSERS



(57) Abstract: A dispenser for dispensing measured amounts of a viscous liquid includes: a liquid reservoir and a pump chamber having an opening in communication with the reservoir. A dispensing orifice is defined in the pump chamber. A pump mechanism is configured with the pump chamber and is movable from a rest to a pressurizing position upon actuation thereof to pressurize liquid within the pump chamber. A check valve mechanism is disposed in the opening. A restriction device is disposed in the dispensing orifice and maintains a closed configuration to prevent leakage of liquid from the dispensing orifice. The restriction device opens upon sufficient liquid pressure build-up within the pump chamber upon actuation of the pump mechanism. The restriction device also may vent the pump chamber upon release of the pump mechanism.

WO 02/054926 A1



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

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

INTERNATI NAL SEARCH REPORT

International Application No

PCT/US 01/48975

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 119 902 A (KISHI TAKAO ET AL) 19 September 2000 (2000-09-19) column 50, line 59 -column 51, line 30; figures 50-53	1-4, 6, 7, 11, 14, 17-26, 31-34
A	GB 2 155 435 A (BRIGHTWELL DISPENSERS) 25 September 1985 (1985-09-25) page 4, line 10 - line 30; figures	6-10, 13, 26, 27
A	US 4 036 406 A (DELUCA RAYMOND F ET AL) 19 July 1977 (1977-07-19) abstract; figure 2	9, 10, 12, 13, 26, 28
A	US 2 622 539 A (MARTIN ORLIE E) 23 December 1952 (1952-12-23) figure 1	5-7, 9, 10, 28
A	EP 0 395 380 A (LIQUID MOLDING SYSTEMS INC) 31 October 1990 (1990-10-31) column 15, line 26 -column 16, line 12; figures 1A-16A	1, 24.
A	WO 00 68038 A (SEAQUIST CLOSURES FOREIGN INC) 16 November 2000 (2000-11-16) abstract; figures 1-4	15, 16, 29, 30

INTERNATIONAL SEARCH REP RT

Information on patent family members

International Application No

PCT/US 01/48975

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5816453	A	06-10-1998	AU 1956395 A	09-10-1995
			EP 0751832 A1	08-01-1997
			WO 9525600 A1	28-09-1995
			JP 9510397 T	21-10-1997
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			AT 94135 T	15-09-1993
			AU 627021 B2	13-08-1992
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			EP 0395380 A2	31-10-1990
			ES 2044435 T3	01-01-1994
			JP 2689009 B2	10-12-1997
			JP 3124568 A	28-05-1991

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/48975

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0395380 A		KR 162090 B1	01-12-1998
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		AU 4978600 A	21-11-2000
		BR 0010335 A	13-02-2002
		EP 1175315 A1	30-01-2002
		WO 0068038 A1	16-11-2000

PCT REQUEST

1/4

KCX-411-PCT

Original (for SUBMISSION) - printed on 17.12.2001 09:23:06 AM

0	For receiving Office use only	
0-1	International Application No.	
0-2	International Filing Date	
0-3	Name of receiving Office and "PCT International Application"	
0-4	Form - PCT/RO/101 PCT Request	
0-4-1	Prepared using	PCT-EASY Version 2.92 (updated 01.03.2001)
0-5	Petition The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	United States Patent and Trademark Office (USPTO) (RO/US)
0-7	Applicant's or agent's file reference	KCX-411-PCT
I	Title of invention	DOSING PUMP FOR LIQUID DISPENSER ✓
II	Applicant	
II-1	This person is:	applicant only
II-2	Applicant for	all designated States
II-4	Name	KIMBERLY-CLARK WORLDWIDE, INC. ✓
II-5	Address:	401 North Lake Street Neenah, WI 54956 United States of America
II-6	State of nationality	US
II-7	State of residence	US
II-8	Telephone No.	920-721-2000
II-9	Facsimile No.	920-721-7339
III-1	Applicant and/or inventor	
III-1-1	This person is:	inventor only
III-1-4	Name (LAST, First)	LEWIS, Richard, P. ✓
III-1-5	Address:	3429 Woodrun Trail Marietta, GA 30062 United States of America
III-2	Applicant and/or inventor	
III-2-1	This person is:	inventor only
III-2-4	Name (LAST, First)	MAHAFFEY, Cleary, E. ✓
III-2-5	Address:	4970 Chatsworth Lane Suwanee, GA 30024 United States of America

PCT REQUEST

2/4

KCX-411-PCT

Original (for SUBMISSION) - printed on 17.12.2001 09:23:06 AM

8

IV-1	Agent or common representative; or address for correspondence The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	agent
IV-1-1	Name	DORITY & MANNING, P.A.
IV-1-2	Address:	P.O. Box 1449 One Liberty Square 55 Beattie Place, Suite 1600 Greenville, SC 29602 United States of America
IV-1-3	Telephone No.	864-271-1592
IV-1-4	Facsimile No.	864-233-7342
V	Designation of States	
V-1	Regional Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AP: GH GM KE LS MW ME SD SL SE TE UG ZW and any other State which is a Contracting State of the Harare Protocol and of the PCT EA: AM AZ BY KG KZ MD RU TJ TM and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT EP: AT BE CH&LI CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR and any other State which is a Contracting State of the European Patent Convention and of the PCT OA: BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG and any other State which is a member State of OAPI and a Contracting State of the PCT
V-2	National Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AE AG AL AM AT AU AZ BA BB BG BR BY BE CA CH&LI CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PH PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW

PCT REQUEST

KCX-411-PCT

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V-6	Precautionary Designation Statement In addition to the designations made under items V-1, V-2 and V-3, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except any designation(s) of the State(s) indicated under item V-6 below. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit.		
V-6	Exclusion(s) from precautionary designations	NONE	
VI-1	Priority claim of earlier national application		
VI-1-1	Filing date	19 December 2000 (19.12.2000) ✓	
VI-1-2	Number	09/741,497	
VI-1-3	Country	US	
VI-2	Priority document request The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s):	VI-1	
VII-1	International Searching Authority Chosen	European Patent Office (EPO) (ISA/EP)	
VIII	Declarations	Number of declarations	
VIII-1	Declaration as to the identity of the inventor	-	
VIII-2	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	-	
VIII-3	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	-	
VIII-4	Declaration of inventorship (only for the purposes of the designation of the United States of America)	-	
VIII-5	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	-	
IX	Check list	number of sheets	electronic file(s) attached
IX-1	Request (including declaration sheets)	4	-
IX-2	Description	17	-
IX-3	Claims	6	-
IX-4	Abstract	1	EZABST00.TXT
IX-5	Drawings	10	-
IX-7	TOTAL	38	

PCT REQUEST

KCX-411-PCT

Original (for SUBMISSION) - printed on 17.12.2001 09:23:08 AM

	Accompanying Items	paper document(s) attached	electronic file(s) attached
IX-8	Fee calculation sheet	✓	-
IX-11	Copy of general power of attorney	reference no. KCX-411-PCT	-
IX-17	PCT-EASY diskette	-	Diskette
IX-18	Other (specified):	Authorization by the CEO of KC	-
IX-18	Other (specified):	ExMail Certificate of Mailing	-
IX-18	Other (specified):	Return Receipt Postcard	-
IX-19	Figure of the drawings which should accompany the abstract	Fig. 1	
IX-20	Language of filing of the international application	English	
X-1	Signature of applicant, agent or common representative		
X-1-1	Name	DORITY & MANNING, P.A.	
X-1-2	Name of signatory	Stephen E. Bondura	
X-1-3	Capacity	Agent	

FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	
10-2	Drawings:	
10-2-1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/EP
10-6	Transmittal of search copy delayed until search fee is paid	

FOR INTERNATIONAL BUREAU USE ONLY

11-1	Date of receipt of the record copy by the International Bureau	
------	---	--

PCT (ANNEX - FEE CALCULATION SHEET)

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KCX-411-PCT

(This sheet is not part of and does not count as a sheet of the international application)

0	For receiving Office use only	
0-1	International Application No.	
0-2	Date stamp of the receiving Office	
0-4	Form - PCT/RO/101 (Annex) PCT Fee Calculation Sheet	
0-4-1	Prepared using	PCT-EASY Version 2.92 (updated 01.03.2001)
0-9	Applicant's or agent's file reference	KCX-411-PCT
2	Applicant	KIMBERLY-CLARK WORLDWIDE, INC.
12	Calculation of prescribed fees	fee amount/multiplier total amounts (USD)
12-1	Transmittal fee T	⇒ 240
12-2	Search fee S	⇒ 846
12-3	International fee	
	Basic fee (first 30 sheets) b1	382
12-4	Remaining sheets	8
12-5	Additional amount (X)	9
12-6	Total additional amount b2	72
12-7	b1 + b2 = B	454
12-8	Designation fees	
	Number of designations contained in international application	89
12-9	Number of designation fees payable (maximum 6)	6
12-10	Amount of designation fee (X)	82
12-11	Total designation fees D	492
12-12	PCT-EASY fee reduction R	-117
12-13	Total International fee (B+D-R) I	⇒ 829
12-14	Fee for priority document	
	Number of priority documents requested	1
12-15	Fee per document (X)	15
12-16	Total priority document fee P	⇒ 15
12-17	TOTAL FEES PAYABLE (T+S+B+P)	⇒ 1,930
12-18	Mode of payment	cheque
12-20	Deposit account instructions	
	The receiving Office:	United States Patent and Trademark Office (USPTO) (RO/US)
12-20-2	Authorization to charge any deficiency or credit any overpayment in the total fees indicated above.	✓
12-20-3	Authorization to charge the fee for priority document.	✓

PCT (ANNEX - FEE CALCULATION SHEET)

KCX-411-PCT

Original (for SUBMISSION) - printed on 17.12.2001 09:23:06 AM

12-21	Deposit account No.	04-1403
12-22	Date	17 December 2001 (17.12.2001)
12-23	Name and signature	DORITY & MANNING, P.A. <i>Alfred Baer</i>

VALIDATION LOG AND REMARKS

13-2-2	Validation messages States	Green? More designations could be made. The following States have not been designated: US. Please verify.
13-2-8	Validation messages Fees	Green? Please confirm that fee schedule utilized is the latest available

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ US

PCT

CHAPTER II

13

DEMAND

under Article 31 of the Patent Cooperation Treaty:
The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated),

For International Preliminary Examining Authority use only

Identification of IPEA		Date of receipt of DEMAND	
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION		Applicant's or agent's file reference KCX-411-PCT (15805)	
International application No. PCT/US01/48975	International filing date (day/month/year) 17 December 2001	(Earliest) Priority date (day/month/year) 19 December 2000	
Title of invention DOSING PUMP FOR LIQUID DISPENSERS			
Box No. II APPLICANT(S)			
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) KIMBERLY-CLARK WORLDWIDE, INC. 401 North Lake Street Neenah, Wisconsin 54956 USA		Telephone No. 920-721-2000	
		Facsimile No. 920-721-7339	
		Teleprinter No.	
		Applicant's registration No. with the Office	
State (that is, country) of nationality: US		State (that is, country) of residence: US	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)			
State (that is, country) of nationality:		State (that is, country) of residence:	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)			
State (that is, country) of nationality:		State (that is, country) of residence:	
☐ Further applicants are indicated on a continuation sheet			

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCEThe following person is ☒ agent ☐ common representativeand ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.Name and address: (Family name followed by given name; for a legal entity, full official designation.
The address must include postal code and name of country.)Stephen E. Bondura
DORITY & MANNING, P.A.
P.O. Box 1449
One Liberty Square
55 Beattie Place, Suite 1600
Greenville, South Carolina 29602 USA

Telephone No.

864-271-1592

Facsimile No.

864-233-7342

Teleprinter No.

Agent's registration No. with the Office

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.**Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION**

Statement concerning amendments:*

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filedthe description ☒ as originally filed☐ as amended under Article 34the claims ☒ as originally filed☐ as amended under Article 19 (together with any accompanying statement)☐ as amended under Article 34the drawings ☒ as originally filed☐ as amended under Article 342. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). (This check-box may be marked only where the time limit under Article 19 has not yet expired.)

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English

☒ which is the language in which the international application was filed.☐ which is the language of a translation furnished for the purposes of international search.☐ which is the language of publication of the international application.☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.**Box No. V ELECTION OF STATES**

The applicant hereby elects all eligible States (that is, all States which have been designated and which are bound by Chapter II of the PCT)

excluding the following States which the applicant wishes not to elect:

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- | | | |
|--|---|--------|
| 1. translation of international application | : | sheets |
| 2. amendments under Article 34 | : | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19 | : | sheets |
| 5. letter | : | sheets |
| 6. other (specify) | : | sheets |

For International Preliminary
Examining Authority use only

- | | |
|--------------------------|--------------------------|
| received | not received |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |

The demand is also accompanied by the item(s) marked below:

- | | |
|--|--|
| 1. ☒ fee calculation sheet | 5. ☐ statement explaining lack of signature |
| 2. ☐ original separate power of attorney | 6. ☐ sequence listing in computer readable form |
| 3. ☐ original general power of attorney | 7. ☒ other (specify): ExMail Certificate of Mailing, Return Receipt Postcard |
| 4. ☐ copy of general power of attorney; reference number, if any: | |

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).


Stephen E. Bondura
Agent
Dority & Manning, P.A.

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply.

☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on:

PCT

CHAPTER II

FEE CALCULATION SHEET

Annex to the Demand

International application No. PCT/US01/48975	For International Preliminary Examining Authority use only
Applicant's or agent's file reference KCX-411-PCT (15805)	Date stamp of the IPEA
Applicant KIMBERLY-CLARK WORLDWIDE, INC.	
CALCULATION OF PRESCRIBED FEES	
1. Preliminary examination fee	750.00 P
2. Handling fee (Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.)	148.00 H
3. Total of prescribed fees Add the amounts entered at P and H and enter total in the TOTAL box	896.00 TOTAL
MODE OF PAYMENT	
☐ authorization to charge deposit account with the IPEA (see below)	☐ cash
☒ cheque	☐ revenue stamps
☐ postal money order	☐ coupons
☐ bank draft	☐ other (specify):
AUTHORIZATION TO CHARGE (OR CREDIT) DEPOSIT ACCOUNT <i>(This mode of payment may not be available at all IPEAs)</i>	
☐ Authorization to charge the total fees indicated above.	IPEA/ <u>US</u>
☒ <i>(This check-box may be marked only if the conditions for deposit accounts of the IPEA so permit)</i> Authorization to charge any deficiency or credit any overpayment in the total fees indicated above.	Deposit Account No.: <u>04-1403</u>
	Date: <u>July 17, 2002</u>
	Name: <u>Stephen E. Bondura</u>
	Signature: <u><i>SE Bondura</i></u>

PCT REQUEST

Original (for SUBMISSION) - printed on 17.12.2001 09:23:08 AM

KCX-411-PCT

0	For receiving Office use only	
0-1	International Application No.	
0-2	International Filing Date	
0-3	Name of receiving Office and "PCT International Application"	
0-4	Form - PCT/RQM01 PCT Request	
0-4-1	Prepared using	PCT-EASY Version 2.92 (updated 01.03.2001)
0-5	Petition The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	United States Patent and Trademark Office (USPTO) (RO/US)
0-7	Applicant's or agent's file reference	KCX-411-PCT
I	Title of invention	DOSING PUMP FOR LIQUID DISPENSER ✓
II	Applicant	
II-1	This person is:	applicant only
II-2	Applicant for	all designated States
II-4	Name	KIMBERLY-CLARK WORLDWIDE, INC. ✓
II-5	Address:	401 North Lake Street Neenah, WI 54956 United States of America
II-6	State of nationality	US
II-7	State of residence	US
II-8	Telephone No.	920-721-2000
II-9	Facsimile No.	920-721-7339
III-1	Applicant and/or inventor	
III-1-1	This person is:	inventor only
III-1-4	Name (LAST, First)	LEWIS, Richard, P.
III-1-5	Address:	3429 Woodrun Trail Marietta, GA 30062 United States of America ✓
III-2	Applicant and/or inventor	
III-2-1	This person is:	inventor only
III-2-4	Name (LAST, First)	MAHAFFEY, Cleary, E. ✓
III-2-5	Address:	4970 Chatsworth Lane Suwanee, GA 30024 United States of America

PCT REQUEST

Original (for SUBMISSION) - printed on 17.12.2001 09:23:08 AM

KCX-411-P

IV-1	Agent or common representative; or address for correspondence The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	agent
IV-1-1	Name	DORITY & MANNING, P.A.
IV-1-2	Address:	P.O. Box 1449 One Liberty Square 55 Beattie Place, Suite 1600 Greenville, SC 29602 United States of America
IV-1-3	Telephone No.	864-271-1592
IV-1-4	Facsimile No.	864-233-7342
V	Designation of States	
V-1	Regional Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AP: GE GM KE LS MW ME SD SL SE TE UG ZW and any other State which is a Contracting State of the Harare Protocol and of the PCT EA: AM AZ BY KG KZ MD RU TJ TM and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT EP: AT BE CH&LI CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR and any other State which is a Contracting State of the European Patent Convention and of the PCT QA: BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG and any other State which is a member State of OAPI and a Contracting State of the PCT
V-2	National Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH&LI CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX ME NO NZ PE PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW

PCT REQUEST

3/4

KCX-411-PCT

Original (for SUBMISSION) - printed on 17.12.2001 09:23:06 AM

V-5	Precautionary Designation Statement In addition to the designations made under items V-1, V-2 and V-3, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except any designation(s) of the State(s) indicated under item V-6 below. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit.		
V-6	Exclusion(s) from precautionary designations	NONE	
VI-1	Priority claim of earlier national application		
VI-1-1	Filing date	19 December 2000 (19.12.2000) ✓	
VI-1-2	Number	09/741,497	
VI-1-3	Country	US	
VI-2	Priority document request The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s):	VI-1	
VII-1	International Searching Authority Chosen	European Patent Office (EPO) (ISA/EP)	
VIII	Declarations	Number of declarations	
VIII-1	Declaration as to the identity of the inventor	-	
VIII-2	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	-	
VIII-3	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	-	
VIII-4	Declaration of inventorship (only for the purposes of the designation of the United States of America)	-	
VIII-5	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	-	
IX	Check list	number of sheets	electronic file(s) attached
IX-1	Request (including declaration sheets)	4	-
IX-2	Description	17	-
IX-3	Claims	6	-
IX-4	Abstract	1	EZABST00.TXT
IX-5	Drawings	10	-
IX-7	TOTAL	38	

PCT REQUEST

4/4

Original (for SUBMISSION) - printed on 17.12.2001 09:23:06 AM

KCX-411-PCT

	Accompanying items	paper document(s) attached	electronic file(s) attached
IX-8	Fee calculation sheet	✓	-
IX-11	Copy of general power of attorney	reference no. KCX-411-PCT	-
IX-17	PCT-EASY diskette	-	Diskette
IX-18	Other (specified):	Authorization by the CEO of KC	-
IX-18	Other (specified):	ExMail Certificate of Mailing	-
IX-18	Other (specified):	Return Receipt Postcard	-
IX-19	Figure of the drawings which should accompany the abstract	Fig. 1	
IX-20	Language of filing of the international application	English	
X-1	Signature of applicant, agent or common representative		
X-1-1	Name	DORITY & MANNING, P.A.	
X-1-2	Name of signatory	Stephen E. Bondura	
X-1-3	Capacity	Agent	

FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	
10-2	Drawings:	
10-2-1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/EP
10-6	Transmittal of search copy delayed until search fee is paid	

FOR INTERNATIONAL BUREAU USE ONLY

11-1	Date of receipt of the record copy by the International Bureau	
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PCT (ANNEX - FEE CALCULATION SHEET)

Original (for SUBMISSION) - printed on 17.12.2001 09:23:08 AM

KCX-411-PCT

(This sheet is not part of and does not count as a sheet of the international application)

8	For receiving Office use only	
0-1	International Application No.	
0-2	Date stamp of the receiving Office.	
0-4	Form - PCT/RO/101 (Annex)	
0-4-1	PCT Fee Calculation Sheet Prepared using	PCT-EASY Version 2.92 (updated 01.03.2001)
0-9	Applicant's or agent's file reference	KCX-411-PCT
2	Applicant	KIMBERLY-CLARK WORLDWIDE, INC.
12	Calculation of prescribed fees	fee amount/multiplier total amounts (USD)
12-1	Transmittal fee T	⇒ 240
12-2	Search fee S	⇒ 846
12-3	International fee	
	Basic fee	
	(first 30 sheets) b1	382
12-4	Remaining sheets	8
12-5	Additional amount (X) 9	
12-6	Total additional amount b2	72
12-7	b1 + b2 = B	454
12-8	Designation fees	
	Number of designations contained in international application	89
12-9	Number of designation fees payable (maximum 8)	6
12-10	Amount of designation fee (X) 82	
12-11	Total designation fees D	492
12-12	PCT-EASY fee reduction R	-117
12-13	Total international fee (B+D-R) I	⇒ 829
12-14	Fee for priority document	
	Number of priority documents requested	1
12-15	Fee per document (X) 15	
12-16	Total priority document fee P	⇒ 15
12-17	TOTAL FEES PAYABLE (T+S++P)	⇒ 1,930
12-18	Mode of payment	cheque
12-20	Deposit account instructions	
	The receiving Office:	United States Patent and Trademark Office (USPTO) (RO/US)
12-20-2	Authorization to charge any deficiency or credit any overpayment in the total fees indicated above.	✓
12-20-3	Authorization to charge the fee for priority document.	✓

PCT (ANNEX - FEE CALCULATION SHEET)

Original (for SUBMISSION) - printed on 17.12.2001 09:23:05 AM

KCY-41 PCT

23

12-21	Deposit account No.	04-1403
12-22	Date	17 December 2001 (17.12.2001)
12-23	Name and signature	DORITY & MANNING, P.A. <i>H. E. B. e.</i>

VALIDATION LOG AND REMARKS

13-2-2	Validation messages States	Green? More designations could be made. The following States have not been designated: US. Please verify.
13-2-3	Validation messages Fees	Green? Please confirm that fee schedule utilized is the latest available

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ US

PCT

CHAPTER II

DEMAND

under Article 31 of the Patent Cooperation Treaty.
The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated),

For International Preliminary Examining Authority use only		
Identification of IPEA		Date of receipt of DEMAND
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION		Applicant's or agent's file reference KCX-411-PCT (15805)
International application No. PCT/US01/48975	International filing date (day/month/year) 17 December 2001	(Earliest) Priority date (day/month/year) 19 December 2000
Title of invention DOSING PUMP FOR LIQUID DISPENSERS		
Box No. II APPLICANT(S)		
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) KIMBERLY-CLARK WORLDWIDE, INC. 401 North Lake Street Neenah, Wisconsin 54956 USA		Telephone No. 920-721-2000 Facsimile No. 920-721-7339 Teleprinter No. Applicant's registration No. with the Office
State (that is, country) of nationality: US		State (that is, country) of residence: US
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)		
State (that is, country) of nationality:		State (that is, country) of residence:
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)		
State (that is, country) of nationality:		State (that is, country) of residence:
☐ Further applicants are indicated on a continuation sheet		

25

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCEThe following person is ☒ agent ☐ common representativeand ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.Name and address: (Family name followed by given name; for a legal entity, full official designation.
The address must include postal code and name of country.)Stephen E. Bondura
DORITY & MANNING, P.A.
P.O. Box 1449
One Liberty Square
55 Beattie Place, Suite 1600
Greenville, South Carolina 29602 USA

Telephone No.

864-271-1592

Facsimile No.

864-233-7342

Teleprinter No.

Agent's registration No. with the Office

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.**Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION**

Statement concerning amendments:*

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filedthe description ☒ as originally filed☐ as amended under Article 34the claims ☒ as originally filed☐ as amended under Article 19 (together with any accompanying statement)☐ as amended under Article 34the drawings ☒ as originally filed☐ as amended under Article 342. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). (This check-box may be marked only where the time limit under Article 19 has not yet expired.)

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English

☒ which is the language in which the international application was filed.☐ which is the language of a translation furnished for the purposes of international search.☐ which is the language of publication of the international application.☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.**Box No. V ELECTION OF STATES**

The applicant hereby elects all eligible States (that is, all States which have been designated and which are bound by Chapter II of the PCT)

excluding the following States which the applicant wishes not to elect:

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- | | | |
|--|---|--------|
| 1. translation of international application | : | sheets |
| 2. amendments under Article 34 | : | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19 | : | sheets |
| 5. letter | : | sheets |
| 6. other (specify) | : | sheets |

For International Preliminary Examining Authority use only
received not received

- | | |
|--------------------------|--------------------------|
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |

The demand is also accompanied by the item(s) marked below:

- | | |
|--|--|
| 1. ☒ fee calculation sheet | 5. ☐ statement explaining lack of signature |
| 2. ☐ original separate power of attorney | 6. ☐ sequence listing in computer readable form |
| 3. ☐ original general power of attorney | 7. ☒ other (specify): ExMail Certificate of Mailing, Return Receipt Postcard |
| 4. ☐ copy of general power of attorney; reference number, if any: | |

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).


Stephen E. Bondura
Agent
Dority & Manning, P.A.

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply.

☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on:

PCT

CHAPTER II

FEE CALCULATION SHEET

Annex to the Demand

International application No. PCT/US01/48975 Applicant's or agent's file reference KCX-411-PCT (15805) Applicant KIMBERLY-CLARK WORLDWIDE, INC.	For International Preliminary Examining Authority use only Date stamp of the IPEA								
CALCULATION OF PRESCRIBED FEES									
1. Preliminary examination fee	750.00 P								
2. Handling fee (<i>Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.</i>)	146.00 H								
3. Total of prescribed fees Add the amounts entered at P and H and enter total in the TOTAL box	896.00 TOTAL								
MODE OF PAYMENT									
<table style="width: 100%;"> <tr> <td>☐ authorization to charge deposit account with the IPEA (see below)</td> <td>☐ cash</td> </tr> <tr> <td>☒ cheque</td> <td>☐ revenue stamps</td> </tr> <tr> <td>☐ postal money order</td> <td>☐ coupons</td> </tr> <tr> <td>☐ bank draft</td> <td>☐ other (specify):</td> </tr> </table>		☐ authorization to charge deposit account with the IPEA (see below)	☐ cash	☒ cheque	☐ revenue stamps	☐ postal money order	☐ coupons	☐ bank draft	☐ other (specify):
☐ authorization to charge deposit account with the IPEA (see below)	☐ cash								
☒ cheque	☐ revenue stamps								
☐ postal money order	☐ coupons								
☐ bank draft	☐ other (specify):								
AUTHORIZATION TO CHARGE (OR CREDIT) DEPOSIT ACCOUNT (This mode of payment may not be available at all IPEAs)									
☐ Authorization to charge the total fees indicated above. ☒ (This check-box may be marked only if the conditions for deposit accounts of the IPEA so permit) Authorization to charge any deficiency or credit any overpayment in the total fees indicated above.	IPEA/ <u>US</u> Deposit Account No.: <u>04-1403</u> Date: <u>July 17, 2002</u> Name: <u>Stephen E. Bondura</u> Signature: <u>[Signature]</u>								

PCT

CHAPTER II

FEE CALCULATION SHEET

Annex to the Demand

International application No. PCT/US01/48975 Applicant's or agent's file reference KCX-411-PCT (15805) Applicant KIMBERLY-CLARK WORLDWIDE, INC.	For International Preliminary Examining Authority use only Date stamp of the IPEA								
CALCULATION OF PRESCRIBED FEES 1. Preliminary examination fee 750.00 ☐ P 2. Handling fee (Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.) 148.00 ☐ H 3. Total of prescribed fees Add the amounts entered at P and H and enter total in the TOTAL box 896.00 TOTAL									
MODE OF PAYMENT <table style="width: 100%;"> <tr> <td>☐ authorization to charge deposit account with the IPEA (see below)</td> <td>☐ cash</td> </tr> <tr> <td>☒ cheque</td> <td>☐ revenue stamps</td> </tr> <tr> <td>☐ postal money order</td> <td>☐ coupons</td> </tr> <tr> <td>☐ bank draft</td> <td>☐ other (specify):</td> </tr> </table>		☐ authorization to charge deposit account with the IPEA (see below)	☐ cash	☒ cheque	☐ revenue stamps	☐ postal money order	☐ coupons	☐ bank draft	☐ other (specify):
☐ authorization to charge deposit account with the IPEA (see below)	☐ cash								
☒ cheque	☐ revenue stamps								
☐ postal money order	☐ coupons								
☐ bank draft	☐ other (specify):								
AUTHORIZATION TO CHARGE (OR CREDIT) DEPOSIT ACCOUNT (This mode of payment may not be available at all IPEAs) ☐ Authorization to charge the total fees indicated above. ☒ (This check-box may be marked only if the conditions for deposit accounts of the IPEA so permit) Authorization to charge any deficiency or credit any overpayment in the total fees indicated above. IPEA/ <u>US</u> Deposit Account No.: <u>04-1403</u> Date: <u>July 17, 2002</u> Name: <u>Stephen E. Bondura</u> Signature: <u><i>Stephen E. Bondura</i></u>									

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
18 July 2002 (18.07.2002)

PCT

(10) International Publication Number
WO 02/054926 A1

29

(51) International Patent Classification: A47K 5/12, B65D 47/34

(74) Agent: DORITY & MANNING, P.A.; P.O. Box 1449, One Liberty Square, 55 Beattie Place, Suite 1600, Greenville, SC 29602 (US).

(21) International Application Number: PCT/US01/48975

(22) International Filing Date:
17 December 2001 (17.12.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/741,497 19 December 2000 (19.12.2000) US

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(71) Applicant: KIMBERLY-CLARK WORLDWIDE, INC. [US/US]; 401 North Lake Street, Neenah, WI 54956 (US).

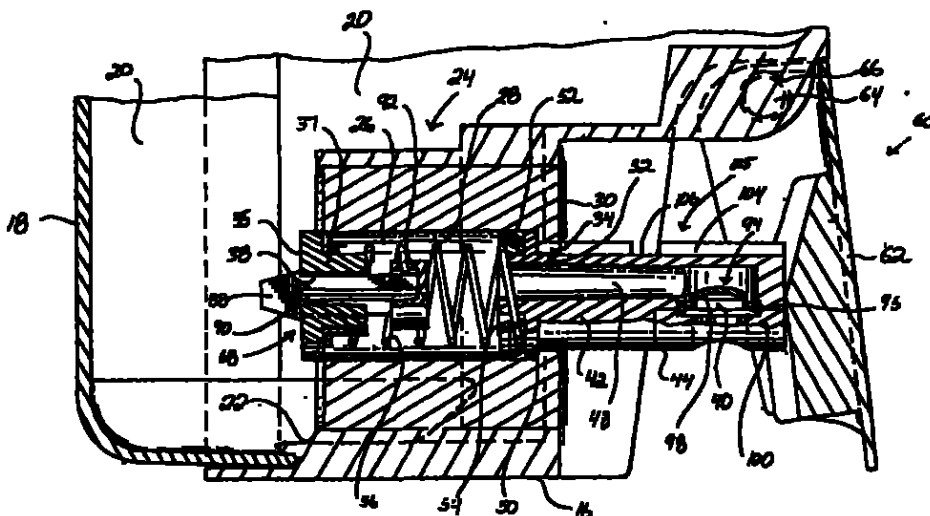
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(54) Title: DOSING PUMP FOR LIQUID DISPENSERS



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(57) Abstract: A dispenser for dispensing metered amounts of a viscous material includes a liquid reservoir and a pump chamber having an opening in communication with the reservoir. A dispensing orifice is defined in the pump chamber. A pump mechanism is configured with the pump chamber and is movable from a rest to a pressurizing position upon actuation thereof to pressurize liquid within the pump chamber. A check valve mechanism is disposed in the opening. A restriction device is disposed in the dispensing orifice and maintains a closed configuration to prevent leakage of liquid from the dispensing orifice. The restriction device opens upon sufficient liquid pressure build-up within the pump chamber upon actuation of the pump mechanism. The restriction device also may vent the pump chamber upon release of the pump mechanism.



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30

TITLE OF THE INVENTION**DOSING PUMP FOR LIQUID DISPENSERS****FIELD OF THE INVENTION**

The present invention relates generally to liquid dispensers, and particularly to a dosing pump for a viscous liquid dispenser.

BACKGROUND OF THE INVENTION

Viscous liquid dispensers are well known in the art for dispensing any manner of viscous liquid, for example lotions, soap, and the like. The conventional dispensers utilize a wide variety of pumping mechanisms which allow a user to depress or manipulate a pump actuator in order to dispense liquid from the dispenser. Exemplary devices are shown, for example, in U.S. Patent Numbers 5,810,203; 5,379,919; 5,184,760; and 4,174,056.

Conventional dispensers and pump mechanisms are configured generally for vertical mode operation. In other words, the dispenser stands generally upright with the pumping device configured at the top of the unit. These pump devices are generally vented around the stem of the pump and should a user attempt to use the dispenser in a horizontal mode, the dispenser will, in all likelihood, leak around the pump stem.

An additional problem noted with conventional pumps, particularly lotion or soap dispenser pumps, is that there is a tendency for leakage of residual liquid left in the pump head. Certain types of combination pumps, such as peristaltic pumps common to liquid skin care product dispensers, incorporate a spring and ball check valve system in the discharge area to prevent leaking. However, this type of check valve system is relatively expensive and complicated, and the components may be subject to corrosion and/or sticking when used with certain chemical compositions.

Diaphragm type valves are used in certain applications, for example squeeze actuated bottles of hand lotion, in which the bottle is squeezed by a user to provide the liquid pressure required to open the diaphragm valve. However, with these configurations, there is no discreet control over the amount of liquid dispensed.

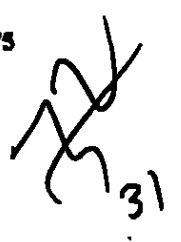
Thus, there is a need in the art for a dosing pump that can dispense a metered amount of viscous liquid in a horizontal as well as a vertical mode while preventing leakage from around the pump mechanism without complicated check valve devices.

SUMMARY OF THE INVENTION

Objects and advantages of the invention will be set forth in part in the following description, or may be obvious from the description, or may be learned through practice of the invention.

The present invention provides a unique dosing pump that is particularly well suited for viscous liquid dispensers, for example, soap dispensers, lotion dispensers, and the like. The pump may be oriented in a generally horizontal configuration and thus allows greater flexibility as to the design and configuration of a dispenser utilizing the pump.

The pump may be utilized with any manner or shape of dispenser. The dispenser will generally comprise a housing member or members that define a liquid reservoir. The pump includes a pump chamber that is in communication with the liquid reservoir. In one embodiment, the pump chamber may be defined internally of the dispenser housing. For example, the pump chamber may comprise an integrally molded component of the housing. In an alternative embodiment, the pump chamber may be configured on the outside of the reservoir or housing with a channel or passage defining a liquid communication path between the reservoir and the pump chamber. It should be appreciated that any number of



configurations may be utilized to define a pump chamber that is in fluid communication with a liquid reservoir.

The pump chamber has a volume that generally defines the metered dose of liquid to be dispensed. A dispensing orifice is defined in the pump chamber. The orifice may be defined in any wall member of the chamber, or in one particular embodiment according to the invention, the orifice may be defined through a pump cylinder.

A pump mechanism is configured with the pump chamber to pressurize liquid within the pump chamber upon actuation of the pump mechanism. The pump mechanism may be any member or configuration of components that pressurizes the liquid contained within the chamber in order to expel or dispense the liquid through the dispensing orifice. In one particular embodiment according to the invention, the pump mechanism includes a pump cylinder that is slidably disposed and retained in the pump chamber. The pump cylinder is moveable from a rest position to a pressurizing position and may be biased to the rest position. An actuator is configured with the pump cylinder and provides a device for an operator to move the pump cylinder to its pressurizing position in order to dispense liquid out the dispensing orifice. The pump mechanism may comprise a shaft and piston type of arrangement wherein the piston is sealed against the chamber walls. Upon movement of the shaft and piston within the pump chamber, any liquid contained within the chamber is pressurized and ultimately dispensed out the dispensing orifice defined in the chamber. The pump mechanism may be a relatively simple diaphragm that pressurizes the pump chamber upon being compressed.

In one embodiment of the invention, the dispensing orifice is defined as a longitudinal channel within a pump cylinder that is slidable within the pump chamber. The channel terminates at a

dispensing orifice defined in a delivery end of the cylinder. The pump cylinder may be biased by a spring member towards its rest position. The spring member may be operably configured within the pump chamber or outside of the pump chamber. Any type of resilient member may be utilized to bias the pump cylinder.

The invention is not limited to any particular type of device for actuating the pump. In one particular embodiment, the actuator may comprise a panel member that is pivotally mounted to the dispenser housing. The panel member rests against a front end of a pump cylinder or shaft and thus moves the pump cylinder or shaft upon an operator depressing the panel member. In an alternate embodiment, the actuator may comprise a panel member plate, button or the like attached directly to the front end of the pump cylinder or shaft. The actuator may be configured in any shape to contribute to the aesthetically pleasing look of the dispenser.

A check valve mechanism is operably disposed in the opening between the pump chamber and the liquid reservoir. Upon actuation of the pump, the check valve mechanism moves to seal the pump chamber so that the liquid within the chamber is pressurized. Upon release of the pump actuator, the check valve mechanism moves to unseal the pump chamber so that a metered amount of viscous liquid is able to flow automatically from the reservoir into the pump chamber for dispensing upon the next subsequent actuation of the pump. The check valve mechanism may take on a number of configurations. For example, the check valve mechanism may comprise a ball seated within a recess that defines the opening between the pump chamber and the reservoir. The recess may include a tapered sealing surface against which the ball seals upon actuation of the pump, and a lower recess portion into which the ball falls by gravity upon release of the pump.

32


In an alternate embodiment, the check valve mechanism may comprise a resilient flap member that is disposed across the opening between the pump chamber and the reservoir. Upon pressurization of the pump chamber, the flap member seals the opening to the reservoir. Upon release of the pump, the flap member hangs freely. The static head pressure of the liquid within the reservoir will move the flap member away from the opening and cause the liquid to refill the pump chamber.

In still another embodiment of the check valve mechanism, a conical plug member takes the place of the ball. The plug member is moveable into and out of engagement with a tapered sealing surface defining the opening in the back of the pump chamber. The plug member may have the general shape of the recess defining the tapered sealing surface, and thus is capable of floating freely within the recess. In an alternate embodiment, the plug member may be guided by a spring loaded rod that is operably connected with the pump piston. The rod may move longitudinally within a recess or channel defined through the piston as the piston and shaft are moved within the pump chamber.

In still another embodiment, the check valve mechanism may comprise an elongated shuttle type valve that is slidable within the opening between the pump chamber and reservoir. The shuttle valve includes a sealing member that seals the opening upon actuation of the pump device. Upon release of the pump, the shuttle valve unseals, and liquid is free to flow past the shuttle valve and into the pump chamber.

The pump according to the invention also includes a restriction device disposed operably across the dispensing orifice. The restriction device is a generally resilient member that opens or moves upon sufficient liquid pressure build up within the pump

chamber. Upon release of the pump mechanism, the restriction device serves two purposes. As the pump mechanism, for example the piston and shaft configuration, cylinder, or diaphragm configuration, moves back to its rest position, the restriction device defines a vent path for venting the pump chamber. As the vacuum within the chamber increases upon release of the pump mechanism, the resilient member is drawn towards the pump chamber and thus opens to define a vent path into the chamber. Once the pump mechanism has reached its rest position, the restriction device closes to completely seal the dispensing orifice, and thus, prevents leakage or dripage from the orifice. With the restriction device disposed within the dispensing orifice, it is not necessary to separately vent the pump chamber around the pump shaft or cylinder or to separately vent the dispenser reservoir.

The invention will be described in greater detail below through embodiments illustrated in the figures.

33

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a prospective view of a viscous liquid dispenser according to the invention;

Figure 2 is a cross sectional view of the pump mechanism taken along the lines indicated in Fig. 1;

Figure 3 is a cross sectional operational view of the pump mechanism;

Figure 4 is a cross sectional operational view of the pump mechanism;

Figure 5a is a partial perspective and cross sectional view of an embodiment of the pump mechanism;

Figure 5b is a partial perspective and cross sectional view of the pump mechanism shown in Fig. 5a particularly illustrating a locking feature thereof;

Figure 6a is a perspective view of a restriction device according to the invention;

Figure 6b is a perspective operational view of the restriction device illustrated in Fig. 6a;

Figure 7 is a cross sectional view of an alternate embodiment of a pump mechanism according to the invention;

Figure 8a is a cross sectional view of a pump mechanism particularly illustrating a conical plug check valve device;

Figure 8b is a cross sectional view of a pump mechanism according to the invention particularly illustrating a flap type of check valve mechanism;

Figure 8c is a cross sectional view of an embodiment of a pump mechanism according to the invention particularly illustrating a plug and rod check valve configuration;

Figure 9 is a cross sectional view of an alternate embodiment of a pump mechanism utilizing a diaphragm device for pressurizing the pump chamber; and

Figure 10 is a cross sectional view of an alternate embodiment of a pump cylinder and chamber configuration.

DETAILED DESCRIPTION

Reference will now be made in detail to embodiments of the invention, one or more examples of which are provided in the drawings. Each example is provided by way of explanation of the invention and not meant as a limitation of the invention. For example, features illustrated or described as part of one embodiment may be utilized with another embodiment to yield still a further embodiment. It is intended that the present invention include such modifications and variations as come within the scope of the appended claims and their equivalents.

The present invention relates to a unique dosing pump for use with any manner of liquid dispenser. The pump apparatus is particularly well suited for use with any manner of viscous liquid dispenser, for example soap dispensers, lotion dispenser, and the like. The present invention also encompasses a dispenser utilizing the unique pump according to the invention.

Figure 1 illustrates a viscous liquid dispenser 10 that is particularly suited as a liquid soap dispenser. The dispenser 10 comprises a housing, generally 14. The housing 14 may comprise any number of components. For example, the housing 14 may include a front housing member 16 that is connected to a back housing member 12. The dispenser 10 illustrated in Fig. 1 is configured as a disposable liquid soap dispenser that can be removably attached to a wall mounted bracket or the like. For this purpose, mounting structure, generally 12, is integrally formed on the back side 18 of the housing 14. The dispenser illustrated in Fig. 1 is described in detail in co-pending and commonly owned U.S. Patent Application Serial No. _____ (TO BE SUPPLIED UPON RECEIPT OF THE SERIAL NO.) entitled "Self-

34
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Contained Viscous Liquid Dispenser" filed concurrently with this application and which is incorporated herein in its entirety for all purposes.

The dispenser 10 includes a liquid reservoir, generally 20 (Figs. 2-4). A dosing pump is configured with the dispenser to dispense metered doses of the viscous liquid contained within the reservoir 20 upon a user depressing or manipulating a pump actuator. The pump actuator may be any structural member that is configured with or connected to a pump mechanism to dispense the viscous liquid from the dispenser 10. The pump mechanism will be described in greater detail below. In the illustrated embodiments, the pump actuator, generally 60, is illustrated as a panel member 62. The panel member 62 adds to the aesthetically pleasing overall configuration of the dispenser 10 and may take on any shape. The panel member 62 illustrated in Figs. 1-4 is pivotally attached to the front component 16 of the housing 14 by way of protrusions 64 that reside in recesses 66 defined in the front component 16. In an alternate embodiment illustrated in Fig. 7, the actuator 60 may comprise a panel member 62 that is attached directly to the front of the pump mechanism. In this regard, the actuator 60 may comprise any type of plate, button, cap, or like structure that is directly fixed to the pump mechanism. The actuator 60 need not be connected to the housing 14.

Various embodiments of the dosing pump apparatus 24 are illustrated in the figures. The apparatus 24 includes a pump chamber 26 defined by any manner of structural components. For example, the pump chamber 26 may be defined by wall members that are molded or otherwise formed on an internal surface, i.e., the bottom surface 22 of the housing 14. In this embodiment, the pump chamber 26 is thus disposed completely within the housing 14. In alternate embodiments, for example as illustrated in Figs. 7-

9, the pump chamber 26 is defined by structural wall members that are attached to the outside surface of the housing member 14 by any conventional means. In either case, the pump chamber 26 is in liquid communication with the reservoir 20. For example, the pump chamber 26 may include a back wall 36 having an opening 38 defined therethrough placing the pump chamber 26 in liquid communication with the reservoir 20. In the embodiment of Figs. 2-4, the back wall of the pump chamber 26 is defined by an end cap member 35 having the opening 38 defined therethrough. This configuration may be used when it is necessary to insert the pump mechanism into the pump chamber 26 prior to sealing the chamber 26.

The pump chamber 26 has an internal volume that essentially defines the metered amount or dose of liquid to be dispensed therefrom. In this regard, the pump chamber can be configured with any desired volume depending on the intended use of the dispenser 10.

A dispensing orifice 40 is also provided in the pump chamber 26 and defines the exit path for the viscous liquid from the pump chamber 26. The dispensing orifice 40 may be defined in any structural member of the pump chamber 26. For example, in the embodiments illustrated in Figs. 7-9, the dispensing orifice 40 is defined by a channel member in the lower surface of the chamber 26. In the embodiment illustrated in Figs. 2-4, the dispensing orifice 40 is defined in a member of the pump mechanism, particularly a cylinder 42 that extends through an opening 32 in a front wall 30 of the pump chamber 26. The pump mechanism of Figs. 2-4 will be described in greater detail below.

As mentioned, the pump apparatus 24 includes a pump mechanism 25 that is operably configured with the pump chamber 26 to pressurize the viscous liquid contained within the pump

chamber upon a user actuating the pump mechanism. Various configurations of devices may be utilized in this regard. For example, the pump mechanism 25 may be a cylinder member 42 that is slidable within the pump chamber 26, as illustrated in Figs. 2-4. The cylinder 42 extends through an opening in the front wall 30 of the pump chamber and is prevented from being pulled out of the chamber 26 by a flange or piston member 50. The piston member 50 also sealingly engages against the walls of the pump chamber 26. An O ring, may be provided on the piston member 50 for this purpose. The cylinder 42 has a longitudinal channel 48 defined therethrough. Channel 48 terminates at the dispensing end of the cylinder 42 at the dispensing orifice 40. Thus, in this embodiment, the dispensing orifice 40 is actually defined in the moveable pump cylinder 42.

The cylinder 42 is moveable between a rest position illustrated in Fig. 2 to a pressurized or dispensing position illustrated Fig. 3. The cylinder 42 is biased to its rest position by any conventional device, for example a spring 56 disposed within the pump chamber 26. The spring 56 has a forward end fitted in a recess 54 defined by a conical flange member 52. The rear end of the spring 56 is fitted around a cylindrical extension 37 of the end cap 35. Referring to Figs. 2-4, the actuator 60 configured as a panel member 62 is disposed in contact against the forward end of the cylinder 42 so that upon a user depressing the panel member 62 from the front side of the dispenser 10, the cylinder 42 is caused to move rearward within the pump chamber 26, as is operationally depicted in Fig. 3.

Referring to Fig. 3, as the cylinder 42 moves into the pump chamber 26, a check valve mechanism (described in greater detail below) seals the opening 38 in the rear wall 36 of the pump chamber in response to an increase in liquid pressure within the

chamber. As the pressure of the liquid increases within the chamber, the liquid is eventually dispensed out of the dispensing orifice 40. In the embodiment of Figs. 2-4, the liquid is caused to travel through the longitudinal channel 48 to be dispensed out of the dispensing end of the cylinder 42, as illustrated in Fig. 3.

Upon release of the actuator 60, the cylinder 42 is caused to return to its rest position, as illustrated in Fig. 4. As the cylinder moves to the right, a vacuum is drawn within the pump chamber 26 that causes the check valve mechanism to unseat. Liquid from the reservoir 20 is then free to flow into the pump chamber 26 to be dispensed upon the next subsequent actuation of the pump mechanism.

Figures 5a and 5b illustrate a locking feature of the cylinder 42. A longitudinal channel 104 is defined in the top surface of the cylinder 42 and is engaged by a tab 34 of the front wall 30. The cylinder 42 thus slides along the tab 34 upon depression of the actuator and is prevented from rotating in use. The orientation of the dispensing orifice 40 is thus ensured. A partial circumferential groove 106 is also defined in the surface of the cylinder 42. Groove 106 is located at a position that corresponds essentially to the fully depressed position of the cylinder 42. Referring to Fig. 5, once the cylinder 42 has been fully depressed, the cylinder 42 may be rotated and engaged by the tab 34. The cylinder 42 is then locked into position. This locking feature is particularly useful during shipment of the dispenser.

Figures 7-8c illustrate alternate embodiments of a pump mechanism utilizing a shaft and piston configuration. A shaft 44 extends through an opening of the front wall 30 of the pump chamber 26. The shaft is connected to a piston 50 that moves within the chamber 26 to pressurize the liquid contained therein. An O-ring 58 is provided on the outer circumference of the piston

36

50 to ensure a sealing engagement against the pump chamber walls. The actuator 60 is connected or in contact against the front of the piston. A spring 56 or other resilient type member is used to bias the shaft and piston to the rest position. It should be noted that, in this embodiment, the spring 56 is disposed outside of the pump chamber 26. Upon depressing the actuator 60, the piston 50 is caused to move into the pump chamber 26 and thus pressurizes the viscous liquid contained therein. The liquid is dispensed through the dispensing orifice 40 defined in a wall of the pump chamber 26.

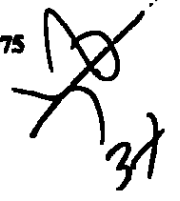
Figure 9 illustrates an embodiment of the pump apparatus 24 wherein the pump mechanism 25 comprises a diaphragm 102 for pressurizing the pump chamber 26. The diaphragm 102 also serves as the pump actuator. To operate the device of Fig. 9, a user manually simply depresses the diaphragm 102 inward to pressurize and dispense the liquid within the chamber 26. The ball check valve mechanism operates according to the embodiment of Fig. 7.

As mentioned, a check valve mechanism, generally 68, is operably disposed in the opening 38 between the pump chamber 26 and the reservoir 20 to seal the opening upon actuation of the pump mechanism 25. Various embodiments of the check valve mechanism 68 are illustrated in the figures. Referring to Figs. 2-5b, the check valve mechanism 68 comprises an elongated shuttle valve 88. The shuttle valve 88 is slidable within the opening 38 in the cap member 35 and has a plurality of radially extending arms 90. Liquid from the reservoir 20 is free to flow past the arms 90 and into the pump chamber 26 so long as the shuttle valve 88 is not sealed against the opening 38. Referring to Fig. 3, the shuttle valve 88 includes a cap 92 that sealingly engages against the end cap member 35 upon actuation of the pump mechanism 25. The cap 92 prevents the liquid contained within the reservoir 20 from

escaping through the opening in the chamber 26 and back into the reservoir 20 upon actuation of the pump mechanism 25. Upon release of the pump mechanism 25, the shuttle valve 88 moves into the chamber 26 and thus unseals the opening 38, as particularly illustrated in Fig. 4. The static head pressure of the liquid within the reservoir 20 should be sufficient to cause the shuttle valve 88 to unseat and move into the pump chamber 26 to allow the chamber 26 to refill with liquid from the reservoir 20. Unseating of the shuttle valve 88 will be further aided by the vacuum drawn in the chamber 26 upon return of the cylinder 42 to its rest position.

Figure 7 illustrates an alternate embodiment of the check valve mechanism 68 that utilizes a ball 76 within a recess 72 that also defines the opening or path between the pump chamber 26 and the reservoir 20. The recess 72 includes a tapered sealing section 76 against which the ball 76 is forced upon actuation of the pump mechanism 25. The ball 76 moves into the tapered section 76 and seals the opening 38. Upon release of the pump mechanism 25, the ball will fall by gravity into a lower portion of the recess 72, as illustrated in Fig. 7. Liquid is then free to flow from the reservoir 20 into the pump chamber 26. The static head pressure of the liquid within the reservoir 20 will also aid in unseating the ball 76 from the tapered section 76.

Figure 8a illustrates an embodiment of the check valve mechanism that utilizes a conical member 79 disposed within the recess 72. Upon actuation of the pump mechanism 25, the conical member 79 is forced into engagement against the tapered section 76 of the recess 72 to seal the opening 38. Upon release of the pump mechanism 25, the conical member 79 will move away from the tapered section 76 and thus allow fluid from the reservoir 20 to flow back into the pump chamber 26. The conical member 79 has



a general overall shape complimenting that of the recess 72 and is thus able to "float" within the chamber 72.

Figure 8b illustrates an alternate embodiment of the check valve mechanism that utilizes a resilient flap member 78. Upon actuation of the pump mechanism 25, the flap member 78 moves against the chamber and thus seals the opening 38. Upon release of the pump mechanism 25, the flap member 78 is free to move away from the wall, and liquid from the reservoir 20 is free to flow into the pump chamber 26. Again, the static head pressure of the liquid within the reservoir 20 will aid in moving the flap member 78. The increase of vacuum within the chamber 26 will also move the flap member away from the wall.

Figure 8c illustrates an embodiment of the check valve mechanism 68 that incorporates a plug member 80 mounted on a guide rod 82. The guide rod 82 is operably connected to the piston 50 so that the piston physically moves the plug member 80 into engagement against the walls of recess 72. The rod 82 may move within a longitudinal recess 84 defined in the piston 50 and shaft 44. A spring 86 may be provided to bias the plug member 80 away from the piston 50.

The pump apparatus according to the invention also includes a restriction device, generally 94, operably disposed across the dispensing orifice 40. In the illustrated embodiment, the restriction device 94 includes at least one resilient flap member 98, and preferably a plurality of flap members 98 defined by slits 94. Referring particularly to Figs. 2-4, 6a, and 6b, the resilient flaps 94 have a concave configuration, and the restriction device 94 is disposed within the dispensing orifice so that the concave flaps are oriented upwards or towards the pump chamber 26. Upon sufficient pressure within the pump chamber 26, the liquid causes the resilient flaps 98 to buckle towards the dispensing orifice 40, as

illustrated particularly in Fig. 6b, and the liquid flows through the dispensing orifice 40. Upon release of the pump mechanism 25 and return of the mechanism to its rest position, the resilient flaps move back into engagement against themselves. However, due to the vacuum drawn in the pump chamber as the pump mechanism returns to its rest position, the flaps are pulled slightly apart and towards the pump chamber 26. The flaps move apart just enough so that the pump chamber is vented as the pump mechanism 25 returns to its rest position. Once the pump mechanism has returned to its rest position, the flaps 98 again completely seal against each other and prevent leakage or drippage of liquid from the pump chamber.

The restriction device 94 provides a relatively simple means of preventing leakage from the pump chamber, particularly in embodiments of the invention wherein the pump chamber is horizontally disposed at the bottom portion of the pump reservoir where static pressure of the liquid within the reservoir is greatest. The restriction device 94 also provides a relatively simple means for venting the pump chamber 26 and eliminates the need to vent the pump mechanism around the pump shaft or cylinder which may result in leakage problems. Additionally, the pump mechanism may be incorporated with unvented dispensers since a vent path is defined through the pump mechanism.

Figure 10 illustrates another embodiment of the dosing pump that is similar in many regards to the embodiment of Figs. 2-4. However, in this embodiment, the channel 28 defined through the pump cylinder 42 has an inlet 49 defined radially with respect to the channel 48. The pump chamber includes a smaller diameter section 27 "upstream" of the piston member 50 and a wall member 53 against which the piston member 50 engages in the rest position of the pump mechanism. The inlet 49 to the channel 48 is



disposed in the chamber section 27 in the rest position of the pump mechanism. The piston member 50 is configured so that viscous liquid within chamber 26 flows through or around the piston member 50 as the cylinder is pushed into the chamber 26. The piston member may include any manner of opening or bypasses for this purpose, but has enough surface area to ensure that the liquid within the chamber 26 is pressurized upon movement of the cylinder 42 into the chamber 26. Upon actuation of the cylinder 42, the cylinder moves into the chamber 26 and the liquid passes into the inlet 49, through the channel 48, and out the dispensing orifice 40. A seal, such as an O-ring 51 is provided around the cylinder 42 upstream of the inlet 49 to seal the chambers 26 and 27. The embodiment of Fig. 10 is useful in that in the rest position of the cylinder 42 as seen in Fig. 10, the smaller diameter chamber 27 is essentially sealed from the larger diameter chamber 26, and thus also from the pressure of the liquid within the reservoir 20. Thus, the dispensing orifice 40 is essentially isolated from the *relatively high static head pressure of the reservoir*. Larger reservoir volumes could be used without fear of overcoming the sealing pressure of the restriction device 98 or the seal 51.

It should be appreciated by those skilled in the art that various modification or variations can be made in the invention without departing from the scope and spirit of the invention. It is intended that the invention include such modifications and variations as come within the scope of the appended claims and their equivalents.

WHAT IS CLAIMED IS:

1. A dispenser for dispensing metered amounts of a viscous liquid, comprising:
 - a liquid reservoir;
 - a pump chamber having an opening in communication with said reservoir;
 - a dispensing orifice in communication with said pump chamber;
 - a pump mechanism configured with said pump chamber and movable from a rest position to a pressurizing position upon actuation thereof to pressurize liquid within said pump chamber;
 - an actuator operably connected with said pump mechanism;
 - a check valve mechanism operably disposed in said opening, upon actuation of said pump mechanism said check valve mechanism movable to seal said opening and upon release of said pump mechanism said check valve mechanism movable to unseal said opening wherein a metered amount of viscous liquid flows automatically from said reservoir into said pump chamber for dispensing upon the next subsequent actuation of said pump mechanism;
 - a restriction device disposed in said dispensing orifice, said restriction device maintaining a closed configuration to prevent leakage of liquid from said dispensing orifice and opening upon sufficient liquid pressure build-up within said pump chamber upon actuation of said pump mechanism ; and
 - wherein said restriction device is configured to vent said pump chamber upon release of said pump mechanism.
2. The dispenser as in claim 1, wherein said pump mechanism comprises a pump cylinder slidably disposed and retained in said pump chamber, said pump cylinder further comprising a delivery end extending through a front wall of said



pump chamber and having a dispensing channel disposed therethrough, said dispensing orifice disposed at a forward end of said dispensing channel.

3. The dispenser as in claim 2, further comprising a biasing element disposed to bias said pump cylinder to said rest position.

4. The dispenser as in claim 2, wherein said dispensing channel comprises an inlet axially aligned with said channel.

5. The dispenser as in claim 2, wherein said dispensing channel comprises a radially extending inlet, and said pump chamber comprises a larger diameter section and a smaller diameter section, said inlet disposed within said smaller diameter section in said rest position of said pump cylinder.

6. The dispenser as in claim 1, wherein said pump mechanism comprises a piston slidable within said pump chamber and movable from said rest position to said pressurizing position, and a shaft connected to said piston and extending through a front wall of said pump chamber, said actuator configured at a front end of said shaft.

7. The dispenser as in claim 6, further comprising a biasing element disposed to bias said piston to said rest position.

8. The dispenser as in claim 1, wherein said pump mechanism comprises a diaphragm member disposed across a front wall of said pump chamber, said diaphragm member comprising a front surface that defines said actuator and is depressible by a user to dispense liquid from said dispenser.

9. The dispenser as in claim 1, wherein said dispensing orifice is defined through a lowermost portion of said pump chamber.

10. The dispenser as in claim 1, wherein said pump chamber is disposed on the outside of said reservoir.

11. The dispenser as in claim 1, wherein said pump chamber is disposed at least partially within said reservoir.
12. The dispenser as in claim 11, wherein said reservoir comprises a molded bottom surface, said pump chamber molded integral with said bottom surface.
13. The dispenser as in claim 1, wherein said actuator is pivotally mounted and engaged against said pump mechanism.
14. The dispenser as in claim 1, wherein said actuator is attached directly to said pump mechanism.
15. The dispenser as in claim 1, wherein said restriction device comprises at least one flexible flap member that is movable to an open position upon pressurization of the liquid in said pump chamber and automatically returns to a closed position upon said pump mechanism moving to said rest position.
16. The dispenser as in claim 15, further comprising a plurality of said flap members that define an opening therethrough in said open position and seal against each other in said closed position.
17. The dispenser as in claim 1, wherein said check valve mechanism comprises a ball seated within a recess that defines said opening in said pump chamber, said recess defining a sealing surface against which said ball seals upon pressurization of the liquid within said pump chamber.
18. The dispenser as in claim 1, wherein said check valve mechanism comprises a resilient flap member having one end mounted within said chamber, said flap member disposed across said opening in said pump chamber.
19. The dispenser as in claim 1, wherein said check valve mechanism comprises a conical plug member movable into and out of engagement with said opening in said pump chamber.

20. The dispenser as in claim 18, wherein said plug member is slidable along a guide rod.

21. The dispenser as in claim 1, wherein said check valve mechanism comprises an elongated shuttle valve slidable within said opening in said pump chamber.

22. The dispenser as in claim 1, wherein said pump chamber is vented through said restriction device upon release of said actuator.

23. The dispenser as in claim 1, further comprising a vent disposed in said reservoir.

24. A dosing pump apparatus for dispensing metered amounts of a viscous liquid from a reservoir, said mechanism comprising:

- a pump chamber having an opening therein in liquid communication with a liquid reservoir;

- a dispensing orifice defined in said pump chamber;

- a pump mechanism configured with said pump chamber to pressurize liquid within said pump chamber upon actuation of said pump mechanism;

- a check valve mechanism operably disposed in said pump chamber opening and movable upon actuation of said pump mechanism to seal said opening and movable upon release of said pump mechanism to unseal said opening so that a metered amount of liquid flows automatically through said opening into said pump chamber;

- a resilient restriction device disposed operably across said dispensing orifice, said restriction device opening upon sufficient liquid pressure build-up within said pump chamber; and

- said restriction device configured to vent said pump chamber upon release of said pump mechanism prior to completely closing to seal said dispensing orifice.

25. The pump apparatus as in claim 24, wherein said pump mechanism comprises a pump cylinder slidably disposed and retained in said pump chamber and biased to a rest position, said pump cylinder further comprising a delivery end extending through a front wall of said pump chamber and having a dispensing channel disposed therethrough, said dispensing orifice disposed at a forward end of said dispensing channel.

26. The pump apparatus as in claim 24, wherein said pump mechanism comprises a piston slidable within said pump chamber and biased to a rest position, and a shaft connected to said piston and extending through a front wall of said pump chamber.

27. The pump apparatus as in claim 24, wherein said pump mechanism comprises a diaphragm member disposed across a front wall of said pump chamber, said diaphragm depressible by a user to pressurize and dispense liquid from said pump chamber.

28. The pump apparatus as in claim 24, wherein said dispensing orifice is defined through a lowermost portion of said pump chamber.

29. The pump apparatus as in claim 24, wherein said restriction device comprises at least one flexible flap member that is movable to an open position upon pressurization of the liquid in said pump chamber and automatically returns to a closed position upon said pump mechanism moving to a rest position.

30. The pump apparatus as in claim 29, further comprising a plurality of said flap members that define an opening therethrough in said open position and seal against each other in said closed position.

31. The pump apparatus as in claim 24, wherein said check valve mechanism comprises a ball seated within a recess that defines said opening in said pump chamber, said recess defining a

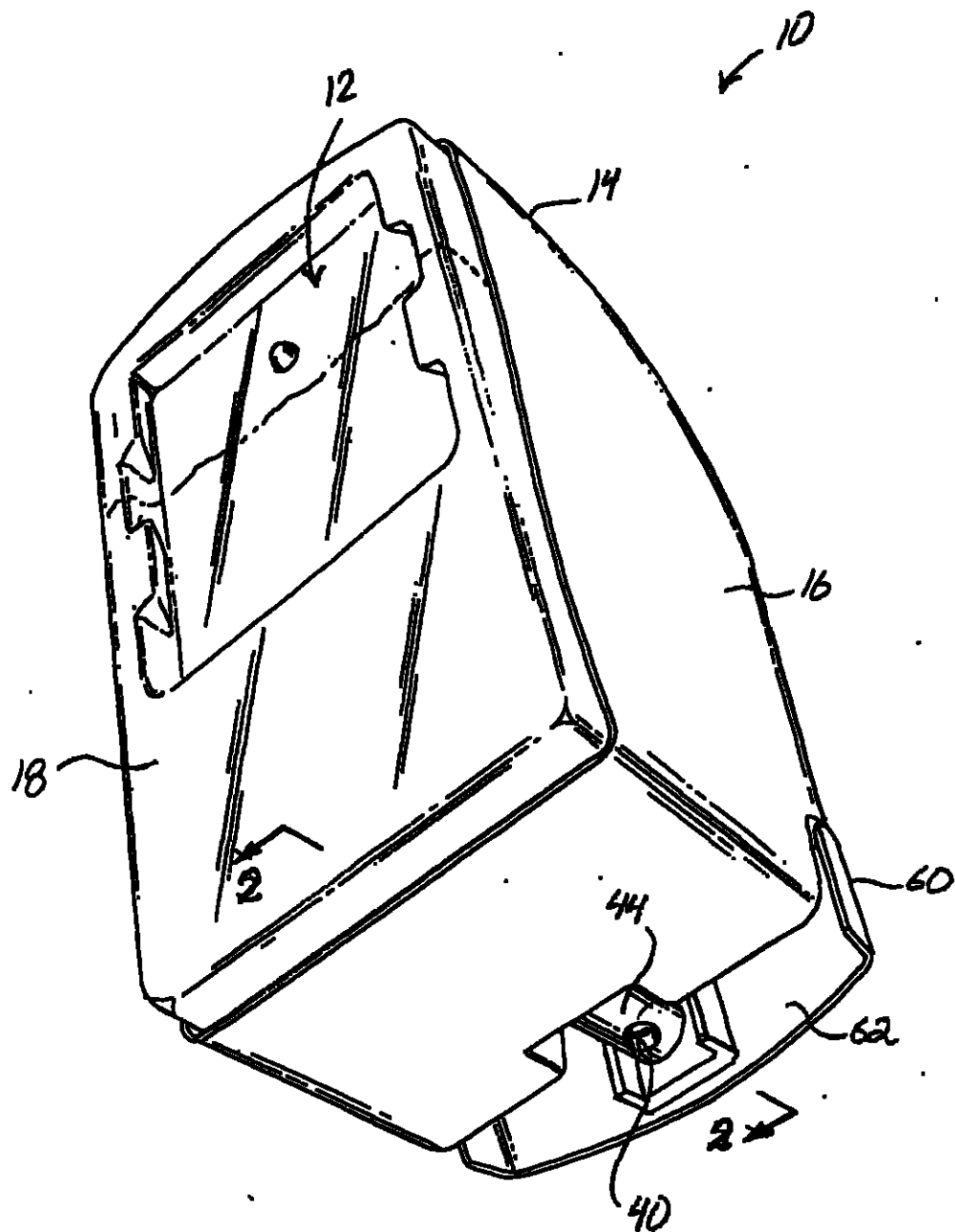
sealing surface against which said ball seals upon pressurization of the liquid within said pump chamber.

32. The pump apparatus as in claim 24, wherein said check valve mechanism comprises a resilient flap member having one end mounted within said chamber, said flap member disposed across said opening in said back end of said pump chamber.

33. The pump apparatus as in claim 24, wherein said check valve mechanism comprises a conical plug member movable into and out of engagement with said opening in said pump chamber.

34. The pump apparatus as in claim 24, wherein said check valve mechanism comprises an elongated shuttle valve slidable within said opening in said pump chamber.

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*Fig. 1*

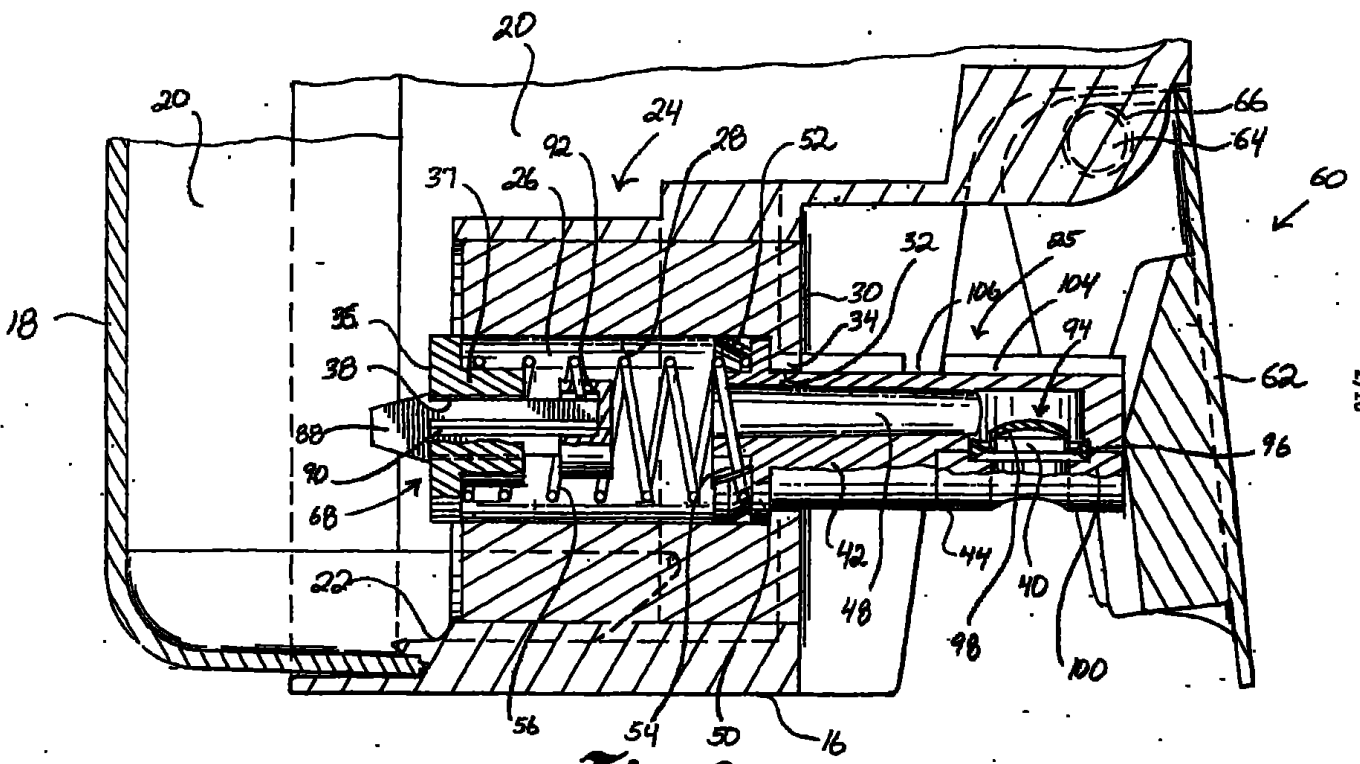
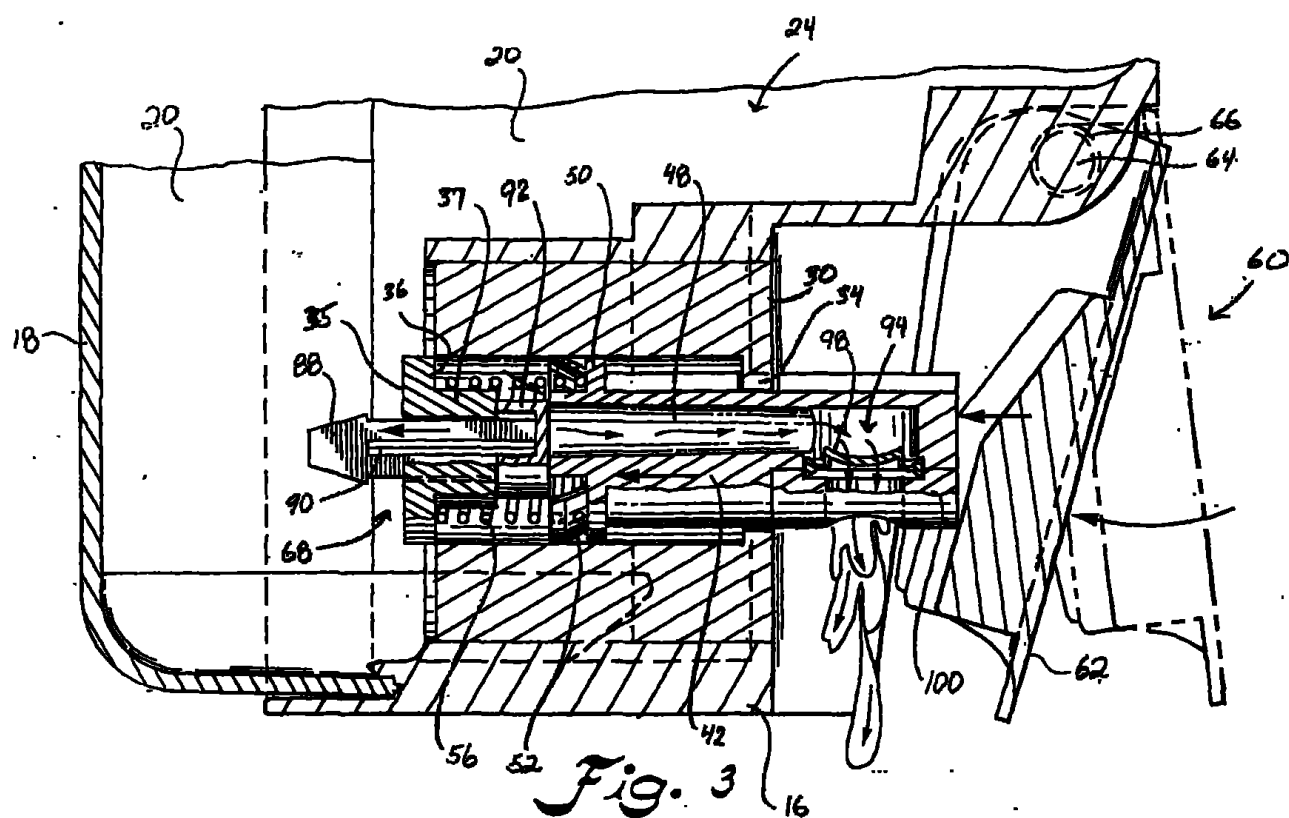
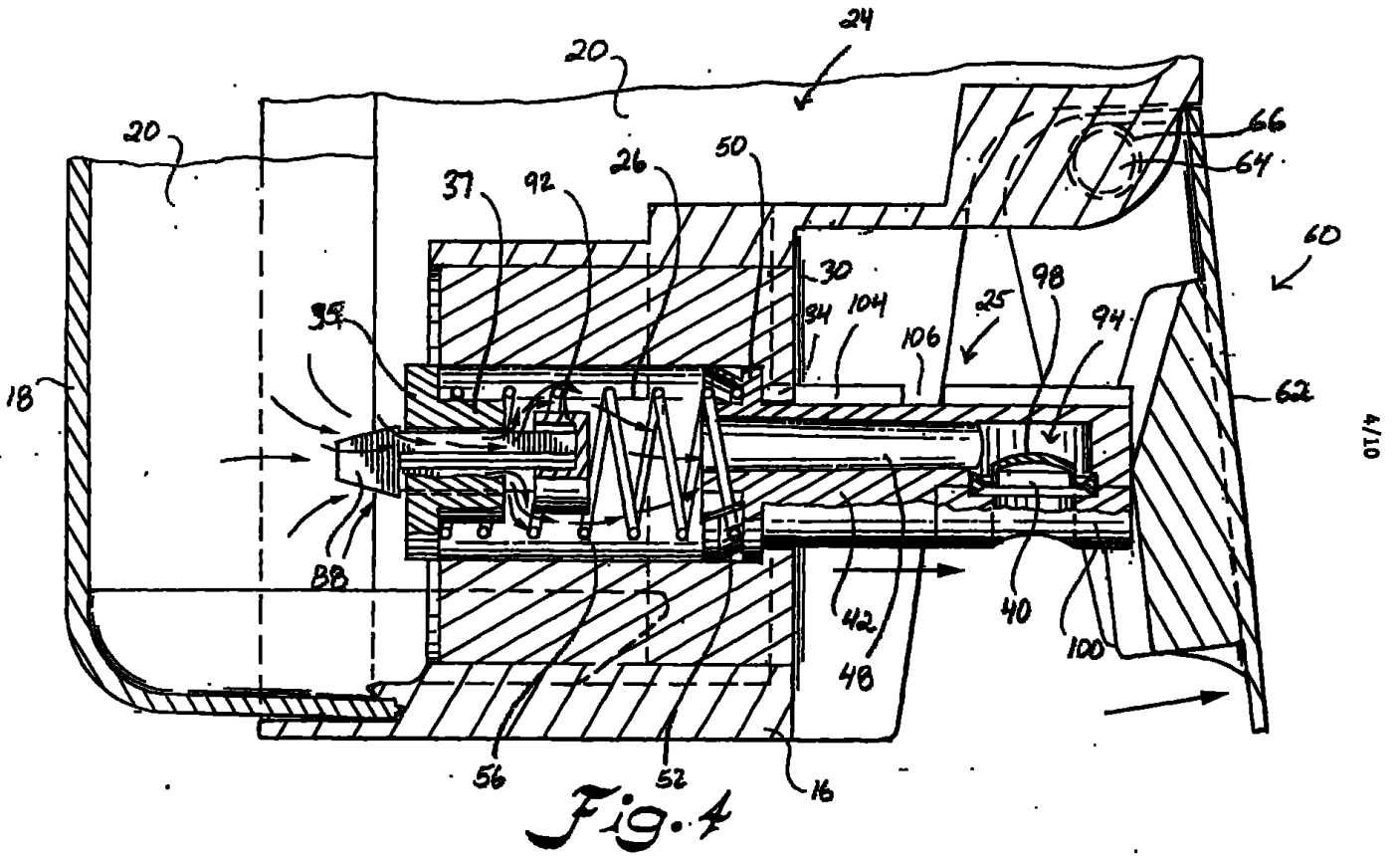


Fig. 2

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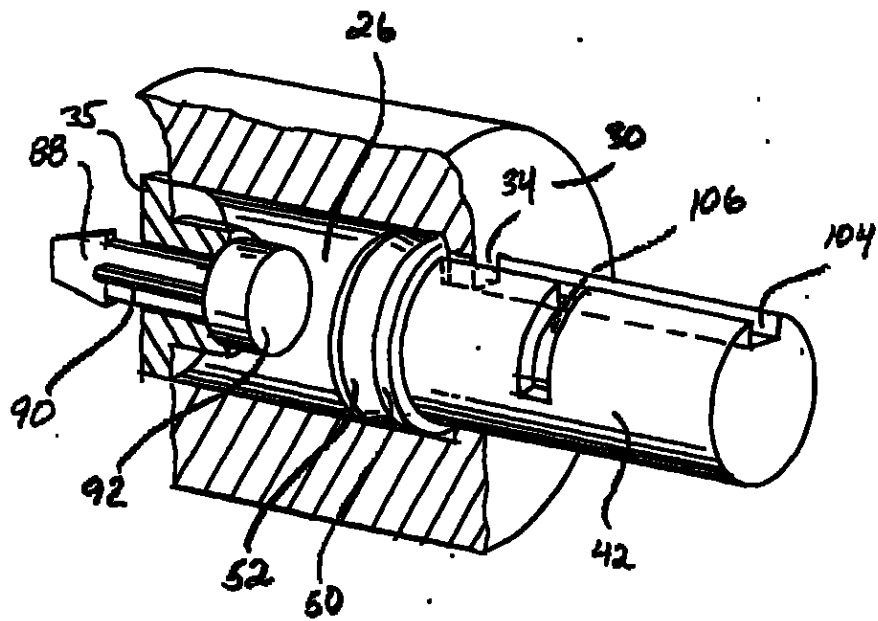


Fig. 5A

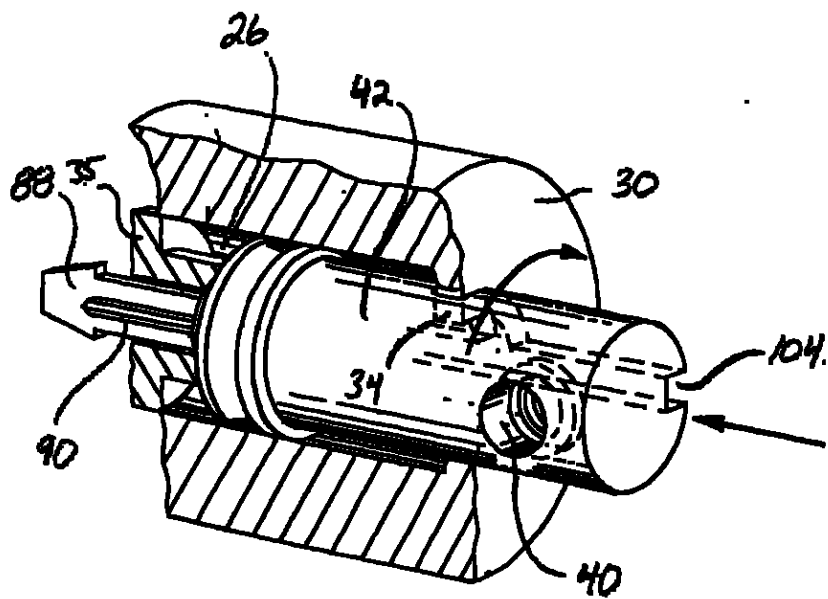


Fig. 5B

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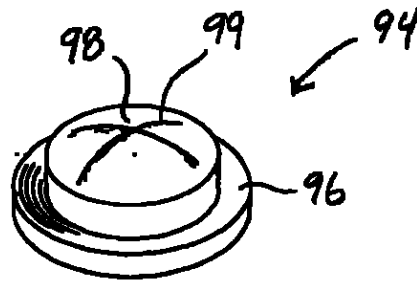


Fig. 6A

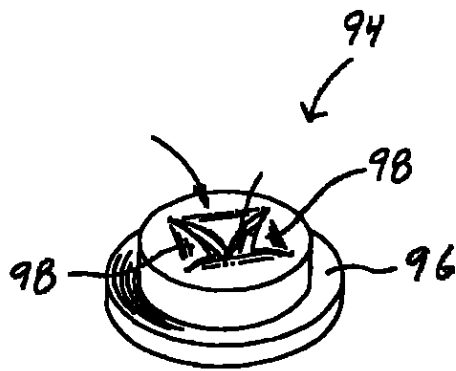


Fig. 6B

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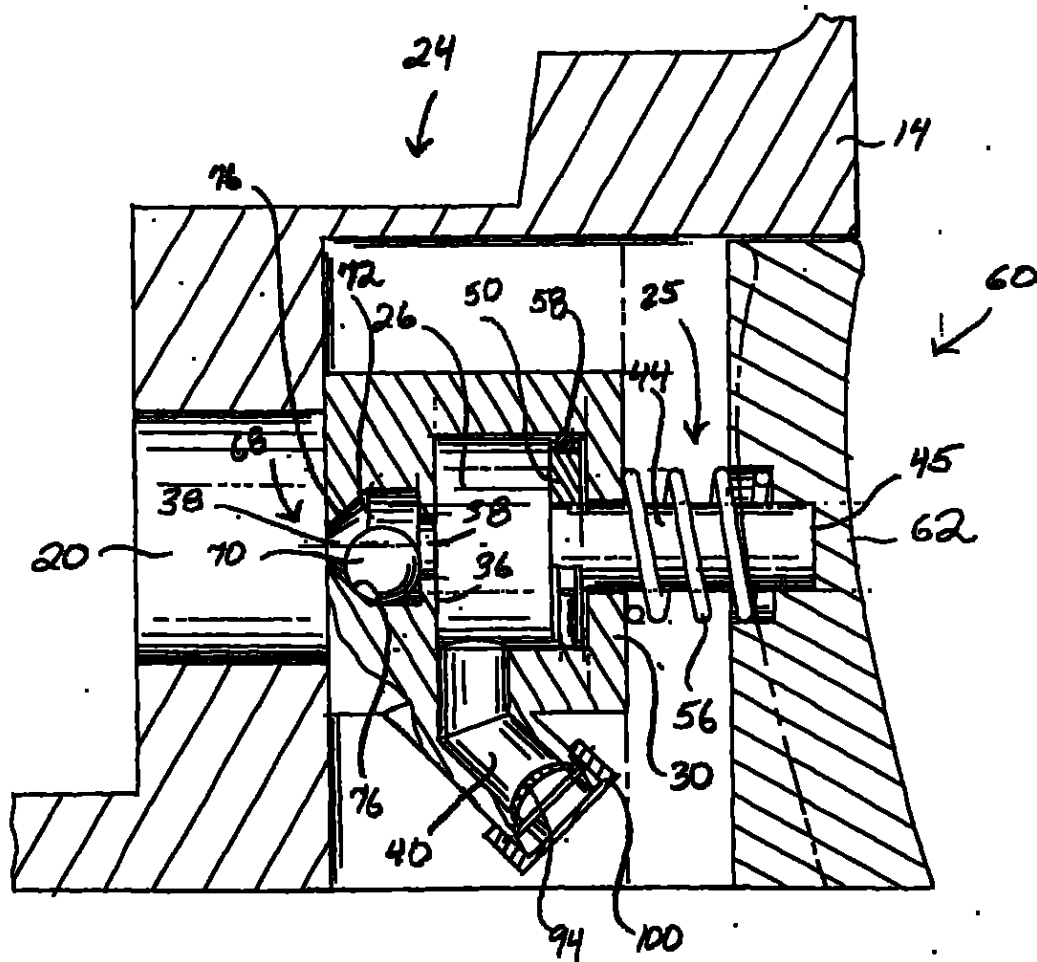


Fig. 9

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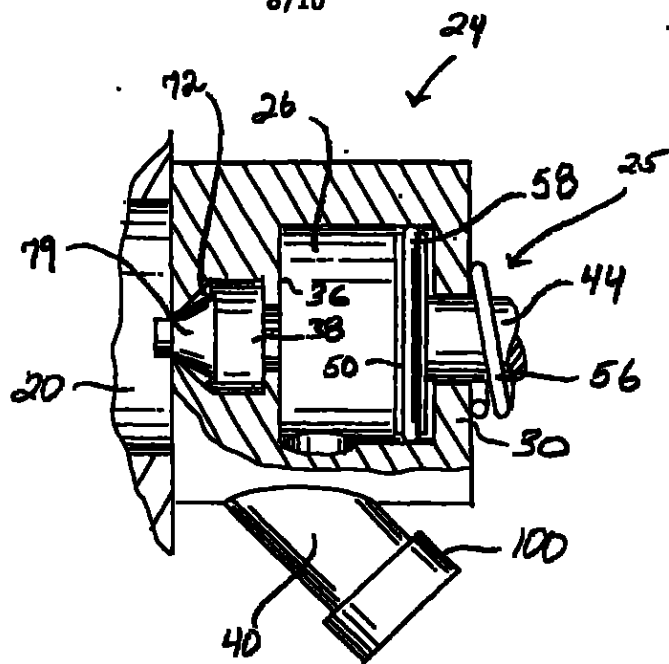


Fig. 8A

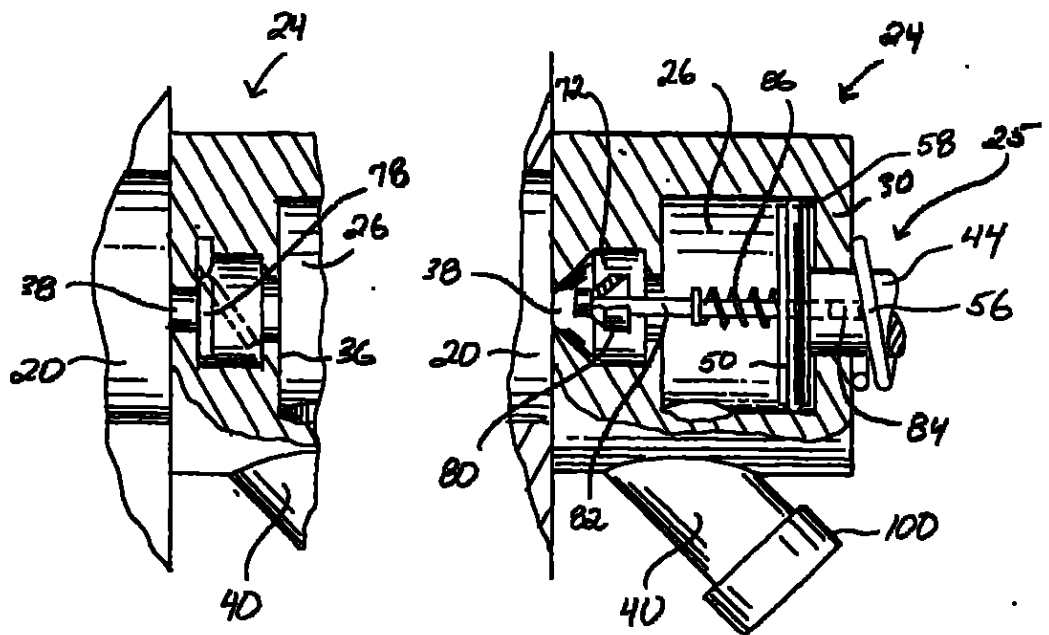


Fig. 8B

Fig. 8C

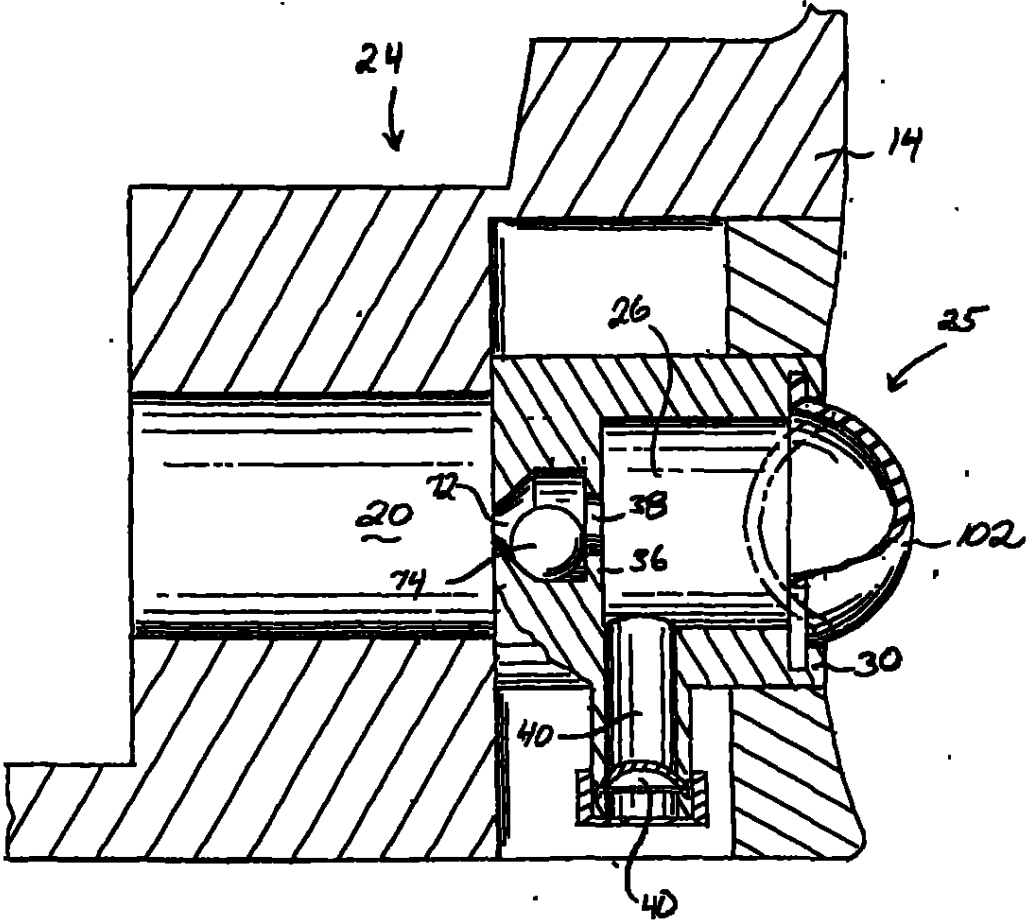


Fig. 9

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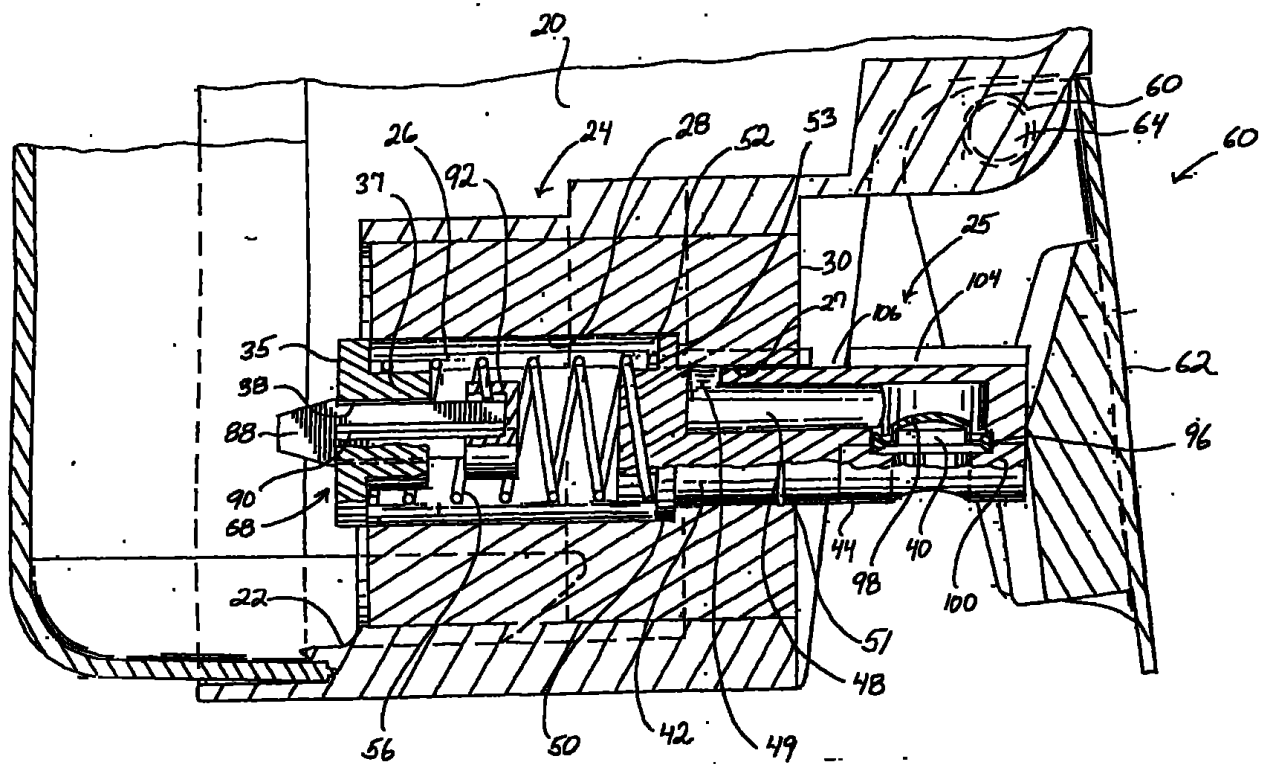


Fig. 10

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INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US 01/48975

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A47K5/12 B65D47/34

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHEDMinimum documentation searched (classification system followed by classification symbols)
IPC 7 B05B A47K

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)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	US 4 991 747 A (VAN BROCKLIN OWEN F) 12 February 1991 (1991-02-12) column 6, line 5 - line 32; figure 2 -/-	1-4,6,7, 11,14, 17-26, 31-34

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

8 May 2002

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 01/48975

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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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International Application No

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BOMBA DOSIFICADORA PARA SURTIDORES DE LIQUIDO

La presente invención se refiere generalmente a
surtidores de líquido y particularmente a una bomba dosificadora
5 para surtir líquido viscoso.

Antecedentes de la Invención

Los surtidores de líquido viscoso son muy
10 conocidos en el arte para surtir cualesquier manera de líquido
viscoso, por ejemplo lociones, jabón y similares. Los
surtidores convencionales utilizan una amplia variedad de
mecanismos de bombeo los cuales permiten a un usuario el oprimir
o manipular un accionador de bomba a fin de surtir el líquido
15 desde el surtidor. Los dispositivos de ejemplo están mostrados,
por ejemplo en las Patentes de los Estados Unidos de América No.
5.810.203; 5.379.919; 5.184.760; y 4.174.056.

Los surtidores convencionales y los mecanismos de
20 bomba están configurados generalmente para una operación de modo
vertical. En otras palabras, el surtidor está de pie
generalmente vertical con el dispositivo de bombeo configurado
en la parte superior de la unidad. Estos dispositivos de bombas
son generalmente ventilados alrededor del vástago de la bomba en
25 caso de que el usuario intente el usar el surtidor en un modo
horizontal, el surtidor con toda probabilidad escurrirá
alrededor del vástago de bomba.

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Un problema adicional notado con las bombas convencionales, particularmente las bombas surtidoras de loción o de jabón, es el de que hay una tendencia al filtrado del líquido residual dejado en la cabeza de bomba. Ciertos tipos de bombas de combinación, tal como las bombas peristálticas comunes a los surtidores de productos para el cuidado de la piel líquidos incorporan un sistema de válvula de verificación de resorte y bola en el área de descarga para evitar el filtrado. Sin embargo, este tipo de sistema de válvula de verificación es relativamente costoso y complicado, y los componentes pueden ser objeto de corrosión y/o de pegarse cuando se usan con ciertas composiciones químicas.

Las válvulas de tipo de diafragma son usadas en ciertas aplicaciones, por ejemplo, apretando las botellas accionadas de loción de mano, en las cuales la botella es apretada por un usuario para proporcionar la presión de líquido requerida para abrir la válvula de diafragma. Sin embargo, con estas configuraciones, no hay un control discreto sobre la cantidad de líquido surtida.

Por tanto, hay una necesidad en el arte de una bomba dosificadora que pueda surtir una cantidad dosificada de líquido viscoso en un modo horizontal así como vertical mientras que se evita el filtrado desde alrededor del mecanismo de bomba sin dispositivos de válvula de verificación complicados.

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Síntesis de la Invención

Los objetos y ventajas de la invención se establecen en parte en la siguiente descripción, o pueden ser obvios de la descripción o pueden aprenderse a través de la práctica de la invención.

La presente invención proporciona una bomba de dosificación única que es particularmente muy adecuada para los surtidores de líquido viscosos, por ejemplo, los surtidores de jabón, los surtidores de loción y similares. La bomba puede ser orientada en una configuración generalmente horizontal y por tanto permitir una mayor flexibilidad en cuanto al diseño y configuración del surtidor que utiliza la bomba.

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La bomba puede ser utilizada con cualesquier manera o forma de surtidor. El surtidor generalmente comprenderá un miembro de caja o miembros que definen un depósito para el líquido. La bomba incluye una cámara de bomba que está en comunicación con el dispositivo para líquido. En una incorporación, la cámara de bomba puede ser definida internamente de la caja surtidora. Por ejemplo, la cámara de bomba puede comprender y tener un componente moldeado integralmente de la caja. En una incorporación alterna, la cámara de bomba puede estar configurada en el exterior del depósito o caja con un canal o conducto que define una trayectoria de comunicación para el líquido entre el depósito y

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la cámara de bomba. Deberá apreciarse que cualquier número de configuraciones puede ser utilizado para definir una cámara para bomba que está en comunicación de fluido con un depósito para líquido.

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La cámara de bomba tiene un volumen que define generalmente la dosis dosificada o medida de líquido que va a ser surtido. Un orificio surtidor está definido en la cámara de bomba. El orificio puede ser definido en cualesquier miembro de pared de la cámara, o en una incorporación particular de acuerdo a la invención, el orificio puede ser definido a través de un cilindro de bomba.

Un mecanismo de bomba está configurado con la cámara de bomba para presurizar el líquido dentro de la cámara de bomba con la actuación del mecanismo de bomba. El mecanismo de bomba puede ser cualquier miembro o configuración de componentes que presurizan el líquido contenido dentro de la cámara a fin de expulsar o surtir el líquido a través del orificio surtidor. En una incorporación particular de acuerdo a la invención, el mecanismo de bomba incluye un cilindro de bomba que está colocado deslizablemente y retenido en la cámara de bomba. El cilindro de bomba puede moverse desde una posición de descanso a una posición presurizada y puede ser presionado a la posición de descanso. Un accionador está configurado con el cilindro de bomba y proporciona un dispositivo para que un operador mueva el cilindro de bomba a su posición presurizada a

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fin de surtir el líquido hacia afuera del orificio surtidor. El mecanismo de bomba puede comprender un tipo de arreglo de eje y pistón en donde el pistón está sellado en contra de las paredes de la cámara. Con el movimiento del eje y pistón dentro de la cámara de bomba, cualquier líquido contenido dentro de la cámara es presurizado y finalmente surtido hacia afuera del orificio surtidor definido en la cámara. El mecanismo de bomba puede ser un diafragma relativamente simple que presuriza la cámara de bomba al ser comprimida.

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En una incorporación de la invención, el orificio surtidor es definido como un canal longitudinal dentro de un cilindro de bomba que es deslizante dentro de la cámara de bomba. El canal termina en un orificio surtidor definido en un extremo de entrega del cilindro. El cilindro de bomba puede ser presionado por un miembro de resorte a su posición de descanso.

El miembro de resorte puede ser configurado operablemente dentro de la cámara de bomba o afuera de la cámara de bomba. Cualquier tipo de miembro elástico puede ser utilizado para presionar el cilindro de bomba.

La invención no está limitada a ningún tipo particular de dispositivo para accionar la bomba. En una incorporación particular, el accionador puede comprender un miembro de panel que es montado en forma de pivote a la caja surtidora. El miembro de panel descansa en contra de un extremo frontal de un cilindro de bomba o de un eje y por tanto mueve al

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cilindro de bomba o al eje al llevarse a cabo una opresión por el operador del miembro de panel. En una incorporación alterna, el accionador puede comprender una placa de miembro de panel, un botón o similares unidos directamente al extremo frontal del cilindro o eje de bomba. El accionador puede ser configurado en cualesquier forma para contribuir a la apariencia estéticamente placentera del surtidor.

Un mecanismo de válvula de verificación está colocado operablemente en la abertura entre la cámara de bomba y el depósito de líquido. Con la actuación de la bomba, el mecanismo de válvula de verificación se mueve para sellar la cámara de bomba de manera que el líquido dentro de la cámara es presurizado. Con la liberación del accionador de bomba, el mecanismo de válvula de verificación se mueve para quitar el sello de la cámara de bomba de manera que una cantidad medida de líquido viscoso es capaz de fluir automáticamente desde el depósito hasta la cámara de bomba para el surtido con la siguiente actuación subsecuente de la bomba. El mecanismo de válvula de verificación puede tomar cualesquier número de configuraciones. Por ejemplo, el mecanismo de válvula de verificación puede comprender una bola asentada dentro de un rebaje que define la abertura entre la cámara de bomba y el depósito. El rebaje puede incluir una superficie de sellamiento usada en contra de la cual la bola sella con la actuación de la bomba, y una parte de rebaje más baja en la cual la bola cae por gravedad con la liberación de la bomba.

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En una incorporación alterna, el mecanismo de válvula de verificación puede comprender un miembro de aleta elástico que está colocado a través de la abertura entre la cámara de bomba y el depósito. Con la presurización de la cámara de bomba, el miembro de aleta sella la abertura al depósito. Con la liberación de la bomba, el miembro de aleta cuelga libremente. La presión de cabeza estática de líquido dentro del depósito moverá el miembro de aleta hacia afuera de la abertura y hará que el líquido vuelva a llenar la cámara de bomba.

En aún otra incorporación del mecanismo de válvula de verificación, un miembro de tapón cónico toma el lugar de la bola. El miembro de tapón es movable para engancharse y salirse del enganche con una superficie de sellamiento usada que define la abertura en la parte posterior de la cámara de bomba. El miembro de tapón puede tener la forma general del rebaje que define la superficie de sellamiento ahusada, y por tanto es capaz de flotar libremente dentro del rebaje. En una incorporación alterna, el miembro de tapón puede ser guiado por una varilla cargada por resorte que es conectada operablemente con el pistón de bomba. La varilla puede moverse longitudinalmente dentro de un rebaje o canal definido a través del pistón al ser movidos el pistón y el eje dentro de la cámara de bomba.

En aún otra incorporación, el mecanismo de válvula

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de verificación puede comprender una válvula de tipo de lanzadera alargada que es deslizable dentro de la abertura entre la cámara de bomba y el depósito. La válvula de lanzadera incluye un miembro de sellamiento que sella la abertura con la
5 actuación del dispositivo de bomba. Con la liberación de la bomba, la válvula de lanzadera quita el sello, y el líquido está en libertad para fluir más allá de la válvula de lanzadera y hasta la cámara de bomba.

10 La bomba de acuerdo a la invención también incluye un dispositivo de restricción colocado operablemente a través del orificio surtidor. El dispositivo de restricción es un miembro generalmente elástico que se abre o se mueve con la acumulación de presión líquida suficiente dentro de la cámara de
15 bomba. Con la liberación del mecanismo de bomba, el dispositivo de restricción sirve para dos propósitos. Al moverse de regreso el mecanismo de bomba, por ejemplo la configuración de pistón y eje, el cilindro o configuración de diafragma se mueve de regreso a su posición de descanso, el dispositivo de restricción
20 define una trayectoria de ventilación para ventilar la cámara de bomba. Al aumentar el vacío dentro de la cámara de bomba con la liberación del mecanismo de bomba, el miembro elástico es jalado hacia la cámara de bomba y por tanto se abre para definir una trayectoria de ventilación hacia adentro de la cámara. Una vez
25 que el mecanismo de bomba ha alcanzado su posición de descanso, el dispositivo de restricción se cierra para sellar completamente el orificio surtidor, y por tanto, evitar el

filtrado o escurrimiento desde el orificio. Con el dispositivo de restricción colocado dentro del orificio surtidor, no es necesario el ventilar separadamente la cámara de bomba alrededor del eje de bomba o del cilindro o ventilar separadamente el dispositivo surtidor.

La invención será descrita en mayor detalle abajo a través de las incorporaciones ilustradas en las figuras.

10

Breve Descripción de los Dibujos

La figura 1 es una vista prospectiva de un surtidor de líquido viscoso de acuerdo a la invención.

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La Figura 2 es una vista en sección transversal del mecanismo de bomba tomada a lo largo de las líneas indicadas en la figura 1.

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La Figura 3 es una vista operacional en sección transversal del mecanismo de bomba;

La Figura 4 es una vista operacional en sección transversal del mecanismo de bomba;

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La Figura 5a es una vista en sección transversal y en perspectiva parcial de una incorporación del mecanismo de bomba;

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La Figura 5b es una vista en sección transversal y en perspectiva parcial del mecanismo de bomba mostrado en la figura 5a ilustrando particularmente una característica de
5 cierre del mismo;

La Figura 6a es una vista en perspectiva de un dispositivo de restricción de acuerdo a la invención;

10 La Figura 6b es una vista operacional en perspectiva del dispositivo de restricción ilustrado en la Figura 6a;

La Figura 7 es una vista en sección transversal de
15 una incorporación alterna de un mecanismo de bomba de acuerdo a la invención;

La Figura 8a es una vista en sección transversal de un mecanismo de bomba que ilustra particularmente un
20 dispositivo de válvula de verificación de tapón cónico.

La Figura 8b es una vista en sección transversal de un mecanismo de bomba de acuerdo a la invención ilustrando particularmente el tipo plano de mecanismo de válvula de
25 verificación;

La Figura 8c es una vista en sección transversal

59 

de una incorporación transversal de un mecanismo de bomba de acuerdo a la invención particularmente ilustrando un tapón y una configuración de válvula de verificación de varilla;

5 La Figura 9 es una vista en sección transversal de una incorporación alterna de un mecanismo de bomba que utiliza un dispositivo de diafragma para presurizar la cámara de bomba; y

10 La Figura 10 es una vista en sección transversal de una incorporación alterna de un cilindro de bomba y de una configuración de cámara.

Descripción Detallada

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Se hará ahora referencia en detalle a las incorporaciones de la invención, uno o más ejemplos de la cual son proporcionados en los dibujos. Cada ejemplo se proporciona por vía de explicación de la invención y no se quiere como una limitación de dicha invención. Por ejemplo, las características ilustradas o descritas como parte de una incorporación pueden ser utilizadas con otra incorporación para dar aún una incorporación adicional. Se intenta que la presente invención incluya tales modificaciones y variaciones como caen dentro del alcance de las reivindicaciones anexas y de sus equivalentes.

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La presente invención se refiere a una bomba de dosificación única para usarse con cualesquier manera de surtidor líquido. El aparato de bomba es particularmente muy adecuado para usarse con cualesquier manera de surtidor líquido viscoso, por ejemplo los surtidores de jabón, el surtidor de loción, y similares. La presente invención también abarca un surtidor que utiliza la bomba única de acuerdo a la invención.

La figura 1 ilustra un surtidor líquido viscoso 10 que es particularmente adecuado como un surtidor de jabón líquido. El surtidor 10 comprende una caja, generalmente 14. La caja 14 puede comprender cualesquier número de componentes. Por ejemplo, la caja 14 puede incluir un miembro de caja frontal 16 que está conectado a un miembro de caja posterior 12. El surtidor 10 ilustrado en la figura 1 está configurado como un surtidor de jabón líquido desechable que puede ser sujetado removiblemente a una ménsula montada en la pared o similar. Para este propósito, la estructura de montaje, generalmente 12, está formada integralmente sobre el lado posterior 18 de la caja 14. El surtidor ilustrado en la figura 1 está descrito en detalle en la solicitud de patente de los Estados Unidos de América copendiente y comúnmente propiedad del solicitante Serie No. _____ (EL NUMERO SERÁ SUMINISTRADO AL SER RECIBIDO), intitulada "Surtidor de líquido viscoso Autocontenido" presentada concurrentemente con esta solicitud y la cual se incorpora aquí en su totalidad para todos los propósitos.

61 2

El surtidor 10 incluye un depósito para líquido, generalmente 20 (figuras 2-4). Una bomba dosificadora está configurada con el surtidor para surtido dosis medidas del líquido viscoso contenido dentro del depósito 20 al oprimir o manipular el usuario un accionador de bomba. El accionador de bomba puede ser cualesquier miembro estructural que esté configurado con o conectado a un mecanismo de bomba para surtir el líquido viscoso desde el surtidor 10. El mecanismo de bomba será descrito en mayor detalle abajo. En las incorporaciones ilustradas, el accionador de bomba generalmente 60, está ilustrado como un miembro de panel 62. El miembro de panel 62 ayuda a la configuración global estéticamente placentera del surtidor 10 y puede tomar cualesquier forma. El miembro de panel 62 ilustrado en las figuras 1-4 está unido pivotalmente al componente frontal 16 de la caja frontal 16 por vía de las protuberancias 64 que residen en los rebajes 66 definidos en el componente frontal 16. En una incorporación alterna ilustrada en la figura 7, el accionador 60 puede comprender un miembro de panel 62 que está unido directamente al frente del mecanismo de bomba. En este aspecto, el accionador 60 puede comprender cualesquier tipo de placa, botón, tapa o estructura similar que está fijado directamente al mecanismo de bomba. El accionador 60 no requiere ser conectado a la caja 14.

25 Varias incorporaciones del aparato de bomba dosificador 24 están ilustradas en las figuras. El aparato 24 incluye una cámara de bomba 26 definida por cualesquier manera

62 1/2

de componentes estructurales. Por ejemplo, la cámara de bomba 26 puede definir los miembros de pared que están moldeados o de otra manera formados en la superficie interna, por ejemplo, la superficie de fondo 22 de la caja 14. En esta incorporación, la cámara de bomba 26 está por tanto completamente colocada dentro de la caja 14. En las incorporaciones alternas, por ejemplo, como se ilustró en las figuras 7-9, la cámara de bomba 26 es definida por los miembros de pared estructurales que están sujetos a la superficie exterior del miembro de caja 14 por cualesquier medios convencionales. En cualesquier caso, la cámara de bomba 26 está en comunicación de líquido con el depósito 20. Por ejemplo, la cámara de bomba 26 puede incluir una pared posterior 36 que tiene una abertura 38 definida a través del mismo colocando la cámara de bomba 26 en comunicación del líquido con el depósito 20. En la incorporación de las figuras 2-4, la pared posterior de la cámara de bomba 26 está definida por un miembro de tapa de extremo 35 que tiene la abertura 38 definida a través de la misma. Esta configuración puede ser usada cuando sea necesario para insertar el mecanismo de bomba en la cámara de bomba 26 antes del sellamiento de la cámara 26.

La cámara de bomba 26 tiene un volumen interno que esencialmente define la cantidad medida o la dosis de líquido que va a ser resurtida desde la misma. En este aspecto, la cámara de bomba puede ser configurada con cualesquier volumen deseado dependiendo del uso intentado del surtidor 10.

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El orificio surtidor 40 se proporciona en la cámara de bomba 26 y define la trayectoria de salida para el líquido viscoso desde la cámara de bomba 26. El orificio surtidor 40 puede ser definido en cualesquier miembro estructural de la cámara de bomba 26. Por ejemplo, en las incorporaciones ilustradas en las figuras 7-9, el orificio surtidor 40 es definido por un miembro de canal en la superficie inferior de la cámara 26. En la incorporación ilustrada en las figuras 2-4, el orificio surtidor 40 está definido en un miembro del mecanismo de bomba, particularmente un cilindro 42 que se extiende a través de una abertura 32 en la pared frontal 30 de la cámara de bomba 26. El mecanismo de bomba de las figuras 2-4 se describirá en mayor detalle abajo.

Como se mencionó, el aparato de bomba 24 incluye un mecanismo de bomba 25 que está configurado operablemente con la cámara de bomba 26 para presurizar el líquido viscoso contenido dentro de la cámara de bomba al actuar el usuario el mecanismo de bomba. Varias configuraciones de los dispositivos pueden ser utilizadas en este aspecto. Por ejemplo, el mecanismo de bomba 25 puede ser un miembro de cilindro 42 que es deslizable dentro de la cámara de bomba 26, como se ilustró en las figuras 2-4. El cilindro 42 se extiende a través de una abertura en la pared frontal 30 de la cámara de bomba y se evita que sea jalado hacia afuera de la cámara 26 por un miembro de pistón o brida 50. El miembro de pistón 50 también engancha selladamente en contra de las paredes de la cámara de bomba 26.

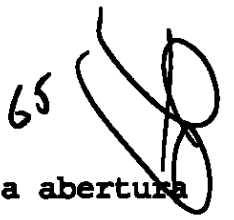
64 / 50

Un anillo en O, puede ser proporcionado sobre el miembro de pistón 50 para este propósito. El cilindro 42 tiene un canal longitudinal 48 definido a través del mismo. El canal 48 termina en el extremo surtidor del cilindro 42 en el orificio 5 surtidor 40. Por tanto, en esta incorporación, el orificio surtidor 40 está actualmente definido en el cilindro de bomba móvil 42.

El cilindro 42 es movable entre una posición de 10 descanso ilustrada en la figura 2 a una posición presurizada o surtida ilustrada en la figura 3. El cilindro 42 es presionado a su posición de descanso por cualesquier dispositivo convencional, por ejemplo un resorte 56 colocado dentro de la cámara de bomba 26. El resorte 56 tiene un extremo delantero 15 ajustado en un rebaje 54 definido por un miembro de brida cónica 52. El extremo posterior del resorte 56 está ajustado alrededor de una extensión cilíndrica 37 de la tapa de extremo 35. Refiriéndonos a las figuras 2-4, el accionador 60 configurado como un miembro de panel 62 está colocado en contacto en contra 20 del extremo delantero del cilindro 42 de manera que al oprimir un usuario el miembro de panel 62 desde el lado frontal del surtidor 10, el cilindro 42 se hace que se mueva hacia atrás dentro de la cámara de bomba 26, como se mostró operacionalmente en la figura 3.

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Refiriéndonos a la figura 3, al moverse el cilindro 42 en la cámara de bomba 26, un mecanismo de válvula de

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verificación (descrito en mayor detalle abajo) sella la abertura 38 en la pared posterior 36 de la cámara de bomba en respuesta a un aumento de la presión de líquido dentro de la cámara. Al aumentar la presión de líquido dentro de la cámara, el líquido es surtido eventualmente hacia afuera del orificio surtidor 40.

En la incorporación de las figuras 2-4, el líquido se hace que se desplace a través del canal longitudinal 48 que va a ser surtido afuera del extremo surtidor del cilindro 42, como se ilustró en la figura 3.

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Con la liberación del accionador 60, el cilindro 42 se hace que regrese a su posición de descanso, como se ilustró en la figura 4. Al moverse el cilindro a la derecha, un vacío es jalado dentro de la cámara de bomba 26 que provoca que el mecanismo de válvula de verificación se desasiente. El líquido del depósito 20 es entonces libre para fluir adentro de la cámara de bomba 26 que va a ser surtido en la siguiente actuación subsecuente del mecanismo de bomba.

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Las figuras 5a y 5b ilustran una característica de cierre del cilindro 42. Un canal longitudinal 104 está definido en la superficie superior del cilindro 42 y es enganchado por un apéndice 34 de la pared frontal 30. El cilindro 42 por tanto se desliza a lo largo del apéndice 34 con la depresión del accionador y se evita que gire en el uso. La orientación del orificio surtidor 40 es por tanto asegurada. Una ranura circunferencial parcial 106 también está definida en la

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superficie del cilindro 42. La ranura 106 está localizada en una posición que corresponde esencialmente a la posición completamente definida del cilindro 42. Refiriéndonos a la figura 5, una vez que el cilindro 42 se ha deprimido completamente, el cilindro 42 puede ser girado y enganchado por el apéndice 34. El cilindro 42 es entonces fijado en posición. Esta característica de cierre es particularmente útil durante el envío del surtidor.

10 Las figuras 7-8 ilustran las incorporaciones alternas de un mecanismo de bomba utilizando una configuración de eje y pistón. Un eje 44 se extiende a través de una abertura de la pared frontal 30 de la cámara de bomba 26. El eje está conectado a un pistón 50 que se mueve dentro de la cámara 26 para presurizar el líquido contenido ahí. Se proporciona un anillo en O 58 sobre la circunferencia exterior del pistón 50 para asegurar un enganche de sellamiento en contra de las paredes de la cámara de bomba. El accionador 60 está conectado o en contacto en contra del frente del pistón. Un resorte 56 u otro miembro de tipo elástico es usado para presionar el eje y el pistón a la posición de descanso. Deberá notarse que, en esta incorporación, el resorte 56 está colocado afuera de la cámara de bomba 26. Al oprimir el accionador 60, el pistón 50 se hace que se mueva adentro de la cámara de bomba 26 y por tanto presione el líquido viscoso contenido ahí. El líquido es surtido a través del orificio surtidor 40 definido en una pared de la cámara de bomba 26.

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La figura 9 ilustra una incorporación del aparato de bomba 24 en donde el mecanismo de bomba 25 comprende un diafragma 102 para presurizar la cámara de bomba 26. El diafragma 102 también sirve como un accionador de bomba. Para
5 operar el dispositivo de la Figura 9, un usuario simplemente deprime manualmente el diafragma 102 hacia adentro para presurizar y surtir el líquido dentro de la cámara 26. El mecanismo de válvula de verificación de bola opera de acuerdo a la incorporación de la figura 7.

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Como se mencionó, un mecanismo de válvula de verificación, generalmente 68, está colocado operablemente en la abertura 38 entre la cámara de bomba 26 y el depósito 20 para sellar la abertura sobre la actuación del mecanismo de bomba 25.
15 Varias incorporaciones del mecanismo de válvula de verificación 68 están ilustradas en las figuras. Refiriéndonos a las figuras 2-5b, el mecanismo de válvula de verificación 68 comprende una válvula de lanzadera alargada 88. La válvula de lanzadera 88 es deslizable dentro de la abertura 38 en el miembro de válvula 35
20 y tiene una pluralidad de brazos que se extienden radialmente 90. El líquido del depósito 20 está libre para fluir más allá de los brazos 90 y adentro de la cámara de bomba 26 siempre que la válvula de lanzadera 88 no esté sellada en contra de la abertura 38. Refiriéndonos a la figura 3, la válvula de
25 lanzadera 88 incluye una tapa 92 que engancha selladamente en contra del miembro de tapa de extremo 35 con la actuación del mecanismo de bomba 25. La tapa 92 evita que el líquido

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contenido dentro del depósito 20 escape a través de la abertura en la cámara 26 y de regreso adentro del depósito 20 con la actuación del mecanismo de bomba 25. Con la liberación del mecanismo de bomba 25, la válvula de lanzadera 88 se mueve adentro de la cámara 26 y por tanto quita el sello de la abertura 38, como se ilustró particularmente en la figura 4. La presión de cabeza estática de líquido dentro del depósito 20 debe ser suficiente para hacer que la válvula de lanzadera 88 se desasiente y se mueva dentro de la cámara de bomba 26 para permitir a la cámara 26 el volver a llenarse con el líquido desde el depósito 20. El desasentamiento de la válvula de lanzadera 88 será auxiliado adicionalmente por el vacío jalado en la cámara 26 al retorno del cilindro 42 a su posición de descanso.

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La Figura 7 ilustra una incorporación alterna del mecanismo de válvula de verificación 68 que utiliza una bola 76 dentro de un rebaje 72 que también define la trayectoria o abertura entre la cámara de bomba 26 y el depósito 20. El rebaje 72 incluye una sección de sellamiento ahusada 76 en contra de la cual la bola 70 es forzada con la actuación del mecanismo de bomba 25. La bola 70 se mueve a la sección ahusada 76 y sella la abertura 38. Con la liberación del mecanismo de bomba 25, la bola caerá por gravedad adentro de una parte inferior del rebaje 72, como se ilustró en la figura 7. El líquido es entonces libre para fluir del depósito 20 adentro de la cámara de bomba 26. La presión de cabeza estática de líquido dentro del

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depósito 20 también ayudará en desasentar la bola 70 de la sección ahusada 76.

La figura 8a ilustra una incorporación del mecanismo de válvula de verificación que utiliza un miembro cónico 79 colocado dentro del rebaje 72. Con la actuación del mecanismo de bomba 25, el miembro cónico 79 es forzado a un enganche en contra de la sección ahusada 76 del rebaje 72 para sellar la abertura 38. Con la liberación del mecanismo de bomba 25, el miembro cónico 79 se moverá hacia afuera de la sección ahusada 76 y por tanto permitirá el fluido desde el depósito 20 para fluir de regreso adentro de la cámara de bomba 26. El miembro cónico 79 tiene una forma generalmente global que complementa aquella del rebaje 72 y por tanto es capaz de "flotar" dentro de la cámara 72.

La Figura 8b ilustra una incorporación alterna del mecanismo de válvula de verificación que utiliza un miembro de aleta elástico 78. Con la actuación del mecanismo de bomba 25, el miembro de aleta 78 se mueve en contra de la cámara y por tanto sella la abertura 38. Con la liberación del mecanismo de bomba 25, el miembro de aleta 78 está libre para moverse hacia afuera de la cámara, y el líquido desde el depósito 20 es libre para fluir adentro de la cámara de bomba 26. De nuevo, la presión de cabeza estática de líquido dentro del depósito 20 ayudará a mover al miembro de aleta 78. El aumento del vacío dentro de la cámara 26 también moverá al miembro de aleta hacia

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afuera de la pared.

La figura 8c ilustra una incorporación del mecanismo de válvula de verificación 68 que incorpora un miembro de tapón 80 montado sobre una varilla de guía 82. La varilla de guía 82 está conectada operablemente al pistón 50 de manera que el pistón físicamente mueve el miembro de tapón 80 a un contacto en contra de las paredes del rebaje 72. La varilla 82 puede moverse dentro de un rebaje longitudinal 84 definido en el pistón 50 y el eje 44. Un resorte 86 puede ser proporcionado para presionar el miembro de tapón 80 hacia afuera del pistón 50.

El aparato de bomba de acuerdo a la invención también incluye un dispositivo de restricción, generalmente 94, colocado operablemente a través del orificio surtidor 40. En la incorporación ilustrada, el dispositivo de restricción 94 incluye por lo menos un miembro de aleta elástico 98, y preferiblemente una pluralidad de miembros de aleta 98 definidos por las hendiduras 94. Refiriéndonos particularmente a las figuras 2-4, 6a, y 6b, las aletas flexibles 94 tienen una configuración cóncava, y el dispositivo de restricción 94 está colocado dentro del orificio surtidor de manera que las aletas cóncavas son orientadas hacia arriba o hacia la cámara de bomba 26. Con una presión suficiente dentro de la cámara de bomba 26, el líquido hace que las aletas flexibles 98 se pandeen hacia el orificio surtidor 40, como se ilustró particularmente en la

71 

Figura 6b, y el líquido fluye a través del orificio surtidor 40.

Con la liberación del mecanismo de bomba 25 y el regreso del mecanismo a su posición de descanso, las aletas elásticas se mueven de regreso al enganche en contra de sí mismas. Sin embargo, debido al vacío jalado en la cámara de bomba al regresar el mecanismo de bomba a su posición de descanso, las aletas son jaladas ligeramente y separadas hacia la cámara de bomba 26. Las aletas se mueven y se separan justo lo suficiente de manera que la cámara de bomba es ventilada al regresar el mecanismo de bomba 25 a su posición de descanso. Una vez que el mecanismo de bomba ha regresado a su posición de descanso, las aletas 98 de nuevo sellan completamente unas en contra de otras y evitan el filtrado o escurrido de líquido desde la cámara de bomba.

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El dispositivo de restricción 94 proporciona unos medios relativamente simples para evitar el filtrado desde la cámara de bomba, particularmente las incorporaciones de la invención en donde la cámara de bomba está colocada horizontalmente en la parte de fondo del depósito de bomba en donde la presión estática de líquido dentro del depósito es mayor. El dispositivo de restricción 94 también proporciona unos medios relativamente simples para ventilar la cámara de bomba 26 y elimina la necesidad de ventilar el mecanismo de bomba alrededor del eje de bomba o de cilindro que puede resultar en problemas de escurrimiento. Adicionalmente, el mecanismo de bomba puede ser incorporado dentro de surtidores no

72

ventilados ya que una trayectoria de ventilación es definida a través del mecanismo de bomba.

La Figura 10 ilustra otra incorporación de la bomba de dosificación que es similar en muchos aspectos a la incorporación de las Figuras 2-4. Sin embargo, en esta incorporación, el canal 28 definido a través del cilindro de bomba 42 tiene una entrada 49 definida radialmente con respecto al canal 48. La cámara de bomba incluye una sección de diámetro más pequeña 27 "corriente arriba" del miembro de pistón 50 y un miembro de pared 53 en contra del cual el miembro de pistón 50 engancha en la posición de descanso del mecanismo de bomba. La entrada 49 al canal 48 está colocada en la sección de cámara 27 en la posición de descanso del mecanismo de bomba. El miembro de pistón 50 está configurado de manera que el líquido viscoso dentro de la cámara 26 fluye a través de o alrededor del miembro de pistón 50 para que el cilindro sea empujado dentro de la cámara 26. El miembro de pistón puede incluir cualesquier manera de aberturas o de desviaciones para este propósito, pero tiene un área de superficie suficiente para asegurar que el líquido dentro de la cámara 26 esté presurizado con el movimiento del cilindro 42 adentro de la cámara 26. Con la actuación del cilindro 42, el cilindro se mueve dentro de la cámara 26 y el líquido pasa dentro de la entrada 49, a través del canal 48 y afuera del orificio surtidor 40. Un sello, tal como un anillo en O 51 se proporciona alrededor del cilindro 42 hacia arriba de la entrada 49 para sellar las cámaras 26 y 27.

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La incorporación de la Figura 20 es útil en el sentido de que en la posición de descanso del cilindro 42 como se ve en la figura 10, la cámara de diámetro más pequeño 27 está esencialmente sellada desde la cámara de diámetro más grande 26, y por tanto
5 también desde la presión del líquido dentro del depósito 20. Por tanto, el orificio surtidor 40 está esencialmente aislado desde una presión de cabeza estática relativamente alta del depósito. Los volúmenes de depósito más grandes pueden ser usados sin miedo de superar la presión de sellamiento del
10 dispositivo de restricción 98 ó del sello 51.

Deberá apreciarse por aquellos expertos en el arte el que pueden hacerse varias modificaciones o variaciones en la invención sin departir del alcance y del espíritu de dicha
15 invención. Se intenta que la invención incluya tales modificaciones y variaciones como caen dentro del alcance de las reivindicaciones anexas y de sus equivalentes.

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REIVINDICACIONES

1. Un surtidor para surtir cantidades medidas de líquido viscoso, que comprende:

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Un depósito para líquido;

Una cámara de bomba que tiene una abertura en comunicación con dicho depósito;

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Un orificio surtidor en comunicación con dicha cámara de bomba;

Un mecanismo de bomba configurado con dicha cámara de bomba y que puede moverse desde una posición de descanso a una posición de presurización con la actuación del mismo para presurizar el líquido dentro de dicha cámara de bomba;

Un accionador conectado operablemente con dicho mecanismo de bomba;

un mecanismo de válvula de verificación conectado operablemente a dicha abertura, con la actuación de dicho mecanismo de bomba dicho mecanismo de válvula de verificación puede moverse para sellar dicha abertura y con la liberación de dicho mecanismo de bomba dicho mecanismo de válvula de verificación puede moverse para quitar el sello de la abertura

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en donde una cantidad medida de líquido viscoso fluye automáticamente desde dicho depósito a la cámara de bomba para el surtido con la siguiente actuación subsecuente del mecanismo de bomba;

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Un dispositivo de restricción colocado en dicho orificio surtidor, dicho dispositivo de restricción mantiene una configuración cerrada para evitar el escurrimiento de líquido desde dicho orificio surtidor y abrirse con suficiente presión de líquido acumulada dentro de dicha cámara de bomba con la actuación de dicho mecanismo de bomba; y

En donde dicho dispositivo de restricción está configurado para ventilar dicha cámara de bomba con la liberación de dicho mecanismo de bomba.

2. El surtidor tal y como se reivindica en la cláusula 1, caracterizado porque dicho mecanismo de bomba comprende un cilindro de bomba colocado deslizablemente y retenido en dicha cámara de bomba, dicho cilindro de bomba además comprende un extremo de entrega que se extiende a través de una pared frontal de dicha cámara de bomba y que tiene un canal surtidor colocado a través del mismo, dicho orificio surtidor está colocado en un extremo delantero de dicho canal surtidor.

3. El surtidor tal y como se reivindica en la

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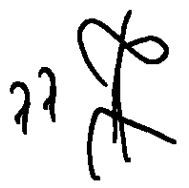
cláusula 2, caracterizado además porque comprende un elemento presionador colocado para presionar dicho cilindro de bomba a la posición de descanso.

5 4. El surtidor tal y como se reivindica en la cláusula 2, caracterizado porque dicho canal surtidor comprende una entrada alineada axialmente con dicho canal.

10 5. El surtidor tal y como se reivindica en la cláusula 2, caracterizado porque dicho canal surtidor comprende una entrada que se extiende radialmente, y dicha cámara de bomba comprende una sección de diámetro más grande y una sección de diámetro más pequeña, dicha entrada está colocada dentro de la sección de diámetro más pequeña en dicha posición de descanso de
15 dicho cilindro de bomba.

20 6. El surtidor tal y como se reivindica en la cláusula 1, caracterizado porque dicho mecanismo de bomba comprende un pistón deslizable dentro de la cámara de bomba y que puede moverse de la posición de descanso a dicha posición presurizante, y un eje conectado a dicho pistón y extendiéndose a través de la pared frontal de dicha cámara de bomba, dicho accionador está configurado en un extremo frontal de dicho eje.

25 7. El surtidor tal y como se reivindica en la cláusula 6, caracterizado además porque comprende un elemento presionador colocado para presionar dicho pistón a dicha

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posición de descanso.

8. El surtidor tal y como se reivindica en la cláusula 1, caracterizado porque dicho mecanismo de bomba
5 comprende un miembro de diafragma colocado a través de una pared frontal de dicha cámara de bomba, dicho miembro de diafragma comprende una superficie frontal que define dicho accionador y es oprimible por un usuario para surtir el líquido desde dicho surtidor.

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9. El surtidor tal y como se reivindica en la cláusula 1, caracterizado porque el orificio surtidor está definido a través de la parte más inferior de dicha cámara de bomba.

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10. El surtidor tal y como se reivindica en la cláusula 1, caracterizado porque dicha cámara de bomba está colocada sobre el exterior de dicho depósito.

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11. El surtidor tal y como se reivindica en la cláusula 1, caracterizado porque dicha cámara de bomba está colocada por lo menos parcialmente dentro de dicho depósito.

12. El surtidor tal y como se reivindica en la
25 cláusula 11, caracterizado porque dicho depósito comprende una superficie de fondo moldeada, dicha cámara de bomba está moldeada integral con dicha superficie de fondo.

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13. El surtidor tal y como se reivindica en la cláusula 1, caracterizado porque dicho accionador es montado en forma de pivote y enganchado en contra de dicho mecanismo de bomba.

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14. El surtidor tal y como se reivindica en la cláusula 1, caracterizado porque dicho accionador está sujetado directamente a dicho mecanismo de bomba.

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15. El surtidor tal y como se reivindica en la cláusula 1, caracterizado porque dicho dispositivo de restricción comprende por lo menos un miembro de aleta flexible que es movable a una posición abierta con la presurización de líquido en dicha cámara de bomba y regresa automáticamente a una posición cerrada al moverse el mecanismo de bomba a dicha posición de descanso.

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16. El surtidor tal y como se reivindica en la cláusula 15, caracterizado además porque comprende una pluralidad de miembros de aleta que definen una abertura a través de los mismos en dicha posición abierta y sellan unos en contra de otros en dicha posición cerrada.

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17. El surtidor tal y como se reivindica en la cláusula 1, caracterizado porque dicho mecanismo de válvula de verificación comprende una bola asentada dentro de un rebaje que define dicha abertura en dicha cámara de bomba, dicho rebaje

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define una superficie de sellamiento en contra de la cual dicha bola sella con la presurización de líquido dentro de la cámara de bomba.

5 18. El surtidor tal y como se reivindica en la cláusula 1, caracterizado porque dicho mecanismo de válvula de verificación comprende un miembro de aleta elástico que tiene un extremo montado dentro de dicha cámara, dicho miembro de aleta está colocado a través de dicha abertura en dicha cámara de
10 bomba.

 19. El surtidor tal y como se reivindica en la cláusula 1, caracterizado porque dicho mecanismo de válvula de verificación comprende un miembro de tapón cónico movable hacia
15 adentro y hacia afuera del enganche con dicha abertura en dicha cámara de bomba.

 20. El surtidor tal y como se reivindica en la cláusula 18, caracterizado porque dicho miembro de tapón es
20 deslizable a lo largo de una varilla de guía.

 21. El surtidor tal y como se reivindica en la cláusula 1, caracterizado porque dicho mecanismo de válvula de verificación comprende una válvula de lanzadera alargada
25 deslizable dentro de dicha abertura en dicha cámara de bomba.

 22. El surtidor tal y como se reivindica en la

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cláusula 1, caracterizado porque dicha cámara de bomba es ventilada a través de dicho dispositivo de restricción con la liberación de dicho accionador.

5 23. El surtidor tal y como se reivindica en la cláusula 1, caracterizado porque además comprende una ventila colocada en dicho depósito.

10 24. Un aparato de bomba dosificadora para surtir cantidades medidas de un líquido viscoso desde un depósito, dicho mecanismo comprende:

Un orificio surtidor definido en dicha cámara de bomba;

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Un mecanismo de bomba configurado con dicha cámara de bomba para presurizar el líquido dentro de dicha cámara de bomba con la actuación de dicho mecanismo de bomba;

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Un mecanismo de válvula de verificación colocado operablemente en dicha cámara de bomba que puede abrirse y moverse con la actuación de dicho mecanismo de bomba para sellar dicha abertura y moverse con la liberación de dicho mecanismo de bomba para quitar el sello de dicha abertura de manera que la

25 cantidad dosificada de líquido fluya automáticamente a través de dicha abertura hasta la cámara de bomba;

Un dispositivo de restricción flexible colocado

operablemente a través del orificio surtidor, dicho dispositivo de restricción se abre con una acumulación de presión de líquido suficiente dentro de la cámara de bomba; y

5 El dispositivo de restricción está configurado para ventilar dicha cámara de bomba con la liberación del mecanismo de bomba antes de cerrar completamente para sellar dicho orificio surtidor.

10 25. El aparato de bomba tal y como se reivindica en la cláusula 24, caracterizado porque dicho mecanismo de bomba comprende un cilindro de bomba colocado deslizablemente y retenido en dicha cámara de bomba y presionado a una posición de descanso, dicho cilindro de bomba además
15 comprende un extremo de entrega que se extiende a través de una pared frontal de dicha cámara de bomba y que tiene una cámara surtidora colocada a través del mismo, dicho orificio surtidor está colocado en un extremo delantero de dicho canal surtidor.

20 26. El aparato de bomba tal y como se reivindica en la cláusula 24, caracterizado porque dicho mecanismo de bomba comprende un pistón deslizable dentro de la cámara de bomba y presionado a una posición de descanso, y un eje conectado a dicho pistón y que se extiende a través de una
25 pared frontal de dicha cámara de bomba.

27. El aparato de bomba tal y como se

86 

reivindica en la cláusula 24, caracterizado porque dicho mecanismo de bomba comprende un miembro de diafragma colocado a través de una pared frontal de dicha cámara de bomba, dicho diafragma es deprimible por un usuario para presurizar y surtir
5 el líquido desde dicha cámara de bomba.

28. El aparato de bomba tal y como se reivindica en la cláusula 24, caracterizado porque dicho orificio surtidor es definido a través de una parte más inferior
10 de dicha cámara de bomba.

29. El aparato de bomba tal y como se reivindica en la cláusula 24, caracterizado porque dicho dispositivo de restricción comprende por lo menos un miembro de
15 aleta flexible que puede moverse a una posición abierta con la presurización de líquido en dicha cámara de bomba y regresar automáticamente a una posición cerrada con el mecanismo de bomba moviéndose a una posición de descanso.

20 30. El aparato de bomba tal y como se reivindica en la cláusula 29, caracterizado además porque comprende una pluralidad de miembros de aleta que definen una abertura a través de los mismos en dicha posición abierta y que sellan unos en contra de otros en dicha posición cerrada.

25 31. El aparato de bomba tal y como se reivindica en la cláusula 24, caracterizado porque el mecanismo

de válvula de verificación comprende una bola asentada dentro de un rebaje que define dicha abertura en dicha cámara de bomba, dicho rebaje define una superficie de sellamiento en contra de la cual sella la bola con la presurización de líquido dentro de
5 dicha cámara de bomba.

32. El aparato de bomba tal y como se reivindica en la cláusula 24, caracterizado porque dicho mecanismo de válvula de verificación comprende un miembro de
10 aleta elástico que tiene un extremo montado dentro de dicha cámara, dicho miembro de aleta está colocado a través de dicha abertura en dicho extremo posterior de dicha cámara de bomba.

33. El aparato de bomba tal y como se reivindica en la cláusula 24, caracterizado porque dicho mecanismo de válvula de verificación comprende un miembro de
15 tapón cónico que puede moverse adentro y hacia afuera del enganche con dicha abertura en dicha cámara de bomba.

20 34. El aparato de bomba tal y como se reivindica en la cláusula 24, caracterizado porque dicho mecanismo de válvula de verificación comprende una válvula de lanzadera alargada deslizable dentro de dicha abertura en dicha cámara de bomba.

R E S U M E N

Un surtidor para surtir cantidades medidas de un líquido viscoso incluye un depósito para líquido y una cámara de bomba que tiene una abertura en comunicación con el depósito. Un orificio surtidor está definido en la cámara de bomba. Un mecanismo de bomba está configurado con la cámara de bomba y puede moverse desde una posición de descanso a una de presurización con la actuación del mismo para presurizar el líquido dentro de la cámara de bomba. Un mecanismo de válvula de verificación está colocado en la abertura. Un dispositivo de restricción está colocado en el orificio surtidor y mantiene una configuración cerrada para evitar el filtrado de líquido desde el orificio surtidor. El dispositivo de restricción se abre con una acumulación de presión de líquido suficiente dentro de la cámara de bomba con la actuación del mecanismo de bomba. El dispositivo de restricción también puede ventilar la cámara de bomba con la liberación del mecanismo de bomba.