Australia PC019FJ
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AUSTRALIA

Patents Act

DECLARATION FOR A PATENT APPLICATION

▼ INSTRUCTIONS
(a) Insert "Convention" if applicable
(b) Insert FULL name(s) of applicant(s)

In support of the (a) Convention application made by
(b)

ALPLAST S.n.c. dei Fratelli Francesco e Renato Goria & C.

(c) Insert "of addition" if applicable
(d) Insert TITLE of invention

(hereinafter called "applicant(s)" for a patent (c) for an invention entitled (d)

"Closure applying apparatus"

(e) Insert FULL name(s) AND address(es) of declarant(s) (See headnote*)

I/~~We~~ (e) GORIA, Erminio Renato
Strada Tigliole 42, I-14016 TIGLIOLE D'ASTI (Asti) Italy

do solemnly and sincerely declare as follows:

1. ~~I am/We are the applicant(s).~~
(or, in the case of an application by a body corporate)
1. I am/~~We are~~ authorized to make this declaration on behalf of the applicant(~~s~~).
2. ~~I am/We are the actual inventor(s) of the invention.~~
(or, where the applicant(s) is/are not the actual inventor(s))

(f) Insert FULL name(s) AND address(es) of actual inventor(s)

2. (f)

MARGARIA Mario
Via N. Sauro No. 1
I-14015 SAN DAMIANO D'ASTI (Asti) Italy

is/~~are~~ the actual inventor(s) of the invention and the facts upon which the applicant(s) is/~~are~~ entitled to make the application are as follows:

(g) Recite how applicant(s) derive(s) title from actual inventor(s) (See headnote**)

(g)

The Applicant is the assignee of the invention from the actual inventor

(**Note:** *Paragraphs 3 and 4 apply* **only** *to Convention applications)*

(h) Insert country, filing date, and basic applicant(s) for the/or EACH basic application

3. The basic application(~~s~~) for patent or similar protection on which the application is based is/~~are~~ identified by **country, filing date, and basic applicant(~~s~~)** as follows:

(h)

ITALY
4th June 1986
ALPLAST S.n.c. dei Fratelli Francesco e Renato Goria & C.

4. The basic application(~~s~~) referred to in paragraph 3 hereof was/~~were~~ the first application(~~s~~) made in a Convention country in respect of the invention the subject of the application.

M004388 15/11/88

(k) Insert PLACE of signing
(l) Insert DATE of signing
(m) Signature(s) of declarant(s)

Note: No legalization or other witness required

Declared at (k) Torino (Italy)
Dated (l) 4th November 1988.
(m) [signature]

To: The Commissioner of Patents

GORIA Erminio Renato

P18/7/81

PHILLIPS ORMONDE & FITZPATRICK
Patent and Trade Mark Attorneys
367 Collins Street
Melbourne, Australia

STUART TAYLOR

(12) PATENT ABRIDGMENT (11) Document No. AU-B-70899/87
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 604688

(54) Title
CLOSURE APPLYING APPARATUS

International Patent Classification(s)
(51)[4] B67B 003/20

(21) Application No. : 70899/87 (22) Application Date : 23.02.87

(87) WIPO Number : WO87/07588

(30) Priority Data

(31) Number	(32) Date	(33) Country
67462 /86	04.06.86	IT ITALY

(43) Publication Date : 11.01.88

(44) Publication Date of Accepted Application : 03.01.91

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(56) Prior Art Documents
US 3031822
EP 103567
US 4249362

(57) Claim

1. Closure applying apparatus suitable for use in capping machines for placing on a container having a threaded neck portion and an annular collar below said neck portion a one-piece tamper-evident screw-type capsule made of rigid plastic material, said capsule including a horizontal end wall and a cylindrical side wall which comprises an upper internally threaded skirt portion, a lower skirt portion which is provided with an inwardly projecting bead for snap engaging beneath said annular collar as a result of screwing of the capsule on the container and a plurality of thin frangible bridges connecting said upper and lower skirt portions, said apparatus comprising a rotary, vertically reciprocable capping chuck having a plurality of jaws for gripping the upper skirt portion of the capsule, each jaw being pivotally movable between an open and closed position and including an inwardly extending projection which, in the jaw-closed position, rests on the top of the capsule and an arcuate portion which engages the upper skirt

.../2

portion of the capsule, wherein each jaw of the chuck is provided at its lower end with an inner flange, the distance between said inner flanges and said inwardly extending projection substantially corresponding to the height of the capsule, whereby each of said flanges forms an axial abutment surface which engages from below the edge of the lower skirt portion, thus preventing fracture of the bridges due to axial stretching beyond their original length during the capping operation.

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International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 4 : B67B 3/20	A1	**(11) International Publication Number:** WO 87/ 07588 **(43) International Publication Date:** 17 December 1987 (17.12.87)

(21) International Application Number: PCT/EP87/00099

(22) International Filing Date: 23 February 1987 (23.02.87)

(31) Priority Application Number: 67462 A/86

(32) Priority Date: 4 June 1986 (04.06.86)

(33) Priority Country: IT

(74) Agents: JACOBACCI, Filippo et al.; Jacobacci-Casetta & Perani S.p.A., Via Alfieri, 17, I-10121 Torino (IT).

(81) Designated States: AT (European patent), AU, BB, BE (European patent), BG, BR, CF (OAPI patent), CG (OAPI patent), CH (European patent), CM (OAPI patent), DE (European patent), DK, FI, FR (European patent), GA (OAPI patent), GB (European patent), HU, IT (European patent), JP, KP, KR, LK, (OAPI patent), n patent), NO, OAPI patent), ean patent), US.

(71) SECTION 34(4)(a) DIRECTION SEE FOLIO 27
NAME DIRECTED ALPLAST S.P.A.
Regione Calvini 90 Strada San Damiano, Italy

(72) ~~Inventor; and~~
(75) **Inventor/Applicant** *(for US only)* : MARGARIA, Mario [IT/IT]; Via N. Sauro No. 1, I-14015 San Damiano D'Asti (IT).

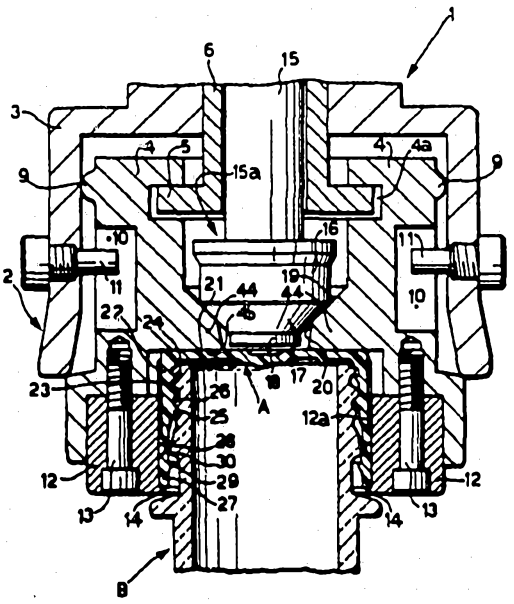
This document contains the amendments made under Section 49 and is correct for printing.

With international search report.

(54) **Title:** CLOSURE APPLYING APPARATUS

(57) **Abstract**

A closure applying apparatus (1) suitable for use in capping machines for placing on a container (B) having a threaded neck portion (26) and an annular collar (30) below said neck portion a tamper-evident screw-type capsule (A) made of rigid plastic material and having a lower skirt portion (27) which is connected by a plurality of thin frangible bridge portions (28) to an upper internally threaded skirt portion (22) and is provided with an inwardly projecting bead (29) for snap engaging beneath said annular collar (30) as a result of screwing of the capsule (A) on the container (B). The apparatus comprises a rotary, vertically reciprocable capping chuck having a plurality of jaws (4) for gripping the capsule (A), each jaw (4) being provided at its lower end with an inner flange (14) which engages from below the edge of the lower skirt portion (27). The flanges (14) of the jaws (4) form an abutment surface for the lower skirt portion (27), which absorbs the forces produced during snap movement of the inwardly projecting head (29) over the collar (30) of the container (B), thus preventing fracture of the bridges (28) during the capping operation.



Closure applying apparatus

The present invention relates to a closure applying apparatus suitable for use in capping machines for placing on a container having a threaded neck portion and an annular collar below said neck portion a one-piece tamper-evident screw-type capsule made of rigid plastic material, said capsule including a horizontal end wall and a longitudinal side wall which comprises an upper internally threaded skirt portion, a lower skirt portion which is provided with an inwardly projecting bead for snap engaging beneath said annular collar as a result of screwing of the capsule on the container and a plurality of thin frangible bridge portions connecting said upper and lower skirt portions.

Said capsules are useful in various applications, including soda bottles and containers which are maintained under significant pressure.

Unscrewing of said capsules after the capping operation provides visible evidence that the container has been opened due to fracture of the bridges and separation of the lower skirt portion from the capsule.

US-A-3,031,822 describes a closure applying apparatus for use in capping machines for placing screw-type caps on containers, which comprises a rotary, vertically reciprocable capping chuck having a plurality of jaws for gripping the cap, each jaw being pivotally movable between an open and a closed position and including an inwardly extending projection which, in the jaw-closed position, rests on the top of the cap and an arcuate portion which engages the cylindrical side wall of the cap.

Said apparatus could not be used for applying a tamper-evident capsule of the above mentioned type to a container, because such a use would imply a very high risk of fracture of the bridges during the capping operation.

As a matter of fact, when during the capping operation, the lower surface of the bead on the lower skirt portion of the capsule comes into contact with the collar of the container, the thin bridges collapse and the upper and lower skirt portions of the capsule come into contact with each other. The lower skirt portion is therefore subjected to a compressive stress before the bead snaps beneath the container collar. During said snap movement the sudden release of said compression stress in the lower skirt portion would cause an elongation of the bridges beyond their original length and a fracture of said bridges due to tensile stress would thereby occur.

The invention as claimed is intended to remove this drawback.

The advantages offered by the invention are that the inner flanges of the jaws of the capping chuck form an abutment surface for the lower skirt portion, which absorbs the forces produced during movement of the inwardly projecting bead over the collar of the container, thus preventing fracture of the bridges during the capping operation.

~~One way of carrying out the invention is described~~ in detail below with reference to the annexed drawings which illustrate ~~in~~ detail only one specific embodiment, ~~in which:~~

Accordingly, the present invention provides closure applying apparatus suitable for use in capping machines for placing on a container having a threaded neck portion and an annular collar below said neck portion a one-piece tamper-evident screw-type capsule made of rigid plastic material, said capsule including a horizontal end wall and a cylindrical side wall which comprises an upper internally threaded skirt portion, a lower skirt portion which is provided with an inwardly projecting bead for snap engaging beneath said annular collar as a result of screwing of the capsule on the container and a plurality of thin frangible bridges connecting said upper and lower skirt portions, said apparatus comprising a rotary, vertically reciprocable capping chuck having a plurality of jaws for gripping the upper skirt portion of the capsule, each jaw being pivotally movable between an open and closed position and including an inwardly extending projection which, in the jaw-closed position, rests on the top of the capsule and an arcuate portion which engages the upper skirt portion of the capsule, wherein each jaw of the chuck is provided at its lower end with an inner flange, the distance between said inner flanges and said inwardly extending projection substantially corresponding to the height of the capsule, whereby each of said flanges forms an axial abutment surface which engages from below the edge of the lower skirt portion, thus preventing fracture of the bridges due to axial stretching beyond their original length during the capping operation.

One way of carrying out the invention is described in detail below with reference to the annexed drawings which illustrate in detail only one specific embodiment, in which:

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- fig.1 is a vertical sectional view of a closure applying apparatus according to the invention,
- fig.2 is an enlarged vertical sectional view of the capping chuck of the apparatus illustrated in fig. 1, the chuck being shown in its open position before it closes on a tamper-evident capsule resting on the mouth of a container, and
- fig.3 is a view similar to fig.2, the chuck being shown in its closed position at the end of the capping operation.

In the drawings, a closure applying apparatus which is suitable for use in capping machines for placing screw-type capsules onto containers is generally indicated 1.

The upper part of the apparatus is of conventional type whereby only the lower part, which includes a rotary, vertically reciprocable capping chuck 2, will be described in detail.

Chuck 2 comprises a bell-shaped driving member 3 and a plurality of jaws 4 having recesses 4a at the upper ends of their inner surfaces, in which the flange 5 of a tubular element 6 slidable centrally within the bell 3 is engaged with play.

To the upper end of the tubular element 6 is screwed a ring 7 against which bears a helical spring 8 which acts against the bell 3 at its other end.

The upper external part of each jaw 4 has a toroidal bead 9 which bears against the inner surface of the bell 3.

The central part of each jaw 4 has a recess 10 in which a drive pin 11 screwed into the bell 3 is engaged.

To the inner lower end of each jaw 4 is connected by screws 13 a part 12 having a plurality of vertical serrations 12a and a radially-inwardly-projecting flange 14 at its lower end.

A rod 15 is slidable in the tubular element 6 and, at its lower end, has an enlarged foot 15a with a cylindrical part 16, a conical part 17, and a cylindrical end part 18.

In correspondence with the foot 15a, the inner surface of each jaw 4 has a tooth-shaped projection 44 with a conical upper surface 19, a conical side surface 20 and a flat lower surface 4b, having a distance from the flange 14 which substantially corresponds to the height of the capsules to be placed on a container.

In the open position of the chuck 2 illustrated in fig.2, the cylindrical surface 16 of the foot 15a of rod 15 engages the conical surface 20 of each jaw, which thus assumes an inclined position with its fulcrum of rotation 4c resting on the flange 5 of the tubular element 6.

The chuck illustrated in fig.2 is moving downwardly in the direction indicated by the arrow F towards a capsule, generally indicated A, resting on the mouth of a container B.

The capsule A is a one-piece tamper-evident screw-type capsule made from a rigid plastics material, such

as polypropylene with a suitable filler, and is suitable for various applications, including soda bottles and containers which are maintained under significant pressure.

The capsule A comprises a horizontal end wall 21 and an upper skirt portion 22 having a plurality of vertical serrations 23.

The inner surface of wall 21 is provided with a sealing ring 24 constituted by a plastic mastic.

The upper skirt portion 22 has internal threading 25 for engaging the external threading 26 of the neck of container B.

The capsule A has a lower integral skirt portion 27 connected to the upper skirt portion 22 by a plurality of thin frangible bridge portions 28.

The lower skirt portion 27 has an inwardly projecting bead 29 for snap-engaging beneath an annular collar 30 carried by the neck of the container B below the threaded portion 26.

The internal diameter of the annular projection 29 is greater than the outer diameter of the threading 26 of the container B whereby the lower end of the capsule threading 25 rests on the upper end of the container threading 26 in the position illustrated in fig.2, that is before the capping operation is started.

The descent of the chuck 2 from the position shown in fig.2 brings the cylindrical part 18 of the foot 15a of rod 15 into contact with the horizontal end wall 21

of the capsule so that the further descent of the chuck causes relative axial movement between the jaws 4 of the chuck and the foot 15a.

As a result of this relative displacement, the cylindrical part 16 is disengaged from the conical part 20 and the conical part 17 is brought into contact with the conical part 19, as illustrated in fig.3, thus allowing the jaws 4 to close on the capsule A.

In this closed position, the flat lower surfaces 4b of the jaws 4 engage the horizontal end wall 21 of the capsule A, the serrations 12a engage the serrations 23 of the upper skirt portion of the capsule to rotate it, and the flanges 14 of the jaws 4 engage from below the lower edge of the lower skirt portion 27.

As the capsule A gripped by the chuck 2 is threaded onto the container B, the lower surface of the bead 29 on the lower skirt portion 27 comes into contact with the collar 30 of the container, the thin bridges 28 collapse and the upper and lower skirt portions 22, 27 come into contact with each other. The lower skirt portion 27 is therefore subjected to a compressive stress before the bead 29 snaps over the container collar 30.

The snap downward movement of the lower skirt portion 27 with respect to the upper skirt portion 22 caused by the sudden release of said compressive stress is limited by the flanges 14 of the jaws 4, which form an abutment for the lower edge of the lower skirt portion 27.

Therefore, the thin bridges 28 connecting the two

skirt portions 22,27 of the capsule cannot be stretched beyond their original length , thus preventing fracture of said bridges during the capping operation.

At the end of the capping operation, that is in the position illustrated in fig.3, a rod 31 of the apparatus illustrated in fig.1 descends and lowers the rod 15, the foot 15a of which is brought into the position illustrated in fig.2, causing the jaws 4 to open.

The claims defining the invention are as follows:

1. Closure applying apparatus suitable for use in capping machines for placing on a container having a threaded neck portion and an annular collar below said neck portion a one-piece tamper-evident screw-type capsule made of rigid plastic material, said capsule including a horizontal end wall and a cylindrical side wall which comprises an upper internally threaded skirt portion, a lower skirt portion which is provided with an inwardly projecting bead for snap engaging beneath said annular collar as a result of screwing of the capsule on the container and a plurality of thin frangible bridges connecting said upper and lower skirt portions, said apparatus comprising a rotary, vertically reciprocable capping chuck having a plurality of jaws for gripping the upper skirt portion of the capsule, each jaw being pivotally movable between an open and closed position and including an inwardly extending projection which, in the jaw-closed position, rests on the top of the capsule and an arcuate portion which engages the upper skirt portion of the capsule, wherein each jaw of the chuck is provided at its lower end with an inner flange, the distance between said inner flanges and said inwardly extending projection substantially corresponding to the height of the capsule, whereby each of said flanges forms an axial abutment surface which engages from below the edge of the lower skirt portion, thus preventing fracture of the bridges due to axial stretching beyond their original length during the capping operation.

2. An apparatus according to claim 1, substantially as herein described with reference to the accompanying drawings.

DATED: 3 October 1989

PHILLIPS ORMONDE & FITZPATRICK

Attorneys for:

ALPLAST S.n.c. DEI FRATELLI FRANCESSCO E RENATO GORIA & C.

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FIG. 1

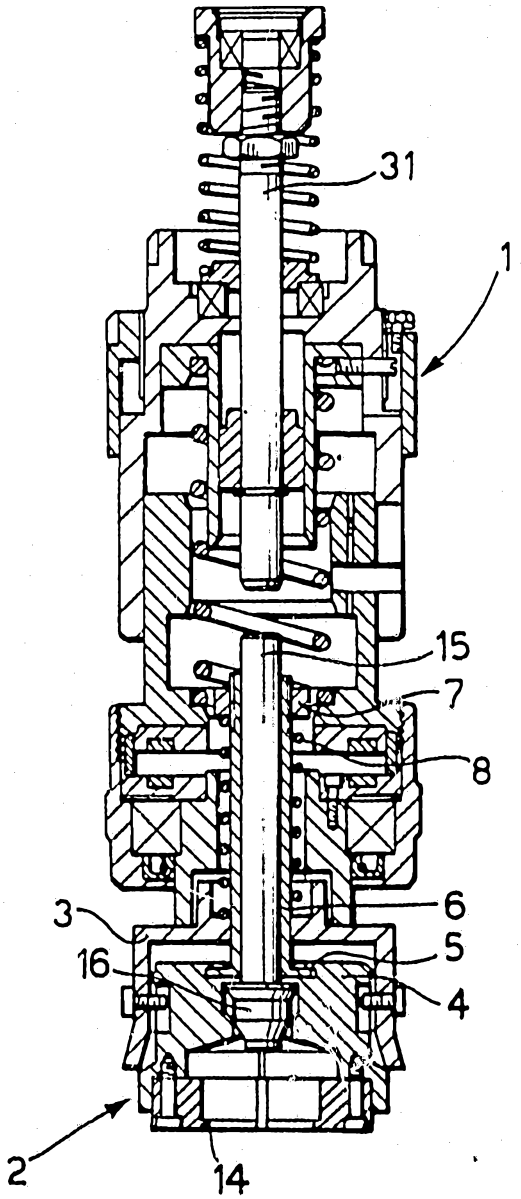

FIG. 2

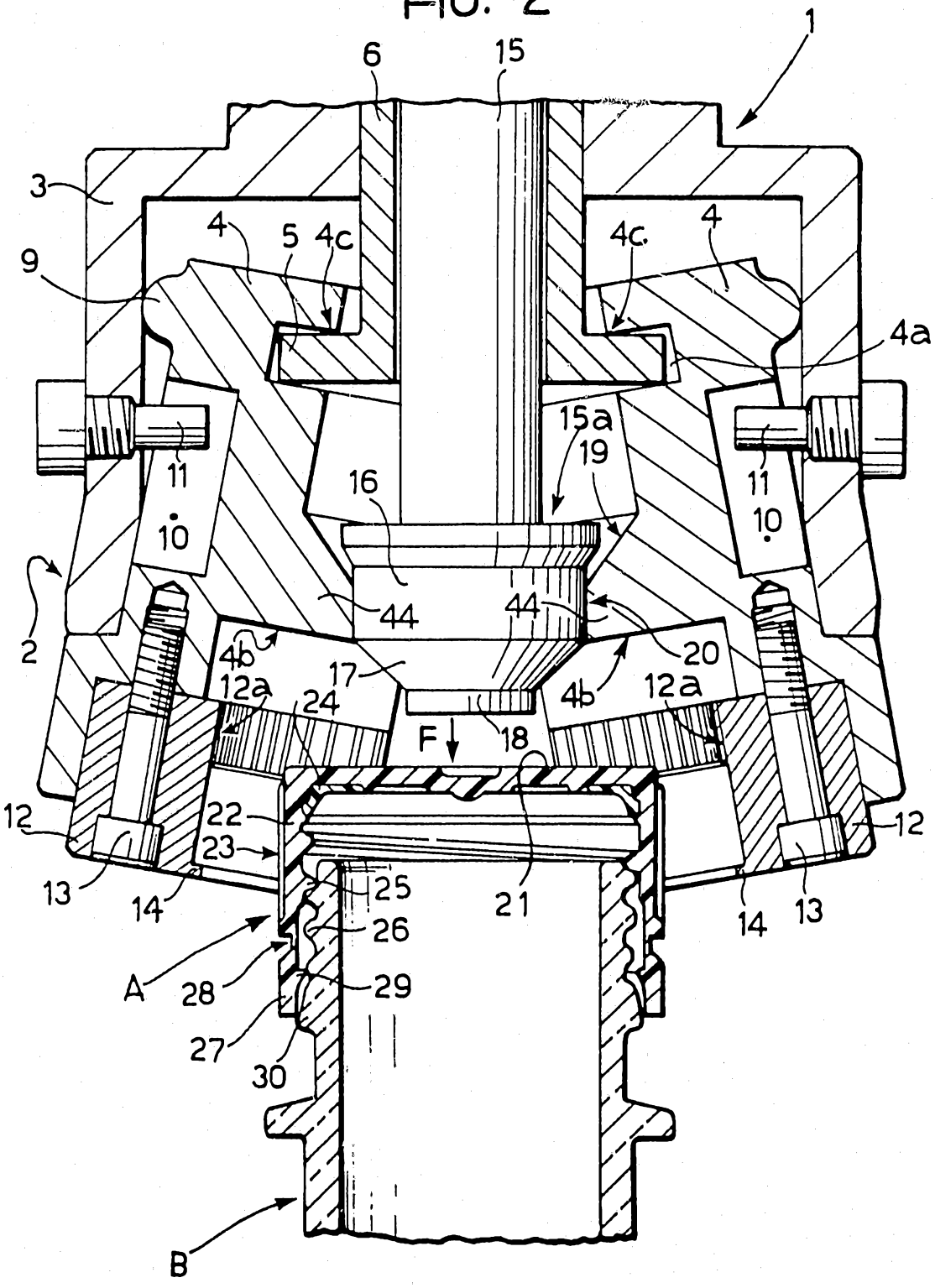
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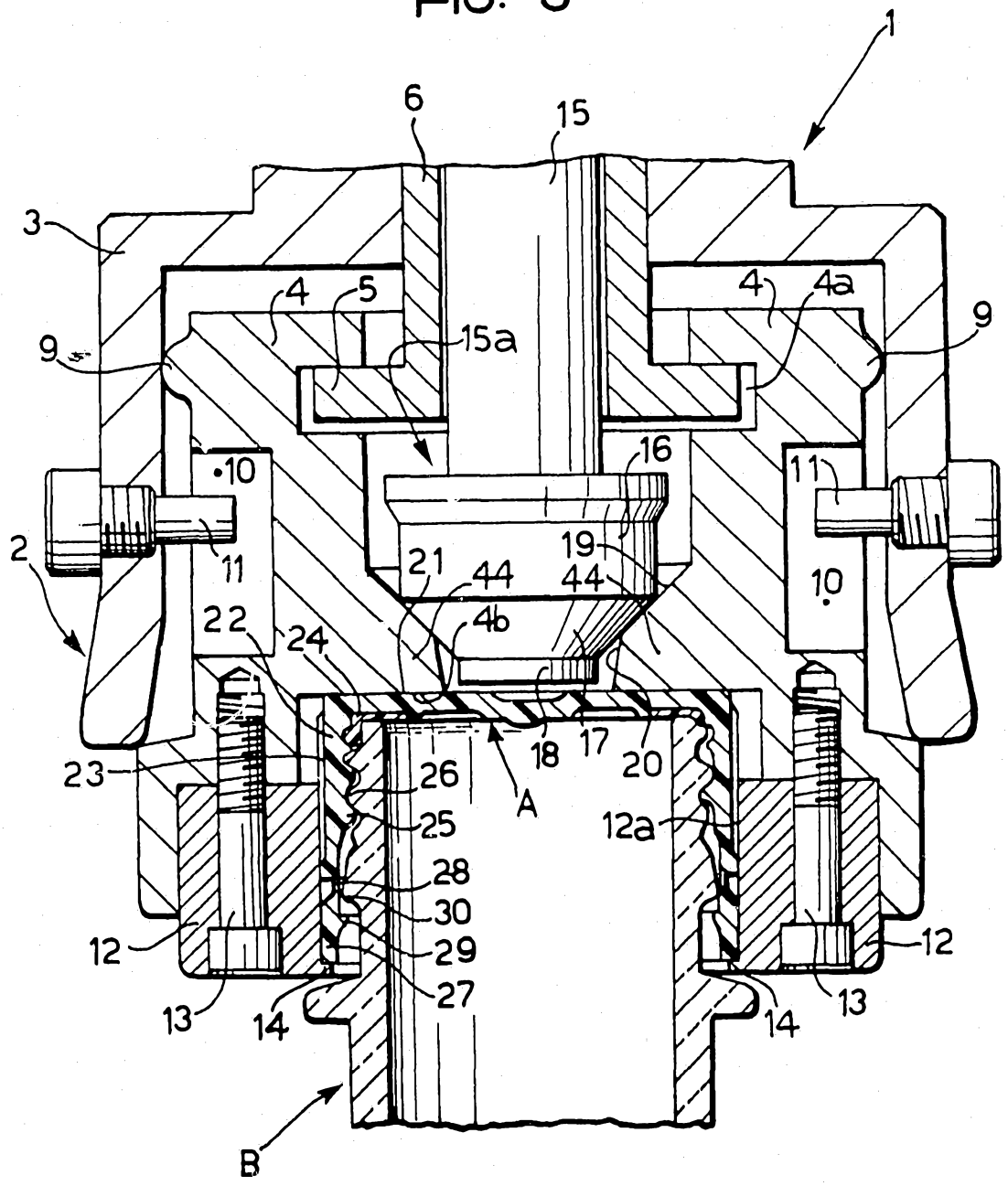
FIG. 3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INTERNATIONAL SEARCH REPORT

International Application No PCT/EP 87/00099

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC[4]: B 67 B 3/20

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
IPC[4]	B 67 B

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category [10]	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
Y	US, A, 3031822 (DIMOND) 1 May 1962 see figures 1-3; column 3, line 19 - column 4, line 32 cited in the application	1
Y	EP, A, 0103567 (SCHÜTT) 21 March 1984 see page 6, line 27 - page 7, line 18; figures 8,9	1
A	FR, A, 2420505 (M.C.G.) 19 October 1979	

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* Special categories of cited documents: [10]

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
19th June 1987	23 JUL 1987
International Searching Authority	**Signature of Authorized Officer**
EUROPEAN PATENT OFFICE	M. VAN MOL

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON

INTERNATIONAL APPLICATION NO. PCT/EP 87/00099 (SA 16355)

This Annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 08/07/87

The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 3031822		None	
EP-A- 0103567	21/03/84	JP-A- 59074069	26/04/84
		AT-A,B 375893	25/09/84
FR-A- 2420505	19/10/79	BE-A- 872374	16/03/79
		NL-A- 7811509	25/09/79
		DE-A- 2836060	27/09/79
		AU-A- 4163778	27/09/79
		US-A- 4249362	10/02/81
		CA-A- 1098876	07/04/81
		GB-A- 1596355	26/08/81
		AT-B- 364264	12/10/81
		CH-A- 629458	30/04/82
		AU-B- 522341	27/05/82
		SE-A- 7811792	23/09/79