

Drigard & Castro
Abogados

Apartado 3692

Cra 7 18-56

Bogotá Colombia S A

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

Radicación : 03046606 00000002

Fecha (AMD): 2003-08-27 16:20:55

Trámite : 002 PATENTES D

Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

DIVISION DE NUEVAS CREACIONES

E S D

RÉSPUESTA A OFICIO 05528 DE JULIO 17 2003

REF Expediente No 03 046 806 – Solicitud de Patente

a favor de OWENS - BROCKWAY GLASS CONTAINER INC

Titulada MÉTODO Y APARATO PARA SOPLAR Y RETIRAR ENVASES DE VIDRIO

RAMIRO CASTRO DUQUE, vecino de Bogotá, portador de la tarjeta profesional No 1003, obrando como apoderado de la sociedad OWENS - BROCKWAY GLASS CONTAINER INC, según lo acredita el documento de poder protocolizado en esa División bajo el No 13516, para dar cumplimiento al requerimiento notificado por fijación en lista el 17 de Julio de 2003, y de acuerdo con los Artículos 38 y 39 de la Decisión 486 de la comisión de la Comunidad Andina, me permito anexar al presente escrito lo siguiente

- 1 Documento donde consta la cesión del derecho a la Patente otorgado por los inventores al solicitante, debidamente apostillado
- 2 Artes finales (2 de 12 cm X 12 cm y 1 de 6 cm X 6 cm)
- 3 Extracto para publicación y Tarjeta de Archivo Temático
- 4 Dibujos formales
- 5 Copia certificada por la Oficina de Patentes de Estados Unidos, de la primera solicitud presentada para la misma invención, de la cual REIVINDICAMOS PRIORIDAD, junto con su correspondiente traducción del inglés al castellano

De la señora Jefe atentamente,

RAMIRO CASTRO DUQUE

C C No 170 322 de Bogotá

Código 340

Cra 7 No 18-56 Piso 9

Bogotá, Agosto 27, 2003

CHP/MEV/hsr

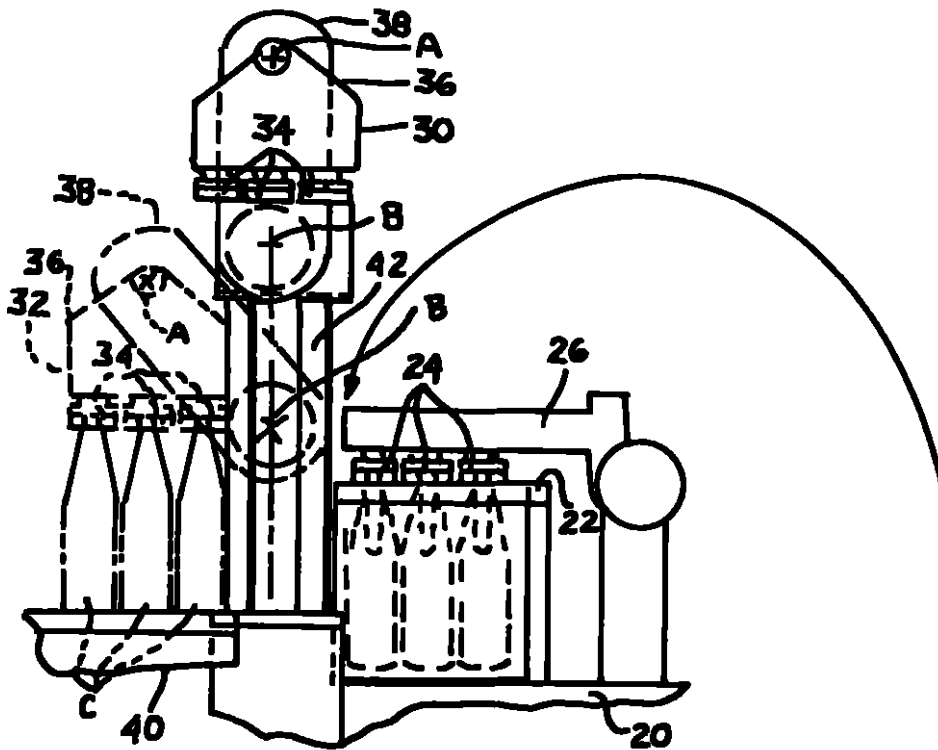
Brigard & Castro
Abogados

Apartado 3692

Cra 7 16 56
Bogotá Colombia S A

Tel Conm 3802200
Tel./Fax (57 1) 2827976
(57 1) 3802700

E Mail brcas : brigardycastro com co



FOL 38 - TIRAJETO TERMINO
FOL 39 - EXTRA PUBLICACION

91093
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APOSTILLE

(Convention de la Haye du 5 octobre 1961)

1 Country United States of America

This public document

2 has been signed by J BERNIE QUILTER

3 acting in the capacity of Clerk of Court of Common Pleas

4 bears the seal/stamp of Court of Common Pleas, Lucas County

CERTIFIED

5 at Columbus, Ohio

6 June 30, 2003

7 by the Secretary of State of Ohio

8 No 133048

9 Seal/Stamp

10 Signature

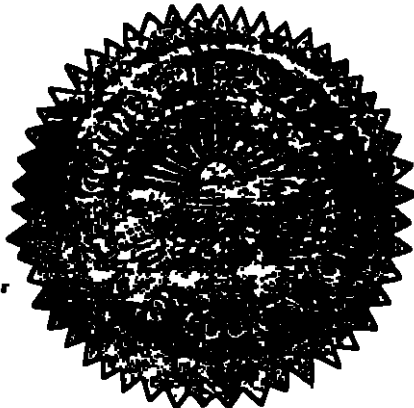


J Kenneth Blackwell
J Kenneth Blackwell
Secretary of State of Ohio

This certification certifies only the authenticity of the signature of the official who signed the document, the capacity in which that official acted, and where appropriate, the identity of the seal or stamp which the document bears. This certification does not imply that the contents of the document(s) are correct, nor that they have the approval of this office.

NOTARY CERTIFICATE

STATE OF OHIO }
COUNTY OF LUCAS }



29 42
J Bernie Quilter Clerk of the Common Pleas Court and Court of Appeals for the County of Lucas and State of Ohio the same being a court of record and having by LAW a Seal do hereby certify that

Judith M Schreiner

whose name is subscribed to the certificate of the proof of acknowledgment of the annexed instrument and thereon written, was, at the time of taking such proof and acknowledgment a Notary Public, duly commissioned and sworn and authorized by the laws of said State to take the acknowledgments and proofs of deeds or conveyances for lands tenements or hereditaments in said State to be recorded therein And further that I am well acquainted with the handwriting of such Notary Public and verily believe that the signature to said certificate of proof or acknowledgment is genuine that impression of seal of such officer is not required by law to be filed in my office and the commission expires on the 2nd day of February 2006

IN TESTIMONY WHEREOF I have hereunto set my hand and affixed the seal of the said Court and County at Toledo Ohio, June 20, 2003

(Date)

J Bernie Quilter Clerk of Courts



J Bernie Quilter

Clerk

**CERTIFIED COPY
OF
ASSIGNMENT**

I, JUDITH M SCHREINER, a Notary Public in and for the State of Ohio, U S.A., hereby certify that the attached documents are true copies of the Assignments made of an improvement invention for METHOD AND APPARATUS FOR BLOWING AND REMOVING GLASS CONTAINERS by its Inventors

- 1) D Wayne Leidy
- 2) Frank J DIFrank

to Owens-Brockway Glass Container Inc , as executed on May 14, 2002 or May 21, 2002, as the case may be, and recorded in the United States Patent and Trademark Office on June 3, 2002 (as evidenced by the Notice of Recordation of Assignment Document also attached), and that the aforesaid Improvement Invention is the subject of United States Patent Application Serial No 10/161,966 filed June 3, 2002

Dated June 12, 2003



JUDITH M SCHREINER
Notary Public, State of Ohio
Commission Expires 2/2/06

Judith M Schreiner
Notary Public



UNITED STATES
PATENT AND
TRADEMARK OFFICE

Owens-Illinois, Inc.

AUG 22 2002

INTELLECTUAL
PROPERTY SECTION

AUGUST 12, 2002

PTAS

Chief Information Officer
Washington DC 20231
www.uspto.gov

OWENS-ILLINOIS, INC
H G BRUSS
ONE SEAGATE, 25-LDP
TOLEDO, OH 43666



102123320A

UNITED STATES PATENT AND TRADEMARK OFFICE
NOTICE OF RECORDATION OF ASSIGNMENT DOCUMENT

THE ENCLOSED DOCUMENT HAS BEEN RECORDED BY THE ASSIGNMENT DIVISION OF
THE U S PATENT AND TRADEMARK OFFICE A COMPLETE MICROFILM COPY IS
AVAILABLE AT THE ASSIGNMENT SEARCH ROOM ON THE REEL AND FRAME NUMBER
REFERENCED BELOW

PLEASE REVIEW ALL INFORMATION CONTAINED ON THIS NOTICE THE
INFORMATION CONTAINED ON THIS RECORDATION NOTICE REFLECTS THE DATA
PRESENT IN THE PATENT AND TRADEMARK ASSIGNMENT SYSTEM IF YOU SHOULD
FIND ANY ERRORS OR HAVE QUESTIONS CONCERNING THIS NOTICE, YOU MAY
CONTACT THE EMPLOYEE WHOSE NAME APPEARS ON THIS NOTICE AT 703-308-9723
PLEASE SEND REQUEST FOR CORRECTION TO U S PATENT AND TRADEMARK OFFICE,
ASSIGNMENT DIVISION, BOX ASSIGNMENTS, CG-4, 1213 JEFFERSON DAVIS HWY,
SUITE 320, WASHINGTON, D C 20231

RECORDATION DATE 06/03/2002

REEL/FRAME 012972/0054
NUMBER OF PAGES 3

BRIEF ASSIGNMENT OF ASSIGNOR'S INTEREST (SEE DOCUMENT FOR DETAILS)

ASSIGNOR

LEIDY, D WAYNE

DOC DATE 05/14/2002

ASSIGNOR

DIFRANK, FRANK J

DOC DATE 05/21/2002

ASSIGNEE

OWENS-BROCKWAY GLASS CONTAINER
INC
ONE SEAGATE
TOLEDO, OHIO 43666

SERIAL NUMBER 10161966
PATENT NUMBER

FILING DATE 06/03/2002
ISSUE DATE

SHARON LATIMER, EXAMINER
ASSIGNMENT DIVISION
OFFICE OF PUBLIC RECORDS

42 45
A

ASSIGNMENT

WHEREAS, I, D. Wayne Leidy, of 9921 Parliament Place, Perrysburg, Ohio 43551 U S A together with Frank J DiFrank, have jointly invented an improvement in "Method and Apparatus for Blowing and Removing Glass Containers and

WHEREAS, I, as a joint applicant with said Frank J DiFrank, have executed an Application for United States Patent based thereon, on the 14 day of May, 2002, and

WHEREAS, Owens-Brockway Glass Container Inc. a corporation of Delaware, is desirous of acquiring certain rights thereunder;

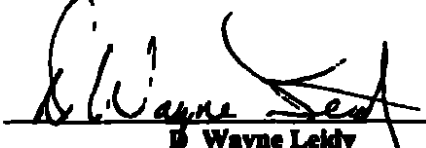
NOW, THEREFORE, for Ten Dollars (\$10 00) and other valuable considerations, receipt of all of which is hereby acknowledged, I have agreed to and do hereby sell, assign, and transfer unto said corporation my entire right, title, and interest in and throughout the United States of America (including its territories and dependencies) and all countries foreign thereto, in and to said invention, said application and any and all patents (including extensions thereof) of any country, which have been or may be granted on said invention or any part thereof, or on said application or any divisional, continuing, renewal reissue, or other patent application, based in whole or in part thereon, or based upon said invention

TO BE HELD AND ENJOYED by said corporation, its successors and assigns, to the full ends of the respective terms for which said patents or any of them have been or may be granted, as fully and entirely as the same would have been held and enjoyed by me had no sale and assignment of said interest been made,

AND I hereby covenant and agree for myself my heirs, and my legal representatives, to assist my said assignee in the prosecution of said application and in any interference which may arise involving said invention and, upon request, to execute without further consideration all necessary and desirable divisional, continuing, renewal, reissue, or other applications for patents in any country, that might be deemed necessary by said assignee fully to secure to said assignee its interest as aforesaid in and to said invention or any part thereof, and in and to said several patents or any of them. Further, I hereby authorize the above-mentioned assignee to insert in this instrument the identifying serial number and filing date of my said application when received

AND I do hereby authorize and request the Commissioner of Patents of the United States of America to issue any and all United States patents which may be granted upon said United States applications or any of them, or upon said invention or any part thereof, to said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal this 14 day of May, 2002


D. Wayne Leidy

STATE OF OHIO)
) ss
COUNTY OF WOOD)

On this 14 day of May, 2002 before me, a Notary Public, personally appeared the above-named D Wayne Leidy, personally known to me and known by me to be the one who executed the foregoing instrument and subscribed the same in my presence, and acknowledged the same to be his free act and deed

My Commission Expires
11/29/04


Notary Public
JOYCE M. MURPHY
Notary Public, State of Ohio
Commission Expires 11-29-04

U S Serial No _____ Filing Date _____

43 46
A

ASSIGNMENT

WHEREAS I, Frank J DiFrank, of 3442 Woodley Road, Toledo, Ohio 43606, U.S.A. together with D Wayne Leidy have jointly invented an improvement in "Method and Apparatus for Blowing and Removing Glass Containers and

WHEREAS, I, as a joint applicant with said D Wayne Leidy have executed an Application for United States Patent based thereon, on the 21 day of May, 2002, and

WHEREAS, Owens-Brockway Glass Container Inc., a corporation of Delaware is desirous of acquiring certain rights thereunder;

NOW, THEREFORE, for Ten Dollars (\$10.00) and other valuable considerations, receipt of all of which is hereby acknowledged, I have agreed to and do hereby sell assign, and transfer unto said corporation my entire right, title, and interest in and throughout the United States of America (including its territories and dependencies) and all countries foreign thereto, in and to said invention, said application and any and all patents (including extensions thereof) of any country, which have been or may be granted on said invention or any part thereof, or on said application or any divisional, continuing, renewal, reissue, or other patent application, based in whole or in part thereon, or based upon said invention

TO BE HELD AND ENJOYED by said corporation, its successors and assigns, to the full ends of the respective terms for which said patents or any of them have been or may be granted, as fully and entirely as the same would have been held and enjoyed by me had no sale and assignment of said interest been made,

AND I hereby covenant and agree for myself my heirs, and my legal representatives, to assist my said assignee in the prosecution of said application and in any interference which may arise involving said invention and, upon request, to execute without further consideration all necessary and desirable divisional, continuing, renewal, reissue, or other applications for patents in any country, that might be deemed necessary by said assignee fully to secure to said assignee its interest as aforesaid in and to said invention or any part thereof and in and to said several patents or any of them Further, I hereby authorize the above-mentioned assignee to insert in this instrument the identifying serial number and filing date of my said application when received.

AND I do hereby authorize and request the Commissioner of Patents of the United States of America to issue any and all United States patents which may be granted upon said United States applications or any of them, or upon said invention or any part thereof, to said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal this 21 day of May, 2002

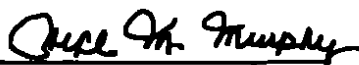

Frank J DiFrank

STATE OF Ohio)
COUNTY OF Wood) ss

On this 21 day of May, 2002, before me, a Notary Public, personally appeared the above-named Frank J DiFrank, personally known to me and known by me to be the one who executed the foregoing instrument and subscribed the same in my presence, and acknowledged the same to be his free act and deed.

My Commission Expires

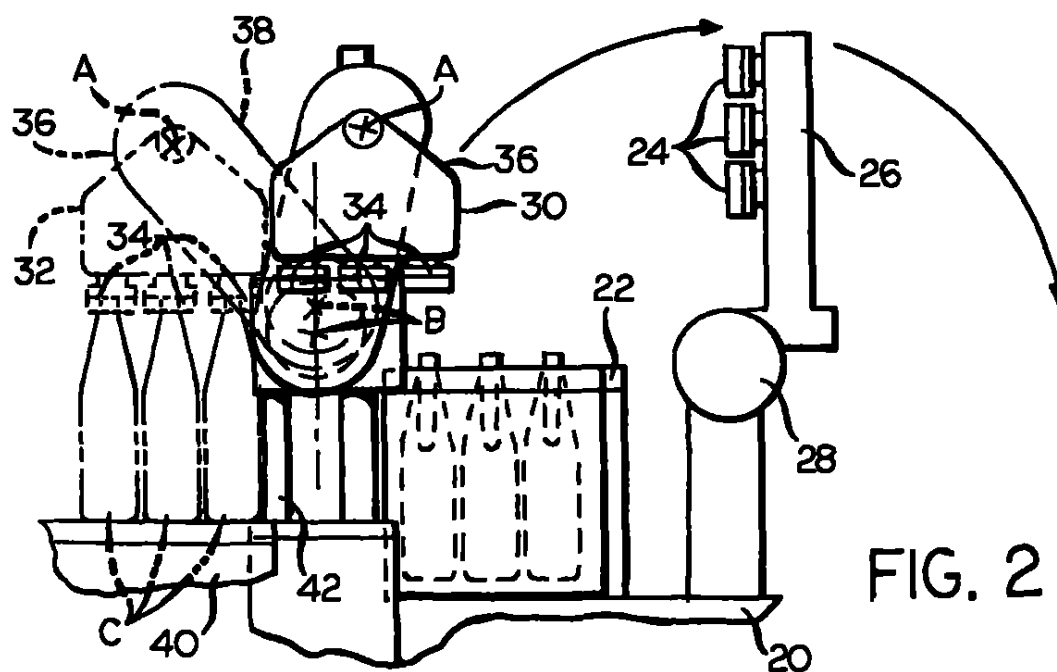
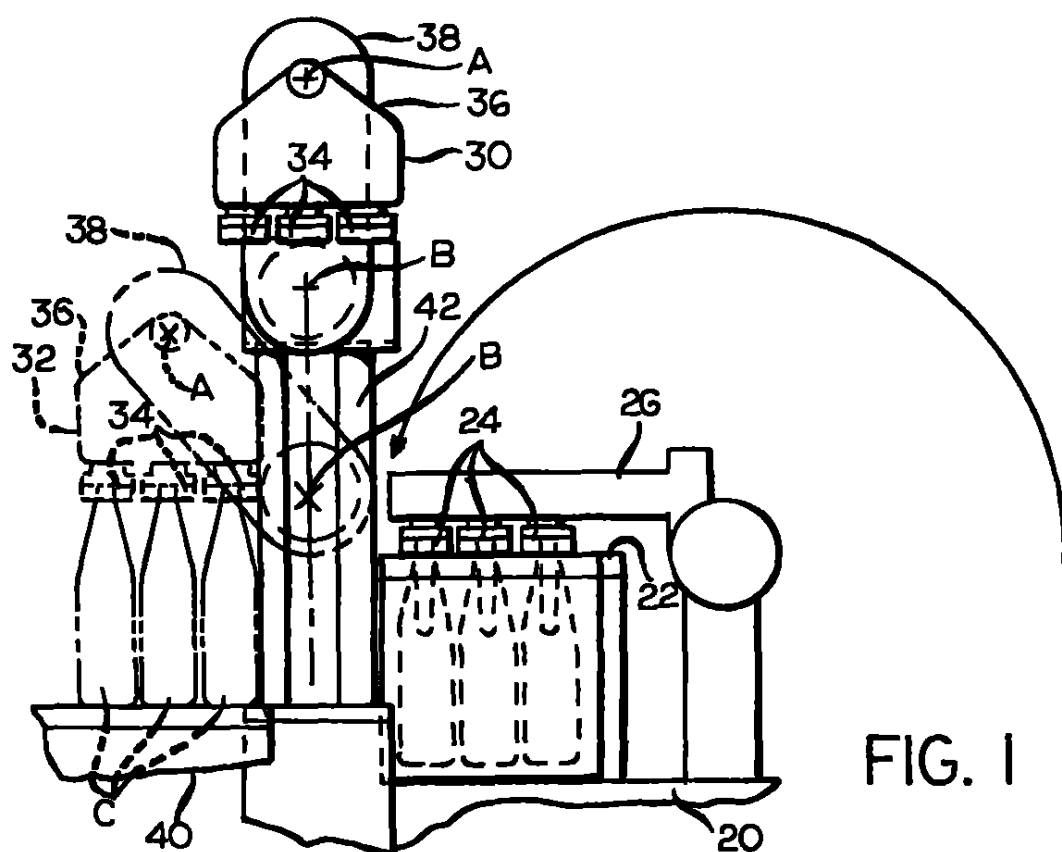
11/29/04


Notary Public

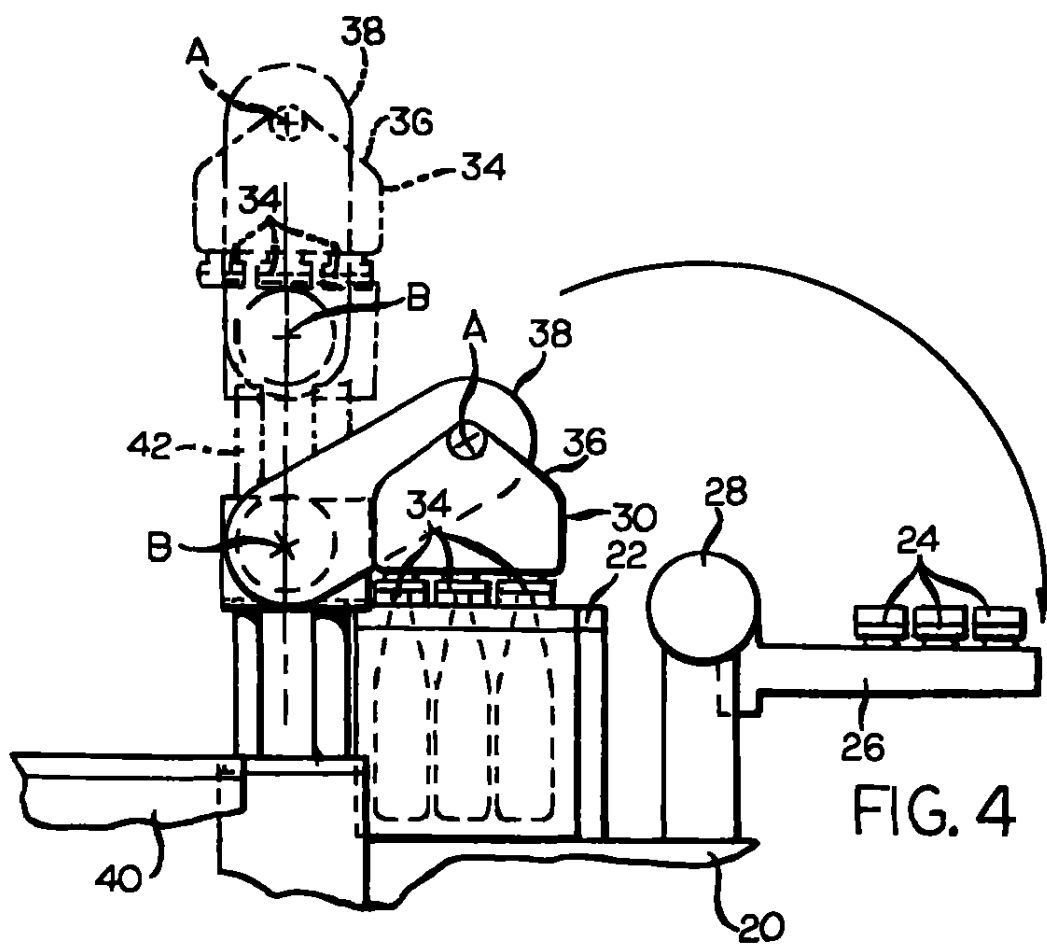
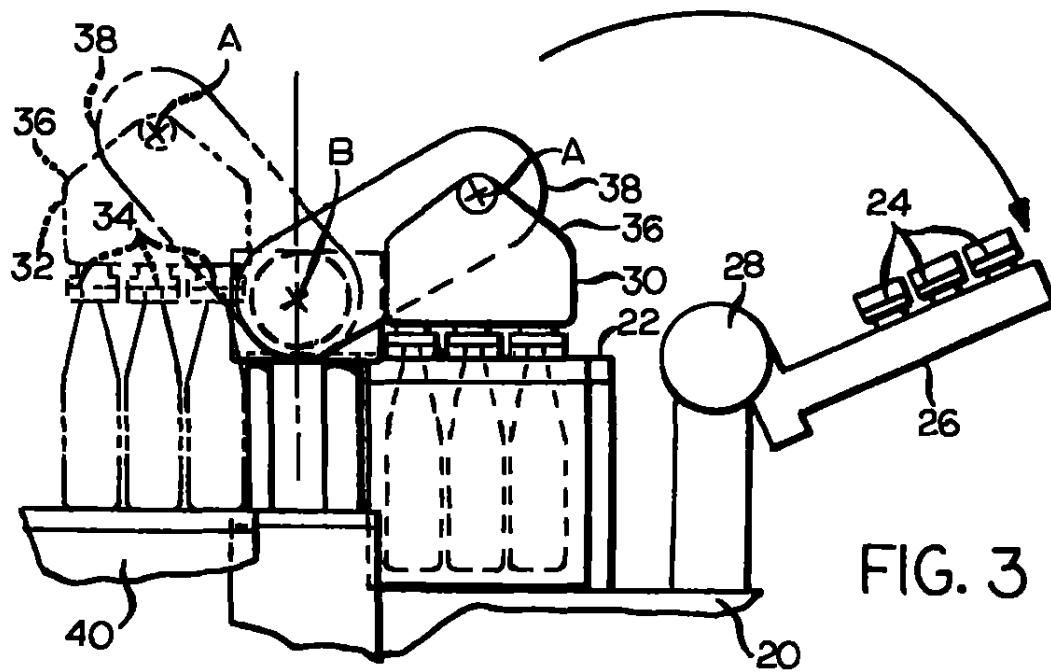
JOYCE M. MURPHY
Notary Public, State of Ohio
Commission Expires 11-29-04

U S Serial No _____ Filing Date _____

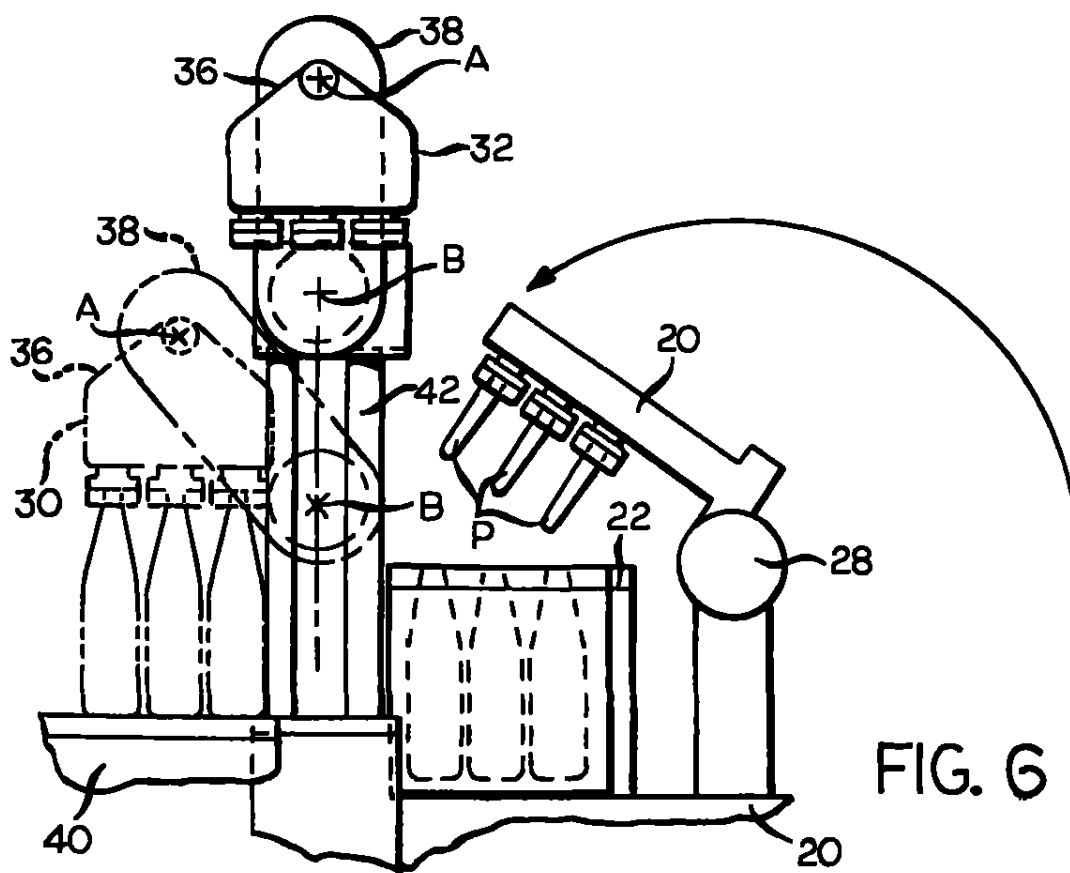
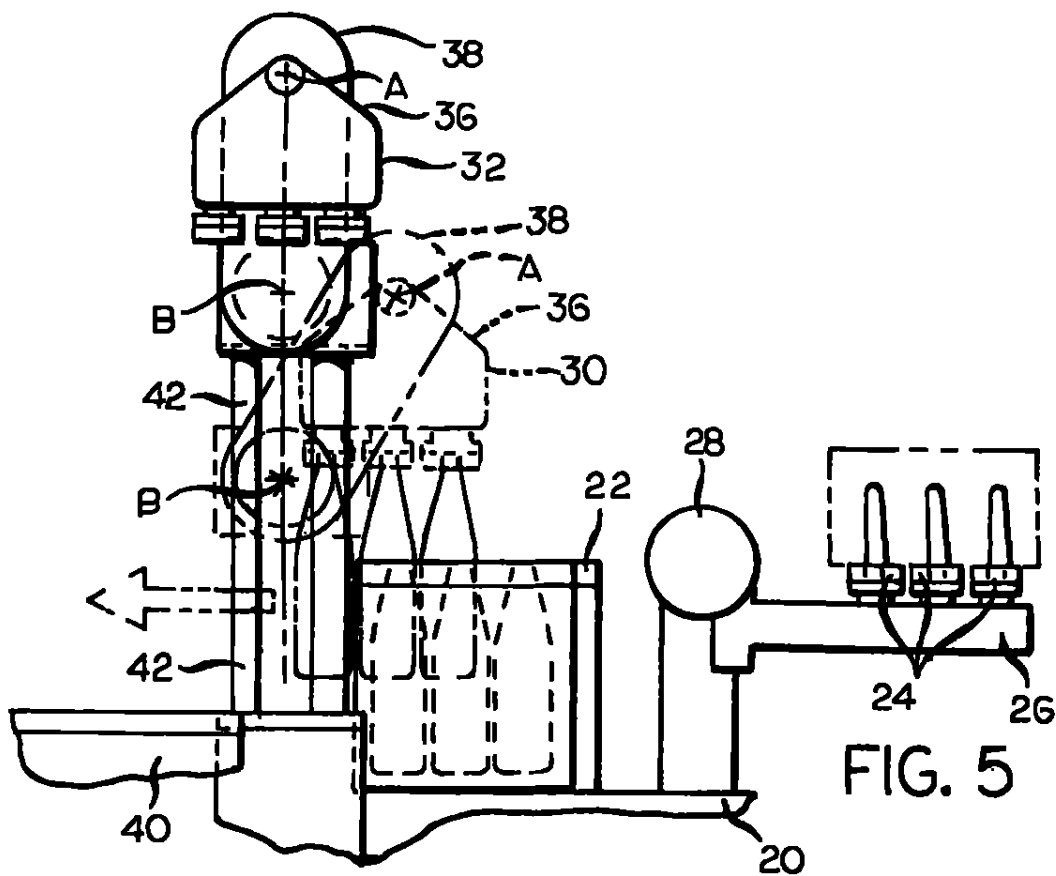
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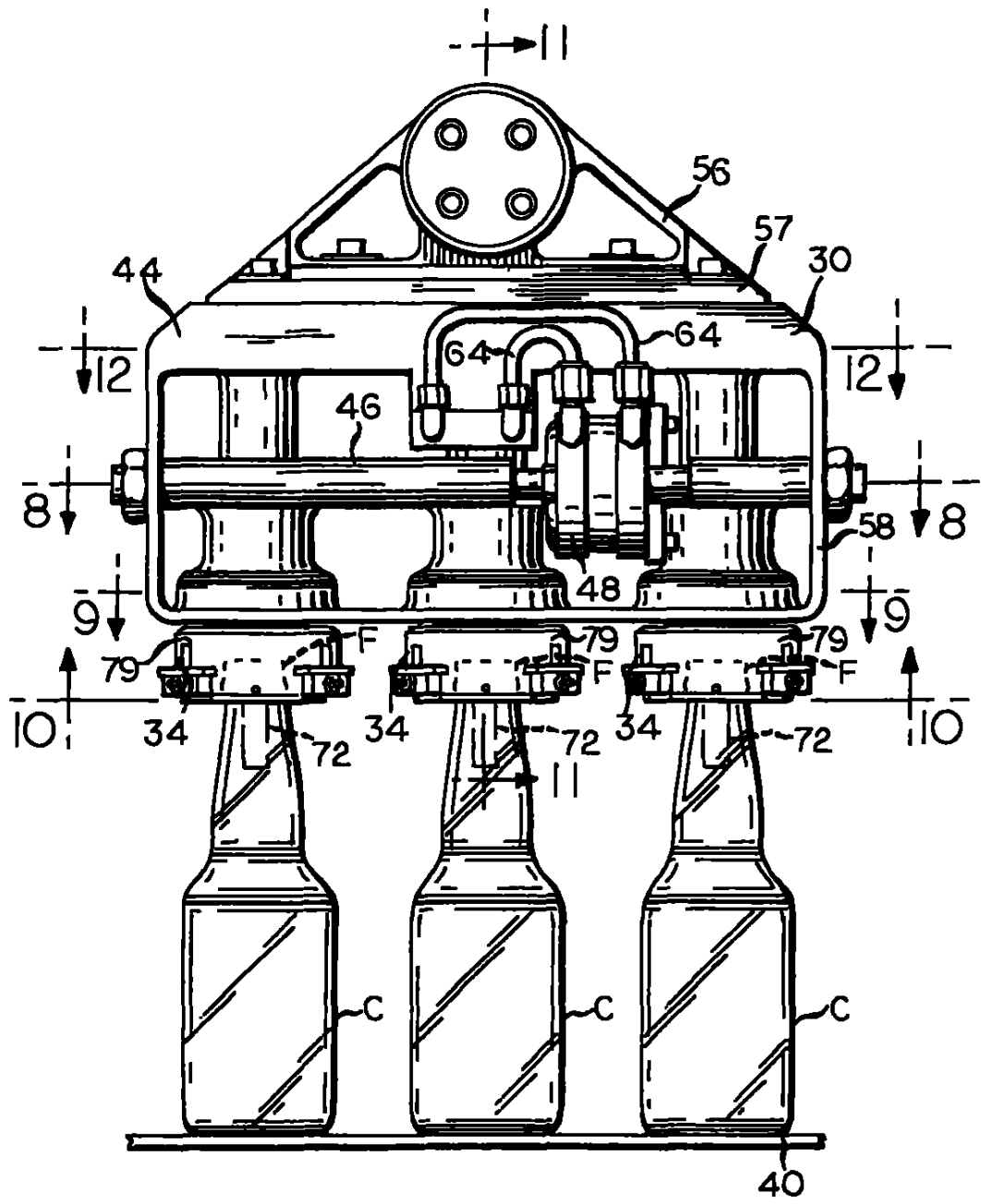


FIG. 7

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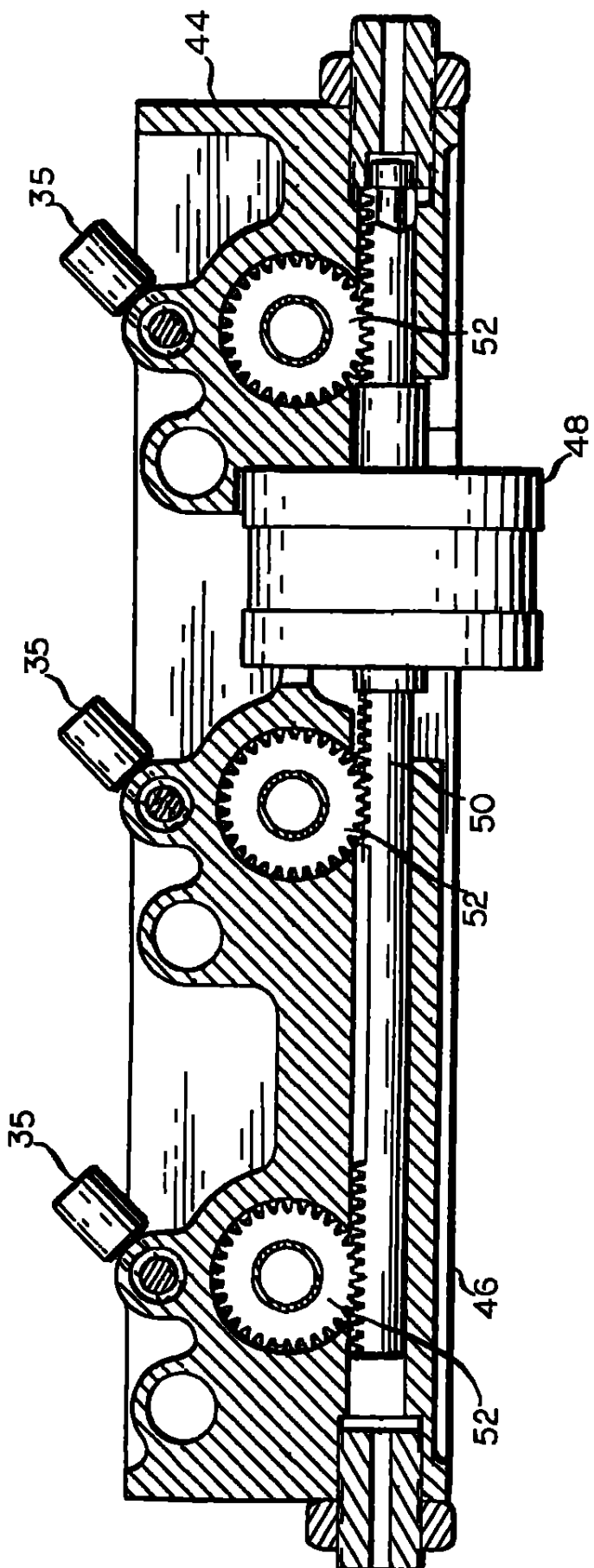


FIG. 8

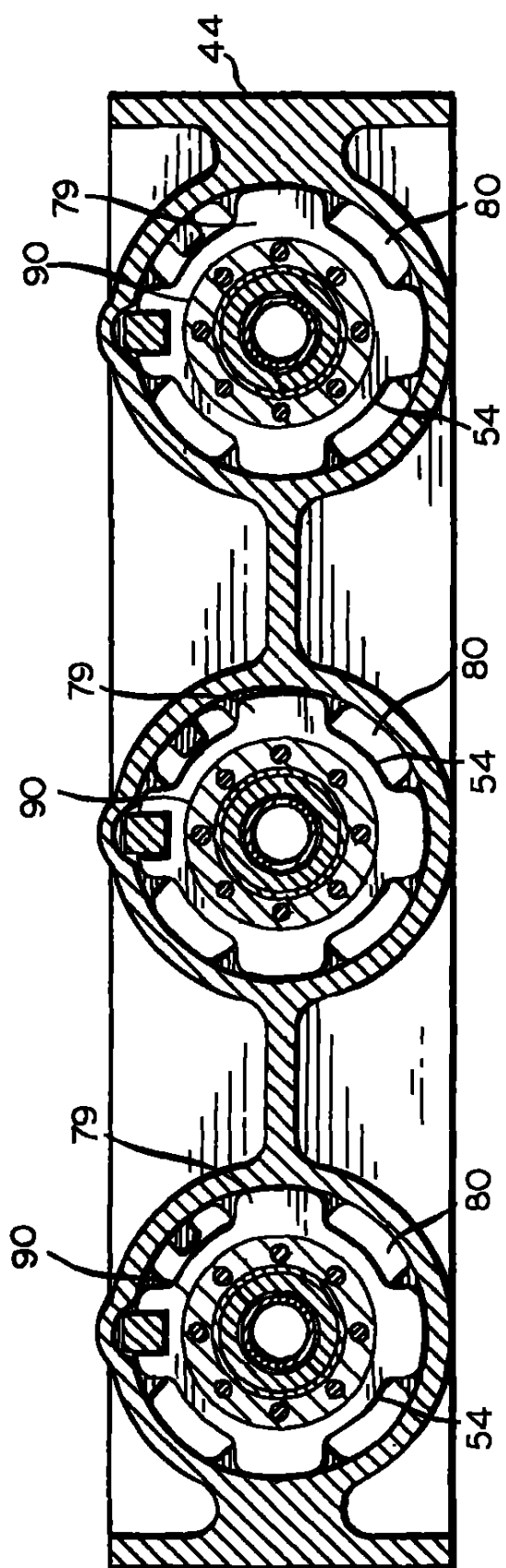


FIG. 9

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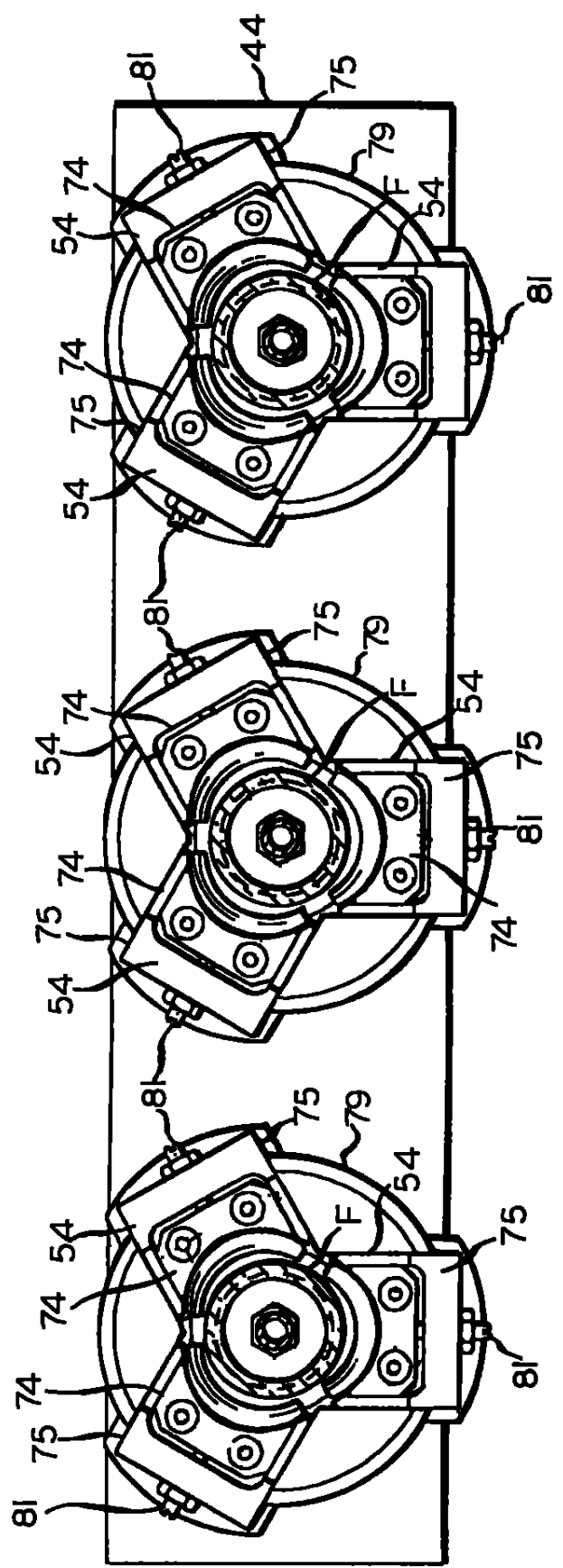


FIG.10

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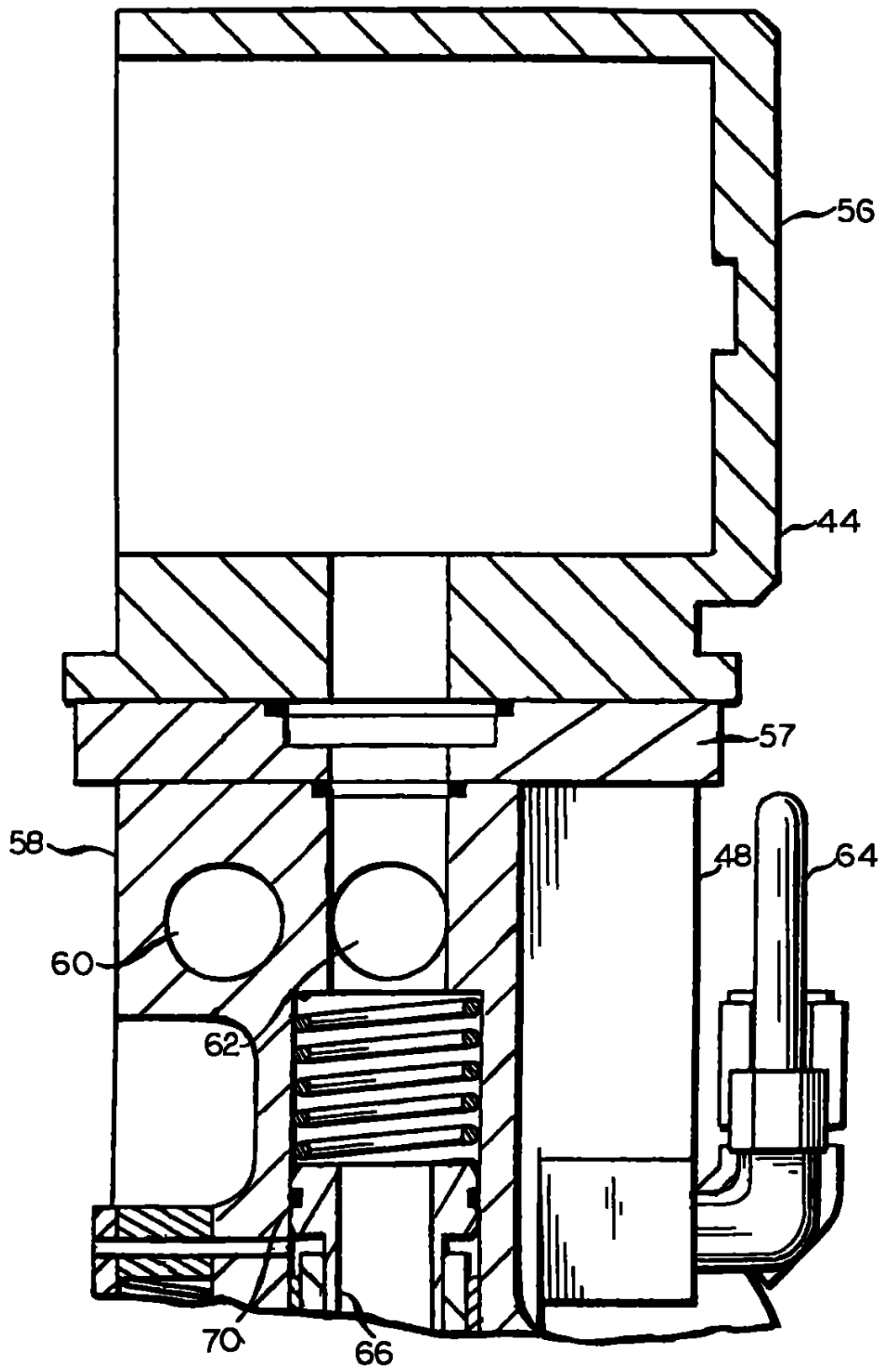


FIG. 11A

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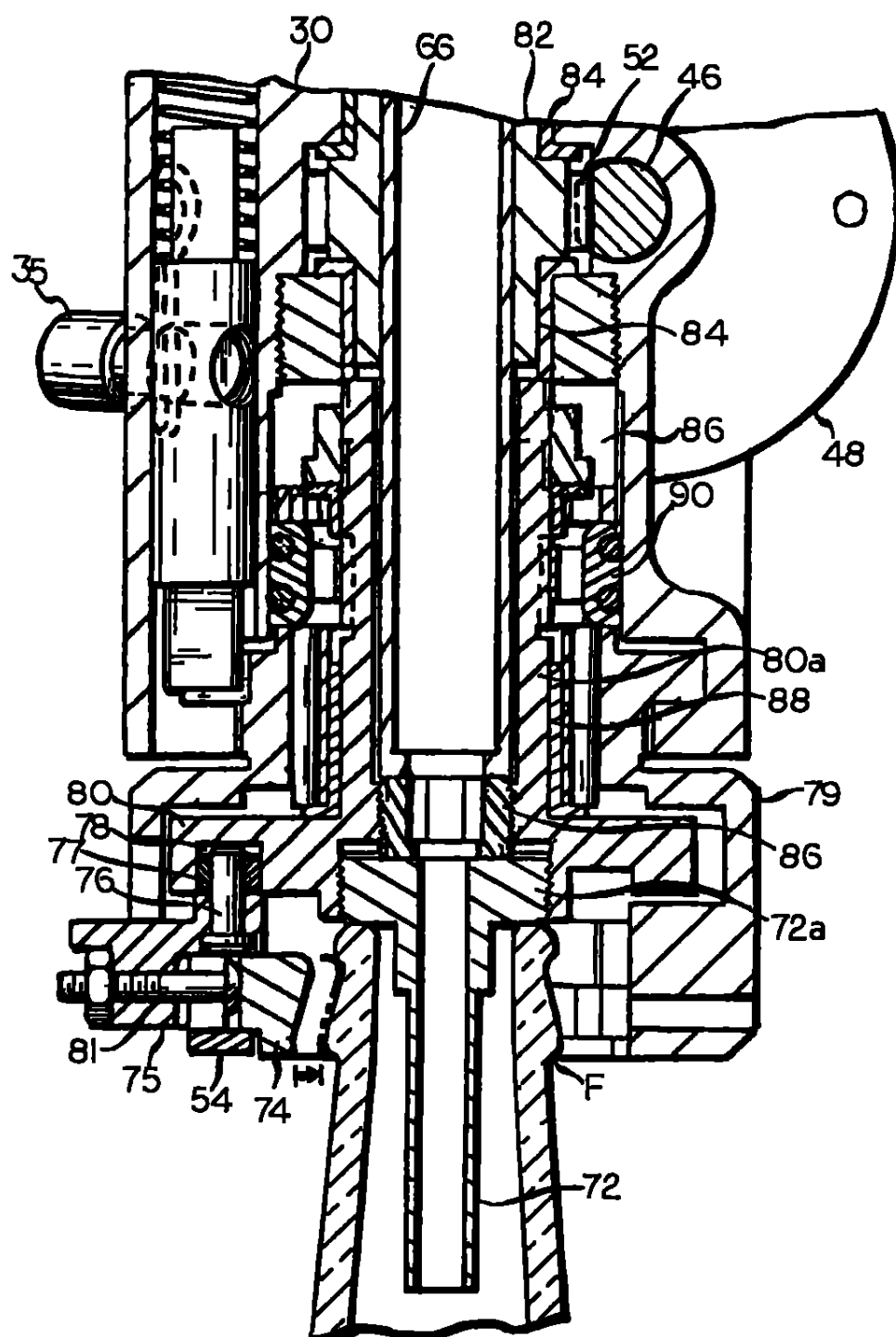


FIG. 11B

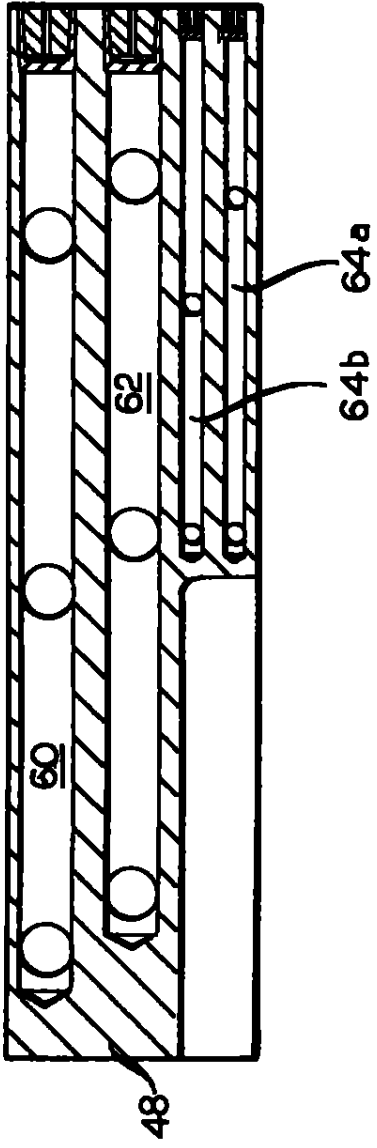


FIG. 12

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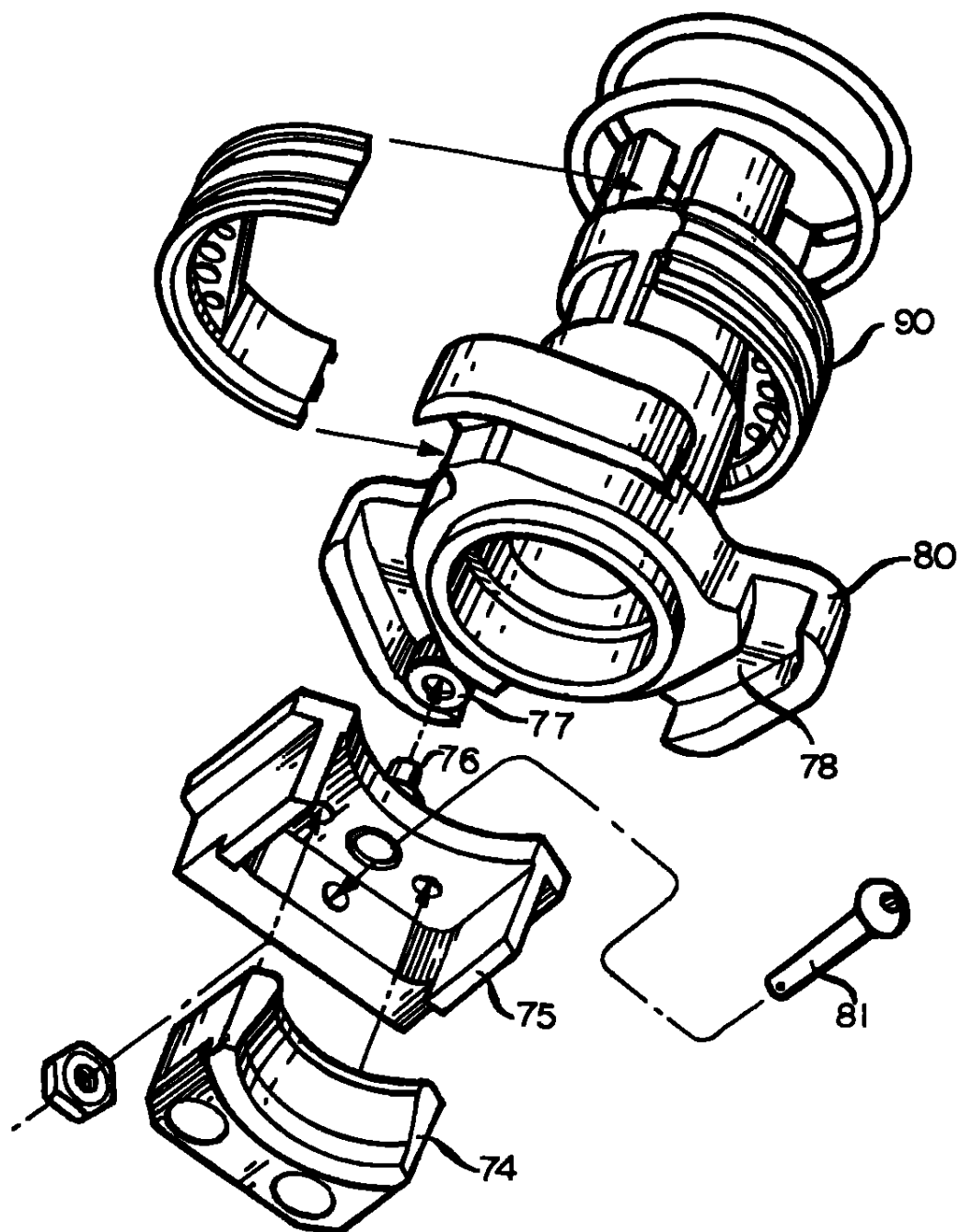
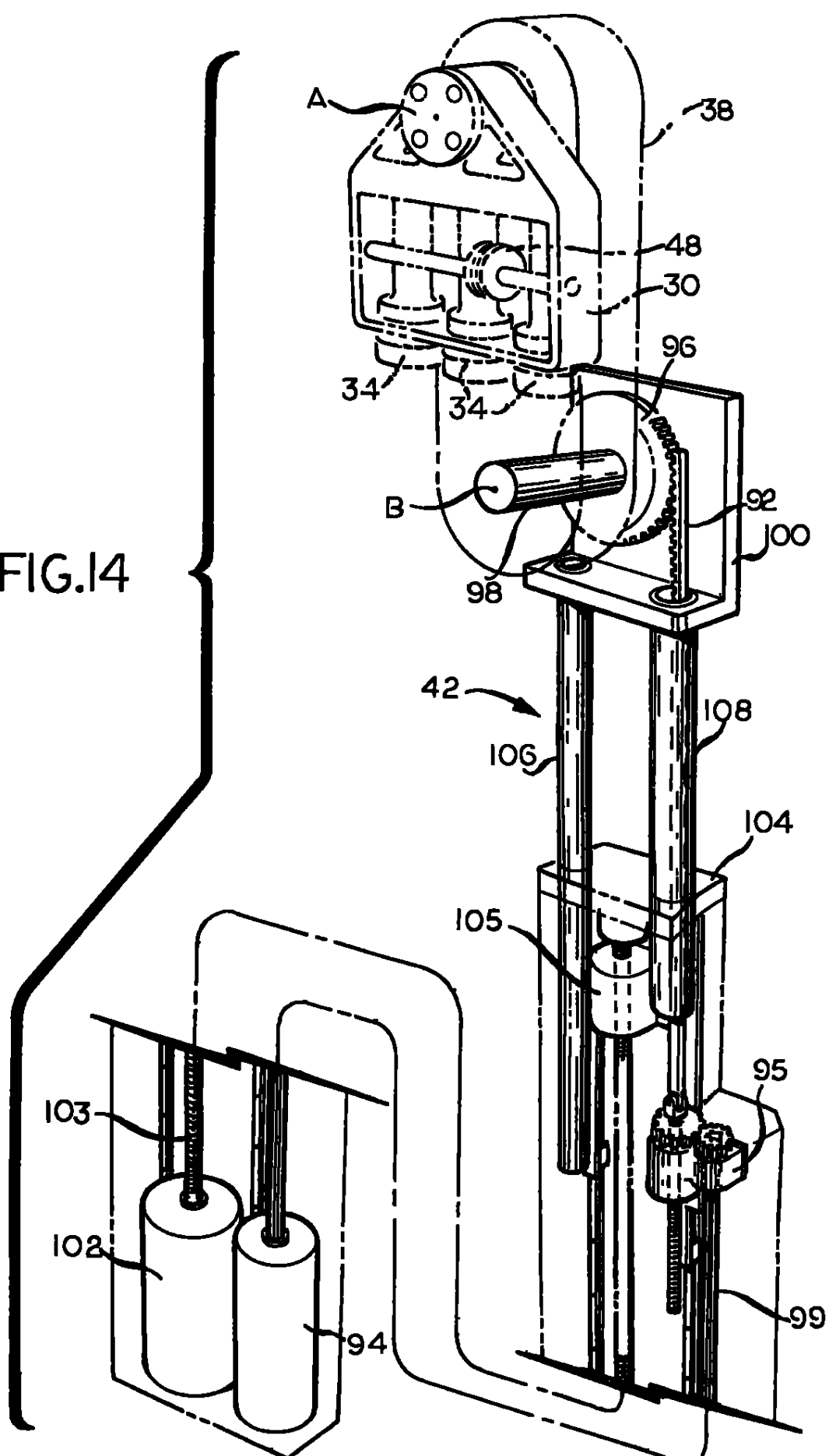


FIG. 13

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02

FIG.14



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PA 1008039

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

May 13, 2003

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM
THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK
OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT
APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A
FILING DATE UNDER 35 USC 111

APPLICATION NUMBER 10/161,966

FILING DATE June 03, 2002

By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS



T. Wallace
T WALLACE

Certifying Officer

6-5-02

10161966.060800

57 760

Approved for use through 10/31/2002 OMB 0851-0032

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

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UTILITY
PATENT APPLICATION
TRANSMITTAL

Attorney Docket No	17377 USA
First Inventor	D Wayne Leidy
Title	Method and Apparatus for Blowing and Removing Glass
Express Mail Label No	EL 507167573 US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

- 1 ☒ Fee Transmittal Form (e.g. PTO/SB/17)
(Submit an original and a duplicate for fee processing)
- 2 ☐ Applicant claims small entity status.
See 37 CFR 1.27
- 3 ☒ Specification [Total Pages 17]
(preferred arrangement set forth below)
- Descriptive title of the invention
 - Cross Reference to Related Applications
 - Statement Regarding Fed sponsored R & D
 - Reference to sequence listing, a table or a computer program listing appendix
 - Background of the Invention
 - Brief Summary of the Invention
 - Brief Description of the Drawings (if filed)
 - Detailed Description
 - Claim(s)
 - Abstract of the Disclosure
- 4 ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 12]
- 5 Oath or Declaration [Total Pages 2]
- a ☒ Newly executed (original or copy)
- b ☐ Copy from a prior application (37 CFR 1.63 (d))
(for continuation/divisional with Box 18 completed)
1. ☐ **DELETION OF INVENTOR(S)**
Signed statement attached deleting inventor(s)
named in the prior application see 37 CFR
1.63(d)(2) and 1.33(b).
- 6 ☐ Application Data Sheet. See 37 CFR 1.76

ADDRESS TO

Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

- 7 ☐ CD-ROM or CD-R in duplicate, large table or
Computer Program (Appendix)
8. Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)
- a ☐ Computer Readable Form (CRF)
- b. Specification Sequence Listing on
- i ☐ CD-ROM or CD-R (2 copies); or
- ii ☐ paper
- c. ☐ Statements verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

- 9 ☒ Assignment Papers (cover sheet & document(s))
10. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney
(when there is an assignee)
- 11 ☐ English Translation Document (if applicable)
- 12 ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
- 13 ☐ Preliminary Amendment
- 14 ☒ Return Receipt Postcard (MPEP 503)
(Should be specifically itemized)
15. ☐ Certified Copy of Priority Document(s)
(if foreign priority is claimed)
16. ☒ Nonpublication Request under 35 U.S.C. 122
(b)(2)(B)(i). Applicant must attach form PTO/SB/35
or its equivalent.
- 17 ☒ Other PTO/SB/81 (2)

18 If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76.

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP)

of prior application No. _____

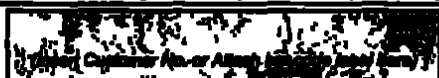
Prior application information

Examiner _____

Group Art Unit _____

For CONTINUATION OR DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

19. CORRESPONDENCE ADDRESS

☐ Customer Number or Bar Code Labelor ☒ Correspondence address below

Name	H G Bruss				
Address	Owens-Illinois, Inc.				
	One SeeGate 25-LDP				
City	Toledo	State	OH	Zip Code	43666
Country	USA	Telephone	419-247-8547	Fax	419-247-8555

Name (Print/Type)	H G Bruss	Registration No (Attorney/Agent)	24,389
Signature		Date	5/31/02

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer U.S. Patent and Trademark Office, Washington DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231

10161966 .0 0302

PTO/BB/17 (10-01)

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

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FEE TRANSMITTAL for FY 2002

Patent fees are subject to annual revision.

TOTAL AMOUNT OF PAYMENT (\$) 782 00

Complete if Known

Application Number
Filing Date
First Named Inventor D Wayne Ledy
Examiner Name
Group Art Unit
Attorney Docket No. 17377 USA

METHOD OF PAYMENT

- 1 ☒ The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:

Deposit Account Number 15-0875
Deposit Account Name Owens-Illinois, Inc

☒ Charge Any Additional Fee Required Under 37 CFR 1.18 and 1.17

☐ Applicant claims small entity status See 37 CFR 1.27

- 2 ☐ Payment Enclosed
☐ Check ☐ Credit card ☐ Money Order ☐ Other

FEE CALCULATION

1 BASIC FILING FEE

Large Entity Code	Small Entity Code	Fee Description	Fee Paid
101 740	201 370	Utility filing fee	740 00
106 330	206 165	Design filing fee	
107 610	207 285	Plant filing fee	
108 740	208 370	Release filing fee	
114 160	214 80	Provisional filing fee	

SUBTOTAL (1) (\$) 740 00

2. EXTRA CLAIM FEES

Total Claims 9
Independent Claims 4
Multiple Dependent
Extra Claims 20th = 0
3rd = 1
Fee from Index 42.00
Fee Paid 0.00
42.00
10.00

Large Entity Code	Small Entity Code	Fee Description
103 18	203 8	Claims in excess of 20
102 84	202 42	Independent claims in excess of 3
104 280	204 140	Multiple dependent claim, if not paid
109 84	209 42	** Release independent claims over original patent
110 18	210 8	** Release claims in excess of 20 and over original patent

SUBTOTAL (2) (\$) 42 00

*for number previously paid, if greater For Releases, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Code	Small Entity Code	Fee Description	Fee Paid
105 130	205 65	Surcharge late filing fee or oath	
127 80	227 25	Surcharge late provisional filing fee or cover sheet	
139 130	139 130	Non-English specification	
147 2,520	147 2,520	For filing a request for ex parte reexamination	
112 620*	112 620*	Requesting publication of BIR prior to Examiner action	
113 1,840*	113 1,840*	Requesting publication of BIR after Examiner action	
115 110	215 55	Extension for reply within first month	
116 400	216 200	Extension for reply within second month	
117 920	217 460	Extension for reply within third month	
118 1,440	218 720	Extension for reply within fourth month	
128 1,960	228 980	Extension for reply within fifth month	
119 320	219 160	Notice of Appeal	
120 320	220 160	Filing a brief in support of an appeal	
121 280	221 140	Request for oral hearing	
138 1,510	138 1,510	Petition to institute a public use proceeding	
140 110	240 55	Petition to revive unavoidable	
141 1,280	241 640	Petition to revive unintentional	
142 1,280	242 640	Utility issue fee (or release)	
143 460	243 230	Design issue fee	
144 620	244 310	Plant issue fee	
122 130	122 130	Petitions to the Commissioner	
123 80	123 80	Processing fee under 37 CFR 1.17(c)	
126 180	126 180	Submission of Information Disclosure Sheet	
581 40	581 40	Recording each patent assignment per property (times number of properties)	
146 740	246 370	Filing a submission after final rejection (37 CFR § 1.129(a))	
148 740	248 370	For each additional invention to be examined (37 CFR § 1.129(b))	
178 740	278 370	Request for Continued Examination (RCE)	
188 900	188 900	Request for expedited examination of a design application	

Other fee (specify)

*Reduced by Basic Filing Fee Paid SUBTOTAL (3) (\$) 0 00

SUBMITTED BY

Name (print name) H G BRUSE

Signature

Registration No. 24,389

(Address/Phone)

Complete if applicable

Telephone 419-247-8547

Date

5/31/02

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REQUEST AND CERTIFICATION UNDER 35 U.S.C. 122(b)(2)(B)(i)	First Named Inventor	D. Wayne Leidy
	Title	Method and Apparatus for Blowing and Removing Glass Containers
	Atty Docket Number	17377 USA

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METHOD AND APPARATUS FOR BLOWING AND REMOVING GLASS CONTAINERS

FIELD OF THE INVENTION

5 This invention relates to a method of and an apparatus for blowing glass containers in molds of a glass container forming machine and for removing blown containers from such molds. More particularly, this invention relates to a method of and an apparatus for blowing glass containers in blow molds of an I S (Individual section) glass container forming machine, and for
10 thereafter removing blown containers from such molds and transferring the blown containers to a deadplate of the machine for cooling and eventual removal for further processing.

BACKGROUND OF THE INVENTION

15 U S Patents 3,472,639 (Mumford) and 4,427,431 (Mumford et al), which were assigned to a predecessor of the assignee of this application, the disclosure of each of which is incorporated by reference herein, generally describe the manufacture of glass containers by a machine type that is known as an I S machine. As taught by such references or as is otherwise known,
20 an I S machine has a plurality of side-by-side sections, usually six, eight, ten or even twelve sections, and containers are formed in each section in a two-step process. In the first step, one or more, and often three or four, container preforms, which are often called parisons or blanks, are formed by blowing or pressing. The preforms, which are formed in an inverted orientation, that is,
25 with their open ends down, have body portions that are formed in split molds, often called blank molds. Threaded or otherwise suitable configured closure-receiving finish portions of such preforms are formed in separate molds, usually referred to as neck molds or neck rings, which are positioned adjacent to the split blank molds during the molding of parisons therein.
30 After the conclusion of the parison molding step, the split molds open and the parisons, which are then gripped by the neck molds, are transferred

by inverting them through an arc of 180° to split blow molds for blowing of the parisons into containers. The inverting step is performed by turning an invert shaft, to which neck mold-carrying arms are slideably affixed, and results in the parisons being upright during blow molding, that is with their open ends up

5 The transferring of glass container parisons or blanks from blank molds to blow molds of a I S machine, as generally described above, is generally described in commonly-assigned U S Patents 5,893,942 (Nickey et al) and 6,098,427 (Kirkman), the disclosure of each of which is also incorporated by reference herein.

10 Conventionally, as is explained, for example, in U S Patent 3,630,709 (Irwin), which was assigned to a predecessor of the assignee of this application, the disclosure of which is also incorporated by reference herein, containers are blown in blow molds of an I S machine by a blowhead that is moved into blowing engagement with the parisons in the blow molds at a

15 given I S machine section, and is then moved out of engagement with blown containers at such blow molds. The blown containers are then removed from the blow molds, after the split molds are opened, by a takeout mechanism that is equipped with a plurality of tongs, one set of tongs for each blow mold at the section of the I S machine with which the takeout mechanism is associated

20 Commonly-assigned U S Patent 6,241,448 B1 (Nicholas), the disclosure of which is also incorporated by reference herein, describes a takeout mechanism as generally described above for removing blown containers from molds of an I S machine section. U S Patent 5,807,419 (Rodriguez-Wong et al) describes an I S machine in which the functions of a blowhead and a

25 takeout mechanism are combined in a single mechanism. However, the mechanism of the '419 reference teaches the use of conventional pivoting tongs (elements 72, 73) to engage each container below a bead, called a transfer bead, that is positioned below the threaded or otherwise configured finish of a container, and this requires that the split blow mold be opened

30 before the blown containers can be grasped for removal by the tongs. The requirement that blow molds be opened before the blown container can be

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grasped by tongs is a machine timing disadvantage for reasons explained in the aforesaid '488 B1 patent.

BRIEF DESCRIPTION OF THE INVENTION

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According to the present invention there is provided a combined blowhead/takeout mechanism for an I S glass container forming machine, and a method for blowing glass containers in blow molds of such a glass container forming machine and removing blown containers from such molds

10 The apparatus includes a container finish engaging chuck for each of the containers that are simultaneously formed at a section of the I S machine, and each chuck includes a plurality, preferably three, circumferentially spaced-apart elements that move in and out, in unison, to engage a container by its finish. In this way, the container may be engaged by the
15 chuck while the split molds in which the container is being blown remain closed, to thereby permit the container to be removed for transfer to a deadplate of I S machine immediately upon the opening of the split molds of the blow molding in which the container was formed. This eliminates the lost cycle time of certain prior arts takeout devices, such as that of the
20 aforesaid '419 patent, which require that the split mold be opened before a container with a transfer bead can be engaged by the takeout device.

In a preferred embodiment of the present invention, a pair of combined blowhead/takeout mechanisms is provided at each section of an I S machine. The combined mechanisms are timed to operate alternatively
25 so that one combined mechanism can be positioned to blow containers in the blow molds of the machine while the other combined mechanism is positioned, after depositing blown containers on the machine deadplate, to immediately return to the blow molds to begin a repeat of the blow molding cycle. This eliminates lost cycle time that can arise in an I S machine with
30 only a single blowhead at each machine section, as the blowing cycle can not begin until the blowhead returns from having deposited blown containers.

on the machine's deadplate. To avoid collision of the separate combined mechanisms during operation, the pivot axis of the pivoting arm of each combined mechanism is moveable in a vertical plane, so that the incoming combined mechanism can be positioned at an elevation above that reached by the outgoing combined mechanism during its pivoting motion to transfer blown containers from the blow molds to the machine deadplate. The use of a pair of combined blowhead/takeout mechanisms in this manner improves forming cycle time because it ensures that a combined blowhead/takeout mechanism will be positioned at the blow molds when the molds close around parisons that were transferred to the molds without the need to wait for the return of a blowhead from the machine deadplate after depositing previously blown containers thereon.

Accordingly, it is an object of the present invention to provide an improved apparatus and method for blowing containers from parisons of formable glass in blow molds of a glass container forming machine and for transferring blown containers from the blow molds to a different position for further processing. More particularly, it is the object of the present invention to provide an improved method and apparatus of the foregoing character in which the parisons are blown in blow molds of a glass container forming machine of the I S type, and are then transferred to a deadplate of the I S machine for cooling and eventual further processing.

For a further understanding of the present invention and the objects thereof, attention is directed to the drawing and the following brief description thereof, to the detailed description of the invention and to the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Figs 1 - 6 are schematic elevational views showing apparatus according to the present invention at different positions during the operating cycle of such apparatus.

Fig 7 is an elevation view at an enlarged scale, of a portion of the apparatus of Figs 1 - 6,

Fig 8 is a sectional view taken on line 8-8 of Fig 7,

Fig 9 is a sectional view taken on line 9-9 of Fig 7,

5 Fig 10 is a sectional view taken on line 10-10 of Fig 7,

Figs 11A, 11B, collectively, constitute upper and lower views, respectively, and at an enlarged scale taken on line 11-11 of Figs 7,

Fig 12 is a sectional view taken on line 12-12 of Figs 7,

10 Fig 13 is an exploded, perspective view of a portion of the apparatus of Figs 7 - 12, and

Fig 14 is an exploded, perspective view at an enlarged scale, of another portion of the apparatus of Figs 1 - 6

15 DETAILED DESCRIPTION OF THE INVENTION

As is shown schematically in Figs 1 - 6, an I S machine section 20, shown fragmentarily, is provided with a set of blow molds 22 in which containers C are blown from blanks or parisons P of a glass composition at a
20 suitable high temperature to be formable by blowing Figs 1 - 6 show three containers being formed in each set of blow molds, but it is to be understood that the invention is suited for use in I S machines that are designed to simultaneously produce as many as four containers at each machine section (a "quad" machine), or even as few as one container at each such section In
25 any case, as is understood in the art, each set of blow molds 22 is made up of an opposed set of split molds that periodically open and close with respect to each other by counteroscillating or counterrectilinear motions to define, when closed, a cavity for each container C to be formed therein

The parisons P to be formed into the containers C in the mold set 22
30 are transferred thereto from a blank molding side of the machine section by neck molds 24, as shown specifically in Fig 5 The neck molds 24 are

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carried by an invert or neck mold arm assembly 26 that is connected to an oscillatable invert or neck mold shaft 28, often referred to as a rock shaft, that oscillates in a 180° arc between the position shown on Fig 1 and the position shown in Fig 5. Upon the transfer of the parisons P to the mold set 22, the invert arm assembly 26, with the neck molds 24 carried thereby, reverts from the Fig 1 position to the Fig 5 position to begin a repeat of the glass container manufacturing process in the mold set 22, following the removal of the previous blown containers C therefrom.

The I S machine section 20 is provided with a side-by-side pair of combined blowhead/takeout mechanisms 30, 32, each of which carries a plurality of individual blowheads 34, one such blowhead 34 for each container C being formed in the mold set 22. The blowhead mechanism 30 is shown in detail in Figs 7 - 13 at the position shown in Figs 6, but it is to be understood that the blowhead 32 is of the same construction as the blowhead 30. In any case, each of the blowhead mechanisms 30, 32 is made up of a carrier arm 36, from which the blowheads 34 are suspended, and an oscillating arm 38, from which the carrier arm 36 is suspended for pivoting motion from the oscillating arm 38 about an axis A. Each carrier arm 36 is pivoted from the oscillating arm 38 of the blow head mechanism 30 or 32 of which it is an element by a parallel linkage or other equivalent structure in a known manner, to ensure that it does not change the angular position of the blowheads 34 that are carried by the carrier arm 36 as the oscillating arm 38 oscillates, for example, from the position of the blowhead mechanism 30 in Fig 1 to its position in Fig. 6.

Fig 1 depicts the position of the blowhead mechanism 32 immediately above a deadplate 40 of the I S machine section 20 to be able to deposit blown containers C thereon. In this condition of the apparatus, the blowhead mechanism 30 is positioned in vertical alignment with a tower 42 to which the blowhead mechanism 30 is secured for pivoting motion about an axis B. Likewise, the blowhead mechanism 32 is secured for pivoting motion about an axis B to a second tower (not shown), which is immediately behind and a

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mirror image of the tower 42 in that regard the pivot axis B for each of the blowhead mechanisms 30, 32 is vertically moveable, by structure that will be hereinafter described in greater detail between a lower position, for example, that of the blowhead mechanism 32 in Fig 1, to the higher position of the blowhead mechanism 32 in Fig 4, to permit the blowhead mechanisms 30, 32 to oscillate between the positions shown in Fig 1 and the positions shown in Fig 4 without interfering contact between the blowhead mechanisms 30, 32, which are aligned in the same vertical plane In this manner, the blowheads 34 of the blowhead mechanism 32 will be positioned to immediately engage parisons P in the molds 22 while the blowhead mechanism 30 is enroute to deposit containers C on the deadplate 40 as can be seen from a comparison, for example, of Figs 4 and 6 This permits a substantial calculated reduction in cycle time between the removal of the set of containers C from the mold set 22 and the removal of the next set of containers C from the mold set 22, compared to an installation using only a single blowhead/takeout mechanism, of approximately 13%, and it does so without reducing the time available for the cooling of the containers C on the deadplate 40 before it is necessary to remove partly-cooled containers C from the deadplate 40 to accommodate the transfer of freshly formed containers C to the deadplate 40 Alternatively, cycle improvement can be somewhat reduced by moving the blowheads 30, 32 more slowly to reduce inertial forces on the blown containers C In any case, the reduction in cycle time can be enhanced by approximately 4%, that is to a total of approximately 17%, if each pair of combined blowheads/takeout mechanisms is adapted to engage blown containers C by finishes before the split molds of the mold set 22 are separated, without the need to delay the engagement of containers C until the split molds are open, which is required when transferring blown containers from the mold set 22 by engagement of a transfer bead by tongs of a conventional takeout mechanism This phenomenon is described in the aforesaid '488 B1 patent Further, the use of blowheads to transfer blown

containers C to the deadplate 40 permits partial cooling of the containers C by blowing air going to the blowhead 30 or 32 during the transfer step

As shown in Fig 7, the blowhead mechanism 30 has a generally trapezoidal-shaped frame 44 that carries the blowheads 34, each of which is quickly disengageable from the frame 44 by way of a disconnect 35 (Fig 11B) The frame 44 is provided with a split annular member 46 that extends therethrough, above and parallel to the orientation of the containers C that are carried by the blowhead 30 A reversing, double acting pneumatic cylinder 48 is positioned between the ends of the annular member 46, and the cylinder 48 drives a split rack 50 (Fig 8) that extends from opposed ends through the annular member 46 The split rack 50, which reciprocates but does not rotate, engages, in a right-angle drive, a screw 52 associated with each of the blowheads 34 to simultaneously open or close a container finish-engaging tong or chuck assembly 54 (Figs 9, 10) that is associated with each of the blowheads 34

As shown in Figs 7, 11A, the frame 44 is made up of a generally triangularly-shaped upper member 56 bolted or otherwise adjustably secured to a lower member 58 with an alignment plate 57 positioned therebetween to ensure proper alignment between the upper member 56 and the lower member 58, which have aligned openings therein The upper member 56 is affixed to the oscillating arm 38 for oscillation with the oscillating arm 38 between the position shown in Figs 3 and 4 and the position shown in Figs 6, and the lower member 58 carries the elements associated with each of the blowheads 34 As shown in Fig 12, cooling air for the cooling of each of the blowheads 34 is circulated through a passage 60 in the lower member 58, and blow air for blowing parisons P into containers C, in the position of the blowhead mechanism 30 shown in Figs 3, 4, is introduced through a passage 62 in the lower member 58 The air for the operation of the cylinder 48, which is shown as a pair of like cylinders disposed tail end to tail end, is introduced through inlet lines 64, which receive air from passages 64a, 64b in the lower member 58 Blowing air from the passage 62 blows downwardly

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into a parison P that is being blown into a container C through a transfer tube 66, an upper end which is resiliently biased downwardly by a compression spring 68, an O-ring 70 being provided to permit sealed, sliding motion between an enlarged upper end of the transfer tube 66 and a passage in the lower member 58 in which the upper end of the transfer tube 66 is positioned. A lower end of the transfer tube 66 seats against and discharges into an upper end of a blow air inlet tube 72 (Fig. 11B) that extends into a parison P or a container C, as the case may be, that is engaged by the blowhead 34 with which the air inlet tube 72 is associated.

Each tong assembly 54 carries a circumferentially-spaced plurality, shown as three, tong elements 74 that simultaneously are powered to move radially either inwardly to grasp a finish F (Fig. 11B) of a container C or outwardly to release the finish F of the container C. While the container C is shown as having a finish F for the application of a crown closure to the container C, it is also contemplated that the finish F engaging surface of the tong elements 74 may be configured to handle containers C with threaded finishes F. In that regard, each of the tong elements 74 is retained within a tong holder 75 and has an upwardly extending pin 76 that is received in an annular cam follower 77, which rides in a noncircular slot 78 of a lobe of an oscillating cam 80. Oscillation of the cam 80 by the extension and retraction of the split rack 50, is effective to simultaneously move the tong elements 74 of each of tong assembly 54 into or out of engagement with a finish (F) of a container (C). The assembly that includes the tong elements 74 and the tong body 76 is slidable within an annular tong housing 79, and rearward travel of such assembly is limited by a pin 81, whose position along its longitudinal central axis is adjustable.

The screw 52 of each blowhead 34 is secured to an annular member 82 that surrounds the transfer tube 66, bushings 84 being provided within a recess 86 in the blowhead mechanism 30 at opposed ends of the transfer tube 82 to permit it to oscillate, with the screw 52 and the transfer tube 66, around the longitudinal central axis of the transfer tube 66. A lowermost end

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of the transfer tube 66 is provided with an externally threaded plug 66 and the cam 80, which has an upstanding annular portion 80a that is rotatable in a bushing 88, is threadably secured to an exterior of the plug 66 to be rotatable therewith. The cam 80 is also threadably secured to an extension of an upper portion 72a of the air inlet tube 72 to be rotatable therewith, thus, reciprocation of the split rack 50 is effective to oscillate the screw 52, and, thereby, to oscillate the cam 80 to move the tong elements 74 inwardly and outwardly, as desired. However, an annular brake assembly 90 is provided surrounding a portion of upstanding portion 80a of the cam 80 to prevent oscillating motion of the cam 80 when desired.

Fig. 14 illustrates apparatus, which has previously been identified as the lower A2, for raising and lowering the axis of the blowhead mechanisms 30, 32. Fig. 14 illustrates such apparatus specifically in reference to the blowhead mechanism 30, and the tower 42 to which it is pivotably secured, but it is to be understood that apparatus for raising and lowering the blowhead mechanism 32 is the same in design and construction as that for the blowhead mechanism 30. The oscillation of the arm 38 about the axis B is powered by a rack 92, whose rectilinear motion is powered by a reversible motor 94, preferably an a.c. servo motor for optimum controllability. Oscillation of the motor 94 results in oscillation of a gear assembly 95, which slides upwardly and downwardly on a ball spline 99 that extends to the gear assembly 95 from the motor 94. The rack 92 drives a spur gear 96 that is affixed to a shaft 98, through which the axis B extends and to which the arm 38 is connected for turning with the shaft 98.

The shaft 98 is rotatably mounted in a bracket 100, and the elevation of the bracket 100, and thereby that of the shaft 98 and the oscillating arm 38, is adjustable based on a rotary motor 102, preferably an a.c. servo motor, which engages a screw 103 that elevates or lowers a bracket 104 from which the bracket 100 is supported by vertical support 106, 108, the support 108 being annular and surrounding a lowermost portion of the rack 92. Thus, the oscillation of the shaft 98, and thereby of the oscillating arm 38, is powered by

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the motor 94, independently of the raising and lowering of the shaft 98, and thereby the oscillating arm 38, which is powered by the motor 102, subject to an electronic or other control system, which may be of conventional construction, that is used to control the operation of the motor 94 and the
5 motor 102 in a timed sequence relative to one another

Although the best mode contemplated by the inventors for carrying out the present invention as of the filing date hereof has been shown and described herein, it will be apparent to those skilled in the art that suitable modifications, variations, and equivalents may be made without departing
10 from the scope of the invention, such scope being limited solely by the terms of the following claims and the legal equivalents thereof

CLAIMS

What is claimed

1 A combined takeout and blowhead assembly for a glass
container forming machine, said combined takeout and blowhead assembly
5 comprising

a first pivoting arm, said first combined takeout and blowhead
mechanism for injecting blowing air into glass containers being blown in
molds of the forming machine and for then grasping the containers,

10 a first combined takeout and blowhead mechanism being
mounted near a free end of said first pivoting arm and away from a pivot axis
of said first pivoting arm,

means for oscillating said first pivoting arm to move said first
combined takeout and blowhead mechanism between a position in alignment
with glass containers in the molds of the forming machine and a position in
15 alignment with a deadplate of the forming machine,

means for raising and lowering the pivot axis of said first pivot
arm,

20 a second combined takeout and blowhead mechanism for
injecting blowing air into a second group of glass containers being blown in
the molds of the forming machine and for then grasping the second group of
containers,

a second pivoting arm, said second combined takeout and
blowhead mechanism being mounted near a free end of said second pivoting
arm and away from a pivot axis of said second pivoting arm,

25 means for oscillating said second pivoting arm to move said
second combined takeout and blowhead mechanism between a position in
alignment with the second group of glass containers in the molds of the
forming machine and a position in alignment with the deadplate of the forming
machine, and

30 means for raising and lowering the pivot axis of said second
pivoting arm,

wherein one of the pivot axis of said first pivoting arm and the pivot axis of said second pivoting arm is raised with respect to the pivot axis of the other of said first pivoting arm and the pivot axis of said second pivoting arm when one of said first pivoting arm and said second pivoting arm is being moved to a position in alignment with the glass containers in the molds of the forming machine to avoid contact between said first combined takeout and blowhead mechanism and said second combined takeout and blowhead mechanism during oscillation of said first pivoting arm and during oscillation of said second pivoting arm

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2 Apparatus according to claim 1 wherein said first combined takeout and blowhead mechanism comprises

a chuck having a circumferentially spaced-apart plurality of chuck elements arranged in an annular array, said chuck elements being simultaneously movable solely in a horizon plane between first positions surrounding a finish of a glass container, but out of contact with the glass container, and second positions in contact with the finish of the glass container, and

means for simultaneously moving the chuck elements between the first positions and the second positions

3 Apparatus according to claim 2 wherein said means for simultaneously moving the chuck elements between the first positions and the second positions comprises

25 an annular cam, said annular cam having a circumferentially spaced apart plurality of double-ended, non-circular slots therein, a non-circular slot for each of said chuck elements,

wherein each of said chuck elements has a pin that is received in one of the non-circular slots of the cam, and

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means for oscillating said cam to move the pin of each of said chuck elements from one position in the non-circular slot in which it is received to a second position in a non-circular slot in which it is received

5 4 Apparatus according to claim 3 wherein said means for oscillating said cam comprises.

a rack,

means for moving said rack in a rectilinear pattern, and

a gear associated with each of said cam elements and

10 engaging said rack for simultaneously oscillating each of said gears in a common annular direction

5 5 The process for blowing glass containers in a mold of a glass container forming machine and for transporting blown containers from the mold to a deadplate of the glass container forming machine, the process comprising

providing a first combined takeout and blowhead mechanism,

injecting air into a first group of containers through the first combined takeout and blowhead mechanism while the containers are in the mold to blow preforms of the containers into containers,

20 grasping the first group of blown containers by the first combined takeout and blowhead mechanism,

transferring the first group of blown glass containers grasped by the first combined takeout and blowhead mechanism to a deadplate and releasing the first group of blown glass containers at the deadplate;

25 providing a second combined takeout and blowhead mechanism,

injecting air into a second group of glass containers being blown in the molds of the forming machine through the second combined takeout and blowhead mechanism while the containers are in the mold to blow preforms of the containers into containers,

grasping the second group of blown glass containers by the second combined takeout and blowhead mechanism, and

transferring the second combined takeout and blowhead mechanism from the deadplate to the blow mold while transferring the first combined takeout and blowhead mechanism from the blow molds to the deadplate without contact between the first combined takeout and blowhead mechanism and the second combined takeout and blowhead mechanism

6 The method according to claim 5 and further comprising
10 reversibly elevating each of the first combined takeout and blowhead mechanism and the second combined takeout and blowhead mechanism while the other of the first combined takeout and blowhead mechanism is transferring containers to the deadplate

15 7 The method according to claim 5 and further comprising continuing to inject air into the containers being transferred by the first combined takeout and blowhead mechanism while the containers are being transferred to the deadplate, and

Continuing to inject air into the containers being transferred by
20 the second combined blowhead and takeout mechanism while the containers are being transferred to the deadplate

8 A grasping mechanism for grasping a finish of a vertically upright glass container being blown in the mold of a glass container forming machine, said grasping mechanism comprising

25 a chuck, said chuck having a circumferential plurality of chuck elements arranged in an annular array said chuck elements being simultaneously moveable solely in a horizontal plane between first positions surrounding the finish of the glass container but out of contact with the glass container; and second positions in contact with the finish of the glass container; and
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means for simultaneously moving the chuck elements between the first positions and the second positions

- 9 A process for removing a vertically upright blown glass
5 container having a finish from a blow mold of a glass container forming machine, the finish being positioned above the blow mold, the blow mold being made up of separable mold halves that are closed with respect to one another during molding of the glass container and are openable with respect to one another after the molding of the glass container to permit a blown glass
10 container to be removed from the blow mold, the process comprising
providing a chuck, the chuck having a plurality of circumferentially disposed chuck elements, the chuck elements being simultaneously movable solely in a horizontal plane between radially outermost first positions and radially innermost second positions,
15 positioning the chuck to surround the finish of the glass container in the blow mold with the mold halves closed and the chuck elements in their first positions,
simultaneously moving the chuck elements to their second positions while the mold halves are closed to engage the finish of the glass
20 container in the blow mold, and
then opening the mold halves of the blow mold and moving the chuck relative to the blow mold while the chuck elements are in their second positions to remove the glass container from the blow mold

ABSTRACT OF THE DISCLOSURE

Vertically aligned first (30) and second (32) combined blowhead and takeout mechanisms are provided to sequentially blow glass parisons (P) into containers (C) in a mold set (22) and to transfer blown containers to a

5 deadplate (40) of a glass container forming machine (20). Each of the combined mechanisms is pivotally suspended about an axis A from a carrier arm (36) that is pivotally attached to an end of an oscillating arm (38), an opposed end of which is pivoted about an axis (B). The axis (B) of each combined blowhead and takeout mechanism is periodically raised and

10 lowered to permit the other combined blowhead and takeout mechanism to oscillate therebeneath, to thereby permit overlapping cycles between the blowhead and takeout mechanisms. Each blowhead and takeout mechanism is provided with a chuck or tong assembly (54) to engage or

15 release each container by its finish (F). Each tong assembly has a plurality of tong elements (74) that are simultaneously moved radially in or out by oscillation of a cam (50) that has a non-circular slot (78) in which a pin (76) carried by each tong element rides.

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**DECLARATION FOR UTILITY OR
DESIGN
PATENT APPLICATION
(37 CFR 1.63)**

☒ Declaration Submitted with Initial Filing
OR
☐ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)

Attorney Docket Number 17377 USA

First Named Inventor D Wayne Leidy

COMPLETE IF KNOWN

Application Number

Filing Date

Art Unit

Examiner Name

As the below named inventor I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name

I believe I am the original and first inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled

METHOD AND APPARATUS FOR BLOWING AND REMOVING GLASS CONTAINERS

(Title of the invention)

the specification of which

☒ is attached hereto

OR

☐ was filed on (MM/DD/YYYY) as United States Application Number or PCT International

Application Number and was amended on (MM/DD/YYYY) (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT International filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America listed below and have also identified below by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
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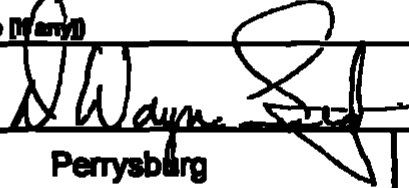
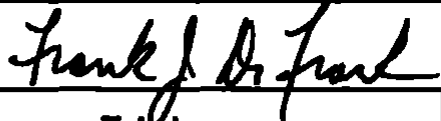
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NAME OF SOLE OR FIRST INVENTOR		☐ A petition has been filed for this unsigned inventor	
Given Name D Wayne (first and middle (if any))		Family Name Ledy or Surname	
Inventor's Signature 		Date 5/14/02	
Residence City Perrysburg	State OH	Country USA	Citizenship USA
Mailing Address 9921 Parliament Place			
City Perrysburg	State OH	ZIP 43551	Country USA
NAME OF SECOND INVENTOR.		☐ A petition has been filed for this unsigned inventor	
Given Name Frank J (first and middle (if any))		Family Name DiFrank or Surname	
Inventor's Signature 		Date 5-21-02	
Residence City Toledo	State OH	Country USA	Citizenship USA
Mailing Address 3442 Woodley Road			
City Toledo	State OH	ZIP 43606	Country USA
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Filing Date	
First Named Inventor	D Wayne Leidy
Group Art Unit	
Examiner Name	
Attorney Docket Number	17377 USA

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Name	Registration Number
Principal Attorneys.	
H G Bruss	24,389
Nirav D. Parikh	46,394
Associate Attorney T. A. Meehan	19,713

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☐ Assignee of record of the entire interest See 37 CFR 3.71
Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/06)

SIGNATURE of Applicant or Assignee of Record

Name

D Wayne Leidy

Signature

D Wayne Leidy

Date

5/14/02

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80 183
A

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First Named Inventor	D Wayne Leidy
Group Art Unit	
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H. G. Bruss	24,389
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Name Frank J. DiFrank

Signature

Frank J. DiFrank

Date

05-21-02

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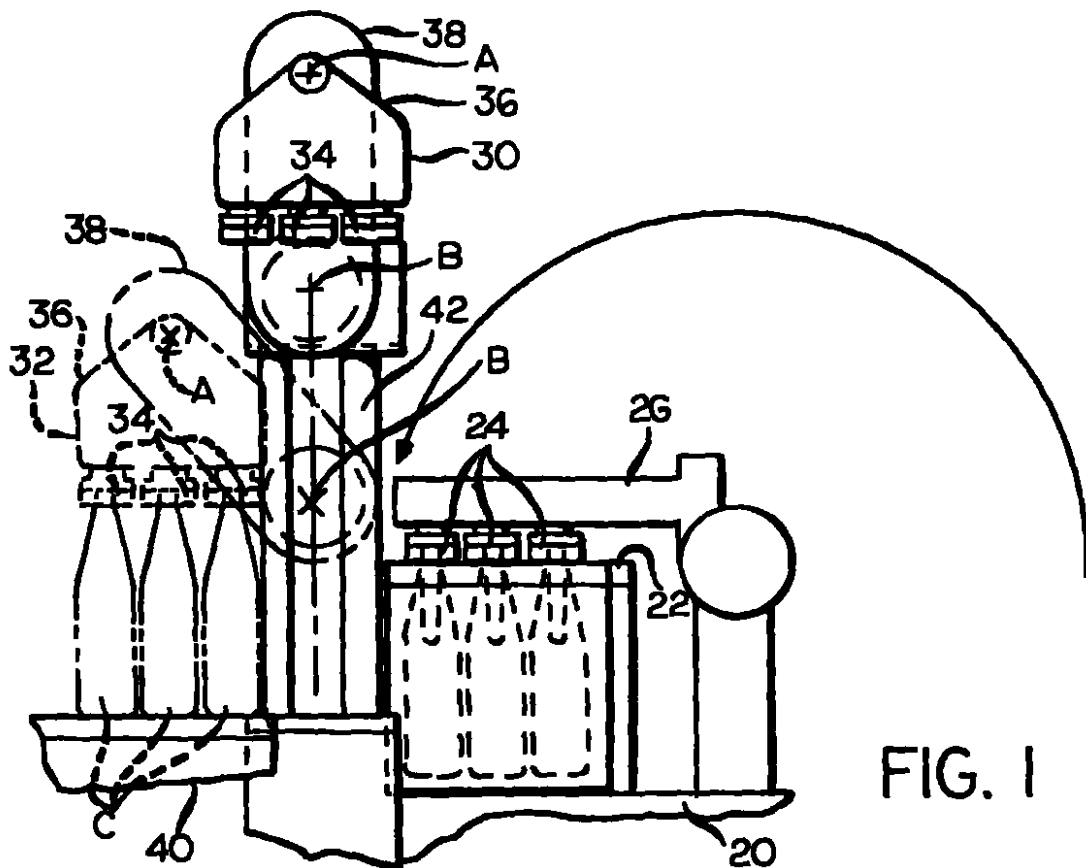


FIG. 1

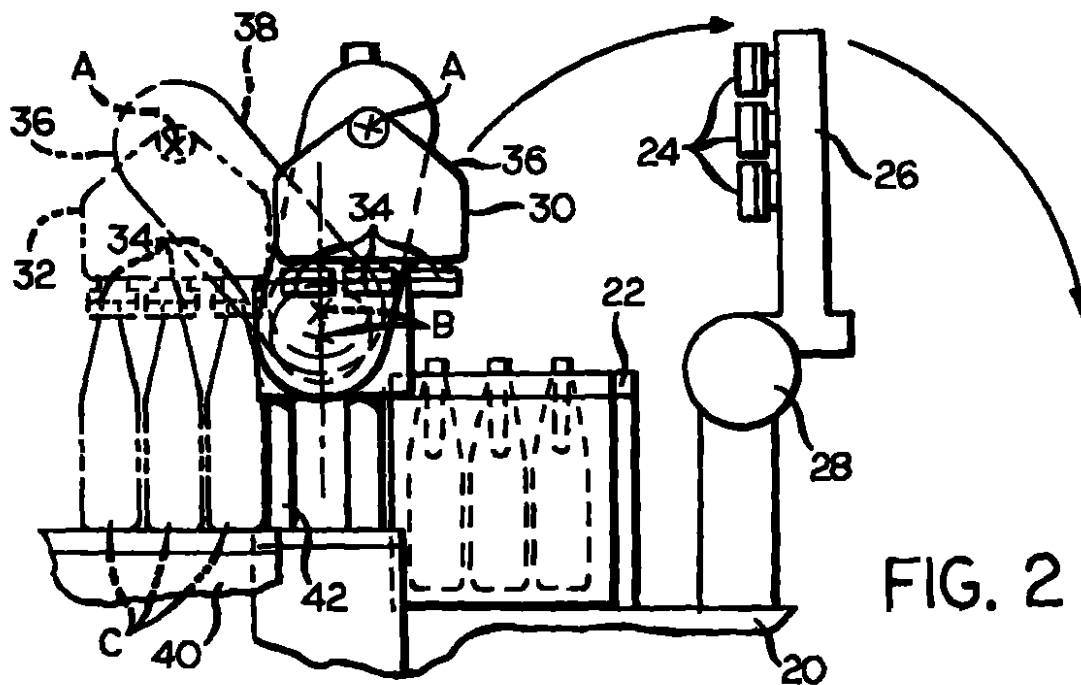
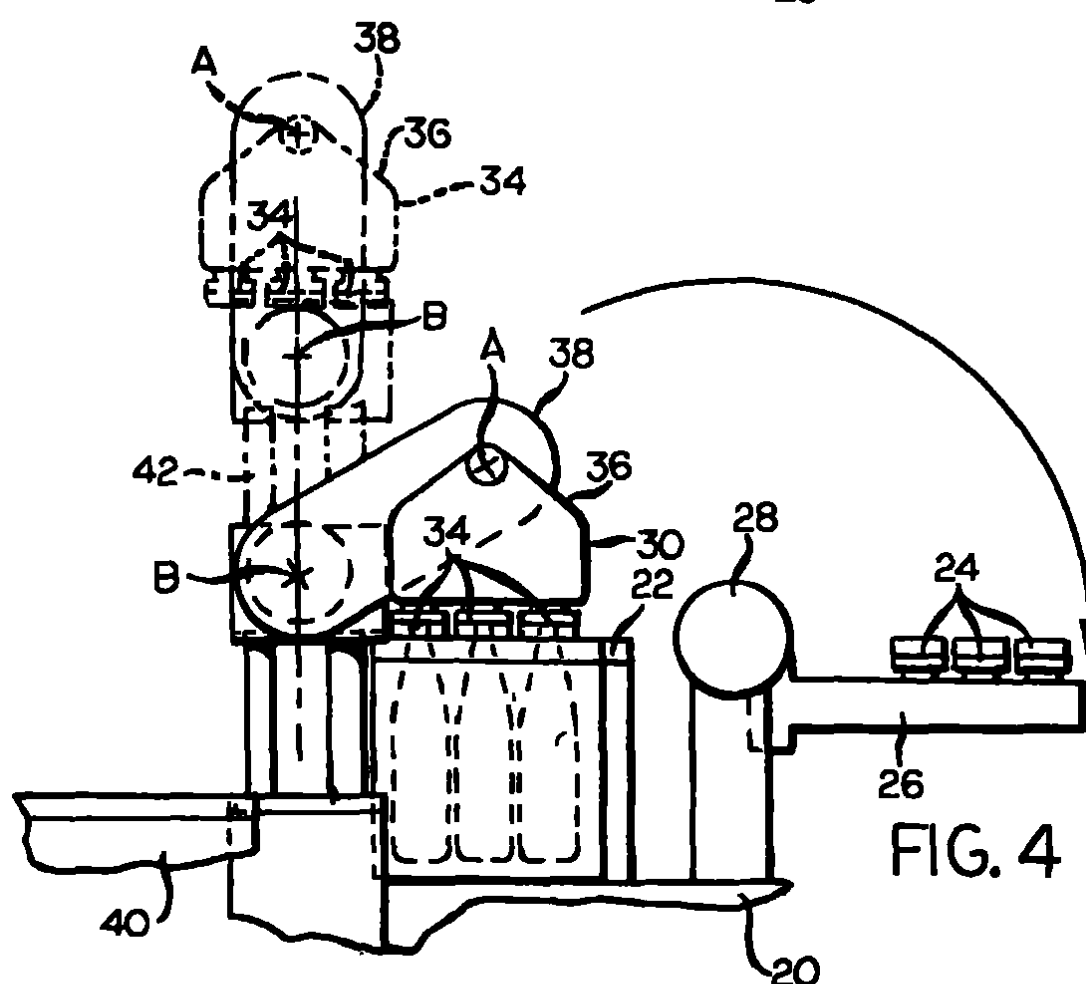
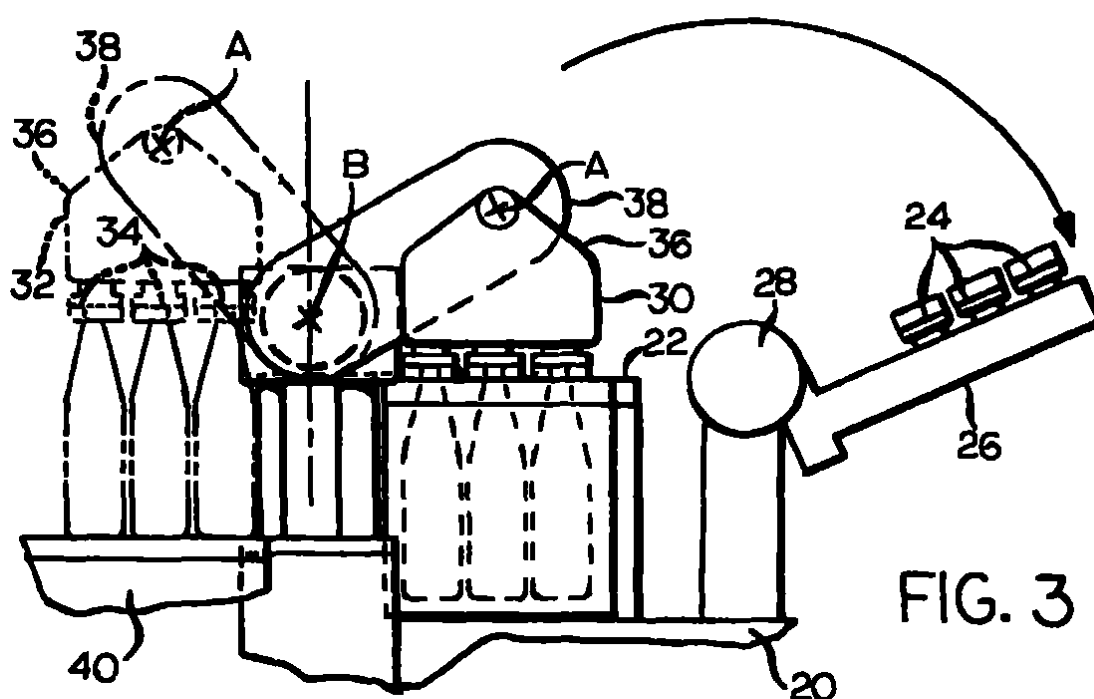
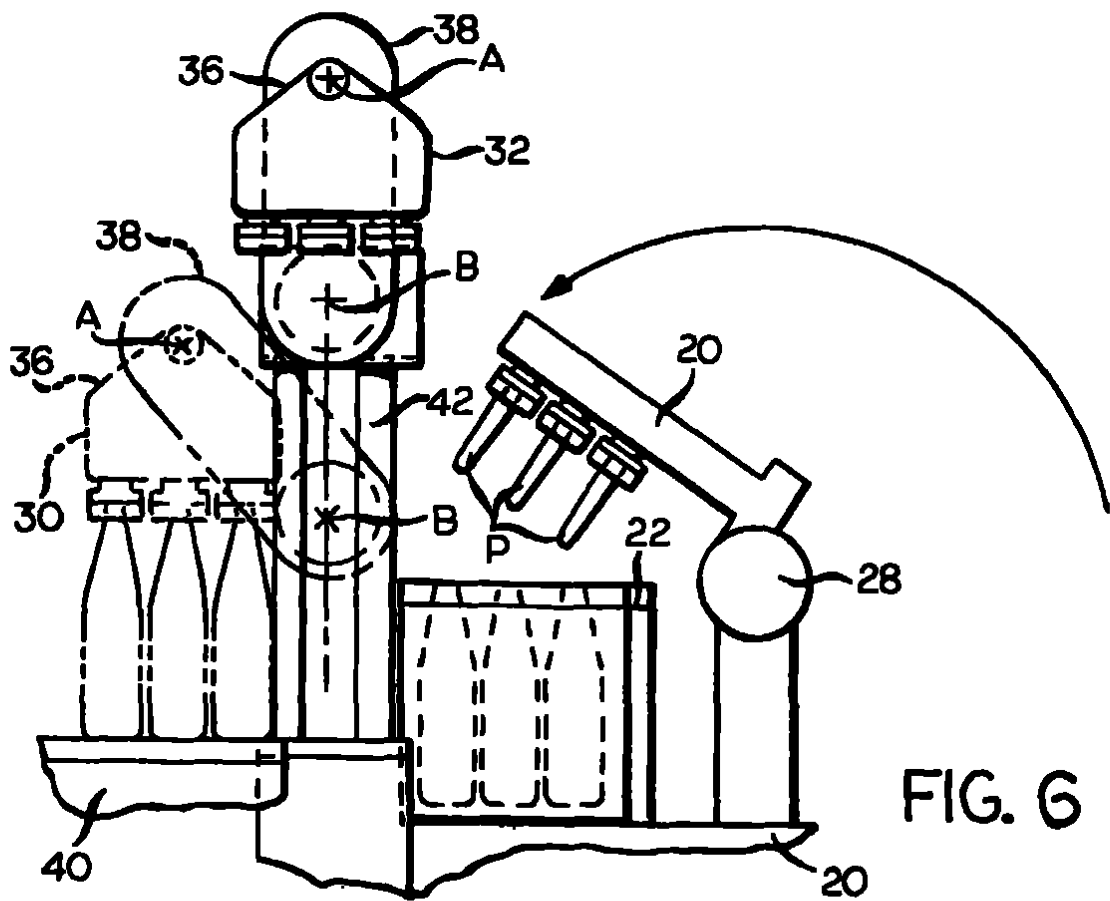
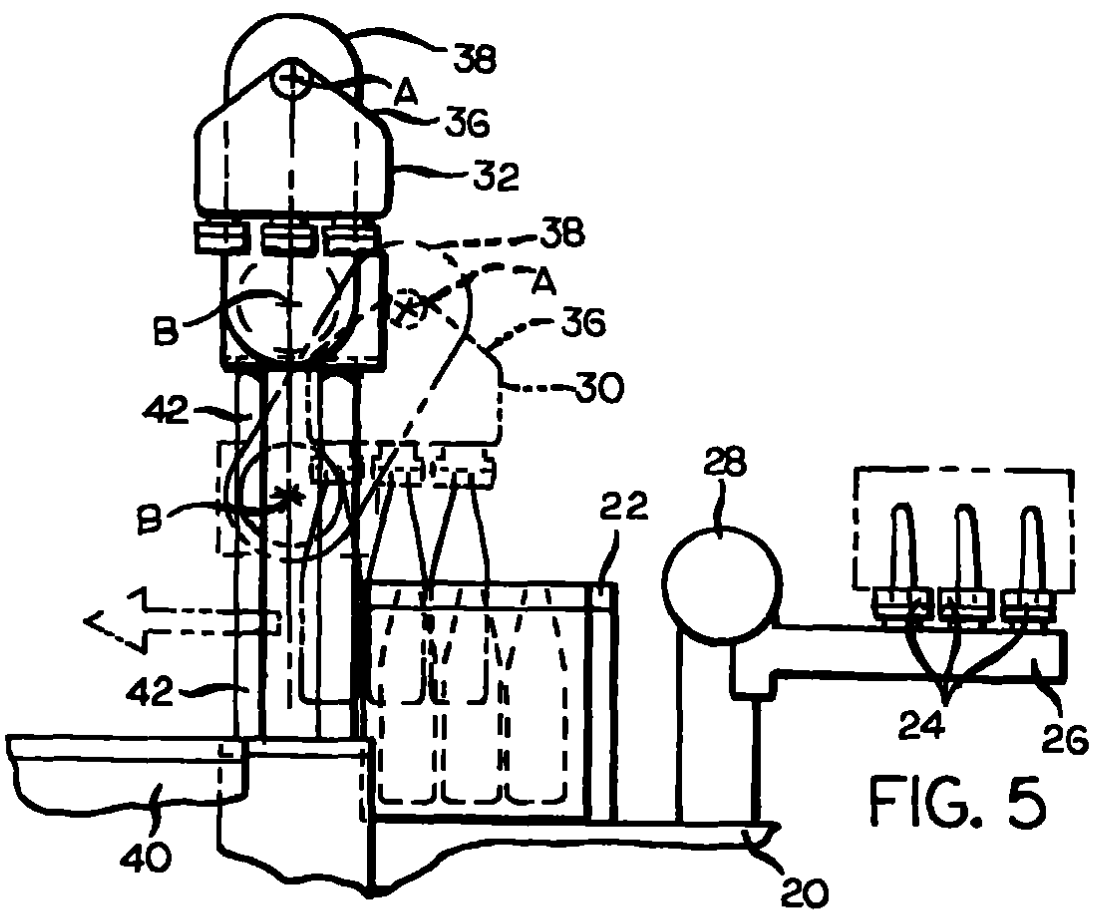


FIG. 2

8200
A



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X



84 87
X

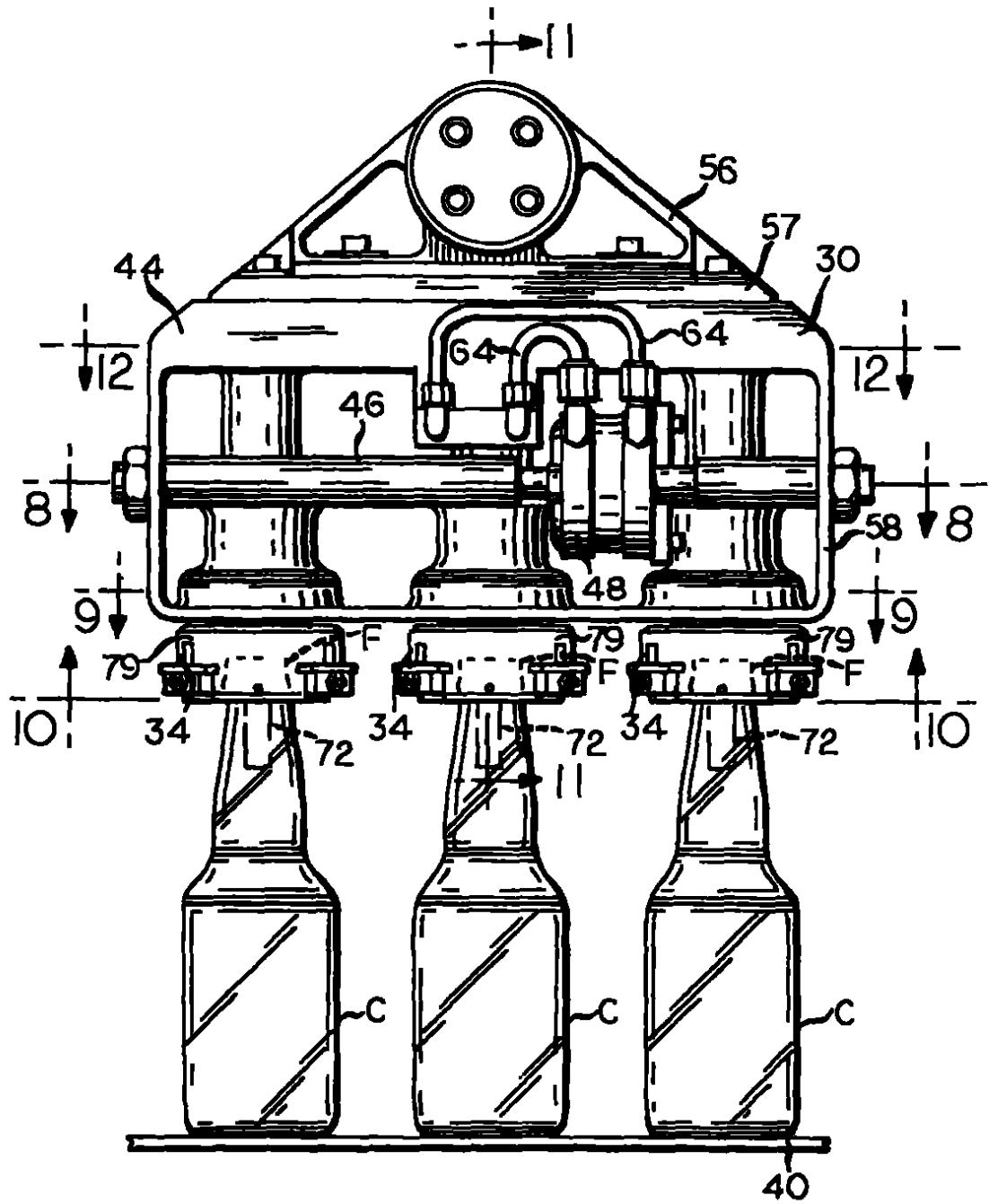


FIG. 7

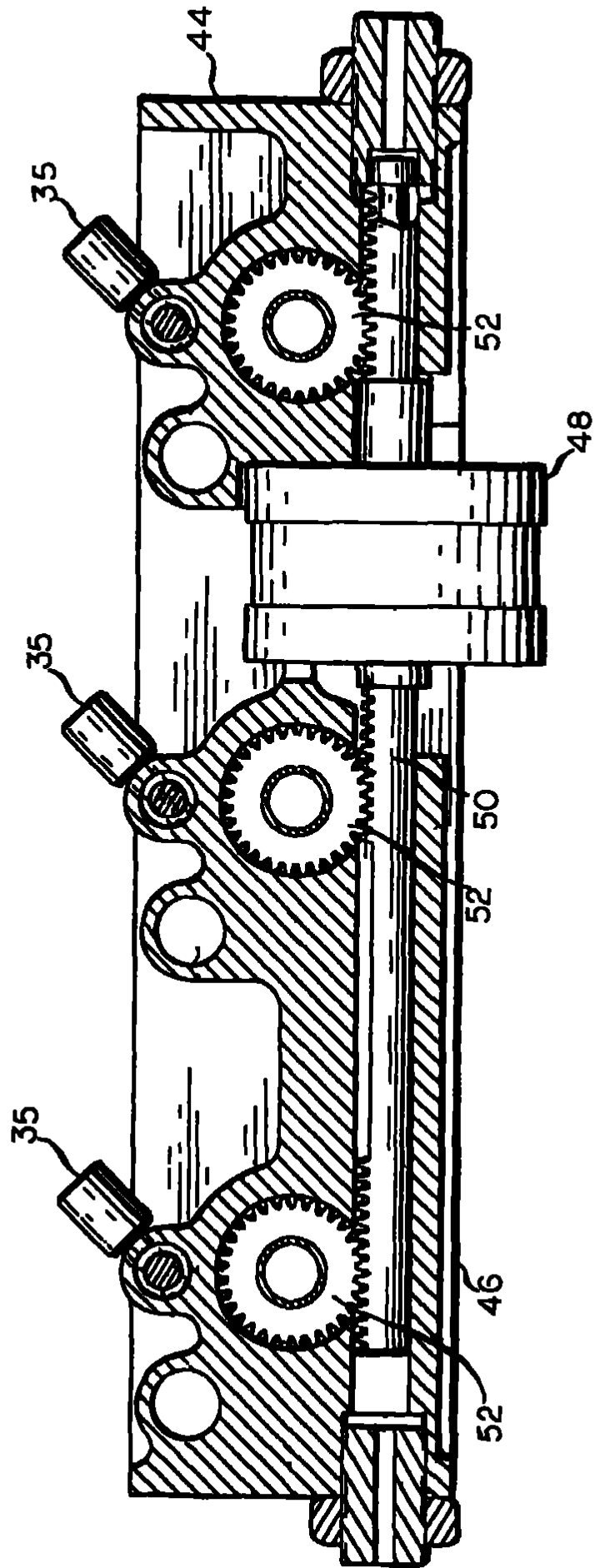


FIG.8

06 89

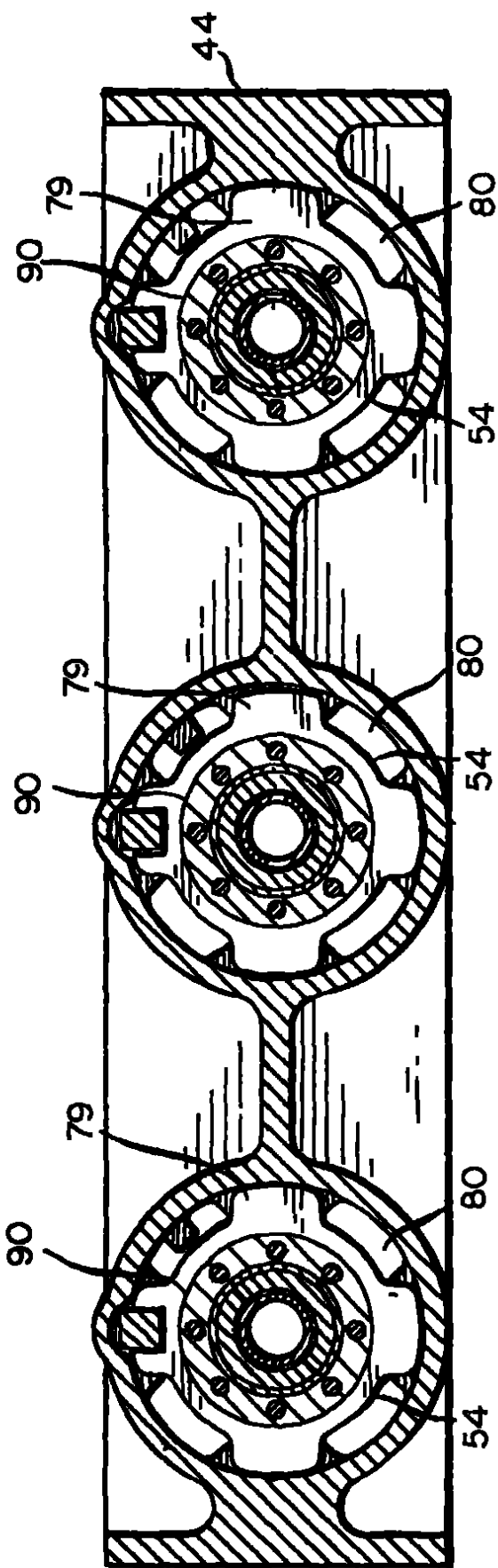


FIG. 9

02 90
R

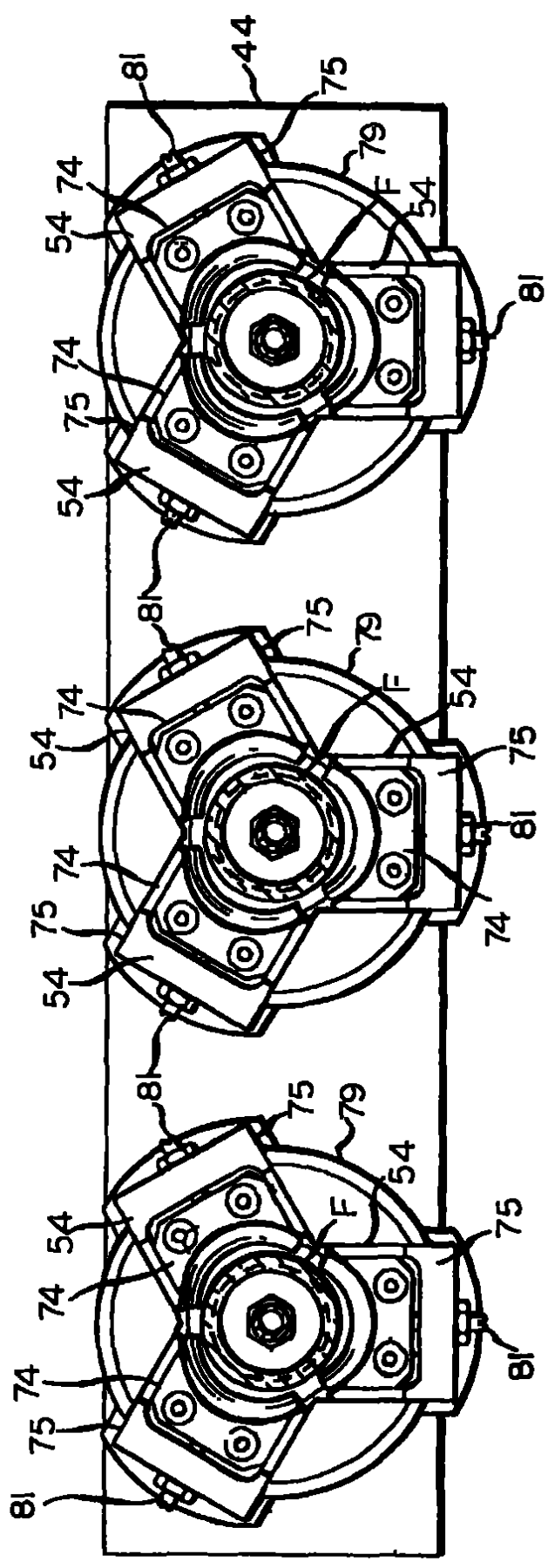


FIG. 10

88
 21
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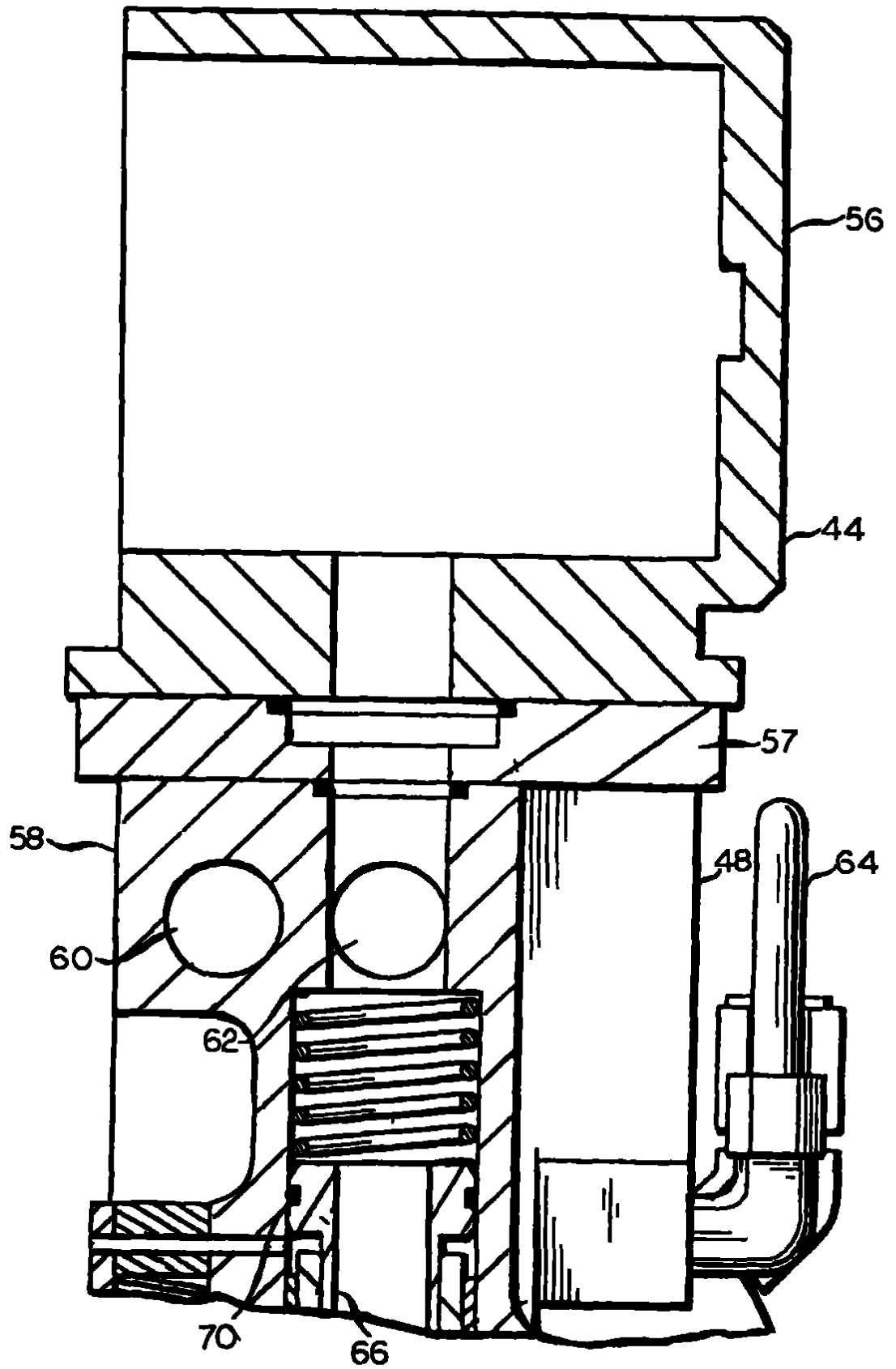


FIG. 11A

8922
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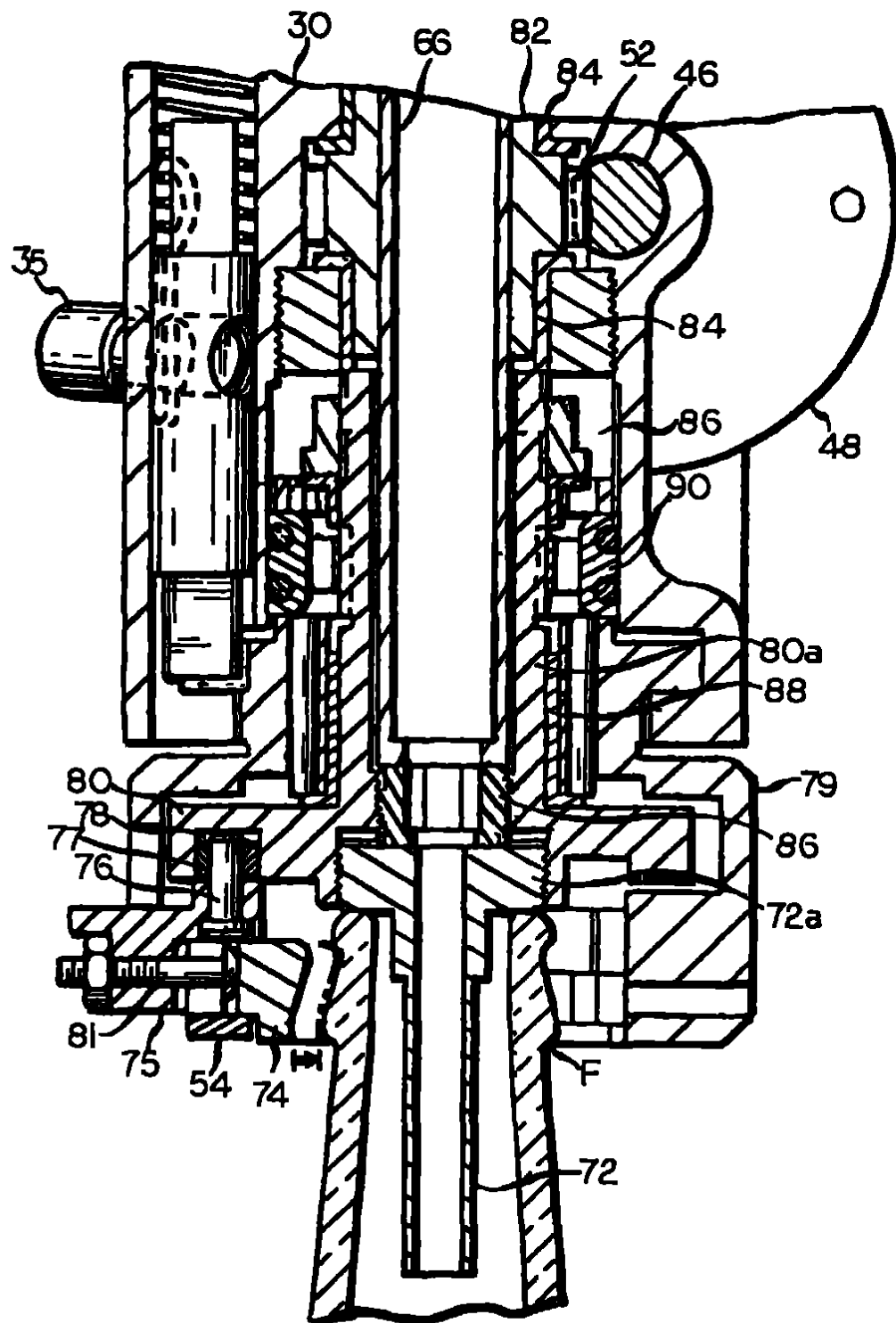


FIG. 11B

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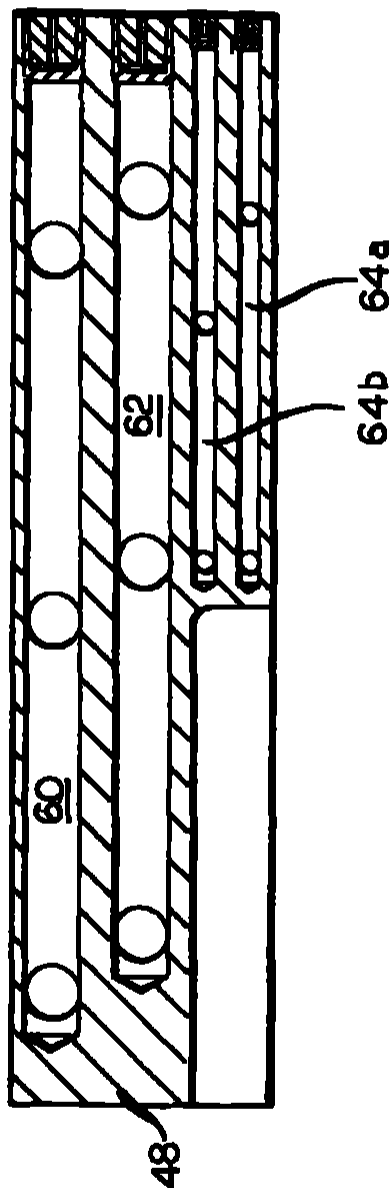


FIG. 12

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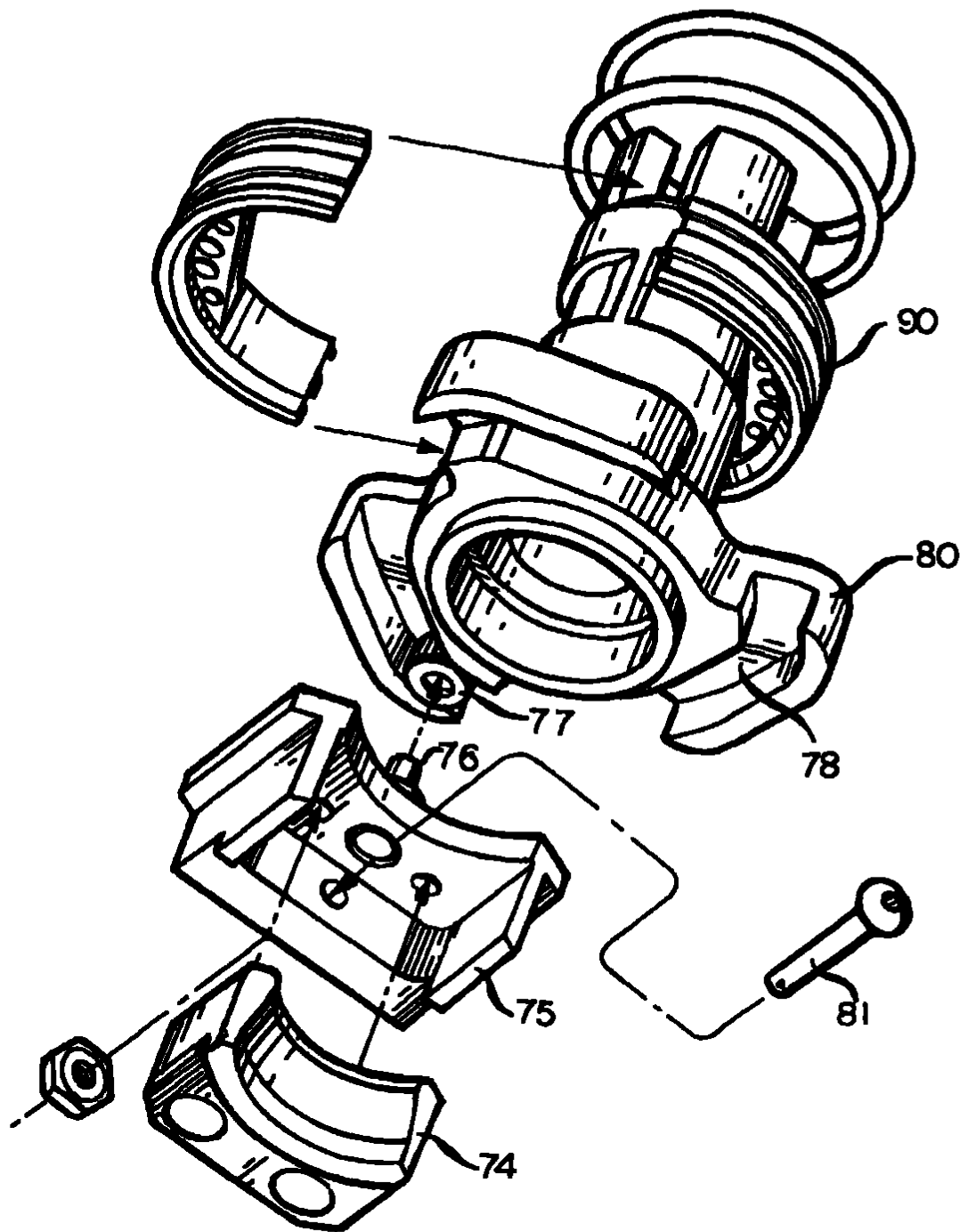
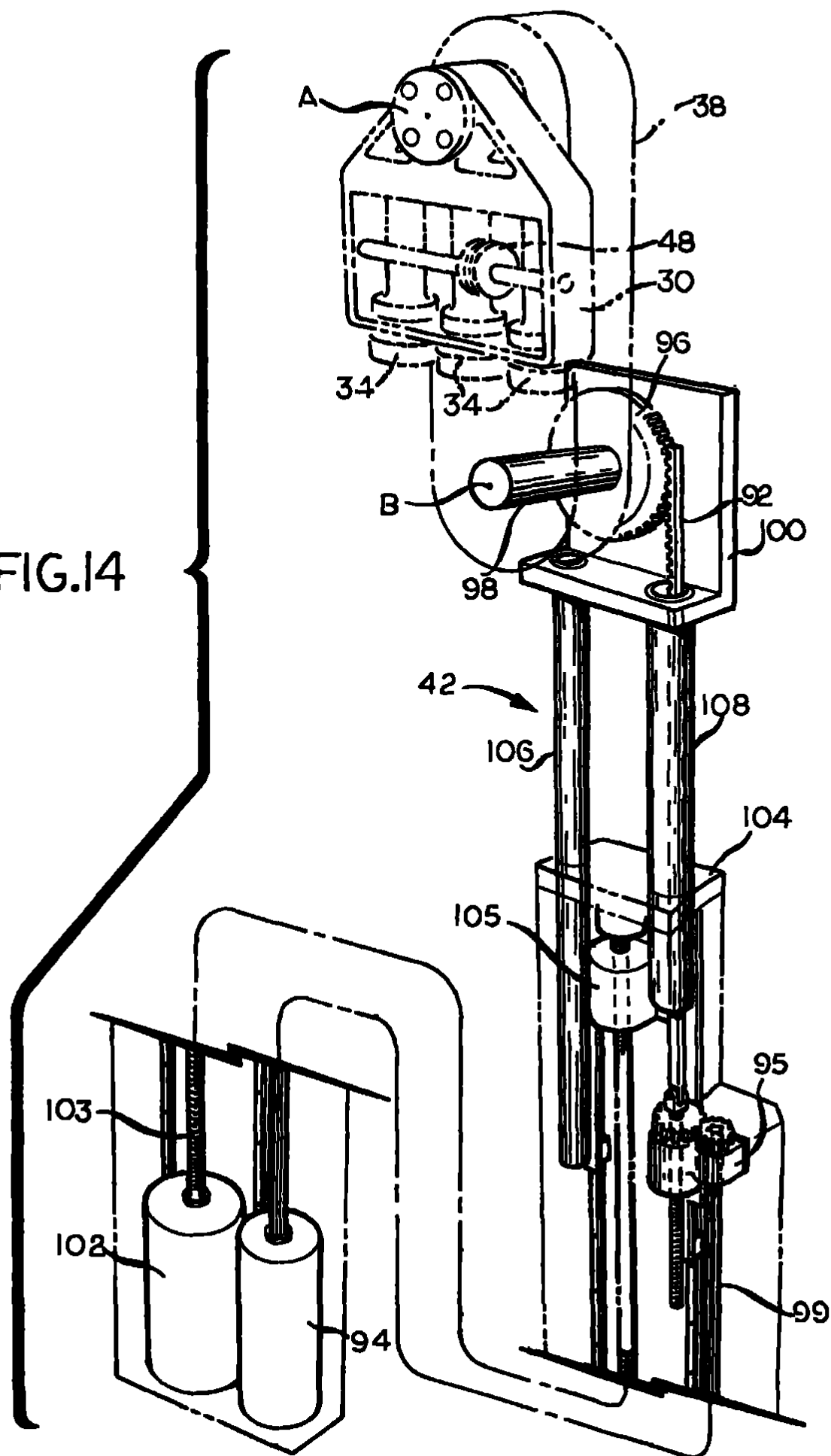


FIG. 13

92 95

FIG.14



93 97
/

TRADUCCION DEL INGLES AL CASTELLANO de la Solicitud de
Patente de los Estados Unidos No 10/161,966 relacionada con

**METODO Y APARATO PARA SOPLAR Y RETIRAR
ENVASES DE VIDRIO**

ANEXOS La Solicitud de Patente de los Estados Unidos Serie No
10/161,966 arriba mencionada Declaracion y Poder, Solicitud de Patente,
Certificacion del Comisionado de Patentes y Marcas de los Estados Unidos
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T WALLACE
Funcionario de Certificaciones**

SELLO ADHERIDO

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MÉTODO Y APARATO PARA SOPLAR Y RETIRAR ENVASES DE VIDRIO

CAMPO DE LA INVENCION

Esta invención se relaciona a un método de y un aparato para soplar los envases de vidrio en los moldes de una máquina para darle forma a envases de vidrio y para retirar los envases sopladados de dichos moldes. Más particularmente, esta invención se relaciona a un método de y un aparato para soplar los envases de vidrio en moldes de soplado de una máquina para darle forma a envases de vidrio I S (sección individual), y para retirar después los envases sopladados de dichos moldes y transferir los envases sopladados a una placa fija de la máquina para su enfriamiento y eventual retiro para ser sometidos a posterior proceso.

ANTECEDENTES DE LA INVENCION

Las patentes de los EE UU 3,472,639 (Mumford) y 4,427,431 (Mumford y colaboradores), que fueron transfendidas a un predecesor del cesionario de esta solicitud, cuya divulgación de cada una de ellas se encuentra incorporada en este documento mediante referencia hecha de las mismas, generalmente describe la fabricación de envases de vidrio por un tipo de máquina conocida como una máquina I S. Tal como lo enseñan dichas referencias o como es por otra parte conocido, una máquina I S tiene una pluralidad de secciones lado a lado, normalmente seis, ocho, diez o incluso doce secciones, y en cada sección se da forma a los envases en un proceso de dos pasos. En el primer paso, soplando o presionando, se forman una o más, y con frecuencia tres o cuatro, preformas de envase que a menudo se les llama "parisons" o blancos. Las preformas, que se forman en orientación invertida, es decir, con sus extremos abiertos hacia abajo, tienen porciones del cuerpo que se forman en moldes divididos, a los que con frecuencia se les llama moldes en blanco. Las porciones de acabado de dichas preformas que reciben el cierre roscado o que de cualquier otra forma se encuentren adecuadamente configuradas se forman en moldes separados, normalmente llamados moldes de cuello o anillos de cuello que se posicionan adyacentes a los moldes blancos, divididos dentro de los mismos durante el moldeado de los "parisons".

as 19
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Después de concluido el paso de moldeado del "parison", se abren los moldes divididos y los "parisons", que se encuentran agarrados por los moldes de cuello, son transfendidos invirtiéndolos a través de un arco de 180° a moldes divididos de soplado para soplar los "parisons" y convertirlos en envases. El paso de inversión se realiza girando un eje invertido al cual se encuentran fijados, en forma deslizable, los brazos portantes del molde de cuello, haciendo que los "parisons" queden en posición vertical durante el moldeado por soplado, es decir con sus extremos abiertos hacia arriba. La transferencia de los "parisons" o blancos de envases de vidrio de los moldes blanco a los moldes de soplado de una máquina I S, como se describió anteriormente de manera general, se encuentra descrita de manera general en las patentes de los EE UU 5,893,942 (Nickey y colaboradores) y 6,098,427 (Kirkman) asignadas de manera comun, descntas anteriormente, cuya divulgación de cada una también se incorpora a este documento mediante referencia.

Convencionalmente, tal como se explica, por ejemplo, en la Patente de los EE UU 3,630,709 (Irwin) que se asignó a un predecesor del cesionario de esta solicitud, cuya divulgación también se encuentra incorporada a este documento mediante referencia, los envases se soplan en los moldes de soplado de una máquina I S usando una cabeza de soplado que se coloca en el enganche de soplado con los "parisons" en los moldes de soplado en una sección dada de la máquina I S, y luego se retira del enganche con los envases soplados en dichos moldes de soplado. Los envases soplados se retiran luego de los moldes de soplado, después de abrir los moldes divididos, usando un mecanismo de extracción que está provisto con una pluralidad de tenazas, un juego de tenazas para cada molde de soplado, en la sección de la máquina I S con la cual se asocia el mecanismo de extracción. La Patente de EE UU 6,241,448 B1 (Nicolás), asignada en forma comun, cuya divulgación también se encuentra incorporada a este documento por referencia, describe un mecanismo de extracción, tal como se describe de manera general anteriormente, para retirar los envases soplados de los moldes de una sección de la máquina I S. La Patente 5 de los EE UU 807 419 (Rodríguez-Wong y colaboradores) describe una máquina I S en la que se combinan las funciones de una cabeza de soplado y un mecanismo de extracción en un solo mecanismo. Sin embargo, el mecanismo de la referencia '419 enseña el uso de tenazas convencionales de pivote (elementos 72, 73) para enganchar cada envase debajo de un reborde, llamado reborde de transferencia que se posiciona por debajo del acabado roscado o configurado de

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cualquier otra forma del envase, y esto requiere que se abra el molde de soplado dividido antes de que las tenazas puedan asir los envases soplados para retirarlos. El requisito de que los moldes de soplado se abran antes de que las tenazas puedan asir el envase soplado se debe a una desventaja en el cronometraje de la máquina por las razones que se explican en la patente '488 B1 mencionada anteriormente.

DESCRIPCIÓN BREVE DE LA INVENCION

Segun la presente invención allí se proporciona un mecanismo combinado de cabeza de soplado / extracción para una máquina I S para darle forma a envases de vidrio, y un método para soplar envases de vidrio en moldes de soplado de dicha máquina para darle forma a envases de vidrio y para retirar los envases soplados de dichos moldes. El aparato incluye un mandril de enganche en el acabado del envase para cada uno de los envases que se forman simultáneamente en una sección de la máquina I S, y cada mandril incluye una pluralidad de elementos espaciados entre sí de forma circunferencial, preferiblemente tres, que se mueven hacia adentro y hacia afuera, al unísono, para enganchar un envase por su acabado. De esta manera, el envase puede ser enganchado por el mandril mientras los moldes divididos, en los que se está soplando el envase, permanecen cerrados para permitir así retirar el envase para trasladarlo inmediatamente a una placa fija de la máquina I S una vez se abran los moldes divididos de moldeado por soplado en el cual se le dio forma al envase. Esto elimina el tiempo de ciclo perdido de ciertos dispositivos de extracción del arte anterior, como el de la patente '419, mencionada anteriormente, que requiere que se abra el molde dividido antes que el dispositivo de extracción pueda enganchar un envase con un reborde de transferencia.

En una representación preferida de la presente invención, se proporcionan un par de mecanismos combinados de cabeza de soplado / extracción en cada sección de una máquina I S. Los mecanismos combinados se cronometran para que operen de manera alterna para que un mecanismo combinado pueda posicionarse para soplar los envases en los moldes de soplado de la máquina.

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✓

una máquina I S con una sola cabeza de soplado en cada sección de la máquina ya que el ciclo de soplado puede no iniciarse hasta que la cabeza de soplado regrese después de haber depositado los envases sopladados en la placa fija de la máquina. Para evitar la colisión de los mecanismos combinados separados durante el funcionamiento, el eje que sirve de pivote al brazo de pivote de cada mecanismo combinado se puede mover en un plano vertical, para que el mecanismo combinado entrante pueda posicionarse a una elevación por encima de la alcanzada por el mecanismo combinado saliente durante su movimiento de pivote para trasladar los envases sopladados de los moldes de soplado a la placa fija de la máquina. El uso de un par de mecanismos combinados de cabeza de soplado / extracción mejora de esta manera el tiempo del ciclo de formado porque asegura que un mecanismo combinado de cabeza de soplado / extracción se posicione en los moldes de soplado cuando los moldes cierran alrededor de los "parisons" que se transfirieron a los moldes sin tener que esperar por el retorno de una cabeza de soplado desde la placa fija de la máquina después de depositar allí los envases previamente sopladados.

De conformidad, es un objeto de la presente invención proporcionar un aparato y un método mejorado para soplar envases partiendo de "parisons" de vidrio moldeable en moldes de soplado de una máquina para darle forma a envases de vidrio y para trasladar los envases sopladados de los moldes de soplado a una posición diferente para posterior proceso. Más particularmente, es el objeto de la presente invención proporcionar un método y un aparato mejorado de la naturaleza anterior en el que los "parisons" se soplan en los moldes de soplado de una máquina para darle forma a envases de vidrio del tipo I S, y luego se transfieren a una placa fija de la máquina I S para enfriamiento y eventual posterior proceso.

Para un entendimiento adicional de la presente invención y de los objetos, se dirige la atención al dibujo y a la breve descripción que se hace del mismo a continuación, a la descripción detallada de la invención y a las reivindicaciones adjuntas.

DESCRIPCIÓN BREVE DE LOS DIBUJOS

Las figuras 1-6 son vistas esquemáticas de elevación que muestran el aparato según la presente invención en posiciones diferentes durante el ciclo de operación de dicho aparato.

La figura 7 es una vista de elevación a escala ampliada, de una porción del aparato de las figuras 1-6,

La figura 8 es una vista seccional tomada en la línea 8-8 de la Fig 7,

La figura 9 es una vista seccional tomada en la línea 9-9 de la Fig 7,

La figura 10 es una vista seccional tomada en la línea 10-10 de la Fig 7,

Las Figuras 11A, 11B, colectivamente, constituyen las vistas superiores e inferiores, respectivamente y a una escala ampliada, tomada en la línea 11-11 de las figuras 7,

La figura 12 es una vista seccional tomada en la línea 12-12 de las figuras 7,

La figura 13 es una vista en perspectiva explotada de una porción del aparato de las figuras 7-12, y

La figura 14 es una vista en perspectiva explotada a una escala ampliada, de otra porción del aparato de las figuras 1-6

DESCRIPCIÓN DETALLADA DE LA INVENCION

Tal como se muestra esquemáticamente en las figuras 1- 6, se proporciona una sección 20 de la máquina I S que se muestra de manera fragmentada, con un juego de moldes 22 de soplado en los cuales se soplan envases C partiendo de blancos o "parisons" P de una composición de vidrio a una temperatura alta conveniente para darles forma soplando. Las figuras 1-6 muestran tres envases a los que se les está dando forma en cada juego de moldes de soplado, pero debe entenderse que la invención es adecuada para el uso en máquinas I S que están diseñadas para producir simultáneamente un máximo de hasta cuatro envases en cada sección de la máquina (una máquina "quad"), o hasta un mínimo de un envase en cada una de dichas secciones. En todo caso, tal como se entiende en el arte, cada juego de moldes de soplado 22 está conformado por un juego opuesto de moldes divididos que periódicamente se abren y se cierran con respecto al uno del otro, mediante movimientos contra-oscilantes o contra-rectilíneos para definir, cuando se cierran, una cavidad en la cual se pueda formar cada envase C.

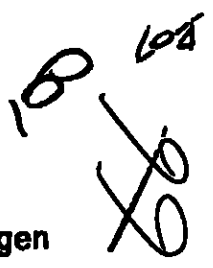
Los "parisons" P que se van a formar dentro de los envases C en el juego de moldes 22 se trasladan hasta allí desde un lado de moldeado de blancos de la sección de la máquina mediante moldes de cuello 24, tal como se muestra

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específicamente en la figura 5 Los moldes de cuello 24 son transportados por un ensamblaje invertido o de brazo de molde de cuello 26 que se encuentra conectado a un eje invertido o de cuello de molde 28 que oscila, al que a menudo se le llama eje mecedor, que oscila en un arco de 180° entre la posición que se muestra en la figura 1 y la posición que se muestra en la figura 5 Una vez realizado la transferencia de los "parsons" P al juego de moldes 22, el ensamblaje de brazo invertido 26, con los moldes de cuello 24 que son transportados allí, revierte de la posición de la figura 1 a la posición de la Fig 5 para empezar la repetición del proceso de fabricación del envase de vidrio en el juego de moldes 22, después del retiro de los envases sopladados C anteriores de ese lugar

La sección 20 de la máquina I S está equipada con un par de mecanismos combinados de cabeza de soplado / extracción 30, 32 colocados lado a lado, cada uno de los cuales lleva una pluralidad de cabezas de soplado 34, correspondiendo una de tales cabezas de soplado 34 a cada envase C que se forme en el juego de moldes 22 El mecanismo de cabeza de soplado 30 se muestra en detalle en las figuras 7 -13 en la posición que se muestra en la figura 6, pero debe entenderse que la cabeza de soplado 32 es de la misma construcción que la cabeza de soplado 30 En todo caso, cada uno de los mecanismos de cabeza de soplado 30, 32 están conformados de un brazo portante 6 del cual se encuentran suspendidas las cabezas de soplado 34, y de un brazo oscilante 38 del cual se encuentra suspendido el brazo portante 36 para poder tener un movimiento de pivote desde el brazo oscilante 38 sobre un eje A Cada brazo portante 36 se encuentra apoyado sobre un pivote del brazo oscilante 38 del mecanismo de cabeza de soplado 30 o 32 del cual es un elemento por una unión paralela o por otra estructura equivalente de una manera conocida, para asegurar que no cambie la posición angular de las cabezas de soplado 34 que son transportadas por el brazo portante 36 a medida que el brazo oscilante 38 oscila, por ejemplo, desde la posición del mecanismo de la cabeza de soplado 30 en la figura 1 a su posición en la figura 6

La figura 1 muestra la posición del mecanismo de la cabeza de soplado 32 inmediatamente sobre una placa fija 40 de la sección 20 de la máquina I S para poder depositar los envases sopladados C sobre la misma En esta condición del aparato, el mecanismo de la cabeza de soplado 30 se posiciona en alineación vertical con una torre 42 a la cual se asegura el mecanismo de la cabeza de soplado 30 para lograr movimiento de pivote sobre un eje B Igualmente, el mecanismo de la cabeza de soplado 32 se asegura a una segunda torre (que no



se muestra), que se encuentra inmediatamente detrás y que es una imagen espejo de la torre 42, para lograr movimiento de pivote sobre un eje B. A este respecto, el eje B que sirve de pivote a cada uno de los mecanismos de las cabezas de soplado 30, 32 se puede mover verticalmente, mediante una estructura que se describirá a continuación en este documento en más detalle, entre una posición más baja, por ejemplo, la del mecanismo de la cabeza de soplado 32 en la figura 1, a la posición más alta del mecanismo de la cabeza de soplado 32 en la figura 4, para permitirle a los mecanismos de las cabezas de soplado 30, 32 oscilar entre las posiciones que se muestran en la figura 1 y las posiciones que se muestran en la figura 4 sin que exista ningún contacto que interfiera entre los mecanismos de las cabezas de soplado 30, 32, que se encuentran alineados en el mismo plano vertical. De esta manera, las cabezas de soplado 34 del mecanismo de cabeza de soplado 32 se posicionarán para enganchar de inmediato los "parisons" P en los moldes 22 mientras el mecanismo de la cabeza de soplado 30 se encuentra en ruta para depositar los envases C en la placa fija 40, como puede verse de una comparación, por ejemplo, de las figuras 4 y 6. Esto permite una reducción sustancial calculada en tiempo de ciclo entre el retiro del juego de envases C del juego de moldes 22 y el retiro del siguiente juego de envases C del juego de moldes 22, comparado a una instalación que usa solamente un solo mecanismo de cabeza de soplado / extracción, de aproximadamente 13%, y lo hace sin reducir el tiempo disponible para el enfriamiento de los envases C en la placa fija 40 antes de que sea necesario retirar los envases C parcialmente enfriados de la placa fija 40 para acomodar la transferencia de envases C recién moldeados a la placa fija 40. Alternativamente, la mejora del ciclo se puede reducir un poco moviendo las cabezas de soplado 30, 32 más despacio para reducir las fuerzas de inercia sobre los envases sopladados C. En todo caso, la reducción en tiempo de ciclo puede mejorarse en aproximadamente un 4%, es decir, a un total de aproximadamente 17% si cada par de mecanismos combinados de cabezas de soplado / extracción se adapta para enganchar los envases sopladados C por los acabados antes de que los moldes divididos del juego de moldes 22 se separen sin necesidad de retrasar el enganche de los envases C hasta que los moldes divididos se encuentren abiertos, lo que sí se requiere cuando se hace la transferencia de envases sopladados desde el juego de moldes 22 enganchando un reborde de traslado con las tenazas de un mecanismo de extracción convencional. Este fenómeno se describe en la patente '488 B1 mencionada anteriormente. Además,

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el uso de cabezas de soplado para trasladar envases soplados C a la placa fija 40 permite el enfriamiento parcial de los envases soplados C con el aire de soplado que va hacia la cabeza de soplado 30 o 32 durante el paso de transferencia

Tal como se muestra en la figura 7, el mecanismo de la cabeza de soplado 30 tiene un marco 44 de forma generalmente trapezoide, que porta las cabezas de soplado 34, las cuales se pueden desenganchar cada una rápidamente del marco 44 mediante un desconectador 35 (figura 11 B) El marco 44 viene provisto de un miembro anular ranurado 46 que se extiende desde allí por encima y en paralelo a la orientación de los envases C que son transportados por la cabeza de soplado 30. Un cilindro neumático 48 de reversión de doble acción se encuentra posicionado entre los extremos del miembro anular 46, y el cilindro 48 impulsa un bastidor ranurado 50 (figura 8) que se extiende desde extremos opuestos a través del miembro anular 46. El bastidor ranurado 50 que reciproca pero no rota, engancha, en un accionamiento de ángulo recto, un tornillo 52 asociado con cada una de las cabezas de soplado 34 para abrir o cerrar simultáneamente una tenaza de enganche del acabado del envase o ensamblaje de mandril 54 (figuras 9, 10) que está asociado a cada una de las cabezas de soplado 34.

Tal como se muestra en Las figuras 7, 11A, el marco 44 está conformado por un miembro superior 56 generalmente de forma triangular que se encuentra atornillado o asegurado de cualquier otra forma que sea ajustable a un miembro inferior 58 con una platina de alineación 57 colocada entre los dos miembros para asegurar una alineación adecuada entre el miembro superior 56 y el miembro inferior 58, que tiene ranuras de alineación en él. El miembro superior 56 se encuentra fijado al brazo oscilante 38 para que oscile con el brazo oscilante 38 entre la posición que se muestra en las figuras 3 y 4 y la posición que se muestra en las figuras 6, y el miembro inferior 58 porta los elementos asociados con cada una de las cabezas de soplado 34. Tal como se muestra en la figura 12, se circula aire de enfriamiento para enfriar cada una de las cabezas de soplado 34 a través de un pasaje 60 en el miembro inferior 58, y el aire de soplado para soplar los "parisons" P dentro de los envases C, en la posición del mecanismo de la cabeza de soplado 30 que se muestra en las figuras 3, 4, se introduce a través de un pasaje 62 en el miembro inferior 58. El aire para el funcionamiento del cilindro 48 que se muestra como un par de cilindros iguales dispuestos de forma que el extremo de la cola toque contra el extremo de la cola, se introduce a través de líneas de entrada 64, que reciben el aire de los pasajes 64a, 64b que se encuentran en el miembro inferior 58. El aire de soplado que proviene del pasaje

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62 sopla hacia abajo dentro de un "parison" P que se está soplando dentro de un envase C a través de un tubo de transferencia 66, un extremo superior que se encuentra sesgado de manera firme hacia abajo por un resorte de compresión 68, un anillo en "O" 70 que se suministra para permitir que haya un movimiento sellado deslizante entre un extremo superior agrandado del tubo de transferencia 66 y un pasaje en el miembro inferior 58 en el que se encuentra posicionado el extremo superior del tubo de transferencia 66. Un extremo más bajo del tubo de transferencia 66 se encuentra asentado sobre y descarga dentro de un extremo superior de un tubo de entrada de aire de soplado 72 (figura 11 B) que se extiende dentro de un "parison" P o un envase C como sea del caso, que se encuentra enganchado por la cabeza de soplado 34 con la cual se encuentra asociado el tubo de entrada de aire 72.

Cada ensamblaje de tenazas 54 porta una pluralidad de elementos de tenaza 74 espaciados de forma circunferencial, que se muestran como tres, que son impulsados simultáneamente para moverse en forma radial o bien hacia adentro para asir un acabado F (figura 11 B) de un envase C o hacia afuera para soltar el acabado F del envase C. Aunque el envase C se muestra como que tuviera un acabado F para la aplicación de un cierre de la corona al envase C, también se contempla que la superficie de enganche del acabado F de los elementos de la tenaza 74 puede configurarse para que maneje los envases C con acabados roscados F. A este respecto, cada uno de los elementos de la tenaza 74 es retenido dentro de un porta-tenaza 75 y tiene un pasador que se extiende hacia arriba 76 que es recibido en un seguidor de leva anular 77 que va montado en una ranura no circular 78 de un lóbulo de una leva 80 oscilante. La oscilación de la leva 80, por la extensión y retracción del bastidor ranurado 50, es eficaz para mover simultáneamente los elementos de la tenaza 74 de cada uno de los ensamblajes de tenaza 54 para enganchar o desenganchar un acabado (F) de un envase (C). El ensamblaje que incluye los elementos de la tenaza 74 y el cuerpo 76 de tenaza son deslizables dentro de una caja 79 anular de tenaza, y el recorrido de dicho ensamblaje hacia atrás se encuentra limitado por un pasador 81 cuya posición es ajustable a lo largo de su eje central longitudinal.

El tornillo 52 de cada cabeza de soplado 34 se asegura a un miembro anular 82 que rodea los bujes 84 del tubo de transferencia 66, que vienen provistos dentro de un hueco 86 en el mecanismo de la cabeza de soplado 30 a extremos opuestos del tubo de transferencia 82 para permitirle oscilar, con el tornillo 52 y el tubo de transferencia 66, alrededor del eje central longitudinal del

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tubo de transferencia 66 Un extremo más inferior del tubo de transferencia 66 está provisto con un tapón 86 roscado externamente, y la leva 80, que tiene una porción anular recta 80a que puede rotar en un buje 88, se encuentra asegurada mediante roscado a un exterior del tapón 86 para que rote junto con éste. La leva 80 también se encuentra asegurada mediante roscado a una extensión de una porción superior 72a del tubo de entrada de aire 72 para que rote junto con éste, así, la reciprocación del bastidor de ranura 50 es eficaz para hacer oscilar el tornillo 52, y, por ende, para hacer oscilar la leva 80 para mover los elementos de la tenaza 74 hacia adentro y hacia afuera, tal como se desee. Sin embargo, se suministra un ensamblaje de freno anular 90 que rodea una porción de la porción recta 80a de la leva 80 para evitar el movimiento oscilante de la leva 80 cuando se desee.

La figura 14 ilustra el aparato que se ha identificado previamente como el eje inferior A2, para elevar y bajar el eje de los mecanismos de la cabeza de soplado 30, 32. La figura 14 ilustra dicho aparato específicamente en referencia al mecanismo de cabeza de soplado 30, y a la torre 42 a la cual se encuentra asegurado mediante el pivote, pero debe entenderse que el aparato para elevar y bajar el mecanismo de la cabeza de soplado 32 es igual en diseño y construcción al del mecanismo para la cabeza de soplado 30. La oscilación del brazo 38 sobre el eje B es impulsada por un bastidor 92 cuyo movimiento rectilíneo se encuentra impulsado por un motor reversible 94, preferiblemente un servomotor de corriente alterna para una capacidad de control óptima. La oscilación del motor 94 tiene como resultado la oscilación de un ensamblaje de engranajes 95 que se desliza hacia arriba y hacia abajo sobre una lengüeta de bola 99 que se extiende hasta el ensamblaje de engranajes 95 desde el motor 94. El bastidor 92 impulsa un engranaje cilíndrico 96 que se encuentra fijado a un eje 98 a través del cual se extiende el eje B y al cual se encuentra conectado el brazo 38 para girar con el eje 98.

El eje 98 se encuentra montado en forma rotatoria sobre una cartela 100, y la elevación de la cartela 100, y por ende la del eje 98 y el brazo oscilante 38, es ajustable con base en un motor rotatorio 102, preferiblemente un servomotor de corriente alterna que engancha un tornillo 103 que eleva o baja una cartela 104.

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brazo oscilante 38 que es impulsado por el motor 102, sujeto a un sistema de control electrónico o a otro sistema de control, que puede ser de construcción convencional, que se usa para controlar la operación del motor 94 y del motor 102 en una secuencia cronometrada con relación al uno y al otro

Aunque en este documento se ha mostrado y descrito el mejor modo contemplado por los inventores para llevar a cabo la presente invención a partir de la fecha de radicación de la misma, estará claro para quienes son experimentados en el arte que pueden hacerse modificaciones, variaciones, y equivalentes adecuados sin alejarse del alcance de la invención, estando limitado dicho alcance solamente por los términos de las reivindicaciones que vienen a continuación y sus equivalente legales

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REIVINDICACIONES

Lo que se reivindica

1 Un ensamble combinado de cabezales de soplado y retiro para una máquina formadora de envases de vidrio, comprendiendo dicho ensamble combinado de cabezales de soplado y retiro

un primer brazo pivotante, dicho primer mecanismo combinado de cabezales de soplado y retiro para inyectar aire d soplado en envases de vidrio que se soplan en moldes de la máquina formadora y para agarrar luego los envases,

un primer mecanismo combinado de cabezales de soplado y retiro que se monta cerca de un extremo libre de dicho primer brazo pivotante y lejos de un eje de pivote de dicho prim r brazo pivotante,

medios para oscilar dicho primer brazo pivotante para mover dicho primer mecanismo combinado de cabezales de soplado y retiro entre una posición en alineación con envases de vidrio en los moldes de la máquina formadora y una posición en alineación con una placa pasiva de la máquina formadora,

medios para elevar y bajar el eje de pivote de dicho primer brazo de pivote,

un segundo mecanismo combinado de cabezales de soplado y retiro para inyectar aire de soplado en un segundo grupo de envases de vidrio que se soplan en los moldes de la máquina formadora y para agarrar luego el segundo grupo de envases,

un segundo brazo pivotante, estando montado dicho segundo mecanismo combinado de cabezales de soplado y retiro cerca de un extremo libre de dicho segundo brazo pivotante y lejos de un eje de pivote de dicho segundo brazo pivotante,

medios para oscilar dicho segundo brazo pivotante para mover dicho segundo mecanismo combinado de cabezales de soplado y retiro entre una posición en alineación con el segundo grupo de envases de vidrio en los moldes de la máquina formadora y una posición en alineación con la placa pasiva de la máquina formadora, y

medios para levantar y bajar el eje de pivote de dicho segundo brazo pivotante,

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en donde uno de los ejes de pivote de dicho primer brazo pivotante y el eje de pivote de dicho segundo brazo pivotante se levanta con respecto al eje de pivote del otro de dicho primer brazo pivotante y el eje de pivote de dicho segundo brazo pivotante cuando uno de dicho primer brazo pivotante y dicho segundo brazo pivotante se está moviendo a una posición en alineación con los envases de vidrio en los moldes de la máquina formadora para evitar el contacto entre dicho primer mecanismo combinado de cabezales de soplado y retiro y dicho segundo mecanismo combinado de cabezales de soplado y retiro durante la oscilación de dicho primer brazo pivotante y durante la oscilación de dicho segundo brazo pivotante

2 Aparato de acuerdo con la reivindicación 1 en donde dicho primer mecanismo combinado de cabezales de soplado y retiro comprende

una mordaza que tiene una pluralidad distanciada circunferencialmente de elementos de mordaza dispuestos en un arreglo anular, siendo dichos elementos de mordaza simultáneamente desplazables sólo en un plano horizontal entre primeras posiciones que rodean un acabado de un envase de vidrio, pero fuera de contacto con el envase de vidrio, y segundas posiciones en contacto con el terminado del envase de vidrio, y

medios para mover simultáneamente los elementos de mordaza entre las primeras posiciones y las segundas posiciones

3 Aparato de acuerdo con la reivindicación 2 en donde dichos medios para mover simultáneamente los elementos de mordaza entre las primeras posiciones y las segundas posiciones comprenden

una leva anular, teniendo dicha leva anular una pluralidad circunferencialmente distanciada de ranuras de doble extremo, no circulares en ella, una ranura no circular para cada uno de dichos elementos de mordaza,

en donde cada uno de dichos elementos de mordaza tiene un pasador que se aloja en una de las ranuras no circulares de la leva, y

medios para oscilar dicha leva para mover el pasador de cada uno de dichos elementos de mordaza de una posición en la ranura no circular en la cual se aloja a una segunda posición en una ranura no circular en la cual se aloja

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4 Aparato de acuerdo con la reivindicación 3 en donde dichos medios para oscilar dicha leva comprenden

una cremallera,
medios para mover dicha cremallera en un patrón rectilíneo, y

un engranaje asociado con cada uno de dichos elementos de leva y que engrana dicha cremallera para oscilar simultáneamente cada uno de dichos engranajes en una dirección anular común

5 El proceso para soplar envases de vidrio en un molde de una máquina formadora de envases de vidrio y para transportar envases sopladados del molde a una placa pasiva de la máquina formadora de envases de vidrio, proceso que comprende

proveer un primer mecanismo combinado de cabezales de soplado y retiro,

inyectar aire en un primer grupo de envases a través del primer mecanismo combinado de cabezales de soplado y retiro mientras los envases se encuentran en el molde para soplar preformas de los envases en envases,

agarrar el primer grupo de envases sopladados por el primer mecanismo combinado de cabezales de soplado y retiro,

transferir el primer grupo de envases de vidrio sopladados agarrados por el primer mecanismo combinado de cabezales de soplado y retiro a una placa pasiva y soltar en la placa pasiva el primer grupo de envases de vidrio sopladados,

proveer un segundo mecanismo combinado de cabezales de soplado y retiro,

inyectar aire en un segundo grupo de envases de vidrio que se soplan en los moldes de la máquina formadora a través del segundo mecanismo combinado de cabezales de soplado y retiro mientras los envases se encuentran en el molde para soplar preformas de los envases en envases,

agarrar el segundo grupo de envases de vidrio sopladados por el segundo mecanismo combinado de cabezales de soplado y retiro, y

transferir el segundo mecanismo combinado de

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cabezales de soplado y retiro de la placa pasiva al molde de soplado transfiriendo mientras tanto el primer mecanismo combinado de cabezales de soplado y retiro de los moldes de soplado a la placa pasiva sin contacto entre el primer mecanismo combinado de cabezales de soplado y retiro y el segundo mecanismo combinado de cabezales de soplado y retiro

6 El método de acuerdo con la reivindicación 5 que comprende además

eleva en forma reversible cada uno del primer mecanismo combinado de cabezales de soplado y retiro y el segundo mecanismo combinado de cabezales de soplado y retiro mientras el otro del primer mecanismo combinado de cabezales de soplado y retiro está transfiriendo envases a la placa pasiva

7 El método de acuerdo con la reivindicación 5 y que comprende además

continuar inyectando aire a los envases que se están transfiriendo por el primer mecanismo combinado de cabezales de soplado y retiro mientras los envases se están transfiriendo a la placa pasiva, y

continuar inyectando aire en los envases que se están transfiriendo por el segundo mecanismo combinado de cabezales de soplado y retiro mientras los envases se están transfiriendo a la placa pasiva

8 Un mecanismo de sujeción para agarrar un terminado de un envase de vidrio puesto verticalmente de pie que se está soplando en el molde de una máquina formadora de envases de vidrio, comprendiendo dicho mecanismo de sujeción

una mordaza, teniendo dicha mordaza una pluralidad circunferencial de elementos de mordaza dispuestos en un arreglo anular, siendo dichos elementos de mordaza simultáneamente desplazables sólo en un plano horizontal entre primeras posiciones que rodean el terminado del envase de vidrio pero fuera de contacto con el envase de vidrio y segundas posiciones en contacto con el terminado del envase de vidrio, y

medios para mover simultáneamente los elementos de mordaza entre las primeras posiciones y las segundas posiciones

9 Un proceso para retirar un envase de vidrio soplado puesto verticalmente de pie que tiene un terminado de un molde de

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soplado de una máquina formadora de envases de vidrio, estando situado el terminado encima del molde de soplado, constanding el molde de soplado de mitades de molde separables que se cierran una con respecto a la otra durante el moldeo del envase de vidrio y abriéndose una con respecto a la otra luego del moldeado del envase de vidrio para permitir que un envase de vidrio soplado se retire del molde de soplado, proceso que comprende

proveer una mordaza, mordaza que tiene una pluralidad de elementos de mordaza dispuestos circunferencialmente, siendo los elementos de mordaza simultáneamente desplazables sólo en un plano horizontal entre primeras posiciones radialmente más alejadas y segundas posiciones radialmente más internas,

ubicar la mordaza para rodear el terminado del envase de vidrio en el molde de soplado con las mitades moldeadoras cerradas y los elementos de mordaza en sus primeras posiciones,

mover simultáneamente los elementos de mordaza a sus segundas posiciones mientras se cierran las mitades moldeadoras para agarrar el terminado del envase de vidrio en el molde de soplado, y

abrir luego las mitades moldeadoras del molde de soplado y mover la mordaza en relación con el molde de soplado mientras los elementos de mordaza están en sus segundas posiciones para retirar el envase de vidrio del molde de soplado

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EXTRACTO DE LA DIVULGACIÓN

Se proveen primeros (30) y segundos (32) mecanismos combinados de cabezales de soplado y retiro, verticalmente alineados, para soplar secuencialmente parisones de vidrio (P) en envases (C) en un conjunto de moldeo (22) y para transferir envases sopladados a una placa pasiva (40) de una maquina formadora de envases de vidrio (20). Cada uno de los mecanismos combinados está suspendido en forma pivotante alrededor de un eje A de un brazo portador (36) que se une en forma pivotante a un extremo de un brazo oscilante (38), un extremo opuesto del cual pivotea alrededor de un eje B. El eje (B) de cada mecanismo combinado de cabezales de soplado y retiro se levanta y baja periódicamente para permitir que el otro mecanismo combinado de cabezales de soplado y retiro oscile debajo de él, para facilitar así ciclos superpuestos entre los mecanismos de cabezales de soplado y retiro. Cada mecanismo de cabezales de soplado y retiro está provisto de una mordaza o ensamble de lengüetas (54) para agarrar o soltar cada envase por su terminado (F). Cada ensamble de lengüetas tiene una pluralidad de elementos de lengüeta (74) que se mueven radialmente en forma simultánea hacia adentro o hacia afuera mediante la oscilación de una leva (50) que tiene una ranura no circular (78) en la cual se desplaza un pasador (76) portado por cada elemento de lengüeta.

2° EXAMEN DE FORMA, PATENTE DE INVENCION

Radicación N° **03-46606**

Folio 115

Concepto Técnico N° **179**

Clasificación Internacional de Patentes **C03B 9/00**

Practicado el examen de acuerdo a lo establecido en el Art 38 de la Decisión 486, se determinó que esta solicitud de **Patente**

- SI ☒ NO ☐ Contiene un resumen de la invención (Art 26-e)
- SI ☒ NO ☐ Contiene el título o nombre de la invención (Art 27-d)
- SI ☒ NO ☐ Contiene la descripción de la invención (Art 26-b)
- SI ☒ NO ☐ NO ES APLICABLE ☐ Contiene los dibujos necesarios para comprender la invención (Art 26-d)
- SI ☒ NO ☐ Contiene una o más reivindicaciones (Art 26-c)
- SI ☐ NO ☐ NO ES APLICABLE ☒ Han sido desarrollados los productos a partir de recursos genéticos o de sus productos derivados de los que cualquiera de los Países Miembros es país de origen (Art 26-h)
- SI ☐ NO ☐ NO ES APLICABLE ☒ Los productos y o procedimientos han sido obtenidos o desarrollados a partir a partir de los conocimientos tradicionales de las comunidades indígenas, afro americanas, o locales de los Países Miembros, de acuerdo a lo establecido en la Decisión 391 y sus modificaciones y reglamentaciones vigentes (Art 26-i)
- SI ☐ NO ☒ La invención se refiere a un producto relativo a un material biológico (Art 26-j)
- SI ☒ NO ☐ NO ES APLICABLE ☐ La prioridad coincide con la materia reivindicada
- SI ☒ NO ☐ **CUMPLE LOS REQUISITOS TÉCNICOS**

OBSERVACIONES Y OTROS SI ☐ NO ☐ Ver hoja(s) anexa(s)

- Nuevos dibujos, folios 47 – 58
-

EXAMINADOR TÉCNICO 202051

Bogotá D C, febrero 06 de 2004

2020
Bogotá D C

Doctor(a)
RAMIRO CASTRO DUQUE
Apoderado(a)

REFERENCIA	Radicación N°	03-46606
	Trámite	002
	Evento	001
	Actuación	416
	Oficio N°	195
	Folios	001

Teniendo en cuenta que la solicitud de privilegio de patente que se tramita bajo el expediente indicado en la referencia, reúne los requisitos de forma establecidos en los artículos 26 y 27 de la Decisión 486, de la Comisión de la Comunidad Andina, y en las demás disposiciones vigentes sobre la materia, se envía el extracto de la solicitud a la oficina de comunicaciones para efecto de su publicación en la Gaceta de Propiedad Industrial, conforme lo establece el artículo 40 de la Decisión 486, a partir del 03/10/2004

Cumplase
Dado en Bogotá D C,

6 FEB 2004


ALIX CARMENZA CESPEDES DE VERGEL
Jefe División de Nuevas Creaciones

202051