

J.M.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



DELEGATURA PROPIEDAD INDUSTRIAL

División de Nuevas Creaciones

PCT
SOLICITUD

PATENTE DE INVENCION

ENTRADA EN FASE NACIONAL

21. EXPEDIENTE No.

05-19559

54. TITULO APARATO DE BARRIDO Y METODO PARA UNA MAQUINA S.I. DE MOLDEO DE
CRISTALERIA

51. CLASIFICACION INTERNACIONAL

71. SOLICITANTE OWENS - BROCKWAY GLASS CONTAINER INC.

DOMICILIO TOLEDO, OHIO, ESTADOS UNIDOS DE AMERICA

74. APODERADO JUAN PABLO CADENA SARMIENTO

22. SANTAFE DE BOGOTA, D.C.

PETITORIO

AS: 96.448



SUPERINDUSTRIA Y COMERCIO
 Radicación : 83819559 00000000 Folios: 115
 Fecha (AMB): 2005-03-02 17:09:57
 Trámite : 011 PCT-PATENT 379 FASE NACI 411 PRESENTA
 Reglamento: 2000 STATUTING DE INDUSTRIAL PROPERTY

FORMULARIO ÚNICO DE SOLICITUD DE PATENTE PCT ENTRADA EN FASE NACIONAL

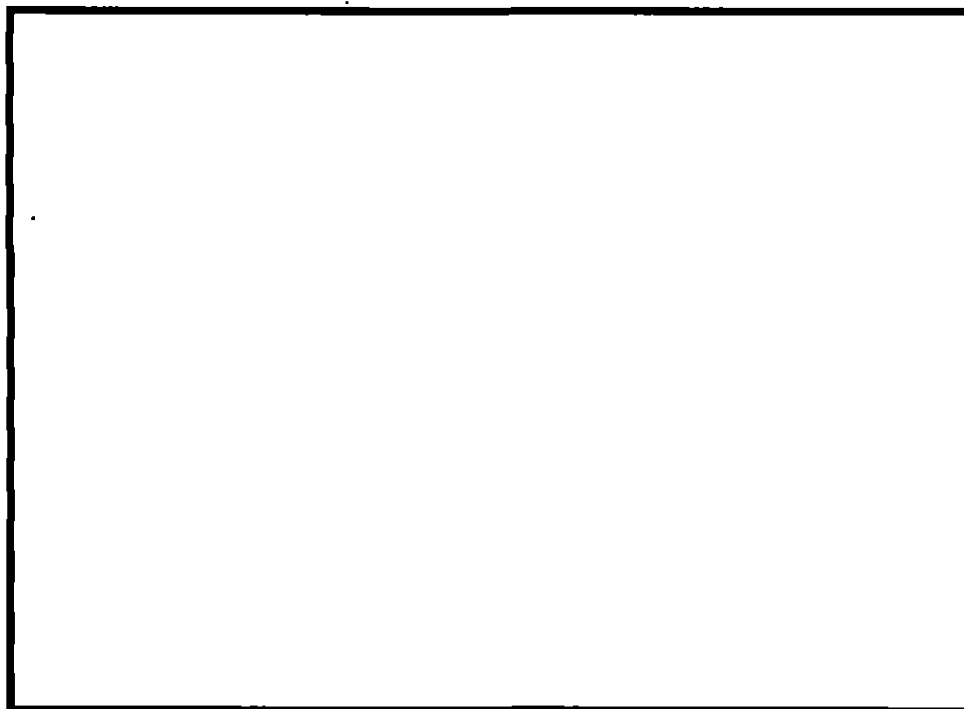
1 SOLICITUD DE:			
☒ Patente de Invención.		☐ Patente de Modelo de Utilidad.	
☐ Capítulo I.		☒ Capítulo II.	
2 SOLICITANTE (71)	Nombre: OWENS - BROCKWAY GLASS CONTAINER INC. Dirección: One SeaGate, Toledo, OH, 43666, Estados Unidos de América Nacionalidad o Domicilio: Estados Unidos Lugar de Constitución: Estados Unidos Teléfono: Fax E-mail		IDENTIFICACION C.C. ☐ NIT ☐ C.E. ☐ Otro ☐ Cual _____ Número _____
3 REPRESENTANTE O APODERADO	Nombre: JUAN PABLO CADENA SARMIENTO Dirección: Cra. 7 No. 16-56 Piso 9 Teléfono: 380-2200 Fax: 380-2700 E-mail:		IDENTIFICACION C.C. ☒ NIT ☐ C.E. ☐ Otro ☐ Cual _____ Número <u>80.410.337</u> TP <u>57492</u>
4 INVENTOR (ES) (72)	Nombre: D. Wayne Leidy, Frank J. DiFrank Dirección: 9921 Parliament Place, Perrysburg, OH 43551, US; 3442 Woodley Road, Toledo, OH 43606, Estados Unidos de América (Respectivamente) Nacionalidad o Domicilio: Estados Unidos de América (Respectivamente)		
5 PCT (86) Solicitud Internacional No. <u>PCT/US2003/027702</u> Fecha <u>04-09-2003</u> Publicación Internacional No. <u>WO 2004/022496 A1</u> Fecha <u>18-03-2004</u>			
Título (54): <u>APARATO DE BARRIDO Y MÉTODO PARA UNA MÁQUINA S.I. DE MOLDEO DE CRISTALERÍA</u>			
7 Clasificación Internacional (51) _____			
8 Prioridad	(33) País de Origen	(32) Fecha	(31) Número de Solicitud
SI ☒ NO ☐	<u>US</u>	<u>04-09-2002</u>	<u>10/235,189</u>
Contraseña de acceso No. <u>00000000</u> Fecha <u>04-09-2005</u>			
Instrucciones para el diligenciamiento del presente formulario, ver reverso de esta página.			

10

ANEXOS

- ☒ Comprobante de pago de la tasa de presentación de la solicitud. \$443.000
- ☐ Documento que acredite la existencia y representación legal cuando el solicitante sea persona jurídica.
- ☒ Poderes, si fuere el caso. Fotocopia Autenticada
- ☐ Documento de cesión del inventor al solicitante o a su causante.
- ☐ Declaraciones
- ☒ Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos)
- ☒ Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicaciones, dibujos)
- ☒ Copia del examen preliminar efectuado por la IPEA.
- ☒ Traducción del examen preliminar efectuado por la IPEA.
- ☐ De ser el caso, copia del contrato de acceso.
- ☐ De ser el caso, documento que acredite la licencia o autorización de uso de conocimientos tradicionales de las comunidades indígenas.
- ☐ De ser el caso, certificado de depósito del material biológico.
- ☐ Apta final 12x12.
- ☐ De ser el caso, información sobre otras solicitudes de patente o títulos obtenidos en el extranjero por el mismo titular o su causante, relacionadas parcial o totalmente con la invención de esta solicitud.
- ☒ Otros: Tarjeta de propietarios.

11 FIGURA CARACTERÍSTICA:



12

Solicitud de concesión de la patente

NOMBRE: JUAN PABLO CADENA SARMENTO

FIRMA:

C.G. 501410337 de Usapent P. 57/92 del C.S.

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

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176009-2

RECIBO OFICIAL DE CAJA : 05 - 4,859
FECHA : ENERO 24 DE 2005

SUPERINDUSTRIA Y COMERCIO
Radicacion : 85819559 00000000 Folios: 115
Fecha (AMB): 2005-02-02 17:09:57
Tramite : 811 PCT-PATENT 379 FASE INCI 411 PRESENTAC
Descripcion: 2005 INVENTION DE NUEVAS FORMAS

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
BRIGARD & CASTRO LTDA	CONSIGNACION	BANCO POPULAR	050-00110-6	21741640	24/01/2005	20,360,000.00

***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-01 SOLICITUDES	1 TRAMITES DE SOL. DE PATENTE DE IN	443,000.00
		TOTAL :	\$ 443,000.00

SON: CUATROCIENTOS CUARENTA Y TRES MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
18 March 2004 (18.03.2004)

PCT

(10) International Publication Number
WO 2004/022496 A1

(51) International Patent Classification⁷: C03B 9/453

(US). DIFRANK, Frank, J. [US/US]; 3442 Woodley Road, Toledo, OH 43606 (US).

(21) International Application Number:
PCT/US2003/027702

(74) Agents: PARIKH, Nirav, D. et al.; Ownes-Illinois, Inc., One SeaGate, 25-LDP, Toledo, OH 43666 (US).

(22) International Filing Date:
4 September 2003 (04.09.2003)

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

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/235,189 4 September 2002 (04.09.2002) US

(71) Applicant (*for all designated States except US*):
OWENS-BROCKWAY GLASS CONTAINER INC.
[US/US]; One SeaGate, Toledo, OH 43551 (US).

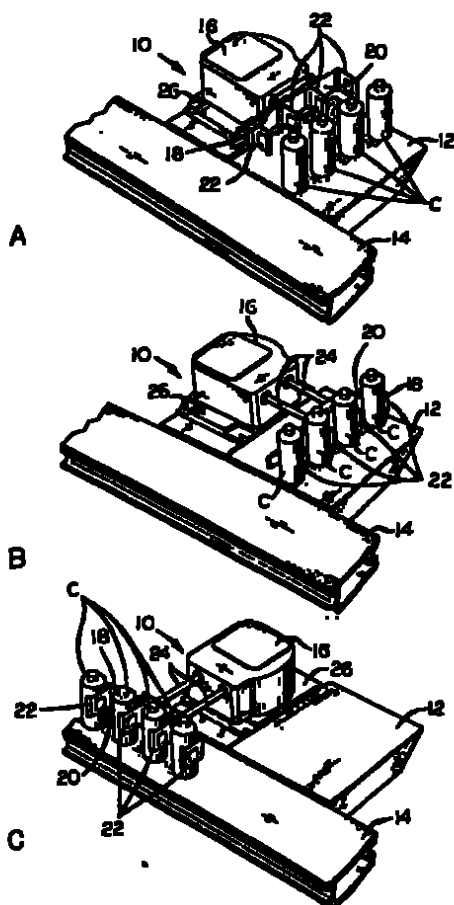
(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ,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

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): LEIDY, D. Wayne
[US/US]; 9921 Parliament Place, Perrysburg, OH 43551

[Continued on next page]

(54) Title: SWEEP-OUT APPARATUS AND METHOD FOR AN I.S. GLASSWARE FORMING MACHINE



(57) Abstract: Sweepout apparatus (10) and method for sweeping an aligned array of glass containers (C) from a deadplate (12) of a I.S. glass container forming machine to a conveyor (14) that runs transversely to the array of containers on the deadplate and serves to transfer the containers for further processing. The apparatus comprises a swivel portion (16 or 116) oscillatable in an arc of approximately 90°; a head (18) carried by the swivel portion and reciprocable relative thereto; an elongated bar (20) carried by the head with a spaced plurality of pocket-defining fingers (22) that extend from the bar; independently operatable first and second coaxial reversible electrical motors (30, 28); an output shaft (32) of the second electric motor (28) passing through an annular output shaft (56) of the first electric motor (30). Reversible motion imparted to the annular output shaft of the first motor causes oscillating motion of the swivel portion of the sweepout apparatus. Reversible motion imparted to the output shaft of the second motor axial through a planetary gear (42) imparts reciprocating motion to the elongated bar relative to the other structure of the sweepout portion. The output shafts (32, 56) are rotatable independently rotatable.

**SWEEP-OUT APPARATUS AND METHOD FOR AN I.S. GLASSWARE FORMING MACHINE****FIELD OF THE INVENTION**

5 This invention relates to a method of, and an apparatus for, transferring a multiplicity of aligned articles on a stationary member to the flight of a conveyor that is moving transversely of the alignment of the articles on the stationary member. More particularly, this invention relates to a sweepout for transferring a multiplicity of aligned, freshly-formed glass containers on a
10 deadplate of a glass container forming machine of the I.S. (individual section) type to the upper flight of a conveyor for transferring the glass containers to an annealing lehr.

BACKGROUND OF THE INVENTION

15 As is explained in commonly-assigned U.S. Patent 6,076,654 (Leidy), the disclosure of which is incorporated by reference herein, various devices and steps are involved in transferring freshly-formed glass containers from the deadplates of an I.S. machine to an annealing lehr for heat treatment of the containers. Among the devices employed in such a process is a sweepout
20 device that is used to simultaneously transfer a plurality of aligned containers, usually two, three or four containers, from an I.S. machine deadplate to an upper moving flight of an endless machine conveyor.

 Prior art I.S. machine sweepout devices are described, for example, in commonly-assigned U.S. patents 3,795,503 (Perry), 4,162,911 (Mallory),
25 4,199,344 (Mumford et al.), 4,222,480 (Perry), and 5,904,745 (Nafziger et al.), the disclosure of each of which is also incorporated by reference herein. As is disclosed in such references, or as is otherwise known, a typical I.S. machine sweepout head has a horizontally extending elongated bar with a plurality of spaced, horizontally extending fingers extending transversely from the

elongated bar. Each finger defines, with the elongated bar, a generally L-shaped container receiving pocket.

Prime movers, heretofore usually pneumatic cylinders, provide dual motions to the head with the elongated bar and fingers that extend therefrom.

5 The first of such motions is a reciprocating motion a first portion of which serves to move the elongated bar and its fingers from a position out of contact with containers on the deadplate into a position engaging the containers on the deadplate. The other motion is a 90° oscillating motion to the head, a first portion of which transfers the containers on the deadplate to the upper flight of
10 the machine conveyor. Then, as a second portion of the reciprocating motion, the elongated bar and its fingers are retracted to a position out of engagement with containers on the machine conveyor to permit the containers to be conveyed away from the forming machine by the machine conveyor, and, as a second portion of the 90° oscillating motion, the head with the elongated bar
15 with its fingers is returned to its original position to be ready to begin a repeat of the process. While pneumatic cylinders have heretofore usually used to power both required motions of a glass container sweepout head, U.S. patent 5,429,651 (Bolin), which specifically discloses a pneumatic device for actuating the reciprocating motion of the sweepout pusher mechanism, does
20 disclose, in words only, at column 13, lines 45 – 50, that a stepping motor could also be used for such purpose. Further, U.S. patent 5,125,499 (Saathoff et al.) does teach the use of a stepping motor for powering the oscillating motion of a sweepout head, but also teaches the use of a fluid motor for powering the reciprocation of the pusher arm.

25 The use of a pneumatic cylinder to power either the reciprocation or the oscillation of a sweepout head finger-carrying bar has certain operating disadvantages, however. Precise control over the timing of the reciprocation or oscillation of the pusher head is difficult to achieve, which creates problems in accurately timing the motion of the pusher head relative to other motions of
30 an I.S. machine. Further, modification of either of the timing of the sweepout

X
6

pneumatic cylinders is difficult to achieve, as is required, for example, when the machine is modified to produce larger or smaller containers, and it is difficult to control the speeds of a pneumatically-powered sweepout head at the beginning and end of its extension and retraction motions.

5

SUMMARY OF THE INVENTION

To overcome the aforesaid and other problems associated with prior art I.S. machine sweepouts, according to the present invention there is provided an all-electric sweepout. The sweepout of the present invention has a pair of
10 vertically arranged, reversible electrical motors, each motor preferably an a.c. servo motor. The motors are coaxially aligned, and the output shaft of the lower motor, which provides reciprocating motion to the sweepout head through a planetary gear drive, extends through an annular output shaft of the upper motor, which imparts oscillating motion to the sweepout head. The
15 output shafts of the lower and upper motors are rotatable with respect to one another. Because the installed positions of the upper and lower motors are fixed, the wiring for the motors need not have a pigtail to accommodate movement of a motor relative to a source of power, and oil lines for motor cooling, which is desired to permit prolonged operation in a hostile, high-
20 temperature environment, need not have flexible components. Also positioning the motors below the sweepout head does somewhat reduce the temperatures to which the motors are exposed.

Accordingly, it is an object of the present invention to provide a method of and an apparatus for transferring a plurality of articles from fixed positions to
25 a moving conveyor in which all required motions are powered by reversible electric motors whose positions are fixed. More particularly, it is an object of the present invention to provide a method and an apparatus of the foregoing character that is well-suited for operating in proximity to a glass container forming machine, where the operating temperatures can be somewhat higher
30 than ambient.

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.

5

BRIEF DESCRIPTION OF THE DRAWING

Figs. 1A, 1B, and 1C are fragmentary, perspective views of apparatus according to the present invention, each view illustrating the apparatus at a different position in a cycle of operation;

10 Fig. 2 is an elevation view, at an enlarged scale, of elements of the apparatus of Figs. 1A, 1B, and 1C;

Fig. 3 is a fragmentary sectional view, at a further enlarged scale, of a portion of the apparatus of Fig. 2;

15 2; Fig. 4 is a view like Fig. 3 of another portion of the apparatus of Fig. 2;

Fig. 5 is a fragmentary perspective view, with a portion of the structure broken away, of the apparatus of Figs. 2 and 3;

Fig. 6 is a sectional view taken on line 6-6 of Fig. 3;

20 Fig. 7 is a fragmentary perspective view, partly in cross-section, of a portion of the apparatus of Figs. 2 – 6;

Fig. 8 is a view like Fig. 2 of an alternate embodiment of the present;

Fig. 9 is a view like Fig. 3 of a portion of the apparatus of Fig. 8;

Fig. 10 is a fragmentary perspective view of a portion of the apparatus of Fig. 8; and

25 Fig. 11 is a view like Fig. 10 with the portion of the apparatus depicted therein being turned by 180° and with a portion of the apparatus being broken away.

DETAILED DESCRIPTION OF THE INVENTION

Sweepout apparatus according to the present invention is indicated generally by the reference numeral 10 in Figs. 1A, 1B, 1C and 2 of drawing. The sweepout apparatus 10 is used to simultaneously transfer an aligned plurality of freshly-formed glass containers C on a deadplate 12 of an I.S. machine to a moving upper flight of a takeout, (machine) conveyor 14. The containers C are then conveyed by the conveyor to an annealing Lehr (not shown) for heat treatment of the containers C to relieve residual stresses therein, as is known in the art. The conveyor 14 extends transversely of the deadplate 12, and the transfer of the containers C from a deadplate 12 to the conveyor 14 requires that the containers C be transferred to the conveyor 14 and turned by 90° as they are transferred, to ensure that the containers C will be aligned with one another on the conveyor 14 as they were on the deadplate 12. To this end, the sweepout apparatus 10 is provided with a swivel portion 16 that is repeatedly oscillated through a 90° arc, including the motion from its Fig. 1A position to its Fig. 1C position. Further, the swivel portion 16 is provided with a sweepout head 18 that is repeatedly reciprocated, and the path of reciprocation of the sweepout head 18 includes movement from the position in Fig. 1A to the position in Figs. 1B and 1C and then back to the position of Fig. 1A.

The sweepout head 18 includes an elongated, horizontally extending bar 20 with a plurality of spaced fingers 22 extending transversely from the bar 20. Each of the fingers 22 defines, with the bar 20, a pocket for receiving a container C, the number of fingers 22 extending from the bar 20 being the same as the number of containers C on the deadplate 12. The elongated bar 20 is mounted on spaced, horizontally extending rods 24 that are reciprocatable with respect to the swivel portion 16, as will be hereinafter described more fully, to reciprocate the bar 20 of the sweepout head 18 from the position of Fig. 1A, where the containers C are not engaged in pockets of the sweepout head 18, to the position of Figs. 1B and 1C, where the

containers C are engaged in the pockets of the sweepout head 18. After the transfer of the containers C from the Fig. 1A position to the Fig. 1C position, the sweepout head 18 is retracted to permit the containers C to be conveyed away by the conveyor 14, and the swivel portion 16 of the sweepout apparatus 10 is then turned, in reverse, from its Fig. 1C position to its Fig. 1A position to begin a repeat of the sweepout cycle with a fresh array of containers C on the deadplate 12. As shown in Figs. 1A, 1B, and 1C, the sweepout head 18 is provided with four container-receiving pockets, and this is the construction that is suited for an I.S. machine that simultaneously produces four containers at each I.S. machine section, a type of machine that is often described as a "quad" machine. Of course, it is also known that an I.S. machine can also be adapted to simultaneously produce three containers at each I.S. machine section, a "triple gob" machine, or even two containers at each I.S. machine section, a "double gob" machine; in such cases, a sweepout apparatus 10 for a triple gob machine would have a sweepout head 18 with only three container-receiving pockets, and a sweepout apparatus 10 for a double gob machine would have a sweepout head with only two container-receiving pockets.

The sweepout apparatus 10 includes a stationary housing 26 that is positioned below and in alignment with the swivel portion 16. First and second reversible a.c. motors 28, 30, each preferably a servo motor for precise controllability, are positioned in vertical, coaxial alignment with each other within the housing 26. The motor 28, which is positioned beneath the motor 30, drives an output shaft 32, Fig. 4, which is rotatably supported in spaced bearings 34, 36. The output shaft 32 has a stub shaft 38 (Fig. 3) of a speed reduction planetary gear set 42 shrunk or otherwise inserted thereon, and the stub shaft 38, which is rotatably supported in a bearing 39, drives a sun gear 40 of the speed reduction planetary gear set 42. The planetary gear set 42 also has a spaced plurality of planetary gears 44, and the planetary gears 44, which are driven by the sun gear 40, engage an interior gear

X
8

surface of a ring gear 46. The ring gear 46 is secured to the interior of a cup-shaped portion 48a of a shaft extension 48 that extends into the swivel portion 16 of the sweepout apparatus 10 and is rotatably supported in bearings 47, 49 for rotation relative to the swivel portion 16. The planetary gear set 42 serves to substantially reduce the rotational speed of the shaft extension 48 relative to that of the shaft 32, for example, by a 1:5 factor. Such a planetary gear set is available as a commercial item from Mectrol, Inc.

The shaft extension 48 carries a drive gear 45, and the drive gear 45 drives a sector gear 50 (Fig. 6). The sector gear 50 is mounted for pivoting motion in and relative to the head 16 about a shaft 51 (Fig. 5) and has an overlying arm 53 (Figs. 3, 5 and 6) that pivots with the sector gear 50, and arcuate motion of the shaft extension 48, which is caused to oscillate by reversing motion of the motor 28, causes reversible motion of a follower 52 that extends from the arm 53 and rides in a slot 54 in a bracket 56 to which the rods 24 are attached. Thus, the reversing motion of the motor 28 is effective to cause the rods 24, with the bar 20 and the fingers 22, to extend and retract in unison to move between the positions shown in Figs. 1A and 1B, and to do so with virtually no backlash.

The a.c. motor 30 has an output shaft 56, and the shaft 56 is rotatably supported in spaced-apart bearings 58, 60. The output shaft 56 is annular in configuration and the output shaft 32 passes through the interior of the output shaft 56 so that the output shaft 56 and the output shaft 32 are rotatable independently of each other.

As seen best in Fig. 3, an annular housing 62 is secured to the shaft 56 by threaded fasteners 64, and an integral bottom plate 66 of the swivel portion 16 of the sweepout apparatus 10 is secured to the annular housing 62 by threaded fasteners 68. Thus, reversible arcuate motion is imparted to the shaft 56 by the motor 30, and this motion is effective to oscillate the swivel portion 16 of the sweepout apparatus 10 between the position shown in Figs. 1A and 1B and the position shown in Fig. 1C, and this motion is must be

controlled relative to the extension and retraction motions imparted to the sweepout head 18 by the motor 28, as both are performed together to impart such extension and retraction motions to the sweepout head while the swivel portion 6 is oscillating.

5 The sweepout apparatus 10, as heretofore described, uses motors 28, 30 within a housing 26 that need not be moved in service. Thus, wiring (not shown) to such motors may be stationary, thereby avoiding the need for flexible or extensible wiring to such motors in a relatively high temperature operating environment, and such wiring may be of a plug-in, quick disconnect
10 type for rapid installation and removal of a sweepout apparatus 10 as a unit. Further, because the housing of the motors 28, 30 need not be moved in service, the motors 28, 30 may readily be oil cooled, as desired, because coolant inlet and outlet lines for such purposes need not be flexible. Further
15 still, an electronic control unit, not shown, may, if desired, be mounted on the housing 26 and, if also desired, it too may be oil cooled, because inlet and outlet lines to and from it will require no flexible elements. In any case, positioning the motor 28, 30 below the head 16 will serve to somewhat reduce the temperatures to which the motor 28, 30 are exposed relative to that experienced by the head 16.

20 In the embodiment of Figs. 8 – 11, elements that correspond at least in function to elements of the embodiment of Figs. 1 – 7 are identified by a 100 series numeral, the last 2 digits of which are the same as the 2 digits of the embodiment of Figs. 1 – 7.

 The sweepout apparatus according to the embodiment of Figs. 8 – 11
25 is indicated generally by the reference numeral 110 in Fig. 8 of the drawing. The sweepout apparatus 110, like the sweepout apparatus 10, is used to simultaneously transfer an aligned plurality of freshly-formed glass containers on a deadplate of an I.S. machine to a moving upper flight of a takeout (machine) conveyor, which transfers the containers to an annealing Lehr (not
30 shown) for heat treatment of the containers to relieve residual stresses



therein, as known in the art. The sweepout apparatus 110 is provided with a swivel portion 116 that is repeatedly oscillated through a 90° arc, and the swivel portion 116 is provided with a sweepout head 118 that is repeatedly reciprocated, and the matter of the path of reciprocation of the sweepout head 16 of the embodiment of Figs. 1 – 7.

The sweepout head 118 includes an elongated, horizontally extending bar 120 with a plurality of spaced fingers 122 extending transversely from the bar 120. The elongated bar 120 is mounted on spaced horizontally extending rods 124 that are reciprocatable with respect to the swivel portion 116, as will be hereinafter described more fully, to reciprocate the bar 120 of the sweepout head 118.

The sweepout apparatus 110 includes a stationary housing 126 that is positioned below and in alignment with the swivel portion 116. First and second reversible a.c. motors 128, 130, each preferably a servo motor for precise controllability, are positioned in vertical, coaxial alignment with each other within the housing 126. The motor 128, which is positioned beneath the motor 130, drives an output shaft 132.

The embodiment of Figs. 8 – 11 differs from the embodiment of Figs. 1 – 7 mainly in the construction illustrated in Figs. 9 – 11, where a shaft extension 148 carries a drive gear 145, which drives a sector gear 150. The sector gear 150 is mounted for pivoting motion in and relative to the head 116 about a stub shaft 151 (Fig. 11) and has an overlying arm 153 that pivots with the sector gear 150. Arcuate motion of the shaft extension 148, which is caused to oscillate by reversing motion of the motor 128, causes reversible motion of a sleeve 152 that extends from the arm 153 and slidably surrounds a rod 154 that is mounted in a bracket 156, to which the rods 124 are attached. Thus, the reversing motion of the motor 128 is effective to cause the rods 124, with the bar 120 and the fingers 122, to extend and retract in unison to move between the innermost and outermost positions of the bar 120, and to do so with virtually no backlash.

The sweepout apparatus 110, as heretofore described, uses motors 128, 130 within a housing 126 that need not be moved in service. Thus, wiring (not shown) to such motors may be stationary, thereby avoiding the need for flexible or extensible wiring to such motors in a relatively high temperature operating environment, and such wiring may be of a plug-end, quick disconnect type for rapid installation and removal of a sweepout apparatus 110 as a unit. Further, because the housing of the motors 128, 130 need not be moved in service, the motors 128, 130 may readily be oil cooled, as desired, because coolant inlet and outlet lines for such purposes need not be flexible. Further still, an electronic control unit, not shown, may, if desired, be mounted on the housing 126 and, if also desired, it too may be oil cooled, because inlet and outlet lines to and from it will require no flexible elements. In any case, positioning the motors 128, 130 below the head 116 will serve somewhat to reduce the temperatures to which the motors 128, 130 are exposed relative to that experienced by the head 116.

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 from the scope of the invention, such scope being limited by the terms of the following claims and the legal equivalents thereof.

7
10**CLAIMS**

We claim:

1. Sweepout apparatus for transferring a plurality of aligned
5 articles on a member to a conveyor that extends transversely to the aligned
articles on the member, said apparatus comprising:

a head with an elongated bar having a spaced plurality of fingers
extending transversely therefrom, each finger defining, with the elongated
10 bar, a pocket for receiving one of the articles, said head with said elongated
bar being oscillatable through an arc of 90° to sweep the plurality of articles
from the member to positions on the conveyor, the elongated bar being
reciprocable to engage the articles on the member and to retract from the
articles on the conveyor.

a first reversible electric motor for imparting oscillating motion to the
15 head, said first reversible electrical motor being fixed in position during its
operation and having an annular output shaft operatively engaging said head;

a second reversible electric motor for imparting reciprocating motion to
the elongated bar with respect to said head, said second reversible electric
motor being fixed in position during its operation and being in coaxial
20 alignment vertically below said first reversible electric motor, said second
reversible electric motor having an output shaft extending through said
annular output shaft of said first reversible electric motor, said annular output
shaft of said first reversible electric motor and said output shaft of said second
reversible electric motor being rotatable relative to one another; and

25 a planetary gear transmission for imparting reciprocating motion from
said output shaft of said second reversible electric motor to said elongated
bar.

2. Sweepout apparatus according to claim 1 wherein each of said first reversible electric motor and said second reversible electric motor is an a.c. servomotor.

5 3. Sweepout apparatus according to claim 2 wherein:
each of said plurality of aligned articles is a freshly-formed glass container;

said member is a deadplate of I.S. glass container forming machine; and

10 said conveyor is a machine conveyor in a glass container manufacturing plant.

4. Apparatus according to claim 3 wherein said planetary gear transmission comprises:

15 an annular sun gear operatively connected to said output shaft of said second reversible electric motor;

a circumferentially spaced-apart plurality of planetary gears engaging said sun gear; and

20 an annular ring gear surrounding and operatively engaging each of said plurality of planetary gears.

5. Apparatus according to claim 4 wherein:
said plurality of planetary gears consists of three planetary gears.

25

6. Apparatus according to claim 5 and further comprising:
a sector gear;
structure for mounting said sector gear for oscillating motion about an axis spaced from an axis of said second reversible electric motor;

a drive gear driven by said planetary gear set and coaxially aligned with said second reversible electric motor, said drive gear engaging said sector gear;

at least one reciprocable rod engaging said elongated bar;

5 a bracket to which said at least one elongated bar is attached, said bracket having a slot therein;

a link mounted coaxially with said sector gear for oscillation with said sector gear, said link having a free end spaced away from the axis of oscillation of said sector gear; and

10 a roller follower at said free end of said link and received in said slot of said bracket, oscillation of said sector gear and said link causing said bracket to reciprocate by virtue of engagement of said roller follower in said slot.

15 7. Apparatus according to claim 6 wherein:

said at least one reciprocable rod comprises a spaced-apart plurality of reciprocable rods.

20 8. The method of transferring a plurality of aligned articles on a member to a conveyor that extends transversely to the aligned articles on the member, the method comprising:

25 providing an elongated bar having a spaced plurality of fingers extending transversely therefrom, each finger defining, with the elongated bar, a pocket for receiving one of the articles, the elongated bar being oscillatable through an arc of 90° to sweep the plurality of articles from the member to positions on the conveyor and being reciprocable to retract from the articles on the conveyor;

providing a first reversible electric motor to impart oscillating motion to the elongated bar;

providing a second reversible electric motor for imparting reciprocating motion to the elongated bar, said second reversible electric motor being positioned in coaxial alignment with said first reversible electric motor;

5 operating said first reversible electric motor to impart oscillating motion to the elongate bar; and

 operating said second reversible electric motor to impart reciprocating motion to said elongate bar.

10 9. The method according to claim 8 wherein:

 each of the plurality of aligned articles on the member is a freshly-formed glass container;

 the member is a deadplate of an I.S. glass container forming machine; and

15 the conveyor is a machine conveyor in a glass container manufacturing plant.

12
3/7

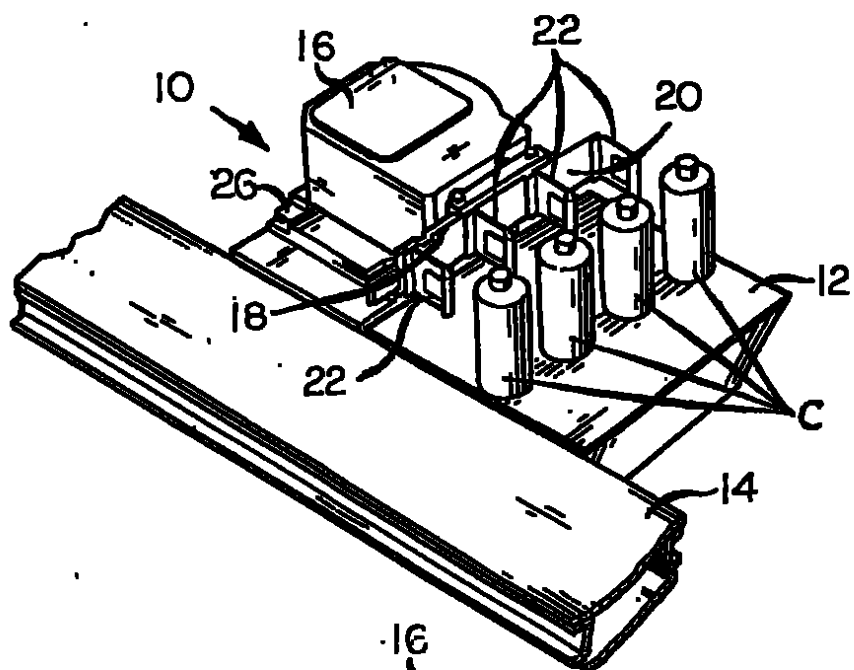


FIG. 1A

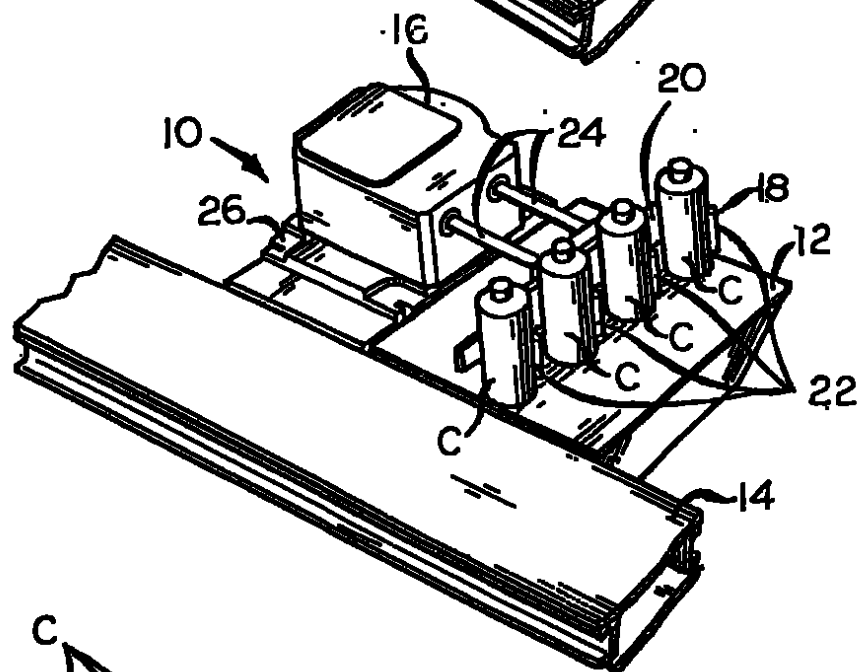


FIG. 1B

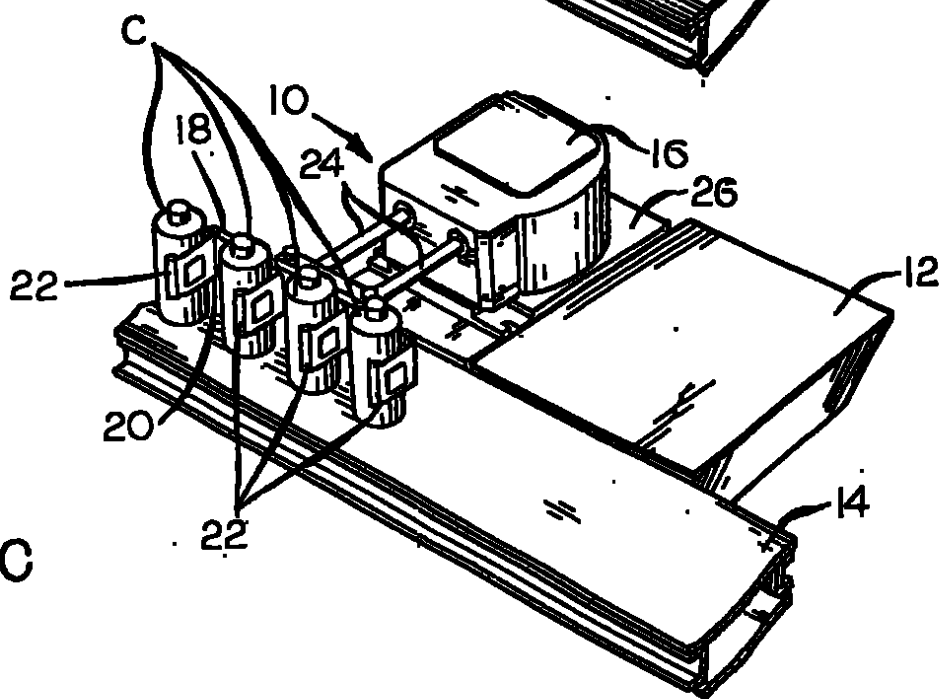


FIG. 1C

13
X

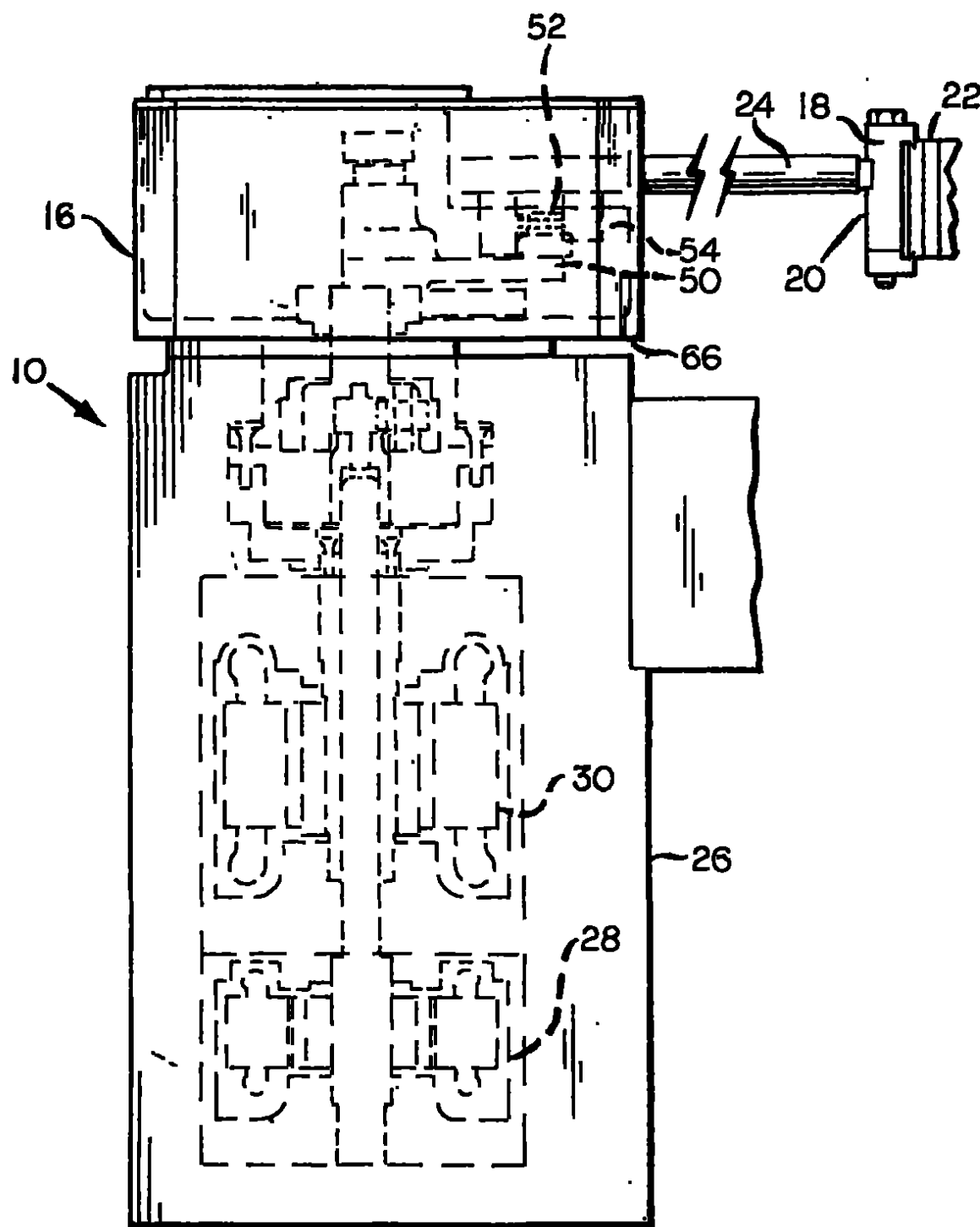


FIG. 2

14

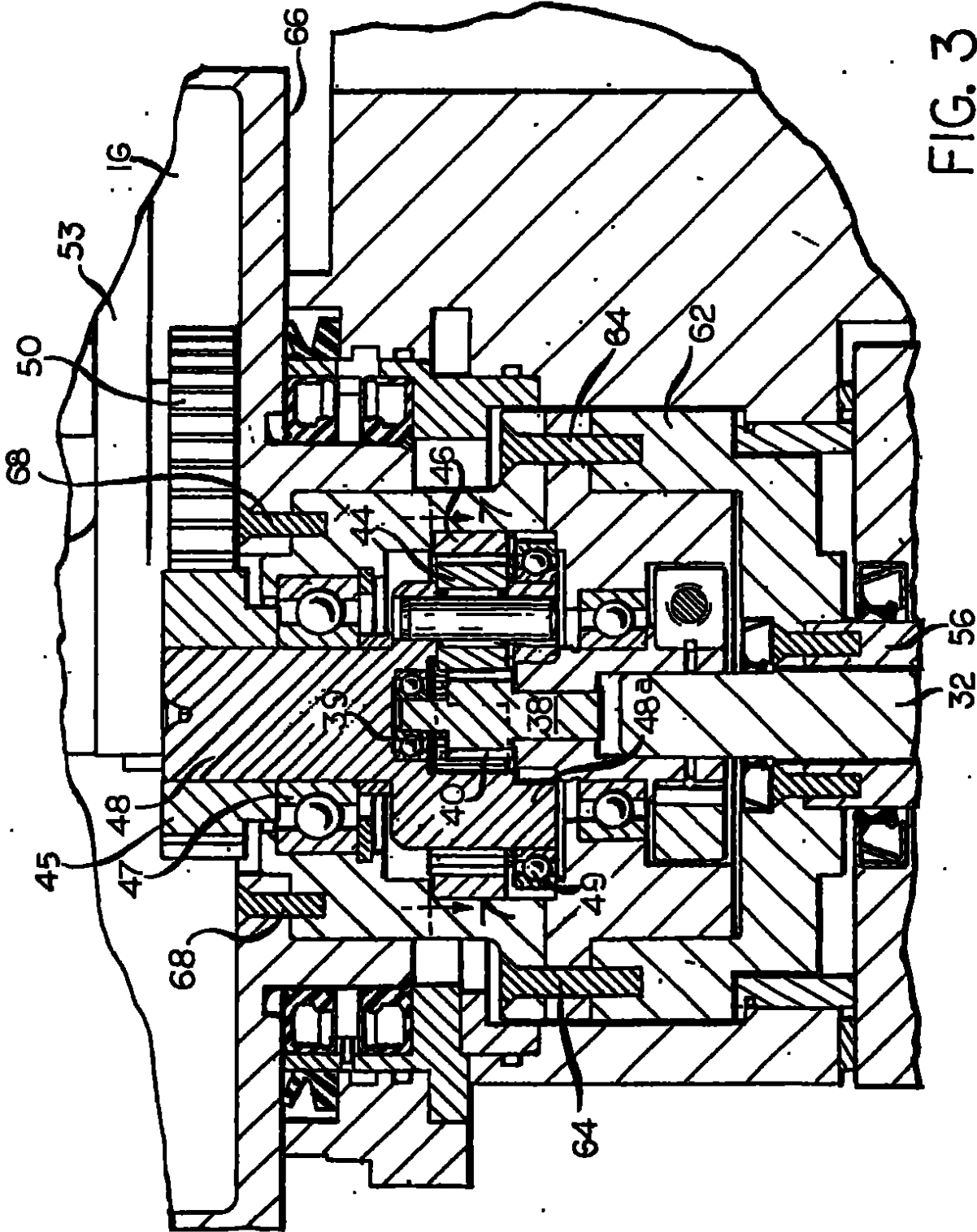


FIG. 3

15

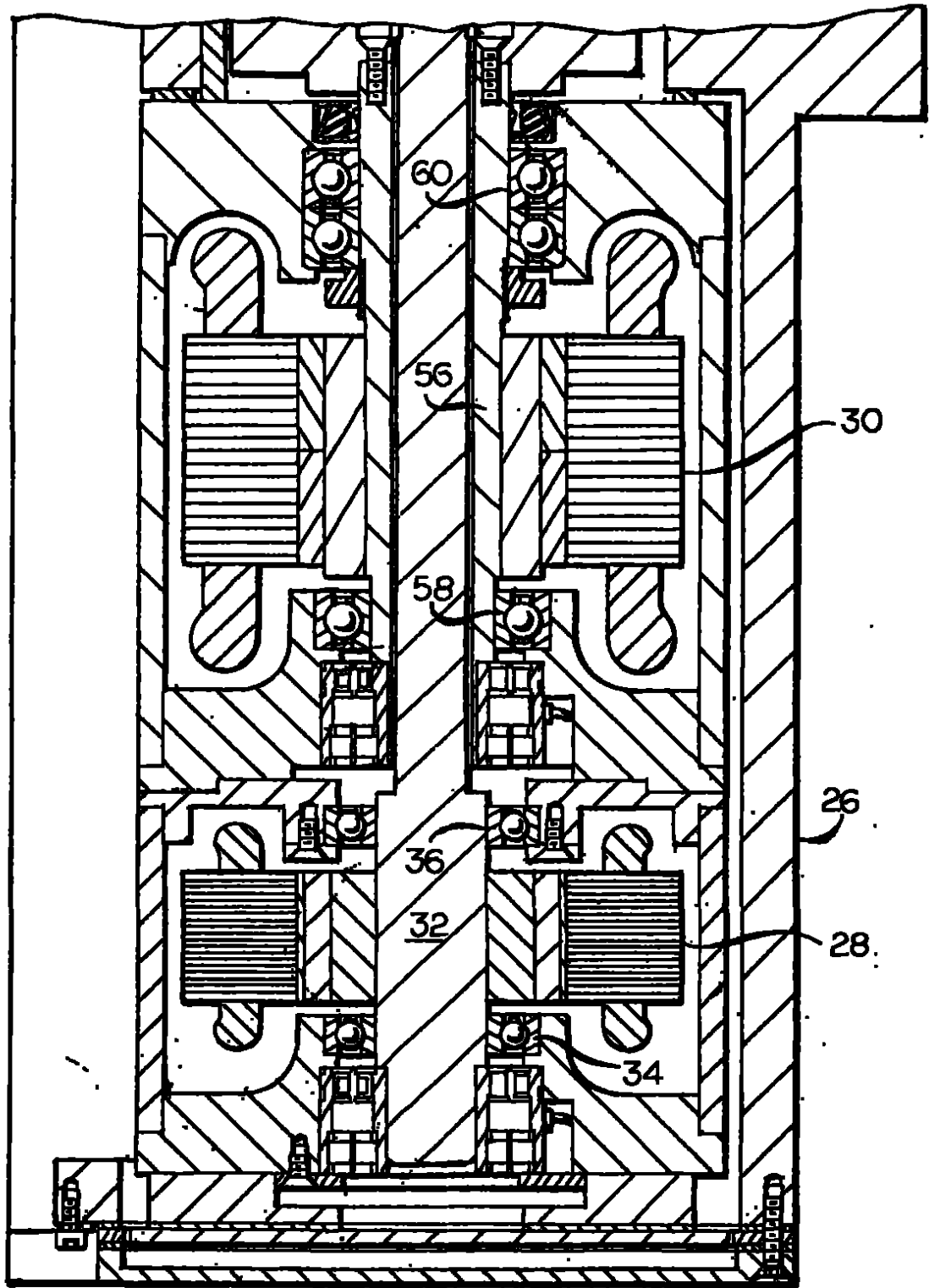
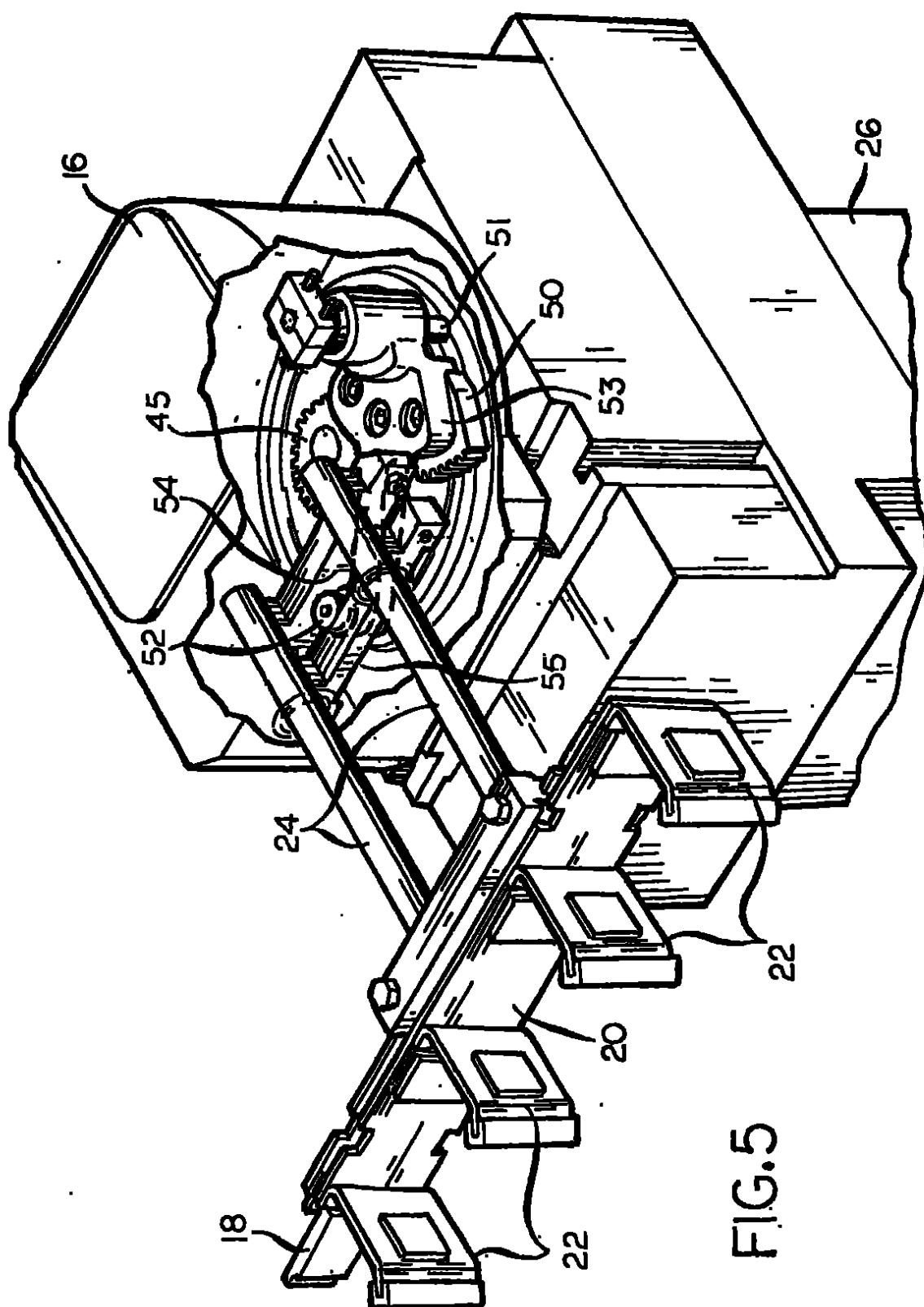


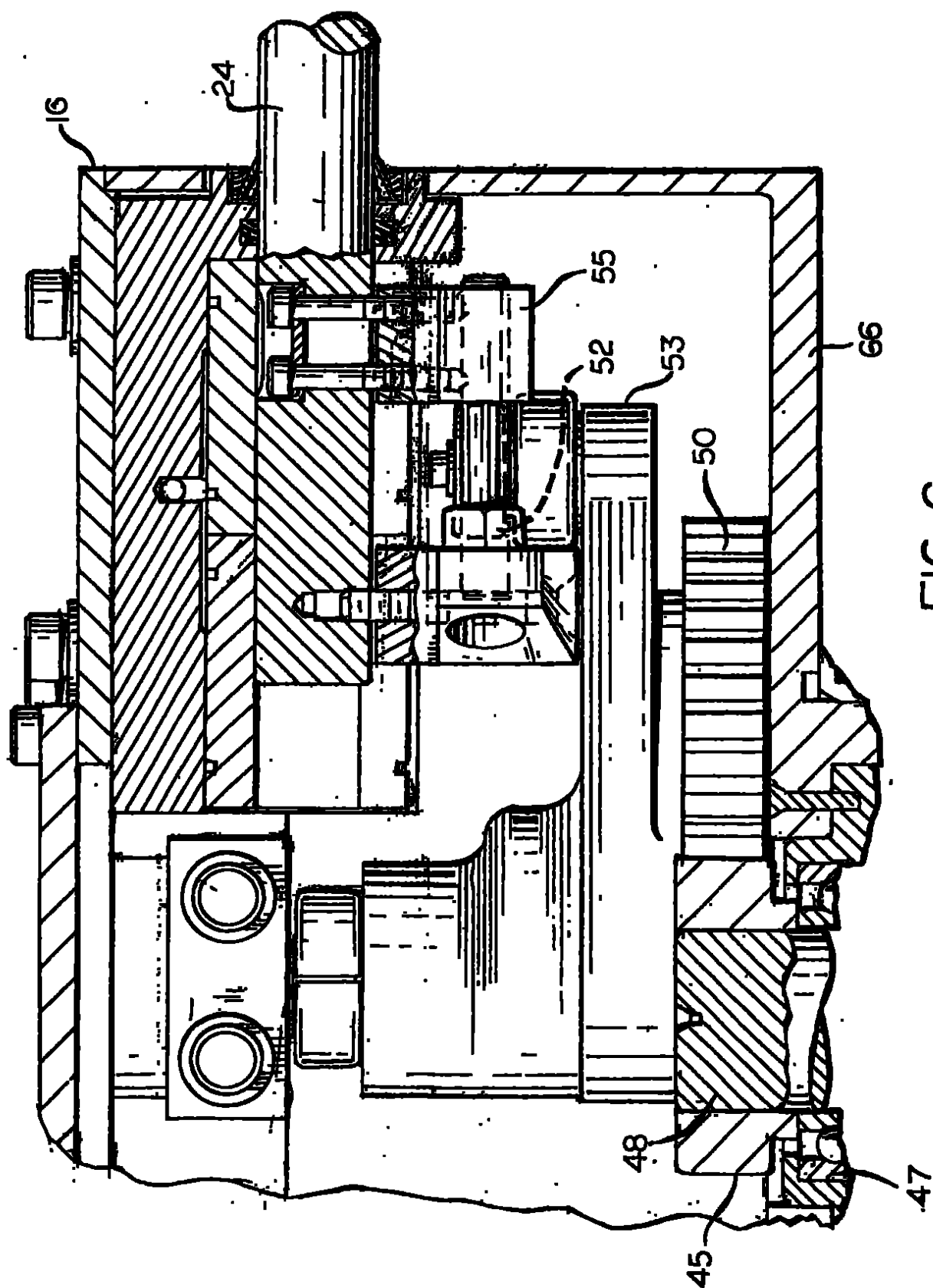
FIG. 4

7¹⁶



5. 6. 7.

17
78



7

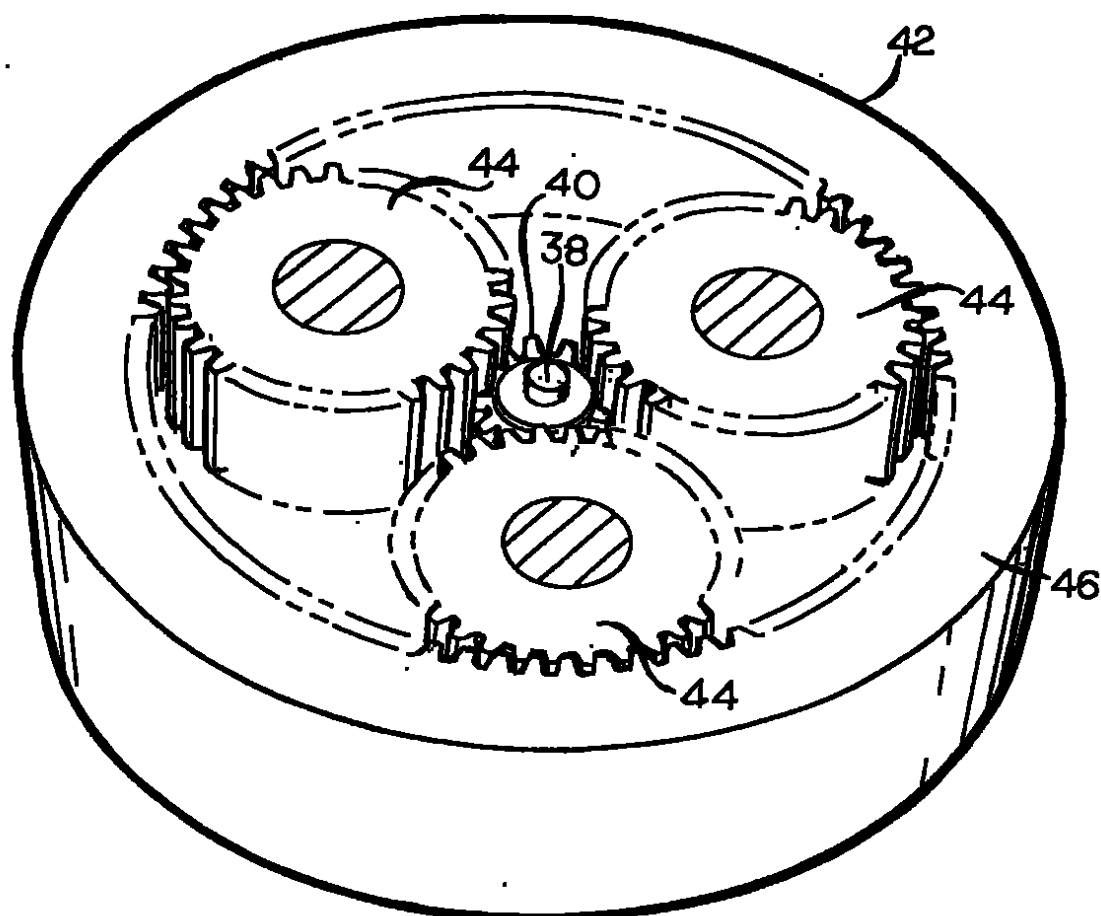


FIG. 7

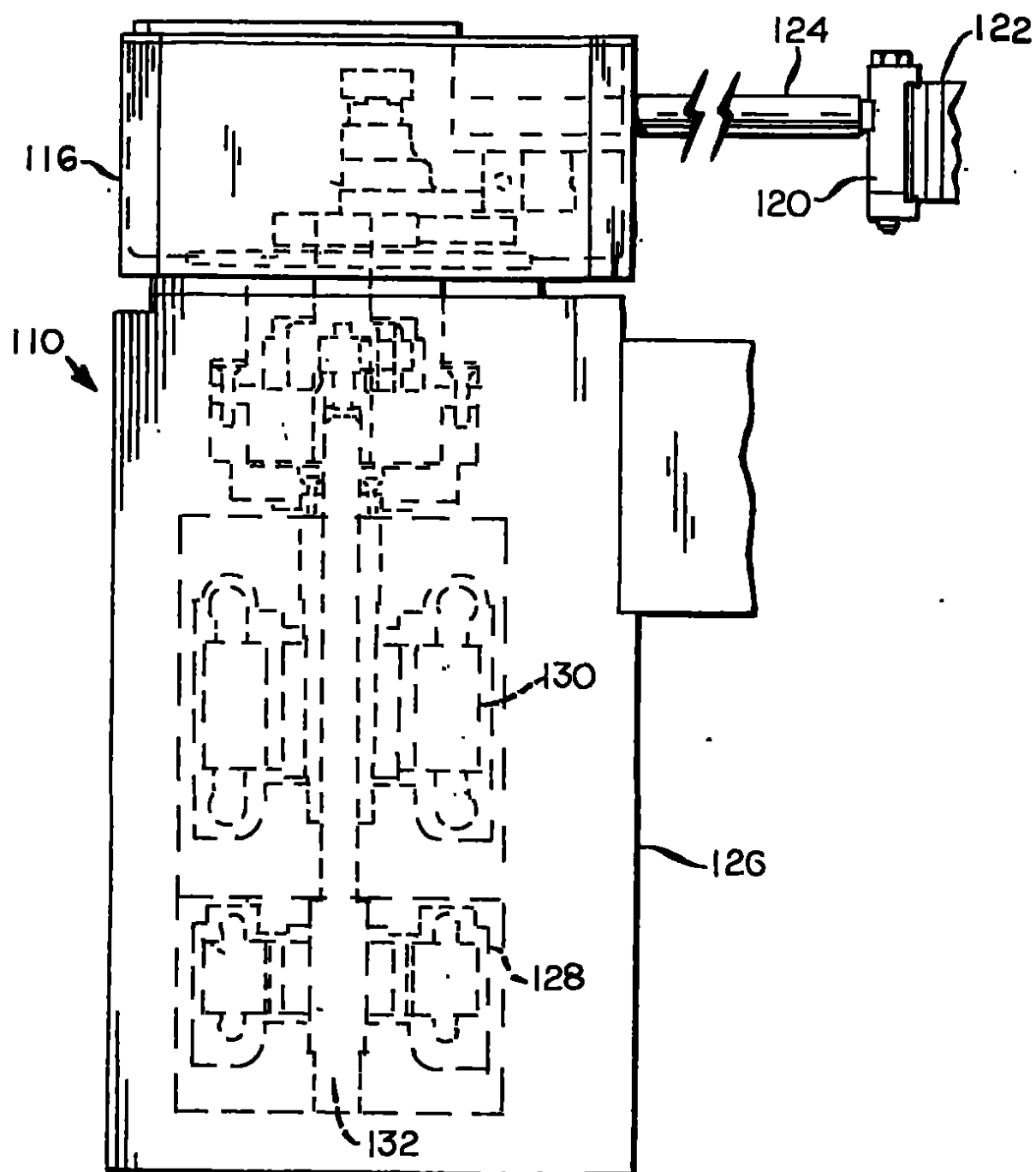
19
20

FIG. 8

212

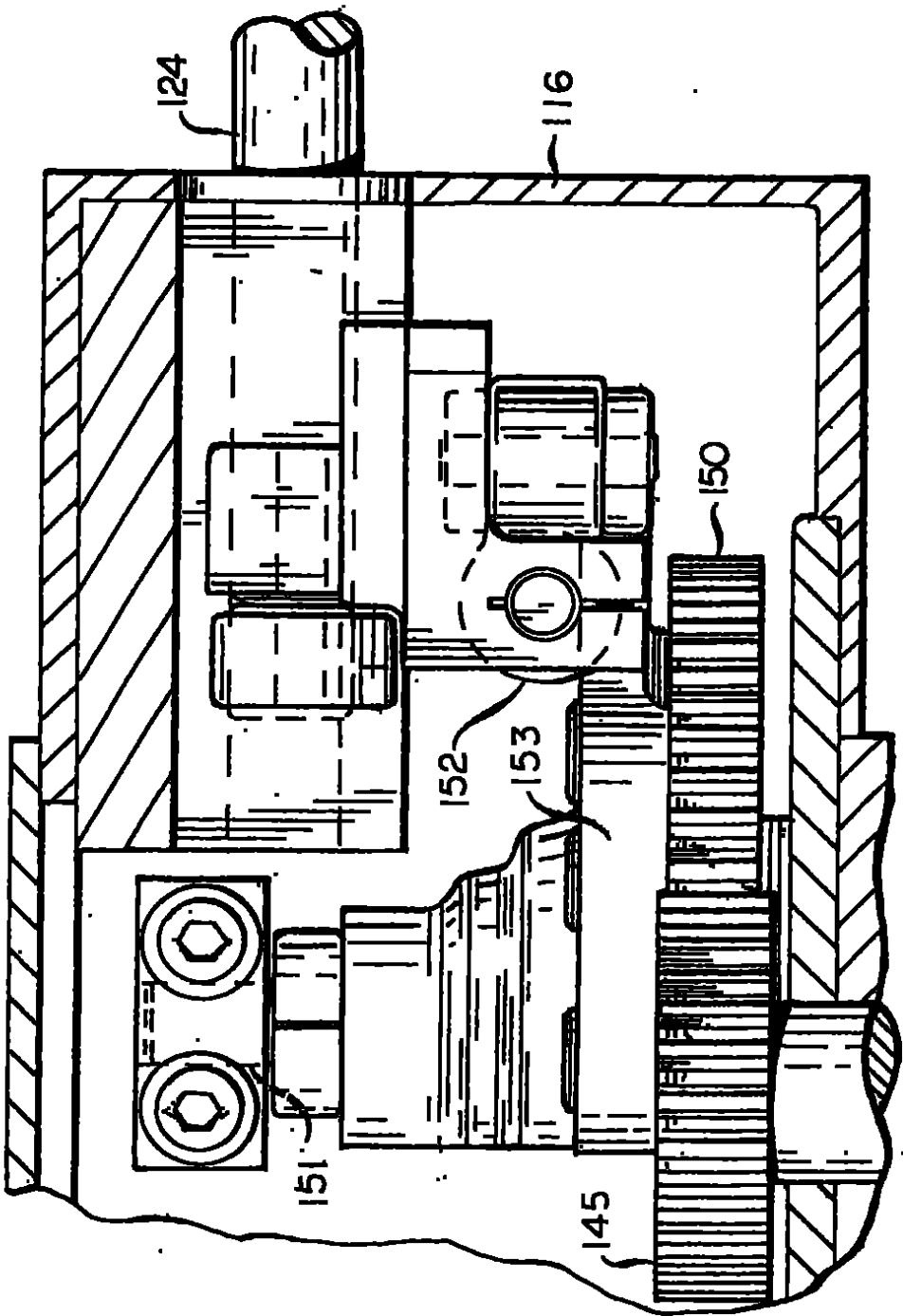


FIG. 9

21
Z

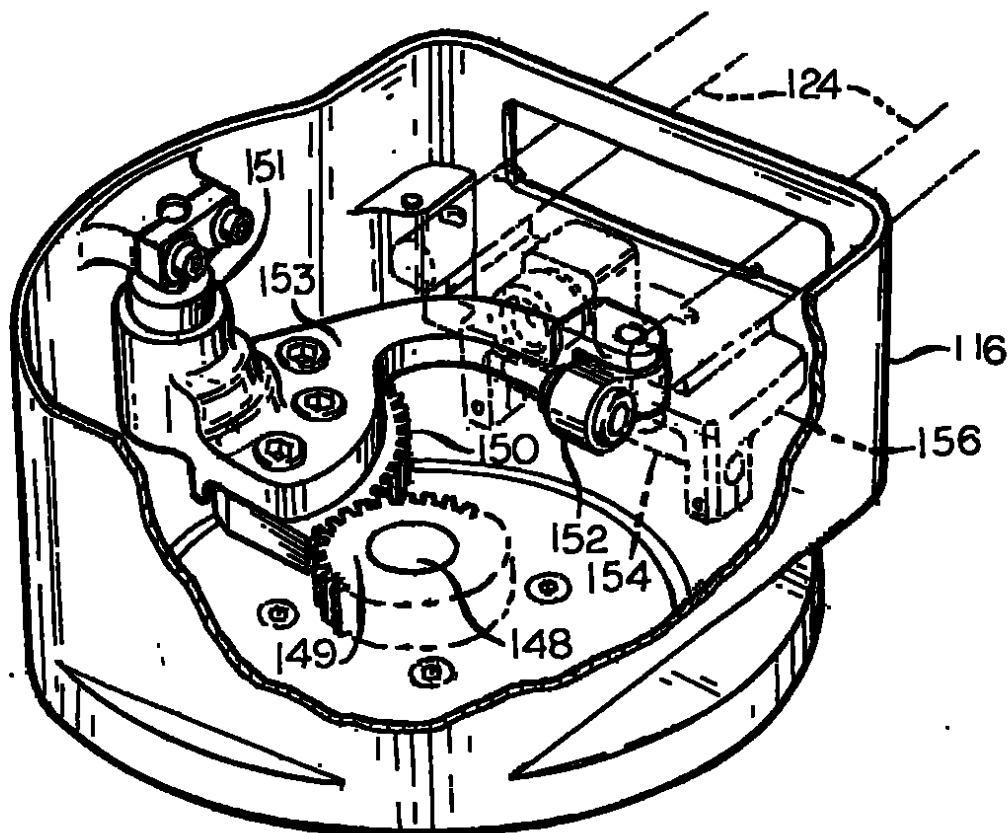


FIG. 11

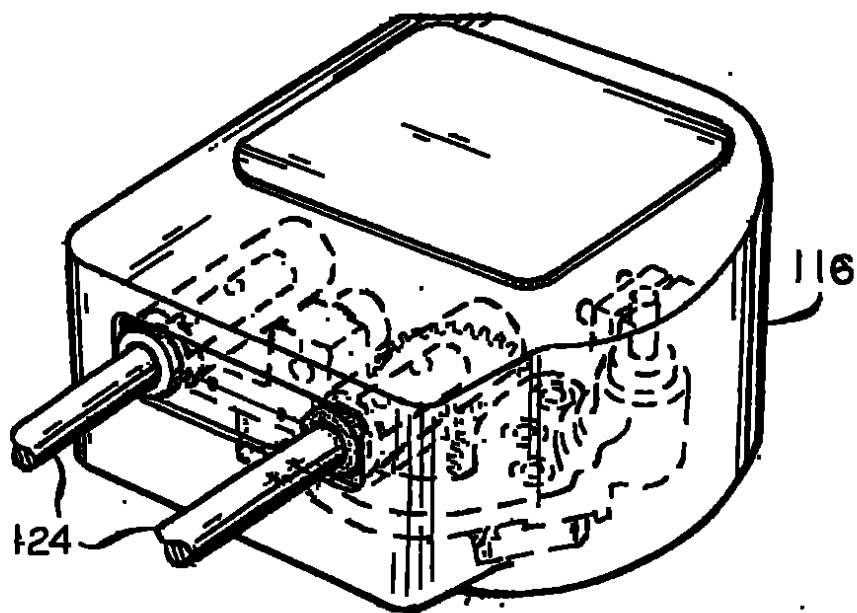


FIG. 10

(12) SOLICITUD INTERNACIONAL PUBLICADA BAJO EL TRATADO DE COOPERACIÓN PARA PATENTES (PCT)

(19) Organización Mundial de Propiedad Intelectual
Oficina Internacional



(43) Fecha de Publicación Internacional
18 de marzo de 2004 (18.03.2004)

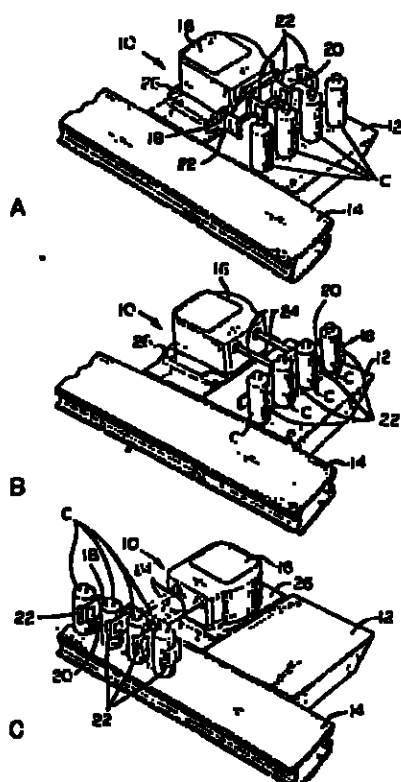
PCT

(10) Número de Publicación Internacional
WO 2004/022496 A1

- (51) Clasificación Internacional de Patente⁷: C03B 9/453 (USA). DIFRANK, Frank, J. [US/US]; 3442 Woodley Road, Toledo, OH 43606 (US).
- (21) Número de Solicitud Internacional PCT/US2003/027702 (74) Agente: PARIKH, Nirav, D. y colaboradores.; Owens-Illinois, Inc., One SeaGate, 25-LDP, Toledo, OH 43666 (US).
- (22) Fecha de Presentación Internacional:
4 de septiembre 2003 (04.09.2003) (81) Estados Designados (nacional): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.
- (25) Idioma de la Presentación: Inglés (84) Estados Designados (regional): patente ARIPO (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- (26) Idioma de Publicación: Inglés
- (30) Datos de la Prioridad:
10/235,189 4 de septiembre 2002 (04.09.2002) USA
- (71) Solicitante (Para todos los estados designados salvo USA): OWENS-BROCKWAY GLASS CONTAINER INC. [USA/USA]; One SeaGate, Toledo, OH 43551 (US).
- (72) Inventores; e
- (75) Inventores/Solicitantes (únicamente para USA): LEYDY, D. Wayne [US/US]; 9921 Parliament Place, Perrysburg, OH 43551

[Continúa en la siguiente página]

(54) Título: APARATO DE BARRIDO Y MÉTODO PARA UNA MÁQUINA S. I. DE MOLDEO DE CRISTALERÍA



(57) Extracto: Aparato de barrido (10) y método para trasladar un conjunto alineado de envases de vidrio (C) depositados sobre una placa neutra (12) de una máquina S.I. de moldeo de envases en vidrio a una cinta transportadora (14) que corre en sentido transversal al conjunto de envases depositados sobre la placa neutra y que sirve para transportar los envases para procesamiento posterior. El aparato comprende una porción giratoria (16 o 116) que oscila en un arco de aproximadamente 90°; un cabezal (18) portado por la porción giratoria y alternante con relación al mismo; una barra alargada (20) portada por el cabezal con una pluralidad espaciada de uñas que definen cavidades (22) que sobresalen de la barra; motores eléctricos primero y segundo, reversibles, coaxiales, de operación independiente (30, 28); un árbol de salida (32) del segundo motor eléctrico (28) que atraviesa un árbol de salida (56) del primer motor eléctrico (30). El movimiento reversible impartido al árbol de salida anular del primer motor genera el movimiento oscilatorio de la porción giratoria del aparato de barrido. El movimiento reversible impartido al árbol de salida del segundo motor axial a través de un engranaje planetario (42) imparte un movimiento alternativo a la barra alargada relativa a la otra estructura de la porción de barrido. Los árboles de salida (32, 56) son giratorios y giran en forma independiente.

Declaración bajo la Regla 4.17:

- en cuanto al derecho del solicitante de solicitar y de que se le otorgue una patente (Regla 4.17(ii)) por las siguientes designaciones AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patente (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), patente de Euroasia (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), patente Europea (AT, BE, BG, CH, CY, CZ, DE,

DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), patente OAPI (BF, BJ, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

- En cuanto al derecho de solicitante de reivindicar la prioridad de la solicitud previa (Regla 4.17(iii)) para todas las designaciones)

Publicada:

- Con informe de búsqueda internacional
— Antes del vencimiento del plazo para corregir las reivindicaciones y para volverla a publicar en caso de que se reciban correcciones.

Para códigos de dos letras y otras abreviaturas, consulte las "Notas de Guía sobre Códigos y Abreviaturas" que aparece al principio de cada ejemplar regular de la Gaceta de PCT.

23

24

**APARATO DE BARRIDO Y MÉTODO PARA UNA MÁQUINA S. I.
DE MOLDEO DE CRISTALERÍA**

CAMPO DE LA INVENCION

Esta invención se relaciona con un método y con un aparato para trasladar una serie de artículos alineados sobre una pieza fija a un tramo de la cinta transportadora que corre en sentido transversal a la alineación de los artículos en la pieza fija. Más particularmente, esta invención se relaciona con un barrido para depositar un conjunto de envases en vidrio alineados y recién formados sobre una placa neutra de una máquina de moldeo del tipo S.I. (sección individual) sobre el tramo superior de una cinta transportadora para trasladar los envases en vidrio a un túnel de recocido.

ANTECEDENTES DE LA INVENCION

Como se explicó en la patente de Estados Unidos de asignación común 6,076,654 (Leidy), cuya divulgación se incorpora a la presente por referencia, existen varios dispositivos y varios pasos en relación con la transferencia de unos envases en vidrio recién formados desde las placas neutras de una máquina S.I. a un túnel de recocido para tratar los envases con calor. Entre los dispositivos empleados en el citado proceso, se encuentra un dispositivo de barrido que se emplea simultáneamente para trasladar varios envases alineados, por lo general dos, tres o cuatro envases, de una placa neutra de una máquina S.I. al tramo superior de una cinta transportadora.

Unas anterioridades describen unos dispositivos de barrido de una máquina S.I. por ejemplo en las patentes de Estados Unidos de asignación común 3,795,503 (Perry), 4,162,911 (Mallory), 4,199,344 (Mumford y colaboradores.), 4,222,480 (Perry) y 5,904,745 (Nafziger y colaboradores), cuya divulgación en cada una de ellas también se incorpora a la presente por referencia. Como se divulga en las citadas referencias, o como se conoce de otra manera, un cabezal de barrido de una máquina S.I. tiene una barra que se extiende en sentido horizontal con un conjunto de uñas

25
20
2

horizontales y espaciadas que se extienden en sentido transversal desde la barra alargada. Cada uña, conjuntamente con la barra alargada, define una cavidad por lo general en forma de L que recibe el envase.

Los generadores de fuerza motriz, hasta la fecha usualmente unos cilindros neumáticos, permiten unos movimientos duales del cabezal con la barra alargada y las uñas que sobresalen de la misma. El primero de dichos movimientos es un movimiento alternativo. Una primera porción sirve para desplazar la barra alargada y sus uñas desde una posición donde no está en contacto con los envases sobre la placa neutra a una posición donde engrana los envases en la placa neutra. El otro movimiento es un movimiento oscilante de 90° del cabezal, donde una primera porción traslada los envases de la placa neutra al tramo superior de la cinta transportadora de la máquina. Luego, como una segunda porción del movimiento alternativo, la barra alargada y sus uñas se retraen a una posición de engranaje con los envases en la cinta transportadora de la máquina para poder retirar los envases de la máquina de moldeo por medio de la cinta transportadora de la máquina, y como una segunda porción del movimiento oscilante de 90°, el cabezal con la barra alargada con sus uñas regresa a su posición original para estar lista para repetir el proceso. Aunque hasta la fecha por lo general se emplearon unos cilindros neumáticos para accionar los dos movimientos requeridos en un cabezal de barrido para los envases en vidrio, la patente de Estados Unidos 5,429,651 (Bolin), la cual específicamente divulga un dispositivo neumático para accionar el movimiento alternativo del aparato de empuje de barrido, si divulga, solamente en palabras, en la columna 13, líneas 45-50, que también se podría utilizar un motor paso a paso para este propósito. Además, la patente de Estados Unidos 5,125,499 (Saathoff y colaboradores) ensaña el uso de un motor paso a paso para accionar el movimiento oscilante de un cabezal de barrido, pero también enseña el uso de un motor hidráulico para accionar el movimiento alternativo del brazo de empuje.

Sin embargo, el uso de un cilindro neumático para accionar bien sea el movimiento alternativo o la oscilación de un cabezal de barrido de una

25
X
2

barra con uñas tiene ciertas desventajas operativas. Es difícil tener un control exacto sobre la precisión en el tiempo del movimiento alternativo o la oscilación del cabezal de empuje lo cual crea unos problemas para lograr calcular el movimiento del cabezal de empuje en relación con los otros movimientos de una máquina S.I.. Además es bastante difícil modificar la precisión de los cilindros neumáticos de barrido, como se requiere, por ejemplo, cuando la máquina se modifica para producir unos envases más grandes o más pequeños, y es difícil controlar la velocidad de un cabezal de barrido accionado en forma neumática en el principio y en el final de sus movimientos de extensión y de retracción.

RESUMEN DE LA INVENCION

Para resolver el problema anterior y otros problemas asociados con las prioridades de unas máquinas S.I. de barrido, de acuerdo con la presente invención se dispone un barrido totalmente eléctrico. El barrido de la presente invención tiene dos motores eléctricos reversibles montados en dirección vertical, cada motor es preferiblemente un servomotor de corriente alterna. Los motores se alinean en dirección coaxial, y el árbol de salida del motor inferior, que permite el movimiento alternativo del cabezal de barrido mediante un engranaje sol, se extiende a través del árbol de salida anular del motor superior, el cual imparte el movimiento oscilante al cabezal de barrido. Los árboles de salida del motor inferior y del motor superior son giratorios y giran en forma independiente. Puesto que las posiciones de instalación del motor superior y del motor inferior son fijas, el cableado de los motores no requiere una conexión en espiral para acomodar el movimiento de un motor en relación con una fuente de energía, ni las tuberías de aceite para enfriar el motor, lo cual es deseable para permitir una operación prolongada en un entorno hostil a altas temperaturas, ni requieren unos componentes flexibles. Igualmente al ubicar los motores por debajo del cabezal de barrido de cierta forma se reducen las temperaturas a las cuales los motores se ven expuestos.

Por lo tanto, un objetivo de la presente invención es proveer un método y un aparato para trasladar un conjunto de artículos desde una posición fija a una cinta transportadora en movimiento, donde todos los movimientos requeridos están accionados por unos motores eléctricos reversibles cuyas posiciones son fijas. Más particularmente, un objetivo de la presente invención es proveer un método y un aparato con las características anteriores que esté bien adaptado para operar cerca a una máquina de moldeo de envases de vidrio, donde las temperaturas de operación pueden ser algo más altas que la temperatura ambiente.

Para un mejor entendimiento de la presente invención y de sus objetivos, se llama la atención a los dibujos y a la breve descripción de los mismos que aparece a continuación, a la detallada descripción de la invención y a las reivindicaciones adjuntas.

BREVE DESCRIPCIÓN DEL DIBUJO

Las figuras 1A, 1B, y 1C son unas presentaciones fragmentadas y en perspectiva del aparato de acuerdo con la presente invención, y cada presentación ilustra el aparato en una posición diferente durante el ciclo de operación.

Fig. 2 es una presentación elevada, a una escala más grande de los elementos del aparato de las Figs. 1A, 1B, y 1C;

Fig. 3 es una presentación fragmentada de una sección, a una escala más grande de una porción del aparato de la Fig. 2;

Fig. 4 es una presentación como la Fig. 3 de otra porción del aparato de la Fig. 2;

Fig. 5 es una presentación fragmentada y en perspectiva, donde se retiró una porción de la estructura, del aparato de las Figs. 2 y 3;

Fig. 6 es una presentación de una sección tomada en la línea 6-6 de la Fig. 3;

Fig. 7 es una presentación fragmentada en perspectiva, de una sección parcialmente transversal de una porción del aparato de las Figs. 2 - 6;

28
5

Fig. 8 es una presentación como la Fig. 2 de una incorporación alterna de la presente;

Fig. 9 es una presentación como la Fig. 3 de una porción del aparato de la Fig. 8;

Fig. 10 es una presentación fragmentada en perspectiva de una porción del aparato de la Fig. 8; y

Fig. 11 es una presentación como la Fig. 10 donde la porción del aparato allí representada fue sometida a una rotación de 180° y donde se retiró una porción del aparato.

DESCRIPCIÓN DETALLADA DE LA INVENCION

Un aparato de barrido de acuerdo con la presente invención se indica en forma general en la referencia del numeral 10 en las Figs. 1A, 1B, 1C y 2 del dibujo. El aparato de barrido 10 se emplea para depositar un conjunto de envases en vidrio recién formados y alineados C en una placa neutra 12 de una máquina S.I. sobre el tramo superior de una cinta transportadora (máquina) de salida en movimiento 14 en forma simultánea. Luego la cinta transportadora lleva los envases C a un túnel de recocido (no se ilustra) para tratar los envases C con calor y aliviar los esfuerzos residuales de los mismos, como se conoce en el arte. La cinta transportadora 14 se extiende en sentido transversal con respecto a la placa neutra 12, y la transferencia de los envases C de una placa neutra 12 a la cinta transportadora 14 requiere que los envases C se transfieran a la cinta transportadora 14 y hagan un giro de 90° en el momento de la transferencia, para asegurarse que los envases C se encuentren alineados en la cinta transportadora 14 de la misma forma que se encontraban en la placa neutra 12. Con este fin se dispone un aparato de barrido 10 con una porción giratoria 16 que oscila repetidamente en un arco de 90°, incluyendo el movimiento para cambiar de la posición en la Fig. 1A a la posición en la Fig. 1C. Además, la porción giratoria 16 se dispone con un cabezal de barrido 18 que tiene un movimiento alternativo y repetido, y el curso del movimiento alternativo del cabezal de barrido 18 incluye el

movimiento de la posición en la Fig. 1A a la posición en las Figs. 1B y 1C y luego su regreso a la posición de la Fig. 16.

El cabezal de barrido 18 incluye una barra alargada en sentido horizontal 20 con un conjunto de uñas espaciadas 22 que se extienden en sentido transversal de la barra 20. Cada una de las uñas 22 define, junto con la barra 20, una cavidad para recibir un envase C, el número de uñas 22 que sobresalen de la barra 20 es el mismo número que el número de envases C en la placa neutra 12. La barra alargada 20 se encuentra montada sobre unas varillas espaciadas y extendidas en sentido horizontal 24 que tienen un movimiento alternativo con respecto a la porción giratoria 16, como se describirá más adelante en detalle, para permitir el movimiento alternativo de la barra 20 del cabezal de barrido 18 desde la posición de la Fig. 1A, donde los envases C no se encuentran engranados en las cavidades del cabezal de barrido 18, a la posición de las Figs. 1B y 1C, donde los envases C se engranan en las cavidades del cabezal de barrido 18. Después de la transferencia de los envases C de la posición en la Fig. 1A a la posición en la Fig. 1C, el cabezal de barrido 18 se retrae para permitir que los envases C sean transportados por la cinta transportadora 14, y la porción giratoria 16 del aparato de barrido 10 gira posteriormente, en reversa, desde su posición en la Fig. 1C a su posición en la Fig. 1A para comenzar una repetición del ciclo de barrido con un conjunto nuevo de envases C en la placa neutra 12. Como aparece en las Figs. 1A, 1B, y 1C, el cabezal de barrido 18 se dispone con cuatro cavidades para recibir envases, y esta es la construcción apropiada para una máquina S.I. que produce cuatro envases en forma simultánea en cada sección de la máquina S.I., un tipo de máquina frecuentemente descrito como una máquina "quad" (*cuadrangular*). Por supuesto, también se sabe que una máquina S.I. se puede adaptar para que produzca tres envases simultáneamente en cada sección de la máquina S.I., una máquina de "tres bulbos", o incluso dos envases en cada sección de la máquina S.I., una máquina de "dos bulbos"; en estos casos, un aparato de barrido 10 de una máquina de tres bulbos tendría un cabezal de barrido 18 con solamente tres cavidades para recibir los envases y un aparato de

30
M

barrido 10 para una máquina de dos bulbos tendría un cabezal de barrido con solamente dos cavidades para recibir los envases.

El aparato de barrido 10 incluye una carcasa estacionaria 26 que se ubica por debajo de y alineada con la porción giratoria 16. El motor eléctrico primero y segundo, reversibles de corriente alterna 28, 30, cada uno preferiblemente un servomotor para tener un control preciso, se ubican en posición vertical y están alineados en forma coaxial el uno con respecto al otro en la carcasa 26. El motor 28, que se ubica debajo del motor 30, acciona un árbol de salida 32, Fig. 4, el cual se soporta en forma rotatoria sobre unas chumaceras espaciadas 34, 36. El árbol de salida 32 tiene un muñón 38 (Fig. 3) de un juego de engranajes planetarios de reducción de velocidad 42 contraído o de otra manera insertado en el mismo y el muñón 38, portado en forma rotatoria sobre una chumacera 39, acciona un engranaje sol 40 del juego de engranajes planetarios de reducción de velocidad 42. El juego de engranajes planetarios 42 también tiene un conjunto de engranajes planetarios espaciados 44, y los engranajes planetarios 44, accionados por el engranaje sol 40, engranan en una superficie de engranaje interior de un engranaje anular 46. El engranaje anular 46 está asegurado en la parte interior de una porción en forma de pocillo 48a de una extensión del árbol 48 que se extiende dentro de la porción giratoria 16 del aparato de barrido 10 y se soporta en forma rotatoria sobre las chumaceras 47, 49 para efectos de la rotación relativa a la porción giratoria 16. El juego del engranaje planetario 42 sirve para reducir sustancialmente la velocidad de rotación de la extensión del árbol 48 en relación con la del árbol 32, por ejemplo a un factor de 1:5. Dicho juego de engranaje planetario está disponible como un artículo comercial en Mectrol, Inc.

La extensión del árbol 48 soporta un engranaje impulsor 45, y el engranaje impulsor 45 acciona un engranaje de sector 50 (Fig. 6). El engranaje de sector 50 está montado de manera que permite un movimiento pivotante sobre y en relación con el cabezal 16 alrededor del árbol 51 (Fig. 5) y tiene un brazo 53 que descansa sobre (Figs. 3, 5 y 6) y que pivota con

31
22
R

el engranaje de sector 50, y el movimiento arqueado de la extensión del árbol 48, ocasionando su oscilación mediante el movimiento de reversa del motor 28, ocasionando un movimiento reversible de un empujador 52 que se extiende desde el brazo 53 y que se inserta en la ranura 54 en un soporte 56 a la cual se encuentran acopladas las varillas 24. Así, el movimiento de reversa del motor 28 es efectivo para que las varillas 24, con la barra 20 y las uñas 22, se extiendan y se retracten al unísono para moverse entre las posiciones que se muestran en las Figs. 1A y 1B, y para efectuarlo prácticamente sin ningún juego.

El motor de corriente alterna 30 tiene un árbol de salida 56, y el árbol 56 se encuentra soportado en forma rotatoria sobre unas chumaceras espaciadas 58, 60. El árbol de salida 56 tiene una configuración anular y el árbol de salida 32 pasa a través del interior del árbol de salida 56 de manera que el árbol de salida 56 y el árbol de salida 32 giran en forma independiente.

Como se aprecia mejor en la Fig. 3, una carcasa anular 62 se encuentra asegurada al árbol 56 mediante unos sujetadores roscados 64, y una placa integral inferior 66 de la porción giratoria 16 del aparato de barrido 10 se encuentra asegurada a la carcasa anular 62 por medio de unos sujetadores roscados 68. Así, el movimiento arqueado reversible se imparte al árbol 56 mediante el motor 30, y este movimiento es efectivo para la oscilación de la porción giratoria 16 del aparato de barrido 10 entre la posición que se muestra en las Figs. 1A y 1B y la posición que se muestra en la Fig. 1C; y este movimiento es y debe estar controlado en relación con los movimientos de extensión y de retracción impartidos al cabezal de barrido 18 por el motor 28, puesto que ambos se efectúan juntos para impartir dichos movimientos de extensión y retracción del cabezal de barrido mientras que la porción giratoria 6 está oscilando.

El aparato de barrido 10, como se describió arriba, utiliza motores 28, 30 en una carcasa 26 que no deben moverse cuando se encuentran en servicio. Por lo tanto, el cableado (no se encuentra ilustrado) a los citados motores puede ser fijo, evitando de esta manera la necesidad de un cableado

32
M
H

flexible o extensible a dichos motores que operan en un entorno de temperaturas relativamente elevadas, y dicho cableado puede ser de tipo enchufe y que se desconectan rápidamente para poder instalar y retirar el aparato de barrido 10 como una unidad en forma rápida. Adicionalmente, puesto que la carcasa de los motores 28, 30 no necesita moverse mientras está en servicio, los motores 28, 30 se pueden enfriar fácilmente con aceite, según se desea, porque las entradas y las salidas del líquido refrigerante no necesitan ser flexibles para este propósito. Y además, una unidad electrónica de control, que no se ilustra, puede, si se desea, montarse sobre la carcasa 26 e igualmente, si se desea, se puede enfriar con aceite, porque las líneas de entrada y de salida desde y hacia la misma no requieren elementos flexibles. En todo caso, la ubicación de los motores 28, 30 debajo del cabezal 16 sirve en cierta forma para reducir las temperaturas a las cuales se exponen los motores 28, 30 en relación con la que experimenta el cabezal 16.

En la incorporación de las Figs. 8-11, los elementos que corresponden, por lo menos en cuanto a función, a los elementos de la incorporación de las Figs. 1-7 se identifican con un número de serie 100, donde los 2 últimos dígitos son los mismos que los 2 dígitos de la incorporación de las Figs. 1-7.

El aparato de barrido de acuerdo con la incorporación de las Figs. 8-11 por lo general se indica mediante un número de referencia de serie 110 en la Fig. 8 del dibujo. El aparato de barrido 110, al igual que el aparato de barrido 10, se emplea para depositar un conjunto de envases en vidrio recién formados alineados en una placa neutra 12 de una máquina S.I. sobre el tramo superior de una cinta transportadora (máquina) de salida en forma simultánea que lleva los envases a un túnel de recocido (no se ilustra) para tratar los envases con calor y aliviar los esfuerzos residuales de los mismos, como se conoce en el arte. Se dispone un aparato de barrido 110 con una porción giratoria 116 que oscila repetidamente en un arco de 90°, y se dispone la porción giratoria 116 con un cabezal de barrido 118 que tiene un

33
X
K

movimiento alternativo repetido, y el curso del movimiento alternativo del cabezal de barrido 16 de la incorporación de las Figs 1-7.

El cabezal de barrido 118 incluye una barra alargada en sentido horizontal 120 con un conjunto de uñas espaciadas 122 que se extienden en sentido transversal de la barra 120. La barra alargada 120 se encuentra montada sobre unas varillas espaciadas y extendidas en sentido horizontal 124 que tienen un movimiento alternativo con respecto a la porción giratoria 116, como se describirá más adelante en detalle, para permitir el movimiento alternativo de la barra 120 del cabezal de barrido 118.

El aparato de barrido 110 incluye una carcasa estacionaria 126 que se ubica por debajo de y alineada con la porción giratoria 116. El motor primero y segundo reversibles de corriente alterna 128, 130, cada uno preferiblemente un servomotor para tener un control preciso, se ubican en posición vertical y están alineados en forma coaxial el uno con respecto al otro en la carcasa 126. El motor 128, que se ubica debajo del motor 130, acciona un árbol de salida 132.

La incorporación de las Figs. 8-11 difiere de la incorporación de las Figs. 1-7 básicamente en la construcción ilustrada en las Figs. 9-11, donde una extensión de árbol 148 acciona un engranaje impulsor 145, el cual acciona un engranaje de sector 150. El engranaje de sector 150 está montado de manera que tiene un movimiento pivotante en y en relación con el cabezal 116 alrededor de un muñón 151 (Fig. 11) y tiene un brazo 153 que descansa sobre y gira con el engranaje de sector 150. Un movimiento arqueado de la extensión del árbol 148, que oscila debido al movimiento de reversa del motor 28, produce un movimiento reversible de una manga 152 que se extiende desde el brazo 153 y se desliza alrededor de una varilla 154 que se encuentra montada en un soporte 156, a la cual se encuentran acopladas las varillas 124. Así, el movimiento de reversa del motor 128 es efectivo para que las varillas 124, con la barra 120 y las uñas 122, se extiendan y se retracten al unísono para desplazarse entre la posición más interna y la más externa de la barra 120, y para hacerlo prácticamente sin ningún juego.

34
X
M

El aparato de barrido 110, como se describió arriba, utiliza motores 128, 130 en una carcasa 126 que no deben moverse cuando se encuentran en servicio. Por lo tanto, el cableado (no se encuentra ilustrado) a los citados motores puede ser fijo, evitando de esta manera la necesidad de un cableado flexible o extensible a dichos motores que operan en un entorno de temperaturas relativamente elevadas, y dicho cableado puede ser de tipo enchufe y que se desconectan rápidamente para poder instalar y retirar el aparato de barrido 110 como una unidad en forma rápida. Adicionalmente, puesto que la carcasa de los motores 128, 130 no necesita moverse mientras está en servicio, los motores 128, 130 se pueden enfriar fácilmente con aceite, según se desea, porque las entradas y las salidas del líquido refrigerante no necesitan ser flexibles para este propósito. Y además, una unidad electrónica de control, que no se ilustra, puede, si se desea, montarse sobre la carcasa 126 e igualmente, si se desea, se puede enfriar con aceite, porque las líneas de entrada y de salida desde y hacia la misma no requieren elementos flexibles. En todo caso, la ubicación de los motores 128, 130 debajo del cabezal 116 sirve en cierta forma para reducir las temperaturas a las cuales se exponen los motores 128, 130 en relación con la que experimenta el cabezal 116.

Aunque el mejor modo contemplado por los inventores para desarrollar la presente invención a partir de la fecha de inscripción de la misma ha sido presentado y descrito en la presente, será claro para aquellos con destreza en el arte que unas modificaciones y variaciones apropiadas y sus equivalentes se pueden realizar a partir del ámbito de la invención, y dicho ámbito se limita por los términos de las siguientes reivindicaciones y las que les sean legalmente equivalentes.

35


REIVINDICACIONES

Nosotros reivindicamos:

1. Un aparato de barrido para trasladar un conjunto de artículos alineados en una pieza a una cinta transportadora que se extiende en sentido transversal a los artículos alineados en la pieza, el citado aparato comprendiendo:

un cabezal con una barra alargada que tiene un conjunto de uñas espaciadas que se extienden en sentido transversal de la misma, y cada uña define junto con la barra alargada, una cavidad para recibir uno de los artículos, el citado cabezal con la citada barra alargada oscilan en un arco de 90° para barrer el conjunto de artículos de la pieza a las posiciones en la cinta transportadora, la barra alargada tiene un movimiento alternativo para engranar los artículos en el miembro y para retraerse de los artículos en la cinta transportadora:

un primer motor eléctrico reversible que imparte un movimiento oscilante al cabezal, el citado primer motor eléctrico reversible está en una posición fija durante su operación y tiene un árbol de salida anular que engrana funcionalmente en el citado cabezal;

un segundo motor eléctrico reversible que imparte un movimiento alternativo a la barra alargada con respecto al citado cabezal, el citado segundo motor eléctrico reversible está en una posición fija durante su operación y se encuentra alineado en dirección coaxial por debajo del citado primer motor eléctrico reversible, el citado segundo motor eléctrico reversible tiene un árbol de salida que se extiende a través del citado árbol de salida anular del citado primer motor eléctrico reversible, el citado árbol de salida anular del citado primer motor eléctrico reversible del citado árbol de salida del citado segundo motor eléctrico reversible son giratorios y giran en forma independiente; y



6. Aparato de acuerdo con la reivindicación 5 y que comprende además:

un engranaje de sector;

una estructura para montar el citado engranaje de sector para un movimiento oscilante alrededor de un eje, distanciado del eje del citado segundo motor eléctrico reversible;

un engranaje impulsor accionado por el citado juego del engranaje planetario y alineado en dirección coaxial con el citado segundo motor eléctrico reversible, el citado engranaje impulsor engranando en el citado engranaje impulsor;

por lo menos una varilla con movimiento alternativo engrana en la citada barra alargada;

un soporte a la cual se fija por lo menos una de las barras extendidas citadas, el citado soporte tiene una ranura;

un enganche montado en dirección coaxial con el citado engranaje impulsor para una oscilación con el citado engranaje impulsor, el citado enganche teniendo un extremo de espacio libre alejado del eje de oscilación del citado engranaje de sector; y

un rodillo empujador en el extremo libre citado del citado enganche y que engrana en la citada ranura del citado soporte, la oscilación del citado engranaje impulsor y el citado enganche hacen que el citado soporte tengan un movimiento alternativo debido a que el citado rodillo empujador encaja en la citada ranura.

7. Aparato de acuerdo con la reivindicación 6 donde:

por lo menos uno de los rodillos con movimiento alternativo citados comprende un conjunto de varillas distanciadas que tienen un movimiento alternativo.

8. El método para trasladar un conjunto de artículos alineados en una pieza a una cinta transportadora que se extiende en sentido transversal a los artículos alineados en la pieza, el método comprendiendo:

suministrar una barra alargada con un conjunto de uñas espaciadas que se extienden en sentido transversal de la misma, y cada uña define, junto con la barra alargada, una cavidad para recibir uno de los artículos, el citado cabezal con la citada barra alargada oscilan en un arco de 90° para barrer el conjunto de artículos de la pieza a las posiciones en la cinta transportadora, la barra alargada tiene un movimiento alternativo para engranar los artículos en el miembro y para retraerse de los artículos en la cinta transportadora;

suministrando un primer motor eléctrico reversible que imparte un movimiento oscilante a la barra alargada;

suministrando un segundo motor eléctrico reversible para impartir un movimiento alternante a la barra alargada, el citado segundo motor eléctrico reversible se encuentra alineado coaxialmente con el citado primer motor eléctrico reversible;

operando el citado primer motor eléctrico reversible para impartir un movimiento oscilante a la barra alargada; y

operando el citado segundo motor eléctrico reversible para impartir un movimiento alternante a la citada barra alargada.

9. El método de acuerdo con la reivindicación 8 donde:

cada uno de los artículos alineados sobre la pieza es un envase en vidrio recién formado;

la pieza es una placa de neutra de una máquina S.I. de fabricación de envases en vidrio; y

la cinta transportadora es una cinta transportadora en una planta que manufactura envases en vidrio.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

AS: 96.448

39 J

Applicant's or agent's file reference 17615 PCT	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEAM16)
International application No. PCT/US 03/27702	International filing date (day/month/year) 04.09.2003	Priority date (day/month/year) 04.09.2002
International Patent Classification (IPC) or both national classification and IPC C03B9/453		
Applicant OWENS-BROCKWAY GLASS CONTAINER INC.		

1. This International preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

I ☒ Basis of the opinion
II ☐ Priority
III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
IV ☐ Lack of unity of invention
V ☒ Reasoned statement under Rule 66.2(a)(II) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
VI ☐ Certain documents cited
VII ☐ Certain defects in the International application
VIII ☐ Certain observations on the international application

Date of submission of the demand 03.05.2004	Date of completion of this report 07.12.2004
Name and mailing address of the International preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Marrec, P Telephone No. +31 70 340-3783 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/US 03/27702**

40 X
D

I. Basis of the report

1. With regard to the elements of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-10 as originally filed

Claims, Numbers

1-7, 9 as originally filed

8 received on 03.05.2004 with letter of 06.04.2004

Drawings, Sheets

1/10-10/10 as originally filed

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the International application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/US 03/27702**

41 

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-9
	No: Claims	-
Inventive step (IS)	Yes: Claims	-
	No: Claims	1-9
Industrial applicability (IA)	Yes: Claims	1-9
	No: Claims	-

2. Citations and explanations

see separate sheet

42

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following document/s/:

D1: GB 2 231 855

- 1) The subject-matter of claims 1-9 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons.
 - 1.1) Document D1, which is considered to represent the most relevant state of the art, discloses a sweep out apparatus for transferring a plurality of aligned articles on a member (4) to a conveyor (6) that extends transversely (figure 2) to the aligned on the member, said apparatus comprising:
 - a head (2) with an elongated bar (8) having a spaced plurality of fingers (12, 14) extending transversely therefrom, each finger defining, with the elongated bar (8), a pocket (3) for receiving one of the articles, said head (2) with said elongated bar (8) being oscillatable through an arc of 90° (figure 2) to sweep the plurality of articles from the member (4) to positions on the conveyor (6), the elongated bar (8) being reciprocable (page 3, lines 19-21);
 - a first reversible motor (28) for imparting oscillating motion to the head (page 2, line 13), said first reversible electrical motor being fixed in position during its operation and having an annular output shaft (30) operatively engaging said head;
 - a second reversible motor (26) for imparting reciprocating motion (page 2, lines 11, 12) to the elongated bar (8) with respect to said head (2), said second reversible electric motor (26) being fixed in position during its operation and being in coaxial alignment vertically below said first reversible electric motor (page 2, line 20), said second reversible electric motor (26) having an output shaft (24) extending through said annular output shaft (30) of said first reversible electric motor (28), said annular output shaft (30) of said first reversible electric motor (28) and said output shaft (24) of said second reversible electric motor (26) being rotatable relative to one another;
- from which the subject-matter of claim 1 differs in that :
 - the electrical motors used are reversible motors,

- a planetary gear transmission is used for imparting reciprocating motion from said output shaft of said second reversible electric motor to said elongated bar.

It is however generally known to the person skilled in the art that a reversible motor is nowadays an improvement (in terms of precision and reliability) to an electrical motor of document D1 and hence can be interchanged where circumstances make it desirable without recurring to any inventiveness.

The feature "planetary gear transmission" is merely one of several straightforward possibilities of gear transmission arrangements from which the skilled person would select, where a more simple (disk gear for example) and precise gear is needed in order to transform a vertical motion into a rotary one, without the exercise of inventive step.

Additionally, it is to be noted that document D1, (page 1, line 31, to page 2, line 2) is dealing with the same problem as the present application (i.e positioning the motors below the sweep out mechanism to reduce the temperatures to which the motors are exposed and to improve its reliability).

Therefore, the solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT).

- 1.2) The method steps of claim 8 being based on the apparatus features of claim 1, the same reasoning applies *mutatis mutandis* to method claim 8, which is therefore not inventive (Article 33(3) PCT).
- 1.3) Dependent claims 2-7, 9 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, the reasons being as follows:

In claims 2-7, 9 slight constructional changes in the sweep out mechanism of claims 1, 9 is defined which comes within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen. Consequently, the subject-matter of claims 2-7, 9 also lacks an inventive step.



providing a second reversible electric motor for imparting reciprocating motion to the elongated bar, said second reversible electric motor being positioned in coaxial alignment with said first reversible electric motor;

5 operating said first reversible electric motor to impart oscillating motion to the elongate bar; and

 operating said second reversible electric motor through a planetary gear transmission to impart reciprocating motion to said elongate bar.

10

9. The method according to claim 8 wherein:

 each of the plurality of aligned articles on the member is a freshly-formed glass container;

 the member is a deadplate of an I.S. glass container forming
15 machine; and

 the conveyor is a machine conveyer in a glass container manufacturing plant.

20

TRATADO DE COOPERACIÓN EN MATERIA DE PATENTES

PCT

INFORME DE EXAMEN PRELIMINAR INTERNACIONAL SOBRE PATENTABILIDAD (PCT Artículo 36 y Regla 70)

45

No. de Expediente del Solicitante o Apoderado 17615 PCT	PROCEDIMIENTO POSTERIOR Consultar notificación de transmisión de Informe de Examen Preliminar Internacional (Formato PCT/IPEA/416)	
No. Solicitud Internacional PCT/US 03/27702	Fecha Internacional de Presentación (día/mes/año) 04.09.2003	Fecha de Prioridad (día/mes/año) 04.09.2002
Clasificación Internacional de Patente (IPC) o Clasificación Nacional e IPC C03B9/453		
Solicitante OWENS-BROCKWAY GLASS CONTAINER INC.		

1. Este informe de examen preliminar internacional fue elaborado por esta Oficina Encargada del Examen Preliminar Internacional y se envía al solicitante según Artículo 36.
2. hojas, inclusive esta portada
Este INFORME comprende un total de 5 hojas, inclusive esta portada
- ☒ Este informe también comprende ANEXOS, es decir hojas con la descripción, las reivindicaciones y los dibujos que fueron corregidos y que son la base de este Informe y para las hojas que contienen las rectificaciones presentadas ante esta Autoridad (consultar regla 70.16 y la Sección 607 de las Instrucciones Administrativas bajo el PCT).
- Estos anexos constan de un total de 1 hojas.

3. Este informe contiene indicaciones relacionadas con los siguientes puntos:
- I ☒ Base del Informe
 - II ☐ Prioridad
 - III ☐ Sin elaboración de un dictamen sobre novedad, actividad inventiva y posibilidad de aplicación industrial
 - IV ☐ Falta de unidad de la invención
 - V ☒ Comprobación justificada según Artículo 35(2) con respecto a la novedad, la actividad inventiva y la posibilidad de aplicación industrial; documentos y explicaciones sustentando esta comprobación
 - VI ☐ Ciertos documentos enumerados
 - VII ☐ Ciertas deficiencias del registro internacional
 - VIII ☐ Ciertas observaciones relacionadas con la solicitud internacional

Fecha de presentación de la petición 03.05.2004	Fecha de la conclusión de este informe 07.12.2004
Nombre y dirección postal de la Oficina Internacional de Examen Preliminar:  Oficina Europea de Patentes – P.B. 5818 Patentaan 2 NL-2280 HV Rijswijk – Países Bajos Tel.: +31 70 340 – 2040 Tx: 31 651 epo nl Fax: +31 70 340 – 3018	Empleado Autorizado Marrec, P Tel.: +31 70 340 – 3793 

**INFORME DE EXAMEN PRELIMINAR
INTERNACIONAL**

Solicitud Internacional No. PCT/US 03/27702

I. Bases del Informe

1. Con respecto a los elementos de la solicitud internacional (*hojas intercambiables que se han suministrado a la Oficina receptora en respuesta a una invitación bajo el Artículo 14 que se mencionan en este informe como "presentadas originalmente" y no se anexan a este informe puesto que no contienen correcciones (Reglas 70.16 y 70.17)*):

Descripción, páginas:

1-10 como fueron presentadas originalmente

Reivindicaciones, No.:

1-7, 9 como fueron presentadas originalmente
8 recibida el 03.05.2004 con carta del 06.04.2004

Dibujos, Hojas

1-10 -10/10 como fueron presentados originalmente

- 2 En lo concerniente al idioma, todos los elementos indicados más arriba estuvieron a disposición de esta Administración o le fueron enviados en el idioma en el cual se radicó la solicitud internacional, salvo indicación en contrario consignada bajo este punto.

Estos elementos estuvieron a disposición de esta Administración o le fueron enviados en el idioma siguiente: , que es:

- ☐ el idioma de una traducción enviada para efectos de la búsqueda internacional (según la regla 23.1 (b)).
☐ el idioma de publicación de la solicitud internacional (según la regla 48.3 (b)).
☐ el idioma de la traducción enviada para efectos del examen preliminar internacional (según la regla 55.2 y/o 55.3).

3. En lo que concierne a cualquier secuencia de nucleótidos y/o aminoácidos divulgada en la solicitud internacional, el examen preliminar internacional se llevó a cabo sobre la base del listado de secuencias:

- ☐ contenido en la solicitud internacional, por escrito.
☐ presentado con la solicitud internacional, en formato de lectura por computador.
☐ remitido posteriormente a la administración, por escrito.
☐ remitido posteriormente a la administración, en formato de lectura por computador.
☐ se ha rendido la declaración, según la cual el listado de secuencias por escrito y suministrado posteriormente no va más allá de la divulgación hecha en la solicitud tal como se radicó.
☐ se ha rendido la declaración, según la cual las informaciones registradas en formato de lectura por computador son idénticas a las de los listados de secuencias, presentados por escrito.

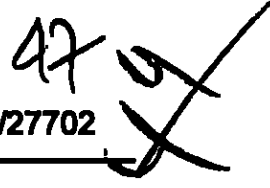
4. Las modificaciones han acarreado la anulación:

- ☐ de la descripción, páginas:
☐ de las reivindicaciones, Nos.:
☐ de los dibujos, hojas:

**INFORME DE EXAMEN PRELIMINAR
INTERNACIONAL**

Solicitud Internacional
No.

PCT/US 03/27702

47 

5. ☐ El presente informe se preparó sin tener en cuenta (algunas de) las modificaciones, que se consideraron que van más allá de la exposición de la invención (regla 70.2 (c))

(Toda hoja intercambiable que incluya modificaciones de esta índole debe indicarse en el punto 1 y anexarse al presente informe.)

6. Observaciones adicionales, si son necesarias:

- V. Declaración motivada bajo Artículo 35(2) en cuanto a la novedad, la actividad inventiva y la posibilidad de aplicación industrial; citas y explicaciones sustentando esta declaración

1. Declaración

Novedad (N)

Si: Reivindicaciones 1-9

No: Reivindicaciones -

Actividad Inventiva (IS)

Si: Reivindicaciones -

No: Reivindicaciones 1-9

Posibilidad de Aplicación Industrial (IA)

Si: Reivindicaciones 1-9

No: Reivindicaciones -

2. Citas y explicaciones

Véase hoja separada.

**INFORME DE EXAMEN PRELIMINAR
INTERNACIONAL**

48
Solicitud Internacional No. PCT/US 03/27702

En relación con el punto V

Declaración motivada bajo la Regla 66.2(a)(II) en cuanto a la novedad, la actividad inventiva y la posibilidad de aplicación industrial

Se hace referencia a el(los) siguiente(s) documento(s):

D1: GB2 231 855

- 1) El tema materia de las reivindicaciones 1-9 de la presente solicitud no se puede considerar que implica una actividad inventiva (Artículo 33(3) PCT) por los siguientes motivos:**
 - 1.1) El Documento D1, el cual se considera que representa la tecnología de punta más destacada divulga un aparato de barrido para trasladar un conjunto de artículos alineados sobre una pieza (4) a una cinta transportadora (6) que corre en sentido transversal (figura 2) a los artículos alineados sobre la pieza, y el citado aparato comprende:**
 - un cabezal (2) con una barra alargada (8) que consta de un conjunto de uñas (12, 14) que sobresalen en dirección transversal de la misma, y cada uña define, conjuntamente con la barra alargada (8), una cavidad (3) para recibir uno de los artículos, el citado cabezal (2) con la citada barra alargada (8) oscilan mediante un arco de 90° (figura 2) para trasladar la totalidad de los artículos de la pieza (4) a las posiciones en la cinta transportadora (6), la barra alargada (8) tiene un movimiento alternativo (página 3, líneas 19-21);**
 - un primer motor reversible (28) para impartir el movimiento oscilante al cabezal (página 2, línea 13), el primer motor eléctrico reversible citado se encuentra fijo en una posición durante su operación y tiene un árbol anular de salida (30) que engrana funcionalmente en el citado cabezal;**
 - un segundo motor reversible (26) para impartir el movimiento alternativo (página 2, líneas 11, 12) a la barra alargada (8) con respecto al citado cabezal (2), el segundo motor eléctrico reversible citado (26) se encuentra fijo en una posición durante su operación y se encuentra coaxialmente alineado en dirección vertical debajo del primer motor eléctrico reversible citado (página 2, línea 20), el segundo motor eléctrico reversible citado (26) tiene un árbol de salida (24) que se extiende a través del citado árbol de salida anular (30) del primer motor eléctrico reversible citado (28), el citado árbol de salida anular (30) del primer motor eléctrico reversible citado (28) y el citado árbol de salida (24) del primer motor eléctrico reversible citado (26) son giratorios y giran en forma independiente**

del cual el tema materia de la reivindicación 1 difiere en que

- los motores eléctricos empleados son motores reversibles.**

- se emplea un engranaje planetario de transmisión para impartir un movimiento alternativo del citado árbol de salida del citado segundo motor eléctrico reversible a la citada barra alargada.

Sin embargo una persona con destreza en el arte sabe que un motor reversible es hoy en día una mejora (en términos de precisión y confiabilidad) de un motor eléctrico del documento D1 y por lo tanto se puede intercambiar cuando las circunstancias lo requieran, sin incurrir en ninguna invención.

La característica de "engranaje planetario de transmisión " es simplemente una de las posibilidades más sencillas de un engranaje de transmisión que una persona con destreza en el arte seleccionaría, y donde se requiere un engranaje más simple (de disco por ejemplo) y preciso para transformar un movimiento vertical en uno giratorio, sin ejercer una actividad inventiva.

Adicionalmente, se deberá notar que el documento D1, (página 1, línea 31, a página 2, línea 2) hace referencia al mismo problema que el de la presente solicitud (es decir ubicar los motores debajo del aparato de barrido para reducir las temperaturas a las cuales los motores se ven expuestos y para aumentar su confiabilidad).

Por lo tanto, la solución propuesta en la reivindicación 1 de la presente solicitud no se puede considerar una actividad inventiva (Artículo 33(3) PCT).

- 1.2) Con respecto a los pasos del método de la reivindicación 8, los cuales se basan en las características de la reivindicación 1, se aplica el mismo razonamiento *mutatis mutandis* que para el método de la reivindicación 8, el cual por lo tanto no es inventivo (Artículo 33(3) PCT).
- 1.3) Las reivindicaciones dependientes 2-7, 9 no comprenden ninguna característica, las cuales conjuntamente con las características de cualquier reivindicación a la cual hacen referencia, cumplen con los requisitos del PCT en relación con la actividad inventiva, por los siguientes motivos:

En las reivindicaciones 2-7, 9 se definen unos cambios de construcción muy leves en el aparato de barrido de las reivindicaciones 1, 9 que se encuentran bajo el ámbito de la práctica acostumbrada seguida por personas con destreza en el arte, especialmente puesto que las ventajas logradas de esta manera son fácilmente predecibles. Por lo tanto el tema materia de las reivindicaciones 2-7, 9 también carece de actividad inventiva.

50
X

suministrando un segundo motor eléctrico reversible para impartir un movimiento alternante a la barra alargada, el citado segundo motor eléctrico reversible se encuentra alineado coaxialmente con el citado primer motor eléctrico reversible;

operando el citado primer motor eléctrico reversible para impartir un movimiento oscilante a la barra alargada; y

operando el citado segundo motor eléctrico reversible mediante un engranaje planetario de transmisión para impartir un movimiento alternante a la citada barra extendida.

9. El método de acuerdo con la reivindicación 8 donde:

cada uno de los artículos alineados sobre la pieza es un envase en vidrio recién formado;

la pieza es una placa de neutra de una máquina I.S. de fabricación de envases en vidrio; y

la cinta transportadora es una cinta transportadora en una planta que manufactura envases en vidrio.

LAW OFFICES OF
EMCH, SCHAFER, SCHAUB & PORCELLO Co., L.P.A.

MARK C. SCHAFER
 CHARLES A. SCHAUB
 JAMES F. PORCELLO, JR.
 CATHERINE E. MARTINEAU
 GREGG W. EMCH
 PHILIP M. RICE
 PATRICK P. FACELLA
 THOMAS A. MEEHAN

ONE SEAGATE, SUITE 1880
 TOLEDO, OH 43604

MAILING ADDRESS:
 P.O. BOX 918
 TOLEDO, OHIO 43687-0918

(419) 243-1284
 FAX NO. (419) 243-8802

Owens-Illinois, Inc.

Sender's E-mail: tmeehan@esap-law.com

September 21, 2004

European Patent Office – P.B. 5818 Patentlaan 2
 NL-2280 HV Rijswijk (Z-H) – Pays Bas

SEP 23 2004
**INTELLECTUAL
 PROPERTY SECTION**

Re: International Application No.: PCT/US03/27702
 International Filing Date: 04.09.2003
 Priority Date: 04.09.2002
 OI Docket No.: 17615 PCT
 Our File No.: 9179

Greetings:

This is in reply to the EPO Written Report in this application. The aforesaid Written Opinion was mailed on 20.07.2004.

Applicants respectfully traverse the finding that each of claims 1 – 9 fails to define an inventive step in the light of reference D1 (GB 2 231 855).

To begin with, the crank mechanism (16, 18) of the reference can not move with the precision of the planetary gear transmission (42) of claims 1 and 8 of this application, and such precision is very important in the operation of a sweepout apparatus, which must oscillate at high rates of oscillation between 2 accurately positioned locations; this is especially true in the context of a glass container forming machine (claims 3 and 9). Specifically, the necessary clearance needed for relative motion between the roll (18) and the slot (20) in which it rides of the reference D1 introduces imprecision in the relative positions of the crank (16) and the housing (34) at the limits of the oscillating travel of the crank (a problem often referred to as "backlash," for example, in the specification at page 7, lines 15-18); this problem is avoided with the planetary gear drive of claims 1 and 8, especially with the link and follower arrangement of claim 6 and the use of multiple reciprocal rods of claim 7.

It is also to be noted that reference D1 fails to teach the use of "reversible electric motors" each of which is "an a.c. servomotor," as called for by claim 2. The "reversible motors" taught by the reference, even if "electric," can not operate with the controlled positional precision of "reversible a.c. servomotors," and, though a.c. reversible servomotors are substantially more expensive, for example, than reversible "stepping motors" (specification, at page 2, lines 16 – 24), the added expense of a reversible servomotor is readily justified for use in a sweepout apparatus because of the operating demands that it must meet.

In summary, the stringency of the operating demands that must be met by the sweepout apparatus of claim 1 and method of claim 8 are not recognized by reference

LAW OFFICES OF
EMCH, SCHAFFER, SCHAUB & PORCELLO CO., L.P.A.

52

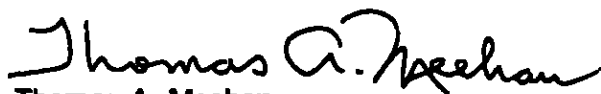
European Patent Office – P.B. 5818 Patentlaan 2
September 21, 2004
Page 2

D1, and this is especially true with respect to the sweepout apparatus for a glass container forming machine of claim 3. Because of this deficiency in the teachings of the reference, it fails to provide any motivation to a skilled artisan to redesign the device of the reference to substitute a complex planetary gear drive (42) for the simpler crank mechanism drive (16, 18) of the reference (claims 1 and 8), nor to substitute more expensive reversible a.c. servomotor drives for the other reversible drives of the reference (claim 2).

In view of the foregoing comments, it is respectfully submitted that the grounds underlying the Rule 68(a)(ii) statement supporting the finding that each of claims 1 – 9 fails to define an inventive step have been overcome as to all pending claims, and certainly as to some of them; reconsideration and withdrawal of such findings are, therefore, respectfully requested.

Respectfully submitted,

EMCH, SCHAFFER, SCHAUB
& PORCELLO CO., L.P.A.


Thomas A. Meehan
U.S.P.T.O. Reg. No.: 19,713

TAM/kah
c: Susan L. Smith, Esq. – Owens-Illinois, Inc.

EMCH, SCHAFFER, SCHAUB & PORCELLO CO., L.P.A.

Septiembre 1, 2004

Oficina Europea de Patentes – P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk (Z-H) Países Bajos

Ref.: Solicitud Internacional No.: PCT/US03/27702
Fecha de Presentación Internacional: 04.09.2003
Fecha de Prioridad: 04.09.2002
Archivo OI No. 17615 PCT
Nuestro Archivo No. 9179

Cordial saludo,

Esta es la respuesta al Informe Escrito EPO de esta solicitud. La Opinión Escrita citada arriba fue enviada por correo el 20.07.2004.

Respetuosamente los solicitantes se oponen a la decisión de que cada una de las reivindicaciones 1 – 9 no definen una actividad inventiva a la luz de la referencia D1 (GB 2 231 855).

Para comenzar, el mecanismo de manivelas (16, 18) de la referencia no se puede mover con la precisión de una transmisión de engranaje planetario (42) de las reivindicaciones 1 y 8 de esta solicitud, y esta precisión es sumamente importante para el funcionamiento de un aparato de barrido, el cual debe oscilar a unas tasas de oscilación altas entre dos puntos ubicados en forma precisa; esto es especialmente cierto en el contexto de una máquina de manufactura de envases de vidrio (reivindicaciones 3 y 9). Específicamente, la luz requerida para un movimiento relativo entre el rodillo (18) y la ranura (20) en la cual se desliza de la referencia D1 introduce una imprecisión en cuanto a las posiciones relativas de la manivela (16) y la carcasa (34) en los límites del curso de oscilación de la manivela (un problema frecuentemente denominado “juego”, por ejemplo en la especificación en la página 7, líneas 15-18). Este problema se evita con el impulsor del engranaje planetario de las reivindicaciones 1 y 8, especialmente con el engranaje y el montaje del empujador de la reivindicación 6 y el uso de múltiples varillas alternantes de la reivindicación 7.

Igualmente se debe notar que la referencia D1 omite enseñar el uso de “motores eléctricos reversibles”, cada uno de los cuales siendo un “servomotor de corriente alterna” como se requiere en la reivindicación 2. Los “motores reversibles” enseñados por la referencia, aunque no operan con la precisión controlada de la posición de unos “servomotores de corriente alterna reversibles”, y aunque los servomotores reversibles de corriente alterna son bastante más costosos, por ejemplo, que un “motor paso a paso” reversible (especificación en la página 2, líneas 16 – 24), el gasto adicional de un servomotor reversible se justifica fácilmente en un aparato de barrido debido a los requerimientos operativos que debe satisfacer.

54
A

Para resumir, la referencia D1 no reconoce la precisión de la operación requerida en un aparato de barrido de la reivindicación 1 y en el método de la reivindicación 8, y esto es especialmente cierto para un aparato de barrido de una máquina para fabricar envases en vidrio de la reivindicación 3. Debido a esta deficiencia en lo enseñado en la referencia, un artesano con destreza en el arte no encuentra ninguna motivación para rediseñar el dispositivo de la referencia y sustituir un impulsor del engranaje planetario (42) por el mecanismo de manivela impulsor más simple (16, 18) de la referencia (reivindicaciones 1 y 8) ni para sustituir unos servomotores impulsores reversibles de corriente alterna más costosos por los otros impulsores reversibles de la referencia (reivindicación 2).

En vista de los comentarios anteriores, respetuosamente se manifiesta que los fundamentos bajo la declaración de la Regla 66 (a)(ii) que respaldan la decisión de que cada una de las reivindicaciones 1 – 9 carece de una actividad inventiva fueron resueltos en cuanto a todas las reivindicaciones pendientes, y ciertamente en cuanto a algunas de ellas; respetuosamente se solicita que se reconsideren y se retiren las decisiones citadas.

Presentado respetuosamente,

EMCH, SCHAFFER, SCHAUB
& PORCELLO CO., L.P.A.

Thomas A. Meehan
U.S.P.T.O. Reg. No. 19.713

PATENT COOPERATION TREATY

AS: 96.448

55

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:		Owens-Illinois, Inc.		PCT	
SMITH, Susan, L. Owens-Illinois, Inc. One SeaGate, 25-LDP Toledo, OH 43666 ETATS-UNIS D'AMERIQUE		JUL 26 2004		WRITTEN OPINION (PCT Rule 66)	
		INTELLECTUAL PROPERTY SECTION			
		Date of mailing (day/month/year)		20.07.2004	
Applicant's or agent's file reference 17815 PCT		REPLY DUE		within 3 month(s) from the above date of mailing	
International application No. PCT/US 03/27702		International filing date (day/month/year) 04.09.2003		Priority date (day/month/year) 04.09.2002	
International Patent Classification (IPC) or both national classification and IPC C08B453					
Applicant OWENS-BROCKWAY GLASS CONTAINER INC.					

- This written opinion is the first drawn up by this International Preliminary Examining Authority.
- This opinion contains indications relating to the following items:
 - ☒ Basis of the opinion
 - ☐ Priority
 - ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - ☐ Lack of unity of invention
 - ☒ Reasoned statement under Rule 66.2(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - ☐ Certain documents cited
 - ☐ Certain defects in the international application
 - ☐ Certain observations on the international application
- The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.3(a).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.5 and 66.5.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
- The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 04.01.2005

Name and mailing address of the International preliminary examining authority:		Authorized Officer	
 European Patent Office - Bld. 5818, Patentkanal 2 NL-2280 HV Rijswijk - The Netherlands Tel: +31 70 340 - 2040 Fax: +31 70 340 3018		Marrec, P Examining officer (incl. extension of time limits) Smits, A Telephone No. +31 70 340-3506	

56

I. Basis of the opinion

1. With regard to the elements of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"*):

Description, Pages

1-10 as originally filed

Claims, Numbers

1-7, 9 as originally filed

8 received on 03.05.2004 with letter of 06.04.2004

Drawings, Sheets

1/10-10/10 as originally filed

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).
3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.
4. The amendments have resulted in the cancellation of:
- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:
5. ☐ This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

G. Additional observations, if necessary:

WRITTEN OPINION

International application No. **PCT/US 03/27702**

57.

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	-
Inventive step (IS)	Claims	1-9
Industrial applicability (IA)	Claims	-

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following document/s/:

D1: GB 2 231 855

- 1) The subject-matter of claims 1-9 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons.**
- 1.1) Document D1, which is considered to represent the most relevant state of the art, discloses a sweep out apparatus for transferring a plurality of aligned articles on a member (4) to a conveyor (6) that extends transversely (figure 2) to the aligned on the member, said apparatus comprising:**
 - a head (2) with an elongated bar (8) having a spaced plurality of fingers (12, 14) extending transversely therefrom, each finger defining, with the elongated bar (8), a pocket (3) for receiving one of the articles, said head (2) with said elongated bar (8) being oscillatable through an arc of 90° (figure 2) to sweep the plurality of articles from the member (4) to positions on the conveyor (6), the elongated bar (8) being reciprocable (page 3, lines 19-21);**
 - a first reversible motor (28) for imparting oscillating motion to the head (page 2, line 13), said first reversible electrical motor being fixed in position during its operation and having an annular output shaft (30) operatively engaging said head;**
 - a second reversible motor (26) for imparting reciprocating motion (page 2, lines 11, 12) to the elongated bar (8) with respect to said head (2), said second reversible electric motor (26) being fixed in position during its operation and being in coaxial alignment vertically below said first reversible electric motor (page 2, line 20), said second reversible electric motor (26) having an output shaft (24) extending through said annular output shaft (30) of said first reversible electric motor (28), said annular output shaft (30) of said first reversible electric motor (28) and said output shaft (24) of said second reversible electric motor (26) being rotatable relative to one another;**

from which the subject-matter of claim differs in that :

- the electrical motors used are reversible motors,
- a planetary gear transmission is used for imparting reciprocating motion from said output shaft of said second reversible electric motor to said elongated bar.

It is however generally known to the person skilled in the art that a reversible motor is nowadays an equivalent to an electrical motor of document D1 and can be interchanged where circumstances make it desirable without recurring to any inventiveness.

The feature "planetary gear transmission" is merely one of several straightforward possibilities of gear transmission arrangements from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to transform a vertical motion into a rotary one.

Additionally, it is to be noted that document D1, (page 1, line 31, to page 2, line 2) is dealing with the same problem as the present application (i.e. positioning the motors below the sweep out mechanism to reduce the temperatures to which the motors are exposed and to improve its reliability).

Therefore, the solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT).

- 1.2) The method steps of claim 8 being based on the apparatus features of claim 1, the same reasoning applies *mutatis mutandis* to method claim 8, which is therefore not inventive (Article 33(3) PCT).
- 1.3) Dependent claims 2-7, 9 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, the reasons being as follows:

In claims 2-7, 9 slight constructional changes in the sweep out mechanism of claims 1, 9 is defined which comes within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen. Consequently, the subject-matter of claims 2-7, 9 also lacks an inventive step.

- 2) It is not at present apparent which part of the application could serve as a basis

**WRITTEN OPINION
SEPARATE SHEET**

International application No. PCT/US 03/27702

9/60

for a new, allowable claim. Should the applicant nevertheless regard some particular matter as patentable, an independent claim could be filed.

TRATADO DE COOPERACIÓN EN MATERIA DE PATENTES

Remitente:

OFICINA ENCARGADA DEL EXAMEN PRELIMINAR INTERNACIONAL

PCT

OPINIÓN ESCRITA
(PCT Regla 66))

A:

SMITH, Susan, L.
Ownes-Illinois, Inc
One SeaGate, 25-LDP
Toledo, OH 43666
ESTADOS UNIDOS DE AMÉRICA

Fecha de envío
(Día/Mes/Año)

20.07.2004

No. de Expediente del Solicitante o Apoderado

RESPUESTA

En 3 meses
A partir de la fecha de envío
escrita arriba

17615 PCT

No. de Solicitud Internacional

PCT/US 03/27702

Fecha Internacional de Presentación
(día/mes/año)

04.09.2003

Fecha de Prioridad (día/mes/año)

04.09.2002

Clasificación Internacional de Patentes (IPC) o la clasificación nacional y la IPC

C03B9/453

Solicitante

OWENS-BROCKWAY GLASS CONTAINER INC.

1. Esta opinión escrita es la primera preparada por esta Oficina de Examen Preliminar Internacional.

2. Esta opinión contiene datos con respecto a los siguientes puntos

- | | | |
|------|-------------------------------------|---|
| I | ☒ | Base de la Opinión |
| II | ☐ | Prioridad |
| III | ☐ | Sin elaboración de un dictamen sobre novedad, actividad inventiva y posibilidad de aplicación industrial |
| IV | ☐ | Falta de unidad de la invención |
| V | ☒ | Comprobación justificada según Artículo 35(2) con respecto a la novedad, la actividad inventiva y la posibilidad de aplicación industrial; documentos y explicaciones sustentando esta comprobación |
| VI | ☐ | Ciertos documentos enumerados |
| VII | ☐ | Ciertas deficiencias del registro internacional |
| VIII | ☐ | Ciertas observaciones relacionadas con la solicitud internacional |

3. Por el presente se invita al solicitante para que conteste esta opinión.

¿Cuándo? Véase el plazo de tiempo indicado arriba. El solicitante podrá, antes del vencimiento del plazo, solicitar una prórroga a esta Oficina, consultar Regla 66.2(d)

¿Cómo? Presentado una respuesta escrita, acompañada, cuando sea pertinente, de las correcciones, de acuerdo con la Regla 66.3. En relación con la forma y el idioma de las correcciones, véanse Reglas 66.8 y 66.9.

Igualmente: Para otra oportunidad de presentar correcciones, véase Regla 66.4
Para la obligación del examinador de considerar las correcciones y/o los argumentos, véase Regla 66.4 bis.
Para una comunicación informal con el examinador, véase Regla 66.6

Si no se presenta una respuesta, se establecerá el informe de examen preliminar internacional sobre la base de la opinión.

4. La fecha final antes de la cual se debe establecer el informe preliminar de búsqueda internacional de acuerdo con la Regla es: 04.01.2005

Nombre y dirección postal de la Oficina Encargada del Examen Preliminar Internacional:



Oficina Europea de Patentes - P.B. 6818 Patentlaan 2
NL-2280 HV Rijswijk - Países Bajos
Tel.: +31 70 340 - 2040 Tx: 31 651 epo nl
Fax: +31 70 340 - 3018

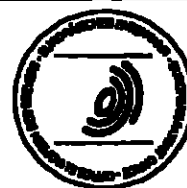
Empleado Autorizado

Marrec, P

Funcionario (incl. Prórroga de Plazos)

Smita, A

Teléfono No. +31 70 340 - 3566



I. Bases de la Opinión

1. Con respecto a los elementos de la solicitud internacional (*hojas intercambiables que se han suministrado a la Oficina receptora en respuesta a una invitación bajo el Artículo 14 que se mencionan en esta opinión como "presentadas originalmente"*):

Descripción, páginas:

1-10 como fueron presentadas originalmente

Reivindicaciones, No.:

1-7, 9 como fueron presentadas originalmente
8 recibida el 03.05.2004 con carta del 06.04.2004

Dibujos, Hojas

1-10 -10/10 como fueron presentados originalmente

2. En lo concerniente al idioma, todos los elementos indicados más arriba estuvieron a disposición de esta Administración o le fueron enviados en el idioma en el cual se radicó la solicitud internacional, salvo indicación en contrario consignada bajo este punto.

Estos elementos estuvieron a disposición de esta Oficina o le fueron enviados en el idioma siguiente: que es:

- ☐ el idioma de una traducción enviada para efectos de la búsqueda internacional (según la regla 23.1 (b)).
☐ el idioma de publicación de la solicitud internacional (según la regla 48.3 (b)).
☐ el idioma de la traducción enviada para efectos del examen preliminar internacional (según la regla 55.2 y/o 55.3).

3. En lo que concierne a cualquier secuencia de nucleótidos y/o aminoácidos divulgada en la solicitud internacional, el examen preliminar internacional se llevó a cabo sobre la base del listado de secuencias:

- ☐ contenido en la solicitud internacional, por escrito.
☐ presentado con la solicitud internacional, en formato de lectura por computador.
☐ remitido posteriormente a la administración, por escrito.
☐ remitido posteriormente a la administración, en formato de lectura por computador.
☐ se ha rendido la declaración, según la cual el listado de secuencias por escrito y suministrado posteriormente no va más allá de la divulgación hecha en la solicitud tal como se radicó.
☐ se ha rendido la declaración, según la cual las informaciones registradas en formato de lectura por computador son idénticas a las de los listados de secuencias, presentados por escrito.

4. Las modificaciones han acarreado la anulación:

- ☐ de la descripción, páginas:
☐ de las reivindicaciones, Nos.:
☐ de los dibujos, hojas:

5. ☐ La presente opinión se preparó sin tener en cuenta (algunas de) las modificaciones, que se consideraron que van más allá de la exposición de la invención (regla 70.2 (c))

6. Observaciones adicionales, si son necesarias:

PINIÓN ESCRITA

Solicitud Internacional No. PCT/US 03/27702

V. Declaración motivada bajo Artículo 35(2) en cuanto a la novedad, la actividad inventiva y la posibilidad de aplicación Industrial; citas y explicaciones sustentando esta declaración

1. Declaración

Novedad (N)

Reivindicaciones -

Actividad Inventiva (IS)

Reivindicaciones 1-9

Posibilidad de Aplicación Industrial (IA)

Reivindicaciones -

2. Citas y explicaciones

Véase hoja separada

En relación con el Punto V

Declaración motivada bajo la Regla 66.2(a)(II) en cuanto a la novedad, la actividad inventiva y la posibilidad de aplicación industrial

Se hace referencia a el(los) siguiente(s) documento(s):

D1: GB2 231 855

- 1) El tema materia de las reivindicaciones 1-9 de la presente solicitud no se puede considerar que implica una actividad inventiva (Artículo 33(3) PCT) por los siguientes motivos:**
 - 1.1) El Documento D1, el cual se considera que representa la tecnología de punta más destacada divulga un aparato de barrido para trasladar un conjunto de artículos alineados sobre una pieza (4) a una cinta transportadora (6) que corre en sentido transversal (figura 2) a los artículos alineados sobre la pieza, y el citado aparato comprende:**
 - un cabezal (2) con una barra alargada (8) que consta de un conjunto de uñas (12, 14) que sobresalen en dirección transversal de la misma, y cada uña define, conjuntamente con la barra alargada (8), una cavidad (3) para recibir uno de los artículos, el citado cabezal (2) con la citada barra alargada (8) oscilan mediante un arco de 90° (figura 2) para trasladar la totalidad de los artículos de la pieza (4) a las posiciones en la cinta transportadora (6), la barra alargada (8) tiene un movimiento alternativo (página 3, líneas 19-21);**
 - un primer motor reversible (28) para impartir el movimiento oscilante al cabezal (página 2, línea 13), el primer motor eléctrico reversible citado se encuentra fijo en una posición durante su operación y tiene un árbol anular de salida (30) que engrana funcionalmente en el citado cabezal;**
 - un segundo motor reversible (26) para impartir el movimiento alternativo (página 2, líneas 11, 12) a la barra alargada (8) con respecto al citado cabezal (2), el segundo motor eléctrico reversible citado (26) se encuentra fijo en una posición durante su operación y se encuentra coaxialmente alineado en dirección vertical debajo del primer motor eléctrico reversible citado (página 2, línea 20), el segundo motor eléctrico reversible citado (26) tiene un árbol de salida (24) que se extiende a través del citado árbol de salida anular (30) del primer motor eléctrico reversible citado (28), el citado árbol de salida anular (30) del primer motor eléctrico reversible citado (28) y el citado árbol de salida (24) del primer motor eléctrico reversible citado (26) son giratorios y giran en forma independiente.**

del cual el tema materia de la reivindicación 1 difiere en que
- los motores eléctricos empleados son motores reversibles.

65
✓

- se emplea un engranaje planetario de transmisión para impartir un movimiento alternativo del citado árbol de salida del citado segundo motor eléctrico reversible a la citada barra alargada.

Sin embargo una persona con destreza en el arte sabe que un motor reversible es hoy en día el equivalente de un motor eléctrico del documento D1 y se puede intercambiar cuando las circunstancias lo requieran, sin incurrir en ninguna invención.

La característica de "engranaje planetario de transmisión " es simplemente una de las posibilidades más sencillas de un engranaje de transmisión que una persona con destreza en el arte seleccionaría, de conformidad con las circunstancias, sin ejercer una actividad inventiva, con el fin de transformar un movimiento vertical en uno giratorio.

Adicionalmente, se deberá notar que el documento D1, (página 1, línea 31, a página 2, línea 2) hace referencia al mismo problema que el de la presente solicitud (es decir ubicar los motores debajo del aparato de barrido para reducir las temperaturas a las cuales los motores se ven expuestos y para aumentar su confiabilidad).

Por lo tanto, la solución propuesta en la reivindicación 1 de la presente solicitud no se puede considerar una actividad inventiva (Artículo 33(3) PCT).

1.2) Con respecto a los pasos del método de la reivindicación 8, los cuales se basan en las características de la reivindicación 1, se aplica el mismo razonamiento *mutatis mutandis* que para el método de la reivindicación 8, el cual por lo tanto no es inventivo (Artículo 33(3) PCT).

1.3) Las reivindicaciones dependientes 2-7, 9 no comprenden ninguna característica, las cuales conjuntamente con las características de cualquier reivindicación a la cual hacen referencia, cumplen con los requisitos del PCT en relación con la actividad inventiva, por los siguientes motivos:

En las reivindicaciones 2-7, 9 se definen unos cambios de construcción muy leves en el aparato de barrido de las reivindicaciones 1, 9 que se encuentran bajo el ámbito de la práctica acostumbrada seguida por personas con destreza en el arte, especialmente puesto que las ventajas logradas de esta manera son fácilmente predecibles. Por lo tanto el tema materia de las reivindicaciones 2-7, 9 también carece de actividad inventiva.

2. En este momento no es claro cual es la parte de la solicitud que podría servir como base para una nueva reivindicación aceptable. Sin embargo, si el solicitante considera que se puede patentar algún tema, es necesario presentar una reivindicación independiente.

PATENT COOPERATION TREATY

Registered

66
CONFIRMATION OF FAX
PCTFrom the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

Owens-Illinois, Inc.

To:

SMITH, Susan, L.
Owens-Illinois, Inc.
One SeaGate, 25-LDP
Toledo, OH 43666
ETATS-UNIS D'AMERIQUE

MAY 26 2004

INTELLECTUAL
PROPERTY SECTIONNOTIFICATION OF RECEIPT
OF DEMAND BY COMPETENT INTERNATIONAL
PRELIMINARY EXAMINING AUTHORITY(PCT Rules 59.3(e) and 61.1(b), first sentence
and Administrative Instructions, Section 601(a))

By fax in advance

Fax: +1 419 247 8665

Date of mailing
(day/month/year) 21-05-2004Applicant's or agent's file reference
17615 PCT

IMPORTANT NOTIFICATION

International application No.

PCT/US03/27702

International filing date (day/month/year)

04/09/2003

Priority date (day/month/year)

04/09/2002

Applicant

OWENS-BROCKWAY GLASS CONTAINER INC.

1. The applicant is hereby notified that this International Preliminary Examining Authority considers the following date as the date of receipt of the demand for international preliminary examination of the international application:

03/05/2004

2. This date of receipt is:

- ☒ the actual date of receipt of the demand by this Authority (Rule 61.1(b)).
☐ the actual date of receipt of the demand on behalf of this Authority (Rule 59.3(e)).
☐ the date on which this Authority has, in response to the invitation to correct defects in the demand (Form PCT/IPEA/404), received the required corrections.

3. ☒ **ATTENTION:** That date of receipt is after the expiration of 19 months from the priority date. Consequently, in respect of some Offices, the demand does not have the effect of postponing the entry into the national phase until 30 months from the priority date (or later in some Offices) (Article 39(1)) and the acts for entry into the national phase must therefore be performed within 20 months from the priority date (or later in some Offices). However, in respect of some other Offices, the time limit of 30 months (or later) may nevertheless apply. See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

- ☒ (If applicable) This notification confirms the information given by telephone, facsimile transmission or in person on:

17.05.04, by fax

4. Only where paragraph 3 applies, a copy of this notification has been sent to the International Bureau.

Name and mailing address of the IPEA/

European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk - Netherlands
Tel.: (+31-70) 340-2040
Fax: (+31-70) 340-3016

Authorized officer

SMITS A M

Tel. (+31-70) 340-3596

Form PCT/IPEA/402 (April 2002; reprint January 2004)

(13/05/2004)



INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/27702

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C03B9/453

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C03B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 231 855 A (EMHART IND) 28 November 1990 (1990-11-28) the whole document	1-9
A	DE 42 31 454 A (GPS GLASPROD SERV GMBH) 24 March 1994 (1994-03-24) the whole document	1-9
A	US 6 076 654 A (LEIDY D WAYNE) 20 June 2000 (2000-06-20) cited in the application the whole document	1-9
A	US 5 429 651 A (BOLIN JAMES A) 4 July 1995 (1995-07-04) cited in the application column 13, line 44 - line 50	1-9

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

* Special categories of cited documents:

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

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

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

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

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

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

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

"A" document member of the same patent family

Date of the actual completion of the international search

9 February 2004

Date of mailing of the international search report

20/02/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax (+31-70) 340-3016

Authorized officer

Marrec, P

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 03/27702

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2231855	A	28-11-1990	NONE
DE 4231454	A	24-03-1994	DE 4231454 A1 24-03-1994
US 6076654	A	20-06-2000	AU 743716 B2 31-01-2002
		AU 2252999 A	14-10-1999
		BR 9902031 A	02-05-2000
		CA 2267462 A1	06-10-1999
		CN 1236739 A	01-12-1999
		CZ 9901179 A3	15-12-1999
		EE 9900068 A	15-12-1999
		EP 0949211 A2	13-10-1999
		HU 9900839 A2	28-12-1999
		JP 11335128 A	07-12-1999
		PL 332361 A1	11-10-1999
		ZA 9902513 A	05-10-1999
US 5429651	A	04-07-1995	AU 670180 B2 04-07-1996
		AU 5874894 A	15-08-1994
		CA 2152938 A1	21-07-1994
		EP 0675845 A1	11-10-1995
		JP 8506558 T	16-07-1996
		WO 9415860 A1	21-07-1994

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 17615 PCT	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US 03/27702	International filing date (day/month/year) 04/09/2003	(Earliest) Priority Date (day/month/year) 04/09/2002
Applicant OWENS-BROCKWAY GLASS CONTAINER INC.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amine acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

4. With regard to the title,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

SWEEP-OUT APPARATUS AND METHOD FOR AN I.S. GLASSWARE FORMING MACHINE

5. With regard to the abstract,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☒ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1a-1c

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 03/27702

69

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

Sweepout apparatus (10) and method for sweeping an aligned array of glass containers (C) from a deadplate (12) of an I.S. glass container forming machine to a conveyor (14) that runs transversely to the array of containers on the deadplate and serves to transfer the containers for further processing. The apparatus comprises: a swivel portion (16 or 116) oscillatable in an arc of approximately 90°; a head (18) carried by the swivel portion and reciprocable relative thereto; an elongated bar (20) carried by the head with a spaced plurality of pocket-defining fingers (22) that extend from the bar; independently operatable first and second coaxial reversible electrical motors (30,28); an output shaft (32) of the second electric motor (28) passing through an annular output shaft (56) of the first electric motor (30). Reversible motion imparted to the annular output shaft of the first motor causes oscillating motion of the swivel portion of the sweepout apparatus. Reversible motion imparted to the output shaft of the second motor axial through a planetary gear (42) imparts reciprocating motion to the elongated bar relative to the other structure of the sweepout portion. The output shafts (32,56) are independently rotatable.

INTERNATIONAL SEARCH REPORT

International Application No.
PCT/US 03/27702

70
2

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C03B9/453

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C03B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 231 855 A (EMHART IND) 28 November 1990 (1990-11-28) the whole document	1-9
A	DE 42 31 454 A (GPS GLASPROD SERV GMBH) 24 March 1994 (1994-03-24) the whole document	1-9
A	US 6 076 654 A (LEIDY D WAYNE) 20 June 2000 (2000-06-20) cited in the application the whole document	1-9
A	US 5 429 651 A (BOLIN JAMES A) 4 July 1995 (1995-07-04) cited in the application column 13, line 44 - line 50	1-9

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- *G* document member of the same patent family

Date of the actual completion of the international search

9 February 2004

Date of mailing of the international search report

20/02/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentplan 2
NL - 2280 HV Rijswijk
Tel (+31-70) 340-2040, Tx 31 651 epo nl,
Fax (+31-70) 340-3016

Authorized officer

Marrec, P

INTEP TIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 03/27702

71

Handwritten marks: a large 'X' and a checkmark.

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2231855	A	28-11-1990	NONE	
DE 4231454	A	24-03-1994	DE 4231454 A1	24-03-1994
US 6076654	A	20-06-2000	AU 743716 B2	31-01-2002
			AU 2252999 A	14-10-1999
			BR 9902031 A	02-05-2000
			CA 2267462 A1	06-10-1999
			CN 1236739 A	01-12-1999
			CZ 9901179 A3	15-12-1999
			EE 9900068 A	15-12-1999
			EP 0949211 A2	13-10-1999
			HU 9900839 A2	28-12-1999
			JP 11335128 A	07-12-1999
			PL 332361 A1	11-10-1999
			ZA 9902513 A	05-10-1999
US 5429651	A	04-07-1995	AU 670180 B2	04-07-1996
			AU 5874894 A	15-08-1994
			CA 2152938 A1	21-07-1994
			EP 0675845 A1	11-10-1995
			JP 8506558 T	16-07-1996
			WO 9415860 A1	21-07-1994

(12) UK Patent Application (10) GB (11) 2 231 855 (13) A

(43) Date of A publication 28.11.1990

(21) Application No 8909663.0

(22) Date of filing 27.04.1989

(71) Applicant

Emhart Industries Inc

(Incorporated in the USA - Connecticut)

701 East Joppa Road, Towson, Maryland 21204,
United States of America

(72) Inventors

Hermann Heinrich Nebelung
Hans Bergmann

(74) Agent and/or Address for Service

J W Randall
c/o Emhart Patents Department, Lyn House,
39 The Parade, Oadby, Leicester, LE2 5BB,
United Kingdom

(51) INT CL⁴

B65G 47/42

(52) UK CL (Edition K)

B8A A6F A6629 A6812 A6836 A6912 A6913 A6914
U1B S1385

(56) Documents cited

None

(58) Field of search

UK CL (Edition J) B8A AGB A6F A6G
INT CL⁴ B65G

(54) Pushout mechanism

(57) A pushout mechanism for a glass container manufacturing machine comprises two coaxially arranged motors (26, 28), one arranged to cause movement of a pusher (12) about a vertical axis and the other, through a crank mechanism (16, 18), to move the pusher between extended and retracted positions. Hydraulic or electric motors can be employed.

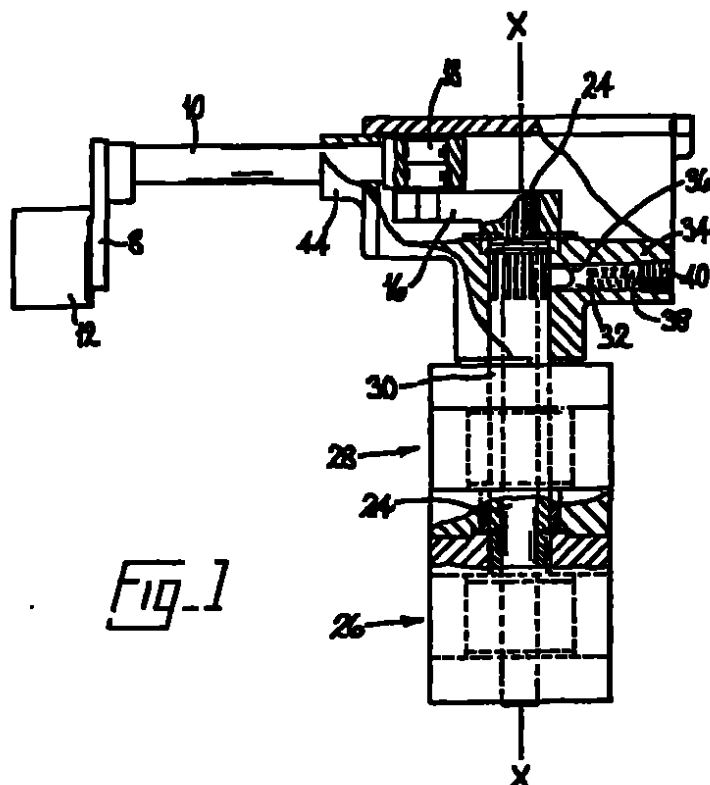
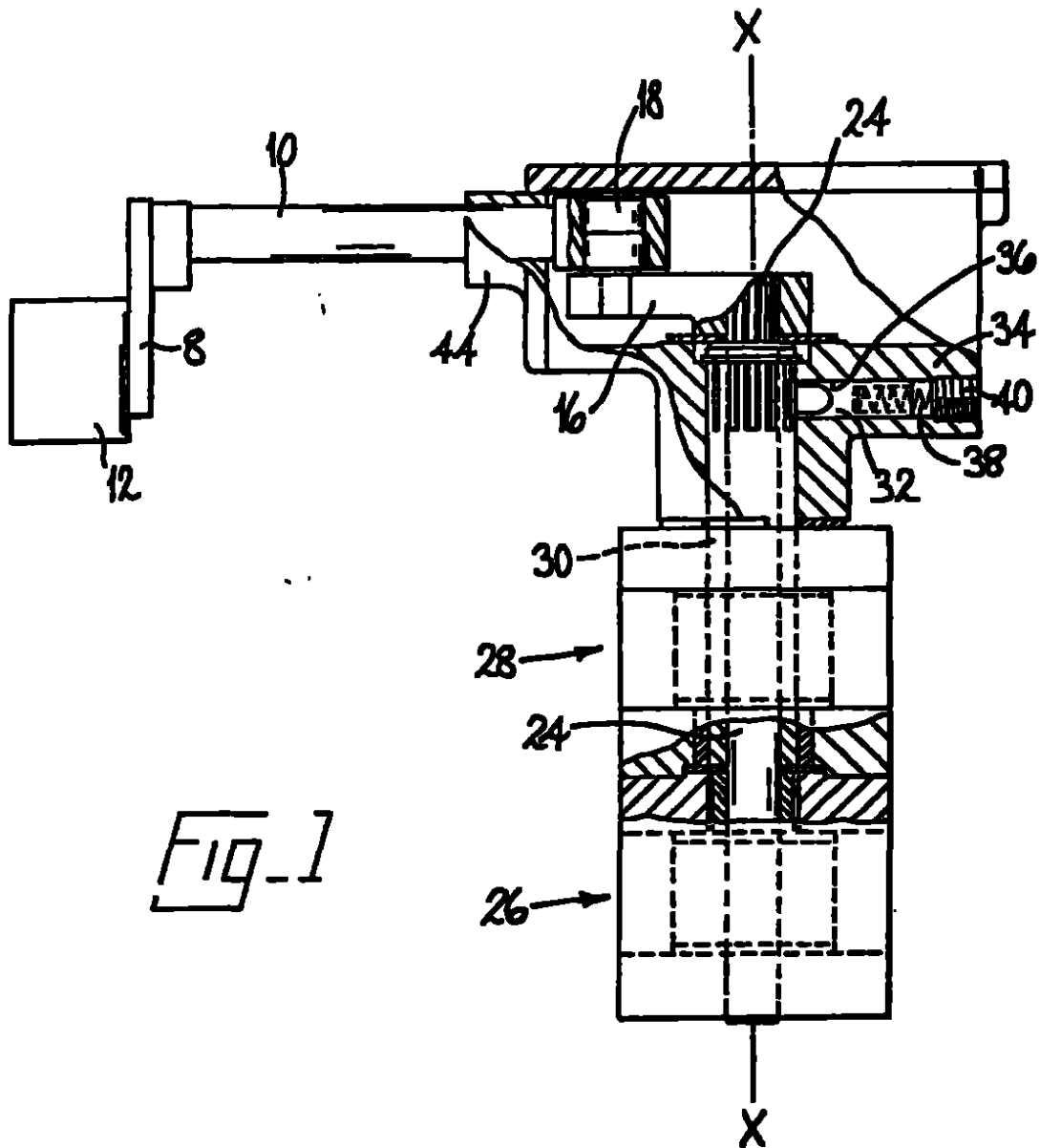


Fig. 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

GB 2 231 855 A



73
A

2/2

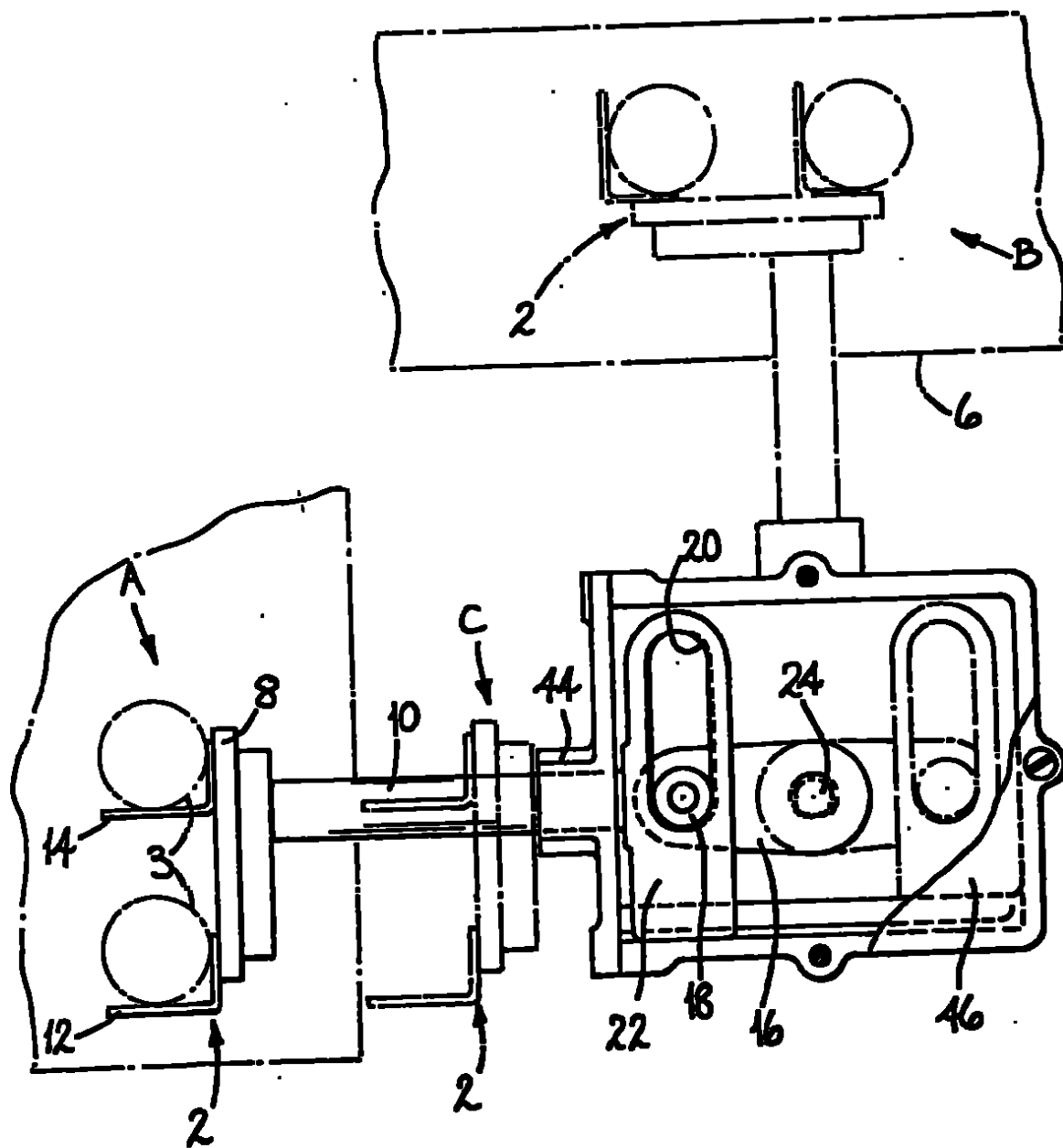


FIG-2

PUSHOUT MECHANISM

The present invention is concerned with pushout mechanisms for use in glass machines.

5 In a conventional glass container manufacturing machine of the I.S. type, glass containers are manufactured in a series of moulds in a plurality of sections positioned side by side in the machine, and the containers manufactured in each section are positioned on a dead plate, where they are
10 cooled. The containers are removed from the dead plate onto a conveyor by a pushout mechanism associated with each section, and are then carried by the conveyor through a lehr, for annealing, and then to inspection and packing devices.

15 It is desirable that the pushout mechanism is compact in construction and reliable in operation. It is also desirable that, in the event of obstruction to the operation of the pushout mechanism, for example by a broken or fallen bottle, that the mechanism is not seriously damaged and can
20 readily be restored to operation when the obstruction has been removed.

Many pushout mechanisms have been proposed in the past, generally pneumatic in operation. Such mechanisms normally comprise two motors, one for rotating a pusher arm of the
25 mechanism to carry containers in an arcuate path from the dead plate of the section on to the conveyor, and the other, a longitudinally reciprocable motor, for moving the pusher arm between extended and retracted positions. Such a reciprocable motor, being rotated with the mechanism as a
30 whole, is bulky and may be difficult to accommodate in the space available. Further, the pushout mechanism is subject to radiant heat from the adjacent container making machinery, pneumatic mechanisms require sealing rings to confine the air under pressure which are subject to serious
35 deterioration under such heat. It is also difficult to control, without undue complexity, the movement of the

74 ~~0~~
~~A~~

longitudinally reciprocable motor so that it moves the container with appropriate acceleration and deceleration.

One of the objects of the present invention is to provide a pushout mechanism which is particularly compact.

5 It is another of the objects of the present invention to provide a pushout mechanism which is reliable in operation and provides for appropriate movement of containers.

The present invention provides a pushout mechanism for
10 use in a glass container manufacturing machine comprising, a pusher head, first means for moving the pusher head longitudinally between an extended and a retracted position, second means for rotating the pusher head about a vertical axis, the first and second means cooperating so that the
15 head moves in a desired path to pick up containers from the machine and to move them in an arcuate path to deposit them on a conveyor wherein the first means comprises a first rotary motor arranged to cause longitudinal movement of the pusher head through a crank mechanism and the second means
20 comprises a second rotary motor mounted coaxially with the first.

Preferably in a pusher mechanism according to the invention the two rotary motors are hydraulic motors, but they may be rotary electric motors. We prefer, for the
25 reasons outlined above, not to use pneumatic motors. Preferably also the second rotary motor comprises a hollow drive shaft and the first rotary motor comprises a drive shaft extending axially through the hollow drive shaft of the second motor. The hollow drive shaft may be connected
30 to a housing of the mechanism through a pin engaging fluting on the shaft and arranged to slip should the pusher head be overloaded.

There now follows a description, to be read with reference to the accompanying drawings, of a pushout
35 mechanism which illustrates the invention by way of example.

In the accompanying drawings,

Figure 1 shows a side view, partly in section, of the illustrative pushout mechanism,

Figure 2 shows a plan view of the illustrative pushout
5 mechanism.

The illustrative pushout mechanism is for use in a glass container manufacturing machine of the I.S. type, and comprises a pusher head 2 which is arranged at a position A to engage glass containers 3 made by the machine resting on
10 a dead plate 4 and to move to a position B to carry the containers arcuately on to a conveyor 6 by which they are removed from the machine for further processing e.g. annealing, inspection and packaging. The pusher head retracts from the conveyor at position B and returns to a
15 retracted position C, from which it may be extended to position A to repeat the cycle.

The pusher head 2 comprises a support plate 8 secured to a rod 10 and two container engaging arms 12, 14. The mechanism comprises first means for moving the pusher head 2
20 longitudinally between an extended position (A and B) and a retracted position (C). This first means comprises a crank 16 carrying a roll 18 which is engaged in a slot 20 of a cross bar 22 secured to the rod 10. The crank 16 is secured on a shaft 24 which is rotated by a hydraulic, rotary motor
25 26. Alternatively an electric motor may be utilized.

The illustrative mechanism also comprises second means for rotating the pusher head about a vertical axis X-X. this second means comprises a hydraulic rotary motor 28. The motor 28 comprises a hollow drive shaft 30 which is
30 arranged to fit rotatably around the shaft 24. The drive shaft 30 is linked by a pin 32 to a housing 34. The pin 32 is positioned in a bore 36 in the housing 34 and is urged into engagement with fluting on the shaft 30 by a loading spring 38 acting between the pin 32 and a screw 40 in the
35 bore 36. The housing 34 is closed by a cover plate 46 and surrounds the crank 16 and cross bar 22 of the first means,

75


and comprises a boss 44 through which the rod 10 may slidably move. It will be understood that the hydraulic motor 28 may be replaced if desired by an electric motor.

It will thus be understood that on the supply of
5 appropriately timed hydraulic pressure to the two motors 26 and 28 the motors cooperate so that the pusher head 2 moves in a desired path, firstly from its retracted position C to its extended position A to engage containers 3 on the dead plate and then to pick up the containers from the dead plate
10 and move them in an arcuate path from A to B to deposit them on the conveyor 6. The first motor 26 is arranged to cause longitudinal movement of the pusher head 2 and the second motor, which is arranged to cause arcuate movement of the pusher head 2, is arranged coaxially with the first.

15 In the event that there is an obstruction to the arcuate movement of the pusher head 2, as may occur should a container fall over or break, the pin 32 rides over the fluting on the shaft 30 and thus damage to the pushout mechanism is avoided.

20 The illustrative pushout mechanism can be seen to be of particularly compact construction, and can be programmed by conventional control means to operate to push out containers in any desired manner at a timing appropriate to the manufacture of the containers. Further, the sinusoidal
25 longitudinal movement of the pusher head 2, deriving from the operation of the crank 16 gives a desirable slow acceleration of initial longitudinal movement of a container and a slow deceleration at the end of such movement, which is highly desirable.

30

35

CLAIMS:

1. A pushout mechanism for use in a glass container manufacturing machine comprising,

5

a pusher head,

first means for moving the pusher head longitudinally between an extended and a retracted position,

second means for rotating the pusher head about a vertical axis,

10

the first and second means cooperating so that the head moves in a desired path to pick up containers from the machine and to move them in an arcuate path to deposit them on a conveyor wherein the first means comprises a first rotary motor arranged to cause longitudinal movement of the pusher head through a crank mechanism and the second means comprises a second rotary motor mounted coaxially with the first.

15

2. A pushout mechanism according to claim 1, wherein the two rotary motors are hydraulic motors.

20

3. A pushout mechanism according to claim 1, wherein the two rotary motors are electric motors.

25

4. A pushout mechanism according to claim 1, wherein the second rotary motor comprises a hollow drive shaft and the first rotary motor comprises a drive shaft extending axially through the hollow drive shaft of the second motor.

30

5. A pushout mechanism according to claim 4, wherein the hollow drive shaft is connected to a housing of the mechanism through a pin which is adapted to slip if the pusher head is overloaded in its arcuate path.

35

⑭ BUNDESREPUBLIK
DEUTSCHLAND



DEUTSCHES
PATENTAMT

⑫ Offenlegungsschrift
⑮ DE 42 31 454 A 1

⑥ Int. Cl.⁸:
C 03 B 9/453
C 03 B 9/183

⑰ Aktenzeichen: P 42 31 454.2
⑱ Anmeldetag: 18. 9. 82
⑲ Offenlegungstag: 24. 3. 84

DE 42 31 454 A 1

⑦ Anmelder:
GPS Glasproduktions-Service GmbH, 45329 Essen,
DE

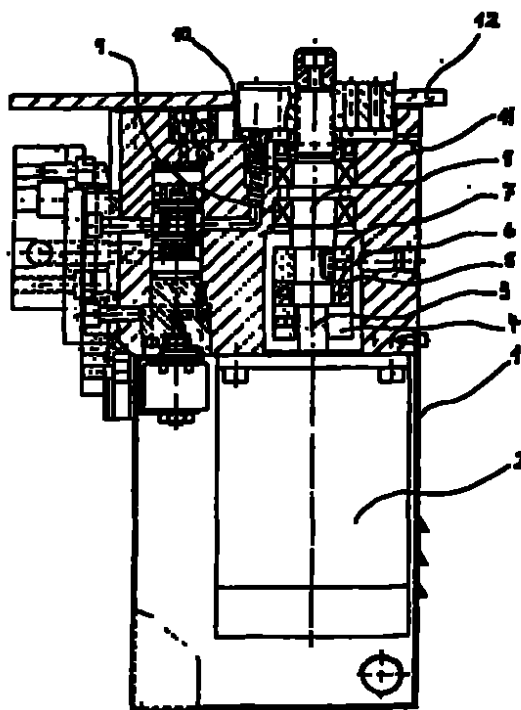
⑧ Vertreter:
Spalthoff, A., Dipl.-Ing.; Leigemann, K., Dipl.-Ing.,
Pat.-Anwälte, 45131 Essen

⑩ Erfinder:
Ertner, Helmut, Dipl.-Ing., 4175 Wachtendonk, DE;
Emrath, Norbert, 4356 Haltern, DE

Prüfungsantrag gem. § 44 PatG ist gestellt

④ Abgabestation für eine IS-Glasformmaschine

- ⑤ Eine Abgabestation für eine IS-Glasformmaschine hat eine Drehplatte (12) zur Aufnahme von Abschlebeeinheiten, eine Abschlebeeinrichtung zum Überschieben der Glasgegenstände von der Drehplatte (12) auf eine Abfördereinrichtung und eine Antriebseinrichtung, mittels der die Drehplatte (12) in unterschiedliche Drehstellungen drehbar ist. Um eine mit geringem konstruktiv-technischen Aufwand herstellbare Antriebsverbindung zwischen der Drehplatte (12) und der Antriebseinrichtung zu schaffen, ist letztere als Servogtriebmotor (2) ausgebildet, dessen Abtriebswelle (3) koaxial zur Drehplatte (12) angeordnet ist.



Die folgenden Angaben sind den vom Anmelder eingereichten Unterlagen entnommen

BUNDESDRUCKEREI 01. 84 408 012/223

4/41

76

DE 42 31 454 A 1

Die Erfindung bezieht sich auf eine Abgabestation für eine IS-Glasformmaschine nach dem Oberbegriff des Patentanspruchs 1.

Aus der DE 30 18 232 A1 ist eine derartige Abgabestation bekannt, auf deren Drehplatte Abschiebeeinheiten aufgenommen werden. Von der Drehplatte werden die Abschiebeeinheiten mittels einer Abschiebeeinrichtung auf eine Abförderereinrichtung überführt. Um den Überführungsvorgang von der Drehplatte zur Abförderereinrichtung möglichst einfach zu gestalten, ist die Drehplatte zwischen einer Stellung, in der die Abschiebeeinheiten von ihr aufgenommen werden, und einer zweiten Stellung, in der die Abschiebeeinheiten von ihr auf die Abförderereinrichtung übertragen werden, dreh- bzw. schwenkbar. Hierzu ist eine Antriebseinrichtung vorgesehen, deren Motorstufe aus einem Schrittmotor besteht, von dessen Abtriebswelle aus die Antriebsenergie über ein Zahnradgetriebe auf eine mit der Drehplatte verbundene Hochwelle übertragen wird. Aufgrund der einer derartigen Übertragung der Antriebsenergie zwischen dem Antriebsmotor und der Hochwelle zwangsläufig innewohnenden Ungenauigkeiten, muß für die Steuerung des Antriebsmotors ein erheblicher Aufwand betrieben werden.

Der Erfindung liegt die Aufgabe zugrunde, die gattungsgemäße Abgabestation derart weiterzubilden, daß mit einem relativ geringen mechanischen und steuerungstechnischen Aufwand eine genauere Dreh- bzw. Schwenkbewegung der Drehplatte ermöglicht ist.

Diese Aufgabe wird erfindungsgemäß dadurch gelöst, daß die Antriebseinrichtung der Drehplatte als Servogetriebemotor ausgebildet ist, dessen Abtriebswelle koaxial zur Drehplatte angeordnet ist. Aufgrund der direkten Kopplung zwischen der Abtriebswelle des Servogetriebemotors und der Drehplatte läßt sich insgesamt eine genauere und gleichmäßigere Steuerung erreichen. Des weiteren ist diese quasi als Direktantrieb zu bezeichnende Antriebseinrichtung platzsparend unterzubringen und ergibt sich eine einfachere Wartung der Antriebseinrichtung.

Vorteilhaft sollte der Servogetriebemotor als Servoelektrogetriebemotor ausgebildet sein, da dieser hinsichtlich seiner Regelgenauigkeit wesentlich besser als ein pneumatischer Getriebemotor ist, ganz abgesehen davon, daß eine pneumatische Anlage nicht erforderlich ist. Ein hydraulischer Getriebemotor wäre hinsichtlich der Regelcharakteristik zwar mit einem Servoelektrogetriebemotor vergleichbar, jedoch erfordert dieser eine besondere Hydraulikstation mit den entsprechenden Zuleitungen, was vergleichsweise aufwendig ist.

Um den Servoelektrogetriebemotor der erfindungsgemäßen Abgabestation gegen an der Drehplatte u. U. auftretende mechanische Beanspruchungen zu schützen, ist vorteilhaft zwischen der Abtriebswelle des Servoelektrogetriebemotors und einer fest und koaxial mit der Drehplatte verbundenen Hochwelle eine Schwingungen dämpfende bzw. aufnehmende Kupplung angeordnet.

Im folgenden wird die Erfindung an Hand einer Ausführungsform unter Bezugnahme auf die Zeichnung näher erläutert, in der in teilweise aufgeschnittener Seitenansicht eine Drehplatte nebst Antriebseinrichtung der erfindungsgemäßen Abgabestation dargestellt ist.

In einem Anschlußgehäuse 1 sitzt ein Servoelektrogetriebemotor 2, dessen Abtriebswelle 3 über eine im einzelnen nicht dargestellte Getriebestufe des Servoelek-

trogetriebemotors 2 an die Ausgangswelle einer ebenfalls im einzelnen nicht dargestellten Elektromotorstufe des Servoelektrogetriebemotors 2 angeschlossen und koaxial zu dieser Ausgangswelle angeordnet ist.

Die Abtriebswelle 3 ist an ihrem servoelektrogetriebemotorfernen Ende an ein Eingangsteil 4 einer Kupplung 5 angeschlossen, welches über einen Dämpfungsabschnitt 6 mit einem Ausgangsteil 7 der Kupplung 5 verbunden ist. Das Ausgangsteil 7 der Kupplung 5 ist an das untere Ende einer Hochwelle 8 angeschlossen, die mittels zweier Lagereinrichtungen 9, 10 drehbar in einem Gehäuse 11 gelagert ist und die an ihrem oberen Ende drehfest mit einer Drehplatte 12 verbunden ist.

Auf der Drehplatte 12 sind nicht dargestellte Abschiebeeinheiten aufnehmbar; die Drehplatte 12 ist mittels des Servoelektrogetriebemotors 2 über dessen Abtriebswelle 3, die Kupplung 5 und die Hochwelle 8 aus einer Stellung, in der die Abschiebeeinheiten auf die Drehplatte 12 aufgebbar sind, in eine Stellung, in der die Abschiebeeinheiten in einfacher Weise mittels einer nicht dargestellten Abschiebeeinrichtung von der Drehplatte 12 auf eine nicht dargestellte Abförderereinrichtung übertragbar sind und zurückdreh- bzw. schwenkbar.

Aufgrund der dem Servoelektrogetriebemotor 2 innewohnenden Eigenschaften und seiner quasi direkten Kopplung an die Hochwelle 8 ist die Verdreh- bzw. Verschwenkbewegung der Drehplatte 12 auch bei langer Nutzungsdauer des Servoelektrogetriebemotors 2 mit einem vergleichsweise geringen technisch-konstruktiven Aufwand stets genau und exakt durchführbar.

Eine Einleitung von an der Drehplatte 12 etwaig auftretenden mechanischen Belastungen in den Servoelektrogetriebemotor 2 wird durch die Kupplung 5, und zwar aufgrund der Wirkung deren Dämpfungsabschnitts 6, vermieden.

Patentansprüche

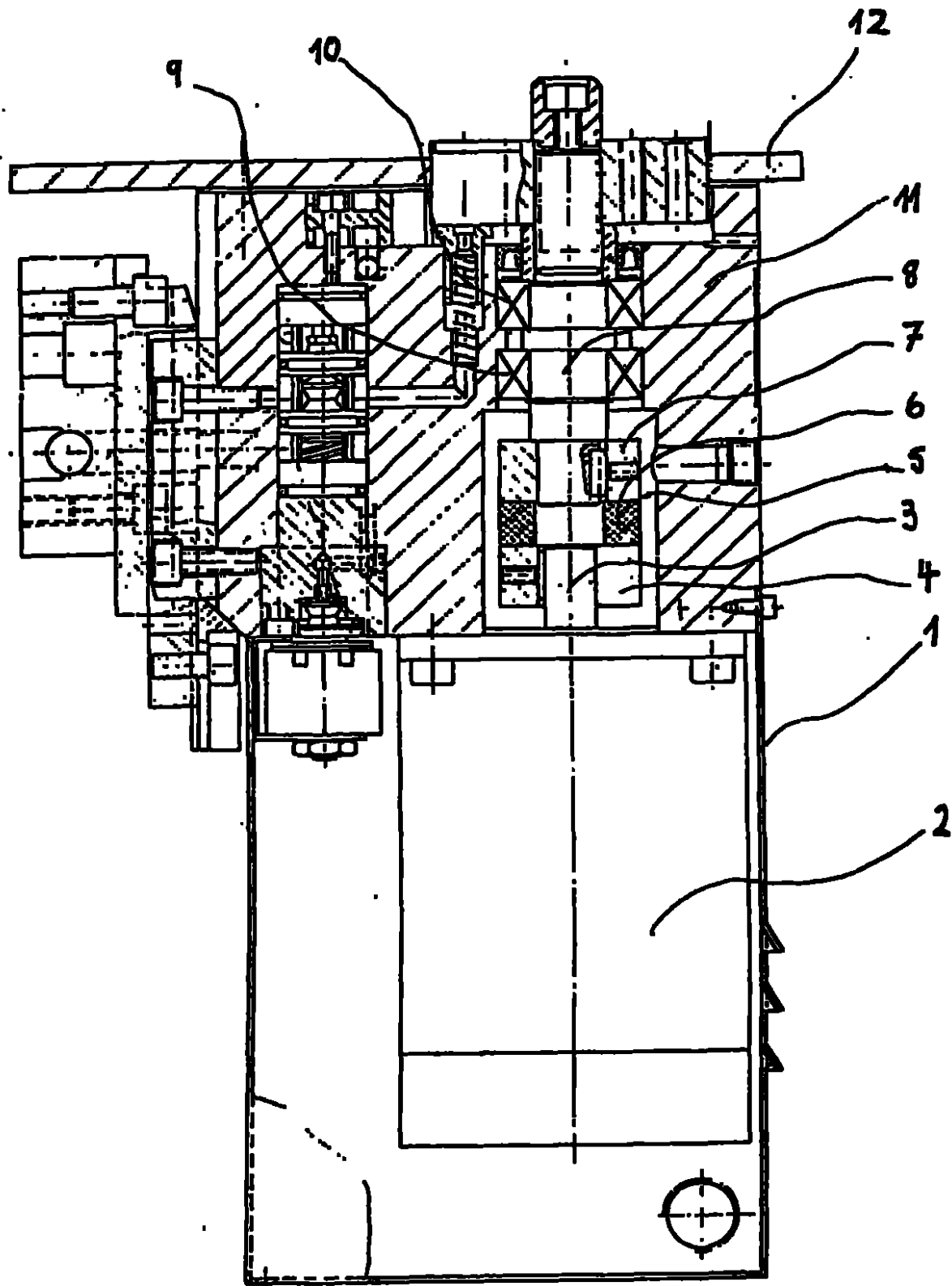
1. Abgabestation für eine IS-Glasformmaschine, mit einer Drehplatte (12) zur Aufnahme von Abschiebeeinheiten, einer Abschiebeeinrichtung zum Überschieben der Abschiebeeinheiten von der Drehplatte (12) auf eine Abförderereinrichtung, und einer Antriebseinrichtung, mittels der die Drehplatte (12) in unterschiedliche Drehstellungen drehbar ist, dadurch gekennzeichnet, daß die Antriebseinrichtung der Drehplatte (12) als Servogetriebemotor (2) ausgebildet ist, dessen Abtriebswelle (3) koaxial zur Drehplatte (12) angeordnet ist.
2. Abgabestation nach Anspruch 1, bei der die Antriebseinrichtung der Drehplatte (12) als Servoelektrogetriebemotor (2) ausgebildet ist.
3. Abgabestation nach Anspruch 1 oder 2, bei der zwischen der Abtriebswelle (3) des Servogetriebemotors (2) und einer fest und koaxial mit der Drehplatte (12) verbundenen Hochwelle (8) eine Schwingungen dämpfende bzw. aufnehmende Kupplung (5) angeordnet ist.

Hierzu 1 Seite(n) Zeichnungen

77

~~g~~

- Leerseite -





US006076654A

United States Patent [19]
Leidy

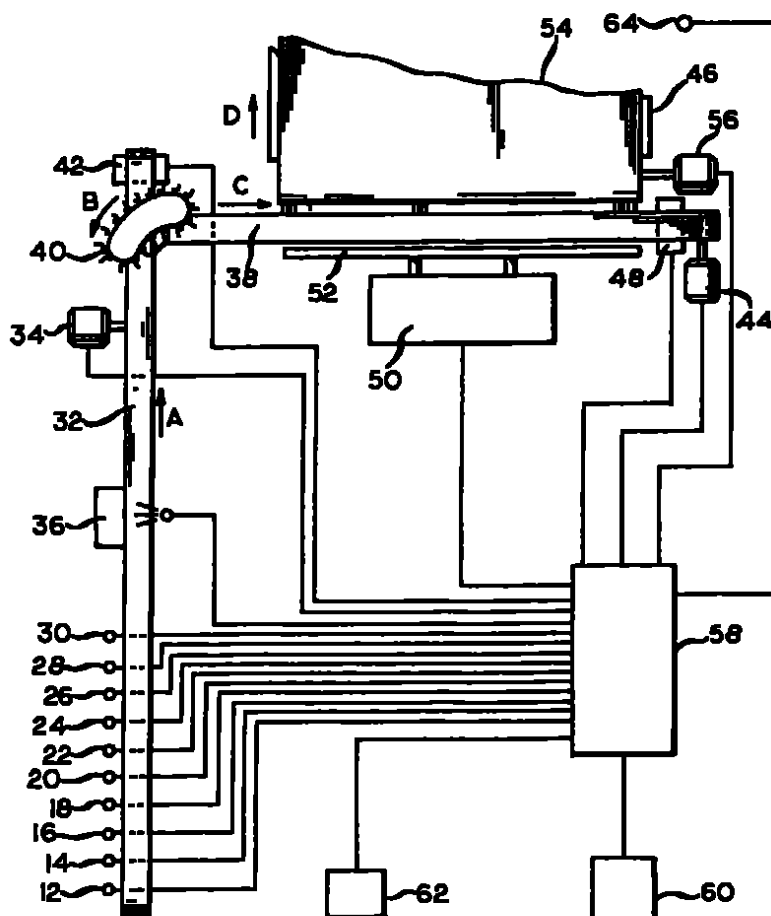
[11] **Patent Number:** 6,076,654
 [45] **Date of Patent:** Jun. 20, 2000

[54] **GLASS CONTAINER HANDLING SYSTEM**[75] **Inventor:** D. Wayne Leidy, Perrysburg, Ohio[73] **Assignee:** Owens-Brockway Glass Container Inc., Toledo, Ohio[21] **Appl. No.:** 09/055,512[22] **Filed:** Apr. 6, 1998[51] **Int. Cl.:** B65G 25/00[52] **U.S. Cl.:** 198/429; 198/457.06; 198/502.3[58] **Field of Search:** 198/370.11, 429, 198/430, 457.03, 457.06, 468.01, 493, 502.3, 575, 577[56] **References Cited****U.S. PATENT DOCUMENTS**

3,258,104	6/1966	Wallden	198/429
4,180,153	12/1979	Krishnan et al.	198/493
4,193,784	3/1980	Munford	198/429
4,203,752	5/1980	Becher et al.	198/468.01
4,448,820	5/1984	Buschor	198/502.3
5,044,488	9/1991	Bolin	198/430
5,429,651	7/1995	Bolin	198/430
5,768,856	12/1996	Odenthal	198/430

Primary Examiner—Joseph E. Valenza**12 Claims, 2 Drawing Sheets**[57] **ABSTRACT**

Glass containers are transferred from the dead plates of a forming machine of the I.S. type to an adjacent machine conveyor by 90° sweepouts, each of which is powered by an a.c. servo motor. The machine conveyor, which is also powered by an a.c. servo motor, conveys containers to a cross-conveyor, which extends perpendicularly to the machine conveyor and conveys the containers to positions adjacent the inlet of an annealing lehr. The transfer of containers from the machine conveyor to the cross-conveyor is effected by a chain transfer device, and the cross-conveyor and the chain transfer device are each powered by an a.c. servo motor. Groups of containers are transferred in unison from the cross-conveyor to a moving conveyor of the annealing lehr by the reciprocating pusher bar of a lehr loader, and the operation of the lehr loader pusher bar which reciprocates along three (3) axes, powered by three (3) a.c. servo motors. The operation of each of the a.c. servo motors for the 90° sweepouts, the machine conveyor, the cross-conveyor, chain transfer device and the lehr loader pusher bar, and the operation of the annealing lehr, which is powered by an a.c. motor, conveyor is simultaneously measured and controlled to process containers at all times from the forming machine dead plates to the annealing lehr conveyor at predetermined controlled rates.



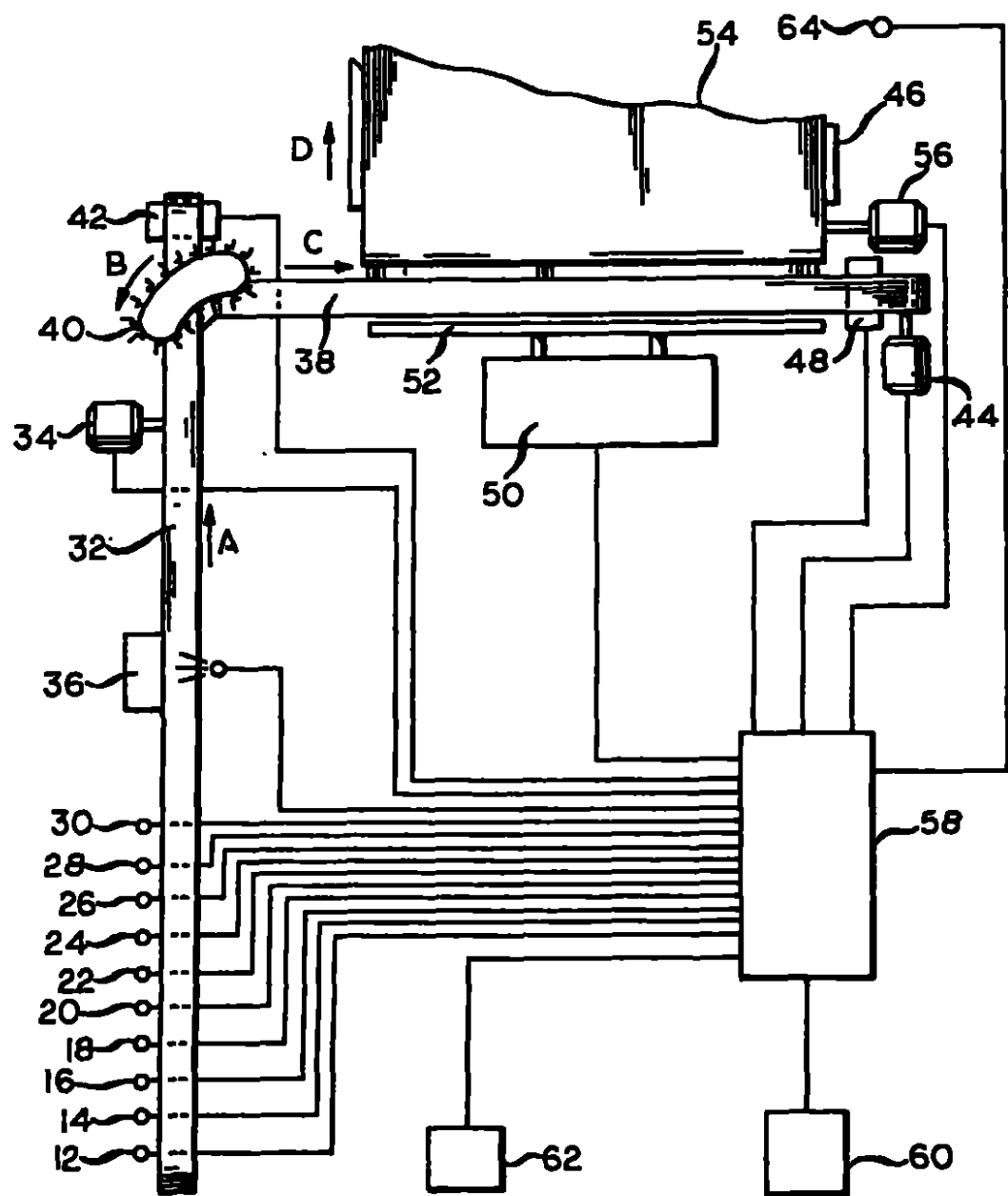


FIG. 1

[Handwritten signature]

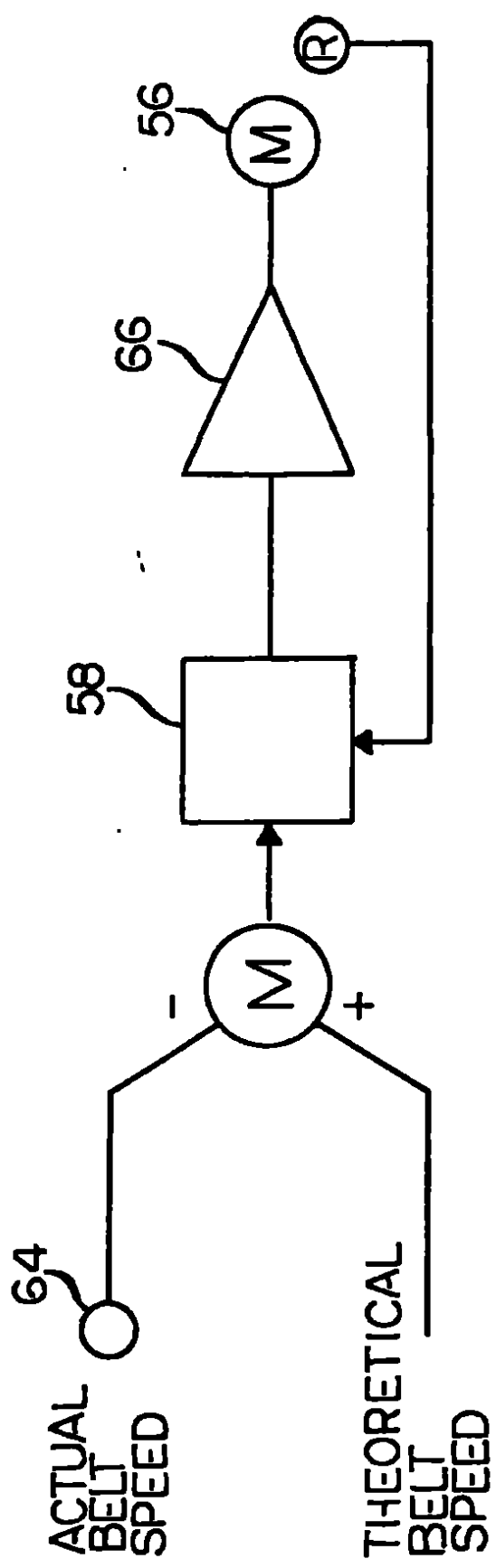


FIG. 2

GLASS CONTAINER HANDLING SYSTEM

FIELD OF THE INVENTION

This invention relates to a system for controlling the operation of the various handling devices for handling and transferring glass containers from a forming machine of the individual section ("I.S.") type to an annealing lehr.

BACKGROUND OF THE INVENTION

Many, if not most, glass containers, including a wide variety of bottles and jars, are, and for many years have been, manufactured by machines of the I.S. type, a type that uses a multiplicity of side-by-side sections each of which forms containers in a two-step molding operation. In a glass container forming operation of this type, a preform of the container, often called a parison or a blank, is formed in a first mold at a blank molding station of the I.S. machine section, either by pressing or blowing, and the blank is then transferred by a 180° inverting operation in a vertical plane to a second mold of the I.S. machine section, often called a blow mold, for forming into the finished container by blowing. In modern I.S. machines typically a multiplicity of containers, such as two or three or even four containers, are simultaneously formed at each section of the I.S. machine, and such machines typically incorporate a rather large number of sections, such as six or eight or even ten sections. U.S. Pat. No. 4,427,431 (Mumford et al.), which is assigned to the assignee of this application, the disclosure of which is incorporated by reference herein, generally discloses a glass container forming machine of this general type.

Containers leaving the blow molds of an I.S. machine are quite hot and need to be cooled to an appreciable extent before they can be subjected to the kinds of mechanical handling steps and devices that are necessary to transfer such containers to an annealing lehr for heat treatment to relieve excess residual internal stresses that can result from the forming steps. Thus, a typical I.S. machine is provided with an air cooled dead plate to which containers are transferred from the blow molds of an I.S. machine by take-out tong mechanisms that are a part of the I.S. machine. The containers are permitted to dwell on the dead plate for a period of time, during which they partially cool to a temperature at which they will be capable of undergoing further handling. Thereupon, the containers are transferred to a moving conveyor, often called a machine conveyor, an action that requires a 90° turning movement of the containers by a sweepout head. The transfer of containers from I.S. machine blow molds to dead plates and from dead plates to a machine conveyor by sweepout heads is generally described in the aforesaid U.S. Pat. No. 4,427,431 and also in U.S. Pat. No. 4,162,911 (Mallory) and U.S. Pat. No. 4,222,480 (Perry), each of which is also assigned to the assignee of this application, the disclosure of each of which is also incorporated by reference herein.

Containers from an I.S. machine that are being conveyed away from the I.S. machine by the machine conveyor are transferred to another conveyor, usually called a cross-conveyor, which extends perpendicular to the machine conveyor and presents the containers at the inlet to an annealing lehr. A container transfer device is provided to effect the transfer of containers from the machine conveyor to the cross-conveyor. This arrangement is generally shown in U.S. Pat. No. 4,193,784 (Mumford), which is also assigned to the assignee of this application, the disclosure of which is also incorporated by reference herein. In practice, transfer devices performing the function of the transfer device of the

aforesaid U.S. Pat. No. 4,193,784 are often constructed in an arcuate or crescent-shape configuration. Containers on the cross-conveyor at the inlet to an annealing lehr are thereupon transferred in groups of a multiplicity of containers in each group to a moving conveyor of the lehr by a transfer device that is often called a lehr loader or stacker. U.S. Pat. No. 4,290,517 (Hafferkamp), which is also assigned to the assignee of this application, the disclosure of which is also incorporated by reference herein, discloses a prior art lehr loader for transferring containers on a cross-conveyor to the conveyor of an annealing lehr in the manner described above.

The many container handling steps and devices involved in transferring containers from I.S. machine dead plates to an annealing lehr conveyor, as described, must be carefully controlled with respect to one another, both as to the speeds of such handling steps and their timing with respect to one another. Further, I.S. machines, as described, are used to produce containers of different designs and sizes, and each job change on an I.S. machine often requires changes in the system for controlling the operation of the container handling devices, frequently involving changes in the spacing between containers on the machine conveyor and the cross-conveyor. Heretofore, such I.S. machine job changes involved changing the gearbox and/or the sprocket ratios of the drives used to drive the machine conveyor, the cross-conveyor and the chain transfer device for transferring containers from the machine conveyor to the cross-conveyor. Of course, such changes lead to significant downtime in the operation of an I.S. machine, which reduces the overall productivity of the machine. Moreover, even in steady state operation, variables can occur in the operation of container handling devices, as described, do, for example, to stretch occurring in the conveyor belts used in some of such devices.

SUMMARY OF THE INVENTION

According to the present invention there is provided a control system for controlling the operation of the various container handling operations and devices that are involved in transferring containers from the dead plates of an I.S. machine to a moving conveyor of an annealing lehr. The handling system of the present invention utilizes a central control station that simultaneously controls the operation of the I.S. machine sweepouts, the machine conveyor, the chain transfer device, the cross-conveyor and the lehr loader, each of which is preferably driven by an a.c. servo motor for precise control over its operation. The central control station also controls the operation of the lehr conveyor driver, which is typically an a.c. motor but not an a.c. servo motor. The central control station of the present invention is programmed to permit an operator to provide it with a desired container-to-container spacing between containers being transferred to a lehr, and each of the handling devices being controlled by the central control station will thereupon be adjusted in its operation to conform to such container-to-container spacing. Further, the control system of the present invention employs monitors for monitoring the linear speeds of the machine conveyor and the cross-conveyor, which can vary even during steady state operation due to stretching of the conveyor belts, and will change the linear speed of each such belt as required to conform its operation to that of its associated handling devices. Additionally, the operating information for the various handling devices involved in handling containers of any particular design and size can be electronically recorded, for example, on a floppy disk, and the control system can bring the various handling devices to

their proper operating conditions very quickly when the line is next adjusted to process containers of that design and size. The control system of the present invention can also be used to control the operation of a container blowoff device of a type used to discharge containers in the event of a line stoppage.

Accordingly, it is an object of the present invention to provide an improved control system for controlling the operation of the various container handling devices involved in transferring glass containers from the dead plates of an I.S. forming machine to an annealing Lehr conveyor. More particularly, it is an object of the present invention to provide a control system of the foregoing character that can quickly modify the operations of the devices controlled by it when there is a change in the design or size of containers being formed on the associated I.S. machine. It is also an object of the present invention to provide a control system that is capable of controlling the operation of conveyors used in the transfer of containers from an I.S. machine to annealing Lehr to take into account any changes in the linear speed of any such conveyor due to stretching.

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 preferred embodiment of the invention and to the appended claims.

IN THE DRAWING

FIG. 1 is a fragmentary plan view, partially schematic, illustrating a glass container handling system for transferring glass containers from the dead plates of an I.S. forming machine to the moving conveyor of an annealing Lehr, and embodying a control system according to the preferred embodiment of the present invention; and

FIG. 2 is a schematic view of a system for adjusting the setpoint at which a controller controls the operation of an electric motor used in the handling system of FIG. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Reference numbers 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 schematically identify sweepouts used to transfer glass containers from the dead plates of an I.S. machine, the number of such sweepouts indicating that the I.S. machine, as shown, is of the ten-section type. The sweepouts 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 are used to transfer containers from the I.S. machine dead plates to the upper flight of an endless machine conveyor 32, which is continuously driven by an a.c. motor 34, which preferably is an a.c. servo motor, to move the upper flight of the conveyor 32 from the bottom to the top in the orientation shown in the drawing as noted by the arrow A. A container blowoff station 36 is provided at a location adjacent to the conveyor 32 to permit containers on the conveyor 32 to be pneumatically discharged for recycling or disposal in the event of a stoppage of any of the container handling devices located downstream of the conveyor 32, as hereinafter described.

Containers are transferred from the machine conveyor 32, where they are conveyed in a single row, to a cross-conveyor 38, which extends perpendicularly of the machine conveyor 32. The transfer of containers from the machine conveyor 32 to the cross-conveyor 38 is effected by an endless transfer device 40, which is shown as being of the curved chain type and is also powered by an a.c. motor (not shown), which preferably is also an a.c. servo motor. The direction of motion of the chain transfer device 40 is illustrated by the

arrow B in the drawing. A belt speed monitor 42 is provided to continuously measure the speed of the machine conveyor 32, and the monitor 42 is preferably positioned along the machine conveyor 32 at a location downstream from the chain transfer device 40. The cross-conveyor 38 is an endless conveyor which is driven by an a.c. motor 44, which preferably is also an a.c. servo motor. The cross-conveyor 38 has an upper flight that moves from left to right in the orientation illustrated in the drawing and as indicated by the arrow C, and is used to present containers in a single file in front of an inlet to an annealing Lehr 46. A belt speed monitor 48 is provided to continuously measure the linear speed of the cross-conveyor 38, and the monitor 48 is preferably positioned along the cross-conveyor at a location downstream of the annealing Lehr 46.

Groups of containers are transferred in unison into the Lehr 46 by a reciprocating Lehr loader 50, whose reciprocating operation toward and away from the Lehr 46 is powered by an a.c. motor (not shown), which preferably is also an a.c. servo motor. In actuality, the Lehr loader 50 requires motion along three axes, a vertical axis and horizontal axes along X and Y coordinates, and three (3) such a.c. motors, which are synchronized with one another, are provided to effect such motions. In any case, containers are engaged by a pusher bar 52 carried by the Lehr loader 50 and are moved from the cross-conveyor 38 to an endless wire mesh conveyor 54, which is driven by an a.c. motor 56. The conveyor 54 of the Lehr 46 has an upper flight on which containers from the cross-conveyor 38 are supported, and the upper flight of the conveyor 54 moves from bottom to top in the orientation shown in the drawing as illustrated by the arrow D to convey the containers through the Lehr 46. A belt speed monitor 64 is provided to continuously monitor the linear speed of the Lehr conveyor 54.

A powered central controller 58 is provided to simultaneously measure and control the operation of each of the sweepouts 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, the bottle blowoff station 36, the a.c. motor 34 for the machine conveyor 32, the a.c. motor for the chain transfer device 40, the a.c. motor 44 for the cross conveyor 38, the a.c. motor for the Lehr loader 50, and the a.c. motor 56 for the conveyor 54 of the annealing Lehr 46, as indicated by the solid lines from the controller 58 to each such device. The controller 58 receives instructions from an operator's station 60 as to the desired operating speeds of each of the devices controlled by it, as described, based, for example, on the design or size of containers being processed at any given time. The controller 58 thereupon automatically controls each of the control devices to operate at rates of operation that are coordinated with one another and are appropriate for containers of the design and size being processed. The operation of a controller 58, together with the operation of all of the devices controlled by it, as described, is activated by a main start/stop station 62, and the entire control system including the controller 58 can be deactivated by the start/stop station 62.

The operating speeds of the machine conveyor 32 and the cross-conveyor 38, as controlled by the central controller 58, may need to be changed from time to time even during steady state operation due to stretching of the machine conveyor 32 and/or the cross-conveyor 38 if the machine conveyor 32 and the cross-conveyor 38 are in the form of belts, which is the typical arrangement. The machine conveyor belt speed monitor 42 provides the controller 58 with a signal indicative of the linear speed of the machine conveyor 32, which will change as the machine conveyor 32 stretches, and the controller 58 will then instruct the a.c. motor 34 to operate at a different speed to compensate for

2/80

5

the change in the linear speed of the machine conveyor 32 due to belt stretching. Likewise, the cross-conveyor belt speed monitor 48 will provide the controller 58 with a signal indicative of the linear speed of the cross-conveyor 38, which will change as the cross-conveyor 38 stretches, and the controller 58 will then instruct the a.c. motor 34 to operate at a different speed to compensate for the change in the linear speed of the cross-conveyor 38 due to belt stretching. Similarly, the belt speed monitor 64 provides the controller 58 with a signal indicative of the linear speed of the lehr conveyor 54, which will change as the lehr conveyor 54 stretches, and the controller 58 will then instruct the a.c. motor 56 to operate at a different speed to compensate for the change in the linear speed of the lehr conveyor 54 due to belt stretching.

FIG. 2 illustrates a system for adjusting the setpoint at which the controller 58 controls the operation of the a.c. motor 56 that is used to control the speed of the operation of the lehr conveyor 54, it being understood that similar arrangements (not shown) are provided to control the operation of the a.c. motor 34 for the machine conveyor 32 and the a.c. motor 44 for the cross-conveyor 38. In the system of FIG. 2, a summation is taken of the actual speed, as measured by the belt speed monitor 64, as a negative value, and a theoretical speed, as a positive value. Ideally, the summation will be zero, in which case no adjustment need be made in the setpoint at which the controller 58 controls the operation of the a.c. motor 56. However, when the actual belt speed varies from the theoretical belt speed, the difference between such speeds will be a finite value, and this finite value is then impressed on the controller 58 to adjust the setpoint at which it controls the operation of the a.c. motor. In any case, the signal from the controller 58 is quite weak, and a power amplifier 66 is provided to amplify the value of such signal before it is impressed on the a.c. motor 56.

Although the best mode contemplated by the inventor 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 from the scope of the invention, such scope being limited solely by the terms of the following claims and the equivalents thereof.

What is claimed:

1. A method of transferring freshly formed glass containers from a plurality of dead plates of a glass container forming machine of the individual section type, said method comprising:

- providing a machine conveyor adjacent the forming machine;
- powering the operation of the machine conveyor by an a.c. motor;
- providing a plurality of 90° sweepouts for transferring container from the plurality of dead plates to the machine conveyor;
- powering the operation of each of the 90° sweepouts by an a.c. motor;
- providing a cross-conveyor extending perpendicularly to the machine conveyor;
- powering the operation of the cross-conveyor by an a.c. motor;
- providing an endless chain transfer device for transferring containers from the machine conveyor to the cross-conveyor;
- powering the chain transfer device by an a.c. motor;

6

- providing an annealing lehr with a conveyor;
- powering the operation of the annealing lehr conveyor by an a.c. motor;
- providing a lehr loader with a reciprocating pusher bar to transfer groups of containers from the cross-conveyor of the annealing lehr;
- powering the reciprocation of the pusher bar of the lehr loader in a direction extending transversely of the cross-conveyor by an a.c. motor;
- simultaneously measuring and controlling the rates of operation of the a.c. motors for the 90° sweepouts, the machine conveyor, the cross-conveyor, the chain transfer device, the lehr loader pusher bar and the annealing lehr conveyor;
- measuring the linear speed of the cross-conveyor to detect stretching of the cross-conveyor; and
- changing the rate of speed of the motor for the cross-conveyor to compensate for a change in the linear speed of the cross-conveyor due to stretching of the cross-conveyor.

2. A method of transferring freshly formed glass containers from a plurality of dead plates of a glass container forming machine of the individual section type, said method comprising:

- providing a machine conveyor adjacent the forming machine;
- powering the operation of the machine conveyor by an a.c. motor;
- providing a plurality of 90° sweepouts for transferring containers from the plurality of dead plates to the machine conveyor;
- powering the operation of each of the 90° sweepouts by an a.c. motor;
- providing a cross-conveyor extending perpendicularly to the machine conveyor;
- powering the operation of the cross-conveyor by an a.c. motor;
- providing an endless chain transfer device for transferring containers from the machine conveyor to the cross-conveyor;
- powering the chain transfer device by an a.c. motor;
- providing an annealing lehr with a conveyor;
- powering the operation of the annealing lehr conveyor by an a.c. motor;
- providing a lehr loader with a reciprocating pusher bar to transfer groups of container from the cross-conveyor to the conveyor of the annealing lehr;
- powering the reciprocation of the pusher bar of the lehr loader in a direction extending transversely of the cross-conveyor by an a.c. motor;
- measuring the linear speed of the machine conveyor to detect stretching of the machine conveyor; and
- changing the rate of operation of the motor for the machine conveyor to compensate for a change in the linear speed of the machine conveyor due to stretching of the machine conveyor.

3. A method according to claim 2 and further comprising: measuring the linear speed of the cross-conveyor to detect stretching of the cross-conveyor; and changing the rate of operation of the motor for the cross-conveyor to compensate for a change in the linear speed of the cross-conveyor due to stretching of the cross-conveyor.

81

7

4. A method according to claim 2 and further comprising: providing a container blowoff station adjacent the machine conveyor; and

controlling the operation of the blowoff station to discharge containers from the machine conveyor upon a stoppage of any of the cross-conveyor, the chain transfer device, the lehr loader pusher bar or the annealing lehr conveyor.

5. A method according to claim 2 wherein:

the linear speed of the machine conveyor is measured at a location downstream of the location of the transfer of containers from the machine conveyor to the cross-conveyor by the chain transfer device.

6. A method according to claim 1 wherein:

the linear speed of the cross-conveyor is measured at a location downstream of the location of the transfer of containers from the cross-conveyor to the annealing lehr conveyor by the pusher bar of the lehr loader.

7. A method according to claim further comprising:

providing an operator's station to permit an operator to change the rates of operation at which the a.c. motor for the 90° sweepouts, the machine conveyor, the cross-

8

conveyor, the chain transfer device, the lehr loader pusher bar and the annealing lehr conveyor are controlled.

8. A method according to claim 2 and further comprising:

providing a start/stop station to selectively activate or deactivate the controlling of the rates of operation of the a.c. motors for the 90° sweepouts, the machine conveyor, the cross-conveyor, the chain transfer device, the lehr loader pusher bar and the annealing lehr conveyor.

9. A method according to claim 1 in which the operation of the machine conveyor is powered by an a.c. servo motor.

10. A method according to claim 1 in which the operation of the cross-conveyor is powered by an a.c. servo motor.

11. A method according to claim 1 in which the operation of the chain transferring device is powered by an a.c. servo motor.

12. A method according to claim 1 in which the reciprocation of the pusher bar of the lehr loader is powered by an a.c. servo motor.

* * * * *



[34] APPARATUS FOR TRANSFERRING GLASS
ARTICLES FROM AN IS TO A HIGH SPEED
TRANSFER CONVEYOR

[75] Inventor: James A. Bolin, Tulsa, Okla.
[73] Assignee: LM.T.E.C. Enterprises, Inc., Tulsa,
Okla.

[21] Appl. No.: 998,557

[22] Filed: Dec. 30, 1992

[51] Int. Cl.⁶ C03B 9/453

[52] U.S. Cl. 65/241; 65/260;
198/468.01; 198/430

[58] Field of Search 65/260, 348, 241;
198/468.01, 740, 430, 426

[36] References Cited

U.S. PATENT DOCUMENTS

2,660,831	12/1953	Rowe	65/260
3,040,867	6/1962	Pasten et al.	198/430
3,072,240	1/1963	Allgeyer	65/260
3,137,394	6/1964	Trudeau	65/260
3,184,031	1/1965	Dunlap	198/430
3,220,566	11/1965	Rowe	65/260
3,559,425	2/1971	Irwin et al.	65/260
3,583,862	2/1971	Stacey	65/348
3,650,725	3/1972	Okumura et al.	68/260
3,960,266	6/1976	Becher	198/430
4,244,725	1/1981	Fenton	65/260
4,708,727	11/1987	Cordenas-Franco et al.	65/160
4,892,183	1/1990	Fenton	65/260
5,037,466	8/1991	Voisine	65/260
5,044,488	9/1991	Bolin	198/430
5,092,449	3/1992	Bolin et al.	198/430

FOREIGN PATENT DOCUMENTS

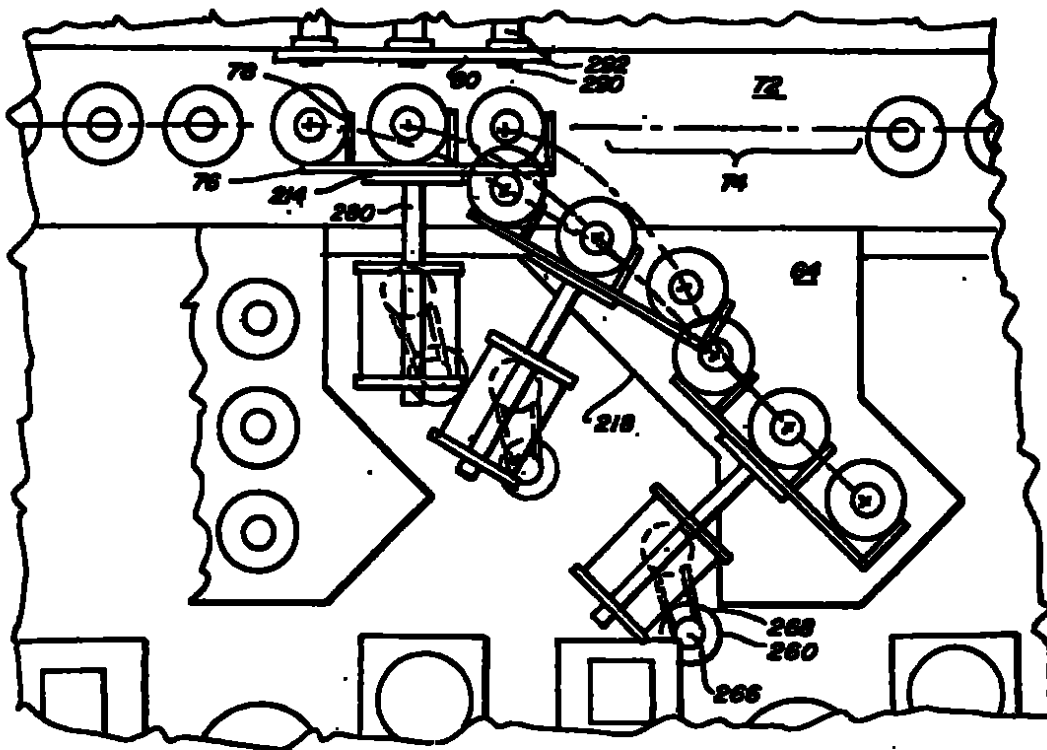
1221570 11/1966 Germany .
0151739 11/1981 Germany .
2174667 11/1986 United Kingdom .

Primary Examiner—W. Gary Jones
Assistant Examiner—John Hoffmann
Attorney, Agent, or Firm—John R. Ley; John B. Philippe

[57] ABSTRACT

A pusher mechanism of an IS transfers a plurality of glass bottles onto a conveyor belt by rotating the bottles through an arc to align the bottles with the conveyor belt while simultaneously linearly moving the bottles at a converging acute angle toward the conveyor belt. The combined rotational and linear movements effectively lengthen the radius of curvature of the path of the bottles and increases the speed of the bottles onto the conveyor belt. The centrifugal force applied to the bottles is limited or reduced to allow the bottles to be more quickly moved onto the conveyor belt without introducing instabilities in the bottles. Other horizontal and vertical movements may be applied. A nozzle may be positioned to deliver a flow of air against the bottles to counteract instabilities. A take-out mechanism used with the pusher mechanism rotates the bottles at an acute angle to the conveyor belt. This initial acute angle reduces the amount of rotation which the pusher mechanism must impart when placing the bottles on the conveyor, thus reducing the possibility of introducing instabilities.

28 Claims, 14 Drawing Sheets



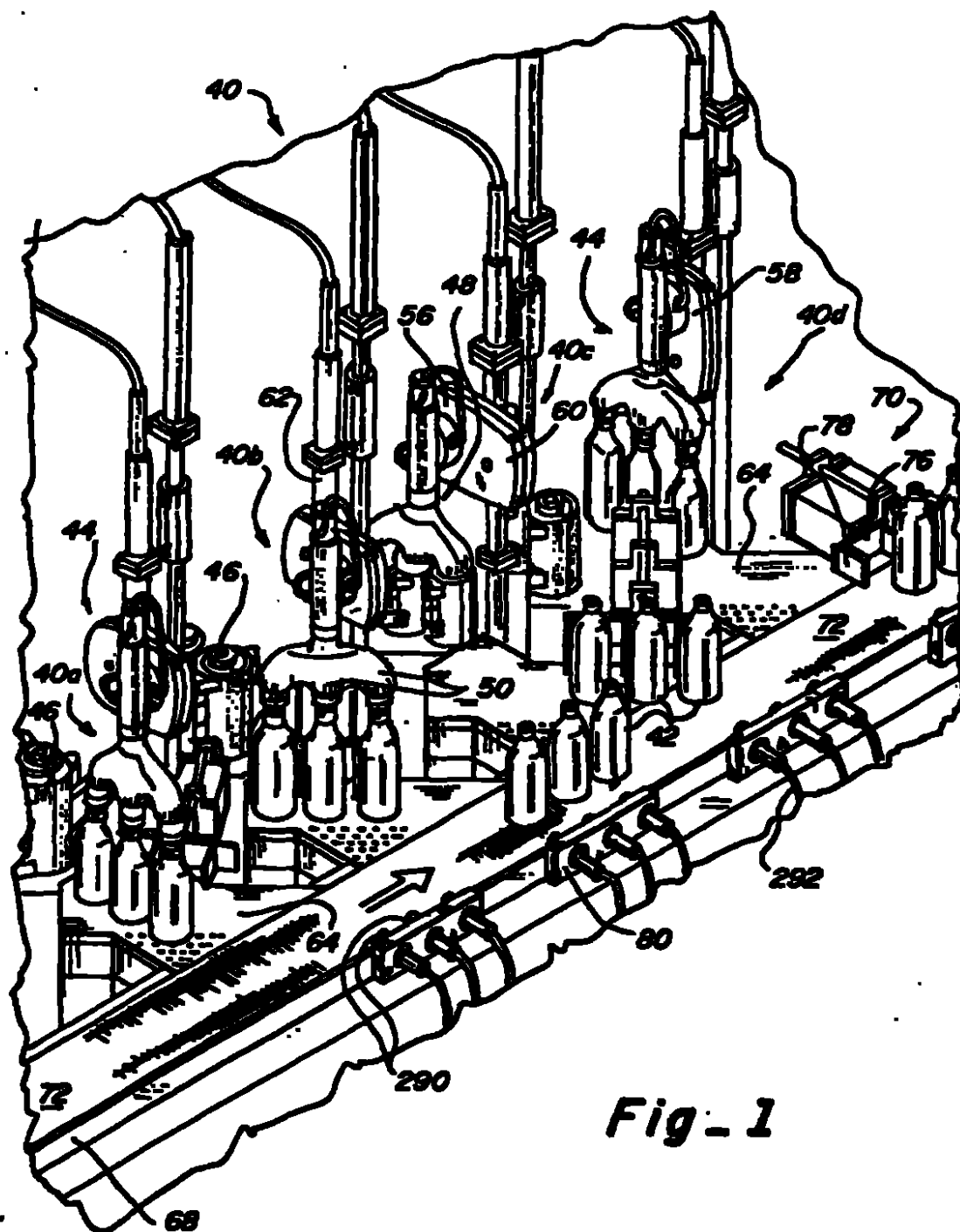


Fig. 1

83
/

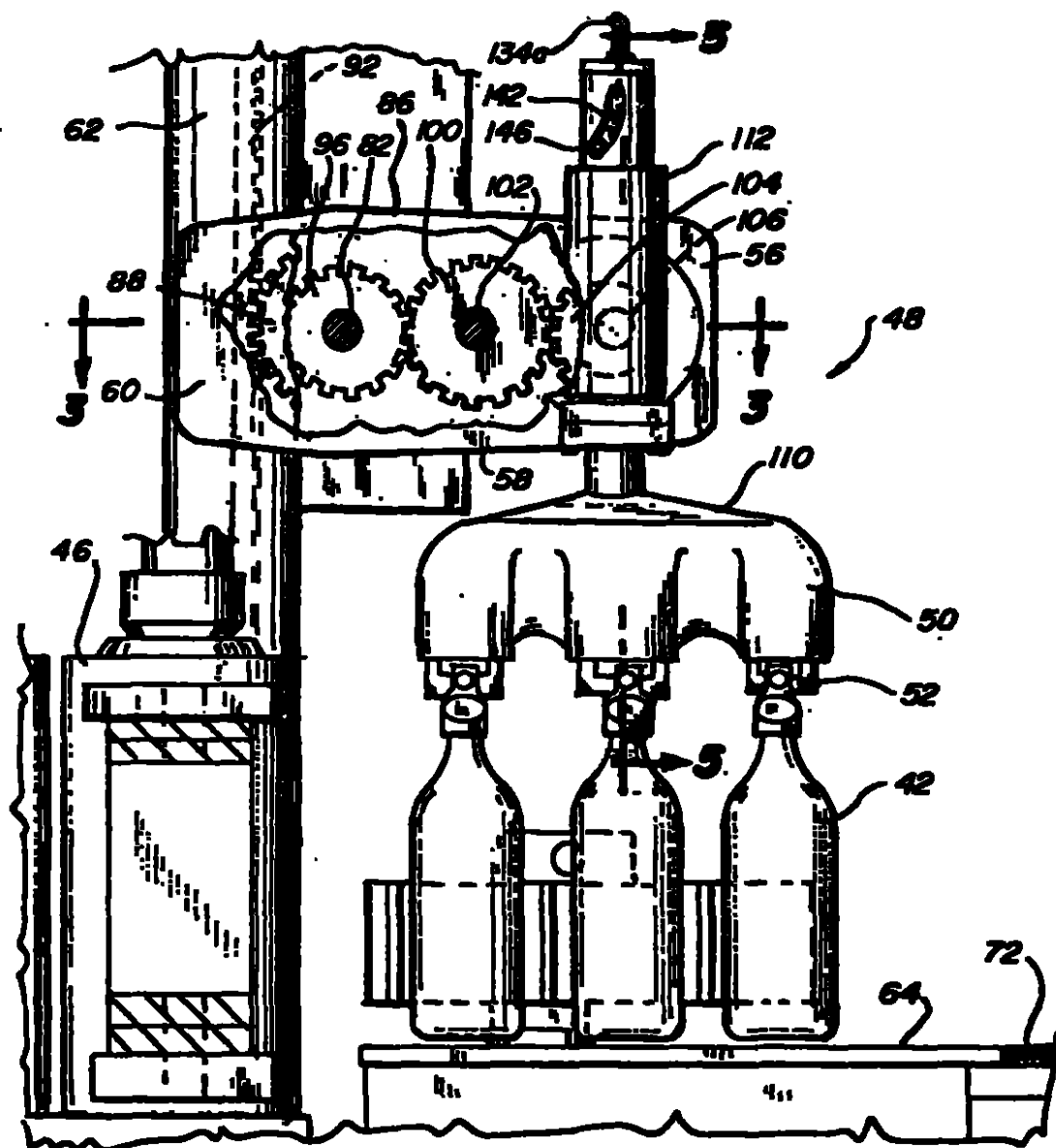


Fig. 2

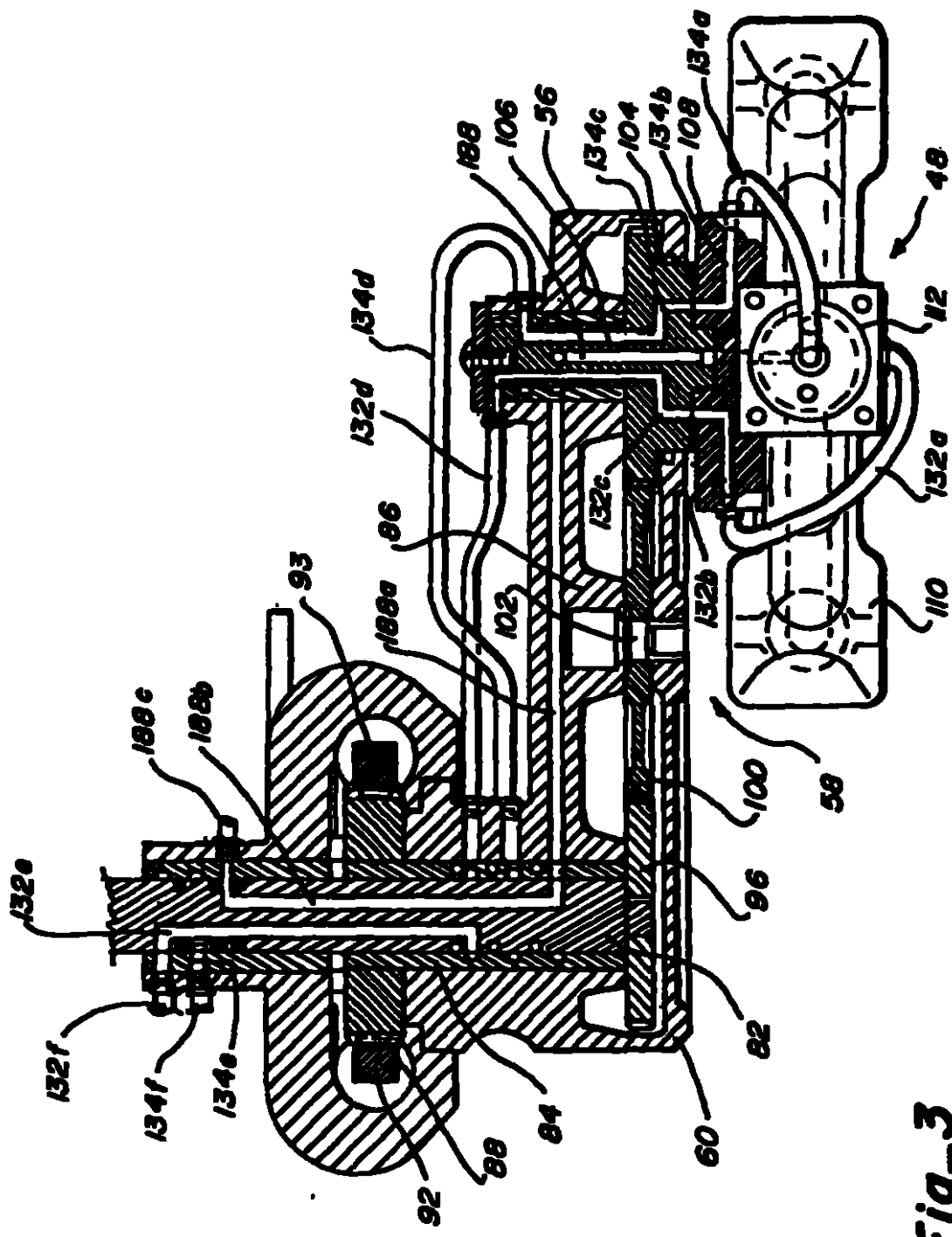


Fig-3

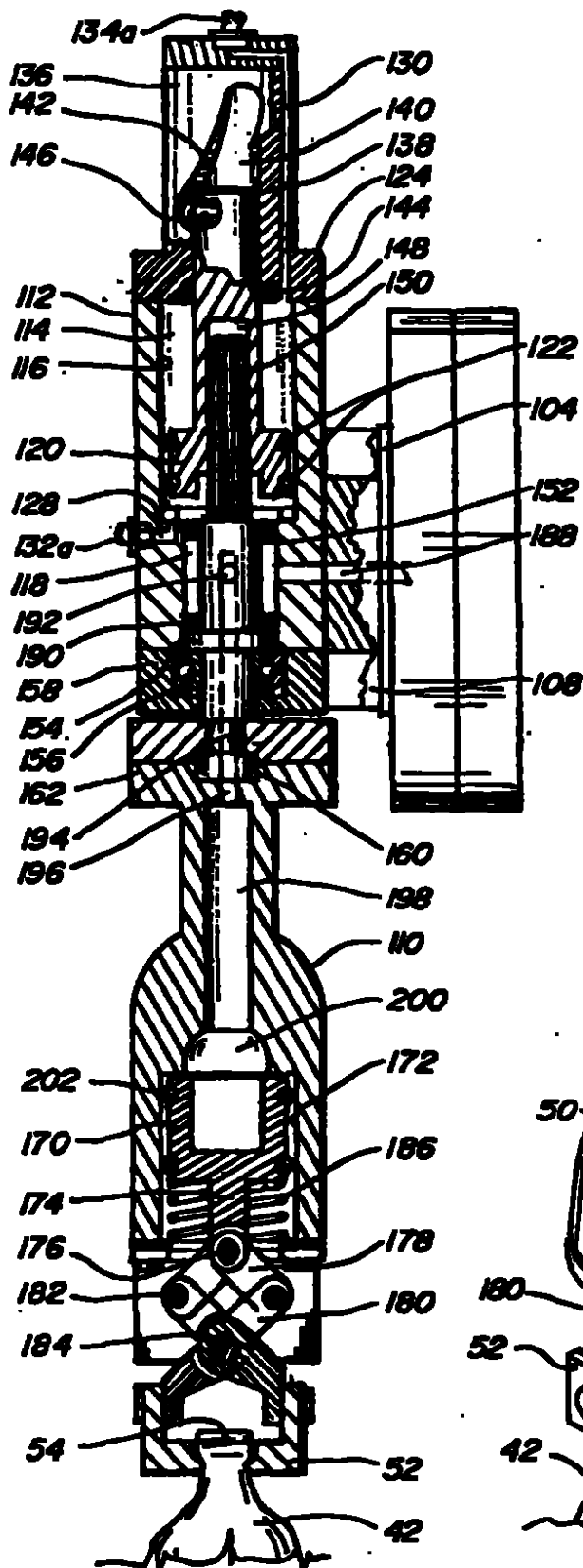


Fig-5

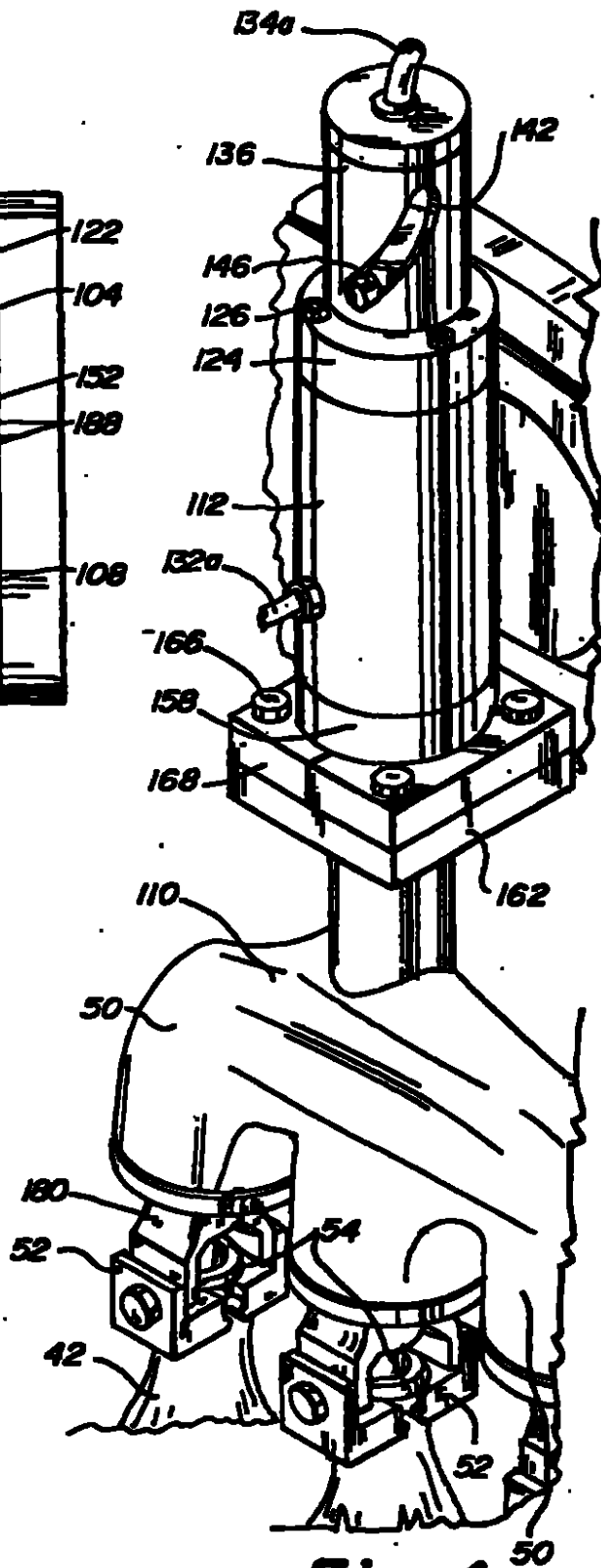


Fig-4

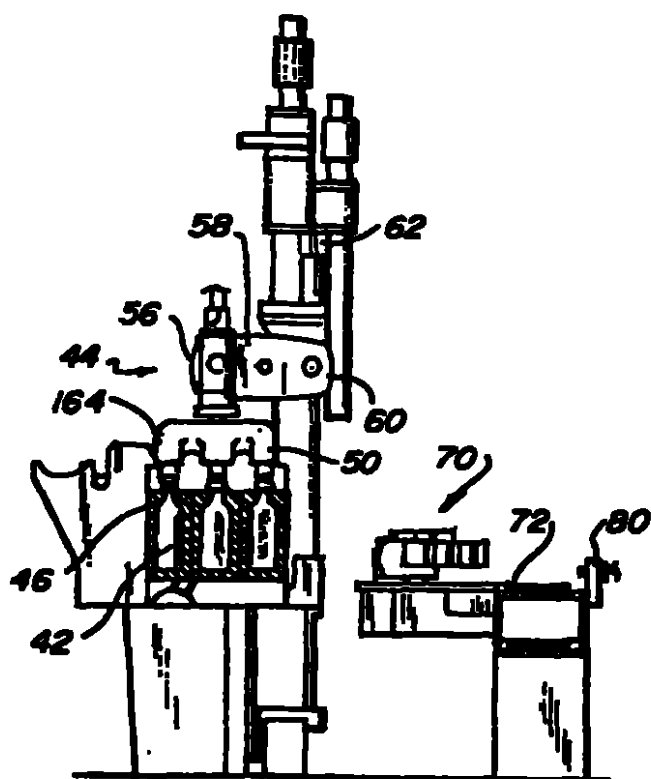


Fig. 6

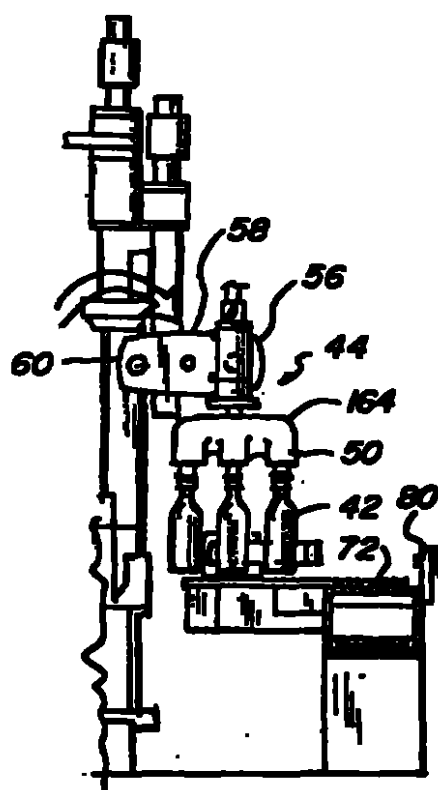


Fig. 7

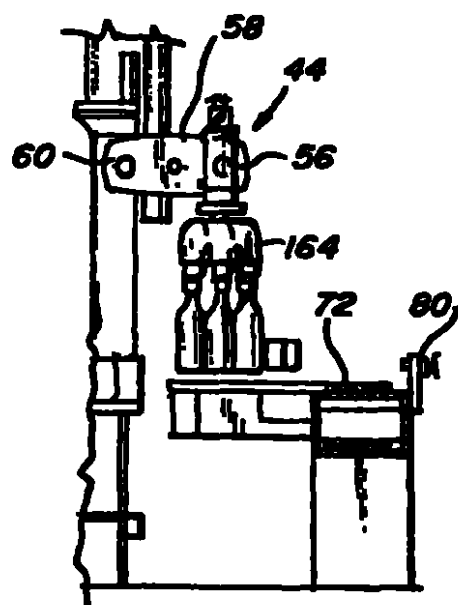


Fig. 8

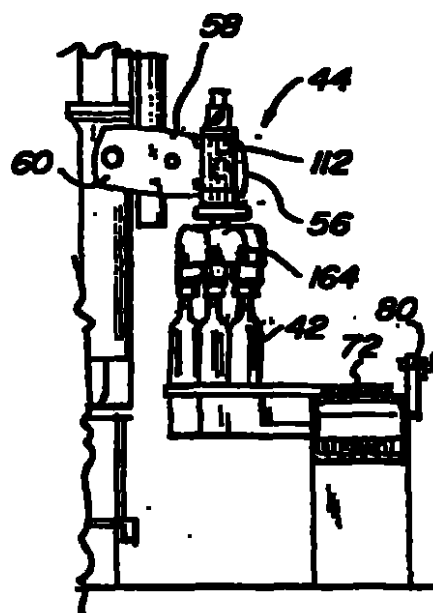
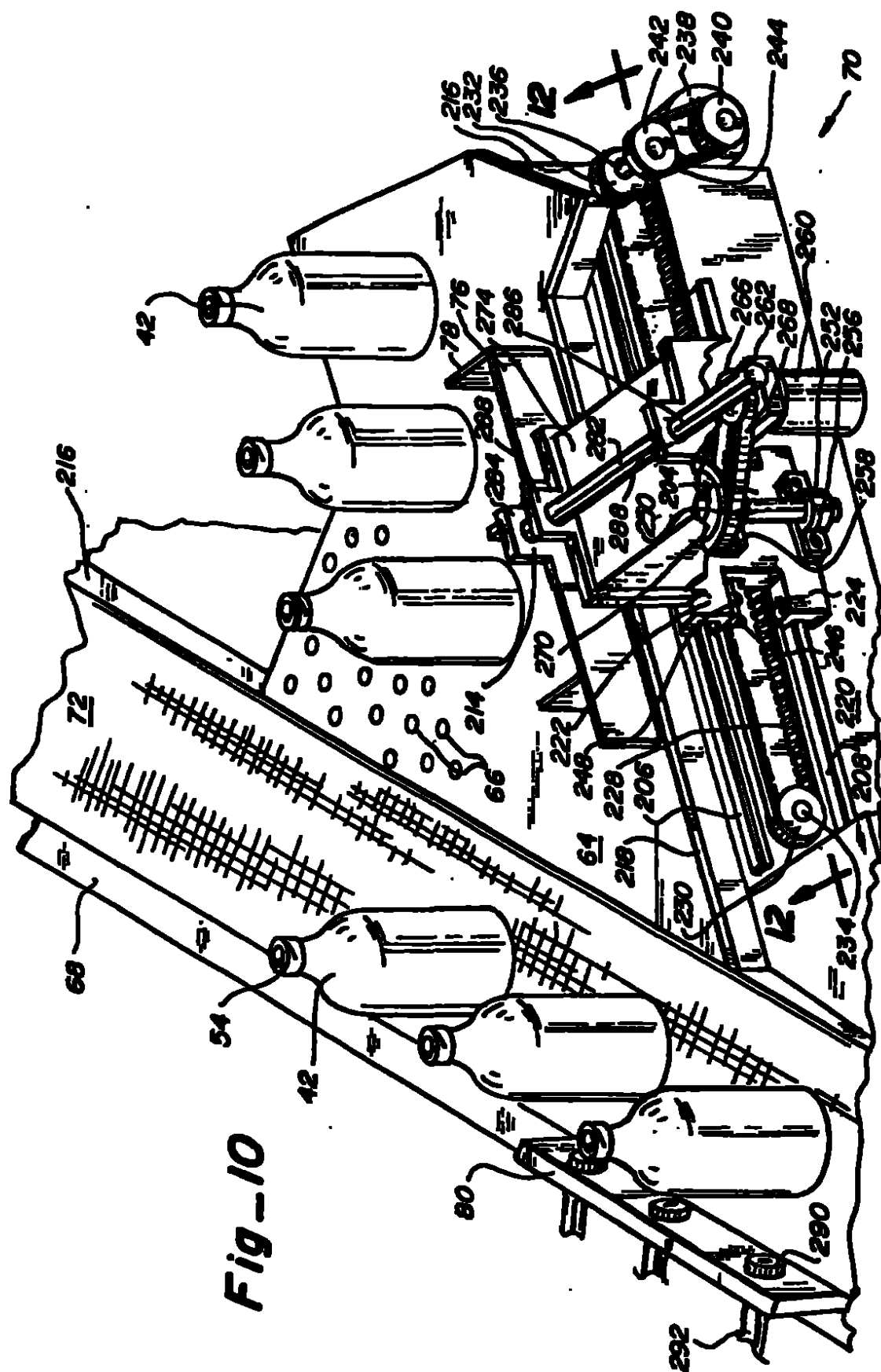


Fig. 9

Fig-10



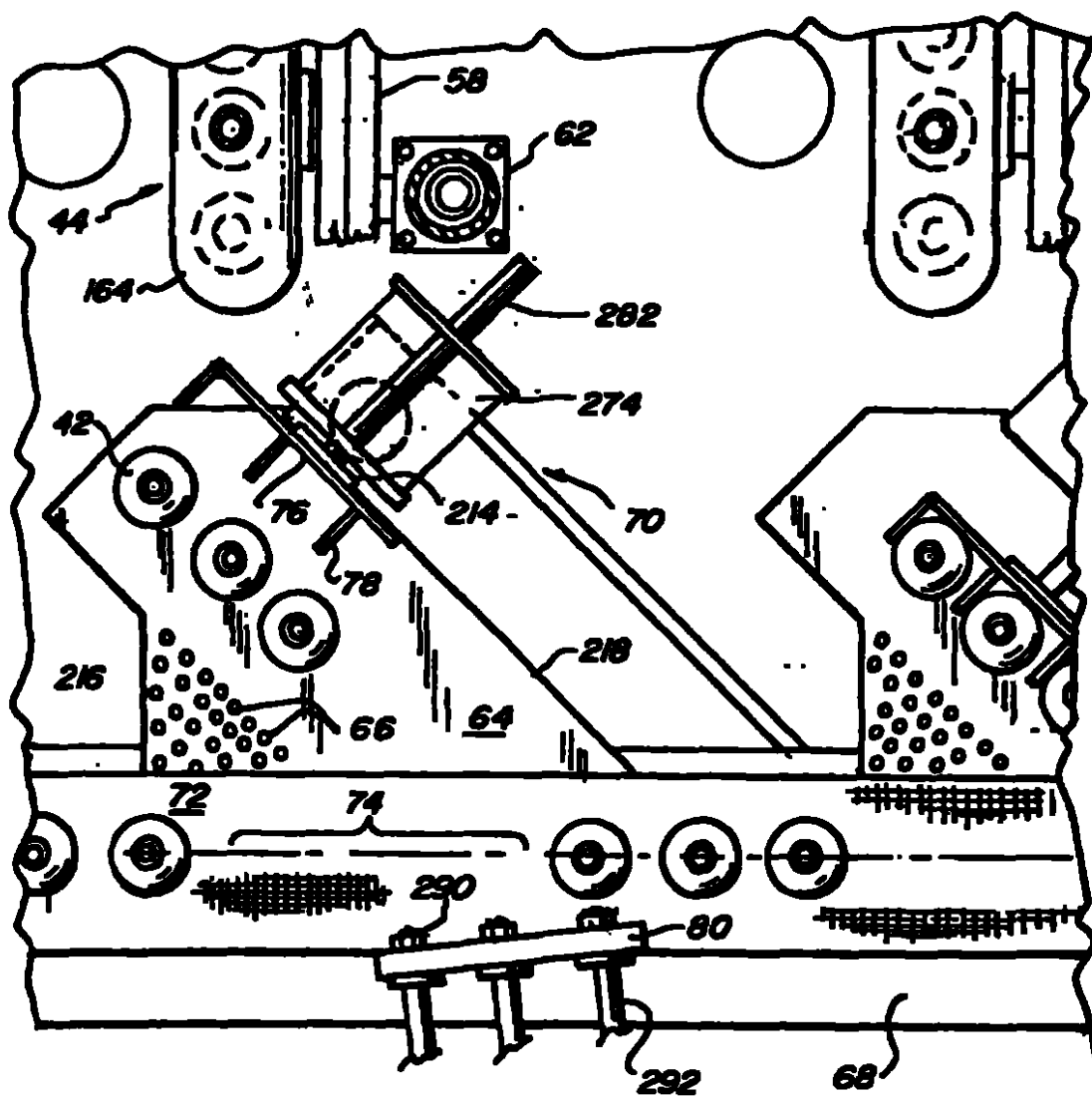
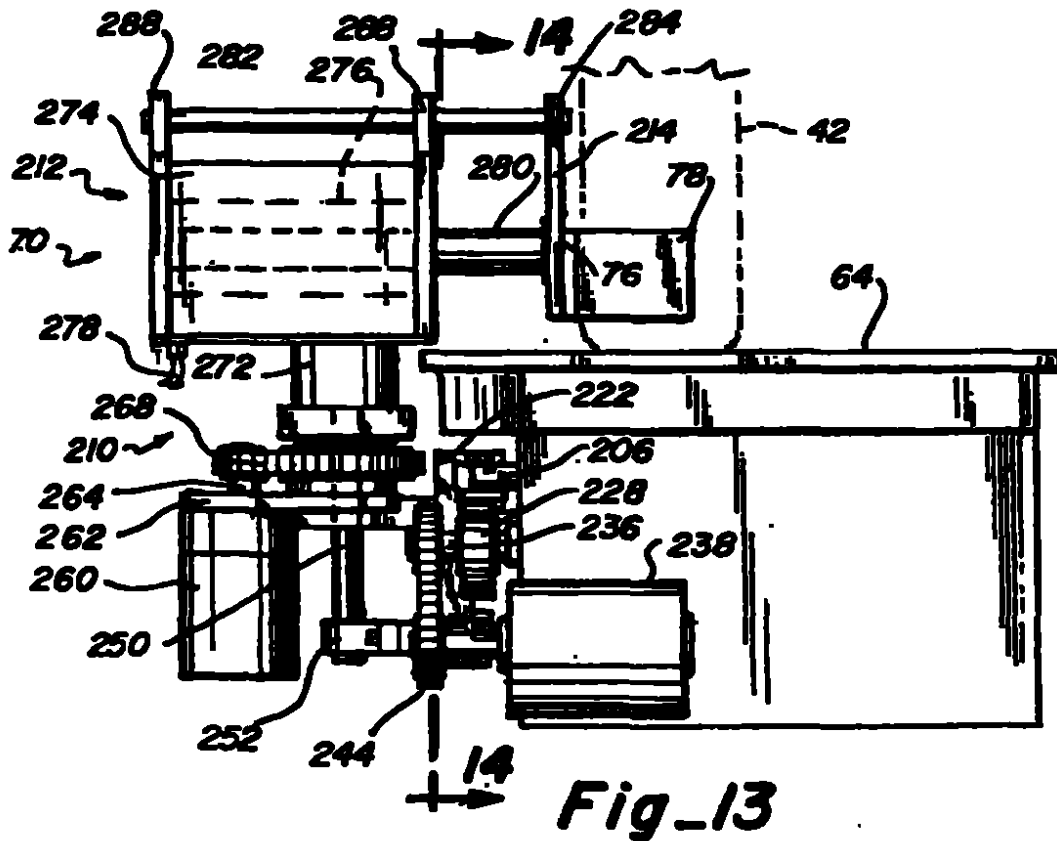
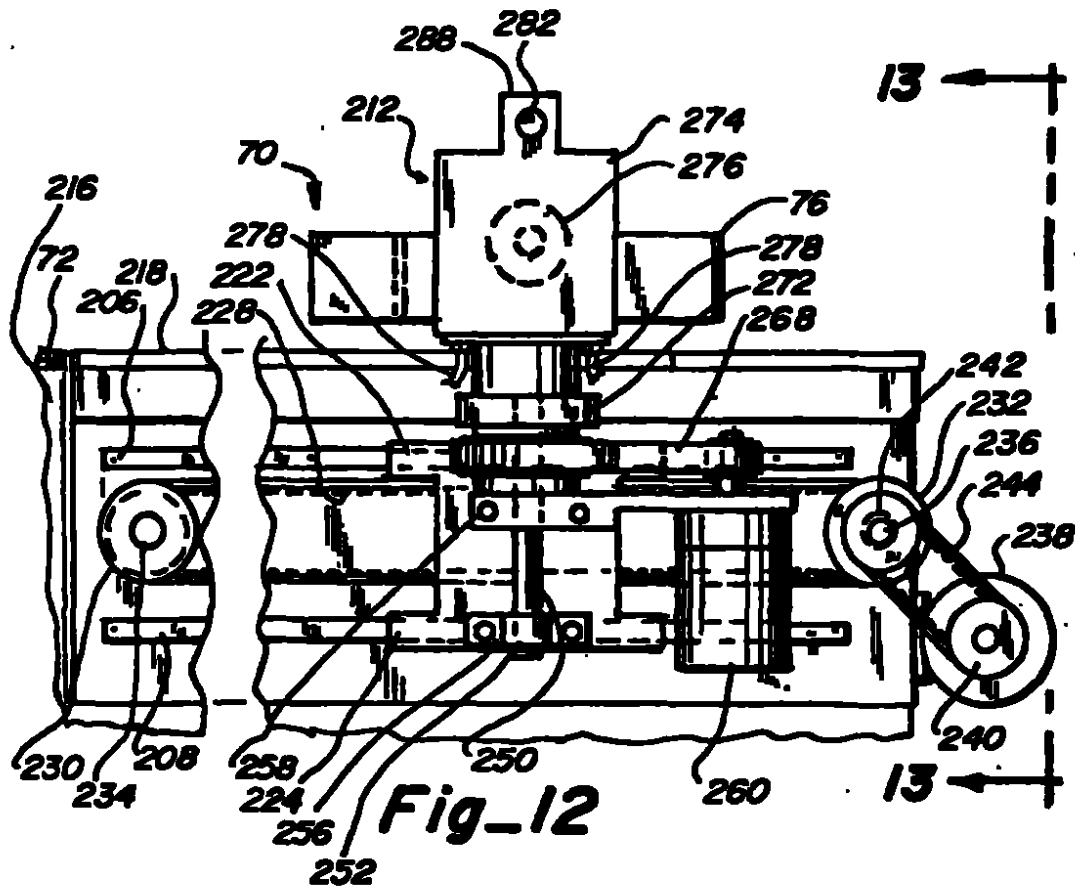


Fig. 11

86



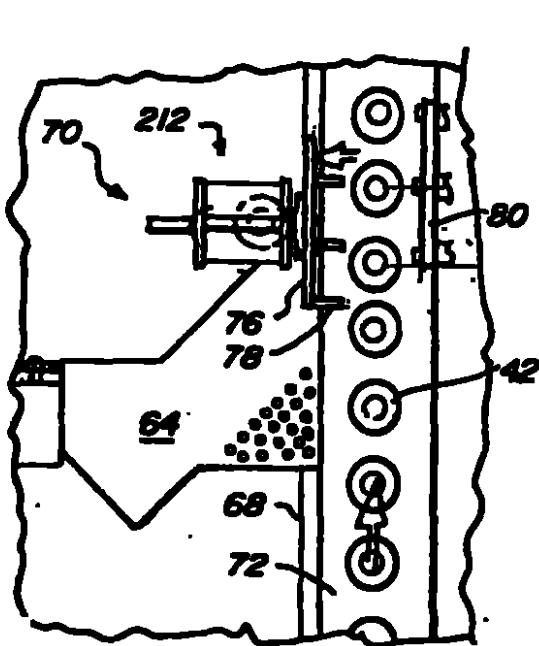


Fig_20

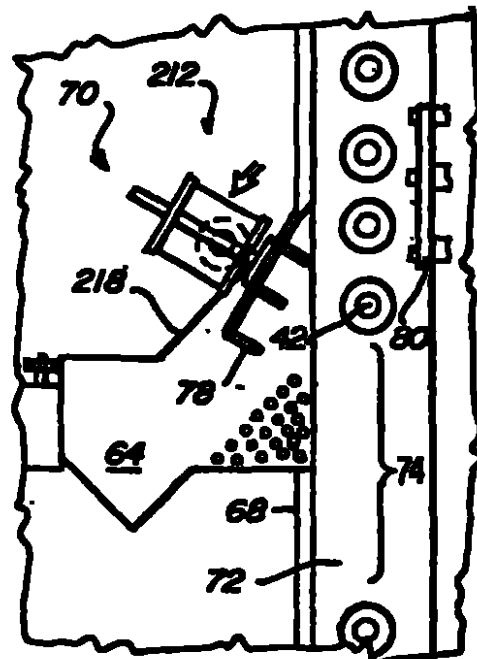


Fig_21

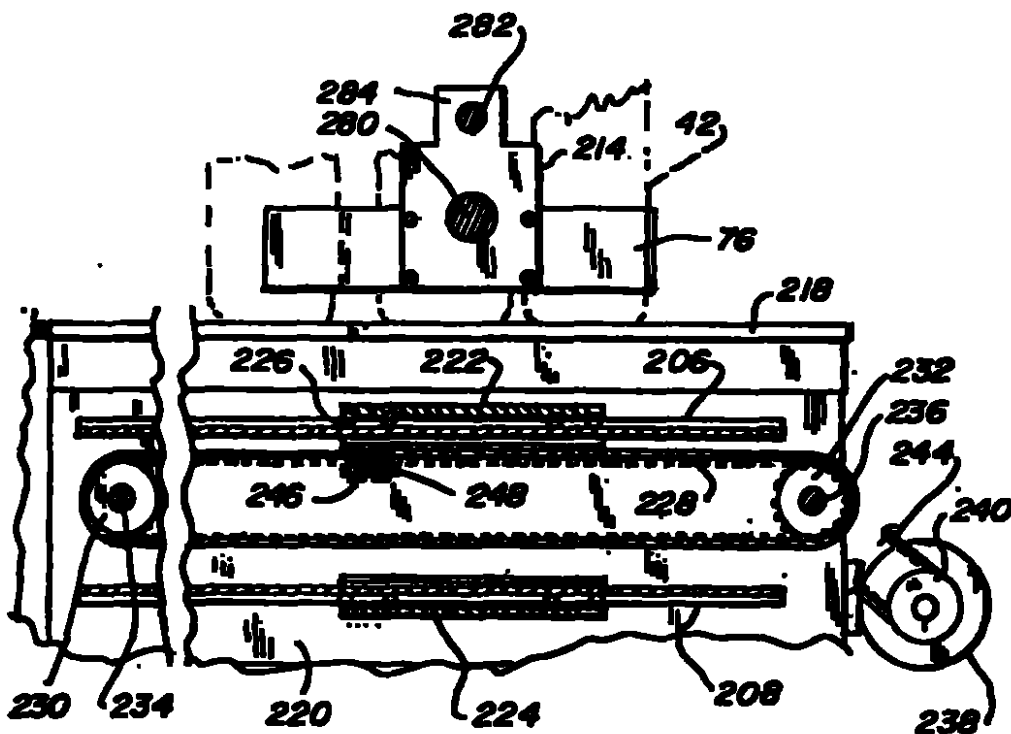


Fig_14

87
88

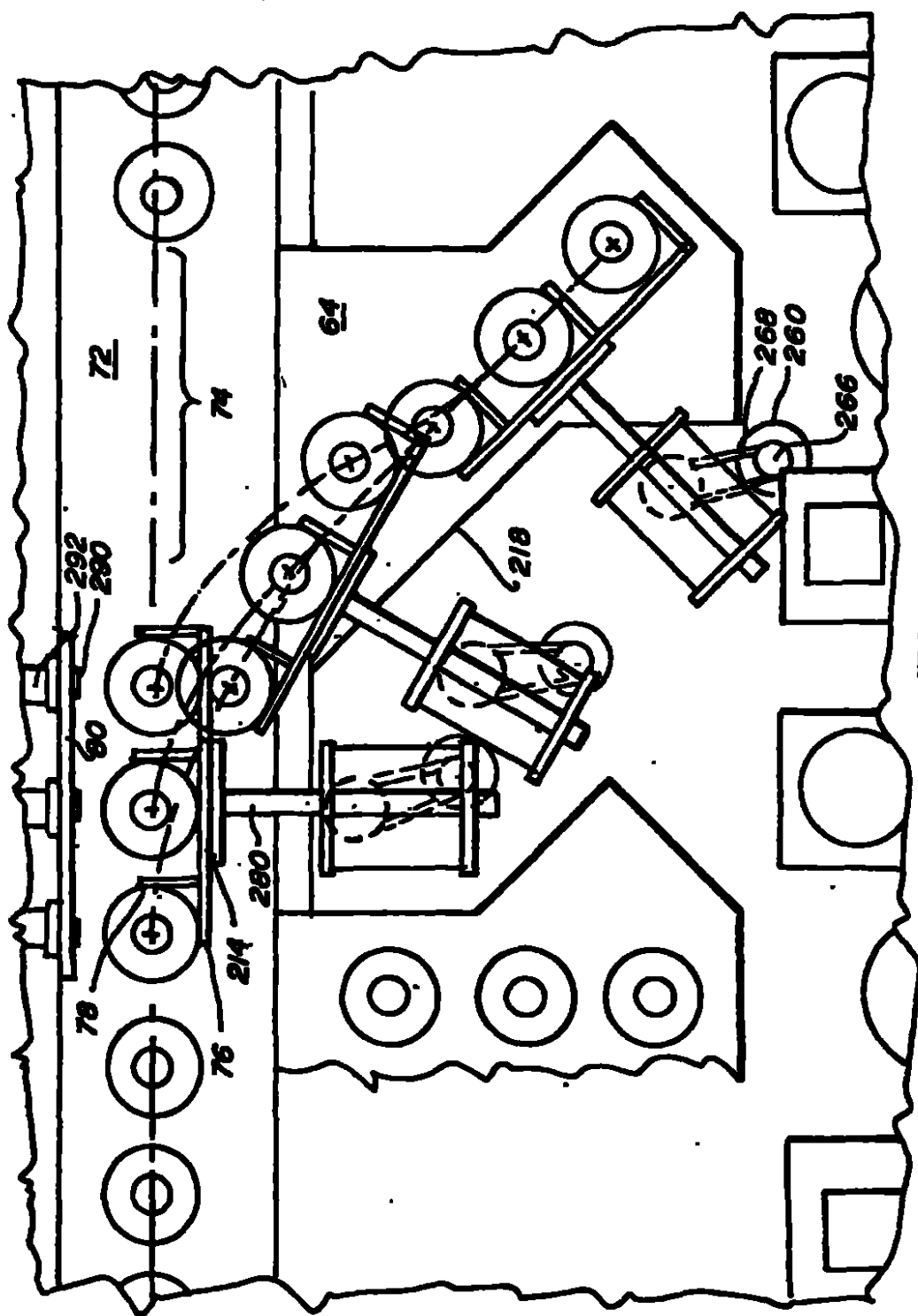


Fig. 15

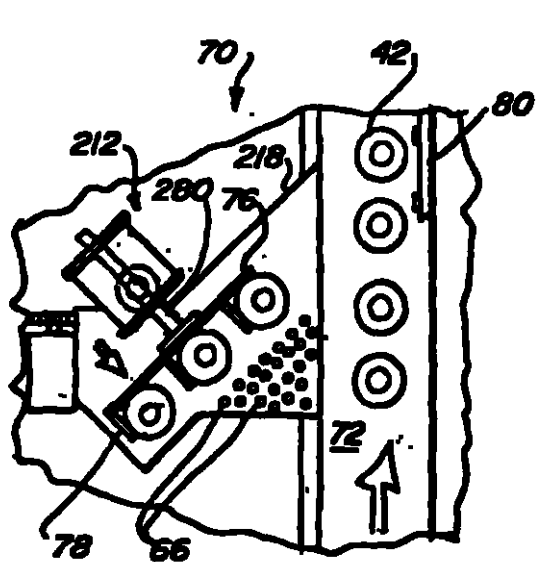


Fig. 16

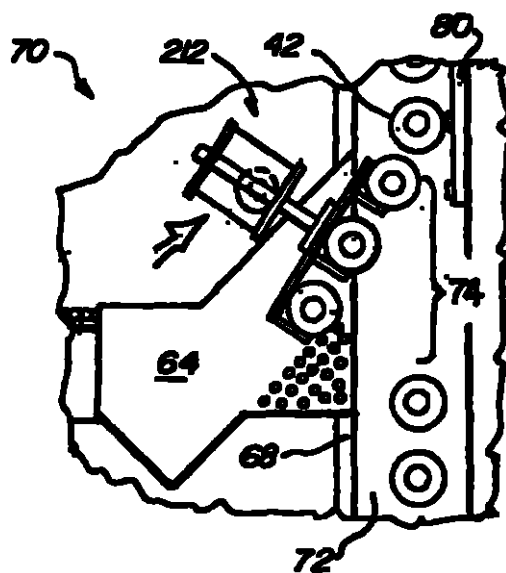


Fig. 17

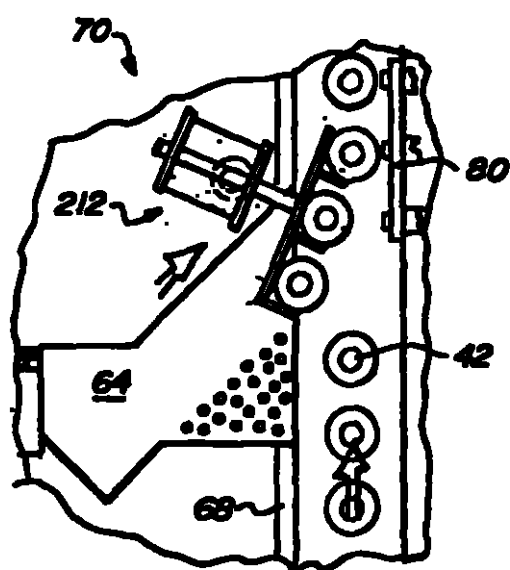


Fig. 18

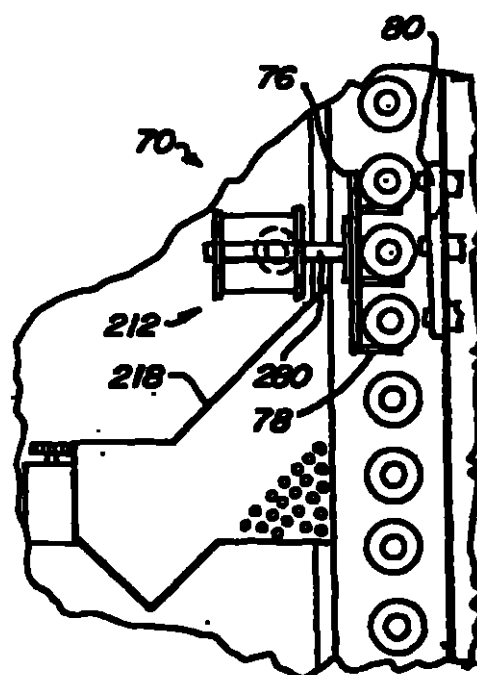


Fig. 19

88
70

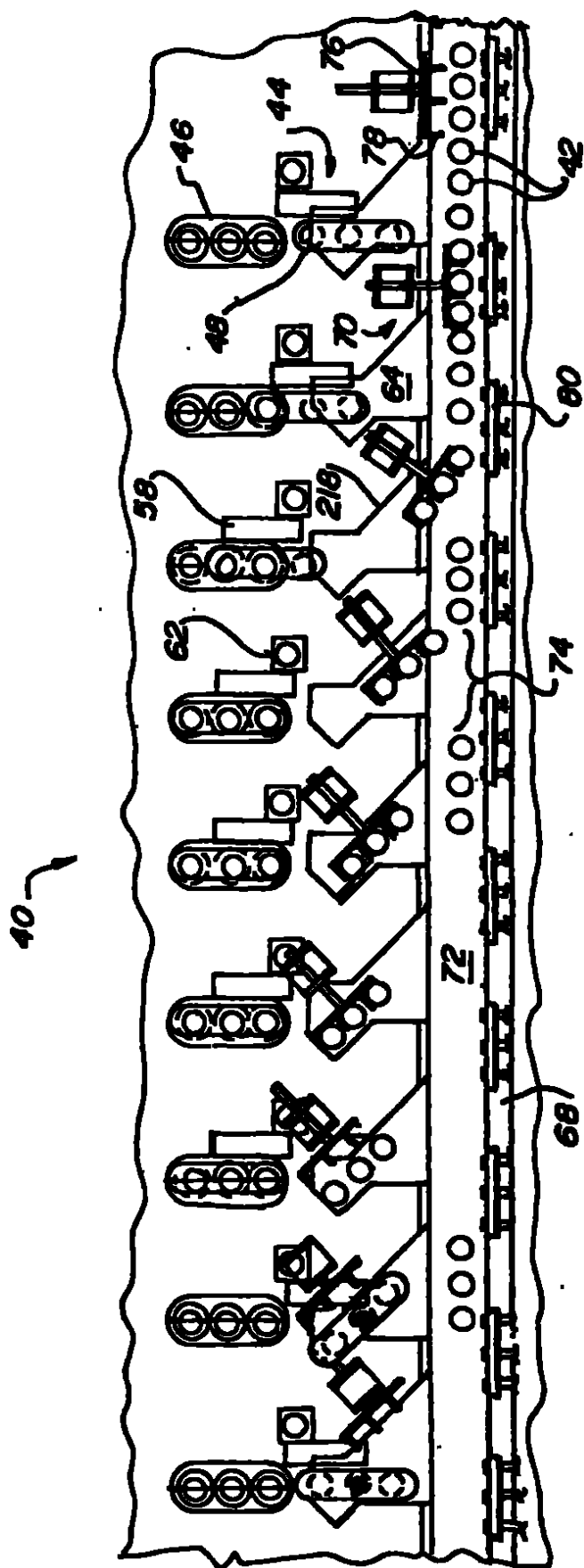


Fig-22

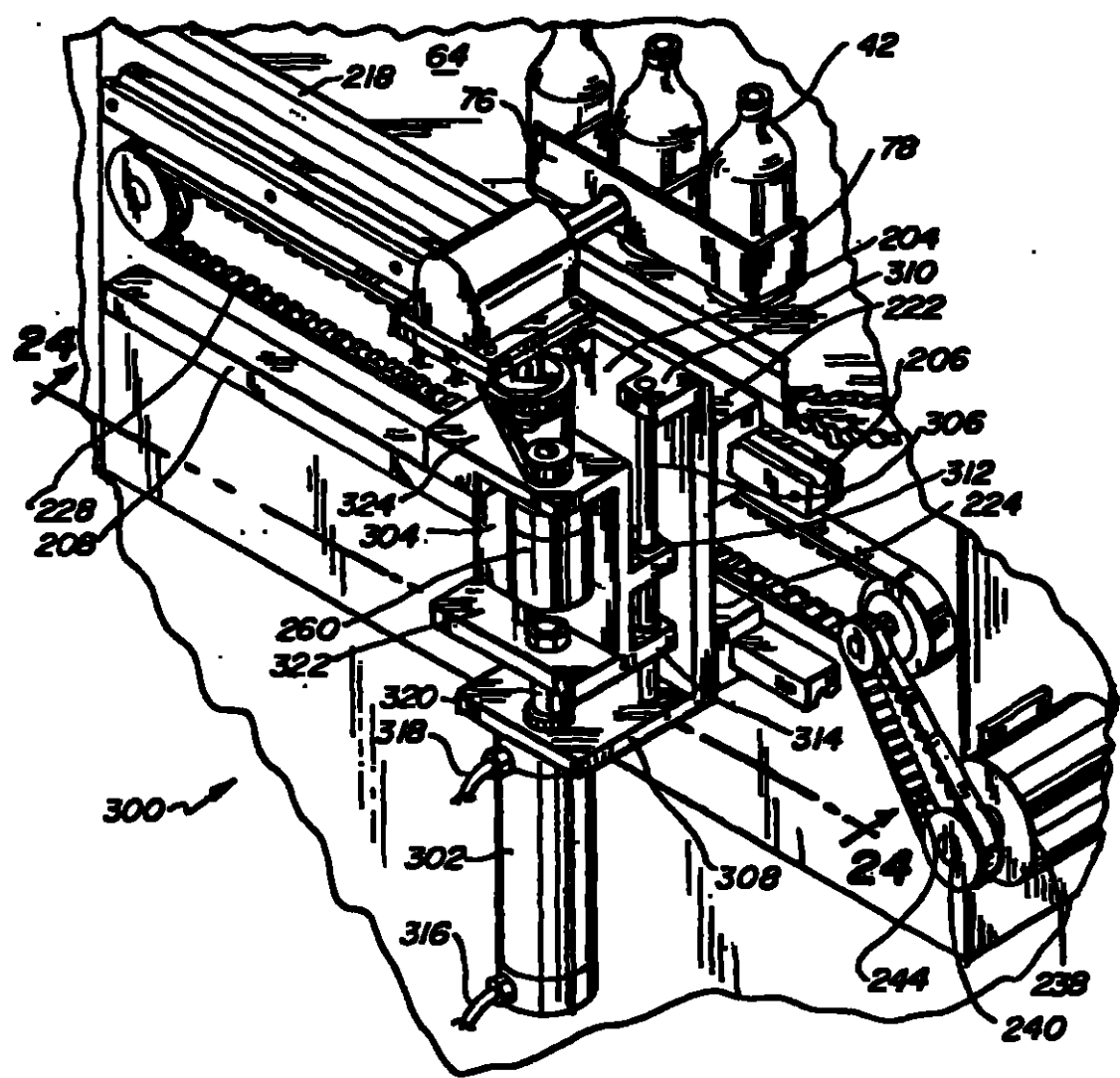


Fig. 23

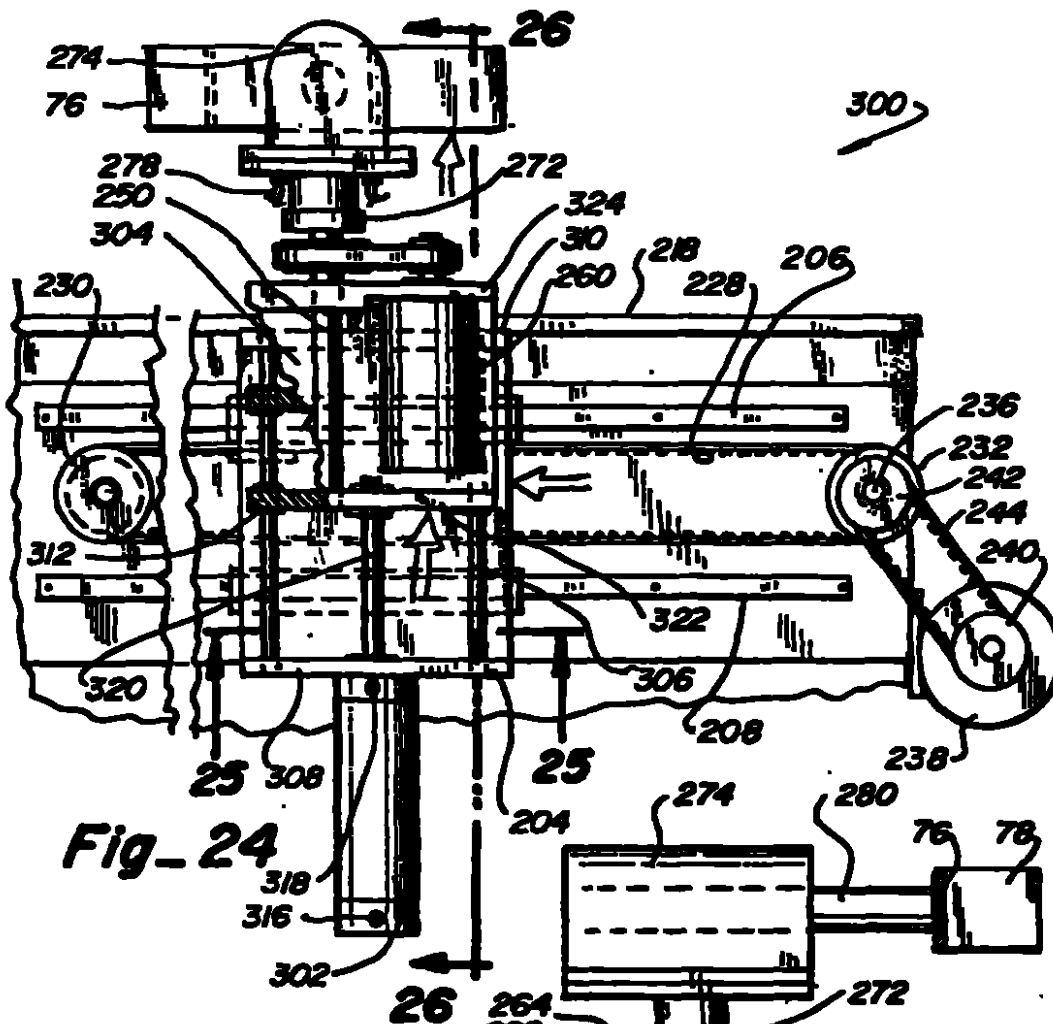


Fig_24

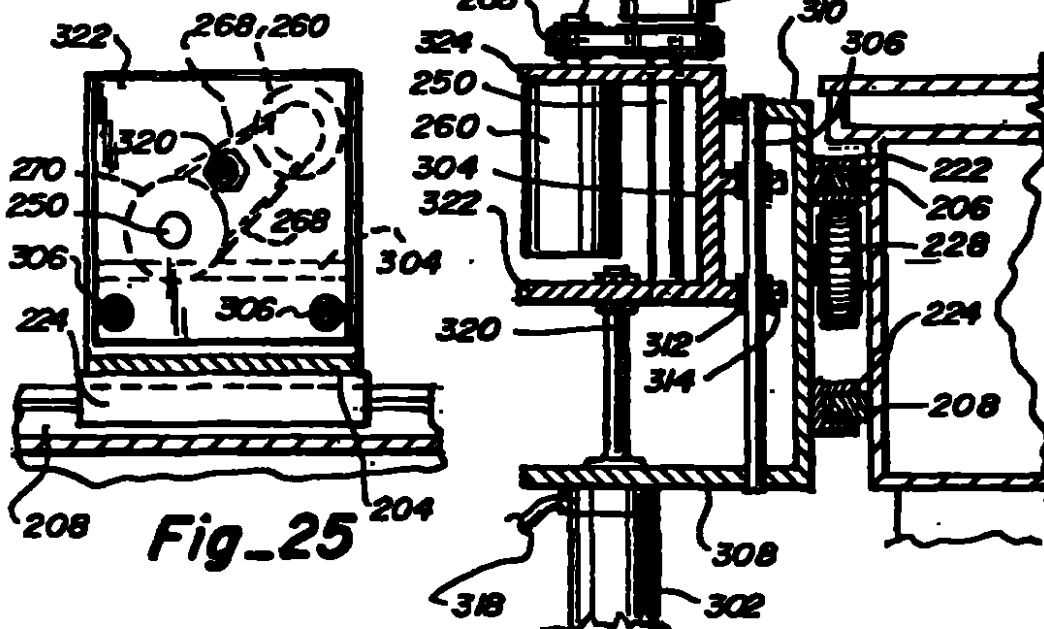


Fig_25

Fig_26

APPARATUS FOR TRANSFERRING GLASS ARTICLES FROM AN IS TO A HIGH SPEED TRANSFER CONVEYOR

This invention relates to the manufacture and production of glass articles, such as bottles, jars and the like (hereinafter referred to as "bottles"), and more particularly to a new and improved technique for more rapidly and effectively transferring the glass articles from individual sections of a glassware forming machine onto a rapidly moving transfer conveyor.

BACKGROUND OF THE INVENTION

Glass articles, such as bottles and jars but herein exemplified by bottles, are typically mass produced in a glassware forming machine. A glassware forming machine is formed by combining or integrating a plurality of individual sections. Each individual section (IS or Section) is capable of producing one to four bottles simultaneously from a similar number of gobes of molten glass. By combining a relatively large number of Sections in a single glassware forming machine, a relatively high capacity for bottle production capacity is achieved. Furthermore, the operation of each Section is coordinated with all of the Sections so that the glassware forming machine achieves an unrestricted production output equal to the cumulative total of the individual capacities of all of the Sections.

One approach to increasing efficiency and profitability in the glass forming industry is to increase bottle production rates. Increasing the manufacturing capacity may be achieved by increasing the number of Sections of a single glassware forming machine. However, substantially increasing the number of Sections may result in a practical problem of difficulty in removing or transporting the bottles away from the glassware forming machine at the same high rate that all of the Sections are capable of producing bottles. If the bottles cannot be removed as fast as the Sections make them, the overall capacity of the glassware forming machine will be diminished and the desired increase in production from combining a larger number of Sections will be lost.

In a conventional IS, a take-out mechanism removes the bottles from a blow mold after they have been formed into the final desired shape and deposits the bottles on a dead plate. A pusher mechanism then moves the bottles from the dead plate onto an adjacent, fast-moving transfer conveyor which removes the still-hot, but fully-formed, bottles to an annealing Lehr, for further treatment to complete the bottle-making procedure. The transfer conveyor typically removes the bottles from the glassware forming machine in a single line in single file so that a transfer wheel can align the bottles and the bottles can be pushed in single bottle rows into the annealing furnace.

The transfer conveyor moves at essentially a right angle to the direction in which the take-out mechanism removes the bottles from the blow molds. The pusher mechanism must therefore alter the orientation of the aligned bottles by ninety degrees while transferring the bottles to empty spaces or "windows" unoccupied by other bottles on the transfer conveyor. The pusher mechanism should also accelerate the bottles to approximately the linear speed of the transfer conveyor so the bottles will remain upright on the conveyor without tipping when they are deposited on the transfer conveyor.

A conventional pusher mechanism typically accomplishes these functions with a rotary motion. The bottles are moved along an arcuate path to change their orientation by the ninety degrees and align their orientation parallel to the transfer conveyor while simultaneously accelerating the bottles along the arcuate path so they achieve a linear speed approximately equal to the speed of the conveyor at the end of the arcuate movement. With this acceleration, the linear velocity of the bottles in the direction of the conveyor approximately matches the speed of the conveyor. By matching the linear velocity of the transferred bottles to the speed of the conveyor, there is little or no relative motion between the bottles and the conveyor when they are delivered to the conveyor. Consequently no significant instabilities are introduced. Instabilities could cause tipping and subsequent destruction of the bottles or misalignment of bottles on the conveyor, or could cause the bottles to contact one another (which would likely create defects within the bottles due to their high temperature).

Although prior art rotary pusher mechanisms are adequate for use with many conventional glassware forming machines, they have proved problematic in glassware forming machines having a relatively large number of Sections operating at full capacity. The problems arise because a higher speed transfer conveyor is needed to remove the increased number of bottles formed by the higher capacity glassware forming machine. The greater speed of the conveyor requires the pusher mechanism to rotate with a greater angular velocity to accelerate the bottles to a speed which will match the speed of the conveyor at the end of the arcuate movement. At the higher angular velocity, the centrifugal force acting on the bottles, which increases by the square of the increase in angular velocity, creates unacceptable instabilities which tend to throw the bottles out of contact with the pusher mechanism, throw the bottles off of the conveyor, tip the bottles, position the bottles out of alignment on the conveyor, or the like. Reducing the angular velocity of the prior art rotary pusher to limit the amount of centrifugal force causes an unacceptable mismatch in the linear speed the bottles and the speed of the conveyor, and this mismatch in speed could be sufficiently destabilizing to cause the bottles to tip, to contact other bottles to be out of alignment on the conveyor, or the like. Of course, reducing the angular velocity of the prior art rotary pusher mechanism may also have the undesirable effect of slowing the operating speed of the IS, thus reducing the output capacity of the glassware forming machine.

Consequently, the limitations of prior art rotary pusher mechanisms have practically limited the output capacity of glassware forming machines to approximately their current levels. It is with respect to the prior art rotary pusher mechanisms' practical restrictions on the further increase in capacity of glassware forming machines, as well as other considerations not specifically discussed in this abbreviated background, that the present invention has evolved.

SUMMARY OF THE INVENTION

The objectives of the present invention include increasing the speed at which the pusher mechanism of an IS can transfer bottles onto a moving transfer conveyor belt, overcoming the present limitation on the number of bottles which may be produced by multiple Sections of a single glassware forming machine without restricting the glass bottle forming capacity of each IS due to

an inability to effectively transfer the bottles onto the transfer conveyor belt, and generally overcoming some of the deficiencies associated with previous pusher and take-out mechanisms.

In accordance with these and other objectives, one feature of the present invention relates to a new and improved pusher mechanism for transferring a plurality of glass bottles onto a transfer conveyor belt after the bottles have been formed in a blow mold of an IS and deposited on a dead plate adjacent to the transfer conveyor. The pusher mechanism includes an bottle contact assembly adapted for contacting the bottles while supported on the dead plate and pushing the bottles from the dead plate to the transfer conveyor belt, a pivotable assembly connected to the bottle contact assembly for rotating the contacted bottles through an arc to align the bottles with the conveyor belt, and a carriage assembly for linearly moving the pivotable assembly at a converging acute angle toward the conveyor belt.

The linear movement of the carriage assembly combined with the rotational movement of the pivotable assembly effectively lengthens the radius of curvature of the path of the bottles between their initial position on the dead plate and their aligned position on the conveyor belt, compared to the arc of the purely rotational movement of the pivotable assembly. The lengthened radius of curvature of the path of the bottles reduces the required angular velocity and hence the amount of centrifugal force applied to the bottles. As a result the bottles may be moved more quickly onto a faster moving conveyor belt. Also, the linear motion of the carrier assembly and the rotation of the pivotable assembly combine to reduce or limit the angular velocity of the bottles compared to prior art rotary pushers. Lastly, the greater rate of movement of the bottles onto the conveyor is achieved both the rotation of the pivotable assembly and the linear motion of the carrier assembly, and these combined movements substantially equal the rate of movement of the conveyor belt. Accordingly the bottles are transferred onto the moving conveyor belt at a faster rate while limiting the forces that would introduce sufficient instabilities to prevent an effective transfer of the bottles.

Another feature of the present invention relates to employing, as part of the bottle contact assembly, an extension device for extending a pusher member along a path which is generally radially oriented with respect to the rotational movement of the pivotable assembly in order to contact the bottles. The extension movement may also be employed along with the linear movement of the carriage assembly and the rotational movement of the pivotable assembly to further control the path of the bottles.

Another feature of the present invention relates to incorporating a lifting assembly operative for lifting the bottle contacting assembly in a vertical movement out of contact with the bottles. The vertical movement of the bottle contacting assembly above the bottles avoids contact with the other bottles on the conveyor, among other things.

An additional feature of the present invention relates to a new and improved take-out mechanism which may be advantageously employed in combination with the pusher mechanism. The take-out mechanism includes a tong head assembly which has a plurality of tong heads, and each tong head has tongs for gripping and releasing a bottle. A translation device translates the tong head

assembly in a linear path between the blow mold and the dead plate, with the tongs gripping the bottles at the molds and releasing the bottles on the dead plate. Prior to releasing the bottles on to the dead plate, the tong head assembly rotates the tong heads to position the bottles on the dead plate in an alignment which forms an acute angle with both the transfer conveyor and the alignment of the bottles in the blow mold. The take-out mechanism thereby contributes to the more effective manner by which the bottles are transferred to the conveyor belt by establishing the initial acute angle so the pusher mechanism need only rotate the bottles the remaining complementary acute angle during transfer to the conveyor.

A more complete appreciation of the present invention and its scope can be obtained from understanding the accompanying drawings, which are briefly summarized below, the following detailed description of a presently preferred embodiment of the invention, and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is perspective illustration of four Sections of an integrated glassware forming machine showing take-out mechanisms and pusher mechanisms which incorporate the present invention and also showing a transfer conveyor for removing bottles from the glassware forming machine.

FIG. 2 is a side elevational view of a portion of an IS shown in FIG. 1, primarily illustrating a take-out mechanism with a portion broken away to show internal details.

FIG. 3 is a partial section view taken substantially in the plane of line 3-3 in FIG. 2.

FIG. 4 is an enlarged perspective view of a tong head assembly of the take-out mechanism illustrated in FIG. 2.

FIG. 5 is an enlarged sectional view taken substantially in the plane of line 5-5 in FIG. 2.

FIGS. 6 to 9 are illustrations showing the sequence in operation of the take-out mechanism shown in FIGS. 1, 2, 3, 4 and 5 when removing the bottles from blow molds of the IS and orienting them at an acute angle prior to the pusher mechanism transferring the bottles onto the transfer conveyor.

FIG. 10 is a perspective view of the pusher mechanism shown in FIG. 1, shown in relationship to the bottles positioned at the acute angle to the transfer conveyor by the take-out mechanism.

FIG. 11 is a top plan view of the pusher mechanism shown in FIG. 10, the transfer conveyor, the bottles on a dead plate of the IS, a portion of the take-out mechanism and a portion of an adjacent IS.

FIG. 12 is a side view of the pusher mechanism illustrated in FIGS. 10 and 11 as viewed from the plane of line 12-12 in FIG. 10.

FIG. 13 is an end view of the pusher mechanism illustrated in FIGS. 10 and 11 as viewed from the plane of line 13-13 in FIG. 12.

FIG. 14 is a sectional view taken substantially in the plane of line 14-14 of FIG. 13.

FIG. 15 is a schematic view similar to FIG. 11 showing the movements of the pusher mechanism illustrated at three separate points during a typical push-out cycle and illustrating with dashed lines the path of the bottles during the push-out cycle.

FIGS. 16 to 21 are illustrations showing the sequence in operation of the pusher mechanism shown in FIGS. 10 to 15, during a push-out cycle.

FIG. 22 is a schematic top view of a plurality of Sections of a glassware forming machine such as that shown in FIG. 1, illustrating the coordinated operation of the take-out and pusher mechanisms of each IS in transferring bottles to the transfer conveyor.

FIG. 23 is a perspective illustration showing another embodiment of the pusher mechanism of the present invention, as an alternative to that embodiment shown in FIG. 10.

FIG. 24 is a side view of the pusher mechanism shown in FIG. 23 as viewed from the perspective of line 24--24 in FIG. 23.

FIG. 25 is a sectional view taken substantially in the plane of line 25--25 in FIG. 24.

FIG. 26 is a sectional view taken substantially in the plane of line 26--26 in FIG. 24.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The features of the present invention are embodied in one presently preferred form, in four triple-gob Sections 40a, 40b, 40c and 40d of a glassware forming machine 40, which is partially shown in FIG. 1. Each IS 40a, 40b, 40c and 40d is identical and all the Sections operate in coordination with one another under the control of conventional timing and synchronization devices (not shown) to bottles 42. It is intended that the glassware forming machine 40 offer a relatively high bottle-making capacity. For example, the present invention may be advantageously used in a glassware forming machine having sixteen triple gob Sections. However, the present invention may be advantageously incorporated in glassware forming machines having any number of Sections.

A take-out mechanism 44 of each IS 40a, 40b, 40c and 40d removes the three newly formed bottles 42 from a conventional blow mold 46 upon separation of the halves of the mold. The take-out mechanism 44 includes a tong head assembly 48 from which three separate tong heads 50 extend. Tongs 52 of each tong head 50 grip each bottle 42 by its finish portion 54, which refers to the neck and mouth portion of the bottle 42. The tong head assembly 48 is pivotably connected to an outer end 56 of a take-out arm 58, and the other inner end 60 of the take-out arm 58 is pivotably connected to a fixed vertical column 62 of the take-out mechanism 44. The take-out mechanism 44 rotates the take-out arm 58 about its inner end 60, and during rotation of the take-out arm 58, the tong head assembly 48 maintains the bottles 42 in a consistent vertical orientation. The bottles are lifted out of the separated halves of the blow mold 46 and are carried forward by the rotation of the take-out arm 58. After the take-out arm 58 rotates through an angle of approximately 180 degrees, the bottles 42 are suspended a slight distance above a dead plate 64 of each IS. Cooling air is blown upward from holes 66 in the dead plate 64 to cool the bottles which are still hot and somewhat flexible. The air cools the bottles, thereby making them less susceptible to deformation. The foregoing operation is conventional in the take-out mechanism of the IS.

One of the improvements of the present invention, associated with the take-out mechanism 44, rotates the bottles suspended by the tong head assembly 48 through an acute angle, for example 45 degrees (FIG. 8), while the bottles are suspended over the dead plate 64. After

the bottles 42 have cooled sufficiently, the take-out arm 58 rotates slightly further about its inner end 60 to lower the bottles 42 onto the dead plate 64. The tong head 50 separates the tongs 52 to release the grip on the bottles as they are lowered onto the dead plate 64 (FIG. 9). The bottles 42 are thus positioned in a line on the dead plate 64 at the acute angle established by the position of the tong heads 50 when the bottles are released. In this position, the bottles 42 are adjacent to a transfer conveyor 68. The transfer conveyor removes the bottles from the individual sections of the glassware forming machine and transports the bottles on for further treatment, such as annealing.

After the bottles are deposited on the dead plate, the tong heads 50 rotate back in alignment with the three bottles formed in the blow mold 46. The take-out arm 58 rotates about its inner end 60 to position the tong heads 50 over the next three bottles in the blow molds, and the tongs 52 grip the finish portions 54 of those bottles to carry them forward and rotate them through the acute angle before depositing them on the dead plate 64. The take-out cycle thus continually repeats itself.

After one group of three bottles is deposited on the dead plate, a pusher mechanism 70 moves the bottles onto a belt 72 of the adjacent transfer conveyor 68. Because the transfer conveyor 68 must remove a considerable number of bottles from a relatively high capacity glassware forming machine 40 than was previously required, the belt 72 is moving relatively fast. The pusher mechanism 70 operates in coordination and synchronization with the take-out mechanism 44 to transfer the bottles deposited from one take-out cycle to the conveyor 68 prior to the bottles from the next take-out cycle being deposited on the dead plate 64.

The pusher mechanism 70 preferably moves the bottles linearly along a path parallel to the acute angle of the bottles deposited on the dead plate while simultaneously rotating the bottles during a push-out cycle to position the bottles into open spaces 74 or windows on the conveyor belt 72. The combination of linear and rotational movement of the pusher mechanism 70 during a push-out cycle achieves a number of improvements. At the commencement of a push-out cycle, a contact plate 76 with fingers 78 extending therefrom first moves linearly into engagement with the bottles 42, as shown in FIG. 16. The pusher mechanism 70 commences a linear acceleration along a path generally parallel to the orientation of the bottles at the acute angle to slide the bottles 42 linearly along the dead plate 64 toward the conveyor belt 72. At some point in the linear motion, as shown in FIG. 17, the pusher mechanism 70 commences rotational motion to rotate the line of bottles 42 prior to inserting the bottles 42 into an open space 74 on the conveyor belt 72 which is unoccupied by other bottles. Further linear and rotational movement brings the bottles 42 fully onto the conveyor belt 72, as shown in FIG. 18. Rotation continues once the bottles 42 are on the belt 72 until the bottles 42 are aligned in single-file order in alignment with the other bottles on the conveyor belt 72, as shown in FIG. 19. Immediately thereafter, the contact plate 76 and the fingers 78 retract away from the bottles just deposited on the conveyor belt 72 to avoid contact with other bottles, as shown in FIG. 20. The pusher mechanism 70 rotates and moves linearly to return to an initial position for the start of the next push-out cycle, as shown in FIG. 21. The pusher mechanism 70 is thus in position to transfer another set of bottles 42, deposited by the take-

out mechanism 44, to the conveyor belt 72 in the next push-out cycle.

The combined linear and rotational movement of the pusher mechanism 70 quickly accelerates the bottles 42 onto the conveyor belt 72, thereby closely matching the linear speed of the bottles to the linear speed of the conveyor belt to prevent instabilities. Further, the rotational movement of the pusher mechanism 70, combined with the initial acute angular orientation of the bottles relative to the conveyor belt 72 and the linear movement of the pusher mechanism 70, is capable of limiting angular velocities and centrifugal forces on the bottles to magnitudes comparable to those produced by conventional rotary pushers. Thus, even though it is necessary to accelerate the bottles to a greater extent due to the higher speeds of the conveyor belt 72, the bottles are subjected to essentially comparable centrifugal and other forces when they are deposited on the faster moving conveyor belt 72.

If desired, in order to help prevent the bottles 42 from tipping laterally under the influence of the centrifugal force of rotation, a blower block 80 may direct a pulse of air at each of the bottles 42 as it rotates onto the conveyor (FIGS. 15 and 19). The pulse of air stabilizes the bottles by counteracting some of the centrifugal force to help prevent the bottles from tipping over or sliding off the conveyor belt 72. Although the air pulses stabilize the bottles 42, the added stability may not be required.

The transfer of the bottles 42 from their blow mold 46 to the transfer conveyor belt 72 is enhanced by the use of the take-out mechanism 44 and the pusher mechanism 70 of the present invention. The rotatable tong heads 50 pivot the bottles 42 to the acute angle prior to setting the bottles 42 on the dead plate 64. The pusher mechanism 70 then slides the bottles 42 toward the conveyor belt 72 while pivoting the bottles to align the bottles 42 with the direction of movement of the conveyor belt 72. This combination of linear and rotational movement reduces the angular velocity and centrifugal force on the bottles 42 as the bottles are propelled onto the conveyor belt 72. The two mechanisms 44 and 70, used together, are capable of transferring bottles 42 to relatively fast moving conveyor belts 72.

The mechanical and operational details of the take-out mechanism 44 are described in greater detail in conjunction with FIGS. 2 to 9. The rotation of the take-out arm 58 is best understood by reference to FIGS. 2 and 3. The inner end 60 of the take-out arm 58 rotates about a fixed shaft 82 which extends from a fixed vertical column 62 of the IS. An annular collar 84 extends rearwardly from a housing 86 of the take-out arm 58 and is connected to a driven gear 88. The driven gear 88 is connected to the collar 84 so that the driven gear 88, collar 84 and housing 86 of the take-out arm 58 rotate together about the fixed shaft 82. The driven gear 88 is rotated by a rack 92 located within the vertical column 62. The rack is retained for linear movement by conventional means (not shown) located in the column 62. The teeth of the rack 92 mesh with the teeth of the driven gear 88. The rack 92 is driven in linear movement by a pneumatic piston (not shown) also near the bottom of the column 62 where it attaches to the frame of the IS. The linear movement of the rack 92 rotates the driven gear 88 and the attached take-out arm 58 through an arc slightly greater than 180 degrees, as shown in FIGS. 6, 7 and 9. By controlling the position of the piston and the connected rack 92, the degree of

rotation and the rotational position of the take-out arm 58 is controlled in a corresponding manner. Although not shown in FIG. 2, another rack 93 (FIG. 3) is connected to the gear 88 on the opposite side of the rack 92. This other rack, which is conventional, is connected to impact a shock absorber (not shown) to decelerate the rotational movement of the take-out arm.

The rotation of the tong head assembly 48 about a horizontal axis to maintain the consistent orientation of the tong head assembly 48 and bottles 42 is shown in FIGS. 2 to 7. The housing 86 of the take-out arm 58 is hollow and within it at its inner end 60, a fixed gear 96 is fixed on the stationary shaft 82. An intermediate gear 100 is rotatably mounted on a shaft 102 fixed within the housing 86. The teeth of the intermediate gear 100 mesh with the teeth of the fixed gear 96 so that the intermediate gear 100 rotates about the shaft 102 and the fixed gear 96 as the take-out arm rotates about its inner end 60. A tong head gear 104 is fixedly attached to a shaft 106 rotatably mounted within the housing 86 at the outer end 56 of the take-out arm 58. The tong head gear 104 also meshes with the intermediate gear 100 and thus rotates when the intermediate gear 100 rotates upon rotation of the take-out arm 58 about its inner end 60. The shaft 106 extends to the outside of the housing 86 where it is connected to the tong head assembly 48. A flange 108 of the tong head assembly 48 is attached to the shaft 106 so that the assembly 48 rotates with the shaft 106.

The fixed gear 96 and the tong head gear 104 are exactly the same size so that as the intermediate gear 100 is rotated by rotation of the take-out arm, the tong head gear 104 will rotate the same amount as the take-out arm 58 but in the relative opposite direction. As the take-out arm 58 rotates about the fixed shaft 82, the shaft 106 will rotate an equal amount in the opposite direction relative to the rotation of the take-out arm 58. Therefore, the tong head assembly 48 rotates about the take-out arm 58 as the take-out arm 58 rotates about the fixed shaft 82. In this manner, the tong head assembly 48 is always in a consistent vertical orientation during rotation of the take-out arm 58.

The mechanism for rotating a tong head housing 110 containing the tong heads 50 about a vertical axis to position the bottles 42 at the acute angle relative to the conveyor belt 72 is shown in FIGS. 2 to 8. The flange 108 connected to the shaft 106 (FIG. 3) extends from a cylinder housing 112 of the tong head assembly 48. The cylinder housing 112 has a hollow interior 114 which is defined by an upper cylinder 116 and a lower annular opening 118. A piston 120 is located within the cylinder 116, and seals 122 establish a substantially air tight seal between the piston 120 and the cylinder 116. A cap member 124 is attached by bolts 126 to the upper end of the cylinder housing 112 to terminate the cylinder 116 at its upper end. Air delivery ports 128 and 130 are formed in the cylinder housing 112 and in the cap member 124, respectively, at positions below and above the location of the piston 120, respectively.

The ports 128 and 130 conduct pressurized air into and out of the cylinder 116 through tubes 132a and 134a, respectively. As is shown in FIG. 3, the tubes 132a and 134a connect with passages 132b and 134b, respectively, formed in the flange 108 of the cylinder housing 112. Passages 132c and 134c continue through the shaft 106 and connect with tubes 132d and 134d, respectively, at annular grooves formed in the housing 86 of the take-out arm 58 surrounding the ends of the

a
37

passages 132c and 134c. The tubes 132d and 134d extend from the outer end 56 to the inner end 60 of the take-out arm 58. Annular grooves are formed in the collar 84 to respectively connect the tubes 132d and 134d to passages 132e and 134e formed in the shaft 82. The passages 132e and 134e communicate through annular grooves in the fixed vertical column to ports 132f and 134f, respectively, where the pressurized air is applied and relieved. In this manner the pressurized air may be applied to alternately raise and lower the piston 120 in a vertical movement in the cylinder 116, regardless of the rotational position of the take-out arm.

The cap member 124 includes an annular sleeve portion 136 extending upward above the cylinder housing 112. A cylindrical end portion 138 of the piston 120 extends upward through a cylindrical opening 140 defined by the annular sleeve portion 136 of the cap member 124. A helical cam slot 142 is formed through the annular sleeve portion 136. Seals 144 between the cap member 124 and the cylindrical end portion 138 of the piston 120 prevent pressurized air from leaking from the cylinder 116 around the end portion 138 of the piston 120. A follower pin 146 is attached to the end portion 138 of the piston 120 and is positioned within the helical cam slot 142.

As the piston 120 is raised and lowered by the application of pressurized air through the ports 128 and 130, the follower pin 146 moves within the helical cam slot 142 and causes the piston 120 to rotate within the cylinder 116. The dimensions of the helical cam slot 142 cause the piston 120 to rotate, for example approximately 45 degrees, as the follower pin 146 moves between the vertical limits of the helical cam slot 142. The location of the helical slot 142 and the follower pin 146 position the three tong heads 50 of the tong head assembly 48 in parallel alignment with the position of the three bottles 42 in the blow mold 46 (FIG. 1) when the piston 120 is in its lowermost position. The amount of rotation of the follower pin 146 within the helical cam slot 142 determines the desired degree of rotation of the tong heads 50. The tong heads 50 rotate to position the bottles at the acute angle relative to the conveyor 68 when the piston 120 is in its uppermost position.

A hollow interior 148 of the piston 120 is splined to a correspondingly shaped end 150 of a tong head shaft 152 which extends downward through the lower annular opening 118. The splined connection of the piston 120 and the shaft 152 allows the piston 120 to move vertically relative to the shaft 152, but the splined connection causes the shaft 152 to rotate in unison with the piston 120 as the piston moves vertically within the cylinder 116. An annular flange 154 supports the shaft 152 on a thrust bearing 156 which is supported by a bearing mount 158 fixed to the bottom of the cylinder housing 112. The bearing 156 allows the shaft 152 to rotate within the cylinder housing 112.

The tong head shaft 152 extends below the cylinder housing 112 and terminates in a square flange 160. A top plate 162 of the tong head housing 110 of the tong head assembly 48 is attached by bolts 166 to two half plates 168. The square flange 160 is sandwiched between the top plate 162 and the half plates 168 so that vertical movement of the piston 120 causes the follower pin 146 to move within the helical slot 142 and rotate the piston 120, the shaft 152 and the attached tong head housing 110.

The manner by which the tongs 52 of the tong heads 50 of the tong head housing 110 grip the finish portion

54 of the bottles is understood from FIGS. 3 to 5. Each tong head 50 includes a piston 170 which is located within a cylinder 172 formed in the housing 110 for the tong heads 50. The piston 170 provides the force for manipulating the bottle-gripping tongs 52 into and out of contact with the finish portion 54 (FIG. 4) of each bottle. The piston 170 includes a lower projection 174 and a pin 176 pivotally attaches the upper ends of two links 178 to the projection 174. Two tong arms 180 are pivotally attached to the lower ends of the links 178 by pins 182. The tong arms 180 are pivotally mounted on a shaft 184 which is fixed to the bottom of the tong head 50. The tongs 52 are bolted to the free ends of the tong arms 180 as shown in FIGS. 4 and 5. As the piston 170 is lowered, the pin 176 moves toward the fixed shaft 184, the distance between the pins 182 increases, and the tong arms 180 pivot about the fixed shaft 184 in a scissor-like fashion to increase the distance between the tongs 52. This type of movement will result in the tongs 52 releasing the bottles 42. Upward movement of the piston 170 causes the opposite or reverse type of movement to close the tongs 52. This type of movement will result in the tongs gripping the bottles 42 about the finish portion 54. Thus, the tongs 52 open and close due to a scissor action of the tong arms 180 created by vertical movement of the piston 170.

A spring 186 maintains the piston 170 in an up position and biases the tongs 52 to the closed gripping position. To open the tongs 52, pressurized air is applied to the top of the piston 170 to compress the spring 186. Pressurized air for moving the piston 170 is fed into the cylinder housing 112 via a passageway 188 through the shaft 106. As is shown in FIG. 3, the passageway 188 is connected through an annular groove in the shaft 106 to a passage 188a formed in the take-out arm housing 86, through another annular groove in the shaft 82, through a passageway 188b formed in the shaft 82, to a port 188c in the column 62. Pressurized air is applied and relieved through the port 188c.

Air from the passageway 188 fills the annular opening 118 around the tong head shaft 152. The opening 118 is bounded by seals 190 to confine the air to the opening 118 during rotation of the shaft 152. A hole 192 is formed radially into the shaft 152 and directs the air within the opening 118 into an axial passageway 194 formed in the shaft 152. The passageway 194 extends through the shaft 152 and the flange 160.

An opening 196 is formed through the top plate 162 of the tong head housing 110 in alignment with the passageway 194 in the shaft 152. The opening 196 opens into a hollow neck 198 of the tong head housing 110. The air then moves from the neck 198 to a manifold 200 which runs the horizontal length of the housing 110 to provide communication with the piston cylinders 172 of each tong head 50 within the housing 110. Seals 202 prevent substantial air leakage around the piston 170 when the piston moves within the cylinder 172. When pressurized air is supplied through the passageway 188, the hole 192, the passageway 194, the opening 196 and the hollow neck 198 to the manifold 200, the piston 170 of each tong head 50 is forced downward. The tongs 52 are moved apart by the downward movement of the piston 170. Conversely, the tongs 52 are closed when the pressurized air to the piston 170 of each tong head 50 is vented or released and the compressed spring 186 is allowed to expand and raise each piston 170.

The take-out cycle begins with air pressure applied to the piston 170 to force it downward against the force of

the spring 186 in the tong head cylinder 172. The tong arms 180 scissor to separate the tongs 52. The separated condition of the tongs 52 is the condition occurring after the bottles 42 from the previous take-out cycle have been released. The tongs 52 are maintained separated while the rack 92 is moved longitudinally to rotate the gear 88 and thereby pivot the take-out arm 58 at its inner end 60 until the tong head assembly 48 is located over the newly formed bottles in the blow mold 46. Since the tongs 52 are separated, the tongs 52 fit adjacent to the finish portion 54 on the newly formed bottles 42 in the blow mold 46. At this time the air pressure to the piston 170 is relieved and the spring 186 moves the piston upward. The tong arms 180 scissor in the other direction and the tongs 52 grip the finish portion 54. The blow mold 46 separates and the rack 92 is moved in the other longitudinal direction to pivot the take-out arm 58 and move the bottles forward from the blow mold 46 to a position over the dead plate 64. The housing 110 tong heads 50 rotates about the take-out arm 58 in a direction opposite to the rotation of the take-out arm 58 to maintain the vertical orientation of the bottles 42 during transfer from the blow mold 46 to the dead plate 64 (see FIGS. 1, 6 and 7). After suspending the glass bottles 42 over the dead plate 64 (FIG. 7) for the cooling period, or while the bottles are suspended over the dead plate 64 during the cooling period, the piston 128 is driven upward in the cylinder housing 112 to cause the follower pin 146 to follow the helical cam slot 142 and thereby rotate the tong head housing 110 and the gripped bottles 42 through the acute angle. Thereafter the take-out arm 58 is rotated slightly further by movement of the rack 92 to deposit the bottles 42 on the dead plate 64. Air pressure is applied to the piston 170 to cause the tongs 52 to open and release the bottles 42 onto the dead plate 64 (FIG. 9). The take-out arm 58 begins rotating in the opposite direction to allow the tongs 52 to clear the bottles 42, and the piston 128 is then moved back to the lower position to return the tong head housing 110 to its position in alignment with the next set of bottles formed in the blow mold 46. This take-out cycle is thereafter repeated on a continuous basis.

The pusher mechanism 70 commences operation at the end of the take-out cycle. The pusher mechanism 70 operates in a push-out cycle to transfer the bottles 42 from the acute angular position in which they are deposited on the dead plate 64 to the transfer conveyor 68. The push-out cycle incorporates both linear and rotational movement, and the movement and functionality of the pusher mechanism 70 is achieved by elements shown generally in FIG. 10. In general, the pusher mechanism 70 includes a linear carrier 204 which moves linearly along guide rails 206 and 208, a pedestal assembly 210 which is pivotably connected to the carrier 204, a pusher cylinder assembly 212 connected to the pedestal assembly 210 and a pusher plate 214. The pusher plate 214 is attached to the contact plate 76 and fingers 78. The pusher cylinder assembly 212 extends the contact plate 76 and fingers 78 into contact with the bottles on the dead plate 64. The linear carrier 204 imparts the linear movement to the bottles 42, and the pivoting pedestal assembly 210 imparts the rotary movement to the bottles as they are transferred to the conveyor 68. The pusher mechanism 70 is described in greater detail in association with FIGS. 10-22.

As is shown best in FIGS. 10-14, the dead plate 64 is mounted on a conveyor beam 216 which forms part of

the support structure for the conveyor 68. The conveyor beam 216 is supported in the conventional manner by legs (not shown), and the legs attach to the frame of the IS with which the pusher mechanism 70 is associated. The upper surface of the dead plate 64 is essentially flush with the conveyor belt 72. An edge 218 of the dead plate 64 extends to the conveyor belt 72 at preferably the acute angle at which the take-out mechanism 44 aligns the bottles 42 on the dead plate 64. Thus, the edge 218 and the initial alignment of the bottles 42 on the dead plate 64 are preferably parallel. Of course, after the push-out cycle commences the parallel alignment is not maintained as the bottles 42 are rotated onto the conveyor belt 72.

The pair of horizontal linear guide rails 206 and 208 for the carrier 204 are rigidly mounted on a vertical wall member 220 of a wind box below the dead plate 64, as is shown in FIGS. 10 to 14. The wind box supplies the air which is delivered through the holes 66 in the dead plate. The carrier 204 includes channels 222 and 224 which slidably engage and are retained to the guide rails 206 and 208, respectively. Roller ball bearings 226 (FIG. 14) within the channels 222 and 224 allow the channels 222 and 224 to easily move along the guide rails 206 and 208, thereby also allowing the carrier 204 to slide easily along the length of the guide rails 206 and 208.

Between the two guide rails 206 and 208, a toothed belt 228 is supported between two sprockets 230 and 232. The sprockets 230 and 232 are rigidly connected to shafts 234 and 236, respectively, which are rotatably attached to extend outward from the vertical wall 220 by conventional bearing and mounting arrangements (not shown). A drive motor 238 (FIGS. 10, 12 and 13) turns a sprocket 240. The sprocket 240 is connected to a sprocket 242 by a toothed belt 244. The sprocket 242 is also rigidly attached to the shaft 236 so the sprockets 232 and 242 rotate in unison with each other. Upon the drive motor 238 rotating the sprocket 240, the belt 244 rotates the sprockets 242 and 232, and the belt 228 is also rotated.

The upper span of the belt 228 between the sprockets 230 and 232 is located closely adjacent to the upper channel 222 of the carrier 204. The belt 228 is fastened to the upper channel 222 by bolts 246 and a small attachment plate 248 as shown in FIGS. 10 and 14. Tightening the bolts 246 squeezes the belt 228 between the channel 222 and the plate 248 to attach the belt 228 to the carrier 204. As a consequence of this connection, the carrier 204 is moved along the guide rails 206 and 208 as the belt 228 is moved. The amount of rotation of the drive motor 238 can thereby precisely control the position, rate and direction of movement of the linear carrier 204 along the edge 218 of the dead plate 64. Preferably the drive motor 238 is an electrical servo motor which is capable of very precise rotational control to achieve the desired degree of control over the position and movement of the carrier 204.

The pedestal assembly 210 includes a main vertical shaft 250 which is rotationally attached by bearings 252 and 254 to mounting flanges 256 and 258 which extend from the linear carrier 204, as is shown in FIGS. 10, 12 and 13. A pivot motor 260 is suspended from a connection plate 262 which is also attached to the upper mounting flange 258. The pivot motor 260 turns a drive shaft 264 which passes through the plate 262 and rotates a sprocket 266 attached to the end of the drive shaft 264. The sprocket 266 drives a toothed belt 268 which in

92

turn rotates a sprocket 270 which is rigidly attached to the vertical shaft 250. Thus, operation of the pivot motor 260 rotates the vertical shaft 250 in an amount, rate and direction controlled by the motor 260. Although not specifically shown the motor 260 is connected to a planetary gearbox to obtain additional torque. The pivot motor 260 is also preferably a servo motor.

The vertical shaft 250 is fixed to the underside of a pedestal 272 which in turn supports the pusher cylinder assembly 212, as is shown in FIGS. 12 and 13. Thus, the pusher cylinder assembly 212 rotates in unison with the pedestal 272 and the vertical shaft 250 when the pivot motor 260 operates. Of course, the pusher cylinder assembly 212 is also carried with the carrier 204 as it moves linearly along the guide rails 206 and 208. The linear movement of the carrier 204 and the independent pivotable movement of the pusher cylinder assembly 212 create the linear and rotational components of movement of the pusher mechanism 70.

The pusher cylinder assembly 212 includes a housing 274 and a pusher cylinder 276 shown by dashed lines in FIGS. 12 and 13. The pusher cylinder 276 is preferably a conventional piston and cylinder assembly which includes an internal piston (not shown) that is moved linearly under the influence of air pressure supplied to the cylinder 276 by air hoses 278 attached to the cylinder housing 274 as shown in FIGS. 12 and 13. The piston within the cylinder 276 is connected to a piston rod 280 which extends out of the cylinder housing 274. The pusher plate 214 is attached to the end of the rod 280 opposite the end which is attached to the piston within the cylinder 276. A support rod 282 is attached to a flange 284 atop the pusher plate 214 and passes through annular support bearings 286 formed within flanges 288 atop the pusher cylinder housing 274. The support rod 282 maintains the pusher plate 214 in alignment with the piston rod 280 during extension and retraction of the piston rod, thereby obtaining improved operation of the pusher cylinder assembly 212. The support rod 282 also supports a portion of the weight of the pusher plate 214, rather than requiring the piston rod 280 to fully support the weight of the pusher plate. As an alternative to the piston and cylinder assembly 212, an electric servo motor driving a ball screw arrangement could be employed. Such an arrangement provides excellent control of the movement of the pusher plate along its movement path, allowing a wide variety of motion profiles to be created.

The contact plate 76 is attached to the pusher plate 214, and the equally spaced fingers 78 are attached to the contact plate 76 as shown in FIGS. 10-13. The fingers 78 project outward from the contact plate 76 at the same intervals as the bottles 42 are spaced when they are released by the take-out mechanism 44. Accordingly, when the pusher cylinder 276 extends the pusher plate 214, the contact plate 76 and the fingers 78 are in the appropriate position to contact the bottles 42 from the side and from behind to move them onto the transfer conveyor belt 72, as shown in FIG. 13.

The attachment of the pusher cylinder assembly 212 atop the pivotable pedestal assembly 210, the attachment of the pedestal assembly 210 to the linear carrier 204, and the linear movement of the carrier 204 allows the pusher plate 214 to be extended, retracted, linearly translated, and rotated in movements which are all independent of each other. These ranges and types of

motion are all utilized in the push-out cycle accomplished by the pusher mechanism 70.

The push-out cycle is illustrated in FIGS. 15 to 22. The push-out cycle sequence of operation begins with the bottles 42 aligned on the dead plate 64 parallel to the edge 218 at the acute angle to the conveyor belt 72 (FIG. 10). The piston rod 280 extends the pusher plate 214 toward the bottles 42 to engage the contact plate 76 and fingers 78 with the bottles 42 (FIGS. 13, 14 and 16). The drive motor 238 propels the linear carrier 204 along the guide rails 206 and 208, accelerating the bottles 42 toward the conveyor belt 72. Simultaneously, the pivot motor 260 starts pivoting the pusher cylinder assembly 212 and the attached contact plate 76, fingers 78 and bottles 42 (FIGS. 15, 17 and 18). The linear and rotational movement of the bottles 42 continues until the bottles are inserted into an open space 74 on the conveyor belt 72 (FIGS. 15 and 19). This movement imparts the bottles with a velocity in the direction of the belt 72 which approximates that of the belt itself. Of course the linear movement of the carrier 204 and the pivoting movement of the pusher assembly and the extension of the pusher plate are all coordinated from a timing standpoint to insert the bottles in open spaces on the transfer conveyor.

Following transfer of the bottles 42 to the transfer conveyor belt 72, the piston rod 280 is quickly retracted to prevent the fingers 78 from contacting the bottles 42 following the fingers 78 (FIG. 20). Once the contact plate 76 and fingers 78 clear the bottles on the conveyor belt 72, the drive motor 238 returns the linear carrier 204 along the guide rails 206 and 208 while the pivot motor 260 returns the pusher cylinder 276 to its initial orientation perpendicular to the edge 218 of the dead plate 64 and to the next group of bottles 42 on the dead plate. This push-out cycle then repeats each time the take-out mechanism 44 delivers a new group of bottles 42 to the dead plate 64.

The combination of rotational and translational movement, as opposed to purely rotational movement achieved by the prior art rotary pushers, effectively reduces centrifugal forces upon the bottles 42. The initial orientation of the bottles on the dead plate 64 is in an alignment which makes an acute angle to the conveyor. This initial orientation of the bottles accounts for a portion of the rotation which must be imparted to the bottles, thereby reducing the amount of rotational movement that the pusher mechanism 70 must impart to the bottles. The linear movement of the pusher mechanism 70 provides an opportunity to accelerate the bottles with a component of movement parallel to the transfer conveyor 68 without having to rely on rotation alone to achieve the final desired linear velocity of the bottles as they are transferred to the conveyor belt 72. The initial placement of the bottles at the acute angle reduces the angular velocity required to transfer the bottles to the conveyor belt 72 which reduces the possibility of instability due to centrifugal force. Furthermore, the effect of the simultaneous linear movement and rotational movement has the effect of moving the bottles through an arc, shown in FIG. 13, which has a greater radius than the radius between the vertical shaft 250 and the pusher plate 214. By increasing the radius of the arc of rotation of the bottles, the centrifugal force on the bottles is reduced.

However, to optionally provide additional protection against inadvertent instabilities of the bottles 42 when they are transferred to the conveyor belt 72 at the

greater belt velocities, each IS may utilize a blower block 80 to direct a pulse of air from a nozzle 290 at each bottle as it is rotated onto the conveyor belt 72. Three separate nozzles 290 are used on each block 80, one for each of the bottles. The nozzles 290 are connected to a source of compressed air by an air hose 292, and a valve (not shown) in each air hose 292 controls the delivery of the pulse of air. Each nozzle 290 targets an individual bottle 42 with the air pulse, and the air pulse counteracts the centrifugal force on each of its target bottles as the bottles move onto the conveyor belt 72. The air pulses delivered by the nozzles 290 may even help maintain the bottles 42 in contact with the contact plate 76 and fingers 78 during transfer to the conveyor belt 72, depending on the length and duration of the pulses. The duration of the air pulse is very short to prevent disturbing bottles which precede or follow the target bottles. The opening and closing of the valves which deliver the air pulses is timed to occur in synchronization with the positioning of the bottles by the pusher mechanism 70.

Another optional feature of the present invention is an alternative embodiment 300 of the pusher mechanism (FIGS. 23 to 26). The pusher mechanism 300 may be useful in reducing the possibility of the fingers 78 inadvertently contacting the bottles on the conveyor belt 72 before the pusher plate 214 can be withdrawn (consider FIG. 20). The pusher mechanism 300 may also be useful in decreasing the rate at which the pusher cylinder assembly 212 needs to be rotated back to its initial position during movement of the pusher mechanism back to its initial position (consider FIG. 21). At a minimum, the pusher mechanism 300 imparts an additional realm of movement to the push-out cycle. The pusher mechanism 300 is similar to the previously described embodiment of the pusher mechanism 70, but additionally employs a pneumatic pop-up cylinder 302 to vertically lift the pusher cylinder assembly 212 and the attached pusher plate 214 above the bottles. The pusher mechanism 300 has generally the same elements as those previously described in conjunction with the pusher mechanism 70, and the same reference numerals will be used to describe elements which were not altered between the first and alternative embodiments.

In the preferred embodiment of the pusher mechanism 300, the pivot motor 260 and the vertical shaft 250 of the pedestal assembly 210 are mounted on a second vertical carrier 304. Vertical guide rods 306 are attached between mounting flanges 308 and 310 on the lower and upper ends of the carrier 204, respectively. The vertical carrier 304 is slidably attached to the guide rods 306 by annular guide bearings 312 which are positioned within flanges 314 attached to the vertical carrier 304. Of course, the carrier 204 moves horizontally along the guide rails 206 and 208. The pneumatic cylinder 302 is attached to and extends below the lower horizontal flange 308 on the horizontal carrier 204. A piston (not shown) within the pop-up cylinder 302 is moved along the length of the cylinder 302 by pressurized air supplied by hoses 316 and 318. The piston within the cylinder 302 is connected to a piston rod 320 which extends through the lower flange 308 of the horizontal carrier 204 and is attached to a bottom plate 322 of the vertical carrier 304. Movement of the piston in the cylinder 302 thus raises or lowers the vertical carrier 304 independent of the position of the horizontal carrier 204. As an alternative to the pneumatic pop-up cylinder 302, a

servo motor controlled ball screw arrangement may be employed.

The pivot motor 260 is suspended from a top plate 324 of the vertical carrier 304. The vertical shaft 250 is rotatably attached to the vertical carrier 304 by bearings (not shown) in the bottom plate 322 and in the top plate 324. The pivot motor 260 rotates the vertical shaft 250 which in turn rotates the pedestal 272 and the attached pusher cylinder assembly 212. The operation of the pedestal assembly 210 and the pusher cylinder assembly 212 is similar to that described above with respect to the pusher mechanism 70.

The push-out cycle of the pusher mechanism 300 is similar to that shown in FIGS. 15 to 22, except for the vertical movement of the pedestal and pusher cylinder assemblies 210 and 212 which may occur at any time during the push-out cycle, but preferably occurs following transfer of the bottles 42 to the conveyor belt 72. The pusher mechanism 300 simply adds the potential for advantageous vertical movement to the linear and rotary movements achieved by the pusher mechanism 70.

Both embodiments 70 and 300 of the pusher mechanism of the present invention represent an improvement over prior art rotary pushers due to the effectiveness of the mechanisms 70 and 300 in reliably transferring bottles 42 to a faster transfer conveyor belt 72. The combined linear and rotary motion of the contact plate 76 and fingers 78 reduce the forces imparted on the bottles 42 during transfer to a higher speed conveyor belt 72.

A presently preferred embodiment of the present invention and many of its improvements have been described with a degree of particularity. This description has been made by way of preferred example and is based on a present understanding of knowledge available regarding the invention. It should be understood, however, that the scope of the present invention is defined by following claims, and not necessarily by the detailed description of the preferred embodiment.

I claim:

1. A pusher mechanism for use in transferring a plurality of glass articles onto a moving conveyor belt after the articles have been formed in a mold of an IS of a glassware forming machine and deposited in a predetermined orientation on a dead plate adjacent to the conveyor belt, said pusher mechanism comprising:
 - an article contact assembly for contacting the articles supported on the dead plate and pushing the articles from the dead plate to the conveyor belt;
 - a pivotable assembly connected to the article contact assembly for moving the article contact assembly in rotational movement through an arc to position the articles on the conveyor belt; and
 - a carriage assembly connected to the pivotable assembly for moving the pivotable assembly in linear movement in a direction having a movement component parallel to the direction of movement of the conveyor belt.
2. A pusher mechanism as defined in claim 1 wherein: the rotational movement of the article contact assembly occurs independently of the linear movement of the pivotable assembly.
3. A pusher mechanism as defined in claim 1 wherein: the rotational movement of the article contact assembly occurs during the linear movement of the pivotable assembly.
4. A pusher mechanism as defined in claim 3, for use with an IS which initially deposits the articles in a pre-

determined orientation on the dead plate in a line which extends at an initial acute angle converging toward the direction of movement of the conveyor belt, and wherein:

the article contact assembly contacts the line of articles substantially at the initial acute angle;
the linear movement of the pivotable assembly is substantially parallel to the initial acute angle of the line of articles; and
the rotational movement of the article contact assembly moves the articles from the acute angle into an aligned orientation parallel to the direction of movement of the conveyor belt with which said pusher mechanism is used.

5. A pusher mechanism as defined in claim 4 wherein: the linear movement of the pivotable assembly and the rotational movement of the article contact assembly effectively lengthen a radius of curvature of a path taken by the articles moving between their initial position on the dead plate and their aligned position on the conveyor belt, compared to a radius of curvature of the arc of the rotational movement of the article contact assembly.

6. A pusher mechanism as defined in claim 4, for use with the conveyor belt which moves at a predetermined rate, and wherein:

the movement of the articles in the direction parallel to the direction of movement of the conveyor belt at the end of the rotational movement of the contact assembly is substantially equal to the rate of movement of the conveyor belt.

7. A pusher mechanism as defined in claim 3, for use with the conveyor belt which moves at a predetermined rate, and wherein:

the rate of movement of the articles in a direction parallel to the direction of movement of the conveyor belt due to the rotation of the contact assembly by the pivotable assembly at the end of the rotational movement and the component of the linear motion of the carrier assembly are additive and the rate of the resultant movement of the articles parallel to the direction of movement of the conveyor belt is adapted to be substantially equal the rate of movement of the conveyor belt.

8. A pusher mechanism as defined in claim 1 wherein the article contact assembly further comprises: a pusher member for contacting the articles; and an extension device connected to the pusher member for moving the pusher member in an extension movement along a radial path of the arc traversed by the article contact assembly.

9. A pusher mechanism as defined in claim 8 wherein: the extension movement of the pusher member occurs independently of the rotational movement of the article contact assembly and independently of the linear movement of the pivotable assembly.

10. A pusher mechanism as defined in claim 8 for use with an IS to achieve a push out cycle during which the articles are transferred from the dead plate to the conveyor belt, wherein:

the extension movement of the pusher member is adapted to occur during the push-out cycle.

11. A pusher mechanism as defined in claim 8, for use with an IS which initially deposits the articles on the dead plate in a line with one another and the line extends at an initial acute angle converging toward the direction of movement of the conveyor belt, and wherein:

the extension movement of the pusher member is adapted to be in a direction toward the articles as initially deposited on the dead plate and at an angle which is essentially perpendicular to the initial line of articles deposited on the dead plate.

12. A pusher mechanism as defined in claim 8 further comprising:

a lifting assembly operatively connected to at least one of the article contact assembly or the pivotable assembly and operative for lifting the article contact assembly in a vertical movement out of contact with the articles.

13. A pusher mechanism as defined in claim 12 wherein:

the vertical movement of the lifting assembly occurs independently of the rotational movement of the article contact assembly and independently of the linear movement of the pivotable assembly and independently of the extension movement of the pusher member.

14. A pusher mechanism as defined in claim 1 further comprising:

a lifting assembly operatively connected to at least one of the article contact assembly or the pivotable assembly and operative for lifting the article contact assembly in a vertical movement out of contact with the articles.

15. A pusher mechanism as defined in claim 14 wherein:

the vertical movement of the lifting assembly occurs independently of the rotational movement of the article contact assembly and independently of the linear movement of the pivotable assembly.

16. A pusher mechanism as defined in claim 14 for use with an IS to achieve a push out cycle during which the articles are transferred from the dead plate to the conveyor belt, wherein:

the vertical movement of the lifting assembly is adapted to occur during the push-out cycle.

17. A pusher mechanism as defined in claim 16 wherein:

the article contact assembly further comprises a pusher member for contacting the articles; and the vertical movement of the lifting assembly lifts the pusher member above the articles and out of contact with the articles at the end of a push-out cycle.

18. A pusher mechanism as defined in claim 1 in combination with a nozzle for use with the conveyor belt, wherein:

the pusher mechanism is adapted to be connected to one side of the conveyor belt; and

the nozzle is adapted to be connected to an opposite side of the conveyor belt facing the pusher mechanism, the nozzle delivering a flow of air against the articles as the articles are transferred onto the conveyor belt to counteract centrifugal forces applied to the articles by the pusher mechanism.

19. A pusher mechanism as defined in claim 1, for use with an IS which initially deposits the articles on the dead plate in a line with one another and the line extends at an initial acute angle converging toward the direction of movement of the conveyor belt, and wherein:

the article contact assembly is adapted to contact the line of articles substantially at the initial acute angle in which the articles are placed on the dead plate.

20. A pusher mechanism as defined in claim 19 in combination with a take-out mechanism for use with the IS, wherein:

- the articles are formed in a linear alignment with one another in the mold of the IS;
- the pusher mechanism is adapted to be connected to the IS of the glassware forming machine; and
- the take-out mechanism is adapted to be connected to the IS of the glassware forming machine, said take-out mechanism comprising:
 - a tong head assembly having tongs arranged in a linear alignment with one another for gripping the articles in the mold of the IS and maintaining the linear alignment of the articles;
 - a translation device connected to the tong head assembly for translating the tong head assembly in a linear path in alignment with the linear alignment of the articles in the mold, the translation device translating the tong head assembly between a first position at which the tongs grip the articles in the mold of the IS and a second position at which the tongs release the articles on the dead plate of the IS; and
 - a rotational assembly for rotating a portion of the tong head assembly to initially deposit the articles on the dead plate of the IS in the line with one another, the line extending along the initial acute angle converging toward the direction of movement of the conveyor belt.

21. A pusher mechanism in combination with a take-out mechanism as defined in claim 20 wherein:

- the linear movement of the pivotable assembly is substantially parallel to the initial acute angle of the line of articles.

22. A pusher mechanism in combination with a take-out mechanism as defined in claim 20 wherein:

- the rotational movement of the portion of the tong head assembly occurs independently of the rotational movement of the article contact assembly and independently of the linear movement of the pivotable assembly and independently of the translational movement of the tong head assembly.

23. A pusher mechanism in combination with a take-out mechanism as defined in claim 20 wherein the rotational assembly further comprises:

- a shaft extending vertically within the tong head assembly; and
- means connected to the shaft for rotating the shaft to accomplish the rotational movement of the portion of the tong head assembly.

24. A pusher mechanism in combination with a take-out mechanism as defined in claim 23 wherein the means for rotating the shaft further comprises:

- a cylinder housing defining a cylinder;
- a piston positioned for longitudinal and rotational movement within the cylinder under the influence of pressurized fluid applied thereto, the shaft extending into the cylinder and connected to the

piston to rotate in unison with the piston while the piston moves longitudinally relative to the shaft; a cap member connected to the cylinder housing and defining a helical cam slot extending in both the rotational and longitudinal directions of movement of the piston; and

a follower member connected to the piston and extending into the helical cam slot to cause the piston to rotate when the piston is moved longitudinally under the influence of the pressurized fluid applied to the piston.

25. A pusher mechanism for use in transferring a plurality of glass articles onto a moving conveyor belt after the articles have been formed in a mold of an IS of a glassware forming machine and deposited in a predetermined orientation on a dead plate adjacent to the conveyor belt, said pusher mechanism comprising:

- an article contact assembly adapted for contacting the articles supported on the dead plate and pushing the articles from the dead plate to the conveyor belt;
- a pivotable assembly connected to the article contact assembly for moving the article contact assembly in rotational movement through an arc to impart a movement component to the articles in a direction adapted to be in a direction of movement of the conveyor belt; and
- a carriage assembly connected to the pivotable assembly for moving the pivotable assembly in linear movement in a direction having a motion component adapted to be parallel to the direction of movement of the conveyor belt.

26. A pusher mechanism as defined in claim 25, for use with an IS which initially deposits the articles on the dead plate in a line with one another and the line extends at an initial acute angle converging toward the direction of movement of the conveyor belt, and wherein:

- the article contact assembly is adapted to contact the line of articles substantially at the initial acute angle;
- the linear movement of the pivotable assembly is substantially adapted to be parallel to the initial acute angle of the line of articles; and
- the arc of the rotational movement of the article contact assembly is substantially equal to the initial acute angle.

27. A pusher mechanism as defined in claim 26 wherein:

- the rotational movement of the article contact assembly occurs during the linear movement of the pivotable assembly.

28. A pusher mechanism as defined in claim 27, for use with the conveyor belt which moves at a predetermined rate, and wherein:

- the movement of the articles in a direction parallel to the direction of movement of the conveyor belt at the end of the arc occurs at a rate which is adapted to be substantially equal to the rate of movement of the conveyor belt.

• • • • •

 UNITED STATES
PATENT AND
TRADEMARK OFFICE

JUNE 20, 2003

PTAS

Under Secretary of Commerce For Intellectual Property and
Director of the United States Patent and Trademark Office
Washington, DC 20231
www.uspto.gov

OWENS-ILLINOIS, INC.
NIRAV D. PARIKH
ONE SEAGATE, 25-LDP
TOLEDO, OH 43666



102364784A

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: 02/06/2003

REEL/FRAME: 013744/0003
NUMBER OF PAGES: 3

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

ASSIGNOR:
LEIDY, S. WAYNE

DOC DATE: 01/28/2003

ASSIGNOR:
DIFRANK, FRANK J.

DOC DATE: 01/23/2003

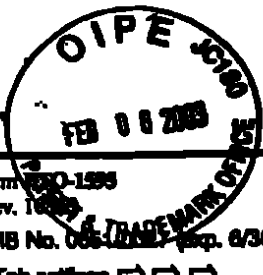
ASSIGNEE:
OWENS-BROCKWAY GLASS CONTAINER
INC.
ONE SEAGATE
TOLEDO, OHIO 43666

SERIAL NUMBER: 10235189
PATENT NUMBER:

FILING DATE: 09/04/2002
ISSUE DATE:

MARY BENTON, EXAMINER
ASSIGNMENT DIVISION
OFFICE OF PUBLIC RECORDS

Owens-Illinois, Inc.
JUN 27 2003
INTELLECTUAL
PROPERTY SECTION



02-13-2003



102364784

17615 USA

Form 100-1595

(Rev. 10/99)

OMB No. 005-1001 (exp. 6/30/2005)

Tab settings

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

To the Honorable Commissioner of Patents and Trademarks: Please record the attached original documents or copy thereof.

1. Name of conveying party(ies):

- (a) D. Wayne Ledy
(b) Frank J. DiFrank

2-6-03

Additional name(s) of conveying party(ies) attached? ☐ Yes ☒ No

3. Nature of conveyance:

- ☒ Assignment ☐ Merger
☐ Security Agreement ☐ Change of Name
☐ Other

(a) 01/28/2003

Execution Date: (b) 01/23/2003

2. Name and address of receiving party(ies)

Name: Owens-Brockway Glass Container Inc.

Internal Address:

Street Address: One SeaGate

City: Toledo State: OH Zip: 43666

Additional name(s) & address(es) attached? ☐ Yes ☒ No

4. Application number(s) or patent number(s):

If this document is being filed together with a new application, the execution date of the application is:

A. Patent Application No.(s) 10/235,189
filed 09/04/2002

B. Patent No.(s)

Additional numbers attached? ☐ Yes ☒ No

5. Name and address of party to whom correspondence concerning document should be mailed:

Name: Nirav D. Parikh

Internal Address: Owens-Illinois, Inc.

Street Address: One SeaGate, 25-LDP

City: Toledo State: OH Zip: 43666

6. Total number of applications and patents involved: 1

7. Total fee (37 CFR 3.41).....\$ 40.00

☐ Enclosed

☒ Authorized to be charged to deposit account

8. Deposit account number:

15-0875

DO NOT USE THIS SPACE

9. Signature.

Nirav D. Parikh

Name of Person Signing

Signature

1/30/03

Date

Total number of pages including cover sheet, attachments, and documents: 3

Mail documents to be recorded with required cover sheet information to:
Commissioner of Patents & Trademarks, Box Assignments
Washington, D.C. 20231

02/12/2003 6T0011 00000073 150073 10235109

01 FC:0021 40.00 CH

97
66

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 of and Apparatus for Transferring Articles from a Fixed Position to a Moving Conveyor"; and

WHEREAS, I, as a joint applicant with said Frank J. DiFrank, have executed an Application for United States Patent based thereon, on the 28th day of January, 2003; and

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

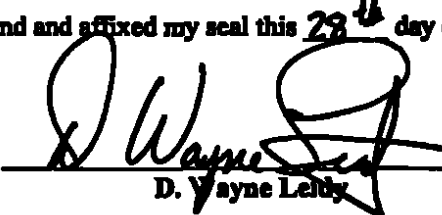
NOW, THEREFORE, for One Dollar (\$1.00) and other valuable considerations, receipt of all of which is hereby acknowledged, I have agreed to and do hereby sell, assign, and transfer unto said corporation my entire right, title, and interest in and throughout the United States of America (including its 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.

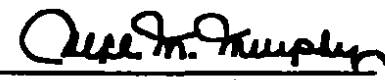
IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal this 28th day of January, 2003.


D. Wayne Leidy

STATE OF OHIO)
) ss:
COUNTY OF WOOD)

On this 28 day of January, 2003, 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.

[SEAL]


Notary Public

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

U.S. Serial No. 10/235,189 Filing Date 09/04/2002

98
00
1

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 of and Apparatus for Transferring Articles from a Fixed Position to a Moving Conveyor"; and

WHEREAS, I, as a joint applicant with said D. Wayne Leidy, have executed an Application for United States Patent based thereon, on the 23 day of JANUARY, 2003; and

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

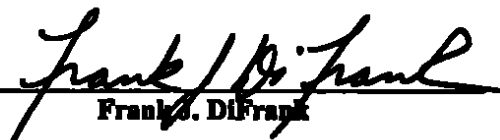
NOW, THEREFORE, for One Dollar (\$1.00) and other valuable considerations, receipt of all of which is hereby acknowledged, I have agreed to and do hereby sell, assign, and transfer unto said corporation my entire right, title, and interest in and throughout the United States of America (including its 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 23 day of JANUARY, 2003.


Frank J. DiFrank

STATE OF Ohio)
COUNTY OF Wood) ss:

On this 23 day of January, 2003, 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.

[SEAL]


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

U.S. Serial No. 10/235,189 Filing Date 09/04/2002



US006702097B1

(12) **United States Patent**
Ledy et al.

(10) Patent No.: **US 6,702,097 B1**
(45) Date of Patent: **Mar. 9, 2004**

(54) **METHOD OF AND APPARATUS FOR
TRANSFERRING ARTICLES FROM A FIXED
POSITION TO A MOVING CONVEYOR**

(75) Inventors: **D. Wayne Ledy, Perrysburg, OH (US);
Frank J. DiFrank, Toledo, OH (US)**

(73) Assignee: **Owens-Brockway Glass Container
Inc., Toledo, OH (US)**

(*) Notice: **Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.**

(21) Appl. No.: **10/235,189**

(22) Filed: **Sep. 4, 2002**

(51) Int. Cl.⁷ **B65G 25/00; C03B 11/00**

(52) U.S. Cl. **198/468.01; 65/239; 65/260**

(58) Field of Search **198/418.6, 426,
198/431, 432, 433, 468.01, 370.02, 370.07,
723, 740; 414/744.2, 198; 65/260, 239,
241**

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,559,537 A * 2/1971 Faure 91/462
3,595,365 A * 7/1971 Faure 198/468.01
3,795,503 A 3/1974 Perry
4,162,911 A 7/1979 Mallory
4,199,344 A 4/1980 Mumford et al.
4,222,480 A 9/1980 Perry
4,340,413 A * 7/1982 Rowland 65/375
4,427,431 A * 1/1984 Mumford et al. 65/163
4,462,519 A * 7/1984 Packell et al. 198/468.01

4,466,532 A * 8/1984 Minneman et al. 198/468.01
5,125,499 A 6/1992 Santhoff et al.
5,160,015 A 11/1992 Perry et al.
5,429,651 A 7/1993 Bolin
5,575,828 A * 11/1996 Duffo et al. 65/158
5,904,743 A 5/1999 Nafziger et al.
6,494,063 B1 * 12/2002 Malek 65/260

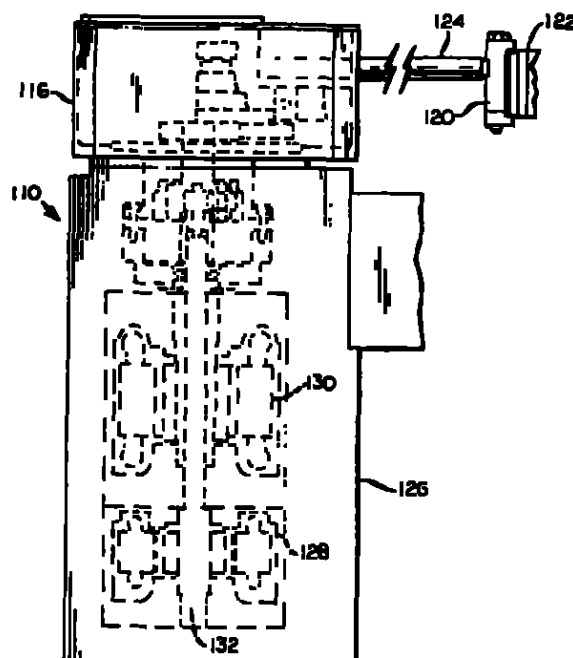
* cited by examiner

Primary Examiner—Richard Ridley

(57) **ABSTRACT**

Sweepout apparatus (10) for sweeping an aligned array of glass containers (C) from a deadplate (12) of a I.S. glass container forming machine to a conveyor (14) that runs transversely to the array of containers on the deadplate and serves to transfer the containers for further processing. The apparatus comprises a swivel portion (16 or 116) that is oscillatable in an arc of approximately 90° and a head (18) that is carried by the swivel portion and is reciprocable relative thereto, the head carrying an elongated bar (20) with a spaced plurality of pocket-defining fingers (22) that extend from the bar. The sweepout further comprises independently operatable first and second coaxial reversible electrical motors (30, 28), an output shaft (32) of the second electric motor (28) passing through an annular output shaft (56) of the first electric motor (30). Reversible motion imparted to the annular output shaft of the first electric motor causes oscillating motion of the swivel portion of the sweepout apparatus. Reversible motion imparted to the output shaft of the second electric motor axial through a planetary gear (42) imparts reciprocating motion to the elongated bar relative to other structure of the sweepout portion. The output shafts (32, 56) are rotatable independently of one another.

9 Claims, 10 Drawing Sheets



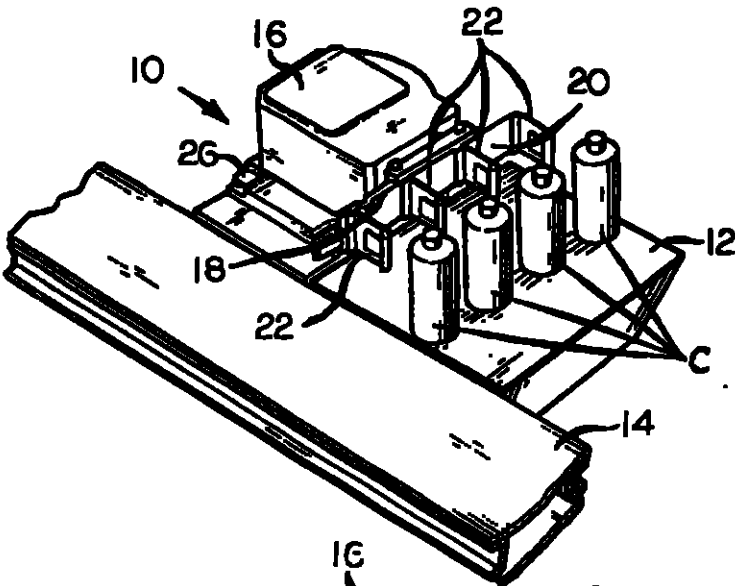


FIG. 1A

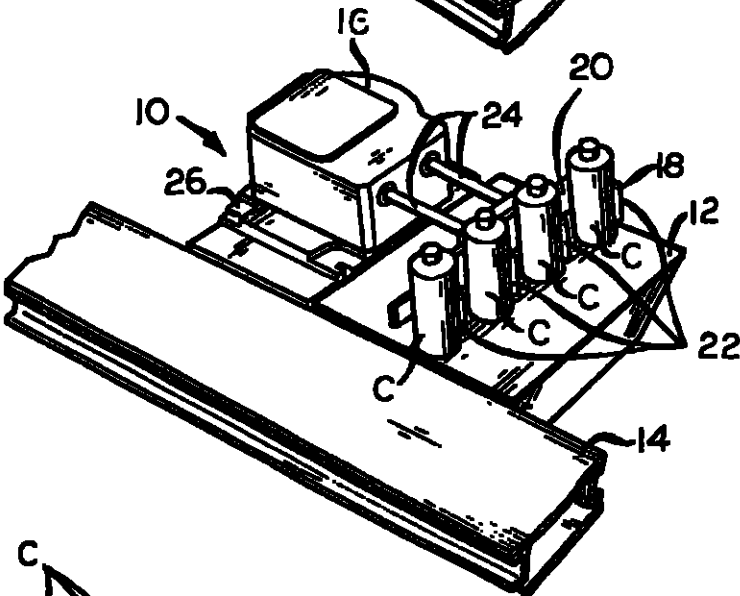


FIG. 1B

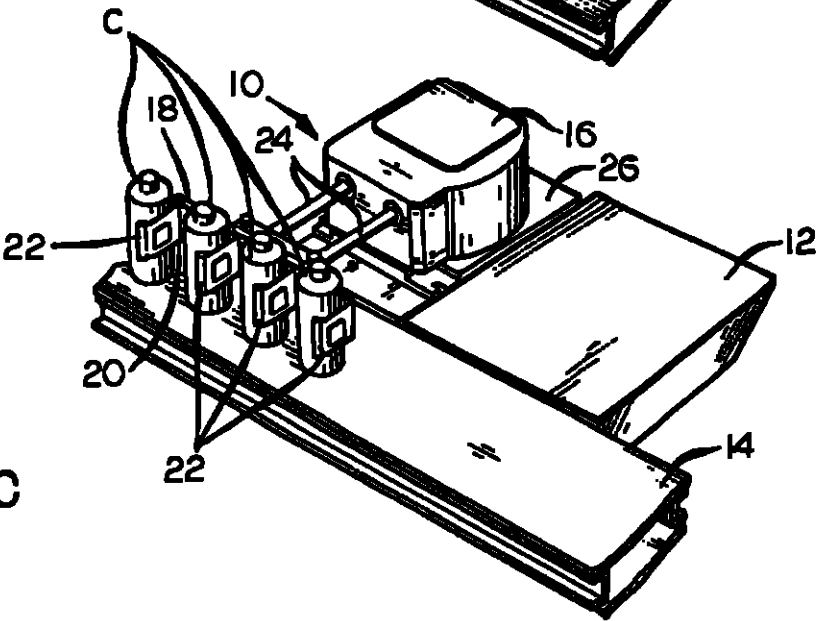


FIG. 1C

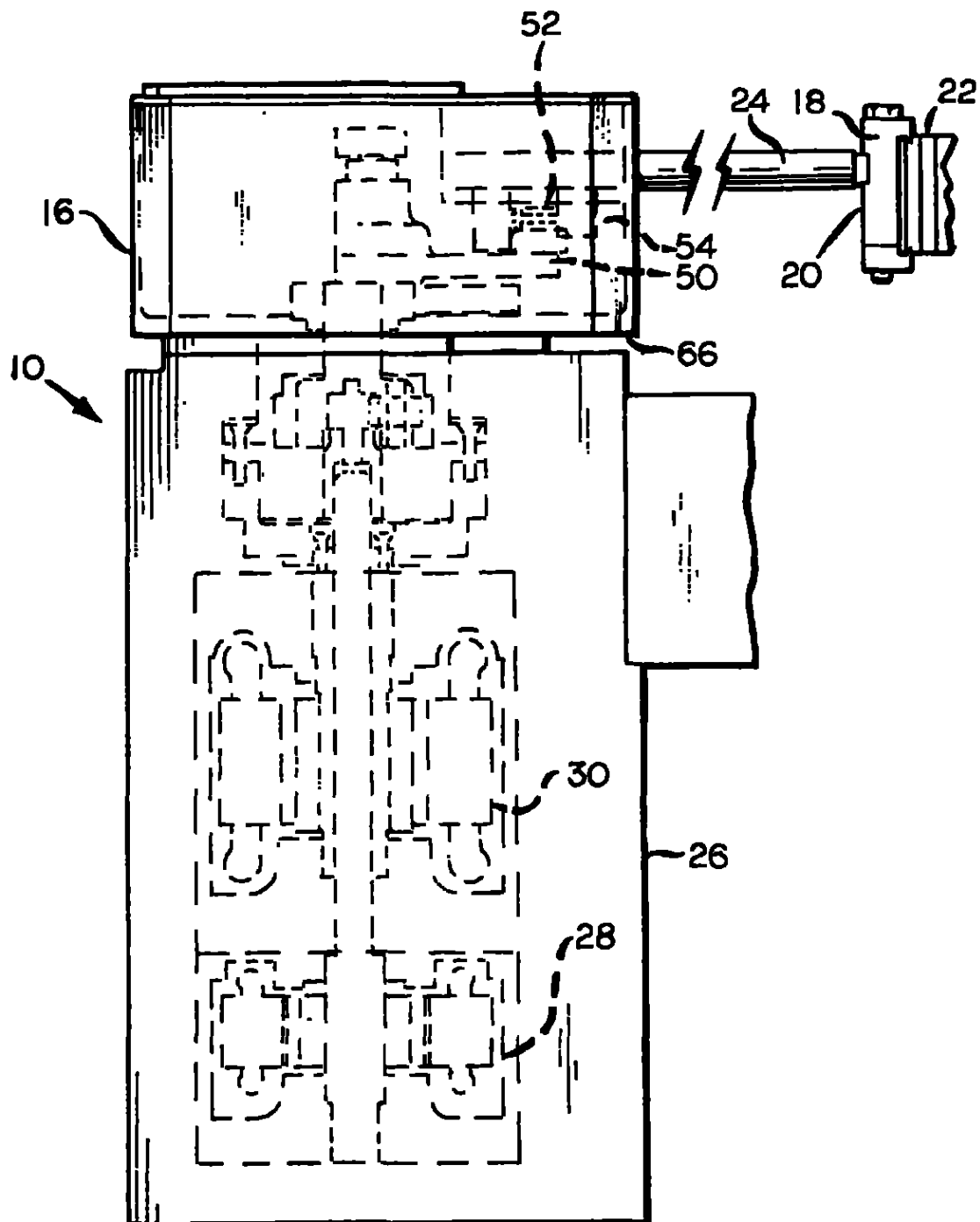


FIG. 2

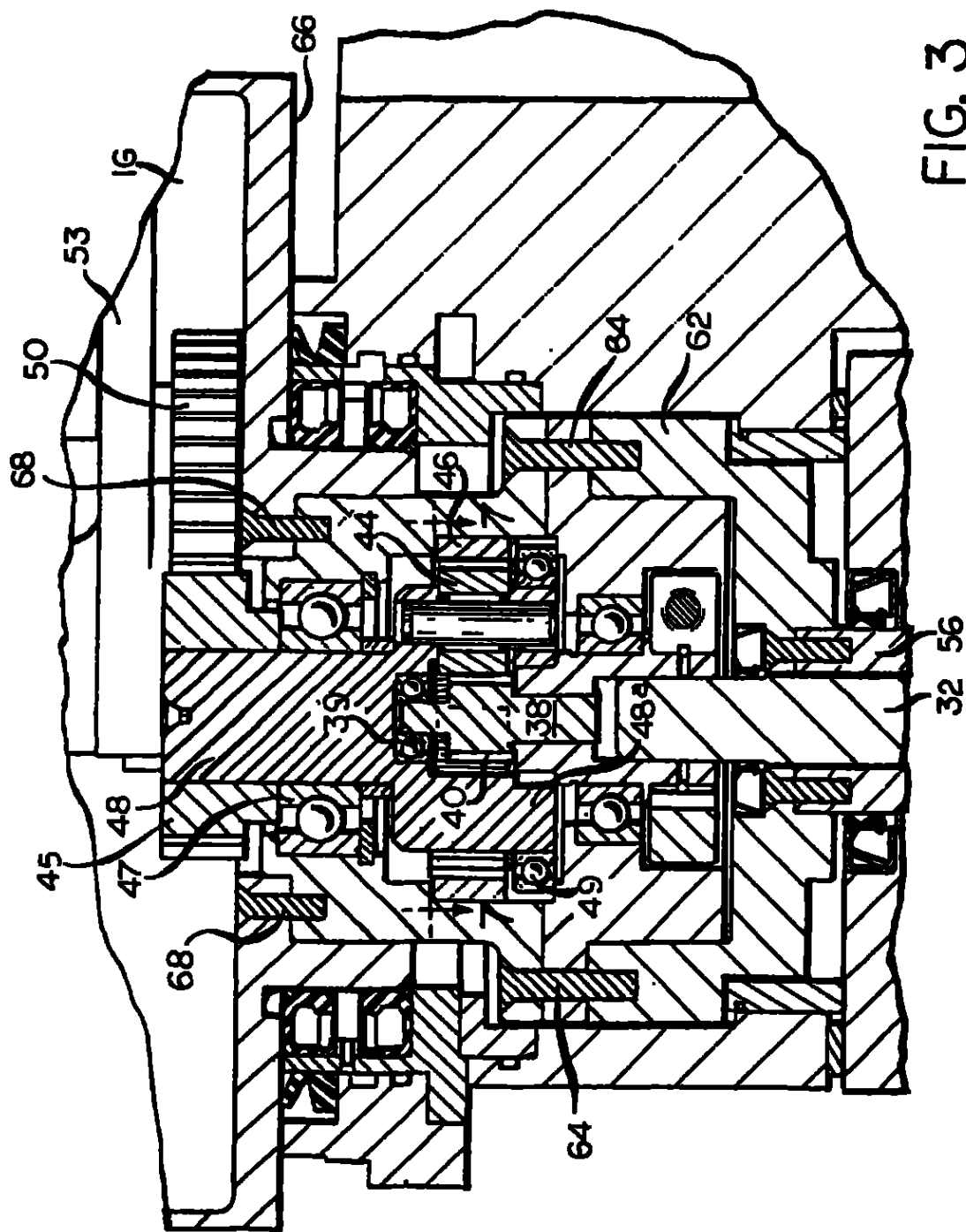


FIG. 3

101
2
6
1

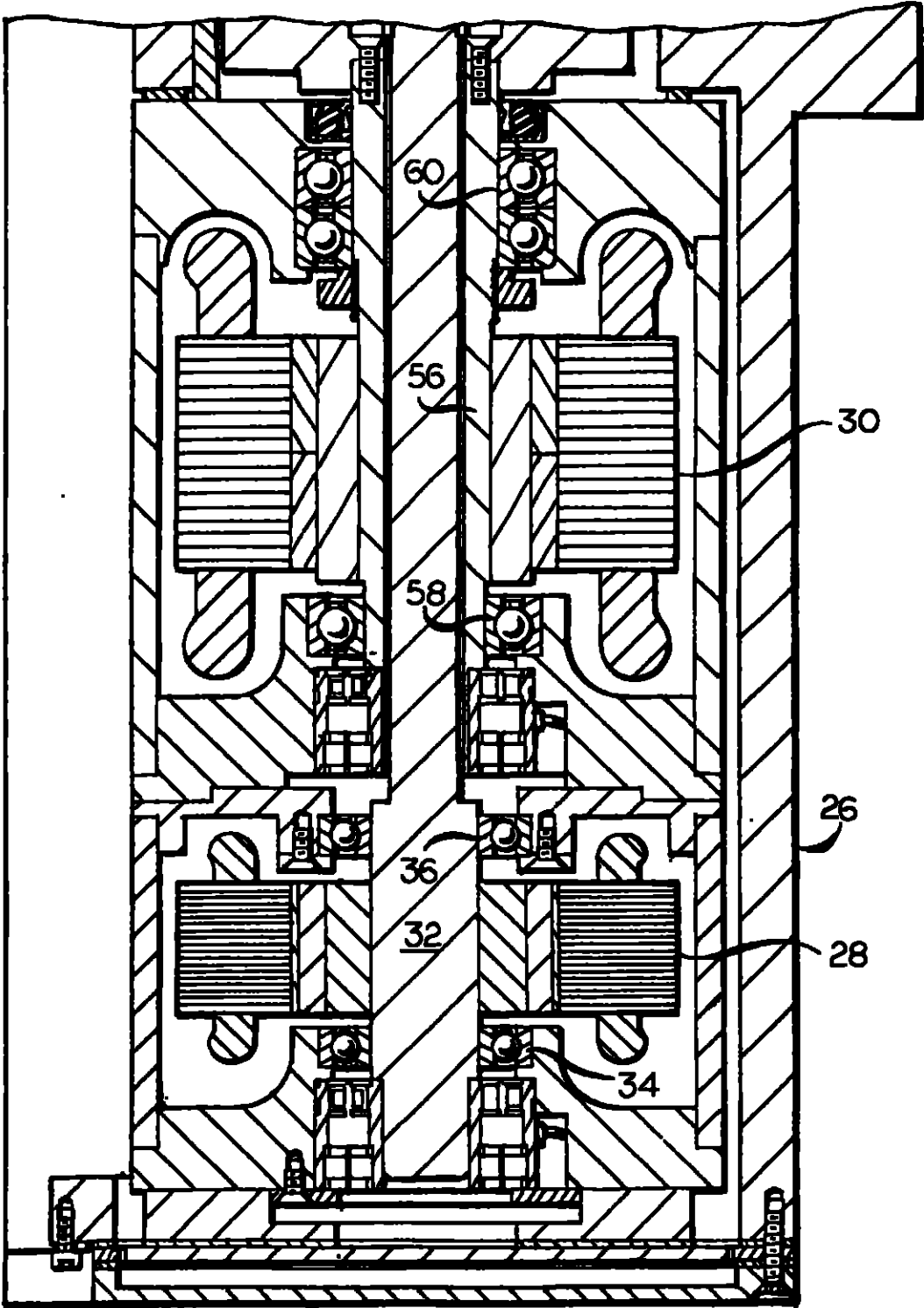
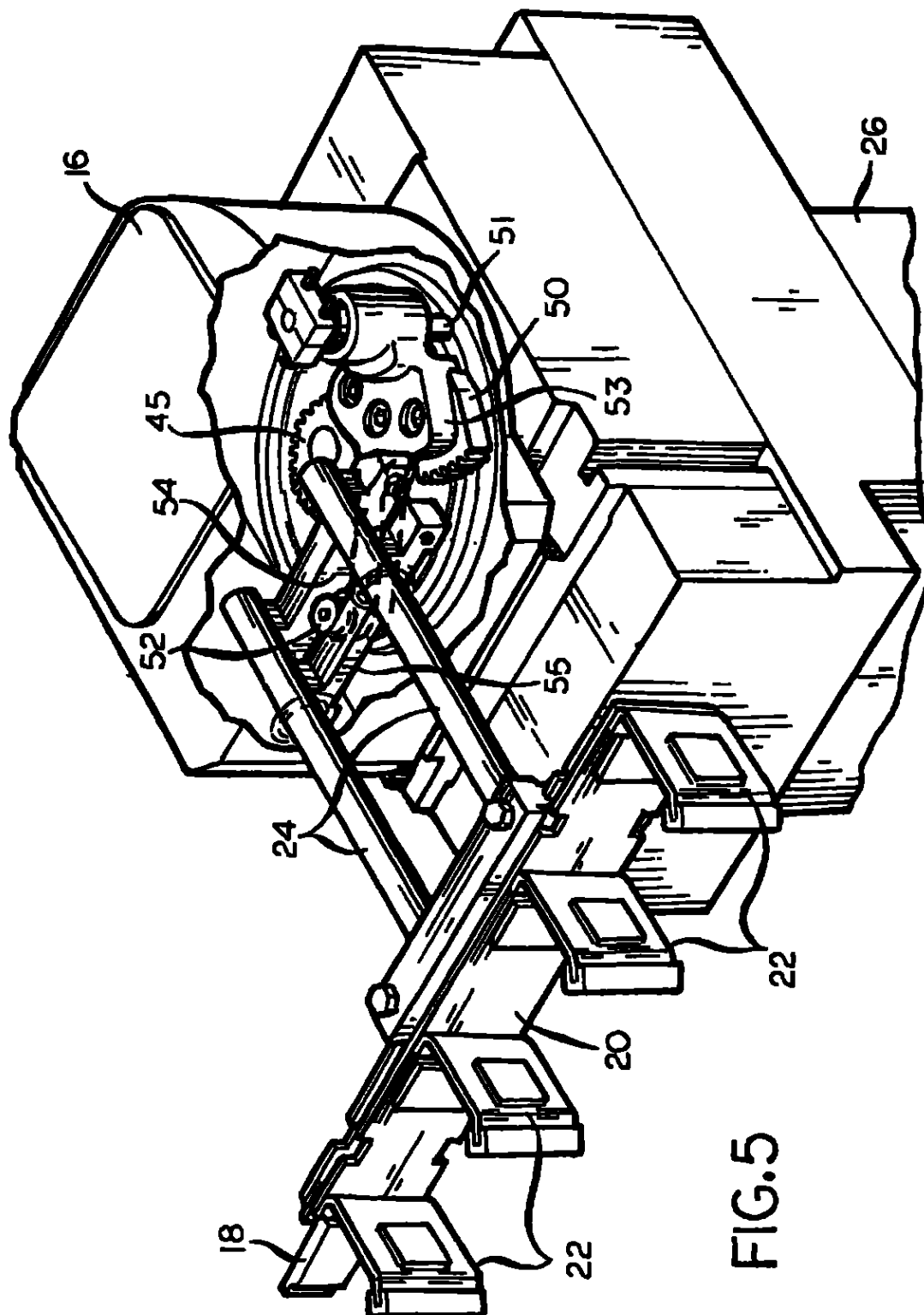


FIG. 4



104102

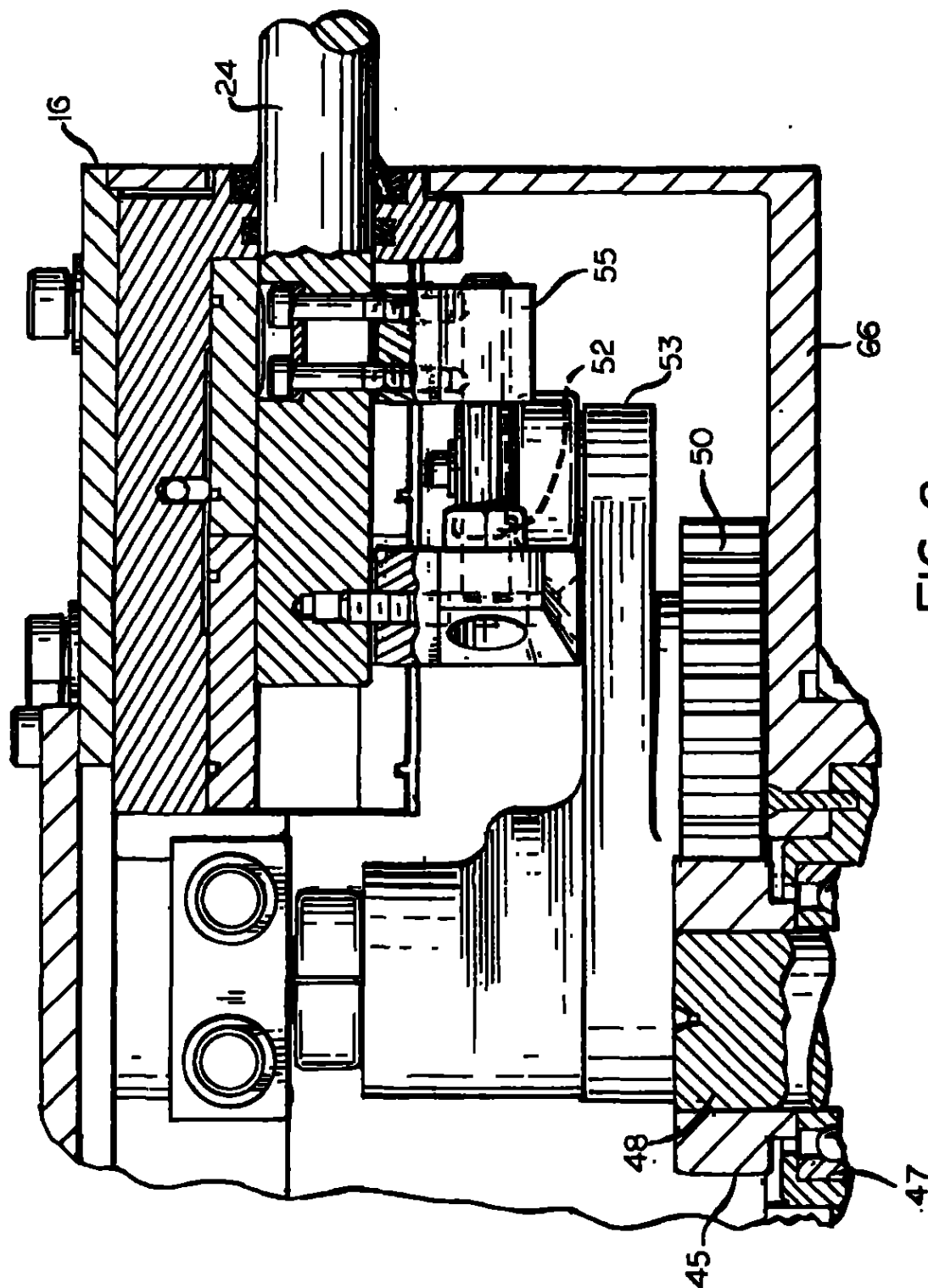


FIG. 6

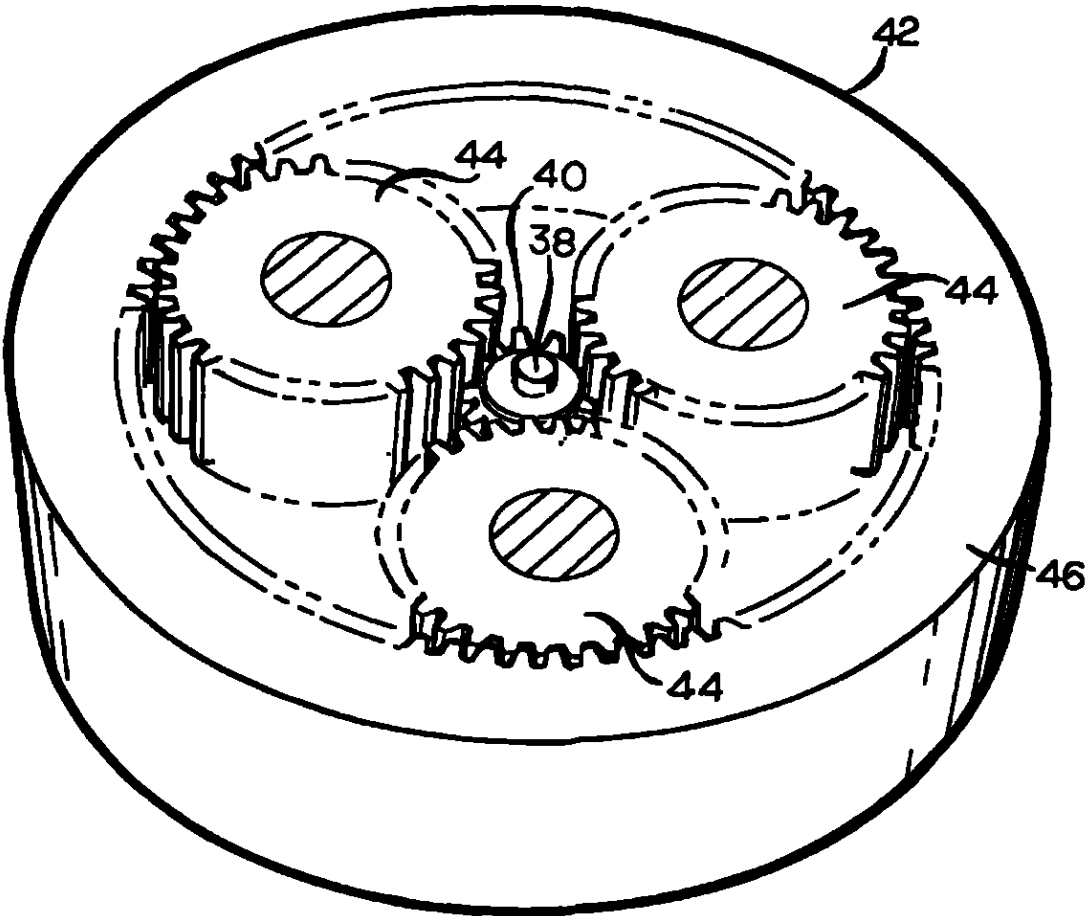


FIG. 7

103
104

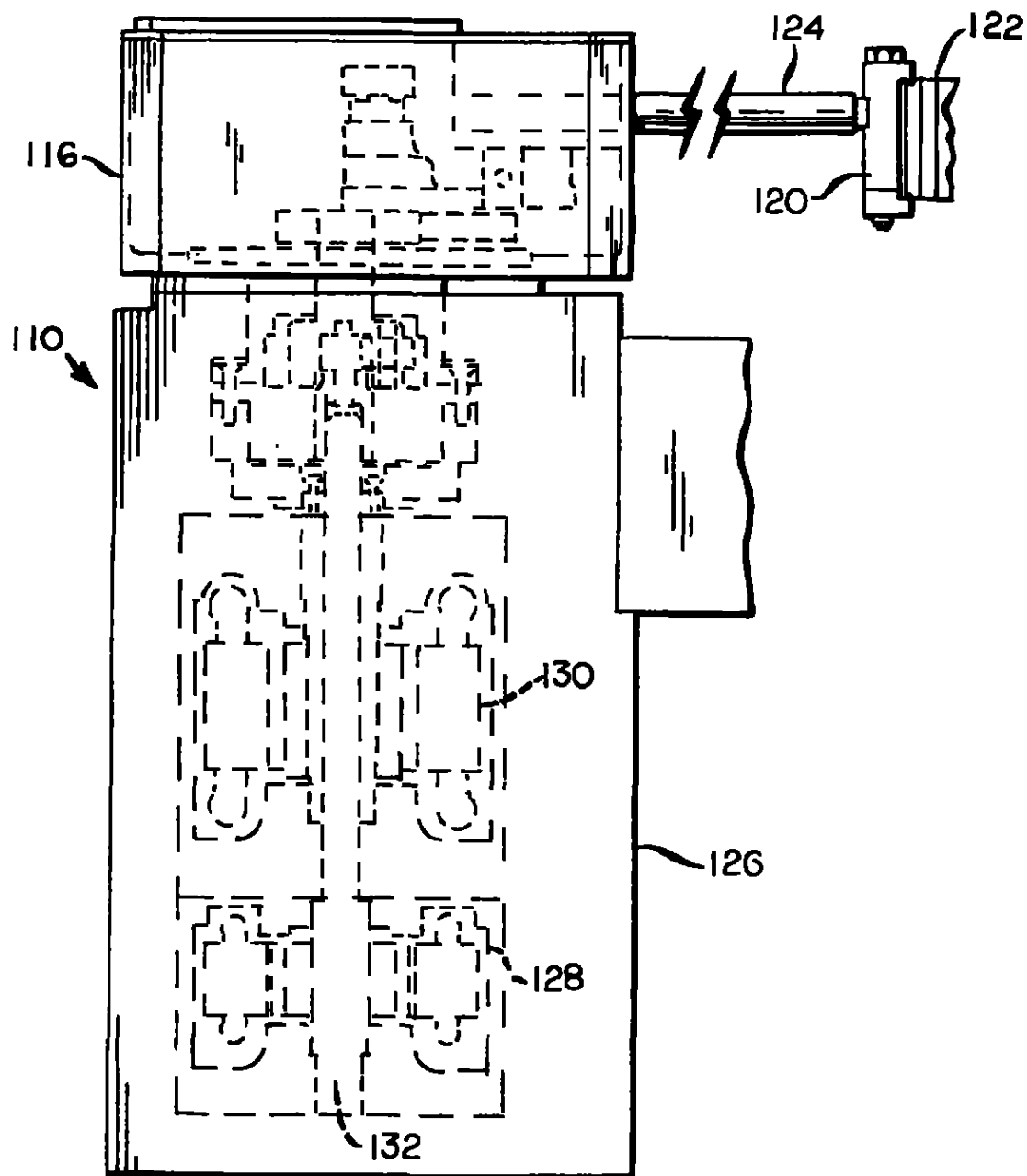


FIG. 8

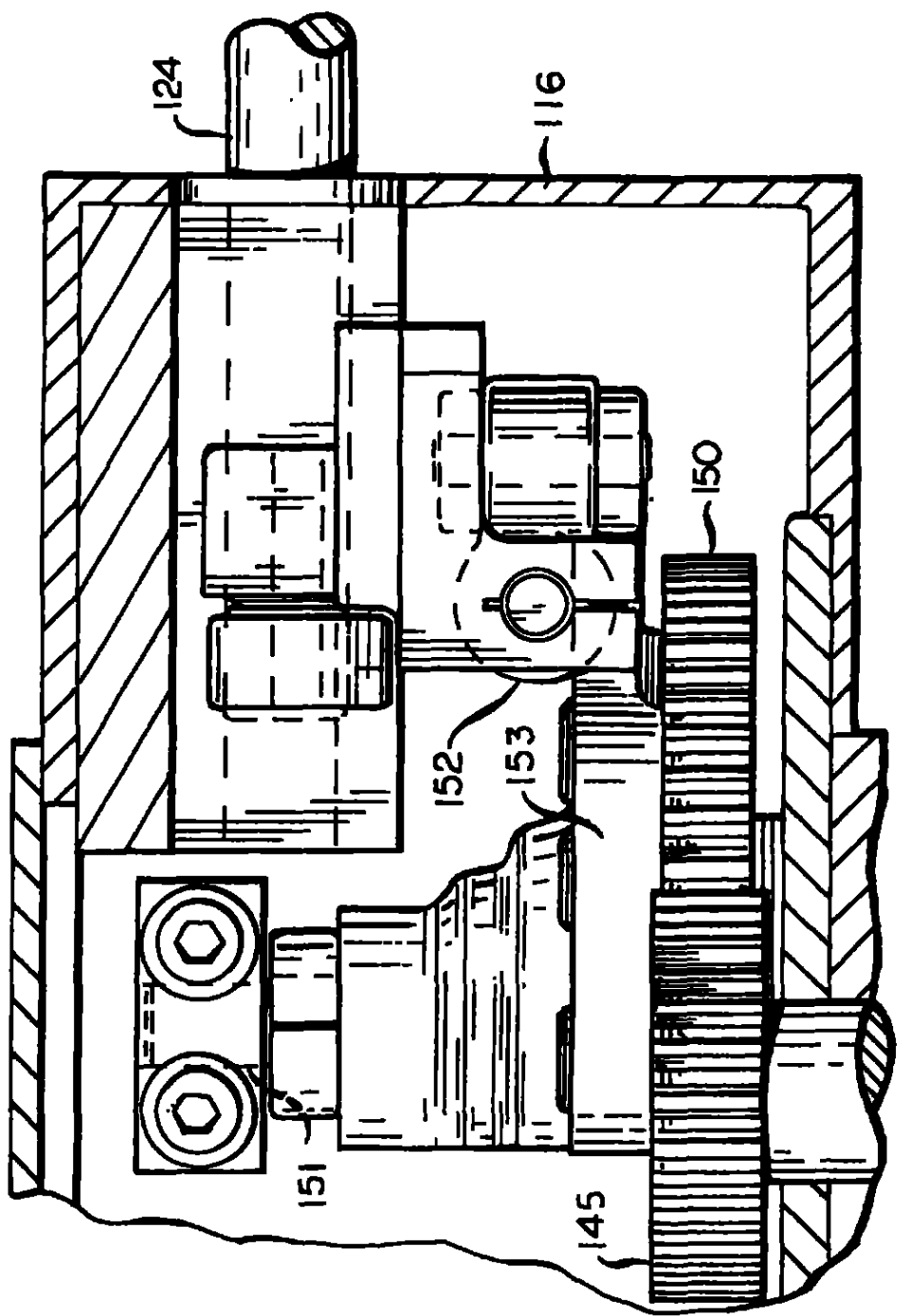


FIG. 9

106

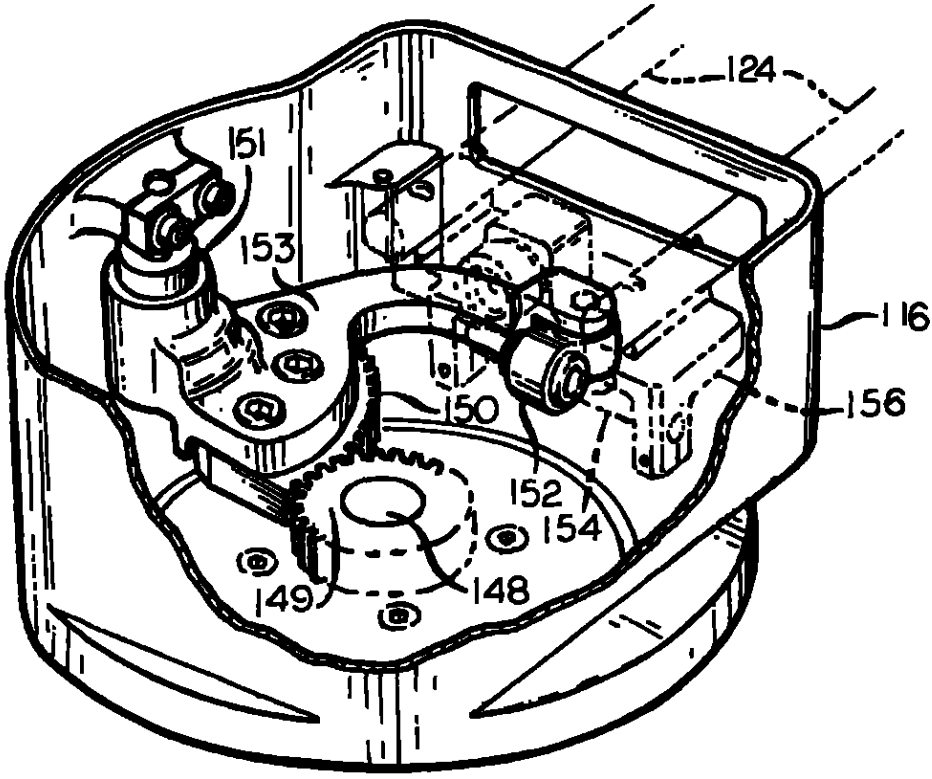


FIG. 11

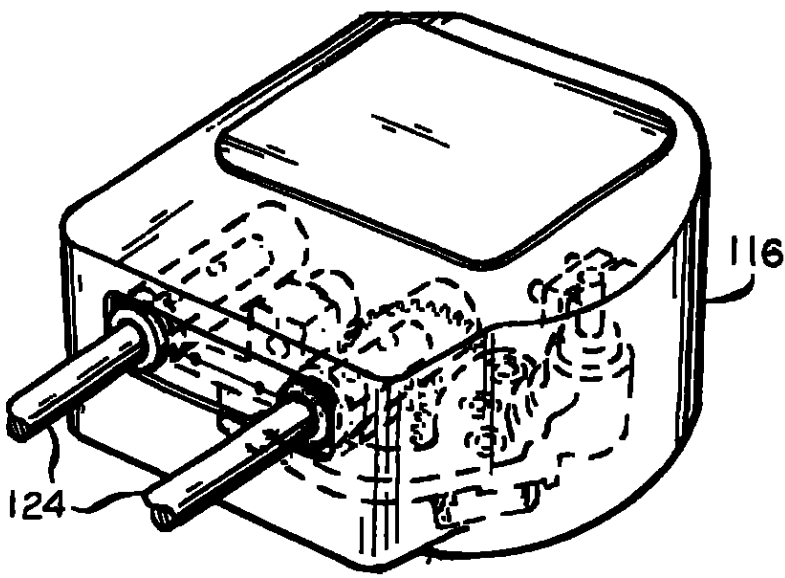


FIG. 10

METHOD OF AND APPARATUS FOR TRANSFERRING ARTICLES FROM A FIXED POSITION TO A MOVING CONVEYOR

FIELD OF THE INVENTION

This invention relates to a method of, and an apparatus for, transferring a multiplicity of aligned articles on a stationary member to the flight of a conveyor that is moving transversely of the alignment of the articles on the stationary member. More particularly, this invention relates to a sweepout for transferring a multiplicity of aligned, freshly-formed glass containers on a deadplate of a glass container forming machine of the I.S. (individual section) type to the upper flight of a conveyor for transferring the glass containers to an annealing lehr.

BACKGROUND OF THE INVENTION

As is explained in commonly-assigned U.S. Pat. No. 6,076,654 (Leidy), the disclosure of which is incorporated by reference herein, various devices and steps are involved in transferring freshly-formed glass containers from the deadplates of an I.S. machine to an annealing lehr for heat treatment of the containers. Among the devices employed in such a process is a sweepout device that is used to simultaneously transfer a plurality of aligned containers, usually two, three or four containers, from an I.S. machine deadplate to an upper moving flight of an endless machine conveyor.

Prior art I.S. machine sweepout devices are described, for example, in commonly-assigned U.S. Pat. No. 3,795,503 (Perry), U.S. Pat. No. 4,162,911 (Mallory), U.S. Pat. No. 4,199,344 (Mumford et al.), U.S. Pat. No. 4,222,480 (Perry), and U.S. Pat. No. 5,904,745 (Nafziger et al.), the disclosure of each of which is also incorporated by reference herein. As is disclosed in such references, or as is otherwise known, a typical I.S. machine sweepout head has a horizontally extending elongated bar with a plurality of spaced, horizontally extending fingers extending transversely from the elongated bar. Each finger defines, with the elongated bar, a generally L-shaped container receiving pocket.

Prime movers, heretofore usually pneumatic cylinders, provide dual motions to the head with the elongated bar and fingers that extend therefrom. The first of such motions is a reciprocating motion a first portion of which serves to move the elongated bar and its fingers from a position out of contact with containers on the deadplate into a position engaging the containers on the deadplate. The other motion is a 90° oscillating motion to the head, a first portion of which transfers the containers on the deadplate to the upper flight of the machine conveyor. Then, as a second portion of the reciprocating motion, the elongated bar and its fingers are retracted to a position out of engagement with containers on the machine conveyor to permit the containers to be conveyed away from the forming machine by the machine conveyor, and, as a second portion of the 90° oscillating motion, the head with the elongated bar with its fingers is returned to its original position to be ready to begin a repeat of the process. While pneumatic cylinders have heretofore usually used to power both required motions of a glass container sweepout head, U.S. Pat. No. 5,429,651 (Bolin), which specifically discloses a pneumatic device for actuating the reciprocating motion of the sweepout pusher mechanism, does disclose, in words only, at column 13, lines 45-50, that a stepping motor could also be used for such purpose. Further, U.S. Pat. No. 5,125,499 (Santhoff et al.) does teach the use of a stepping motor for powering the

oscillating motion of a sweepout head, but also teaches the use of a fluid motor for powering the reciprocation of the pusher arm.

The use of a pneumatic cylinder to power either the reciprocation or the oscillation of a sweepout head finger-carrying bar has certain operating disadvantages, however. Precise control over the timing of the reciprocation or oscillation of the pusher head is difficult to achieve, which creates problems in accurately timing the motion of the pusher head relative to other motions of an I.S. machine. Further, modification of either of the timing of the sweepout pneumatic cylinders is difficult to achieve, as is required, for example, when the machine is modified to produce larger or smaller containers, and it is difficult to control the speeds of a pneumatically-powered sweepout head at the beginning and end of its extension and retraction motions.

SUMMARY OF THE INVENTION

To overcome the aforesaid and other problems associated with prior art I.S. machine sweepouts, according to the present invention there is provided an all-electric sweepout. The sweepout of the present invention has a pair of vertically arranged, reversible electrical motors, each motor preferably an a.c. servo motor. The motors are coaxially aligned, and the output shaft of the lower motor, which provides reciprocating motion to the sweepout head through a planetary gear drive, extends through an annular output shaft of the upper motor, which imparts oscillating motion to the sweepout head. The output shafts of the lower and upper motors are rotatable with respect to one another. Because the installed positions of the upper and lower motors are fixed, the wiring for the motors need not have a pigtail to accommodate movement of a motor relative to a source of power, and oil lines for motor cooling, which is desired to permit prolonged operation in a hostile, high-temperature environment, need not have flexible components. Also positioning the motors below the sweepout head does somewhat reduce the temperatures to which the motors are exposed.

Accordingly, it is an object of the present invention to provide a method of and an apparatus for transferring a plurality of articles from fixed positions to a moving conveyor in which all required motions are powered by reversible electric motors whose positions are fixed. More particularly, it is an object of the present invention to provide a method and an apparatus of the foregoing character that is well-suited for operating in proximity to a glass container forming machine, where the operating temperatures can be somewhat higher than ambient.

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 DRAWING

FIGS. 1A, 1B, and 1C are fragmentary, perspective views of apparatus according to the present invention, each view illustrating the apparatus at a different position in a cycle of operation;

FIG. 2 is an elevation view, at an enlarged scale, of elements of the apparatus of FIGS. 1A, 1B, and 1C;

FIG. 3 is a fragmentary sectional view, at a further enlarged scale, of a portion of the apparatus of FIG. 2;

FIG. 4 is a view like FIG. 3 of another portion of the apparatus of FIG. 2;

FIG. 5 is a fragmentary perspective view, with a portion of the structure broken away, of the apparatus of FIGS. 2 and 3;

3

FIG. 6 is a sectional view taken on line 6—6 of FIG. 3;

FIG. 7 is a fragmentary perspective view, partly in cross-section, of a portion of the apparatus of FIGS. 2-6;

FIG. 8 is a view like FIG. 2 of an alternate embodiment of the present;

FIG. 9 is a view like FIG. 3 of a portion of the apparatus of FIG. 8;

FIG. 10 is a fragmentary perspective view of a portion of the apparatus of FIG. 8; and

FIG. 11 is a view like FIG. 10 with the portion of the apparatus depicted therein being turned by 180° and with a portion of the apparatus being broken away.

DETAILED DESCRIPTION OF THE INVENTION

Sweepout apparatus according to the present invention is indicated generally by the reference numeral 10 in FIGS. 1A, 1B, 1C and 2 of drawing. The sweepout apparatus 10 is used to simultaneously transfer an aligned plurality of freshly-formed glass containers C on a deadplate 12 of an I.S. machine to a moving upper flight of a takeout, (machine) conveyor 14. The containers C are then conveyed by the conveyor to an annealing lehr (not shown) for heat treatment of the containers C to relieve residual stresses therein, as is known in the art. The conveyor 14 extends transversely of the deadplate 12, and the transfer of the containers C from a deadplate 12 to the conveyor 14 requires that the containers C be transferred to the conveyor 14 and turned by 90° as they are transferred, to ensure that the containers C will be aligned with one another on the conveyor 14 as they were on the deadplate 12. To this end, the sweepout apparatus 10 is provided with a swivel portion 16 that is repeatedly oscillated through a 90° arc, including the motion from its FIG. 1A position to its FIG. 1C position. Further, the swivel portion 16 is provided with a sweepout head 18 that is repeatedly reciprocated, and the path of reciprocation of the sweepout head 18 includes movement from the position in FIG. 1A to the position in FIGS. 1B and 1C and then back to the position of FIG. 1A.

The sweepout head 18 includes an elongated, horizontally extending bar 20 with a plurality of spaced fingers 22 extending transversely from the bar 20. Each of the fingers 22 defines, with the bar 20, a pocket for receiving a container C, the number of fingers 22 extending from the bar 20 being the same as the number of containers C on the deadplate 12. The elongated bar 20 is mounted on spaced, horizontally extending rods 24 that are reciprocable with respect to the swivel portion 16, as will be hereinafter described more fully, to reciprocate the bar 20 of the sweepout head 18 from the position of FIG. 1A, where the containers C are not engaged in pockets of the sweepout head 18, to the position of FIGS. 1B and 1C, where the containers C are engaged in the pockets of the sweepout head 18. After the transfer of the containers C from the FIG. 1A position to the FIG. 1C position, the sweepout head 18 is retracted to permit the containers C to be conveyed away by the conveyor 14, and the swivel portion 16 of the sweepout apparatus 10 is then turned, in reverse, from its FIG. 1C position to its FIG. 1A position to begin a repeat of the sweepout cycle with a fresh array of containers C on the deadplate 12. As shown in FIGS. 1A, 1B, and 1C, the sweepout head 18 is provided with four container-receiving pockets, and this is the construction that is suited for an I.S. machine that simultaneously produces four containers at each I.S. machine section, a type of machine that is often described as a "quad" machine. Of course, it is also known that an I.S. machine can

4

also be adapted to simultaneously produce three containers at each I.S. machine section, a "triple gob" machine, or even two containers at each I.S. machine section, a "double gob" machine; in such cases, a sweepout apparatus 10 for a triple gob machine would have a sweepout head 18 with only three container-receiving pockets, and a sweepout apparatus 10 for a double gob machine would have a sweepout head with only two container-receiving pockets.

The sweepout apparatus 10 includes a stationary housing 26 that is positioned below and in alignment with the swivel portion 16. First and second reversible a.c. motors 28, 30, each preferably a servo motor for precise controllability, are positioned in vertical, coaxial alignment with each other within the housing 26. The motor 28, which is positioned beneath the motor 30, drives an output shaft 32, FIG. 4, which is rotatably supported in spaced bearings 34, 36. The output shaft 32 has a stub shaft 38 (FIG. 3) of a speed reduction planetary gear set 42 shrunk or otherwise inserted thereon, and the stub shaft 38, which is rotatably supported in a bearing 39, drives a sun gear 40 of the speed reduction planetary gear set 42. The planetary gear set 42 also has a spaced plurality of planetary gears 44, and the planetary gears 44, which are driven by the sun gear 40, engage an interior gear surface of a ring gear 46. The ring gear 46 is secured to the interior of a cup-shaped portion 48a of a shaft extension 48 that extends into the swivel portion 16 of the sweepout apparatus 10 and is rotatably supported in bearings 47, 49 for rotation relative to the swivel portion 16. The planetary gear set 42 serves to substantially reduce the rotational speed of the shaft extension 48 relative to that of the shaft 32, for example, by a 1:5 factor. Such a planetary gear set is available as a commercial item from Mectrol, Inc.

The shaft extension 48 carries a drive gear 45, and the drive gear 45 drives a sector gear 50 (FIG. 6). The sector gear 50 is mounted for pivoting motion in and relative to the head 16 about a shaft 51 (FIG. 5) and has an overlying arm 53 (FIGS. 3, 5 and 6) that pivots with the sector gear 50, and arcuate motion of the shaft extension 48, which is caused to oscillate by reversing motion of the motor 28, causes reversible motion of a follower 52 that extends from the arm 53 and rides in a slot 54 in a bracket 55 to which the rods 24 are attached. Thus, the reversing motion of the motor 28 is effective to cause the rods 24, with the bar 20 and the fingers 22, to extend and retract in unison to move between the positions shown in FIGS. 1A and 1B, and to do so with virtually no backlash.

The a.c. motor 30 has an output shaft 56, and the shaft 56 is rotatably supported in spaced-apart bearings 58, 60. The output shaft 56 is annular in configuration and the output shaft 32 passes through the interior of the output shaft 56 so that the output shaft 56 and the output shaft 32 are rotatable independently of each other.

As seen best in FIG. 3, an annular housing 62 is secured to the shaft 56 by threaded fasteners 64, and an integral bottom plate 66 of the swivel portion 16 of the sweepout apparatus 10 is secured to the annular housing 62 by threaded fasteners 68. Thus, reversible arcuate motion is imparted to the shaft 56 by the motor 30, and this motion is effective to oscillate the swivel portion 16 of the sweepout apparatus 10 between the position shown in FIGS. 1A and 1B and the position shown in FIG. 1C, and this motion is must be controlled relative to the extension and retraction motions imparted to the sweepout head 18 by the motor 28, as both are performed together to impart such extension and retraction motions to the sweepout head while the swivel portion 16 is oscillating.

The sweepout apparatus 10, as heretofore described, uses motors 28, 30 within a housing 26 that need not be moved

105

in service. Thus, wiring (not shown) to such motors may be stationary, thereby avoiding the need for flexible or extensible wiring to such motors in a relatively high temperature operating environment, and such wiring may be of a plug-in, quick disconnect type for rapid installation and removal of a sweepout apparatus 10 as a unit. Further, because the housing of the motors 28, 30 need not be moved in service, the motors 28, 30 may readily be oil cooled, as desired, because coolant inlet and outlet lines for such purposes need not be flexible. Further still, an electronic control unit, not shown, may, if desired, be mounted on the housing 26 and, if also desired, it too may be oil cooled, because inlet and outlet lines to and from it will require no flexible elements. In any case, positioning the motor 28, 30 below the head 16 will serve to somewhat reduce the temperatures to which the motor 28, 30 are exposed relative to that experienced by the head 16.

In the embodiment of FIGS. 8-11, elements that correspond at least in function to elements of the embodiment of FIGS. 1-7 are identified by a 100 series numeral, the last 2 digits of which are the same as the 2 digits of the embodiment of FIGS. 1-7.

The sweepout apparatus according to the embodiment of FIGS. 8-11 is indicated generally by the reference numeral 110 in FIG. 8 of the drawing. The sweepout apparatus 110, like the sweepout apparatus 10, is used to simultaneously transfer an aligned plurality of freshly-formed glass containers on a deadplate of an I.S. machine to a moving upper flight of a takeout (machine) conveyor, which transfers the containers to an annealinglehr (not shown) for heat treatment of the containers to relieve residual stresses therein, as known in the art. The sweepout apparatus 110 is provided with a swivel portion 116 that is repeatedly oscillated through a 90° arc, and the swivel portion 116 is provided with a sweepout head 118 that is repeatedly reciprocated, in the matter of the path of reciprocation of the sweepout head 16 of the embodiment of FIGS. 1-7.

The sweepout head 118 includes an elongated, horizontally extending bar 120 with a plurality of spaced fingers 122 extending transversely from the bar 120. The elongated bar 120 is mounted on spaced horizontally extending rods 124 that are reciprocatable with respect to the swivel portion 116, as will be hereinafter described more fully, to reciprocate the bar 120 of the sweepout head 118.

The sweepout apparatus 110 includes a stationary housing 126 that is positioned below and in alignment with the swivel portion 116. First and second reversible a.c. motors 128, 130, each preferably a servo motor for precise controllability, are positioned in vertical, coaxial alignment with each other within the housing 126. The motor 128, which is positioned beneath the motor 130, drives an output shaft 132.

The embodiment of FIGS. 8-11 differs from the embodiment of FIGS. 1-7 mainly in the construction illustrated in FIGS. 9-11, where a shaft extension 148 carries a drive gear 145, which drives a sector gear 150. The sector gear 150 is mounted for pivoting motion in and relative to the head 116 about a stub shaft 151 (FIG. 11) and has an overlying arm 153 that pivots with the sector gear 150. Arcuate motion of the shaft extension 148, which is caused to oscillate by reversing motion of the motor 128, causes reversible motion of a sleeve 152 that extends from the arm 153 and slidably surrounds a rod 154 that is mounted in a bracket 156, to which the rods 124 are attached. Thus, the reversing motion of the motor 128 is effective to cause the rods 124, with the bar 120 and the fingers 122, to extend and retract in unison

to move between the innermost and outermost positions of the bar 120, and to do so with virtually no backlash.

The sweepout apparatus 110, as heretofore described, uses motors 128, 130 within a housing 126 that need not be moved in service. Thus, wiring (not shown) to such motors may be stationary, thereby avoiding the need for flexible or extensible wiring to such motors in a relatively high temperature operating environment, and such wiring may be of a plug-end, quick disconnect type for rapid installation and removal of a sweepout apparatus 110 as a unit. Further, because the housing of the motors 128, 130 need not be moved in service, the motors 128, 130 may readily be oil cooled, as desired, because coolant inlet and outlet lines for such purposes need not be flexible. Further still, an electronic control unit, not shown, may, if desired, be mounted on the housing 126 and, if also desired, it too may be oil cooled, because inlet and outlet lines to and from it will require no flexible elements. In any case, positioning the motors 128, 130 below the head 116 will serve somewhat to reduce the temperatures to which the motors 128, 130 are exposed relative to that experienced by the head 116.

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 from the scope of the invention, such scope being limited by the terms of the following claims and the legal equivalents thereof.

We claim:

1. Sweepout apparatus for transferring a plurality of aligned articles on a member to a conveyor that extends transversely to the aligned articles on the member, said apparatus comprising:

a head with an elongated bar having a spaced plurality of fingers extending transversely therefrom, each finger defining, with the elongated bar, a pocket for receiving one of the articles, said head with said elongated bar being oscillatable through an arc of 90° to sweep the plurality of articles from the member to positions on the conveyor, the elongated bar being reciprocable to engage the articles on the member and to retract from the articles on the conveyor;

a first reversible electric motor for imparting oscillating motion to the head, said first reversible electrical motor being fixed in position during its operation and having an annular output shaft operatively engaging said head;

a second reversible electric motor for imparting reciprocating motion to the elongated bar with respect to said head, said second reversible electric motor being fixed in position during its operation and being in coaxial alignment vertically below said first reversible electric motor, said second reversible electric motor having an output shaft extending through said annular output shaft of said first reversible electric motor, said annular output shaft of said first reversible electric motor and said output shaft of said second reversible electric motor being rotatable relative to one another; and

a planetary gear transmission for imparting reciprocating motion from said output shaft of said second reversible electric motor to said elongated bar.

2. Sweepout apparatus according to claim 1 wherein each of said first reversible electric motor and said second reversible electric motor is an a.c. servomotor.

3. Sweepout apparatus according to claim 2 wherein: each of said plurality of aligned articles is a freshly-formed glass container;

7

said member is a deadplate of I.S. glass container forming machine; and

said conveyor is a machine conveyor in a glass container manufacturing plant.

4. Apparatus according to claim 3 wherein said planetary gear transmission comprises:

an annular sun gear operatively connected to said output shaft of said second reversible electric motor;

a circumferentially spaced-apart plurality of planetary gears engaging said sun gear; and

an annular ring gear surrounding and operatively engaging each of said plurality of planetary gears.

5. Apparatus according to claim 4 wherein:

said plurality of planetary gears consists of three planetary gears.

6. Apparatus according to claim 5 and further comprising:

a sector gear;

structure for mounting said sector gear for oscillating motion about an axis spaced from an axis of said second reversible electric motor;

a drive gear driven by said planetary gear set and coaxially aligned with said second reversible electric motor, said drive gear engaging said sector gear;

at least one reciprocable rod engaging said elongated bar;

a bracket to which said at least one elongated bar is attached, said bracket having a slot therein;

a link mounted coaxially with said sector gear for oscillation with said sector gear, said link having a free end spaced away from the axis of oscillation of said sector gear; and

a roller follower at said free end of said link and received in said slot of said bracket, oscillation of said sector gear and said link causing said bracket to reciprocate by virtue of engagement of said roller follower in said slot.

8

7. Apparatus according to claim 6 wherein:

said at least one reciprocable rod comprises a spaced-apart plurality of reciprocable rods.

8. The method of transferring a plurality of aligned articles on a member to a conveyor that extends transversely to the aligned articles on the member, the method comprising:

providing an elongated bar having a spaced plurality of fingers extending transversely therefrom, each finger defining, with the elongated bar, a pocket for receiving one of the articles, the elongated bar being oscillatable through an arc of 90° to sweep the plurality of articles from the member to positions on the conveyor and being reciprocable to retract from the articles on the conveyor;

providing a first reversible electric motor to impart oscillating motion to the elongated bar;

providing a second reversible electric motor for imparting reciprocating motion to the elongated bar, said second reversible electric motor being positioned in coaxial alignment with said first reversible electric motor;

operating said first reversible electric motor to impart oscillating motion to the elongated bar; and

operating said second reversible electric motor to impart reciprocating motion to said elongated bar.

9. The method according to claim 8 wherein:

each of the plurality of aligned articles on the member is a freshly-formed glass container;

the member is a deadplate of an I.S. glass container forming machine; and

the conveyor is a machine conveyor in a glass container manufacturing plant.

* * * * *

106
201



15. 77-875

AG 6000 1P 15 102

Brigard & Castro

BOGOTA - COLOMBIA

PODER

P WER F ATTORNEY

Yo (nosotros) OWENS - BROCKWAY GLASS CONTAINER INC.

I (We) OWENS - BROCKWAY GLASS CONTAINER INC.

domiciliado(s) en One SeaGate, Toledo Ohio 43686, Estados Unidos de América

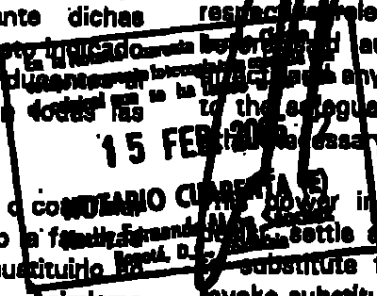
domiciled in One SeaGate, Toledo Ohio 43686, United States of America

Nombro(amos) a: JUAN PABLO CADENA SARMIENTO y/o BEATRIZ JARAMILLO y/o CARLOS H. PALACIO EASTMAN y/o HECTOR GOMEZ MEJIA, de Bogotá, Colombia, apoderados verdaderos y legales con poder especial, amplio y suficiente, para recabar de las oficinas y autoridades colombianas administrativas, judiciales y de policía, en cualquier instancia o recurso, la obtención de patentes de invención, registros de marcas, diseños industriales, modelos de utilidad, depósitos de nombres comerciales y enseñas, registros de derechos de autor y contratos sobre los mismos, obtención de certificados de obtentor de variedades vegetales, así como sus prórrogas, renovaciones, anotaciones de traspaso, cambios de nombre y/o domicilio; elaborar, tramitar y registrar contratos de licencia y licencias de cualesquiera clases; intervenir como demandante o como demandado en cualquier instancia y recurso ante cualquier juez, corporación, funcionario público o autoridad en acciones judiciales, administrativas y de policía tales como: oposiciones al registro de marcas; acciones de caducidad, cancelación y nulidad; acciones reivindicatorias, acciones derivadas de la obtención o explotación de licencias; acciones de competencia desleal; demandas penales; acciones de indemnización de perjuicios, reclamos y observaciones a solicitudes de patentes, diseños industriales, modelos de utilidad, en el ejercicio de medidas cautelares y en otras acciones o medidas similares.

Hereby appoints JUAN PABLO CADENA SARMIENTO and/or BEATRIZ JARAMILLO and/or CARLOS H. PALACIO EASTMAN and/or HECTOR GOMEZ MEJIA, of Bogotá, Colombia, my (our) true and lawful attorneys with special, ample and sufficient power to obtain from the Colombian administrative, judicial and police offices and authorities, in any instance, privileges of patents of invention, registration of trademarks, industrial designs and utility models; registration of commercial names and emblems, registration of copyright and contracts related thereto, certificates of obtainers of vegetable varieties, as well as extensions, renewals and recordal of assignments and changes of name and domicile related to the above; to prepare, prosecute and register licenses of any kind; to act as plaintiff or defendant in any instance or recourse, and before any judge, corporation, public official or authority in judicial, administrative and police actions, such as: oppositions to the registration of trademarks; caducity, cancellation and nullity actions; claim actions derived from the obtaining or exploitation of licenses, action of unfair competition; criminal proceedings, actions for payment of damages; claims or observations on patent applications, models, industrial designs and utility models; in the exercise of preventive measures and in other actions or similar proceedings.

A este efecto, lo(s) faculto(amos) para elevar solicitudes, formular descripciones, enmiendas, protestas, declaraciones, oposiciones, cancelaciones, nulidades, apelaciones y reclamos; pagar impuestos, cuotas y gravámenes prescritos por la ley; renunciar o desistír a derechos concedidos o en curso de concesión; recibir toda clase de documentos y valores, dando el descargo respectivo, y, en general, para dar ante dichas autoridades todos los pasos necesarios al efecto indicado y tomar todas las medidas que creyeran conducentes al resguardo de mis (nuestros) intereses, con todas las demás facultades legales necesarias.

To that effect they hereby empowered to file applications, formulate descriptions, amendments, protests, declarations, oppositions, cancellations, nullities, appeals and claims; to pay taxes, quotas and assessments prescribed by law, renounce or waive the rights granted or in the process of granting; to receive all kind of documents and valuables, giving the respective release of receipt, and, in general, to take before the authorities the necessary steps to such effect, and any measures that they may deem pertinent to the safeguard of my (our) interest(s) with all the necessary legal powers.



Este poder comprende la facultad de ratificar o confirmar en mi (nuestro) nombre lo actuado así como la facultad de desistír, transigir, comprometer, y la de sustituirlo en todo o en parte y revocar sustituciones. Asimismo nombro(amos) a: JUAN PABLO CADENA SARMIENTO y/o BEATRIZ JARAMILLO y/o CARLOS H. PALACIO EASTMAN y/o HECTOR GOMEZ MEJIA, domiciliado(s) en la Carrera 7 No. 16-56 Piso 9, mis (nuestros) apoderados en Colombia, con facultades para recibir notificaciones y designar apoderados judiciales o extrajudiciales.

This power includes the faculty to ratify or confirm in my (our) name the acts and compromise on my (our) behalf, and to substitute this power in whole or in part and to revoke substitutions. At the same time I (We) hereby appoints JUAN PABLO CADENA SARMIENTO and/or BEATRIZ JARAMILLO and/or CARLOS H. PALACIO EASTMAN and/or HECTOR GOMEZ MEJIA, domiciled in Carrera 7 No. 16-56, Piso 9, my (our) attorney(s) in fact, with powers to receive notifications and to designate judicial and extrajudicial attorneys.

Otorgado y firmado en

Granted and signed in PERRYSBURG, OHIO

hoy de de 200_

this 2 day of DEC. 2004

Firma
Nombre
Cargo

Signature
Name
Title

ROBERT E. LACHMILLER
VICE-PRESIDENT

CERTIFICADO NOTARIAL (SOCIEDAD)

NOTARIAL CERTIFICATE (CORP RAYON)

Hoy de
personalmente compareció ante mí

a quien conozco, y de quien me consta que firmó el anterior documento, debidamente juramentado declaró y dijo que él (ella) es

de OWENS - BROCKWAY GLASS CONTAINER INC

Sociedad legalmente constituida para un período de duración que aún no ha terminado; que el declarante está autorizado por dicha compañía para conferir este poder; que el sello estampado por él al pie de tal poder, en nombre y representación de la expresada compañía, es el sello oficial de ella; y que el objeto para el cual se confiere este instrumento está comprendido dentro del objeto social de la sociedad.

El suscrito Notario hace constar que tuvo a la vista las pruebas de la existencia de la sociedad.

Estado de
con fecha

y que quien confiere el presente poder es su representante.

Notario Público (sello)

CERTIFICADO NOTARIAL
PERSONA NATURAL

Hoy,
ante mí

de

de

compareció (person) C. C. C.

Notario Público (sello)

LEGALIZACION POR APOSTILLA ES REQUERIDA.

On this 2 day of DECEMBER 2004 I personally appeared before me

ROBERT E. LACHMILLER

to me known, and known to me to be the person who signed the foregoing instrument who being by me duly sworn did depose and say that he (she) is the

VICE-PRESIDENT

of OWENS - BROCKWAY GLASS CONTAINER INC

Which is legally constituted for a term not yet expired, that deponent is authorized by said Company to confer this Power of Attorney: that the seal affixed hereunto by the deponent in the name and on behalf of said Corporation is the corporate seal thereof; and that the purpose for which this instrument is granted is included within the corporate purpose of company.

The undersigned Notary Public attests that he has seen the documents that prove the existence of the company.

State of Ohio
under date of 12-2-04

and that he (she) who grants the power of attorney is its Representative

ROBIN S. RAYNER
Notary Public, State of Ohio
My Commission Expires 02/28/2007

NOTARIAL CERTIFICATE
NATURAL PERSON

day of

of

Notary Public (Seal)

LEGALIZATION BY APOSTILLE IS REQUIRED.

APOSTILLE

(Convention de la Haye du 5 octobre 1961)

1. Country: United States of America

This public document

2. has been signed by REBECCA E. BHAER

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

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

CERTIFIED

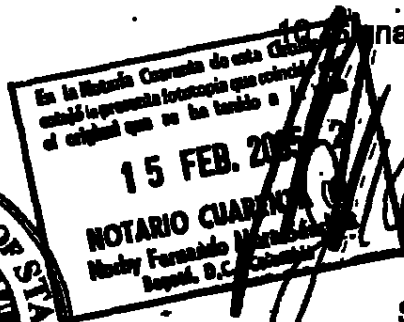
5. at Columbus, Ohio

6. December 20, 2004

7. by the Secretary of State of Ohio.

8. No. 200417

9. Seal/Stamp:



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.

172116

CERTIFICATE OFFICIAL CHARACTER

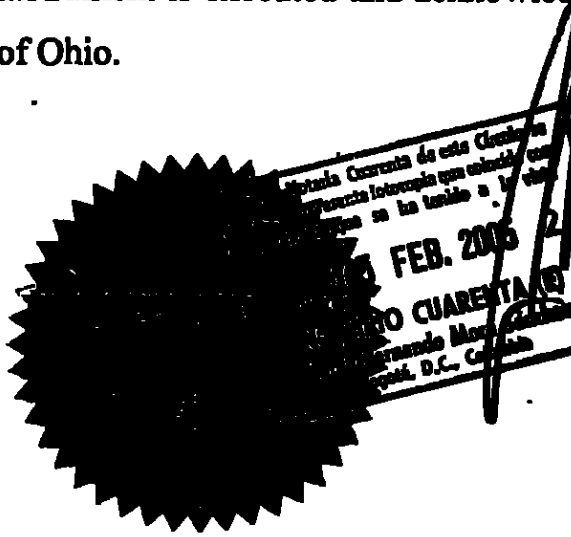
THE STATE OF OHIO

WOOD COUNTY

COMMON PLEAS COURT

I, THE UNDERSIGNED Clerk of the Court of Common Pleas, a Court of Law and Record of said County, do hereby certify that **ROBIN S. RAYNER** before whom the annexed instrument was taken and whose name is subscribed in the certificate of proof thereof, was, at the time of taking the same, a Notary Public in and for said County, duly sworn and acting as such, and authorized to take the same that had authority to take the proofs and acknowledgments of deeds to be recorded in the State; that the impression of HIS/HER official seal is not required by the laws of the State of Ohio to be filed in my office; and that HIS/HER commission expires FEBRUARY 17, 2008. And further that I am well acquainted with HIS/HER handwriting, and verily believe the signature thereto to be HIS/HER genuine signature; and further, that the annexed instrument is executed and acknowledged according to the laws of the State of Ohio.

In Testimony Whereof, I hereunto subscribe my name and affix the seal of said Court at Bowling Green, Ohio, this 8th day, of December, 2004.



Rebecca E. Bhaer
Rebecca E. Bhaer
Clerk of Courts, Wood County, OH

111 M
TRADUCCION OFICIAL NO. 033/2004.-

TRADUCCION DE LOS SELLOS QUE SE ENCUENTRAN EN EL PODER
OTORGADO POR OWENS - BROCKWAY GLASS CONTAINER INC., COMPAÑIA
DOMICILIADA EN ONE SEA GATE, TOLEDO OHIO 43666, ESTADOS
UNIDOS DE AMERICA, A LOS DOCTORES JUAN PABLO CADENA SARMIENTO
Y/O BEATRIZ JARAMILLO Y/O CARLOS H. PALACIO EASTMAN Y/O
HECTOR GOMEZ MEJIA. -

OTORGADO Y FIRMADO EN PERRYSBURG, OHIO, A LOS 2 DIAS DEL MES
DE DICIEMBRE DE 2004.

FIRMADO: ROBERT E. LACHMILLER, VICEPRESIDENTE

CERTIFICADO NOTARIAL (SOCIEDAD)

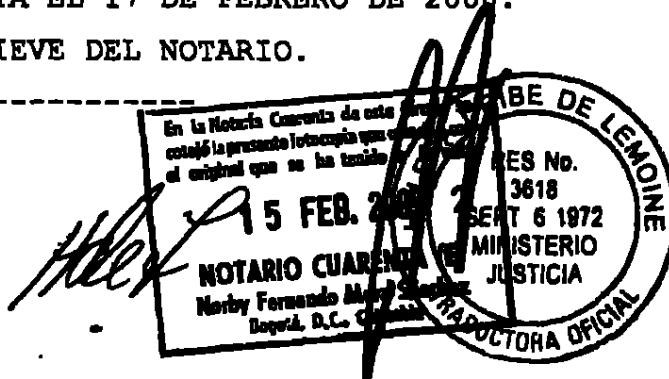
EL DIA 2 DE DICIEMBRE DE 2004 PERSONALMENTE COMPARECIÓ ANTE
MI ROBERT E. LACHMILLER, VICEPRESIDENTE DE OWENS - BROCKWAY
GLASS CONTAINER INC., UNA SOCIEDAD LEGALMENTE CONSTITUIDA
PARA UN PERIODO DE DURACIÓN QUE AUN NO HA TERMINADO; QUE EL
DECLARANTE ESTA AUTORIZADO POR DICHA COMPAÑIA PARA CONFERIR
ESTE PODER; QUE EL SELLO ESTAMPADO POR EL AL PIE DE TAL
PODER, EN NOMBRE Y REPRESENTACIÓN DE LA EXPRESADA COMPAÑIA,
ES EL SELLO OFICIAL DE ELLA; Y QUE EL OBJETO PARA EL CUAL SE
CONFIERE ESTE INSTRUMENTO ESTA COMPRENDIDO DENTRO DEL DE LA
SOCIEDAD. EL SUSCRITO NOTARIO HACE CONSTAR QUE TUVO A LA
VISTA LAS PRUEBAS DE LA EXISTENCIA DE LA SOCIEDAD.

ESTADO DE OHIO, EL 2 DE DICIEMBRE, 2004.

Y QUE QUIEN CONFIERE EL PRESENTE PODER ES SU REPRESENTANTE.

FIRMADO: ROBIN S. RAYNER, NOTARIO PUBLICO, ESTADO DE OHIO,
CON COMISIÓN HASTA EL 17 DE FEBRERO DE 2008.

HAY SELLO EN RELIEVE DEL NOTARIO.



CERTIFICADO CON CARÁCTER OFICIAL
ESTADO DE OHIO – CONDADO DE WORD
TRIBUNAL DE ASUNTOS COMUNES

El suscrito funcionario de la Corte de Asuntos Comunes, una Corte de Derecho y Registro de dicho Condado, por medio del presente certifico que ROBIN S. RAYNER ante quien se celebró el anterior documento y cuyo nombre figura en el certificado de prueba era, en el momento de ejecutar dicho acto, Notario Público en y para dicho Condado, debidamente juramentado y autorizado para celebrar dicho acto. Que la ley del Estado de Ohio no exige que su sello sea registrado en este despacho; y que su comisión expira el 17 de Febrero de 2008. Certifico además que estoy familiarizado con la firma de dicho Notario Público y creo que la firma en el documento es la suya; y además, certifico que el instrumento adjunto ha sido ejecutado y reconocido de conformidad con las leyes del Estado de Ohio.

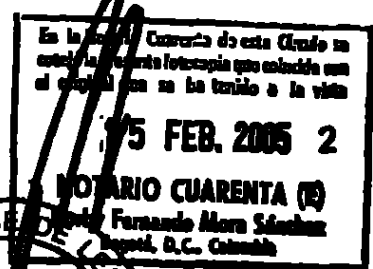
En testimonio de lo anterior, firmo y suscribo mi nombre y coloco el sello de la Corte en la ciudad de Bowling Green, Ohio, a los 8 días del mes de Diciembre del año 2004.

FIRMADO: REBECCA E. BHAER

SECRETARIO DE LAS CORTES, CONDADO DE WOODS, OHIO.

HAY SELLO EN RELIEVE DE LA CORTE

Hele V



113

APOSTILLA

CONVENIO DE LA HAYA DEL 5 DE OCTUBRE DE 1961

1. PAIS: ESTADOS UNIDOS DE AMERICA
EL PRESENTE DOCUMENTO PUBLICO
2. HA SIDO FIRMADO POR: REBECCA E. BHAER
3. ACTUANDO EN SU CAPACIDAD DE: SECRETARIO DE LA CORTE DE
ASUNTOS COMUNES
4. LLEVA FIRMA Y SELLO DE: CORTE DE ASUNTOS COMUNES, ESTADO DE OHIO.

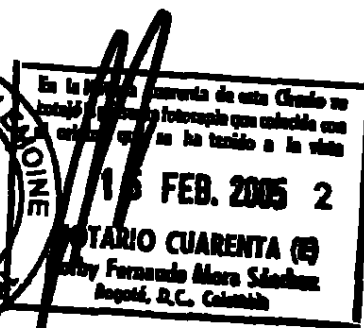
- CERTIFICADO

5. EN: COLUMBUS, OHIO
6. EL: 20 DE DICIEMBRE, 2004
7. POR: EL SECRETARIO DE ESTADO DE OHIO
8. BAJO EL NO.: 200417
9. SELLO: SECRETARIO DE ESTADO DE OHIO
10. FIRMADO: J. KENNETH BLACKWELL, SECRETARIO DE ESTADO DE OHIO

LA TRADUCTORA OFICIAL

Helena Uribe de Lemoine

HELENA URIBE DE LEMOINE



REQUISITOS NECESARIOS PARA PRESENTACION Y AGILIZACION DEL
TRAMITE

	USUARIO	RADICADOR
PATENTE DE INVENCION ✓	()	(✓)
MODELO DE UTILIDAD	()	()
- Indicación de que se solicita la concesión de una patente.	()	(✓)
- Datos de identificación del solicitante o de la persona que se presenta la solicitud.	()	(✓)
- Descripción de la invención.	()	(✓)
- Dibujos de ser estos pertinentes. ✓	()	(✓)
- Comprobante de Pago de las tasas establecidas.	()	()

COMPLETA () INCOMPLETA ()

DISEÑO INDUSTRIAL ()

- Indicación de que se solicita el registro de Diseño Industrial	()	()
- Datos de identificación del solicitante o de la persona que presenta la solicitud.	()	()
- Representación gráfica o fotográfica del Diseño Industrial o muestra del Material que incorpora el diseño.	()	()
- Comprobante de pago de las tasas establecidas	()	()

COMPLETA () INCOMPLETA ()

ESQUEMA DE TRAZADO ()

- Indicación de que solicita el registro de un Esquema de trazado.	()	()
- Datos de identificación del solicitante o de la persona que presenta La solicitud.	()	()
- Representación gráfica del esquema de trazado	()	()
- Comprobante de pago de las tasas establecidas.	()	()

COMPLETA () INCOMPLETA ()

Firma Responsable: Claudia M. Nava

Fecha:

Folio _____

2020
Bogotá DC

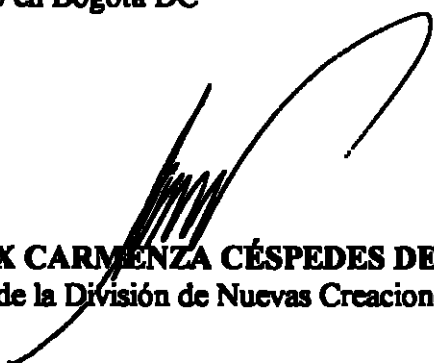
Doctor
JUAN PABLO CADENA SARMIENTO
Apoderado
OWENS-BROCKWAY GLASS CONTAINER INC.

REFERENCIA:	Radicación No.	05-19559
	Solicitud Internacional	PCT/US2003/027702
	Fecha inicio fase nacional	04-04-2005
	Trámite	011
	Evento	379
	Actuación	416
	Oficio No.	404
	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 la Decisión 486 de la Comisión de la Comunidad Andina, el Tratado de Cooperación en Materia de Patentes (PCT), el Reglamento y la Circular Única de la Superintendencia de Industria y Comercio, se envía el extracto de la solicitud a la Oficina de Comunicaciones para efecto de su publicación en la Gaceta de Propiedad Industrial.

Cúmplase
Dado en Bogotá DC

04 ABR 2005


ALIX CARMENZA CÉSPEDES DE VERGEL
Jefe de la División de Nuevas Creaciones

202030