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SUPERINDUSTRIA Y COMERCIO

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Señores

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO**DIVISION DE NUEVAS CREACIONES****E. S. D.**REF: Expediente No.00 090.628 - Solicitud de Patente
a favor de OWENS - BROCKWAY GLASS CONTAINER INC.Titulada: APARATO Y METODO PARA CONTROLAR EL FLUJO DE
VIDRIO FUNDIDO A TRAVES DE UN ANTEHOGAR

RAMIRO CASTRO DUQUE, vecino de Bogotá, portador de la tarjeta profesional No. 1003, obrando como apoderado de la Sociedad OWENS - BROCKWAY GLASS CONTAINER INC., según lo acredita el documento de poder presentado en esa División, para dar cumplimiento al requerimiento notificado por fijación en lista de fecha 15 de Febrero de 2001, y de acuerdo con el Artículo 39 de la Decisión 486 de la Comunidad Andina, me permito anexar al presente escrito los siguientes documentos:

1. Documento de cesión de derechos sobre la invención a favor del solicitante, debidamente apostillado.
2. La dirección del solicitante es:
One Sea Gate, Toledo, Ohio 43666, Estados Unidos de América.
3. Dibujos formales.
4. Extracto para Publicación y Tarjeta de Archivo Temático.
5. Artes finales (2 de 12 cm X 12 cm y 1 de 6 cm X 6 cm).
6. Copia certificada por la Oficina de Patentes de los Estados Unidos de la primera solicitud presentada para la misma invención, de la cual REIVINDICAMOS PRIORIDAD, junto con su correspondiente traducción del inglés al castellano.

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Del señor Jefe atentamente,

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Santafé de Bogotá, Abril 05, 2001

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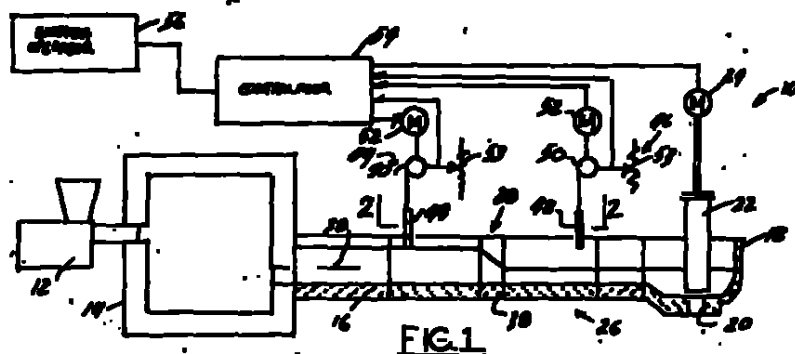
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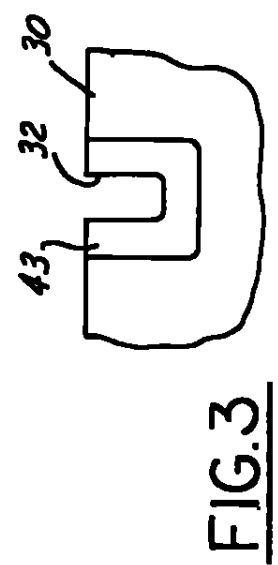
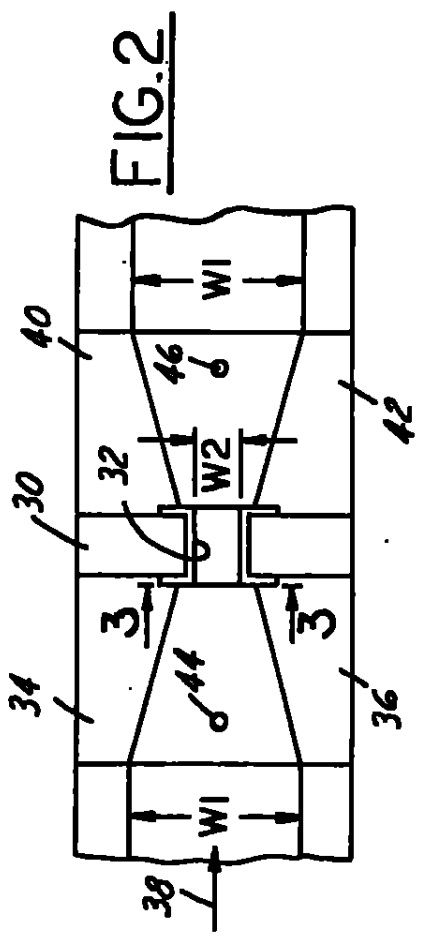
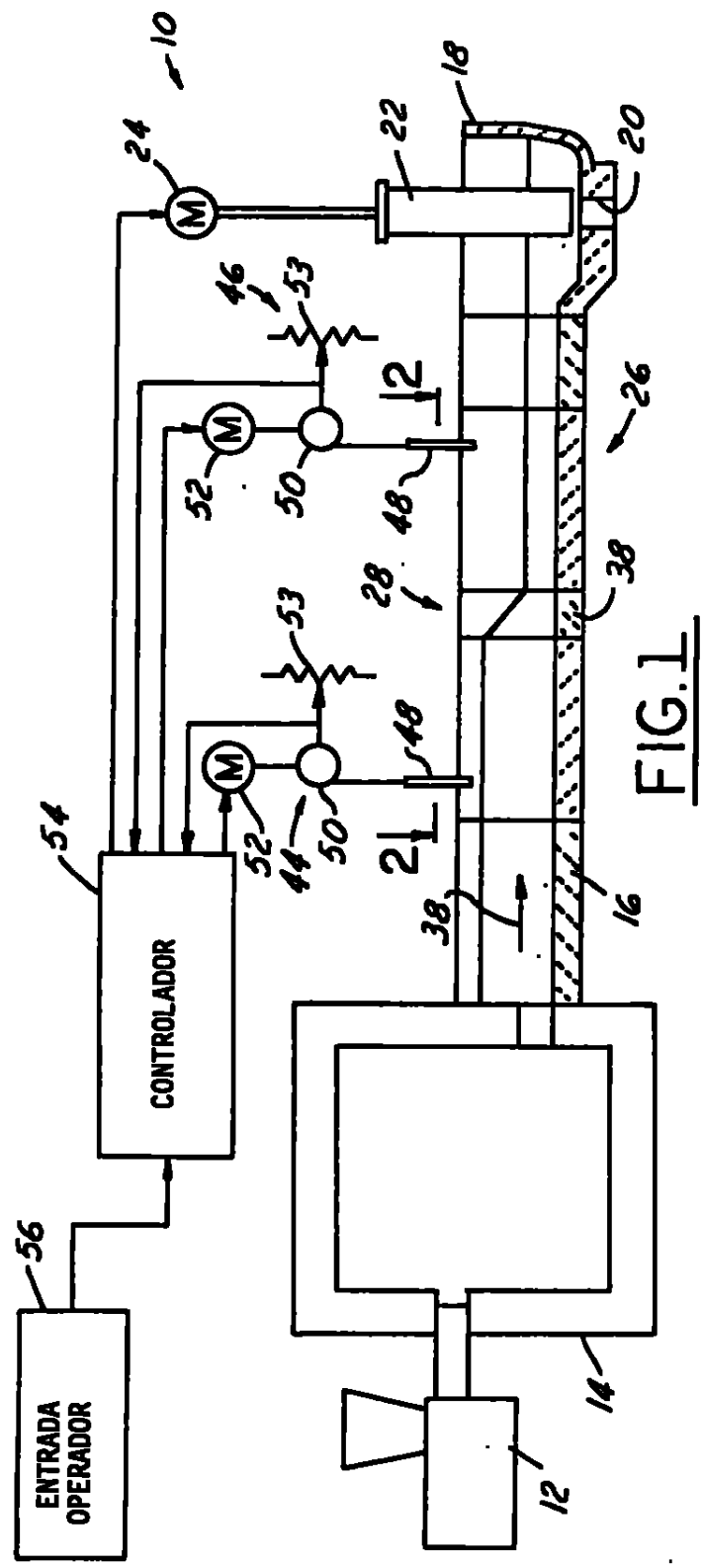
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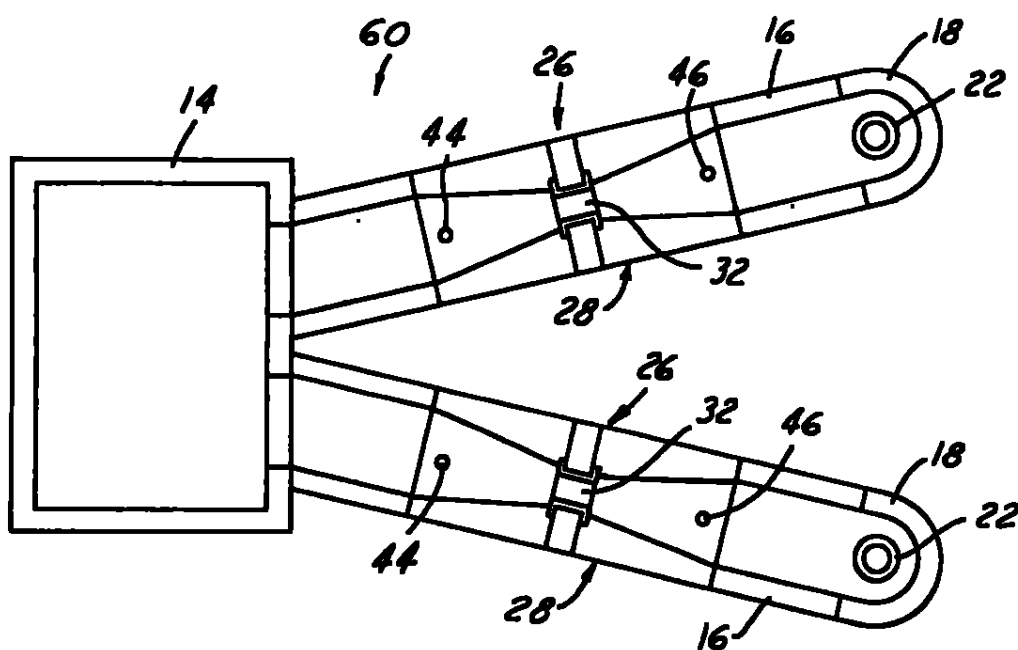


FIG.4

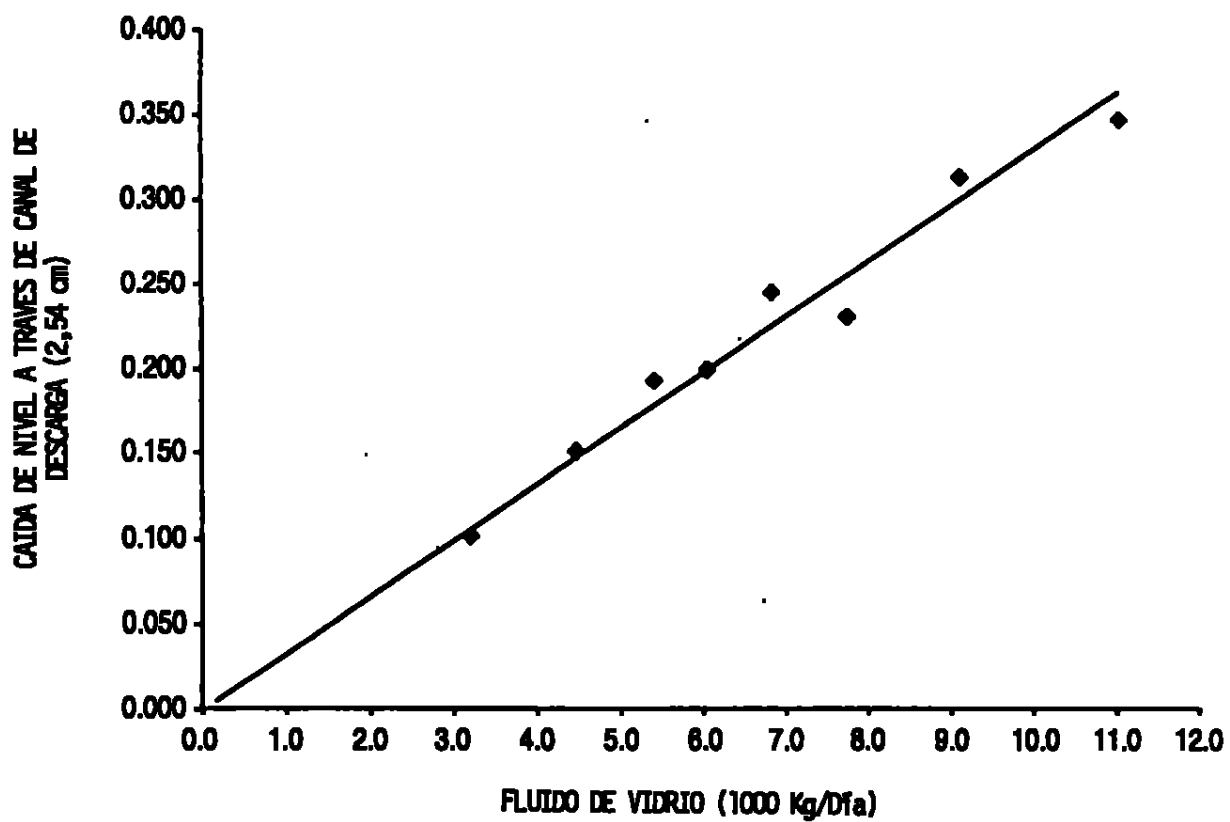
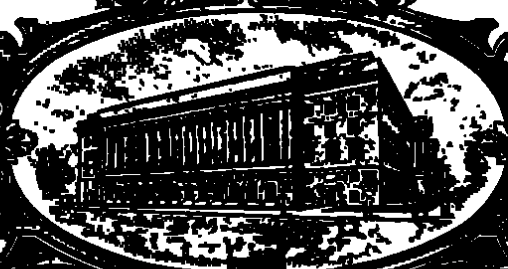


FIG.5

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APPLICATION NUMBER: 09/450,453

FILING DATE: November 29, 1999



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UTILITY PATENT APPLICATION TRANSMITTAL (Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))	Attorney Docket No. 17409 USA
	First Inventor or Application Identifier Perry, Philip D.
	Title Apparatus and Method for Controlling ...
	Express Mail Label No. EL 413905332US

APPLICATION ELEMENTS See MPEP chapter 600 concerning utility patent application contents.	ADDRESS TO: Assistant Commissioner for Patents Box Patent Application Washington, DC 20231
1. ☒ * Fee Transmittal Form (e.g., PTO/SB/17) (Submit an original and a duplicate for fee processing)	5. ☐ Microfilm Computer Program (Appendix)
2. ☒ Specification [Total Pages 11] (preferred arrangement set forth below) - Descriptive title of the invention - Cross References to Related Applications - Statement Regarding Fed sponsored R & D - Reference to Microfilm Appendix - Background of the invention - Brief Summary of the invention - Brief Description of the Drawings (if filed) - Detailed Description - Claim(s) - Abstract of the Disclosure	6. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary) a. ☐ Computer Readable Copy b. ☐ Paper Copy (identical to computer copy) c. ☐ Statement verifying identity of above copies
3. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 2]	ACCOMPANYING APPLICATION PARTS 7. ☒ Assignment Papers (cover sheet & document(s)) 8. ☐ 37 C.F.R. § 5.73(b) Statement ☐ Power of Attorney (when there is an assignee) 9. ☐ English Translation Document (if applicable) 10. ☒ Information Disclosure Statement (IDS)/PTO-1449 ☒ Copies of IDS Citations 11. ☐ Preliminary Amendment 12. ☒ Return Receipt Postcard (MPEP 603) (Should be specifically itemized) 13. ☐ * Small Entity Statement filed in prior application, Status still proper and desired (PTO/SB/09-12) 14. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed) 15. ☐ Other: _____
4. Oath or Declaration [Total Pages 3] a. ☒ Newly executed (original or copy) b. ☐ Copy from a prior application (37 C.F.R. § 1.63(d)) (for continuations/divisional with Box 16 completed) ☐ DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).	
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Signature	<i>[Signature]</i>	Date	11/29/99

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APPARATUS AND METHOD FOR CONTROLLING MOLTEN GLASS FLOW THROUGH A FOREHEARTH

The present invention is directed to delivery of a glass stream for forming glass charges or gobs for glassware manufacture, and more particularly to a method and apparatus for measuring and controlling rate of glass flow through a forehearth.

Background and Summary of the Invention

5 In the art and science of glassware manufacture, there are two basic methods currently employed for measuring rate of molten glass flow, such as in tons per day. The first method is to obtain a sample of glass as it exits the forehearth/feeder orifice, and weigh the sample. Although this technique provides an accurate measurement of glass flow, it causes loss of production due to the sampling. The second method is an indirect method, in that the glass
10 flow is calculated by averaging batch charger material flow to the furnace. Although this method provides a fairly accurate measurement in a system in which the furnace feeds a single forehearth, it is ineffective for systems in which the furnace feeds two or more forehearths.

It is therefore a general object of the present invention to provide a method and apparatus for measuring molten glass flow through a forehearth that are accurate, that are
15 implemented in the forehearth, and therefore can be readily employed in systems in which a furnace feeds more than one forehearth, and that do not require interruption of operation of the glassware forming system. Another and more specific object of the present invention is to provide a method and apparatus of the described character for both measuring and controlling rate of molten glass flow, in which glass flow adjustments are automatically implemented.

20 Apparatus for controlling rate of molten glass flow through a forehearth in accordance with one aspect of the presently preferred embodiment of the invention includes a flume disposed in the forehearth for restricting the width of the forehearth to glass flow, such that there is a difference in level of molten glass in the forehearth upstream and downstream of the flume. Sensors measure the level of molten glass upstream and downstream of the flume, and
25 a controller is responsive to the sensors for determining rate of molten glass flow through the

forehearth as a function of a difference in molten glass level between the sensors. In the preferred implementation of the invention, rate of glass flow through the forehearth is controlled as a function of the difference in glass level across the flume.

In the preferred implementation of the invention, the forehearth terminates in a spout having a lower opening for delivering molten glass. A flow control tube is disposed within the spout for movement toward and away from the spout opening to restrict or increase glass flow through the opening. Position of the flow control tube is controlled responsive to the controller for moving the tube with respect to the opening when rate of glass flow through the flume departs from a desired glass flow rate input by an operator. In glass flow systems that include multiple forehearths fed by a single furnace, the glass level measurement sensors and the flow control tubes in each forehearth operate independently of each other.

The flume is preferably disposed with respect to the direction of glass flow through the forehearth such that the depth of the forehearth and flume to glass flow remains constant, while the width to glass flow is the same upstream and downstream of the flume, while the flume includes a smooth transition upstream and downstream of a flume restriction to glass flow. This restriction preferably is coated with platinum or other corrosion-resistant material both to prevent pick-up of stones or particles in the glass eroded from the flume, and to maintain a constant flume cross-section to glass flow. The sensors in the preferred embodiment of the invention comprise contact-type sensors that are disposed above the forehearth, and are selectively lowered and brought into contact with the molten glass surface. Variable resistors or other suitable devices are coupled to the sensors for determining sensor position. The sensors preferably are zeroed prior to glass flow by lowering the sensors against a bottom wall surface of the forehearth. Knowing (or measuring) glass viscosity and temperature at the restriction area, glass flow can be accurately calculated based upon the difference in surface level upstream and downstream in the flume..

Brief Description of the Drawings

The invention, together with additional objects, features and advantages thereof, will be best understood from the following description, the appended claims and the accompanying drawings in which:

5 FIG. 1 is a fragmentary elevational schematic diagram of a glass delivery system in accordance with one presently preferred embodiment of the invention;

 FIG. 2 is a fragmentary top plan view taken from the direction 2-2 in FIG. 1;

 FIG. 3 is a fragmentary sectional view taken substantially along the line 3-3 in FIG. 2;

10 FIG. 4 is a top plan schematic diagram of a glass delivery system in accordance with the present invention comprising a furnace feeding a pair of forehearth; and

 FIG. 5 is a graph that illustrates operation of the invention.

Detailed Description of Preferred Embodiments

The disclosure of U.S. Patent 5,944,863 is incorporated herein by reference.

15 FIGS. 1-3 illustrate a glass delivery system 10 in accordance with one presently preferred embodiment of the invention. A glass batch charger 12 feeds glass to a furnace 14, in which the glass is melted and fed in molten form to a forehearth 16. Glass flows through forehearth 16 to a glass delivery spout 18, which has an opening 20 at its lower end. A glass delivery control tube 22 is variably positionable within spout 18, and is coupled to a motor 24
20 for movement toward and away from spout opening 20 for controlling the rate of glass flow through the spout opening.

 Apparatus 26 for measuring and controlling rate of glass flow through forehearth 16 in accordance with a presently preferred embodiment of the invention comprises a flume 28 positioned within forehearth 16 for restricting glass flow through the forehearth. Flume 28
25 comprises a restriction block 30 that spans the width of forehearth 16, and provides a U-shaped restriction opening 32 approximately centrally of the forehearth. A first pair of complementary transition blocks 34, 36 are positioned upstream of restriction block 30 (with respect to the direction 38 of molten glass flow through the forehearth) for providing a smooth transition

between the width W1 of forehearth 16, and the width W2 of opening 32. A second pair of transition blocks 40, 42 are provided on the downstream side of restriction block 30, again for providing a smooth transition between the width W2 of opening 32 and the width W1 of forehearth 16. The width W1 of forehearth 16 to glass flow is the same upstream and downstream of flume 26, and the depth of forehearth 16 and flume 26 is constant, as best seen in FIG. 1. Restriction block 30, transitions blocks 34, 36, 40, 42, and the blocks that make up the sidewalls of forehearth 16 may be of suitable high-temperature ceramic construction. Restriction opening or passage 32 is preferably provided with a coating 43 of platinum or other high-temperature corrosion-resistant material to prevent erosion of the ceramic material caused by restricted glass flow through the flume. Prevention of erosion not only helps prevent pick-up of ceramic particles in the molten glass stream, which may subsequently appear in the manufactured glassware, but also helps maintain a constant cross-section to glass flow at restriction opening 32. Maintaining a constant cross-section to glass flow helps maintain accuracy of the glass flow measurement.

A pair of level measurement sensors 44, 46 are mounted above forehearth 16 upstream and downstream of flume restriction block 38 respectively. Sensors 44, 46 are identical, and each comprise a contact-type probe 48 coupled by a suitable mechanism 50 to a motor or actuator 52 for vertically lowering and raising probe 48 with respect to forehearth 16. Each probe 48 is coupled to a sensor, such as a variable resistor 53, for providing an absolute measurement of probe vertical position. Sensor motors 52, as well as control tube motor 24, are coupled to a suitable electronic controller 54. Controller 54 receives input signals from variable resistors 53 indicative of position of the associated probes 48, as well as input signals from an operator input terminal or device 56.

In operation, sensors 44, 46 are first zeroed by lowering the sensors probes 48 against the bottom wall surface of forehearth 16 before glass flows through the forehearth. With sensor probes 48 touching the bottom surface of the forehearth, resistors 52 provide an indication of vertical level of the forehearth bottom surface, which may thereafter be compared with glass material surface level to provide an absolute measurement of glass height upstream and

downstream of flume 28. Probes 48 are then withdrawn upwardly, and molten glass is permitted to flow through the forehearth from batch charger 12 and furnace 14 to spout 18 and outlet opening 20. Thereafter, sensors 44, 46 are periodically vertically lowered against the glass surface, and corresponding surface level measurements are obtained by controller 54 from variable resistors 52. Knowing (or measuring) glass temperature and viscosity, the rate of glass flow through forehearth 16 can then be readily determined based upon the level drop across the flume. FIG. 5 illustrates actual level drop across the flume in inches versus the rate of glass flow in tons per day. The illustrated data points were obtained by measuring the level drop across the flume as compared with glass flow rate determined by other means, while the line illustrates a linear calculation of flow rate versus level drop. (It will be appreciated that the level drop illustrated schematically in FIG. 1 is greatly exaggerated, and that actual level drop across the flume will be on the order of tenths or hundredths of an inch as illustrated in FIG. 5.) If glass flow rate determined by sensors 44, 46 departs from the desired level, such as input from operator panel 56, controller 54 operates motor 24 to raise or lower flow control tube 22 with respect to spout opening 20 to increase or decrease glass flow through the spout opening. At a later time suitable for the glass flow rate to reach and stabilize at a new level, level measurements are again taken at sensors 44, 46, and the position of flow control tube 22 again adjusted. The flow control tube position is preferably in preset increments after each measurement so that measured glass flow control gradually approaches the level desired by the operator, and does not overshoot the desired level.

FIG. 4 illustrates a molten glass flow control system 60 that includes a single furnace 14 feeding a pair of forehearths 16. Each forehearth 16 includes an associated outlet spout 18 with associated flow control tube 22. Each forehearth 16 also includes an associated level measurement apparatus 26, including flume 28 and associated level measurement sensors 44, 46. These level measurement sensors and flow control tubes may be operated independently of each other for independently controlling flow of molten glass through the associated forehearths. The desired flow rates through the respective forehearths need not be the same.

Software in controller 54 can account for changes in temperature or viscosity, as well as changes in overall glass depth.

Level measurement sensors 44, 46 in the preferred embodiment illustrated in FIG. 1 comprise so-called "string pots" for measuring level of the molten glass under the adverse operating conditions of a glass shop. Contact-type probes 48 are of a type that change electrical characteristics when brought into surface contact with the molten glass. However, other types of measurement sensors, both contact-types and non-contact-types, may be implemented without departing from the present invention in its broadest aspects. Controller 54 may be of any suitable type.

There have thus been disclosed an apparatus and method for measuring and controlling rate of molten glass flow through a forehearth that fully satisfy all of the objects and aims previously set forth. Although the invention has been disclosed in conjunction with a presently preferred embodiment thereof, a number of modifications and variations have also been suggested. Other modifications and variations will readily suggest themselves to persons of ordinary skill in the art. The invention is intended to embrace all such modifications and variations as fall within the spirit and broad scope of the appended claims.

CLAIMS

1.

1 Apparatus for controlling rate of molten glass flow through a forehearth having
2 a width and a depth, which comprises:
3 a flume disposed in said forehearth for restricting the width of said forehearth to
4 glass flow while said depth remains constant, such that there is a difference in level of molten
5 glass in the forehearth upstream and downstream of said flume,
6 sensors for measuring level of molten glass upstream and downstream of said
7 flume,
8 a controller responsive to said sensors for determining rate of molten glass flow
9 through said forehearth as a function of a difference in molten glass level between said sensors,
10 and
11 means responsive to said controller for variably controlling rate of glass flow
12 through the forehearth.

2.

1 The apparatus set forth in claim 1 wherein said flume is disposed with respect to
2 the direction of glass flow through the forehearth such that the width of the forehearth to glass
3 flow is the same upstream and downstream of said flume.

3.

1 The apparatus set forth in claim 2 wherein said flume comprises a restriction
2 block having a restriction passage, and transition blocks upstream and downstream of said
3 restriction block for smooth transition of the width to glass flow from the width of said
4 forehearth to the width of said restriction passage.

4.

1 The apparatus set forth in claim 3 wherein said restriction block is platinum
2 coated around said restriction passage.

5.

1 The apparatus set forth in claim 1 wherein said sensors comprise first and second
2 contact-type sensors, means coupled to said controller for selectively moving said sensors into
3 and out of surface contact with the glass in said forehearth, and means responsive to movement
4 of said sensors for determining molten glass level.

6.

1 The apparatus set forth in claim 5 wherein said means coupled to said controller
2 comprises motorized actuators for moving said sensors vertically into and out of contact with the
3 glass surface, and wherein said movement-responsive means comprises variable resistors coupled
4 to said sensors.
5

7.

1 The apparatus set forth in claim 1 wherein the forehearth terminates in a spout
2 having a lower opening for delivering molten glass, a flow control tube disposed within said
3 spout for movement toward said opening to restrict glass flow through said opening, and means
4 responsive to said controller for moving said tube with respect to said opening when rate of glass
5 flow through said flume departs from a desired glass flow rate.

8.

1 A system for controlling rate of molten glass flow, which comprises:
2 a furnace for supplying molten glass,
3 at least two forehearth coupled to said furnace for receiving molten glass from
4 said furnace,
5 a flume disposed in each said forehearth for restricting molten glass flow through
6 the forehearth, such that there is a difference in level of molten glass in each said forehearth
7 upstream and downstream of the associated flume,
8 sensors in each said forehearth for measuring level of molten glass upstream and
9 downstream of the associated flume,
10 a controller responsive to said sensors for determining rate of molten glass flow
11 through the associated forehearth, and
12 means responsive to said controller for variably controlling rate of glass flow
13 through each said forehearth independently of each other.

9.

1 The system set forth in claim 8 wherein each said forehearth terminates in a spout
2 having a lower opening for delivering molten glass, a flow control tube disposed within said
3 spout for movement toward and away from said opening variably to restrict glass flow through
4 said opening, and means responsive to said controller for moving said tube with respect to said
5 opening when rate of glass flow through said flume departs from a desired glass flow rate.

10.

1 A method of controlling rate of molten glass flow through a forehearth, which
2 comprises the steps of:

3 (a) positioning a flume in said forehearth for restricting the width of said
4 forehearth while maintaining depth constant,

5 (b) directing molten glass through said forehearth and flume,

6 (c) measuring level of molten glass upstream and downstream of said flume,

7 (d) determining rate of molten glass flow through said forehearth and flume
8 as a function of a difference in molten glass level upstream and downstream of said flume, and

9 (e) variably controlling rate of glass flow through said forehearth and flume
10 as a function of said difference.

11.

1 The method set forth in claim 10 wherein said step (d) is carried out by:

2 (d1) positioning glass level measurement sensors above said forehearth
3 upstream and downstream of said flume, and

4 (d2) prior to said step (b), zeroing said sensors against a bottom wall surface
5 of said forehearth.

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Abstract of the Disclosure

Apparatus for controlling rate of molten glass flow through a forehearth that includes a flume disposed in the forehearth for restricting the width of the forehearth to glass flow, such that there is a difference in level of molten glass in the forehearth upstream and downstream of the flume. Sensors measure the level of molten glass upstream and downstream of the flume, and a controller is responsive to the sensors for determining rate of molten glass flow through the forehearth as a function of a difference in molten glass level between the sensors. Rate of glass flow through the forehearth is controlled as a function of the difference in glass level across the flume as compared with a desired flow rate set by an operator.

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)	Attorney Doctant Number	17409 USA
	First Named Inventor	Perry, Philip D.
	COMPLETE IF KNOWN	
	Application Number	/
	Filing Date	
	Group Art Unit	
☒ Declaration Submitted with Initial Filing	OR	☐ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)
Examiner Name		

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

APPARATUS AND METHOD FOR CONTROLLING MOLTEN GLASS FLOW THROUGH A FORESHEATH

the specification of which

(Title of the Invention)

☒ is attached hereto

OR

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

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

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

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.55.

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

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
			☐	YES	NO
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

I hereby claim the benefit under 35 U.S.C. 119(a) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)

☐ Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

(Page 1 of 2)

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U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)

As a signed inventor, I hereby appoint the following registered practitioner(s) to prosecute the application and to transact all business in the Patent and Trademark Office connected therewith:

☐ **Relevant number(s) to contact before**

Name	Registration Number	Name	Registration Number
Principal Attorney: H. G. Bruss	24,389	Associate Attorney: R. C. Collins	27,430

Direct all correspondence to: ☐ Customer Number or Bar Code Label ☐ OR ☒ Correspondence address below

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Given Name (first and middle if any)	Family Name or Surname
Philip D.	Perry

☒ Additional inventors are being named on the 1 supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.

75
43

17409 USA

PTO/SB/02A (3-97)

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DECLARATION

ADDITIONAL INVENTOR(S)
Supplemental Sheet
Page 1 of 1

Name of Additional Joint Inventor, if any:		☐ A petition has been filed for this unsigned inventor					
Given Name (first and middle (if any))		Family Name or Surname					
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Name of Additional Joint Inventor, if any:		☐ A petition has been filed for this unsigned inventor					
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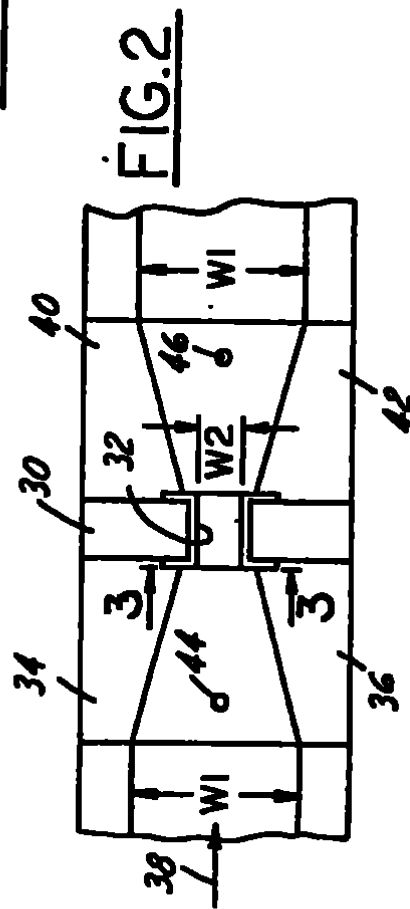
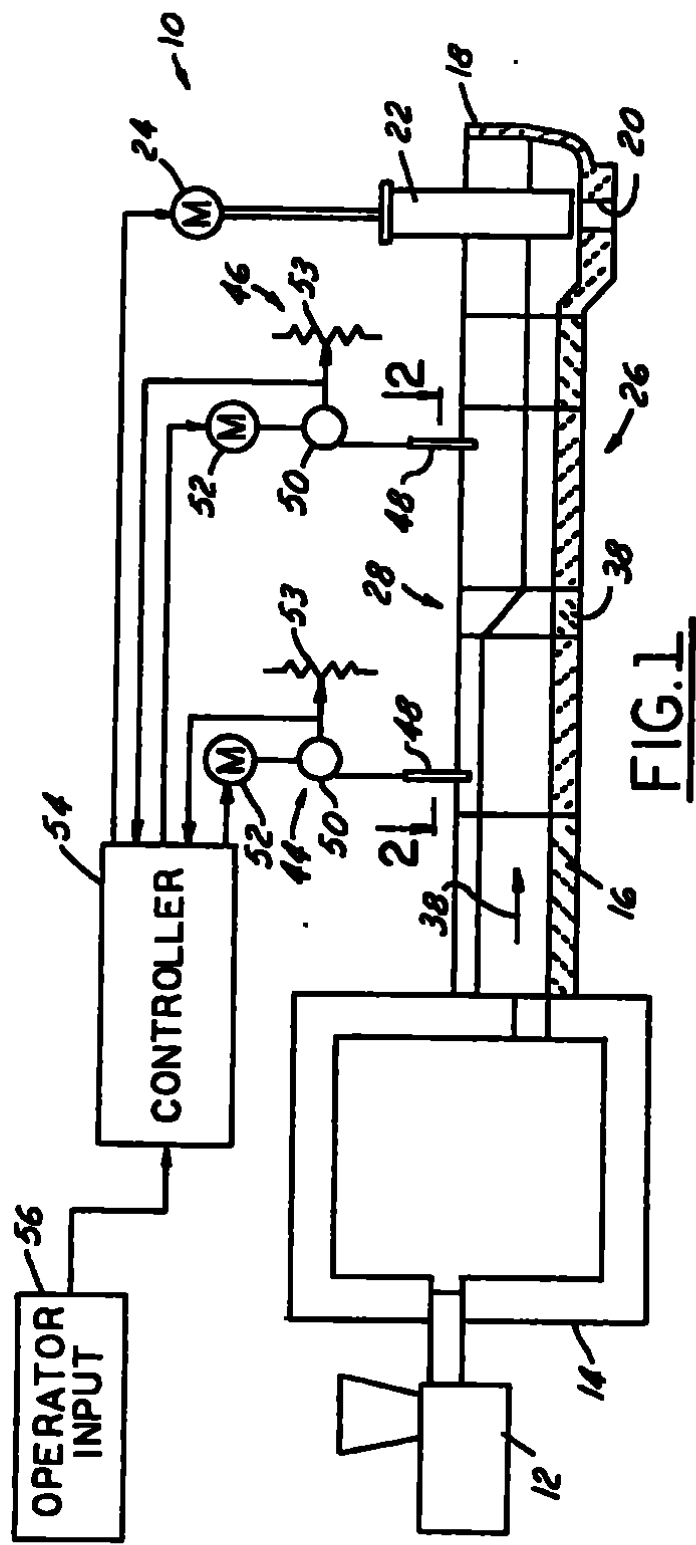


FIG. 3

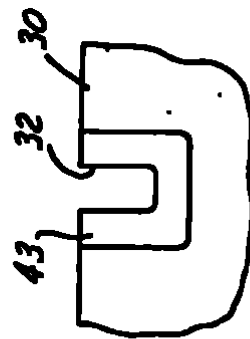


FIG. 3

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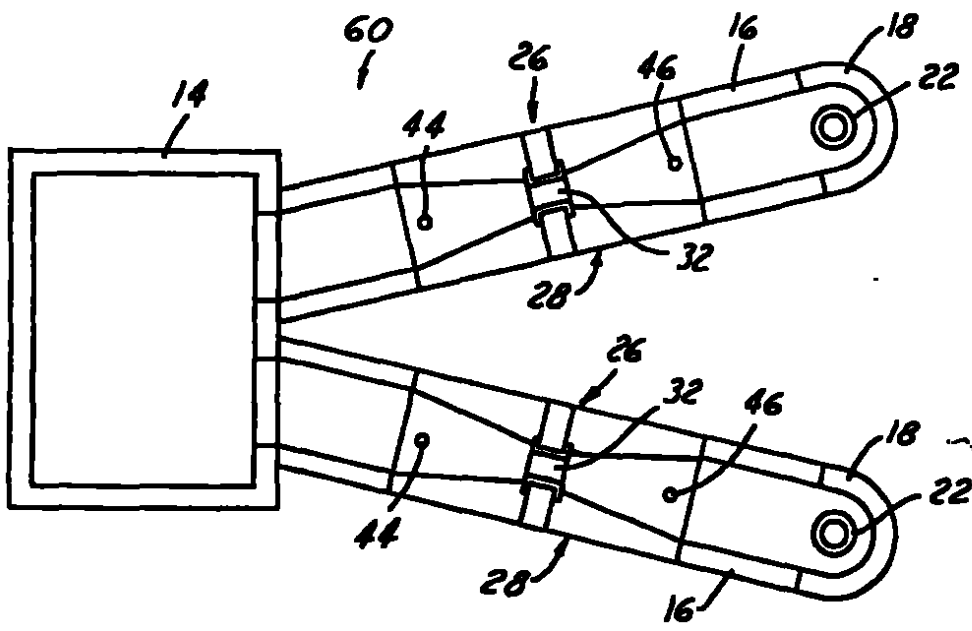


FIG.4

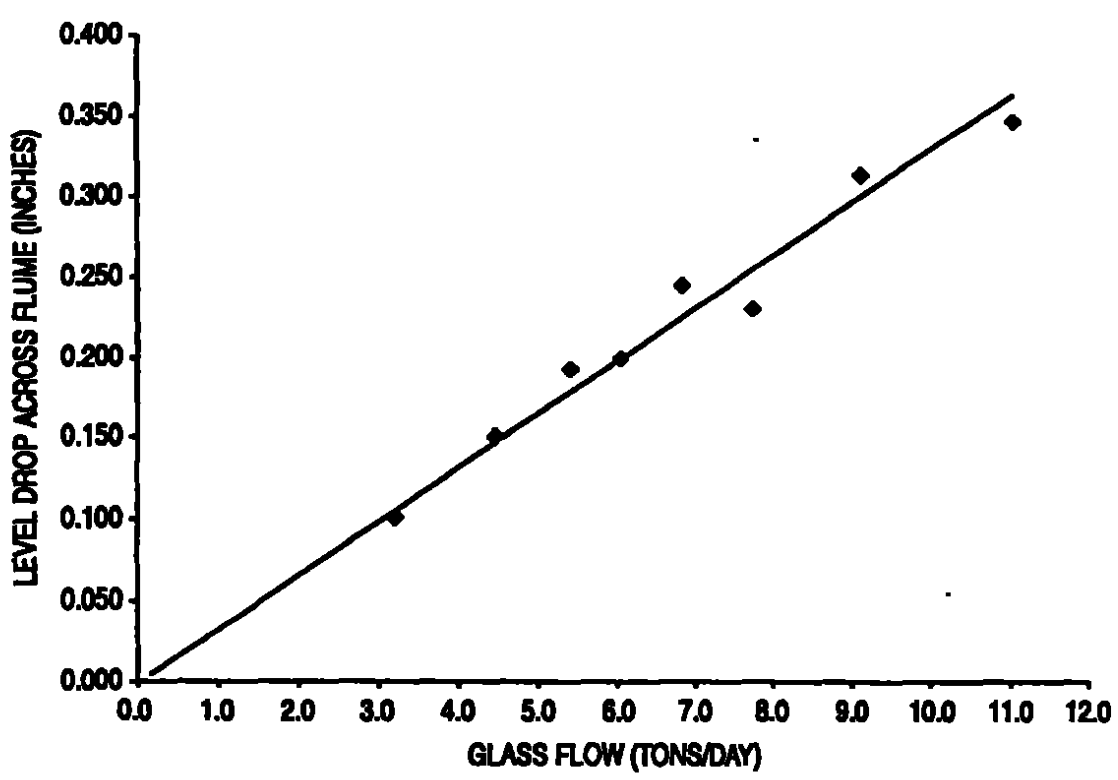


FIG.5

40.1
46

**TRADUCCIÓN DEL INGLÉS AL CASTELLANO de la Solicitud de
Patente de los Estados Unidos No.09/450,453 relacionada con:**

**APARATO Y MÉTODO PARA CONTROLAR EL FLUJO DE VIDRIO
FUNDIDO A TRAVÉS DE UN ANTEHOGAR**

**ANEXOS. La Solicitud de Patente de los Estados Unidos Serie No.09/
450,453 arriba mencionada, Declaración y Poder, Solicitud de Patente,
Certificación del Comisionado de Patentes y Marcas de los Estados
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**NUMERO DE SOLICITUD: 09/450,453
FECHA DE PRESENTACION: Noviembre 29, 1999**

**Por autorización del
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17409

**APARATO Y MÉTODO PARA CONTROLAR EL FLUJO DE VIDRIO
FUNDIDO A TRAVÉS DE UN ANTEHOGAR**

La presente invención está dirigida hacia el suministro de una corriente de vidrio para la formación de cargas de vidrio o pequeñas masas para la fabricación de, artículos de vidrio, y más particularmente hacia un método y aparato para medir y controlar la rata de flujo de vidrio a través de un antehogar.

Antecedentes y Resumen de la Invención

En el arte y ciencia de la fabricación de artículos de vidrio, hay dos métodos básicos empleados corrientemente para medir la rata de flujo de vidrio fundido, tal como toneladas por día. El primer método es obtener una muestra de vidrio a medida que sale del orificio del antehogar/alimentador, y pesar la muestra. Aunque esta técnica proporciona una medición precisa del flujo de vidrio, ocasiona pérdidas de producción debido al muestreo. El segundo método es un método indirecto, en cuanto a que el flujo de vidrio es calculado promediando el flujo de material del cargador de lote al horno. Aunque este método proporciona una medición bastante precisa en un sistema donde el horno alimenta un único antehogar, no es efectivo para sistemas donde el horno alimenta dos o más antehogares.

En consecuentemente un objetivo general de la presente invención proporcionar un método y aparato para medir el flujo de vidrio fundido a través de un antehogar que, sean precisos, que sean implementados en el antehogar y consecuentemente puedan emplearse fácilmente en sistemas donde un horno alimenta más de un antehogar, y que no requieren de la interrupción de la operación del sistema de formación de artículos de vidrio. Otro y más específico objetivo de la invención es proporcionar un método y aparato del carácter descrito tanto para medir como para controlar la rata de flujo de vidrio fundido, donde los ajustes del flujo de vidrio se implementan automáticamente.

El aparato para controlar la rata de flujo de vidrio fundido a través de un antehogar de acuerdo con un aspecto de la modalidad actualmente preferida de la invención incluye un canal de descarga colocado en el antehogar para restringir el ancho del antehogar al flujo de vidrio, en forma tal que hay una diferencia en nivel del vidrio fundido en el antehogar corrientes arriba y corrientes abajo del canal de descarga. Sensores miden el nivel vidrio fundido corrientes arriba y corrientes abajo del canal de descarga, y un controlador responde a los sensores para determinar la rata de flujo de vidrio fundido a través de el antehogar como una función de una diferencia en el nivel de vidrio fundido entro los sensores. En la implementación preferida de la invención, la rata de flujo

de vidrio a través del antehogar se controla como una función de la diferencia en el nivel del vidrio a través del canal de descarga.

En una implementación preferida de la invención, el antehogar termina en un pico que tiene una abertura inferior para suministrar vidrio fundido. Un tubo de control de flujo está colocado entre el pico para movimiento hacia y lejos de la abertura del pico para restringir incrementar el flujo de vidrio a través de la abertura. La posición del tubo de control de flujo se controla en respuesta al controlador para mover el tubo con respecto a la abertura cuando la rata del flujo de, vidrio a través del canal de descarga se aparta de una entrada deseada de rata de flujo de vidrio. En sistemas de flujo de vidrio que incluyen múltiples antehogares alimentados por un único horno, los sensores de medición de nivel de vidrio y los tubos de control de flujo en cada ante hogar opera independientemente los unos de los otros.

El canal de descarga está colocado preferiblemente con respecto a la dirección del flujo de vidrio a través del antehogar en forma que la profundidad del antehogar y el canal de descarga al flujo de vidrio permanece constante, mientras que el ancho al flujo de vidrio es igual corrientes arriba y corrientes abajo del canal de descarga, mientras que el canal de descarga incluye una corriente arriba y corriente debajo de transición suave de una restricción del canal de descarga al flujo de vidrio. Esta restricción preferiblemente está revestida con platino u otro material resistente a la corrosión tanto para evitar la recogida de piedras partículas en el vidrio erosionado del canal de descarga, como para mantener una sección transversal constante del canal de descarga al flujo de vidrio. Los sensores en la modalidad preferida de la invención comprenden sensores del tipo de contacto que están colocados encima del antehogar, y se descienden selectivamente y son llevados en contacto con la superficie del vidrio fundido. Resistores variables u otros dispositivos adecuados son acoplados a los sensores para determinar la posición de los sensores. Los sensores se colocan a cero preferiblemente antes del flujo de vidrio descendiendo los sensores contra una superficie de pared inferior del antehogar. Conociendo (o midiendo) la viscosidad del vidrio y la temperatura en el área de restricción, se puede calcular en forma precisa el basado en la diferencia en el nivel de la superficie corrientes arriba y corrientes abajo en el canal de descarga..

Breve Descripción de los Dibujos

La invención, conjuntamente con sus adicionales objetivos, características y ventajas, se entenderá en mejor forma a partir de la

siguiente, descripción, las reivindicaciones del apéndice y los dibujos que se acompañan en los cuales:

la Figura 1 es un diagrama esquemático en elevación fragmentado de un sistema de suministro de vidrio de acuerdo con una modalidad actualmente preferida de la invención;

la Figura 2 es una vista en planta superior fragmentada tomada desde la dirección 2-2 en la Figura 1;

la Figura 3 es una sección fragmentada tomada sustancialmente a lo largo de la boca 3-3 en la Figura 2;

la Figura 4 es un diagrama esquemático en planta superior de un sistema de suministro de vidrio de acuerdo con la presente invención que comprende un horno que alimenta un par de antehogares; y

la Figura 5 es un gráfico que ilustra la operación de la invención.

Descripción Detallada de las Modalidades Preferidas

La divulgación de la Patente US 5,944,863 se incorpora aquí a modo de referencia.

Las Figuras 1 a 3 ilustran un sistema de suministro de vidrio 10 de acuerdo con una modalidad actualmente preferida de la invención. Un cargador 12 de lotes de vidrio alimenta vidrio a un horno 14 en el cual el vidrio es fundido y alimentado en forma fundida a un antehogar 16. El vidrio fluye a través del antehogar 18 hacia un pico de suministro de vidrio 18, el cual tiene una abertura 20 en su extremo inferior. Un tubo de control 22 de suministro de vidrio es colocable en forma variable dentro del pico 18, y acoplado a un motor 24 para movimiento hacia y lejos de la abertura del pico 20 para controlar la rata de flujo de vidrio a través de la abertura del pico.

Un aparato 26 para medir y controlar la rata de flujo de vidrio a través del antehogar 16 de acuerdo con una modalidad actualmente preferida de la invención comprende un canal de, descarga 28 colocado dentro del antehogar 16 para restringir el flujo de vidrio a través del antehogar. El canal de descarga 28 comprende un bloque de restricción 30 que se expande el ancho del antehogar 16, y proporciona un abertura de restricción 32 en forma de U aproximadamente centralmente al antehogar. Un primer par de bloques de transición complementarios 34, 36 están colocados corrientes arriba del bloque de restricción 30 (con respecto a la dirección 38 del flujo de vidrio fundido a través del antehogar) para proporcionar una transición suave entre el ancho W1 del antehogar 16, y el ancho W2 de la abertura 32. Un segundo par de bloques de transición 40, 42 se proporcionan en el lado corrientes abajo del bloque de restricción 30, proporcionando nuevamente una transición suave entre el

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ancho W2 de la abertura 32 y el ancho W1 del antehogar 16. El ancho W1 del antehogar 16 al flujo de vidrio es igual corrientes arriba y corrientes abajo del canal de descarga 16 y la profundidad del antehogar 16 y el canal de descarga 26 es constante, como se observa en mejor forma en la Figura 1. El bloque de restricción 30, los bloques de transiciones 34, 36, 405- 42, y los bloques que desarrollan las paredes laterales del antehogar 16 pueden ser de adecuada construcción de cerámica de alta temperatura. La abertura o pasaje de restricción 32 se proporciona preferiblemente con un revestimiento 43 de platino u otro material resistente a la corrosión a alta temperatura para evitar la erosión del material de cerámica causado por el flujo de vidrio restringido a través del canal de descarga. La prevención de la erosión no solamente ayuda a evitar la recogida de partículas de cerámica en la corriente de vidrio fundido, la cual puede subsecuentemente aparecer en el artículo de vidrio fabricado sino que también ayuda a mantener una constante sección transversal al flujo de vidrio en la abertura de restricción 32. Manteniendo una sección transversal constante al flujo de vidrio ayuda a mantener la precisión de la medición del flujo de vidrio.

Un par de sensores de medición de nivel 44, 46 están montados encima del antehogar 16 corrientes arriba y corrientes abajo del bloque de restricción del canal de descarga 38, respectivamente. Los sensores 44, 46 son idénticos y comprenden cada uno una sonda 48 del tipo de contacto, acoplada mediante un mecanismo adecuado 50 a un motor o accionador 52 para descender o levantar verticalmente la sonda 48 con respecto al antehogar 16. Cada sonda 49 está acoplada a un sensor, tal como un resistor variable 53, para proporcionar una medición absoluta de la posición vertical de la sonda. Los motores 52 de, sensores así como el motor del tubo de control 24,, están acoplados a un adecuado controlador electrónico 54. El controlador 54 recibe señales de entrada desde los resistores variables 53 indicativos de la posición de las sondas asociadas 48, así como señales de entrada desde un terminal o dispositivo 56 de entrada del operador.

En operación, los sensores 44, 46 son colocados primero en cero descendiendo las sondas 48 contra la superficie de pared inferior del antehogar 16 antes de que el vidrio fluya a través del antehogar. Con las sondas de los sensores 48 tocando la superficie inferior del ante hogar, los resistores 52 proporcionan una indicación del nivel vertical de la superficie inferior del antehogar, la cual puede compararse posteriormente con el nivel de la superficie del material de vidrio para proporcionar una medición absoluta de la altura del vidrio corrientes arriba y corrientes abajo del canal de descarga 28. Las sondas 48 son entonces retiradas hacia arriba, y el vidrio fundido se deja fluir a través del antehogar desde

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el cargador 12 de lotes y el horno 14 al pico 18 y la abertura de salida 20. Posteriormente, los sensores 44, 46 son descendidos periódicamente en forma vertical contra la superficie del vidrio, y correspondientes mediciones del nivel de superficie se obtienen mediante el controlador 54 desde los resistores variables 52. Conociendo (o midiendo) la temperatura y viscosidad del vidrio, la rata del flujo de vidrio a través del antehogar 16 puede entonces determinarse fácilmente basado en la caída de nivel a través del canal de descarga. La Figura 5 ilustra la caída de nivel actual a través del canal de descarga en centímetros (pulgadas) con respecto a la rata de flujo de vidrio en kg por día. Los puntos de datos ilustrados se obtuvieron midiendo la caída de nivel a través del canal de descarga en comparación con la rata de flu o de vidrio determinada por otro medio, mientras que la línea ilustra un cálculo lineal de la rata de flujo contra la caída de nivel. (Se apreciará que la caída de nivel ilustrada esquemáticamente en la Figura 1 se exagera en gran medida, y que la caída de nivel actual a través del canal de descarga será del orden de decenas o centenas de centímetros como se ilustra en la Figura 5). Si la rata de flujo de vidrio determinada por los sensores 44, 46 se aparta del nivel deseado, tal como una entrada del panel de operador 56, el controlador 54 opera el motor 24 para elevar o descender el tubo de control de flujo 22 con respecto a la abertura del pico 20 para incrementar o disminuir el flujo de vidrio a través de la abertura del pico. En un tiempo posterior adecuado para que la rata de flujo de fluido alcance y se establezca a un nuevo nivel, las mediciones de nivel son tomadas nuevamente en los sensores 44, 46, y la posición del tubo de control de flujo 22 se ajusta nuevamente. La posición del tubo de control de flujo está preferiblemente a incrementos establecidos previamente después de cada medición en forma tal que el control de flujo de vidrio medido se aproxima gradualmente al nivel deseado mediante un operador, y no rompe el nivel deseado.

La Figura 4 ilustra un sistema de control de flujo de vidrio fundido 60 que incluye un único horno 14 que alimenta un par de antehogares 16. Cada antehogar 16 incluye un pico de salida asociado 18 con un tubo asociado de control de flujo 22. Cada antehogar 16 también incluyo un aparato asociado de medición de nivel 26, que incluye un canal de descarga 28 y sensores asociados de medición de nivel 44,46. Estos sensores de medición de nivel y tubos de control de flujo pueden operarse independientemente el uno del otro para controlar independientemente el flujo de vidrio fundido a través de los antehogares asociados. Las deseadas ratas de flujo a través de los respectivos antehogares no necesitan ser iguales. El soporte lógico en el controlador 54 puede tenerse en cuenta para cambios en la temperatura o viscosidad, así como cambios en la profundidad total del vidrio.

Los sensores 44, 46 de medición de nivel en la modalidad preferida ilustrada en la Figura 1 comprenden denominados "puntos de cordel" para medir el nivel del vidrio fundido bajo las condiciones adversas de operación de una tienda de vidrio. Las sondas del tipo de contacto 48 son de un tipo que cambia las características eléctricas cuando se lleva en contacto superficial con el vidrio fundido. Sin embargo, otros tipos de sensores de medición, tanto tipos de contacto como de no contacto, pueden implementarse, sin apartarse de la presente invención en sus aspectos más amplios. El controlador 54 puede ser de cualquier tipo adecuado.

Se ha divulgado consecuentemente un aparato y un método para medir y controlar la rata de flujo de vidrio fundido a través de un antehogar que satisface completamente todos los objetivos y demandas previamente establecidos. Aunque la invención se ha divulgado en conjunción una modalidad de ella actualmente preferida, un número de modificaciones y variaciones se han sugerido igualmente. Otras modificaciones y variaciones serán ellas mismas rápidamente sugeridas a personas de experiencia ordinaria en el arte. La invención pretendo abarcar todas estas modificaciones y variaciones que se encuentran dentro del espíritu y amplio alcance de las reivindicaciones del apéndice.

REIVINDICACIONES

1. Un aparato para controlar la rata de flujo de vidrio fundido a través de un antehogar que tiene un ancho y una profundidad, el cual se caracteriza porque incluye:

un canal de descarga colocado en dicho antehogar para restringir el ancho de dicho antehogar al flujo de vidrio mientras dicha profundidad permanece constante, en forma tal que hay una diferencia en el nivel de vidrio fundido en el antehogar corrientes arriba y corrientes abajo de dicho canal de descarga,

sensores para medir el nivel de vidrio fundido corrientes arriba y corrientes debajo de, dicho canal de descarga,

un controlador que responde a dichos sensores para determinar la rata de flujo de vidrio fundido a través de dicho antehogar como una función de una diferencia en el nivel de vidrio fundido entre dichos sensores, y

medios que responden a dicho controlador para controlar en forma variable la rata de flujo de vidrio a través del antehogar.

2. El aparato establecido en la reivindicación 1 donde dicho canal de descarga está colocado con respecto a la dirección del flujo de vidrio a través del antehogar en forma tal que el ancho del antehogar con

respecto al flujo de vidrio es igual corrientes arriba y corrientes debajo de dicho canal de descarga.

3. El aparato establecido en la reivindicación 2 donde dicho canal de descarga incluye un bloque de restricción que tiene un pasaje de restricción y bloques de transición corrientes arriba y corrientes debajo de dicho bloque de restricción para transición suave del ancho con respecto al flujo de vidrio desde el ancho de dicho antehogar con respecto al ancho de dicho pasaje de restricción.

4. El aparato establecido en la reivindicación 3 donde, dicho bloque de restricción es platino revestido alrededor de dicho pasaje de restricción.

5. El aparato establecido en cualquiera de las reivindicaciones precedentes donde dichos sensores comprenden primer y segundos sensores del tipo de contacto, medios acoplados a dicho controlador para mover selectivamente dichos sensores dentro y fuera del contacto de superficie con el vidrio en dicho antehogar, y un medio que responde al movimiento de dichos sensores para determinar el nivel de vidrio fundido.

6. El aparato establecido en la reivindicación 5 donde dichos medios acoplados a dicho controlador incluyen accionadores motorizados para mover dichos sensores verticalmente dentro y fuera del contacto con la superficie del vidrio, y donde dicho medio que responde al movimiento incluye resistores variables acoplados a dichos sensores.

7. El aparato establecido en cualquiera de las reivindicaciones precedentes donde el antehogar termina en un pico que tiene una abertura inferior para suministrar vidrio fundido, un tubo de control de flujo colocado dentro de dicho pico para movimiento hacia dicha abertura para restringir el flujo de vidrio a través de dicha abertura, y un medio que responde a dicho controlador para mover dicho tubo con respecto a dicha abertura cuando la rata de flujo de vidrio a través de dicho canal de descarga se aparta de una deseada rata de flujo de vidrio.

8. Un sistema para controlar la rata de flujo de vidrio fundido empleando un aparato como se establece en cualquier reivindicación precedente, el cual incluye:

- un horno para suministrar vidrio fundido,
- por lo menos dos de dichos antehogares acoplados a dicho horno para recibir vidrio ~do desde dicho horno,
- un canal de descarga colocado en cada uno de dichos antehogares para restringir el flujo de vidrio fundido a través del

antehogar, en forma tal que hay una diferencia en el nivel de vidrio fundido en cada uno de dichos antehogares corrientes arriba y corrientes abajo del canal de descarga asociado,

sensores en cada uno de dichos antehogares para medir el nivel de vidrio fundido corrientes arriba y corrientes abajo del canal de descarga asociado,

un controlador que responde a dichos sensores para determinar la rata de vidrio fundido a través del antehogar asociado, y medios que responden a dicho controlador para controlar en forma variable la rata de flujo de vidrio a través de dicho antehogar independientemente el uno del otro.

9. El sistema establecido en la reivindicación 8 donde cada uno de dichos antehogares termina en un pico que tiene una abertura inferior para suministrar vidrio fundido, un tubo de control de flujo colocado dentro de dicho pico para movimiento hacia y lejos de dicha abertura en forma variable para restringir el flujo de vidrio a través de dicha abertura, y medios que responden a dicho controlador para mover dicho tubo con respecto a dicha abertura cuando la rata de flujo de vidrio a través de dicho canal de descarga se aparta de una rata deseada de flujo de vidrio.

10. Un método para controlar la rata de flujo de vidrio fundido a través de un antehogar, el cual incluye los pasos de:

(a) colocar un canal de descarga en dicho antehogar para restringir el nacho de dicho antehogar mientras se mantiene una profundidad constante.

(b) dirigir vidrio fundido a través de dicho antehogar y canal de descarga,

(c) medir el nivel de vidrio fundido corrientes arriba y corrientes abajo del dicho canal de descarga,

(d) determinar la rata de flujo de vidrio fundido a través de dicho antehogar y canal de descarga como una función de una diferencia en nivel de vidrio fundido corrientes arriba y corrientes abajo del dicho canal de descarga, y

(e) controlar en forma variable la rata de flujo de, vidrio a través de dicho antehogar y canal de descarga como una función de dicha diferencia.

11. El método establecido en la reivindicación 10 donde dicho paso (d) se lleva a cabo mediante:

(d1) colocar sensores de medición del nivel de vidrio encima de dicho antehogar corrientes arriba y corrientes abajo del dicho canal de descarga, y

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(d2) antes del dicho paso (b) colocar en cero dichos sensores contra una superficie de pared inferior de dicho antehogar .

Extracto de la Divulgación

Un aparato para controlar una rata de flujo de vidrio fundido a través de un antehogar que incluye un canal de descarga colocado en el antehogar para restringir el ancho de; antehogar al flujo de vidrio en forma tal que hay una diferencia en nivel del vidrio fundido en el antehogar corrientes arriba y corrientes abajo del canal de descarga. Los sensores miden el nivel de vidrio fundido corrientes arriba y corrientes abajo del canal de descarga y un controlador responde a los sensores para determinar la rata de flujo de vidrio fundido a través del antehogar como una función de una diferencia en el nivel de vidrio fundido entre los sensores. La rata de flujo de vidrio a través del antehogar es controlada como una función de la diferencia en nivel de vidrio a través del canal de descarga en comparación con una deseada rata de flujo establecida por un operador.

ES TRADUCCIÓN FIEL Y COMPLETA DEL DOCUMENTO ANEXO
TERMINADA ESTE 2 DE ABRIL, 2001.

83867

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APOSTILLE

(Convention de la Haye du 5 octobre 1961)

1. Country: United States of America

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2. has been signed by J. BERNIE QUILTER.

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

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

CERTIFIED

5. at Columbus, Ohio

6. March 16, 2001

7. by the Secretary of State of Ohio.

8. N^o 55898

9. Seal/Stamp:

10. Signature:



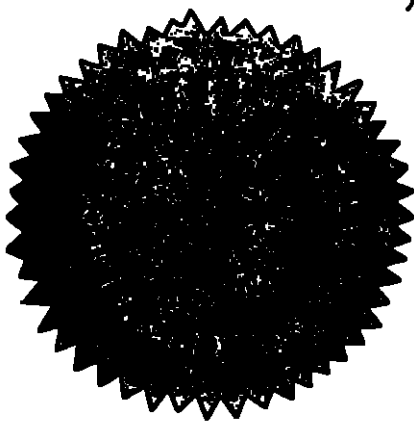
J. Kenneth Blackwell

J. Kenneth Blackwell
Secretary of State of Ohio

NOTARY CERTIFICATE

THE STATE OF OHIO }
COUNTY OF LUCAS }

ss.



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

JUDITH M SCHREINER

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

FEBRUARY 2006

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seal of the said Court and County, at Toledo, Ohio, MARCH 9th 2001

(Date)

J. Bernie Quilter, Clerk of Courts



J. Bernie Quilter

, Clerk

**CERTIFIED COPY
OF
ASSIGNMENT**

I, JUDITH M. SCHREINER, a Notary Public in and for the State of Ohio, U.S.A., hereby certify that the attached documents are true copies of the Assignments made for an improvement invention for APPARATUS AND METHOD FOR CONTROLLING MOLTEN GLASS FLOW THROUGH A FOREHEARTH by its inventors:

**PHILIP D. PERRY
MICHAEL T. DEMBICKI**

to Owens-Brockway Glass Container Inc., as executed on November 29, 1999, and recorded in the United States Patent and Trademark Office on November 29, 1999 (as evidenced by the Notice of Recordation of Assignment Document also attached), and that the aforesaid improvement invention is the subject of United States Patent Application Serial No. 09/450,453 filed November 29, 1999.

Dated: March 2, 2001

Judith M. Schreiner
Notary Public

(Certify by Apostille)



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

62
59



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER
OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

MARCH 03, 2000

OWEN-ILLINOIS
H. G. BRUSS
ONE SEAGATE, 25-LDP
TOLEDO, OH 43666

PTAS

MAR 1 1999



101218626A

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: 11/29/1999

REEL/FRAME: 010420/0269
NUMBER OF PAGES: 3

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

ASSIGNOR:

PERRY, PHILIP D.

DOC DATE: 11/29/1999

ASSIGNOR:

DEMBICKI, MICHAEL T.

DOC DATE: 11/29/1999

ASSIGNEE:

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

SERIAL NUMBER: 09450453
PATENT NUMBER:

FILING DATE: 11/29/1999
ISSUE DATE:

KIMBERLY WHITE, EXAMINER
ASSIGNMENT DIVISION
OFFICE OF PUBLIC RECORDS

12-09-1999

17409 USA

Tab settings == > ▼

101218626

U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office

To the Honorable Commissioner of Patents and Trademarks, Please return the following original documents or copy thereof.

1. Name of conveying party(ies):

Philip D. Perry and
Michael T. Dembicki

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

3. Nature of conveyance:

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

Execution Date: November 29, 1999

2. Name and address of receiving party(ies)

Name: Owens-Brockway Glass Container Inc.

Internal Address: _____

Street Address: One SeaGate

City: Toledo State: Ohio 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: Nov. 29, 1999

A. Patent Application No.(s)

B. Patent No.(s)

Additional numbers attached? ☐ Yes ☒ No

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

Name: H. G. Bruss

Internal Address: Owens-Illinois

Street Address: One SeaGate, 25-LDP

City: Toledo State: Ohio 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 ✓

(Attach duplicate copy of this page if paying by deposit account)

12/09/1999 DMUYEN 00000126 150675 09450453

FC:581

(40.00 CH)

DO NOT USE THIS SPACE

9. Statement and signature.

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.

H. G. Bruss

Name of Person Signing

Signature

Date

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

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

ASSIGNMENT

WHEREAS, I, PHILIP D. PERRY
25688 Normandy, Perrysburg, Ohio 43551 U. S. A.,
together with Michael T. Dembicki

have jointly invented an improvement in "APPARATUS AND METHOD FOR
CONTROLLING MOLTEN GLASS FLOW THROUGH A FOREHEARTH" ; and

WHEREAS, I, as a joint applicant with said Michael T. Dembicki
have executed an Application for United States Patent based thereon, on the
29 day of November, 1998 and

WHEREAS, OWENS-BROCKWAY GLASS CONTAINER INC., a Delaware
corporation, 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 terri-
tories 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 repre-
sentatives 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 identi-
fying 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
29 day of November, 1998
Philip D. Perry
Philip D. Perry WOOD ss:
STATE OF OHIO, COUNTY OF WOOD

On this 29 day of November, 1999, before me, a Notary Public,
personally appeared the above named Philip D. Perry, personally known
to me and known by me to be the one who executed the foregoing instrument and
subscribed the same in my presence, and acknowledged the same to be his free
act and deed.

My Commission Expires:

November 29, 1999

Joyce M. Murphy
Joyce M. Murphy

U. S. Serial No. Filing Date

ASSIGNMENT

WHEREAS, I, MICHAEL T. DEMBICKI
6095 Linwood Road, Pemberville, Ohio 43450 U. S. A.,
together with Philip D. Perry

have jointly invented an improvement in "APPARATUS AND METHOD FOR
CONTROLLING MOLTEN GLASS FLOW THROUGH A FOREHEARTH" ; and

WHEREAS, I, as a joint applicant with said Philip D. Perry
have executed an Application for United States Patent based thereon, on the
29 day of November, 1977; and

WHEREAS, OWENS-BROCKWAY GLASS CONTAINER INC., a Delaware
corporation, 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 terri-
tories 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 repre-
sentatives 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 identi-
fying 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
29 day of November, 1977.

STATE OF OHIO, county of Wood ss:
Michael T. Dembicki

On this 29 day of November, 1977, before me, a Notary Public,
personally appeared the above named Michael T. Dembicki, personally known
to me and known by me to be the one who executed the foregoing instrument and
subscribed the same in my presence, and acknowledged the same to be his free
act and deed.

My Commission Expires:

November 29, 1999

Joyce M. Murphy
Joyce M. Murphy

U. S. Serial No. _____ Filing Date _____



2do. EXAMEN DE FORMA PATENTE DE INVENCION

Folio 67

Radicación no 00-00628

Concepto Técnico no 278

Clasificación Internacional de Patentes: C03B 3/02

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

- SI ☒ NO ☐ Contiene un resumen de la invención (Art.26-e).
- SI ☒ NO ☐ Contiene el título o nombre de la invención (Art.27-d).
- SI ☒ NO ☐ Contiene la descripción de la invención (Art.28-b).
- SI ☒ NO ☐ NO ES APLICABLE ☐ Contiene los dibujos necesarios para comprender la invención (Art.26-d)
- SI ☒ NO ☐ Contiene una o más reivindicaciones. (Art.26-c).
- SI ☐ NO ☐ NO ES APLICABLE ☒ Han sido desarrollados los productos y/o procedimientos a partir de recursos genéticos o de sus productos derivados de los que cualquiera de los Países Miembros es país de origen. (Art. 26- h).
- SI ☐ NO ☐ NO ES APLICABLE ☒ Los productos y/o procedimientos han sido obtenidos o desarrollados a partir de los conocimientos tradicionales de las comunidades indígenas, afroamericanas, o locales de los países miembros, de acuerdo a lo establecido en la Decisión 391 y sus modificaciones y reglamentaciones vigentes.(Art.26-i).
- SI ☐ NO ☒ La invención se refiere a un producto relativo a un material biológico. (Art.26-j).
- SI ☒ NO ☐ NO ES APLICABLE ☐ La prioridad coincide con la materia reivindicada.
- SI ☒ NO ☐ CUMPLE LOS REQUISITOS TÉCNICOS

OBSERVACIONES Y OTROS: SI ☐ NO ☐ ver hoja(s) anexa(s)
- NUEVOS DIBUJOS, FOLIOS: 28 - 29

EXAMINADOR TÉCNICO
202051

Bogotá D. C., enero 31 de 2003



Folio 68

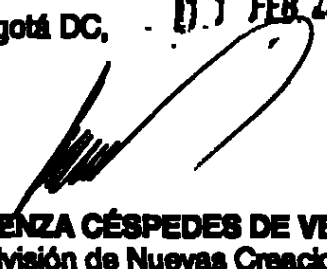
2020
Bogotá DC

Doctor(a)
RAMIRO CASTRO DUQUE
Apoderado(a)

REFERENCIA:	Radicación No.	00-90828
	Trámite	002
	Evento	001
	Actuación	416
	Oficio No.	297
	Folios	001

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

Cúmplase
Dado en Bogotá DC, 11 FEB 2003


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

202051