

Drigard & Castro
Abogados

Apartado 3692

Cra. 7 16-56
Bogotá - Colombia S.A.

Tel. Conm. 3802200
Tel./Fax: (57.1) 2827976
(57.1) 3802700

E-Mail: bricas@brigardycastro.com.co

AS: 82.469

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISION DE NUEVAS CREACIONES
E. S. D.

Radicación : 00030855 00000004 Folios: 2
Fecha (MS): 2002-11-28 16:05:47
Trámite : 002 PATENTES D 1 REGISTRO/ 536 PETICION
Dependencia: 2829 DIVISION DE NUEVAS CREACIONES

REF.: Expediente No. 00 030.855 solicitud de Patente a nombre de
VITRO CORPORATIVO, S.A. DE C.V.

RAMIRO CASTRO DUQUE, vecino de Bogotá, portador de la tarjeta profesional No. 1003 del Consejo Superior de la Judicatura, obrando como apoderado de la Sociedad VITRO CORPORATIVO, S.A. DE C.V., según lo acredita el documento de poder protocolizado en la Secretaría General bajo el No. 18710 de acuerdo con el Artículo 44 de la Decisión 486 de la Comisión de la Comunidad andina, me permito solicitar que se examine si la invención contenida en la solicitud en referencia es patentable.

De acuerdo con lo anterior, me permito anexar el recibo oficial de caja No. 02-77,422 por valor de \$318.000.

Señor Superintendente,


RAMIRO CASTRO DUQUE
C.C. No. 170.322 de Bogotá
Código 340
T.P. No.1003 del C.S.J.
Cra 7 No. 16-56 Piso 9

Noviembre 28, 2002
CPB/har.



154
149

Industria y Comercio
SUPERINTENDENCIA

SUPERINDUSTRIA Y COMERCIO
Radiación: 00030055 00000004 Folios: 2
Fecha (AMD): 2002-11-20 16:05:47
Trámite: 002 PATENTES D 1 REGISTRO/ 530 PETICION
Dependencia: 0020 DIVISION DE NUEVAS CREACIONES

NIT: 800176089-2

RECIBO OFICIAL DE CAJA : 02 - 77,422
FECHA : NOVIEMBRE 20 DE 2002

***** CONSIGNACION *****

DEPOSITANTE	TIPO PASO	BANCO	CUENTA	No. PASO	FECHA PGO	Vr. PASO
BRIGARD & CASTRO LTDA	CONSIGNACION	BANCO POPULAR	050-00110-6	7316842	19/11/2002	33,082,000.00

***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-01	SOLICITUDES	
		112 PTC CAP-I EXAMEN DE PATENTIBILIDA	318,000.00
		TOTAL :	\$ 318,000.00

SON: TRESCIENTOS DIEZ Y OCHO MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

Carrera 13 No. 27-00 Pisos 5, 7 y 10
Conmutador 382 0840
Fax 350 5220
E-mail: info@sic.gov.co
www.sic.gov.co
Bogotá, D.C., Colombia

**SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISIÓN DE NUEVAS CREACIONES**

2020

Bogotá, D. C., 6 de Abril de 2005

Doctor

RAMIRO CASTRO DUQUE

Representante **VITRO CORPORATIVO, S. A. DE C. V.**

ASUNTO	Radicación No.	00-30855
	Trámite	002
	Evento	001
	Actuación	430
	Oficio	12571
	Folios	012

Como resultado del examen de fondo, realizado con fundamento en el artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le comunica

1) Documentos estudiados:

- a) Para el presente estudio se tendrán en cuenta el capítulo descriptivo, comprendido en los folios 5 a 17 de la solicitud en estudio.
- b) Para el presente estudio se tendrán en cuenta los dibujos comprendidos en los folios 77 a 84 de la solicitud en estudio.
- c) Para el presente estudio se tendrá en cuenta el capítulo reivindicatorio que comprende 13 reivindicaciones en los folios 73 a 76 de la solicitud en estudio.
- d) Conforme lo establece los artículos 9, 10 y 11 de la decisión 486 de la Comisión de la Comunidad Andina, la presente solicitud en estudio fue presentada el 28 de abril de 2000, y en el momento de la radicación SI se reclamo prioridad de la primera solicitud presentada en Estados Unidos US 09/307388.

2) Objeto de la Invención

- a) Las reivindicaciones 1 a 13 de la solicitud en estudio se refieren a (1.-) un método para preparar cargas pre-reaccionadas de material primas, exentas de bióxido de carbono, para la producción de fórmulas de vidrio, que comprende: a. seleccionar sustancias que contienen sistemas moleculares de sílice-sodio, sílice-sodio-calcio, sílice-sodio-magnesio, sílice-calcio-magnesio, sílice-sodio-calcio-magnesio, que tengan temperaturas de reacción que no forman fase líquida y que tienen temperaturas de liberación de CO₂, y que se encuentran localizados en puntos invariantes o de puntos en una línea que conecta puntos invariantes de diagramas de fases de dichos sistemas moleculares; b. mezclar cantidades estequiométricas de las sustancias seleccionadas o mezclas de las mismas, hasta completar cercanamente una fórmula molecular de vidrio deseada; y c. hacer reaccionar la mezcla a una temperatura que no forme una fase líquida para producir la fórmula molecular de vidrio deseada.

- b) El anterior procedimiento busca mejores formas de fabricar vidrio.
- c) Según la Clasificación Internacional de Patentes, la codificación para esta solicitud corresponde a C 03 B 1/00.

3) Claridad de la Solicitud

- a) El artículo 28 de la Decisión 486 de la Comisión de la Comunidad Andina de Naciones establece

"La descripción deberá divulgar la invención de manera suficientemente clara y completa para su comprensión y para que una persona capacitada en la materia técnica correspondiente pueda ejecutarla"

La descripción no es clara toda vez que la redacción es ambigua y no se ajusta a los términos técnicos de uso común.

- i) Técnicamente no existen las "cargas pre- reaccionadas de materias primas". Los compuestos reaccionan o no reaccionan, pero no existen los compuestos pre –reaccionados o pos-reaccionados. Es un absurdo.
- ii) De acuerdo a lo leído, el objetivo no puede ser "producir formulas de vidrio". Lo que se trata es de "producir vidrio de diferentes formulaciones". Es muy diferente
- iii) Es absurdo que el solicitante diga que se mezclan cantidades estequiométricas de sustancias seleccionadas de minerales naturales, minerales parcialmente tratados etc. Un técnico habla de cantidades estequiométricas cuando muestra claramente una reacción química de dos o más reactantes claramente establecidos (formulas moleculares) y de sus relaciones. No se puede afirmar que existen relaciones estequiométricas de compuestos no identificados. No se puede afirmar que existen cantidades estequiométricas de minerales, sean naturales o sintéticos, o intermedios de los mismos, pues no están identificados los reactantes. Un mineral difícilmente es 100% un compuesto puro. Un mineral generalmente es una mezcla de un sinnúmero de compuestos diferentes. Por lo mismo, no puede afirmarse que se pueden emplear mezclas estequiométricas cuando ni siquiera se han identificado los compuestos.
- iv) La expresión "sistemas moleculares" es demasiado imprecisa y, por lo tanto, ambigua. Técnicamente no tiene ningún significado válido. Es posible que el solicitante se esté refiriendo a compuestos. Pero para eso existen expresiones técnicas válidas.
- v) Los diagramas de fases se configuran para mostrar el comportamiento de varios compuestos mezclados o en reacción. Sin embargo, técnicamente no existen en dichos diagramas "puntos invariantes". No es claro a lo que se refiere el solicitante.
- vi) No existen técnicamente los "compuestos pre- descompuestos". Es un absurdo.
- vii) El folio 14 es un caos. Palabras en inglés, términos desconocidos, etc.

viii)Etc.

La solicitud debe ser nuevamente redactada de forma completa y donde se eliminan todas las incoherencias, ambigüedades y términos no empleados en la técnica usual.

Por lo anterior, la presente solicitud no cumple con el artículo 28 de la Decisión 486.

- b) El artículo 30 de la Decisión 486 de la Comisión de la Comunidad Andina establece que

"Las reivindicaciones definirán la materia que se desea proteger mediante la patente. Deben ser claras y concisas y estar enteramente sustentadas por la descripción. Las reivindicaciones podrán ser independientes o dependientes. Una reivindicación será independiente cuando defina la materia que se desea proteger sin referencia a otra reivindicación anterior. Una reivindicación será dependiente cuando defina la materia que se desea proteger refiriéndose a una reivindicación anterior. Una reivindicación será dependiente cuando defina la materia que se desea proteger refiriéndose a una reivindicación anterior.- Una reivindicación que se refiera a dos o más reivindicaciones anteriores se considerará reivindicación dependiente múltiple."

El capítulo reivindicatorio no es claro toda vez que:

- i) Todas las objeciones planteadas para el capítulo descriptivo aquí son aplicables.
- ii) El solicitante es muy ambiguo en las reivindicaciones. Un mineral parcialmente es demasiado general. El obtener una formula molecular de vidrio deseada es demasiado ambiguo. El tener productos intermedios de minerales tratados es muy ambiguo. Etc.

De acuerdo a lo anterior, el capítulo reivindicatorio no cumple con el requisito de claridad de acuerdo a lo establecido en el Art. 30 de la Decisión 486.

4) Determinación del Estado de la Técnica

El artículo 16 de la Decisión 486 de la Comisión establece:

"El estado de la técnica comprenderá todo lo que haya sido accesible al público por una descripción escrita u oral, utilización, comercialización o cualquier otro medio antes de la fecha de presentación de la solicitud de patente o, en su caso, de la prioridad reconocida."

"Sólo para el efecto de la determinación de la novedad, también se considerará dentro del estado de la técnica, el contenido de una solicitud de patente en trámite ante la oficina nacional competente cuya fecha de presentación o de prioridad fuese anterior a la fecha de presentación o de prioridad de la solicitud de patente que se estuviese examinando, siempre que dicho contenido este incluido"

en la solicitud de fecha anterior cuando ella se publique o hubiese transcurrido el plazo previsto en el artículo 40."

Consultadas las bases de datos y los archivos con que cuenta la entidad, especialmente bajo las clasificaciones C 03 B 1/00 y las más cercanas a ellas, se encontró que antes del 3 de mayo de 1999 (fecha para determinar el estado de la técnica) habían sido publicados los documentos que se enumeran en la siguiente tabla los cuales se relacionan con formas de fabricar vidrio.

De acuerdo con lo establecido en el artículo 16 se determinó el estado de la técnica y se encontró el siguiente antecedente:

Nº	Documento	Título	Fecha de Publicación
D1	EP 0355618	Method of making glass with preliminary reaction of batch materials	28.02.1990
D2	US 3082102	Process of manufacturing glass	19.03.1969

5) Evaluación de los requisitos de patentabilidad

El artículo 14 de la Decisión 486 de la Comisión de la Comunidad Andina establece:

"Los Países Miembros otorgarán patentes para las invenciones, sean de producto o procedimiento, en todos los campos de la tecnología, siempre que sean nuevas tengan nivel inventivo y sean susceptibles de aplicación industrial".

En cumplimiento con este artículo, se procedió a evaluar los requisitos de novedad, nivel inventivo y aplicación industrial con el fin de establecer la patentabilidad de la invención reivindicada en la solicitud en estudio.

a) Evaluación de la novedad y el del Nivel Inventivo

El art. 16 de la Decisión 486 de la Comisión de la Comunidad Andina establece:

"Una invención se considerará nueva cuando no está comprendida en el estado de la técnica." "El estado de la técnica comprenderá todo lo que haya sido accesible al público por una descripción escrita u oral, utilización comercialización o cualquier otro medio antes de la fecha de presentación de la solicitud de patente o, en su caso, de la prioridad reconocida."

"Sólo para el efecto de la determinación de la novedad, también se considerará dentro del estado de la técnica, el contenido de una solicitud de patente en trámite ante la oficina nacional competente, cuya fecha de presentación o de prioridad fuese anterior a la fecha de presentación o prioridad de la solicitud de patente que se estuviese examinando, siempre que dicho contenido esté incluido en la solicitud de fechas de prioridad cuando ella se publique o hubiese transcurrido el plazo previsto en el artículo 40."

El art. 18 de la Decisión 486 de la Comisión de la Comunidad Andina establece:

"Se considerará que una invención tiene nivel inventivo, si para una persona del oficio normalmente versada en el arte en la materia técnica correspondiente, esa invención no hubiese resultado obvia ni se hubiese derivado de manera evidente del estado de la técnica".

D1 (EP 0355618) relaciona un procedimiento para fabricar vidrio, donde los reactantes son pretratados. Muy similar a lo que pretendería proteger el solicitante.

D2 (US 3082102) al igual que D1, contempla una forma de fabricar el vidrio con características similares a las esbozadas por el solicitante

b) Resumen

En conclusión los requisitos de patentabilidad de la presente solicitud se podrían ver afectados así:

Nº	Documento	Reivindicaciones afectadas	Requisito que afecta
D1	EP 0355618	1-13	Nivel inventivo
D2	US 3082102	1-13	Nivel inventivo

6) Notificación

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que dentro del término de sesenta días contados a partir de la fecha de la notificación de la presente comunicación debe responder a la notificación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente.

Notifíquese el presente oficio conforme a lo dispuesto por el numeral 5.2, literal e) del capítulo quinto del título primero de la Circular Única N° 10 de 2001


ALIX CARMENZA CÉSPEDES DE VERGEL
Jefe División de Nuevas Creaciones

El anterior requerimiento fue notificado por fijación en la lista, de fecha

14 ABR. 2005¹

Concepto Técnico N°	EXAMINADOR TÉCNICO Código No.	EXAMINADOR JURÍDICO Código No.
469	202003	

160
155

⑨



Europäisches Patentamt
European Patent Office
Office européen des brevets

⑪ Publication number:

**0 355 618
A2**

⑩

EUROPEAN PATENT APPLICATION

⑫ Application number: 89114881.9

⑬ Int. Cl.4: C03C 1/02 , C03B 1/00 ,
C03B 3/00

⑭ Date of filing: 11.08.89

⑮ Priority: 19.08.88 US 233707

⑯ Date of publication of application:
28.02.90 Bulletin 90/09

⑰ Designated Contracting States:
AT BE CH DE ES FR GB GR IT LI LU NL SE

⑲ Applicant: PPG INDUSTRIES, INC.
One PPG Place
Pittsburgh Pennsylvania 15272(US)

⑳ Inventor: Demarest, Henry Martin, Jr.
1208 Cambridge Street
Natrona Height, Pa. 15065(US)

㉑ Representative: Starnagel, Hans-Günther, Dr.
et al
Patentanwälte Dr. Michael Hann Dr. H.-G.
Starnagel Sander Ave 30
D-50650 Bergisch Gladbach 2(DE)

㉒ Method of making glass with preliminary reaction of batch materials.

㉓ Silica is reacted with sodium carbonate to form sodium silicate as a preliminary step in a glass melting process. Preferably, calcium carbonate-containing batch materials are calcined separately and then combined with the sodium silicate as liquefying is initiated. The materials may be substantially free of bubble-producing carbonates as the molten phase begins to form.

EP 0 355 618 A2

METHOD OF MAKING GLASS WITH PRELIMINARY REACTION OF BATCH MATERIALS

In the conventional manufacture of glass, raw batch materials are mixed and then subjected to high temperatures to effect the chemical reactions and dissolution that convert the batch mixture to molten glass. Proposals have been made in the past to separately carry out some of the reactions between batch constituents prior to initiating the main melting process. Although these proposals indicate theoretical energy savings, the costs of extra processing have generally rendered the economics unfavorable in actual practice.

U.S. Patent No. 3,082,102 (Cole et al.) discloses heating the batch mixture prior to melting to effect reaction between silica and soda ash to produce sodium metasilicate. The temperature is limited to 820° C for soda-lime-silica glass to avoid producing a molten phase that would lead to clogging of the preliminary heating apparatus.

U.S. Patent No. 3,682,888 (Lacourge) discloses a similar process of reacting the whole batch mixture to produce silicates prior to melting in which a lowered reaction temperature between 600° C and 787° C is made possible by the inclusion of a small amount of halide.

U.S. Patent No. 3,817,778 (Gringras) partially reacts preheated sand grains to sodium silicate by contact with molten caustic soda. The remainder of the batch ingredients are added subsequently. This process has the disadvantage of requiring the use of caustic soda, which is more costly than soda ash as a source of sodium for making glass. Also, the process of contacting solids with molten material is more difficult to control and more prone to plugging than a solid state reaction.

Another useful pretreatment of the batch constituents is the calcining of the limestone and/or dolomite constituents so as to decompose the carbonates to oxides, thereby releasing carbon dioxide. Eliminating carbon dioxide before melting begins is advantageous for the sake of avoiding entrapping gaseous inclusions in the glass. An example of a calcining pretreatment is disclosed in U.S. Patent No. 4,539,030 (Demarest). Calcining requires temperatures in excess of 1800° F (870° C), which precludes treatment of the whole batch mixture because such temperatures would cause fusion of other constituents of the batch, particularly the soda ash or other soda source.

In summary, prior art preheating schemes generally involve only portions of the batch or are limited as to the temperatures that can be attained. Others have unfavorable process features or involve costly raw materials. It would be desirable to maximize the recovery of waste heat from glass melting processes and to preheat and pre-react all

portions of the batch.

Summary of the Invention

In the present invention all portions of the batch are preheated and pre-reacted to an optimized potential prior to initiation of melting. The batch is pretreated in two separate portions. The first portion is characterized by the inclusion of the majority of soda source material (e.g., soda ash), and the second portion is characterized by the inclusion of the majority of the calcium and/or magnesium sources (e.g., limestone and/or dolomite). The calcium and magnesium carbonates are calcined at a temperature above 1800° F (870° C). Preferably, a majority of the silica source material (e.g., sand) accompanies the calcium and magnesium carbonates during calcining and is preheated. With the sand present, the calcining process can be utilized to preheat that portion of the batch to temperatures greater than 2000° F (1100° C) or higher. The soda source is mixed with a minor portion of the silica source and reacted in the solid state at elevated temperatures to produce sodium silicate, primarily sodium metasilicate. The two separately pretreated portions of the batch are combined in a liquefier vessel where melting is initiated.

Because all portions of the batch entering the liquefier have been preheated and have had preliminary endothermic reactions carried out, heat requirements for initiating melting in the liquefier are relatively minor. Under the preferred operating conditions, the major consumption of energy takes place in the calcining stage, and the exhaust gas from the calcining stage may be sufficient to provide a substantial portion of the energy requirement of the sodium silicate reactor. Therefore, the exhaust from the calciner may be directed into the silicate reactor. Exhaust from the liquefier may also be passed into the metasilicate reactor.

Although not essential to the present invention, a particularly advantageous embodiment for the calcining step entails the combustion of fuel (e.g., coal) while mixed with the batch portion as disclosed in U.S. Patent No. 4,834,481 (Demarest et al.).

Other objects and advantages of the invention will be apparent from the detailed description of the preferred embodiment which follows and from the drawing.

The Drawing

The figure is a schematic side view of a specific embodiment for carrying out the present invention including separate calciner, silicate reactor, and liquefier vessels.

Detailed Description

In order to provide a more complete understanding of the invention, a specific preferred embodiment will be described in detail, which embodiment includes rotary kiln pretreatment vessels feeding a rotary liquefier vessel. It should be understood that the concepts of the present invention are not limited to the specific apparatus described and that other means could be employed.

In the embodiment of the figure, a rotary kiln 10 is employed to calcine the portion of the batch that includes the calcium and magnesium carbonates. Most commercial soda-lime-silica flat glass includes a significant amount of magnesium contributed by the dolomite batch material. However, magnesium is not essential to the type of glass to which the present invention relates, and pretreatment of a magnesium source may be considered an optional feature of the present invention. The benefits of the present invention are maximized if all of the calcium and magnesium carbonates of the batch are subjected to the calcining pretreatment, but benefits of a lesser degree may be attained if only a portion are passed through the calciner. Preferably the portion of the batch fed to the calciner constitutes at least a majority of the calcium and/or magnesium source materials. That portion of the batch may be fed to the calciner by a screw feeder 11 at an inlet end of the rotary kiln 10.

In one mode of operation the calcining kiln 10, a burner (not shown) may be provided for heating the interior of the kiln to the calcining temperature. Typically, such a burner would be at the opposite end from the screw feeder 11 and the solids and gases would pass counter-current to each other. However, the preferred method of heating the rotary kiln 10 is to combust fuel in admixture with the batch materials in accordance with the teachings of U.S. Patent No. 4,519,814 (Demarest et al.). One advantage of that approach is that a fuel such as coal can be used without difficulties with ash contamination or discoloration. The batch constituents and the solid or liquid fuel may be mixed prior to being passed through the screw feeder 11 or they may be fed separately to the rotary kiln 10 where mixing will be effected by the tumbling action of the kiln. The barrel 12 of the screw feeder 11 may be water cooled and equipped with conduits to introduce air or oxygen to the interior of the rotary kiln 10 to support combustion of the fuel. The use of oxygen is preferred for the sake of maintaining

higher temperature within the kiln, for minimizing the exhaust gas volume, and for reducing formation of nitric oxide emissions.

When coal is used as the fuel in the calcining rotary kiln the amount of coal required will depend upon the temperature desired and the heat content of the particular coal. A mixture of sand, limestone, and dolomite with 6% to 10% of coal has been found to heat the mixture to 1100°C to 1300°C when combusted with oxygen, which is sufficient to thoroughly calcine the carbonates. Reasonably active calcining for the purposes of the present invention is considered to begin at temperatures of about 1800°F (870°C), but higher temperatures are preferred to maximize the heat input at this stage. The extent to which the carbonates are calcined is essentially complete above 1800°F (870°C). Therefore, the materials being discharged from the rotary kiln 10 may be characterized as being substantially fully calcined, that is, the great majority of the carbonates have been decomposed to oxides. Calcination is highly advantageous for the sake of reducing the energy requirements of the subsequent liquefier stage and for avoiding the production of CO₂ during the subsequent liquefying process where the gas may become entrapped in the molten phase.

Because higher temperatures are attained in the portion of the batch subjected to calcining than in the portion involved in metasilicate production, it is preferred to maximize the portion of silica source material (sand) passed through the calcining vessel so as to provide it with the highest preheat temperature. Having the highest melting temperature of any major batch constituent, the sand may be preheated to very high temperatures without fusing. Some of the silica source must be supplied to the metasilicate reactor, but that amount need be no more than necessary to complete the reaction with the soda source to form sodium metasilicate. Approximately one fifth of the total silica source is sufficient to complete the sodium silicate reaction. The remainder of the silica may be fed to the calcining vessel. Alternatively, a portion of the silica may be separately preheated to temperatures even higher than those attained in the calcining process and then fed directly to the liquefier, thereby reducing the energy requirements of the liquefier even further. Including the maximum amount of sand in the portion of the batch passed through the calciner is believed to have the desirable effect of inhibiting agglomeration of the other materials, thereby permitting higher preheating temperatures along with the calcination.

The sodium silicate reaction may be carried out in a separate vessel that may take a variety of forms, the example shown in the drawing being another rotary kiln 20. An alternative silicate reactor

vessel embodiment may comprise a multiple hearth furnace as is known in the art for contacting solids with gases. The latter arrangement involves a vertical stack of trays having orifices through which pulverulent solids fall from one tray to the tray below when pushed by rotating rakes while the gas passes upwardly through the tray orifices. The rate of the solid state reaction between silica and soda ash is dependent upon temperature and particle size. The size of the reaction vessel is chosen in accordance with the residence time requirement which, in turn, is determined by the rate of reaction. Although an independent heat source could be employed, it is preferred for the sake of energy efficiency to heat the silicate reactor by means of the exhaust gas from the calciner. Under preferred operating conditions the calciner exhaust is of sufficient temperature and volume to provide the entire energy requirement for the silicate reaction. In some cases the exhaust from the calciner may need to be diluted with cooler gas to avoid high temperatures in the silicate reactor that may cause fusion of the materials prematurely. In other cases, additional heat may be needed to be provided by an auxiliary burner (not shown) at the gas entrance end of the silicate reactor.

The parameter affecting the reaction rate that is subject to a wide range of variation is the particle size of the material, particularly the silica. Soda ash in its common commercial form is sufficiently fine for the process. The particle size of conventional glass batch sand, however, is too large to yield practical reaction rates if used as the silica source for the sodium silicate reaction. Although finely divided silica is a more costly raw material than sand, only a minor portion of the overall silica requirement (typically about 20 percent) needs to be fed to the silicate reactor. The silica source for the remainder of the process may be ordinary sand. The amount of silica involved in the silicate reaction can vary, but because of the cost involved for finely divided silica, the amount of silica provided in the silicate reactor is preferably maintained at a minimum, that is, at an amount just sufficient to complete the reaction with the soda ash. At those amounts the product will be predominantly sodium metasilicate. Sodium orthosilicate can be produced if the amount of silica present substantially exceeds the amount required stoichiometrically to complete the metasilicate reaction. A suitable particle size of silica for the silicate reactor may be 200 to 235 mesh (U.S. standard sieve size) finely ground glass sand such as that sold under the name "Supersil." Larger particle sizes may be used, but the reaction rate may be reduced, thereby requiring a larger vessel to complete the reaction. In the upper portion of the permissible temperature range, however, the

effect of the particle size on the reaction rate may be diminished, and more coarse sand may be used without substantial detriment. Finer particle size silica than the range noted above may also be used to advantage, limited only by the tendency for finer materials to be entrained excessively by the gas stream. Some entrainment can be tolerated and controlled by dust collector means on the exhaust gas stream leaving the silicate reactor.

Temperatures in the silicate reactor are preferably maximized to shorten the reaction time but are limited by the tendency for fusion to take place when the solids are at a temperature of about 1800° F (870° C), which is slightly above the melting point of soda ash. This upper temperature may vary somewhat depending upon the particular mixture of silica and soda ash and the amount of agitation provided. The gas entering the silicate reactor may be at temperatures somewhat above the maximum temperature for the solids. For example, exhaust gas from the calciner entering the silicate reactor may be at temperatures as high as 1700° F to 1800° F (930° C to 980° C). The solid state reaction between silica and soda ash is reported as theoretically being initiated at temperatures as low as 570° F (300° C) but reaction time at such a temperature would be very slow. At 1470° F (800° C) the maximum reaction rate (i.e., at the finest particle size) to form sodium metasilicate is reported to be 0.083% per minute, which is feasible to carry out to completion in a rotary kiln as shown in the drawing. Maximum benefit is provided by substantially completing the reaction of the soda ash, but somewhat less than complete reaction may be acceptable to reduce the reactor size. Substantial benefits may be attained even at a completion of only fifty percent or less.

Once the reaction time is determined, the size of the rotary kiln 20 can be calculated for a given throughput from the following equation:

$$t = 2.28 L / NDS \text{ where:}$$

t = residence time, minutes

D = diameter, feet

L = length, feet

N = rotational speed, revolutions per minute

S = slope, inches per foot

A screw feeder 21 may be used to feed a mixture of silica and soda ash to the silicate reactor 20, or the reactants may be fed separately. Exhaust from the calciner 10 may be directed into the silicate reactor 20 by means of a transfer duct 22. A housing 23 closes the other end of the rotary kiln 20 and directs the exhaust to an exhaust duct 24. To modulate the temperature of gas entering the rotary kiln 20, air or gas recycled from the exhaust duct 24 may be introduced at the transfer duct 22 by means of a duct 25. A fan 26 may be provided in duct 25 for recycling the exhaust.

The products from the calciner 10 and the silicate reactor 20 are brought together while still at elevated temperatures and additional heat is provided to initiate melting and glass forming reactions. The manner in which the two portions of the batch are brought together and melted may vary. A simple approach may be to deposit the two streams in a conventional tank type melting furnace. But a preferred arrangement is shown in the drawing where both streams are combined and melting is initiated in a liquefying vessel 30 of the type disclosed in U.S. Patent No. 4,381,934 (Kunide et al.) A preferred structure for a large liquefier is shown in U.S. Patent No. 4,888,272 (Newcamp et al.) In this preferred embodiment the liquefier 30 comprises a rotating drum 31 and a stationary lid 32. The lid 32 may be fabricated of ceramic refractories, water-cooled metal, or combinations of both. A sloped lining 33 of batch material is retained on the interior of the drum 31. As the products of the rotary kilns 10 and 20 are fed onto the lining 33 they become mixed as the drum rotates past the respective feed locations. Further mixing occurs as the material tumbles down the surface of the lining 33. Heat may be provided to the interior of the liquefier 30 by a burner 34 which may extend through the lid. Such an arrangement is intended to merely initiate the melting process, that is, to render the pulverulent materials to a semi-molten, flowable state. Because of the sloped surface 33, the semi-molten materials flow freely from the liquefier through outlet 35 before melting is completed. Completion of the melting and refining of the glass may be completed in subsequent stages (not shown) in accordance with methods known in the art. Examples of techniques that may be used in the subsequent steps are disclosed in U. S. Patent Nos. 4,810,711 (Matesa et al.), 4,854,088 (Kunide et al.) or 4,738,938 (Kunide et al.) Because the materials being fed to the liquefier 30 are preheated and have undergone their endothermic chemical reactions, the heat requirement of the liquefier is substantially reduced. This is advantageous for the sake of minimizing the amount of combustion required within the liquefier 30 and for maximizing the rate of throughput of a liquefier vessel of relatively small size. Burner 34 is preferably fired with oxygen to minimize the exhaust gas volume. The exhaust from the liquefier may be passed to the silicate reactor 20 by way of a duct 38 connected to an opening in the lid 32.

In a calculated example, production of soda-lime-silica glass at 200 tons per day consumes a total of 23 million BTU per hour. The calciner is a rotary kiln 20 feet (6 meters) long with an interior diameter of 5 feet (1.5 meters) and consumes 15.4 million BTU per hour by combustion of coal. The

silicate reactor is a rotary kiln 170 feet (51 meters) long with an interior diameter of 8 feet (1.8 meters) designed to produce a silicate exit temperature of about 800° F (425° C). The silicate reactor requires 28 million BTU per hour, of which 1.8 million BTU per hour is provided by an auxiliary burner and the remainder of which is supplied by the exhaust from the calciner and liquefier. The liquefier burner consumes 3.5 million BTU per hour.

The description of this invention has been set forth with reference to particular embodiments for the sake of disclosing the best mode known to the inventor, but it should be apparent that other variations and modifications as would be apparent to those of skill in the art may be resorted to without departing from the scope of the invention as defined by the claims that follow.

Claims

1. A method of making glass from batch materials including a silica source material, sodium carbonate, and a source of calcium, comprising: contacting at least a portion of the silica source material with the sodium carbonate in a first zone at a sufficient temperature for a sufficient time to form a product consisting predominantly of sodium silicate;
2. The method of claim 1 wherein a minor portion of the silica source material is brought into contact with the sodium carbonate in the first zone, and a major portion of the silica source is preheated prior to being brought into contact with the sodium metasilicate.
3. The method of claim 2 wherein at least a portion of the major portion of the silica source is preheated while in contact with at least a portion of the calcium source.
4. The method of claim 3 wherein the calcium source comprises calcium carbonate, and the preheating of the calcium source in contact with the portion of silica source is at sufficient temperatures to substantially calcine the calcium carbonate.
5. The method of claim 1 wherein the calcium source comprises calcium carbonate, and the calcium carbonate is heated in a third zone so as to be substantially calcined prior to being brought into contact with the sodium silicate.
6. The method of claim 5 wherein a substantial portion of the heat for calcining is provided by combustion of coal.
7. The method of claim 5 wherein the third

165
160

zone is heated by combustion, and exhaust gas from the third zone is passed to the first zone.

8. The method of claim 7 wherein the second zone is heated by combustion, and exhaust gas from the second zone is passed to the first zone.

5

9. The method of claim 8 wherein the majority of energy supplied to the first zone is in the form of exhaust gas.

10. The method of claim 9 wherein substantially the entire energy requirement of the first zone is provided by heat recovery from exhaust gas.

10

11. The method of claim 1 wherein the second zone is heated by combustion, and exhaust gas from the second zone is passed to the first zone.

15

20

25

30

35

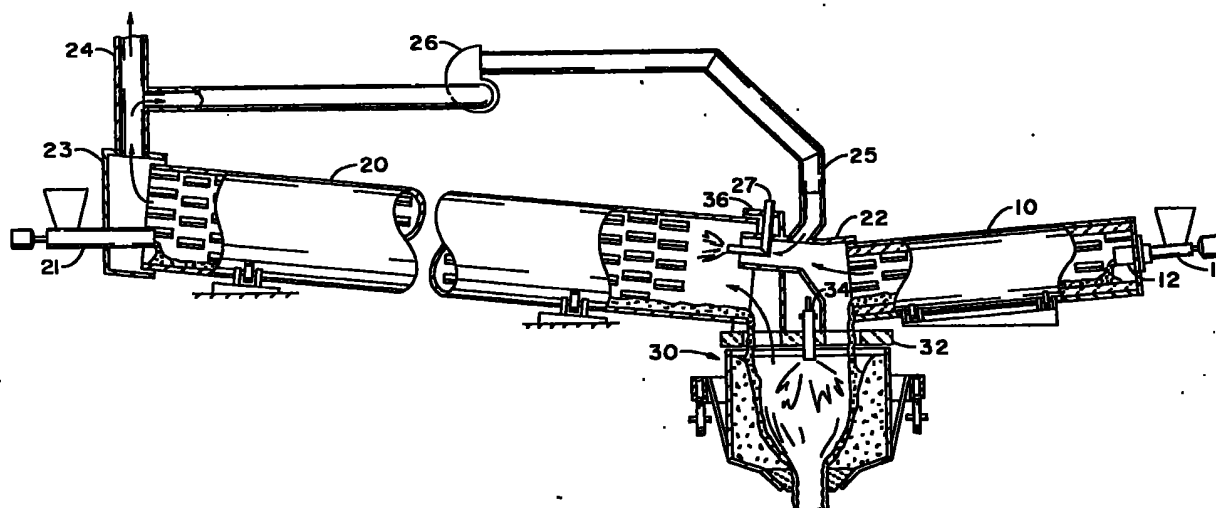
40

45

50

55

6



EP 0 365 618 A2

167
162

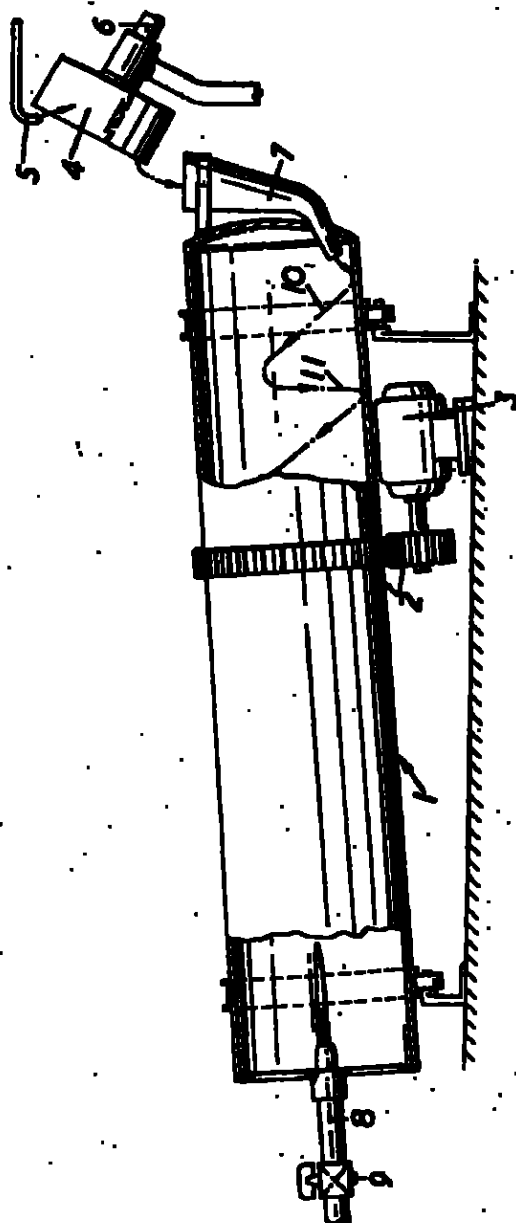
March 19, 1963

H. COLE ETAL

3,082,102

PROCESSES OF MANUFACTURING GLASS

Filed Sept. 3, 1958



Inventors
Horace Cole
James Peter Proctor
By
Kenneth E. Kennedy, Counsel
Attorneys

1

3,082,102

PROCESSES OF MANUFACTURING GLASS

Horace Cole, Helena, and James P. Procter, Manchester, England, assignors to Pilkington Brothers Limited, Liverpool, England, a corporation of Great Britain

Filed Sept. 3, 1958, Ser. No. 758,817

Claims priority, application Great Britain Sept. 10, 1957 16 Claims. (Cl. 106-52)

This invention relates to silicate glass manufacture.

In a customary method of making glass, a silicate glass batch (which is in granular form) is fed to a tank furnace to form molten glass, the molten glass is flowed therefrom in ribbon form and cooled. The batch from which the molten glass is formed usually comprises silica (about 70%); calcium carbonate, sodium carbonate, sodium sulphate, the sodium sulphate being present to combine with the residual silica during the melting process.

In feeding the furnace, heaps of batch are successively dumped into previously formed molten glass at the charging end of the furnace. The heaps so dumped float partly submerged in the molten glass; accordingly the batch material is exposed to widely different melting temperatures.

The part of each heap (about one third) above the level of the molten glass is exposed on all sides to the high temperature of the heating gases, and a liquid phase in the form of a thin layer of melted batch flows down each heap to the molten glass; on the other hand the submerged part (about two thirds) of each heap is more slowly melted since it is exposed to a much lower temperature, which may be several hundred degrees centigrade lower, being shielded from the burning gases and subjected only to the temperature of the body of molten glass.

The flow of melted material on the heaps involves the formation of low silica glass which glass separates from still undissolved silica and undissolved silica flows on to the surface of the tank.

To obtain greater uniformity in the heat treatment of glass batch fed to a glass melting furnace, the batch is sometimes fed to the furnace in the form of relatively thin compacted layers on to the molten glass in the furnace, the layers being successively deposited in contiguity on the molten glass in the layer form, each layer of batch fed to the molten glass extending substantially across the width thereof.

Thus, in both these well known methods of melting batch, the batch is heated up to the melting temperature (1500° C.) in the furnace and is held at such elevated temperature until melting is completed. In practice, the batch is at such temperature for a considerable time (about 36 hours) before melting is completed because the rate determining step in the final production of homogeneous glass is the dissolution of free silica into the already formed low silica glass. This is a slow process.

A main object of the present invention is to provide an improved process of converting the batch into molten glass with considerable economy in the expenditure of heat.

A process of producing molten glass from a glass batch according to the present invention is characterized by the step of maintaining the glass batch at a temperature and for a period of time sufficient to complete chemical reaction between the component particles while the batch as a whole remains in the solid state at the completion of the reaction, before subjecting the embryo glass so formed to a temperature high enough to melt the embryo glass.

2

Examples of the types of reactions in question are indicated by the following equations:



From another aspect the invention comprises a process of producing molten glass from a glass batch characterized in that the batch is first subjected to a thermal treatment at a temperature and for a period of time which is sufficient to complete chemical reaction between the component particles of the batch while the latter as a whole remains solid and subsequently subjecting the embryo glass so formed to a temperature high enough to melt the embryo glass.

In referring to the state of the batch as a whole remaining at the completion of the reaction as being in a solid state we mean either that no liquid phase has been produced at any time during reaction or, of a low melting point component is present, that any liquid phase is momentary only as it is immediately combined with the solid components. An example of a commonly employed component having a low melting point and momentary existence as a liquid in the presence of other components of glass batch is that substance known as boric acid.

Thus the reaction between the particles of the batch is completed while they are still in the solid state and without the formation of a liquid phase and practically speaking no silica is left in the treated batch.

The present invention also comprises a process of producing molten glass from a batch consisting of silica, calcium carbonate and sodium carbonate and little or no sodium sulphate by maintaining the batch at a temperature and for a period of time sufficient to complete chemical reaction between the components while the batch as a whole remains in the solid state at the completion of the reaction and subsequently subjecting the embryo glass to a temperature high enough to melt the embryo glass.

Experiments have shown that by subjecting a soda-lime-silica glass batch to a temperature of about 800° C. 810° C. but not more than 820° C., for a length of time depending on the particle size of the silica grain, the mass can be entirely converted into a homogeneous body of embryo glass; that is to say, that the body thus formed has only to be subjected to a melting temperature for that body for a very short time to convert the reacted body into molten glass.

For normal size sand grains (all passing through 20-mesh sieve i.e. 20 meshes to the inch) approximately 50% reaction has taken place in one hour but where said grains all pass through 150 mesh the reactions are substantially complete in this time.

The experiments have shown that a soda-lime-silica batch of 20 mesh particle size (the usual particle size of sand used in glass making) takes 4 hours at 800° C. for the completion of the reactions. It will therefore be observed that the reaction time varies with the fineness of the particles, and it will be appreciated that the melting point of the sodium carbonate governs the reaction temperature.

In the case of borosilicate glass batch suitable for employment in the manufacture of glass filaments, for example a batch having the composition, silica 53-67%, calcium oxide 16-30%, magnesium oxide 1-7%, aluminium oxide 7-17%, boric oxide 8-9%, the reaction may be effected at a temperature of up to 900° C.

From the foregoing it will be observed that the reaction effected according to the invention is effected below the sintering temperature of any of the reaction products formed in the thermal treatment, thus as no liquid phase of the batch is created the production of a sticky mass in the embryo glass is entirely avoided.

The present invention comprehends the method of making an embryo glass, comprising maintaining the batch at a temperature and for a period of time sufficient to cause reaction between the batch ingredients while the batch as a whole remains in the solid state at the completion of the reaction, as well as the embryo glass produced as a new article of manufacture which is immediately convertible by heat treatment into molten glass.

Because of the condition in which the pre-reaction is effected, it may conveniently be carried out in a slowly rotating rotary tunnel rotating at about 40 r.p.m., which tunnel may be of cylindrical or polygonal cross section, and inclined at an angle of about 5° to the horizontal. The batch material is fed into the upper end of the tunnel, and is fed by gravity along the tunnel, as hereinafter explained, as the latter rotates. The burning gases which effect the heat treatment are projected into the lower end.

When carrying out the reaction in a rotary tunnel it is preferred to nodulate the glass batch, for example to sizes of 1/4"-1/2" diameter.

The nodulating step is effected for convenience in handling the fine powdery material of which the batch consists and to minimize adhesion to the walls of the tunnel, moreover dust formation at the feeding end of the kiln is avoided and of course dust losses up the flue of the tunnel are minimized. Further a higher output is obtained from the tunnel, as compared with feeding the granular batch thereto, because of increase of bulk density; and from another aspect a greater weight of batch is acted on in the tunnel in a given unit of time than would occur if the granular batch was fed in.

Another advantage of nodulation is the decrease of loss of volatile ingredients in the batch as opposed to physical carry-over by gas streams.

The nodules may be conveniently prepared by continuously feeding batch into nodulating apparatus of known form and consisting of a drum which revolves on an axis inclined to the vertical and subjecting the batch to a spray of water as the drum is rotated. The amount of water applied to the batch to form the nodules depends upon the nature of the batch but is usually 12-15% by weight of the batch.

In this aspect, therefore, the present invention provides a process of producing embryo glass comprising converting particulate batch material into nodules in each of which the batch material is bound together by means of water, feeding the nodules into the upper end of a downwardly inclined rotating tunnel kiln, the tunnel rotating at a low angular velocity and set at a small angle to the horizontal so that the nodules travel through the tunnel by being alternately carried upwardly by the wall of the tunnel as it rotates and then allowed to tumble down to the floor area of the tunnel but at a point further down the tunnel than that at which they started their upward journey, and heating the space within the tunnel so that during the passage of the nodules through the tunnel they are maintained at a temperature and for a period of time sufficient to complete reaction between the component particles while the batch as a whole remains solid.

In order that the invention may be more clearly understood a preferred embodiment thereof will now be described by way of example with reference to the accompanying diagrammatic drawing which is a side elevation view, partly exploded of a rotating tunnel kiln, and associated nodulating drum.

Referring to the drawing an elongated cylindrical tunnel kiln indicated generally at 1 is inclined at an angle of about 5° to the horizontal and is driven by means of reduction gearing 2 associated with a motor 3. Glass batch is nodulated in a drum 4, equipped with a water pipe 5 and rotated with shaft 6 driven by a motor not shown from which the nodules fall into hopper 7 and are then fed from the hopper into the upper end of the kiln whilst combustion gas is fed into the lower end of the kiln from pipe 8 in

quantities controlled by valve 9 and burnt in order to maintain the interior of the kiln at the desired temperature.

The kiln is rotated at such a rate that the nodules travel down through the kiln by successively being carried up the side wall of the kiln in a diagonal direction as indicated at 10, and then tumbling down onto the floor area of the kiln, as indicated at 11, at a point further down the kiln than that from which they started, that is, they travel in a zig-zag form of path.

The employment of separate nodules of batch, in conjunction with the tumbling effect, thus ensures that the whole surface of the batch is exposed to the heat in the kiln and so maintained at the desired temperature. The residence time of the nodules may be controlled by altering the length of the kiln and/or its inclination.

After the pre-reaction is completed the embryo glass so formed may be fed to a glass melting furnace where only the extra heat of melting and fining to required from the furnace to produce the molten glass, hence great heat economy is achieved by effecting the two-stage treatment of reacting and then melting in the production of molten glass as a continuous process.

By feeding the embryo glass material produced according to the present invention to a furnace for melting glass dissolution of silica into an already made glass is entirely avoided and in consequence efficient heat utilisation is obtained i.e. for a given amount of heat a greater (twice the normal) quantity of molten glass can be produced or the same quantity may be produced at a much lower temperature i.e. 100° C. less than normal melting temperature, with a resultant increase of useful life of the furnace. In the absence of any production of low silica glass homogeneity is achieved with the absence of seed and bubble as all gases in the batch material were driven off in producing the embryo glass.

However, it will be appreciated that there is economy in the consumption of heat even if the product obtained from the pre-reaction stages is allowed to cool before being fed to a glass melting furnace, as the chemical reaction required between the components to form glass has already been carried out. As a result the embryo glass has only to be brought to the melting temperature for the glass to directly convert the solid reacted components into a molten condition and then to the working temperature in the glass melting furnace.

Experiments have shown that a very considerable saving in fuel required for producing molten glass can be obtained and that, under optimum conditions, about ten times the amount of batch can be converted into molten glass for a given quantity of fuel when operating in accordance with the invention than has hitherto been produced in the ordinary tank furnace, in which the granular batch is floated on molten glass.

As homogeneity is established in the embryo glass, the subsequent treatment in a glass melting equipment is purely physical, causing the embryo glass to be converted to a molten workable state.

A process as herein described forms a relatively easy means of melting those batches of material which in ordinary processes are difficult to melt, in particular "hard" boro silicate batches and low-alkali glasses.

By employing a batch which does not include sodium sulphate (salt cake) the refractories of the melting tank of a glass melting furnace are not exposed to the chemical attack engendered by the presence of this usual component of batch used in making glass, which attack is the more serious at the higher temperatures of melting in the furnace.

Owing to the rapid rate of melting embryo glass produced according to the invention a relatively small glass melting tank only is required to give the necessary surface area for a required output of glass. Further owing to the rapid rate of melting of embryo glass made according to the invention only a relatively small melting area is sufficient for a required output of refined molten glass.

We claim:

1. In the production of molten glass from a silicate glass batch of the group consisting of soda-lime-silica glass batches and borosilicate glass batches, said glass batch providing a proportion of silica which is relatively large with respect to any other ingredient, the step of substantially completing the chemical reactions between the component particles by maintaining the glass batch at a temperature of not over approximately 900° C. and below the sintering temperature of any of the reaction products for a period of time sufficient to substantially complete said chemical reactions between the component particles while the batch as a whole remains in the solid state at the completion of the reaction and before subjecting the embryo glass so formed to a temperature high enough to melt the embryo glass.

2. A process of producing molten glass from a silicate glass batch of the group consisting of soda-lime-silica glass batches and borosilicate glass batches, said glass batch providing a proportion of silica which is relatively large with respect to any other ingredient characterized in that the chemical reactions between the component particles are substantially completed by subjecting the component particles to a thermal treatment at a temperature of not over approximately 900° C. and below the sintering temperature of any of the reaction products for a period of time which is sufficient to substantially complete chemical reactions between the component particles of the batch while the latter as a whole remains in the solid state at the completion of the reaction, and subsequently subjecting the embryo glass to a temperature high enough to melt the embryo glass.

3. A process of producing embryo glass comprising converting a silicate glass batch material into nodules in each of which the particulate batch material is bound together by means of water, feeding the nodules into the upper end of a downwardly inclined rotating tunnel kiln, the tunnel rotating at a low angular velocity and set at a small angle to the horizontal so that the nodules travel through the tunnel by being alternately carried upwardly by the wall of the tunnel as it rotates and then allowed to tumble down to the floor area of the tunnel but at a point further down the tunnel than that at which they started their upward journey, and heating the space within the tunnel so that during the passage of the nodules through the tunnel they are maintained at a temperature below the sintering temperature of any of the reaction products and for a period of time sufficient to complete chemical reaction between the component particles while the nodules as a whole remain in a solid but unsintered state at the completion of the reaction, the heating of the nodules being below the sintering temperature thereof.

4. A process of producing molten glass from a silicate glass batch consisting essentially of a major proportion of silica, minor proportions of calcium carbonate and sodium carbonate and optionally sodium sulphate, by maintaining the batch at a temperature not exceeding 820° C. and below the sintering temperature of any of the reaction products for a period of time sufficient to complete chemical reaction between the component particles while the batch remains in the solid state at the completion of the reaction to form embryo glass, and subsequently subjecting the embryo glass to a temperature high enough to melt the embryo glass, the proportions of said ingredients being such that, at the completion of the reactions, the batch is substantially free from uncombined silica.

5. A process of producing in a molten state soda lime silica glass from a silicate glass batch consisting essentially of a major proportion of silica and minor proportions of calcium carbonate and sodium carbonate, characterized

in that the chemical reactions between the component particles of the particulate batch are substantially fully completed at a temperature of about 800° C. to 810° C. for a period of time depending on the particle size of the silica grains, while the batch remains solid, and subsequently subjecting the embryo glass formed to a temperature high enough to melt the embryo glass, the proportions of the said ingredients being such that at the completion of the said reactions the batch is substantially free from uncombined silica.

6. A process of converting a particulate soda lime silica glass batch consisting essentially of a major proportion of silica and minor proportions of calcium carbonate and sodium carbonate into embryo glass, characterized by substantially fully completing the chemical reaction between the component particles while the batch remains solid, by a treatment carried out at a temperature of about 800° C. to 810° C., but not exceeding 820° C., for a period of time dependent on the particle size of the silica grains, the proportions of the ingredients of the batch being such that at the completion of said reactions the batch is substantially free from uncombined silica.

7. A process of producing an embryo borosilicate glass from a borosilicate glass batch consisting essentially of a predominating proportion of silica and lesser proportions of calcium oxide, aluminum oxide and boric oxide, the embryo glass being convertible to molten glass by subjecting the embryo glass to a temperature high enough to melt the embryo glass, the process comprising maintaining the borosilicate glass batch at a temperature not exceeding 900° C. and below the sintering temperature of any of the reaction products, for a period of time sufficient to complete chemical reaction between the component particles while the batch remains in the solid state at the completion of the reaction, the proportions of the said ingredients being such that at the completion of the reaction the batch is substantially free from uncombined silica.

8. As a new article of manufacture, embryo silicate glass prepared by the process of claim 7 and consisting of fully reacted batch material devoid of a liquid phase, which embryo material is directly convertible by heat treatment into a molten glass.

9. A process of producing an embryo borosilicate glass from a borosilicate glass batch comprising 53% to 67% silica, 16% to 30% calcium oxide, 1% to 7% magnesium oxide, 7% to 17% aluminum oxide and 8% to 9% boric oxide, which latter is convertible to molten glass by subjecting the embryo glass to a temperature high enough to melt the embryo glass, the process comprising maintaining the borosilicate glass batch at a temperature not exceeding 900° C. and below the sintering temperature of any of the reaction products for a period of time sufficient to complete chemical reaction between the component particles while the batch remains in the solid state at the completion of the reaction, and the reacted batch forming the embryo glass being substantially free of uncombined silica.

10. As a new article of manufacture, embryo silicate glass prepared by the process of claim 6 and consisting of fully reacted batch material devoid of a liquid phase, which embryo material is directly convertible by heat treatment into a molten glass.

References Cited in the file of this patent

UNITED STATES PATENTS

1,394,973	Crosley	Oct. 25, 1921
1,543,770	Hilbert	June 30, 1925
2,260,749	Kelsey	Oct. 28, 1941
2,265,540	Nichols	Dec. 9, 1941
2,886,461	Taylor et al.	May 12, 1959

166

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

RADICACIÓN: 0-30855

EDICTO No. 10064

**LA SECRETARÍA GENERAL AD-HOC
HACE SABER:**

Que esta Superintendencia profirió Resolución No. 17967 de 27-JUL-2005. Que el contenido de la parte resolutive es como sigue: El Superintendente de Industria y Comercio.

RESUELVE

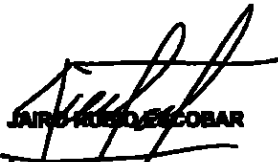
ARTICULO PRIMERO: Negar el privilegio de patente de invención para la solicitud correspondiente a "METODO PARA PREPARAR CARGAS PRE-REACCIONADAS DE MATERIAS PRIMAS PARA LA PRODUCCION DE FORMULAS DE VIDRIO".

ARTICULO SEGUNDO: Notificar personalmente el contenido de la presente resolución al doctor Ramiro Castro Duque, o a quien haga sus veces, en su calidad de apoderado de Vitro Corporativo, S.A. de C.V., entregándole copia de la misma, advirtiéndole que contra ella procede el recurso de reposición interpuesto ante el Superintendente de Industria y Comercio, al momento de la notificación o dentro de los 5 días hábiles siguientes a ella.

NOTIFIQUESE Y CUMPLASE

Dada en Bogotá, D.C., a los **27 JUL 2005**

EL SUPERINTENDENTE DE INDUSTRIA Y COMERCIO,


JAIME RUBIO ESCOBAR

Para notificar a los interesados, se fija el presente EDICTO en lugar visible al público en la SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO, por el término de (10) diez días hábiles contados a partir de las 8:30 a.m. de hoy.

Secretaría General Ad-Hoc 19-AGO-2005  Este edicto se desfija hoy 01-SEP-2005 a las cinco (5:00 p.m.) 
Secretaría General Ad-Hoc
EDICTO No. 10064