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DIVISION DE NUEVAS CREACIONES
Superintendencia de Industria y Comercio
E. S. D.

137

Trámite :002
Evento :001
Actuación :444

Referencia : Expediente No. **00-047560**

Asunto : Solicitud de Patente para **"APARATO Y PROCESO DE PREHIDROLISIS DE BIOMASA"**

Solicitante : **RM MATERIAIS REFRATÁRIOS LTDA.**

Yo, Emilio FERRERO, obrando como apoderado de la sociedad solicitante en el asunto de la referencia, atentamente, solicito a Usted se sirva agilizar el trámite de la presente solicitud, ya que la última actuación que obra en el expediente es la solicitud presentada el 07 de noviembre de 2003, para que se realice el examen de patentabilidad.

Teniendo en cuenta que se encuentran completos todos los aspectos de carácter formal, de manera atenta le solicito darle pronto trámite.

Bogotá,
Señora Jefe,

EMILIO FERRERO
T.P.A. No. 31.929

COLO 12223-801-002-1
NNJ-JMG
ID-373 WPCL002H

DIVISION DE NUEVAS CREACIONES

RADICACIÓN EXPEDIENTE No. **00- 47560**

EL EXTRACTO DE LA PRESENTE SOLICITUD DE **PATENTE DE INVENCION**,

FUE.PUBLICADO EN LA GACETA DE PROPIEDAD INDUSTRIAL No **528**, DE

FECHA **30** DE **MAYO** DE **2003**, EL TERMINO HABIL SEÑALADO POR LA LEY

EXPIRA EL **29** DE **AGOSTO** DE **2003**.

NOTA: Dentro del plazo de los seis (6) meses siguientes a partir de la fecha de publicación en la gaceta de Propiedad Industrial, deberá solicitar y cancelar el examen de patentabilidad so pena de que la solicitud caiga en abandono, de acuerdo con lo establecido en el Artículo 44 de la Decisión 486/2000.

SE PRESENTARON OPOSICIONES POR PARTE DE TERCEROS.

SI ____ _____ NO ____ X ____

United States Patent [19]

Kitabatake et al.

[11] **Patent Number: 4,997,124**

[45] **Date of Patent: Mar. 5, 1991**

[54] **VACUUM-INSULATED, DOUBLE-WALLED METAL STRUCTURE AND METHOD FOR ITS PRODUCTION**

[75] Inventors: **Akihiro Kitabatake**; **Akihiro Kanada**, both of Nara; **Kazuhiro Nishikawa**, Itami; **Mamoru Fujiyama**, Nara, all of Japan; **Ikuo Kawamoto**, Bankok, Thailand

[73] Assignee: **Zojirushi Corporation**, Osaka, Japan

[21] Appl. No.: **340,644**

[22] Filed: **Apr. 20, 1989**

[30] **Foreign Application Priority Data**

Apr. 20, 1988 [JP] Japan 63-98855
Apr. 20, 1988 [JP] Japan ..... 63-54095[U]
May 27, 1988 [JP] Japan 63-130737

[51] Int. Cl.[5] B23K 31/02; A47J 41/02

[52] U.S. Cl. 228/184; 228/190; 228/217; 228/221; 228/234; 285/287; 285/142; 220/430; 220/424

[58] Field of Search 228/184, 190, 217, 221, 228/234; 285/287, 142, 143, 148; 220/420, 424, 425, 453, 454, 465

[56] **References Cited**

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Primary Examiner—Sam Heinrich
Attorney, Agent, or Firm—Jones, Tullar & Cooper

[57] **ABSTRACT**

A vacuum-insulated, double-walled metal structure comprises inner and outer shells made of a metal and seamed together to form a double-walled structure with a space between them, the space being exhausted of air. At least one of the inner and outer shells is provided with at least one activated foil of a metal selected from the group consisting of copper, titanium and zirconium. The inner shell may be wound with an activated titanium or zirconium foil, and covered by another metal foil selected from the group consisting of copper, aluminum, titanium and zirconium, except for a part of its bottom. The metal foil wound on the metal structure is activated by preliminarily exhausting air from the space so that a pressure therein becomes reduced to a low vacuum of the order of 10^{-2} Torr, and then heating the double-walled structure at not less than about 400° C.

2 Claims, 5 Drawing Sheets

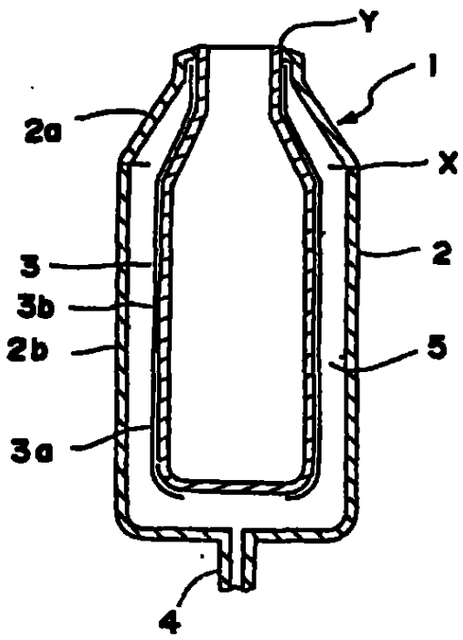

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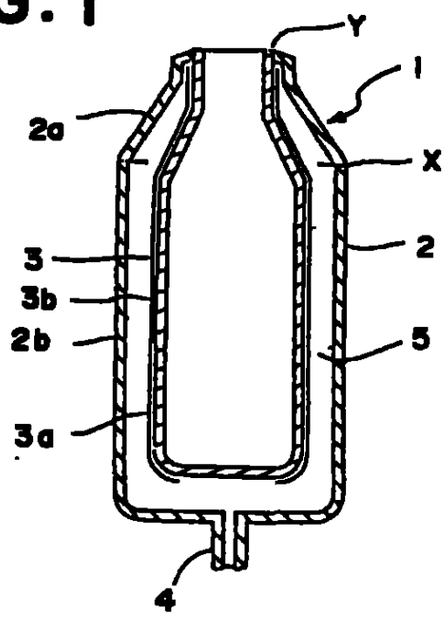
FIG. 1



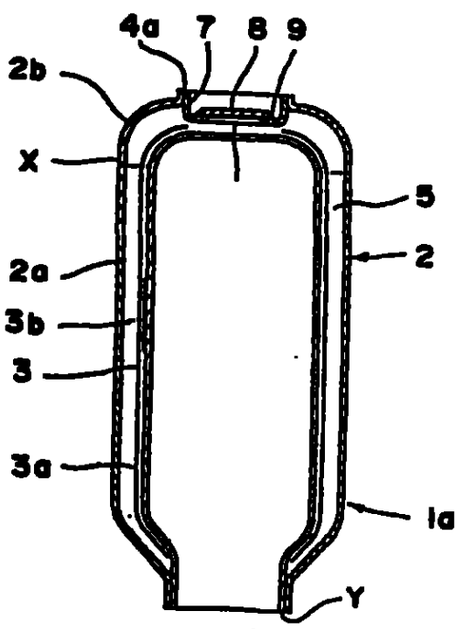


FIG. 2

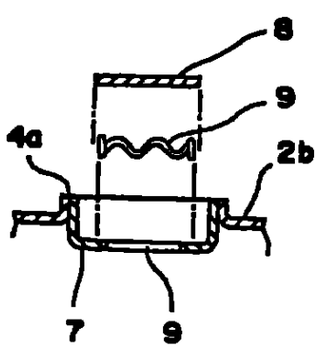


FIG. 3

FIG. 9

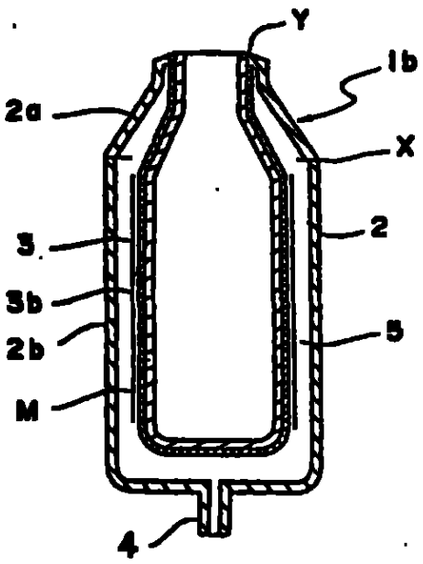


FIG. 10

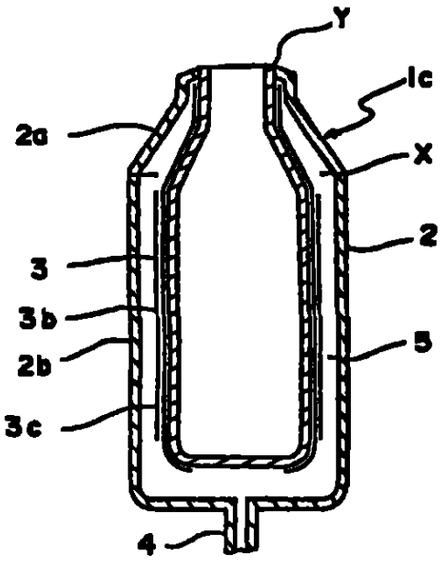


FIG. 11

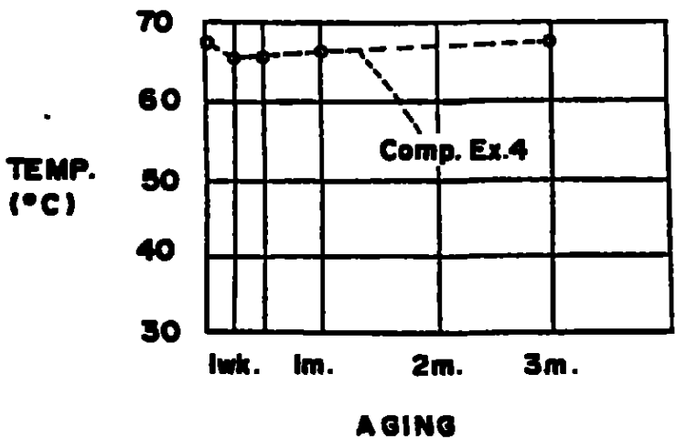


FIG. 10 is a section view of a vacuum-insulated double-walled vessel, showing another embodiment of the present invention;

FIGS. 11 to 14 are graphs showing thermal insulating properties of double-walled structures of the prior art.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1, there is shown a metal vacuum bottle 1 embodying the present invention, comprising an outer shell or bottle 2 and an inner shell or bottle 3, which are made of a stainless steel and seamed together at the top ends of their openings Y to form a double-walled bottle with a space 5 between the inner and outer shells 2, 3, the space 5 being exhausted of air. The inner bottle 3 is covered with an activated titanium foil 3*b* with a thickness of 25 μm and a weight of 0.8 g, and an activated copper foil 3*a* with a thickness of 16.6 μm and a weight of 12 g, except for a central portion at its bottom. At the bottom of the outer bottle 2, there is provided a tip tube 4 for exhaustion of air.

The above metal vacuum bottle can be produced in the following manner. Using a stainless steel sheet, there are prepared an upper member 2*a* and lower member 2*b*. The lower member 2*b* is then provided at a central portion of its bottom with a tip tube 4. Also, there are prepared an inner barrel with a neck portion, and an inner bottom member, which are then seamed together by welding to form the inner bottle 3. The inner bottle 3 is wound with a slender titanium foil 3*b*, and further wound with a sheet of copper foil 3*a* except for a top end of its neck portion and a central part of the bottom wall that faces the opening of the tip tube. The inner bottle 3 is then seamed at the tip Y of the neck portion with the upper member 2*a*, with which the lower member 2*b* is seamed at X to form a double-walled bottle with a space between the inner and outer bottles.

The thus prepared double-walled bottle is treated by a series of steps diagrammed in FIG. 7 to complete the vacuum bottle. The double-walled bottle is placed in a furnace, and its tip tube 4 is connected to a vacuum pump. The space 5 is preliminarily exhausted of the air through the tip tube 4 until the pressure in the space 5 becomes reduced to about 10^{-2} Torr, as shown in step 21 of FIG. 7. Since the bottom of the inner bottle 3 facing the tip tube is not covered with the copper foil 3*a*, no suction of the copper foil 3*a* takes place.

Under such a low vacuum, the double-walled bottle is heated in step 22 to a temperature of 400° to 450° C. to remove gases adhered to or absorbed in the surfaces of the inner and outer bottles defining the space as well as to activate the copper foil 3*a* and titanium foil 3*b*. During heat treatment, the outer bottle 2 is directly heated by the heat from the furnace, while the inner bottle 3 is heated by radiation, thermal conduction from the outer bottle 2 at the seamed portion between the inner and outer bottles, and convection caused by the remaining gases in the space 5.

Although the pressure in the space 5 of the double-walled bottle is reduced to 1×10^{-2} Torr, the heat transfer from the outer bottle 2 to the inner bottle 3 is scarcely damaged by preliminary exhaustion since the heat transfer due to convection becomes a dominant factor even under such a low vacuum. Accordingly, the inner bottle 3 is heated to the predetermined temperature in 10 to 20 minutes, and the gases absorbed in the surface of inner bottle 3 are released therefrom into the space 5 as well as that of the outer bottle 2, thus making it possible to perform degassing sufficiently in a short time. At the same time, the copper foil 3*a* and titanium foil 3*b* are activated by heating as they release the absorbed gases such as water vapor (H_2O), nitrogen (N_2), carbon dioxide (CO_2), carbon monoxide (CO), etc. Since the heating is carried out at a temperature below the temperature range where sensitization of stainless steel takes place, there is no fear of intercorrosion due to sensitization.

After heat treatment, the double-walled bottle is further exhausted of the remaining gas until the pressure is reduced to a high vacuum of about 10^{-4} Torr, in step 23 of FIG. 7. During this step, the double-walled bottle is maintained to the same temperature as that of the heat treatment in step 22, and the gases remaining in the space 5 and released from the surfaces of the inner and outer bottles, copper foil 3*a* and titanium foil 3*b* are exhausted through the tip tube 4. Then, the double-walled bottle is allowed to cool under a high vacuum in step 24, and the tip tube 4 is pinched off to complete a metal vacuum bottle in step 25.

The activated copper foil 3*a* serves as the reflective layer and absorbs hydrogen (H_2) remaining in the space or released from the surfaces of the outer and inner bottles 2 and 3 defining the vacuum space, while the activated titanium foil 3*b* absorbs nitrogen (N_2) remaining in the space or released from the surfaces of the outer and inner bottles 2 and 3. Thus, the space between the outer and inner bottles 2 and 3 is kept at a high vacuum for a long period of time, and the vacuum bottle possesses excellent thermal insulating properties.

Referring now to FIGS. 2 and 3, there is shown another embodiment of the present invention. The metal vacuum bottle 1*a* has the same structure as that of FIG. 1 except that the tip tube 4 is replaced with a suction port 6 adapted to be closed by a lid member 8. The outer bottle 2 is provided at its bottom with an opening 4*a*, to which a cylindrical member 7 with the suction port 6 is seamed by welding. The suction port 6 is closed by brazing a lid member 8 to the cylindrical, member 7 with a soldering material. Exhaustion of the space 5 is carried out as follows.

For example, the above metal vacuum bottle 1*a* may be produced in the following manner. After preparing a double-walled bottle, a waved annular solder 9 is placed on the bottom of the double-walled bottle previously turned upside down, and then a lid member 8 is placed on the solder 9, as shown in FIG. 3. The double-walled bottle is then placed in a vacuum furnace (not shown), and the air exhausted by a series of steps diagrammed in FIG. 8.

In preliminary exhaustion step 31 of FIG. 8, the double-walled bottle is preliminarily exhausted of the air so that the pressure in the space 5 is reduced to about 10^{-2} Torr, and then heated to about 850° to 950° C. to remove gases adhered to or absorbed in the surfaces of the inner and outer bottles defining the space as well as to activate the copper foil 3*a* and the titanium foil 3*b*, as shown in heating and degassing step 32 of FIG. 8. Then, the double-walled bottle is further exhausted of the remaining gas so that the pressure in the space 5 is reduced to a high vacuum of about 10^{-4} Torr, in step 33 of FIG. 8. After the exhaustion step, the double-walled bottle is heated to a temperature of about 1000° C. under the high vacuum, so that the solder 9 is allowed to melt. Thus, the lid member 8 sinks to the bottom of the member 7 by the action of gravity and closes the suction port 6. After this, the double-walled bottle is cooled rapidly

in step 35, so that the melted solder solidifies and hermetically joins the cylindrical member 7 with the lid member 8 as shown in FIG. 2, while the space is being kept at a high vacuum. The thus produced vacuum bottle possesses excellent thermal insulating properties for a long period of time as well as that of embodiment of FIG. 1. In this embodiment, the activation of titanium foil and copper foil is carried out under the reduced pressure at a temperature of not less than 700° C., so that the titanium foil can serve as a getter which absorbs hydrogen and nitrogen.

In this embodiment, it is possible to remove the absorbed gases from the surfaces of the inner and outer bottles defining the space 5 sufficiently in a short time since there remains some gases even under the reduced pressure of 1×10^{-2} Torr, causing heat transfer due to convection as well as in the embodiment of FIG. 1. Further, it is possible to carry out the exhaustion of the remaining gases in the step 33 in a short time since the pressure in the space 5 is previously reduced to 10^{-2} Torr.

In addition, the copper foil 3*a* and titanium foil 3*b* are activated by heating as they release the absorbed gases such as water vapor (H_2O), nitrogen (N_2), carbon dioxide (CO_2), carbon monoxide (CO), etc. The copper foil 3*a* and titanium foil 3*b* absorb the gases remaining in the space 5 and released from the inner and outer bottles 2, 3 after the bottle is allowed to cool, thus making it possible to prevent the vacuum bottle from decreasing the thermal insulating properties. Since degassing from the surfaces of the double-walled bottle is carried out at a temperature beyond the temperature range where sensitization of stainless steel takes place, and then cooled rapidly, it is possible to prevent the stainless steel from intercorrosion due to sensitization.

FIG. 4 shows a vacuum-insulated, double-walled pipe used as a nonfreezing water pipe, embodying the present invention. The nonfreezing pipe comprises inner and outer shells 10 and 11, which are joined together by end closure members 13 and 14 at opposite ends of the outer shell 11 to provide an elongated cylindrical space 20. The space 20 is exhausted of air.

The inner pipe 10 is made of stainless steel pipe with an inside diameter of 22 mm and a thickness of 1 mm when used as a feed pipe, and covered with an activated copper foil 10*a*. Arranged between the inner pipe 10 and copper foil 10*a* is an activated titanium foil 10*b* wound on the inner pipe 10. If a nonfreezing pipe has a long length, it is preferred to provide one or more spacers on the inner shell 10 to keep the distance between the inner and outer shell 10 and 11 constant and to prevent them from contact. The outer shell 11 is made of a stainless steel pipe with an inside diameter of 42 mm and is a thickness of 1.2 mm, and provided at its upstream side with a tip tube 12 of copper for exhaustion. The outer shell 11 extends coaxially with the inner shell 10 and is fixed to the inner shell 10 by end closure members 13 and 14 at the opposite ends. The end closure members 13 and 14 are cylindrical members of stainless steel with a U-shaped cross section, and are respectively seamed to the inner and outer shells 10, 11 to provide a space between them.

At the opposite ends of the outer shell 11, there are provided caps 15 and 16 of stainless steel to cover the end closure members 13, 14, and sealant 17 is filled into spaces formed between end closure members 13, 14 and caps 15, 16. The tip tube 12 is protected by a cap 18 and the downstream cylindrical portion of the cap 16. As illustrated in FIG. 4, a cap 19 may be put on the tip tube 12 and filled with a sealant 17 to improve the thermal insulating properties of the nonfreezing pipe.

The above nonfreezing pipe may be produced in the following manner. For example, the end closure, member 13 is fitted on the inner shell 10 first so that the free ends of its cylindrical portions face outwardly, and then are joined to the outer periphery of the inner shell 10 at A by welding. On the other hand, the other end closure member 14 is fitted in one of the openings of the outer shell 11 so that the free ends of its cylindrical portions face outwardly, and are then joined at B to the inner periphery of the upstream (right) end of outer shell 11 by welding. The outer shell 11 is fitted on the inner shell 10 from the upstream (right) end of inner shell 10 until the upstream end of inner shell 10 protrudes beyond the end closure member 14 for the determined distance.

After concentrically aligning or orienting the inner and outer shells 10 and 11, the end closure members 13 and 14 are respectively joined to the internal wall portion of the outer shell 11 and the external wall portion of the inner shell 10 at C and D to form an annular space 20 surrounding the inner shell 10. During the fitting step, the tip ends of the inner and outer shells 10 and 11 do not come into contact with each other, thus making it possible to form a pipe of a double-walled construction easily and smoothly without damaging the copper foil 10*a* wound on the inner shell 10.

The space 20 of the resultant double-walled pipe is exhausted in the same manner as in the embodiment shown in FIG. 1. When heating the double-walled pipe in the furnace, the temperature of the outer shell 11 rises first, and then the temperature of the inner shell 10 rises. Thus, the outer shell 11 provides higher thermal expansion as compared to the inner shell 10. For this reason, the end closure members 13 and 14 are deformed by the stress acting thereon in the directions indicated by arrows a and b in FIG. 4. When cooling the pipe, the outer shell 11 provides larger shrinkage as compared to the inner shell 10 because of a higher cooling rate of the outer shell, so that the end closure members 13 and 14 are deformed by the stress acting thereon in the reverse directions indicated by arrows a' and b' in FIG. 4.

As will be understood from the above, the thermal stress produced in the outer and inner shells are absorbed by the end closure members 13 and 14, thus making it possible to prevent the welded portions of the pipe from cracking during the exhausting step.

In the embodiment shown in FIGS. 4 and 5, the tip tube 12 is used for exhaustion of air, but may be replaced with a suction port previously provided in the outer shell. In this case, the suction port is closed with a lid member in the same manner as in the embodiment of FIGS. 2 and 3. Similar results can be obtained.

FIG. 9 shows another embodiment of a vacuum-insulated, double-walled vessel of the present invention. The vacuum bottle 1*b* has the same structure as that of the embodiment of FIG. 1 except that an inner vessel 3 is provided at its outer surface with a plating M of copper or silver to prevent heat transfer due to radiation, and that a barrel portion of the inner vessel 3 is covered only with an activated titanium foil 3*b* having a thickness of 25 μm and a weight of 0.8 g. The activated titanium foil 3*b* may be fixed on the inner surface of the outer vessel 2 by spot welding. The space 5 formed between the outer and inner vessel 2 and 3 is exhausted of air.

In this embodiment, the titanium foil 3*b* is activated by heating it at a temperature of 700° C. and above under a low vacuum ranging from 100 Torr to 10^{-2} Torr. This activated titanium foil absorbs all the gasses such as nitrogen, hydrogen, carbon monoxide, etc., which remain in the space 5 or are released from the surfaces of the inner and outer vessels defining the vacuum space 5. Accordingly, it is possible to keep the space at a high vacuum.

Referring now to FIG. 10, there is shown another embodiment of a vacuum-insulated, double-walled vessel of the present invention. The vacuum bottle 1*c* has the same structure as that of the embodiment of FIG. 1 except that an inner vessel 3 is covered with an aluminum foil 3*c*, and that a part of the aluminum foil 3*c* is covered with an activated titanium foil 3*b*. The activated titanium foil 3*b* may be fixed on the inner surface of the outer vessel 2 by spot welding. The space 5 formed between the outer and inner vessel 2 and 3 is exhausted of air.

In this embodiment, the titanium foil 3*b* is activated by heating it at a temperature of not less than 700° C. under a low vacuum ranging from 100 Torr to 10^{-2} Torr. This activated titanium foil absorbs all the gasses such as nitrogen, hydrogen, carbon monoxide, etc., which remain in the space 5 or are released from the surfaces of the inner and outer vessels defining the vacuum space 5. Accordingly, it is possible to keep the space at a high vacuum.

EXAMPLE 1

In order to determine the thermal insulating properties of the vacuum bottles of the present invention, there were prepared samples of vacuum bottles in the same manner as above under the conditions listed in Table 1. The thickness of copper and titanium foils are also listed in Table 1. Then, grease was removed from the inner surface of each vacuum bottle in accordance with the well known process.

TABLE 1

Sample	Foil	(μm)	Exhaustion conditions
1	Cu	16.5	Preliminary exhaust: 1 Torr
	Ti	25	Degassing: 10 min, 450° C., 1 Torr
2	Cu	9	Vacuum exhaust: 40 min, 450° C., 10^{-5} Torr
	Ti	25	

For each vacuum bottle, the thermal insulating properties were determined by measurement of a temperature of hot water poured in the vacuum bottle and allowed to stand for 24 hours in an atmosphere of 20° C. The initial temperature of the hot water was 95° C. and the vacuum bottle was corked and allowed to stand for that time. This test was carried out (1) just after production of each vacuum bottle, (2) one week later, (3) two weeks later, (4) four weeks later, (5) three months later, and (6) four months later from the date of production. During the test period, each vacuum bottle was kept in an atmosphere of 95° C. Results are shown in Table 2. The data in this table are the mean for five samples.

TABLE 2

Sample	Thickness (μm)		Water Temperature (°C.) Initial	1 week	2 weeks	4 weeks
1	Ti	25	67.6	66.6	66.7	67.7
	Cu	16.5				
2	Ti	25	68.5	67.7	67.5	68.1
	Cu	9				

For comparison, there were prepared comparative samples of vacuum bottles in the following manner.

COMPARATIVE EXAMPLE 1

Using the same stainless steel sheet used in Example 1, there were prepared upper and lower members for the outer bottle and an inner bottle in the same manner as in Example 1. The lower member was then provided at a central portion of its bottom with a tip tube. The inner bottle was heated in air to form an oxidized film on its outer surface, and then covered with a copper foil of a thickness of 16.5 μm except for a top end of its neck portion and a central part of the bottom that faces the opening of the tip tube. The inner bottle was seamed at the tip of the neck portion with the upper member of the outer bottle, and then the lower member of the outer bottle was seamed with the upper member to form a double-walled bottle with a space between the inner and outer bottles.

The thus prepared double-walled bottle was placed in a furnace, and its tip tube was connected to a vacuum pump. The space between the inner and outer bottle was exhausted of air through the tip tube for 70 minutes. After exhaustion, the double-walled bottle was heated at a temperature of 400° to 450° C., and the tip tube 4 was then pinched off to complete a vacuum bottle.

COMPARATIVE EXAMPLE 2-3

Vacuum bottles were prepared in the same manner as in Comparative example 1 except that the exhaustion of air was carried out for 50 or 30 minutes.

COMPARATIVE EXAMPLES 4-7

Vacuum bottles were prepared in the same manner as in Comparative example 1 except that removal of grease on the inner bottle was carried out instead of formation of oxidized film, and that exhaustion of air was carried out for 100, 70, 50 and 30 minutes, respectively.

For each comparative sample, the thermal insulating properties were determined in the same manner as above. Results are shown in FIGS. 11-14.

From the results shown in Table 2, the thermal insulating properties of the vacuum bottles of the present invention scarcely vary with the lapse of time, and its change falls within 1 degree. In contrast therewith, the thermal insulating properties of the vacuum bottle of the prior art are greatly lowered in one or two weeks, as shown in FIGS. 11 to 14. Thus, the vacuum bottle of the present invention is superior to that of the prior art.

Further, the present invention makes it possible to shorten the time required for exhaustion of air.

What is claimed is:

1. A method for producing a vacuum-insulated, double-walled metal structure having a suction port or tip tube, comprising the steps of: preparing an inner shell member and an outer shell member; covering an outer surface of said inner shell member with at least one metal foil selected from the group consisting of copper, titanium and zirconium; seaming said inner shell member and said outer shell member together to prepare a double-walled structure with a space between them;

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SUPERINTENDENCIA DE INDUSTRIA Y COMERCI
DIVISION DE NUEVAS CREACIONES

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202084
Bogotá, D.C. 22 de Junio de 2007

Abogado
EMILIO FERRERO

Solicitante: RM MATERIAIS REFRATARIOS LTDA

ASUNTO	Radicación	00047560
	Trámite	002
	Evento	001
	Actuación	430
	Oficio	08683
	Folios	11

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

1.1. Descripción: Folios: 2 a 40 como se radicó inicialmente

1.2. Reivindicaciones: Folios 41 a 45 como se radicó inicialmente

1.3. Dibujos: Folios 123 a 128 como se radicó inicialmente

1.4. Prioridad: Folios: 64 a 112 (23/06/1999, Brasil PI9902607-4).

2. Objeto de la invención

Título de la solicitud: "APARATO Y PROCESO DE PREHIDRÒLISIS DE BIOMASA".
Folios 1 a 141 como se radicó inicialmente.
El objeto de la presente solicitud se refiere a un aparato que comprende un revestimiento externo y uno interno, con un espacio en medio de los dos revestimientos, en donde se produce un vació. Y un proceso de prehidròlisis de biomasa.
Según la descripción, el aparato es un reactor, y un proceso de prehidròlisis de cualquier tipo de biomasa (Madera, pulpa, paja, césped, residuos vegetales, parte orgánica de la basura, etc.) para la obtención de productos comerciales, tales como la celulignina y soluciones de azúcares, llamados prehidrolizados, que contienen xilosa, glucosa, mamosa, galactosa, arabinosa, acetilenos, ácidos uránicos, etc.
La presente solicitud también menciona en su descripción un sistema de control de micro-escapes en el reactor por medio de sensores, por lo cual lo denominan "reactor tipo falla segura", además se refieren al invento como una nueva tecnología de fabricación de reactores químicos para procesos en medios altamente corrosivos, haciendo uso de materiales como el acero carbono, lo cual también lo haría mas liviano y móvil.

El cual se lleva acabo de acuerdo con las caracteristicas reivindicadas, donde la nueva reivindicacion 1 dice: "Un Aparato para prehidrólisis de biomasa que comprende:
Un revestimiento externo,
un revestimiento interno,
el dicho revestimiento interno que reviste el interior del revestimiento externo; siendo que entre el dicho revestimiento interno y revestimiento externo existe un espacio, el dicho aparato caracterizado porque en el mencionado espacio entre el revestimiento interno y el revestimiento externo se produce vacío".

Y la reivindicación 15 dice: "Y un proceso de prehidrólisis de biomasa que comprende las siguientes etapas:
Descarga de la biomasa en el alimentador helicoidal;
Inicio, en el dispositivo de prehidrólisis de biomasa, de la operación de presurización que comprende las siguientes etapas:

b.1) inundación del dispositivo de prehidrólisis de biomasa con solución ácida precalentada: b.2) calentamiento; y b.3) presurización;
c) el referido proceso caracterizado porque la prehidrólisis se ejecuta simultáneamente con la oscilación rotatoria del aparato de prehidrólisis de biomasa, purga del vapor y control de temperatura, presión, contenido de ácido, tiempo de prehidrólisis y relación líquido/sólido,
d) acompañamiento del contenido de azúcar hasta un valor cercano a los 10 Bricks a través de un dispositivo medidor de azúcar.
e) descarga del prehidrolizado en el tanque a través del intercambiador de calor;
f) lavado de recuperación de azúcar, y
g) descarga de la celulignina en lavadores mecánicos o carros que se lavan por percolación".

El problema planteado en esta solicitud es la necesidad de tener un aparato para el procesamiento de una biomasa.
Para solucionar este problema técnico la solicitud en estudio proporciona un aparato con dos revestimientos, uno externo y uno interno, y un espacio en medio de los dos revestimientos, en donde se produce una vació. Y un proceso de prehidrólisis de biomasa

El objeto de la solicitud definido anteriormente se clasificó en la IPC C08B 17/00 Y B09B 3/00

3. De la solicitud de Patente

3.1. Reivindicaciones (artículo 30 D 486)

Se observa que la reivindicación 6 no es clara, ya que únicamente nos dice: "caracterizado por que es un reactor" y nos remite a la reivindicación 1 en donde no nos agrega ningún rasgo estructural que haga referencia al reactor.

4. Unidad de invención (artículo 25 D 486)

Analizando la (s) reivindicación (es) 1 a 14 (folios: 40 a 42), que se refiere(n) a un aparato que comprende un revestimiento externo y uno interno, con un espacio en medio de los dos revestimientos, en donde se produce un vació, no guarda(n) unidad de invención con la (s) reivindicación (es) 15 a 25 (folios: 42 a 44), que se refieren a

un proceso de prehidròlisis de biomasa.
Ya que existen dos grupos de invenciones con reivindicaciones diferentes, por lo tanto el estudio se hará para el aparato, relacionado en la (s) reivindicación (es) 1 a 14

5. Determinación del Estado de la Técnica

Considerando que la fecha de presentación de la primera solicitud de patente de la cual se reivindica prioridad es: 23/06/1999, se buscaron documentos del estado de la técnica relacionados, con fecha de publicación anterior a esta, que pueden afectar la patentabilidad del objeto de la presente solicitud, encontrándose:

Nº	Documento	Título	Fecha de Publicación
D1	US4997124	ESTRUCTURA METÁLICA CON DOBLE PARED AISLADA POR VACÍO, Y EL MÉTODO PARA SU PRODUCCIÓN	05-03-1991

6. Análisis de patentabilidad (según requisito) (artículo 14 D 486)

6.1. Novedad (artículo 16 D 486)

- De acuerdo a la reivindicación 1: Un Aparato para prehidrólisis de biomasa que comprende:
  Un revestimiento externo,
  un revestimiento interno,
  el dicho revestimiento interno que reviste el interior del revestimiento externo;
  siendo que entre el dicho revestimiento interno y revestimiento externo existe un espacio, el dicho aparato caracterizado porque en el mencionado espacio entre el revestimiento interno y el revestimiento externo se produce vacío.

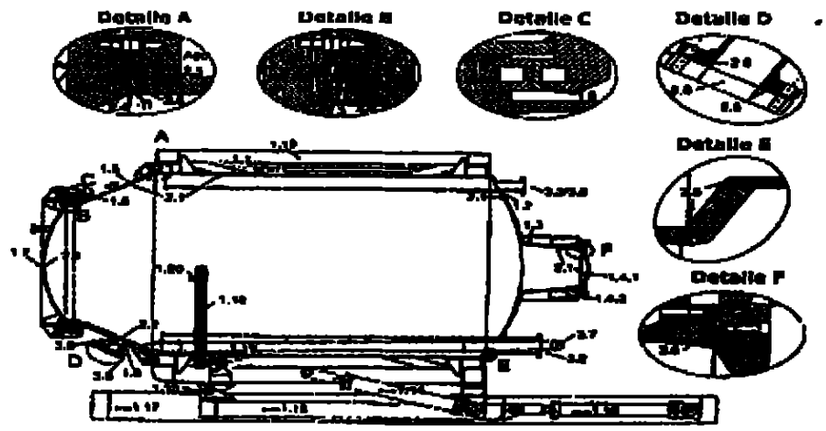
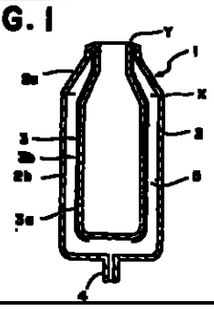


FIG. 2a

- Y teniendo en cuenta que el documento **US4997124** (mencionado de ahora en adelante como **D1**), se refiere a: una "Estructura metálica con doble pared aislada por vacío", de acuerdo a lo que muestra la FIG. 1, 2, 9,10, y los párrafos relacionados a continuación:

FIG. 1



Columna 5 Línea 9 a la línea 21 (US4997124)

En la FIG 1 se muestra una botella metálica (1), que presenta un vació, con una pared externa (2) y una interna (3), hecha de acero inoxidable, unido en la parte superior, con un espacio (5) en medio de las dos paredes, interna y externa, en el cual existe un vació.

También se encuentra en el D1 las diferentes conformaciones de dicha botella metálica, mostradas en las figuras 2,9 y 10; y descritas en los siguientes apartes:
Columna 6 Línea 22 a la línea 42 (D1)
Columna 8 línea 56 a la Columna 9 línea 20 (D1)

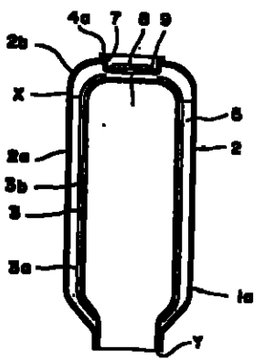


FIG. 2

FIG. 9

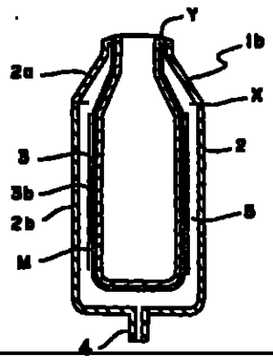
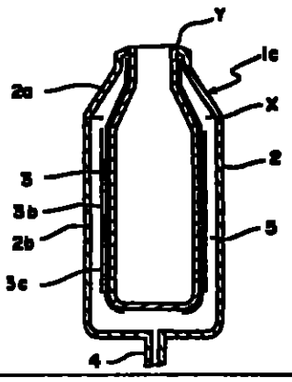
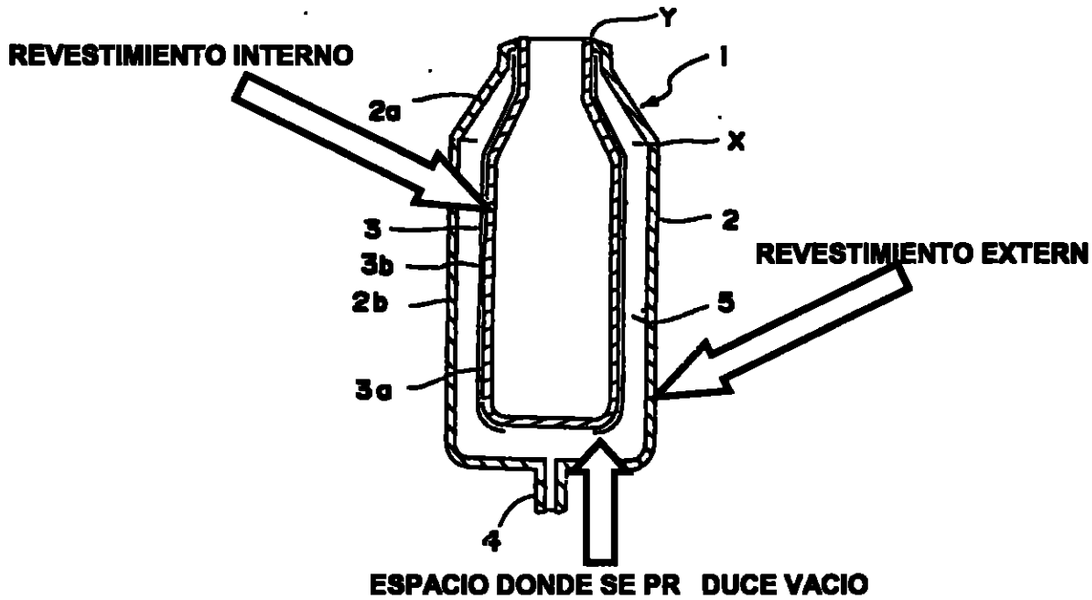


FIG. 10



- Al comparar elemento por elemento de la invención tal como esta definido en la reivindicación 1 con el documento D1: vemos que el dicho documento contiene las características de la reivindicación 1.

FIG. 1 del Documento US4997124 (D1)



- El documento **D1** se refiere a: una "Estructura metálica con doble pared aislada por vacío" que comprende:
  - Una botella metálica (1).
  - Con una pared externa (2).
  - Una pared interna (3), hecha de acero inoxidable, unido en la parte superior.
  - Un espacio (5) en medio de las dos paredes, interna y externa, en el cual existe un vació.
- El capitulo reivindicatorio no delimita claramente la invención respecto al documento **D1** (estado de la técnica). En la reivindicación principal no se observa ninguno de los rasgos particulares de construcción del aparato, o lo nuevo que se está aportando a la tecnología ni lo que lo hace diferente de lo ya existente, la reivindicación principal es demasiado general y el documento D1 lo abarca en su contenido
- Realizada la comparación del documento **D1** con la presente solicitud de patente de invención, se observa que dicho documento contiene todas las características técnicas reivindicadas en la patente de invención; con lo cual quedaría desvirtuada la novedad de esta.

7. Conclusión:

Los requisitos de patentabilidad de la presente solicitud se encuentran afectados así:

Nº	Documento Nº	Reivindicaciones Afectadas	Requisito que Afecta
D1	US4997124	1	Novedad

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que debe dar respuesta dentro del término de sesenta días contados a partir de la fecha de notificación de la presente comunicación. 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 en el numeral 5.2 literal e) del capítulo quinto, del titulo primero de la circular única No. 20 de 2001.

CLARA CASTELLANOS DE JAIMES
Jefe de División de Nuevas Creaciones (E)

El anterior requerimiento fue notificado por fijación en lista, de fecha 19 JUL. 2007

CONCEPTO TECNICO No.946	EXAMINADOR TECNICO Código No. 84

150

APARATO Y PROCESO DE PREHIDROLISIS DE BIOMASA

EXAMEN TÉCNICO DE FONDO			
Nº Radicación	00047560	Fecha de presentación	23-06-2000
Nº Prioridad	PI 9902607-4	Fecha de Prioridad	23-06-1999

	APARATO		PROCESO		PREHIDROLISIS		BIOMASA	
Palabras claves / sinónimos	aparato	Device	Proceso	process	Hidrólisis	Hidrólisis	Biomasa	Biomass
	utensilio	utensil	procedimiento	procedure	Hidrolizar	Hidrolizar	Material orgánico	Organic material
	dispositivo	device	Transformación	Transformation			Residuos orgánicos	organic Residues
	maquinaria	machinery	Desarrollo	Development				
	mecanismo	mechanism	Técnica	Technique				
	instrumento	Instrument	Tratamiento	Treatment				
	Reactor	reactor	Processamiento	Processing				
	Bioreactor	Bioreactor						
	Caldera	Boiler						

CLASIFICACIONES INTERNACIONALES DE BÚSQUEDA	
C08B 17/00 ✓	APARATOS ESTERIFICACION CELULOSA
B01J 19/02	APARATOS MATERIALES RESISTENTES A AGENTES QUIMICOS- REFRACTARIOS
B09B 3/00 ✓	DESTRUCCION DE DESECHOS SÓLIDOS- TRANSFORMACION EN ALGO UTIL

DOCUMENTOS CORRESPONDIENTES EN OTROS PAÍSES			
US4997124	05-03-1991		
US3056664	10-02-1962		
WO0078446	23-06-1999		
US6878212	12-04-2005		
Patente Original	PI 9902607-4	DE BRASIL	

BASES DE DATOS CONSULTADAS			
COLOMBIANA	000-47556 (Patente)		
MIMOSA			
ESPACENET			

INFORMES DE EXÁMENES EN OTRAS OFICINAS		
Oficina	Fecha	Reivindicaciones
EUROPEA		

ANTERIORIDADES ENCONTRADAS		
Documento	Relevancia	Reivindicaciones afectadas
US4997124	Novedad	1
US3056664		

Fecha del examen	Art. 45: 25-06-2007	CONCEPTO TECNICO No.946	EXAMINADOR TECNICO Código No. 84