



Industria y Comercio

SUPERINTENDENCIA

Organizacion CSA Ltda

Organizacion CSA Ltda

DVN
N.º 1000

INVENTARIO

**SOLICITUD
PATENTE DE INVENCION**

00-07075

21. EXPEDIENTE No.

54. TITULO ESTRUCTURA DE TOBERIA Y METODO DE FABRICACION

61. CLASIFICACION INTERNACIONAL

F16L 31/00, 22/02

71. SOLICITANTE HANCOR, INC

DOMICILIO

401 Olive Street, P.O. Box 1047, Findlay, Ohio 45839-1047 U.S.A.

74. APODERADO DARÍO CÁRDENAS NÚÑEZ

22. SANTAFE DE BOGOTA, D.C.

00-02-04



00 7075

RECIBIDO
Fecha 07/11/2011 11:51:11
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**SEÑORES
SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DELEGATURA PROPIEDAD INDUSTRIAL
DIVISION DE NUEVAS CREACIONES
E.S.D.**

REF.: Expediente No.

ASUNTO: Solicitud de la PATENTE DE INVENCION: **ESTRUCTURA DE TUBERIA Y METODO DE FABRICACION**,

SOLICITANTE: **HANCOR, INC.**

DARIO CARDENAS NAVAS, mayor de edad, vecino de Santafé de Bogotá D.C., con cédula de ciudadanía No. 17.066.629 de Santafé de Bogotá, abogado titulado con Tarjeta Profesional No. 1.250 obrando como apoderado de la Sociedad **HANCOR, INC.**, sociedad domiciliada en 401 olive street, P.O. Box 1047, Findlay, Ohio 45839-1047, Estados Unidos de América, en ejercicio del poder que me ha sido conferido, solicito a ustedes que de conformidad con el Capítulo I de la Decisión 344 del Acuerdo de Cartagena y demás textos legales sobre la materia, se sirva conceder a mi Poderdante privilegio de **PATENTE DE INVENCION**, con el objeto de que pueda explotar en el territorio de la República de Colombia, con exclusión de toda otra persona, el invento denominado: **ESTRUCTURA DE TUBERIA Y METODO DE FABRICACION**, de conformidad con descripción y las reivindicaciones que se anexan.

RECIPROCIDAD DEL CONVENIO DE PARIS

2. La fuente normativa de reciprocidad que trata el numeral 1, literal a) del artículo 4 del Convenio de París, el cual establece que:

“Quien hubiere depositado regularmente una solicitud de patente de invención, de modelo de utilidad, de dibujo o modelo industrial, de marca de fabrica o de comercio, en alguno de los países de la Unión o su causahabiente, gozará para efectuar el depósito en los otros países, de un derecho de prioridad, durante los plazos fijados más adelante en el presente.”

Como apoderado de la Sociedad Peticionaria, manifiesto a usted que recibiré notificaciones en ese Despacho o en mis oficinas de abogado situadas en la Carrera 7a. No. 71-52 Torre B, Piso 9° de Santafé de Bogotá D.C.

Atentamente,

DARIO CARDENAS NAVAS
C.C. No. 17.066.679 de Bogotá
T.P. 1.250 de Minjusticia



REPUBLICA DE COLOMBIA



SOLICITUD DE PATENTE DE INVENCION

DIVISION DE NUEVAS CREACIONES

DATOS DEL SOLICITANTE

(71) Nombres y Apellidos o Razón Social

HANCOR, INC.

No. de Identificación

Representante Legal (Persona Jurídica)

País de Domicilio

ESTADOS UNIDOS DE AMERICA

Departamento o Estado

Ciudad

Dirección

401 OLIVE STREET, P.O. BOX 1047, FINDLAY, OHIO 45839-1047

(74) DATOS DEL APODERADO

Nombre

DARIO CARDENAS NAVAS

Dirección

CARRERA 7ª. No. 71-52 TORRE B PISO 9, SANTAFE DE BOGOTA D.C.

DATOS DEL INVENTOR

(72) Nombre del Inventor (es)

1. ROGER LEE SIFERD

2. MATTHEW C. ANKROM

3. LARRY E. PORTER

Dirección y Domicilio

1. 11029 TR 180, FINDLAY, OHIO 45840

2. 706 HAWTHORNE ROAD, FINDLAY, OHIO 45840

3. 554 W. LINCOLN, FINDLAY, OHIO 45840

Identificación

DATOS DE LA PATENTE DE INVENCION

(54) Título de la Invención

ESTRUCTURA DE TUBERIA Y METODO DE FABRICACION.

PRIORIDAD REIVINDICADA

SI

☒

NO

(33) País ESTADOS UNIDOS
DE AMERICA

(32) Fecha

FEBRERO 5 DE 1999

(31) No. Solicitud

09/245,766

(51) CLASIFICACION INTERNACIONAL

F16L 31/00, 22/02

RESUMEN CON EL OBJETO Y LA FINALIDAD DE LA INVENCION

UNA SECCION DE TUBERIA POR UN MATERIAL DE POLIMERO QUE TIENE UN ESPESOR SUSTANCIALMENTE
CONSTANTE A LO LARGO, EL BORDE TERMINAL DE LA CONEXIÓN HEMBRA CON UNA ESTRUCTURA DE
REFUERZO QUE RIGIDIZA EL EXTREMO DE LA CONEXIÓN HEMBRA Y PREVIENE LA DEFORMACION, LA
SECCION DE TUBERIA TENIENDO PREFERIBLEMENTE UN EXTREMO ACAMPANADO, Y LA ESTRUCTURA
DE REFUERZO CONSISTIENDO PREFERIBLEMENTE DE UN CANAL SEMICIRCULAR FORMADO EN EL EXTREMO
DE LA SECCION DE TUBERIA POR UN MANDRIL DESPUES DE LA EXTRUSION INICIAL DE LA SECCION DE
TUBERIA; EN CONJUNTO CON UN METODO Y APARATO PARA FORMAR LA SECCION DE TUBERIA, UN ENSAM-
BLE DE TUBERIA QUE INCLUYE DICHA SECCION DE TUBERIA, Y UN METODO PARA FORMAR EL ENSAMBLE
DE TUBERIA.

ANEXOS DE LA SOLICITUD

Certificado de Existencia y Representación Legal cuando el Solicitante sea Persona Jurídica

X

Los poderes debidamente otorgados, o mención de su protocolización ante la S.I.C.

X

Recibo de la tasa respectiva

X

Si se reivindica prioridad, el certificado respectivo (copia legalizada)

☐

Traducción oficial

☐

Capítulo descriptivo

X

Dibujos, planos necesarios

X

Capítulo reivindicatorio

X

Tarjeta archivo propietarios según formato

X

Tarjeta archivo temático según formato

X

Extracto para resumen o para publicación según formato

X

Arte final 12 x 12 cms.

X

SOLICITO LA CONCESION DE LA PATENTE DE INVENCION Y DECLARO QUE LA INVENCION ES
NUEVA Y DE MI PROPIEDAD

FIRMA DEL APODERADO

C.C.

TP No.

- Colombia -

POWER OF ATTORNEY

In the city of Findlay, Ohio USA on
the day of the month of , one thousand nine hundred and
ninety (199) before me, Notary Public,
appeared Donald Morrison of age, and domiciled
at 401 Olive Street, Findlay, Ohio US and stated:

 Vice-President of
FIRST: That he/she acts in his/her capacity of Business Development of
HANCOR, INC. a company legally constituted and in existence in accordance with the
laws of the State of Ohio, United States of America, and domiciled at 401 Olive Street,
P.O.Box 1047, Findlay, Ohio, 45839-1047, United States of America, as evidenced in
the By Laws, documents which I have examined.

SECOND: That in such capacity he/she grants hereby special, ample and sufficient
Power of Attorney to DARIO CARDENAS-NAVAS and/or EDUARDO CARDENAS-
CABALLERO and/or BERNARDO P. CARDENAS-MARTINEZ y/o JAMES VALDIRI-
REYES and/or LUZ HELENA ADARVE-GOMEZ, registered lawyers of the firm
CARDENAS & CARDENAS-LAWYERS, domiciled at Carrera 7 No. 71-52, Torre B,
Piso 9 Bogotá, D.C., Colombia, to carry before the corresponding Colombian national
Offices and authorities the proceedings to obtain trademarks, patents, utility models,
industrial drawings and designs, deposits of commercial names and ensigns, as well
as processing of renewals, assignments, change of name or domicile of the owner,
waivers and licenses of the same for which purpose they are empowered to take
before said authorities all necessary actions for the indicated purposes; to file
applications, statements, claims, formulate descriptions, amendments, oppositions and
appeals; pay all taxes and installments and make any other payments determined by
law; to receive every document and values issuing the respective discharge; to fulfill
any other requirements and take, in general, every measure that they shall deem
opportune for the defense and protection of the Industrial Property of the company in
the event of infringements, oppositions, proceedings for cancellation or annulment,
imposition of fines, passing the antecedents to the courts; they are empowered to
appear as plaintiff or defendant before the competent judges, being entitled to transact,
submit to arbitration, waive, receive, resign, appeal and all other legal powers which
may be necessary, and it is hereby declared ever since now valid and good whatever
such attorneys do for its benefit, granting them also power to substitute this proxy and
if necessary to revoke such substitutions.

THIRD: That for purposes of articles 597 and 543 of the Colombian code of Commerce
the attorneys are empowered to receive service of notice and designate judicial and
extrajudicial attorneys.

SIGNED

AT Findlay, Ohio US ON

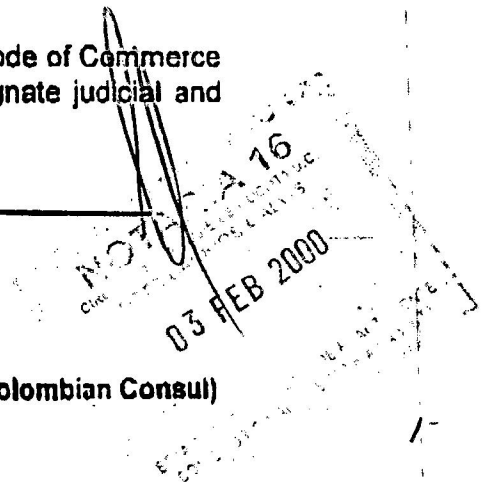
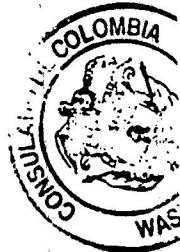
BY

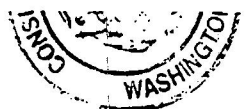
Donald Morrison

Vice-President of Business Development

NOTARY PUBLIC

(To be legalized up to the Colombian Consul)





CONSULADO DE COLOMBIA
WASHINGTON, D.C.

No. 164

EL CONSULADO DE COLOMBIA

CERTIFICA:

Que es auténtica la firma de Joan C. Hampton
quien el día Enino 22 de 1998
desempeñaba las funciones de Of. de Aut. Dpto. Estado
la cual aparece al pie de los documentos anexos relacionados con Poder-

Dado en Washington, D.C. a los Veintidos (22) días del mes de Enino
Ocho de mil novecientos noventa y ochos (1998)

6=
15=
21=
Pago US\$ 21=
(El Consulado no asume ninguna

CONSUELO SANCHEZ DURAN

Corcuera
MINISTERIO DE RELACIONES
EXTERIORES
Sánchez
209549

NO SE ASUME
RESPONSABILIDAD DEL TEXTO

1998 FEB -27 12:14

JEFE DE LEGALIZACIONES
SANTAFE DE BOGOTA D.C.

COPIA FIRMA APARECE EN EL
DOCUMENTO DESEMPENA
FUNCIONES INDICADAS

[Signature]
33 FEB 2000

No. 9801466-2
United States of America



DEPARTMENT OF STATE

To all to whom these presents shall come, Greetings:



I Certify That the document hereunto annexed is under the Seal of the Secretary of State of the State of Ohio, and that such Seal is entitled to full faith and credit.*

In testimony whereof, I, Madeleine K. Albright, Secretary of State, have hereunto caused the seal of the Department of State to be affixed and my name subscribed by the Authentication Officer of the said Department, at the city of Washington, in the District of Columbia, this twenty-second day of January, 1998.

Madeleine K. Albright
Secretary of State
By *Jean C. Hampton*
Assistant Authentication Officer,
Department of State

Issued pursuant to CHXIV, State of
Sept. 15, 1789, 1 Stat. 68-69; 22
USC 2657; 22 USC 2651a; 5 USC
301; 28 USE 1733 et. seq.; 8 USC
1443(f); RULE 44 Federal Rules of
Civil Procedure.

* FOR THE CONTENTS OF THE ANNEXED
DOCUMENT, THE DEPARTMENT ASSUMES NO
RESPONSIBILITY

This certificate is not valid if it is removed or altered in any way whatsoever

3 FEB 2000

8

United States of America
State of Ohio
Office of the Secretary of State

*I, BOB TAFT, Secretary of State,
do hereby certify that I am the duly elected, qualified and acting Secretary of State of the State of
Ohio, and I further certify that*

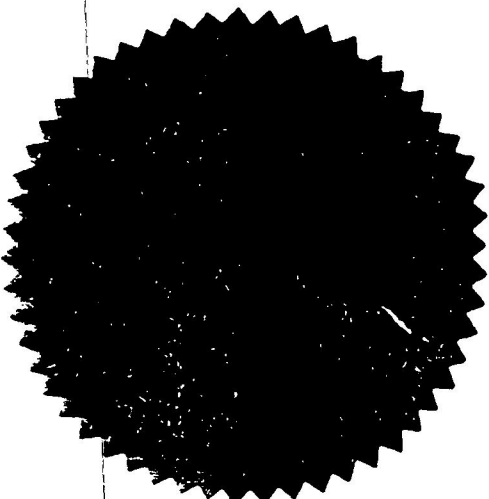
CATHY PROSSER WILCOX

*whose signature and official seal are affixed to the attestation hereto attached, was at the date hereof, the
duly elected, commissioned and qualified CLERK OF THE COURT OF COMMON PLEAS OF
HANCOCK COUNTY, OHIO, and that she is the proper official to make said attestation, which is in
due form; and that her official acts are entitled to full faith and credit.*

*IN TESTIMONY WHEREOF, I have hereunto
subscribed my name and affixed the official
Seal of the Secretary of State of Ohio, at
Columbus, Ohio, this 20th day
of January, 1998*

Bob Taft

BOB TAFT
Secretary of State



THE STATE OF OHIO.
HANCOCK COUNTY CLERK'S OFFICE

SS.

I, CATHY PROSSER WILCOX, Clerk of said county and of the Courts thereof, the same being Courts of record, do hereby certify that PAULA V. DETER whose name is subscribed to the proof or acknowledgment of the annexed instrument in writing, was at the time of taking such proof or acknowledgment, a NOTARY PUBLIC in and for the said county, duly commissioned, sworn and authorized to take the same and to take the proof or acknowledgment of deeds and other instruments in writing, and to administer oaths or affirmations in said county; and further, that I am well acquainted with his handwriting, and verily believe that the signature to the said proof or acknowledgment is genuine; and further, that the annexed instrument is executed according to the laws of the State of Ohio.

In Testimony Whereof, I have hereunto set my hand and affixed
FINDLAY
the seal of said county, at OHIO this 12 day of JAN 19 98

Cathy Prosser Wilcox
Clerk

NOTARY PUBLIC
03 FEB 2000
RECEIVED
COUNTY CLERK'S OFFICE
HANCOCK COUNTY, OHIO

The undersigned Notary Public certifies that Mr. Donald Morrison
appeared before me and signed the preceding document; that I know him personally and
I am certain that he has legal capacity to grant it; that he is
Vice-President of Business Development of
Hancor, Inc. and is consequently authorized to
grant such document; that the named company exists and is organized under the laws of
Ohio, US and is domiciled in _____; and
that the act for which this document is granted is included among those which constitute
the corporate object of the named company.

I am certain of all these facts because I have examined the respective documents
consisting of _____
_____ all of which I hereby
attest.

Paula V. Deter

NOTARY PUBLIC (signature)

Issued and signed in

Dated 1-5-98

PAULA V. DETER
NOTARY PUBLIC - STATE OF OHIO
My Commission Expires SEPT. 29, 1999

(LEGALIZATION BY COLOMBIAN CONSUL IS REQUIRED)

NOTARIA 16
03 FEB 2000


UN.D.C.

Traducción Oficial No. 98-125

Efectuada el día 4 de febrero de 1998, de un documento escrito en Inglés, al cual para su identificación se le estampa el sello de María del Pilar Iglesias, Traductora e Intérprete Oficial por Resolución No. 819 del 15 de abril de 1971 expedida por el Ministerio de Justicia de la República de Colombia.

P O D E R

En la ciudad de Findlay, Ohio Estados Unidos de América, el ___ de _____ de 199_, ante mí _____, Notario Público, compareció el Sr. Donald Morrison, mayor de edad, y domiciliado en el 401 Olive Street, Findlay, Ohio, Estados Unidos, y manifestó:

PRIMERO: Que actúa en su calidad de Vicepresidente de Desarrollo Comercial de **HANCOR, INC.**, compañía legalmente constituida y existente conforme a las leyes del Estado de Ohio, Estados Unidos de América, domiciliada en el 401 Olive Street, P.O. Box 1047, Findlay, Ohio 45839-1047, tal como se comprueba en los Estatutos que tuve a la vista.

SEGUNDO: Que en tal calidad por el presente otorga un Poder especial, amplio y suficiente a **DARIO CÁRDENAS-NAVAS y/o EDUARDO CÁRDENAS-CABALLERO y/o BERNARDO P. CÁRDENAS-MARTÍNEZ y/o JAMES VALDIRI-REYES y/o LUZ HELENA ADARVE- GÓMEZ**, abogados registrados de la firma **CÁRDENAS & CÁRDENAS - ABOGADOS**, domiciliada en la Cra. 7 # 71-52,

MP. L. Iglesias
Hasta del 1998
INTERPRETE
Resolución No. 819 del 15 de abril de 1971

NOTA
CRA. OTRO ESTATUTO
03 FEB 2000
ESTADO DE OHIO
CORTE SUPLENTE

Torre B, Piso 9, Bogotá, C.D., Colombia, para que adelanten ante las correspondientes Oficinas y autoridades nacionales colombianas todas las gestiones necesarias para obtener registros marcas, patentes, modelos, dibujos y diseños industriales, registro de nombres y emblemas comerciales, así como para gestionar renovaciones, cesiones, cambios de nombre o de domicilio del propietario, renunciaciones y licencias, para cuyo propósito quedan facultados para adelantar ante las mencionadas autoridades todo lo que se requiera para los propósitos indicados; para presentar solicitudes, declaraciones, reivindicaciones, descripciones de fórmulas, reformas, oposiciones y apelaciones; pagar todos los impuestos y las cuotas correspondientes y hacer cualquier otro pago determinado por la ley; recibir cualquier documento y valores, emitiendo el respectivo finiquito; cumplir cualquier otro requisito y, en general, tomar cualquier medida que consideren oportuna para la defensa de los derechos de Propiedad Industrial de la compañía en el caso de usurpaciones, oposiciones, juicios para cancelación o anulación, imposición de sanciones, informando los antecedentes a los tribunales; y quedando facultados para comparecer como demandantes o demandados ante los jueces competentes, teniendo derecho a transigir, someter a arbitramento, condonar, recibir, renunciar, apelar y ejercer cualquier otra facultad legal que sea necesaria; y por medio de este documento se declara desde ahora como válido y vigente todo lo que los mencionados apoderados adelanten para beneficio de la Compañía y a ellos se les otorga la facultad de sustituir este Poder, y si fuere necesario, de revocar tales sustituciones.

AMV
Calle del Río de los Rios 123
INTERPRETE F
INTERPRETE OFICIAL
Bogotá, D.C. 111111

03 FEB 2000
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TERCERO: Que para los propósitos de los Artículos 597 y 543 del Código de Comercio Colombiano los Apoderados están facultados para recibir citaciones judiciales y para nombrar apoderados que actúen judicial y extrajudicialmente.

Firmado en Findlay, Ohio, Estados Unidos, el _____ de 199__.

(Por) (Fdo) Donald Morrison, Vicepresidente de Desarrollo Comercial.

El suscrito Notario Público certifica que el Sr. Donald Morrison compareció ante mí y firmó el documento precedente; que lo conozco personalmente y doy fe de su capacidad legal para otorgar tal instrumento; que la Compañía nombrada existe conforme a las leyes de Ohio, Estados Unidos de América, y que el acto para el cual se otorgó el instrumento está dentro de su objeto social.

(Fdo) Paula V. Deter Notario Público del Estado de Ohio, cuyo cargo vence el 29 de septiembre de 1999 según consta en su correspondiente sello notarial.

ESTADO DE OHIO - CONDADO DE HANCOCK -

OFICINA DEL ESCRIBANO DEL CONDADO

La suscrita Cathy Prosser Wilcox, escribano del mencionado Condado y de los tribunales del mismo, por el presente certifico que Paula V. Deter, cuyo nombre aparece suscrito en la prueba o reconocimiento del instrumento anexo, desempeñaba en el momento de firmar el mismo, las funciones de Notario Público en y para dicho Condado, estando debidamente comisionado, juramentado y

W.P. 1
Notario Público
Cathy Prosser Wilcox
Escritura No. 19-1-1000000

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03 FEB 2000
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autorizado para tomar reconocimientos o pruebas de escrituras y otros instrumentos escritos, y para tomar juramentos y afirmaciones; igualmente certifico que conozco bien la letra manuscrita de dicho Notario y creo que la firma estampada en el reconocimiento adjunto es auténtica; certifico además que el instrumento anexo se otorgó conforme a las leyes del Estado de Ohio.

En fe de lo cual firmo de mi puño y letra y estampo el sello del Condado en Findlay, Ohio el 12 de enero de 1998.

(Fdo) Cathy Prosser Wilcox, Escribano.

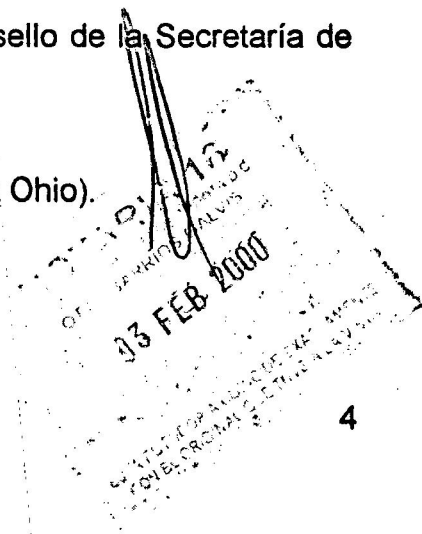
ESTADOS UNIDOS DE AMERICA - ESTADO DE OHIO

OFICINA DE LA SECRETARIA DE ESTADO

El suscrito Bob Taft, Secretario de Estado, por medio de este documento certifico que soy el Secretario de Estado de Ohio, debidamente habilitado y en ejercicio de mi cargo, y certifico además que Cathy Prosser Wilcox, cuya firma y sello oficial están estampados en la atestiguación aquí anexa, desempeñaba en esa fecha las funciones de Escribano del Tribunal de Litigios Ordinarios del Condado de Hancock, Ohio, estando debidamente comisionado y habilitado, y que ella es el funcionario idóneo para hacer dicha atestiguación, la cual se expidió en debida forma; y que todos sus actos oficiales merecen toda fe y pleno crédito.

En fe de lo cual, firmo de mi puño y letra y estampo el sello de la Secretaría de Estado de Ohio, en Columbus, el 20 de enero de 1998.

(Fdo) Bob Taft, Secretario de Estado (Sello del Estado de Ohio).



9801466-2

ESTADOS UNIDOS DE AMERICA

DEPARTAMENTO DE ESTADO

A quien pueda interesar:

Por el presente se certifica que el documento aquí anexo está sellado con el sello de la Secretaría de Estado de Ohio y que dicho Sello merece toda fe y pleno crédito.

En fe de lo cual, la suscrita Madeleine K. Albright, Secretario de Estado, hago estampar el sello del Departamento de Estado y firmo a través del funcionario de Autenticaciones de dicho Departamento, en la ciudad de Washington, Distrito de Columbia, el 22 de enero de 1998.

Madeleine K. Albright, Secretario de Estado.

(Por) (Fdo) Joan C. Hampton, Funcionario de Autenticaciones del Departamento de Estado.

La firma precedente fue posteriormente certificada por el Consulado de Colombia en Washington, en la autenticación No. 164 firmada por Consuelo Sánchez Durán, Cónsul de Colombia, cuya firma fue finalmente autenticada ante el Ministerio de Relaciones Exteriores de Colombia bajo el **sello No. 209549** del 2 de febrero de 1998.

ES TRADUCCION FIEL Y COMPLETA EFECTUADA POR:

Jose del Pilar Iglesias

María del Pilar Iglesias, C.C. 41.339.183 de Bogotá.

Jose del Pilar Iglesias
Jose del Pilar Iglesias
C. C. 41.339.183 de Bogotá
Intérprete Oficial según Resolución No. 319 de
15 de Abril de 1971 del Ministerio de Justicia
/2

16
MINISTERIO DE RELACIONES
EXTERIORES

Maria del

107270

Pilar Iglesias

COYA FIRMA APARECE EN EL
DOCUMENTO DESEMPEÑA
LAS FUNCIONES INDICADAS

NO SE ASUME
RESPONSABILIDAD DEL TEXTO

98 FEB - 5 PM 12: 28

md
JEFE DE LEGALIZACIONES
SANTAFE DE BOGOTA D.C.

03 FEB 2000
16 14 17
SANTAFE DE BOGOTA D.C.

[Signature]

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16



Industria y Comercio

SUPERINTENDENCIA Y COMERCIO

Radicación : 20007075 00000003 Folios: 05
 Fecha (UTC): 2000-02-04 15:01:26
 Trámite : 012 FARMACIAS E 1 REGISTRO/ 411 PRESENTAC
 Dependencia: 2220 DIVISION DE NUEVAS CREACIONES

NIT : 900170100-2

RECIBO ORIGINAL DE CAJA : 7,767
 : FEBRERO 2 DE 2000

***** CONSIGNACION *****

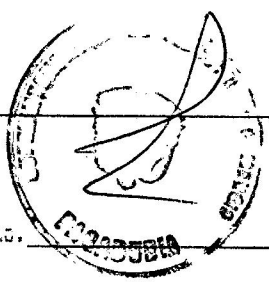
DEPOSITANTE	TIPO PAGO	BANCO	SUCURSAL	CUENTA	Nº. PAGO	VAL. PAGO
CARRENAS Y CARRENAS ASOCIADOS	CONSIGNACION	BANCO POPULAR	BOGOTA	350 00024-9	51012	2,777,000.00

***** CONCEPTO *****

CONCEPTO	CONCEPTO	TOTAL CONCEPTO
1 00000-01-01 SOLICITUDES	1 TRAMITES DE SOL. DE PATENTE DE IN	300,000.00
	TOTAL :	300,000.00

SON: TRESCIENTOS CERO MIL PESOS

RESPONSABLE :



RECIBO DE CAJA APLICADO AL EXPERIENTE N°.

Carrera 13 N°. 27-00 Pisos 5 y 10
 Conmutador: 334 12 21
 Fax: 281 31 25
 Santa Fe de Bogotá, D.C., Colombia

PIPE STRUCTURE AND METHOD OF MANUFACTURE

Field of the Invention

5 This invention relates to pipes made from polymeric material, and more particularly to pipes made as segments which are assembled into larger pipe systems during installation.

Background of the Invention

During recent years, it has become more and more common for pipes for the transmission of fluids to be made from plastic materials.

10 Non-metal materials are made into various types of pipes by several methods. For instance, it is known to extrude PVC into various shaped pipes. Another more economical method is the corrugated pipe technique, which uses blow mold and vacuum mold techniques to produce a pipe which is formed as extruded tubes of a polymer such as IMPE (high density polyethylene). Systems for fabricating such corrugated pipes are sold by Corma, Inc. of Concord, Ontario. A system of this type is also described in U. S. Patent No. 5,296,188, which is herein
15 incorporated by reference.

Polymer material pipes are generally manufactured as continuous extrusions which are then cut into sections. Frequently, each section has a male end and a female end, and these sections are linked sequentially across the distance needed for the pipe to extend. The female end of the pipe, sometimes called a bell, receives the male end, sometimes called a spigot, of the next pipe therein.

20 One problem presented in such pipes derives from the fact that, during fabrication, the material from which the pipe is made is heated, and then cooled. As different portions of the pipe cool and shrink at different rates, stresses are created. If the pipe is then exposed to heat, even such as that of strong sunlight, it may cause enough warming to soften portions of the pipe.

25 The result of this is that portions of the bell are altered from the desired shape. As a result, the bell, which is optimally an open flared cone or skirt with a circular mouth, "flowers", i.e., deforms into a roughly clover-leaf or flower cross-section. This flowered structure presents problems when the pipe sections are to be assembled, since the puckering of this shape may make the female end of the pipe too small to easily accommodate the male end of the next pipe section. This means that the construction crew must try to pry the flowered bell apart to insert the male portion.
30 This is inefficient in terms of labor costs and time. Moreover, the flowering can render the pipe section completely unusable.

Similarly, stacking of the pipe section can create loads in the Female end of the pipe section. If environmental factors such as heat created by sunlight or high ambient temperatures are present, this can soften the material to the degree that deformation occurs.
35

Objects and Summary of the Invention

It is therefore an object of the invention to provide a pipe section having a female end with a strengthened periphery.

5 It is also an object of the invention to provide a pipe section with a female end resistant to deformation.

It is another object of the invention to provide a pipe section which is readily connected with another pipe section to form a pipe assembly.

It is still another object of the invention to provide a pipe assembly which is efficiently and cost-effectively fabricated in the field and is reliably sealed against leakage.

10 It is a further object of the invention to provide a method and apparatus for making the pipe section of the invention.

It is yet another object of the invention to provide a method of fabricating the pipe assembly of the invention.

15 Accordingly, in one aspect the invention is a pipe section which comprises a segment of polymeric material configured as a conduit having an end strengthened by a reinforcing structure formed integrally of said material around the periphery of said end.

20 In another aspect, the invention is a pipe assembly for accommodating fluid flow therethrough, which includes a first pipe section comprising a segment of polymeric material configured as a conduit and having a male end and a female end, said first pipe section's female end being flared and being strengthened by a reinforcing structure formed integrally of said material around the periphery of said female end, and a second pipe section comprising a segment of polymeric material configured as a conduit and having a male end and a female end, said male end of said second pipe section being in the female end of the first pipe section such that fluid may flow from one of said sections into the other.

25 In a further aspect, the invention is a method of forming a pipe section, which comprises subjecting an end of a segment of polymeric material configured as a conduit to conditions sufficient to render the material proximate such end plastic, and turning the plastic polymeric material at such end back away from the end to form an integral reinforcing structure.

30 In yet another aspect, the invention is method of fabricating a pipe assembly for accommodating fluid flow therethrough, said assembly including a first pipe section comprising a segment of polymeric material configured as a conduit and having a male end and a female end, said female end being flared and being strengthened by a reinforcing structure formed integrally of said material around the periphery of said female end, and a **second pipe section** comprising a segment of polymeric material configured as a conduit and having a male end and a female end, which method comprises bringing the female end of said first pipe section and the male end of said second pipe

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Fig. 4 shows an enlarged partial view of Fig. 3.

Figs. 5 to 10 are enlarged views similar to that of Fig. 4, showing alternate embodiments of the invention herein.

Fig. 11 is a cross-sectional view of a pipe section of the invention during manufacture.

5 Fig. 12 shows the initial fabricated female connection portion and a mandrel used to form it into the final desired structure of the invention.

Fig. 13 shows an apparatus for forming the reinforced rim structure in a pipe section.

Figs. 14- 16 are detailed sectional views of mandrels for forming rim structures of alternate embodiments.

10

Detailed Description of Certain

Preferred Embodiments of the Invention

A central feature of our invention is formation of the integral reinforcing member on the female end of a subject pipe section. This member reinforces the female end's peripheral edge so that it can withstand rough contact, jostling and the like when a male end of another pipe section is inserted and moved around to secure alignment pursuant to connection of the pipe sections. Typically, practice of the present invention results in attainment of a hoop strength at the reinforced female end of at least 10, and preferably at least 15, pounds (e.g. for 4-inch diameter conduit) and in some cases 50, and preferably at least 80, pounds (e.g., for 12-inch diameter conduit), hoop strength being defined as the amount of force needed to laterally compress a pipe by 5% of its diameter. Moreover, the reinforcing member strengthens the female end of a subject pipe section, especially when flared, against deformation resulting from flowering by providing a skeletal frame which holds the end in its desired shape. Also, the reinforcing member provides extra support while the pipe section is being stored, for example, stacked in contact with other pipe sections. In the event ambient conditions such as heat, sunlight or the like cause a softening of the pipe section's constituent material the reinforcing member contributes added structural integrity so that degradation which might otherwise occur can be prevented or at least decreased substantially.

While useful with a range of materials, the invention is especially applicable to piping made of polymeric materials such as polyethylene, polypropylene and PVC (in certain good embodiments, especially with polypropylene and PVC for instance, fuller is also incorporated to reduce cost). Over and above such materials' intrinsic value in piping applications, they are particularly useful for producing piping in a variety of shapes and styles, especially piping having a corrugated wall, which structure confers a relatively greater strength to weight ratio *vis-a-vis* non-corrugated piping. This is a consequence of the fact that the solidified polymeric materials of which conduit is made characteristically are formed from precursors (such as the polymeric material at elevated temperature, e.g., hot polyethylene, or a reaction mixture subjected eventually to curing conditions) which have

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theological properties permitting material flow until setting. Since such precursors are highly formable, the polymeric materials are particularly useful in extrusion processes, and other processes which similarly require a high degree of formability, for making the corrugated pipe sections on other shapes and styles contemplated in connection with the present invention.

5 It follows that a preferred embodiment of the invention is a method of forming a pipe section, which comprises subjecting an end of a length of polymeric material configured as a conduit with a corrugated wall to conditions sufficient to render the material proximate said end plastic; shaping the plastic polymeric material proximate said end into a flared portion; turning the plastic material at the end of said flared portion back away from the end to form an integral reinforcing structure.

10 The characteristics of the inventive pipe section as herein described lead to a highly advantageous pipe assembly comprising at least two pipe sections aligned and connected utilizing the invention. As brought out in more depth below, the present invention is very effective in maintaining the shape of a subject pipe section's female end so that a good fit between it and the male end of another pipe section can reliably be achieved, without the necessity for mechanical working of such female end in order to return it to its initial configuration conforming to and accommodating the shape of the male end. Moreover, when the female end of a subject pipe section is flared, the reinforcing member has the further effects of dimensionally stabilizing the flared end (again for the purpose of reliably accommodating the other pipe section's male end), and strengthening the edge of the flared portion so that movement therein of the other pipe section's end to achieve the desired alignment can be carried out with decreased danger of deformation of the flared portion through rough contact, etc.

15 It can, therefore, be seen that another preferred embodiment of the invention is that it involves a method of fabricating a pipe assembly as aforesaid. In this method the pipe section is formed from a polymeric material, and it has a first tubular conduit. A female connection at the end of the conduit has a generally cylindrical or conical structure which extends from the end of the conduit.

25 The terminal portion of the end structure is then heated to make the material plastic. The terminal portion of the female connection and a mandrel are then pressed together. The mandrel has a pocket structure which causes the heated end of the female connection to bend backwards to form a reinforcing rim structure. The heated end is then allowed to set. The cooled material of the rim structure reinforces the female connection so that the flowering and other deformation problems of the prior art are not encountered.

30 To provide an integrated treatment of various structural aspects of the invention, we consider a pipe assembly formed of at least first and second pipe sections. The first pipe section comprises a tubular conduit with a female connection on the end. The second pipe section has a tubular conduit

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with a male connection on its end. The female connection receives the male connection so that the interior of the first pipe section communicates with the interior of the second pipe section, and water or other fluid can flow through the pipe assembly.

5 The female connection is formed of a polymeric material. It has a first connection portion which is connected to the end of the conduit and extends longitudinally away from it. The female connection also has an annular terminal edge which defines an opening at the end of the pipe section. The terminal edge has a reinforcement structure which rigidifies the end of the female connection and prevents the flowering and other deformation problems of the prior art.

10 The reinforcement structure preferably includes a first annular portion formed integral with the first connection portion, a second annular portion formed integral with this portion and extending radially inwardly or outwardly of the first annular portion, and a third annular portion which is formed integral with the second annular portion and extends longitudinally inwardly of the first pipe section.

15 In a preferred embodiment, the first pipe section has a corrugated outer structure of the same polymeric material as the female connection affixed to the outer surface of the conduit. Preferably, the corrugated outer surface is formed integral with the female connection portion and is of material which is substantially the same thickness as in the female connection.

20 The female connection is also provided with a widening flared opening to aid assembly of the pipes in, for instance, a trench, where it is difficult to perfectly align the pipe sections for assembly. This is a valuable feature, since it is often fairly difficult to align the pipes precisely before pressing them together; provision of a flared portion which helps guide another pipe section's end toward the female connection site expedites attaining alignment. In such connection, it should be noted that as used herein: the term "approximate registration" refers to the condition in which two pipe sections are oriented vis-à-vis one another that the male end of one can be or is inserted into the flared female end of the other and the term "alignment" refers to the condition of such section. The flare also enhances the structural strength of the end of the pipe section.

25 The rigidity of the female connection also may be enhanced by the use of several crimped or creased portions of the end portion which additionally reinforce the structure of the female connection.

30 Now, with reference to the figures of drawing, as best seen in Fig. 1, a pipe section, generally indicated at 3, extends longitudinally between a male end or spigot, generally indicated at 5, and a female end or bell, generally indicated at 7.

35 Intermediate these two ends is a middle length of the pipe section generally indicated at 9, which is shown in contracted cut-away in Figure 1. The usual length of the pipe sections of this type is about 20 feet, although there may be variations in this depending on the application and environment

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for which the use is desired. Inner diameters of the pipes may vary widely, but in the preferred embodiment range from about 10 inches to about 37 inches.

5 The pipe section 3 has an outer structure 11 which is preferably formed of a continuous extrusion of polymer material, most preferably a thermoplastic such as high density polyethylene (HDPE). The outer structure 11 has a number of ring-shaped corrugations 13 each extending around the pipe. Alternatively, the outer structure may have a different pattern, such as spiral corrugations.

10 The inside of the pipe section 3 is a tubular or cylindrical conduit 15 which extends between the male and female ends 5 and 7 and which is bonded to the corrugated structure 11 during fabrication of the pipe section. The conduit is preferably also formed as a continuous extrusion of polymer material, most preferably HDPE. This inner cylindrical conduit 15 defines a passage generally indicated 17 going through the pipe section from the male end 5 to the female end 7.

15 During assembly of the pipe sections, as best shown in Fig. 2, the male end 5 is inserted into the female connection 7. The female connection provides a inwardly facing conical engagement surface 19 against which abuts a resilient sealing member 21, which is a gasket, preferably an extruded rubber profile, supported in a radially outwardly facing recess on the last corrugation 23 of the male end 5 of the pipe section 3. Alternatively, a gasket may be held in the valley 24 between the first and second corrugations at the male end 5, which gasket is radially wide enough to sealingly engage surface 19. This engagement between the sealing member 21 and the engagement surface 19 effectively seals the joint so that fluids passing through the pipe sections do not leak out in appreciable amounts. The engagement surface 19 flares outwardly at an angle of 1° to 10° , and most preferably about 5° , to the centerline axis of cylindrical conduit 15.

20 Fig. 3 shows an enlarged cross-section of the female connection 7. It will be understood that the cross section of the pipe section will be the same for all cross-sections through the centerline of the pipe because the form of the preferred embodiment is a shape of rotation with circular cross-sections. It will be understood that non-circular cross-section pipes, e.g., oval cross-sections, may also benefit from the present invention.

25 After the last corrugation 13, the female connection end 7 comprises a bell structure 27 with an opening generally indicated at 25, into which the male end 5 can be inserted. The bell structure 27 comprises a generally conical flare portion 29 which tapers longitudinally outward and radially outward from the end 31 of the cylindrical conduit 15. This taper extends to the wall portion 33 which provides the inwardly facing engagement surface 19 against which the sealing member 21 of the male end 5 engages. Wall portion 33 tapers outward at an angle of about 1° to 10° , and most preferably about 5° , as indicated above.

30 Longitudinally outward of engagement surface 19, the wall portion 33 includes a further flared second flare section 35. This flare section 35 flares outward at a flare of about 15° to 30° , and

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most preferably about 20° from the centerline of the conduit 15 and preferably has a longitudinal length of about 1 to 2 inches, and most preferably 1.5 inches.

To rigidify the end opening 25 of female connection 7, the flare portion 35 is also provided with a plurality of small corrugations or crimps 37 which provide a ribbed annular portion which extends around the circumference of the conical flare section 35. In the preferred embodiment there are three crimps 37, but it will be understood that depending on the thickness of wall used and the length of this flare section 35, more or fewer crimps may be used.

Flare portion 35 is flared out at an angle of about 20° , which allows for insertion of the male end 5 into the female connection 7 with some degree of angular play. In common installation of such pipe sections, a trench is dug and the pipe section of 20 feet in length is lowered by the use of machinery such as a back hoe. As the pipe is lowered into the trench it may be fairly difficult to ensure that the axis of the second pipe section aligns with the axis of the first pipe section perfectly. The angulation of flare portion 35 allows for some play or tolerance in the alignment, in certain good embodiments up to as much as 20° or even 30° as the male end 5 is settled into the female connection 7.

The wall portion 33 extends to a longitudinal terminal end indicated at 39. This longitudinal terminal end 39 is provided with a reinforcing rim structure which keeps the shape of the mouth 25 of the female connection 7 circular.

As best seen in Fig. 4, the reinforcing structure comprises a first portion 41 formed integral with the distal end of the second flare portion 35. This first portion 41 extends longitudinally outward of the pipe section 3. Formed integral with the first section is a second section 43 which curves to extend radially outward from first portion 41. The third portion 45 is formed integral with second portion 43 and this extends backwards in a longitudinal direction towards the longitudinal center of the pipe section 3, spaced from the first portion 41. Third portion 45 has a terminal end portion 47 which is spaced from the first portion 41.

These annular structures combine to form an annular reinforcing structure which is roughly a U-shaped channel.

The U-shaped channel has a curved cross-section taken through the centerline of the pipe section. The radius of curvature of this channel is preferably about 1.25 times the thickness of the material of the flare portion, although the radius may be as large as 4 times the thickness of the material.

When the bell 7 is formed by extrusion it has a substantially uniform thickness throughout. The preferred thickness varies with the size of the pipe. A 12-inch diameter pipe will preferably have a thickness of about .110 to .112 inches. A 30-inch inside diameter pipe will preferably have thicker

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material, about .185 inches, and a 60-inch inside diameter pipe will preferably be of material about .25 inches thick.

The combination of the reinforcing structure and the 20° flare is remarkably sturdy, structure, as much as about five times stronger than the same pipe without the flare or reinforcement. A deformation test comparing two 12" pipes, one with a flare and reinforced rim as described herein, and the other identical, but with no rim or flare, yielded striking results. A 5% deformation of the unflared and unreinforced pipe required a compressive lateral load of 26 pounds. To achieve the same 5% deformation in the reinforced and flared pipe required a load of 122.5 pounds.

The curving structure of this reinforcing ring formed by the portions 41, 43 and 45 also provides an additional benefit in that no corners project either in a longitudinal direction or radially. During assembly of the female connection 7 with the male end 5, the roundness of all corners prevents the end portion 39 from catching the resilient sealing member 21 and dislodging it from its position on the first corrugation 23 in the male portion 5 and also significantly reduces the insertion force.

Figures 5 through 10 show alternate embodiments that can also be used to reinforce the end of the female connection 7. The same reference numbers are used for similar parts in these embodiments.

Figure 5 shows an alternate embodiment in which the third annular portion 45 is curved so that the terminal end 47 thereof contacts the outer side of flare portion 35. The result is that the reinforcing structure defined by the three elements of portions 40, 43 and 45 is a tubular structure reinforcing the rim of female connection portion 7.

In Figure 6, a further alternate embodiment is shown wherein the third portion 45 is pressed inward so that the third portion 45 lies adjacent to and engaging the first portion 41 on its radial outside surface.

Referring to Figure 7, a further alternate embodiment is shown wherein the curvature of the reinforcing structure at the end of the female connection 7 does not have a curvature as pronounced as that in the embodiment of Figure 5. Instead of having the curvature of approximately a complete semicircle, the embodiment of Figure 87 has a cross-section which is less than a semicircle and wherein the tangent to the terminal end portion 47 of the third portion 45 is at an angle α from the perpendicular passing through the longitudinal axis of the pipe section. This angle α is preferably less than 90° and more than about 10°, to produce some sort of channel structure in the rim. In the embodiment shown, the angle α is about 60°.

Referring to Figure 8, an embodiment is shown wherein the third portion 45 of the reinforcing structure is connected to a further outwardly disposed portion 49 which engages and overlies radially outer surface of third portion 45 so as to provide a generally S-shaped reinforcing structure at the mouth of female connection 7.

A further alternate embodiment is disclosed in Figure 9, wherein an annular bead 51 is formed around the outside of terminal end 53. This bead 51 is annular and reinforces outer rim 53 against deformation out of a desired shape in a fashion similar to the reinforcing structures of Figures 4 through 8.

5 This bead 51 may be formed by reforming the end of the extruded bell of female connection 7 without any additional material. An alternate possibility is that the bead 51, which is of the same material as used for the extrusion, which is preferentially high density polyethylene, is additional material applied around the longitudinal terminal end 53 of the formed flare portion 35. The application of this bead 51 is under conditions sufficient to cause it to fuse with the material of the
10 flare portion 35 and structurally unite with that member. This bead may be applied as a string of polyethylene or other suitable material wrapped around the flare portion 35, or as a loop of polyethylene material which is shrunk around the flare portion 35.

15 It will be understood that reinforcement structures such as the bead need not be at the terminal end of the female connection, but may provide beneficial structural reinforcement when spaced slightly inward from the end, so long as the reinforcement is in the end region of the pipe to prevent deformation of the end.

It will also be understood that these embodiments are exemplary of reinforcement structures, and that other cross-sectional structures may be readily devised by those of skill in the art.

20 Figure 10 shows another alternative embodiment which can be applied not only to rim structure indicated in Figure 4 but to the reinforcing rim structures of Figures 5 through 9, as well. As seen in Figure 10, the curvature of the reinforcing structure may be reversed so that it extends radially inwardly of the flared portion 35. In Figure 10, the reinforcing structure consists of a first portion 53 extending longitudinally outwardly, a second portion 55 extending radially inwardly and a third portion 57 which extends back longitudinally towards the longitudinal center of the pipe section 3.
25 The inward terminal end 59 of this inward reinforcement structure is spaced inwardly from the first portion 53.

30 The configuration of this reinforcing structure may be varied so it can have a cross-section similar to that of the embodiment of Figure 6 (a tube structure), Figure 7 (a folded structure), Figure 8 (a less than semicircular arch), or Figure 9 (an S-shaped, folded structure). It will also be understood that the same concept can be applied to the structure of Figure 10, wherein the bead 51 would be mounted on the radial inside of the lip 53 of the mouth of the female connection.

35 The preferred method of manufacture of the pipe sections of the invention is by extrusion of polymer material. Particularly preferred is the corrugated pipe extrusion method discussed in U.S. Patent 5,296,188, and/or embodied in the Corma, Inc., system sold under the model designation "3020".

Such a system produces a generally continuous corrugated tube which is cut into separate pipe sections.

Fig. 11 shows a segment of the continuous tube which is cut to form the male and female ends 5 and 7. The corrugated tube comprises two tubular parisons or sheets of extruded material, preferably of a thermoplastic nature, such as HDPE, which parisons have a substantially constant thickness over the length of the pipe. The outer parison 50 comprises the bell 7, including crimps 37, and the pipe structure 11 with the corrugations 13. The inner parison 60 is a generally cylindrical tube which constitutes the conduits 15 of the pipe sections 3. Both parisons are of the same material and are bonded together at annular regions 67 during the extrusion process.

The first step of processing after extrusion is that the pipe sections are cut to separate them from each other. This is done by cutting completely through the extrusion at plane A of Figure 11.

The next step of processing involves cutting through each of the parisons 50 and 60 with a skiving tool, which is usually a router held in place to cut through one of the extruded parisons while the pipe section is rotated. Two cuts are made, inner parison 60 being skived at plane B and outer parison 50 at plane C. This frees a portion, referred to as "top-hat" 64, which is recycled.

The resulting female end 7 has a cross-section as shown in Figure 12.

As an alternative to this arrangement which requires skiving out the "top-hat" is that in the area of the bell the inner parison 60 may be pressed outward to form a double-walled bell shape. Such a structure would only require a single cut, to separate the pipe section. The interior shape would be correct without further skiving needed.

At this point, the pipe wall portion 33 has a longitudinal end 61 which extends generally along the line of the generally conical surface 19 of wall 33. It is this end 61 that is formed into the rim structure.

In order to introduce the rim structure, the female connection 7 and a mandrel 63 are pressed together so the mandrel enters into the opening 25 of the female connection 7.

As best seen in Figure 12, the mandrel 63 comprises a central body portion 65 which is generally circular about the central axis of the pipe section 3. This may be solid, or it may be torroidal, with a hole in the middle and a similar radially outward configuration. The central portion 65 fits into the opening 25 at the end of the pipe section, and this first portion of the mandrel has a generally cylindrical outer wall 67. The cylindrical outer wall 67 blends into a flaring frustoconical wall 69, which flares outwardly at approximately 20° to impart a flare to the end structure 61 of the female connection 7.

The frustoconical surface 69 extends flaringly outward to pocket structure 71, which includes a curving surface 73 which curves from the outer end of the frustoconical section upwardly and then

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back in a longitudinal direction towards the end section of the pipe structure, forming an annular packet or trough generally indicated at 75.

In this stage of fabrication, the thermoplastic material is either heated by a secondary source or the mandrel itself may be heated to soften this material and make it pliable to form the reinforcing structure. The softened end of the pipe is then pressed into the mandrel, by movement of either the pipe or the mandrel, or both together.

The engagement of the pipe with the mandrel is at specified temperature, pressure and duration. For a 12 inch inner diameter pipe with a 0.112 inch wall thickness, the end of the pipe is heated to about 350° F, and the mandrel and pipe are pressed together with a force of about 400 pounds. The engagement is maintained for about 15 to 20 seconds, which imparts the proper shape to the pipe. These parameters, it will be understood, vary with the size of pipe, and may be varied even with the same size pipe.

An apparatus particularly preferred for finishing the female end 7 of the pipe section 3 is shown in Figure 13. The female end 7 of the pipe is held in a rotary station indicated at 77 between rollers 79 and 81 that rotate the pipe 3 in place.

First, skiving device 83, which has two routing devices 85 and 87 mounted on a moving carriage, moves laterally to place the skiving device in operative position at the end 7 of the pipe 3. As the pipe is rotated, the top-hat (not shown in Figure 13) is cut out. The skiving device 83 is then retracted to the position shown in Figure 13.

Mandrel device 89 then descends on vertical track 91 to line up with the end 7 of pipe 3. Heating device 93, preferably a gas torch or a quartz radiant heater, is then activated to heat and soften the material at the end of pipe 3. The mandrel 63 is supported on pneumatic cylinder structure 95, which, when activated, presses the mandrel 63 into engagement with the end 7 of the pipe 3, forming the reinforcement structure on the pipe.

The mandrel 63 is then retracted and the mandrel device 89 moves up to its starting position shown in Figure 13.

The pipe is then cooled and allowed to set. Cooling may be assisted with an air mister.

Other systems for pressing the engagement of the pipe end with the mandrel can readily be assembled by one of ordinary skill in the art. For example, a yoke that grips the end of the pipe may be attached to a pneumatic press with the mandrel thereon which, when activated, presses the mandrel against the end of the pipe.

Different mandrel designs can be used to obtain the rim structures of alternate embodiments shown in Figs. 5 to 10.

For example the embodiment of Figure 8 is preferably obtained by the mandrel arrangement as seen in Figure 14. Mandrel 97 has a sloping conical surface 99 which terminates at an abutment

surface 101. A spot heating element 105 applies heat to a middle third of the annular end portion 103 while the mandrel 97 and pipe 3 are being rotated relative thereto. As the end portion 103 is pushed against the abutment surface 101, the softened middle portion folds to form the S-shaped reinforcement.

5 The radially inwardly disposed reinforcement structure shown in Figure 10 is preferably formed by a mandrel 107 as seen in Figure 9. 215?

Figure 16 shows a preferred embodiment for formation of a bead 57 as seen in Figure 9. The mandrel 109 is rotated adjacent a rotating roller 111, which co-acts therewith to shape the bead 51 at the end of pipe 3.

10 The terms used herein are intended to be terms of description rather than limitation, as those knowledgeable in the art with this specification in hand will be able to make modifications therein without departing from the spirit of the invention.

What is claimed is:

1. A pipe section which comprises a segment of polymeric material configured as a conduit having an end strengthened by a reinforcing structure formed integrally of said material around the periphery of said end, said structure including a portion which extends back away from said end.

2. A pipe section as defined in claim 1, wherein the reinforcing structure is formed at said end by turning the conduit material back over on itself.

3. A pipe section as defined in claim 1, wherein the hoop strength of said end is of least 10 pounds.

4. A pipe section as defined in claim 3, wherein the hoop strength of said end is at least 15 pounds.

5. A pipe section, which comprises a segment of polymeric material configured as a conduit with a corrugated wall, said conduit having an end portion which is flared, and which is strengthened by a reinforcing structure formed integrally of said material around the periphery of said end, said structure including a portion which extends back away from said end.

6. The pipe assembly of claim 5, wherein the flared portion flares at an angle of about 15° to 30° relative to the longitudinal axis of the conduit.

7. The pipe assembly of claim 6, wherein the angle is about 20° .

8. The pipe assembly of claim 5, wherein the flared portion includes at least one rigidifying crease structure, said crease structure being annular and extending substantially around the flared portion.

9. A pipe section comprising:

inner and outer longitudinally extending generally tubular parisons each of high density polyethylene material and formed by extrusion, each parison having a respective substantially constant thickness throughout;

the inner parison comprising a substantially cylindrical longitudinally extending conduit having a passage therein for fluids to pass through the pipe section, said conduit having two longitudinal ends and an outer surface;

said outer parison comprising a corrugated structure surrounding the conduit and affixed to the outer surface thereof and a bell structure formed integral with the corrugated structure adjacent one of the ends of the conduit and projecting longitudinally outward therefrom;

said corrugated structure having a male connection structure secured adjacent the other end of the conduit, said bell structure forming a female connection structure configured to sealingly receive therein another male connection structure having a configuration substantially the same as said male connection of the pipe section;

the bell structure comprising:

5 a first flare section connected with the corrugated structure adjacent the associated end of the conduit and projecting longitudinally and radially outward therefrom, said flare section including a radially inwardly disposed generally conical engagement surface tapering outwardly at an angle of about 1 to 10° and configured to sealingly engage said other male connection structure when placed in the bell structure;

a second flare portion formed integral with and projecting radially and longitudinally outwardly from an outer end portion of the first flare portion and tapering outwardly at an angle of about 15 to 30° for a distance of about 1 to 2 inches;

10 said second flare portion including a longitudinal terminal end portion of the bell structure, said terminal end portion defining in the female connection a generally circular end opening communicating with the passage in the conduit;

the terminal end portion including a reinforcement structure comprising

15 a first annular portion formed integral with the second flare portion and extending longitudinally outwardly therefrom;

a second annular portion formed integral with the first annular portion and extending radially outwardly therefrom;

a third annular portion formed integral with the second annular portion and extending longitudinally inward therefrom;

20 said reinforcing structure being formed by shaping the terminal end portion to turn back on itself so that the reinforcing structure has a channel or tubular cross-section.

10. A pipe assembly for accommodating fluid flow therethrough, which includes

25 a first pipe section comprising a length of polymeric material configured as a conduit and having a male end and a female end, said first pipe section's female end being flared and being strengthened by a reinforcing structure formed integrally of said material around the periphery of said female end, said structure including a portion which extends back away from said end, and

a second pipe section comprising a length of polymeric material configured as a conduit and having a male end and a female end;

30 said male end of said second pipe section being in the female end of the first pipe section such that fluid may flow from one of said sections into the other.

11. A pipe assembly comprising:

first and second pipe sections;

the first pipe section comprising a longitudinally extending tubular first conduit portion having a longitudinal end and a female connection portion on said end, said female connection

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portion having a first opening therein and said conduit portion having a passage therein communicating with the first opening;

the second pipe section comprising a longitudinally extending tubular second conduit portion with a longitudinal end and a male connection portion on said end, said male connection having a
5 second opening therein and the second conduit portion having a passage therein communicating with the second opening;

said female connection portion receiving the male connection portion therein so that the passage in the first pipe section communicates with the passage in the second pipe section and so that fluid can move through the pipe assembly by passing through said conduit portions and said
10 connection portions;

said female connection portion comprising a first connection portion connected with the end of the conduit portion and extending in a longitudinal direction therefrom, said female connection portion including a longitudinal annular terminal end portion extending around said first opening and including a first annular portion formed integral with the first connection portion and extending
15 therefrom generally longitudinally outwardly of the first pipe section;

a second annular portion formed integral with the first annular portion and extending generally radially inwardly or outwardly from the first annular portion; and a third annular portion formed integral with the second annular portion and extending longitudinally inwardly of the first pipe section therefrom;

said first, second and third annular portions together forming a generally circular reinforcement structure which strengthens the terminal end portion to preserve a circular shape thereof.

12. The pipe assembly of claim 11, wherein the first pipe section further comprises a corrugated outer structure, the first conduit portion having an outer surface, said corrugated outer structure surrounding and being affixed to said outer surface.
25

13. The pipe assembly of claim 12, wherein said corrugated outer structure is of the polymeric material, said corrugated outer structure being formed integral with said female connection portion, the corrugated outer structure and the female connection portion having a substantially uniform thickness.

14. The pipe assembly of claim 11, wherein said first connection portion includes a flare portion adjacent the terminal edge portion, said flare portion flaring radially outwardly and longitudinally outwardly of the first pipe section, thereby facilitating alignment of the first and second pipe section during assembly of the pipe assembly.
30

15. The pipe assembly of claim 11, wherein said second annular portion extends radially inwardly from the first annular portion and supports the third annular portion radially inwardly of the first annular portion.

5 16. The pipe assembly of claim 11, wherein said second annular portion extends radially outwardly from the first annular portion and supports the third annular portion radially outwardly of the first annular portion.

17. The pipe assembly of claim 11, wherein the third annular portion has a terminal end directed longitudinally inwardly of the first pipe section.

10 18. The pipe assembly of claim 17 and said first connection portion providing a radially inward facing engagement surface, and said male connection portion supporting thereon a gasket, said gasket engaging the engagement surface so as to substantially seal the connection between the male and female connection portions to resist escape of fluid from inside said pipe assembly; and

15 said first, second, and third annular portions being curvingly configured so that the terminal end portion of the female connection portion has no corners directed radially inwardly and longitudinally outwardly of the first pipe section that could contact and dislodge the resilient seal member from the male connection portion during assembly of the first and second pipe sections.

19. The pipe assembly of claim 11, wherein said polymeric material is high density polyethylene.

20 20. The pipe assembly of claim 12, wherein the corrugated outer structure and the first conduit portion are formed simultaneously by extrusion of thermoplastic material.

21. The pipe assembly of claim 11, and said female connection portion being formed by extrusion of thermoplastic material.

25 22. A pipe section comprising:
a longitudinally extending tubular first conduit portion having a longitudinal end and a female connection portion on said end, said female connection portion having a first opening therein and said conduit portion having a passage therein communicating with the first opening;
the female connection portion being adapted to receive therein in said opening a male connection of a second pipe section;

30 said female connection portion being formed as an extrusion of polyethylene material having a substantially constant thickness throughout, said female connection portion comprising a first connection portion connected with the end of the conduit portion and extending generally in a longitudinal direction therefrom, and an annular longitudinal terminal end portion extending around said first opening, said longitudinal terminal end portion including a generally annular reinforcement

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structure formed integral with and around the terminal edge portion, which reinforcement structure strengthens the terminal end portion to preserve the shape thereof and of the first opening.

23. The pipe section of claim 22, wherein the first pipe section further comprises a corrugated outer structure, the first conduit portion having an outer surface, said corrugated outer structure surrounding and being affixed to said outer surface.

24. The pipe section of claim 23, wherein said corrugated outer structure is extruded of polyethylene material, said corrugated outer structure being formed integral with said female connection portion.

25. The pipe section of claim 22, wherein said first connection portion includes an angulated flare portion supporting the terminal edge portions, said flare portion flaring radially outwardly and longitudinally outwardly of the first pipe section adjacent the terminal edge portion.

26. The pipe section of claim 25, wherein the flare portion flares at an angle of about 15° is 30° relative to the axis of the first conduit portion.

27. The pipe section of claim 26, wherein the flare portion flares at an angle of about 20° relative to the axis of the first conduit portion.

28. The pipe section of claim 25, wherein the flare portion includes at least one rigidifying crease structure, said crease structure being annular and extending substantially around the flare portion.

29. The pipe section of claim 25, wherein said reinforcement structure extends radially inwardly from the terminal end portion.

30. The pipe section of claim 25, wherein said reinforcement structure extends radially outwardly from the terminal end portion.

31. The pipe assembly of claim 21 and said first connection portion providing a radially inward facing engagement surface adapted to engage a resilient sealing member supported on said male connection portion so as to substantially seal the connection between the male and female connection portions to resist escape of fluid from inside said pipe assembly and resist flow of external fluids into the pipe assembly; and

said reinforcement structure being curvingly configured so that the terminal end portion of the female connection portion has no corners directed radially inwardly and longitudinally outwardly of the first pipe section that could contact and dislodge the resilient seal member from the male connection portion during assembly of the first and second pipe sections.

32. The pipe assembly of claim 21, wherein the reinforcement structure has a cross section taken through the axis of the conduit portion which cross-section is a channel shape.

33. The pipe assembly of claim 21, wherein the reinforcement structure has a cross section taken through the axis of the conduit portion which cross-section is a U-shape

34. The pipe assembly of claim 21, wherein the reinforcement structure has a cross section taken through the axis of the conduit portion which cross-section is an accurate shape of between 100° and 180°.

5 35. The pipe assembly of claim 21, wherein the reinforcement structure has a cross section taken through the axis of the conduit portion which cross-section is a tubular configuration.

36. The pipe assembly of claim 21, wherein the reenforcement structure has a cross section taken through the axis of the conduit portion which cross-section is an S-shape.

10 37. The pipe assembly of claim 21, wherein the reinforcement structure has a cross section taken through the axis of the conduit portion which cross-section is that of a substantially solid bead of material.

38. A pipe assembly comprising:

a first pipe section;

15 the first pipe section comprisingly a longitudinally extending tubular first conduit portion having a longitudinal end and a female connection portion on said end, said female connection portion having a first opening therein and said conduit portion having a passage therein communicating with the first opening;

the female connection portion being adapted to receive therein in said opening a male connection of a second pipe section;

said female connection portion comprising

20 a first connection portion connected with the end of the conduit portion and extending generally in a longitudinal direction therefrom, and

a flare portion extending from the first connection portion and being angulated with respect thereto so that said fare portion tapers radially and longitudinally outwardly of the first connection portion;

25 said flare portion including an annual longitudinal terminal end portion distal to the conduit portion and extending around said first opening;

said longitudinal terminal end portion including a generally annual reinforcement structural formed integral therewith, which reinforcement structure strengthens the terminal end portion to preserve the shape thereof and of the first opening.

30 39. The pipe assembly of claim 38, wherein the first pipe section further comprises a corrugated outer structure, the first conduit portion having an outer surface, said corrugated outer structure surrounding and being affixed to said outer surface.

35 40. The pipe assembly of claim 39, wherein said corrugated outer structure and the female connection portion are extruded of polyethylene material, said corrugated outer structure being formed integral with said female connection portion.

41. The pipe assembly of claim 38, wherein the rare portion flares at an angle of about 15° to 30° relative to the axis of the first conduit portion.

42. The pipe assembly of claim 41, wherein the flare portion flares at an angle of about 20° relative to the axis of the first conduit portion.

5 43. The pipe assembly of claim 38, wherein the flare portion includes at least one rigidifying crease structure, said crease structure being annular and extending substantially around the flared portion.

44. The pipe assembly of claim 38, wherein said reinforcement structure extends radially inwardly from the terminal end portion.

10 45. The pipe assembly of claim 38, wherein said reinforcement structure extends radially outwardly from the terminal end portion.

46. The pipe assembly of claim 38, and
said first connection portion providing a radially inward facing engagement surface adapted to engage a resilient sealing member supported on said male connection portion so as to substantially seal the connection between the male and female connection portions to resist escape of fluid from inside said pipe assembly; and

15
20 said reinforcement structure being curvingly configured so that the terminal end portion of the female connection portion has no corners directed radially inwardly and longitudinally outwardly of the first pipe section that could contact and dislodge the resilient seal member from the male connection portion during assembly of the first and second pipe sections.

47. The pipe assembly of claim 38, wherein the reinforcement structure has a cross section taken through the axis of the conduit portion which cross-section is a channel shape.

48. The pipe assembly of claim 38, wherein the reinforcement structure has a cross section taken through the axis of the conduit portion which cross-section is a U-shape.

25 49. The pipe assembly of claim 38, wherein the reinforcement structure has a cross section taken through the axis of the conduit portion which cross-section is an accurate shape of between about 100° and 180°.

50. The pipe assembly of claim 38, wherein the reinforcement structure has a cross section taken through the axis of the conduit portion which cross-section is a tabular configuration.

30 51. The pipe assembly of claim 38, wherein the reinforcement structure has a cross section taken through the axis of the conduit portion which cross-section is an S-shape.

52. The pipe assembly of claim 38, wherein the reinforcement structure has a cross section taken through the axis of the conduit portion which cross-section is that of a substantially solid bead of material.

35 53. A method of forming a pipe section, which comprises

subjecting an end of a segment of polymeric material configured as a conduit to conditions sufficient to render the material proximate such end plastic;

turning the plastic polymeric material at such end back away from the end to form an integral reinforcing structure.

5

54. A method of forming a pipe section, which comprises

subjecting an end of a segment of polymeric material configured as a conduit with a corrugated wall to conditions sufficient to render the material proximate said end plastic;

shaping the plastic polymeric material proximate said end into a flared portion;

10

turning the plastic material at the end of said flared portion back away from the end to form an integral reinforcing structure.

55. A process for extruding a pipe section, said process comprising:

15

continuously extruding a corrugated pipe extrusion of a polyethylene material, said extrusion comprising inner and outer parisons, said inner parison being a continuous cylinder having an interior passage and an outer surface, the outer parison having at least two corrugated structures and a bell portion there between extruded continuously, the corrugated structures each being affixed to the outer surface of the inner parison;

circumferentially cutting both parisons of said extrusion between said bell portion and one of the corrugated structures to produce a pipe segment having a single bell portion and a single corrugated structure;

20

circumferentially cutting said outer parison of the pipe segment in said bell portion and circumferentially cutting said inner parison adjacent the corrugated structure so that said bell portion has generally conical portion defining a concave opening in the bell portion communicating with the interior of the inner parison;

25

pressing said annular end portion in engagement with a mandrel, said mandrel engaging the end portion of the bell structure and re-shaping the conical portion to have a flare portion adjacent the annular end portion, said flare portion being generally conical and tapering outwardly at an angle of about 20°mm;

30

said engaging with the mandrel causing said annular end portion to turn back radially outward of the flare portion and form a lip structure having a general channel shaped cross-section on the end of the bell portion;

allowing the polyethylene material to set so that said lip structure reinforces said opening to retain a circular shape.

35

56. The method of claim 55 and further comprising

heating the terminal end portion of the bell structure prior to engagement with the mandrel.

57. The method of claim 56. and said mandrel being heated to heat the end of the bell structure.

58. A method of fabricating a pipe assembly, said method comprising:
 forming a female connection portion for a pipe section from a polymeric material by
 5 extrusion, said pipe section including a first tubular conduit portion having an interior passage therein
 and a longitudinal end with an opening communicating with the passage;
 the female connection portion having a generally tabular end structure having a first
 connection portion for connection with the end of the conduit portion, said end structure having a
 longitudinal terminal portion distal from the first connection portion, said end structure having a
 10 substantially constant wall thickness;
 heating the longitudinal terminal portion of the end structure to become plastic; and
 pressing engagement between the longitudinal terminal portion and a mandrel, said mandrel
 being configured so that engagement of the mandrel with the end structure of the female connector
 portion causes the plastic terminal end portion of the female connector portion to form a reinforcing
 15 structure therein; and
 causing the polymer material of the female connector portion is set so that said reinforcing
 structure reinforces said female connector portion retaining its shape.

59. The method of claim 55 and
 said end structure being formed conical and extending flaringly outward from the first
 20 connection portion at an angle of about 1° to 10°.

60. The method of claim 59 and
 said flare angle being about 5°

61. The method of claim 58, and
 said end structure being formed conical and extending flaringly outwardly from the first
 25 connection portion at an angle of about 15° to 30°.

62. The method of claim 61 and
 said angle being about 20°.

63. The method of claim 58, and
 said mandrel having a central body portion which extends in a first direction into said end
 30 structure and an annular pocket structure extending around said central body portion, said pocket
 structure having a first pocket portion projecting radially outwardly from the central body portion and
 a second pocket portion extending in said first direction and spaced radially outward of the central
 body portion, said first and second pocket portions and the central body portion defining there-
 between an annular recess around the central body portion;

said terminal end portion being formed with reinforcing crease structures rigidifying the flared shape of the female connection portion.

5 64. The method of claim 63 and
said central body portion of the mandrel having a conical or frustoconical flaring surface adjacent the pocket structure, said flaring surface tapering inwardly away from the pocket structure so that said terminal end portion of the female connector portion is given an outwardly flared shape adjacent said reinforcing structure.

10 65. The method of claim 58 and
said polymer material being a thermoplastic.

66. The method of claim 65 and
said polymer material being high density polyethylene.

67. The method of claim 58 and
said heating of the terminal end portion being achieved by beating of the mandrel.

15 68. The -method of claim 58 and
said heating of the terminal end portion being performed by a secondary heat source, and
said mandrel being cooled to cause the setting of the material.

20 69. A method of fabricating a pipe assembly for accommodating fluid flow there
through, said assembly including a first pipe section comprising a length of polymeric material
configured as a conduit and having a male end and a female end, said female end being flared and
being strengthened by a reinforcing structure formed integrally of said material around the periphery
of said female end, said structure including a portion which extends back away from said end, and a
second pipe section comprising a length of polymeric material configured as a conduit and
having a male end and a female end, which method comprises

25 bringing the female end of said first pipe section and the male end of said second pipe section
into approximate registration by inserting the male end of the second pipe into the reinforced flared
female end of the first pipe section, and connecting the male end of the second pipe section and the
female end of the first pipe section when the two sections are in alignment, such that fluid may flow
from one of said sections into the other.

30 70. A method of fabricating a pipe assembly, said method comprising:
forming a pipe section from a polymeric material by extrusion, said pipe section including a
first generally cylindrical conduit portion having an interior passage therein and longitudinal end with
an opening communication with the passage, and a female connection portion on the end of the
conduit portion, the female connection portion having a generally cylindrical or conical end structure
connected with and extending from the end of the conduit portion, said conical end structure
35 having a longitudinal terminal portion distal from the end of the conduit portion, said

end structure having a substantially constant wall thickness; and

applying an annular bead of polymer material to said terminal end portion, said annular bead reinforcing said end portion to maintain a circular shape.

5 71. Apparatus for forming a reinforcing structure on an open end of a polymeric pipe section, which comprises

a mandrel having a wall for contacting said pipe section, said mandrel including a first portion wherein said wall is configured is be received in the open end of the pipe section, and another portion in which said wall extends outwardly of said first portion in arcuate fashion such that an annular pocket is formed;

10 means for holding said pipe section in an orientation such that it and said mandrel can be brought into contact, with the mandrel's first portion being that part of it first received in the opening at the end of the pipe section;

15 means for causing movement of the mandrel and the pipe section holding means relative to one another such that the mandrel and the pipe section come together with the mandrel's first portion being received by the opening at the end of the pipe section and thereafter the annular pocket of the third portion coming into contact with and deforming the end of the pipe section to form a reinforcing structure

20 72. Apparatus as defined in claim 71, wherein said mandrel includes a second portion intermediate said first portion and said other portion, said second portion having a wall which flares outwardly in- respect of said first portion such that when the second portion is brought into contact with the pipe section a part of said pipe section proximate the end is caused to flare outwardly.

73. The pipe assembly as defined in claim 31, wherein said connection resists flow of external fluids into the pipe assembly.

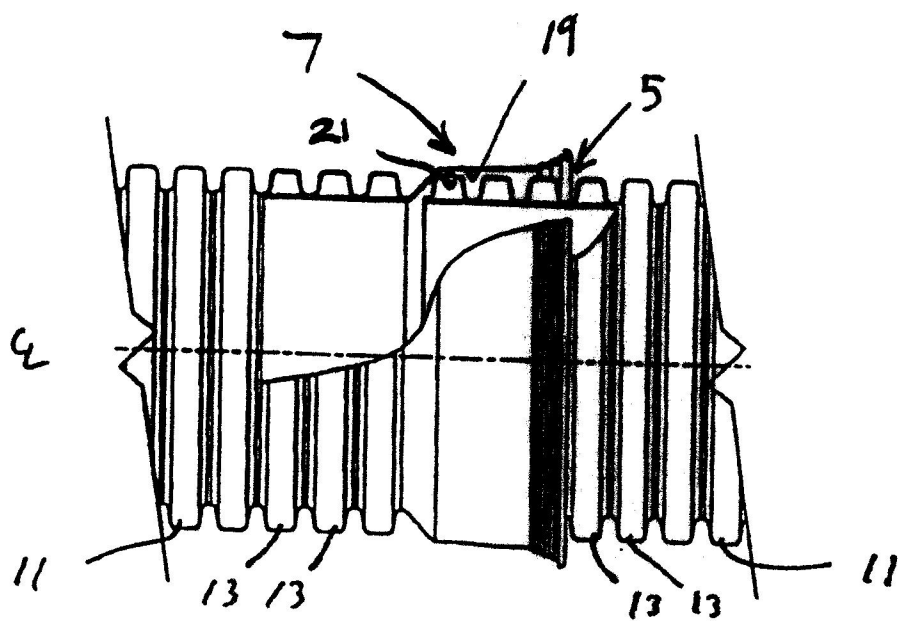
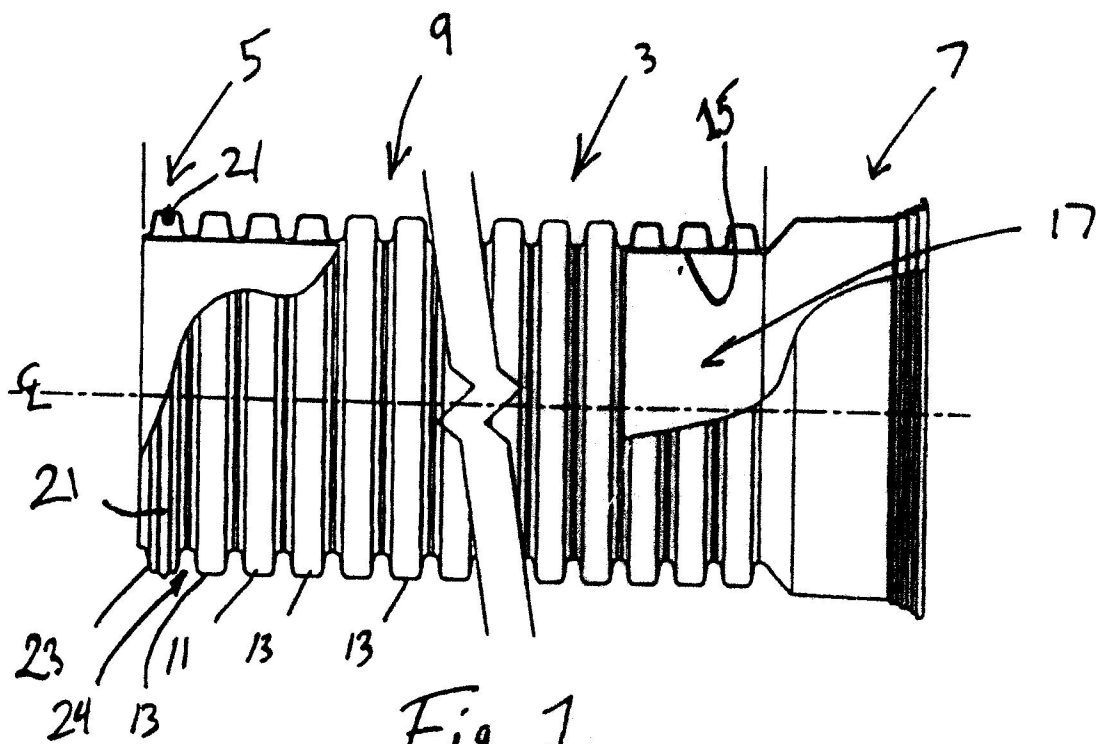
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-25-

ABSTRACT

A pipe section formed of a polymeric material which has a substantially constant thickness throughout, the terminal edge of the female connection having a reinforcement structure which rigidifies the end of the female connection and prevents deformation, the pipe section preferably
5 having a fared end, and the reinforcement structure preferably being a semicircular channel formed at the end of the pipe section by a mandrel after initial extrusion of the pipe section; along with a method and apparatus for forming the pipe section, a pipe assembly including such pipe section, and a method of forming the pipe assembly.

10



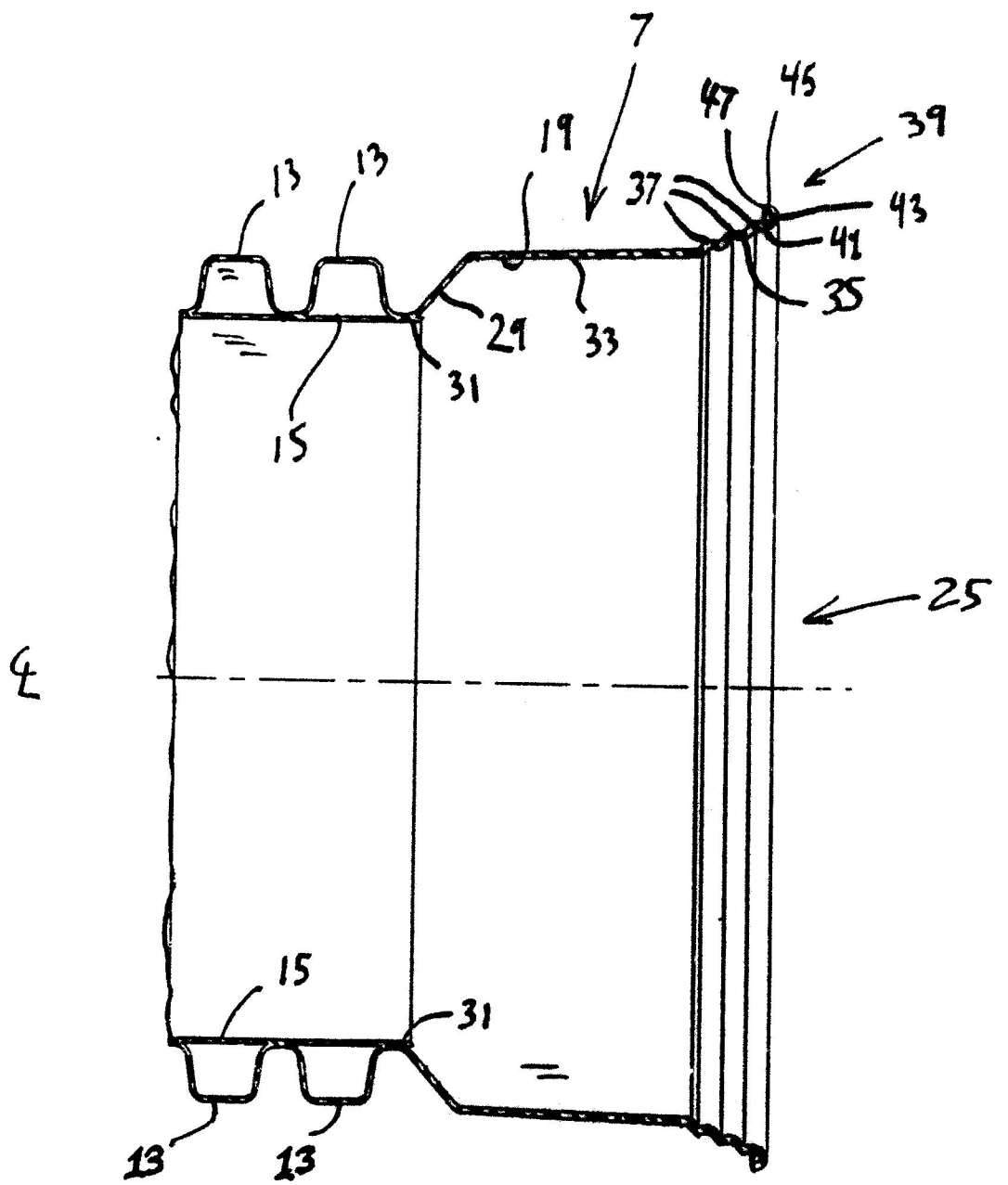


Fig. 3

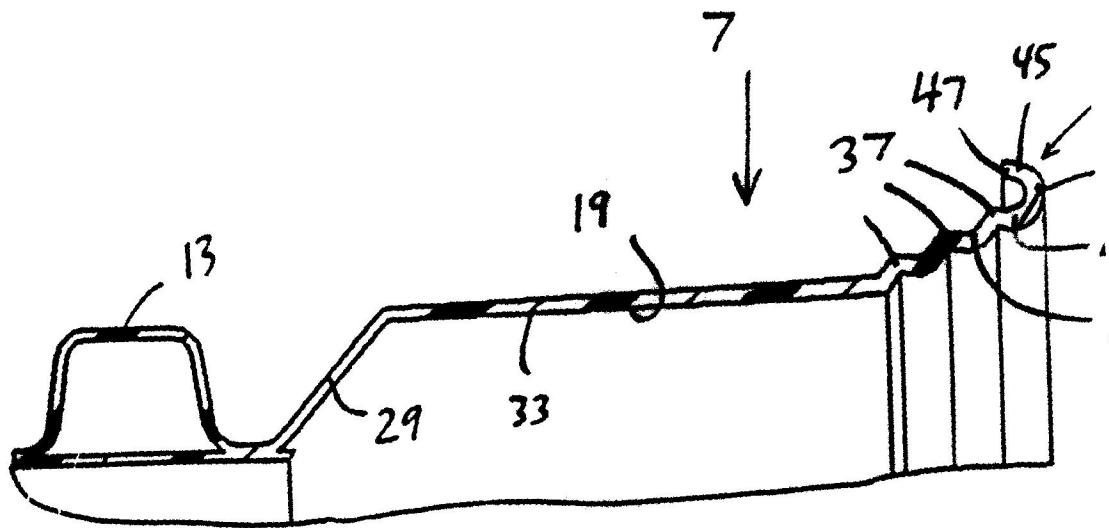


Fig. 4

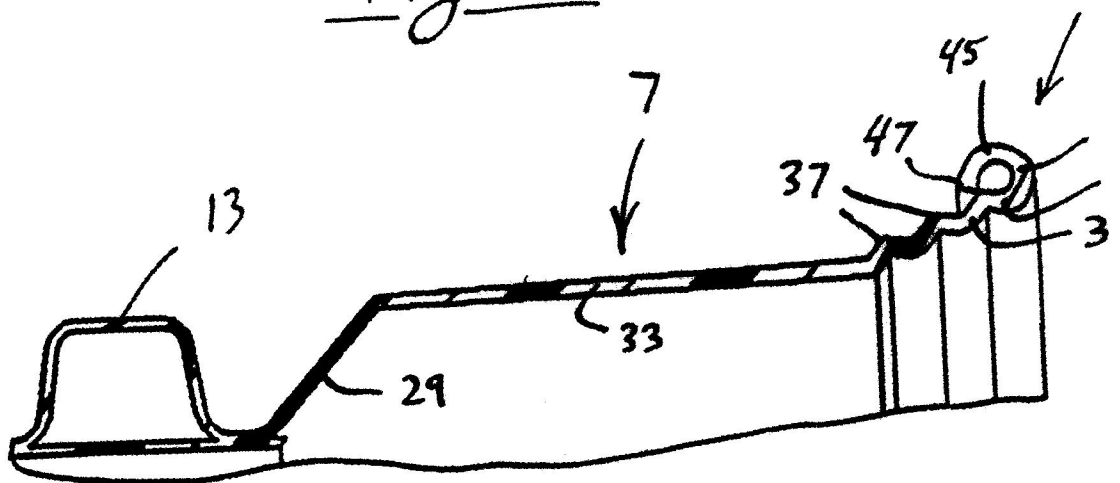
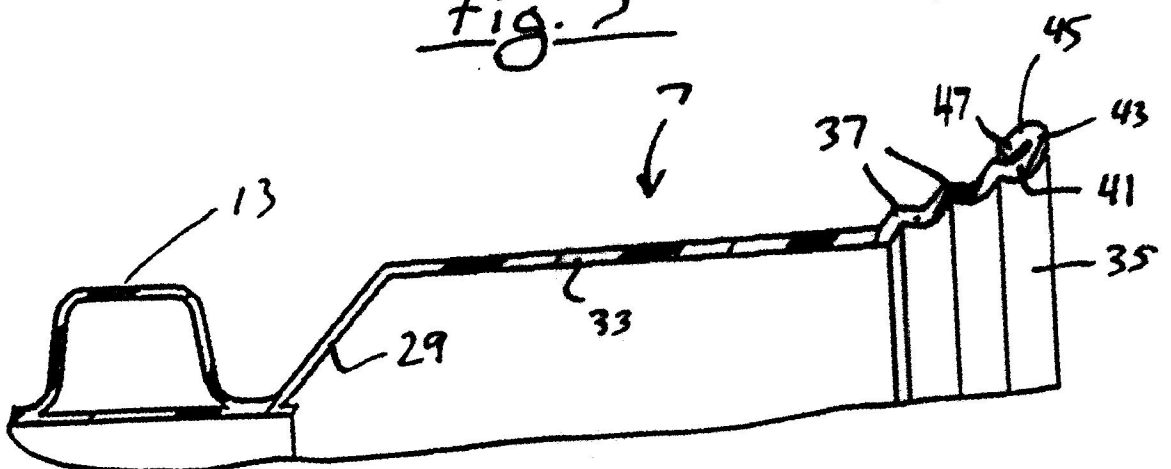


Fig. 5



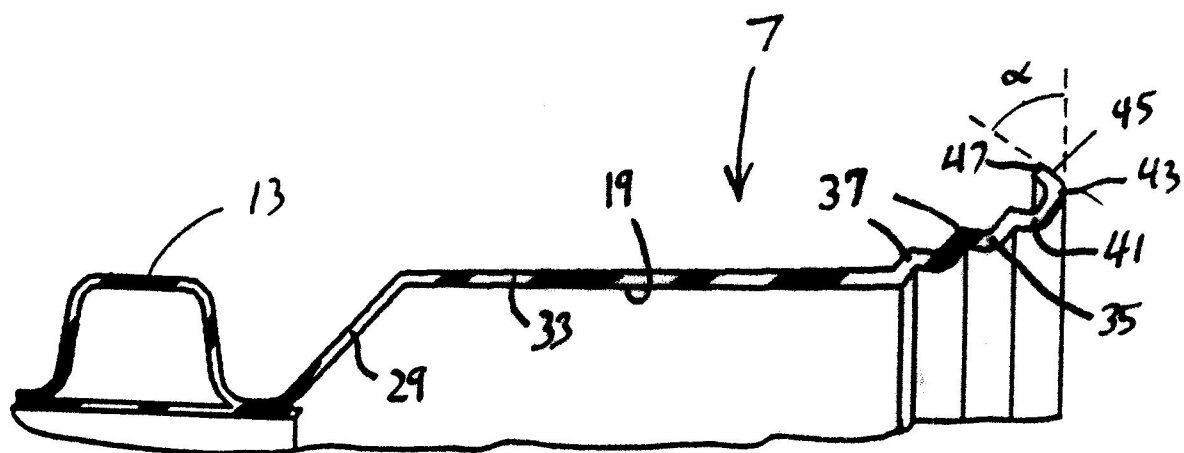


Fig. 7

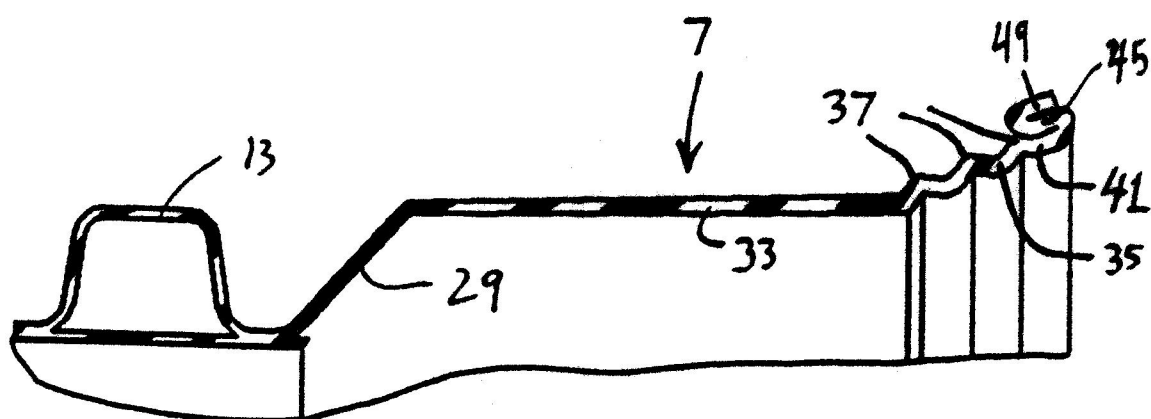


Fig. 8

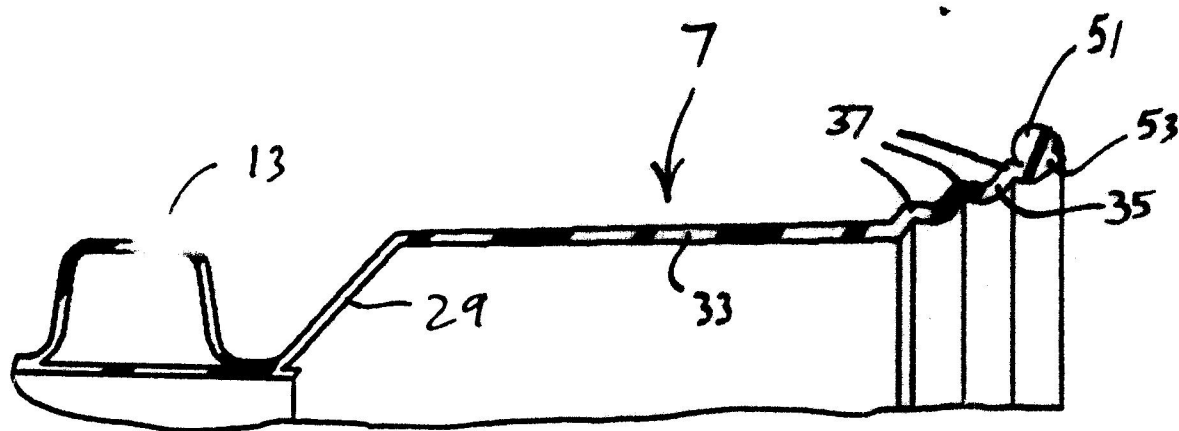


Fig. 9

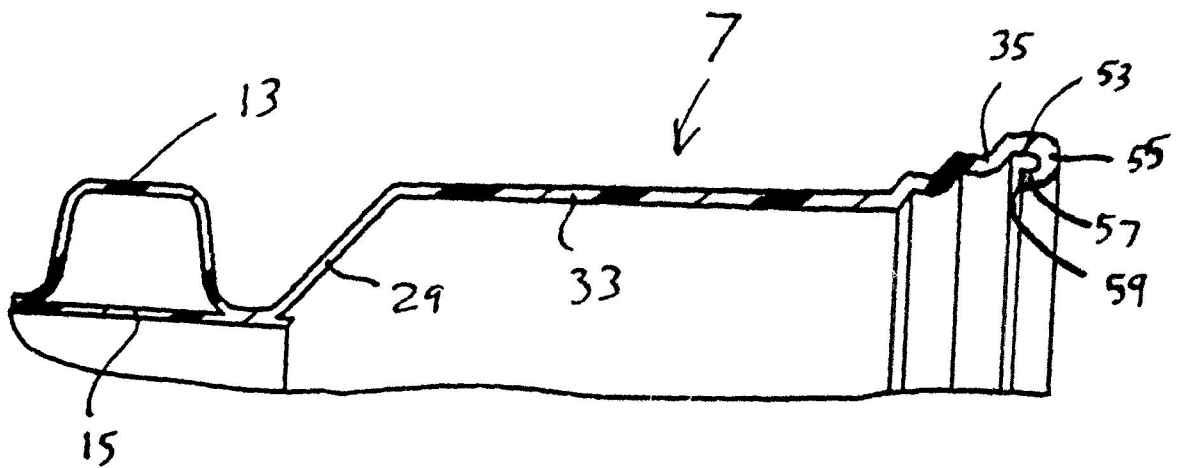
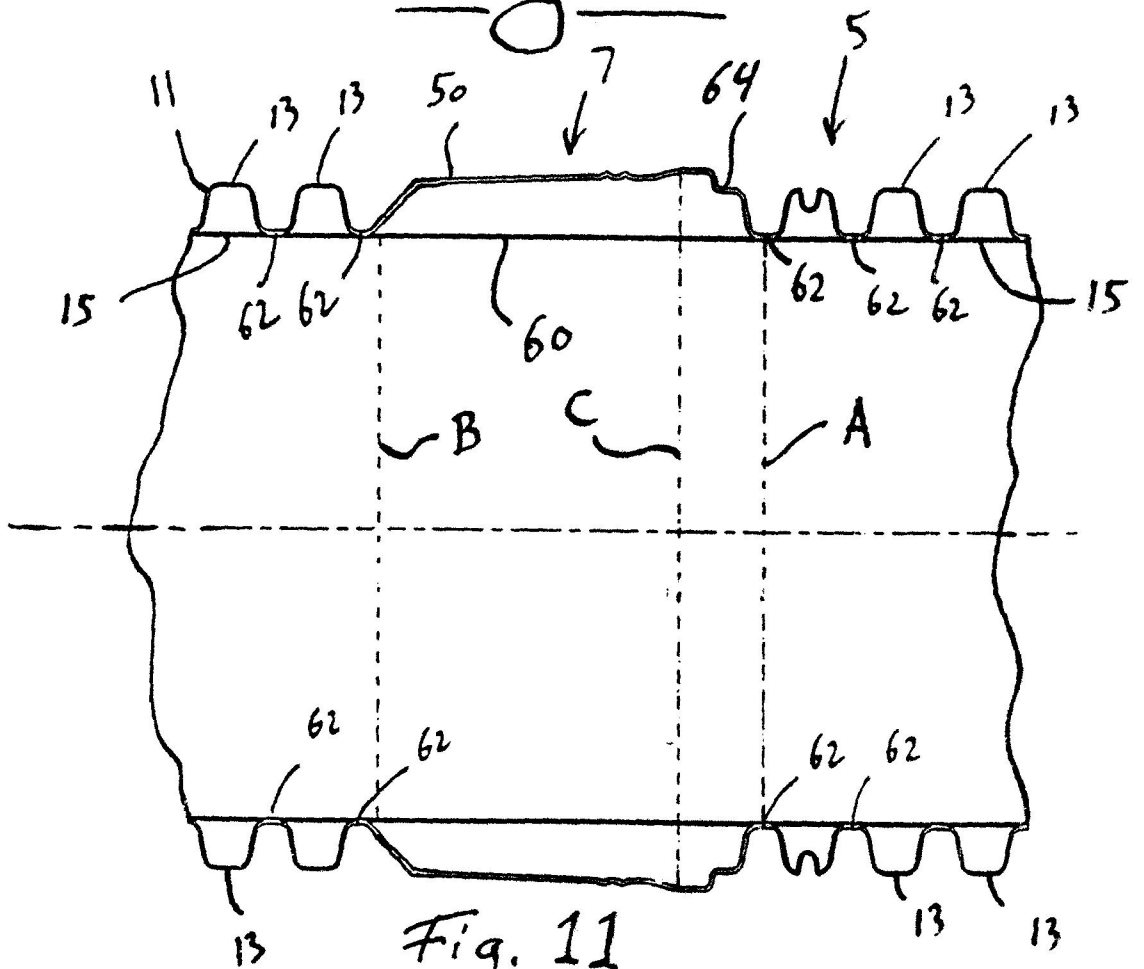


Fig. 10



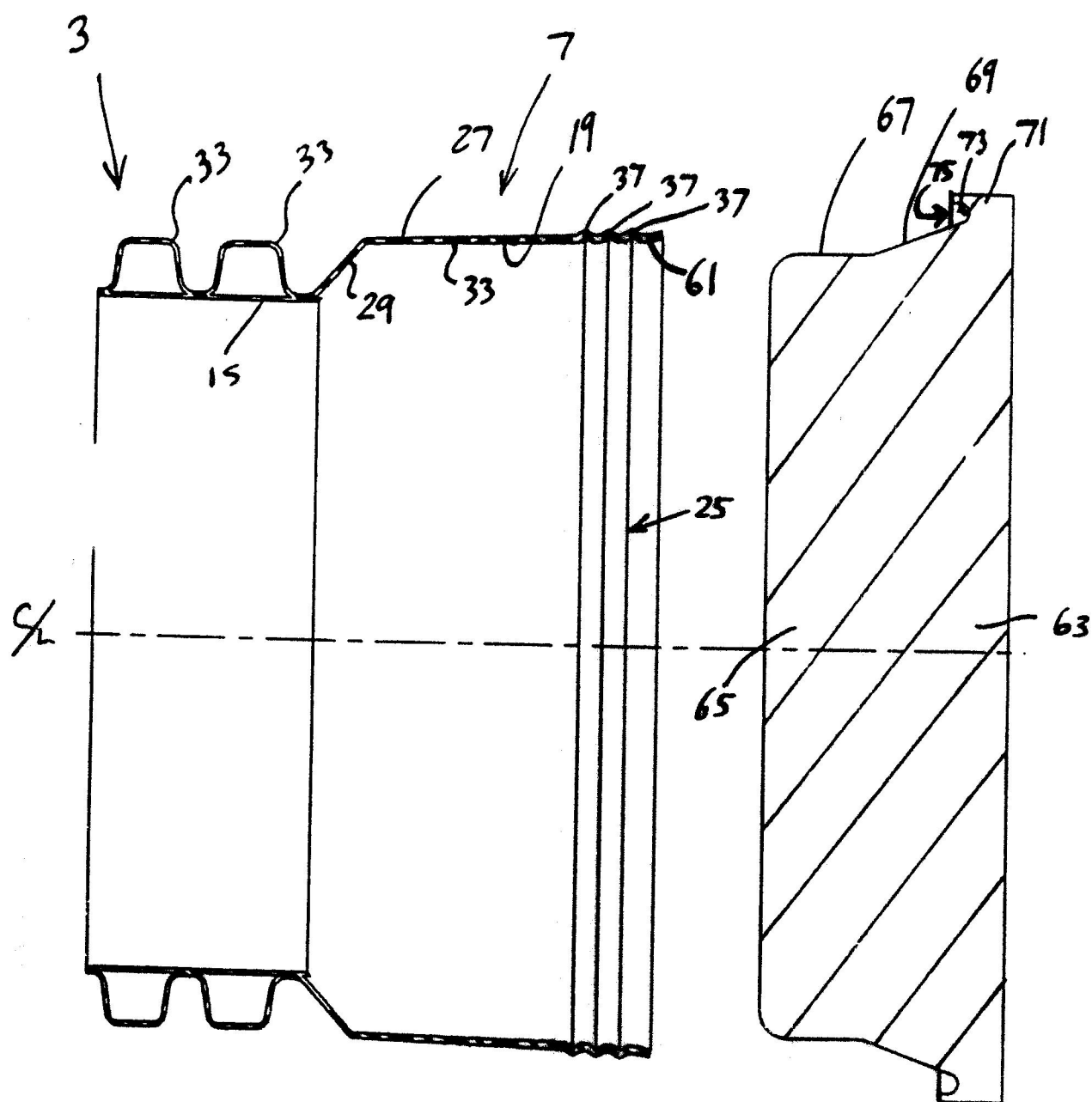


Fig. 12

Fig. 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

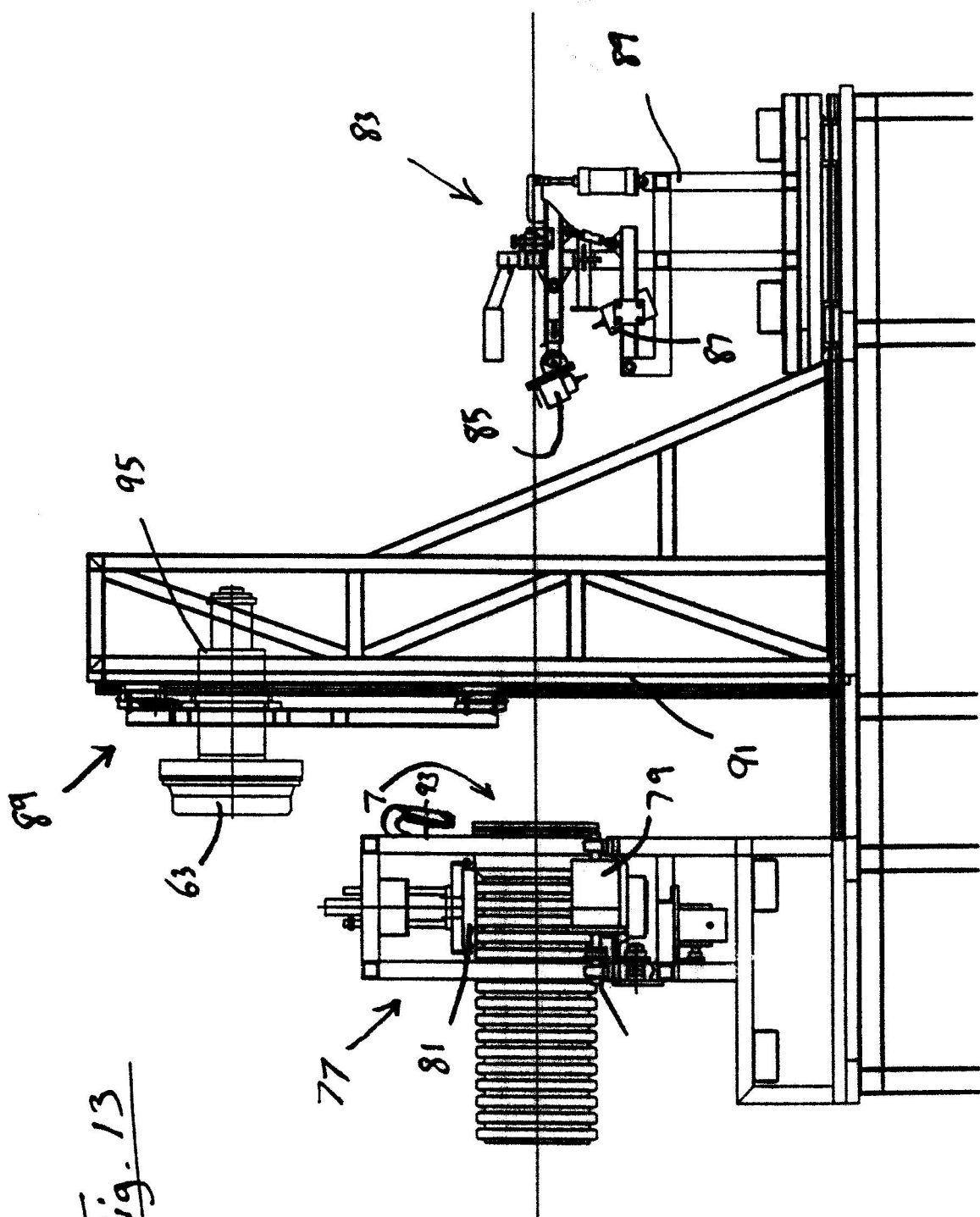


Fig. 13

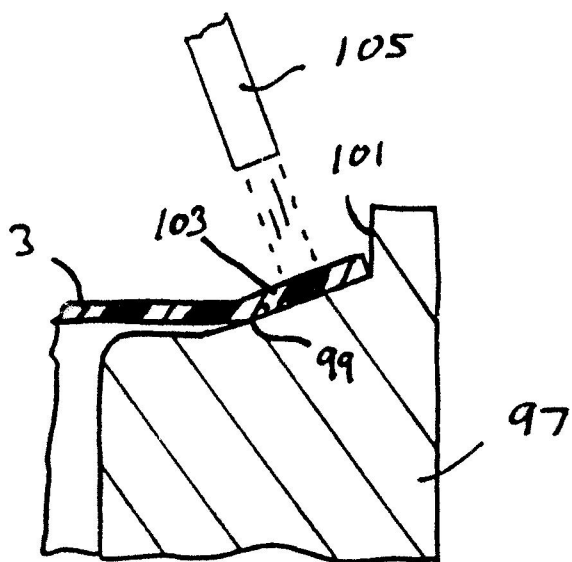


Fig. 14

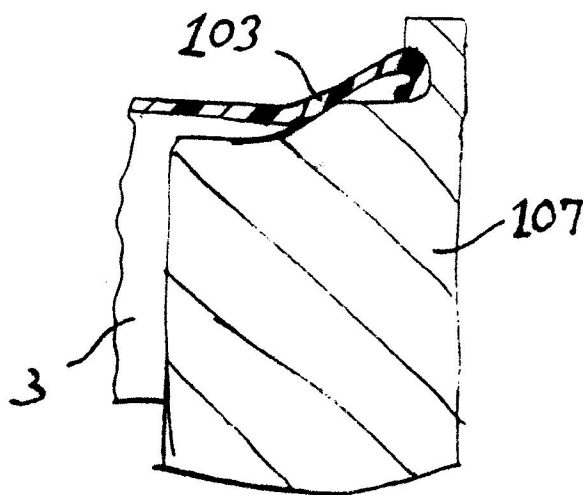


Fig. 15

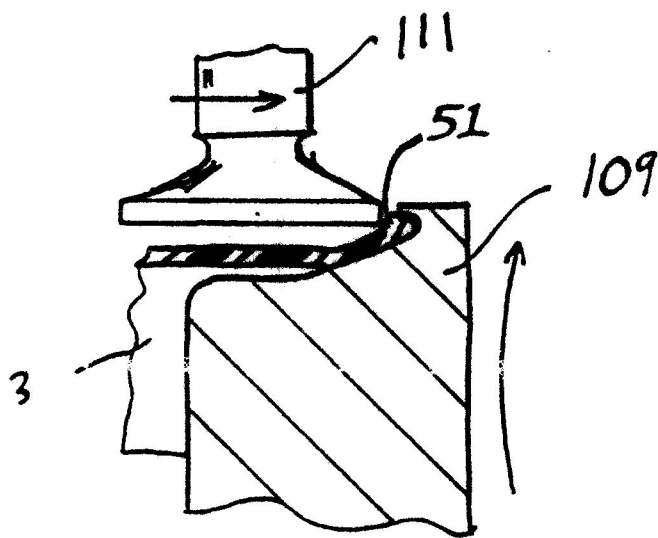


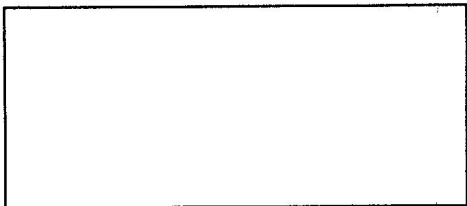
Fig. 16



REPUBLICA DE COLOMBIA



SOLICITUD DE
PATENTE DE
INVENCION



DELEGATURA PROPIEDAD INDUSTRIAL

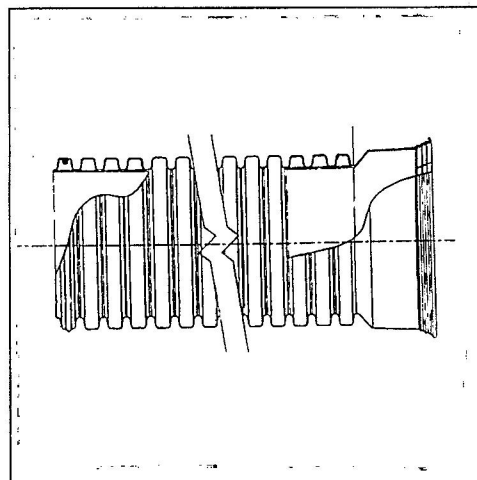
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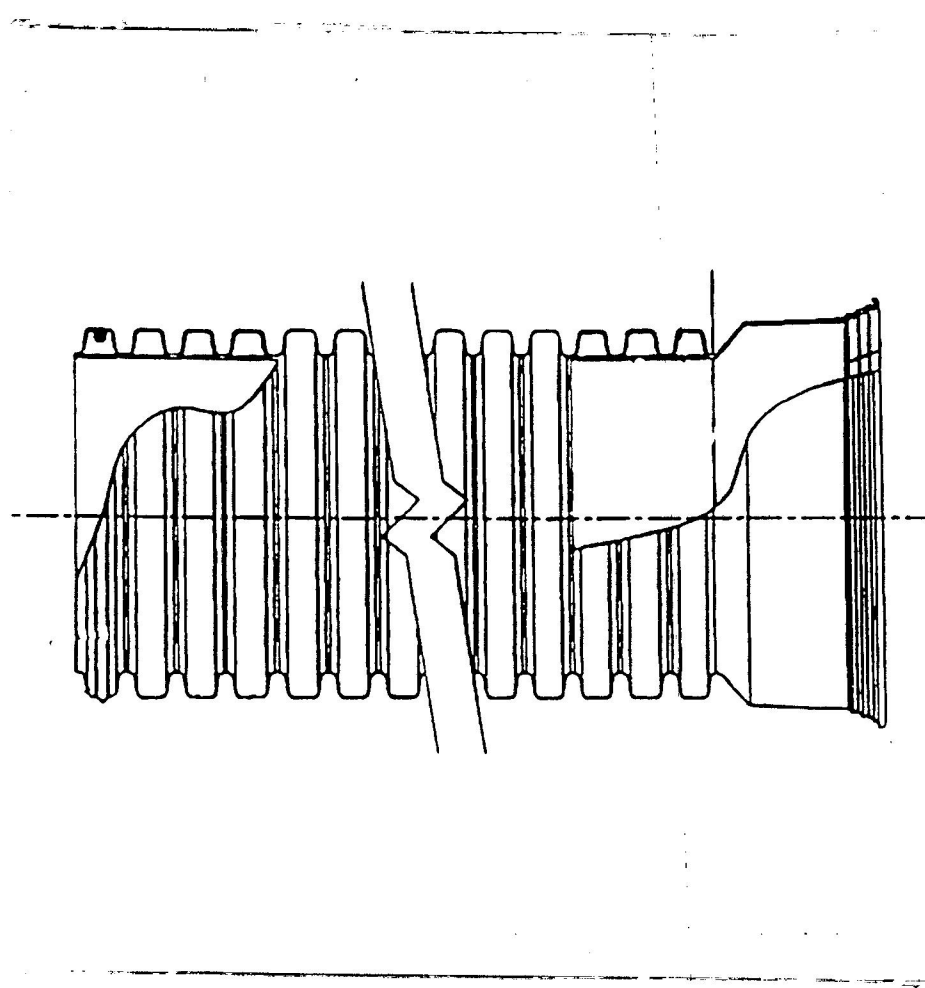
(21) No. SOLICITUD		(51) INT. CL.	
(22) FECHA DE PRESENTACION	FEBRERO 4 DEL 2000	(71) SOLICITANTE	HANCOR, INC.
(30) PRIORIDAD	SI		
(31) No. DE SOLICITUD	09/245,766	(72) INVENTORES	1. ROGER LEE SIFERD 2. MATTHEW C. ANKROM 3. LARRY E. PORTER
(32) FECHA DE PRESENTACION	FEBRERO 5 DE 1999		
(33) PAIS	ESTADOS UNIDOS DE AMERICA	(74) APODERADO	DARIO CARDENAS NAVAS

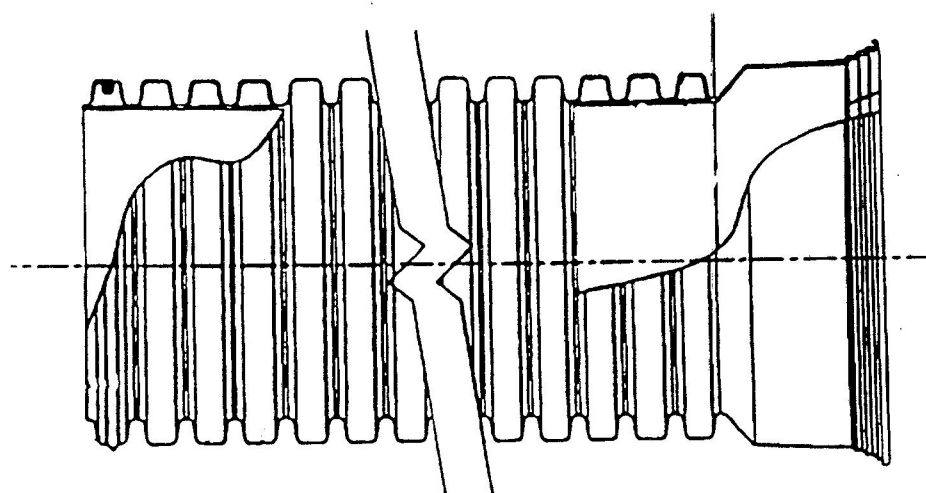
(54) TITULO ESTRUCTURA DE TUBERIA Y METODO DE FABRICACION

(57) RESUMEN

UNA SECCION DE TUBERIA POR UN MATERIAL DE POLIMERO QUE TIENE UN ESPESOR SUSTANCIALMENTE CONSTANTE A LO LARGO, EL BORDE TERMINAL DE LA CONEXIÓN HEMBRA CON UNA ESTRUCTURA DE REFUERZO QUE RIGIDIZA EL EXTREMO DE LA CONEXIÓN HEMBRA Y PREVIENE LA DEFORMACION, LA SECCION DE TUBERIA TENIENDO PREFERIBLEMENTE UN EXTREMO ACAMPANADO, Y LA ESTRUCTURA DE REFUERZO CONSISTIENDO PREFERIBLEMENTE DE UN CANAL SEMICIRCULAR FORMADO EN EL EXTREMO DE LA SECCION DE TUBERIA POR UN MANDRIL DESPUES DE LA EXTRUSION INICIAL DE LA SECCION DE TUBERIA; EN CONJUNTO CON UN METODO Y APARATO PARA FORMAR LA SECCION DE TUBERIA, UN ENSAMBLE DE TUBERIA QUE INCLUYE DICHA SECCION DE TUBERIA, Y UN METODO PARA FORMAR EL ENSAMBLE DE TUBERIA.







2000-02-17
430

DIVISION DE NUEVAS CREACIONES

EXPEDIENTE 0-07075

AUTO 0296

DISPONE

ARTICULO PRIMERO: Reconocer personería al doctor DARIO CARDENAS NAVAS como apoderado del solicitante, en los términos y para los efectos del poder conferido.

ARTICULO SEGUNDO: Conforme lo establece el artículo 22 de la Decisión 344 de la Comisión del Acuerdo de Cartagena, requiérese al solicitante, para que dentro del plazo de treinta (30) días hábiles siguientes a la fecha de notificación del auto, presente respuesta a las observaciones o complemente los antecedentes señalados en el examen de forma.

ARTICULO TERCERO: Notificar por estado el presente auto, advirtiéndole que contra el no procede recurso alguno en la vía gubernativa.

NOTIFIQUESE Y CUMPLASE

15 FEB. 2000

Dado en Santafé de Bogotá D.C., a los _____

EL JEFE DE LA DIVISION DE NUEVAS CREACIONES,


ALIX CARMENZA CESPEDES DE VERGEL

NOTIFICADO POR ESTADO

Santafé de Bogotá D.C.,

17 FEB 2000

notificado por anotación en estado de esta misma fecha.

VENCIMIENTO NOTIFICACION ESTADO

SOLICITO PRORROGA TERMINO SI _____ NO _____

VENCIMIENTO TERMINO PRORROGA

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
PRIMER EXAMEN DE FORMA

Folio 58

2000-02-16

480

Radicación no 00-07075

Concepto Técnico no 0185 Clasificación Internacional de Patentes F16L 31/00, 27/02

Practicado el examen de acuerdo a lo establecido en el Art. 21 de la Decisión 344 se determinó que esta solicitud de **Patente de Invención**:

- SI ☒ NO ☐ Contiene la identificación correcta del inventor (Art.8, Art.13-a).
- SI ☒ NO ☐ Contiene la identificación correcta del solicitante (Artículo 13-a).
- SI ☐ NO ☐ Contiene el resumen con el objeto y finalidad de la invención en forma correcta (Art.13-e).
- SI ☐ NO ☐ Contiene el título o nombre de la invención en forma correcta (Art.13-b).
- SI ☐ NO ☒ Contiene la descripción clara y completa de la invención (Art.13-c).
- SI ☐ NO ☐ Contiene los dibujos correctos (Art.14-c junto con el literal d) del Art. 4 del Dto. 117 del 94).
- SI ☐ NO ☒ Contiene las unidades de medida en el sistema exigido (Art.14-c junto con el Decreto 3464 del 26 de diciembre de 1980).
- SI ☐ NO ☒ Contiene una o más reivindicaciones, en forma correcta, que precisen la materia para la cual se solicita la protección mediante la patente (Art.13-d).
- SI ☐ NO ☐ Contiene el extracto de acuerdo con el literal c) del artículo 4 del Dto. 117 /94.
- SI ☐ NO ☒ Contiene el arte final del dibujo característico de acuerdo con el literal c) del artículo 4 y el artículo 27 del Dto. 117 /94.
- SI ☒ NO ☐ Contiene la tarjeta del Archivo Temático [formato P-104] en forma correcta (Art.14-c junto con el literal b) del artículo 4 del Dto. 117 /94).
- SI ☒ NO ☐ Contiene la tarjeta del Archivo de Propietarios [formato P-105] en forma correcta (Art.14-c junto con el literal b) del artículo 4 del Dto. 117 /94).
- SI ☐ NO ☒ **CUMPLE LOS REQUISITOS TÉCNICOS**

OBSERVACIONES Y OTROS: SI ☒ NO ☐ ver hoja(s) anexa(s)

Santa Fe de Bogotá, D.C.,

EXAMINADOR TÉCNICO

58
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Expediente n.º 00 - 07 075

CONCEPTO TÉCNICO

El solicitante debe presentar:

- ▶ una modificación en el resumen con el objeto y finalidad de la invención, porque el presentado tiene la expresión 'Una sección de tubería por un material de polímero...' que carece de sentido, según el contexto;
- ▶ la descripción y las reivindicaciones en español, de acuerdo con lo estipulado por el artículo 1º de la Ley 14 de 1979;
- ▶ el desistimiento (o la modificación) de la reivindicación 73, porque un montaje o ensamblaje de tubería no puede ser definido por los agentes externos a él, en este caso, la resistencia al flujo de fluidos externos es el resultado de ciertas características físicas --que debe definir el solicitante en la reivindicación-- del montaje (un defecto similar ocurre cuando alguien pretende definir el continente por el contenido);
- ▶ los valores que aparecen dentro del texto de la descripción y las reivindicaciones en unidades del Sistema Internacional;
- ▶ una rectificación a la figura 13, porque hay dos elementos diferentes señalados con el numeral de referencia 89 --si es pertinente, también se deberán hacer los ajustes correspondientes en el texto de la descripción, para evitar anfibologías respecto a ese numeral--; y,
- ▶ el arte final de la figura característica de la invención, en sus dos tamaños: 12cm x 12cm y 6cm x 6 cm; de acuerdo con lo establecido explícitamente en el artículo 27 del Decreto 117 de 1994 y tácitamente en el artículo 4-b del mismo Decreto, porque los artes finales presentados no corresponden exactamente a ninguna de las figuras presentadas y por lo tanto no corresponden a la figura característica de la invención.

Santa Fe de Bogotá, D.C., 10 de febrero del 2000

Examinador Código n.º 202 009

con copia para el solicitante

DIVISION DE NUEVAS CREACIONES
PRIMER EXAMEN DE FORMA

2000-02-07-
430

EXPEDIENTE 0-07075

Practicado el examen jurídico de acuerdo con lo establecido en el art. 21 de la Decisión 344 se determinó que esta solicitud de **Patente de Invención**:

- SI** ☒ **NO** ☐ **NO APLICABLE** ☐ Presentó los poderes necesarios en forma correcta (Decisión 344, art. 14-a).
- SI** ☒ **NO** ☐ **NO APLICABLE** ☐ Acreditó, en forma correcta, la existencia y representación de la persona jurídica solicitante (art. 14-c de la Decisión 344; literal g) del art. 4 del Decreto 117/94).
- SI** ☒ **NO** ☐ **NO APLICABLE** ☐ Presentó, en forma correcta el comprobante de pago por la tasa de presentación establecida (art. 13-f de la Decisión 344 y el Decreto 298 del 17 de febrero de 1999).
- SI** ☒ **NO** ☐ **EXTEMPORANEAMENTE** ☐ Reivindicó prioridad, dentro del plazo y de acuerdo con lo previsto en el Artículo 4 del Convenio de París.
- SI** ☐ **NO** ☒ **NO APLICABLE** ☐ Presentó copia, certificada su conformidad por la Administración que recibió la solicitud de la cual reivindica prioridad, al momento de radicar la solicitud nacional.
- SI** ☐ **NO** ☒ **NO APLICABLE** ☐ Presentó la traducción del capítulo reivindicatorio de la solicitud de la cual se reivindica prioridad (Art. 4, D-3 Convenio de París; Concepto: 5 de enero de 1999 S.I.C.).
- SI** ☐ **NO** ☒ **CUMPLE LOS REQUISITOS JURIDICOS**

OBSERVACIONES JURIDICAS CONVENIO DE PARIS: En todo caso, deberá presentar copia certificada su conformidad por la Administración que recibió la solicitud de la cual reivindica prioridad, **en cualquier momento dentro del plazo de tres (3) meses**, contados a partir de la fecha de depósito de la solicitud posterior. La omisión de esta formalidad implicará la pérdida del derecho de prioridad. Además deberá anexar la traducción correspondiente por cuanto el castellano es el idioma oficial de Colombia. En consecuencia, se conceptúa que esta solicitud:

- SI** ☐ **NO** ☒ Se ajusta a los aspectos **FORMALES** indicados en la Decisión 344 y por tanto,
- SI** ☐ **NO** ☒ Se recomienda **PUBLICAR** el extracto correspondiente.

Santafé de Bogotá, D.C., 7 de Febrero del 2000

EXAMINADOR JURIDICO.

Carrera 13 N° 27-00 Pisos 5° y 10°
Conmutador 334 1221-2-3-4
Fax 281 3125
Santafé de Bogotá, D.C. - Colombia

Patente de Invención



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