



DIRECCIÓN DE NUEVAS CREACIONES
PRESENTACIÓN DE OPOSICIÓN

1. Oposición a solicitud de:

- ☒ Patente de invención
☐ Registro de Diseño Industrial
☐ Patente de Modelo de Utilidad
☐ Esquema de Trazado de Circuitos Integrados

Número de expediente: **11.123.479**
Solicitante: **COFLEX S.A. DE C.V.**
Apoderado: **LUIS FELIPE CASTILLO GIBSON**
Título de la Nueva Creación: **SUMIDERO DE DRENAJE FLEXIBLE**
Gaceta: **GACETA 658 de 17 de diciembre de 2012**

2. Datos del Opositor

☐ Persona Natural ☒ Persona Jurídica

P.V.C. GERFOR S.A.

Nombre o denominación /Razón social completa

MARIA PAOLA FORERO MOLINA

Nombre del representante legal

Documento de identificación: C.C. ☐ C.E. ☐ NIT ☒ Otro ☐Cuál _____

Número 860.502.509-1

Dirección Autopista Medellín Km. 2- 600 metros Entrada Parcela Ciudad COTA, CUNDINAMARCA

Teléfono 8776800 Fax: 8776819 Correo electrónico _____

☐ Autorizo expresamente a la Superintendencia de Industria y Comercio para que todas las comunicaciones sean enviadas a través de la dirección de correo electrónico

3. Datos del representante o apoderado:

GELVEZ EPALZA EDDY MARGOT

32.404.604 de Medellín

28824

Apellidos y Nombre

Documento de identificación

Tarjeta profesional

Dirección del representante

CALLE 90 No. 11 – 44 Piso 6 Bogotá D.C.

Dirección electrónica

No Fax

Número telefónico

asesorias@zuluagayduranabogados.com.co

6110764

6110812/14/15

En caso de haber presentado poder general para asuntos que se adelanten ante la Delegatura de Propiedad Industrial, sírvase indicar el número de su radicación o protocolo de poder general: _____

4. Fundamentos de la oposición

Causal:

Justificación

Prórroga:

SI

☐

NO

☒

5. Anexos

- ☒ Comprobante de pago de la tasa.
- ☒ Poder, si fuera el caso.
- ☒ Fundamentos de la oposición. Se anexan 18 folios (obligatorios indicar cuántos).
- ☐ Anexo de fundamentos de la oposición. Se anexan _____ folios (obligatorios indicar cuántos)
- ☒ Copias para traslado.
- ☐ Copia de la solicitud y sus anexos en formato magnético.

6. Firma

GELVEZ EPALZA EDDY MARGOT

Eddy Margot Gelvez Epalza

Nombre del Firmante

Firma

32.404.604 de Medellín

28824

C.C

Tarjeta Profesional

Señores

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

DIVISION DE NUEVAS CREACIONES

E.

S.

D.

REFERENCIA:

Expediente : No. 11 – 123.479

Asunto : Proceso gubernativo de oposición al registro de la Patente de
Invención denominada **SUMIDERO DE DRENAJE FLEXIBLE**

Solicitante : COFLEX, S.A. DE C.V.

Opositor : P.V.C. GERFOR S.A.

Apoderados del opositor: Dr. HELMER ZULUAGA VARGAS o FELIPE ZULUAGA
DURAN o ANGELA DURAN DE ZULUAGA o NORDY ALVERNIA
LOBO o EDDY MARGOT GELVEZ EPALZA o JUAN ESTEBAN
ZULUAGA DURAN

Publicación: Gaceta No. 658 del 17 de diciembre de 2012, No. Pub. 1975

Yo, **EDDY MARGOT GELVEZ EPALZA**, mayor de edad, vecina de Bogotá, D.C., identificada como aparece al pie de mi firma, con T.P.A. No. 28824, en mi condición de Apoderada de la sociedad **P.V.C. GERFOR S.A.**, (**ANEXO 1**) organizada y existente de conformidad con las leyes colombianas y domiciliada en la ciudad de Bogotá D.C, en ejercicio de la acción de **OPOSICIÓN** establecida en el Artículo 42 de la Decisión 486 de la Comisión de la Comunidad Andina y estando dentro del término de sesenta (60) días establecido por el artículo 42, respetuosamente solicito a esa Superintendencia declarar fundadas y en consecuencia resolver favorablemente las pretensiones contenidas en la presente **OPOSICIÓN** contra la solicitud de Patente de Invención de la referencia.

II. SOLICITUD DE PATENTE DE INVENCION CONTRA LA CUAL SE PRESENTA OPOSICION.

La solicitud de Patente de Invención contra la cual se presenta **OPOSICION** corresponde a la contenida en el expediente No. **11-123.479** titulada "**SUMIDERO DE DRENAJE FLEXIBLE**", cuyo solicitante es la sociedad **COFLEX, S.A. DE C.V.**, que corresponde a la solicitud **PCT/IB2009/005483** presentada el día 31 de marzo de 2009 la cual entró en fase nacional en Colombia el 31 de octubre de 2010, publicada en la Gaceta de Propiedad Industrial No. 658 del 17 de diciembre de 2012, No. Publicación 1975, y el término para presentar oposiciones fundamentadas vence el 14 de marzo de 2013.

III. PRETENSIONES.

Que se declare la falta de novedad y nivel inventivo del objeto reivindicado en la solicitud de Patente de Invención que obra en el expediente No. **11-123.479** consistente en un "**SUMIDERO DE DRENAJE FLEXIBLE**", como se demostrará a través del presente memorial.

Que con fundamento en dicha declaración, se niegue el privilegio de Patente de Invención para el objeto reivindicado en la solicitud que obra en el expediente **11-123.479**.

IV. LEGITIMO INTERES PARA LA PRESENTACIÓN DE LA OPOSICIÓN.

Nuestro mandante la sociedad **P.V.C. GERFOR S.A.** es una empresa fabricante de toda clase de tubería, grifería y accesorios para tubería sanitaria, en material plástico, que lleva en el mercado colombiano cincuenta años de existencia, tal como se describe en el **OBJETO SOCIAL** de la empresa, (**ANEXO 2**), el cual es la fabricación, adquisición, exportación, distribución, importación de toda clase de materiales para la construcción, utensilios para el hogar y demás accesorios que se puedan elaborar mediante la inyección de P.V.C. material plástico o fundación en cobre o hierro; con lo cual se acredita el interés real de mi representado y lo legitima para presentar esta Oposición, toda vez que si se llega a conceder el privilegio de patente de invención a la solicitud de la referencia, se estaría desconociendo la existencia del conocimiento técnico que ha venido y seguirá evolucionando desde hace varios años atrás, no solamente afectando nuestros intereses comerciales sino también de los demás empresarios que constituyen este ramo de la industria.

V. HECHOS.

Los hechos en los cuales se fundamenta la presente **OPOSICIÓN** son los siguientes:

El día 31 de marzo de 2009 la sociedad **COFLEX, S.A. DE C.V.**, presentó la solicitud de patente de invención **PCT/IB2009/005483** titulada "**SUMIDERO DE DRENAJE FLEXIBLE**" la cual entró en fase nacional en Colombia el 31 de octubre de 2010, bajo el expediente No. **11-123.479**, publicada en la Gaceta de Propiedad Industrial No. 658 del 17 de diciembre de 2012, No. Publicación 1975, la cual en su capítulo reivindicatorio describe: "Un ensamble del sumidero de drenaje para el mantenimiento de un sello de agua, el conjunto del sumidero de drenaje que comprende: Un sumidero que tiene primera y segunda porciones de extremo y una porción de sumidero entre la primera y segunda porciones de extremo, el sumidero es operable para retener una reserva de agua en la porción del sumidero; Un conector de instalación sanitaria acoplado a la primera porción de extremo del sumidero, el conector de la instalación sanitaria es operable para ser conectado a una descarga de una instalación sanitaria; y Una unión de descarga acoplada a la segunda porción de extremo del sumidero, la unión de descarga es operable para ser conectada a una salida de tubo de drenaje, en donde la unión de descarga comprende una manguera flexible que tiene una superficie interna sustancialmente lisa.

VI. LA PATENTE DE INVENCION SOLICITADA NO CONSTITUYE UNA PATENTE SEGÚN LAS NORMAS ANDINAS.

De conformidad con los artículos 14 y 16 de la Decisión 486 de la Comisión de la Comunidad Andina, que dicen:

"Artículo 14.- Los Países Miembros otorgarán patentes para las invenciones, sean de producto o de procedimiento, en todos los campos de la tecnología, siempre que sean nuevas, tengan nivel inventivo y sean susceptibles de aplicación industrial".

"Artículo 16.- Una invención se considerará nueva cuando no está comprendida en el estado de la técnica.

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

“Artículo 18.- Se considerará que una invención tiene **nivel inventivo**, si para una persona del oficio normalmente versada en la materia técnica correspondiente, esa invención no hubiese resultado obvia ni se hubiese derivado de manera evidente del estado de la técnica”.

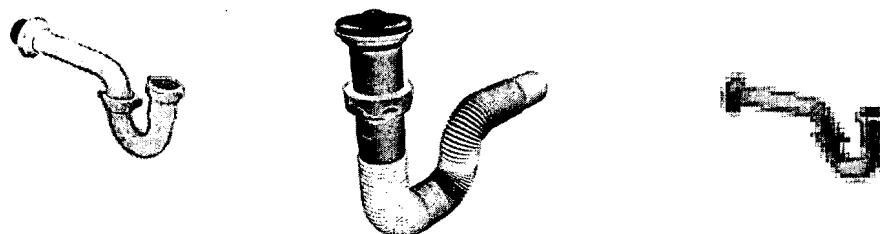
“Artículo 19.- Se considerará que una invención es susceptible de **aplicación industrial**, cuando su objeto pueda ser producido o utilizado en cualquier tipo de industria, entendiéndose por industria la referida a cualquier actividad productiva, incluidos los servicios”.

La solicitud de Patente de Invención de la Sociedad **COFLEX, S.A. DE C.V.**, **Expediente No. 11-123.479**, no es susceptible de patentabilidad porque **carece de novedad** puesto que su objetivo se viene desarrollando e implementando en la industria de tubería plástica, grifería de uso doméstico y accesorios desde hace varios años, tal como se demostrará a continuación:

Las características principales del **Ensamble del sumidero de drenaje** para el mantenimiento de un sello de agua de la Reivindicación 1 de la solicitud No. **11-123.479**, son:

El conjunto de sumidero de drenaje comprende un sumidero que tiene una primera y segunda porciones de extremo y una porción de sumidero entre la primera y segunda porciones de extremo, el sumidero es operable para retener una reserva de agua en la porción del sumidero; un conector de instalación sanitaria acoplado a la primera porción de un extremo del sumidero; una unión de descarga acoplada a la segunda porción de extremo del sumidero; donde la unión de descarga comprende una manguera flexible que tiene una superficie interna sustancialmente lisa.

La anterior tecnología es **SIMILAR** a la empleada por la sociedad opositora **P.V.C. GERFOR S.A.** y en general por todas las empresas que fabrican y comercializan todo tipo de accesorios para grifería, sifones plásticos, principalmente para ser usados en sanitarios, tal como aparece en los diferentes catálogos de productos, ver imágenes siguientes:



Además, antes de la fecha de prioridad de la solicitud de patente de invención, objeto de la oposición se encontraron los siguientes documentos que afectan la patentabilidad de la presente solicitud, como son:

D1: US 4.846.510 publicada el 11 de julio de 1989, titulada: **“ADJUSTABLE TUBULAR WALL STRUCTURE FOR CONNECTORS AND THE LIKE”** a nombre de **EMPRESAS TWENTIETH CENTURY, INC.** (Ver ANEXO 3)

D2: US 4.516. 278 publicada el 14 de mayo de 1985 titulada: "MICROENCAPSULATABLE SOLVENT ADHESIVE COMPOSITION AND METHOD FOR COUPLING CONDUITS" (VER ANEXO 4)

Los anteriores documentos afectan tanto la **NOVEDAD** como el **NIVEL INVENTIVO** porque:

El documento **D1** se refiere a Un tubo flexible, ajustable, que comprende un cuerpo tubular de configuración plegada asimétrica con pliegue de acordeón, en el que cada pliegue está definido por un segmento de pared del cono de empuje y una arandela Belleville-como segmento de pared. Los extremos más estrechos de los dos segmentos de pared están integralmente conectados para formar una articulación anular alrededor de un eje central y los extremos más anchos de los distintos segmentos de pared arandela Belleville de cada pliegue están integralmente conectados a los extremos más anchos de los conos de empuje del pliegue sucesivo siguiente, para formar una articulación anular alrededor del eje central. La arandela Belleville-como segmentos de pared de cada pliegue están proporcionados para ser desplazados a presión a través de la articulación de la misma para el cono de empuje del pliegue adyacente siguiente, para acortar o alargar el tubo.

El documento **D2** describe Un sifón de fontanería para el uso con tubos de desagüe de fregaderos u otros accesorios que sirve de tubo de diferentes diámetros, las tuberías de drenaje no necesitan estar en perfecta alineación, y pueden ser de un diámetro diferente en la entrada que en la salida del sifón. El sifón se puede montar y desmontar fácilmente, está moldeado de un plástico flexible que proporciona una estructura suave que puede ser manipulada manualmente para descargar obstrucciones del mismo sin la eliminación de los tubos de drenaje, y es impermeable a la mayoría de productos químicos.

Con respecto a las reivindicaciones 1 y 23 de la solicitud de patente de invención objeto de oposición, el documento **D1** no menciona que la parte interior de la manguera flexible tiene una superficie interior sustancialmente lisa; sin embargo, el documento **D2** si describe la manguera flexible con la superficie interior lisa. Por lo tanto, habría sido evidente para un experto en la materia, en el momento de realizar la invención, modificar el dispositivo del documento **D1** añadiéndole el tubo liso del documento **D2** con el fin de permitir que el fluido fluya libremente a través del tubo con una mínima fricción o resistencia y así disminuyendo el cambio del tubo obstruido.

VII. CONCLUSION.

Por lo anteriormente expuesto se concluye que con la descripción de la solicitud contenida en el **expediente No. 11-123.479**, el problema técnico que se busca resolver es obtener un sumidero de drenaje flexible, donde la forma del sumidero es la comúnmente conocida y al cual por un extremo se le acopla una manguera flexible.

Como quedó claramente demostrado, es que la solicitud **No.11-123.479**, **NO presenta características técnicas novedosas, ni representa un nuevo dispositivo con una ventaja que le imprima un nuevo efecto técnico que antes no era de conocimiento por ninguna persona versada en la materia**, que le permita un mejor o diferente funcionamiento, utilización o fabricación del objeto que no se haya resuelto ya previamente con respecto a los documentos de Patente de Invención **D1 y D2 del estado de la técnica**.

Por lo tanto, se deben tener en cuenta los argumentos técnicos expuestos en el presente memorial de **OPOSICIÓN** y se proceda a **NEGAR** el privilegio solicitado a la Patente de Invención descrita en el **Exp. 11-123.479** puesto que la tecnología propuesta existe con anterioridad a la fecha de presentación de la solicitud en estudio, **afectando la NOVEDAD y NIVEL INVENTIVO DE LA INVENCION** y por consiguiente, no cumple con los requisitos de patentabilidad establecidos por los **artículos 14, 16, del Título II de las Patentes de Invención de la Decisión 486 de la Comisión de la Comunidad Andina.**

VIII. ANEXOS.

Con el escrito acompaño los siguientes documentos.

1. Poder que me faculta para actuar en las presentes diligencias.
2. Certificado de Existencia y Representación Legal de la sociedad opositora
3. Recibo de pago por concepto de tasas o impuestos en la presentación de la oposición.
4. US 4.846.510
5. US 4.516. 278
6. Copia de la oposición para el traslado.

IX. NOTIFICACIONES

Mi poderdante y yo, las recibiremos en mi oficina de Abogado situada en la calle 90 No. 11-44 piso 6to, teléfonos 611 08 12, 6 11 08 14, 6 11 08 15, correo electrónico asesorias@zuluagayduranabogados.com.co, de la ciudad de Bogotá D.C.

Atentamente,


EDDY MARGOT GELVEZ EPALZA
C.C. No. 32.404.604 de Medellín
T.P. No. 28824.

DELEGATURA PARA LA PROPIEDAD INDUSTRIAL
FORMULARIO PARA OTORGAR PODER A ABOGADO
EN LOS TRÁMITES DE PROPIEDAD INDUSTRIAL

1. Datos del otorgante

☐

Persona Natural

☐

Persona Jurídica

P.V.C. GERFOR S.A.

Nombre o denominación /Razón Social completa (En caso de que haya más de un solicitante, relaciónese en hoja adjunta)

MARIA PAOLA FORERO MOLINA

Nombre del representante

Tipo de empresa

☐

Micro

☐

Pequeña

☐

Mediana

☐

Otra

Documento de identificación:

☐

C.C.

☐

C.E

☐

NIT

☐

Otro

Número 860.502.509-2

Nacionalidad/País de constitución	Dirección del otorgante	
COLOMBIA	Autopista Medellín Km. 2-600 metros entrada Parcelas – Cota, C/marca.	
Dirección electrónica	No. Fax	Número telefónico
	6776819	8776800

2. Datos del apoderado:

GELVEZ EPALZA EDDY MARGOT

32.404.604 de Medellín

28824

Apellidos y Nombre

Documento de identificación

Tarjeta profesional

Nacionalidad/País de constitución	Dirección del otorgante	
COLOMBIA	CALLE 90 No. 11 – 44 PISO 6 BOGOTA D.C.	
Dirección electrónica	No. Fax	Número telefónico
asesorias@zuluagayduranabogados.com.co	6110764	6110812 - 6110814

☐

Autorizo expresamente a la Superintendencia de Industria y comercio para que todas las comunicaciones sean enviadas a través de la dirección de correo electrónico.

Mediante el presente documento, la persona indicada en el punto 1 de este documento nombra a la persona que se identifica en el punto 2 como apoderado para las actuaciones que se relacionan a continuación:

3. Actuaciones en cuestión:

Este poder concierne:

☐

Todas las solicitudes y/o registros actuales y futuros del otorgante.

☒

La(s) siguiente(s) solicitud(es) y/o registro(s):

Proceso gubernativo de oposición a la Patente de Invención denominada **SUMIDERO DE DRENAJE FLEXIBLE.**

NOMBRE	NÚMERO DE SOLICITUD O REGISTRO
SUMIDERO DE DRENAJE FLEXIBLE	11.123.479

NOTA: Si el espacio anterior no es suficiente, por favor relacione las actuaciones en hoja anexa.

4. Alcance del poder:

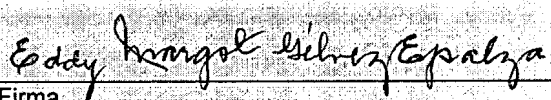
- ☒ Confiero expresamente al apoderado todas las facultades legales para que represente mi(s) interés(es) en la(s) actuación(es) señalada(s) en el punto 3 de este documento, incluyendo:
- ☒ Desistir de la(s) solicitud(es) y de las demás actuaciones

☒ Renunciar a los derechos del registro de signos distintivos o de nuevas creaciones

☒ Transigir

☒ Recibir

☒ Conciliar

5. Firma	GELVEZ EPALZA EDDY MARGOT	
Nombre del Firmante	32.404.604 de Medellín	Firma
		28824
C.C		Tarjeta Profesional

Señores

DIRECCIÓN DE NUEVAS CREACIONES

Superintendencia de Industria y Comercio.

E. S. D.

Referencias:

Expediente: 11.123.479

Asunto: Proceso gubernativo de oposición al registro de la patente de Invención PCT denominada SUMIDERO DE DRENAJE FLEXIBLE.

Solicitante: COFLEX S.A. DE C.V.

Opositor: P.V.C. GERFOR S.A.

Apoderados del Opositor: Doctores HELMER ZULUAGA VARGAS o ANGELA DURAN DE ZULUAGA o FELIPE ZULUAGA DURAN o EDDY MARGOT GELVEZ EPALZA o NORDY ALVERNIA LOBO o JUAN ESTEBAN ZULUAGA DURAN.

Yo, **MARÍA PAOLA FORERO MOLINA**, mayor de edad, vecina y domiciliada en Bogotá D.C., República de Colombia, identificada como aparece al pie de mi firma, actuando en nombre y representación legal de la sociedad **P.V.C. GERFOR S.A.**, sociedad domiciliada en Cota, Departamento de Cundinamarca, atentamente manifiesto a ustedes:

P O D E R

Por medio del presente escrito, confiero poder especial a los doctores HELMER ZULUAGA VARGAS o ANGELA DURAN DE ZULUAGA o FELIPE ZULUAGA DURAN o EDDY MARGOT GELVEZ EPALZA o NORDY ALVERNIA LOBO o JUAN ESTEBAN ZULUAGA DURAN, para que, separadamente y en cualquier orden, procedan a presentar OPOSICIÓN al registro de la **Patente de Invención PCT denominada SUMIDERO DE DRENAJE FLEXIBLE**, tramitada bajo el expediente No. 11.123.479.

Además de las facultades conferidas por el Artículo 70 del C. de P. C., los apoderados quedan facultados para modificar, adicionar o reformar la oposición, para atender, pagar derechos o tasas, para transigir, desistir, sustituir y revocar sustituciones, y para renunciar este poder, pero, en ningún caso, podrán confesar.

De la División, atentamente

M. Paola Forero M
MARÍA PAOLA FORERO MOLINA
C.C. No. 52.339.448 Bta.

DILIGENCIA DE RECONOCIMIENTO
DE FIRMA

En la Notaría Cuarenta del Círculo de Bogotá D.C.,
compareció: Forero Molina
Maria Paola
quien exhibió la C.C. No: 52339448
expedida en BZ
y declaró que la firma que aparece en el presente
documento es suya y que el contenido del mismo es
cierto y verdadero.

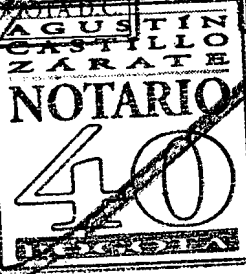
Ma. Paola Forero M

Firma autógrafa del declarante

31 ENE 2013

Bogotá D.C.

EL NOTARIO CUARENTA DE BOGOTÁ D.C.



DILIGENCIA DE AUTENTICACIÓN
DE HUELLA

En la Notaría Cuarenta del Círculo de Bogotá D.C.,
compareció: Forero Molina
Maria Paola
quien exhibió la C.C. No: 52339448
expedida en BZ
y declaró que la huella que aparece en el presente
documento es suya.



Bogotá D.C.

EL NOTARIO CUARENTA DE BOGOTÁ D.C.



SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
NIT : 800.176.089-2
- / -

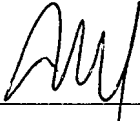
 Industria y Comercio SUPERINTENDENCIA	RECIBO DE CAJA	No. 13 - 0010494
		Bogotá D.C., Febrero 01 de 2013 - 14:53:04

RECIBIDO DE : P.V.C. GERFOR S.A.	NI 860.502.509
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*** Soporte del Pago ***					
TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PAGO	VR. PAGO
CONSIGNACION	BANCO DE BOGOTA	062754387	186924684	30/01/2013	325.000.00

*** Conceptos Pagados ***			
CANT.	RENTISTICO	CONCEPTO	Vr. UNIDITARIO Vr. CONCEPTO
1	50005-01-04 PRESENTACION DE OBSERVACIONES A SOLICITUDES	12 OPOSICION POR CADA CLASE-MARCAS Y LEMAS COMERCIALES	325.000.00 325.000.00
			\$325.000.00

SON: **TRESCIENTOS VEINTICINCO MIL PESOS MONEDA CORRIENTE**

Responsable: 

Recibo de Caja Aplicado al Expediente No. _____

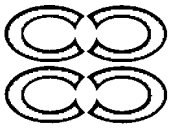
SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

No. 11-123479- -00006-0000
Fecha: 2013-03-13 15:42:41 Dep. 2020 DIR.NUEVASCR
Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI
Act. 400 OPOSIOBSERVTER Folios: 34



01

* 1 2 6 2 3 3 2 7 0 *



Cámara
de Comercio
de Bogotá

CAMARA DE COMERCIO DE BOGOTA

SEDE CENTRO

17 DE ENERO DE 2013

HORA 12:08:02

R036831341

PAGINA: 1 de 5

* * * * *

CERTIFICADO DE EXISTENCIA Y REPRESENTACION LEGAL O INSCRIPCION DE DOCUMENTOS

LA CAMARA DE COMERCIO DE BOGOTA, CON FUNDAMENTO EN LAS MATRICULAS E INSCRIPCIONES DEL REGISTRO MERCANTIL

CERTIFICA:

NOMBRE : P V C GERFOR S A

N.I.T. : 860502509-1

DOMICILIO : COTA (CUNDINAMARCA)

CERTIFICA:

MATRICULA NO: 00166099 DEL 16 DE FEBRERO DE 1982

CERTIFICA:

RENOVACION DE LA MATRICULA : 11 DE ABRIL DE 2012

ULTIMO AÑO RENOVADO: 2012

ACTIVO TOTAL REPORTADO: \$149,078,711,000

CERTIFICA:

DIRECCION DE NOTIFICACION JUDICIAL : AUT. MEDELLIN KM 2, 600 MTS ENTRADA VIA PARCELAS-COTA

MUNICIPIO : COTA (CUNDINAMARCA)

EMAIL DE NOTIFICACION JUDICIAL : gerforimpuestos@gerfor.com

DIRECCION COMERCIAL : AUT. MEDELLIN KM 2, 600 MTS ENTRADA VIA PARCELAS-COTA

MUNICIPIO : COTA (CUNDINAMARCA)

EMAIL COMERCIAL : contabilidad@gerfor.com

CERTIFICA:

CONSTITUCION: ESCRITURA PUBLICA NO.1410 ACLARADA POR ESCRITURA -- NO.2015 Y OTORGADAS EN LA NOTARIA 20 DE BOGOTA EL 14 DE JULIO Y EL 21 DE SEPTIEMBRE DE 1.981, INSCRITAS EN ESTA CAMARA DE COMERCIO EL 16 DE FEBRERO DE 1.982 BAJO LOS NUMEROS 111979 Y 111980 RESPECTIVAMENTE DEL LIBRO IX, SE CONSTITUYO LA SOCIEDAD LIMITADA, DENOMINADA: "PANAMERICANA DE ACCESORIOS LIMITADA".

CERTIFICA:

QUE POR E.P. NO. 3.681 DE LA NOTARIA 4 DE BOGOTA DEL 20 DE JUNIO DE 1.989, INSCRITA EL 27 DE JUNIO DE 1.989 BAJO EL NO. 268.406 - DEL LIBRO IX, LA SOCIEDAD CAMBIO SU RAZON SOCIAL DE PANAMERICANA DE ACCESORIOS S.A. POR EL DE: PANACCESORIOS GERFOR S.A.

CERTIFICA:

QUE POR E.P. NO. 6730 NOTARIA 4 DE SANTA FE DE BOGOTA, DEL 10 DE SEPTIEMBRE DE 1991, BAJO EL NO. 340.255 DEL LIBRO IX, LA SOCIEDAD CAMBIO SU NOMBRE DE: PANACCESORIOS GERFOR S.A. POR EL DE: P.V.C. GERFOR S.A. ---

CERTIFICA:

QUE POR ESCRITURA PUBLICA NO. 3684 DE LA NOTARIA 40 DE BOGOTA D.C., DE 08 DE NOVIEMBRE DE 2007, INSCRITA EL 23 DE NOVIEMBRE DE 2007, BAJO EL NUMERO 1172691 DEL LIBRO IX, LA SOCIEDAD DE LA REFERENCIA TRASLADO SU DOMICILIO DE LA CIUDAD DE: BOGOTA D.C., A

LA CIUDAD DE: COTA- CUNDINAMARCA.

CERTIFICA:

QUE POR ESCRITURA PUBLICA NO. 6.878 OTORGADA EN LA NOTARIA 4 DE - BOGOTA EL 29 DE DICIEMBRE DE 1.984, INSCRITA EN ESTA CCAMARA DE - COMERCIO EL 17 DE ENERO DE 1.985 BAJO EL NO. 164.089 DEL LIBRO IX LA SOCIEDAD SE TRANSFORMO DE LIMITADA EN ANONIMA BAJO EL NOMBRE - DE "PANAMERICANA DE ACCESORIOS S.A."

CERTIFICA:

QUE POR E.P. NO. 2.773 DE LA NOTARIA CINCUENTA Y SEIS DE SANTAFE DE BOGOTA, DEL 27 DE DICIEMBRE DE 1.995, INSCRITA EL 27 DE DICIEMBRE DE 1.995, BAJO EL NO. 521.156 DEL LIBRO IX, SE FUSIONO LA SOCIEDAD : "P.V.C. GERFOR S.A.", ABSORBIENDO A LA SOCIEDAD : "INALGRIFOS S.A."

CERTIFICA :

QUE POR ESCRITURA PUBLICA NO. 2842 DE LA NOTARIA 40 DE BOGOTA D.C., DEL 20 DE NOVIEMBRE DE 2002, INSCRITA EL 29 DE NOVIEMBRE DE 2002 BAJO EL NUMERO 854985 DEL LIBRO IX, EN VIRTUD DEL ACUERDO DE ESCISION, LA SOCIEDAD DE LA REFERENCIA TRANSFIERE EN BLOQUE PARTE DE SU PATRIMONIO SIN DISOLVERSE A FAVOR DE LA SOCIEDAD FORERO MOLINA Y CIA S EN C.

CERTIFICA :

QUE POR ESCRITURA PUBLICA NO. 4575 DE LA NOTARIA 38 DE BOGOTA D.C., DE 06 DE JULIO DE 2007, INSCRITA EL 17 DE JULIO DE 2007, BAJO EL NUMERO 1145368 DEL LIBRO IX, EN VIRTUD DE LA ESCISION MULTIPLE ENTRE LAS SOCIEDADES P V C GERFOR S A, PLASTICOS GERFOR S A, PLASTICOS FOREMOL S A E INVERGER S A, LA SOCIEDAD DE LA REFERENCIA SE ESCINDIO PARCIALMENTE, TRANSFIRIENDO PARTE DE SU PATRIMONIO A LA SOCIEDAD INVERFAMILIARES GERFOR S A.

CERTIFICA :

QUE POR ESCRITURA PUBLICA NO. 4342 DE LA NOTARIA 40 DE BOGOTA D.C., DEL 21 DE DICIEMBRE DE 2007, INSCRITA EL 26 DE DICIEMBRE DE 2007 BAJO EL NUMERO 1179912 DEL LIBRO IX, LA SOCIEDAD DE LA REFERENCIA SE ESCINDIO TRANSFIRIENDO PARTE DE SU PATRIMONIO A LA CONSTITUCION DE LA SOCIEDAD GERFOR HOLDING S.A.

CERTIFICA :

QUE POR ESCRITURA PUBLICA NO. 4156 DE LA NOTARIA 40 DE BOGOTA D.C., DEL 15 DE DICIEMBRE DE 2010, INSCRITA EL 22 DE DICIEMBRE DE 2010 BAJO EL NUMERO 01438407 DEL LIBRO IX, LA SOCIEDAD DE LA REFERENCIA SE ESCINDE SIN DISOLVERSE TRANSFIRIENDO PARTE DE SU PATRIMONIO A LA SOCIEDAD INVERSIONES GERFOR S A S QUE SE CONSTITUYE.

CERTIFICA :

QUE POR ESCRITURA PUBLICA NO. 1689 DE LA NOTARIA 26 DE BOGOTA D.C., DEL 21 DE SEPTIEMBRE DE 2012, INSCRITA EL 9 DE OCTUBRE DE 2012 BAJO EL NUMERO 01672660 DEL LIBRO IX, EN VIRTUD DE LA ESCISION LA SOCIEDAD PLASTICOS GERFOR S.A SE DISUELVE SIN LIQUIDARSE TRANSFIRIENDO EN BLOQUE LA TOTALIDAD DE SU PATRIMONIO A LAS SOCIEDADES PVC GERFOR S.A E INGERFOR S.A (BENEFICIARIAS).

CERTIFICA :

QUE POR ESCRITURA PUBLICA NO. 1689 DE LA NOTARIA 26 DE BOGOTA D.C., DEL 21 DE SEPTIEMBRE DE 2012, INSCRITA EL 9 DE OCTUBRE DE 2012 BAJO EL NUMERO 01672666 DEL LIBRO IX, EN VIRTUD DE LA ESCISION LA SOCIEDAD PLASTICOS FOREMOL S.A SE DISUELVE SIN LIQUIDARSE TRANSFIRIENDO EN BLOQUE LA TOTALIDAD DE SU PATRIMONIO A LAS SOCIEDADES PVC GERFOR S.A E INGERFOR S.A (BENEFICIARIAS).

CERTIFICA :

QUE POR ESCRITURA PUBLICA NO. 1689 DE LA NOTARIA 26 DE BOGOTA D.C., DEL 21 DE SEPTIEMBRE DE 2012, INSCRITA EL 9 DE OCTUBRE DE 2012 BAJO EL NUMERO 01672671 DEL LIBRO IX, LA SOCIEDAD INGERFOR S.A SE ESCINDE



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TRANSFIRIENDO EN BLOQUE PARTE DE SU PATRIMONIO A LA SOCIEDAD PVC GERFOR S.A (BENEFICIARIA).

** ACLARACIÓN ESCISIÓN **

QUE POR ESCRITURA PUBLICA NO. 1889 DE LA NOTARIA 26 DE BOGOTA D.C., DEL 24 DE OCTUBRE DE 2012, INSCRITA EL 8 DE NOVIEMBRE DE 2012 BAJO EL NUMERO 01679725 DEL LIBRO IX, SE ACLARA LA ESCISIÓN CONTENIDA EN LA ESCRITURA 1689 DEL 21 DE SEPTIEMBRE DE 2012 INSCRITA EL 9 DE OCTUBRE DE 2012 BAJO LOS REGISTROS NUMEROS 01672660, 01672666 Y 01672671 DEL LIBRO IX DE LA SOCIEDAD P V C GERFOR S AP Y LOS REGISTROS NUMEROS 01672661, 01672667 Y 01672672 DEL LIBRO IX DE LAS SOCIEDADES PLASTICOS GERFOR SA, PVC GERFOR SA, PLASTICOS FOREMOL SAS E INGERFOR SA, TODA VEZ QUE FUERON PROTOCOLIZADOS ESTADOS FINANCIEROS DE LA SOCIEDAD PVC GERFOR SA, DIFERENTES A LOS APROBADOS POR LA ASAMBLEA DE ACCIONISTAS DE DICHA SOCIEDAD.

CERTIFICA:

REFORMAS:

ESCRITURA NO.	FECHA	NOTARIA	INSCRIPCION
838	29-VII-1983	26. BTA.	31-VIII-1983-NO.138.316
1.101	31-VIII-1984	26. BTA.	17-IX-1984-NO.158.171
2.848	3-VI -1986	4A. BTA.	6-VI-1986-NO.191.630
1.398	26-III -1987	4A. BTA.	24-IV-1987-NO.209.985
3.681	20-VI- 1989	4A. BTA.	27-VI- 1989-NO.268.406
6.730	10-IX -1991	4A STAFE BTA	23-IX- 1991-NO.340.255
3.159	22-VI -1994	4 STAFE BTA	24-VI- 1994 NO.452.615
4.030	26- X - 1995	40 STAFE BTA	7-XI- 1995 NO.515.068
2.773	27-XII- 1995	56 STAFE BTA	27-XII-1995-NO.521.156

CERTIFICA:

REFORMAS:

E.P. NO.	FECHA	NOTARIA	CIUDAD	FECHA	NO. INSC.
0000992	1997/05/09	0056	BOGOTA D.C.	1997/05/21	00585614
0000510	2001/03/05	0040	BOGOTA D.C.	2001/04/25	00774203
0001329	2002/06/24	0040	BOGOTA D.C.	2002/06/25	00832717
0002842	2002/11/20	0040	BOGOTA D.C.	2002/11/29	00854985
0002722	2005/10/31	0040	BOGOTA D.C.	2005/11/02	01019454
0002903	2005/11/18	0040	BOGOTA D.C.	2005/11/23	01022686
0003040	2005/12/01	0040	BOGOTA D.C.	2005/12/02	01024449
0004575	2007/07/06	0038	BOGOTA D.C.	2007/07/17	01145368
0003684	2007/11/08	0040	BOGOTA D.C.	2007/11/23	01172691
0004342	2007/12/21	0040	BOGOTA D.C.	2007/12/26	01179912
ISO 4156	2010/12/15	0040	BOGOTA D.C.	2010/12/22	01438407
1689	2012/09/21	0026	BOGOTA D.C.	2012/10/09	01672660
1689	2012/09/21	0026	BOGOTA D.C.	2012/10/09	01672666
1689	2012/09/21	0026	BOGOTA D.C.	2012/10/09	01672671
1889	2012/10/24	0026	BOGOTA D.C.	2012/11/08	01679725

CERTIFICA:

VIGENCIA: QUE LA SOCIEDAD NO SE HALLA DISUELTA. DURACION HASTA EL
29 DE DICIEMBRE DE 2083.

CERTIFICA:

OBJETO SOCIAL: LA FABRICACION, ADQUISICION, EXPORTACION, DISTRIBUCION, IMPORTACION DE TODA CLASE DE MATERIALES PARA LA CONSTRUCCION, UTENSILIOS PARA EL HOGAR Y DEMAS ACCESORIOS QUE SE PUEDAN ELABORAR MEDIANTE LA INYECCION P.V.C. MATERIAL PLASTICO O FUNDICION EN COBRE O HIERRO. LA SOCIEDAD PODRA CELEBRAR TODA CLASE DE ACTOS O CONTRATOS RELACIONADOS CON EL EJERCICIO DE SU OBJETO SOCIAL COMO CONTRATAR CREDITOS O EMPRESTITOS CON ENTIDADES FINANCIERAS NACIONALES O DEL EXTERIOR, BIEN SEA PERSONAS NATURALES O JURIDICAS Y GARANTIZARLOS CON BIENES PROPIOS DE LA SOCIEDAD. PODRA FORMAR PARTE DE OTRAS, TRANSFORMARSE, FUSIONARSE, ABSORBER OTRAS COMPANIAS. CELEBRAR CONTRATOS DE COMPRAVENTA Y PERMUTA DE BIENES DE SUMINISTROS DE TRANSPORTE, DE TRABAJO, DE SEGUROS, DE MUTUO, DE DEPOSITO, DE PREPAGA, DE ANTICRESIS, DE FIDUCIA, DE CUENTA CORRIENTE, DE MANDATO Y CUALQUIER TIPO DE CONTRATO BANCARIO COMO DEPOSITO A TERMINO, DEPOSITO DE AHORRO, APERTURA DE CREDITO DE CUENTA CORRIENTE, ETC. PODRA GIRAR, ACEPTAR, ENDOSAR, PROTESTAR, COBRAR, DESCONTAR, CANCELAR Y NEGOCIAR EN GENERAL TITULOS VALORES Y CUALESQUIERA OTRA CLASE DE TITULOS DE CREDITO. PODRA DAR Y RECIBIR DINERO A INTERES DE ACCIONISTAS O DE TERCEROS, INVERTIR Y NEGOCIAR EN TODA CLASE DE TITULOS PUBLICOS, CEDULAS, ACCIONES, ETC. EN CUANTO SEA NECESARIO PARA EL DESARROLLO DEL OBJETO SOCIAL. PARAGRAFO: LA SOCIEDAD NO PODRA SERVIR DE FIADORA DE OBLIGACIONES PERSONALES DE LOS ACCIONISTAS NI DE OBLIGACIONES EXTRAÑAS AL GIRO NORMAL DE LOS NEGOCIOS, A MENOS QUE LO DETERMINE LA JUNTA DIRECTIVA CON EL VOTO FAVORABLE DE LA MAYORIA DE SUS MIEMBROS. ADEMAS DE ESTAS OPERACIONES LA COMPANIA TAMBIEN PODRA ADELANSTAR NEGOCIACIONES COMERCIALES DE DIFERENTE ORDEN VINCULADAS CON EL OBJETO PRINCIPAL ANTERIOR, CONSTITUIR COMPANIAS DE COMERCIO O DE INDUSTRIA DE TRANSFORMACION, EXTRACCION, ENSAMBLAJE, ETC. REPRESENTAR A PERSONAS NATURALES O EXTRANJERAS, ADELANSTAR AMPLIAMENTE EL NEGOCIO DE COMISIONES DE COMERCIO, INDUSTRIAS, PROPIEDADES MUEBLES O INMUEBLES Y EN FIN, LLEVAR A CABO CUALESQUIERA OPERACIONES PENDIENTES AL DESARROLLO EFECTIVO DE LAS ACTIVIDADES MENCIONADAS.

CERTIFICA:

CAPITAL:

** CAPITAL AUTORIZADO **

VALOR	: \$4,000,000,000.00
NO. DE ACCIONES	: 40,000,000.00
VALOR NOMINAL	: \$100.00

** CAPITAL SUSCRITO **

VALOR	: \$3,477,650,000.00
NO. DE ACCIONES	: 34,776,500.00
VALOR NOMINAL	: \$100.00

** CAPITAL PAGADO **

VALOR	: \$3,477,650,000.00
NO. DE ACCIONES	: 34,776,500.00
VALOR NOMINAL	: \$100.00

CERTIFICA:

** JUNTA DIRECTIVA: PRINCIPAL (ES) **

QUE POR ACTA NO. 0000013 DEL 1 DE ABRIL DE 1992, INSCRITA EL 3 DE JUNIO DE 1992 BAJO EL NUMERO 00367135 DEL LIBRO IX, FUE (RON) NOMBRADO



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(S):

NOMBRE
PRIMER RENGLON

IDENTIFICACION

FORERO RODRIGUEZ GERMAN C.C. 000000017194578
QUE POR ACTA NO. 0000064 DE ASAMBLEA DE ACCIONISTAS DEL 16 DE
NOVIEMBRE DE 2005, INSCRITA EL 2 DE DICIEMBRE DE 2005 BAJO EL NUMERO
01024489 DEL LIBRO IX, FUE (RON) NOMBRADO (S):

NOMBRE
SEGUNDO RENGLON

IDENTIFICACION

FORERO MOLINA MARIA PAOLA C.C. 000000052339448
QUE POR ACTA NO. 0000078 DE ASAMBLEA DE ACCIONISTAS DEL 14 DE ABRIL DE
2008, INSCRITA EL 30 DE ABRIL DE 2008 BAJO EL NUMERO 01210624 DEL
LIBRO IX, FUE (RON) NOMBRADO (S):

NOMBRE
TERCER RENGLON

IDENTIFICACION

FORERO MOLINA MARIA DEL PILAR C.C. 000000052242504
** JUNTA DIRECTIVA: SUPLENTE (S) **
QUE POR ACTA NO. 0000013 DEL 1 DE ABRIL DE 1992, INSCRITA EL 3 DE
JUNIO DE 1992 BAJO EL NUMERO 00367135 DEL LIBRO IX, FUE (RON) NOMBRADO
(S):

NOMBRE
PRIMER RENGLON

IDENTIFICACION

MOLINA DE FORERO BEATRIZ HELENA
GUADALUPE C.C. 000000032503730
QUE POR ACTA NO. 0000049 DE ASAMBLEA DE ACCIONISTAS DEL 23 DE
DICIEMBRE DE 2002, INSCRITA EL 23 DE ENERO DE 2003 BAJO EL NUMERO
00863240 DEL LIBRO IX, FUE (RON) NOMBRADO (S):

NOMBRE
SEGUNDO RENGLON

IDENTIFICACION

BELTRAN ENCISO FLAVIO C.C. 000000017041538

TERCER RENGLON

OLANO HENAO RICARDO JAIME C.C. 000000014975838

CERTIFICA:

REPRESENTACION LEGAL: EL GOBIERNO Y LA ADMINISTRACION DIRECTA DE
LA COMPAÑIA ESTARAN A CARGO DE UN GERENTE PRINCIPAL Y DOS (2)
SUPLENTES DEL GERENTE. DE IGUAL FORMA LA SOCIEDAD TENDRA UN
TERCER SUPLENTE DEL GERENTE.



CERTIFICA:

*** NOMBRAMIENTOS ***

QUE POR ESCRITURA PUBLICA NO. 0006878 DE NOTARIA 4 DE BOGOTA D.C. DEL
29 DE DICIEMBRE DE 1984, INSCRITA EL 17 DE ENERO DE 1985 BAJO EL
NUMERO 00164089 DEL LIBRO IX, FUE (RON) NOMBRADO (S):

NOMBRE
GERENTE

IDENTIFICACION

FORERO RODRIGUEZ GERMAN C.C. 000000017194578

QUE POR ACTA NO. 0000649 DE JUNTA DIRECTIVA DEL 28 DE NOVIEMBRE DE 2005, INSCRITA EL 2 DE DICIEMBRE DE 2005 BAJO EL NUMERO 01024503 DEL LIBRO IX, FUE (RON) NOMBRADO (S):

NOMBRE	IDENTIFICACION
PRIMER SUPLENTE DEL GERENTE	
FORERO MOLINA MARIA PAOLA	C.C. 000000052339448

QUE POR ACTA NO. 733 DE JUNTA DIRECTIVA DEL 14 DE OCTUBRE DE 2010, INSCRITA EL 21 DE OCTUBRE DE 2010 BAJO EL NUMERO 01423122 DEL LIBRO IX, FUE (RON) NOMBRADO (S):

NOMBRE	IDENTIFICACION
SEGUNDO SUPLENTE DEL GERENTE	
FORERO MOLINA MARIA DEL PILAR	C.C. 000000052242504
TERCER SUPLENTE DEL GERENTE	
ESCOVAR CARDOZO JOSE MARIA	C.C. 000000079143208

CERTIFICA:

FACULTADES DEL REPRESENTANTE LEGAL: A- EJECUTAR LOS DECRETOS DE LA ASAMBLEA GENERAL DE ACCIONISTAS Y LOS ACUERDOS DE LA JUNTA DIRECTIVA. B- SUSPENDER LOS EMPLEADOS DE SUS DEPENDENCIAS, NOMBRAR LOS REMPLAZOS Y DAR CUENTA DE ELLO A LA JUNTA DIRECTIVA PARA QUE ESTA RESUELVA EN DEFINITIVA; C- CONSTITUIR LOS APODERADOS JUDICIALES O EXTRAJUDICIALES QUE JUZGUE NECESARIOS PARA REPRESENTAR A LA COMPAÑIA; D.- EJECUTAR LOS ACTOS O CELEBRAR LOS CONTRATOS.----- CUANDO SE TRATE DEL GERENTE PRINCIPAL, CELEBRAR TODOS LOS ACTOS-- Y CONTRATOS NECESARIOS PARA EL FUNCIONAMIENTO DE LA SOCIEDAD, EN CONCORDANCIA CON LO PREVISTO EN EL ARTICULO QUINCUAGESIMO SEPTIMO LITERAL J) SIN LIMITACION DE VUSNTIA. (SIC) CUANDO SE TRATE DE--- LOS GERENTES SUPLENTE DEBERAN SER AUTORIZADOS POR LA JUNTA DIRECTIVA, CONFORME SE ESTABLECE EN EL ARTICULO QUINCUAGESIMO SEPTIMO LITERAL J) DE LOS ESTATUTOS SOCIALES. CORRESPONDE A LA JUNTA DIRECTIVA: J) AUTORIZAR A LOS GERENTES SUPLENTE DE LA SOCIEDAD PARA REALIZAR, TODOS LOS ACTOS QUE TENGAN POR OBJETO ADQUIRIR, ENAJENAR, HIPOTECAR, GRAVAR O LIMITAR EL DOMINIO SOBRE BIENES INMUEBLES, DAR EN PRENDA MUEBLES, TOMAR DINERO A MUTUO O DARLO A ESTE TITULO Y CELEBRAR CUALQUIER OTRO NEGOCIO CUALESQUIERA QUE FUERE - SU CUANTOA. EL GERENTE PRINCIPAL NO TENDRA NINGUNA LIMITACION PARA LA REALIZACION DE TALES ACTOS. ATRIBUCIONES DEL TERCER SUPLENTE DEL GERENTE. SON ATRIBUCIONES DEL TERCER SUPLENTE DEL GERENTE: 1. FIRMAR Y PRESENTAR LAS LICITACIONES PUBLICAS Y/O LAS INVITACIONES DIRECTAS A CONTRATAR Y EN GENERAL, LAS QUE SE PACTEN A TRAVES DE CUALQUIER MEDIO DE CONTRATACION, EN LAS QUE PARTICIPE PVC GERFOR S.A., ANTE ENTIDADES DE CARACTER PRIVADO, MUNICIPAL, DEPARTAMENTAL Y/O NACIONAL, PARA EL SUMINISTRO DE PRODUCTOS FABRICADOS POR P.V.C. GERFOR S.A. 2. SUSCRIBIR LOS CONTRATOS DE LICITACIONES PUBLICAS Y/O INVITACIONES DIRECTAS A CONTRATAR Y EN GENERAL, LOS QUE SE PACTEN A TRAVES DE CUALQUIER MEDIO DE CONTRATACION, QUE SEAN ADJUDICADOS A PVC GERFOR S.A., POR PARTE DE ENTIDADES DE CARACTER PRIVADO, MUNICIPAL DEPARTAMENTAL Y/O NACIONAL, PARA EL SUMINISTRO DE PRODUCTOS FABRICADOS Y/ O COMERCIALIZADOS POR P.V.C. GERFOR S.A. 3. AUTORIZAR Y/ O OTORGAR PODER A LAS SOCIEDADES DE RT INTERMEDIACION ADUANERA S. I. A. PARA TRAMITAR Y SUSCRIBIR, ANTE EL MINISTERIO DE COMERCIO, INDUSTRIA Y TURISMO, ANTE LA DIRECCION DE IMPUESTOS Y ADUANAS Z NACIONALES DIAN, ANTE LAS SOCIEDADES PORTUARIAS DE COLOMBIA Y ANTE LAS AUTORIDADES ADUANERAS, PORTUARIAS, AEROPORTUARIAS, MARITIMAS, TERRESTRES, DE LA POLICIA NACIONAL DEMAS AUTORIDADES COMPETENTES, TODOS Y CADA UNO DE LOS DOCUMENTOS REQUERIDOS POR



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UNA DE ESTAS. AUTORIDADES, INDIVIDUAL O COLECTIVAMENTE, RELACIONADOS CON CADA IMPORTACION, EXPORTACION Y TRANSITO ADUANERO ... DE: PRODUCTOS TERMINADOS, FABRICADOS Y / O COMERCIALIZADOS POR P.V.C. GERFOR S.A., Y QUE SE REALICEN, UNICA Y EXCLUSIVAMENTE POR CUENTA Y A NOMBRE DE P.V.C. GERFOR S. A. 4. FIRMAR LAS COMUNICACIONES QUE SEAN DIRIGIDAS A LA COMISION DE ADMINISTRACION DE DIVISAS (CADIVI) DE VENEZUELA, PARA EL COBRO DE LAS EXPORTACIONES HECHAS POR P.V.C. GERFOR S.A. AL CITADO PAIS. 5. FIRMAR LAS CARTAS DE PODER PARA ASUMIR LA RESPONSABILIDAD, EN NOMBRE DE P.V.C. ; GERFOR S.A. , POR LOS DAÑOS, DEMORAS Y/ O PERDIDAS DE LOS CONTENEDORES UTILIZADOS PARA REALIZAR IMPORTACIONES YLO EXPORTACIONES DE PRODUCTOS TERMINADOS, FABRICADOS Y/O COMERCIALIZADOS POR P.V.C. GERFOR S. A. , QUE SE REALICEN UNICA Y EXCLUSIVAMENTE, POR CUENTA Y A NOMBRE DE P.V. C. GERFOR S.A., AUTORIZANDO A LAS SOCIEDADES DE INTERMEDIACION ADUANERA S. I. A. PARA SUSCRIBIR CONTRATOS DE COMODATO PARA ELEMENTOS DE TRANSPORTE DE PRODUCTOS TERMINADOS, FABRICADOS Y/ O COMERCIALIZADOS POR P.V.C GERFOR S.A., IMPORTADOS Y/O EXPORTADOS UNICA Y EXCLUSIVAMENTE POR CUENTA Y A NOMBRE DE P.V. C. GERFOR S.A. 6. FIRMAR LOS FORMULARIOS DE REGISTRO DE PRODUCTORES NACIONALES, OFERTA EXPORTABLE Y SOLICITUD DE DETERMINACION DE ORIGEN DE LOS PRODUCTOS, EXPORTADOS UNICA Y EXCLUSIVAMENTE, POR CUENTA Y A NOMBRE DE P.V.C. GERFOR S. A. 7. ENDOSAR LAS GUIAS AEREAS Y LOS B/L (BILL OF LADING) DE TODAS Y CADA UNA DE LAS IMPORTACIONES DE PRODUCTO TERMINADO QUE SE REALICEN UNICA Y EXCLUSIVAMENTE POR CUENTA Y A NOMBRE DE P.V. C. GERFOR S. A. 8. FIRMAR TODAS LAS RESPUESTAS YLO DOCUMENTOS RELACIONADOS CON REQUERIMIENTOS ORDINARIOS Y/ O EXTRAORDINARIOS EMANADOS DE LA DIRECCION DE IMPUESTOS Y ADUANAS NACIONALES DIAN, QUE TENGAN QUE VER CON LAS IMPORTACIONES DE PRODUCTOS TERMINADOS NO FABRICADOS POR P.V.C. GERFOR S.A. Y DE EXPORTACION DE PRODUCTOS TERMINADOS, FABRICADOS Y/O COMERCIALIZADOS POR P.V.C GERFOR S. A. , UNICA Y EXCLUSIVAMENTE, POR CUENTA Y A NOMBRE DE PVCF GERFOR S. A. 9. ELABORAR Y FIRMAR CARTAS ACLARATORIAS DIRIGIDAS A CLIENTES Y/ O A ENTIDADES Y AUTORIDADES CAMBIARIAS EN EL EXTERIOR. 10. FIRMAR Y PRESENTAR REPOSICIONES DE PLAN VALLEJO

CERTIFICA:

** REVISOR FISCAL **

QUE POR ACTA NO. 0000067 DE ASAMBLEA DE ACCIONISTAS DEL 25 DE ABRIL DE 2006, INSCRITA EL 2 DE MAYO DE 2006 BAJO EL NUMERO 01052763 DEL LIBRO

EX-7 FUE (RON) NOMBRADO (S):

NOMBRE

IDENTIFICACION

REVISOR FISCAL PRINCIPAL

QUEVEDO DELGADO WILSON

C.C. 000000079660557

QUE POR ACTA NO. 91 DE ASAMBLEA DE ACCIONISTAS DEL 10 DE JULIO DE

2012, INSCRITA EL 4 DE SEPTIEMBRE DE 2012 BAJO EL NUMERO 01663325 DEL LIBRO IX, FUE (RON) NOMBRADO (S):

NOMBRE
REVISOR FISCAL SUPLENTE

IDENTIFICACION

CORZO SANTOS GEISA VIVIANA

C.C. 000000052479973

CERTIFICA:

QUE POR RESOLUCION NO. AN-08737 DE LA SUPERINTENDENCIA DE SOCIEDADES DEL 17 DE AGOSTO DE 1.989, INSCRITA EL 6 DE SEPTIEMBRE DE 1.989, BAJO EL NO.274.064 DEL LIBRO IX, SE CONCEDE PERMISO DEFINITO DE FUNCIONAMIENTO A LA SOCIEDAD.

CERTIFICA:

QUE POR ACTA DE ASAMBLEA DE ACCIONISTAS DEL 18 DE SEPTIEMBRE DE 2003, INSCRITO EL 3 DE OCTUBRE DE 2003 BAJO EL NUMERO 00900605 DEL LIBRO IX, SE COMUNICO QUE SE HA CONFIGURADO UNA SITUACION DE CONTROL POR PARTE DE LA SOCIEDAD MATRIZ: P V C GERFOR S A, RESPECTO DE LAS SIGUIENTES SOCIEDADES SUBORDINADAS:

- PLASKROMLTDA

DOMICILIO: COTA (CUNDINAMARCA)

QUE POR DOCUMENTO PRIVADO DE REPRESENTANTE LEGAL DEL 30 DE MARZO DE 2012, INSCRITO EL 13 DE ABRIL DE 2012 BAJO EL NUMERO 01625127 DEL LIBRO IX, SE COMUNICO QUE SE HA CONFIGURADO UNA SITUACION DE CONTROL POR PARTE DE LA SOCIEDAD MATRIZ: P V C GERFOR S A, RESPECTO DE LAS SIGUIENTES SOCIEDADES SUBORDINADAS:

- MOORLAND CORP.

DOMICILIO: (FUERA DEL PAIS)

FECHA DE CONFIGURACION DE LA SITUACION DE CONTROL : 2009-12-13

QUE POR DOCUMENTO PRIVADO DEL 18 DE SEPTIEMBRE DE 2003, INSCRITO EL 3 DE OCTUBRE DE 2003 BAJO EL NUMERO 00900600 DEL LIBRO IX, SE COMUNICO QUE SE HA CONFIGURADO UNA SITUACION DE GRUPO EMPRESARIAL POR PARTE DE LA SOCIEDAD MATRIZ: P V C GERFOR S A, RESPECTO DE LAS SIGUIENTES SOCIEDADES SUBORDINADAS:

- PLASKROMLTDA

DOMICILIO: COTA (CUNDINAMARCA)

CERTIFICA:

****ACLARACION DE SITUACION DE CONTROL****

QUE LA SITUACION DE CONTROL INSCRITA BAJO EL NO. 900605 DEL LIBRO IX, ES EJERCIDA DE MANERA CONJUNTA ENTRE LA SOCIEDAD DE LA REFERENCIA Y LA SOCIEDAD FORERO MOLINA S EN C. (MATRICES CONJUNTAS).

****ACLARACIÓN SITUACIÓN DE CONTROL****

SE ACLARA LA SITUACIÓN DE CONTROL INSCRITA EL DIA 13 DE ABRIL DE 2012, BAJO EL NO. 01625127 DEL LIBRO IX, EN EL SENTIDO DE INDICAR QUE LA SOCIEDAD DE LA REFERENCIA, POR INTERMEDIO DE SU SUBORDINADA MOORLAND CORP. EJERCE CONTROL RESPECTO DE LAS SOCIEDADES PVC GERFOR PERU SAC, PVC GERFOR GUATEMALA S A, PVC GERFOR HONDURAS S A DE CV Y PVC GERFOR EL SALVADOR S A DE CV.

CERTIFICA:

DE CONFORMIDAD CON LO ESTABLECIDO EN EL CODIGO DE PROCEDIMIENTO ADMINISTRATIVO Y DE LO CONTENCIOSO Y DE LA LEY 962 DE 2005, LOS ACTOS ADMINISTRATIVOS DE REGISTRO AQUI CERTIFICADOS QUEDAN EN FIRME DIEZ (10) DIAS HABILES DESPUES DE LA FECHA DE INSCRIPCION, SIEMPRE QUE NO SEAN OBJETO DE RECURSOS.

* * * EL PRESENTE CERTIFICADO NO CONSTITUYE PERMISO DE
* * * FUNCIONAMIENTO EN NINGUN CASO

* * *
* * *

SEÑOR EMPRESARIO, SI SU EMPRESA TIENE ACTIVOS INFERIORES A 30.000



01



CAMARA DE COMERCIO DE BOGOTA

SEDE CENTRO

17 DE ENERO DE 2013

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PAGINA: 5 de 5

SMLMV Y UNA PLANTA DE PERSONAL DE MENOS DE 200 TRABAJADORES, USTED TIENE DERECHO A RECIBIR UN DESCUENTO EN EL PAGO DE LOS PARAFISCALES DE 75% EN EL PRIMER AÑO DE CONSTITUCION DE SU EMPRESA, DE 50% EN EL SEGUNDO AÑO Y DE 25% EN EL TERCER AÑO. LEY 590 DE 2000 Y DECRETO 525 DE 2009.

RECUERDE INGRESAR A www.supersociedades.gov.co PARA VERIFICAR SI SU EMPRESA ESTA OBLIGADA A REMITIR ESTADOS FINANCIEROS. EVITE SANCIONES.

EL SECRETARIO DE LA CAMARA DE COMERCIO,
VALOR : \$ 4,100

DE CONFORMIDAD CON EL DECRETO 2150 DE 1995 Y LA AUTORIZACION IMPARTIDA POR LA SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO, MEDIANTE EL OFICIO DEL 18 DE NOVIEMBRE DE 1996, LA FIRMA MECANICA QUE APARECE A CONTINUACION TIENE PLENA VALIDEZ PARA TODOS LOS EFECTOS LEGALES



* * *

NO ES VALIDO POR ESTA CARA

* * *

[54] FLEXIBLE PLUMBING TRAP

[76] Inventor: Lee T. Lamond, 613 Shearer St.,
North Wales, Pa. 19454

[21] Appl. No.: 200,954

[22] Filed: Oct. 27, 1980

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 126,546, Mar. 3, 1980,
abandoned.

[51] Int. Cl.³ E03C 1/00; F16K 9/00

[52] U.S. Cl. 4/191; 4/DIG. 13;
4/DIG. 16; 285/387; 137/247.41

[58] Field of Search 4/191, 207, DIG. 7,
4/DIG. 13, DIG. 16, 197; 285/169, 174, 176,
387, 388, DIG. 22; 137/247.41-247.51

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2,353,012	7/1944	Cheney	285/387
2,484,031	6/1944	Havrenius	4/DIG. 13
2,736,577	2/1956	Mackey	285/354 X

2,935,992	5/1956	Barker	137/247.11
2,959,430	11/1960	Haslam	285/354 X
3,313,314	5/1964	Burke et al.	137/247.27
3,719,209	9/1970	Rush et al.	138/177
3,860,978	5/1973	Wirth	4/207
3,908,208	5/1973	McIlroy	4/207
3,967,324	5/1975	Olive	4/207
4,081,190	3/1976	Itzler	285/226

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1409730 4/1969 Fed. Rep. of Germany ... 4/DIG. 16

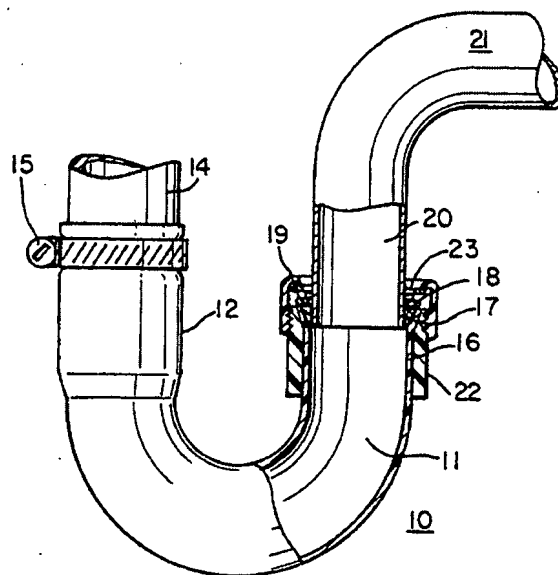
Primary Examiner—Charles E. Phillips

Attorney, Agent, or Firm—Z. T. Wobensmith, III

[57] ABSTRACT

A plumbing trap is described for use with drain pipes from sinks or other fixtures that fits pipe of different diameters, which drain pipes need not be in perfect alignment, and may be of a different diameter at the entrance than at the exit of the trap. The trap can be easily attached and detached, is molded of a flexible plastic which provides a soft structure that can be manually manipulated to discharge obstructions therefrom without removal from the drain pipes, and is impervious to most chemicals.

15 Claims, 8 Drawing Figures



FLEXIBLE PLUMBING TRAP

CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation in part of my prior application Ser. No. 126,546, filed Mar. 3, 1980.

BACKGROUND OF THE INVENTION

1. Field of the Invention

A plumbing trap is provided of the type that is easily attached and detached, flexible to provide for obstruction removal without disconnection and is easily adaptable to fit pipes of various types and diameters.

2. Description of the Prior Art

A plumbing trap that is easy to service without the necessity of dismantling it from the attached drain pipes has long been the goal of many inventors. Until my invention no trap was provided that was usable with pipes of different sizes and types, was easy to dislodge obstructions from, and was simple enough so that the average homeowner could install and remove it without the use of special tools.

One example of previously available traps is shown in the U.S. Pat. No. 178,059 to Hutchins, which is a trap of conventional shape, made of india rubber to prevent bursting from freezing, and which appears to be of tubing that slips on the pipes at each end but which has no provisions for secure attachment, and is not adaptable to different diameters of pipes.

The patent to Havrenius, U.S. Pat. No. 2,484,031 shows a drain trap of rubber with an internal partition forming an S-type of trap, with the ends of the trap containing ridges which grip the drain pipes over which they extend. The Havrenius structure requires the entrance and exit pipes to be in close vertical alignment, would not be useful otherwise, and has no provisions for manual manipulation for obstruction removal.

The U.S. Pat. No. 2,935,992 to Barker et al., illustrates a flexible trap of ball like configuration with internal partitions requiring vertical alignment of the pipes and is not useful in other dispositions.

The U.S. Pat. No. 3,313,314 to Burke et al., shows a flexible drain for sinks, of a modified S-bend shape, which is shown as attached to pipes from two sinks, and connected to one outlet, by slipping it over the pipes and is retained by radiator hose type clamps. The Burke structure requires fairly precise vertical pipe alignment and is not suitable for other applications.

The U.S. Pat. No. 3,860,978 to Wirth, shows a trap composed of a length of flexible hose, with a removable clamp for maintaining the hose in a U-shape, with male and female end fittings for connections to pipes from a sink and to an outlet pipe connected to a sewer or septic system.

The U.S. Pat. No. 3,719,209 to Rush et al., shows arcuate tubular articles of rigid plastic which can include plumbing traps, requires precise pipe alignment and cannot be compressed to dislodge particles therein.

The U.S. Pat. No. 3,908,208 to McIlroy illustrates a quick release safety trap which is fabricated from a deflectable type of plastic material which is connected at the ends by resilient clamps. The trap is composed of transparent high density polyethylene, cannot be squeezed to dislodge obstructions, is not suitable for connection to many types of drain pipes and cannot be used with pipes of different diameters.

The U.S. Pat. No. 3,967,324 to Olive, illustrates a flexible trap for a waste line assembly to be used with a toilet. The trap cannot be squeezed to dislodge obstructions, and is not suitable for use with pipes of different diameters or with sink drain pipes.

The U.S. Pat. No. 4,081,190 to Itzler illustrates a plumbing device for connecting a sink tailpiece to an out-of-alignment trap. The device has straight rigid end portions and a flexible pleated section therebetween all constructed of blowmolded polyethylene. The Itzler device cannot be squeezed, does not operate as a trap, and does not fit pipes of different diameters.

SUMMARY OF THE INVENTION

In accordance with the invention, a flexible plumbing trap is provided which is usable with different diameters and types of pipes, and is molded of a corrosive resistant plastic material, that can be manually manipulated to dislodge obstructions contained therein.

The principal object of the invention is to provide a flexible plumbing trap that can be easily manipulated to remove obstructions.

A further object of the invention is to provide a flexible plumbing trap that can be used with pipes that are not in precise alignment.

A further object of the invention is to provide a flexible plumbing trap that can be readily attached and detached by unskilled personnel.

A further object of the invention is to provide a flexible plumbing trap that can be used with different types of pipes.

A further object of the invention is to provide a flexible plumbing trap that can be used with pipe of different diameters at the entrance and the exit ends of the trap.

Other objects and advantageous features of the invention will be apparent from the description and claims.

DESCRIPTION OF THE DRAWINGS

The nature and characteristic features of the invention will be more readily understood from the following description taken in connection with the accompanying drawings forming part hereof in which:

FIG. 1 is a side elevational view in partial section of one embodiment of the invention, connected to one and one half inch diameter metal drain pipes;

FIG. 2 is an exploded view, enlarged, of the embodiment of the invention as illustrated in FIG. 1;

FIG. 3 is an elevational view illustrating the assembly of a portion of the trap to a one and one half inch diameter metal drain pipe;

FIG. 4 is a side elevational view of a portion of the trap in partially assembled relation on a one and one quarter inch metal drain pipe;

FIG. 5 is a side elevational sectional view of a portion of another embodiment of the invention connected to the end of a one and one quarter inch diameter rigid plastic drain pipe;

FIG. 6 is a side elevational sectional view illustrating a portion of another embodiment of the invention connected to a one and one half inch diameter rigid plastic drain pipe;

FIG. 7 is a side elevational sectional view of still another embodiment of the invention connected to a one and one quarter inch diameter rigid plastic drain pipe; and

FIG. 8 is a side elevational view in partial section illustrating still another embodiment of the invention

connected to a one and one quarter inch diameter rigid plastic drain pipe.

It should, of course, be understood that the description and drawings herein are illustrative merely and that various modifications and changes can be made in the structure disclosed without departing from the spirit of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now more particularly to the drawings and FIGS. 1, 2 and 3 thereof, one embodiment of the flexible plumbing trap 10 is shown which includes an arcuate tubular hollow central body portion 11 with an end portion 12 of slightly larger diameter, at the left thereof, which as shown is connected to drain pipes 14 and 21 of one and one half inch diameter. The end portion 12 engaged with a straight piece of rigid drain pipe 14 is retained thereon by an adjustable clamp 15 of well known type similar to that used for the connection of automobile radiator hoses.

The body portion 11 at the right side thereof has a straight end piece 16 with a flared portion 17 engaged with a ferrule 18 of well known type which is engaged with a flat rim 19 on the straight end 20 of a piece of metal drain pipe 21 of one and one half inch diameter and which extends upwardly.

The flared portion 17 of end piece 16 is also engaged with a threaded outer rigid collar member 22 which has a collar nut 23 detachably engaged therewith squeezing the flared portion 17 between the member 22 and the ferrule 18 thereby forming a water-tight seal.

The collar nut 23 includes conventional internal threads 24 and an outer surface 25 with projections 26 for gripping by the installer. The nut 23 is open at the top with two opposed locking ears 27 that extend inwardly to engage the rim 19 of pipe 21 in installed position.

Referring now to FIG. 4, a one and one quarter inch diameter metal drain pipe 100 is illustrated which has a straight portion 101 with a rim 102 thereon. A collar nut 23 is shown on the pipe 100 with a flat sealing washer 103 therebelow, which washer 103 is flexible to permit its passing over the rim 102. A flat brass washer 105 is provided with an inside diameter the same as the outside diameter of pipe 100 and split to permit it to pass over the rim 102.

Referring now to FIG. 5, a straight portion of a one and one quarter inch drain pipe 200 is illustrated which may be formed of PVC plastic with a tapered rim 201 on its lower end 202. The rim 201 is engaged with a ferrule 203 which engages a flared portion 204 of collar member 205 to which a straight portion 206 of a flexible plumbing trap in accordance with the invention (not shown) is attached preferably by solvent welding. The collar member 205 is preferably formed of rigid polyvinylchloride plastic (PVC) with a threaded upper portion 207 which is engaged by a collar nut 23.

A flat metal washer 208 of approximately one and one-fourth inches inside diameter is provided which engages the rim 201 and has a flat plastic washer 209 of larger inside diameter engaged therewith and with the locking ears 27 of nut 23 retaining the pipe 200 to the collar member 205. The washer 208 is preferably formed of brass and the washer 209 preferably formed of PVC.

Referring now to FIG. 6, a one and one-half inch drain pipe 300 is illustrated with a straight end 301

which may be formed of rigid PVC and with a tapered end rim 302. The rim 302 is engaged with a flared portion 303 of an outer rigid collar member 304 to which a straight portion 305 of a flexible plumbing trap in accordance with the invention (not shown) is attached preferably by solvent welding. The collar member 304 is preferably formed of rigid PVC with a threaded outer upper portion 306 which is engaged by a collar nut 23 which has ears 27 that engage the rim 302 of pipe 300 thereby forming a water-tight seal between the rim 302 and collar member 304.

Referring now more particularly to FIG. 7, another embodiment of the invention is illustrated which includes the upper straight portion 400 from a flexible plumbing trap in accordance with the invention (not shown) which has a flexible plastic sleeve 401 between it and a straight portion 402 from a plastic drain pipe 403 of one and one-fourth inch diameter. The straight portion 400 is retained on the sleeve 401 and on the straight portion 402 by a hose clamp 405 of well known type making a water-tight seal therewith.

Referring now more particularly to FIG. 8, still another embodiment of the invention is illustrated, and which includes the upper portion 500 of a flexible plumbing trap in accordance with the invention (not shown) which includes a wall 501 of one-eighth inch thickness. An end portion 502 of wall 501 is pushed back inside itself and retained on the straight end portion 503 of a one and one-fourth inch diameter plastic drain pipe 504 by a clamp 505 of conventional type thereby forming a water-tight seal.

It should be noted that the locking ears 27 of collar nut 23 extend partially around the nut and are deformable to the extent that they can snap over rims both flat and tapered as found on drain pipes. An illustration of the assembly of the collar nut is depicted in FIG. 3 for a one and one-half inch metal drain pipe 21 but is assembled onto drain pipes with tapered ends in the same manner.

It will thus be seen that structures are provided with which the objects of the invention have been attained.

I claim:

1. A flexible plumbing trap for use with drain pipes from plumbing fixtures which drain pipes include one smooth straight drain pipe and one drain pipe with rim means on its end which trap comprises
 - an arcuate tubular hollow central body portion,
 - one end portion extending from said body portion and of different diameter than said body portion for engagement with said smooth straight drain pipe,
 - adjustable clamp means for detachably connecting said one end portion of said trap to said smooth straight drain pipe,
 - an other end portion of said trap extending from said body portion,
 - a collar member engaged with the said other end portion of said trap and said drain pipe rim means end,
 - a collar nut engaged with said rim means end of said drain pipe and said collar member, and
 - said collar nut is deformable for movement over said rim means and has a pair of opposed locking ears which engage said rim means.
2. A flexible plumbing trap as defined in claim 1 in which
 - said first mentioned end portion of said trap has an additional end portion of reduced diameter.

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3. A flexible plumbing trap as defined in claim 1 in which said second mentioned end portion of said trap has a flared end.

4. A flexible plumbing trap as defined in claim 3 in which said flared end is in contact with the end of said drain pipe and said collar member.

5. A flexible plumbing trap as defined in claim 3 in 10
which
said flared end of said trap is solvent welded to said
collar member.

6. A flexible plumbing trap as defined in claim 1 in which
at least one of said drain pipes is formed of metal.

7. A flexible plumbing trap as defined in claim 1 in which said rim means is tapered.

8. A flexible plumbing trap as defined in claim 1 in which

said pipe is of metal and said rim means is a flat rim,
and
a ferrule is provided on said pipe between said rim
and said collar member.

9. A flexible plumbing trap as defined in claim 1 in which

a flat sealing washer is provided on said drain pipe engaged by said ears of said collar nut, and
a flat split washer is provided on said pipe engaged by said sealing washer and said rim means on said drain pipe.

10. A flexible plumbing trap as defined in claim 1 in which
a flexible plastic sleeve is provided between said smooth straight drain pipe and said first mentioned end of said trap.

11. A flexible plumbing trap as defined in claim 1 in which
said first mentioned end of said trap is doubled back on itself and engaged with said smooth straight drain pipe.

12. A flexible plumbing trap as defined in claim 1 in which at least one of said drain pipes is of rigid plastic.

13. A flexible plumbing trap as defined in claim 1 in
20 which
said trap is molded flexible synthetic plastic.

14. A flexible plumbing trap as defined in claim 1 in which said trap is of molded polyvinylchloride.

25 15. A flexible plumbing trap as defined in claim 1 in which
at least one of said drain pipes is of rigid polyvinylchloride.

* * * * *

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 4,516,278

DATED : May 14, 1985

INVENTOR(S) : LEE T. LAMOND

It is certified that error appears in the above—identified patent and that said Letters Patent is hereby corrected as shown below:

Column 6,

Line 21, after "is", insert - of -.

Signed and Sealed this

Third Day of September 1985

[SEAL]

Attest:

DONALD J. QUIGG

Attesting Officer Acting Commissioner of Patents and Trademarks - Designate

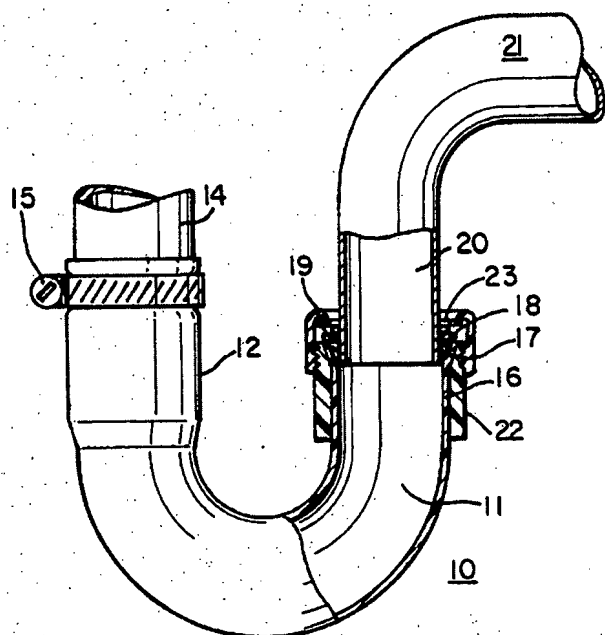


FIG. 1

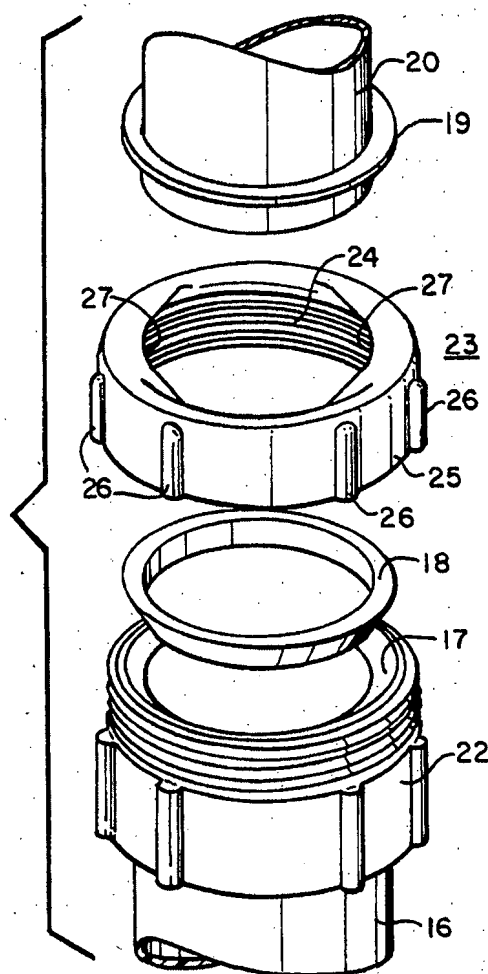


FIG. 2

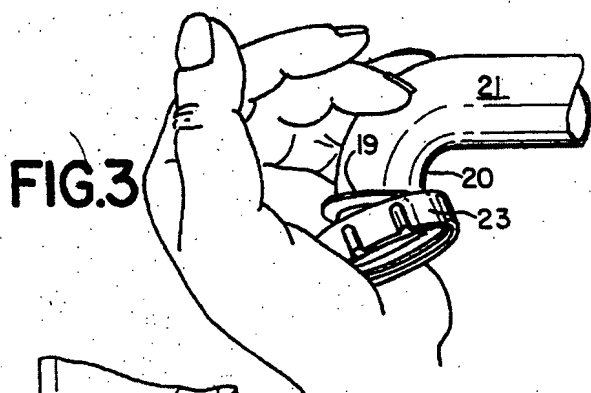


FIG. 3

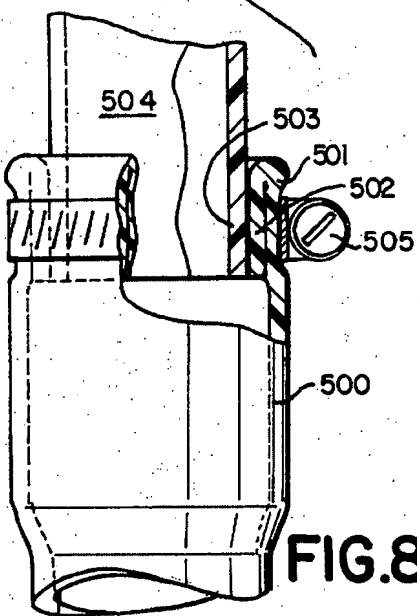


FIG. 8

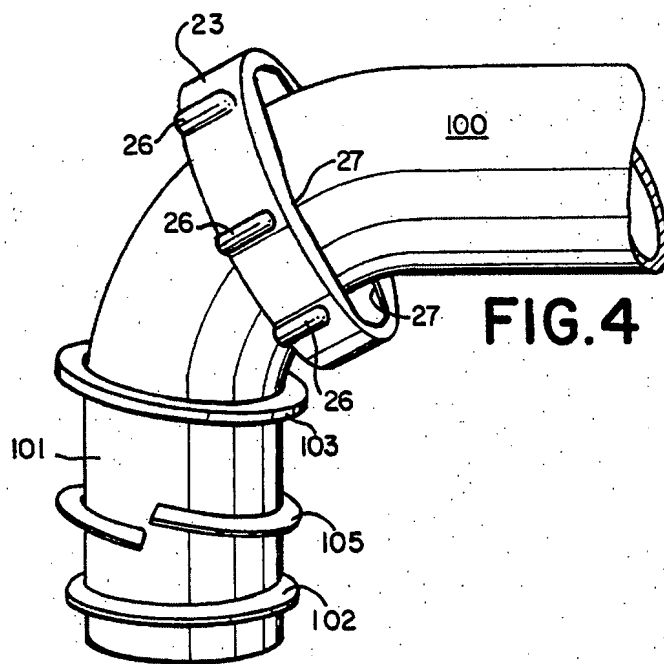


FIG. 4

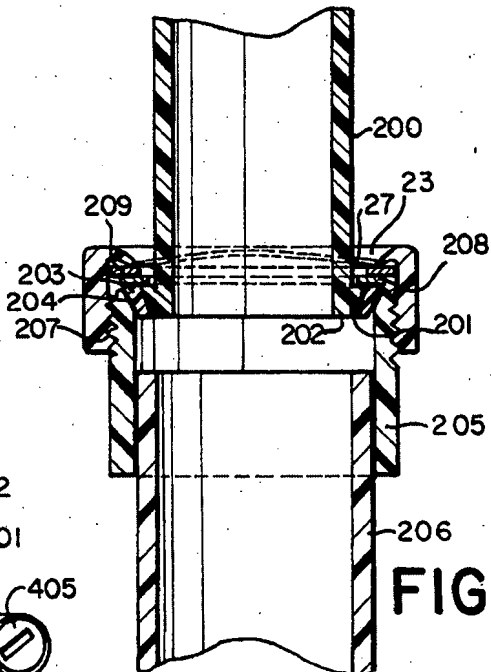


FIG. 5

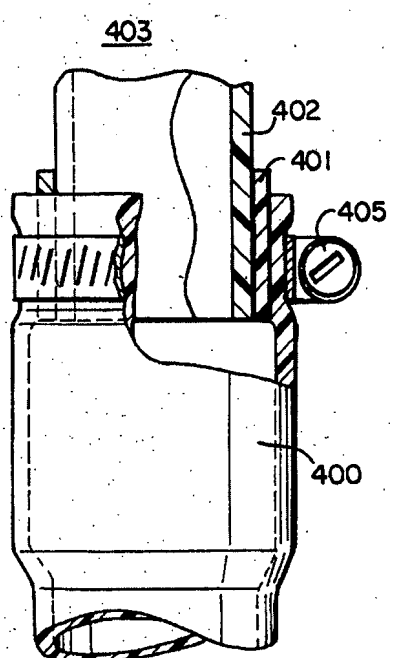


FIG. 7

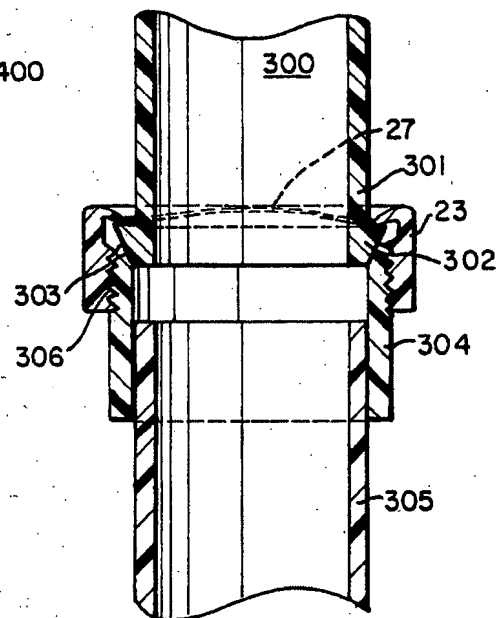


FIG. 6

- [54] ADJUSTABLE TUBULAR WALL
STRUCTURE FOR CONNECTORS AND THE
LIKE
- [75] Inventor: Erwin F. Mikol, Park Ridge, Ill.
- [73] Assignee: Twentieth Century Companies, Inc.
- [21] Appl. No.: 487,865
- [22] Filed: Apr. 22, 1983
- [51] Int. Cl.⁴ F16L 27/00
- [52] U.S. Cl. 285/226; 138/121;
285/423
- [58] Field of Search 285/226, 229, DIG. 4,
285/57, 299, 423; 138/121; 92/47, 42; 206/218
- [56] References Cited

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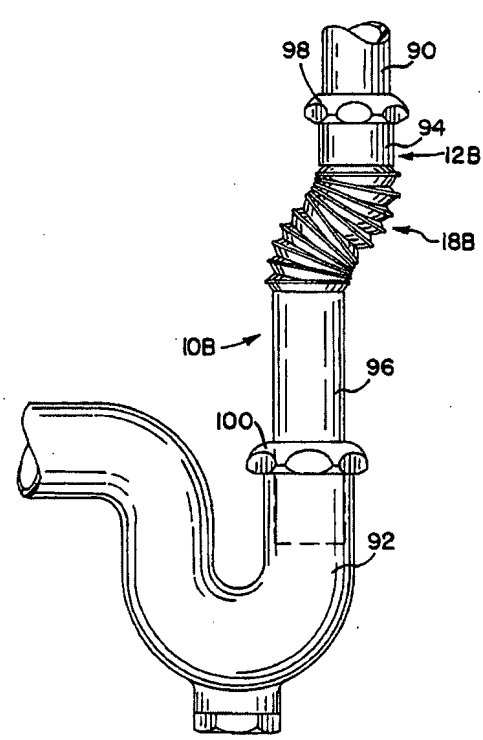
3544571	5/1973	Australia	239/33
89088	9/1958	Netherlands	285/226
1036459	7/1966	United Kingdom .	
1584365	2/1981	United Kingdom .	

Primary Examiner—Gary L. Smith
Assistant Examiner—Erik K. Nicholson
Attorney, Agent, or Firm—Donald E. Egan

[57] ABSTRACT

A flexible, adjustable tube which comprises a tubular body of pleated asymmetrical accordion fold configuration wherein each pleat is defined by a thrust cone wall segment and a Belleville washer-like wall segment. The narrower ends of the two wall segments are integrally connected to form an annular articulation about a central axis and the wider ends of the individual Belleville washer wall segments of each pleat are integrally connected to the wider ends of the thrust cones of the next succeeding pleat, to form an annular articulation about the central axis. The Belleville washer-like wall segments of each pleat are proportioned to be snap shifted through the articulation of same to the thrust cone of the next adjacent pleat, for shortening or lengthening the tube. Similar partial snap shifting of the individual Belleville washer wall segments may be effected, for angulating the tubular body, by canting the thrust cone wall segment of a selected pleat sidewise.

6 Claims, 3 Drawing Sheets



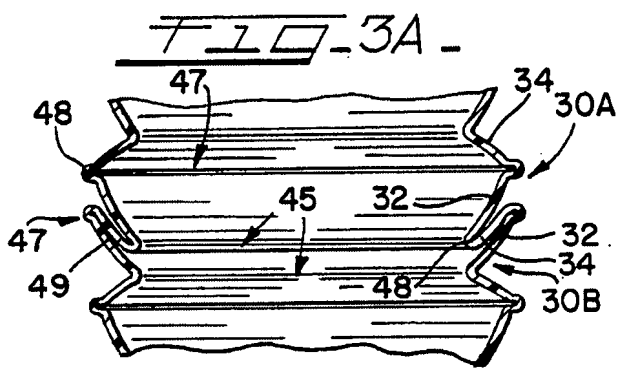
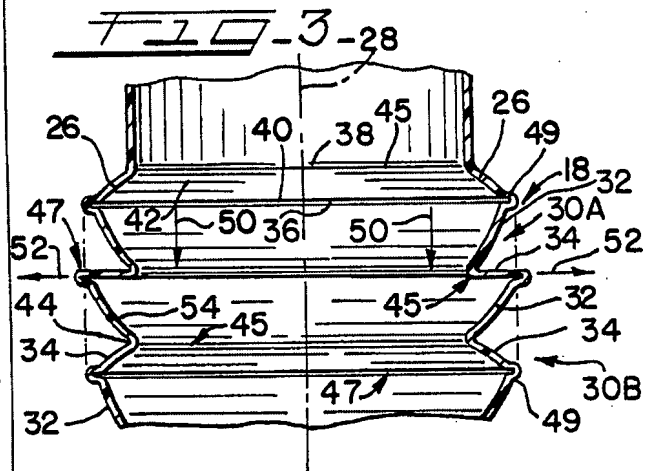
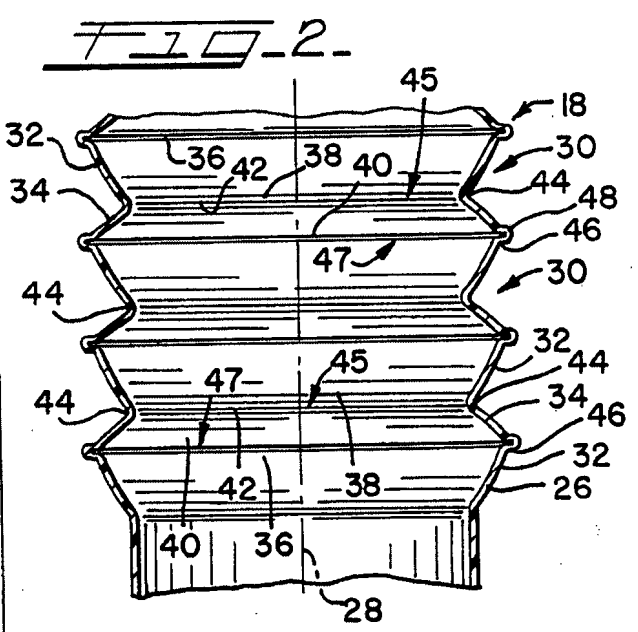
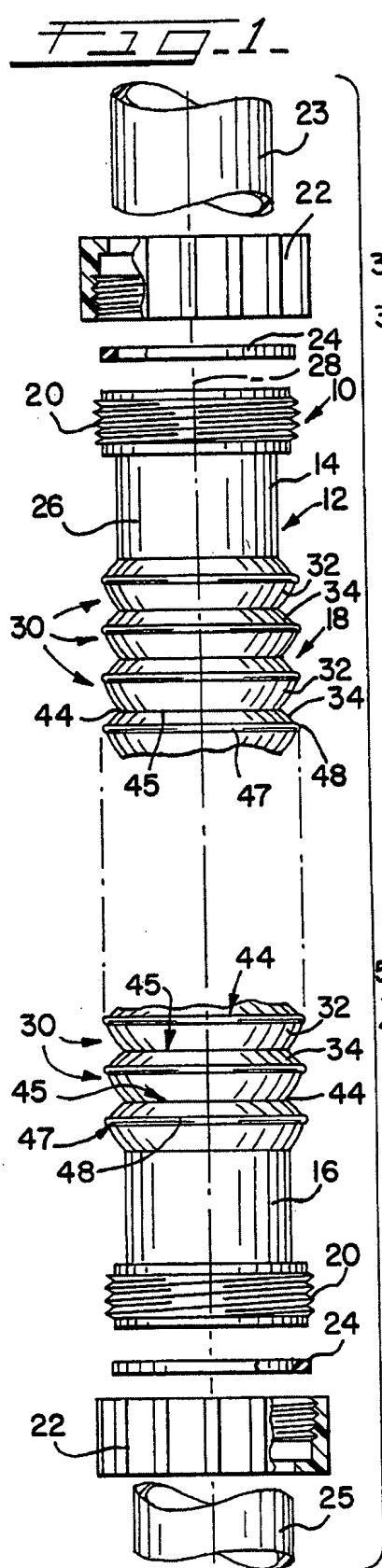


FIG. 4

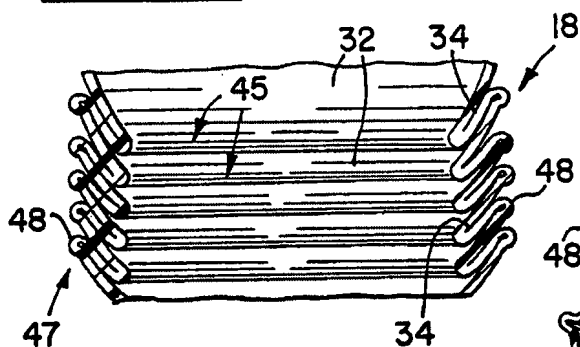


FIG. 5

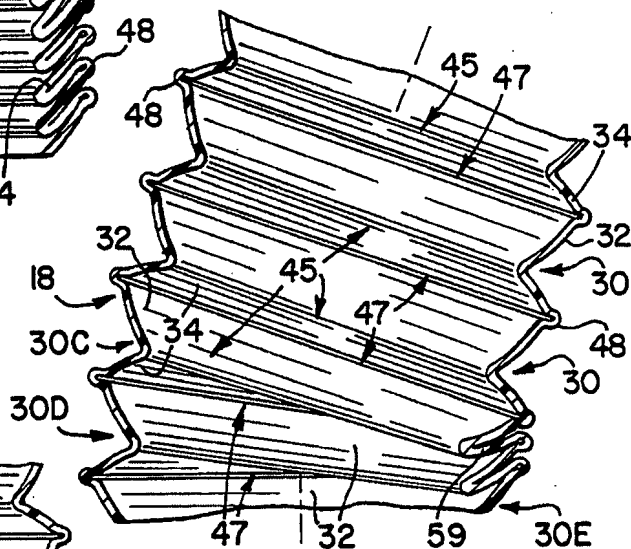


FIG. 6

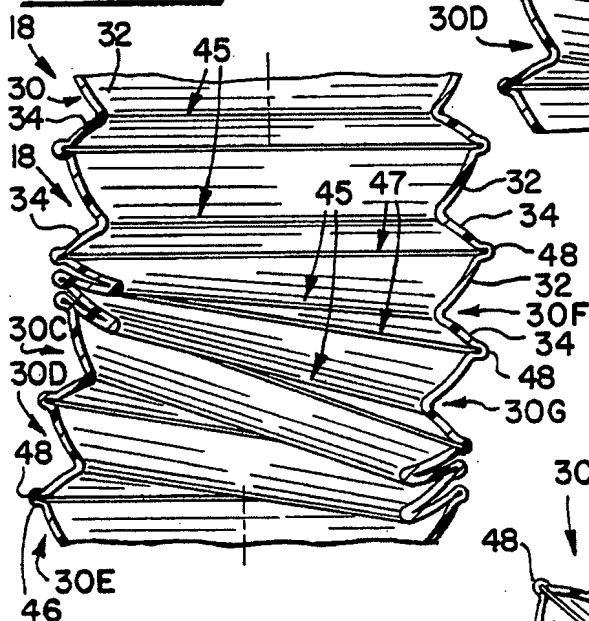
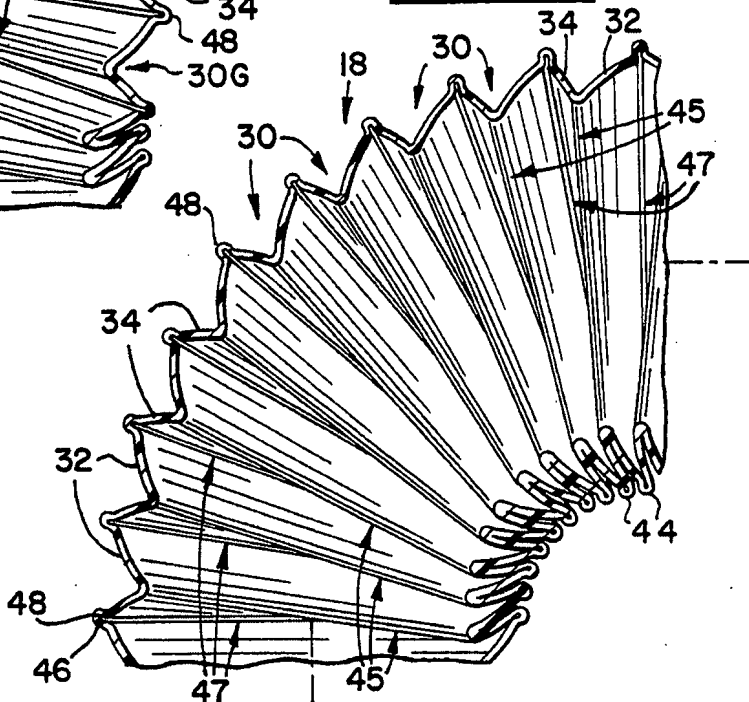
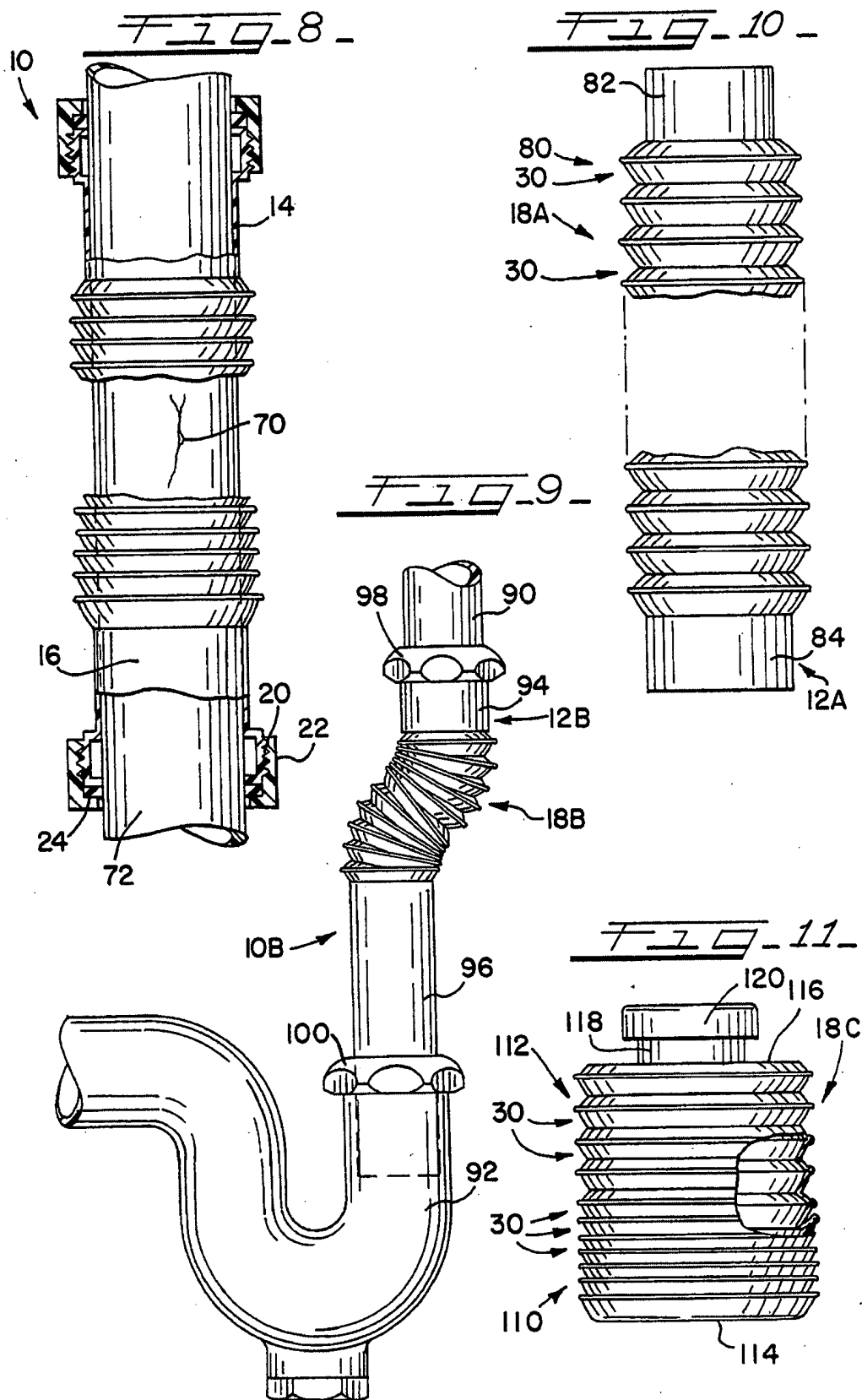


FIG. 7





ADJUSTABLE TUBULAR WALL STRUCTURE FOR CONNECTORS AND THE LIKE

This invention relates to an adjustable tubular wall structure for tubular connectors, conduits, containers, and the like, and more particularly, to a pleated tubular body that is extensible, contractible, or partially extensible and/or contractible, both longitudinally and laterally thereof, and/or may be angled relative to its central axis, at one or more locations along its length, for accommodating, for instance, a connection between out of alignment discharge and intake ports or apertures in the plumbing field, and yet be stable when adjusted to define any one, some, or all of these relations.

It is a common problem in many fields that a tubular connector that has some degree of adjustability or adaptability must be provided to connect, for instance, spaced apart drain or duct openings or ports that are not aligned, and that are to be connected, for instance, for fluid flow from one to another or perhaps with periodic reverse flow being provided for, with the problem being commonly accommodated by providing a flexible tube or hose that may be readily flexed or shaped to accommodate the misalignment connection involved. It is often desirable that the connection forming tube be extendable or contractible lengthwise thereof to accommodate specific applications so that the connecting tube may be offered in standard lengths that have the adjustability needed to make a neat connection without requiring overlength sizes or cutting of the tubing to make the connections desired.

In the plumbing field, for instance, it is often necessary in installing drain systems to connect the drain outlet of basins or sinks for lavatories or laboratories, or the like, to traps or other sump like inlets that are not aligned with the drain outlet, and this is commonly done using tubing formed, for instance, from a suitable polyolefin, and having upper and lower straight and rigid, or relatively rigid, tubular sections that are integrally connected together by a flexible pleated section that can be extended or contracted and angled by flexing the pleated section to make the fit desired. The upper straight tubular section is secured to the basin or sink drain in some conventional seal tight manner, and the connecting tube is flexed at its pleated portion to align the lower section with the trap or the like, with excising of the lower section being effected as needed, and the lower section sealed tight connected to the trap or the like using conventional implements well known to the art. Reference may be had to Itzler U.S. Pat. Nos. 4,081,190 and 4,165,110 for examples of this type of device.

Connection implements of this type, while being flexible at the pleated section, have little or no stability at the pleated section as disposed in the adjusted relation due to the elastic memory involved in the material forming the connector. Thus, the pleated section when extended, contracted, or angled from its normal rectilinear position tends to return to its normal straight line relation, thereby subjecting the outlet or end port structures its ends are connected to, and the seals that are employed for this purpose, to undesirable localized and distorting stresses that can adversely affect the seal provided. Using a material that is freely flexible can create problems of lack of durability and corrosion resistance, and the use of semi-rigid materials, as such, to make implements of this type can result in the imple-

ment being too stiff to effectively manipulate as needed without experiencing breakage, this problem sometimes being partially alleviated by varying the thickness connector wall section along its pleated second, which greatly complicates design and production of same.

A principal object of the present invention is to provide a tubular wall structure for tubular connectors, conduiting, containers, and the like, that is in the form of a tubular body of pleated accordion fold configuration formed from a semi-rigid but resiliently flexible material of substantially uniform gauge along its length, with the tubular body being extensible and contractible or partially in either direction, and/or angled laterally for, in the case of serving as a connector, providing substantially precise adjustment to fit and make the connection desired, yet be fully stable along the length of same in its set adjusted position or contour for securement at its ends to make the connection desired free of stresses at the connected end portions involved that might otherwise be due to elastic memory or other stresses introduced into the wall structure by shaping it to fit the application that would in turn effect stress applications to such connections.

Another principal object of the invention is to provide a pleated accordion fold tubular body for use in connecting spaced apart ports, apertures, and the like for fluid flow conducting or other ducting purposes, in which the individual pleats have a pop in, pop out, relation for partially or wholly contracting and extending the tubing, or for angling the tubing ends as needed by utilizing the pop in action to partially contract or telescope one or more pleats on one side of the body so as to cant a part of the pleat to provide the angulation desired, with each such pleat being separately so cantable, and at a choice of location and adjustment of 360 degrees thereabout for maximizing precise adjustment in configuration of the tubular body as it is to be applied to make the connection desired.

Another principal object of the invention is to provide a pleated accordion fold imperforate tubular body for use in connecting apertures and ports for drain and ducting purposes, which, in addition to being extendible, contractible, and angulatable with full stability in each and all such relations is also expandable radially of its central axis, by adjusting the tubular body to its contracted relation, which permits its use as a temporary repair for leaks in the sides of pipes or conduiting that are under low pressure conditions, by contracting the tubular body lengthwise thereof to achieve its expanding relation, applying it over the portion of the pipe or conduit having the defect, and clamping the ends of the tubular body to the exterior or the pipe or conduit using conventional pipe seal clamp devices or fittings.

Still other important objects of the invention are to provide a pleated accordion fold tubular body that is of a special asymmetrical pleated configuration, which tubular body is readily adapted for general purpose use, that is formed from a semirigid resiliently flexible polyolefin of substantially uniform gauge that is of film thickness proportions, which tubular body is arranged for snap action pop in and pop out contraction and extension lengthwise thereof, either on a selected pleat by pleat basis, or for all its pleats, and that also provides for partial pop in and pop out action of selected pleats, and positionally as selected or adjusted 360 degrees thereabout, for canting individual pleats for selected angular adjustment purposes, with the tubular body as

so adjusted being fully stable in all three relations through its length, but permitting repeated similar adjustments by the user as the needs arise.

Yet other important objects of the invention are to provide a pleated fold tubular body that is semirigid in nature, but is resiliently flexible, while providing for snap action contraction, extension, and angulation of the body for stabilized, precise fit, adjustment purposes, with full and reliable stability in any and all such relations, to provide a tubular body of the type indicated that is adapted for incorporation in a wide variety of plumbing type connection devices, as well as such diverse structures as ducting or hose lengths, containers, and arms for toy robots, and that is economical of manufacture, convenient to work with, install, use, and that is long lived in application.

In accordance with the invention, an adjustable tubular wall structure for tubular connectors, conduits, containers, and the like, is provided in which the wall structure comprises a tubular body of pleated, asymmetrical accordion fold, configuration, formed from a suitable semirigid resiliently flexible material (such as polypropylene) of substantially uniform gauge that may be of film thickness dimensions, that has a central axis extending centrally and longitudinally of same, of which each pleat is defined by an axially longer thrust cone wall segment and an axially shorter Belleville washer wall segment, in which the narrower or smaller ends of the two wall segments are integrally connected to form annular articulations therebetween and thereabout, and the wider or larger ends of the pleat Belleville washer wall segments are integrally connected to the wider or larger ends of the thrust cones of the next adjacent pleat, to form annular articulations therebetween and thereabout with such articulations respectively forming the roots and crowns of the pleating. The Belleville washer wall segments of each pleat are proportioned to be snap shifted through the articulation of same to the thrust cone wall segment of the next adjacent pleat, into internally seated relation with such thrust cone wall segment, for contracting or lengthening the tubular body after it has been contracted, with such articulation including an integral annular protuberance thereabout that controls the axial thrust needed for that purpose.

Partial snap shifting of such Belleville washer wall segments is also provided for whereby the thrust cone of the pleat is manually cantable sidewise of the tubular body by way of the resulting partial deflection of the Belleville washer wall segment of the pleat in question, into the thrust cone of the next adjacent pleat. Such canting action at the individual pleats provides a predetermined angulation of the tubular member at such pleat, with similar angulation of adjacent pleats similarly increasing the angulation provided, which may be located to be in other than in coplanar relation with the tubular body as a whole, with 360 degrees choice being provided for with regard to each pleat, either by way of direct angulation, or adjustment of same about the central axis of the tubular body.

In all these relations of the tubular body involved, namely its extended, contracted, angled, or any partially effected relation of one of these types, the tubular body is stabilized in its adjusted position at and between its ends, whereby precise adjustment lengthwise and laterally of the tubular body may be effected to make the connection desired if that is the intent of the user, with assurance that the connection providing device

will remain as adjusted, and be free of unbalanced stresses between and along the ends of same.

Other objects, uses, and advantages will become obvious or be apparent from a consideration of the following detailed description and the application drawings in which like reference numerals indicate like parts throughout the several views.

In the drawings:

FIG. 1 is a plan view of the invention embodied in a plumbing device for connecting two pipe or conduit ends that may be aligned (as shown) or out of alignment, for connecting the pipe conduit ends for fluid flow therebetween or any other purpose, with part of the pleated section being shown broken away to simplify the drawing, and the standard nut and washer type seals employed at each end of the device (for this purpose), being shown in exploded relation and in partial section;

FIG. 2 is a fragmental longitudinal sectional view through the pleated section of the device of FIG. 1, but on an enlarged scale, and diagrammatically illustrating the structural arrangement of the special asymmetrical pleating involved, and when in its extended relation;

FIG. 3 is similar to FIG. 2, but shows the pleated section in the process of being contracted longitudinally of same, by snap or pop shifting of an annular wall segment of one of the pleats into socketed relation with an annular wall segment of the next succeeding pleat;

FIG. 3A is similar to FIG. 3, but shows the contracted socketed relation of the pleat shown being so processed in FIG. 3;

FIG. 4 is similar to FIGS. 2 and 3, but shows the pleated section of the connector with all of its pleats in the snap pop shifted, contracted relation for shortening the connector longitudinally of same, and expanding its pleated section radially of same;

FIG. 5 is a view similar to those of FIGS. 2 and 3, but with two adjacent pleats of the pleated section shown in the half popped or snap shifted, half socketed relation that provides for angulation positioning of the pleated section;

FIG. 6 is similar to that of FIG. 5, but shows the pleated section with two pleats in half popped or snap shifted relation on one side of the connector, and two other pleats in half popped or snap shifted relation on the other side of the connector involved, for disposing the ends of the pleated section in parallel but misaligned relations;

FIG. 7 is similar to that of FIGS. 5 and 6, but shows the pleated section pleats consecutively half popped or snap fitted into socketed relation with adjacent pleats along one side of the pleated section so as to establish a 90 degree bend in the connector;

FIG. 8 is a view of the connector of FIG. 1, with the pleated section fully contracted lengthwise of same for expanding the internal diameter of the pleated section, so that the device of FIG. 1 may be applied as indicated in overlying relation to a cracked pipe, to serve as a temporary repair for same, with parts being shown in section and other parts being broken away to better illustrate the general arrangement involved;

FIG. 9 is an elevational view showing the invention applied to an alternate form of connecting device, arranged in accordance with the invention, employed to connect the outlet of a sink or lavatory basin, namely the tailpiece of same, to a trap that is not aligned with the tailpiece;

FIG. 10 is a view similar to that of FIG. 1 illustrating the invention incorporated in a tubular body suitable for ducting or hose use, and

FIG. 11 is a side elevational view, partially in section, showing a container that embodies the pleated section of the tubular body of this invention, with the container being shown in partially contracted relation.

However, it is to be distinctly understood that the specific drawing illustrations provided are supplied primarily to comply with the requirements of the Patent Laws, and that the invention is susceptible of modifications and variations that will be obvious to those skilled in the art, and that are intended to be covered by the appended claims.

GENERAL DESCRIPTION

Reference numeral 10 of FIGS. 1 and 8 generally indicates the invention incorporated in a basic connector that serves, for instance, as a plumbing tool for connecting, in drain systems the end of one pipe to the end of another pipe for, for instance, conveying fluid from one pipe to the other, and for purposes of this invention it is to be understood that the two pipe ends to be connected may be aligned as shown or out of alignment (for instance, as shown in FIG. 9) and perhaps may even be in angled relation to each other.

In the simplified tubular connector device in which the invention is embodied in the showing of FIG. 1, the device 10 comprises a tubular member or body 12 comprising straight end portions or sections 14 and 16 which are integrally connected by the special pleated section 18 that is arranged in accordance with the invention to provide for contraction, extension, and angulation of the device 10 as needed to precisely position the device for sealed connection to the pipe ends in question free of unbalanced stresses that do not contribute to the sealing action provided.

The tubular member 12 is of one piece construction and is preferably formed from a suitable polyolefin, such as polypropylene, as by employing a suitable blow-molding operation, with the end sections 14 and 16 being suitably threaded as at 20 for threadedly receiving a standard nut 22 that fits over and against a standard sealing washer 24, formed from rubber, nylon, or the like, for seal clamping the threaded end portions of the section 14 and 16 to, for instance, the respective pipe ends 23 and 25 in the well known conventional manner (see, for instance, FIG. 8).

Referring to FIG. 2, and specifically to the specifics of which the pleated section 18, the tubular member or body 12 of which the pleated section 18 forms a part is preferably formed from a semi-rigid resiliently flexible material of a substantially uniform gauge along the length of the tubular body 12, or at least its pleated section 18, that for many applications may be of film thickness dimensions, with the tubular body 12 defining an encompassing wall 26 of tubular configuration that extends the length of same, and having a central axis 28 extending centrally and longitudinally of same. The straight sections 14 and 16 of the specific connector 10 shown are of cylindrical configuration and are conventionally shaped so as to define the threading 20. At the pleated section 18, the wall 26, in accordance with the invention, defines individual pleats 30 that are of the accordion fold configuration, but are asymmetrical in shaping, with the wall 26 in the area of the pleated section 18 being shaped to define at each pleat 30 a thrust cone wall segment 32 and a Belleville washer wall segment

34. As clearly brought out in FIG. 2, the thrust cone wall segment 32 and the Belleville washer wall segment 34 are both of frusto-conical configuration,, with the individual thrust cone wall segments 32 each defining a relatively wide end portion 36 at one end of same and a relatively narrow end portion 38 at the other end of same, and the Belleville washer wall segments 34 each defining a relatively wide end portion 40 at one end of same, and a relatively narrow end portion 42 at the other end of same.

For each pleat 30, the wall segments 32 and 34 of same are integrally connected at their respective narrower or smaller end portions 38 and 42 to define annular hinged connections or articulations 45 therebetween, which also form the roots 44 of the pleats 30. The wide or larger end portion 40 of each Belleville washer wall segment 34 is integral with the wider or larger end portion 36 of the thrust cone wall segment 32 of the next consecutive pleat 30 adjacent to it, to form the crowns 46 of the pleats, and also define radially outwardly distensible or expandable annular articulations 47 or hinged connections between the integrally connected Belleville washer wall segments and thrust cone wall segments, respectively.

It will be noted that when the pleated section 18 is in its rectilinear extended relation that is shown in FIGS. 1 and 2, the articulations 47 lie in a plane that extends normally of the tubular body central axis 28, and the individual pleat crowns 46 are coplanar with such plane in the case of the individual pleats 30. The articulation 45 of each pleat 30 lies in a plane, that in the rectilinear relation of the tubular body 26, is also normally disposed with respect to the central axis 28 and includes the root 44 of the respective pleats 30.

Further in accordance with the invention, the pleat crowns 46 each include an integral, externally disposed, annular rib or protuberance 48 that is in circumambient relation about the respective crowns 46, which is provided in accordance with the invention to resiliently resist distension of the crowns 46 radially outwardly of the plane of the respective crowns 46, when the tubular body 26 is to be contracted from the relation of FIGS. 1 and 2, to, for instance, the retracted relations of FIGS. 3 and 4, or vice versa. Thus, the dimensions of the annular protuberances 48 radially and longitudinally of the axis 28 controls the amount of thrust that needs to be employed longitudinally of the tubular body 20 to contract or extend same, as is about to be described. The protuberances 48 actually are in the nature of hollow O-rings 49 that are open on the internal side of the tubular wall 26 and are integrally connected with the pleats 30 at and externally about their respective crowns 46.

As indicated, the pleats 30 are of asymmetrical configuration, and the thrust cone wall segments 32 have a height or depth dimension lengthwise of the axis 28 that approximates about twice the corresponding dimension of the Belleville washer wall segments 34. Further, in the extended relation of the pleated section 18, for each pleat 30 the thrust cone wall segments 32 at their narrower ends 38 are substantially perpendicular to the corresponding narrow ends 42 of the Belleville washer wall segment 34 of same (see FIG. 2). The wall segments 32 and 34, while being basically of frusto-conical configuration are also arched somewhat spherically, as indicated in FIGS. 2 and 3, to provide each such wall segment with arch type strength or resistance against deformation or deflection, in addition to the semi-rigid

nature of the material from which the wall structure 26 is formed.

A feature of the invention is that the relationship of components involved in each pleat 30 of pleated section 18 is such that the Belleville washer wall segment 34 of each pleat 30 may be wholly or partially snap shifted or popped across the respective articulations 47 into socketed and internally seated relation with the thrust cone wall segment 32 of the next succeeding pleat, and this being done in any manner that will subject the pleated section 18 to compressive stress acting longitudinally of its central axis 28. When this is done, where the Belleville washer wall segment 34 of one pleat 30, for instance, the pleat 30A of FIG. 3, is to be snap shifted into the thrust cone wall segment 32 of the next adjacent pleat 30B, the compressive forces involved act on the thrust cone 32 in question to push the Belleville washer wall segment 34 involved into over centered relation and into a reversely arched, socketed and internally seated, relation with the indicated next succeeding wall segment 32 of the next pleat 30B, as shown in FIG. 3A.

Thus, as indicated by the arrows 50 of FIG. 3, the tubular member or body 12 may be contracted longitudinally of its central axis 28 by pressing one of its ends toward the other and so that a thrust cone wall segment 32 of one of the pleats 30, for instance pleat 30A, acts on the Belleville washer wall segment 34 of that pleat, at its articulation or hinged connection 45, to shift the pleat wall segment 34 in question from its positioning indicated in FIG. 2 to the radially disposed position of FIG. 3, for the pleat 30A, in which it is in coplanar relation with the articulation 47 with the next adjacent thrust cone wall segment 32, and thence to an over or passed center relation to same, in which the acted on wall segment 34 is socketed into and seats against, as at 49, the thrust cone wall segment 32 of the next succeeding pleat 30B, as indicated in FIG. 3A. In achieving this contracted relation, insofar as the pleats 30A and 30B are concerned, the pleated section 18 is shortened or contracted approximately twice the length of the indicated wall segment 34 lengthwise of the central axis 28, and the seating of the indicated wall segment 34 against the wall segment 32 of the next succeeding pleat is against the inside surfacing 54 thereof 360 degrees thereabout, with the indicated wall segment 34 being reversibly arched, as indicated in FIG. 3A.

Generally speaking, it is immaterial which pleat 30 is acted on in this manner to shorten or contract the tubular body 26 lengthwise thereof, and where all the pleats 30 are so contracted, as suggested by the showing of FIG. 4, the tubular body 26 is shortened a corresponding amount for each pleat of the pleated section 18.

The tubular body 12, and namely its side wall 26 is extended from the contracted relation indicated at FIG. 4 by suitably tensioning the body 26, as by pulling the ends of same away from each other, whereby the Belleville washer wall segments 34 are snap shifted or popped in the reverse manner across the articulations 47 to dispose them in the extended relation of the pleats 30 that is illustrated in FIG. 2, with the length of the tubular wall increasing axially thereof approximately twice the length of the contracted wall segments 34 (axially of wall 26) that are involved. The wall segments 34 have thus been returned to their original arched relation of FIG. 2.

Further in accordance with the invention, when the tubular body 12 is in its fully contracted relation, as by the snap or pop closing of all of the pleats 30 in the

manner that is indicated, the internal diameter of the body at its pleated section 18 is enlarged radially of the central axis 28. As indicated by the showing of FIG. 3, as the pleat wall segments 34 are snap shifted or popped past the articulations 47 at the pleat crowns 46, an outward distending action is effected on the pleat crowns 46, and when the wall segments 34 are socketed into the wall segment 32 of the next succeeding pleats 30, as, for instance, pleat 30B of FIG. 3, the socketed wall segments 34 are seated against the internal surfacings 54 of the wall segments 32 in question to hold the crowns 46 in a somewhat reduced but still radially enlarged relation, over that indicated in FIGS. 1 and 2. The ribs or protuberances 48 that are defined by O-rings 49 bias the pleats 30 to hold same in either the extended or contracted relation, and against the overcenter pop or snap changing action that has been described and illustrated. The biasing and resistance action provided by the ribs or protuberances 48 may be adjusted by varying the proportions of same radially and axially of the wall 26, with respect to the wall segments 32 and 34 of the pleated section 18; as indicated, this controls the axially acting forces needed to contract or extend the pleated section 18.

The contractibility and extensibility of the tubular member or body 12, and specifically, its pleated section 18, that has been described, provides for flexibility of the pleated section longitudinally of the tubular body 12. An additional feature of the invention is that the pleated section 18 may also be angled in a similar manner thereby providing for angling flexibility of the tubular member or body 12 even though it is formed from a semirigid material.

In the showing of FIG. 5, one way of adjusting the tubular body 26 for angulation purposes is illustrated. The angulation involved is obtained by reason of the fact that for each pleat 30, the wall segments 34 thereof may be only partially socketed into the wall segment 32 of the next succeeding pleat 30, this being done by angulating the tubular body 26 so that, for instance, at a pleat 30C, the wall segment 34 at one side or section 59 of same is partially snapped across the articulation 47 connecting it to the wall segment 32 of the next succeeding pleat, for instance, the pleat 30D, to seat the indicated wall segment 34 against the internal surfacing 54 of the indicated wall segment 32 at a relatively small area of engagement at one location along the annular internal surfacing 54 defined by the wall segment 32 in question. In such angled relation for a particular pleat 30C, the wall segment 34 is deflected toward the wall segment 32 of the next succeeding pleat 30D approximately 180 degrees thereabout to effect a predetermined amount of angulation of the tubular body 26 relative to its central axis 28, for instance, 10 degrees. By similarly socketing the wall segment 34 of the next succeeding pleat 30D into the pleat 30E, and at the same location along the circumference of side wall of the tubular body 26, so that the angle portions of same are in coplanar relation, a second angulation unit is added to the angulation, which if the parts are proportioned to give an angulation for each pleat 30 of 10 degrees, would provide a 20 degree angulation of the tubular body 26. Similarly, partially socketing adjacent pleats will provide for increased angulation, such as for the 90 degree angulation indicated in FIG. 7. The angulation may be 180 degrees or more for a particular tubular body 12 if it is provided with a pleated section 18 having the requisite number of pleats 30. The number of pleats 30 employed to define

pleated section 18 of body 12 is optional and will depend, for any given structure provided with a pleated section 18 in accordance with the invention, on the use to which such structure is to be put.

The angulation provided for partial snap or pop shifting for partial socketing of the respective pleats (that has been indicated) will depend on the size of the tubing involved, and specifically, will depend on the ratio that diameter of the pleat crown bears to the radial length of the pleat convolutions (that is, the difference between the outer diameter of the pleat crowns and the outer diameter of the pleat roots). For the proportioning of parts illustrated in FIGS. 1-7, the angulation provided per pleat partial pop or snap shift is approximately 10 degrees.

In the showing of FIG. 6, the socketing described in connection with the showing of FIG. 5 is provided at the pleats 30C, 30D, and 30E, with a similar partial socketing being provided at the pleats 30F, 30G and 30C, but on the opposite side of the tubular body 12, which has the effect of disposing the end portions 14 and 16 of the tubular body 12 in substantially parallel but misaligned, oppositely extending relations.

In this connection, it is pointed out that with regard to the partial socketing feature of the invention that has been described, for any one pleat 30, this may be effected at any location 360 degrees thereabout, with a similar partial socketing being effected at one or more pleats 30 spaced from the partially socketed pleat in question, and at other locations 360 degrees thereabout, as desired by the user or as needed by the application. This will dispose the end of the pleated portion 18, and thus the ends of the tubular body 12 at angles relative to each other which are not coplanarly related, and which may, for instance, be angled to the front or rear of the showing of FIGS. 5 and 6, or otherwise angled, for further adjustable flexibility of the tubular body 26.

It has also been found that when one of the pleats 30 has been partially socketed for angulation purposes in the manner indicated, the thus partially socketed and angled pleat is stably held in such angled relation and it also may be swung or rotated, about axis 28, and in effect rolled about the wall segment 32 into which it has been partially socketed, to dispose the angled portion of the pleated section at the desired position of angulation, with regard to the circumference of body 12. Other pleats may be similarly partially socketed and rolled 360 degrees thereabout to provide the desired positioning of the angled tubular body portions involved, to achieve multiple angular positioning of the tubular body ends.

In all of these operative relations of the pleated section 18 insofar as the body 26 is concerned, the body 12 is stable in its adjusted relation. Thus, the body 12 and specifically its pleat section 18 in its extended relation of FIGS. 1 and 2 is stable due to the special asymmetrical shaping of the pleats 30 that is involved, and particularly the wall segments 32 and 34 thereof, together with the semirigid nature of the material from which the tubular body 26 is formed. While the material is semirigid in nature, it is also resiliently flexible so that the conventional seals applied to the threaded ends 20 are effective in use in the conventional manner. However, the body 12 at its pleated section 18 has its wall segments 32 and 34 shaped and proportioned to resist the snap shifting or popping that has been referred to until adequate pressure is applied to achieve the resiliently flexible deformation or flexing that has been referred to.

In the contracted relation of the body 12, as illustrated by FIGS. 3A and 4, the socketed relation of the popped in pleats 30, and the engagement of the wall segments 34 thereof with the inner surfacings 54 of the wall segments 32 of the next succeeding pleats thereof 360 degrees thereabout, insures stability of the tubular body lengthwise and transversely of same after it has been adjusted for application purposes.

When the tubular body 12 is to be angularly related, as by employing the partial socketing relations described in connection with the showings of FIGS. 5-7, the seating of the partially socketed wall segments 34 against the inner surfacing 54 of the wall segment 32 of the next succeeding pleat 30 provides a bracing action that together with the semirigid nature of the material involved, and the arched configuration of the wall segments 32 and 34, insures stability in the angled adjusted position of the tubular body 12.

It is to be understood that the basic aspects of the invention are concerned with the specific arrangement of the tubular body 12 insofar as the pleated section 18 is concerned. In practice the pleated section 18 may be incorporated in tubular bodies used for a wide variety of purposes, several of which are indicated in the showings of FIGS. 8-11. Thus, while the pleated sections are particularly useful in connection with connecting devices employed for plumbing drain system and other plumbing purposes, the pleated section 18 may also be employed in the form of ducting for automobile venting purposes and electrical conduit receiving purposes, hose lengths of any given standard length in which the entire length of the hose has the configuration of the pleated section 18, and as the tubular member employed form the arms and legs of toy robots. The same pleated configuration may be employed in containers, as the side wall structure for the container, to provide a container of adjustable volume.

For connecting devices for plumbing drain system and other plumbing purposes, the gauge of the material forming the pleated section 18 should be uniform through out the axial length of same, and preferably should be in the range of from about 0.030 inch to about 0.070 inch, depending on the application (for fluid conveying purposes, body 12 should, of course, be imperforate). However, the gauge may also range from about 0.005 inch to about 0.25 for specific applications, as for instance, drains arranged as suggested in connection with the description of FIG. 11 may have a gauge at the larger end of the scale, while an appropriate polyolefin material, such as polypropylene, a suitable metal, such as copper, may also be employed.

Also, for plumbing drain system and other plumbing purposes, the gauge of the material at the pleated section 18 may be somewhat less than at straight sections 14 and 16, but the mass per unit length of the pleated section is preferably about equal to the mass per unit length of the straight sections, in the extended relation of the pleated section. In the fully contracted relation the pleated section will have a mass per unit length that obviously exceeds that of the straight sections because of the telescoped relation involved.

SPECIFIC DESCRIPTION

The device 10 arranged as indicated in FIG. 1 may be employed to connect adjacent ends of separate pipes together, as by selecting a device 10 of the needed length to span the gap between the pipes 23 and 25, and overlap the ends of the pipe ends to be connected, first

applying the nuts 22 and the sealing washers 24 to the respective ends of the pipes (being connected) in the usual manner, and then taking the tubular body 12, adjusting it lengthwise of same and angulation wise of same so that its straight ends 14 and 16 will slip over the ends of the pipes in question, and then tightening the nuts 22 against the seals 24 utilizing the threadings 20 in the usual manner. For this purpose, the pleated section 18 is contracted, angled, and reextended as needed, following the principles described in connection with the showing of FIGS. 3-7, as needed to precisely flex the pleated section 18 of the tubular body 26 for good fitting relation with the pipe ends in question.

In the showing of FIG. 8, the device 10 is shown employed to provide a temporary seal for a crack 70 of a plastic pipe 72. The device 10 may be used in this manner by assuming that the device 10 in question is selected in terms of size so that its internal diameter of its straight sections 14 and 16, and thus of the pleated section roots 44, is proportioned to suitably fit over pipe 72, disconnecting the pipe 72 at its closest end portion, and slipping one of the nuts 22 and the washer 24 therefor over the pipe end and beyond the crack 70, then contracting the tubular body 12 at its pleated section 18 so that all of its pleats 30 are in socketed relation, and slipping tubular body 12 as so contracted over the pipe 72 to the position indicated in FIG. 8, with its pleated section 18 in overlying relation to the crack 70, and then applying the other sealing nut 22 and seal 20 over the pipe; thereafter, the ends of the device 10 are sealed to the external surface of the pipe 72 by threading the nuts 22 about the threadings 20 against the respective seals 24 in the conventional manner that is known to the art, and as shown in FIG. 8. The body 12 being imperforate in nature along its length, and the contracted relation of the pleated section 18 having the added internal radial dimensioning that has been indicated, provides for easy slipping of the tubular body 26 over the pipe 72 for application in sealing relation in the manner indicated to the crack 70. The pipe 72 open end in question may then be reconnected for continued use of the pipe 72 until permanent repairs can be made.

In the showing of FIG. 9, the body 12B is employed to connect a standard tailpiece 90 of a sink or basin to a standard trap 92. The tubular body 12B defines plumbing connector device 10B that is of unitary blow-molded plastic tubular construction and formed from a material such as polypropylene to define an upper straight section 94 and a lower straight section 96, which are integrally connected by pleated section 18B that is arranged in accordance with the teachings of FIGS. 1-7.

The upper portion of the upper section 94 is threaded in the manner indicated for the straight sections 14 and 16 of the device 10, and thus to define the threading 20 that threadedly receives the standard nut 98 which is applied against the usual sealing washer that is comparable to washer 24 (not shown). The nut 98 and the seal it bears against initially is slipped over the end of the tailpiece 90 and are followed by application of the device straight section 94 over same, after which the nut 98 is tightened on the threading of the upper section 94 to compress the washer to effect the usual seal between the section 94 and the tailpiece 90; as indicated by the showing of FIG. 9, the trap 92 is out of alignment with the tailpiece 90, and the pleated section 18B is flexed lengthwise and angularity wise for precise fit application of the device 10B to the trap 92, with the lower end of the lower section 96 being excised as needed to be

received within the trap 92. Lower section 96 is equipped with a conventional sealing nut 100 and associated washer type seal (not shown but of the conventional type referred to above) for making the familiar application of same to threading at the upstanding end of the trap 92, as is well known in the art.

In the showing of FIG. 10, the length of ducting or hose 80 is illustrated which may have any desired length, and which for its full length except at its extreme ends 82 and 84 is pleated to define the individual pleats 30 for the full length of pleated section 18A of the ducting or hosing 80 in question that is formed by body 12A. Such ducting or hose 80 may be used for any purpose that conventional ducting or hosing is currently used for, as, for instance, commonly in automobiles for venting purposes, and in buildings for air supply or discharge purposes, and for serving as garden hose. For packaging purposes, the ducting or hose 80 may be contracted to a fraction of its extended relation length by disposing all of its pleats 30 in the fully socketed relation that has been described. Ends 82 and 84 may be straight sections similar to end sections 14 and 16 of device 10 for sealing type connections of the type indicated in FIGS. 1 and 8, or suitably threaded, flanged, socketed, or the like for conventional connection at their ends as needed for attaching conventional ducting or hosing to use same.

In the showing of FIG. 11, reference numeral 110 illustrates a container formed from polypropylene or the like to define sidewall 112 that includes pleated section 18C that extends substantially the length of the sidewall 112 and has the configuration indicated in FIGS. 2 - 7 for contraction and extension purposes. The container has integral bottom wall 114, an integral top wall 116 defining in the form illustrated an upstanding neck 118 to which a closure cap 120 of any suitable type may be applied. Other than the cap 120, the container 110 may be of one piece construction made by a suitable molding procedure.

The sidewall 112 of the container 110 is shown to have its several pleats 30 in extended and contracted relations at several locations along the height of the container, for varying the height or length of the container.

Alternately, the container 110 may be in the form of a relatively small cylindrical shaped can, or be proportioned similarly to the sides of the well known 55 gallon drum, with the sidewalls of same incorporating the pleated section 18 for varying the capacity of same.

It will therefore be seen that the invention provides a tubular body that may serve as a connector, conduit, or container, which includes the special pleated section 18 or its equivalents having the contractible, extensible, and angularity adjustments that have been described that are effected by articulating the pleated section at the annular articulations or loci that have been described, which define the flexing loci of the device. When the device has been disposed at its pleated section to have the extended, contracted, or angled relation indicated, it is stable in all of these relations, once so adjusted by the user. The socketed relation of the pleat Belleville washer wall segments 34 into the thrust cone wall segments 32 of the next adjacent pleats, whether for full contraction purposes, or for angulation purposes, provides a bracing effect on the tubular body at the socketed area that enhances stability. For angulation purposes, the ability of the partially socketed pleats to be rotated or rocked around the axis of the tubular body

for positioning it in any desired location 360 degrees thereabout, together with the indicated stability for the angled position in of same, permits the device to have wide adaptability of connecting components that are spaced apart and misaligned, with full freedom of undesired shifting or internal bias caused by elastic memory, after the device has been adjusted as desired

The device may be made from other polyolefin materials, such as polyvinyl chloride, and the high temperature version of same (see PVC), as well as polyethylene and the already suggested polypropylene, for instance. In a specific embodiment of the invention intended for plumbing drain system applications, the material employed is polypropylene, the gauge of the pleated section walls is 0.046 inch, the axial length of the individual pleats is 0.440 inch, the wall segments 32 and 34 are angled at 31 degrees and 52 degrees relative to the axial center line 28 of the tubular body involved, and the protuberances or ribs extend 0.046 axially of the tubular body and 0.046 radially of same.

The foregoing description and the drawings are given merely to explain and illustrate the invention and the invention is not to be limited thereto, except insofar as the appended claims are so limited, since those skilled in the art who have the disclosure before them will be able to make modifications and variations therein without departing from the scope of the invention.

What is claimed is:

1. A tubular wall structure for tubular connectors and the like, said wall structure comprising:
a tubular body of pleated accordion fold configuration formed from a semirigid resiliently flexible material of substantially uniform gauge to define an encompassing wall of tubular configuration that has a longitudinal central axis extending centrally and longitudinally of same,
said wall being formed to define along said central axis alternating thrust cone wall segments and Belleville washer like wall segments integrally connected consecutively along the length of said pleated section,
said thrust cone wall segments defining a wide end at one end of same and a narrow end portion at the other end of same, said wall segments being spherically contoured,
said Belleville washer like wall segments defining a wide end portion at one end of same and a narrow end portion at the other end of same, said wall segments being spherically contoured,
with each of said pleats comprising a thrust cone wall segment and a Belleville washer like wall segment integrally connected at their respective narrow end portions to define annular articulations therebetween and form the roots of the pleats,
with the wide end portion of each Belleville washer like wall segment of each pleat being integral with the wide end portion of the thrust cone wall segment of the next consecutive pleat to form the crowns of the pleats,
said crowns of said pleats each respectively lying in a plane that extends normally of said axis and defining a radially outwardly distensible annular articulation between the Belleville washer like wall segment and the thrust cone wall segment, said wide ends integrally connected thereat including an integral, externally disposed, protuberance in circumambient relation thereabout for resiliently resisting distension of said crown radially outwardly thereof in the plane of the crown,

- said Belleville washer like wall segment of each pleat being proportioned to be wholly snap shifted through the said plane at the articulation between same and the thrust cone wall segment of the next adjacent pleat for disposing said pleats in contracted and extended relation axially of said body, with the respective pleats in their extended relations each having the said thrust cone wall segment thereof disposed relative to said Belleville washer like wall segment thereof such that said other end of said thrust cone segment is disposed substantially 90° of said other end of said Belleville washer like wall segment thereof annularly about said root of the respective pleats,
- said proportioning of said Belleville washer like wall segment at the respective pleats accommodating snap shifting of one side only of said other end of same through said plane thereof at the said articulation thereof within an in stabilized seating relation against the thrust cone wall segment of the said next adjacent pleat, for disposing said thrust cone wall segment thereof in angled relation to such next adjacent pleat thrust cone wall segment, whereby said tubular body is stable in and may be preset, prior to use, in its said extended, contracted and angled relations.
2. The wall structure set forth in claim 1 wherein: said protuberances and said crowns of said pleats are asymmetrical in configuration, and said wall segments are of substantially frusto-conical configuration.
3. The wall structure set forth in claim 1 wherein: the thrust cone wall segments of each pleat are proportioned to extend axially of said central axis approximately twice the corresponding amount that said Belleville washer like wall segments extend.
4. The wall structure set forth in claim 1 wherein: said tubular body includes a flexing loci at said roots and said crowns of said pleats with said wall segments being in thrust transmitting relation therebetween.
5. The wall structure set forth in claim 1 wherein: said wall structure defines a container that is closed at one end of said tubular body and that is open at the other end of said tubular body for reception therein of material to be received in said body, and including means for removably closing said other end of said body, whereby said container is extendable and contractible axially of said body central axis.
6. The wall structure set forth in claim 1 wherein: said protuberances are grooved internally of said wall structure, said protuberances each being of substantially like dimensions in relation to said wall structure.

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