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COLOMBIA

P-3441

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISION DE NUEVAS CREACIONES

E. S. D.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 12-130301- -00002-0000

Fecha: 2012-10-04 15:13:35 Dep. 2020 DIR.NUEVASCR
Tra. 2 PATENTES Eve: 1 REGDEPOSITO
Act. 444 RESPUESTAREQUE Folios: 30

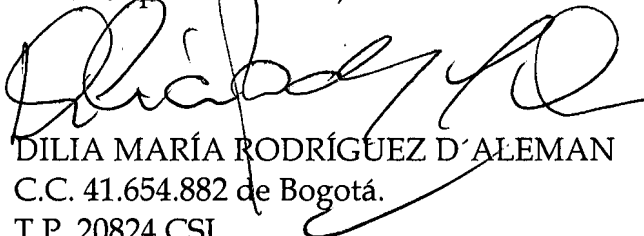
Ref.: Expediente No. 12.130.301
Solicitud de Patente a nombre de
PLAINSMAN MANUFACTURING INC.

Yo, DILIA MARÍA RODRÍGUEZ D'ALEMAN, identificada como aparece al pie de mi firma, domiciliada en la Carrera 11 No. 86-53, piso 6, obrando como apoderada de la sociedad **PLAINSMAN MANUFACTURING INC.**, solicitante de la patente de la referencia, en respuesta al oficio No. 17129 notificado por fijación en lista el día 25 de Septiembre de 2012, atentamente me permito presentar:

1. Documentos donde consta la cesión del derecho a la patente otorgada por los inventores a favor de mi mandante, con su respectiva traducción del inglés al español.
2. Documento de poder con su respectiva traducción del inglés al español.
3. Copia certificada de la solicitud de Patente número 61/514,350 de 02 de agosto de 2011, con la debida traducción de lo pertinente.

Espero con esto haber dado cabal cumplimiento a lo solicitado por ese despacho y de conformidad con lo indicado en los artículos 3°, inciso 3, 35 inciso 2 y 59 inciso 2 del CCA, al analizar este memorial, atentamente ruego se traten todas las cuestiones planteadas con motivo del mismo.

Señor Superintendente,



DILIA MARÍA RODRÍGUEZ D'ALEMAN
C.C. 41.654.882 de Bogotá.

T.P. 20824 CSJ

notificaciones@clarkemodet.com.co

1

This is Exhibit 1 referred to in the affidavit of Mark A. Lea-Wilson sworn before me this 21 day of September, 2012.

Robbie Nissen
Robbie Nissen

Notary
public in
and for
the province
of Alberta.

ASSIGNMENT

In consideration of good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, each Assignor named below hereby assigns and confirms that the Assignor has assigned to the Assignee named below, whose address is as shown below, all of the Assignor's interest for Canada, the United States and the entire world in the following listed patent applications and/or patents, the inventions described therein, any patent granted from the patent applications, and any patent or patent application claiming domestic or foreign priority from any one or more of the patent applications, including the right to claim priority from the patent applications under any national law or international convention:

Title: ISOLATED SHEARING MECHANISM FOR DOWNHOLE TOOLS		
US Patent Application No. 61514350 Filing Date: August 2, 2011	US Patent Application No. 13/305,709 [Lambert Intellectual Property Law has authority to insert the application no. and filing date] Filed: November 28, 2011	CA Patent Application No. 2,760,149 [Lambert Intellectual Property Law has authority to insert the application no. and filing date] Filed: November 28, 2011

Assignor will, without further consideration, but at the expense of Assignee, do all such things and execute all such documents as may be necessary or desirable to obtain and maintain patents for the inventions and for additions and modifications thereto in any country.

Assignor enters into this assignment freely, and consents to disclosure of all personal information contained herein to the extent required to prosecute, maintain and enforce the rights assigned.

This assignment is governed by the laws of Alberta, Canada. This assignment is effective August 2, 2011.

Assignor name: Mark A. Lea-Wilson

Signature of assignor: [Signature] Date of signing: 28 Nov/11

Assignor name: Shane McAssey

Signature of assignor: [Signature] Date of signing: 2011/11/28

Assignee: Plainsman Manufacturing Inc.

Address of assignee: 8305 McIntyre Road, Edmonton, AB, T6E 5J7, Canada

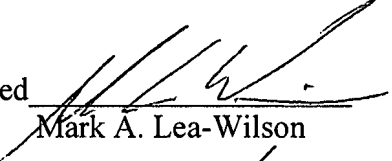
Signature of assignee/representative: [Signature] Date of signing: Nov, 28, 2011

Title of authorized representative: President

City of Edmonton
Province of Alberta
Country of Canada

I, Mark A. Lea-Wilson, confirm that the document attached to this affidavit as Exhibit 1, namely a scanned copy of an assignment to Plainsman Manufacturing Inc. of patent applications entitled "Isolated Shearing Mechanism for Downhole Tools", is a true copy of the original document, which I have seen.

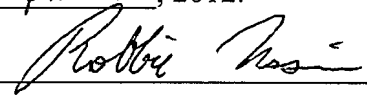
Signed


Mark A. Lea-Wilson

Dated

21 SEP/12

Sworn before me at Edmonton in the
Province of Alberta, this 21 day of
September, 2012.



Name: Robbie Nissen
NOTARY PUBLIC and Commissioner for
Oaths in the Province of Alberta
Student-at-law

My commission expires at Her Majesty's
Pleasure upon my ceasing to be a student-at-
law in good standing of the Law Society of
Alberta.

BOGOTA D.C. OCTUBRE 02, 2012

TRADUCCION POR TRADUCTOR E INTERPRETE OFICIAL
(VERIFIQUE ANTES DE PROCEDER)

CESION

En consideración de buena y valuable compensación cuyo recibo y suficiencia con el presente son reconocidos, cada Cedente citado adelante con el presente cede y confirma que el Cedente ha cedido al Cesionario citado adelante, cuya dirección aparece adelante, todo el interés del Cedente para Canadá, Estados Unidos y en todo el mundo en las siguientes solicitudes de patente listadas y/o patentes, los inventos descritos en los mismos, cualquier patente conferida de las solicitudes de patente, y cualquier patente o solicitud de patente reclamando prioridad doméstica o extranjera de cualquiera o más de las solicitudes de patente, incluyendo el derecho de reclamar prioridad de las solicitudes de patente bajo cualquier ley nacional o convención internacional.

Título: MECANISMO DE CORTE AISLADO PARA HERRAMIENTAS DE ORIFICIO DE POZO (ISOLATED SHEARING MECHANISM FOR DOWNHOLE TOOLS)					
Solicitud de Patente de Estados Unidos No. 61514350. Fecha de radicación: Agosto 02, 2011		Solicitud de Patente de Estados Unidos No. 13/305,709 [La Ley de Propiedad Intelectual Lambert tiene autoridad para insertar en No. de solicitud y fecha de radicación] Radicada: Noviembre 28, 2011		Solicitud de Patente de Canadá No. 2,760,149 [La Ley de Propiedad Intelectual Lambert tiene autoridad para insertar en No. de solicitud y fecha de radicación] Noviembre 28, 2011	



El Cedente, sin más compensación, pero a costa del Cesionario, realizará todo lo que sea necesario y firmará todos los documentos que sean necesarios o deseables para obtener y mantener patentes para los inventos y para adiciones y modificaciones a las mismas en cualquier país.

El Cedente suscribe esta cesión libremente, y acepta la revelación de toda la información personal contenida en la presente hasta donde sea requerido para conseguir, mantener y aplicar los derechos cedidos.

Esta cesión está gobernada por las leyes de Alberta, Canadá. Esta cesión entra en vigencia en Agosto 02, 2011.

Nombre del Cedente. Mark A. Lea-Wilson

Firma del Cedente (HAY FIRMA) Fecha de firma: 28/NOV/11

Nombre del Cedente. Shane McAssey

Firma del Cedente (HAY FIRMA) Fecha de firma: 2011/11/28

Cesionario: Plainsman Manufacturing Inc.

Dirección del Cesionario: 8305 McIntyre Road, Edmonton, AB, T6E 5J7, Canadá

Firma del representante del Cesionario (HAY FIRMA) Fecha firma: Nov/25/2011

Cargo del representante autorizado: PRESIDENTE.

Ciudad de Edmonton

Provincia de Alberta

País, Canadá



Yo, Mark A. Lea-Wilson, confirmo que el documento anexo a esta declaración como Exhibición 1, copia escaneada de una cesión a Plainsman Manufacturing Inc. de las solicitudes de patente tituladas MECANISMO DE CORTE AISLADO PARA HERRAMIENTAS DE ORIFICIO DE POZO (ISOLATED SHEARING MECHANISM FOR DOWNHOLE TOOLS), es una copia auténtica del documento original, que he visto.

Firmado (HAY FIRMA)

Mark A. Lea-Wilson

Fecha: 21/SEP/12.

Juramentado ante mi en Edmonton en la Provincia de Alberta, hoy Septiembre 21, 2012.

(HAY FIRMA)

Nombre: Robbie Nissen

NOTARIO PUBLICO y Comisionado para Juramentos en la Provincia de Alberta.

Mi comisión expira a voluntad de Su Majestad, luego de cesar de ser estudiante de derecho en buena reputación de la Sociedad Legal de Alberta.

NOTA DE TRADUCCION: Manuscrito al inicio: esta es la exhibición 1 a que hace referencia la declaración de Mark A. Lea-Wilson, juramentado ante mi hoy septiembre 21 de 2012 (HAY FIRMA) Robbie Nissen notario publico provincia de alberta

CERTIFICADO DE AUTENTICIDAD: El suscrito Traductor e Intérprete Oficial juramentado, debidamente registrado ante el Ministerio de Relaciones Exteriores de Colombia, con el presente certifica que esta es una traducción al Idioma Castellano, del documento en Inglés anexo para verificación. Cualquier reproducción anula la traducción, firma y sello.

TRAINING AND EDUCATION SERVICES

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Bogotá – Colombia

FIDEL ANTONIO MURCIA MURCIA

Traductor e Intérprete Oficial

Resolución No. 488/94 Ministerio de Justicia



P-3441



COLOMBIA

Carrera 11 N° 86-53 Piso 6 Bogotá Colombia Tel: (57 1) 6181088 Fax: (57 1) 6350824 Email: info@clarkemodet.com.co

PODER

POWER OF ATTORNEY

Yo (nosotros), abajo firmante(s)

I (we), the undersigned

en mi (nuestro) carácter de representante(s) legales de

legal representative(s) of

PLAINSMAN MANUFACTURING INC. (Plainsman Mfg. Inc.)

PLAINSMAN MANUFACTURING INC. (Plainsman Mfg. Inc.)

una sociedad organizada y existente de acuerdo con las leyes de

an organization existing under the laws of

y en actual cumplimiento de su objeto social, con domicilio en 8305 McIntyre Road, Edmonton AB T6E 5J7, Canada.

and in present execution of its business activity, domiciled at 8305 McIntyre Road, Edmonton AB T6E 5J7, CA.

por el presente instrumento confiero (conferimos) poder especial a favor de DILIA MARIA RODRIGUEZ D'ALEMAN, con Cédula de Ciudadanía No. 41.654.882 de Bogotá, y tp. 20824 con domicilio en Bogotá, Colombia, para que actuando en su orden en nombre del (de la) otorgante le (la) representen ante cualquier entidad, autoridad y/o persona, especialmente ante las del orden Administrativo, Contencioso Administrativo, Judicial, Tribunales de Arbitramento y/o cualquier otro en lo referente a los siguientes asuntos:

do hereby grant POWER OF ATTORNEY to DILIA MARIA RODRIGUEZ D'ALEMAN, identification card No. 41.654.882 of Bogotá, and tp. 20824 residing in Bogotá Colombia, to act in the order of their appointment in behalf of grantor before any entity, authority and/or natural or juridical person, specially before those Administrative, Administrative-Contentious, Judicial, arbitration courts, and/or any other, in all matters concerning the following:

- 1) Solicitar, tramitar, obtener y/o registrar cualquiera de las modalidades de Propiedad Industrial, tales como: patentes de invención, modelos de utilidad; diseños industriales, variedades vegetales; marcas, lemas, nombres y enseñanzas comerciales y denominaciones de origen; así como sus renovaciones, prórrogas, transferencias, cambios de nombre y/o domicilio, contratos y licencias.
- 2) Solicitar, tramitar, obtener y/o registrar derechos de autor, en cualquiera de sus presentaciones así como la protección de secretos industriales y know-how.
- 3) Solicitar, tramitar, obtener y/o registrar registros sanitarios, permisos y/o licencias de funcionamiento; así como sus renovaciones o prórrogas, transferencias, cambios de nombre y/o domicilio, contratos y licencias.
- 4) Ejercer acciones de oposición, observación, reclamos, reconsideración, reposición, apelación, cancelación administrativa o judicial, nulidad, protección al consumidor, concesión de licencias, protección de secretos industriales y demás acciones y recursos relacionados con derechos derivados de los asuntos arriba indicados y en contra de la competencia desleal, acciones derivadas de la obtención o explotación de licencias, acciones de indemnización de perjuicios. También podrá(n) intervenir en juicios civiles, comerciales, penales, contencioso-administrativos, tutelas y de policía; en acciones o juicios promovidos por el (la) mandante o en contra el (ella).
- 5) Registrar nombres de dominio ante la entidad competente.
- 6) En el ejercicio de este mandato los mandatarios arriba mencionados quedan facultados para: conciliar, cancelar, transigir, comprometer en árbitros, desistir, recibir y tomar posesión de la cosa objeto de litigio y renunciar o desistir a derechos concedidos o en curso de concesión, admitir los hechos del proceso.
- 7) Ratificar o no la agencia oficiosa.
- 8) Así mismo faculto (facultamos) a los mencionados apoderados para recibir notificaciones y designar apoderados judiciales o extrajudiciales, sustituir el presente poder y revocar las sustituciones que hicieren.

- 1) To apply, process, obtain and/or register any of the modalities of Industrial Property, such as: Patents of Invention, Utility Models; Designs, plant varieties; Marks, Slogans, Trade Names and emblems and appellations of Origin; as well as their renewals, assignments, changes of name and/or domicile, agreements and licenses.
- 2) To apply, process, obtain and/or register copyrights of any kind as well as protection of industrial secrets or know-how.
- 3) To apply, process, obtain and/or register sanitary registrations, operating authorizations and/or licenses; as well as their renewals or assignments, changes of name and/or domicile, agreements and licenses.
- 4) To bring actions of opposition, observations, claims, reconsideration, appeal or legal remedies, cancellations, nullity, protection to the consumer, granting of licenses, protection of trade secrets and other actions related with rights derived from the above-mentioned matters and against the unfair competition, actions resulting from the obtaining or exploitation of licenses, recovering damages actions. They can also intervene or participate in Civil, Commercial, Criminal or Contentious-Administrative Trials; the actions for writ mandamus, police actions; in actions, lawsuits or litigations instituted by the grantor or against him.
- 5) To register domain names before the competent entity.
- 6) To the effect of this mandate the above-named proxy are empowered to: conciliate, cancel, settle, submit to arbitration, withdraw and to receive and take possession of the litigation related objet and waive or renounce the rights granted or in process of granting, admit the facts of the case.
- 7) To ratify or not the officious agency.
- 8) I (we) hereby appoint the afore mentioned attorneys with powers to receive notifications and to designate judicial and extrajudicial attorneys, substitute this Power of Attorney and to revoke such substitutions.

Dado y firmado en

Granted and signed at

a los días de

on this day of

Firma / signatura

ESTADOS UNIDOS DE AMERICA
A TODOS AQUELLOS A QUIENES EL PRESENTE LLEGUE:

DEPARTAMENTO DE COMERCIO DE LOS ESTADOS UNIDOS
Oficina de Patentes y Marcas de los Estados Unidos

Septiembre 05,2012

La presente es para certificar que el anexo es una copia fiel de los registros de la Oficina de Patentes y Marcas de los Estados Unidos, de los documentos de la solicitud de patente identificada más adelante, que cumplieron con los requerimientos para concederse una fecha de presentación de acuerdo con 35 USC 111.

Número de Solicitud: **61/514,350**

Fecha de Presentación: Agosto 02 de 2011

EL CÓDIGO DEL PAÍS Y EL NÚMERO DE SU SOLICITUD DE PRIORIDAD, PARA SER USADA EN LA PRESENTACIÓN EXTRANJERA BAJO EL CONVENIO DE PARÍS ES **US61/514,350**

Por la autoridad de

Bajo el Secretario de Comercio para la Propiedad Intelectual y el Director de la Oficina de Patentes y Marcas de los Estados Unidos de América

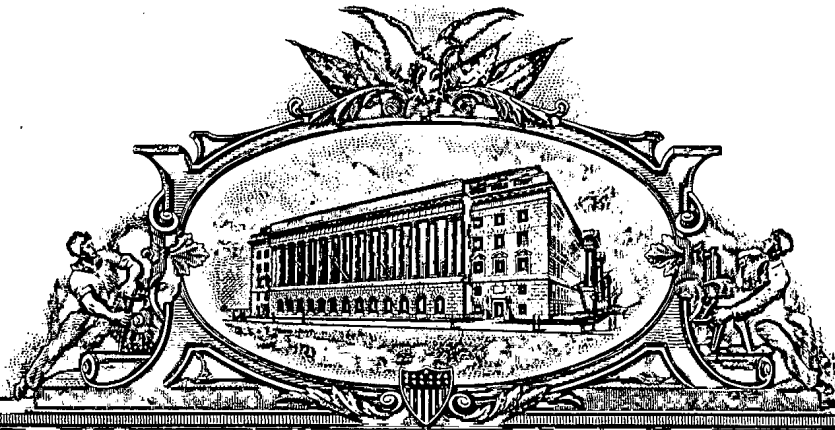
(fdo) **T.WALLACE**

Oficial Certificador

Sello oficial de la Oficina de Patentes y Marcas de los Estados Unidos de América

3491

PA 7375046



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

**UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office**

September 05, 2012

**THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM
THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK
OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT
APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A
FILING DATE UNDER 35 USC 111.**

APPLICATION NUMBER: 61/514,350

FILING DATE: August 02, 2011

**THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY
APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS
CONVENTION, IS US61/514,350**

**By Authority of the
Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office**



T. Wallace
T. WALLACE
Certifying Officer

9

Electronic Acknowledgement Receipt

EFS ID:	10648069
Application Number:	61514350
International Application Number:	
Confirmation Number:	4163
Title of Invention:	ISOLATED SHEARING MECHANISM FOR SHEAR COUPLINGS, TUBING DRAINS AND OTHER DOWNHOLE TOOLS
First Named Inventor/Applicant Name:	Mark Lea-Wilson
Customer Number:	20212
Filer:	Anthony Richmond Lambert
Filer Authorized By:	
Attorney Docket Number:	143-12US
Receipt Date:	02-AUG-2011
Filing Date:	
Time Stamp:	17:31:59
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 110
RAM confirmation Number	4590
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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1	Provisional Cover Sheet (SB16)	ProvisionalSB.pdf	1093342 55950eb5344ed8c3b23358aa1f06955a25f77c78	no	3
Warnings:					
Information:					
2	Claims	Claims.pdf	180129 0f49cc0b11f68836403bb75ada87db639bfc d50d	no	2
Warnings:					
Information:					
3	Drawings-other than black and white line drawings	Figures.pdf	545046 d7f3f40e382a26e4134c14dd418f34abc6d1 46c6	no	3
Warnings:					
Information:					
4	Specification	Specification.pdf	180011 96886856ac4755de1fc2ce95d77447e862a d75ff	no	5
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	29756 e0ff7235c6496751a693acd009132206d40c d898	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			2028284		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

Provisional Application for Patent Cover Sheet
This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c)

Inventor(s)

Inventor 1					Remove
Given Name	Middle Name	Family Name	City	State	Country i
Mark		Lea-Wilson	Edmonton	AB	CA

Inventor 2					Remove
Given Name	Middle Name	Family Name	City	State	Country i
Shane		McAssey	Ardrossan	AB	CA

All Inventors Must Be Listed – Additional Inventor Information blocks may be generated within this form by selecting the **Add** button.

Title of Invention	ISOLATED SHEARING MECHANISM FOR SHEAR COUPLINGS, TUBING DRAINS AND OTHER DOWNHOLE TOOLS
Attorney Docket Number (if applicable)	143-12us

Correspondence Address

Direct all correspondence to (select one):

☒ The address corresponding to Customer Number	☐ Firm or Individual Name
Customer Number	20212

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.	
☒ No.	
☐ Yes, the name of the U.S. Government agency and the Government contract number are:	

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

Entity Status Applicant claims small entity status under 37 CFR 1.27					
☒ Yes, applicant qualifies for small entity status under 37 CFR 1.27 ☐ No					
Warning Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.					
Signature Please see 37 CFR 1.4(d) for the form of the signature.					
Signature	/tonylambert#32813/			Date (YYYY-MM-DD)	2011-08-02
First Name	Anthony	Last Name	Lambert	Registration Number (If appropriate)	32813
This collection of information is required by 37 CFR 1.51. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. This form can only be used when in conjunction with EFS-Web. If this form is mailed to the USPTO, it may cause delays in handling the provisional application.					

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that : (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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ISOLATED SHEARING MECHANISM FOR SHEAR COUPLINGS, TUBING DRAINS AND OTHER DOWNHOLE TOOLS

BACKGROUND OF THE INVENTION

[0001] The present invention relates to sucker rod components, tubing drains and downhole tooling, assuring that components will detach at an applied pre-determined tensile load or pressure while eliminating the effects of torsion and bending on the shearing mechanism.

[0002] In a producing oil or gas well using a rotating downhole pump is driven from the surface by a sucker rod string. The pump typically consists of a rotor which is attached to the sucker rod string and spins inside a stator. Sometimes it is necessary to remove the sucker rod string from the rotor. The shear coupling is threaded onto the sucker rod string near the pump and when a pre-determined axial load is applied to the shear coupling it separates allowing the sucker rod string to be removed.

[0003] Similar to sucker rod strings tubing string are formed of segments of tubing. The sucker rod and pump lie within the tubing string. Tubing drains thread between segments of tubing near the bottom of the string. The tubing drain is activated prior to removing the tubing from the well and is necessary to avoid lifting the weight of the fluid column and to avoid fluid contamination of the surface at the well site.

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SUMMARY OF THE INVENTION

[0003] Presently most shear couplings are comprised of two components, one male component which mates with a female component, and a number of shear pins inserted into holes drilled transversely through both components of the shear coupling [U.S. Pat. No. 4,422,508]. Alternatively some shear couplings are comprised of single or multiple components with a reduced cross sectional area designed to shear when a pre-determined tensile load is applied [U.S. Pat. No. 2004/0202521 A1, U.S. Pat. No. 5,470,118]. Known shear mechanisms in shear couplings at this time are subject to combined axial, bending and torsion loading experienced in typical downhole production, and the bending and torsional loading is much greater in deviated wells than vertical wells because of well deviation and friction along the tubing string. The combined stress from axial, bending and torsion loading may result in early activation of the shear mechanism below the designed pre-determined axial load disrupting production. Additionally the bending and torsion loading fatigues the shear mechanism leading to early failure and disrupting production. Even designs utilizing keyways and shear pins are subject to torsional and bending loads at the pins. Not all circumferential displacement is taken up key and this displacement travels down through the male component of the shear coupling and is then transferred to the shear pins.

[0004] Unlike known shear coupling designs the shear mechanism according to this invention is only subject to axial loading within the shear coupling even though the shear coupling body is subject to axial, bending and torsional loading. The present invention in the preferred embodiment is a shear mechanism consisting of two components, one male and one female, with matching grooves on both components. A wire is fed into the groove when the components are mated together through a hole which intersects the groove from outside the shear coupling assembly and forms the shear mechanism and the shear load is controlled by varying the wire diameter, ultimate strength and length of the wire fed into the groove. A key and keyway transmits torque without applying the load to the wire which forms the shear mechanism. Similarly the key, keyway and shaft transmit the bending load without applying load to the shear mechanism. The wire may be isolated from downhole fluids using an o-ring or similar seal preventing corrosion and binding of the shear mechanism. Additionally the present invention of the shear mechanism allows the shear coupling to be hollow and fluid to flow through the shear coupling; this is a feature that is not present in any known shear coupling designs and is beneficial to well sites in certain conditions.

[0005] The present invention of the wire shearing mechanism may also be incorporated in tubing drains. Similar to a shear coupling a tubing drain is comprised of two components, one male and one female. The male component is referred to as the tubing drain body and resembles a large diameter pipe which threads onto segment of tubing. A number of holes or slots in the tubing drain body allow downhole fluids to flow in or out of the tubing body through the opening. The female component is referred to as a sleeve and functions by sealing the openings in the body by sliding over top of openings with o-rings or similar seals on either side of the openings. The sleeve is designed to slide down the body allowing the fluid to drain out when the inside pressure reaches a pre-determined amount and activates a shear mechanism between the tubing drain body and sleeve. All known tubing drain designs use a shear mechanism comprising of multiple shear pins which thread through the sleeve into the body where the pre-determined shear pressure is controlled by varying the ultimate strength of the screws and the shear diameter of the screws. Tubing drains are activated prior to removing the tubing from the well and are necessary to avoid lifting the fluid weight and avoid fluid contamination of the surface at the well site. As with the shear couplings the present invention in the preferred embodiment is a shear mechanism consisting of two components, a body and sleeve, with matching grooves on both components. A wire is fed into the groove when the components are mated together through a hole which intersects the groove from outside the tubing drain assembly and forms the shear mechanism and the shear pressure is controlled by varying the wire diameter, ultimate strength and length of the wire fed into the groove. The benefits of incorporating the present invention into a tubing drain are that the length of the tubing drain can be reduced because the wire diameter is typically much smaller than the diameter of shear screws and the wall thickness of the body at the groove will be thicker. The increased wall thickness results in a greater strength of the tubing drain body and the decreased sleeve length allows for a larger gripping area for use with power tongs making the installation and removal of the tubing drain easier.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. 1 is an isometric view sectioned through the axis of the preferred embodiment of the shear mechanism in an assembled shear coupling. Wire not shown; removed for clarity. The shear mechanism is isolated from torsion.

[0007] FIG. 2 is an exploded isometric view of the preferred embodiment of the shear mechanism in a shear coupling. Wire not shown; removed for clarity. The shear mechanism is isolated from torsion.

[0008] FIG. 3 is a front view sectioned through the axis of the preferred embodiment of the shear mechanism in a shear coupling. Wire not shown; removed for clarity. The shear mechanism is isolated from torsion.

[0009] FIG. 4 is a front view sectioned through the axis of an alternative embodiment of the shear mechanism in a shear coupling in which the shear mechanism is isolated from bending and torsional loads.

[0010] FIG. 5 is a front view sectioned through the axis of a secondary alternative embodiment of the shear mechanism in a shear coupling in which the shear mechanism is isolated from bending and torsional loads.

[0011] FIG. 6 is a front view sectioned through the axis of a tertiary alternative embodiment of the shear mechanism in a shear coupling in which the shear mechanism is isolated from torsional loads and is similar to the secondary embodiment but lacking the tube which resists bending loads.

DETAILED DESCRIPTION OF THE INVENTION

[0012] In **FIG. 1, 2, 3, 4, 5, and 6**, **1** is the male component of the shear coupling with a thru hole along the central axis allowing for fluid flow within the coupling. **2** is the female component of the shear coupling with a thru along the central axis which mates with **1**. **3** and **4** are the grooves which house the wire (not shown; removed for clarity) which forms the shear mechanism. **5** and **6** are the key and keyway respectively and transmit torque applied to the shear coupling. **7** is a seal necessary for fluid to flow through the shear coupling. In **FIG. 2**, **8** is the installation hole which the shear wire is fed into. The installation hole intersects the groove formed by **3** and **4** and the wire wraps around the diameter of the as it is fed into the groove. In **FIG. 1, 2 and 3**, **9** is the flow through area which allows fluid to flow through the shear coupling rather than outside the shear coupling.

[0013] There are many variations and applications for the present invention and all are not shown in the included figures. One of the possible variations is to omit the flow through area, **9** in **FIG. 1, 2 and 3**. In this variation the fluid would flow outside the shear coupling as is the industry norm as shown in **FIG. 4, 5 and 6**. **FIG. 4 and FIG 5** show the shear mechanism isolated from both bending and torsion. **FIG. 6** shows a variation of **FIG. 4 and 5** without the tube which resists bending. An alternate possible application of the present invention is the shear mechanism in a tubing drain where the screw screws are replaced with the shear wire (not shown).

The shear coupling thus described comprises a male member mated with a female member. The male member and female member have cooperating receiving parts that together define a receiving space, in

the embodiment shown the receiving parts are half-grooves which together form a groove. A breakable part is located in the receiving space. The breakable part contacts against each of the male member and the female member to convey axial forces between the male member and the female member below a first axial load. The first axial load defines an upper boundary for a first operating range in which the shear coupling is intended to convey axial loads. The breakable part is breakable under axial loads within a second operating range of axial loads below the axial load break points of the male member and female member and above the first axial load. The second operating range corresponds to a pre-set operating range for breaking the shear coupling. In an embodiment disclosed here, the receiving space comprises a groove, and the breakable part comprises a wire. Instead of a wire, other elements may be used such as ball bearings, rollers, and segments of a wire. The receiving space may be continuous or discontinuous. The shear coupling may be used as disclosed.

REIVINDICACIONES

1. Un mecanismo de corte para segurar dos componentes que corta en una carga axial predeterminada, el mecanismo de corte comprende:
 - (a) un componente macho que se acopla en un componente hembra, el componente macho tiene una primer ranura que se extiende alrededor del componente macho y el componente hembra tiene una segunda ranura que se extiende alrededor del componente hembra, la primera ranura y la segunda ranura cooperan cuando el componente macho se inserta en el componente hembra para definir una cavidad anular;
 - (b) una abertura dentro de uno o ambos componentes macho y componente hembra, la abertura se alinea con la cavidad anular; y
 - (c) un componente de corte dentro de la cavidad anular, el componente de corte tiene una carga de corte que se controla mediante el material y el tamaño del componente de corte.
2. El mecanismo de corte de la reivindicación 1 en la que el componente de corte comprende un cable.
3. El mecanismo de corte de la reivindicación 1 en la que el componente de corte comprende una banda.
4. El mecanismo de corte de la reivindicación 1, 2 o 3 en la que el componente macho se acopla al componente hembra.

5. El mecanismo de corte de la reivindicación 4 en la que el componente macho se acopla al componente hembra con una chaveta hexagonal.
6. El mecanismo de corte de la reivindicación 1, 2 o 3 en la que el componente macho es un cuerpo de drenaje de tubería y el componente hembra es un manguito.
7. Un mecanismo de corte, comprende:
 - un componente macho acoplado con un componente hembra;
 - el componente macho y el componente hembra tienen partes de recepción cooperantes que definen juntas un espacio de recepción que se extiende alrededor del componente macho; y
 - una parte rompible ubicada en el espacio de recepción, la parte rompible hace contacto contra cada uno de los componentes macho y hembra para transferir las fuerzas axiales entre el componente macho y el componente hembra por debajo de una primer carga axial y la parte rompible se puede romper bajo cargas axiales dentro de un rango de operación de cargas axiales por debajo de los puntos de ruptura de cargas axiales del componente macho y el componente hembra y por encima de la primer carga axial, y el rango de operación que corresponde a un rango preestablecido para la ruptura del acoplamiento de corte.
8. El mecanismo de corte de la reivindicación 7 en la que el espacio de recepción comprende una ranura anular.

9. El mecanismo de corte de la reivindicación 10 en la que la parte rompible comprende un cable o banda.
10. El mecanismo de corte de la reivindicación 7, 8 o 9 en la que el componente macho se acopla al componente hembra.
11. El mecanismo de corte de la reivindicación 10 en la que el componente macho se acopla al componente hembra con una chaveta hexagonal.
12. El mecanismo de corte de la reivindicación 7, 8, 9, 10 o 11 que comprende adicionalmente una abertura en uno ambos de los componentes macho y el componente hembra que se alinean con el espacio de recepción.
13. El mecanismo de corte de una cualquiera de las reivindicaciones 7-12 en combinación con una sarta de pozo, y el mecanismo de corte forma un acoplamiento de corte.
14. El mecanismo de corte de una cualquiera de las reivindicaciones 7-12 en la que el componente macho es un cuerpo de drenaje de tubería y el componente hembra es un manguito.
15. Un acoplamiento de corte, que comprende:
 - un componente macho que se acopla con un componente hembra;
 - el componente macho y el componente hembra tienen partes de recepción cooperantes que definen juntas uno o más espacios de recepción;

una o más partes rompibles ubicadas en uno o más espacios de recepción, una o más partes rompibles entran contacto con cada uno de los componentes macho y hembra para transferir las fuerzas axiales entre el componente macho y el componente hembra por debajo de una primer carga axial y la parte rompible se puede romper bajo cargas axiales dentro de un rango de operación de cargas axiales por debajo de los puntos de ruptura de carga axial del componente macho y el componente hembra y por encima de la primer carga axial, y el rango de operación que corresponde a un rango preestablecido para la ruptura del acoplamiento de corte;

el componente macho tiene un extremo de conexión que se conecta a una parte en una sarta de pozo diferente del componente hembra y tiene un extremo que va contra el componente hembra; y

el componente macho tiene una parte de diámetro reducido entre el extremo de conexión y el extremo que va contra el componente hembra para proporcionar salida de estrés en la parte rompible en operación del acoplamiento de corte.

16. El acoplamiento de corte de la reivindicación 15 en la que la parte de diámetro reducido se suministra entre el extremo de conexión y el espacio de recepción.
17. El acoplamiento de corte de la reivindicación 14 o 15 en la que el componente macho se acopla al componente hembra.

18. El acoplamiento de corte de la reivindicación 17 en la que el componente macho se acopla al componente hembra con una chaveta hexagonal.
19. El acoplamiento de corte de la reivindicación 15, 16 o 17 que comprende adicionalmente una abertura en uno o ambos componentes macho y el componente hembra que se alinea con el espacio de recepción.
20. Un mecanismo de corte para segurar dos componentes que cortan en una carga axial predeterminada, el mecanismo de corte comprende:
 - (a) un componente macho que se acopla en un componente hembra, el componente macho y el componente hembra tienen uno más espacios de recepción cooperantes;
 - (b) una abertura dentro de uno componente macho y un componente hembra, la abertura se alinea con la cavidad anular;
 - (c) uno o más componentes de corte dentro de uno o más espacios de recepción cooperantes, uno o más componentes de corte tienen una carga de corte que se controla por el material y el tamaño del componente de corte.
 - (d) el componente macho tiene un extremo de conexión que se conecta con una parte en una sarta de pozo diferente del componente hembra y tiene un extremo que va contra el componente hembra; y
 - (e) el componente macho tiene una parte de diámetro reducido entre el extremo de conexión y el extremo que va contra el componente hembra para proporcionar salida de

estrés en una o más partes rompibles en operación del mecanismo de corte.

21. El mecanismo de corte de la reivindicación 20 en la que el componente macho se acopla al componente hembra.
22. El mecanismo de corte de la reivindicación 21 en la que el componente macho se acopla al componente hembra con una chaveta hexagonal.

CLAIMS

1. A shearing mechanism for securing two components which shears at a pre-determined axial load.
The shearing mechanism comprising:
 - (a) a male component which mates into a female component. A groove is machined into the male component and aligns with a matching groove on the female component.
 - (b) a female component which mates on a male component. A groove is machined into the female component and aligns with a matching groove on the female component.
 - (c) a wire which is fed into the groove when the two components are mated together through a hole which intersects the groove from outside the assembly and forms the shear mechanism and the shear load or shear pressure is controlled by varying the wire diameter, ultimate strength and length of the wire fed into the groove.
2. The shearing mechanism of claim 1 in which a strip is fed into the groove when the two components are mated together through a hole or slot which intersects the groove from outside the assembly and forms the shear mechanism and the shear load or shear pressure is controlled by varying the cross sectional area of the strip, ultimate strength and length of the strip fed into the groove.
3. A shearing mechanism which is isolated from bending and torsional loads applied to the shearing assembly and shears at a pre-determined axial load or pressure as in claim 1 and claim 2.
4. A shearing mechanism which is isolated from cyclic bending, torsional loads and fatigue applied to the shearing assembly and shears at a pre-determined axial load or pressure as in claim 1 and claim 2.
5. A shear coupling, comprising:
 - a male member mated with a female member;
 - the male member and female member having cooperating receiving parts that together define a receiving space;
 - a breakable part located in the receiving space, the breakable part contacting against each of the male member and the female member to convey axial forces between the male member and the female member below a first axial load and the breakable part being breakable under axial loads within an operating range of axial loads below the axial load break points of the male member and female member and above the first axial load, and the operating range corresponding to a pre-set range for breaking the shear coupling.
6. The shear coupling of claim 5 in which the receiving space comprises a groove.

7. The shear coupling of claim 5 in which the breakable part comprises a wire.

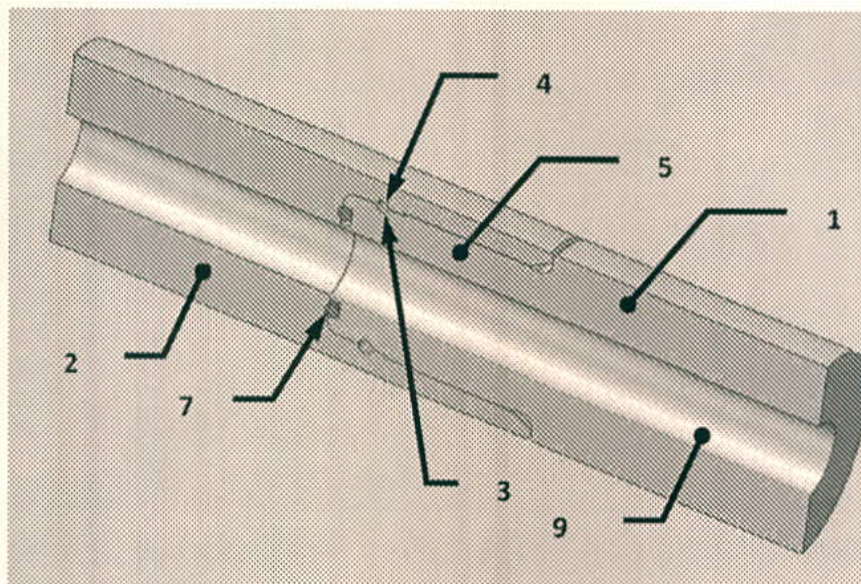


Fig. 1

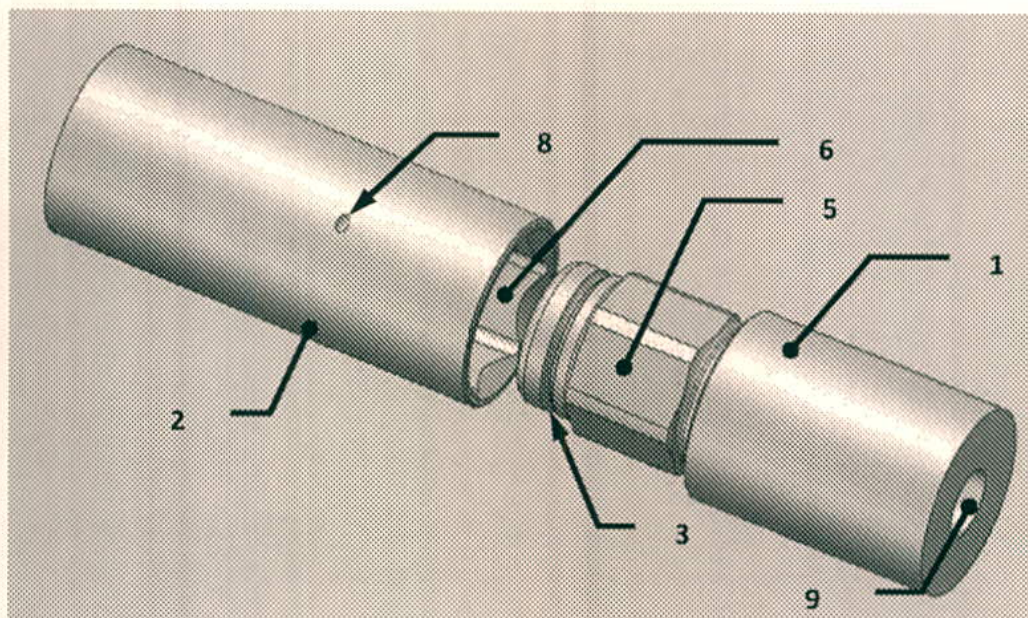


Fig. 2

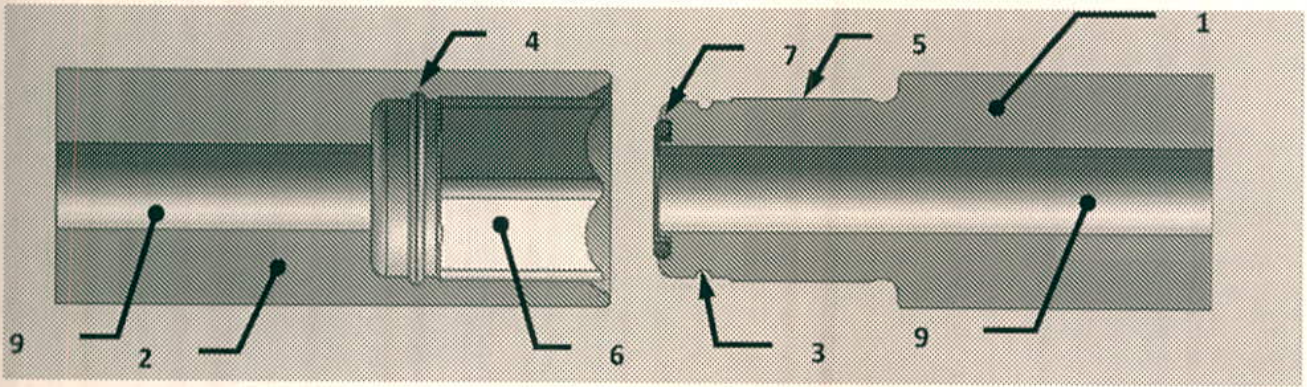


Fig. 3

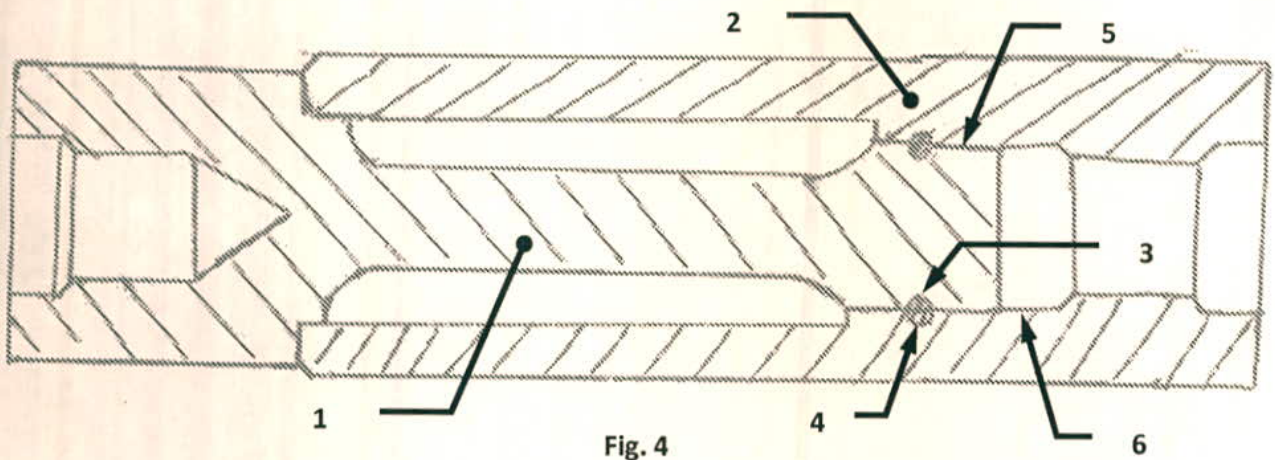


Fig. 4

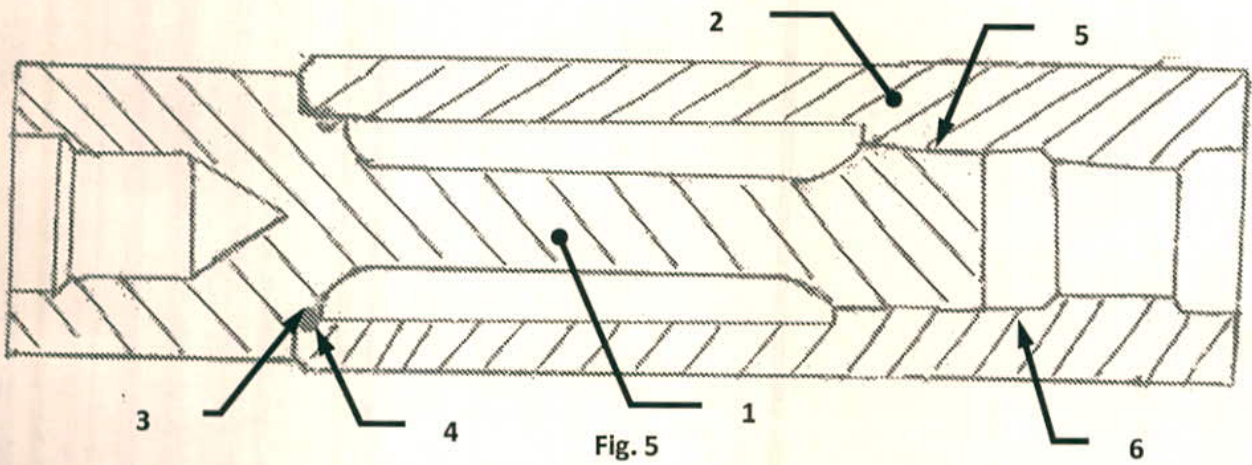


Fig. 5

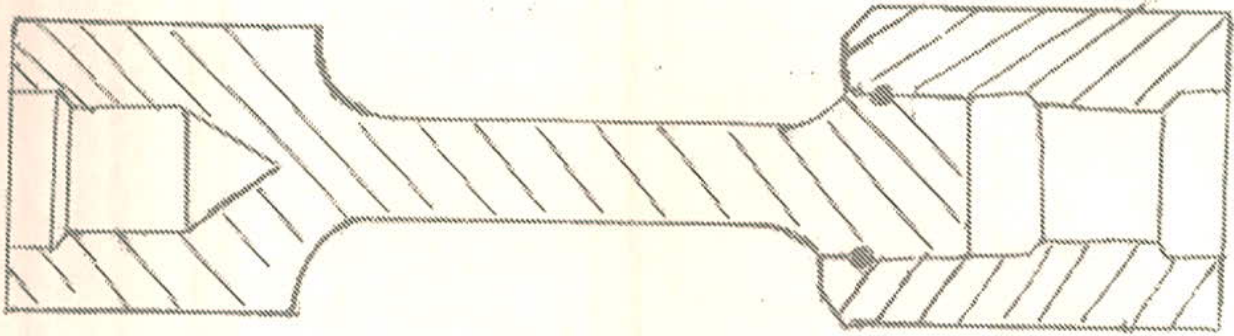


Fig. 6