



New connection on: : 06-03-2018 : 13:52:44 - Last disconnection on: : 06-03-2018 : 13:27:28

V 4.0.0.44358(LP,U,linux) (Rev:43856 2017-04-27 09:03:29+0200#(D201802)) (RPM D201802)

Welcome to EPOQUE Rebuild under the Production Environment

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PN - [US2017350224](#) A1 20171207

PR - US201715499547 20170427; US201662345494P 20160603; US201662345553P 20160603; US201662345590P 20160603; US201662345627P 20160603; US201662345654P 20160603

AP - US201715499547 20170427

DT - **

CCI - [C09K8/62](#) ; [C09K8/80](#) ; [E21B43/26](#)

CQI - [E21B33/138](#) ; [E21B43/261](#) ; [E21B49/02](#)

CQA - [E21B43/267](#) ; [E21B49/00](#)

PA - ENHANCED PRODUCTION INC [US]

TI - Hydraulic Fracturing in Highly Heterogeneous Formations by Fluid Selection based on Fracture Surface Roughness

AB - Well completion technology is disclosed for accounting for fracture surface roughness. A fracture **fluid** is **pumped** into the **wellbore** to form a **fracture** in a formation surrounding a wellbore. In one example, a **method** for completing a **wellbore** comprises **determining** a **fracture** surface roughness for a given formation rock, and for a given fracture **fluid** or **pumping** schedule or both, prior to hydraulic fracturing. A fracture **fluid** and/or a **pumping** schedule is selected based on the determined fracture surface roughness and formation characteristics. The selected fracture **fluid** is **pumped** into the wellbore, with the selected pumping schedule, to create a desired fracture network in the formation.

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PN - [MX2016006715](#) A 20160817

PR - US201314091677
20131127; WO2014US65532
20141113

AP - MX20160006715 20141113

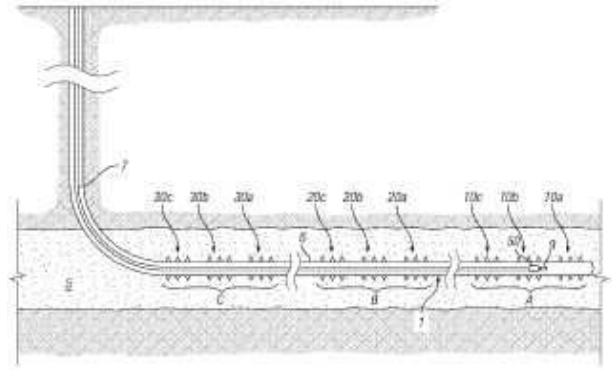
DT - I

CCI - [E21B43/14](#) ; [E21B43/26](#) ;
[E21B43/261](#)

PA - BAKER HUGHES INC [US]

TI - SYSTEM AND METHOD FOR RE-
FRACTURING MULTIZONE
HORIZONTAL WELLBORES.

AB - A packer on a tubing string
and diverting material
pumped down the tubing
string may be used isolate a
fracture cluster in a
multizone horizontal wellbore
that has been previously
hydraulically fractured. Once
hydraulically isolated, **fluid**
may be **pumped** down the
tubing string to re-fracture
the previously fractured
fracture cluster in an effort to
increase hydrocarbon
production from the
horizontal wellbore. The
tubing string may include
a **testing** device used
to **determine** whether a
specific fracture cluster
within the
horizontal **wellbore** should
be re-**fractured**. Diverting
material may be pumped
down the tubing string and
positioned adjacent a
fracture cluster to
hydraulically isolate the
fracture cluster during the re-
fracturing process. The
diverting material may be
cleaned out of the
horizontal **wellbore** after all
desired **fracture** clusters
along the horizontal wellbore
have been individually re-
fractured.



PN - [CN105765162](#) A 20160713

PR - US201314091677
20131127; WO2014US65532
20141113

AP - CN2014864834 20141113

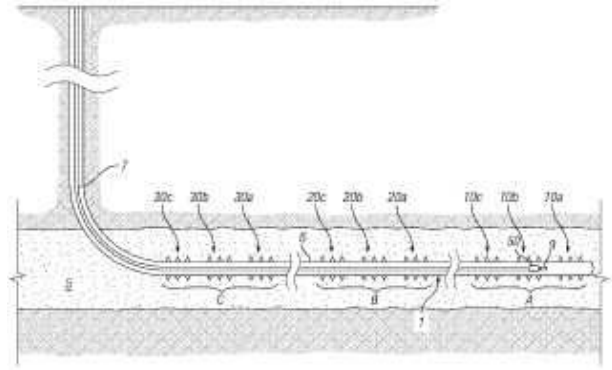
DT - I

CCI - [E21B43/14](#) ; [E21B43/26](#) ;
[E21B43/261](#)

PA - BAKER HUGHES INC

TI - System and method for re-
fracturing multizone
horizontal wellbores

AB - A packer on a tubing string
and diverting material
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string may be used isolate a
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specific fracture cluster
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material may be pumped
down the tubing string and
positioned adjacent a
fracture cluster to
hydraulically isolate the
fracture cluster during the re-
fracturing process. The
diverting material may be
cleaned out of the
horizontal **wellbore** after all
desired **fracture** clusters
along the horizontal wellbore
have been individually re-
fractured.



PN - [CA2931186](#) A1 20150604

PR - US201314091677
20131127; WO2014US65532
20141113

AP - CA20142931186 20141113

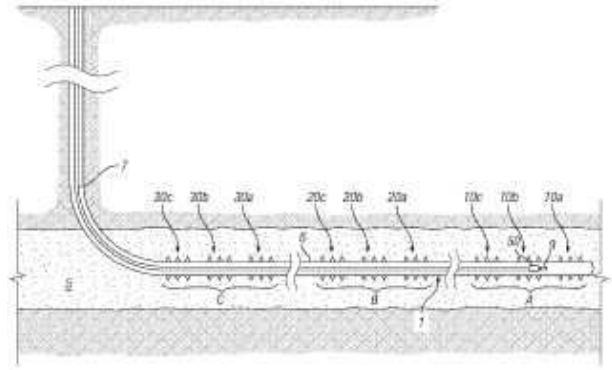
DT - I

CCI - [E21B43/14](#) ; [E21B43/26](#) ;
[E21B43/261](#)

PA - BAKER HUGHES INC [US]

TI - SYSTEM AND METHOD FOR RE-
FRACTURING MULTIZONE
HORIZONTAL WELLBORES

AB - A packer on a tubing string and diverting material pumped down the tubing string may be used isolate a fracture cluster in a multizone horizontal wellbore that has been previously hydraulically fractured. Once hydraulically isolated, **fluid** may be **pumped** down the tubing string to re-fracture the previously fractured fracture cluster in an effort to increase hydrocarbon production from the horizontal wellbore. The tubing string may include a **testing** device used to **determine** whether a specific fracture cluster within the horizontal **wellbore** should be re-**fractured**. Diverting material may be pumped down the tubing string and positioned adjacent a fracture cluster to hydraulically isolate the fracture cluster during the re-fracturing process. The diverting material may be cleaned out of the horizontal **wellbore** after all desired **fracture** clusters along the horizontal wellbore have been individually re-fractured.



PN - [AU2014355043](#) A1 20160526

PR - US201314091677
20131127; WO2014US65532
20141113

AP - AU20140355043 20141113

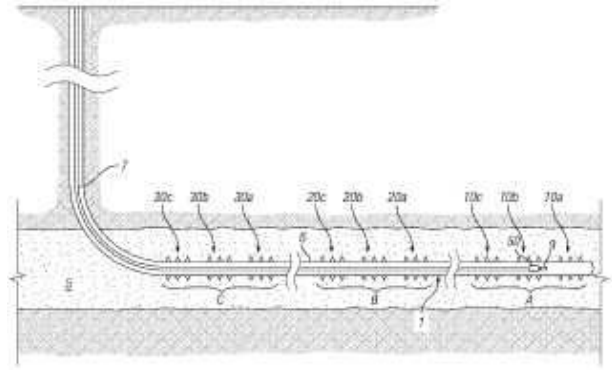
DT - I

CCI - [E21B43/14](#) ; [E21B43/26](#) ;
[E21B43/261](#)

PA - BAKER HUGHES INC

TI - System and method for re-
fracturing multizone
horizontal wellbores

AB - A packer on a tubing string
and diverting material
pumped down the tubing
string may be used isolate a
fracture cluster in a
multizone horizontal wellbore
that has been previously
hydraulically fractured. Once
hydraulically isolated, **fluid**
may be **pumped** down the
tubing string to re-fracture
the previously fractured
fracture cluster in an effort to
increase hydrocarbon
production from the
horizontal wellbore. The
tubing string may include
a **testing** device used
to **determine** whether a
specific fracture cluster
within the
horizontal **wellbore** should
be re-**fractured**. Diverting
material may be pumped
down the tubing string and
positioned adjacent a
fracture cluster to
hydraulically isolate the
fracture cluster during the re-
fracturing process. The
diverting material may be
cleaned out of the
horizontal **wellbore** after all
desired **fracture** clusters
along the horizontal wellbore
have been individually re-
fractured.



PN - [US2016053606](#) A1 20160225

PR - US201414784035
20140428; US201361820748P
20130508; WO2014US35600
20140428

AP - US201414784035 20140428

DT - **

CT - || R141 (A1)
[US9612359](#) B2 20170404 [
] (HOLLAND MARC [DE], et al);
[US9551208](#) B2 20170124 [
] (MA JIANFU [US], et al);
[US9158021](#) B2 20151013 [
] (MCKENNA JONATHAN P
[US]);
[US8960280](#) B2 20150224 [
] (MCKENNA JONATHAN P
[US], et al);
[US8898044](#) B2 20141125 [
] (CRAIG DAVID P [US]);
[US9513395](#) B2 20161206 [
] (ZHANG YANG [US], et al)

CCI - [E21B43/267](#) ; [E21B47/0003](#)

CUI - [E21B43/26](#)

PA - MICROSEISMIC INC [US]

TI - DETERMINING STIMULATED
RESERVOIR VOLUME FROM
PASSIVE SEISMIC MONITORING

AB - A **method** for **determining** a
stimulated rock volume
includes determining a
position of a plurality of
seismic events from seismic
signals recorded in response
to **pumping** fracturing **fluid**
into a formation penetrated
by a wellbore. The signals
generated by recording output
of a plurality of seismic
receivers disposed proximate
a volume of the Earth's
subsurface to be evaluated. A
source mechanism of each
seismic event is determined
and is used to determine a
fracture volume and
orientation of a fracture
associated with each seismic
event. A volume of each
fracture, beginning
with **fractures** closest to

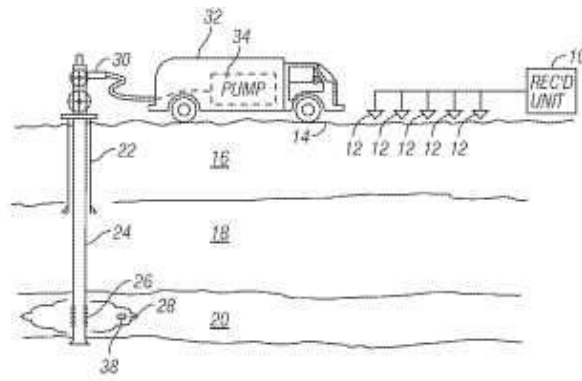


FIG. 1

a **wellbore** in which the **fracturing fluid** was **pumped** is subtracted from a total volume of proppant **pumped** with the fracture **fluid** until all proppant volume is associated with fractures. A stimulated rock volume is determined from the total volume of fractures associated with the volume of proppant pumped.

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- PN - [CA2911378](#) A1 20141113
- PNFP - CA2911378 C 20160301
- PR - US201361820748P
20130508; WO2014US35600
20140428
- AP - CA20142911378 20140428
- DT - I
- CCI - [E21B43/267](#) ; [E21B47/0003](#)
- CUI - [E21B43/26](#)
- PA - (A1 C)
MICROSEISMIC INC [US]
- TI - (A1 C)
DETERMINING STIMULATED
RESERVOIR VOLUME FROM
PASSIVE SEISMIC MONITORING
- AB - (A1 C)
A **method** for **determining** a stimulated rock volume includes determining a position of a plurality of seismic events from seismic signals recorded in response to **pumping** **fracturing fluid** into a formation penetrated by a wellbore. The signals generated by recording output of a plurality of seismic receivers disposed proximate a volume of the Earth's subsurface to be evaluated. A source mechanism of each seismic event is determined and is used to determine a fracture volume and orientation of a fracture associated with each seismic

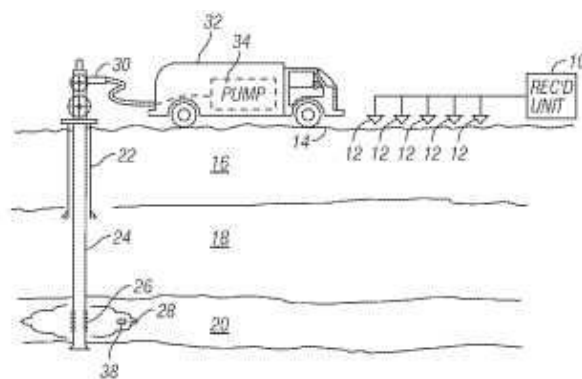


FIG. 1

event. A volume of each fracture, beginning with **fractures** closest to a **wellbore** in which the **fracturing fluid** was **pumped** is subtracted from a total volume of proppant **pumped** with the fracture **fluid** until all proppant volume is associated with fractures. A stimulated rock volume is determined from the total volume of fractures associated with the volume of proppant pumped.

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PN - [MX2015002141](#) A 20150511

PR - US201261692867P
20120824; WO2013US56461
20130823

AP - MX20150002141 20130823

DT - I

CCI - [E21B43/26](#)

CUI - [E21B49/00](#)

PA - SCHLUMBERGER TECHNOLOGY
BV [NL]

TI - SYSTEM AND METHOD FOR
PERFORMING STIMULATION
OPERATIONS.

AB - A system and method is provided for performing a **fracturing** operation about a **wellbore** penetrating a subterranean formation. The method may acquire integrated wellsite data. The method may generate a mechanical earth model using the integrated wellsite data. The method may simulate an intersection of an induced hydraulic fracture with a natural fracture using the mechanical earth model. The **method** may **determine** intersection properties of the intersected natural fracture. The method may also generate a stimulation plan

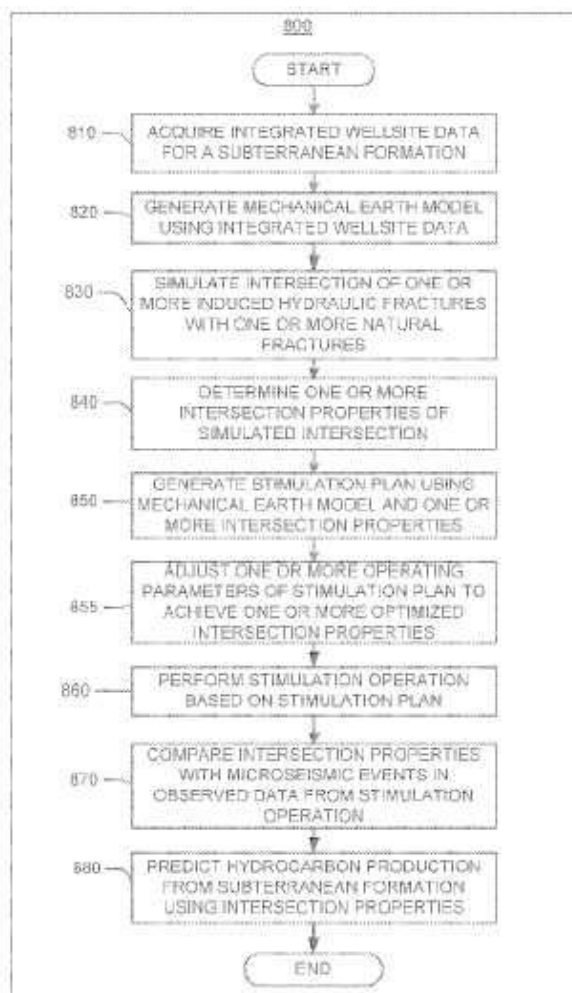


Fig. 8

using the mechanical earth model and the intersection properties. The stimulation plan may include a fluid viscosity or a rate of **injection** of a fracturing **fluid**.

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PN - [US2015204174](#) A1 20150723

PR - US201314423235
20130823; US201261692867P
20120824; WO2013US56461
20130823

AP - US201314423235 20130823

DT - **

CT - || R141 (A1)
[US2011257944](#) A1 20111020
[] (DU CHANGAN MIKE [US], et al);
[US2010256964](#) A1 20101007
[] (LEE DONALD W [US], et al);
[US2009065253](#) A1 20090312
[] (SUAREZ-RIVERA ROBERTO [US], et al)

CTNP - || R141 (A1)
[] - Sesetty_2012 (Modeling and Analysis of Stimulation for Fracture Network Generation, Proceedings, thirty-seventh workshop on geothermal reservoir engienering, stanfor university, stanford, california, January 30 - february 1, 2012, SGP-TR-194

CCI - [E21B43/26](#)

CUI - [E21B49/00](#)

PA - SCHLUMBERGER TECHNOLOGY CORP [US]

TI - SYSTEM AND METHOD FOR PERFORMING STIMULATION OPERATIONS

AB - A system and method is provided for performing a **fracturing** operation about a **wellbore** penetrating a subterranean formation. The method may acquire integrated wellsite data. The method may generate a mechanical earth model

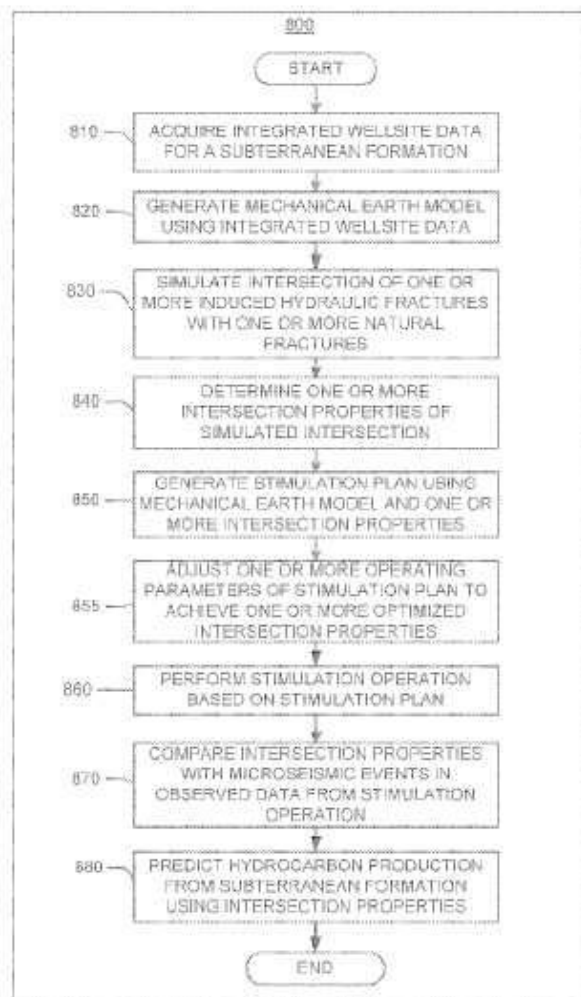


Fig. 8

using the integrated wellsite data. The method may simulate an intersection of an induced hydraulic fracture with a natural fracture using the mechanical earth model. The **method** may **determine** intersection properties of the intersected natural fracture. The method may also generate a stimulation plan using the mechanical earth model and the intersection properties. The stimulation plan may include a fluid viscosity or a rate of **injection** of a fracturing **fluid**.

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PN - [CN104685153](#) A 20150603

PR - WO2013US56461
20130823; US201261692867P
20120824

AP - CN2013851746 20130823

DT - I

CT - || STSE (A)
[US2005125209](#) A1 20050609
[A] (SOLIMAN MOHAMED Y [US], et al)
[A] 1-23
* 全文 *;
[US2007272407](#) A1 20071129
[X] (LEHMAN LYLE V [US], et al)
[X] 1-23
* 说明书第5-9、25-64段及附图1-6 *;
[US2009065253](#) A1 20090312
[A] (SUAREZ-RIVERA ROBERTO [US], et al)
[A] 1-23
* 全文 *;
[US2010004906](#) A1 20100107
[A] (SEARLES KEVIN H [US], et al)
[A] 1-23
* 全文 *;
[CN102606126](#) A 20120725
[A] (DONGFANG BAOLIN SCIENCE AND TECHNOLOGY DEV BEIJING CO LTD)
[A] 1-23
* 全文 *

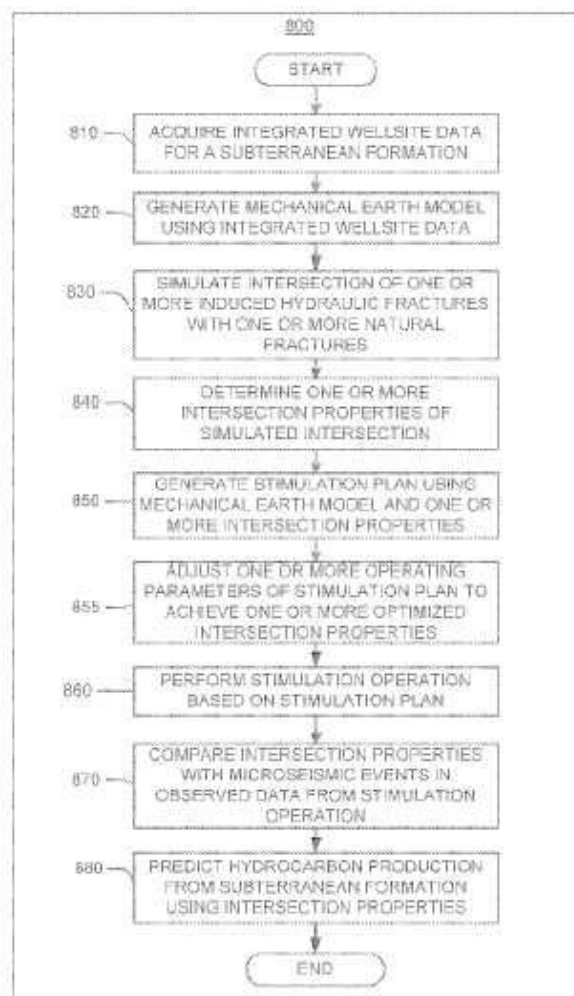


Fig. 8

CCI - [E21B43/26](#)

CUI - [E21B49/00](#)

CNOI - [E21B43/26](#) ; [E21B47/124](#) ;
[E21B49/00](#)

PA - PRAD RES & DEV LTD

TI - System and method for performing stimulation operations

AB - A system and method is provided for performing a **fracturing** operation about a **wellbore** penetrating a subterranean formation. The method may acquire integrated wellsite data. The method may generate a mechanical earth model using the integrated wellsite data. The method may simulate an intersection of an induced hydraulic fracture with a natural fracture using the mechanical earth model. The **method** may **determine** intersection properties of the intersected natural fracture. The method may also generate a stimulation plan using the mechanical earth model and the intersection properties. The stimulation plan may include a fluid viscosity or a rate of **injection** of a fracturing **fluid**.

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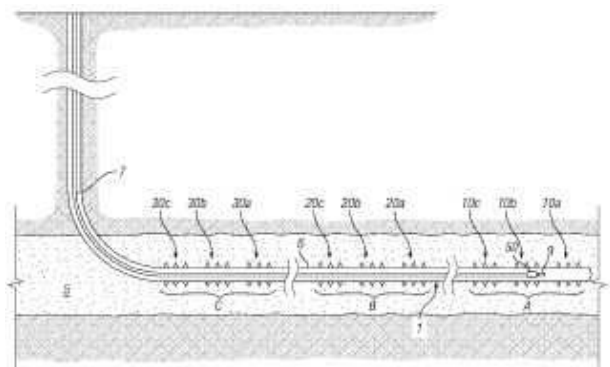
PN - [WO2015080872](#) A1 20150604

PR - US201314091677 20131127

AP - WO2014US65532 20141113

DT - **

CT - |KR| ISR (A1)
[US5273115](#) A 19931228
[A] (SPAFFORD STEPHEN D [US]);
[US2011220363](#) A1 20110915
[A] (GUPTA D V
SATYARNARAYANA [US], et al);
[US2013186625](#) A1 20130725
[A] (O'MALLEY EDWARD J [US]);
[US2008200352](#) A1 20080821
[A] (WILLBERG DEAN M [US], et al);



[US2013146291](#) A1 20130613
[A] (O'MALLEY EDWARD J [US])

- CCI - [E21B43/14](#) ; [E21B43/26](#) ;
[E21B43/261](#)
- PA - BAKER HUGHES INC [US]
- TI - SYSTEM AND METHOD FOR RE-FRACTURING MULTIZONE HORIZONTAL WELLBORES
- AB - A packer on a tubing string and diverting material pumped down the tubing string may be used isolate a fracture cluster in a multizone horizontal wellbore that has been previously hydraulically fractured. Once hydraulically isolated, **fluid** may be **pumped** down the tubing string to re-fracture the previously fractured fracture cluster in an effort to increase hydrocarbon production from the horizontal wellbore. The tubing string may include a **testing** device used to **determine** whether a specific fracture cluster within the horizontal **wellbore** should be re-**fractured**. Diverting material may be pumped down the tubing string and positioned adjacent a fracture cluster to hydraulically isolate the fracture cluster during the re-fracturing process. The diverting material may be cleaned out of the horizontal **wellbore** after all desired **fracture** clusters along the horizontal wellbore have been individually re-fractured.

PN - [US2015144347](#) A1 20150528

PNFP - US9366124 B2 20160614

PR - US201314091677 20131127

AP - US201314091677 20131127

DT - *; Rep

CT - || STSE (B2)

[US4951751](#) A 19900828 [] (JENNINGS JR ALFRED R [US])

[US5273115](#) A 19931228 [] (SPAFFORD STEPHEN D [US])

[US5462118](#) A 19951031 [] (JENNINGS JR ALFRED R [US], et al)

[US6446727](#) B1 20020910 [] (ZEMLAKE WARREN M [CA], et al)

[US7062420](#) B2 20060613 [] (POE JR BOBBY D [US])

[US7096954](#) B2 20060829 [] (WENG XIAOWEI [US], et al)

[US7225869](#) B2 20070605 [] (WILLETT RONALD M [US], et al)

[US7278486](#) B2 20071009 [] (ALBA RUBEN A [US], et al)

[US7380600](#) B2 20080603 [] (WILLBERG DEAN [RU], et al)

[US7389185](#) B2 20080617 [] (CRAIG DAVID P [US])

[US7478676](#) B2 20090120 [] (EAST JR LOYD E [US], et al)

[US7766083](#) B2 20100803 [] (WILLETT RONALD M [US], et al)

[US7934556](#) B2 20110503 [] (CLARK WILLIAM ERNEST [US], et al)

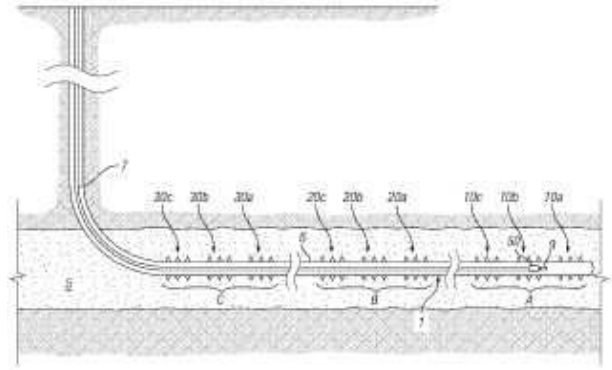
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[US8167043](#) B2 20120501 [] (WILLBERG DEAN M [US], et al)

[US8210257](#) B2 20120703 [] (DUSTERHOFT RONALD GLEN [US], et al)

[US8220543](#) B2 20120717 [] (CLARK WILLIAM ERNEST [US], et al)

[US8646529](#) B2 20140211 [] (CLARK WILLIAM ERNEST [US], et al)



[US8726991](#) B2 20140520 [] (BONEY CURTIS [US])
[US8794316](#) B2 20140805 [] (CRAIG DAVID P [US])
[US8857513](#) B2 20141014 [] (O'MALLEY EDWARD J [US])
[US8887803](#) B2 20141118 [] (EAST JR LOYD EDDIE [US], et al)
[US9027641](#) B2 20150512 [] (ALEKSEENKO OLGA PETROVNA [RU], et al)
[US2002092650](#) A1 20020718 [] (TOLMAN RANDY C [US], et al)
[US2002096324](#) A1 20020725 [] (POE BOBBY D [US])
[US2003121663](#) A1 20030703 [] (WENG XIAOWEI [US], et al)
[US2005211439](#) A1 20050929 [] (WILLETT RONALD M [US], et al)
[US2006113077](#) A1 20060601 [] (WILLBERG DEAN [RU], et al)
[US2006196667](#) A1 20060907 [] (ALBA RUBEN A [US], et al)
[US2007083331](#) A1 20070412 [] (CRAIG DAVID P [US])
[US2007284109](#) A1 20071213 [] (EAST LOYD E [US], et al)
[US2008000639](#) A1 20080103 [] (CLARK W E [US], et al)
[US2008110622](#) A1 20080515 [] (WILLETT RONALD M [US], et al)
[US2008210424](#) A1 20080904 [] (DUSTERHOFT DALE [US], et al)
[US2008289823](#) A1 20081127 [] (WILLBERG DEAN M [US], et al)
[US2009250211](#) A1 20091008 [] (CRAIG DAVID [US])
[US2010084134](#) A1 20100408 [] (TULISSI MICHAEL G [CA], et al)
[US2010212906](#) A1 20100826 [] (FULTON DWIGHT D [US], et al)
[US2011067871](#) A1 20110324 [] (BURDETTE JASON A [US], et al)
[US2011186298](#) A1 20110804

[] (CLARK W E [US], et al)
[US2011209868](#) A1 20110901
 [] (DUSTERHOFT RONALD G
 [US], et al)
[US2011226479](#) A1 20110922
 [] (TIPPEL PHILIPP [AT], et al)
[US2012285690](#) A1 20121115
 [] (WEAVER JIMMIE D [US], et
 al)
[US2013032349](#) A1 20130207
 [] (ALEKSEENKO OLGA
 PETROVNA [RU], et al)
[US2013048282](#) A1 20130228
 [] (ADAMS DAVID M [US], et
 al)
[US2013105157](#) A1 20130502
 [] (BARMATOV EVGENY
 BORISOVICH [GB], et al)
[US2013168082](#) A1 20130704
 [] (CLARK W E [US], et al)
[US2013186625](#) A1 20130725
 [] (O'MALLEY EDWARD J [US])
[US2013264054](#) A1 20131010
 [] (EAST LOYD EDDIE [US], et
 al)
[US2015027692](#) A1 20150129
 [] (EAST LOYD EDDIE [US], et
 al)
[US2015053397](#) A1 20150226
 [] (FILYUKOV RUSLAN V [US],
 et al)
[US2015075779](#) A1 20150319
 [] (WALTERS HAROLD
 GRAYSON [US], et al)
 - || R141 (A1)
[US4951751](#) A [];
[US5462118](#) A [];
[US2002096324](#) A1 [];
[US2002092650](#) A1 [];
[US6446727](#) B1 [];
[US2003121663](#) A1 [];
[US2005211439](#) A1 [];
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[US2006196667](#) A1 [];
[US2007083331](#) A1 [];
[US7225869](#) B2 [];
[US7278486](#) B2 [];
[US2008000639](#) A1 [];
[US2008110622](#) A1 [];
[US7389185](#) B2 [];
[US7380600](#) B2 [];

[US2008210424](#) A1 [];
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[US9027641](#) B2 [];
[US5273115](#) A [];
[US2011209868](#) A1 [];
[US8210257](#) B2 [];
[US2013186625](#) A1 [];
[US8726991](#) B2 [];
[US2015075779](#) A1 [];
[US2015053397](#) A1 [];
[US7478676](#) B2 [];
[US2007284109](#) A1 []

- CCI - [E21B43/14](#) ; [E21B43/26](#) ;
[E21B43/261](#)
- PA - (A1 B2)
 BAKER HUGHES INC [US]
- TI - (A1 B2)
 System and Method for Re-
 fracturing Multizone
 Horizontal Wellbores
- AB - (A1)
 A packer on a tubing string
 and diverting material
 pumped down the tubing
 string may be used isolate a
 fracture cluster in a
 multizone horizontal wellbore
 that has been previously
 hydraulically fractured. Once
 hydraulically isolated, **fluid**

may be **pumped** down the tubing string to re-fracture the previously fractured fracture cluster in an effort to increase hydrocarbon production from the horizontal wellbore. The tubing string may include a **testing** device used to **determine** whether a specific fracture cluster within the horizontal **wellbore** should be re-**fractured**. Diverting material may be pumped down the tubing string and positioned adjacent a fracture cluster to hydraulically isolate the fracture cluster during the re-fracturing process. The diverting material may be cleaned out of the horizontal **wellbore** after all desired **fracture** clusters along the horizontal wellbore have been individually re-fractured.

- (B2)

A packer on a tubing string and diverting material pumped down the tubing string may be used to isolate a fracture cluster in a multizone horizontal wellbore that has been previously hydraulically fractured. Once hydraulically isolated, **fluid** may be **pumped** down the tubing string to re-fracture the previously fractured fracture cluster in an effort to increase hydrocarbon production from the horizontal wellbore. The tubing string may include a **testing** device used to **determine** whether a specific fracture cluster within the horizontal **wellbore** should be re-**fractured**. Diverting material may be pumped

down the tubing string and positioned adjacent a fracture cluster to hydraulically isolate the fracture cluster during the re-fracturing process. The diverting material may be cleaned out of the horizontal **wellbore** after all desired **fracture** clusters along the horizontal **wellbore** have been individually re-fractured.

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PN - [CA2881718](#) A1 20140227

PR - US201261692867P
20120824; WO2013US56461
20130823

AP - CA20132881718 20130823

DT - I

CCI - [E21B43/26](#)

CUI - [E21B49/00](#)

PA - SCHLUMBERGER CA LTD [CA]

TI - SYSTEM AND METHOD FOR
PERFORMING STIMULATION
OPERATIONS

AB - A system and method is provided for performing a **fracturing** operation about a **wellbore** penetrating a subterranean formation. The method may acquire integrated wellsite data. The method may generate a mechanical earth model using the integrated wellsite data. The method may simulate an intersection of an induced hydraulic fracture with a natural fracture using the mechanical earth model. The **method** may **determine** intersection properties of the intersected natural fracture. The method may also generate a stimulation plan using the mechanical earth model and the intersection properties. The stimulation plan may include a fluid

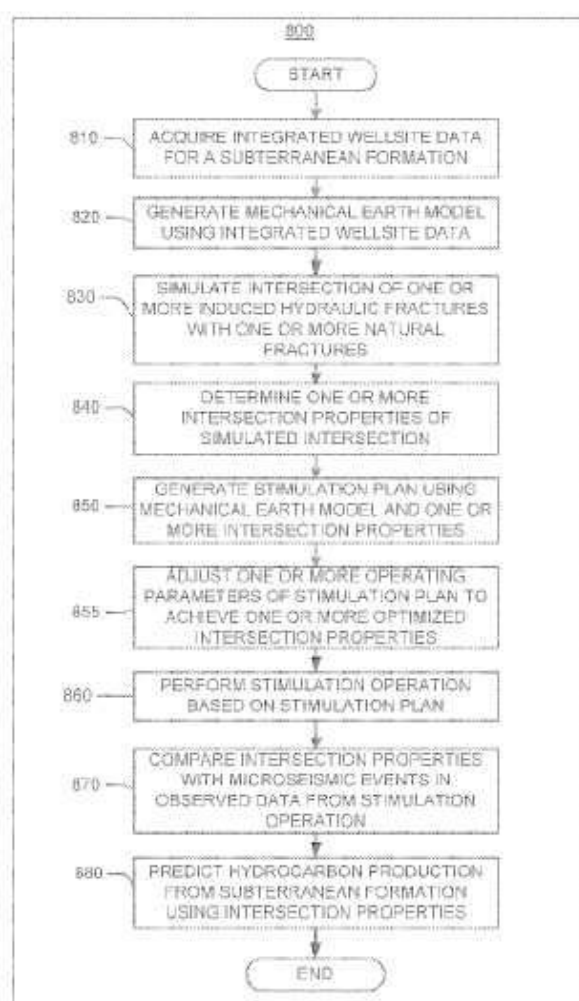


Fig. 8

viscosity or a rate of **injection**
of a fracturing **fluid**.

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PN - [WO2014182479](#) A2 20141113

PNFP - WO2014182479 A3 20150507

PR - US201361820748P 20130508

AP - WO2014US35600 20140428

DT - *; Rep

CT - |US| ISR (A3)
[US2011110191](#) A1 20110512
 [A] (WILLIAMS-STROUD
 SHERILYN [US], et al);
[US2010256964](#) A1 20101007
 [A] (LEE DONALD W [US], et al);
[US2012318500](#) A1 20121220
 [A] (URBANCIC THEODORE
 IVAN [CA], et al);
[US2011257944](#) A1 20111020
 [A] (DU CHANGAN MIKE [US],
 et al)

CCI - [E21B43/267](#) ; [E21B47/0003](#)

CUI - [E21B43/26](#)

PA - (A2 A3)
 MICROSEIMIC INC [US]

TI - (A2 A3)
 DETERMINING STIMULATED
 RESERVOIR VOLUME FROM
 PASSIVE SEISMIC MONITORING

AB - (A2 A3)
 A **method** for **determining** a
 stimulated rock volume
 includes determining a
 position of a plurality of
 seismic events from seismic
 signals recorded in response
 to **pumping** fracturing **fluid**
 into a formation penetrated
 by a wellbore. The signals
 generated by recording output
 of a plurality of seismic
 receivers disposed proximate
 a volume of the Earth's
 subsurface to be evaluated. A
 source mechanism of each
 seismic event is determined
 and is used to determine a
 fracture volume and
 orientation of a fracture
 associated with each seismic
 event. A volume of each

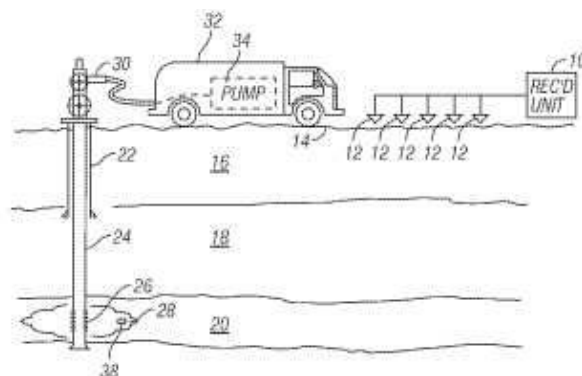


FIG. 1

fracture, beginning with **fractures** closest to a **wellbore** in which the **fracturing fluid** was **pumped** is subtracted from a total volume of proppant **pumped** with the fracture **fluid** until all proppant volume is associated with fractures. A stimulated rock volume is determined from the total volume of fractures associated with the volume of proppant pumped.

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PN - [WO2014032003](#) A1 20140227

PR - US201261692867P 20120824

AP - WO2013US56461 20130823

DT - *; Rep

CT - |KR| ISR (A1)

[US2007294034](#) A1 20071220
[A] (BRATTON TOM [US], et al);

[US2008183451](#) A1 20080731
[A] (WENG XIAOWEI [US], et al);

[US2011125471](#) A1 20110526
[A] (CRAIG DAVID P [US], et al);

[US2011257944](#) A1 20111020
[A] (DU CHANGAN MIKE [US], et al);

[US2012158380](#) A1 20120621
[A] (HAJIBEYGI HADI [US], et al)

CCI - [E21B43/26](#)

CUI - [E21B49/00](#)

PA - SCHLUMBERGER CA LTD [CA];
SCHLUMBERGER SERVICES
PETROL [FR]; SCHLUMBERGER
HOLDINGS [GB];
SCHLUMBERGER TECHNOLOGY
BV [NL]; PRAD RES & DEV LTD
[GB]; SCHLUMBERGER
TECHNOLOGY CORP [US]

TI - SYSTEM AND METHOD FOR
PERFORMING STIMULATION
OPERATIONS

AB - A system and method is
provided for performing
a **fracturing** operation about
a **wellbore** penetrating a

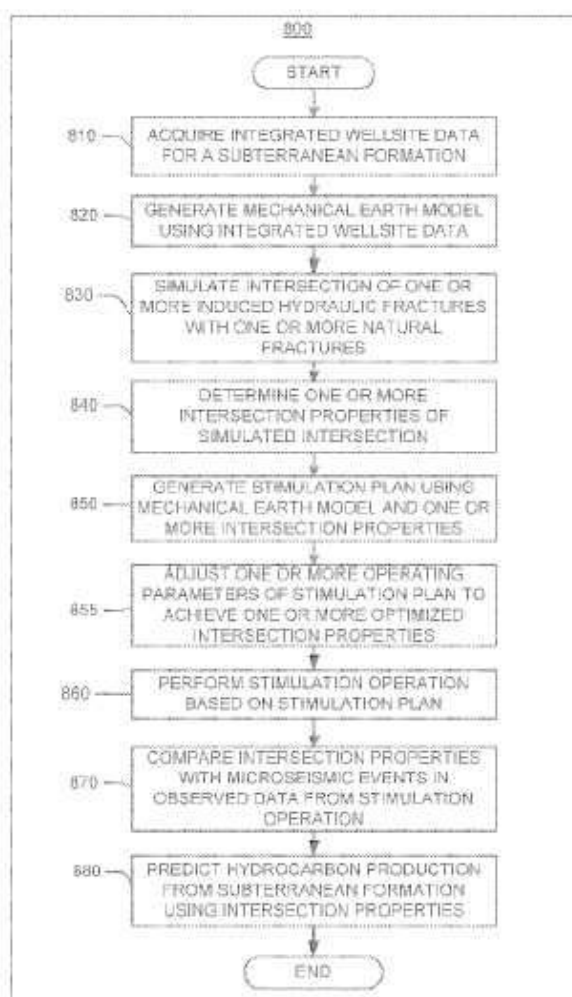
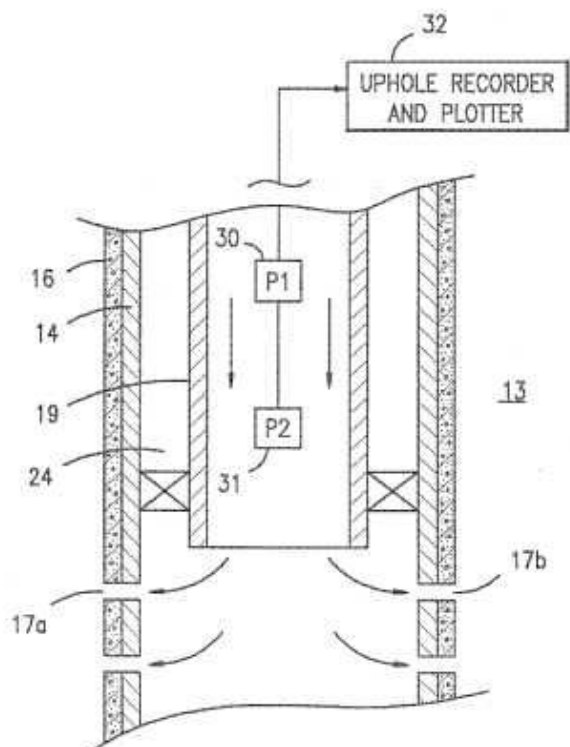


Fig. 8

subterranean formation. The method may acquire integrated wellsite data. The method may generate a mechanical earth model using the integrated wellsite data. The method may simulate an intersection of an induced hydraulic fracture with a natural fracture using the mechanical earth model. The **method** may **determine** intersection properties of the intersected natural fracture. The method may also generate a stimulation plan using the mechanical earth model and the intersection properties. The stimulation plan may include a fluid viscosity or a rate of **injection** of a fracturing **fluid**.

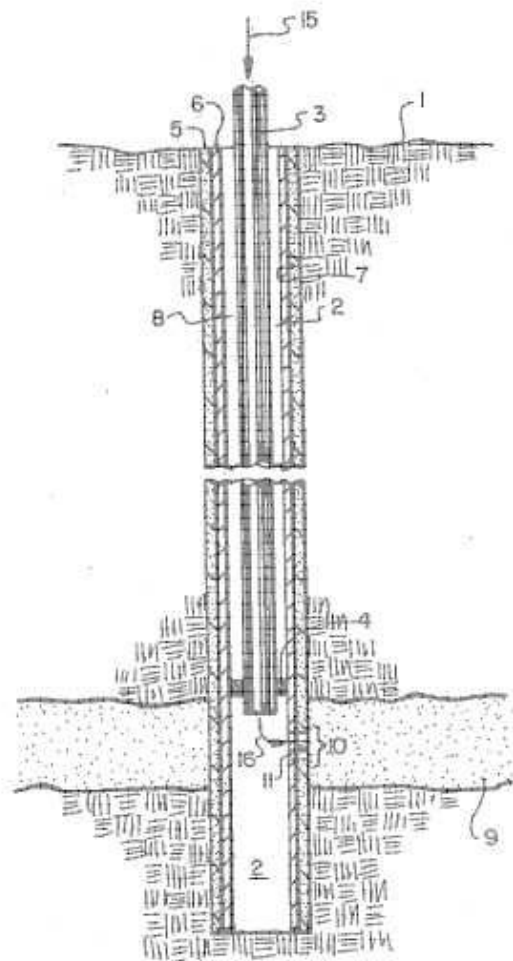
- 16/21 © EPODOC / EPO
- PN - [US5492175](#) A 19960220
- PR - US19950370274 19950109
- AP - US19950370274 19950109
- DT - *
- CT - [US3965982](#) A []; [US4067389](#) A [];
[US4378845](#) A []; [US4393933](#) A [];
[US4515214](#) A []; [US4549608](#) A [];
[US4687061](#) A []; [US4858130](#) A [];
[US5206836](#) A []; [US5327971](#) A [];
[US5353637](#) A []
- CCI - [E21B43/26](#)
- PA - MOBIL OIL CORP [US]
- TI - **Method** for **determining** closure of a hydraulically induced in-situ fracture
- AB - A subsurface formation surrounding a **borehole** is hydraulically **fractured** when a fracturing fluid is supplied down through the borehole by way of a **fluid injection** line from the surface of the earth.



Pressure drop is measured along the **injection** line as fracturing **fluid** flows therethrough. Both fracture closure and minimum in-situ stress are determined at the point where such pressure drop is equal only to a hydrostatic pressure difference along the injection line.

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- PN - [US4439677](#) A 19840327
- PR - US19810318511 19811105
- AP - US19810318511 19811105
- DT - *; Rep
- CT - || STSE (A)
[US2358945](#) A 19440926 [] (TEICHMANN CHARLES F);
[US2588210](#) A 19520304 [] (CRISMAN ORVIL W, et al);
[US3503447](#) A 19700331 [] (HAMBY TYLER W JR);
[US3940612](#) A 19760224 [] (SPARLIN DERRY D, et al)
- CCI - [E21B47/1015](#)
- PA - ATLANTIC RICHFIELD CO [US]
- TI - **Wellbore fracture** tracing
- AB - A **method** for **determining** the vertical extent of a **fracture** in a **wellbore** wall wherein a fluid loss control composition is employed which contains at least at one filter cake forming material which has been radioactively tagged so that upon **injection** of the **fluid** control composition into the wellbore in the vicinity of the fracture, the filter cake is built up along the fracture and thereafter, upon running a nuclear log survey in the wellbore to determine the vertical extent of the filter cake, the vertical extent of the fracture is also thereby determined.



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PN - [W09621799](#) A1 19960718

PN - [WO9621799](#) A1 19960718

PR - US19950370274 19950109

AP - WO1996US00332 19960111

DT - **

CT - |US| ISR (A1)

US5327971 A 19940712

[A] (GAR BUTT CHARLES F [US],
et al);

US5206836 A 19930427

[A] (HOLZHAUSEN GARY R [US],
et al);

US4858130 A 19890815

[A] (WIDROW BERNARD [US]);

US4393933 A 19830719

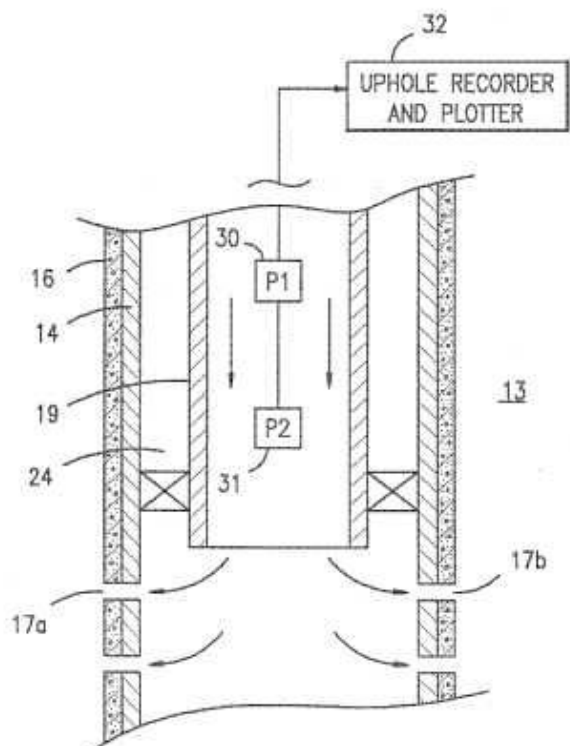
[A] (NOLTE KENNETH G, et al)

CCI - E21B43/26

PA - MOBIL OIL CORP [US]

TI - METHOD FOR DETERMINING CLOSURE OF A HYDRAULICALLY INDUCED IN-SITU FRACTURE

AB - A subsurface formation (13) surrounding a **borehole** (10) is hydraulically **fractured** when a fracturing fluid is supplied down through the borehole (10) by way of a **fluid injection** line (19) from the surface (11) of the earth. Pressure drop is measured along the injection line (19) as fracturing fluid flows therethrough. Both fracture closure and minimum in-situ stress are determined at the point where pressure drop is equal only to a hydrostatic pressure difference along the injection line (19).



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PN - [RU2006118852](#) A 20071220

PNFP - RU2324810 C2 20080520

PR - RU20060118852 20060531

AP - RU20060118852 20060531

DT - 1

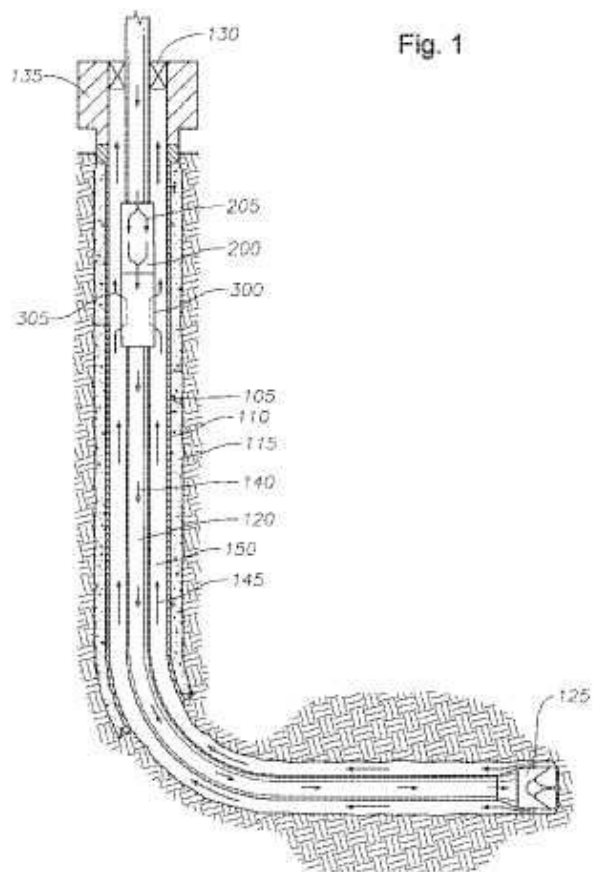
CCI - E21B43/26 ; E21B49/00

PA - (C2)

SCHLUMBERGER TECHNOLOGY BV [NL]

- TI - (C2)
METHOD FOR DETERMINING DIMENSIONS OF FORMATION HYDRAULIC FRACTURE
- AB - (C2)
 FIELD: mining. ^ SUBSTANCE: invention relates to the methods of controlling parameters of a formation hydraulic fracture and, in particular, it is meant for determining dimensions of cracks formed by hydraulic fracturing of rocks and may find application in oil and natural gas fields. It enhances the efficiency of determining parameters of a formation hydraulic fracture, i.e. dimensions of its cracks. Substance of the invention: a method includes process of making a hydraulic **fracture** crack in the **borehole** environment, whereby a hydraulic fracturing fluid partially penetrates through the crack surface to the formation and forms a filtrate area around the crack, then the length and width of the hydraulic fracture crack are determined on the basis of measuring the content of said hydraulic fracturing fluid. The method in accordance with the invention consists in preliminary producing numerical model of the displacement of said hydraulic fracturing fluid from the crack and said filtrate area by a formation fluid for specified formation parameters, hydraulic fracture data and possible crack size for calculating the modifications of the fracturing liquid content in a total production while bringing a well into production after the hydraulic fracture, in periodically sampling of the producible fluid from a borehole mouth when starting the well operation during the entire time of **pumping** the hydraulic fracturing **fluid**, in measuring the content of the hydraulic fracturing fluid in the samples, in comparing the results of measurement with the model calculations and in determining the crack length on the basis of the best agreement between the results of measurement and said model calculations. ^ EFFECT: enhancement of the efficiency of determining parameters of a formation hydraulic fracture, i.e. dimensions of its cracks. ^ 3 cl, 4 dwg

PN - [GB2416793](#) A 20060208
 PNFP - [GB2416793](#) B 20090805
 PR - [US20040911223](#) 20040804
 AP - [GB20050015975](#) 20050803
 DT - **
 CT - (A B)
 [US6938707](#) B2 [
]; [US2005045337](#) A1 [
]; [WO03100208](#) A1 [
]; [WO2005075790](#) A1 [
 CCI - [E21B36/006](#) ; [E21B43/10](#) ;
 [E21B21/08](#)
 CNOI - (A B)
 [E21B36/006](#) ; [E21B21/003](#)
 CCA - [E21B2021/006](#)
 CNOA - (A B)
 [E21B36/04](#)
 PA - (A B)
 WEATHERFORD LAMB [US]
 TI - (A)
 Downhole heating of **wellbore**
 formation to reduce **fracture**
 formation
 (B)
 Method for completing a well
 AB - (A)
 The fracture gradient of an
 earth formation can be
 reduced by heating; reducing
 the fracture gradient
 increases the formation's
 resistance to fracture
 formation. In order to heat a
 wellbore formation, fluids
 such as drilling mud or
 cement are heated and then
 pumped through an annulus
 adjacent the wellbore
 formation. The fluids are
 heated downhole by a heating
 apparatus which can be flow
 restriction device. The flow
 restriction device can include
 a pump with rotor and stator
 to effect combined **pumping**
 and heating. The **fluid** heater
 could alternatively be an
 electric heater. Also disclosed
 is a **method** of drilling
 including **determining** the



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PN	- CA2209306 A1 19960718
PR	- US19950370274 19950109
AP	- CA19962209306 19960111
DT	- I
CCI	- E21B43/26
PA	- MOBIL OIL CORP [US]
TI	- METHOD FOR DETERMINING CLOSURE OF A HYDRAULICALLY INDUCED IN-SITU FRACTURE
AB	- A subsurface formation (13) surrounding a borehole (10) is hydraulically fractured when a fracturing fluid is supplied down through the borehole (10) by way of a fluid injection line (19) from the surface (11) of the earth. Pressure drop is measured along the injection line (19) as fracturing fluid flows therethrough. Both fracture closure and minimum in-situ stress are determined at the point where pressure drop is equal only to a hydrostatic pressure difference along the injection line (19).

