

Weatherford Int'l, LLC v. Baker Hughes Oilfield Operations

IPR2019-00708 & IPR2019-00768
Patent RE46,137

Petitioner Weatherford
June 9, 2020



Weatherford[®]

708 Petition

- **Ground 1:** Anticipation by Giroux
 - Claims 1-2, 4-7, 12-25, 31-35, 41-44
- **Ground 2:** Obviousness over Giroux in view of knowledge of a POSITA and admitted prior art
 - Claims 1-44
- **Ground 3:** Obviousness over Ground 2 & Patel '853
 - Claims 1-44

768 Petition

- **Ground 1:** Anticipation by Patel '427
 - Claims 1-2, 4-7, 12-15, 18-20, 23-30, 32-40, 43, 44
- **Ground 2:** Obviousness over Patel '427 in view of Giroux
 - Claims 1-44
- **Ground 3:** Obviousness over Patel '427 in view of Giroux and knowledge of POSITA and admitted prior art
 - Claims 1-44

Timeline

- **Dec. 20, 2018:** Baker Hughes files complaint alleging infringement of '137 Patent claim 1.
- **Feb. 20, 2019:** Weatherford files 708 (Giroux) Petition.
- **March 1, 2019:** Weatherford files 768 (Patel '427) Petition.
- **Sept. 5, 2019:** Both IPRs instituted
- **Dec. 9, 2019:** Baker Hughes files *Ex Parte* Reexam 90/014,418 disclaiming all but claims 1, 8-11, 16, 17, 31, 34, 41, and 42.

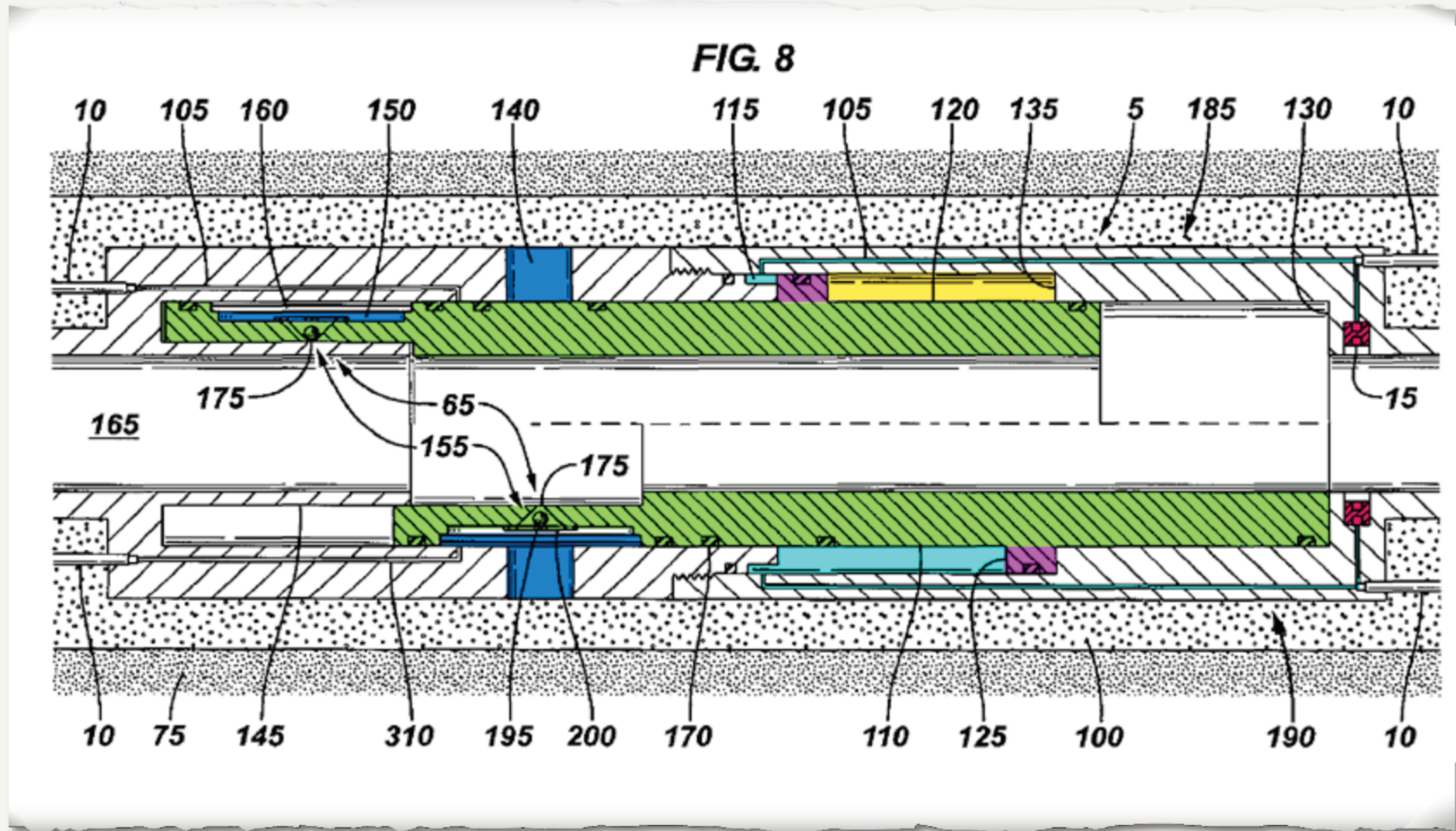
Remaining Claims

- **708 Ground 1:** (Giroux Anticipation)
 - Claims 1, 16, 17, 31, 34, 41, and 42.
- **768 Ground 1:** (Patel '427 Anticipation)
 - Claims 1 and 34.
- **708 and 768 Grounds 2, 3:** (Obviousness)
 - Claims 1, 8-11, 16, 17, 31, 34, 41, and 42.

768 Patel '427 Summary

- **Ground 1:** Patel '427 Anticipation
 - No argument that Patel '427 does not anticipate.
- **Grounds 2, 3:** Patel '427 Obviousness
 - Baker Hughes argues:
 - (1) no prior art discloses urging
 - (2) no motivation to add urging to Patel '427
 - (2) no motivation to use Giroux in a toe sleeve application

768 Patel '427 Anticipation



EX1021, Fig. 8 (annotated)

768 Patel '427 Summary

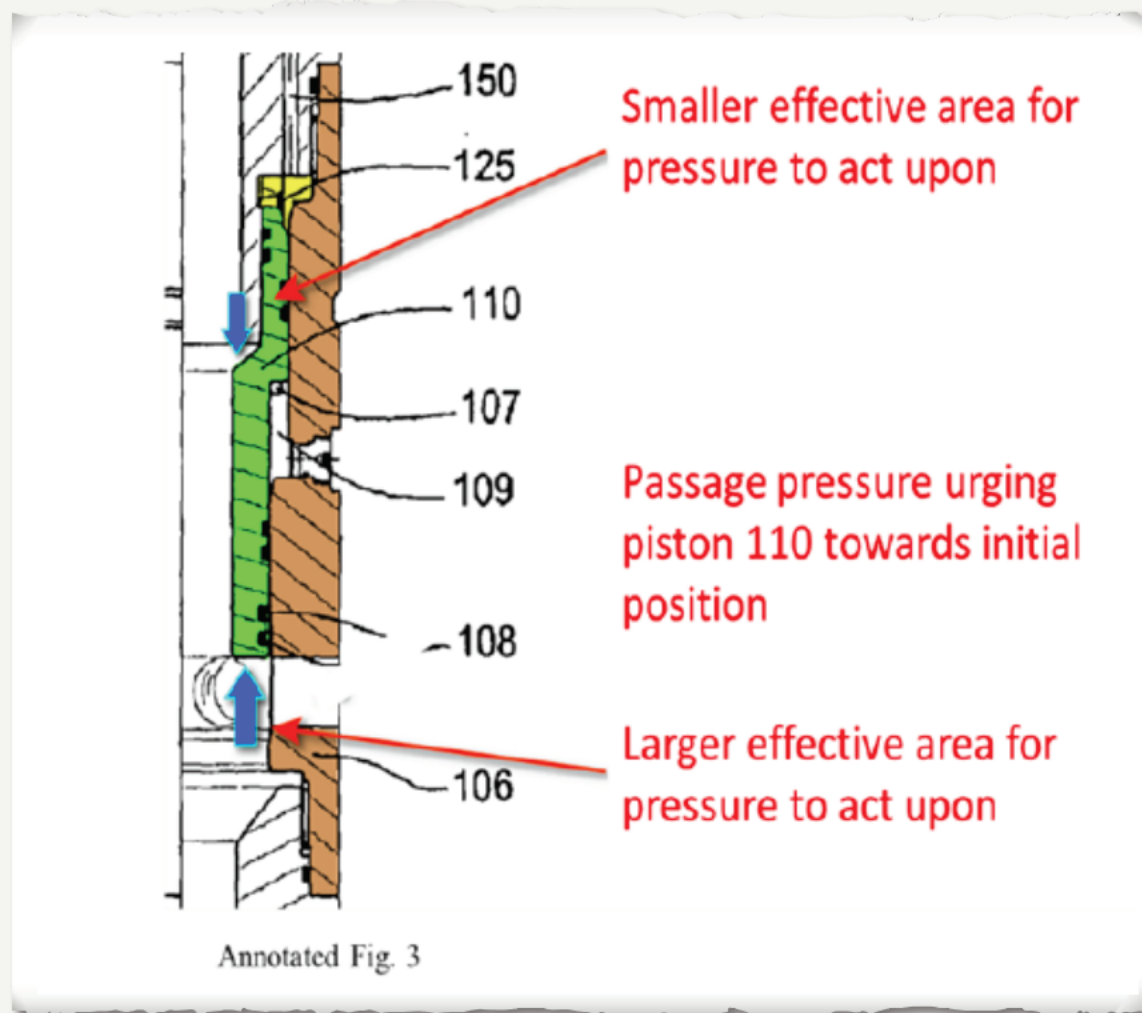
✓ **Ground 1:** Patel '427 Anticipation

- No argument that Patel '427 does not anticipate.

• **Grounds 2, 3:** Patel '427 Obviousness

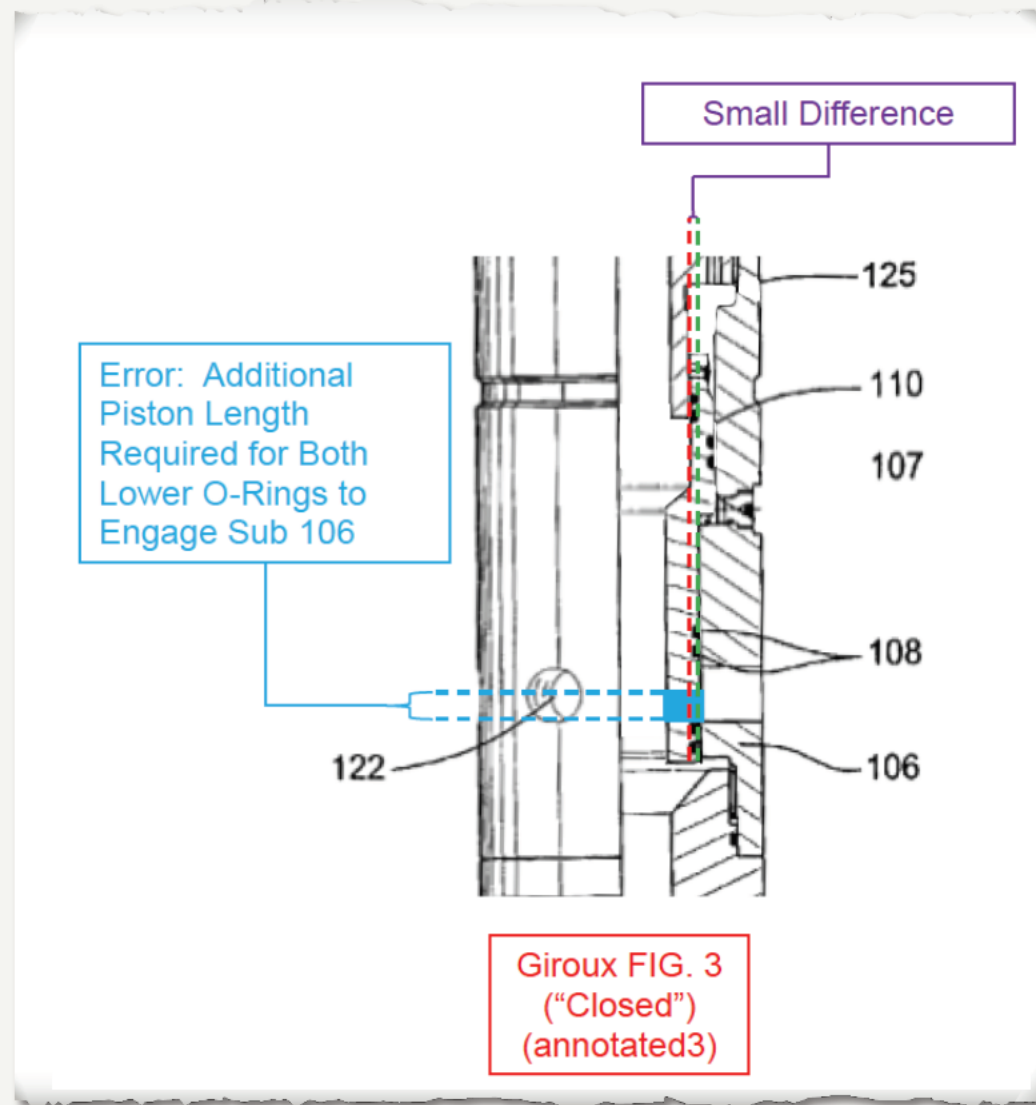
- Baker Hughes argues:
 - (1) no prior art discloses urging
 - (2) no motivation to add urging to Patel '427
 - (3) no motivation to use Giroux in a toe sleeve application

768 Grounds 2, 3: Giroux Discloses Urging



Giroux - EX1003, Fig. 3 (annotated)

768 Grounds 2, 3: Giroux Discloses Urging



Giroux - EX1003, Fig. 3 (annotated)

768 Grounds 2, 3: Giroux Discloses Urging

16 So persons of skill in the art are
17 high-pressure plumbers; and this is what they live with
18 every day, cross-sectional area and pressure.

Chambers Dep. - EX2004 81:16-18

said second [(open)] position.” Bringing their experience with pistons, pressures, and cross-sectional areas to bear, a POSITA would have understood that all this requires is that the pressure-area force in the second chamber be *less than* the pressure-area force in the closed chamber on the opposite side of the piston. Chambers Depo. at 81:11-18 (“So persons of skill in the art are high-pressure plumbers; and this is what they deal with every day, cross-sectional area and pressure”). In this way, assuming equal piston areas in the closed and second

Fleckenstein Decl. - EX2001 ¶33

768 Grounds 2, 3: Giroux Discloses Urging

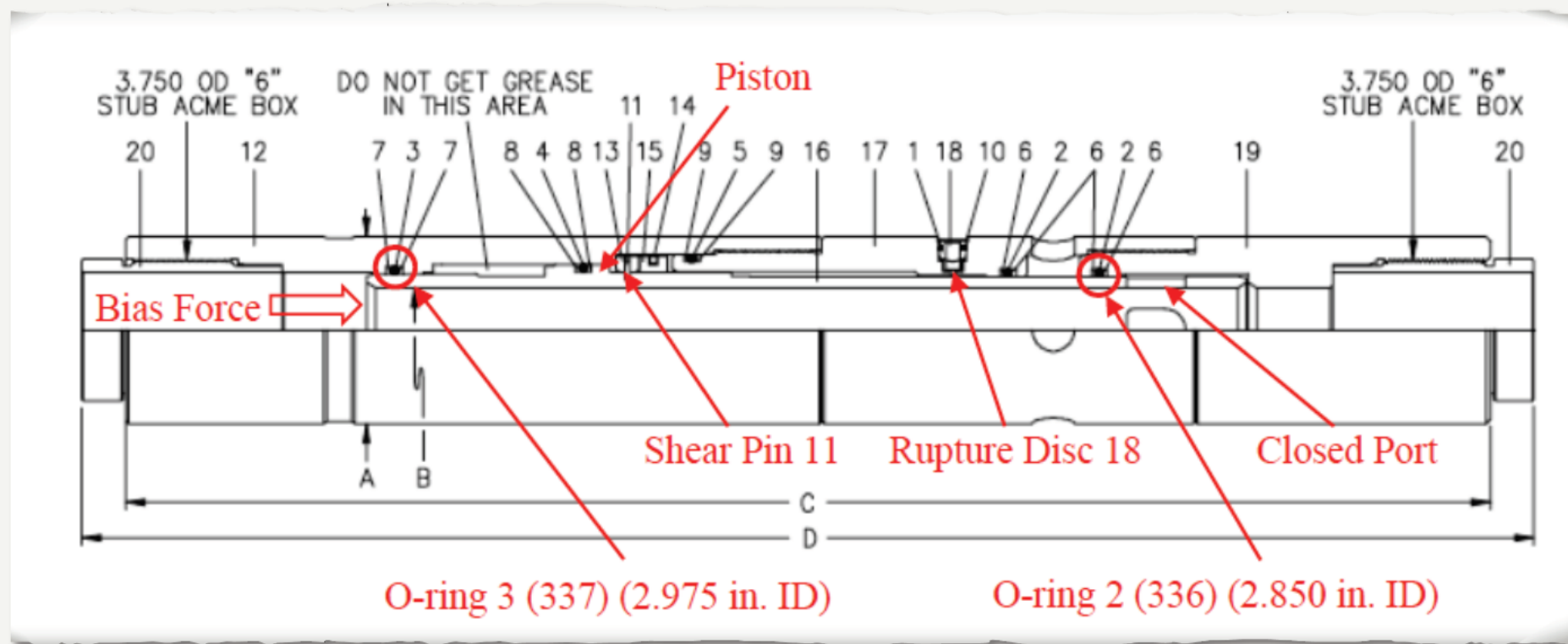
11 Q. (BY MR. WILSON) Now, a person of ordinary
12 skill in the art in 2011, early 2011 understood that any
13 difference in opposed surface areas exposed to the same
14 pressure, it would create a bias or net force, correct?

15 MR. GARRETT: Objection, scope.

16 THE WITNESS: It would create a force. I'm
17 not sure if I would agree that it would create -- you
18 would understand it would create a bias. It would
19 create a force that is going to try and move something.
20 And if it is not resisted, it would move it unless
21 something is actually holding it in place.

Fleckenstein Dep. - EX1045 100:11-21; see also *id.* 101:9-102:9

768 Grounds 2, 3: Giroux Discloses Urging



Baker Hughes AORV Specification - EX1027 at 3 (annotated)

768 Grounds 2, 3: Giroux Discloses Urging

Q. Mr. Richards, you described earlier walking away from an OTC conference with four bags of materials handed out by vendors; correct?

A. Yes.

Q. Did you regard any of the materials that you received at OTC as confidential?

A. No.

Richards Dep. - EX2010 68:2-9

Q. Okay. With regard to the CD that you got from Baker Hughes at the 1998 OTC conference, did you have to sign an NDA with Baker Hughes to get that CD?

A. No.

Q. Do you recall anyone at the Baker Hughes booth telling you that that CD was confidential or that you needed to treat it as confidential?

A. No.

Q. Do you view that CD that you got from Baker Hughes at the 1998 OTC conference as confidential information?

A. No.

Q. Did OSCA at all work with Baker Hughes in creating or manufacturing the tools that are described on the CD you got at the 1998 OTC conference?

A. No.

Richards Dep. - EX2010 69:2

768 Grounds 2, 3: Giroux Discloses Urging

Q. Okay. So if, in fact, the -- the dashed green line as drawn in the figure is farther out than the dashed red line in the figure, then the lower exposed area is bigger than the upper exposed area, correct?

MR. GARRETT: Objection, form.

THE WITNESS: It could be.

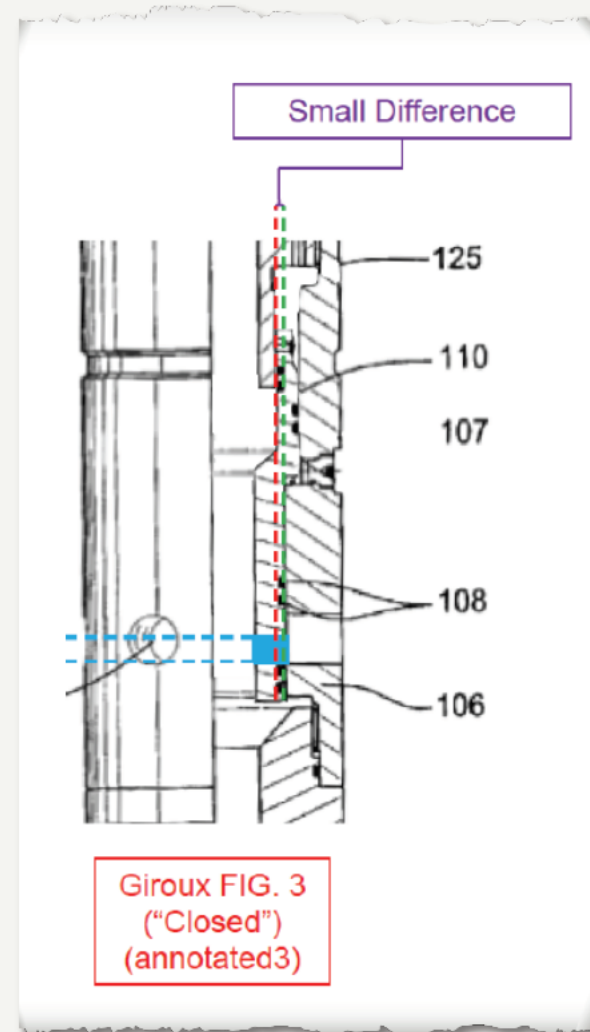
Q. (BY MR. WILSON) Well, if the dashed green line is actually outside of the dashed red line as you've drawn it here, then it is, correct?

A. To the --

MR. GARRETT: Objection. Same objections.

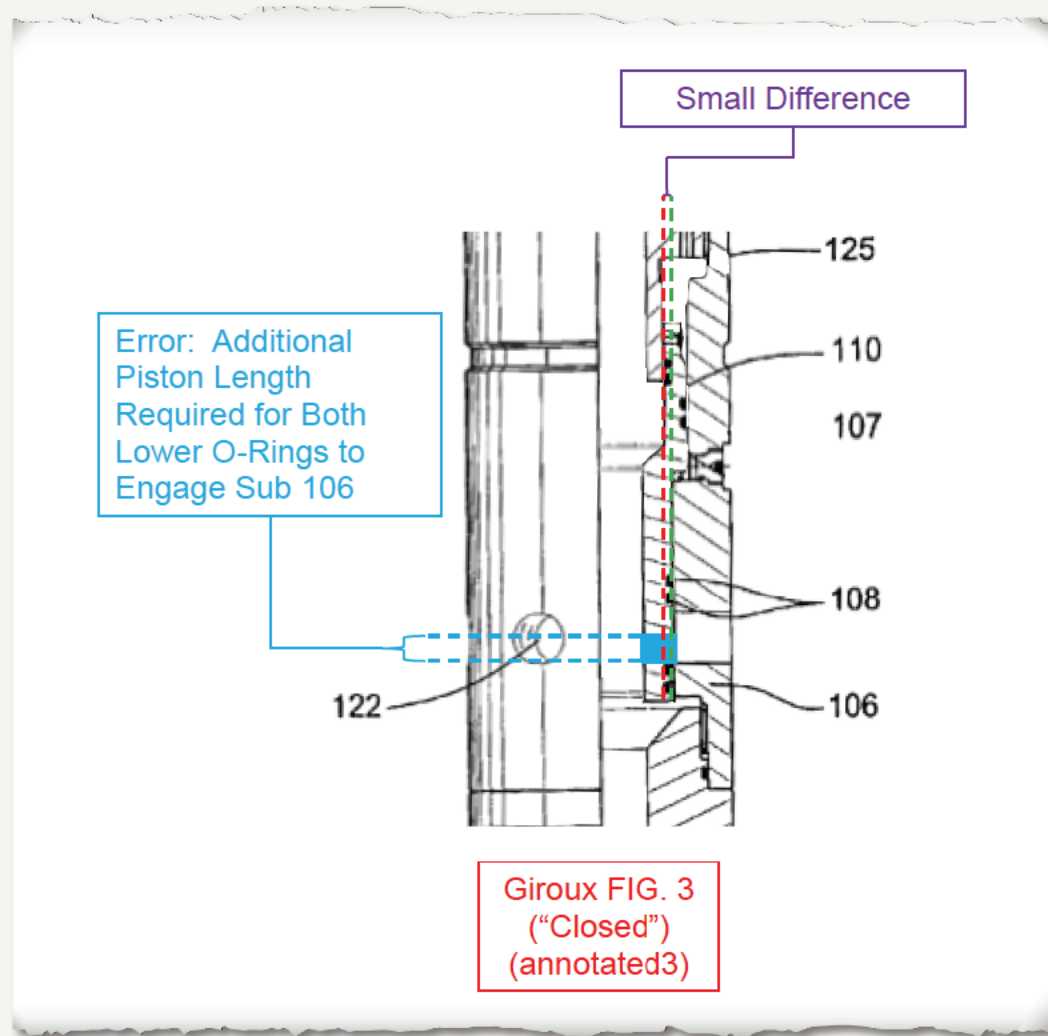
THE WITNESS: My apologies. To the naked eye, I think I've even labeled it, there's a small difference that's perceptible, you know, to the naked eye in looking at that.

Fleckenstein Dep. - EX1045 176:18-177:7



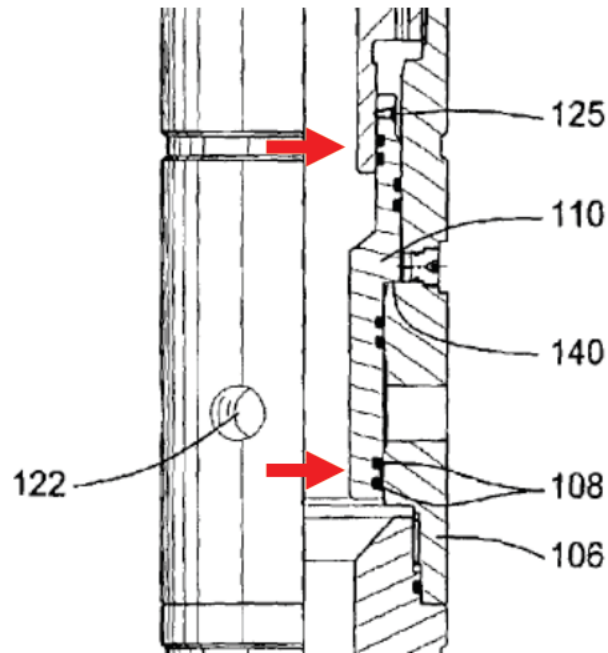
Giroux - EX1003, Fig. 3 (annotated)

768 Grounds 2, 3: Giroux Discloses Urging



Giroux - EX1003, Fig. 3 (annotated)

768 Grounds 2, 3: Giroux Discloses Urging



Giroux - EX1003, Fig. 4 (annotated)

Q. Still looks like seals 108 at the bottom of the piston 110 in Giroux 4 are larger in diameter than the seals at the top left of piston 110, correct?

A. Yes, they had to move because, obviously, if

Fleckenstein Dep. - EX1045 182:9-12

768 Grounds 2, 3: Giroux Discloses Urging

302 F.2d 950 (1962)

Application of Adolph WOLFENSBERGER.

Patent Appeal No. 6790.

United States Court of Customs and Patent Appeals.

May 18, 1962.

⁹⁵¹ *951 Strauch, Nolan & Neale and James E. Nolan, Washington, D. C., for appellant.

Clarence W. Moore, Washington, D. C. (George C. Roeming, Washington, D. C., of counsel), for the Commissioner of Patents.

Before WORLEY, Chief Judge, and RICH, MARTIN, and SMITH, Judges, and Judge WILLIAM H. KIRKPATRICK.¹

RICH, Judge.

This appeal is from the decision of the Patent Office Board of Appeals affirming the examiner's rejection of claim 33, the sole claim before us, "as failing to read on applicant's disclosed structure." Appellant presented claim 33 in his application Ser. No. 521,495, filed July 12, 1955, entitled "Ball Type Valve," requesting an interference on this claim with Kaiser Patent No. 2,868,498 issued January 13, 1959, from which patent the claim was copied.

Appellant's invention relates to a ball type valve "for use in large high pressure fluid pipe lines up to 30 inches and more in diameter." Appellant's valve contains a shut-off member in the form of a roughly spherical ball plug having a diametal bore therethrough. The plug is rotatable about an axis perpendicular to the bore. When the bore in the ball plug is in alignment with the axis of the pipe line with which it is used, the valve is fully open. When the plug is rotated approximately 90° out of alignment with the pipe line axis, the valve is closed.

Claim 33 reads:

"33. In a valve device, in combination, a valve housing member formed with a bore therethrough; a valve arranged in said housing member, said valve being formed with a passage therethrough and being movable between open and closed positions wherein said passage is in and out of registration with said bore, respectively; and sealing means interposed between said housing member and said valve, said sealing means including an annular sealing member coaxial with said bore of said housing member, said members being so shaped as to form between themselves an *annular chamber* of substantially rectangular cross-section bounded by an inner face, an outer face and two side faces, and a *packing ring* arranged in said chamber, said ring being made of a resilient material ⁹⁵² and being compressed between said side faces of said annular

⁹⁵²

“We find nothing therein, however, which raises a presumption that drawings such as those here are not drawn to scale with reasonable accuracy or that *four enlarged detailed figures consistently showing the same relative proportions must be ignored.*”

In re Wolfensperger, 302 F.2d 950, 959 (C.C.P.A. 1962)
(emphasis added)

768 Grounds 2, 3: Giroux Discloses Urging

Q. Okay. So if, in fact, the -- the dashed green line as drawn in the figure is farther out than the dashed red line in the figure, then the lower exposed area is bigger than the upper exposed area, correct?

MR. GARRETT: Objection, form.

THE WITNESS: It could be.

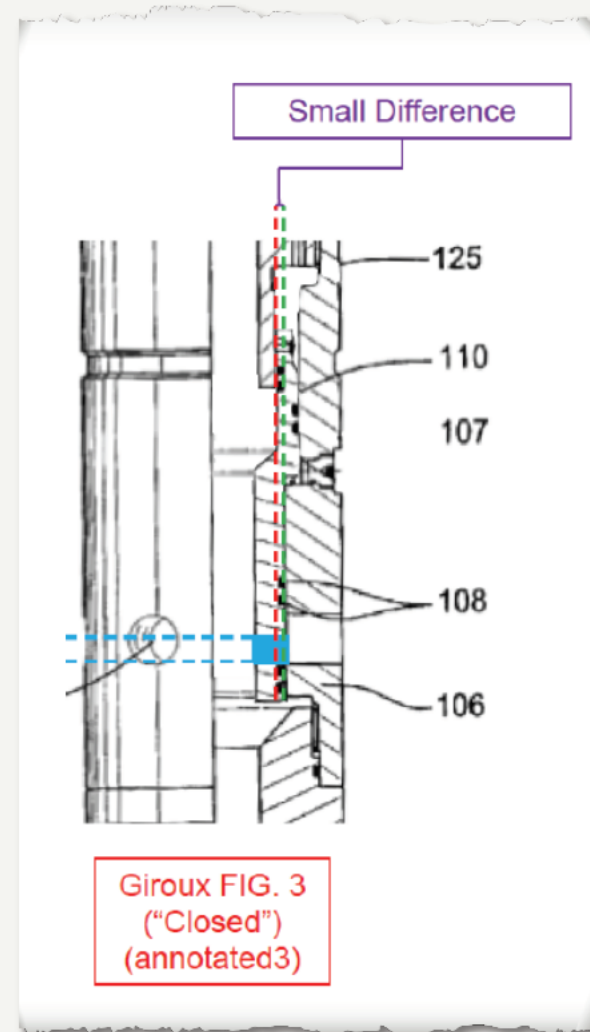
Q. (BY MR. WILSON) Well, if the dashed green line is actually outside of the dashed red line as you've drawn it here, then it is, correct?

A. To the --

MR. GARRETT: Objection. Same objections.

THE WITNESS: My apologies. To the naked eye, I think I've even labeled it, there's a small difference that's perceptible, you know, to the naked eye in looking at that.

Fleckenstein Dep. - EX1045 176:18-177:7



Giroux - EX1003, Fig. 3 (annotated)

768 Grounds 2, 3: Giroux Discloses Urging

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UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT AND TRIAL AND APPEAL BOARD

WEATHERFORD)
INTERNATIONAL, LLC)
Petitioner) CAGES IPR
) IPR2019-0
VS.) RE46,137
)
BAKER HUGHES OILFIELD)
OPERATIONS, LLC,)
Patent Owner)

ORAL DEPOSITION OF WILLIAM W. FLECKENSTEIN
FEBRUARY 3, 2020

ORAL DEPOSITION OF WILLIAM W. FLECKENSTEIN
produced as a witness at the instance
and duly sworn, was taken in the above
cause on Monday, February 3, 2020, from
3:19 p.m., before JANALYN ELKINS, CSR,
State of Texas, reported by computerized
machine, at the offices of Norton Rose
Fleckenstein Dep. - EX1045 178:3-8
Jacinto Boulevard, Suite 1100, Austin, Texas, pursuant to
the Federal Rules of Civil Procedure and any provisions
stated on the record herein.

Page 1

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866 299-5127

Weatherford Ex. 1045
Weatherford v. Baker Hughes
Page 1 of 232

Q. Okay. So to the naked eye, there's a difference in that diameter. Would you discount any disclosure of biasing because Giroux doesn't expressly discuss it in the text, correct?

MR. GARRETT: Objection, form.

THE WITNESS: That is correct. And it's

Fleckenstein Dep. - EX1045 178:3-8

768 Grounds 2, 3: Giroux Discloses Urging

IN RE MRAZ 867

United States Court of Customs and Patent Appeals, March 9, 1972

APPEAL from Patent Office, Serial No. 458,289

[Affirmed.]

Albert L. Ely, Jr. (Ely, Golrick & Flynn), attorneys of record, for appellant.
S. Wm. Cochran for the Commissioner of Patents, *John W. Dewhirst*, of counsel.

[Oral argument February 7, 1972 by Mr. Ely and Mr. Dewhirst]

Before RICH, ALMOND, BALDWIN, LANE, *Associate Judges*, and ROSENSTEIN,
Judge, sitting by designation

RICH, *Judge*.

This appeal is from the decision of the Patent Office Board of Appeals affirming the rejection of claims 1-4, 7, and 8¹ in application serial No. 458,289, filed May 24, 1965, for "Edging and Burring Roll." We affirm.

Subject Matter Claimed

Appellant claims apparatus for removing edge burrs from thin metal strips. Such burrs may be formed at the longitudinal edges of strips as a result of slitting or shearing operations used in forming the strips from wider sheet stock. These burrs are asserted to unfit the thin strips for many uses (e.g., for use as the magnetic cores of motors, transformers, and the like), and appellant's specification states that

For sheet metal less than substantially 0.030 inch thick, * * * de-burring has been done by time-consuming and expensive hand operation since there was no entirely satisfactory equipment for this purpose.

Appellant's solution to the above problem may be understood from his figures 1 and 2:

¹ [1] Appellant's brief states that his appeal is from a decision affirming the rejection "of all of appellant's claims 1 to 8 * * *." However, the board's decision did not affirm the rejection of claims 5 and 6; indeed, these claims have not been rejected. They have been withdrawn by the examiner from further consideration as drawn to non-elected species, and over the propriety of that determination neither we nor the board have jurisdiction. *In re Hengehold*, 58 CCPA 1099, 440 F. 2d 1395, 169 USPQ 473 (1971).

"Description for the purposes of anticipation can be by drawings alone as well as by words."

In re Mraz, 455 F.2d 1069, 1072 (C.C.P.A. 1972) (quoting *In re Bager*, 47 F.2d 951, 952-53 (C.C.P.A. 1931)).

768 Grounds 2, 3: POSITA Knew About Urging

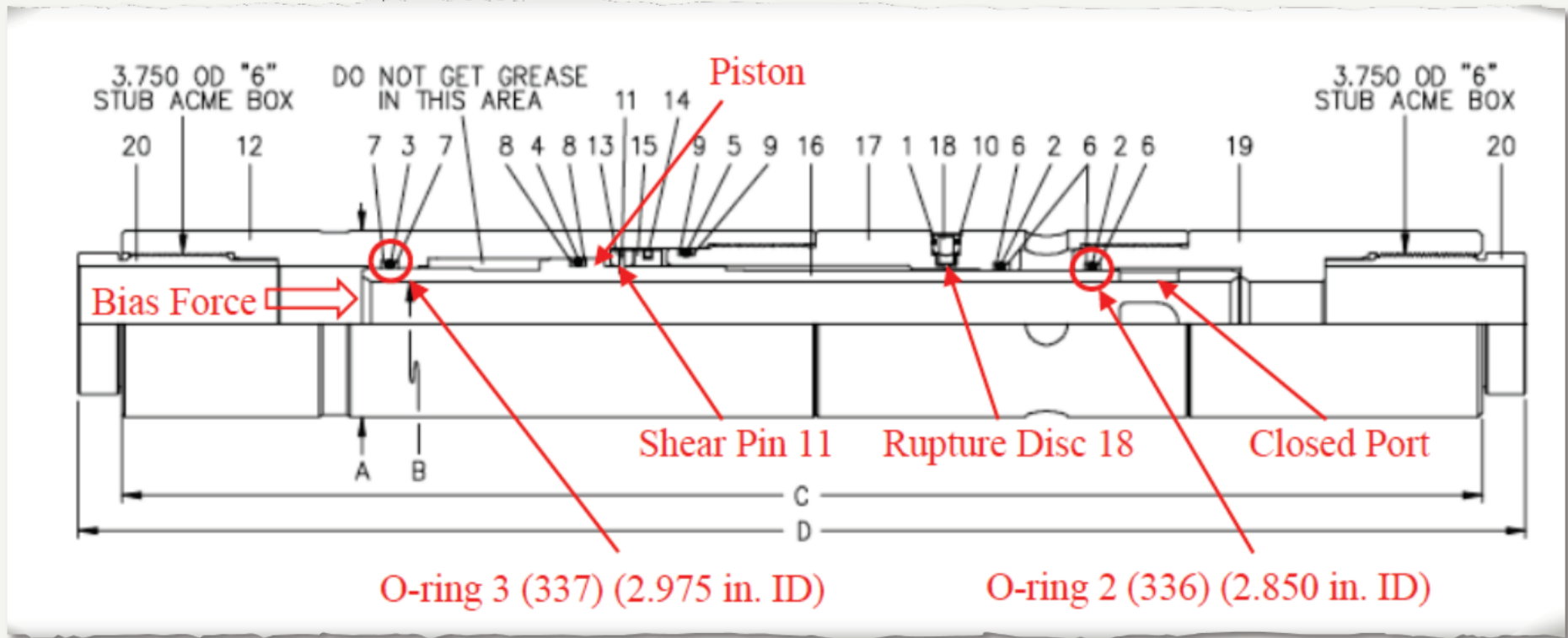
16 So persons of skill in the art are
17 high-pressure plumbers; and this is what they live with
18 every day, cross-sectional area and pressure.

Chambers Dep. - EX2004 81:16-18

said second [(open)] position.” Bringing their experience with pistons, pressures, and cross-sectional areas to bear, a POSITA would have understood that all this requires is that the pressure-area force in the second chamber be *less than* the pressure-area force in the closed chamber on the opposite side of the piston. Chambers Depo. at 81:11-18 (“So persons of skill in the art are high-pressure plumbers; and this is what they deal with every day, cross-sectional area and pressure”). In this way, assuming equal piston areas in the closed and second

Fleckenstein Decl. - EX2001 ¶133

768 Grounds 2, 3: POSITA Knew About Urging



Baker Hughes AORV Specification - EX1027 at 3 (annotated)

768 Patel '427 Summary

✓ **Ground 1:** Patel '427 Anticipation

- No argument that Patel '427 does not anticipate.

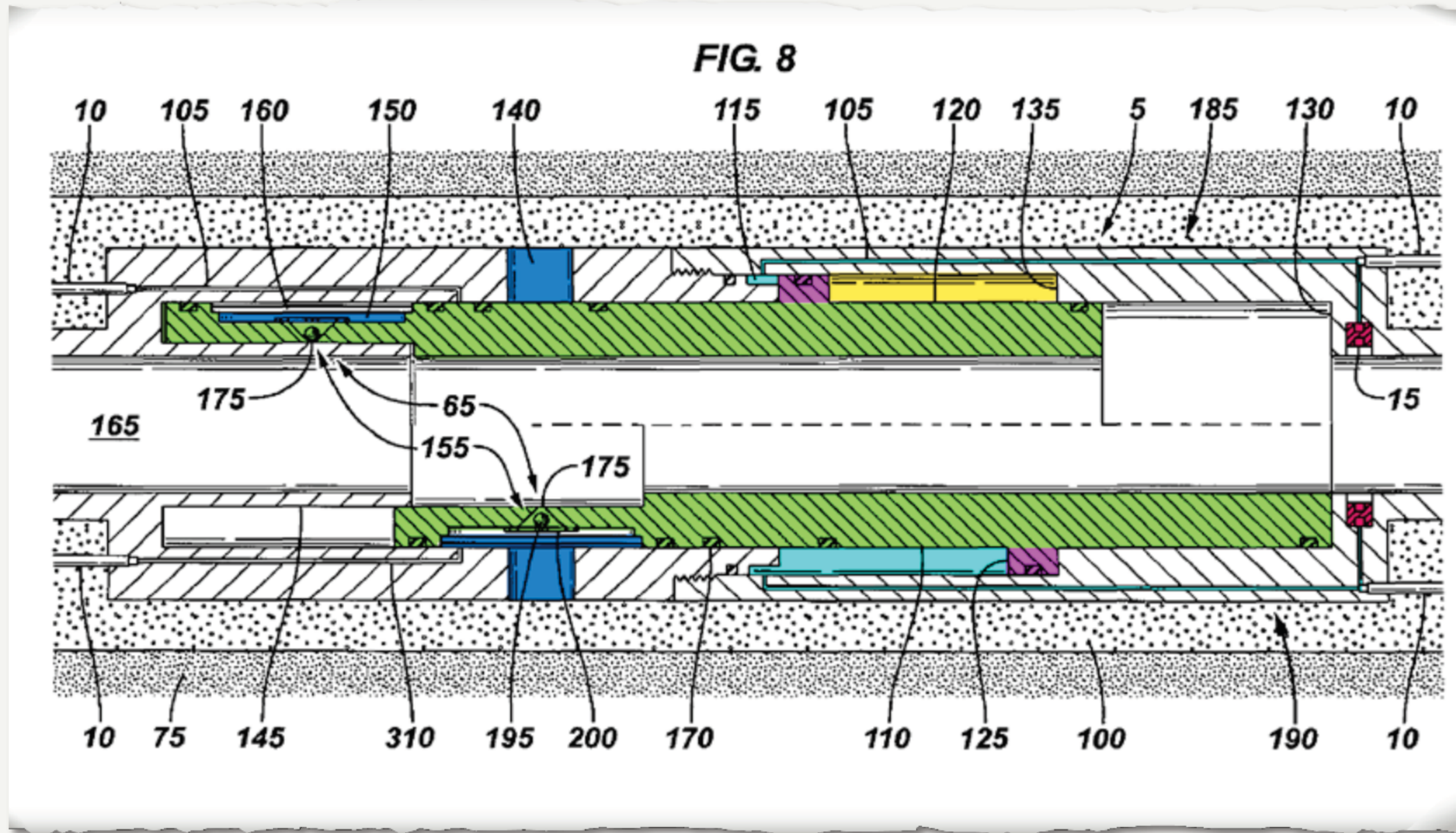
• **Grounds 2, 3:** Patel '427 Obviousness

- Baker Hughes argues:

X (1) no prior art discloses urging

- (2) no motivation to add urging to Patel '427
- (3) no motivation to use Giroux in a toe sleeve application

768 Grounds 2, 3: Motivation to Add Urging



EX1021, Fig. 8 (annotated)

768 Grounds 2, 3: Motivation to Add Urging



SPE 125365

Continuous Multistage Fracture-Stimulation Completion Process in a Cemented Wellbore

Noel Stegent and Matt Howell, Halliburton

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This paper was prepared for presentation at the 2009 SPE Eastern Regional Meeting held in Charleston, West Virginia, USA, 23-25 September 2009.

This paper was selected for presentation by an SPE program committee following review and evaluation of information contained in an abstract submitted by the author(s). Contents of the paper have not been reviewed by the Society of Petroleum Engineers and are subject to correction by the author(s). The material does not necessarily reflect any position of the Society of Petroleum Engineers, its officers, or members. Electronic reproduction, distribution, or storage of any part of this paper without the written consent of the Society of Petroleum Engineers is prohibited. Permission to reproduce in print is restricted to an abstract of not more than 300 words; illustrations may not be copied. The abstract must contain conspicuous acknowledgment of SPE copyright.

Abstract

Multiple-stage fracturing is a very common practice, especially in reservoirs with micro-Darcy permeability. The process of perforating, fracturing, and setting plugs has been performed for many years and has both advantages and disadvantages. Coiled tubing (CT) completion methods have increased completion efficiencies but can have limitations as well. Though multistage tools placed in the casing string have become a standard completion practice in horizontal completions, little has been done in vertical, cemented wellbores. As multiple wells drilled on single pads become more common, increased economic completion efficiencies are necessary.

To address the increasing need for completion efficiency, an alternate method of multiple completions was tested in several vertical wellbores. The casing strings were conventionally cemented in place and ball-activated sliding sleeves were placed across target completion intervals. Failures in similar techniques can have catastrophic effects if the initial tool does not open. To address this issue, a new hydraulic-actuated sleeve was developed. It was successfully tested in multiple wellbores and performed as designed. Multiple fractures were completed in a continuous operation with excellent production results.

This completion process can provide an efficient method for multistage fracturing in conventional and unconventional reservoirs in either vertical or horizontal wellbores. It can be used on single-well completions or on multistage pads.

This process provides an efficient, low-cost alternative to conventional multistage fracturing for vertical and horizontal wells.

Introduction

For decades, the standard method of multistage fracturing has been to perforate, frac, and set an isolation plug. Advances in CT fracturing have increased the efficiency for multiple completions that allow for deeper completions (Peak et al. 2007); however, eliminating perforating, wireline intervention, and problematic means of isolation from the completion process is still desired. The installation of sliding sleeves in casing strings, specifically ball-activated versions that enable the interventionless completion methods, is not new and has been common practice in openhole, horizontal applications (Vargus et al. 2008). However, there has been concern regarding if this type of system could be deployed in vertical, cemented wellbores. A new set of problems was identified with this completion method when cement was used as the method of zonal isolation. One specific challenge identified was how the interventionless process would be initiated. In past cemented applications, the cement was overdisplaced so that a wet shoe would be present, providing a flow path that enabled the initiation of the interventionless process. This was not an acceptable solution in many cases because of the downsides of having a wet shoe (i.e., possible leak paths, lack of isolation, and no pressure integrity of the casing, etc.). To address these issues, the development of a specialized hydraulic sliding sleeve, minor modifications to the remaining ball-activated sliding sleeves, and adjustments to the processes and procedures were required to enable an interventionless completion method for cemented applications.

Development of the specialized hydraulic sliding sleeve, changes to the existing ball-activated sliding sleeves, and all process and procedure changes were completed within six months. The system was installed and field tested with excellent results. Challenges included development of a new hydraulic sliding-sleeve design that allowed for proper tool operation with cement contamination and setting up the remaining equipment, process, and procedures to help ensure the sliding sleeve was not unintentionally opened. Four field trials were conducted to determine the operational accuracy of the sliding sleeves as well as the production results after the fracture treatments.

Weatherford International, LLC Exhibit 1009
Page 1 of 12

The accuracy of activation was needed in the hydraulic-activated sliding sleeve so *that the tool would not be opened inadvertently during installation or prematurely during operations.*

SPE 125365 - EX1009 at 3 (emphasis added)

768 Grounds 2, 3: Motivation to Add Urging

Q. Now, in your opinion using passage pressure to maintain the sleeve in its initial position, closed position, is an advantage because it avoids premature actuation, correct?

A. It's one of the factors that will help to prevent that by holding it closed, that is correct. Using the pressure also gives you the ability to do -- to use that same pressure to use the actuation also so it simplifies the tool. So it's a variety of things that that use of that passage pressure allows you to do, and it gives you those two function that I mentioned.

Q. Okay. But one of the advantages that you get from biasing it closed is avoiding premature actuation, correct?

A. Yes, that is correct.

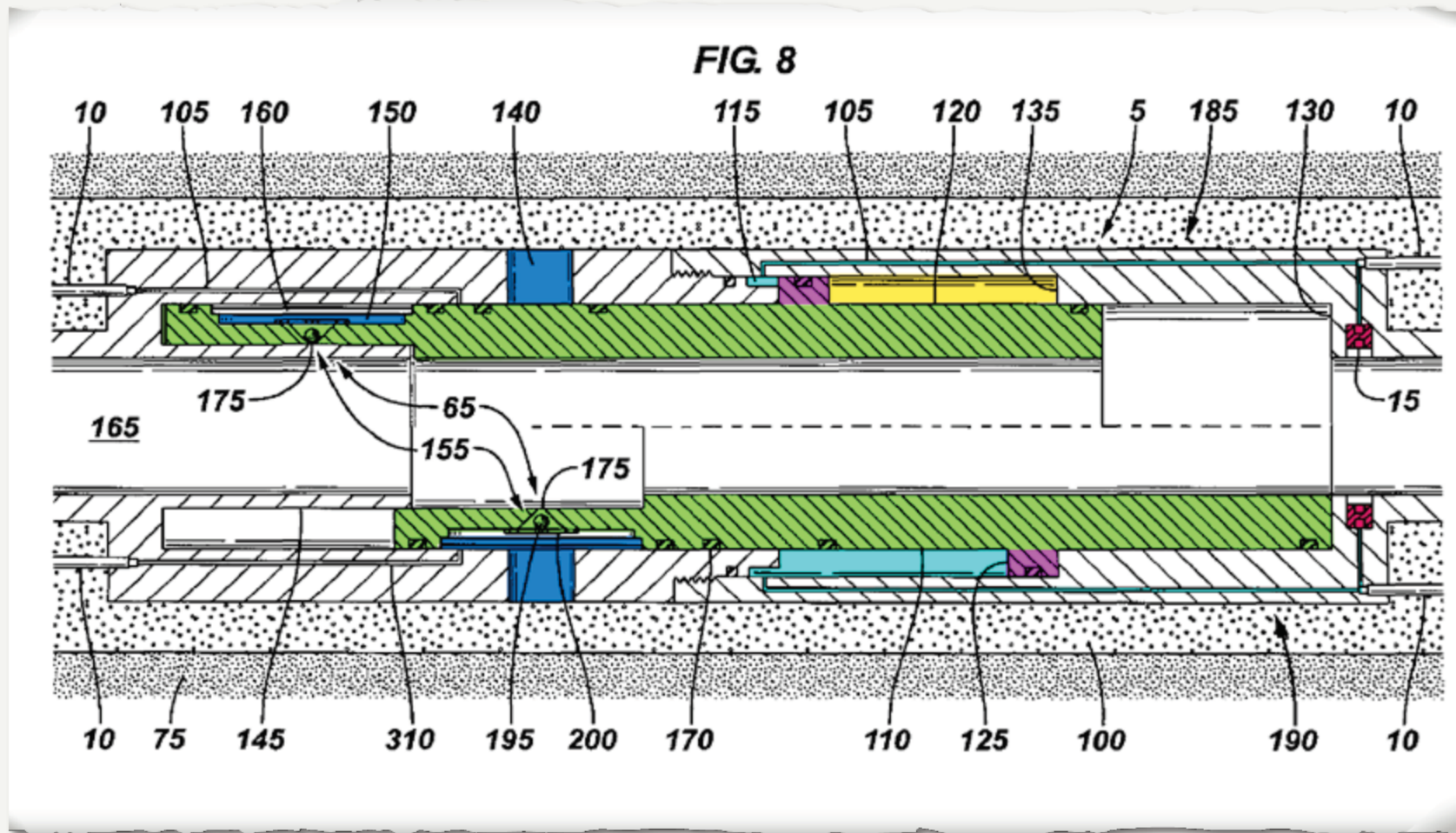
Fleckenstein Dep. - EX1045 108:16-109:5

Q. Now, it was known before early 2011 that prematurely actuation was a concern for sliding sleeves used in down hole applications, correct?

A. It -- it was well-known before 2011 that if a sleeve for whatever reason actuates beforehand malfunctions that it going to cause probably an additional cost to the completion of that well if you're using these sleeves for completions.

Fleckenstein Dep. - EX1045 109:6-13

768 Grounds 2, 3: Motivation to Add Urging



EX1021, Fig. 8 (annotated)

768 Grounds 2, 3: Motivation to Add Urging

United States Patent [19]
Carmody et al.



US006041857A

[11] Patent Number: 6,041,857
[45] Date of Patent: Mar. 28, 2000

[54] MOTOR DRIVE ACTUATOR FOR
DOWNHOLE FLOW CONTROL DEVICES

[51] Int. Cl.
[52] U.S. Cl.

[75] Inventors: Michael A. Carmody, Houston; Kevin R. Jones, Humble; Robert J. Coon, Houston; Douglas J. Murray, Humble; Mark E. Hopmann, Alvin; Steven L. Jennings, Friendswood; Wayne Welch, Houston; Jeffrey Edwards, Friendswood; David Martin, Houston, all of Tex.

[58] Field of

[73] Assignee: Baker Hughes Incorporated, Houston, Tex.

4,715,443
5,220,963
5,234,057
5,343,963

[21] Appl. No.: 08/930,668

Primary Exam
Attorney, Agent

[22] PCT Filed: Feb. 14, 1997

[57]

[86] PCT No.: PCT/US97/02334

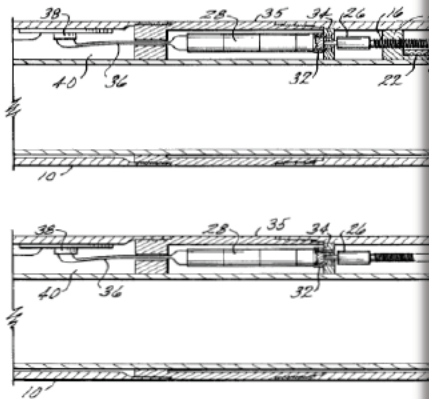
§ 371 Date: Oct. 14, 1997

Several motor
provide linear
The embodiment
screw assembly
downhole flow

§ 102(e) Date: Oct. 14, 1997

[87] PCT Pub. No.: WO97/30269

PCT Pub. Date: Aug. 21, 1997

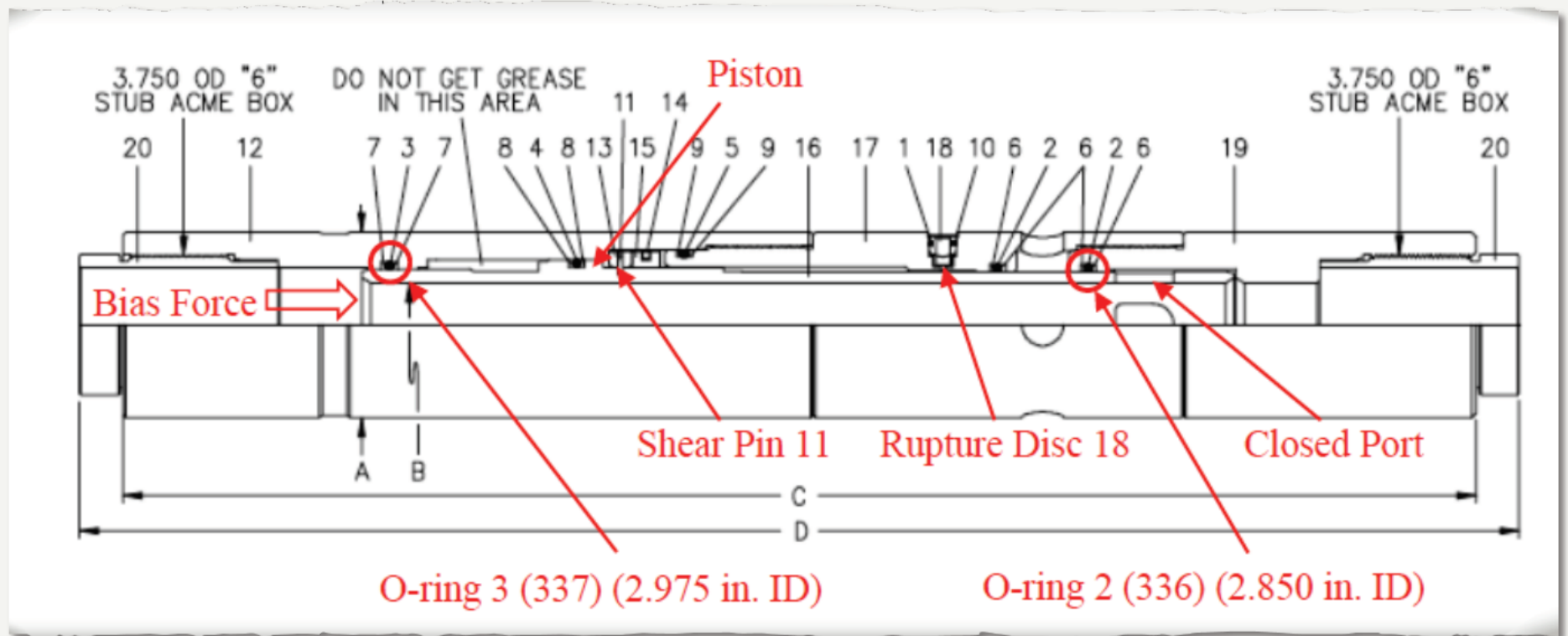


Each of the latter three embodiments of the invention employ an identical shear out structure or member utilizing a plurality of dogs and a plurality of shear screws. The dogs provide for translation of the energy of movement from the actuator assembly to the sliding sleeve without imparting shear stress to the shear screws. This avoids premature failure of the shear screws and increases longevity of the tool. In the event the actuation mechanisms of the invention fail, the shear out structure may be shifted uphole to release the dogs. Once the dogs have disengaged from the actuation drive mechanism, the tool of the invention allows conventional shifting of the insert in the sliding sleeve by employing a prior art shifting tool on shifting profiles.

U.S. Patent No. 6,041,857 - EX1036 3:8-20

Weatherford Ex. 1036
Weatherford v. Baker Hughes
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768 Grounds 2, 3: Motivation to Add Urging



Baker Hughes AORV Specification - EX1027 at 3 (annotated)

768 Patel '427 Summary

✓ **Ground 1:** Patel '427 Anticipation

- No argument that Patel '427 does not anticipate.

• **Grounds 2, 3:** Patel '427 Obviousness

- Baker Hughes argues:

X (1) no prior art discloses urging

X (2) no motivation to add urging to Patel '427

- (3) no motivation to use Giroux in a toe sleeve application

768 Grounds 2, 3: Motivation to Use Giroux

Q. So a person of ordinary skill in the art knew in 2009 that perforations at the toe of a cemented multi-stage fracturing completion could be successfully replaced with hydraulically actuated sliding sleeves, correct?

A. Could be. But again, you have to go back to the sentence you've noted, which was failures in similar techniques can have catastrophic effects, so you have to be very careful with the choice of that hydraulic -- that hydraulic actuated sleeve. It's not just any sleeve. It is going to be a certain type of a sleeve.

Fleckenstein Dep. - EX1045 76:10-20

Q. Okay. A person of ordinary skill in the art knew in 2009 that to replace such for perforations, the hydraulically actuated sleeve had to run in closed and be actuated to open, correct?

A. Yes, I believe that is correct.

Fleckenstein Dep. - EX1045 76:21-25; see also 74:5-13

Q. Okay. A person of ordinary skill of the art in 2009 had a motivation to develop a hydraulically actuated sliding sleeve for use in a cemented multi-stage fracturing completion to replace perforations at the toe of the well, correct?

MR. GARRETT: Same objections.

THE WITNESS: Yes, I would say that would be a reasonable motivation at that time.

Fleckenstein Dep. - EX1045 78:16-23

Q. Okay. Giroux's preferred and alternative embodiments relied upon by Mr. Chambers are hydraulically actuated sliding sleeves, correct?

A. Yes, that is correct, I believe.

Fleckenstein Dep. - EX1045 73:4-7

768 Grounds 2, 3: Motivation to Use Giroux

“Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references. Thus, [Giroux] must be read, not in isolation, but for what it fairly teaches in combination with the prior art as a whole.”

In re Merck & Co., Inc., 800 F.2d 1091, 1097-98 (Fed. Cir. 1986) (citation omitted)

768 Patel '427 Summary

✓ **Ground 1:** Patel '427 Anticipation

- No argument that Patel '427 does not anticipate.

✓ **Grounds 2, 3:** Patel '427 Obviousness

- Baker Hughes argues:
 - X (1) no prior art discloses urging
 - X (2) no motivation to add urging to Patel '427
 - X (3) no motivation to use Giroux in a toe sleeve application

708 Petition

- **Ground 1:** Anticipation by Giroux
 - Claims 1, 16, 17, 31, 34, 41, and 42
- **Ground 2:** Obviousness over Giroux in view of knowledge of a POSITA and admitted prior art
 - Claims 1, 8-11, 16, 17, 31, 34, 41, and 42
- **Ground 3:** Obviousness over **Ground 2** & Patel '853
 - Claims 1, 8-11, 16, 17, 31, 34, 41, and 42

708 Ground 1: Giroux Anticipation

- Giroux's Preferred Embodiment anticipates claim 1 because claim 1 is not limited to actuation to open the sleeve.
- Giroux anticipates claims 1, 16, 17, 31, 34, 41, and 42 without regard to the construction of claim 1 because:
 - Giroux discloses sliding sleeves that are actuated to open;
 - Giroux discloses urging; and
 - Giroux discloses that piston 110 is the same in both embodiments.

708 Ground 1: Giroux Anticipation

(19) **United States**
(12) **Reissued Patent**
Jason et al.

(10) **Patent Number:** US
(45) **Date of Reissued Patent:**

(54) **PRESSURE ACTUATED PORTED SUB FOR SUBTERRANEAN CEMENT COMPLETIONS**

(71) Applicant: **BAKER HUGHES INCORPORATED**, Houston, TX (US)

(72) Inventors: **Mallard C. Jaxon**, The Woodlands, TX (US); **Judith C. Kollmer**, Pearland, TX (US); **Charles C. Johnson**, League City, TX (US); **Charles T. Kirkpatrick**, New Caney, TX (US); **Marcus A. Avanti**, Kingwood, TX (US)

(73) Assignee: **Baker Hughes Incorporated**, Houston, TX (US)

(21) Appl. No.: **14/881,894**

(22) Filed: **Oct. 13, 2015**

Related U.S. Patent Documents

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Appl. No.: **13/193,992**
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E21B 34/08 (2006.01)
E21B 34/06 (2006.01)
E21B 34/10 (2006.01)
E21B 33/14 (2006.01)
E21B 34/00 (2006.01)

(52) U.S. Cl.
CPC *E21B 34/063* (2013.01); *E21B 33/14* (2013.01); *E21B 34/10* (2013.01); *E21B 34/08* (2013.01)

(58) Field of Classification Search
CPC *E21B 34/063*; *E21B 34/10*; *E21B 33/14*; *E21B 34/08*
See application file for complete search history.



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(74) *Attorney, Agent, or Firm* — Paris

(57) **ABSTRACT**
A tubing pressure operated sliding sleeve having a tubular string. The sleeve is closed as pressure builds in a wellbore and is further raised a rupture disc. Blows of an integral piston disposed outside the sleeve of the piston is exposed to a low pressure chamber located between upper and lower seals. The thickness near the chamber can be increased to avoid flexing or bending under differential force to shift the sleeve is from the piston rather than the piston upper and lower seals.

44 Claims, 2 Drawing



Weatherford Inter

1. A valve for subterranean use, comprising:

a housing having a passage therethrough and a port in a wall thereof;

a sleeve having a flow path therethrough movably mounted in said passage of said housing between a first position where said port is closed and a second position where said port is at least in part open;

a piston associated with said sleeve for moving said sleeve, said piston selectively isolated from passage pressure until a predetermined pressure is reached.

US RE46,137 - EX1001 4:42-51 (emphasis added)

708 Ground 1: Giroux Anticipation

(12) **United States Patent**
Giroux et al.



US006834726B2

(10) Patent No.: **US 6,834,726 B2**
(45) Date of Patent: **Dec. 28, 2004**

(54) **METHOD AND APPARATUS TO REDUCE DOWNHOLE SURGE PRESSURE USING HYDROSTATIC VALVE**

(75) Inventors: **Richard Giroux**, Cypress, TX (US); **David M. Haugen**, League City, TX (US); **David Hosie**, Sugar Land, TX (US)

(73) Assignee: **Weatherford/Lamb, Inc.**, Houston, TX (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 31 days.

(21) Appl. No.: **10/157,743**

(22) Filed: **May 29, 2002**

(65) **Prior Publication Data**
US 2003/021837 A1 Dec. 4, 2003

(51) Int. Cl. **E21B 43/12**; E21B 34/06; E21B 34/08

(52) U.S. Cl. **166/386**; 166/320; 166/332.4; 166/334.4; 166/373

(58) **Field of Search** 166/373, 381, 166/386, 316, 317, 318, 319, 320, 332.1, 332.4, 334.1, 334.4

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12 Claims, 12 Figs.



Weatherford International, LLC Exhibit 1003
Page 1 of 20

As shown in FIG. 7, the heating coil 170 has melted or weakened the wire 185 such that the hydrostatic pressure acting upon the top surface of the small piston 180 forces the small piston 180 into the lower atmospheric chamber 109. Wellbore fluid is then allowed to make contact with the *piston 110* and *in the same manner as that described above, the piston 110 is forced downward and the bypass ports (not shown) are sealed.*

Giroux - EX1003 7:14-21 (emphasis added)

708 Ground 1: Giroux Anticipation

(12) **United States Patent**
Giroux et al.



(10) Patent No.
(45) Date of Pat.

(54) **METHOD AND APPARATUS TO REDUCE DOWNHOLE SURGE PRESSURE USING HYDROSTATIC VALVE**

(75) Inventors: Richard Giroux, Cypress, TX (US); David M. Haugen, League City, TX (US); David Hosie, Sugar Land, TX (US)

(72) Assignee: Weatherford/Lamb, Inc., Houston, TX (US)

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(52) U.S. Cl. 166/386; 166/320; 166/332.4; 166/334.4; 166/373

(58) Field of Search 166/373, 381, 166/386, 316, 317, 318, 319, 320, 332.1, 332.4, 334.1, 334.4

(56) References Cited
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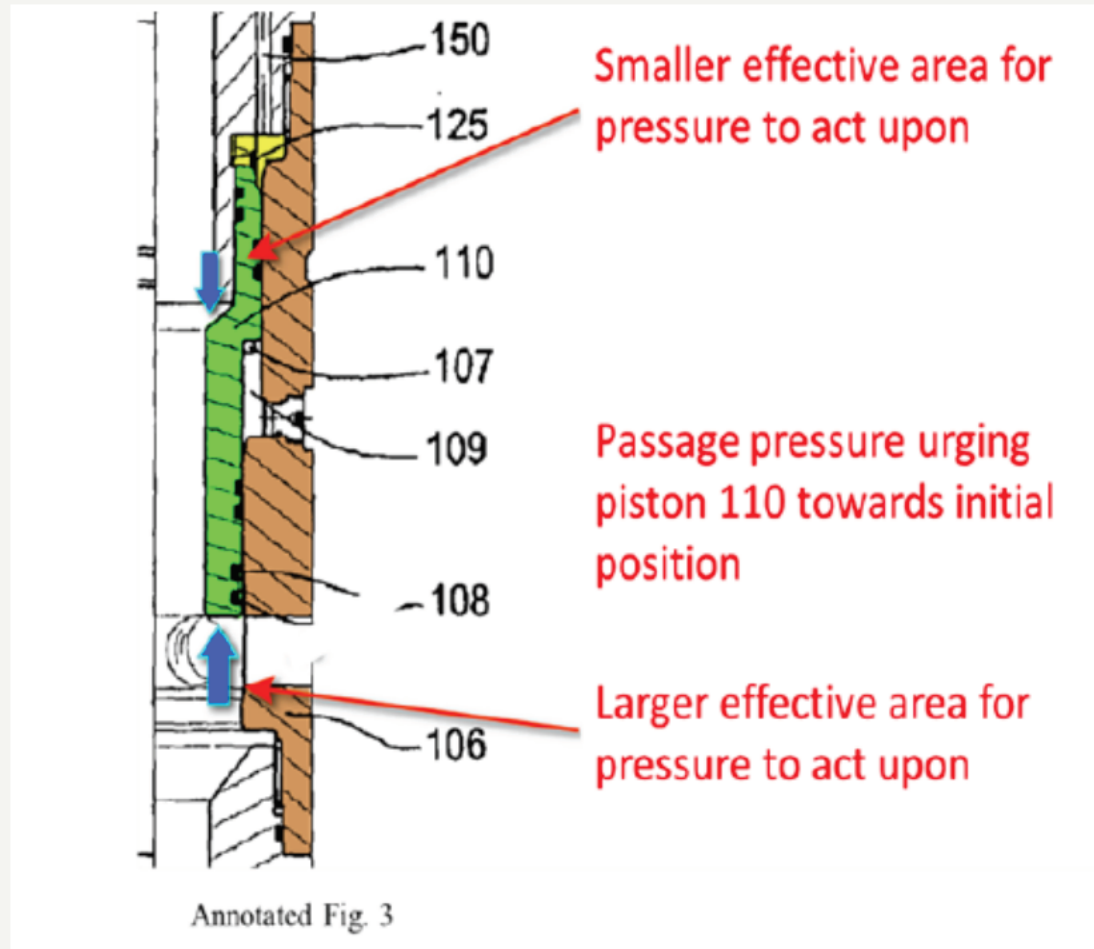
12 Claim

This embodiment may also be segmented such that a series of the tool described immediately above would be connected together, thus allowing for multiple or repeatable closings and openings. A first piston would close the bypass ports in the same manner as that described above in a single signal operated device. However, a second unique operation signal could then be sent to the tool and a second piston could be operated to open a lower set of bypass ports.

The lower set of bypass ports are closed when a third signal is sent from the surface to move a third piston to close the tool. *Additional opening and closing segments could be mated together in order to satisfy the needs of the operators.* Advantageous to this system is its repeatability, its ability to open or close the bypass fluid path more than once.

Giroux - EX1003 7:22-35 (emphasis added)

708 Ground 1: Giroux Anticipation



Giroux - EX1003, Fig. 3 (annotated)

708 Petition

✓ **Ground 1:** Anticipation by Giroux

- Claims 1, 16, 17, 31, 34, 41, and 42

• **Ground 2:** Obviousness over Giroux in view of knowledge of a POSITA and admitted prior art

- Claims 1, 8-11, 16, 17, 31, 34, 41, and 42

• **Ground 3:** Obviousness over **Ground 2** & Patel '853

- Claims 1, 8-11, 16, 17, 31, 34, 41, and 42

708 Ground 2: Giroux Obviousness

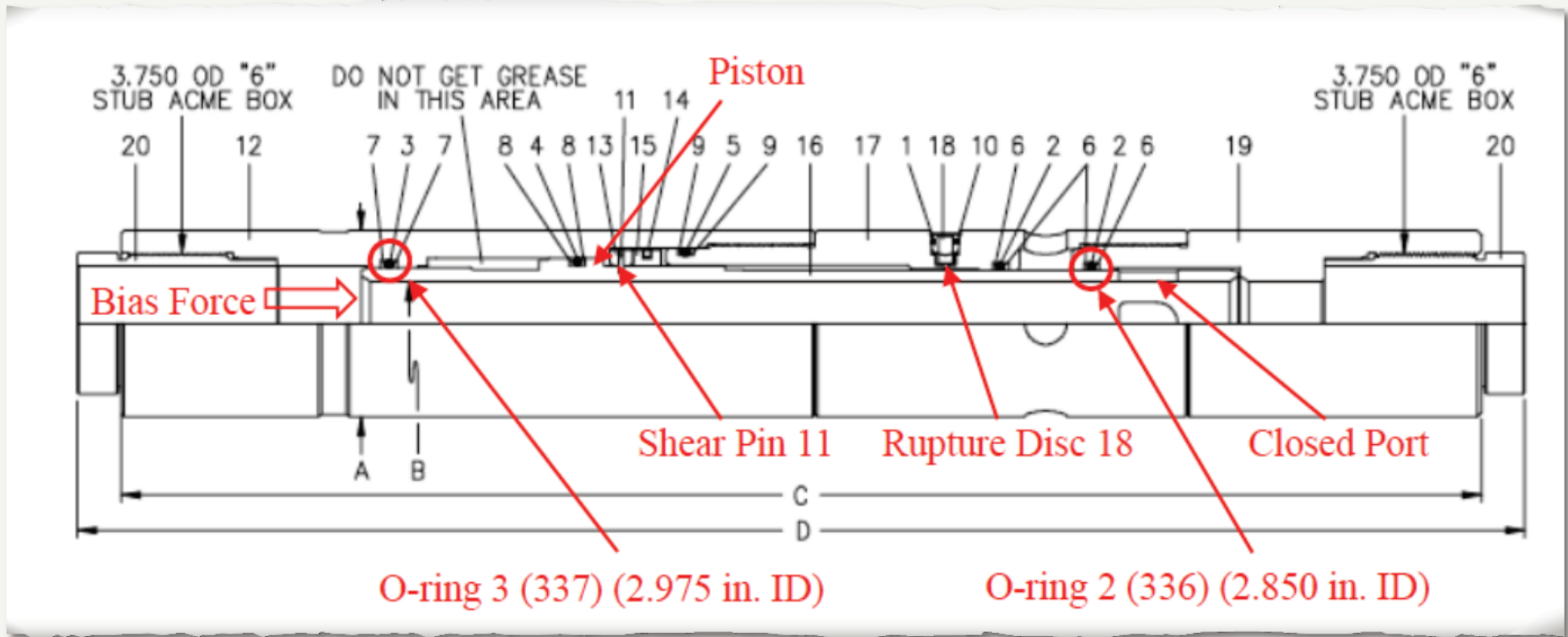
16 So persons of skill in the art are
17 high-pressure plumbers; and this is what they live with
18 every day, cross-sectional area and pressure.

Chambers Dep. - EX2004 81:16-18

said second [(open)] position.” Bringing their experience with pistons, pressures, and cross-sectional areas to bear, a POSITA would have understood that all this requires is that the pressure-area force in the second chamber be *less than* the pressure-area force in the closed chamber on the opposite side of the piston. Chambers Depo. at 81:11-18 (“So persons of skill in the art are high-pressure plumbers; and this is what they deal with every day, cross-sectional area and pressure”). In this way, assuming equal piston areas in the closed and second

Fleckenstein Decl. - EX2001 ¶33

708 Ground 2: Giroux Obviousness



Baker Hughes AORV Specification - EX1027 at 3 (annotated)

708 Ground 2: Giroux Obviousness

2 Q. Okay. But one of the advantages that you get
3 from biassing it closed is avoiding premature actuation,
4 correct?

5 A. Yes, that is correct.

6 Q. Now, it was known before early 2011 that
7 prematurely actuation was a concern for sliding sleeves
8 used in down hole applications, correct?

9 A. It -- it was well-known before 2011 that if a
10 sleeve for whatever reason actuates beforehand
11 malfunctions that it going to cause probably an
12 additional cost to the completion of that well if you're
13 using these sleeves for completions.

Fleckenstein Dep. - EX1045 109:2-13

708 Petition

✓ **Ground 1:** Anticipation by Giroux

- Claims 1, 16, 17, 31, 34, 41, and 42

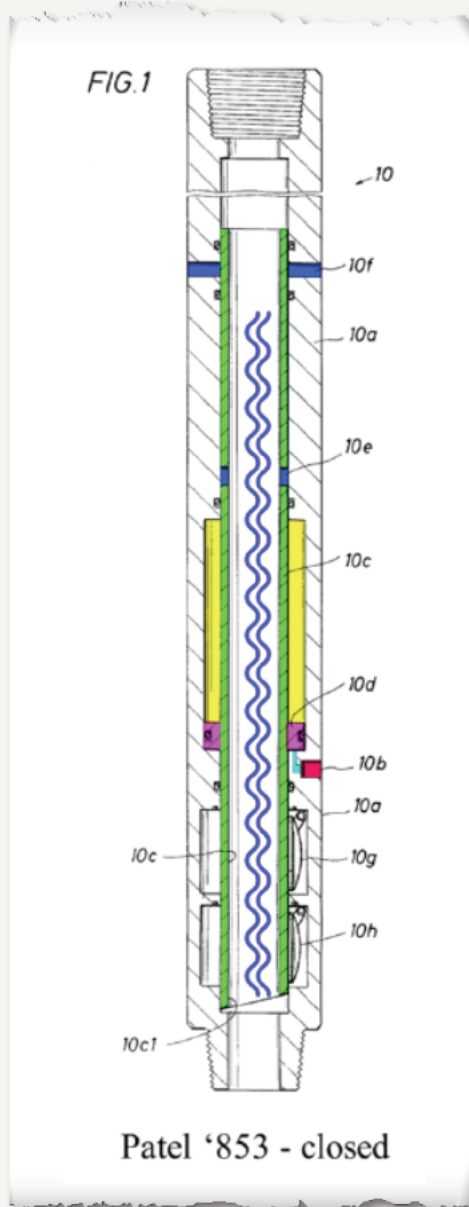
✓ **Ground 2:** Obviousness over Giroux in view of knowledge of a POSITA and admitted prior art

- Claims 1, 8-11, 16, 17, 31, 34, 41, and 42

• **Ground 3:** Obviousness over **Ground 2** & **Patel '853**

- Claims 1, 8-11, 16, 17, 31, 34, 41, and 42

708 Ground 3: Giroux Obviousness



In operation, . . . the port 10e in mandrel 10c and the reversing port 10f in the outer housing 10a are not in congruence with one another. Therefore, fluid cannot flow between the internal area within the valve 10 and the external area outside the valve 10.

Patel '853 - EX1004 3:51-57

EX1004, Fig. 1 (annotated)

708 Petition

✓ **Ground 1:** Anticipation by Giroux

- Claims 1, 16, 17, 31, 34, 41, and 42

✓ **Ground 2:** Obviousness over Giroux in view of knowledge of a POSITA and admitted prior art

- Claims 1, 8-11, 16, 17, 31, 34, 41, and 42

✓ **Ground 3:** Obviousness over **Ground 2** & Patel '853

- Claims 1, 8-11, 16, 17, 31, 34, 41, and 42