

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

OMRON OILFIELD & MARINE, INC.
Petitioner

v.

MD/TOTCO, A DIVISION OF VARCO, L.P.
Patent Owner

Patent No. 5,474,142
Issue Date: December 12, 1995
Title: AUTOMATIC DRILLING SYSTEM

Case IPR2013-00265

PATENT OWNER PRELIMINARY RESPONSE TO PETITION
PURSUANT TO 37 C.F.R. § 42.107

TABLE OF CONTENTS

I.	INTRODUCTION	1
A.	Relationship of the Parties.....	1
B.	Prior Challenges of the ‘142 Patent.....	1
C.	Claims 1, 11, and 14 of the ‘142 Patent	3
II.	CLAIM CONSTRUCTION.....	5
A.	Claims 1, 11, and 14 – “drilling fluid”	5
B.	Claim 14 – Construction of “bit weight”.....	7
C.	Claims 1, 11 and 14 – Construction of “drill string controller”	8
D.	Claims 1, 11, and 14 – Construction of “release of [the] drill string”	8
E.	Claim 14 – Construction of “Regulates the Release [of] said drill string”	11
F.	Claim 1 – Construction of “drilling fluid pressure regulator”	11
III.	NOV’S OBJECTION TO PETITIONER’S PURPORTED EXPERT DECLARATION (Exhibit 1012)	11
IV.	NOV’S RESPONSE TO PETITIONER’S ALLEGED GROUNDS FOR INVALIDITY	13
A.	NOV’s Response to Petitioner’s Anticipation (§ 102(b)) Challenges	14
1.	<u>NOV’s Response to Petitioner’s Ground 1:</u> “Claims 1, 11, and 14 are invalid under 35 U.S.C. § 102(b) over Lindstad.” Pet. at 13-22	14

a.	Under 35 U.S.C. § 325, Lindstad is cumulative of prior art already considered by the PTO.....	14
b.	Neither Lindstad nor Stoner disclose all the elements of Claims 1, 11, and 14	21
(1)	Neither Lindstad nor Stoner disclose “drilling fluid”	22
(2)	Neither Lindstad nor Stoner disclose a system capable of the “release of the drill string” (Claims 1, 11 and 14).....	22
(3)	Neither Lindstad nor Stoner disclose a “drill string controller” (Claims 1, 11 and 14).....	23
(4)	Neither Lindstad nor Stoner disclose “measuring ... <u>bit weight</u> ... producing a second signal in responses to changes in <u>bit weight</u> ” (Claim 14).....	24
(5)	Neither Lindstad nor Stoner disclose “selecting” one or more signals to control (Claim 14).....	24
2.	<u>NOV’s Response to Petitioner’s Ground 4: “Claims 1, 11, and 14 are invalid under 35 U.S.C. § 102(b) over Warren.”</u> Pet. at 38 – 46.....	25
a.	U.S. Pat. No. 4,854,397 to Warren et al. (Warren) was examined by the PTO during the Second Reexamination of the ‘142 Patent.....	25
b.	Warren does not disclose a “drill string controller” for “regulating the release” of the drill string, <u>increasing and decreasing the rate of release</u>	27

c.	Warren does not disclose a “drilling fluid pressure sensor” or “measuring drilling fluid pressure”	30
d.	Warren does not disclose a system for “selecting” as required by claim 14 of the ‘142 Patent	31
e.	Under 35 U.S.C. § 325, Warren is Substantially <i>LESS</i> Relevant than Previously Considered and Rejected Prior Art	32
3.	<u>Petitioner’s Ground 6: “Claims 1 and 11 are invalid under 35 U.S.C. § 102(b) over Miller.”</u> Pet. at 47	33
a.	Miller fails to disclose <u>increasing</u> or <u>decreasing</u> the “ <u>rate of release</u> ” of the drill string	33
b.	Miller, Like Lindstad and Stone, fails to measure “drilling fluid pressure”	37
c.	Claims 1 and 11 overcome Miller for the same reason Varney was overcome in the First Reexamination – No “Rate of Release” of the Drill String.....	37
d.	Miller fails to disclose controlling the release with a “ <u>direct effect at the drill bit associated with the drill string</u> ”	39
e.	Claims 1 and 11 overcome Miller for the same reason Le Compte was overcome in the Second Reexamination – No “ <i>direct effect</i> at the drill bit associated with the drill string”	40
B.	NOV’s Response to Petitioner’s Obviousness (§ 103(a)) Challenges	42

1.	<u>NOV’s Response to Petitioner’s Grounds 3 & 5:</u> Claims 1, 11, and 14 are invalid under § 103(a) over (3) Lindstad and Brooks; (5) Warren and Brooks”	46
a.	Brooks is Merely an Electronic Drilling Recorder	47
b.	Under 35 U.S.C. § 325, the combination of Brooks with either Lindstad or Warren is cumulative of prior art and arguments already considered by the PTO	48
c.	Petitioner misrepresents the disclosure in Brooks to allege a non-existent motivation to combine Brooks and Lindstad	49
d.	The proposed combination of Brooks and Lindstad does not practice Claims 1, 11, or 14	50
e.	Brooks and Warren do not contain every element of Claims 1, 11, and 14	51
2.	<u>NOV’s Response to Petitioner’s Grounds 2, 7 & 8:</u> (“Claims 1, 11, and 14 are invalid under § 103(a) over Crake in combination with either (1) Lindstad; (2) Miller; or (3) Le Compte”	52
V.	CONCLUSION	56

TABLE OF EXHIBITS

Ex. 2001	U.S. Patent No. 5,474,142 (Bowden)
Ex. 2002	National Oilwell Varco's Complaint (W.D. of TX Case No. 1:12-cv-00773)
Ex. 2003	Special Master Karl Bayer's Report and Recommendations dated August 1, 2013 (W.D. of TX Case No. 1:12-cv-00773)
Ex. 2004	Pason Reports Second Quarter 2013 Results (Press Release)
Ex. 2005	Excerpts from McGraw-Hill Dictionary of Scientific and Technical Terms, Sixth Edition, 2003
Ex. 2006	Definition of Release (Dictionary.com, August 5, 2013)
Ex. 2007	Jury Instructions Read by Judge Matsch on November 5, 2008 – Courts Claim Interpretation (Dist. of Colo. Case No. 03-cv-02579)
Ex. 2008	Memorandum Opinion and Order (Claim Construction) (E.D. of TX Case No. 5:09-cv-00085; <i>National Oilwell Varco, L.P. v. Auto-Dril, Inc.</i>)
Ex. 2009	USPTO Office Action in Ex Parte Reexamination dated 12/9/2009 (Reexamination Control No. 90/010,615; Patent No. 5,474,142)
Ex. 2010	U.S. Patent No. 3,265,359 (Bowden)
Ex. 2011	U.S. Patent No. 2,005,889 (Dillon)
Ex. 2012	U.S. Patent No. 3,550,697 (Hobhouse)
Ex. 2013	<i>Markman</i> Hearing Transcript Excerpts (W.D. of TX Case No. 1:12-cv-00773)
Ex. 2014	Federal Circuit 436 F3d 1368 (<i>Varco, L.P. v. Pason</i> ; Court of Appeals No. 05-1136)
Ex. 2015	Decision Denying <i>Inter Partes</i> Review (<i>Monsanto Company v. Pioneer Hi-Bred International, Inc.</i> ; USPTO Case No. IPR2013-00023(SGL))
Ex. 2016	USPTO Detailed Action dated 4/19/1993 (Serial No. 08/050,527; Patent No. 5,474,142)
Ex. 2017	Pason's Request for Reexamination dated 1/23/2004 (Patent No. 5,474,142)

Patent No. 5,474,142**Patent Owner Preliminary Response (37 C.F.R. § 42.107)**

Ex. 2018	U.S. Patent No. 4,793,421 (Jasinski)
Ex. 2019	USPTO Office Action in Ex Parte Reexamination dated 2/17/2010 (Reexamination Control No. 90/010,615; Patent No. 5,474,142)
Ex. 2020	Patentee's Response to Office Action mailed 12/14/2009 (Reexamination Control No. 90/010,615; Patent No. 5,474,142)
Ex. 2021	U.S. Patent No. 4,662,608 (Ball)
Ex. 2022	Petroleum Engineering Drilling and Well Completions by Carl Gatlin, 1960
Ex. 2023	Excerpts from McGraw-Hill Dictionary of Scientific and Technical Terms, Sixth Edition, 2003
Ex. 2024	USPTO Notice of Reexamination Request, dated 1/29/2004 (Reexamination Control No. 90/006,919; Patent No. 5,474,142)
Ex. 2025	USPTO Order Granting <i>Ex Parte</i> Reexamination dated 8/19/2009 (Reexamination Control No. 90/010,615; Patent No. 5,474,142)
Ex. 2026	U.S. Patent No. 4,165,789 (Rogers)
Ex. 2027	Society of Petroleum Engineers – Field Experiences with Computer- Controlled Drilling SPE 20107 By: J.F. Brett and T.M. Warren
Ex. 2028	Trial to Jury Transcript Excerpts Days 6 – 7 (Dist. of Colo. Case No. 03-cv-02579)
Ex. 2029	Patent Owner's Statement Under 37 CFP 1.530(B) (Reexamination Control No. 90/006,919; Patent No. 5,474,142)
Ex. 2030	USPTO Notice of Intent to Issue Ex Parte Reexamination Certificate, dated 11/23/2005 (Reexamination Control No. 90/006,919; Patent No. 5,474,142)
Ex. 2031	U.S. Patent No. 3,223,183 (Varney)

I. INTRODUCTION

A. Relationship of the Parties

Omron Oilfield & Marine, Inc. (“Petitioner”) has been accused of willfully infringing Claims 1, 11, and 14 of U.S. Patent No. 5,474,142 (‘142 Pat.) in Case No. 1:12-cv-00773, pending in the Western District of Texas, Austin Division. Ex. 2002, NOV’s Original Complaint (8/23/2012). National Oilwell Varco, L.P. (“NOV”) is the successor in interest to MD/Totco, and owns the ‘142 Patent’s rights. On May 3, 2013, Petitioner petitioned this Board to grant an *inter partes* review (IPR), and moved the district court to stay NOV’s lawsuit. Petitioner’s requested stay of the lawsuit was denied. The Court appointed Special Master recently issued his rulings on claim construction. Ex. 2003.

B. Prior Challenges of the ‘142 Patent

The ‘142 Patent was originally prosecuted from 1993 – 1995. The principle novel concept of the ‘142 Patent is the invention’s ability to automatically adjust the rate of release of the drill string in response to changes in drilling fluid pressure, alone or in combination with other measured drilling parameters.

Since its issuance, the ‘142 Patent has been litigated *eight* separate times, each time with a favorable result for the patent owner. *See* Pet. for IPR at 1¹. *NOV*

¹ Petitioner inadvertently omitted *Bowden v. Dick’s Oilfield*; Case No. 5:98-cv-01174-FB; filed December 22, 1998, in the Western District of Texas, San Antonio Division.

Patent No. 5,474,142

Patent Owner Preliminary Response (37 C.F.R. § 42.107)

v. Pason (Dist.Colo. No. 03-cv-02579), was appealed *three* times to the Federal Circuit. NOV and Pason recently settled all of the patent infringement cases in the U.S. and Canada against Pason for \$112,000,000.00. Ex. 2004, Pason’s Quarterly Report (8/02/2013).

The ‘142 Patent has been reexamined twice by the PTO since its initial prosecution and issuance. Ex. 2001, ‘142 Pat. with Reexam Certificates attached. Both of these reexaminations were instituted by a party found by a jury to be a willful infringer of the ‘142 Patent -- Pason Systems U.S. Corp. The ‘142 Patent has withstood all attacks by infringers. Claim 1 (as amended), Claim 11 (as amended), and Claim 14 have been confirmed by the PTO several times.

Petitioner relies on cumulative prior art of little relevance, and asserts the same arguments repeatedly considered and rejected by the PTO. The following chart compares the previously considered prior art disclosures, alone and in combination, with the prior art relied on by Petitioner:

CATEGORY	PRIOR ART	Control the “Rate of Release”?	Parameter(s) Measured
Weight-On-Bit Automatic Drilling Systems	Bowden ‘359 (3)	Yes	WOB
	Ball (1)(2)(3)		
	Crake (4)		
Telescoping Joint Automatic Drilling Systems	Varney (2)	No	Drilling Fluid Pressure
	Miller (4)	No	
	Le Compte (3)(4)	Yes	
Hydraulic Snubbing Unit Automatic Drilling Systems	Rogers (1)(2)	No	WOB, RPM, Torque AND/OR Drilling Fluid Pressure
	Brett et al. (3)		
	Hobhouse (3)		
	Dillon (3)	No	RPM, Torque, Force Added to the Top of

Motorized Drive Automatic Drilling System	Jasinski (1)(2)		Drill String (Jasinski), WOB (Dillon), and/or Mud Pressure (Dillon) Air Pressure (Jasinski)
	Stoner	No	Downward Force Added to the Top of Drill String AND/OR Torque
	Lindstad (4)	No	Air Pressure
Drilling Fluid Pressure Is An Important Factor in Drilling	Gatlin (1) (2)	No	WOB, RPM, Torque AND/OR Drilling Fluid Pressure
	Gray, Jr. (1) (2)		
	Brooks (4)		
Downhole MWD Signal Automatic Driller	Alder (1) (2)	Yes	RPM
	Warren (3)(4)	No	WOB

Key: (1) – examined during original prosecution
 (2) – examined during first reexamination
 (3) – examined during second reexamination
 (4) – asserted by Petitioner in its petition for IPR

 - previously examined

Thus, many prior art references have been considered by the PTO in prior reexamination proceedings, including Warren and Le Compte which Petitioner is currently asserting. Ex. 2001, ‘142 Pat. Reexam Certs.

Petitioner must show “a reasonable likelihood that the petitioner [will] prevail with respect to at least 1 of the claims challenged ...” 35 U.S.C. § 314. Under 35 U.S.C. § 325, this burden of proof cannot be met using the “same or substantially the same prior art or arguments [that] were previously presented to the Office.” Petitioner fails this test.

C. Claims 1, 11, and 14 of the ‘142 Patent

Claim 1 is an apparatus claim for an automatic drilling system for

Patent No. 5,474,142

Patent Owner Preliminary Response (37 C.F.R. § 42.107)

“automatically regulating the release of the of the drill string of a drilling rig ...” Exhibit 2001, ‘142 Patent (24:38 – 40). It contains a “drilling fluid pressure regulator” that measures changes in drilling fluid pressure. *Id* (24:38 – 59). A “relay” is connected to the “drilling fluid pressure regulator” to supply a “drill string control signal” to the “drill string controller.” *Id*. Based on this signal, the “drill string controller” is capable of either “effect[ing] an increase in the rate of release of said drill string” or “effect[ing] a decrease in the rate of release of said drill string.” Exhibit 2001, ‘142 Pat. (24:50-60)(emphasis added). During the second reexamination, a clarifying amendment was added to the automatic driller of Claim 1 stating that increasing or decreasing the rate of release of drill string has a “direct effect at the drill bit.” *Id*.

Claim 11 is for a “method for automatically regulating the release of the drill string of a drilling rig drill ...” Ex. 2001, ‘142 Pat. (27:44-46) & (28:24-25). It measures the changes in “drilling fluid pressure” and “produces a signal in response to changes in drilling fluid pressure.” *Id* at (27:44-56). This signal is sent to a “drill string controller,” which increases or decreases “the rate of release of said drill string” depending on whether the signal represents an increase or decrease in drilling fluid pressure. *Id*. (27:52-56)(emphasis added). During the second reexamination, the same clarifying amendment was added to Claim 11 stating that this method has a “direct effect at the drill bit.” *Id*.

Claim 14 is for a “method for automatically regulating the release of the drill string of a drilling rig drill ...” Ex. 2001, ‘142 Pat. *Id.* (28:24-25). It involves the control of the drill string based on multiple parameters – changes in pressure and bit weight. *Id.* (28:24-39). Signals are generated in response to changes in drilling fluid pressure and bit weight. *Id.* The automatic driller of claim 14 “select[s] any one of said first signal [representing changes in pressure], said second signal [representing changes in bit weight], and both said first and second signals to control the release of the drill string.” *Id.* Whichever signal (or signals) is selected, it is then relayed to the “drill string controller” that “regulates the release said drill string in response to said selected signal or signals.” *Id.* (emphasis added). Claim 14 has survived all challenges without amendment.

II. CLAIM CONSTRUCTION

A. Claims 1, 11, and 14 – “drilling fluid”

Drilling fluid should be construed to mean “drilling mud.” The patentee specifically defined “drilling fluid” as “mud” for driving a downhole mud motor:

“mud motor 85 which allows directional and horizontal boreholes to be drilling ... Pump 25 pumps **drilling fluid (i.e. mud)** into drill string 21 ... The drilling fluid drives mud motor 85.”

Exhibit 2001, ‘142 Pat. (3:67 – 4:10)(emphasis added).

In the underlying district court case (*NOV v Omron*), the Special Master interpreted “drilling fluid” consistent with the specification and the ordinary

meaning to mean “mud pumped down the drill string.” Ex. 2003, Special Master’s Recommended Constructions 8/01/2013, p. 2 of 24.

In *Abbott Laboratories v. Novopharm Ltd.* the Federal Circuit held that the inventor’s use of the “i.e.” abbreviation “explicitly defined” the preceding term. 323 F.3d 1324, 1330 (Fed. Cir. 2003) (“Hence, this is a case in which the patentee has ‘chosen to be his own lexicographer,’ and the district court did not err by reading the patentee's definition from the specification into the claim.”)(emphasis added); *See also Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1334 (Fed. Cir. 2009)(“As the court correctly reasoned, the specification's use of ‘i.e.’ signals an intent to define the word to which it refers...”)(emphasis added); *See also Poris v. Novellus Sys., Inc.*, C 10-00947 JSW, 2011 WL 3355061 (N.D. Cal. Aug. 3, 2011)(“The use of ‘i.e.’ signals the patentee's intent to define the word to which it refers.”)(emphasis added).

The ‘142 patentee specifically defined “drilling fluid” as drilling “mud” by using the symbol “i.e.” “Mud” consists of “clay, water, and chemical additives.” Ex. 2005, Dictionary Def’n of “Drilling Fluid” & “Drilling Mud.” This term excludes any prior art drilling systems that use, instead, air circulated through the drilling system. A “mud motor” is powered by drilling mud, not compressed air.

Petitioner asks this Board to construe drilling *fluid* as including *air* pumped down a drill string. *See* Pet. at II.A. Petitioner does this because its primary prior

Patent No. 5,474,142

Patent Owner Preliminary Response (37 C.F.R. § 42.107)

art reference Lindstad (Exhibit 1001) discloses a “blasthole drill” that pumps “compressed *air* through a hollow drill stem” (to drill shallow holes “ranging from 15 to 60 feet”). Ex. 1001, ‘805 (1:5-7) & (1:27-30)(emphasis added).² An inventor’s definition *always* governs over a party’s proposed claim construction. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005)(“[T]he inventor’s lexicography governs.”)(emphasis added).

“Drilling fluid” can only reasonably be defined as “Drilling mud,” which is a “special mixture of clay, water, and chemical additives pumped downhole through the drillpipe and drill bit.” Ex 2005. It does not mean *air*.

B. Claim 14 – Construction of “bit weight”

“Bit weight” or “weight on bit” is the amount of force applied to a drill bit by the weight of drill string. The ‘142 Patent used the terms “bit weight” and “weight on bit” interchangeably. Exhibit 2001, ‘142 Pat. (6:12 – 33).

In the underlying district court case (*NOV v Omron*), the Special Master interpreted “bit weight” to mean “an approximation of downward force placed on the bit by the weight of the drill string.” Ex.2003, Special Master’s Recommended Constructions 8/01/2013, p. 2 of 24.

“Weight” is “the force that gravitation exerts upon a body, equal to the mass

² **Lindstad’s blasthole drill relates to using force to drive the drill down for shallow holes to place dynamite in to blow up land for the building of roads. This is an entirely different field of invention as the ‘142 Patent that relates to drilling very deep boreholes to extract oil and gas products.**

of the body times the local acceleration of gravity (emphasis added).³ Petitioner would have this Board eliminate *gravity* from the measurement of “bit weight.” Pet. at 11-12. Petitioner argues this because Lindstad’s uses a “downfeed motor 10” to *push* the drill (into shallow holes) instead of the *pull* of *gravity* acting on a drill string. Ex. 1001, Lindstad (3:66-68). Petitioner wants “bit weight” to include the artificial driving force created by the downfeed motor of Lindstad, which is completely different from the *pull* of *gravity*. The ‘142 Patent specification contradicts Petitioner’s construction since it depends on the “drill sting 21” to apply weight – via gravity – “on top of drill bit 23.” Ex. 2001, ‘142 Pat. (6:12-33). A patentee’s lexicography always governs. *Phillips*, 415 F.3d at 1316.

C. Claims 1, 11 and 14 – Construction of “drill string controller”

In the underlying district court case (*NOV v Omron*), the Special Master interpreted “drill string controller” to mean “a device that changes the rate of release of the drill string in response to signals from the relay(s).” Ex. 2003, Special Master’s Recommended Constructions 8/01/2013, p. 2 of 24 (emphasis added).

D. Claims 1, 11, and 14 – Construction of “release of [the] drill string”

Petitioner advocates for the construction of “release of [the] drill string” to mean “the *downward movement* of the drill string into the borehole.” Pet. at II.C.

³ Ex. 2005. McGraw Hill Scientific Dictionary.

at 12. Petitioner's construction vitiates the term "release" altogether. "Release" means "slacking" of or "letting go" of the drill string. Ex. 2006. "Pushing" from above (like a home owner's power drill) is different.

A traditional drilling rig operates like a fishing line. Drill string is controlled as: (1) cable from the drum is "released;" (2) gravity pulls on the cable through the weight of the drill string hanging from the hook; (3) this cable is pulled through the crown block and then released to the traveling block (still pulled by the weight of the drill string); and (4) this extra cable lowers the drill string. This operation is repeatedly described in the '142 Patent's Specification:

Brake 32 controls the release of cable 28 from drum 26 to adjust the vertical position of drill string 21 with respect to derrick 20.

Ex. 2001, '142 Pat. (3:61-63).

Accordingly, brake 32 must be manipulated to permit drum 26 to release cable 28 and adjust drill string 21, thereby providing the constant pressure on drill bit 23 required to maintain the optimal rate of penetration.

Id. (4:24-32)(emphasis added).

[A]utomatic driller 33 connects to brake handle 208 via cable 207 to regulate the release of cable 28 from drum 26. Automatic driller 33 senses when drill bit 23 is "off bottom" and manipulates brake 32 to release cable 28 and lower drill string 21 until drill bit 23 is against "on bottom".

Id. (4:33-39)(emphasis added).

Although regulators 200 – 203 may be used concurrently to control brake 32, they may also be utilized individually or in any combination

to control the release of cable 28 from drum 26.

Id. (7:26-34)(emphasis added).

The release of cable lowers drill string 21 to place drill bit 23 “on bottom”. With drill bit 23 “on bottom”, backpressure created within drill string 21 raises drilling fluid pressure back to its optimal value. Once drilling fluid pressure reaches its optimal value, drilling fluid pressure regulator 200 stops the release of cable 28 to end the lowering of drill string 21 (emphasis added).

Id. (8:22-31).

Petitioner seeks a construction where “release” can mean the “use of a motor to apply a downward force” to the top of the drill pipe as used in Petitioner’s primary reference Lindstad. Pet. II.C. at 12. Petitioner’s construction makes no sense. **“Release” is a verb meaning to “let go;”⁴ to “set free from restraint;” or “to relieve from something that confines.”⁵** Petitioner’s argument contradicts itself, since nothing is “released” when a motor is used to *drive* a drill into the ground. Petitioner’s construction would equate to regulating the descent of a car down a hill – not by adjusting the brake (like the ‘142 Patent) – but instead by adjusting the accelerator. These concepts are completely different. Petitioner’s construction draws no support from either the patent claims or the specification.⁶ It is a litigation gambit.

⁴ Dictionary.com.

⁵ Ex. 2006, Websters.com definitions of “release”.

⁶ Petitioner’s proposed construction of “release” to include increasing the “downward force” applied to the drill string ignores the everyday meaning of this

E. Claim 14 – Construction of “Regulates the Release [of] said drill string”

District courts in Colorado and Texas interpreted “regulates the release” to mean increasing and decreasing the “rate of release” of the drill string. Exs. 2007 & 2008. The PTO also understood Claim 14’s use of “regulating the release” means controlling the “rate of release. Ex. 2009, 2nd Reexam, 12-14-2009 Office Action, p. 7 – 8).

F. Claim 1 – Construction of “drilling fluid pressure regulator”

Petitioner proposes that the “drilling fluid regulator” of Claim 1 is a device that measures changes in drilling fluid pressure and produces an out signal representative of any changes. Pet. at 13. NOV does not disagree.

**III.
NOV’S OBJECTION TO
PETITIONER’S EXPERT DECLARATION (Exhibit 1012)**

Petitioner relies almost exclusively on arguments from their designated expert in the district court litigation - Mitchell Pinckard (Exhibit 1012). Petitioner agrees that a person of ordinary skill in the art must be someone with “engineering background” and “five years of experience” in the oil and gas industry, whose experience must include the “running of oil rigs, particularly the process of braking

word. “Release” has nothing to do with the amount of “downward force” added to the drill string. (Increasing the “downward force” could be applied by stacking weights on top of the drill string or mechanically pushing or driving the top of the drill string downward. That is not a “release”).

or not braking the release of the drill string, and the experience with the design of the systems that are used for that.” Ex. 2013, *NOV v Omron Markman* Transcript (15:15 – 16:3). Pinckard’s declaration does not mention any experience with control systems for “braking the release of the drill string.” See Exhibit 1012, ¶¶ 5-9.

Patents must be interpreted through the “eyes” of a “person of ordinary skill in the art [POOSITA].” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005). Using Petitioner’s own definition of a POOSITA, Pinckard does not qualify to render opinions relevant to the ‘142 Patent. Pinckard’s declaration should be disqualified and stricken from the record.

Further, Pinckard makes many conclusory opinions that do not mention any experimentation, data, or facts supporting his opinions. For example, the Federal Circuit recognized one of the key elements of the invention in Claim 14 to be the automatic driller’s ability to “select” the controlling drilling parameter – pressure, bit weight, or both. Ex. 2014, *Varco*, 436 F.3d at 1374. Pinckard makes a conclusory statement that the Lindstad and Stoner patents disclose this step, but fails to cite any portion of either patent to support his assertion. See Pinckard Dec. (Exhibit 1012) at ¶ 33.

Expert testimony must “disclose the underlying facts or data” on which it is based. 37 C.F.R. § 42.65(a). Otherwise, it “is entitled to little or no weight.” *Id.*;

See also 77 Fed. Reg. at 48,763 (“[A]ffidavits expressing an opinion of an expert must disclose the underlying facts or data upon which the opinion is based.”) (citing 42.65 and Fed. R. Evid. 705). Since Pickard’s affidavit is the primary evidence provided to support Petitioner’s petition, the Board has the authority to deny Petitioner’s petition entirely. *See, e.g.,* Case IPR2013-00023 (SGL) Paper No. 32 Denying Petition for *Inter Partes Review*. Ex. 2015.

**IV.
NOV’S RESPONSE TO
PETITIONER’S ALLEGED GROUNDS FOR INVALIDITY**

Petitioner ignores all the prior PTO proceedings, and asserts grossly cumulative and irrelevant prior art in its petition. Petitioner will reap a high financial reward if it can continue to infringe. *See* 77 Fed. Reg. 70385, 70386 – 87 (Nov. 26, 2012)(“[T]he identity of the real-party-in-interest might also affect the credibility of evidence presented in a proceeding.”) Further: “Arguments of counsel cannot take the place of evidence lacking the record.” *Zund Systemtechnik Ag. & Zund Am., Inc. Requester*, No. 2011-013537, 2012 WL 527411, at *9 (Bd. Pat. App. & Interf. Feb. 16, 2012. NOV addresses each of Petitioner’s alleged grounds for invalidity below.⁷

NOV responds to Petitioner’s alleged grounds for invalidity in two main

⁷NOV is not admitting the presence or absence of any claim element not specifically commented upon below. NOV focuses on the most glaringly missing claim elements to save this Boards’ valuable time and resources.

Patent No. 5,474,142

Patent Owner Preliminary Response (37 C.F.R. § 42.107)

sections: (A) anticipation (35 U.S.C. § 102(b)); and (B) obviousness (35 U.S.C. § 103(a)), to avoid unnecessary duplication of its response.

A. NOV’s Response to Petitioner’s Anticipation (§ 102(b)) Challenges

Petitioner asserts that certain prior art anticipates claims 1, 11 and 14 of the ‘142 Patent. Pet. Grounds 1, 4, and 6. Invalidity under 102(b) “requires that all of the claim elements and their limitations are shown in a single prior art reference.” *In re Skvorecz*, 580 F.3d 1262, 1266 (Fed. Cir. 2009). The prior art reference “must also disclose those elements arranged as in the claim.” *See* MPEP 2121; *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008).

1. NOV’s Response to Petitioner’s Ground 1:

“Claims 1, 11, and 14 are invalid under 35 U.S.C. § 102(b) over Lindstad.” Pet. at 13 – 22.

a. Under 35 U.S.C. § 325, Lindstad is cumulative of prior art already considered by the PTO.

During the original prosecution of the ‘142 Patent the PTO Examiner cited U.S. Patent No. 4,793,421 to Jasinski. Ex. 2001, ‘142 Pat., *References Cited & Ex.* 2016, 3/11/1994 O.A.:

E	4662608	5-87	Dall	175	27
F	4793421	12-88	Jasinski	175	27
G	4875437	11-88	...	175	27

Patent No. 5,474,142
Patent Owner Preliminary Response (37 C.F.R. § 42.107)

The PTO also considered Jasinski during the First Reexamination:⁸

Claims 1 and 11 of the Bowden patent are considered to be **unpatentable under 35 U.S.C. 103** in view of the prior art patent document to Varney and further with the teachings of Varney in view of the prior art cited during prosecution of the Bowden patent.

Ex. 2017, 1/23/2004 1st Reexam Request, p. 3 (emphasis added).

The PTO previously considered Jasinski, which describes Lindstad and Stoner as follows:

“Control systems for **blast hole drills** are also described in U.S. Pat. Nos. 3,581,831 [Stoner]; 3,593,807 and 3,613,805 [**Lindstad**] with the Nos. ‘830 and ‘850 patents being commonly assigned. In the No. ‘830 patent the control system balances rotary torque and **downfeed force** to reduce downfeed speed when torque feedback exceeds a predetermined value.

* * *

Automatic depth control is provided in the control system described in the No. ‘805 patent as well as automatic shut down.

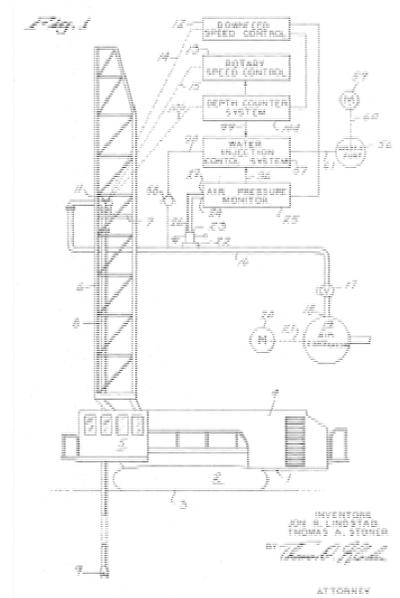
Although automatic drill control systems have been constructed and used, they have not been employed to optimize the automatic drilling of a **blast hole drill** in the most efficient manner.”

Ex. 2018, **Jasinski** (1:31-45).

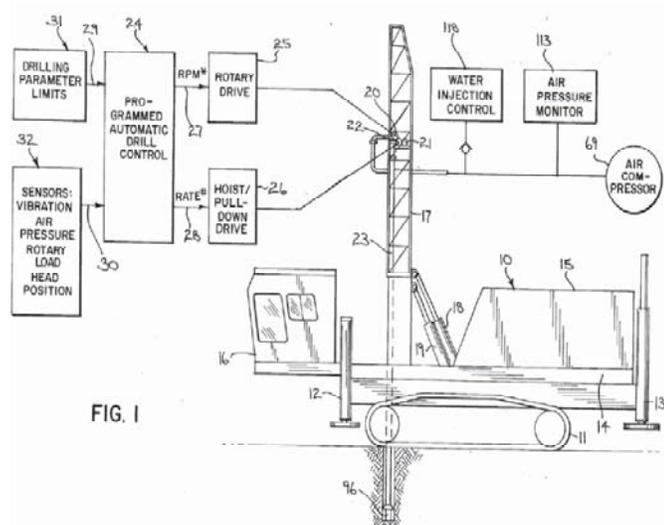
⁸ MPEP 707.05 (“Citation of References”)(2010 Ed.)(“During the examination of an application or reexamination of a patent... The examiner must consider all the prior art references (alone and in combination) cited in the application or reexamination.”)

Patent No. 5,474,142
Patent Owner Preliminary Response (37 C.F.R. § 42.107)

Jasinski (Ex. 2018) and Lindstad (Ex. 1013) have substantially the same disclosure:



Lindstad

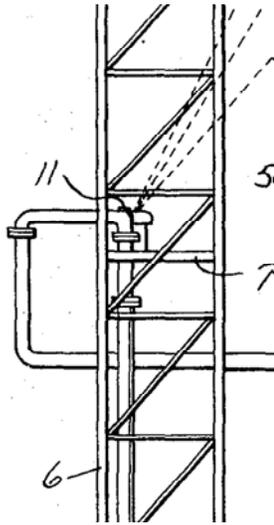


Jasinski

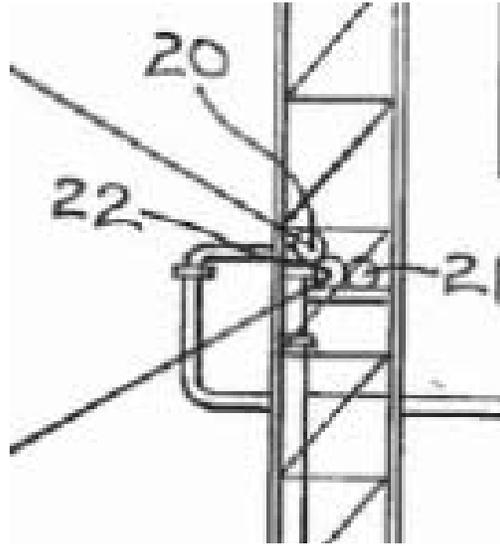
The Lindstad and Jasinski disclosures are compared in the following table:

Feature	Lindstad	Jasinski
Air Pressure Sensor	“Air Pressure Monitor 25”	“Air Pressure Sensor 32” “Air Pressure Monitor 113”
Downfeed Force Sensor	Lindstad - None, Stoner: “Force Sensor 107”	“actual force 127” into “force limit rate correction function 126”
Computer for Controlling Downfeed	“Downfeed Speed Control 12”	“Programmed Automatic Drill Control 24”
Downfeed Motor	“Vertical Traverse Unit 7” “Hydraulic Downfeed Drive Motor 10”	“Hoist Pulldown Mechanism 21” “Hoist Pulldown Motor 22”
Air Compressor for delivering air	“Air Compressor 19”	Air Compressor 69”

Lindstad and Jasinski are “blast hole” drilling rigs mounted on a track driven vehicle. The mast and drive mechanism for forcing the drill sting into the earth are identical:



Lindstad



Jasinski

A comparison of the respective patents reveals that previously-considered Jasinski is more significant prior art than either Lindstad or Stoner.

Lindstad is merely a “blast hole drill” that is:

“used primarily in surface mining to drill holes for explosives. Hence, these drills usually bore holes ranging in depth from 15 to 60 feet...”

Ex. 1013, Lindstad (1:4-8).

Lindstad’s holes are generally shallow, vertical, straight holes where the drill pipe is pushed into the ground by mechanical force. This is not even close to the oil drilling system of the ‘142 Patent. The ‘142 Patent was invented for drilling directional or horizontal wells described as follows:

“Although bit weight automatic drillers function adequately for completely vertical boreholes, they cease to operate properly for any type of directional or horizontal drilling operations. ... Accordingly, a need exists for an automatic driller that not only operates through bit weight measurements but also operates in response to other measurements so that directional or horizontal boreholes may be drilled.” Ex. 2001, ‘142 Pat. (1:51-54)(emphasis added).

Lindstad and Stoner are incapable of solving the problem which was overcome by the inventor of the ‘142 Patent – how to automatically drill directional and horizontal oil and gas wells.

The PTO disregarded Jasinski during the original prosecution and the First Reexamination. The several possible grounds for this decision, any one of which would be sufficient, are described below:

1. Jasinski, like Lindstad and Stoner, does not disclose a system which utilizes “drilling *fluid*” or measures “drilling *fluid* pressure,” i.e., “mud pumped down the drill string.” *See* Section II. above. Jasinski, Lindstad, and Stoner uses *air* and measures *air pressure* instead of using mud and measuring mud pressure.
2. Jasinski, Lindstad, and Stoner do not disclose a system which includes a “drill string controller” or the “*release* of the drill string” as required by claims 1, 11, and 14. *See* Section II, D, above. Jasinski, Lindstad,

and Stoner have a *drive* system which exerts downward force on the top of the drill string.

3. Jasinski, Lindstad, and Stoner do not measure “bit weight” as that term is used in the ‘142 Patent. Jasinski and Stoner only measure the downward force being exerted on the top of the drill string by the drive system.

35 U.S.C. § 325 states that the Board should reject a request for IPR based on “same or substantially the same prior art or arguments [that] were presented to the Office [previously].” “A piece of prior art is not material to patent prosecution when it is cumulative of information already before the examiner.” *Rothman v. Target Corp.*, 556 F.3d 1310, 1326 (Fed. Cir. 2009); *See also Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 537 F.3d 1357, 1367 (Fed.Cir.2008) (“It is well-established...that information is not material if it is cumulative of other information already disclosed to the PTO.”)

Petitioner tries to incorporate Stoner (Exhibit 1014) by reference into Lindstad (Exhibit 1001). A comparison of the disclosure of Lindstad and Stoner, as alleged by Petitioner, is compared below to previous PTO Examiners’ comments on prior art which has been considered and rejected:

Lindstad (Exhibit 1001)	<u>Petitioner’s claim:</u> “Lindstad discloses a blasthole drilling system that <u>automatically regulates the release of the drill string in response to changes in drilling fluid pressure.</u> ” Pet. at 13 (emphasis added).
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<p>Varney (Exhibit 2031)</p>	<p><u>PTO Examiner:</u> “Varney teaches an automatic drilling system and method for <u>automatically regulating the release of a drill string including a pressure sensor 112</u>. Drilling fluid pressure regulator 125 coupled to sensor 112 measures changes in drilling fluid pressure and outputs a signal representing those changes by use of potentiometer 125 ... Power transformer 132 drives a brake 134 that is considered the controller couple to the relay that controls the rate of release ... <u>Varney teaches the use of drilling fluid pressure to control release of the drill string as described above.</u>” Ex. 2024, pp. 2-3 (emphasis added).</p>
<p>Dillon (Ex. 2011)</p>	<p><u>PTO Examiner:</u> “Dillon et al. (US 2,005,889) teaches an automatic drilling system that controls the rate of release of a drill string as a function of ... <u>drilling fluid pressure</u> ... The drilling fluid pressure sensor 104-106 is selectively used to provide input to the controller 65 via a selector switch 98 ...” Ex. 2025, Decision Granting 2nd Reexam (8/21/2009), p. 2 (emphasis added).</p>
<p>Le Compte (Ex. 1023)</p>	<p><u>PTO Examiner:</u> “Le Compte et al (US 1,891,329) teaches an automatic drilling system that controls the rate of release of a drill string as a function of <u>drilling fluid pressure</u> ... The valve 80 controls a pneumatic cylinder 67 as a function of the drilling fluid pressure, and the cylinder 67 actuates a brake lever 60 to control the rate of release of a drill string cable E from a cable drum D.” Ex. 2025, Decision Granting 2nd Reexam (8/21/2009), p. 3 (emphasis added).</p>
<p>Brett/Warren (Ex. 2027)</p>	<p><u>PTO Examiner:</u> “Brett et al. (‘Field Experience with Computer-Controlled Drilling’) teaches an <u>automatic drilling system that controls the rate of release of a drill string as a function of ... drilling fluid pressure.</u>” Ex. 2025, Decision Granting 2nd Reexam (8/21/2009), p. 3 (emphasis added).</p>
<p>Stoner (Ex. 1014)</p>	<p><u>Petitioner’s claim:</u> “Stoner discloses that the ‘downfeed control’ incorporated into Lindstad also automatically <u>regulates the rate of release of the drill string in response to changes in the force on the drill bit (the ‘bit weight’).</u>” Pet. at 16 (emphasis added).</p>
<p>Ball (Ex. 1021)</p>	<p><u>PTO Examiner:</u> “Ball discloses an automatic drilling control system in which comprises an electronic drum brake control system <u>in response to the bit weight variations</u> (Fig 3). <u>Ball basically teaches the same principle of controlling the rate of drill string release</u> ...” Ex. 2016, O.A. (3/11/1994), p. 4-5 (emphasis added).</p>

	added).
Rogers (Ex. 2026)	PTO Examiner: “Rogers discloses a drilling optimization control system (Figs 1-3) which comprises a computer control system for optimizing the penetration rate. In which the drilling rpm and the thrust (or bit weight) are monitored and manipulated by the computer to achieve the optimal penetration conditions.” Ex. 2016, O.A. (3/11/1994), p. 4-5 (emphasis added).
Hobhouse (Ex. 2012)	PTO Examiner: “Hobhouse (US 3,550,697) teaches an automatic driller system that controls the rate of release of a drill string as a function of drilling motor torque and bit weight.” Ex. Ex. 2025, Decision Granting 2 nd Reexam (8/21/2009), pp. 2-3 (emphasis added).
Dillon et. al. (Ex. 2011)	PTO Examiner: “Dillon et al. (US 2,005,889) teaches an automatic drilling system that controls the rate of release of a drill string tension (which corresponds to bit weight) ...” Ex. Ex. 2025, Decision Granting 2 nd Reexam (8/21/2009), p. 2.
Bowden ‘359 (Ex. 2010)	PTO Examiner: (incorporating requestors statement by reference): “Bowden ‘359 describes a drill string controller that operates nearly identically to that of the ‘142 Patent [Ex. 2001] in relation to bit weight, and inherently regulates the rate of drill string release.” Ex. 2025, Decision Granting 2 nd Reexam (8/21/2009), p. 2 (emphasis added).

Lindstad and Stoner are completely cumulative of prior art considered and rejected by the PTO.⁹ Omron’s first ground for IPR should be denied. 35 U.S.C. § 325.

b. Neither Lindstad nor Stoner disclose all the elements of Claims 1, 11, and 14.

Lindstad and Stoner do *not* disclose at least the following claim elements:

- a. “drilling fluid” (Claims 1, 11, and 14)

⁹ See, e.g., 37 C.F.R. § 1.56(b)(“[I]nformation is material to patentability when it is not cumulative to information already of record or being made of record in the application ...”)

- b. “release of the drill string” (Claims 1, 11, and 14);
- c. “drill string controller” (Claims 1, 11, and 14);
- d. “measuring ... bit weight ... producing a second signal in responses to changes in bit weight” (Claim 14);
- e. “selecting” one or more signals to control (Claim 14).

The lack of any one of these elements would be sufficient to survive a 102(b) challenge under Lindstad or Stoner, and they lack all of them. They are addressed in order below.

(1) Neither Lindstad nor Stoner disclose “drilling fluid”

As discussed above, “drilling fluid” means “drilling mud.” Ex. 2003, Special Master Interpretation (“Mud pumped down the drill string.”). Both Lindstad and Stoner utilize compressed *air* – not drilling mud. Ex. 1013, Lindstad (1:27-29). While Lindstad sometimes uses “water injection” to reduce the amount of dust blown out of the hole (1:35-40), Lindstad does not disclose a sensor or any method for measuring water pressure.

(2) Neither Lindstad nor Stoner disclose a system capable of the “release of the drill string” (Claims 1, 11 and 14)

Claim 1 requires an automatic drilling system for automatically regulating the “*release* of the drill string ... during the drilling of a borehole.” Ex. 2001, ‘142 Patent (24:37-39). Claims 11 and 14 also describe steps for “regulating the *release* of the drill string.” As explained above, the ‘142 Patent requires the release of drill

string – “slacking” of or “letting go” of the drill string. Ex. 2006.

Lindstad and Stoner disclose shallow blasthole drilling where a drill with an attached bit is driven down by a “hydraulic downfeed *drive* motor 10.” Ex. 1013, Lindstad (3:30-44)(emphasis added). Stoner discloses an identical structure. Ex. 1014, Stoner (3:9-20). Lindstad, Stoner, and Jasinski use “downfeed” and “linear force” interchangeably. Ex. 1014, Stoner (8:33-34)(“Downfeed or linear force will then be increased ...”)(emphasis added); Ex. 1013, Lindstad (7:67-69); Ex. 2018, Jasinski (2:15-18)(“the hoist pulldown motor will cause a pulldown mechanism to exert a downward force on the drill pipe as it is being rotated.”). These prior art references do not regulate the *release* of the drill string. They simply control the downfeed/linear force exerted on the top of the drill pipe to push it down.

(3) Neither Lindstad nor Stoner disclose a “drill string controller” (Claims 1, 11, and 14)

As explained above, the district court in the underlying action interpreted “drill string controller” to be “a device that changes the rate of release of the drill string in response to signals from the relay(s).” Ex. 2003, p. 3 of 24. Neither Lindstad nor Stoner are capable of regulating the release of the drill string. Thus, neither Lindstad and Stoner has the “drill string controller” required by claims 1, 11 and 14 of the ‘142 Patent.

(4) Neither Lindstad nor Stoner disclose “measuring ... bit weight ... producing a second signal in responses to changes in bit weight” (Claim 14).

As set out above, the district court in the underlying action construed “bit weight” as “an approximation of downward force placed on the *bit* by the *weight* of the *drill string*.” Ex. 2003, Special Master Claim Construction, p. 2 of 24 (emphasis added).

Neither Lindstad nor Stoner measure, estimate, or approximate the downward force on the bit by the weight of the drill string. Lindstad doesn’t disclose measurement or control of *any* force on the drill pipe. Stoner merely discloses a “force sensor 107” and “pressure sensors 22 and 23” for sensing the “amount of that pressure or force of that feed.” Ex. 1014, Stoner (5:20-22). Because the feed system is connected to the *top* of the “drill stem 5,” the force being measured is the force imparted to the *top* of the “drill stem 5,” not the “downward force on the *bit* by the *weight* of the *drill string*.”

(5) Neither Lindstad nor Stoner disclose “selecting” one or more signals to control (Claim 14).

Claim 14 of the ‘142 Patent requires a step of “selecting” one or more signals for controlling the rate of release of the drill string. Ex. 2001, ‘142 Pat. (28:33-35).

Nothing in Lindstad or Stone discloses, much less suggests, a method of selection of either or both signals representing changes in drilling fluid (drilling

mud) pressure or bit weight (downward force on the bit by the weight of the drill string).

Thus, since Lindstad and Stoner lack most of the elements of Claims 1, 11, and 14, Petitioner's first ground for IPR should be denied. 35 U.S.C. § 102(b).

2. **NOV's Response to Petitioner's Ground 4:**
"Claims 1, 11, and 14 are invalid under 35 U.S.C. § 102(b) over Warren." Pet. at 38 – 46.

Petitioner misrepresents Warren's disclosure. *See* Ex. 1012, Pinckard Dec. ¶¶ 61 – 62. Warren discloses a broad idea of "inputt[ing] desired limits of weight-on-bit (WOB), torque, RPM, drillstring inclination and azimuthal direction, and other parameters found useful in directional drilling." **Warren does not disclose drilling fluid pressure as a parameter.** Ex. 1018, Warren (4:14-22).

a. **U.S. Pat. No. 4,854,397 to Warren et al. (Warren) was examined by the PTO during the Second Reexamination of the '142 Patent.**

Warren is cumulative prior art under 35 U.S.C. § 325, because it was considered by the PTO during the Second Reexamination of the '142 Patent. Warren was submitted to the PTO by a third-party reexamination petitioner (Pason) in a post-verdict, second reexamination of claims 1, 11 and 14 of the '142 Patent.¹⁰ The Second Reexamination Certificate, dated July 12, 2010, cites

¹⁰ This was the second re-examination requested by Pason. The first was filed after they were sued. The second was filed after a jury unanimously found that they were willful infringers of the '142 Patent.

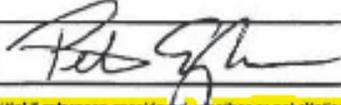
Patent No. 5,474,142
Patent Owner Preliminary Response (37 C.F.R. § 42.107)

Warren as a prior art patent considered by the PTO Examiner during the reexamination. *See* Ex. 2001 '142 Patent (2nd Reexam Certificate).¹¹ (MPEP 707.05 (“Citation of References”)(2010 Ed.).)

In accord with MPEP 707.05, the PTO examiner assigned to reexamine the '142 Patent placed his initials next to Warren, indicating that Warren was considered in the PTO’s validity analysis:

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Parties or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number Kind Code ² (if known)			
PE	AA	US-3,265,359	06-27-1966 8/19/66	Rowden	
	AB	US-4,362,808	09-24-1984 5/19/87	Bell	
	AC	US-2,305,889	44-12-1950 6/19/85	Dillon et al.	
	AD	US-3,306,467 3,550,697	02-22-1967 12/19/70	Hobhouse	
	AE	US-7,169,400 1,891,329	08-20-1992 12/19/92	LeCompts et al.	
	AF	US-3,223,183	06-22-1966 12/19/85	Varny	
AG	US-4,854,397	02-10-1985 8/19/89	Warren et al.		
AH	US-				

* * *

Examiner Signature		Date Considered	8/17/09
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EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 809. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.
¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.

Ex. 2025, Order Granting Reexam (8/21/2009) P. 10. The examiner followed the express instructions on this PTO form found under the Examiner’s signature – “[i]nitial if reference considered.” *Id.*

Warren is cumulative prior art. Since Claims 1, 11, and 14 have already survived a reexamination in view of Warren this is not a valid basis to grant

¹¹ During the examination of an application or reexamination of a patent ... The examiner must consider all the prior art references (alone and in combination) cited in the application or reexamination, including those cited by the applicant in a properly submitted Information Disclosure Statement.

- b. **Warren does not disclose a “drill string controller” for “regulating the release” of the drill string, increasing and decreasing the rate of release.**

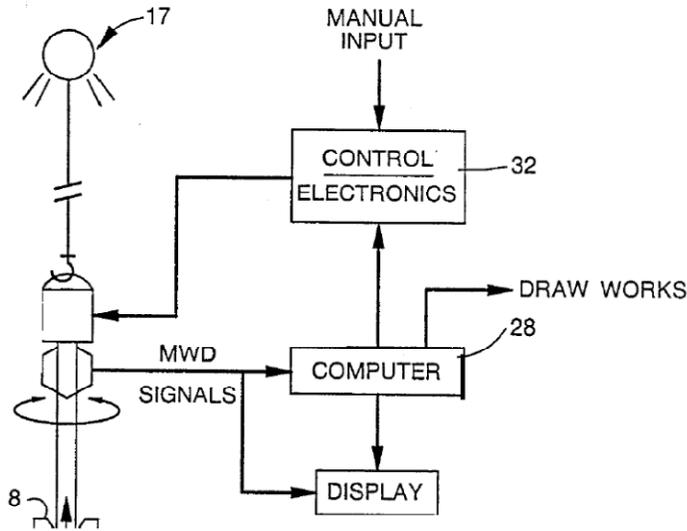
To anticipate under § 102(b), Warren must disclose all the claim elements arranged in a '142 claim. MPEP 2121; *Net MoneyIN, Inc.*, 545 F.3d at 1369. Warren does not disclose any type of “drill string controller” for regulating the “rate of release” of drill string.

Claims 1, 11 and 14 each require a “drill string controller.” (Ex. 2001, '142 Pat. (24:50; 27:51; & 28:36-37)). The Special Master construed “drill string controller” as “a device that changes the rate of release of the drill string in response to signals from the (relay(s).” (Ex. 2003, P. 3.)

Petitioner contends that the word “draw works” 28 in Figure 1 of Warren (with an arrow from “computer”) is a “drill string controller”. Petition at pp. 43, 26.

As shown in the partial reproduction of Warren's Fig. 1 below, Petitioner claims that the arrow pointed towards the word “draw works” represents a “drill string controller” for “regulating the rate of release” of drill string. Petitioner argues that Warren is operated by the driller's input of limits of drilling parameters into the “computer” 28, which are compared to incoming MWD signals to regulate draw works. As shown in Ex. 1018, Warren Fig. 1 (below), the “Control

Electronics” 32 control the *top drive* 12, not the *draw works*. Further, the drillers



“Manual Input” of desired “limits” are entered into “Control Electronics” 32 which has no arrow to draw works. The limits are not inputted into the “Computer” 28. Thus, in Warren, there cannot be a “drill string controller” which “regulates the

rate of release” of drill string. Ex. 1018.

Warren (4:13-38) sounds like a description of a computer which has the logic to automatically drive an automobile and maintain values such as RPM, speed, gear, and braking force:

Warren	Hypothetical Disclosure
<p>“Computer logic within the programmable digital computer ... causes the draw works 17, top drive or power swivel 12, rotary table 18 and/or mud pumps to be adjusted by a preselected amount or increment. Most preferably, the logic calculates the optimum adjustment necessary to the devices so that the parameter values are brought back to within the desired limits.” Ex. 1018, Warren 4:27-38</p>	<p>Computer logic within the programmable digital computer ... causes the transmission, engine, brakes, fuel injector, parking brake, and/or accelerator to be adjusted by a preselected amount or increment. Most preferably, the logic calculates the optimum adjustment necessary to the devices so that the parameter values are brought back to within the desired limits.”</p>

Both Warren and Petitioner's citation to Warren leave out a critical element – a device for making the adjustment happen, i.e., a “drill string controller” for controlling drawworks. Warren's disclosure could just as easily say “the computer makes the drawworks fly into outer space,” and then draw an arrow from “computer” to the words “draw works” and say “see – the arrow shows it happening!” Warren doesn't disclose anything for controlling drawworks other than an arrow from a computer.

Warren does not disclose increasing and decreasing the rate of release of the drill string in response to changes in drilling fluid pressure. For example, Warren discloses taking measurements only intermittently, not continuously. See Ex. 1018, Warren (3:63-64)(“once every five minutes, preferably one every 30 seconds”). If Warren measures the “drilling fluid pressure,” at quickest, every 30 seconds – how could Warren increase or decrease the rate of release in response to sudden changes? Assuming that Warren measured an increase in “drilling fluid pressure” and somehow responded by controlling the drawworks to “decrease” the “rate of release”, when would Warren know when to stop decreasing the “rate of release?” The soonest that Warren could make such a determination would be the next successive measurement somewhere between 30 seconds and 5 minutes later. Such an adjustment could only occur after each successive measurement which is somewhere between 30 seconds and 5 minutes. Warren's concept of a

“preselected amount or increment” adjustment is just another “on/off” control like the others distinguished during the first reexamination (Varney) and second reexamination (Dillon, Brett, Hobhouse, Warren). Ex. 1018, Warren (4:33 – 36).

c. Warren does not disclose a “drilling fluid pressure sensor” or “measuring drilling fluid pressure”

Warren describes using a downhole measuring device, referred to as measuring while drilling (MWD), to transmit data including “downhole pressure” to the Earth’s surface (Warren 3:16). This is not the same as “drilling fluid pressure” in the ‘142 Patent. [Note: Warren’s description of “downhole pressure” (Warren 3:16), is sometimes called “bottom hole pressure” (BHP).] “Downhole pressure” (or BHP) is a term understood by a POOSITA as:

“1. Gas-drive pressure recorded at the bottom of an oil-well shaft; used to analyze oil-reservoir performance and evaluate the performance of downhole equipment. 2. The pressure in a well measured at a point opposite the producing formation.” (Ex. 2023, McGraw Hill Dictionary of Scientific and Technical Terms, 6th Ed. (2003).

The “downhole pressure” (Warren 3:16) referenced in Warren is a measurement of the pressure of formation fluids – the fluids and gases contained in the geological formation being drilled. Warren 3:2-4.

The ‘142 patent describes “drilling fluid pressure” as the pressure of the “drilling fluid (i.e., mud)” that mud pump 25 pumps into drill string that “drives

mud motor 85...” Ex. 2001, ‘142 Pat. (4:10-14). The specification describes measuring the “drilling fluid pressure” with a “drilling fluid pressure sensor 34” on the mud “line 88” (sometimes called the standpipe) between the mud “pumps 25” and the swivel. **The “drilling fluid pressure” referred to in the ‘142 Patent’s claims is drilling mud pressure created by the mud pump – not hydrostatic pressure of the formation fluids trapped in the geological formation being drilled.** When the ‘142’s mud pump is turned off, not pumping, the “drilling fluid pressure” falls to zero. (Ex. 2001, ‘142 Pat. (11:2-3)).

Further, Warren does not disclose drilling fluid pressure (or bit weight) sensors attached to a drilling fluid pressure (or bit weight) regulator to output a signal to a drill string controller to regulate the release of the drill string. Exhibit 2001, ‘142 Pat. (24:38-62)(Claim 1)(27:44-56)(Claim 11)(28:23-39)(Claim14) (Omitting Claim elements [1b – e], [11b – d], and [14b – f]. In no way does Warren disclose an automatic driller capable of regulating the release of the drill string like Claims 1, 11, and 14. *Id.*

d. Warren does not disclose a system for “selecting” as required by claim 14 of the ‘142 Patent

Warren mentions absolutely nothing about the multi-parameter control recognized by the Federal Circuit as the “conflict resolution process” of Claim 14. Ex. 2001, ‘142 Pat. (28:33-36) (“selecting any one of said first signal [representing changes in pressure], said second signal [representing changes in bit weight], and

both said first and second signals to control the release of said drill string ...”);
Varco, 436 F.3d at 1374 (emphasis added).

Petitioner tries to rely on Warren (Ex. 1018 (4:13-38)) for the “selecting” step of Claim 14. Pet. at 45-46. An examination of the cited section of Warren reveals that it contains no “selecting” between different parameter signals.

e. Under 35 U.S.C. § 325, Warren is Substantially *LESS* Relevant than Previously Considered and Rejected Prior Art.

In assessing the disclosure of the Warren reference, the Board should consider the sworn testimony Mr. Tommy Warren himself. Mr. Warren testified about his invention in prior ‘142 Patent litigation, trying (and failing) to invalidate Claims 1, 11, and 14 under 35 U.S.C. §§ 102(b) & 103(a). Mr. Warren was called by Pason to discuss his 1990 paper (written a year after Warren’s patent) on an automatic drilling control system. He testified that he developed an automatic driller that sensed measurements in drilling fluid pressure. Ex. 2028, Trial Tr. 1226:8 - 1228:25; 1232:19 – 1233:19. He further testified that the specific features of his automatic driller were never patented, but were instead published in the Brett/Warren Paper (Ex. 2027):

Q: But you didn’t patent the actual automated control system that you developed on this experimental rig, correct?

A: No, we did not.

Q: Did you publish your findings?

A: Yes, we did.

Q: Mr. Warren, are you familiar with this document?

A: Yes, That is the paper that was published that described the control system on the rig.

Q: And is it entitled "Field Experience with Computer Controlled Drilling?"

A: Yes.

Ex. 2028, Trial Tr. 1233:20 – 1234:24. As admitted to by the inventor of Warren, the Brett/Warren paper is far more relevant prior art than the Warren Patent. *Id.* This paper was considered and *rejected* by the PTO in the second reexamination.

Ex. 2001, '142 Pat., 2nd Reexam Cert.

3. Petitioner's Ground 6: "Claims 1 and 11 are invalid under 35 U.S.C. § 102(b) over Miller." Pet. at 47.

Claims 1 and 11 are distinguishable from Miller (Ex. 1022) because Miller fails to disclose: (a) *increasing* or *decreasing* the "rate of release" of the drill string; (b) controlling the release with a "direct effect at the drill bit associated with the drill string"; and (c) is cumulative of prior art and arguments already considered by the PTO under 35 U.S.C. § 325.

a. Miller fails to disclose *increasing* or *decreasing* the "rate of release" of the drill string

Miller fails to disclose any device or method of increasing or decreasing the "*rate of release*" of the drill string as required by claims 1 and 11. Rather, it is an

on/off device like all the other distinguishable prior art. Miller’s device for controlling the vertical movement of the upper drill string (“205” of FIG. 5; Miller 6:45) above the “telescopic choke” / “telescopic joint” (“206” of FIG. 5; FIGS. 1-4 & 12-17) is a “vertical positioning means” (Ex. 1022, Miller FIG. 5 – 7:35-36; FIG. 6 – 7:56-57; FIG. 7 – 8:15; FIGS. 8 & 9 – 9:29; FIGS. 10 & 11 -- 10:52).

The “vertical positioning means” is controlled by a “relief valve” which supplies compressed air to power the “motor 218.” Each embodiment of Miller describes controlling the “vertical positioning means” (air “motor 218” with cables and wheels) by either **opening and closing (on-off) a “relief valve”** connected between the air supply and the “motor 218,” as follows:

<p>Figure (Embodiment) [Valve]</p>	<p>Description of the “Relief Valve” that Controls the “Motor 218” (On-Off Control Valve)</p>
<p>FIG 6 (opens until pressure ceases) [“normally closed spring loaded relief valve 230”]</p>	<p>“... as shown in FIGUREW 6, control means 216 may comprise simply a <u>normally closed spring loaded relief valve 230</u> ... set by means of adjustment 231 <u>to open at a pressure somewhat higher, e.g., 2 p.s.i., than normal operating pressure in drill string.</u>” Ex. 1022, Miller (7:47-57) (emphasis added)</p>
<p>FIG 7 (opens until pressure ceases) [“pilot operated diaphragm relief valve 240”]</p>	<p>“In place of the simple spring loaded relief valve 230 of the FIGURE 6 construction, a pilot operated diaphragm relief valve 240 ... may be employed. ... The regulator 241 ... <u>normally maintains the valve 240 closed.</u> If pressure in the drill string rises 2 p.s.i. above normal, <u>relieve valve 240 opens quickly and fully,</u> thereby causing prompt operation of the vertical positioning means to lower the drill string. <u>The FIGURE 7 construction illustrates a surface control means which will be operating on-off</u>” Ex. 1022, Miller (7:75 – 8:18)</p>
<p>FIGS. 8 & 9</p>	<p><u>“relief valve 283 opens quickly and fully and causes</u></p>

<p>(opens for a predetermined time) [“pilot operated diaphragm relief valve 250”]</p>	<p><u>main valve 250 to open. This is quite similar to the operation of the control means of the FIGURE 7 construction.</u> However, upon drop in pressure in pipe 215, the main valve 250 <u>remains open</u> for whatever period (0 to 60 seconds) it is set. The vertical positioning means continues to lower the drill string. ... <u>Ultimately valve 250 recloses and the drive motor 218 of the vertical positioning means stops.</u>” Ex. 1022, Miller (9:18-20) (emphasis added)</p>
<p>FIGS. 10 & 11 (opens for a predetermined distance of travel) [“pilot operated diaphragm relief valve 340”]</p>	<p>Whenever the pressure in pipe 215 rises a preset amount, pilot valve 341 opens and thus in turn <u>opens relief valve 340</u> ... allow valve spring 349 to <u>close the valve.</u>” Ex. 1022, Miller (10:13-31) (emphasis added)</p>

The “relief valves” which control the “air motor 218” of the “vertical positioning means” are described as “**on-off**” valves which cannot increase or decrease the “rate of release” of the drill string:

The suggested alternatives to the above embodiments also describe “on-off” control of the “vertical positioning means” (by replacing pneumatic “relief valves” with “hydraulic control valves or electric switches”) (Miller 13:58-63).

Miller actually teaches away from the concept of using drilling fluid pressure to increase or decrease the rate of release of the drill string, by stating that providing an “intermittent type vertical positioning means is preferred over a continuously operating means”:

“The apparatus of the invention may be classified as of the intermittent type since the vertical positioning means is actuated only periodically ... An intermittently actuating system is preferred since

opportunity is given for operators with valves wide open to purge the system and the time of throttling and rapid wear is reduced.”
Ex. 1022, Miller (3:70 – 4:12).

The above-described “intermittent” control which is “actuated only periodically” is an “on-off” control, just as described by the specification – “surface control means which will be operating on-off.” Therefore, Miller fails to disclose a system for increasing or decreasing the “rate of release” of the drill string.

Miller was cited as an invalidating prior art by defendant Pason in prior litigation involving the ‘142 Patent. **Pason’s own invalidity expert (a recognized POOSITA) testified in trial that Miller also does *not* disclose controlling the “rate of release” of the drill string:**

Q: Mr. Brett, you lump Le Compte, Dillon, Miller, Garrett, and Varney all together.

A: They all – I lump them together because **they have that similar on/off type nature to them.**

Q: **They all have the on/off nature, which you just testified is different than the Bowden 142.**

A: **I agree.**

Q: Thank you. I think that you’ve said for these four that **they are the on/off**, if the error is big enough it will either hold back or let go, put pressure back on target.

A: **Right.**

Q: It's not a continuous – the automatic drillers at issue in this case, the **Bowden 142** and the Pason, the evidence has been **move the brake handle *continuously up or down*.**

A: That's right.

Ex. 2028, 1392 – 93.

These elements of Claims 1 and 11 relate to increasing or decreasing the “*rate of release*” of the drill string, not just turning the release “on” or “off” intermittently. *See* Claim elements [1e] and [11e]. Miller is not anticipating prior art, because it does not disclose the limitations of Claims 1 and 11. MPEP 2121; *Net MoneyIN, Inc.*, 545 F.3d at 1369.

b. Miller, Like Lindstad and Stone, fails to measure “drilling fluid pressure”

Miller is an air drilling system that utilizes an “air compressor 211” to “air drill 200.” There is no measurement of *drilling fluid* – “drilling mud.”

c. Claims 1 and 11 overcome Miller for the same reason Varney was overcome in the First Reexamination – No “Rate of Release” of the Drill String.

In the First Reexamination, the PTO Examiner considered Varney. NOV explained to the PTO Examiner that:

“the transformer 132 for controlling the release of the drill string in the Varney Patent is either ‘on’ or ‘off.’” Thus, **the brake taught by the Varney Patent is controlled by a controller to either be ‘on’, thereby completely stopping the rate of release of the drill string; or ‘off’, thereby completely releasing the full weight of the drill**

string. The “on”/”off” nature of this type of brake control system prevents any increases or decreases in rate of release of the drill string.” Ex. 2029, NOV’s Response, p. 11)(emphasis added).

The PTO Examiner agreed with NOV. In the *Statement of Reasons for Patentability and/or Confirmation*, the PTO Examiner distinguished claims 1 and 11 over Varney as follows:

“the prior art of record, including Varney, US Patent 3,223,183, fail to show or suggest an automatic drilling system having drill string wherein a decrease in drilling fluid pressure results in a relay supplying a drill string control signal that operates a drill string controller to effect an ‘increase in the rate of release’ of said drill string and an increase in drilling fluid pressure results in said relay supplying a drill string control signal that operates said drill string controller to effect a ‘decrease in the rate of release’ of said drill string. While Varney shows drill string control based upon drilling fluid pressure that relaxes and tightens the drill string. **Varney does not teach or suggest effecting an ‘increase in the rate of release’ and a ‘decrease in the rate of release’ as it pertains to independent claims 1, 9 and 11.**” Ex. 2030, *Statement of Reasons for Patentability and/or Confirmation* (11/23/2005), p. 2 (Emphasis added).

Miller is distinguishable from claims 1 and 11 for the same reasons Varney, during the First Reexamination of the ‘142 Patent, was found distinguishable.

d. **Miller fails to disclose controlling the release with a “*direct effect at the drill bit associated with the drill string*”**

Miller discloses a telescopic joint system comprising an upper drill string and a lower drill string similar to previously examined patents Varney (1st Reexamination) and Le Compte et al. (2nd Reexamination):

“In this regard the term telescopic joint is to be considered in its broadest sense, namely, a lost motion connection between the upper and lower portions of a drill string.” (Miller 3:2-5) (emphasis added);

The telescopic joint of Miller is designed to isolate the lower drill string from the upper drill string to maintain a constant, pre-loaded weight on bit. Miller describes a system where the weight of the lower drill string (below the telescopic joint) remains *constant* and is not affected by the lowering of the upper drill string (above the telescopic joint):

“the downward force on the drill bit will remain substantially constant, consisting of the weight of the drill string below the telescopic joint plus the weight of the lower half of the telescopic joint plus the force of the drilling fluid acting to extend the telescopic joint.” (Miller 2:15-20) (emphasis added);

Further:

“The telescopic choke 206 is inserted above the hammer and whatever joints of drill steel collars, if any, are desired, and below the lower end of the drill pipe, so that **none of the weight of the drill pipe is imposed on the bit ...**” Ex. 1022, Miller (6:71-7:5) (emphasis

added).

Every claim of Miller describes a drill string having an “upper portion and a lower portion” and a “positioning means” for “raising and lowering” *only* the “upper portion” of the drill string. *Id.* at (13:74-18:29) (Emphasis added). Therefore, Miller does not have a “direct effect at the drill bit associated with the drill string.”

- e. **Claims 1 and 11 overcome Miller for the same reason Le Compte was overcome in the Second Reexamination – No “direct effect at the drill bit associated with the drill string”**

In the second reexamination, the examiner rejected Claims 1 and 11 in view of Le Compte. 456 – 460/851. Claims 1 and 11 were then amended to clarify that the regulation of the release of the drill string had a “*direct effect* at the drill bit associated with the drill string.” 15 & 20 – 21/851. NOV explained to the examiner:

Le Compte discloses a telescoping joint type drill string for drilling a vertical well, i.e., not a directional or horizontal well ... Le Compte will only work with a sectioned drill string comprising an upper drill string suspended within the drilling rig derrick and a lower drill string having a drilling bit connected at its lower end ... **Because the lower drill string or stem is connected to a telescoping joint, the drawworks does not regulate the release of the lower drill stem.**

Ex. 2013, NOV’s Final O.A. Response (3/22/2010), p. 14-15 (Emphasis added).

Claims 1 and 11 were allowed over Le Compte based upon the amendment.

In the *Reasons for Patentability*, the PTO Examiner distinguished amended claims

1 and 11 over Le Compte et al as follows:

“Claim 1 [and 11] has been amended to define over the Le Compte et al reference (US 1,891,329) taken alone. Specifically the claim has been amended to recite that the drill string controller responds to a decreasing in drilling fluid pressure by affecting an increase in the rate of release of the drill string *with direct effect at the drill bit*, and the drill string controller responds to an increase in drilling fluid pressure by affecting an decrease in the rate of release of the drill string *with direct effect at the drill bit*. As argued by the patent owner, this amendment defines over Le Compte et al. **Le Compte et al. controls the rate of release of the upper drill string portion, but the drill bit is isolated from the upper drill string portion by a telescopic section positioned between the upper drill string portion and the lower drill string portion. As a result, the control of the rate of release of the upper drill string portion in Le Compte et al. does not take place with direct effect at the drill bit, as required by the claim.**” (Ex. 2023, 2nd Reexam. (3/27/2010) Statement of Reasons for Patentability and/or Confirmation, pp. 2-3)(emphasis added).

Petitioner herein cites Miller, which contains the exact same separation of the upper drill string and the lower drill string by a telescopic joint as Le Compte. Pet. at 47-48. Petitioner admits: “The lower end of the drill string of Miller includes a telescopic joint 206.” *Id.* Exactly like Le Compte, Miller uses pressure

to control the *upper portion* of the drill stem *above* the drill bit. Ex. 1022, Miller (1:11-16)(“Exactly like Le Compte, Miller has no direct effect on the lower end of the drill string where the drill bit is attached:

In the foregoing manner drilling can proceed with the intermittent downward progress of the drill string keeping up with the fairly steady downward travel of the drill bit. At the same time, the downward force on the drill bit will remain substantially constant, consisting of the weight of the drill string below the telescopic joint plus the weight of the lower half of the telescopic joint plus the force of the drilling fluid acting to extend the telescopic joint.

Ex. 1022, Miller (2:13-20). The clarifying amendments made to Claims 1 and 11 to overcome Le Compte, for the exact same reason, also overcome Miller.

B. NOV’s Response to Petitioner’s Obviousness (§ 103(a)) Challenges

Petitioner asserts that the prior art establishes a *prima facie* case of obviousness. Pet. Grounds 2-3, 5, and 7-8. This is absolutely incorrect. However, even if Petitioner could somehow establish a *prima facie* case of obviousness, the PTO has already determined the overpowering evidence of secondary considerations of non-obviousness¹² overcomes even a *prima facie case*:

Patent owner has also established the required nexus between the claimed invention and the secondary considerations ... All of the competent rebuttal evidence presented by the Patent Owner, taken as a

¹² Ex. 2020, NOV’s 1/10/2010 Office Action Response, pp. 21-29, with attached experts from the appendix containing evidence of the linking and non-obviousness.

whole, has been weighed against the evidence supporting the *prima facie* case of obviousness. **It is the examiner's determination that the evidence of secondary considerations, which are indicia of nonobviousness, outweigh the evidence of obviousness.** Ex. 2019, PTO 2/22/2010 O.A., p. 9.

This PTO decision is supported by the Federal Circuit standards governing an obvious determination. *In re Huai-Hung Kao*, 639 F.3d 1057, 1067-68 (Fed. Cir. 2011)(“To start, when secondary considerations are present, though they are not always dispositive, it is error not to consider them.”); *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1349 (Fed. Cir. 2012)(“Objective evidence of nonobviousness is an important component of the obviousness inquiry because ‘evidence of secondary considerations may often be the most probative and cogent evidence in the record. It may often establish that an invention appearing to have been obvious in light of the prior art was not.’”)

The individual and combination of prior art disclosures alleged by Petitioner have been examined and rejected by the PTO ad nauseam. The following table compares the prior art disclosures previously examined¹³ alone and in combination

¹³ MPEP 707.05 (“Citation of References”)(2010 Ed.) (“During the examination of an application or reexamination of a patent ... The examiner must consider all the prior art references (alone and in combination) cited in the application or reexamination, including those cited by the applicant in a properly submitted Information Disclosure Statement.”)

during (1) the initial prosecution; (2) 1st reexamination; and (3) 2nd reexamination; with (4) the prior art asserted by Petition in its petition for IPR:

CATEGORY	PRIOR ART	Control the “Rate of Release”?	Parameter(s) Measured
Weight-On-Bit Automatic Drilling Systems	Bowden ‘359 (3)	Yes	WOB
	Ball (1)(2)(3)		
	Crake (4)		
Telescoping Joint Automatic Drilling Systems	Varney (2)	No	Drilling Fluid Pressure
	Miller (4)	No	
	Le Compte (3)(4)	Yes	
Hydraulic Snubbing Unit Drilling Systems	Rogers (1)(2)	No	WOB, RPM, Torque AND/OR Drilling Fluid Pressure
	Brett et al. (3)		
	Hobhouse (3)		
Motorized Drive Automatic Drilling System	Jasinski (1)(2)	No	RPM, Torque WOB (Dillon), Force Added to the Top of Drill String (Jasinski); and/or Air Pressure (Jasinski), Mud Pressure (Dillon)
	Dillon (3)		
	Stoner	No	Downward Force Added to the Top of Drill String and Torque
	Lindstad (4)	No	Air Pressure
Drilling Fluid Pressure Is An Important Factor in Drilling	Gatlin (1) (2)	No	WOB, RPM, Torque AND/OR Drilling Fluid Pressure
	Gray, Jr. (1) (2)		
	Brooks (4)		
Downhole MWD Signal Automatic Driller	Alder (1) (2)	Yes	RPM
Downhole MWD Signal Automatic Driller	Warren (3)(4)	No	WOB

Petitioner’s arguments for obviousness in its petition are identical to the disclosures already considered by the PTO in analyzing obviousness¹⁴:

¹⁴ Ex. 2022, 2nd Reexam Office Action (12/14/2009), pp. 6 & 7 (“Claims 1, 5 and 11-15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Bowden ‘359 (US 3,265,359,359) in view of Dillon et al. (US 2,005,889) and Hobhouse

Prior Art	PTO Determination of Disclosure
<p>Bowden ‘359 (Ex. 2021)</p>	<p><u>Automatic Driller that Regulates the Rate of Release in Response to Changes in Bit Weight (WOB)</u> PTO Examiner: “Bowden ‘359 discloses an automatic well drilling control system. ... As a result, the rate of release of the drill string is automatically controlled in proportion to the pressure measured by the sensor 16 ... Bowden lacks a drilling fluid pressure sensor supplying the pressure signal for controlling the drill string payout.” Ex. 2011, 2nd Reexam O.A. (12/14/2009), pp. 6-8 (emphasis added)</p>
<p>Dillon et al. (Ex. 2011)</p>	<p><u>Automatic Driller that Controls the Release in Response to Multiple Parameters Including (1) Drilling Fluid Pressure; (2) Bit Weight (WOB); (3) Torque; AND/OR (4) RPM</u> PTO Examiner: “Both Dillon and Hobhouse disclose automatic well drilling control systems including drilling fluid pressure sensors. ... Dillon teaches an automatic well drilling control system wherein the payout of the drill line is controlled as a function of drill line tension (i.e., bit weight), drilling motor load (i.e., torque), drilling motor speed (i.e., RPM), and drilling fluid pressure. From these teachings of Dillon, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Bowden ‘359 by also controlling the rate of release of the drill string as a function of drill string load/torque and drilling motor speed/RPM, in addition to the control based on bit weight and drilling fluid pressure, in order to provide for an even greater degree of control.” Ex. 2022, 2nd Rexam O.A. (12/14/2009), pp. 7-8. (Internal citations omitted & emphasis added)</p>
<p>Hobhouse (Ex. 2012)</p>	<p><u>Automatic Driller that controls the release in response to drilling fluid pressure</u></p>

(US 3,550,697). ... One of ordinary skill in the art would know that excess drilling fluid pressure is undesirable and, therefore, would apply the fluid pressure sensor taught by Dillon and Hobhouse to the system of Bowden ‘359 in order to bring about a decrease in the rate of release of the drill string in response to an undesirable build up in drilling fluid pressure.”)

	<p><u>PTO Examiner:</u> “Both Dillon and <u>Hobhouse</u> disclose automatic well drilling control systems including drilling fluid pressure sensors. ... In the embodiment of Fig. 8 of <u>Hobhouse</u>, elements 103-109 constitute a drilling fluid pressure sensor providing inputs to a controller 111 that controls the drill string payout and the bit weight. <u>Hobhouse</u> also suggests the claimed relationship between drilling fluid pressure and drill string release, describing stopping the sinkage of the drill string in response to an increase in drilling fluid pressure, and increasing the sinkage of the drill string in response to a decrease in drilling fluid pressure (column 8, lines 38-49).” Ex. 2022, 2nd Reexam O.A. (12/14/2009), p. 7-8 (emphasis added)</p>
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Petitioner is arguing the same claims of obviousness, including prior art disclosures, already considered by the PTO. According to the PTO, the solid evidence of secondary factors proves the non-obviousness of Claims 1, 11, and 14. These secondary factors remain unchanged.

**1. NOV’s Response to Petitioner’s Grounds 3 & 5:
Claims 1, 11, and 14 are invalid under § 103(a) over (3) Lindstad and Brooks; (5) Warren and Brooks”**

As explained above, claims 1, 11, and 14 have already been found to be able to overcome a *prima facie* case of obviousness with substantial secondary evidence of non-obviousness.

Lindstad: Lindstad is distinguished above in conjunction with Ground 1.

Warren: Warren is distinguished above in conjunction with Ground 4.

Brooks: Brooks, as described below, merely discloses an electronic drilling recorder capable of recording multiple drilling parameters:

a. Brooks is Merely an Electronic Drilling Recorder

Petitioner measures and records various drilling parameters. Pet. at 31-33. Brooks does not disclose an automatic driller. Pet. at 31-31. The only alleged novelty of Brooks is simultaneously recording six or seven drilling parameters (or variables), instead of one at a time. Ex. 1017, Brooks (1:61-66). While two of these variables are pressure and bit weight, Brooks has absolutely nothing to do with automatic drilling control. It discloses only “a superior drilling information gathering system.” *Id.* (2:1-12). These gathering systems, often referred in the industry as electronic drilling recorders or EDRs, have been in the industry for years. They do not relate to the automatic drilling system and method disclosed in Claims 1, 11, and 14. Ex. 2001, ‘142 Pat.

Petitioner claims Brooks discloses a WOB automatic drilling system. (Ex. 1017, 9:69-10:6.) However, the portions relied upon state that the “control equipment 38” is used for “measuring hookload ... where it is corrected to measure weight on the bit.” The “control equipment 38” does not operate any equipment for controlling the release of the drill string. It merely measures WOB and after parameters. Although Brooks recognizes that WOB may be used “manually or automatically” to “control ... the lowering of the traveling block”, there is absolutely no disclosure of any structure, system, or method for automatically controlling the rate of release of the drill string. Brooks is, at best, an

acknowledgement that prior art WOB automatic drillers including Bowden '359 (Ex. 2010), Ball (Ex. 2021) and Crake (Ex. 1015) can use a WOB signal as a variable to control. This is a well known principle.

Further, Brooks teaches neither a “drill string controller” nor the step of “selecting” one or more drilling parameters for controlling the rate of release of the drill string.

b. Under 35 U.S.C. § 325, the combination of Brooks with either Lindstad or Warren is cumulative of prior art and arguments already considered by the PTO.

Petitioner’s alleged disclosure of Brooks (Ex. 1017) is identical to art already considered by the examiner. Petitioner’s own arguments about Brooks are compared below to the PTO’s previous conclusions about analogous prior art considered and rejected during the patenting of the ‘142 patent:

Brooks (Ex. 1017)	<u>Petitioner</u> : “Brooks discloses a drilling rig with a drilling information gathering system for detecting various drilling parameters, including weight on bit and drilling fluid pressure.” Pet. at 31 – 32.
Gatlin (Ex. 2022)	<u>PTO Examiner</u> : “Because it is well known in the art that among other things, the relationship between the rate of penetration and the drilling parameters including the pumping pressure, the rpm, the bit weight, and the drilling torque are interrelated and interactive one cannot simply isolate one parameter from the others (<i>see Petroleum Engineering</i> by Carl Gatlin, pp. 114-131, included herein as a reference). Ex. 2016, PTO O.A. (3/11/1994), p. 3 <u>“Ball basically teaches the same principle of controlling the rate of drill string release as being recited in applicant’s respective claims with the exception of the drilling fluid pressure sensor, the torque sensor and rpm sensor. Inclusion of such sensors, in the</u>

	examiner's opinion, is well within the scope of general engineering design considerations ... It is therefore obvious to one of the ordinary skill in the art to have modified Ball's automatic drilling control system by including rpm sensor as been taught by Roger <u>and further including the pumping pressure and the drilling torque sensors into the control systems so that more drilling parameters can be monitored and the penetration rate can be more effectively controlled as such as been clearly taught in Gatlin publication.</u> " <i>Id.</i> at pp. 4-5.
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As shown above, Brooks is substantially similar to the Gatlin publication which was cited and relied upon by the PTO Examiner during the original prosecution and also the First Reexamination of the '142 patent.

c. Petitioner misrepresents the disclosure in Brooks to allege a non-existent motivation to combine Brooks and Lindstad.

Petitioner grossly misstates the disclosure in Brooks to argue a motivation to combine this reference with Lindstad (Ex. 1013). Pet. at 33. Brooks only mentions the broad concept of using the display of drilling parameters to "achieve and maintain any desired weight on the bit." Ex. 1017, Brooks (9:68-10:7). Brooks does not disclose the components or the operation of an automatic driller. Brooks says nothing about a system and method for automatically maintaining a desired differential (changes) pressure (Claims 1 and 11) or a combination of differential pressure and differential bit weight (Claim 14). That type of automatic drilling control system was not invented until over twenty years later, when the '142 Patent revolutionized the drilling industry.

Petitioner's expert declaration alleging a motivation to combine stretches the disclosure of Brooks so far that it calls into question the credibility of his entire declaration. *See supra* § V; Pinckard Dec. at ¶ 49 - 50. There would have been no motivation to combine these references.

d. The proposed combination of Brooks and Lindstad does not practice Claims 1, 11, or 14.

As stated in *supra* IV. A.1. (NOV's Response to Ground 1), Lindstad does not contain most of the claim elements and certainly does not contain them as arranged in the claims. MPEP 2121; *Net MoneyIN, Inc.*, 545 F.3d at 1369. The addition of the sensors disclosed in Brooks does not change the fact that the following combination of prior art would still be missing:

- An automatic driller that automatically regulates the release of a drill string ([1a], [11a], and [14a]);
- An automatic driller that operates by measuring changes in pressure based on drilling fluid ([1b], [11b], [14b]);
- An automatic driller capable of selecting between signals relating to changes in bit weight and pressure ([14e]); or
- A drill string controller that regulates the release of the drill string based on the selected signal or signals ([14f]).

Since Petitioner does not allege these elements consist of common sense or were obvious to try, its proposed combination of prior art does not meet the basic requirement of containing every element of the claimed invention. *KSR*, 550 U.S.

at 401. Petitioner's alleged motivation to combine should be entirely disregarded for failure to cite credible evidence and failure to meet legal requirements.

e. Brooks and Warren do not contain every element of Claims 1, 11, and 14.

While Brooks may add the additional disclosure of using sensors instead of downhole MWD mud-pulse telemetry, the combination of Brooks and Warren still fails to disclose the following:

- An automatic driller that operates by measuring changes in pressure based on drilling fluid ([1b], [11b], [14b]);
- A drill string controller that operates to increase or decrease the rate of release of the drill string in response to changes in drilling fluid pressure ([1e], [11e]);
- An automatic driller capable of selecting between signals relating to changes in bit weight and pressure ([14e]); and
- A drill string controller that regulates the release of the drill string based on the selected signal or signals ([14f]).

Petitioner does not allege that any of these elements consist of common sense or would have been obvious to try. *See* Pinckard Dec. (Exhibit 1012). Since this combination of prior art does not even meet the basic requirement of containing the claimed invention, there is no need to consider Petitioner's alleged motivation to combine. *KSR Intern.*, 550 U.S. at 401.

**2. NOV's Response to Petitioner's Grounds 2, 7 & 8:
"Claims 1, 11, and 14 are invalid under § 103(a) over Crake in combination with either (1) Lindstad; (2) Miller; or (3) Le Compte"**

As explained above, claims 1, 11, and 14 have already overcome a *prima facie* case of obviousness with substantial secondary evidence of non-obviousness.

Lindstad: Lindstad is distinguished above in conjunction with Ground 1.

Miller: Miller is distinguished above in conjunction with Ground 7.

Crake: Crake merely discloses a WOB automatic driller like Ball (Ex. 2021) and Bowden '359 (Ex. 2010), patents already evaluated during the original prosecution and second reexamination. Exs. 2001 & 2017. These WOB automatic drillers contain controllers or limiters for the rate of penetration (ROP). Ex. 1015, Crake ("speed controller 32"); Ex. 2010, Bowden '359 (2:37-41)("regulator unit 3... [which] reduces the pressure to any predetermined value."); Ex. 2021, Ball (6:30-32) and (7:31-33). The speed regulators control the maximum speed the automatic driller will release the drill string. The '142 Patent discloses a speed controller. Ex. 2001, '142 Pat. (7:40-48)("Flow regulator 212, therefore, determines the maximum rate at which drill bit 23 could penetrate into formation 87."). However, the '142 Patent was a distinct improvement over earlier automatic drillers.

Bowden '359 (Ex. 2010) and Ball (Ex. 2022), like Crake (Ex. 2015), disclosed automatic drillers which control the "rate-of-release" of the drill string in

Patent No. 5,474,142

Patent Owner Preliminary Response (37 C.F.R. § 42.107)

response to changes in WOB (measured by changes in tension of the hoisting system's dead line). Petitioner attempts to substitute Crake's use of WOB to control "rate of release" of drill string for Lindstad's use of mechanical power to push a drill into the earth. Pet. at 24. The drawworks brake controller of Crake cannot be substituted for the drive motor 18 of Lindstad (Ex. 1013). The control mechanism of Crake controls the brake, and the control mechanism of Lindstad (Ex. 1013) provides power to a motor to drive the drill bit down. Petitioner's suggestion for a combination would be like replacing a braking system of one car with an accelerator from another car. Like the control systems of Lindstad and Crake, these systems are opposite. This proposed combination was attempted during the second reexamination and squarely rejected by the PTO.

The fact that bit weight automatic drillers like Crake existed prior to the invention is disclosed on the face of the '142 Patent in the "Description of the Related Art." Exhibit 2001, '142 Pat., (1:14 – 35) ("Typical automatic drillers presently control the drill string using only bit weight.") The combination of Lindstad, Miller, or Le Compte with bit weight automatic drillers has already been attempted by others in efforts to invalidate Claim 14.

Moreover, the automatic selection step of Claim 14 is not suggested anywhere in Lindstad or Crake. Exhibit 2001, '142 Pat. (28:24-25). Crake discloses two controllers – "Weight Controller 31" & "Speed Controller 32."

Crake describes these two controllers as acting “independently of the other controller” such that there is no “selecting” step. Ex. 1015, Crake (6:34-35). Since a combination of Lindstad and Crake fails to disclose all the elements of Claim 14, there is no reason to even consider Petitioner’s arguments about a motivation to combine. *KSR.*, 550 U.S. at 401.

Le Compte: Le Compte (Ex. 1023) is a telescoping-joint automatic driller that controls the release of only the upper portion of the drill string in response to drilling fluid pressure.

Claims 1 and 11 were distinguished from *Le Compte* during the Second Reexamination:

“[T]he control of the rate of release of the upper drill string portion in *Le Compte et al.* does not take place with *direct effect* at the drill bit, as required by the claim.”

(Ex. 2023, 2nd Reexam., 3/27/2010 Statement of Reasons for Patentability and/or Confirmation, pp. 2-3). The PTO held that the ‘142 overcame a *prima facie* case of obviousness in view of *Le Compte*, alone or in combination with other prior art, with substantial evidence of non-obviousness. *Id.* at p. 4.

Because the PTO has previously confirmed the validity of the ‘142 patent in view of *Le Compte*, and also in view of WOB automatic drillers including Bowden ‘359 (Ex. 2010) and Ball (Ex. 2021), the PTO should not revisit this issue in view of Crake (Ex. 1015).

As discussed in *supra* § VI.G.3 (combination of Crake and Miller), Crake only discloses the use of a bit weight controller. Crake's combination with Le Compte would not disclose elements [14e] and [14f], called by the Federal Circuit the "conflict resolution process" between multiple drilling parameters. Ex. 2014, *Varco*, 436 F.3d at 1374.

Since the combination of Crake and Le Compte would still fail to disclose all the elements of Claim 14, there is no reason to even consider Omron's arguments about a motivation to combine. *KSR Intern.*, 550 U.S. at 401.

While Crake may add the disclosure of a bit weight automatic driller, the combination of Miller and Crake still fails to disclose:

- An automatic driller capable of selecting between signals relating to changes in bit weight, pressure, or both ([14e]); and
- A drill string controller that regulates the release of the drill string based on the selected signal or signals ([14f]).

Since this combination of prior art does not even meet the basic requirement of containing the claimed invention, there is no need to consider Omron's alleged motivation to combine. *KSR Intern.*, 550 U.S. at 401. As discussed, *supra* Resp. to ground 2, the '142 Patent discloses the use of multiple parameters to control the rate of penetration including changes in bit weight and changes in pressure:

"Automatic driller 33 may be programmed to utilize any one of the above measurements [including changes in pressure and bit weight], any combination of the above measurements, or all the above

measurements to regulate brake 32 and, thus, the position of drill bit 23 within borehole 86.”

Id. at (4:52 – 56). This is accomplished through the use of valve selectors that are capable of selecting drill fluid pressure, bit weight, or both to maintain the desired rate of penetration. *Id.* at (7:49 – 8:6).

The automatic selecting step of Claim 14 is not disclosed, or even suggested, anywhere in Miller or Crake. Since the combination of Crake and Miller would still fail to disclose all the elements of Claim 14, there is no reason to even consider Omron’s arguments about a motivation to combine. *KSR Intern.*, 550 U.S. at 401.

VI. CONCLUSION

Petitioner cannot demonstrate a reasonable likelihood that a ‘142 claim will be invalidated. 35 U.S.C. § 314(a). Petitioner’s grounds for invalidity are repetitive arguments, based on cumulative prior art that has been considered and rejected by the PTO on multiple occasions. The secondary factors of non-obviousness outweigh even a *prima facie* case of obviousness, rendering such alleged grounds futile. Petitioner’s prior art references omit critical elements of Claims 1, 11, and 14 in both Petitioner’s anticipation and obviousness arguments.

Petitioner’s petition for IPR should be denied.

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing Power of Attorney was served on August 6, 2013 by electronic and regular mail, directed to the attorneys of record for the petitioner at the following address:

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