

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GREENE'S ENERGY GROUP, LLC,
Petitioner,

v.

OIL STATES ENERGY SERVICES, LLC,
Patent Owner.

Case IPR2014-00216
Patent 6,179,053 B1

Before SCOTT E. KAMHOLZ, WILLIAM A. CAPP, and
JAMES A. TARTAL, *Administrative Patent Judges*.

TARTAL, *Administrative Patent Judge*.

FINAL WRITTEN DECISION

35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

Greene's Energy Group, LLC ("Petitioner") filed a reformatted Petition (Paper 6, "Pet.") requesting an *inter partes* review of claims 1 and 22 of U.S. Patent No. 6,179,053 B1 (Ex. 1001, "the '053 patent"). Based on the information provided in the Petition, we instituted a trial pursuant to 35 U.S.C. § 314(a) of claims 1 and 22 of the '053 patent as anticipated under 35 U.S.C. § 102 by Dallas '118.¹ Paper 12 ("Inst. Dec.").

After institution of trial, Oil States Energy Services, LLC ("Patent Owner") filed a Patent Owner's Response (Paper 20, "PO Resp.") and Petitioner filed a Reply (Paper 35, "Reply"). Patent Owner also filed a Motion to Amend (Paper 23, "Mot.") proposing substitute claim 28 if claim 1 is found unpatentable, and substitute claim 29 if claim 22 is found unpatentable. Petitioner filed an Opposition to the Motion to Amend (Paper 36, "Opp."), and Patent Owner filed a Reply (Paper 44, "PO Reply"). A transcript of the Oral Hearing conducted on February 11, 2015, is entered as Paper 52 ("Tr.").

We issue this Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, Petitioner has shown by a preponderance of the evidence that claims 1 and 22 of the '053 patent are unpatentable, and Patent Owner's Motion to Amend is denied.

¹ Canadian Patent Application 2,195,118 (Ex. 1003, "Dallas '118"). In this decision, the cited page numbers of Dallas '118 correspond to the numbers centered at the bottom of the pages of Exhibit 1003.

A. *The '053 Patent*

The '053 patent, titled “Lockdown Mechanism for Well Tools Requiring Fixed-Point Packoff,” relates to an apparatus and method for securing a mandrel of a well tool in an operative position in which the mandrel is packed off against a fixed-point in a well. Ex. 1001, Abstract, 1:6–10. The '053 patent issued on January 30, 2001, from Application No. 09/373,418, filed August 12, 1999 (“the '418 application”).

According to the '053 patent, the servicing of oil and gas wells to stimulate production requires pumping generally corrosive and abrasive fluids under high pressure. *Id.* at 1:16–20. Such fluids purportedly can cause irreparable damage if they are pumped directly through the spool and valves that make up a wellhead. *Id.* at 1:21–23. The '053 patent states that it is well known to isolate a wellhead by inserting a mandrel through the wellhead to prevent damage from stimulation fluids. *Id.* at 1:23–30. At the bottom end of the mandrel, a packoff (fluid seal)² assembly usually is provided to isolate the wellhead from the stimulation fluids. *Id.* at 1:32–36.

If the packoff assembly seals against the inside of the production tubing or casing, however, then the smaller internal diameter of the mandrel used will reduce the flow rate at which stimulation fluids may be pumped into the well. *Id.* at 1:43–47. To avoid such a reduction in flow rate, the '053 patent proposes a lockdown mechanism for securing a mandrel requiring a fixed-point packoff in an operative position in the well. *Id.* at 2:43–45. “The fixed-point for packoff may be a bit guide mounted to the top of a casing, . . . an annular step above back pressure valve threads of a

² The parties agree “packoff” means a fluid seal. *See* Pet. 13; PO. Resp. 9; Ex. 1001, 1:32-36.

tubing hanger, . . . or any other type of fixed-point location used for packoff in a wellhead, a casing, a tubing or downhole tool.” *Id.* at 5:34–39.

According to the ’053 patent, such an arrangement permits the internal diameter of the mandrel to be the same as that of the well tubing or casing. *Id.* at 1:62–67.

As described by the ’053 patent, the mandrel is locked in an operative position only when both first and second lockdown mechanisms are in respective lockdown positions. *Id.* at 4:5–7. The first lockdown mechanism includes a base member for connection to a wellhead and a locking member for detachably engaging the base member. *Id.* at 4:10–13. The second lockdown mechanism has a range of adjustment adequate to ensure that the mandrel can be moved into the operative position and locked down while the first lock down mechanism is in the lockdown position. *Id.* at 4:13–17.

Figure 2 of the '053 patent is reproduced below.

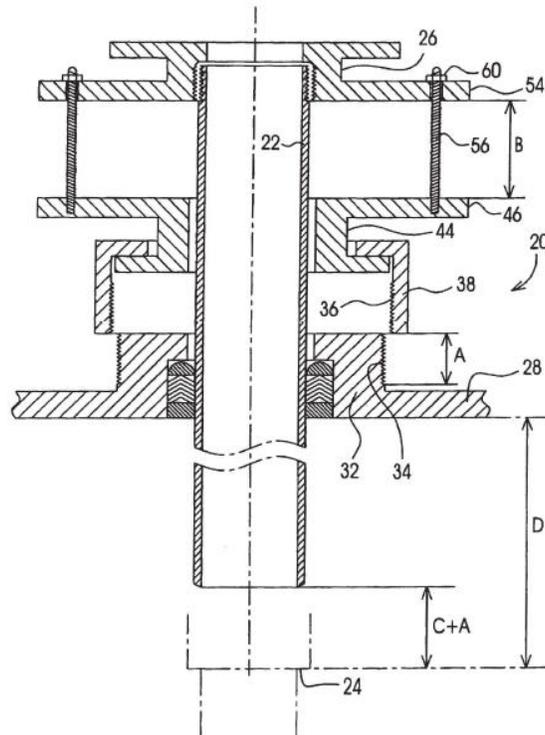


FIG. 2

Figure 2 shows a cross-sectional view of one embodiment of an apparatus for securing mandrel 22 of a well tool in an operative position in which mandrel 22 may be packed-off against fixed-point 24 in a well. Ex. 1001, 7:6–9. Base plate 28 may be mounted on the top of a wellhead while it is disengaged from the other parts of apparatus 20. *Id.* at 7:8–10. The other parts of apparatus 20 remain connected to the top end of mandrel 22, and are moved with mandrel 22 when it is inserted into the wellhead by a setting tool (not shown in Figure 2). *Id.* at 7:10–12. Upper flange 46 of connector 44 remains spaced from lower flange 54 of mandrel head 26 as mandrel 22 is inserted through the wellhead. *Id.* at 7:15–19. For safe engagement to restrain the high fluid pressures during a well treatment to stimulate production, after mandrel 22 is inserted through the wellhead, a first locking

mechanism is set by engaging threads 34–36 by rotating lockdown nut 38. *Id.* at 5:60-61, 7:19–22.

At this stage, the bottom end of mandrel 22 is still above fixed-point 24 for packoff. *Id.* at 7:22–24. After lockdown nut 38 is fully engaged, mandrel 22 is stroked down until the bottom end of mandrel 22 packs-off against fixed-point 24. *Id.* at 7:24–27. A second lockdown mechanism then is set by rotating nuts 60 down against flange 54 of mandrel head 26 to prevent a fluid seal on the lower end of mandrel 22 from being forced away from fixed-point 24. *Id.* at 7:27–32. Connector 44 may be replaced by an integral hydraulic cylinder. *Id.* at 7:51–54. A piston in the hydraulic cylinder is fixed to the mandrel so that when pressurized hydraulic fluid is injected in the chamber above the piston, the mandrel is forced downward to packoff against the fixed point. *Id.* at 7:57–58, 8:21–27, Fig 7.

B. Challenged Claims 1 and 22

Petitioner challenges claims 1 and 22, which read:

1. An apparatus for securing a mandrel of a well tool in an operative position requiring fixed-point packoff in the well, comprising:

a first and a second lockdown mechanism arranged so that the mandrel is locked in the operative position only when both the first and the second lockdown mechanism are in respective lockdown positions;

the first lockdown mechanism adapted to detachably maintain the mandrel in proximity to the fixed-point packoff when in the lockdown position, the first lockdown mechanism including a base member for connection to a wellhead of the well and a locking member for detachably engaging the base member; and

the second lockdown mechanism having a range of adjustment adequate to ensure that the mandrel can be moved into the operative position and locked down in the

operative position while the first lockdown mechanism is in the lockdown position.

22. A method for lockdown of a mandrel of a well tool in an operative position in which the mandrel is packed off against a fixed-point in the well, comprising steps of:

- a) mounting above a wellhead of the well an apparatus for securing the mandrel of the well tool in the operative position, comprising a first and a second lockdown mechanism arranged so that the mandrel is locked in the operative position only when both the first and second lockdown mechanisms are in respective lockdown positions; the first lockdown mechanism being adapted to detachably maintain the mandrel in proximity to the fixed-point for packoff, and including a base member for connection to a top of a wellhead of the well and a locking member for detachably engaging the base member; and the second lockdown mechanism having a range of adjustment to ensure that the mandrel can be moved into the operative position and locked down in the operative position while the first lockdown mechanism is in the lockdown position;
- b) after inserting the mandrel through the wellhead into proximity to the fixed-point in the well, engaging the locking member of the first lockdown mechanism with the base member so that the mandrel is only moveable within the range of adjustment;
- c) moving the mandrel into the operative position if the mandrel is not yet packed off against the fixed-point; and
- d) locking the second lockdown mechanism in the lockdown position.

II. ANALYSIS

A. Claim Construction

In an *inter partes* review, claims of unexpired patents are construed by applying the broadest reasonable interpretation, in light of the specification. 37 C.F.R. § 42.100(b); *see In re Cuzo Speed Techs., LLC*, 778 F.3d 1271,

1278–1282 (Fed. Cir. 2015). Consistent with the broadest reasonable construction, claim terms are presumed to have their ordinary and customary meaning, as understood by a person of ordinary skill in the art, in the context of the entire patent disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

In our Decision to Institute we made a number of initial claim construction determinations that Patent Owner does not contest in its Response and that Petitioner does not address in its Reply. We determined the broadest reasonable construction of “operative position,” consistent with its usage in the Specification of the ’053 patent and its plain meaning, is “a position in which the mandrel is packed off against a fixed-point in the well.” Inst. Dec. 8–9. We also determined that no express construction of “fixed-point” is necessary, because the ’053 patent states that a bit guide attached to the top end of a casing provides a fixed-point for packoff of the mandrel, and Dallas ’118 discloses such a bit guide (Ex. 1001, 2:39–40). Inst. Dec. 9. We also determined that the meaning of “mandrel” does not require that it be of an adjustable length. *Id.* at 12. We also declined to adopt Petitioner’s assertion that steps of claim 22 required a particular order. Inst. Dec. 12–13. With respect to “first lockdown mechanism” and “second lockdown mechanism,” we determined that Petitioner had not overcome the rebuttable presumption that § 112, ¶ 6 does not apply to such claim limitations that lack the term “means.” *See, e.g., Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1358 (Fed. Cir. 2004); *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1369 (Fed. Cir. 2002). Inst. Dec. 9–12. Having considered whether any of these determinations

should be changed in light of the evidence introduced during trial, we are not persuaded any modification is necessary.

1. “*second lockdown mechanism*”

Patent Owner argues that “second lockdown mechanism” would be understood by a person of ordinary skill in the art to mean “a lockdown mechanism separate from a setting tool which locks the mandrel in position without hydraulic pressure.” PO Resp. 10. In particular, Patent Owner argues that a “second lockdown mechanism” would be understood to be 1) mechanical, and 2) separate from a setting tool. *Id.*

a) The “Second Lockdown Mechanism” is Not Limited to a Mechanical Apparatus

In support of its contention that a “second lockdown mechanism” must be mechanical, Patent Owner identifies several statements in the ’053 patent Specification:

The apparatus includes a mechanical lockdown mechanism to secure the tool to the wellhead and maintain the mandrel in proximity to the fixed-point for packoff, and a mechanical or a hydraulic mechanism to move the mandrel into the operative position while the mechanical lockdown mechanism is in a lockdown position. A second mechanical locking mechanism is provided to ensure the mandrel is maintained in the operative position in the event that hydraulic pressure is lost.

Ex. 1001, Abstract.

In addition, a hydraulic lockdown mechanism is considered less secure than a mechanical lockdown mechanism. The hydraulic lockdown mechanism is dependent on maintenance of the hydraulic fluid pressure in the setting tool. Since fluid pressure may be lost for a variety of reasons, persons in the industry are generally less inclined to endorse or accept a hydraulic lockdown mechanism.

Ex. 1001, 3:2–9.

Therefore, there exists a need for a lockdown mechanism for securing a mandrel of a well tool in an operative position requiring fixed-point packoff in the well which provides a broader range of adjustment while ensuring a secure mechanical lockdown for maximum security.

Ex. 1001, 3:40–45.

Patent Owner further asserts that each embodiment described in the '053 patent uses a second lockdown mechanism that mechanically locks the mandrel in the operative position. PO Resp. 11–14. Patent Owner offers the Declaration of Gary R. Wooley in support of its proposed construction.

Ex. 2012 ¶¶ 55–57. Patent Owner also notes that in related proceedings between the parties, the district court, relying upon the portion of the Abstract set forth above, construed “second lockdown mechanism” as the “second part of the apparatus that interacts with the first lockdown mechanism to lock the mandrel in the operative position without hydraulic pressure.” PO Resp. 14 (citing District Court Markman Order, Ex. 2008, 16).³

Patent Owner’s argument that “second lockdown mechanism” should be construed to mean “a lockdown mechanism . . . which locks the mandrel

³ Petitioner contends that the district court *sua sponte* adopted a construction of “second lockdown mechanism” requiring that it operate “without hydraulic pressure” without argument from the parties, and Patent Owner’s Declarant, Mr. Wooley, confirms that the construction adopted by the district court was not proposed by Patent Owner. *See* Tr. 14:1–7; Ex. 2012 ¶ 57.

in position without hydraulic pressure,” is untenable in light of the manner in which the term is used in the claims of the ’053 patent.

Claim 8, which depends from claims 2 and 1, recites:

An apparatus as claimed in claim 2 wherein the first member of the second lockdown mechanism includes a piston fixed to the mandrel and the second member of the second lockdown mechanism includes a cylinder connected with the locking member of the first lockdown mechanism, the piston being adapted to be reciprocated within the cylinder using fluid pressure.

Ex. 1001, 11:13–19. Patent Owner offers no explanation for how a “second lockdown mechanism” that purportedly must operate without hydraulic pressure nevertheless includes a piston adapted to be reciprocated in a cylinder using fluid pressure, as required by claim 8. *See also id.* at 11:20–22 (claim 9, reciting the apparatus of claim 8, requires “wherein a maximum stroke of the piston within the cylinder determines the range of adjustment of the second lockdown mechanism”). Certain claims of the ’053 patent require expressly a “mechanical” lockdown mechanism. The absence of the “mechanical” qualifier in broader claims implies that those claims were not intended to be limited to a mechanical lockdown mechanism. For example, Claim 10, which depends from claims 8, 2, and 1, recites that “the second lockdown mechanism comprises a mechanical locking mechanism adapted to ensure the mandrel is maintained in the operative position in the event that the fluid pressure is lost.” Ex. 1001, 11:23–27; *see also* 11:47–65 (claim 14 reciting “a mechanical lockdown mechanism”). Interpreting “lockdown mechanism” to require a mechanical apparatus operating without hydraulic pressure would render the use of “mechanical” to describe the lockdown mechanism in other claims superfluous. *See Biocon, Inc. v. Straumann Co.*,

441 F.3d 945, 950 (Fed. Cir. 2006) (stating “claims are interpreted with an eye toward giving effect to all terms in the claim” (citations omitted)).

Moreover, contrary to Patent Owner’s argument, we agree with Petitioner that the ’053 patent describes the use of a hydraulic mechanism as a second lockdown mechanism. *See* Reply 3–5. With regard to an embodiment shown in Figure 5 of the ’053 patent, which corresponds to the apparatus of claim 10, the ’053 patent Specification explains that the mandrel is forced downwardly to packoff against the fixed-point under a force exerted on the piston by the pressurized hydraulic fluid. Ex. 1001, 8:24–27. As the ’053 patent explains, “the mandrel [] is locked down in its operative position by the hydraulic force [].” Ex. 1001, 8:30–31. The embodiment described further includes an additional mechanical feature “to ensure that the mandrel is secured in the operative position” (Ex. 1001, 31–34). Collectively, the Specification and claims of the ’053 patent make clear that a second lockdown mechanism may be hydraulic, and that an additional mechanical feature further may be added to the second lockdown mechanism, not that the second lockdown mechanism must be mechanical. Accordingly, we conclude that the meaning of “second lockdown mechanism” as used in the ’053 patent is not limited to a mechanical apparatus, but instead encompasses any machinery for maintaining the mandrel in a fixed position.

b) The “Second Lockdown Mechanism” is Not Limited to an Apparatus Separate from a Setting Tool

In support of its contention that a “second lockdown mechanism” must be separate from a setting tool, Patent Owner points out that the embodiments in the ’053 patent Specification show the setting tool and

second lockdown mechanism as separate features. PO Resp. 15–19. According to Patent Owner, the “setting tool” is “used to ‘insert the mandrel . . . to an operative position . . . to stimulate production.’” PO Response 15 (quoting Ex. 1001, 8:35–48). Patent Owner also suggests that a “setting tool” is “the portion of the overall structure that moves the mandrel down through the wellhead toward the operative position.” *Id.* at 29. Patent Owner identifies three instances in which the Specification “describes the setting tool as being a separate structure that can be removed.” *Id.* at 21. Patent Owner also argues that it was an object of the invention to provide a lockdown mechanism having a low profile, which is achieved by using a separate and removable setting tool. *Id.* at 23. Patent Owner’s proposed construction is supported by Mr. Wooley.⁴ Ex. 2012 ¶¶ 50–54.

The term “setting tool” does not occur in any claim of the ’053 patent. The term also is not expressly defined in the ’053 patent. Based on the evidence presented, we determine that Patent Owner has not clearly shown what a “setting tool” includes or excludes, much less that the second lockdown mechanism must be separate from any “setting tool.” To the extent any embodiment depicts an unclaimed feature described as a “setting tool” as separate from the second lockdown mechanism, the claim language does not preclude that separate element from being incorporated into the second lockdown mechanism. We decline to import limitations from a

⁴ Patent Owner’s argument that “second lockdown mechanism” should be construed to be separate from the “setting tool” was rejected in the related district court proceeding as “not helpful because it introduces the unnecessary and ambiguous term ‘setting tool.’” District Court Markman Order, Ex. 2008, 15.

preferred embodiment into the claim. *See Deere & Co. v. Bush Hog, LLC*, 703 F.3d 1349, 1354 (Fed. Cir. 2012) (“While claim terms are understood in light of the specification, a claim construction must not import limitations from the specification into the claims.”). Accordingly, we conclude that the meaning of “second lockdown mechanism” as used in the ’053 patent is not limited to an apparatus separate from a setting tool.

2. “lock”

Claims 1 and 22 require that the “mandrel is locked in the operative position only when both the first and second lockdown mechanism are in respective lockdown positions.” Patent Owner proposes two constructions for the term “lock”: (1) “the mandrel does not move away from the operative position during the normal course of operation,” and (2) “to ensure that the mandrel is safely secured in the operative position to prohibit the displacement of the mandrel during a well treatment to stimulate production.” PO Resp. 24, 26. The second construction follows the definition provided by Patent Owner’s Declarant, Mr. Wooley. Ex. 2012 ¶ 58. Patent Owner contends its proposed construction is consistent with a dictionary definition of “lock” as meaning “to make fast or immovable, as by engaging parts.” PO Resp. 24 (quoting WEBSTER’S UNABRIDGED DICTIONARY 1128 (2d ed. 2001) (Ex. 2016), entry 17 for “lock”). Patent Owner also asserts that Petitioner’s Declarant, Mr. Shackelford, agreed that “lock” means the mandrel would not move from its operative position during the normal course of operation. PO Resp. 25.

Petitioner does not provide an express construction of the term “lock,” but instead argues that the ’053 patent “defines the term ‘lock’ to include hydraulic force applied to hold a mandrel in an operative position.” Reply

2–3. In particular, Petitioner identifies statements in the '053 patent that (1) “[t]he mandrel [] is locked down in its operative position by the hydraulic force P2,” and (2) a particular structure is “used to hydraulically lock the mandrel in an operative position.” Reply 4–5 (quoting Ex. 1001, 2:48–51, 8:30–31).

Neither party has shown that the term “lock” is used in the '053 patent in any way other than its ordinary and customary manner. Because the claim expressly recites that the “mandrel is locked in the operative position,” repeating the same language in the construction of “lock” would render such claim language superfluous. *See Biocon, Inc.*, 441 F.3d at 950. Nor is there anything in the use of “lock” in the '053 patent that would require its definition to incorporate “during a well treatment to stimulate production,” as Patent Owner proposes. Indeed, neither claim 1 nor 22 requires “a well treatment to stimulate production.” Nor has Petitioner provided a rationale to link a means used to “lock,” such as hydraulic pressure, to the meaning of “lock.” We apply its ordinary and customary meaning, as understood by a person of ordinary skill in the art, in the context of the entire patent disclosure. We recognize that one ordinary and customary meaning of lock, as suggested by Patent Owner, is “to make fast or immovable, as by engaging parts.” Prelim. Resp. 24.

B. Anticipation by Dallas '118

Petitioner must demonstrate by a preponderance of the evidence that the challenged claims are unpatentable to prevail. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). Petitioner contends that claims 1 and 22 of the '053 patent are anticipated by Dallas '118. Pet. 41–47. Dallas '118 is the Canadian Patent Application counterpart to U.S. Patent No. 5,819,851 (“the

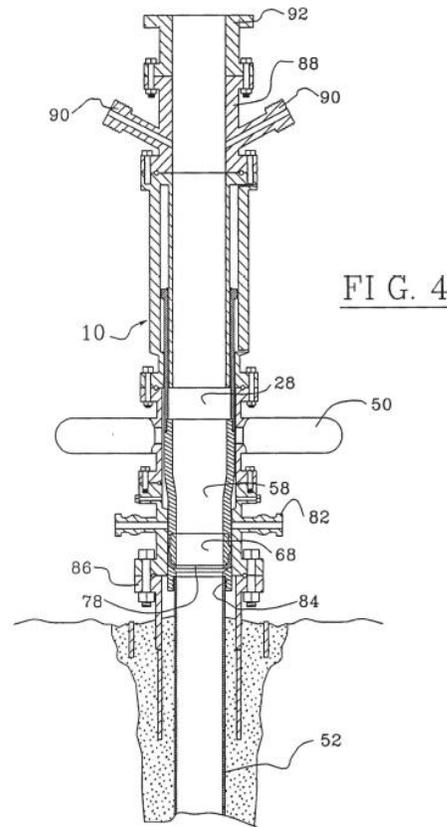
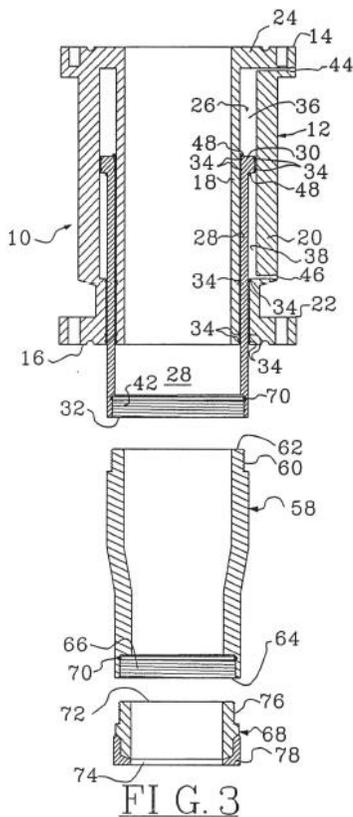
'851 patent"), with the disclosures of both documents being essentially identical.⁵ See PO Resp. 4. L. Murray Dallas is the sole named inventor on the face of the '053 patent, the '851 patent, and Dallas '118.

“To anticipate a claim, a reference must disclose every element of the challenged claim and enable one skilled in the art to make the anticipating subject matter.” *PPG Indus., Inc. v. Guardian Indus. Corp.*, 75 F.3d 1558, 1566 (Fed. Cir. 1996). Enablement requires that “the prior art reference must teach one of ordinary skill in the art to make or carry out the claimed invention without undue experimentation.” *Minnesota Mining & Mfg. Co. v. Chemque, Inc.*, 303 F.3d 1294, 1301 (Fed.Cir. 2002). The determination of whether “undue experimentation” is required may include consideration of factors such as (1) the quantity of experimentation; (2) the amount of direction or guidance present; (3) the presence or absence of working examples; (4) the nature of the invention; (5) the state of the prior art; (6) the relative skill of those in the art; (7) the predictability or unpredictability of the art; and (8) the breadth of the claims. *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988).

1. Summary of Dallas '118

Dallas '118 describes an apparatus and method for protecting blowout preventers (BOPs) from high pressures and exposures to abrasive or corrosive fluids during well fracturing or stimulation treatments. Ex. 1003, 4. Figures 3 and 4 of Dallas '118 are reproduced below.

⁵ The parties agree that the '851 patent is not prior art to the '053 patent. Joint Stipulation Regarding the '851 Patent, Paper No. 10. Patent Owner does not dispute that Dallas '118 is prior art to the '053 patent.



Figures 3 and 4 depict cross-sectional views of BOP protector 10, with Figure 4 further including related spools mounted on a wellhead above a BOP. Ex. 1003, 9. Figure 3 shows mandrel extension 58 connectable to the bottom of mandrel 28. *Id.* at 14. Mandrel packoff assembly 68 is connectable to the bottom of mandrel extension 58. *Id.* The bottom of mandrel packoff assembly 68 includes annular seal 78, which sealingly engages a top of the well casing. *Id.* BOP protector 10 includes bottom flange 22 adapted for fluid tight connection with a top end of a BOP or a casing spool. *Id.* at 10. Figure 4 shows BOP protector 10 stroked down through both BOP 50 and well tubing head 82 into sealing contact with bit guide 84 attached to the top of casing 52. *Id.* at 15. According to Dallas '118, hydraulic fluid injected through hydraulic fluid port 44 into upper chamber 36, shown in Figure 3, should be maintained at a pressure of about

1000 psi while BOP protector 10 is in use to seat annular seal 78 against bit guide 84 with enough force to ensure a fluid tight seal. *Id.* Stimulation fluids then may be pumped through unions 90 of high pressure valve spool 88 mounted to the top of BOP protector 10. *Id.* at 16–17.

2. *Dallas '118 Discloses Every Element of Claims 1 and 22*

Claim 1 requires a first lockdown mechanism that includes a base member for connection to a wellhead of the well, and a locking member for detachably engaging the base member. Claim 22 contains a similar requirement. We agree with Petitioner that bottom flange 22 of Dallas '118 corresponds to the base member of a first lockdown mechanism, and that bolts through the bores in lower flange 22 correspond to a locking member, as claimed in the '053 patent. *See* Pet. 42.

Claim 1 further requires a second lockdown mechanism having a range of adjustment adequate to ensure that the mandrel can be moved into the operative position, and locked down in the operative position while the first lockdown mechanism is in the lockdown position. Claim 22 contains a similar requirement. We agree with Petitioner that the hydraulic cylinder mechanism of Dallas '118, which ensures a fluid tight seal between annular seal 78 and bit guide 84 by maintaining a pressure of about 1000 psi in upper chamber 36, corresponds to the recited second lockdown mechanism. *See* Pet. 36, 44.

Patent Owner asserts that the hydraulic mechanism taught in Dallas '118 does not correspond to the claimed second lockdown mechanism because it relies on hydraulic pressure. PO Resp. 28. Patent Owner's argument is unpersuasive because we conclude, in construing "second lockdown mechanism," that the claimed element is not limited to a

mechanical apparatus for the reasons discussed above. Patent Owner also asserts that the hydraulic setting tool taught in Dallas '118 does not correspond to the claimed second lockdown mechanism because it is not separate from a setting tool. *Id.* at 29. Patent Owner's argument is unpersuasive because we conclude, in construing "second lockdown mechanism," that the claimed element is not limited to an apparatus separate from a setting tool.

Claim 1 further requires that the first and second lockdown mechanisms are arranged "so that the mandrel is locked in the operative position only when both the first and the second lockdown mechanism are in respective lockdown positions." Claim 22 contains a similar requirement. We agree with Petitioner that mandrel 28 of Dallas '118 is locked in an operative position only when tool 10 is locked down on the wellhead and the piston at the top 30 of mandrel 28 is locked down, forcing assembly 69 against bit guide 84. *See* Pet. 32 (citing Ex. 1003, 13:25–14:1, Ex. 1002 ¶ 76.)

We are not persuaded by Patent Owner's argument that Dallas '118 discloses holding a mandrel in place to form a fluid-tight seal but not "affirmatively 'locking' the mandrel in place such that it does not move during normal operation of the tool." PO Resp. 30. Dallas '118 states that a fluid tight seal between annular seal 78 and bit guide 84 is ensured by maintaining a pressure of about 1000 psi in upper chamber 36, and that the "hydraulic fluid pressure in the upper chamber 36 should be maintained at about 1,000 psi at all times while the BOP protector 10 is in use." Ex. 1003, 15:26–31. Patent Owner argues that ensuring a fluid-tight seal is formed is "fundamentally different from 'locking' or 'securing' the mandrel in an

operative position.” PO Resp. 30. Patent Owner, however, offers no sufficient explanation of the purported “fundamental difference.”

Patent Owner’s argument is also unpersuasive because it is inconsistent with the treatment of the ’851 patent in the ’053 patent itself.⁶ The ’053 patent states that the “setting tool [of the ’851 patent] is used to hydraulically lock the mandrel in an operative position,” and that it is “very convenient for securing a mandrel of a well tool in the operative position.” Ex. 1001, 2:48–51, 58–62. Patent Owner’s argument that a hydraulic apparatus is insufficient to lock the mandrel in place is also inconsistent with one of the disclosed embodiments of the ’053 patent, which makes clear that “[t]he mandrel 72 is locked down in its operative position by the hydraulic force P2.” Ex. 1001, 8:30–31. Patent Owner offers no explanation for why we should disregard the disclosure of the ’053 patent, which expressly equates ensuring a fluid-tight seal, such as disclosed by Dallas ’118, to locking the mandrel in an operative position. Petitioner has demonstrated by a preponderance of the evidence that Dallas ’118 discloses every element of claims 1 and 22.

3. *Dallas ’118 Does Not Fail to Enable a Device that “Locks” the Mandrel in an Operative Position*

Patent Owner suggests that we should look “[b]eyond the exact semantics that were used in describing [Dallas ’118],” and focus instead on its contention that the tool described in Dallas ’118 “did not work to protect a wellhead during hydraulic fracturing operations by reliably securing the mandrel in the operative position.” PO Resp. 32. Patent Owner concedes

⁶ As noted above, the Dallas ’118 disclosure mirrors the disclosure of the ’851 patent.

that the tool described in Dallas '118 was used in operation, but alleges it “failed approximately 50% of the time,” and “began to fail at pressures much lower than those typically used in fracking.” *Id.* Patent Owner proceeds to provide various reasons why the tool described in Dallas '118 was not reliable, including the “inherently unpredictable nature of the device,” “substantial pressure swings caused by changes in the pumping rate of fracking fluid,” “vibration and transient pressure spikes during a fracking operation,” “sway and vibration of the tool” due to its height, “the compressibility of hydraulic fluid,” the temperature differential between fluid flowing through the mandrel and the ambient air, and the condition of the bit guide. PO Resp. 33–39. From this, Patent Owner insists it would have taken undue experimentation for one of ordinary skill in the art to practice the invention of the challenged claims using the disclosure of Dallas '118. *Id.* at 39. We disagree.

Patent Owner’s contention that Dallas '118 lacks enablement is premised on Patent Owner’s contention that “locked” should be construed to mean protecting “a wellhead during hydraulic fracturing operations by reliably securing the mandrel in the operative position.” PO Resp. 32. For the reasons discussed above, we decline to adopt Patent Owner’s construction of “locked” as it attempts to incorporate limitations concerning the use of the claimed apparatus and its reliability, which are not present in the claim language. Accordingly, Patent Owner’s argument that Dallas '118 lacks enablement is not persuasive because Patent Owner is demanding enablement of features not set forth in claims 1 and 22 of the '053 patent.

Patent Owner’s argument that Dallas '118 lacks enablement is also not supported by the evidence. The record in this proceeding makes clear

that not only was the tool of Dallas '118 sufficiently enabled to teach one of ordinary skill in the art to make or carry out the anticipating subject matter without undue experimentation, the tool was in fact made, and in fact carried out the anticipating subject matter. L. M. Dallas October 28, 2014 Deposition Transcript, Ex. 1009, 109:15–110:15. Patent Owner further wants us to ignore the disclosure of the '053 patent itself, which expressly states that the tool of the '851 patent (the same tool as that of Dallas '118) is “very convenient for securing a mandrel of a well tool in the operative position.”

Patent Owner’s arguments on experimentation also are not persuasive. The issues Patent Owner raises with regard to the reliability of the prior art tool do not demonstrate that undue experimentation would be necessary to enable one of ordinary skill in the art to make or carry out the claimed invention. Patent Owner argues that the seal formed by the setting tool in Dallas '118 “failed approximately 50% of the time,” and, therefore, concedes it also worked approximately 50% of the time. *Hildreth v. Mastoras*, 257 U.S. 27, 34 (1921) (“The machine patented may be imperfect in its operation; but if it embodies the generic principle and works . . . it is enough.”); *Decca Ltd. v. United States*, 544 F.2d 1070, 1077 (Ct. Cl. 1976) (“The mere fact that the system has some drawbacks, or that under certain postulated conditions it may not work . . . does not detract from the operability of the disclosed equipment to perform its described function.”). Mr. Dallas further testified that the tool of the '851 patent (the same tool as that of Dallas '118) “would be fine on low pressure, small valve, low stroke applications.” L. M. Dallas March 13, 2014 Deposition Transcript, Ex. 1008, 160:2–11. Claims 1 and 22 of the '053 patent are not directed to

any particular pressure, valve size, or stroke application. Petitioner's Declarant, Mr. Shackelford, further explained that the hydraulic system of the Dallas '118 tool could readily be designed for a known working pressure so that it would always have a net downward force holding the seal in place. Ex. 2015, 79:11–20. Nor are the claims tied to any particular rate of reliability for securing or locking the mandrel in place. Weighing the *Wands* factors, we determine that the quantity of experimentation, state of the prior art, presence of working examples (including the use in practice of the setting tool described in Dallas '118), and the nature of the invention (using conventional features) support a conclusion that a preponderance of the evidence demonstrates that the anticipatory subject matter of Dallas '118 was enabled, permitting one of ordinary skill in the art to carry out the invention of claims 1 and 22 of the '053 patent. *See Wands*, 858 F.2d at 737.

4. *Conclusion*

Having considered the parties' contentions and supporting evidence, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1 and 22 are anticipated by Dallas '118.

C. Patent Owner's Motion to Amend

In its Motion to Amend, Patent Owner proposes substitute claim 28, contingent on claim 1 being found unpatentable, and substitute claim 29, contingent on claim 22 being found unpatentable. Mot. 4. We determine that claims 1 and 22 are unpatentable and, therefore, reach the merits of Patent Owner's Motion to Amend.

Entry of the proposed amendments is not automatic, but occurs only upon Patent Owner having demonstrated the patentability of the proposed

substitute claims. As the moving party, Patent Owner bears the burden of proof to establish that it is entitled to the relief requested and, therefore, bears the burden of proof in demonstrating adequate written description support and patentability of the proposed substitute claims. 37 C.F.R. §§ 42.20(c), 42.121(b).

Patent Owner's proposed substitute claim 28 is reproduced below, with additions relative to claim 1 underlined and deletions in brackets.

28. An apparatus for securing a mandrel of a well tool in an operative position requiring fixed-point packoff above the casing of the well and within a tubing head spool of a [in the] wellhead assembly, the apparatus comprising:

a setting tool that is arranged to insert a bottom end of the mandrel through the wellhead, and is removable from the other portions of the apparatus;

a first and a second mechanical lockdown mechanism that are separate from the setting tool and arranged so that the mandrel is locked in the operative position only when both the first and the second mechanical lockdown mechanism are in respective lockdown positions;

the first mechanical lockdown mechanism adapted to detachably maintain the mandrel in proximity to the fixed-point packoff when in the lockdown position,

the first mechanical lockdown mechanism including a base member for connection to a wellhead of the well and a locking member for detachably engaging the base member; [and]

the second mechanical lockdown mechanism having a range of adjustment adequate to ensure that the mandrel can be moved into the operative position, and then locked down in the operative position without the use of hydraulic pressure while the first mechanical lockdown mechanism is in the lockdown position; and

the mandrel including a packoff assembly that seals against the fixed-point packoff within the tubing head spool.

Mot. 1–2. The amendments Patent Owner proposes to claim 22 in proposed substitute claim 29 are substantively the same as the changes proposed in

substitute claim 28. Patent Owner does not distinguish its arguments for the patentability of claim 29 from its arguments for the patentability of claim 28. Patent Owner contends that two features of the proposed substitute claims are novel: (1) a removable setting tool, separate from the first and second lockdown mechanisms, arranged to insert the mandrel through the wellhead; and, (2) a mechanical second lockdown mechanism that operates without the use of hydraulic power. *Id.* at 6. Patent Owner acknowledges in its Motion that the prior art discloses “wellhead isolation tools with a separate setting tool.” *Id.* at 8 (citing U.S. Patent No. 4,241,786 (Ex. 2020, “Bullen”)). Patent Owner also acknowledges there are references which disclose wellhead isolation tools that include one or more mechanical lockdown mechanisms. *Id.* (citing U.S. Patent No. 4,632,183 (Ex, 1004, “McLeod”)). Patent Owner asserts the prior art references identified do not, however, disclose “the particular features of the proposed amended claims.” *Id.*

1. Written Description Support

Pursuant to 37 C.F.R. § 42.121(b), a motion to amend in an *inter partes* review must set forth “[t]he support in the original disclosure of the patent for each claim that is added or amended,” and “[t]he support in an earlier-filed disclosure for each claim for which benefit of the filing date of the earlier filed disclosure is sought.” Patent Owner provided virtually no discussion of the support for its proposed substitute claims in its Motion to Amend, relying instead on a chart purportedly showing where each element of the proposed substitute claims was disclosed in the Specification, claims, and Figures of the ’053 patent and the ’418 application. *See* Mot. 4 (citing Exhibit 2021). Patent Owner’s Declarant, Mr. Wooley, does not address written description support in his Declaration that accompanies the Motion

to Amend. *See* Ex. 2017. The chart of written description support provided by Patent Owner contains only string citations with no discussion of how the cited disclosures pertain to the additional claim language. Indeed, those citations are not tailored to a specific disclosure, but instead encompass, among other things, all nine figures in the '418 application. *See* Ex. 2021. During oral argument, Patent Owner sought to narrow the citations relied upon as written description support, but failed to remedy the problem of insufficient explanation linking the citations to the amended language. *See* Tr. 61:4–64:20.

The determination of whether there is written description support turns on whether the original disclosure of the application relied upon reasonably conveys to a person of ordinary skill in the art that the inventor had possession of the claimed subject matter as of the filing date. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). The proposed substitute claims introduce the term “wellhead assembly,” a term that does not appear in the '418 application or the '053 patent. Patent Owner’s string citation to various disclosures, none of which identify a “wellhead assembly,” is insufficient to demonstrate written description support absent some explanation. The same is true with regard to the proposed addition of language requiring both an apparatus for securing the mandrel “within a tubing head spool of a wellhead assembly” and a setting tool “arranged to insert a bottom end of the mandrel through the wellhead.” A string citation does not explain how the original disclosure of the application relied upon reasonably conveys to a person the features intended to be encompassed by the proposed substitute claims. In particular, we cannot discern from Patent Owner’s conclusory discussion how the

original disclosure describes both securing the mandrel within the wellhead assembly and inserting the mandrel through the wellhead, particularly where Patent Owner further argues a distinction between inserting a mandrel “into” a wellhead as opposed to “through” a wellhead. *See* PO Reply. 1–2.

Accordingly, we conclude Patent Owner has not satisfied its burden of showing written description support for the proposed substitute claims 28 and 29.

2. Claim Interpretation

Patent Owner bears the burden in a motion to amend to show a patentable distinction of each proposed substitute claim over the prior art. *See* 37 C.F.R. § 42.20(c). This includes providing a construction of new claim terms sufficient to support the distinction of the proposed substitute claim over the prior art. Patent Owner introduces the new claim terms “wellhead assembly” and “setting tool” in the proposed substitute claims, but provides no express construction of either term.

Absent any discussion of what is encompassed by the recited “wellhead assembly,” it is unclear how the term differs from the use of “wellhead,” alone, elsewhere in the claim. This is particularly problematic, as discussed above, when attempting to discern what is claimed as a setting tool “arranged to insert a bottom end of the mandrel through the wellhead,” relative to the claimed apparatus for securing a mandrel “above the casing of the well and within a tubing head spool of a wellhead assembly.”

In its Motion to Amend, Patent Owner also does not provide a construction for “setting tool.” We note that Patent Owner was aware that the district court had previously suggested the term “setting tool” was “ambiguous.” District Court Markman Order, Ex. 2008, 15. In reply to

Petitioner's opposition to the Motion, Patent Owner argues that "the defining characteristics of the 'setting tool'" are set out in the claim language as:

(1) "arranged to insert a bottom end of the mandrel through the wellhead," and, (2) "separate from" the first and second lockdown mechanisms and thus "removable." PO Reply 1. Patent Owner proceeds to dispute the

construction of "setting tool" proposed by Petitioner's Declarant, Mr. Perkin, but fails to offer any express construction of the term itself.

Petitioner's Declarant, Mr. Perkin, defined "setting tool" as "any device that is used to align the mandrel with the wellhead so that the mandrel can be inserted without interference." Perkin Decl., Ex. 1014 ¶ 44. Patent Owner's Declarant, Mr. Wooley, testified that "setting tool" is "usually the name given to a device for inserting some sort of tool." Ex. 1011, 61:17–21.

Absent a clear explanation of what is claimed, Patent Owner's assertion that a particular reference does not teach "any kind of setting tool" is conclusory and not persuasive. *See* Mot. 9. Patent Owner has not provided a sufficient construction of the term "setting tool" by merely pointing to other claim language or by disputing Petitioner's proposed construction.

By failing to articulate adequately a construction of "setting tool" or "wellhead assembly," Patent Owner has not satisfied its burden of showing a patentable distinction of each proposed substitute claim over the prior art.

3. Conclusion

We conclude Patent Owner has not come forward with sufficient evidence to establish proposed substitute claims 28 and 29 have adequate written description support. We further conclude Patent Owner has not supported sufficiently the distinction of the proposed substitute claims 28 and 29 over the prior art by failing to provide adequately the necessary

IPR2014-00216
Patent 6,179,053 B1

construction of the proposed amendments to claims 1 and 22. For these reasons, we deny Patent Owner's Motion to Amend.

III. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 1 and 22 of U.S. Patent No. 6,179,053 B1 are unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Amend is denied; and

FURTHER ORDERED that, because this is a Final Written Decision, the parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2014-00216
Patent 6,179,053 B1

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