

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DYNAENERGETICS EUROPE GMBH and
DYNAENERGETICS US, INC.,
Petitioner,

v.

QINETIQ LIMITED,
Patent Owner.

Case PGR2023-00003
Patent 11,215,039 B2

Before WILLIAM V. SAINDON, WILLIAM A. CAPP, and
CARL M. DeFRANCO, *Administrative Patent Judges*.

Opinion for the Board filed by *Administrative Patent Judge CAPP*

Opinion Dissenting filed by *Administrative Patent Judge DeFRANCO*

CAPP, Administrative Patent Judge.

DECISION
Granting Institution of Post-Grant Review
37 C.F.R. § 42.208

Dynaenergetics Europe GmbH and Dynaenergetics US, Inc. filed a Petition (Paper 1, “Pet.”) requesting post-grant review of claims 1–5 of U.S. Patent No. 11,215,039 B2 (Ex. 1001, the “’039 patent”). QinetiQ Limited (“QinetiQ”) has elected not to file a Preliminary Response.¹ We have jurisdiction under 35 U.S.C. § 6. We conclude that Petitioner has demonstrated that at least claim 1 of ’039 Patent is more likely than not unpatentable under 35 U.S.C. § 102. Accordingly, we institute post grant review as to claims 1–5. *See* 35 U.S.C. § 324(a)

I. RELATED MATTERS

Petitioner represents that are no related matters currently pending between the parties. Pet. 1.

II. BACKGROUND

A. *The ’039 patent (Ex. 1001)*

The ’039 patent, entitled “Shaped Charge And Method Of Modifying A Shaped Charge” issued as a continuation of non-provisional application No. 16/704,524 (now U.S. Pat. No. 11,002,118), which is a continuation of application No. 14/651,829 (now U.S. Pat. No. 10,533,401), which was filed on December 13, 2013. Ex. 1001. The Specification of the ’039 patent generally discloses a perforator used in fracking procedures in the oil and gas industry. Ex. 1001, 2:19–44. Known perforators comprise charge case 20, explosive composition 60, and liner 30. *Id.* Fig. 1. Claims 1–5 relate to designing variations in the shape of the liner component. *Id.*

¹ QinetiQ has filed a motion to dismiss the Petition. Paper 6. Dynaenergetics opposes the motion. Paper 7. We dispose of the motion to dismiss in a separate order issued substantially contemporaneously herewith.

Figure 5 of '039 Patent is reproduced below.

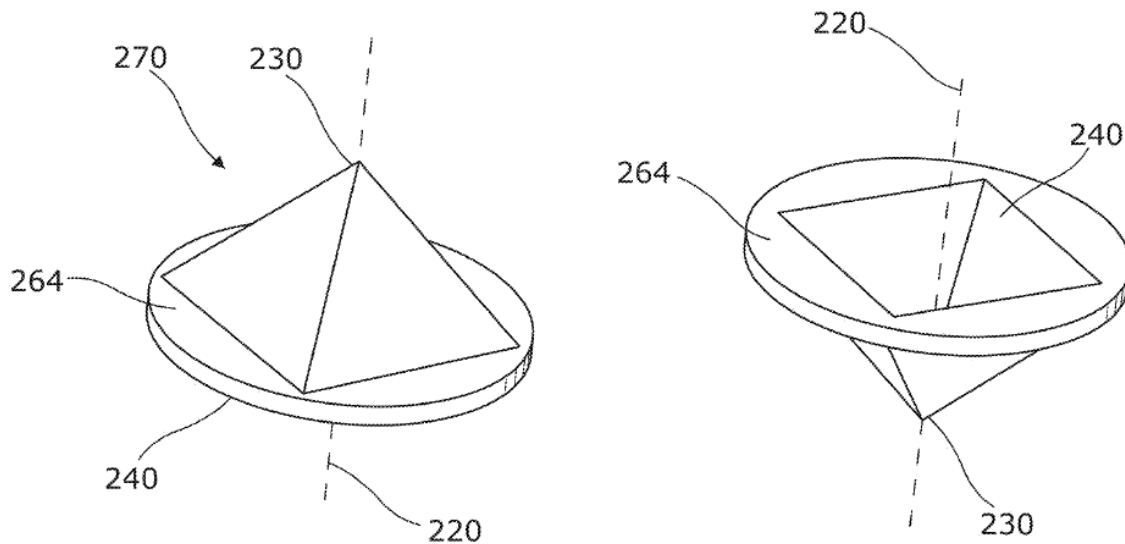


FIGURE 5 OF '039 PATENT

Figure 5 above depicts side-by-side respective upper and lower perspective views of a shaped charge liner that adopts the shape of a pyramid surrounded circumferentially by a circular lip.

B. The Challenged Claims

Petitioner challenges claims 1–5. Independent claim 1 is representative of the claimed subject matter and is reproduced below:

1. A method of manufacturing an enhanced shaped charge liner design for use in an oil/gas well perforator that is usable to form a desired hole shape in a rock formation, the method comprising

comparing the desired hole shape to a library of known liner designs, the library including data relating to a hole shape formed by each of the known liner designs within the library;

selecting a liner design from the known liner designs that produces a hole shape optimised to the desired hole shape;

varying at least one parameter of the selected liner design to form a modified liner design;

modelling the hole shape that the modified liner design produces;

repeating the varying and modelling steps until the hole shape of the modified liner design converges towards the desired hole shape to thereby create a final liner design; and

forming the enhanced shaped charge liner in accordance with the final liner design.

C. The Asserted Grounds of Unpatentability

Petitioner asserts 12 grounds of unpatentability, which grounds are summarized in the following table. The various grounds of unpatentability are supported by the Declaration of Marco Serra (Ex. 1003).

Claims	§	References²/Basis
1–5	101	Subject Matter Eligibility
1–5	112(b)	Indefiniteness
1–5	112(a)	Non-Enablement
1–5	112(a)	Lack of Written Description
1–5	102	Davison (Ex. 1009)
2–4	103	Davison (Ex. 1009), Quattlebaum (Ex. 1007)
2–4	103	Davison (Ex. 1009), Walters (Ex. 1014)
5	103	Davison (Ex. 1009), Smith (Ex. 1015)
1	102	Guinot (Ex. 1010)
1–4	103	Guinot (Ex. 1010), Quattlebaum (Ex. 1007)
2–4	103	Guinot (Ex. 1010), Walters (Ex. 1014)
5	103	Guinot (Ex. 1010), Smith (Ex. 1015)

² A more detailed description of the listed prior art references is set forth in pages 17–28 of the Petition.

D. Claim Interpretation

In trial proceedings under the America Invents Act, we apply the same claim construction standard that is applied in civil proceedings under 35 U.S.C. § 282(b). *See* 37 C.F.R. § 42.200(b); *Cupp Computing AS v. Trend Micro Inc.*, 53 F.4th 1376, 1380 (Fed. Cir. 2022) citing *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc); *Polaris Innovations Ltd. v. Brent*, 48 F.4th 1365, 1372 n.3 (Fed. Cir. 2022).

A claim construction analysis begins and remains centered on the claim language itself. *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004). The words of a claim are generally given their ordinary and customary meaning, which is the meaning that the term would have to a person of ordinary skill in the applicable art at the time of the invention. *Id.* at 1312-13. The person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification. *Id.* Therefore, claims “must be read in view of the specification, of which they are a part.” *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed.Cir.1995) (*en banc*), *aff’d*, 517 U.S. 370 (1996). The specification may define claim terms by implication such that the meaning may be ascertained by reading the patent documents. *Phillips*, 415 F.3d at 1321.

Petitioner submits testimony from Dr. Serra in support of its proposed claim construction. Serra (Ex. 1003) ¶ 46. Extrinsic evidence, such as expert testimony, can be useful for a variety of purposes, such as to provide background on the technology at issue, to explain how the invention works, to ensure that the court’s understanding of technical aspects of a patent is

consistent with that of person of skill in the art, or to establish that a particular term in a patent or the prior art has a particular meaning in the pertinent field. *Phillips*, 415 F.3d at 1319. However, extrinsic evidence is generally considered less reliable than the patent and its prosecution history in determining how to read the claim terms. *Id.*³ The specification is generally the single best guide to the meaning of a disputed term, and usually, it is dispositive. *Id.* at 1315. For purposes of the instant decision, we rely solely on intrinsic evidence to construe the claims.

In the Petition, Petitioner proposes constructions for two claim terms, subject to the qualification that they are not found to be indefinite. Pet. 31–33.

Optimized

Petitioner proposes that we construe a hole shape from a known liner design as “optimized” to a desired hole shape if it “differs the least” from the desired hole shape in comparison to that of other liner shape designs in the library of known known liner designs. *Id.* at 31.

With respect to the method steps set forth in the Figure 17 of the disclosure, the Specification states that, at step 416, the shaped charge liner within the library that results in a hole that is closest to the desired hole shape is chosen. Ex. 1001, 12:42–44.

³ Undue reliance on extrinsic evidence poses the risk that it will be used to change the meaning of claims in derogation of the “indisputable public records consisting of the claims, the specification and the prosecution history,” thereby undermining the public notice function of patents. *Phillips*, 415 F.3d at 1319 (citing *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1578 (Fed. Cir. 1995)).

In view of the foregoing and for purposes of this preliminary stage of the proceeding, we will construe the “*optimized*” term as relating to a hole shape associated with a known liner design that most closely approximates the desired hole shape in some objectively discernable manner when compared to hole shapes that are associated with other liner designs that are maintained in a library.

Converge toward the desired hole shape

With respect to “repeating . . . steps until the hole shape of the modified liner design converges towards the desired hole shape,” Petitioner proposes that the hole shape of the “modified liner design” is considered to be more similar in any quantifiable respect to the “desired hole shape” than the hole produced by the “known liner design.” *Id.* at 32.

The Specification states that, at step 422 of the Figure 17 method, the hole produced by the modified liner design is compared again to the desired hole profile. Ex. 1001, 12:52–53. Certain design steps may then be repeated until the liner performance shows no further, appreciable improvement. *Id.* at 2:53–57. This occurs until the modified liner performance has converged towards the desired hole shape. *Id.* at 12:58–59.

In view of the foregoing and for purposes of this preliminary stage of the proceeding, we will construe the “*converge*” term as the product of an iterative design and modelling process that results in a liner design that produces a hole shape that more closely approximates the desired hole shape than the hole shape associated with the known liner design selected from the library.

Otherwise, we have reviewed the analysis section of the Petition and it does not appear to us, at this stage of the case, that any issue regarding

whether a limitation of claim 1 is met by a cited prior art reference hinges on the meaning of any particular claim term. Under the circumstances, we will defer further consideration of claim construction in this case until the record is more fully developed.

III. ANALYSIS

A. *Anticipation of Claim 1 by Davison*

1. *Davison*

Davison is an article entitled *Hydrocode-Designed Well Perforator With Exceptional Performance* published by the 17th International Symposium on Ballistics, in Midrand, South Africa, in March of 1998. Davison is directed to a well perforator improvement effort to increase the jet energy and penetration of shaped charges. Ex. 1009, p. 1. Davison discusses modifying the liner of shaped charges, which it considers to be “[t]he most critical component of the perforator.” *Id.* Figure 3 of Davison depicts a baseline perforator that features a conical liner juxtaposed to an improved perforator that features a bell-shaped liner of variable thickness. *Id.* at 3. According to Davison, perforations created by the baseline design tapered to a small diameter, while those created by the improved design were deeper and did not taper to a small diameter. *Id.* at 4. Davison reports that the improved design is more effective in bringing hydrocarbons to the wellbore. *Id.*

Davison describes its design approach in the following terms:

The following is a summary of the shaped charge design approach: (1) Compute the perforator jetting with the definitive AUTODYN 2D program; (2) Compute the hole shape using the analytical penetration theory; (3) Derive liners that give jets of maximum energy and holes of maximum size; (4) Test the most

promising designs; and (5) Iterate to converge on the “best” design(s).

Davison (Ex. 1009), p. 4.

2. Davison – the individual claim elements

Petitioner alleges that Davison discloses each limitation of claim 1. Pet. 54–61. Petitioner recites each individual element of claim 1 in a subheading and then, beneath each such subheading, offers allegations as to how such recited element is satisfied by Davison. *Id.* Petitioner’s allegations are supported by citations to Davison and to Mr. Serra’s declaration (Ex. 1003). *Id.* Petitioner’s allegations are further supported by annotated drawings from Davison. Pet. 58. Having reviewed the Petition, the Davison reference, and Mr. Serra’s declaration, and further in light of the fact that QinetiQ has not filed a preliminary response in opposition to the Petition, it appears to us that Petitioner’s allegations have sufficient evidentiary support to warrant exercise of our discretion to institute a trial. Indeed, on this record, the steps of Davison’s iterative process quoted above sufficiently track the steps of the claimed process that no further explanation is required at this stage of the proceeding.

IV. CONCLUSION

Petitioner has shown that it is more likely than not that claim 1 is anticipated by Davison. Under prevailing law, a determination that any one claim is more likely than not unpatentable permits institution of a trial on all challenged claims. *SAS Institute, Inc. v. Iancu*, 138 S.Ct. 1348, 1356 (2018). We have not, however, made a final determination with respect to the patentability of any challenged claim or the construction of any claim term.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that pursuant to 35 U.S.C. § 324(a), a post-grant review is hereby instituted as to claims 1–5 of the '039 patent on the following grounds of unpatentability:

A. Claims 1–5 under 35 U.S.C. § 101 as directed to a judicial exception to patentable subject matter.

B. Claims 1–5 under 35 U.S.C. § 112(b) as indefinite for failure to particularly point out and distinctly claim the subject matter that co-inventors regard as the invention.

C. Claims 1–5 under 35 U.S.C. § 112(a) for failure to satisfy the enablement requirement.

D. Claims 1–5 under 35 U.S.C. § 112(a) for failure to satisfy the written description requirement.

E. Claims 1–5 under 35 U.S.C. § 102 as anticipated by Davison.

F. Claims 2–4 under 35 U.S.C. § 103(a) as obvious over Davison and Quattlebaum.

G. Claims 2–4 under 35 U.S.C. § 103(a) as obvious over Davison and Walters.

H. Claim 5 under 35 U.S.C. § 103(a) as obvious over Davison and Smith.

I. Claim 1 under 35 U.S.C. § 102 as anticipated by Guinot.

J. Claims 1–4 under 35 U.S.C. § 103 as obvious over Guinot and Quattlebaum.

K. Claims 2–4 under 35 U.S.C. § 103 as obvious over Guinot and Walters.

L. Claim 5 under 35 U.S.C. § 103 as obvious over Guinot and Smith.

FURTHER ORDERED that, pursuant to 35 U.S.C. § 324(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial commencing on the entry date of this Order.

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Dissenting Opinion, filed by *Administrative Patent Judge* DEFRANCO.

I respectfully dissent for the reasons set forth in my dissent from the majority's decision denying dismissal of the petition, which is entered this same day. *See* Paper 8. The issue of whether the petition should have been dismissed in the first instance for failure to comply with a statutory requirement will be preserved for trial so long as Patent Owner raises and addresses the issue again in its Patent Owner Response.

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