

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SCIENTIFIC DRILLING INTERNATIONAL, INC.

Petitioner

v.

GUNNAR LLLP

Patent Owner

PGR2025-00061

U.S. Patent No. 12,110,780

**PATENT OWNERS BRIEF REQUESTING DISCRETIONARY DENIAL
OF INSTITUTION**

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EXHIBIT LIST

EXHIBIT 2001	U.S. Patent No. 9,759,060 (“Kuckes ‘060”)
EXHIBIT 2002	U.S. Patent No. 10,760 407 (“Donderici/Moss ‘407”)
EXHIBIT 2003	U.S. Patent No. 10,145,231 (“Donderici/Moss ‘231”)
EXHIBIT 2004	Information Disclosure Statement Acknowledged by Examiner on September 26, 2022 in Application No. 17/482,045
EXHIBIT 2005	Information Disclosure Statement Acknowledged by Examiner on March 19, 2024 in Application No. 18/457,139
EXHIBIT 2006	Information Disclosure Statement Acknowledged by Examiner on June 4, 2023 in Application No. 17/482,045
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EXHIBIT 2010	Office Action of June 6, 2025 in Application No. 18/826,924
EXHIBIT 2011	Declaration of Clinton Moss

I. INTRODUCTION

Petitioner Scientific Drilling International, Inc.’s (“SDI” or “Petitioner”) PGR petition challenging claims 1-22 of the ’780 patent should be denied under 35 U.S.C. § 325(d), as (1) the same or substantially the same prior art or (2) the same or substantially the same arguments have been considered by the Office. In evaluating the arguments under § 325(d), the Office applies the two-part framework set forth in *Advanced Bionics*:

- (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and
- (2) if either condition of the first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Advanced Bionics. LLC v. MED-EL Elektromedizinische Gerate GmbH, IPR2019-01469, Paper 6 at 7-8 (PTAB Feb 13, 2009)(precedential); *see also Becton, Dickinson and Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at 17-18 (PTAB Dec. 15, 2017)(listing factors of § 325(d) analysis, the *Becton-Dickson* factors).

SDI chastises Patent Owner for not citing Donderici/Moss ‘534 during prosecution, however, SDI does not address that Donderici/Moss ‘534 is nearly identical and cumulative of several references that Patent Owner submitted to the Office, including Donderici/Moss ‘407 (EX2002) and Donderici/Moss ‘231 (EX2003). Further, SDI admits that Fredriksen was considered by the Examiner. (Pet. 7)

In addition, Donderici '301 is substantially similar to Donderici/Moss '407 and Donderici/Moss '231 as well as U.S. Patent No. 9,759,060 to Kuckes ("Kuckes" '060)(EX2001). Kuckes was used in the Examiner's rejection of pending claims of the application leading to the '780 patent and was the subject of considerable discussion before the Patent Office. (EX1007, EX2007) The Schulz reference relied on by SDI is also cumulative to Kuckes in all relevant aspects.

Lastly, SDI's 112 written description and indefiniteness arguments are weak and also cumulative of issues considered by the Examiner.

II. THE '780 PATENT AND ITS PROSECUTION HISTORY

A. The '780 Patent

The '780 patent is directed to novel methods, devices and systems for magnetic ranging while drilling. (EX1001, Abs.) The novel system and method uses a downhole sensor to sense a magnetic ranging signal on a target well, a drill pipe portion and a power supply that is connected to the drill pipe so that current can be injected into the earth through the drill string, and an electrically insulated gap sub that influences the movement and direction of electrical energy from the drill string into the earth. (EX1001, 3:13-25) The invention seeks to eliminate the use of wireline electrodes as used in prior art systems, such as the Kuckes patent. (EX1001, 2:53-3:10) In one embodiment, wired pipe, such as disclosed in Fredriksen (EX1004) and discussed in the '780 patent, can be used with the invention.

(EX1001, 7:55-8:7)

B. The Prosecution History of The ‘780 Patent

The ‘780 patent was filed as App. No. 18/457,139 on August 28, 2023, and is a continuation application claiming priority to Application 17/482,045, now Patent 11,781,421. (EX1001) Frekricksen as well as Kuckes were submitted in an IDS and considered by the Examiner during prosecution of the parent ‘421 patent and the prosecution of the ‘780 patent. (EX2004, EX2005) Donderici/Moss ‘407 and ‘231 were also submitted in an IDS and considered by the Examiner during prosecution of the parent ‘421 patent and the ‘780 patent. (EX2005, EX2006)

During prosecution, the Examiner initially found that pending claims 1-8 and 18-22 were anticipated or obvious in view of Kuckes. (EX1007) Patent Owner amended the rejected claims to recite that “connection between the wire and the drill pipe” “maintains it rigid connection” as the “drill pipe is drilling.” (EX2007)

In response to Patent Owner’s amendment, the Examiner issued a notice of allowance stating that “the closest prior art of record is Kuckes” and “[t]he prior art of record fails to disclose, alone or in combination, the key features” of:

“the connection between the wire and the drill pipe is a rigid connection that maintains its rigid connection as the at least one section of drill pipe is drilling”

“at least one wire inside the at least one section of drill pipe that connects the

power supply and the at least one section of drill pipe, wherein the connection between the wire and the drill pipe is a rigid connection and is not spring loaded”

“the connection between the wire and the drill pipe maintains a continuous connection while the at least one section of drill pipe is drilling”

“connecting a power supply to at least one section of drill pipe using at least one wire that is located inside the at least one section of drill pipe, wherein the connection from the at least one wire to the at least one section of drill pipe is made at surface and is a rigid connection.”

(EX2008)

III. INSTITUTION SHOULD BE DENIED UNDER 35 U.S.C. § 325(D)

A. Asserted Art and Arguments Are the Same or Substantially the Same as Those Considered by the Examiner (*Advanced Bionics Part One*)

Petition Grounds 3-6 rely on various combinations of four references, all being the same or substantially the same as art considered by the Office.

Reference	PGR Grounds (Claims)	Status Before the Office
Fredriksen (EX1004)	3-6 (Claims 1-22)	Considered
Donderici/Moss ‘534 (EX1002)	3, 4 (Claims 1-6, 8-15, 17-22)	Substantially the same as Donderici/Moss ‘407/‘231
Donderici ‘301 (EX1003)	5, 6 (Claims 1-6, 8-15, 17-22)	Substantially the same as Donderici/Moss ‘407/‘231 and Kuckes
Schulz (EX1005)	4, 6 (Claims 7, 16)	Substantially the same as Kuckes

1. Ground 3 Art and Arguments Are the Same or Substantially the Same as Those Considered by the Examiner

In Ground 3, SDI argues obviousness over Donderici/Moss ‘534 (EX1002)

in view of Fredriksen (EX1004). (Pet. 16-35) SDI admits that Fredriksen was considered by the Examiner. (Pet. 7) Indeed, Fredriksen was cited in the ‘780 patent and was also discussed in the specification of the ‘780 patent. (Pet. 7; EX1001, citing 2019/0119990 to Fredriksen, and 7:60-66). SDI chastises Patent Owner for not citing Donderici/Moss ‘534, however, SDI does not address that Donderici/Moss ‘534 is nearly identical and cumulative of several references that Patent Owner submitted to the Office, including Donderici/Moss ‘407 and Donderici/Moss ‘231. Thus, as addressed below, *Becton Dickinson* factors (a)-(b) and (d) all support denying institution based on Ground 3.

Donderici/Moss ‘534 is more than just “similar” to Donderici/Moss ‘407 and ‘231, which were considered during prosecution. (EX2003, EX2004) *Google LLC v. Valtrus Innovations Ltd.*, IPR2022-01197, Paper at 8 at 15-16 (PTAB June 13, 2023) (“Our precedent holds that providing a document to the Office in an Information Disclosure Statement is sufficient to satisfy prong one of *Advanced Bionics* . . .”) The references have nearly identical relevant disclosures as seen below:

‘780 Claim	SDI’s Reliance on Donderici/Moss ‘534	Donderici/Moss ‘407 and ‘231 (submitted to Patent Office)
(a) Claims 1, 9 and 18 “An apparatus for magnetic ranging comprising:”	“Thus, a wellbore ranging tool for electromagnetic ranging between first and second wellbores has been described.” (Pet. 16-17, 22, 28; EX1002, 16:57-58)	“A system for ranging between two wellbores where an emitter electrode and a return electrode of a current injection system are disposed to drive current to a conductive member within a target wellbore to create an electromagnetic field about

'780 Claim	SDI's Reliance on Donderici/Moss '534	Donderici/Moss '407 and '231 (submitted to Patent Office)
		the conductive member.” (EX2002, Abst.) ¹
(b) Claims 1, 9 and 18 “a power supply”	“The current injection system 50 includes either a voltage controlled or current controlled transmitter 38, and it preferably alternates as very low frequencies in the order of 0.02-250 Hz to generate the current injected by emitter electrode E. Transmitter may be locally carried on drill string 48, such as part of power module 56, or positioned at the surface with conducting wiring extending down to emitter electrode E, such as shown in FIG. 1.” (Pet. 17, 22, 28; EX1002, 7:31-38)	“The current injection system also includes either a voltage controlled or current controlled transmitter 38, and in some embodiments, alternates as very low frequencies in the order of 0.02–250 Hz to generate the current injected by emitter electrode E. Transmitter, 38 may be locally positioned relative to emitter electrode E, or positioned at a location removed from emitter electrode E in electrical contact with electrode E via conductive wiring. Likewise, power and communications to EM sensor 51 may be carried locally by appropriate modules 56-62 or may be transmitted via conveyance system 48.” (Id., 4:52-62)
(c) Claims 1, 9 and 18 “at least one section of drill pipe . . .”	“With ongoing reference to FIGS 1 and 2, there is shown a second wellbore 28 shown in the process of being drilled. A drilling system 30 is generally shown associated therewith. Drilling system 30 may include a drilling platform 32 positioned over formation 12, and a	“A second wellbore 28 shown in the process of being drilled. A drilling system 30 is generally shown associated therewith. Drilling system 30 may include a drilling platform 32 positioned over formation 12, and a wellhead installation 34, including blowout preventers 36. Platform 32 may be disposed for raising and lowering a conveyance mechanism 48 within second wellbore.

¹ Citations are to Donderici/Moss '407 (EX2002). Donderici/Moss '407 is a continuation of Donderici/Moss '231, which is submitted as Exhibit 2003 to Patent Owner's Brief.

'780 Claim	SDI's Reliance on Donderici/Moss '534	Donderici/Moss '407 and '231 (submitted to Patent Office)
	wellhead installation 34, including blowout preventers 36. Platform 32 may be disposed for raising and lowering a conveyance mechanism. 48 within second wellbore 28." (Pet. 17, 22-23, 29; EX1002, 3:42-49) "conveyance mechanism 48 may be a tubing string or drill string" (Pet. 17, 23, 29; EX1002, 4:5-6)	(EX2002, 4:1-7) "Conveyance mechanism 48 may be a tubing, a pipe string such as a drill string." (EX2002X, 4:7-8)
(d) Claims 1, 9 and 18 "at least one wire inside the at least one section of drill pipe"	"Transmitter may be locally carried on drill string 48, such as part of power module 56, or positioned at the surface with conducting wiring extending down to emitter electrode E, such as shown in FIG. 1." (Pet. 17-18, 23-24, 29-30; EX1002, 7:31-38) SDI argues Fredriksen in combination discloses this element. Fredriksen was considered by the Examiner and discussed in the '780 patent.	"Transmitter, 38 may be locally positioned relative to emitter electrode E, or positioned at a location removed from emitter electrode E in electrical contact with electrode E via conductive wiring. Likewise, power and communications to EM sensor 51 may be carried locally by appropriate modules 56-62 or may be transmitted via conveyance system 48." (Id., 4:56-62) SDI argues Fredriksen in combination discloses this element. Fredriksen was considered by the Examiner and discussed in the '780 patent.
(e) Claims 1, 9 and 18 "a first electrically insulated member"	"current injection system 50 (emitter E and return R electrodes) that injects alternating currents (AC) into formation" (Pet. 19, 24, 30; EX1002, 4:65-67)	"current injection system, namely emitter electrode E and return electrode R, injects alternating currents (AC) into formation" (EX2002, 4:26-28)

‘780 Claim	SDI’s Reliance on Donderici/Moss ‘534	Donderici/Moss ‘407 and ‘231 (submitted to Patent Office)
	“one or more insulators or gap subs G deployed along the string to insulate one or more of the emitter electrode E, one or more of the return electrodes R and the EM sensor(s) 51” (Pet. 19, 24, 30; EX1002, 5:30-32) “In FIG. 3C, an emitter electrode E is shown downhole of return electrode R, but in close proximity thereto. In the embodiment, a first gap sub G1 is deployed on the drill string 48 between emitter electrode E and return electrode R to ensure that current is not conducted from emitter electrode E to return electrode R by drill string 48.” (Pet. 19, 24, 30; EX1002, 5:59-64) “power and communications to current injection system 50, if any, may be carried locally by the appropriate modules 56-62 or may be transmitted via conveyance system.” (Pet. 19, 25, 30-31; EX1002, 4:18-21)	“In certain embodiments, one or more insulators or gap subs G deployed along conveyance mechanism 48 to insulate the return electrodes R from the EM sensor 51, and in particular, to inhibit current 34c from traveling along conveyance mechanism 48 from return electrode R to EM sensor 51.” (EX2002, 8:16-21) “power and communications to EM sensor 51 may be carried locally by appropriate modules 56-62 or may be transmitted via conveyance system.” (EX2002, 4:59-62)
(f) Claims 1,	“EM sensor 51 includes at	“In some embodiments, EM sensor

‘780 Claim	SDI’s Reliance on Donderici/Moss ‘534	Donderici/Moss ‘407 and ‘231 (submitted to Patent Office)
9 and 18 “a sensor for detecting . . .”	least a magnetic gradient sensor or magnetic gradiometer (receiver)” to “form a tool for EM ranging.” (Pet. 19, 25; EX1002, 3:60-65)	51 includes at least a magnetic gradient sensor or magnetic gradiometer (receiver).” (EX2002, 4:18-20)
(g) Claims 2, 10 and 15 “a second electrically insulated member located further down-hole from the first electrically insulated member.”	“one or more insulators or gap subs G deployed along the string to insulate one or more of the emitter electrode E, one or more of the return electrodes R and the EM sensor(s) 51” (Pet. 19, 25; EX1002, 5:30-32) “a second gap sub G2 is deployed on the drill string 48 between emitter electrode E and EM sensor 51, which is positioned proximate or adjacent drill bit 54.” (Pet. 19-20, 25; EX1002 5:64-67)	“In certain embodiments, one or more insulators or gap subs G deployed along conveyance mechanism 48 to insulate the return electrodes R from the EM sensor 51, and in particular, to inhibit current 34c from traveling along conveyance mechanism 48 from return electrode R to EM sensor 51.” (EX2002, 8:16-21)
(h) Claims 3 and 11 “the sensor is part. . .” BHA	“EM sensor may be part of the bottom-hole-assembly (BHA) 52.” (Pet. 20, 25-26; EX1002 4:3-4)	“EM sensor 51, may be part of the bottom-hole-assembly (BHA) 52.” EX2002, 4:38-39)
(i) Claims 4 and 12 “the sensor is part of the drill pipe.”	“current injection system 50 and EM sensor 51 are attached to, or part of, a drill string 48.” (Pet. 20, 26; EX1002, 5:5-7)	“EM sensor 51, may be part of the bottom-hole-assembly (BHA) 52 of a drilling system. In such embodiments, conveyance mechanism 48 may be a tubing or drill string, having a BHA 52 attached to the end of string 48.” (Id., 4:38-42)
(j) Claims 5-6, 13-14 “the	“conveyance mechanism may be a tubing string or	“conveyance mechanism 48 may be a tubing or drill string” EX2002,

‘780 Claim	SDI’s Reliance on Donderici/Moss ‘534	Donderici/Moss ‘407 and ‘231 (submitted to Patent Office)
drill pipe. . .”	drill string” (Pet., 20-21, 27; EX1002, 4:5-6)	4:41-42)
(k) Claims 8 and 17 “the power supply is connected to the drill pipe using one or more conductors”	“power and communications to current injection system 50, if any, may be carried locally by appropriate modules 56-62 or may be transmitted via conveyance system” (Pet. 22; 27-28; EX1002, 4:18-21) “[t]ransmitter 38 may be locally carried on drill string 48, sch as part of power module 56, or positioned at the surface with conductive wiring extending down to emitter electrode E, such as shown in Figure 1.” (Pet. 22; EX1002 7:35-38)	“power and communications to EM sensor 51 may be carried locally by appropriate modules 56-62 or may be transmitted via conveyance system.” (EX2002, 4:59-62) “Transmitter, 38 may be locally positioned relative to emitter electrode E, or positioned at a location removed from emitter electrode E in electrical contact with electrode E via conductive wiring.” (EX2002, 4:56-59)
Claim 19 “A method.”	See (a) above.	See (a) above.
Claim 19 “installing a sensor . . .”	See (f) above	See (f) above.
Claim 19 “installing a first .”	See (g) above.	See (g) above.
Claim 19 “installing at least one section of drill pipe . . .”	See (e) above.	See (e) above.
Claim 19 “connecting.”	See (d) above.	See (d) above.

‘780 Claim	SDI’s Reliance on Donderici/Moss ‘534	Donderici/Moss ‘407 and ‘231 (submitted to Patent Office)
Claim 19 “energizing the power supply. . .”	“current injection system 50 (emitter E and return R electrodes) that injects alternating currents (AC) into formation 12 which currents travel to and then along conductive member 14 in first wellbore 10, and (ii) an EM sensor 51, namely a magnetic gradient sensor or magnetic gradiometer (receiver), that sense the gradient magnetic fields due to these AC currents on the conductive member 14.” (Pet. 33; EX1002, 4:65-5:5)	“current injection system, namely emitter electrode E and return electrode R, injects alternating currents (AC) into formation 12 which currents travel to and then along conductive member 14 in first wellbore 10. EM sensor 51 is disposed within the second wellbore 28 to sense the magnetic fields due to these AC currents on the conductive member 14.” (EX2002, 4:26-28)
Claim 19 “sampling . . .”	See (f) above.	See (f) above.
Claims 19 and 20 “adjusting the drilling operations. . .”	“adjust the drilling parameters for the second wellbore, such as the trajectory of the wellbore path, after which, in step J, a geo steering system carried by the drill string may be accordingly adjusted in order to steer the drill bit based on the magnetic ranging.” (Pet. 34; EX1002, 16:33-37)	“In step I, the computed distance and direction are used to adjust the drilling parameters for the second wellbore, such as the trajectory of the wellbore path, after which, in step J, a geo steering system carried by the drill string may be accordingly adjusted in order to steer the drill bit based on the magnetic ranging and drilling resumes.” (EX2002, 16:17-21)
Claim 21 “The method”	See (g) above.	See (g) above.
Claim 22 “The method	“preferable, as at step D, to interrupt drilling during	“as at step D, drilling is interrupted or temporarily suspended during

‘780 Claim	SDI’s Reliance on Donderici/Moss ‘534	Donderici/Moss ‘407 and ‘231 (submitted to Patent Office)
of claim 19 wherein the step of sampling the magnetic ranging signal occurs while drilling is taking place.”	wellbore ranging in order to minimize noise levels that could interfere with ranging measurements.” (Pet. 35; EX1002 15:19-21) “FIG. 1 may be a measurement-while-drilling or logging-while-drilling system in which passive ranging can be utilized to guide drill bit 54 while a drill string is deployed in wellbore 28.” (Pet. 35; EX1002 4:11-15)	wellbore ranging in order to minimize noise levels that could interfere with ranging measurements.” (EX2002, 15:32-35) “the BHA 52 illustrated in FIGS 1A and 1B may be measurement-while-drilling or logging-while-drilling system in which EM ranging can be utilized to guide drill bit 54 while a drill string is deployed in wellbore 28.” (EX2002, 4:48-51)

Becton Dickinson factors (a), (b) and (d) support denying institution on Ground 3.

2. Ground 4 Art and Arguments Are the Same or Substantially the Same as Those Considered by the Examiner

In Ground 4, SDI argues that claims 7 and 16 are obvious based on Donderici ‘534 and Fredriksen² in view of Schulz. (Pet. 35-37). SDI asserts that Donderici ‘534 discloses that “[p]ower and communications to current injection system

² Fredriksen relied on by SDI is the same Fredriksen discussed in the specification of the ‘780 patent, which was also submitted and considered by the Examiner. (Pet. 7; EX1001)

50, if any, may be carried locally by appropriate modules 56-62 or may be transmitted via conveyance system.” (Pet. 36) SDI further asserts that Schulz discloses transmission lines for communicating an electrical signal downhole “include a coaxial cable, a triaxial cable, a multiaxial cable, a twisted pair cable, a ribbon cable, and insulated conductors.” (Pet. 36) As discussed below, art that was considered by the Office is the same or substantially the same as the art relied on by SDI in Gound 4.

Like Donderici ‘534, Donderici/Moss ‘407 and ‘231 disclose that:

[t]he current injection system also includes either a voltage controlled or current controlled transmitter 38 Transmitter, 38 may be locally positioned relative to emitter electrode E, or positioned at a location removed from emitter electrode E in electrical contact with electrode E via conductive wiring. Likewise, power and communications to EM sensor 51 may be carried locally by appropriate modules 56-62 or may be transmitted via conveyance system 48. (EX2002, 4:52-62)

As can be seen, the teaching of Donderici/Moss ‘407 and ‘231 are substantially identical to the teachings of Donderici ‘534.

In addition, like Shulz’s disclosure of various multi-conductor transmission lines, Donderici/Moss ‘407 and ‘231 disclose that the emitter electrode may be “deployed on a twisted wire pair 39 for delivery of a current to conductive member 14.” (EX2002, 8:60-62) Kuckes, which was also before the Office, discloses a multi-conductor wireline that “incorporates both a power cable for injecting AC current into the earth and a data cable for connecting downhole instruments with

the surface.” (EX2001, 9:66-10:1)(*see also*, 10:1-29 for discussion of connections for power cable and data cable to the surface) Further, Kuckes discloses in Figures 3 and 9 that the wireline is a “7-wire wireline.” (EX2001, FIGS. 3 and 9)

Arguments made during prosecution are also substantially similar to arguments made by SDI. During prosecution, the Examiner cited Kuckes and stated that with regard to “claim 7, [Kuckes] discloses that the power supply (24) is connected to the drill pipe (57) using at least one wire (90) of a multiribbon wire (the wireline is disclosed as capable of carrying data and current, hence it is inherently a multiribbon wire).” (EX2002, p.5) No further discussion was had regarding this rejection but the claims issued after amendment by the Applicant.

Becton Dickinson factors (a), (b) and (d) support denying institution on Ground 4.

3. Ground 5 Art and Arguments Are the Same or Substantially the Same as Those Considered by the Examiner

In Ground 5, SDI argues obviousness over Donderici ‘301 (EX1002) in view of Fredriksen (EX1004). (Pet. 37-60) SDI admits that Fredriksen was considered by the Examiner and that Fredriksen was cited in the ‘780 patent; Fredriksen was also discussed in the specification of the ‘780 patent. (Pet. 7; EX1001, citing 2019/0119990 to Fredriksen, and 7:60-66). Donderici ‘301 is substantially similar

to Kuckes as well as Donderici/Moss ‘407 and ‘231.³ Kuckes was used in the Examiner’s rejection of pending claims of the application leading to the ‘780 patent and was the subject of considerable discussion before the Patent Office in the parent application. (EX1007, EX2007) As addressed below, *Becton Dickinson* factors (a), (b) and (d) all support denying institution based on Ground 5 as well.

As show below, Donderici ‘301 is materially the same as Kuckes.⁴ In fact, the excerpts below show that Kuckes is more relevant to the claims of the ‘780 patent than Donderici ‘301:

‘780 Claim Language	SDI’s Reliance on Donderici ‘301	Kuckes (submitted to Patent Office)
(a) Claims 1, 9 and 18 “An apparatus for magnetic ranging comprising:”	“[a] galvanic tool may comprise any tool, such as downhole tool 111, with electrodes or a toroidal coil through which current is injected into a subterranean formation and a voltage response of the formation to the injected current is measured.” (Pet. 37, 45, 51; EX1003, 4:37-34)	“[t]he invention is directed to methods and apparatus for injecting time-varying electrical currents into the earth from one or more electrodes in a borehole being drilled, for detecting at the drill bit of that borehole the electromagnetic field vectors resulting from the portion of such injected currents which flows in metal at the target.” (EX2001, 1:24-30)
(b) Claims 1, 9 and 18 “a power supply”	“[t]he source of excitation may be located downhole or at the surface.” (Pet. 38, 45, 51; EX1003, 6:22-24)	“The power cable in the wireline is connected at the surface to suitable source 24 (FIG. 1) of periodically varying current such as a low-frequency AC.” (EX2001,

³ Compare the ‘534 patent disclosure in the claim chart of Section III(A)(1) supra with the disclosure of Donderici ‘301 below.

⁴ Donderici/Moss ‘534 is also cumulative of Kuckes in all relevant aspects.

‘780 Claim Language	SDI’s Reliance on Donderici ‘301	Kuckes (submitted to Patent Office)
		10:4-7) “as illustrated in FIG. 8, to inject several amperes of current 130 having, for example, a frequency of about 1 to 20 Hertz, into the earth formation 18 surrounding the target well 12 and the relief well 52. (Id., 12:52-56) “The package 170 also incorporates an electrode power supply 178, such as a battery pack and a suitable inverter, an alternator, or both, with the power supply being connected through suitable cables 180 and 182 to the drill string electrodes 142 and 144, respectively.” (EX2001, 14:2-6)
(c) Claims 1, 9 and 18 “at least one section of drill pipe . . .”	“rig, 101 at the surface 105 associated with a well 141 and positioned above borehole” and “a drilling assembly 107, comprising drill string 108 and bottom hole assembly (BHA) 109.” (Pet. 39, 45, 53; EX1003, 4:6-8) “system control unit 104 may be positioned at the surface 105 as depicted in FIG. 1 and may be communicably or communicatively coupled to downhole elements including, but not limited to, drilling assembly, 107, telemetry system	“a relief borehole, or well 52, which is illustrated in dashed lines, is produced by a drill carried by a drill string 54, which is suspended from a surface drilling rig (not shown) in conventional manner. Such drill string typically consists of multiple drill string section of steel pipe, such as illustrated sections 56, 57, 58, 59.” (Id., 8:56-62) “Locatable within the drill string 54 is a wireline 90, which is suspended from the earth’s surface at the drill rig.” (EX2001, 9:58-59) “The power cable in the wireline

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	118, downhole tool 111.” (Pet. 39, 45, 53; EX1003, 5:24-28) “the system control unit 104 may excite the survey electrode 130a” but for “other embodiments, the survey electrode 130a is excited by a downhole source located at or associated with the downhole tool.” (Pet. 39, 45-46, 53; EX1003, 6:15-22)	is connected at the surface to suitable source 24 (FIG. 1) of periodically varying current such as a low-frequency AC to produce alternating current 96 in the cable, and is connected at its lower end to an electrode 92 which is uninsulated and is located on the wireline for electrical communication with the interior of the isolated drill pipe section 57.” (Id., 10:4-11) “The package 170 also incorporates an electrode power supply 178, such as a battery pack and a suitable inverter, an alternator, or both, with the power supply being connected through suitable cables 180 and 182 to the drill string electrodes 142 and 144, respectively.” (EX2001, 14:2-6)
(d) Claims 1, 9 and 18 “at least one wire . . .”	“system control unit 104 may be positioned at the surface 105 as depicted in FIG. 1 and may be communicably or communicatively coupled to downhole elements including, but not limited to, drilling assembly, 107, telemetry system 118, downhole tool 111.” (Pet. 40, 46, 53; EX1003, 5:24-28) “communicatively coupled as used herein is intended to	“The power cable in the wireline is connected at the surface to suitable source 24 (FIG. 1) of periodically varying current such as a low-frequency AC to produce alternating current 96 in the cable, and is connected at its lower end to an electrode 92 which is uninsulated and is located on the wireline for electrical communication with the interior of the isolated drill pipe section 57. This electrode may physically contact the interior of section 57 by way of

‘780 Claim Language	SDI’s Reliance on Donderici ‘301	Kuckes (submitted to Patent Office)
	mean either direct or an indirect communication connection Such wired and wireless connections are well known to those of skill in the art.” (Pet. 40, 46, 53; EX1003, 3:29-36) SDI argues Fredriksen in combination discloses this element. Fredriksen was considered by the Examiner and discussed in the ‘780 patent.	spring-loaded contacts, for example” (EX2001, 10:4-12) SDI argues Fredriksen in combination discloses this element. Fredriksen was considered by the Examiner and discussed in the ‘780 patent.
(e) Claims 1. 9 and 18 “a first electrically insulated member. . .”	“gap sub 112 is located between the electrodes 130 (for example, survey electrode 130a and return electrode 130b to electrically insulate two portions of the BHA 109 and to prevent shorting.” (Pet. 41, 47, 54; EX1003, 9:20-24) “current 134 may be induced within the formation 102 by energizing the survey electrode 130a of the drilling assembly 107” (Pet. 41, 47, 54; EX1003, 4:65-5:1)	“This pipe electrode 57 is formed by inserting one or more electrically insulating subs 71 and 72 which may be short insulating pipe sections about one meter in length, in the drill string above and below the drill pipe section 57 that is to be isolated.” (Id., 9:13-18) “The power cable in the wireline is connected at the surface to suitable source 24 (FIG. 1) of periodically varying current such as a low-frequency AC to produce alternating current 96 in the cable, and is connected at its lower end to an electrode 92 which is uninsulated and is located on the wireline for electrical communication with the interior of the isolated drill pipe section 57. This electrode may physically contact the

‘780 Claim Language	SDI’s Reliance on Donderici ‘301	Kuckes (submitted to Patent Office)
		interior of section 57 by way of spring-loaded contacts, for example” (EX2001, 10:4-12)
(f) Claims 1, 9 and 18 “a sensor. . .”	“In certain embodiments, the system control unit may further send commands to a receiver, for example, receiver 110, to cause any one or more receivers 110 to measure the induced magnetic field 136 on the second borehole 103. The receiver 110 may be a magnetometer, a collection of magnetometers, a solenoidal coil wrapped around the downhole tool 111 (for example, with a tilt between 0 degrees and 45 degrees), a solenoidal coil placed on the side of the downhole tool 111, or a collection of solenoidal coils.” (Pet. 41, 47-48; EX1003, 6:39-47)	“In accordance with the present invention, by providing magnetic field and other sensors in a drill bit sensor instrument 102 mounted on the drill bit sub 70. A schematic diagram of a suitable sensor instrument 102 is illustrated in FIG. 4. . . the instrument 102 incorporates a three-part AC magnetometer.” (Id., 10:43-50) “The magnetometer components 103, 104, 105, the orientation package 106, and the AC amplifier 107 are connected to a downhole control computer 108 in the instrument 102 for preliminary processing.” (EX2001, 11:20-23)
(g) Claims 2, 10 and 15 “a second electrically insulated member. . .”	FIG. 1 Gap subs 112 (Pet. 42, 48, 50; EX1003, FIG. 1)	“This pipe electrode 57 is formed by inserting one or more electrically insulating subs 71 and 72 which may be short insulating pipe sections about one meter in length, in the drill string above and below the drill pipe section 57 that is to be isolated.” (Id., 9:13-18)
(h) Claims 3 and 11 “the sensor is part of the bottom	“BHA 109 may comprise a drill bit 113 and downhole tool 111.” (Pet. 42, 49; EX1003 4:11-12)	“[i]n accordance with the present invention, by providing magnetic field and other sensors in a drill bit sensor instrument 102

‘780 Claim Language	SDI’s Reliance on Donderici ‘301	Kuckes (submitted to Patent Office)
hole assembly.”	“the receiver may be a magnetometer, a collection of magnetometers, a solenoidal coil wrapped around the downhole tool 111.” (Pet. 42-43; EX1003 6:42-45)	mounted on the drill bit sub 70. A schematic diagram of a suitable sensor instrument 102 is illustrated in FIG. 4. . . the instrument 102 incorporates a three-part AC magnetometer.” (EX2001, 10:43-50)
(i) Claims 4 and 12 “the sensor is part of the drill pipe.”	“a drilling assembly 107, comprising drill string 108” (Pet. 43; 49 EX1003 4:9-10 and FIG. 1)	“In accordance with the present invention, by providing magnetic field and other sensors in a drill bit sensor instrument 102 mounted on the drill bit sub 70.” (EX2001, 10:43-46)
(j) Claims 5 and 13 “the drill pipe is coiled tubing.”	Reference does not mention coiled tubing, but SDI asserts it would have been obvious to one of skill in the art to use coiled tubing. (Pet. 43, 49-50)	Examiner acknowledged that reference does not mention coiled tubing, but asserted in Office Action that coiled tubing would have been obvious to one of skill in the art. (EX1007, p.5)
(k) Claims 6 and 14 “the drill pipe is a section of threaded drill pipe.”	SDI merely asserts that Donderici’s disclosure of “drill string” includes this limitation. (Pet. 44, 50)	“such drill string typically consists of multiple drill string sections for steel pipe, such as the illustrated sections 56, 57, 58, 59, each normally about ten meters in length and coupled together end-to-end at threaded joints.” (EX2001, 8:60-64)
(l) Claims 8 and 17 “the power supply is connected to the drill pipe using one or more conductors”	“if a first device couples to a second device, that connection may be through a direct connection or through an indirect mechanical or electrical connection.” (Pet. 44, 51; EX1003, 3:26-28)	“The power cable in the wireline is connected at the surface to suitable source 24 (FIG. 1) of periodically varying current such as a low-frequency AC to produce alternating current 96 in the cable, and is connected at its lower end to an electrode 92 which is uninsulated and is located on the wireline for electrical communication

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		with the interior of the isolated drill pipe section 57. This electrode may physically contact the interior of section 57 by way of spring-loaded contacts, for example” (EX2001, 10:4-12)
Claim 19 “A method. . .”	See (a) above.	See (a) above.
Claim 19 “installing a sensor. . .”	“one or more receivers 110 to measure the induced magnetic field 136 on the second borehole 103.” (Pet. 55; EX1003, 6:41-42)	See (f) above.
Claim 19 “installing a first electrically insulative gap”	See (e) above.	See (e) above.
Claim 19 “installing. . .”	See (c) above.	See (c) above.
Claim 19 “connecting .”	See (b), (c) and (d) above.	See (b), (c) and (d) above.
Claim 19 “energizing the power supply. . .”	“current 134 may be induced withing the formation 102 by energizing the survey electrode 130a of the drilling assembly 107” (Pet. 57; EX1003, 4:65-5:1) “Part of the formation current 134 may be received and concentrated at the casing 140 within the conductive target (target well 142), shown as current 138 on the casing 140 may induce a magnetic field 136.” (Pet. 57-58; EX1003, 5:7-12)	“After the wireline 90 is positioned in the drill string, electrode 92 is energized, as illustrated in FIG. 8, to inject several amperes of current 130 having, for example, a frequency of about 1 to 20 Hertz, into the earth formation 18 surrounding the target well 12 and the relief well.” (Id., 12:52-56) “the injected current flow through the earth eventually returns to the ground point 26, with part of this alternative current flow through

‘780 Claim Language	SDI’s Reliance on Donderici ‘301	Kuckes (submitted to Patent Office)
		the conductive path of least resistance in target well 12, as illustrated at 132 in FIG. 8.” (Id., 12:57-61) “The current 132 produces a corresponding target magnetic field around target well 12.” (EX2001, 12:66-13:1)
Claim 19 “sampling. . .”	See (f) above.	See (f) above.
Claims 19 and 20 “adjusting the drilling operations. . .”	“one or more drilling parameters are adjusted based, at least in part, on the determined one or more ranging parameters.” (Pet. 59; EX1003, 11:28-30)	“In order to precisely measure the distance and direction from the drill bit to the target to permit accurate guidance of further drilling.” (Id., 13:12-14) “The present invention relates, in general, to methods and apparatus for locating a nearby conductive target, such as a cased well or borehole, from a remote location such as a second borehole or deep well to obtain data for use in guiding the direction of drilling the second well with respect to the target.” (Id., 1:19-23)
Claim 21	See (g) above.	See (g) above.
Claim 22 “The method of claim 19 wherein. . . while drilling is taking place.”	“FIG. 1 is a diagram showing an illustrative logging while drilling environment.” (Pet. 60; EX1003, 1:51-53) “In LWD, data is typically collected during the drilling process.” (Pet. 60; EX1003, 3:43-44)	“Located in the drill string 54 just above the housing 64 is a conventional measurement-while-drilling (MWD) measurement instrument for use in producing a log of the drilling and for controlling the direction of drilling” (Id., 9:4-8)

Becton Dickinson factors (a), (b) and (d) support denying institution on Ground 5.

4. Ground 6 Art and Arguments Are the Same or Substantially the Same as Those Considered by the Examiner

In Ground 6, SDI argues that claims 7 and 16 are obvious based on Donderici ‘301 and Fredriksen⁵ in view of Schulz. (Pet. 60-61) SDI asserts that Donderici ‘301 discloses that “system control unit may be positioned at the surface 105 as depicted in FIG. 1 and may be communicably or communicatively coupled to downhole elements including, but not limited to, drilling assembly 107, telemetry system 118, downhole tool 111.” (Pet. 60) SDI further asserts that Schulz discloses transmission lines for communicating an electrical signal downhole “include a coaxial cable, a triaxial cable, a multiaxial cable, a twisted pair cable, a ribbon cable, and insulated conductors.” (Pet. 60-61) As discussed below, art that was considered by the Office is the same or substantially the same as the art relied on by SDI in Gound 6.

Like Donderici ‘301, Kuckes discloses that:

[t]he power cable in the wireline is connected at the surface to suitable source 24 (FIG. 1) of periodically varying current such as a low-frequency AC to produce alternating current 96 in the cable, and is connected at its

⁵ Fredriksen relied on by Petitioner is the same Fredriksen discussed in the specification of the ‘780 patent, which was also submitted and considered by the Examiner.

lower end to an electrode 92 which is uninsulated and is located on the wireline for electrical communication with the interior of the isolated drill pipe section 57. This electrode may physically contact the interior of section 57 by way of spring-loaded contacts, for example (EX2001, 10:4-12)

The teaching of ‘Kuckes is substantially the same as the that of Donderici ‘301.

In addition, like Shulz’s disclosure of various multi-conductor transmission lines, Kuckes discloses a multi-conductor wireline that “incorporates both a power cable for injecting AC current into the earth and a data cable for connecting down-hole instruments with the surface.” (EX2001, 9:66-10:1) (*see also*, 10:1-29 for discussion of connections for power cable and data cable to the surface) Further, Kuckes discloses in Figures 3 and 9 that the wireline is a “7-wire wireline.” (EX2001, FIGS. 3 and 9)

Arguments made during prosecution are also substantially similar to arguments made by SDI. During prosecution, the Examiner cited Kuckes and stated that with regard to “claim 7, [Kuckes] discloses that the power supply (24) is connected to the drill pipe (57) using at least one wire (90) of a multiribbon wire (the wireline is disclosed as capable of carrying data and current, hence it is inherently a multiribbon wire).” (EX2002, p.5) No further discussion was had regarding this rejection but the claims issued after amendment by the Applicant.

Becton Dickinson factors (a), (b) and (d) all support denying institution on Ground 6.

B. The Examiner Did Not Err in a Manner Material to the

Patentability (*Advanced Bionics* Part Two)

SDI cannot make a case that the Examiner erred in any material manner or that its art and arguments would have led to a different result during prosecution. *Advanced Bionics*, IPR2019-01469, Paper No. 6 at 8; *Becton Dickinson*, factors (c) and (e). Nor does SDI’s “additional evidence” (*Becton Dickinson* factor (f)), including the Dorey declaration and “newly” cited references, provide any basis for reconsideration of what the Office decided. At best, especially given the near exact duplication of Donderici/Moss ‘407 and ‘231 and SDI’s cited Donderici/Moss ‘534, SDI’s petition merely reiterates what the Examiner already considered. The same can be said for SDI’s challenge using Donderici ‘301 as the primary reference. Indeed, Kuckes is more relevant to the ‘780 patent claims than Donderici ‘301 or Donderici/Moss ‘534. Since Kuckes was used by the Examiner to reject the claims, SDI is hard pressed to assert that the Examiner erred in a manner material to patentability. *Advanced Bionics*, Paper 6 at 9. (“If reasonable minds can disagree regarding the purported treatment of the art or arguments, it cannot be said that the Office erred in a manner material to patentability.”)

IV. SDI’S 112 ARGUMENTS

A. SDI’s 112 Written Description Argument (Ground 1)

SDI's written description argument is weak and cumulative. SDI argues that the '780 patent lacks written description because certain claims recite a "rigid connection" between the wire and the pipe and the specification of the '780 patent does not use the word "rigid." (Pet., 11-13) SDI's argument fails because, to satisfy the written description requirement, the specification need not recite the claimed invention "*in haec verba*". *Univ. of Rochester v. G.D. Searle & Co.*, 358 F.3d 916, 923 (Fed. Cir. 2004)(bold emphasis added).

Further, SDI and its declarant, admit that the wired pipe embodiment shown in Fig. 6 is "at least one example of a rigid connection." (Pet. 10, Ex. 1009, ¶6) One can satisfy the written description requirement "by such descriptive means as words, structures, **figures**, formulas, etc., that fully set forth the claimed invention." *Lockwood v. Am. Airlines, Inc.*, 107 F.3d 1565, 1572 (Fed. Cir. 1997)(emphasis added). Thus, Fig. 6, which SDI and its declarant admit shows a rigid connection, satisfies the written description requirement.

Further, Figures 2 and 3 disclose a rigid connection between the wire and coiled tubing. (EX2011, ¶¶ 4-10) Specifically, the depicted wire is grounded (as indicated by the Tri lines at the connection point). A POSITA would know that the depicted grounding is a bonded rigid connection. (*Id.*) The Federally adopted National Electric Code and UL Standard confirm that such connections are "rigid" (EX2011, ¶¶ 8-10).

SDI's written description argument is also cumulative. During prosecution, the Examiner was required to evaluate the claims as amended for compliance with the written description and definiteness requirements of 35 U.S.C. § 112. MPEP §§2103, 2163.02 and 2173.02. Indeed, the Examiner is presumed to have "reviewed [the application] to make certain that the whole application meets all formal and substantive (i.e., statutory) requirements and that the language of the claims . . . finds adequate descriptive support in, the application disclosure as originally filed." MPEP § 1302.01. Moreover, the Examiner is presumed to have properly done their job. *PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1304 (Fed. Cir 2008) (explaining the "deference that is due to a qualified government agency presumed to have properly done its job, which includes one or more examiners who are assumed to have some expertise in interpreting the references and to be familiar from their work with the level of skill in the art and whose duty it is to issue only valid patents.")

B. SDI's 112 Indefiniteness Argument (Ground 2)

With regard to indefiniteness, the test is whether the claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty. *Nevro Corp. v. Boston Scientific Corp.*, 955 F.3d 35, 41 (Fed. Cir. 2020). Claim indefiniteness is decided from the viewpoint of persons skilled in the field of the invention; the claims

principle function is to provide notice of the boundaries of the right to exclude and to define limits. *Vascular Solutions LLC v. Medtronic, Inc.*, 117 F.4th 1361, 1369. The test is not merely whether a claim is susceptible to differing interpretations, as such a test would render nearly every claim term indefinite so long as a party could manufacture a plausible construction. *Nevro*, 955 F.3d at 41.

SDI's indefiniteness challenge to the '780 patent is also cumulative and not strong. As described above, the concept of "rigid" connections is well understood according to a POSITA. The NEC and UL codes confirm that "rigid" is a commonly understood term in the art. (EX2011, ¶¶ 8-10).

In addition, SDI's argument is cumulative. During prosecution, the Examiner was required under the MPEP to evaluate the claims as amended for compliance with definiteness requirements of 35 U.S.C. § 112. MPEP §§2103, 2163.02 and 2173.02. The Examiner is presumed to have "reviewed [the application] to make certain that the whole application meets all formal and substantive (i.e., statutory) requirements and that the language of the claims is enabled by, and finds adequate descriptive support in, the application disclosure as originally filed," when the application was ready for allowance. MPEP § 1302.01. Moreover, the Examiner is presumed to have properly done their job. *PowerOasis, Inc.*, 522 F.3d at 1304 (Fed. Cir 2008)

During prosecution of the parent application the Examiner issued an

indefiniteness rejection of certain claims. (EX2009, pp. 2-3) In a later filed continuation of the ‘780 patent, the Examiner issued another indefiniteness rejection. (EX2010, p. 4) The Examiner’s multiple rejections of claims in related applications shows that the Examiner considered indefiniteness while examining the application for the ‘780 patent, and presumably found that the claims at issue satisfied the 112 requirements. SDI’s indefiniteness argument is also cumulative.

Furthermore, SDI does not provide any compelling evidence why a person of skill in the art would not understand the meaning of the phrase “rigid connection.” Indeed, the term “rigid” has a definite meaning, and nothing in the prosecution history changes what “rigid” means outside of its understood meaning. The fact that Applicant amended one claim to state that the connection is a “rigid connection that is not spring loaded” does not make the term “rigid” indefinite.

V. Section 325 (d) is Sufficiently Implicated Such That the Board Should Deny Institution on All Grounds

Even if the Board determines that not all 1-6 Grounds of the Petition involved the same of substantially the same art or arguments as were previously presented, the Board still has discretion to deny the Petition in its entirety. Here, § 325 (d) is “sufficiently implicated” that its statutory purpose would be undermined by instituting review. *Passage Bio, Inc. v. The Trustees of the Univ. of Pennsylvania, et. al.*, PGR2021-0073, Paper 13, 7 (“We determine that 35 U.S.C. § 325(d) is sufficiently implicated that instituting review on all grounds would

undermine the statutory purpose of 35 U.S.C. § 325(d).”); *Evergreen Theragnostics, Inc. v. Advanced Accelerator Applications SA*, PGR2021-00003, Paper 10 at 18-19 (“For the reasons set forth above, we do not institute review of claims 1-24 under grounds 1-10 and 13, under 35 U.S.C. §325(d), the same or substantially the same art previously was presented to the Office, and SDI has not shown that the Office erred in a manner material to patentability. Furthermore, we determine that 35 U.S.C. § 325(d) is sufficiently implicated . . .”); *Ideavillage Products Corp. v. Koninklijke Philips N.V.*, PGR2021-00116, Paper 6 at 25-26 (denying institution where Petition has not met its burden on eight of nine grounds)

Furthermore, if the Board finds that while most grounds for challenge are the same or substantially the same as has been decided by the Office, but is convinced that one or two challenges may have a reasonable likelihood of success, the Board can also deny institution under § 314(a) if it believes the pursuit is not an efficient use of its time and resources. *Chevron Oronite Co. LLC v. Infineum USA L.P.*, IPR2018-00923, Paper 9 at 11 (“On this record, instituting a trial with respect to all twenty claims based on evidence and arguments directed to dependent claims 3 and 4 is not an efficient use of the Board’s time and resources.”)

VI. CONCLUSION

Patent Owner respectfully requests discretionary denial of the PGR petition on the grounds presented above.

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CERTIFICATE OF SERVICE

The undersigned certifies that on September 19, 2025, a complete and entire copy of this PATENT OWNERS DISCRETIONARY DENIAL BRIEF was served by electronic mail to Petitioner's counsel of record:

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