

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT TRIAL AND APPEAL BOARD

HEBEI HUATONG WIRES AND CABLES GROUP CO, LTD.
Petitioner

v.

GULF COAST DOWNHOLE TECHNOLOGIES LLC
Patent Owner

CASE: IPR2023-00908
U.S. PATENT NO. 7,581,565

PETITION FOR *INTER PARTES* REVIEW

Mail Stop *Patent Board*
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
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List of Exhibits

- Ex. 1001: U.S. Patent No. 7,581,565 to Torrance et al. (“the ‘565 Patent”).
- Ex. 1002: Reexamination Certificate for the ‘565 Patent.
- Ex. 1003: Declaration of Dr. John Ballato
- Ex. 1004: U.S. Patent No. 7,113,680 to Hurley et al. (“*Hurley*”).
- Ex. 1005: Prosecution history for the ‘565 Patent
- Ex. 1006: Reexamination history for the ‘565 Patent
- Ex. 1007: U.S. Patent Appl. Pub. No. 2006/0153508 (“*Bowker*”)
- Ex. 1008: U.S. Patent No. 5,469,523 to Blew et al. (“*Blew*”)
- Ex. 1009: U.S. Patent No. 6,236,790 to Okada et al. (“*Okada*”)
- Ex. 1010: U.S. Patent No. 7,324,730 to Varkey et al. (“*Varkey*”)
- Ex. 1011: U.S. Patent Pub. No. 2002/0085820 to Gaillard, et al. (“*Gaillard*”)
- Ex. 1012: Vyas, M.K.R., *et al.*, *Design and Development of Steal Resistant Fiber Optic Cable*, Proceedings of the Fortieth International Wire and Cable Symposium (Nov. 1991), pp. 55-64 (“Vyas”)
- Ex. 1013: Arroyo, C.J., *et al.*, *The Use of Superabsorbent Materials in Fiber Optic Cable Design*, Proceedings of the Fortieth International Wire and Cable Symposium (Nov. 1991), pp. 326-331 (“Arroyo”)

Mandatory Notices (37 C.F.R. § 42.8(b))

A. Real Parties-In-Interest

Hebei Huatong Wires and Cables Group Co., Ltd. (“Huatong”), with its head office at No. 111 Huatong Avenue Fengnan Industrial Zone Tangshan, Hebei Province, China, is the sole real party-in-interest in this proceeding.

B. Related Matters

There are no matters related to this petition. The ‘565 Patent has not been the subject of any district court patent infringement action, nor has it been the subject of any previous *inter partes* review. It was the subject of *Ex Parte* Reexamination No. 90/020,065.

C. Lead and Backup Counsel and Service (37 C.F.R. § 42.8(b)(3)-(4))

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Petitioner consents to electronic service by email.

I. INTRODUCTION

Huatong requests institution of *inter partes* review of all claims surviving the reexamination of the ‘565 Patent¹ and the subsequent cancellation of such claims in view of the grounds described below.

The purported invention of the ‘565 Patent is directed to “a tear cord used to conveniently and safely remove a protective jacket surrounding a solid wall metal tube.” Ex. 1001, col. 1, lines 41-43; Ex. 1003, ¶ 9. Faced with a reexamination challenge to the claims as originally issued, the Patent Owner amended such claims by adding limitations specifying the manner in which the claimed apparatus is to be employed, and limitations identifying characteristics necessarily resulting from the structural limitations, to overcome the cited prior art. When stripped away of such limitations, the reexamined claims of the ‘565 Patent do not survive scrutiny when compared to the prior art cited herein. As such, Huatong respectfully requests that the Board institute a trial in this proceeding, resulting in a decision that the challenged claims are invalid, thereby cancelling those claims.

¹ The claims having survived reexamination include claims 1-7, 9-15, 18-20, 22 & 25.

II. THE ‘565 PATENT

A. Background

The ‘565 Patent issued on September 1, 2009 from U.S. Patent Appl. No. 12/178,246 (“the ‘246 Application”), which claimed priority of July 23, 2008. Ex. 1001 at 1. A Reexamination Certificate, modifying the claims of that patent challenged herein, and cancelling the remainder, issued on June 9, 2015. Ex. 1001 at 11-12. The ‘565 Patent, as reexamined, has 20 claims, claims 1, 14 and 18 of which are independent. Claims 1-15, 22 and 25 are apparatus claims, while claims 18-20 are method claims. While Prysmian was the original owner of the ‘565 Patent, that patent was ultimately assigned in 2015 to Gulf Coast Downhole Technologies LLC (“Gulf Coast”), a member of Prysmian Group.

Reexamined claim 1 of the ‘565 Patent reads:

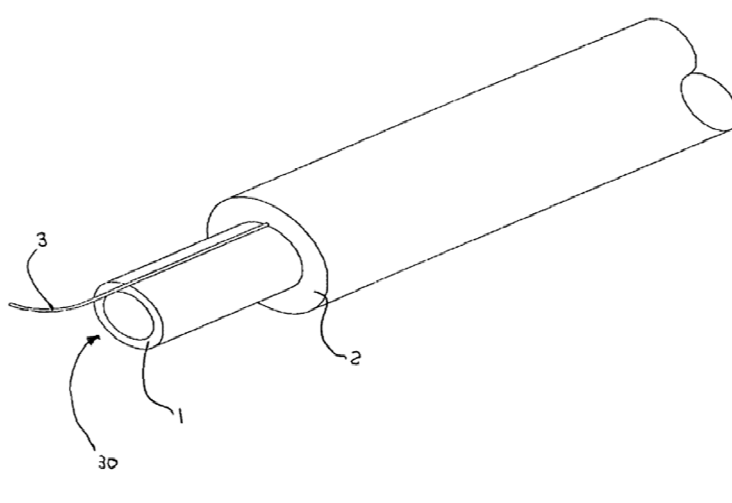
A jacketed metal tube comprising a metal tube, a first protective jacket adjoining and surrounding the metal tube, and a tear cord positioned between the metal tube and the first protective jacket characterized wherein the protective jacketed metal tube is for use in downhole applications relating to hydrocarbon extraction, wherein the protective jacketed metal tube has a wall which is of hollow cylindrical shape and is smooth walled, solid, substantially straight, continuous, without break or interruption, is structured to be hermetically sealed, maintain a positive or negative pressure, and is structured

for connection to hermetically sealing compression fittings to convey fluids downhole, and in that the tear cord is positioned proximate to an outer surface of the metal tube and inside the diameter of the outer first protective jacket and is able to be pulled back to create a slit in the first protective jacket and to allow the first protective jacket to be separated from the metal tube without damage to the metal tube surface.

Ex. 1002, col. 1, lines 24-43.

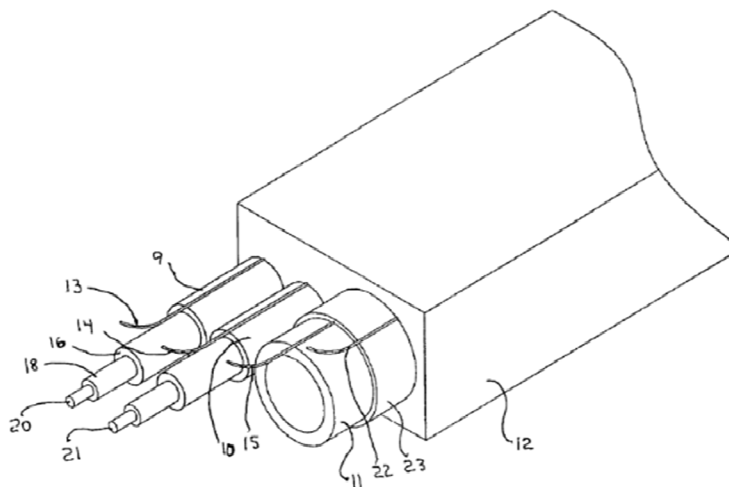
Jacketed tubing of the type described in the ‘565 Patent is used “in a hydrocarbon production downhole well bore.” Ex. 1001, Abstract. Such tubing “may also contain an electrical power, electronic data transmission or fiber optic lines.” *Id.*, col. 2, lines 19-20. Irrespective of the application, the ‘565 Patent teaches that “[t]he sealing surface of the tubing is of prime importance, *i.e.*, the wall of the tubing is to be free from nicks and gouges.” *Id.*, col. 2, lines 21-22. Such “damage can result from use of a knife or other sharp edge instrument to cut away the protective jacket.” *Id.*, col. 2, lines 23-24. Gouges and nicks will result in pressure loss. *Id.*, col. 2, lines 42-44. To solve for this problem, the ‘565 Patent teaches the use of “a tear cord placed between the tube and the protective jacket,” which allows the worker to pullback the tear cord and thereby create a slit in the jacket.” *Id.*, col. 3, lines 5-7; Ex. 1003, ¶ 12.

The invention claimed in the '565 Patent, in its simplest form, is depicted in Figure 1 of that patent:



Ex. 1001 at 2; Ex. 1003, ¶ 13.

In the above depiction, a tear cord 3 is placed adjacent to the tube 1 under the protective jacket 2. Ex. 1001, col. 3, lines 22-23; Ex. 1003, ¶ 14. A more complex, multi-tube iteration of the claimed invention is depicted in Figure 3 of the '565 Patent:



Ex. 1003, ¶ 15.

This embodiment shows tubes 9-11, with tube 11 jacketed by elements 12 and 23, with two separate tear cords (15 and 22) for one of the tubes. Ex. 1001, col. 4, lines 4-9. “[S]maller diameter” tubes 9 and 10 “provide mechanical support 16 and the innermost layer providing electrical insulation 18 for the wire or fiber optic cable 20, 21.” *Id.*, col. 4, lines 11-13. Although not specifically described as such, a person of ordinary skill in the art would understand that tube 11, with its larger diameter, is intended to convey “hydraulic fluid or chemicals” into a well bore, as described in the Abstract of the ‘565 Patent. Ex. 1003, ¶ 15. In other words, a skilled person would understand that the multi-tube embodiments of the ‘565 Patent are intended to convey different media, *e.g.*, fluids, and electronic and optical information. *Id.*

Representative claim 1 specifies that the claimed jacketed metal tube is to be “hermetically sealed,” and must “maintain a positive or negative pressure.” Ex. 1002, col. 1, lines 34-37. The specification teaches “the integrity of the tubing diameter and good uniform sealing surface is important in making a hermetically sealed connection.” Ex. 1001, col. 2, lines 53-56. It also teaches “[g]ouges and nicks may also penetrate the tube wall. For example, if the tube is conveying hydraulic fluid, there will be a pressure loss.” *Id.*, col. 2, lines 43-45.

While claim 1 is representative of the claims in the ‘565 Patent, method claim 18, and the two claims depending therefrom, further include the limitation “a first

outer protective jacket around a metal tube to form a jacketed tube *which is spoolable*.” Ex. 1002, claim 18 (emphasis added). The ‘565 Patent does not describe any embodiments of a “spoolable” tube. Ex. 1003, ¶ 17. However, during reexamination, the Patent Owner contended during reexamination that, “[a]lthough spoolable, the tubes are maintained substantially straight to prevent deformation from small radius bends” which is part of “the problem that is addressed” by the ‘565 Patent. See Ex. 1006 at 81; Ex. 1003, ¶ 17.

B. Prosecution History of the ‘565 Patent

1. Examination before the Examining Corps

During original prosecution, the then-pending claims 18-20 of the ‘246 Application received a first office action rejection on section 102 grounds in light of U.S. Patent No. 5,574,816 to Yang et al. (“*Yang*”). Ex. 1005 at 41. Claims 1, 7, 14 and 15 received a section 103(a) rejection in light of U.S. Patent Appl. No. 2003/178222 to Moore et al (“*Moore*”). *Id.* at 42. Claims 1, 4, 8, 11 and 13 separately received a section 103(a) rejection over *Yang* in view of *Moore*. *Id.* at 4. The then-pending dependent claims were objected to as being dependent on a rejected base claim, but would be allowable if re-written in independent form. *Id.*

An Examiner interview was held after the issuance of the first office action, wherein the applicant discussed an amendment to claims 18-20 specifying that the claimed tear cord is on the outer surface of the metal tube, as the tear cord was not

intended to cut through the metal tube. *Id.* at 26. This distinguished the claimed invention from *Yang*, which placed a tear cord underneath the metal tube. *Id.* Claim 20 was amended to specify that the tear cord is located in a helical pattern along the longitudinal length of the cord. *Id.*

The Applicant also distinguished *Yang*'s metal structure, which was not fluid-tight or solid. *Id.* at 26-27. The *Yang* structure also did not provide a sealing surface. *Id.* at 28. *Moore*, which was combined with *Yang*, according to Applicant, did not indicate that its tube was smooth or had a solid wall. *Id.* at 27. Nor did *Moore* indicate that rip cord is placed over the metal tube. *Id.* at 28.

Separately, Applicant argued that dependent claim 8 calls for a second inner jacket outside the metal tube, and claim 11 requires positioning the tear cord selectively within the cable, neither of which were taught in the prior art. *Id.* The claims were amended accordingly. *Id.* at 22-25. In light of such amendments, the Examiner issued a notice of allowability. *Id.* at 14.

2. *Ex Parte* Reexamination

On December 20, 2013, RSCC Wire & Cable, LLC filed a request for *ex parte* reexamination. Ex. 1006 at 369-412. The request claimed to raise substantial new questions of patentability in light of 10 prior art references. *Id.* at 376-77. An office action was issued in response, finding that claims 1, 4, 5, 11, 13 and 24 were anticipated in light of U.S. Patent No. 7,113,680 to Hurley et al. ("*Hurley*"). *Id.* at

211. Additionally, claims 1-5, 8, 10-17, 21 and 22 were rejected under section 103(a) in light of U.S. Patent No. 3,526,086 to Morgan (“*Morgan*”) in view of U.S. Patent No. 5,557,698 to Gareis *et al.* (“*Gareis*”). *Id.* at 212-13. Claims 6 and 9 were rejected under section 103(a) in light of *Morgan* in view of *Gareis* in further view of U.S. Patent No. 6,236,790 to Okada et al. *Id.* at 214. Finally, claims 1, 7, 18-20, 23 and 24 received a section 103(a) rejection in light of U.S. Patent No. 6,472,614 to Dupont et al. *Id.* at 215.

In response to this office action, the Patent Owner made clear that the field of endeavor of the ‘565 Patent “is the removal of protective jackets from hollow pressure tubes used in downhole operations while protecting the tube surface.” Ex. 1006 at 79. The Patent Owner doubled down on this characterization of the jacket removal problem solved by the ‘565 Patent:

Succinctly stated, [the ‘565 Patent] is for a downhole protective jacketed metal pressure tube wherein the jacket can be safely removed from the tube without damaging the tube surface. This allows the outer wall of the metal tube (sealing surface) to be used for creating an hermetic seal. Although spoolable, the tubes are maintained substantially straight to prevent deformation from small radius bends. ***That is the problem that is addressed by [the ‘565 Patent].***

Ex. 1006 at 81 (emphasis added).

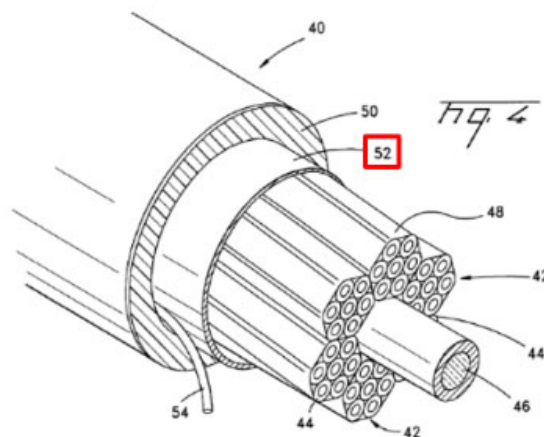
The Patent Owner submitted the declaration of Mark Watson supporting this statement, who declared that a “tear cord can be pulled back to create a slit in the jacket and allow the jacket to be separated from the metal tube without damage to the metal tube” (*id.* at 143, ¶ 9), which “protects the outer sealing surface of the high-pressure tubes” (*id.*) from the scratches and gouges that otherwise result from the use of cutting blades (*id.*, ¶ 4). In other words, the use of a tear cord allows a tube to maintain pressure. Ex. 1003, ¶ 26.

In conjunction with this effort to distance the claimed invention from the prior art, the Patent Owner substantially amended the claims of the ‘565 Patent. *See* Ex. 1006 at 47-52. Those amendments fell into two general categories: 1) those directed to a purpose for the claimed apparatus, including, for example, “use in downhole applications relating to hydrocarbon extraction” (claim 1) and “to convey hydraulic fluid” (claim 2); and 2) those directed to characteristics of the claimed apparatus necessarily resulting from the separate structural limitations, *e.g.*, “structured to be hermetically sealed, maintain a positive or negative pressure,” and “structured for connection to hermetically sealing compression fittings to convey fluids downhole” (claim 1). *Id.* at 47.

The Patent Owner then sought to distinguish the amended claims of the ‘565 Patent over *Hurley* on the ground that such reference “does not disclose a ‘smooth solid wall metal tube.’” *Id.* at 59. The Patent Owner cited *Hurley*’s teaching of a

“helically wound ‘ribbon like’ single piece of metal,” an “example” of which a “CPID interlock armor” having “an outer ridged surface.” *Id.* at 60-61. This structure, according to the Patent Owner, was not a tube that was “smooth, solid substantially straight, continuous, without break or interruption,” and therefore did not allow for hermetic sealing or the maintenance of pressure. *Id.*

The Patent Owner, in attempting to conflate the entirety of *Hurley*’s teachings into the single CPID interlock armor example depicted in Figure 8, thereof, effectively disregarded Figure 4 from *Hurley*, which clearly shows as element 52 a smooth solid wall metal tube:



Ex. 1004 at 7; Ex. 1003, ¶ 29.

Hurley teaches that, in Figure 4, “separation layer 52 can be formed from by [sic] an armor layer, for example, a metal that may be formed . . . from one or more pieces,” and “may provide, for example, crush resistance.” Ex. 1004 at 10:46-52.

In other words, *Hurley* taught the round, smooth solid wall, undeformed metal that, according to the Patent Owner during reexamination, was “structured for connection to hermetically sealing compression fittings.” *See* Ex. 1006 at 62; Ex. 1003, ¶ 31. Notwithstanding these clear teachings regarding *Hurley*’s Figure 4, the Patent Owner suggested to the Examiner that separation element 52 therein may be formed only of “polyester such as a MYLAR film.” Ex. 1006 at 58.

In any event, after the applicant amended the claims during reexamination, the Examiner conducted an interview where “accepted amended claims were discussed.” *Id.* at 18. The Patent Owner maintained the afore-referenced amendments to apparatus claims 1, 2 and 14 directed to the purpose thereof. *See id.* at 19 and 21-22. The Examiner thereafter allowed the claims as amended, citing the purpose limitations as among those that successfully distinguished the claimed invention over the prior art. *See id.* at 7-9.

III. GROUNDS FOR STANDING (37 C.F.R. § 42.104(A))

Huatong certifies that: (1) the ‘565 Patent is amenable to review; (2) it is not barred or estopped from requesting review on the grounds identified herein; and (3) it has not been served with a complaint relating to the ‘565 Patent.

IV. PAYMENT OF FEES (37 C.F.R. §§ 42.15 AND 42.103)

Huatong authorizes the USPTO to charge any required fees to Deposit Account 02-1818.

V. PERSON OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art is a hypothetical person who is presumed to know the relevant prior art. (*See Gnosis S.P.A et al. v. S. Ala. Med. Sci. Foundation*, Case IPR2013-00116, Paper 68 at 9, 37 (PTAB June 20, 2014)). That person has ordinary creativity, is not an automaton, and is capable of combining teachings of the prior art. (*Id.* (citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 420-421 (2007))). In July 2008, a person of ordinary skill in the relevant technology – jacketed cables – would have had at least an undergraduate degree in materials science, and at least three years of experience in cable technology. Ex. 1003, ¶ 34.

VI. CLAIM CONSTRUCTION

In *inter partes* reviews filed after November 13, 2018, claims are construed according to the *Phillips* standard consistent with Article III federal courts. 83 Fed. Reg. 51340, 51340-41 (Oct. 11, 2018) (citing *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*)). Further, the Federal Circuit has explained that “[a]pparatus claims cover what a device is, not what a device does.” *Hewlett-Packard Co. v. Bausch & Lomb, Inc.*, 909 F.2d 1464, 1468 (Fed. Cir. 1990). As a result, “[a]n invention need not operate differently than the prior art to be patentable, but need only be different.” *Id.* at 1464 (citations omitted). A corollary to these principles is that a prior art reference may anticipate or render obvious an apparatus claim if the reference discloses an apparatus that is reasonably capable of operating

so as to meet the claim limitations, even if it does not meet the limitations directed to purpose in all modes of operation. *ParkerVision, Inc. v. Qualcomm Inc.*, 903 F.3d 1354, 1361 (Fed. Cir. 2018).²

As noted above, the Patent owner added during reexamination the limitation “for use in downhole applications relating to hydrocarbon extraction” to claim 1 of the ‘565 Patent.” Ex. 1002, col. 1, lines 31-32. The Patent Owner also added the limitation “to convey hydraulic fluid.” *Id.*, col. 1, line 52. This is in contrast with other added limitations to the claims, specifying what the claimed tube is “structured” to be. *See id.*, col. 1, lines 35-38 (“structured to be hermetically sealed, maintain a positive or negative pressure, and is structured for connection to hermetically sealing compression fittings”). When used in a claim, terms such as “for” describe non-limiting purpose, while terms such as “capable of” are a limiting description of structure. *See, e.g., Roy-G-Biv Corp. v. ABB, Ltd.*, 6:11-cv-622, 2013

² The Federal Circuit has recognized an exception to the rule set forth in *Hewlett-Packard* where the claims at issue are directed to computer- or software-based inventions, which routinely depend on functional claiming to describe the apparatus. *Aristocrat Techs. Australia Pty Ltd. v. Int’l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008). Obviously, the claims of the ‘565 Patent are not directed to computer or software technology, so this exception would not be applicable here.

WL 3884192 at *14 (E.D. Tex. July 25, 2013). *See also Bally Technologies, Inc. v. Business Intelligence Systems Solutions, Inc.*, 2:10-cv-00440, 2012 WL 3656495 at *9 (D. Nev. Aug. 23, 2012) (distinguishing between an apparatus claim that recites the structure of the apparatus and the functions it performs, and an apparatus claim that recites the structure of the apparatus and the functions it is *capable* of performing).

In light of the foregoing authority, the following limitations directed to purpose have been found to be non-limiting in an apparatus claim:

Limitation(s)	Decision
“for inclusion as a line item on a food and/or beverage check presented to the user”	<i>Tabletop Media, LLC v. AMI Entertainment Network, LLC</i> , 16-cv-1121, 2018 WL 2949467 at *6 (D. Del. June 13, 2018)
“[a] barrier film preventing diffusion of copper from a copper wiring layer formed on a semiconductor substrate”/ “prevents diffusion of copper from a copper wiring layer formed on a semiconductor substrate”	<i>Godo Kaisha IP Bridge I v. Broadcom Ltd.</i> , 2:16-CV-134, 2016 WL 6611490 at *12 (E.D. Tex. Nov. 9, 2016)
“in an unfiltered waste water side of said filter device”	<i>Polylok, Inc. v. Bear Onsite, LLC</i> , 3:12-cv-535, 2014 WL 4914695 at *3 (W.D. Ky. Sept. 30, 2014)
“pressing fruit and vegetable down onto said grating disc for grating”	<i>Breville Pty Ltd. v. Storebound LLC</i> , 12-cv-01783, 2013 WL 3153383 at *5 (N.D. Cal. June 19, 2013)

In each of the foregoing decisions, the presiding court found that the subject limitations were not descriptions of structure – they described the purpose for such structure, and, as such, were not limiting.

Similarly, the limitations added in reexamination to apparatus claims 1 and 2 (“**for** use in downhole applications relating to hydrocarbon extraction” and “**to** convey hydraulic fluid”) are directed to purpose rather than structure. This purpose is reinforced by the arguments made by the Patent Owner during reexamination – “[s]ystem reliability is of critical importance to the commercial success of companies providing IWS and **downhole** monitoring systems.” Ex. 1006 at 80 (emphasis added). *See also id.* at 81 (the ‘565 Patent “is for a **downhole** protective jacketed metal pressure tube” (emphasis added)); and *id.* at 84 (“the jacketed tubes have the **function** of conveying fluids into downhole hydrocarbon extraction wells” (emphasis added)). In light of the foregoing, a person of ordinary skill in the art would understand the subject limitations as being directed to the purpose of the apparatus claimed in the ‘565 Patent. Ex. 1003, ¶ 36. They therefore do not count in evaluating the patentability of that apparatus over the prior art.

As for method claim 18 of the ‘565 Patent, the preamble reads “[a] method of conveying fluids into a wellbore.” Ex. 1002, col. 2, line 66. The preamble is followed by two limitations directed to a method of manufacturing a metal tube (“placing a first outer protective jacket around a metal tube” and “placing a protective jacket around the metal tube and the tear cord proximate to an outer surface of the metal tube and inside the first protective jacket”). Ex. 1002, col. 2, line 67 – col. 3, line 11. Claim 18 concludes with a method step of “pulling the tear

cord back to create a slit in the first protective jacket.” *Id.*, col. 3, lines 11-12. None of these limitations pertains to the actual conveyance of fluids – into a wellbore or otherwise. As such, the preamble of claim 18 “is only a statement of purpose and intended result,” and “does not result in a manipulative difference in the steps of the claim.” *Bristol-Myers Squibb Co. v. Ben Venue Laboratories, Inc.*, 246 F.3d 1368, 1376 (Fed. Cir. 2001). The preamble, therefore, is not limiting for purposes of determining the patentability of claim 18 vis-à-vis the prior art. *See id.*

VII. STATEMENT OF THE PRECISE RELIEF REQUESTED AND THE REASONS THEREFORE (37 C.F.R. § 42.22(a) AND 42.104(b))

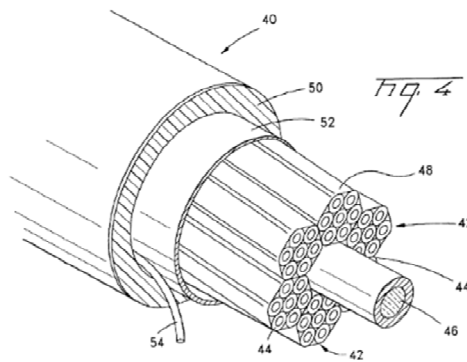
Petitioner requests the institution of IPR and the cancellation of the Challenged Claims on the following Grounds:

Ground	Basis	Reference(s)	Claims
1	Section 102	<i>Hurley</i>	1-5, 11, 13, 18-20 & 22
2	Section 103	<i>Hurley</i>	1-5, 11, 13, 18-20 & 22
3	Section 103	<i>Hurley</i> in view of <i>Bowker</i>	1-5, 11, 13, 18-20 & 22
4	Section 103	<i>Hurley</i> in view of <i>Okada</i>	6 & 9
5	Section 103	<i>Hurley</i> in view of <i>Varkey</i>	7
6	Section 103	<i>Hurley</i> in view of <i>Gaillard</i>	10
7	Section 103	<i>Hurley</i> in view of <i>Blew</i>	12, 14 & 15

A. Description of the Prior Art

1. The State of the Art

Jacketed cable technologies dates back to the 1860s, with significant technological advances having been made therein since. Ex. 1003, ¶¶ 37-42. As of the 2008 priority date for the '565 Patent, the major components of the invention claimed therein – a jacketed metal tube with a ripcord – were well known. Indeed, as discussed above, the *Hurley* reference at issue in the Reexamination proceeding depicted all three of those elements clearly in a single figure:



Id.

Hurley is not alone in this disclosure. Similar structure has been repeatedly disclosed in the annual Proceedings of the International Wire and Cable Symposium (“IWCS”). Ex. 1003, ¶ 44. For example, the following, depicting a coated metal tube with a ripcord, appeared in the compendium of papers in the 1991 edition of the IWCS Proceedings:

4. LT cable with welded aluminum tube and PE sheath

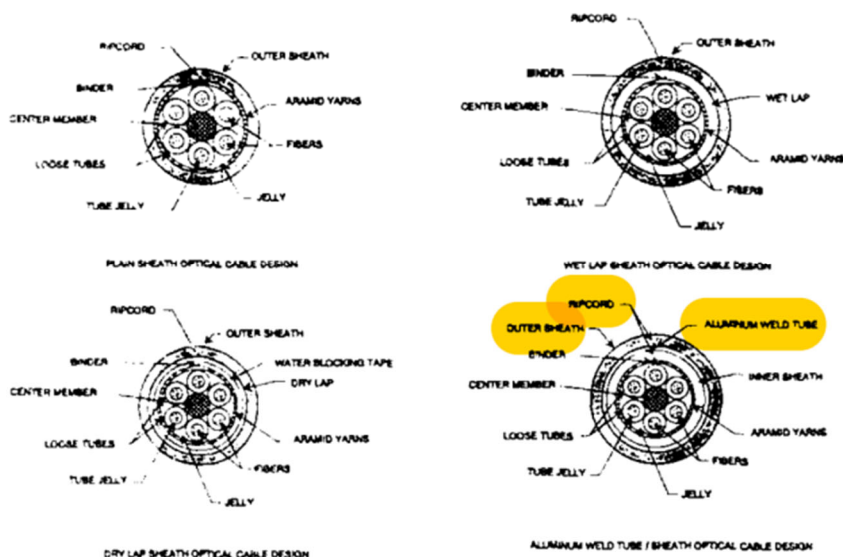
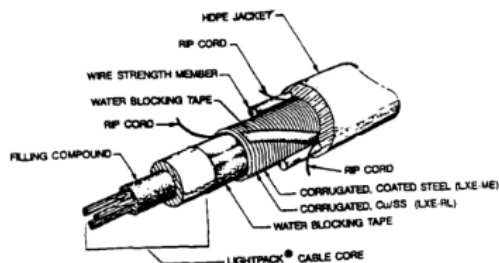


FIG. 5 DIFFERENT LOOSE TUBE OPTICAL CABLE DESIGN

Ex. 1012 at 5; Ex. 1003, ¶ 44.

This was not even the sole depiction of the subject structure from the compendium that year, as shown below:



Ex. 1013 at 329; Ex. 1003, ¶ 45.

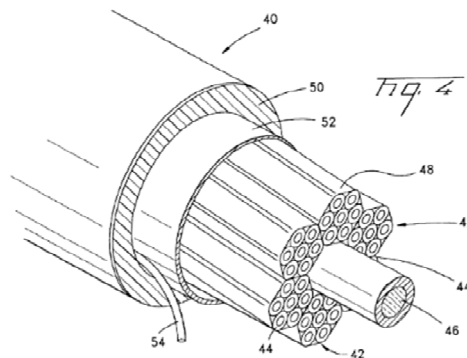
Despite the title of the ‘565 Patent - *Tear Cord for Jacketed Tube* – the Patent Owner must look beyond the afore-depicted structure for any purported novelty and non-obviousness of the claimed invention. As shown below, however, not even the remaining limitations save the challenged claims.

2. *Hurley*

Hurley issued on September 26, 2006, meaning that it is prior art at least under pre-AIA section 102(b) of the Patent Statute. *See* Ex. 1004 at 1. *Hurley* was cited during reexamination of the ‘565 Patent.

Hurley addressed the challenge of increasing the optical fiber count of a single fiber optic cable. Ex. 1004, col. 1, lines 25-26; Ex. 1003, ¶ 46. It accomplished this by bundling optical fibers, and surrounding the bundle with a “separation layer,” which, in turn, is surrounded by a “jacket.” Ex. 1004, col 3, lines 22-31; Ex. 1003, ¶ 46. The structure also has a “ripcord” for “facilitating removal of” the jacket. Ex. 1004, col. 5, lines 2-3; Ex. 1003, ¶ 46.

Figure 4 of *Hurley* depicts an embodiment of the invention described and claimed in that patent:

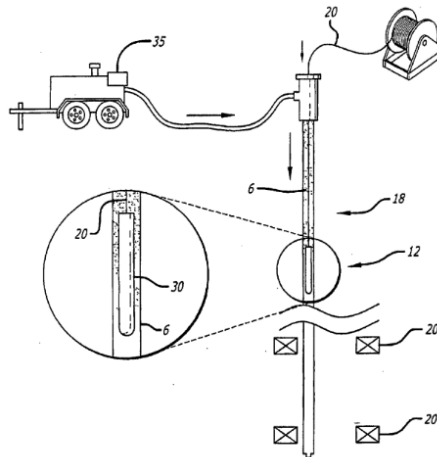


Ex. 1004 at 7.

In that figure, element 52 is a “separation layer” that can be formed from “a metal” of “one or more pieces.” *Id.*, col. 10, lines 48-50; Ex. 1003, ¶ 488. In one embodiment taught in *Hurley*, the armor “includes a smooth inner surface.” Ex. 1004, col. 13, lines 30-31; Ex. 1003, ¶ 48. Element 50 in Figure 4 is a “cable jacket” (Ex. 1004, col. 5, line 1) and element 54 is a “ripcord” (*id.*, col. 5, lines 2-3). Ex. 1003, ¶ 48.

3. *Bowker*

Bowker was published on July 13, 2006, and is therefore prior art under pre-AIA section 102(b). *See* Ex. 1007 at 1. *Bowker* is generally directed to a “fiber optic sensor assembly capable of deployment down an instrumentation tube located in a well bore,” which, as depicted below, can be spooled:

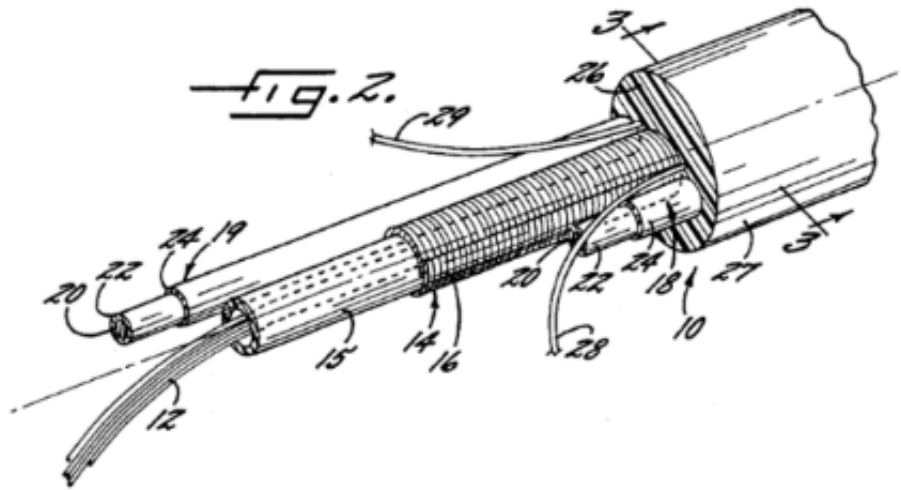


Ex. 1007 at 1; Ex. 1003, ¶ 49.

Bowker also teaches: 1) that the tube be hermetically sealed (Ex. 1007, ¶ 0015); 2) pumping a fluid under high pressure into the lumen of the tube disposed within the well bore (*id.*, ¶ [0016]); 3) “[t]he device of the invention is suitable for use in a caustic, high temperature and pressure environment, such as the environment found downhole in an oil or gas well” (*id.*, ¶ [0024]); and 4) continuous pressure maintenance within the tube (*id.*). Ex. 1003, ¶ 50.

4. *Blew*

Blew issued on November 21, 1995, and is therefore prior art to the ‘565 Patent under at least pre-AIA section 102(b). Ex. 1008 at 1. The invention of *Blew* is directed to “a composite fiber optic and electrical cable having a polymer jacket which is formed around a pair of electrical conductors and a core containing a number of optical fibers, wherein the jacket can be easily stripped from the electrical conductors in order to facilitate connecting the conductors between a power supply and a signal repeater or other electrical device.” Ex. 1008, col. 1, lines 54-60; Ex. 1003, ¶ 51. Figure 2 of *Blew* shows “wires 18 and 19” that are “surrounded by a jacket 26” (Ex. 1007, col. 4, lines 16-17), and a core 14 containing optical fibers 12 (*id.*, col. 3, lines 36-37):

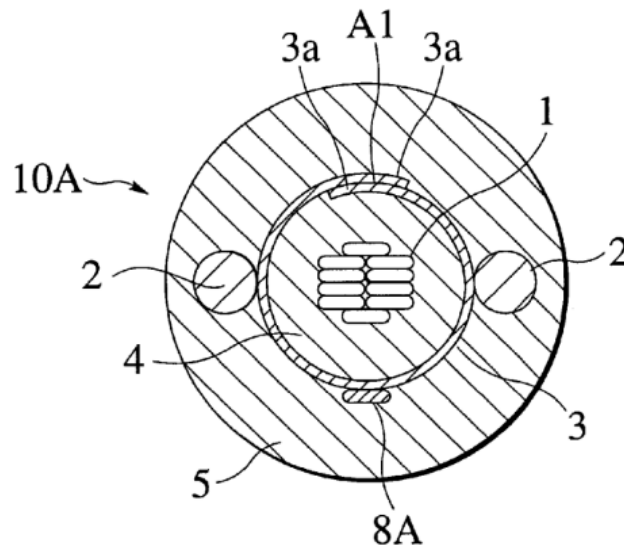


Ex. 1003, ¶ 52.

Blew solves, *inter alia*, the problem of separate tubes containing electrical connectors and optical fibers, *i.e.*, by having jacketed tubes containing different cable media within the same structure. Ex. 1008, col.1, lines 45-49; Ex. 1003, ¶ 53.

5. Okada

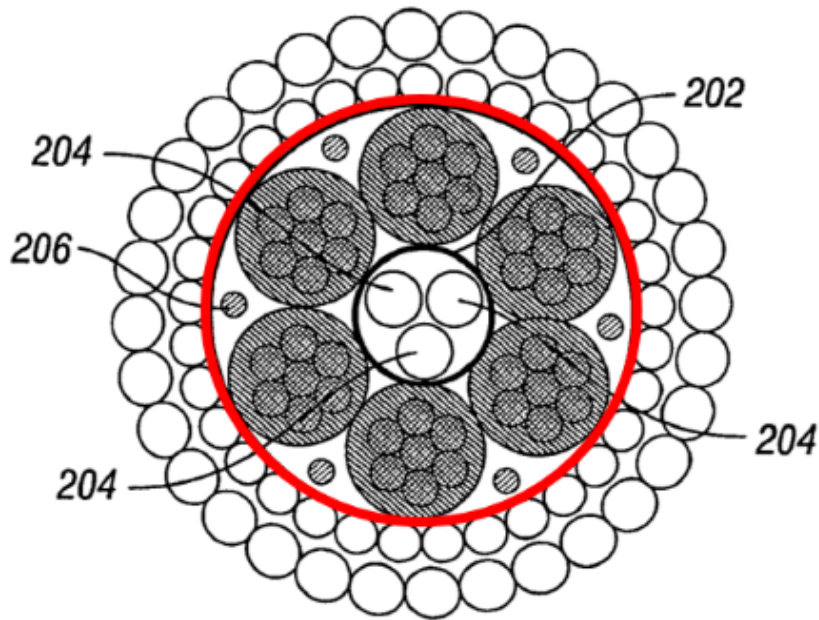
Okada issued on May 22, 2001, and is prior art to the ‘565 Patent under at least pre-AIA section 102(b). Ex. 1009 at 1. *Okada* was cited during the reexamination of the ‘565 Patent. *Okada* is generally directed to “an optical-fiber cable capable of being manufactured at lower cost than by the conventional method.” *Id.*, col. 2, lines 13-16; Ex. 1003, ¶ 54. *Okada* teaches a “sheath 5” covering “cylinder body 3,” with a “rip cord 8A” disposed between the two, which can be manufactured of various materials, including polymer and metal. Ex. 1009, col. 4, lines 11-23; Ex. 1003, ¶ 54. Figure 1 of *Okada* graphically depicts this arrangement:



Ex. 1009, col. 3, lines 40-41; Ex. 1003, ¶ 54.

6. *Varkey*

Varkey issued on January 29, 2008 from an application claiming priority of May 19, 2004. Ex. 1010 at 1. It is therefore prior art to the ‘565 Patent at least pursuant to section 102(e)(2). *Varkey* describes as “[a] typical technique” introducing “optical fibers into wire line cables is using a metal (*i.e.* stainless steel) tube to contain the optical fibers, as optical fibers are fragile and prone to damage and degradation.” Ex. 1010, col. 3, lines 40-43; Ex. 1003, ¶ 55. *Varkey* shows the prior art’s use of “a metal tube 202,” which, as noted above, can be made of stainless steel:



Ex. 1010, col. 5, lines 2-4; Ex. 1003, ¶ 55.

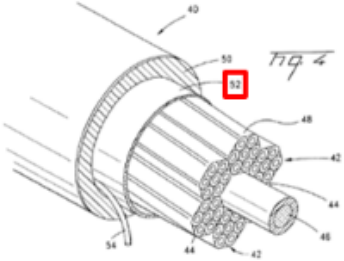
7. *Gaillard*

Gaillard was published on July 4, 2002, and is therefore prior art to the ‘565 Patent at least pursuant to section 102(b). Ex. 1010 at 1. *Gaillard* was cited during reexamination of the ‘565 Patent. *Gaillard* has as an inventive object “a cable assembly in which removal of the protective jacket or sheath can be facilitated by having the ripcords attached to a tape in the cable assembly, which provides access to the underlying core.” *Id.*, ¶ [0002]; Ex. 1003, ¶ 56. *Gaillard*’s teachings, the ripcord can be disposed through a cable in “a helical fashion.” Ex. 1010, ¶ [0004]; Ex. 1003, ¶ 56.

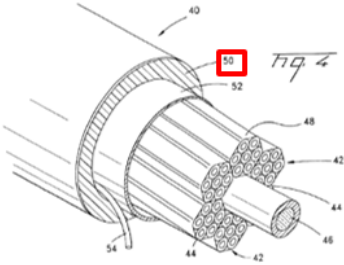
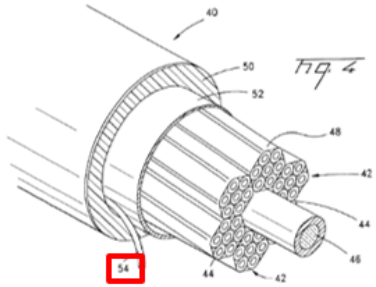
B. The Challenge Grounds

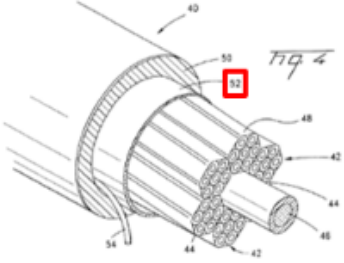
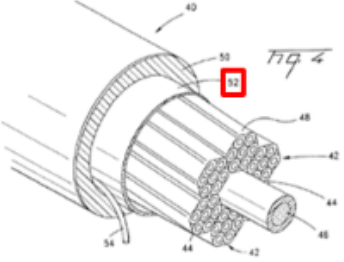
1. Ground 1: Claims 1-5, 11, 13, 18-20 & 22 of the ‘565 Patent are Anticipated by *Hurley*

The following chart shows how each limitation of claims 1-5, 11, 13, 18-20 & 22 of the ‘565 Patent are taught by *Hurley*, and therefore that reference anticipates such claims (Ex. 1003, ¶ 57):

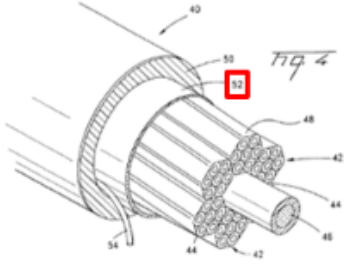
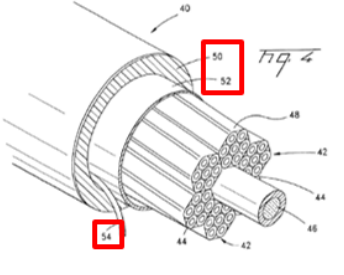
‘565 Patent	<i>Hurley</i>
1. A jacketed metal tube comprising a metal tube,	“Separation layer 52 can be formed from by [<i>sic</i>] an armor layer, for example, <i>a metal</i> . . . layer that may be formed from one or more pieces.”³  Ex. 1004, col. 10, lines 48-50 (emphasis added)) and Fig. 4.
a first protective jacket adjoining and surrounding the metal tube,	<i>Hurley</i> shows “[c]able jacket 50” adjoining separation layer 52:

³ Contrary to the Patent Owner’s suggestion during reexamination, separation layer 52 in *Hurley*’s Figure 4 is not limited to a polyester material, such as MYLAR. See Ex. 1006 at 58-59.

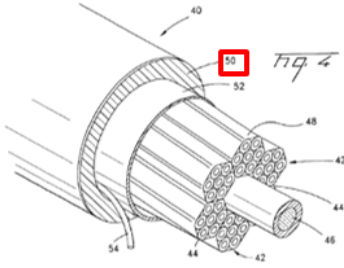
'565 Patent	<i>Hurley</i>
	 Ex. 1004 col. 5, line 1 and Fig. 4.
and a tear cord positioned between the metal tube and the first protective jacket characterized wherein	<i>Hurley</i> shows “ripcord 54” positioned between separation layer 52 and jacket 50 “for facilitating removal of cable jacket 50:”  Ex. 1004, col. 5, lines 2-3 and Fig. 4.
the protective jacketed metal tube is for use in downhole applications relating to hydrocarbon extraction,	This limitation is directed to intended deployment, and does not count in evaluating patentability. <i>See</i> §VI, <i>supra</i>.
wherein the protective jacketed metal tube has a wall which is of hollow cylindrical shape and is smooth walled, solid, substantially straight, continuous, without break or interruption,	<i>Hurley</i> teaches that “[s]eparation layer 52 can be formed from by an armor layer, for example, a metal . . . layer that may be formed from one or more pieces,” <i>i.e.</i>, continuous, without break or interruption. Ex. 1004, col. 10, lines 48-50 (emphasis added) and Fig. 4.

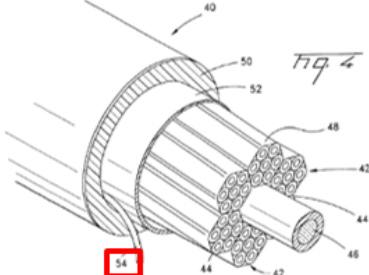
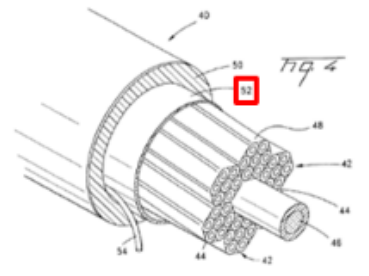
'565 Patent	<i>Hurley</i>
	 “Separation layer 52 . . . is formed from a flexible armor. The flexible armor preferably includes a smooth inner surface.” Ex. 1004, col. 13, lines 30-31. As shown in Figure 4 of <i>Hurley</i>, separation layer 52 is a hollow cylinder to accommodate the fiber optic elements. In the embodiments wherein separation layer 52 is metal (Ex. 1004, col. 10, lines 48-50), it is solid.
is structured to be hermetically sealed,	As is shown in Figure 4 of <i>Hurley</i>, the separation layer 52 is shown as having a round, undeformed tube circumference required for hermetic sealing:  Further, <i>Hurley</i> teaches that the separation layer 52 “may provide, for example, crush resistance.” Ex.1004 at 10:46-52.

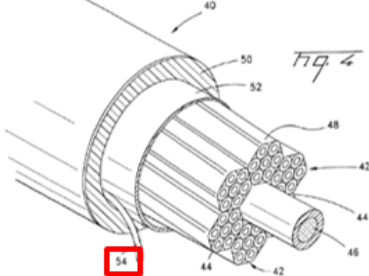
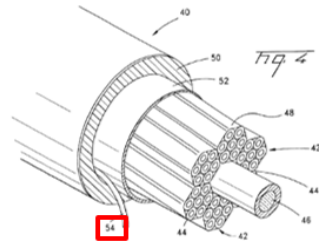
'565 Patent	<i>Hurley</i>
	The Patent Owner argued during reexamination that a round, undeformed tube circumference allows for hermetic sealing. <i>See</i> Ex. 1004 at 62.
maintain a positive or negative pressure,	The tear cord 54 shown in Figure 2 of <i>Hurley</i> avoids the gouges and nicks would otherwise result in pressure loss: Ex. 1004, col. 2, lines 21-22 and Fig. 4. The applicant argued during reexamination that nicks and gouges from the use of other than tear cords result in loss in pressure. Ex. 1006 at 143, ¶¶ 4 & 7. <i>See also</i> Ex. 1001, col. 2, lines 21-24 (tying nicks and gouges to loss in pressure).
and is structured for connection to hermetically sealing compression fittings to convey fluids downhole,	As is shown in Figure 4 of <i>Hurley</i>, the separation layer 52 has a round, smooth solid wall, of undeformed metal:

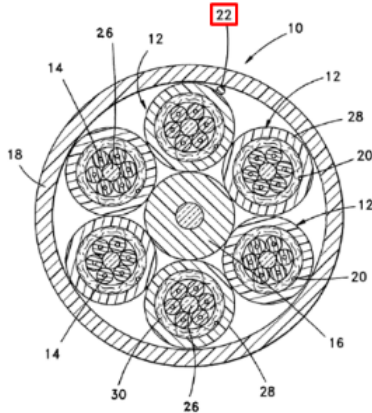
'565 Patent	<i>Hurley</i>
	 Further, <i>Hurley</i> teaches that the separation layer 52 “may provide, for example, crush resistance.” Ex.1004 at 10:46-525. The Patent Owner argued during reexamination that a round, undeformed tube circumference allows for hermetic sealing. See Ex. 1006 at 62.
and in that the tear cord is positioned proximate to an outer surface of the metal tube and inside the diameter of the outer first protective jacket	As shown below, ripcord 54 in <i>Hurley</i> is positioned on the outer surface of separation layer 52, and on the inside wall of jacket 50: 
and is able to be pulled back to create a slit in the first protective jacket	The rip cord 54 in <i>Hurley</i> is able to be pulled back to slit open jacket 50. Ex. 1006 at 143, ¶ 9.
and to allow the first protective jacket to be separated from the metal tube without damage to the metal tube surface.	The resulting slit in jacket 50 in <i>Hurley</i> can be used to remove the jacket without scratches or gouges to the surface of separation layer 52. Ex. 1006 at 143, ¶¶ 4 & 7.

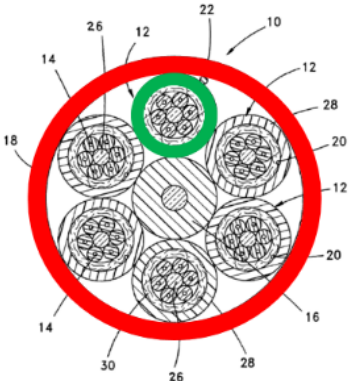
'565 Patent	<i>Hurley</i>
2. A jacketed metal tube of claim 1 wherein	<i>See claim 1, supra.</i>
the tube is to convey hydraulic fluid.	This limitation is directed to intended deployment, and does not count in evaluating patentability. <i>See §VI, supra.</i>
3. A jacketed metal tube of claim 1 wherein	<i>See claim 1, supra.</i>
the tube conveys chemicals.	This limitation is directed to intended deployment, and does not count in evaluating patentability. <i>See §VI, supra.</i>
4. The jacketed tube of claim 1 wherein	<i>See claim 1, supra.</i>
the jacket comprises polyamide, polyethylene, ethylene chlorotrifluoroethylene or a thermoplastic elastomer cross linking ethylene propylene diene monomer rubber and polypropylene.	<i>Hurley</i> teaches that jacket 28 may be formed of a blend of PVC and polyethylene. Ex. 1004, col. 1, lines 57-60.
5. The jacketed tube of claim 1 wherein	<i>See claim 1, supra.</i>
the jacket comprises engineered thermoplastic vulcanates, perfluoroalkoxy, polyvinylidene fluoride or fluorinated ethylene propylene.	<i>Hurley</i> teaches that “jacket 28 may be formed of a fluoro-plastic, such as polyvinylidene fluoride.” Ex. 1004, col. 1, lines 57-58.
11. The jacketed tube claim 1 further comprising	<i>See claim 1, supra.</i>
a tear cord placed at a selected location on a length of the tube.	<i>Hurley</i> teaches “ripcord 54 for facilitating removal of cable jacket 54,” meaning that it must be placed on a selected location on a length of the tube to allow such removal. <i>See Ex. 1004, col. 5, lines 2-3.</i>
13. The jacketed metal tube of claim 1 wherein the first protective jacket comprises one or more materials of a group consisting of polyethylene, ethylene chlorotrifluoroethylene, a thermoplastic elastomer cross linking	<i>Hurley</i> discloses forming the jacket 50 of polyethylene (Ex. 1004, col. 8, lines 15-31) or polyvinylidene (<i>id.</i> , col. 1, lines 48-62).

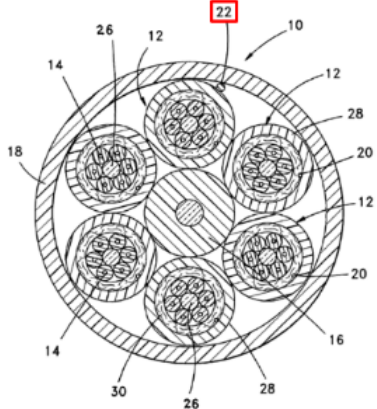
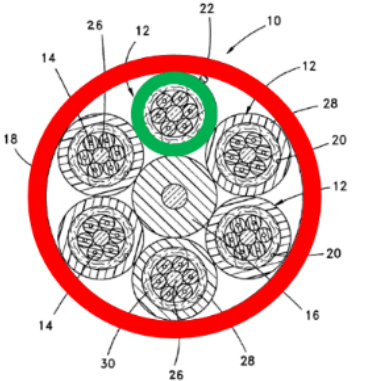
'565 Patent	<i>Hurley</i>
ethylene propylene diene monomer rubber and polypropylene, perfluoroalkoxy, polyvinylidene fluoride and fluorinated ethylene propylene,	
and wherein the material is extruded onto the metal tube without radiation curing.	<i>Hurley</i> discloses extruding the jacketing material onto the tube (Ex. 1004, col. 1, line 62 – col. 2, line 18 & col. 8, lines 49-61) without using ultraviolet light (<i>id.</i> , col. 2, lines 4-45 & col. 6, lines 12-15).
18. A method of conveying fluids into a wellbore, the method comprising:	The preamble is non-limiting. <i>See</i> §VI, <i>supra</i> .
i. placing a first outer protective jacket around a metal tube to form a jacketed tube which is spoolable,	<i>Hurley</i> shows that cable jacket 50 surrounds separation layer 52 that can be formed of a metal (Ex. 1004, col. 10, lines 48-50):  <i>Id.</i>, col. 5, line 1 & col. 10, lines 48-50.
the metal tube having a wall which is of hollow cylindrical shape and is smooth, solid, substantially straight, continuous, without break or interruption,	In <i>Hurley</i>, “[s]eparation layer 52 can be formed from by an armor layer, for example, a metal . . . layer that may be formed from one or more pieces,” <i>i.e.</i>, continuous, without break or interruption. Ex. 1004, col. 10, lines 48-50 (emphasis added). “layer 52 . . . is formed from a flexible armor. The flexible armor preferably

'565 Patent	<i>Hurley</i>
	includes a smooth inner surface.” Ex. 1004, col. 13, lines 30-31. As shown in Figure 4 of <i>Hurley</i>, separation layer 52 is a hollow cylinder to accommodate the fiber optic elements. 
capable of being hermetically sealed and suitable for connection to hermetically sealing compression fittings to convey fluids under positive or negative pressure downhole,	As is shown in Figure 2 of <i>Hurley</i>, the separation layer 52 is shown as having a round, undeformed tube circumference required for hermetic sealing.  Further, Hurley teaches that the separation layer 52 “may provide, for example, crush resistance.” Ex.1004 at 10:46-52. The Patent Owner argued during reexamination that a round, undeformed tube circumference allows for hermetic sealing. See Ex. 1006 at 62.

'565 Patent	<i>Hurley</i>
	The tear cord 54 shown in Figure 2 of <i>Hurley</i> avoids the gouges and nicks would otherwise result in pressure loss (col. 2, lines 21-22):  The applicant argued during reexamination that nicks and gouges from the use of other than tear cords result in loss in pressure. Ex. 1006 at 143, ¶¶ 4 & 7. See also Ex. 1001, col. 2, lines 21-24 (tying nicks and gouges to loss in pressure).
ii. placing a tear cord proximate to an outer surface of the metal tube and inside the first protective jacket,	Hurley shows “ripcord 54” (col. 5, lines 2-3) positioned between separation layer 52 and jacket 40: 
and iii. pulling the tear cord back to create a slit in the first protective jacket to allow the first protective jacket to be separated from the metal tube without damage to the metal tube surface.	The rip cord 54 is able to be pulled back to slit open jacket 50. Ex. 1006 at 143, ¶ 7; Ex. 1003, ¶ 63. The resulting slit in jacket 50 can be used to remove the jacket without scratches or gouges to the surface of separation layer 52. <i>Id.</i>, ¶¶ 4 & 7.

‘565 Patent	<i>Hurley</i>
19. The method of claim 18 further comprising	<i>See</i> claim 18, <i>supra</i> .
placing a second tear cord adjacent to the outer surface of the first protective jacket	<i>Hurley</i> depicts a “conventional fiber optic cable” (Ex. 1004, col. 4, lines 6-8) with “a cable jacket 18 extruded about the bundles 12 of optical fibers 14, and an optional ripcord 22 for facilitating removal of cable jacket 18” (<i>id.</i>, col. 1, lines 30-32). “Each bundle 12 of optical fibers 14 further includes a jacket 28 that surrounds the plurality of optical fibers, and an optional ripcord 20 for facilitating removal of jacket 28” (<i>id.</i>, col. 1, lines 50-53). In this configuration, ripcord 22 for removal of jacket 18 is adjacent to the outer surface of jacket 28: 
and covering the first protective jacket with a second protective jacket.	In <i>Hurley</i> , Jacket 18 (red) covers jacket 28 (green):

'565 Patent	<i>Hurley</i>
	 Ex. 1004, Fig. 1.
20. The method of claim 18 wherein the first protective jacket comprises one or more materials of the group consisting of polyethylene, ethylene chlorotrifluorethylene, a thermoplastic elastomer cross linking ethylene propylene diene monomer rubber and polypropylene, perfluoroalkoxy, polyvinylidene fluoride fluorinate ethylene propylene.	See claim 18, <i>supra</i>. Jacket 28 may be formed of a blend of PVC and polyethylene. Ex. 1004, col. 1, lines 57-60.
22. The tube of claim 1 further comprising	See claim 1, <i>supra</i>.
a second protective jacket and a second tear cord, wherein the second protective jacket surrounds the first protective jacket, and the second tear cord is positioned between the outer diameter of the first protective jacket and the inner diameter of the second protective jacket.	<i>Hurley</i> depicts a “conventional fiber optic cable” (Ex. 1004, col. 4, lines 6-8) with “a cable jacket 18 extruded about the bundles 12 of optical fibers 14, and an optional ripcord 22 for facilitating removal of cable jacket 18” (<i>id.</i>, col. 1, lines 30-32). “Each bundle 12 of optical fibers 14 further includes a jacket 28 that surrounds the plurality of optical fibers, and an optional ripcord 20 for facilitating removal of jacket 28” (<i>id.</i>, col. 1, lines 50-53).

'565 Patent	<i>Hurley</i>
	In this configuration, ripcord 22 for removal of jacket 18 is between the outer diameter of jacket 28 and the inner diameter of jacket 18:  In <i>Hurley</i>, Jacket 18 (red) covers jacket 28 (green):  Ex. 1004, Fig. 1.

**2. Ground 2: 1-5, 11, 13, 18-20 & 22 of the '565 Patent are
Obvious in Light of *Hurley***

Given the positions it took during reexamination, Petitioner anticipates that the Patent Owner will once again take the position that *Hurley* fails to teach the

limitations “the protective jacketed metal tube has a wall which is of hollow cylindrical shape and is smooth walled, solid, substantially straight, continuous, without break or interruption” (claim 1), and “the metal tube having a wall which is of hollow cylindrical shape and is smooth, solid, substantially straight, continuous, without break or interruption” (claim 18). Assuming the Board disagrees with Petitioner’s understanding of what is shown in *Hurley’s* Figure 4, and the accompanying text, then such structural limitations would have been obvious in light of the prior art.

It is beyond dispute that Figure 4 of *Hurley* teaches that the separation layer 52 shown in Figure 4 can be made of metal. Ex. 1003, ¶ 59. It is also clear that the separation layer shown in Figure 4 is not the CPID interlock armor embodiment depicted in Figure 8. *Id.* Being unbounded by this embodiment from *Hurley’s* teachings, and where the separation layer is otherwise to be made of metal per the teachings of *Hurley*, a person of ordinary skill in the art would have known in July 2008 to manufacture a smooth, solid, substantially straight, continuous tube that is without break or interruption, as such a geometry is easier to manufacture than products with more complex geometries, *e.g.*, corners and uneven surfaces. *Id.*

\Further, a circular, smooth surface makes conveyance of fluid more efficient. Geometric variations in the tube interior may cause fluid turbulence, impeding conveyance of the optical fiber. Ex. 1003, ¶ 60. Thus, even if the subject limitations

from claims 1 and 18 were somehow missing from *Hurley's* express teachings, they would have been obvious to incorporate in a cable product practicing the remaining teachings from that reference. *Id.*, ¶ 60.

**3. Ground 3: 1-5, 11, 13, 18-20 & 22 of the '565 Patent are
Obvious in Light of *Hurley* in View of *Bowker***

To the extent that the Board concludes that the subject claims are indeed limited to fluid delivery in a downhole application, despite those limitations being directed to the purpose of the claimed apparatus, or that the preamble of claim 18 directed to “[a] method of conveying fluids into a wellbore,” one of ordinary skill in the art would have looked to prior art in that specific field to solve for the problems facing the inventors of the '565 Patent. Ex. 1003, ¶ 61.

The '565 Patent's stated Field of Use is “tubes used in hydrocarbon production down hole environments.” Ex. 1001, col. 1, lines 6-7; Ex. 1003, ¶ 61. *Bowker's* Field of Invention is “deploying fiber optic sensors into hostile environments such as down well bores.” Ex. 1007, ¶ [0003]; Ex. 1003, ¶ 62. The substantial similarity between these fields indicates that one facing the problem confronted by the inventors of the '565 Patent would have been motivated to consult *Bowker* for the downhole-specific application. Ex. 1003, ¶ 62.

Bowker supplies the purpose-specific limitations of the ‘565 Patent, to the extent such limitations are relevant to an invalidity analysis, as shown below (Ex. 1003, ¶ 63):

‘565 Patent	<i>Bowker</i>
(Claim 1) the protective jacketed metal tube is for use in downhole applications relating to hydrocarbon extraction,	<i>Bowker</i> pumping a fluid under high pressure into the lumen of the tube disposed within the well bore. Ex. 1007, ¶ [0016].
(Claim 2) the tube is to convey hydraulic fluid.	<i>Bowker</i> pumping a fluid under high pressure into the lumen of the tube disposed within the well bore. Ex. 1007, ¶ [0016].
(Claim 3) the tube conveys chemicals.	In addition to water, <i>Bowker</i> teaches pumping “common silicone oils,” which are chemicals, into the well bore. Ex. 1007, ¶ [0026].
(Claim 18) A method of conveying fluids into a wellbore, the method comprising:	<i>Bowker</i> pumping a fluid under high pressure into the lumen of the tube disposed within the well bore. Ex. 1007, ¶ [0016].

Further, to the extent the structure of the claimed jacketed metal tube does not impart the performance limitations of the ‘565 Patent, *i.e.*, maintaining pressure and hermetic sealing, *Bowker* provides those limitations as well (Ex. 1003, ¶ 64):

‘565 Patent	<i>Bowker</i>
(Claim 1) is structured to be hermetically sealed,	<i>Bowker</i> teaches that the tube is hermetically sealed Ex. 1007, ¶ [0015].
(Claim 1) maintain a positive or negative pressure,	<i>Bowker</i> teaches that continuous pressure is maintained in the tube. Ex. 1007, ¶ [0024].

‘565 Patent	<i>Bowker</i>
(Claim 1) and is structured for connection to hermetically sealing compression fittings to convey fluids downhole,	<i>Bowker</i> teaches a fitting designed to allow the tubing to be pressurized. Ex. 1007, ¶ [0026]. <i>Bowker</i> pumping a fluid under high pressure into the lumen of the tube disposed within the well bore. Ex. 1007, ¶ [0016].
(Claim 18) placing a first outer protective jacket around a metal tube to form a jacketed tube which is spoolable,	<i>Bowker</i> teaches a flexible tubing assembly for storage spooling and unspooling during fiber optic cable deployment. Ex. 1007, ¶ [0013].
(Claim 18) capable of being hermetically sealed and suitable for connection to hermetically sealing compression fittings to convey fluids under positive or negative pressure downhole,	<i>Bowker</i> teaches that the tube is hermetically sealed Ex. 1007, ¶ [0015]. <i>Bowker</i> teaches a fitting designed to allow the tubing to be pressurized. Ex. 1007, ¶ [0026]. <i>Bowker</i> pumping a fluid under high pressure into the lumen of the tube disposed within the well bore. Ex. 1007, ¶ [0016].

4. Ground 4: Claim 6 & 9 of the ‘565 Patent are Obvious over

Hurley in Light of Okada

As noted above, during reexamination of the ‘565 Patent, the Patent Owner identified “the” problem addressed by the invention of that patent as including safely removing a protective jacket without damaging the underlying tube surface, which the inventors solved by the deployment of a tear cord. *See* Ex. 1006 at 81. As

explained above, *Hurley* teaches using a ripcord to facilitate removal of a protective jacket from an underlying tube. *See* Ex. 1004, col. 5, lines 2-3; Ex. 1003, ¶ 66. As *Hurley's* teaching is silent as to the appropriate materials for such ripcord, a person of ordinary skill in the art would have been motivated to look to the teachings of *Okada* regarding such materials. Ex. 1003, ¶ 66. The following shows how *Hurley* as modified by *Okada's* teachings yield claims 6 and 9 of the '565 Patent (Ex. 1003, ¶ 67):

Claims	<i>Hurley/Okada</i>
6. The jacketed tube of claim 1 further comprising a tear cord made of poly-aramid fiber.	<i>See</i> claim 1, <i>supra</i> . <i>Okada</i> discloses the use of ripcords that are made from aramid fiber. Ex. 1008, col. 7, line 28. Modifying <i>Hurley's</i> teachings with those of <i>Okada</i> results in <i>Hurley's</i> ripcord made of an aramid fiber.
9. The jacketed tube of claim 1 further comprising: a tear cord made of metal.	<i>See</i> claim 1, <i>supra</i> . <i>Okada</i> discloses the use of ripcords that are made from steel wire. Ex. 1008, col. 7, line 29. Modifying <i>Hurley's</i> teachings with those of <i>Okada</i> results in <i>Hurley's</i> ripcord made of metal.

5. Ground 5: Claim 7 is Obvious over *Hurley* in Light of *Varkey*

Starting with *Hurley's* teaching that separation layer can be made of metal (Ex. 1004, col. 10, lines 48-50; Ex. 1003, ¶ 68), that reference is silent as to the type of metal to be used. Thus, one looking to practice *Hurley's* teachings would have been motivated to turn to *Varkey*, which describes as “[a] typical technique” introducing “optical fibers into wire line cables is using a metal (*i.e.* stainless steel) tube to contain the optical fibers, as optical fibers are fragile and prone to damage and degradation.” Ex. 1010, col. 3, lines 40-43; Ex. 1003, ¶ 68. Logically, one skilled in the art would not have been inclined to experiment with new materials to combine with *Hurley's* teachings when known, “typical” techniques in the same field of endeavor (optical fiber technologies) were available. Ex. 1003, ¶ 69.

The following chart shows the result of modifying *Hurley's* teachings with those of *Varkey* to arrive at claim 7 of the '565 Patent (Ex. 1003, ¶ 70):

Claim	<i>Hurley in light of Varkey</i>
7. The jacketed tube of claim 1 wherein the solid wall metal tube comprises incoloy, stainless steel, carbon steel, or galvanized carbon steel.	<i>See Claim 1, supra.</i> “A typical technique to introduce optical fibers into wire line cables is using a metal (<i>i.e. stainless steel</i>) tube to contain the optical fibers, as optical fibers are fragile and prone to damage and degradation.” Ex. 1010, col. 3, lines 41-44 (emphasis added).

Claim	<i>Hurley in light of Varkey</i>
	Modifying <i>Hurley's</i> teachings with those of <i>Varkey</i> results in the separation layer 52 made out of stainless steel.

6. Ground 6: Claim 10 is Obvious over *Hurley* in Light of *Gaillard*

One of ordinary skill in the art reading *Hurley* would have known to use a ripcord to remove a protective jacket from an underlying tube. *See* Ex. 1004, col. 5, lines 2-3; Ex. 1003, ¶ 71. However, *Hurley* is agnostic as to the configuration of the ripcord. Ex. 1003, ¶ 71. *Gaillard* directed to “a cable assembly in which removal of the protective jacket or sheath can be facilitated by having the ripcords attached to a tape in the cable assembly, which provides access to the underlying core.” Ex. 1011, ¶ [0002]; Ex. 1003, ¶ 72. One looking to practice *Hurley's* teachings would have turned to *Gaillard* to discern different manners of deploying a ripcord, which, in the case of *Gaillard*, includes in “a helical fashion.” Ex. 1011, ¶ [0004]; Ex. 1003, ¶ 72. The following is a chart that shows how one arrives at claim 10 of the ‘565 Patent by modifying *Hurley's* teachings in light of *Gaillard* (Ex. 1003, ¶ 73):

10. The jacketed metal tube of claim 1 wherein the tear cord is helically wound around the tube.	<i>Gaillard</i> discloses that ripcords can be disposed “through the cable . . . in a helical fashion.” Ex. 1010, ¶ [0004]. Modifying <i>Hurley's</i> teachings with those of <i>Gaillard</i> results in a ripcord disposed in a helical fashion around
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	the tube to facilitate the removal of the protective jacket therefrom.
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**7. Ground 7: Claims 12, 14 and 15 are Obvious over *Hurley* in
Light of *Blew***

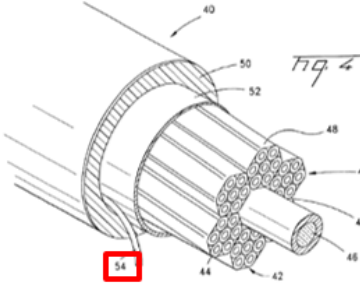
As noted above, *Hurley* addressed the challenge of increasing the optical fiber count of a single fiber optic cable. Ex. 1004, col. 1, lines 25-26; Ex. 1003, ¶ 74. *Blew* solves the problem of separate tubes containing electrical connectors and optical fibers, *i.e.*, by having tubes containing different cable media within the same jacketed structure. Ex. 1008, col.1, lines 45-49; Ex. 1003, ¶ 74. The two references have in common an aim toward maximized design efficiency in cables. Ex. 1003, ¶ 74. A feature that would have been intuitive to one of ordinary skill in the art in 2008 is cable strength. *Id.*, ¶ 74. In fact, *Hurley* teaches “a central strength member along which optical fibers 44 extend.” Ex. 1004, col. 11, lines 14-15; Ex. 1003, ¶ 74.

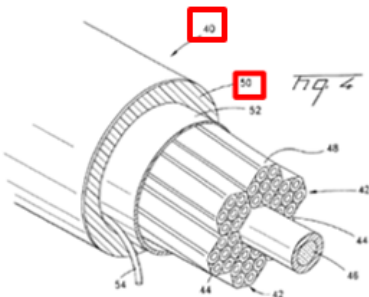
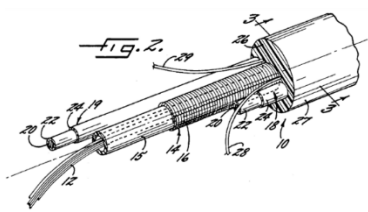
One reading *Hurley*’s teachings would have been motivated to explore possible materials for enhancing cable strength, and, in that regard, *Blew* teaches electrically conductive wires that “include a steel center or core” which “serves to strengthen the cable longitudinally and to stiffen the cable, thus further reducing bending stresses imparted upon” the optical fibers. Ex. 1008, col. 3, lines 59-64; Ex.

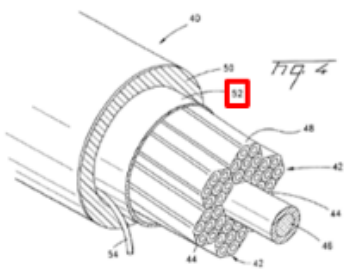
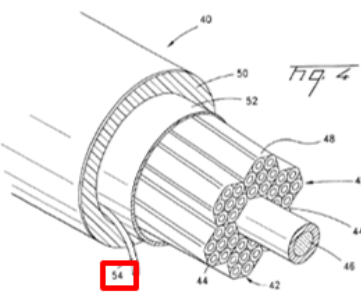
1003, ¶ 75. There would, therefore, have been a motivation to modify *Hurley's* teachings with those of *Blew* to arrive at the claimed invention. Ex. 1003, ¶ 75.

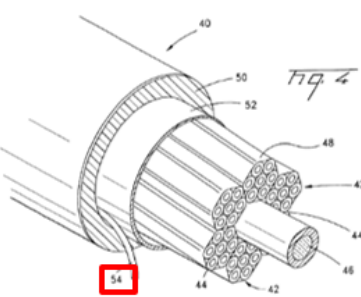
Further, given the aim of both references to maximize cable design efficiency, one of ordinary skill reading *Hurley* would have been motivated to consider the multi-media cable configuration within one jacket described in *Blew* in order to modify *Hurley's* teachings. See Ex. 1008, col.1, lines 45-49; Ex. 1003, ¶ 76. The following chart shows the resulting combination in the context of claims 12, 14 and 15 of the '565 Patent (Ex. 1003, ¶ 77):

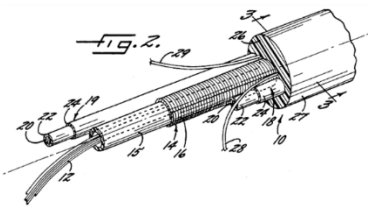
Claim	<i>Hurley in Light of Blew</i>
12. A jacketed metal tube of claim 1 further comprising	<i>See claim 1, supra.</i>
one or more steel ropes within one or more protective jackets surrounding the metal tube	<i>Blew</i> teaches electrically conductive wires that “include a steel center or core” which “serves to strengthen the cable longitudinally and to stiffen the cable, thus further reducing bending stresses imparted upon” the optical fibers. Ex. 1008, col. 3, lines 59-64. <i>Hurley</i> teaches “a central strength member along which optical fibers 44 extend.” Ex. 1004, col. 11, lines 14-15. It also teaches that jacket 50 “generally surrounds strength members.” Ex. 1004, col. 12, line 385. Modifying <i>Hurley's</i> teachings with those of <i>Blew</i> results in a steel strength member within jacket 50 along which the optical fibers disposed within separation layer 52 would extend.

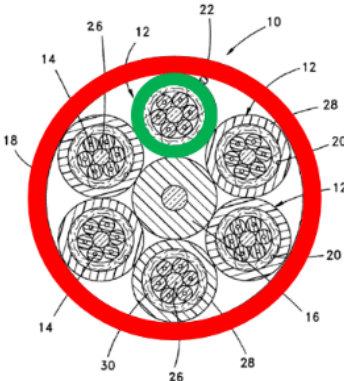
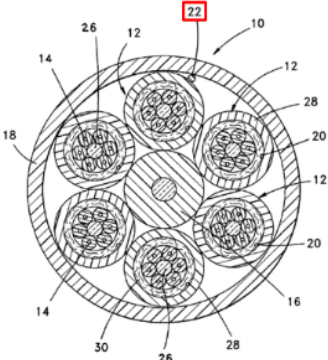
Claim	<i>Hurley</i> in Light of <i>Blew</i>
and one or more tear cords wherein at least one tear cord is positioned next to each steel rope and metal tube	<i>Hurley</i> shows “ripcord 54” positioned between separation layer 52 and jacket 50:  Ex. 1006, col. 5, lines 2-3 and Fig. 4. As the steel strength member from <i>Blew</i> would be within <i>Hurley</i>’s jacket 50, <i>Hurley</i>’s ripcord 54 would be next to such steel strength member.
wherein each steel rope has the same axis of orientation as the metal tube and is positioned adjacent to the metal tube within the one or more protective jackets	As noted above, the steel strength member from <i>Blew</i> would be within jacket 50, meaning it necessarily would be oriented in same axis as the separation layer 52, and positioned next to such separation layer.
whereby each tear cord can be pulled back to create a slit in the one or more protective jacket	The rip cord 54 in <i>Hurley</i> is able to be pulled back to slit open jacket 50. Ex. 1006 at 143, ¶ 9.
and to allow the one or more protective jackets to be separated from each steel rope and metal tube without damage to the metal tube surface.	The resulting slit in jacket 50 in <i>Hurley</i> can be used to remove the jacket without scratches or gouges to the surface of separation layer 52. Ex. 1006 at 143, ¶¶ 4 & 7.
14, An encapsulated cable comprising a protective jacket in which the protective jacket surrounds a plurality of solid wall metal tubes,	<i>Hurley</i> teaches a cable 40 that includes a jacket 50 covering a “separation layer” 52 (col. 10, lines 21-24), which can be formed from by an armor layer, for example, <i>a metal . . . layer</i> that may be formed from one or more pieces.” Col. 10, lines 48-50 (emphasis added).

Claim	<i>Hurley in Light of Blew</i>
	 Figure 2 of <i>Blew</i> shows “two electrically conductive wires 18 and 19” (Ex. 1008, col. 3, lines 49-50), with “a steel center or core 20 and a surrounding layer of copper cladding 22,” <i>i.e.</i>, a tube (<i>id.</i>, col. 3, lines 60-61), and “wires 18 and 19 are in turn surrounded by a jacket 26” (<i>id.</i>, col. 4, lines 16-17).  Modifying <i>Hurley</i> with the teachings of <i>Blew</i> results in a multiplicity of separation layers (tubes) covered by a jacket.
and wherein each metal tube has a parallel axis of orientation with the other tube or tubes	<i>Blew</i> shows wires 18 and 19 have “their centers located along the major axis of the cable's elliptical cross section,” <i>i.e.</i>, they are parallel with each other. Ex. 1008, col. 5, lines 8-11). Modifying <i>Hurley</i> with the teachings of <i>Blew</i> results in the multiplicity of

Claim	<i>Hurley in Light of Blew</i>
	separation layers that are parallel to one another.
and further wherein the metal tubes comprise smooth metal walls structured to be hermetically sealed, maintain a positive or negative pressure, and are structured for connection to hermetically sealing compression fittings	<i>Hurley's</i> "[s]eparation layer 52 . . . is formed from a flexible armor. The flexible armor preferably includes a smooth inner surface." Ex. 1004, col. 13, lines 30-31. As is shown in Figure 4 of <i>Hurley</i>, the separation layer 52 is shown as having a round, undeformed tube circumference required for hermetic sealing:  The tear cord 54 shown in <i>Hurley's</i> Figure 2 avoids the gouges and nicks would otherwise result in pressure loss (col. 2, lines 21-22):  The applicant argued during reexamination that nicks and gouges result in loss in pressure. Ex. 1006 at

Claim	<i>Hurley in Light of Blew</i>
	143, ¶ 4. <i>See also</i> Ex. 1001, col. 2, lines 21-24 (tying nicks and gouges to loss in pressure).
and whereby at least one tear cords is positioned between the outside surface of at least one metal tube and the inside of said protective jacket	<i>Hurley</i> shows “ripcord 54” (col. 5, lines 2-3) positioned between separation layer 52 and jacket 40: 
whereby the at least one tear cord is oriented longitudinally along the length of the at least one metal tube	Figure 4 shows “ripcord 54” (col. 5, lines 2-3) positioned between separation layer 52 and jacket 40, and oriented longitudinally along the length of the separation layer.
and whereby the at least one tear cord can be pulled back to create a slit in the protective jacket to allow the protective jacket to be separated from the at least one metal tubes without damage to the outside surface of the at least one metal tube.	The rip cord 54 in <i>Hurley</i> is able to be pulled back to slit open jacket 50. Ex. 1006 at 143, ¶ 9. The resulting slit in jacket 50 in <i>Hurley</i> can be used to remove the jacket without scratches or gouges to the surface of separation layer 52. Ex. 1006 at 143, ¶¶ 4 & 7.
15. The encapsulated cable of claim 14 wherein at least one of the metal tubes contains therein a fiber optic cable, electrical wire or data communication cable.	<i>Hurley</i> teaches “bundles 42 of optical fibers 44 may be stranded around an electrical component, for example, a coaxial cable or other Suitable electrical components.” Ex. 1004, col. 10, lines 53-55.

Claim	<i>Hurley</i> in Light of <i>Blew</i>
25. The jacketed metal tube of claim 1 further comprising a plurality of substantially straight metal tubes with the same planar axis of orientation	See claim 1, <i>supra</i>. Figure 2 of <i>Blew</i> shows “two electrically conductive wires 18 and 19” (col. 3, lines 49-50), with “a steel center or core 20 and a surrounding layer of copper cladding 22,” <i>i.e.</i>, a tube (col. 3, lines 60-61). Both copper-clad wires are shown to be substantially straight, with the same planar axis of orientation.  Modifying <i>Hurley</i> with the teachings of <i>Blew</i> results in a multiplicity of separation layers (tubes) covered by a jacket.
wherein at least one metal tube is surrounded by a second protective jacket,	<i>Hurley</i> depicts a “conventional fiber optic cable” (Ex. 1004, col. 4, lines 6-8) with “a cable jacket 18 extruded about the bundles 12 of optical fibers 14, and an optional ripcord 22 for facilitating removal of cable jacket 18” (<i>id.</i>, col. 1, lines 30-32). “Each bundle 12 of optical fibers 14 further includes a jacket 28 that surrounds the plurality of optical fibers, and an optional ripcord 20 for facilitating removal of jacket 28” (<i>id.</i>, col. 1, lines 50-53). In <i>Hurley</i>, Jacket 18 (red) covers jacket 28 (green):

Claim	<i>Hurley in Light of Blew</i>
	 Ex. 1004, Fig. 1.
and wherein a second tear cord is located between the first protective jacket and the second protective jacket.	In <i>Hurley's</i> configuration, ripcord 22 for removal of jacket 18 is adjacent to the outer surface of jacket 28:  See Ex. 1004, col. 1, lines 30-32.

C. The Board Should not Use Its Discretion to Deny Institution

Section 314(a) of the Patent Statute does not require the Director to institute an *inter partes* review. See *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“[T]he PTO is permitted, but never compelled, to institute an IPR proceeding.”). Rather, a decision whether to institute is within the Director’s discretion. See 37 C.F.R. § 42.4(a); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct.

2131, 2140 (2016). The statute sets forth two bases for consideration in determining whether to exercise discretion in denying institution in light of what occurred during prosecution: 1) whether the same or substantially the same prior art was presented to the Office; and 2) whether the same arguments were previously presented to the Office. 35 U.S.C. § 325(d).

Petitioner acknowledges that substantially the same art was considered during reexamination of the ‘565 Patent. However, the Examiner did not consider the irrelevance of limitations directed to purpose that the Patent Owner added during reexamination, discussed above with regard to claim construction. Similarly, the Examiner did not consider the non-binding nature of the preamble in claim 18. As such, the Board should not exercise its discretion in denying institution.

The factors to consider related to arguments previously made to the Office are (d) the extent of the overlap between the arguments made during examination and the manner in which petitioner relies on the prior art: 1) the extent of the overlap between the arguments made during examination and the manner in which petitioner relies on the prior art; 2) whether petitioner has pointed out sufficiently how the examiner erred in its evaluation of the asserted prior art; and 3) the extent to which additional evidence and facts presented in the petition warrant reconsideration of the prior art or arguments. *See Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (PTAB Dec. 15, 2017) at 17-18.

Each of these factors turns on one simple truth – to overcome the prior art cited during reexamination, the Patent Owner added limitations directed to purposes, *i.e.*, “for use in downhole applications relating to hydrocarbon extraction” to claim 1 of the ‘565 Patent.” (Ex. 1002, col. 1, lines 31-32), and “to convey hydraulic fluid.” (*Id.*, col. 1, line 52). The Examiner did not raise the impropriety of adding such limitations to apparatus claims during reexamination. Rather, as discussed above, the Patent Owner touted the purported purpose of the claimed invention as providing the requisite non-obviousness over the prior art. There is, therefore, no overlap on this issue between the instant Petition and reexamination. The Petition also points out the precedent rendering these limitations ineffective in distinguishing the claimed invention over the prior art. Finally, this newly-presented ineffectiveness warrants reconsideration of the art previously considered by the Office. As such, the Board should not exercise its discretion in denying institution in this matter.

VIII. CONCLUSION

This Petition demonstrates a reasonable likelihood that at least one claim of the ‘565 Patent is unpatentable under 37 C.F.R. § 42.108(c). Accordingly, the requested review should be instituted in its entirety.

Respectfully submitted by

K&L GATES LLP,

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Darlene F. Ghavimi-Alagha
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Certification of Service Under 37 C.F.R. § 42.6(e)(4)

A copy of this Petition for *Inter Partes* Review and supporting materials has been served at the following correspondence address of record for the subject patent via USPS Certified Mail on this 5th day of May, 2023:

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Certification of Word Count Under 37 C.F.R. §42.24(d)

The undersigned hereby certifies that the foregoing Petition for *Inter Partes* Review contains 10,466 words, not including a table of contents, table of authorities, mandatory notices under §42.8, certificate of service, certificate of word count, and appendix of exhibits or appendix of claim listing as specified by 37 C.F.R. §42.24, according to the word count feature of the word-processing software used to prepare the Petition.

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