

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FMC TECHNOLOGIES, INC.,
Petitioner,

v.

ONESUBSEA IP UK LIMITED,
Patent Owner.

Case IPR2016-00328
Patent 8,540,018 B2

Before JOSIAH C. COCKS, CARL M. DEFRANCO, and
MICHELLE N. WORMMEESTER, *Administrative Patent Judges*.

DEFRANCO, *Administrative Patent Judge*.

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

I. INTRODUCTION

OneSubsea IP UK Limited (“OneSubsea”) is the owner of U.S. Patent No. 8,540,018 B2 (“the ’018 patent”). FMC Technologies, Inc. (“FMC”) filed a Petition (Paper 2, “Pet.”) seeking *inter partes* review of claims 1–9, 14, and 34–38 of the ’018 patent. We instituted *inter partes* review of all the challenged claims (Paper 8, “Inst. Dec.”) because FMC demonstrated a “reasonable likelihood” of prevailing on “at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a).

After institution, OneSubsea filed a Patent Owner Response (Paper 13, “PO Resp.”), and FMC followed with a Reply (Paper 18, “Pet. Reply”). With our authorization, OneSubsea filed a Sur-Reply (Paper 24, “PO Sur-Reply”). We conducted a hearing on March 29, 2017, during which the parties presented their respective cases. Paper 28 (“Tr.”).

We have jurisdiction over these proceedings under 35 U.S.C. § 6(b). After considering the evidence and arguments of the parties, we determine that FMC has proven by a preponderance of the evidence that claims 1–9, 14, and 34–38 of the ’018 patent are unpatentable. *See* 35 U.S.C. § 316(e). We issue this Final Written Decision pursuant to 35 U.S.C. § 318(a).

II. BACKGROUND

A. *The Related District Court Action*

The ’018 patent is involved in a concurrent district court case, *OneSubsea IP UK Limited v. FMC Technologies, Inc.*, Case No. 4:16-cv-00051 (S.D. Tex.), which commenced March 30, 2015, as transferred from Case No. 2:15-cv-00445 (E.D. Tex.). Paper 6. The district court case is

currently stayed pending resolution of this proceeding and three related proceedings.

B. The '018 Patent

The '018 patent relates to a subsea Christmas tree system for an oil or gas well. Ex. 1001, 1:53–60. Subsea Christmas trees are well known in the art of oil and gas wells, and comprise an assembly of pipes, valves, and fittings for controlling the flow of oil and gas from the wellhead to a subsea production flow line. *Id.* The particular subsea Christmas tree of the '018 patent includes a “diverter assembly,” connected to a “wing branch” of the tree, for diverting fluid flow from its “usual path” in the tree to a “processing apparatus,” followed by recovery and return of the processed fluid to the branch of the tree for communication with the production flow line. *Id.* at 2:46–3:44, 4:42–54.

C. The Challenged Claims

Of the challenged claims, three are independent—claims 1, 34, and 38. Claim 1 is directed to a “subsea system” for connection with an oil well bore, and claims 34 and 38 are directed to a “subsea tree assembly” that provides fluid communication between an oil well bore and a production flowline. Claims 2–9 and 14 depend from claim 1, while claims 35–37 depend from claim 34. Claim 1 is illustrative of the challenged claims:

1. A subsea system, comprising:
 - a manifold configured to communicate with a well bore, wherein the manifold comprises a branch;
 - a diverter assembly directly coupled to the branch; and
 - a bypass conduit coupled to the diverter assembly, wherein the bypass conduit is configured to couple to the well bore whilst bypassing at least a part of the branch;

wherein the manifold is connected to a processing apparatus via the bypass conduit.

Ex. 1001, 34:32–40.

D. The Instituted Grounds

In its Petition, FMC asserts seven grounds that include anticipation under 35 U.S.C. § 102 and obviousness under 35 U.S.C. § 103. Pet. 4. Although we instituted *inter partes* review on all the challenged claims, we declined review of two of the asserted grounds. Inst. Dec. 10. The grounds on which we granted review are as follows.

Reference(s)	Basis	Claims Challenged
Kelly ¹ and Bednar ²	§ 103	1–6, 9, and 14
Kelly, Bednar, and Fenton ³	§ 103	1, 7, 9, and 14
Bednar	§ 102	1–6, 8, 9, and 14
Bednar and Fenton	§ 103	1, 7, 8, 9, 14, and 34–38
Gatherar ⁴ and Fisher ⁵	§ 103	34–38

In support of these grounds, FMC proffers the declaration of Robert Herrmann (Ex. 1003).

III. ANALYSIS

A. APA Due Process

We instituted *inter partes* review of the challenged claims because, pursuant to 35 U.S.C. § 314(a), FMC demonstrated a “reasonable likelihood” of proving that “at least 1 of the claims challenged in the

¹ U.S. Patent No. 4,589,493, iss. May 20, 1986 (Ex. 1004, “Kelly”).

² U.S. Patent No. 5,010,956, iss. Apr. 30, 1991 (Ex. 1007, “Bednar”).

³ U.S. Pat. App. No. 2002/0070026 A1, pub. June 13, 2002 (Ex. 1005, “Fenton”).

⁴ U.S. Patent No. 6,481,504 B1, iss. Nov. 19, 2002 (Ex. 1006, “Gatherar”).

⁵ U.S. Patent No. 4,190,114, iss. Feb. 26, 1980 (Ex. 1008, “Fisher”).

petition” is unpatentable, namely, claims 1 and 34. Inst. Dec. 4–6, 8–9. After deciding that claims 1 and 34 met the threshold for institution, we exercised our discretion under 37 C.F.R. § 42.108(b) to institute on *all* the challenged claims. *Id.* at 6–7 (citing *Intex Recreation Corp. v. Bestway Inflatables & Material Corp.*, IPR2016-00180, Paper 13, at 8–11 (PTAB June 6, 2016)).

OneSubsea argues that we overstepped our statutory authority and violated its due process rights “[b]y failing to perform a claim-by-claim analysis” for all the claims in our institution decision and by failing to provide it “with notice of the facts and arguments” in support thereof. PO Resp. 79–82. Citing 35 U.S.C. § 314, OneSubsea argues that “[t]he Board is required to first determine that there is a reasonable likelihood that the petitioner will prevail with respect to *the claims* being challenged” before instituting an *inter partes* review. *Id.* at 81 (emphasis added). We disagree.

OneSubsea fails to recognize the critical language of the statute. The statute does not require that the threshold for institution must be met for “the claims,” as OneSubsea urges. Instead, the statute requires simply that the threshold must be met with respect to “*at least 1* of the claims challenged in the petition.” 35 U.S.C. § 314(a) (emphasis added). Thus, contrary to what OneSubsea argues, we did not need to analyze all the challenged claims individually, for the statutory threshold need only be applied to one claim, not all the claims.

Nor did we need to analyze all the asserted grounds individually, for, again, the statute requires simply that one claim “in the petition” meet the threshold, not one claim in each ground. *Id.* Indeed, section 314(a) of the statute omits the term “ground” altogether, despite its express mention in

preceding sections of the statute. *See, e.g.*, 35 U.S.C. § 311(b) (“a petitioner . . . may request to cancel . . . claims of a patent only on *a ground* that could be raised under section 102 or 103”) (emphasis added); 35 U.S.C. § 312(a) (“A petition . . . may be considered only if— . . . the petition identifies . . . *the grounds* on which the challenge to each claim is based.”) (emphasis added). That clear omission of the term “ground” from section 314(a) supports that the threshold for institution need only be met for one claim in the petition, not one claim in each ground. As such, our substantive analysis of only a subset of the challenged claims as a precursor to exercising our discretion to institute on all the challenged claims satisfies our statutory obligation of determining a reasonable likelihood for “at least 1 of the claims challenged in the petition.”

Our discretionary decision to institute on all the challenged claims after analyzing only some of those claims is also consistent with our regulatory authority. For instance, 37 C.F.R. § 42.108(c) tracks the language of the statute and precludes institution on “a ground of unpatentability unless the Board decides that *the petition* supporting the ground would demonstrate that there is a reasonable likelihood that at least one of the claims challenged in *the petition* is unpatentable.” (Emphases added). Like 35 U.S.C. § 314(a), the purpose of that rule is simple—it sets a minimum threshold for exercising our discretion to institute an *inter partes* review. While subsections (a) and (b) of the rule permit us discretion to institute on “all or some” of the claims and grounds, subsection (c) limits that discretion by requiring that “at least one claim in the petition” satisfy the “reasonable likelihood” standard. In other words, the rule is permissive—it does not

state that we *must* address the merits of each challenged claim and asserted ground, only that we do so for at least one claim in *the petition*.

Had the rule meant to invoke a more stringent requirement that one claim *in each ground* meet the threshold, the rule would have omitted reference to “the petition” and, instead, required “*the ground* would demonstrate that there is a reasonable likelihood” and “one of the claims challenged *in the ground* is unpatentable.” It does not. An interpretation that emphasizes mention of “the ground” over “the petition,” in essence, reduces the latter term to nothing more than unnecessary surplus verbiage. We cannot interpret our rules in a manner that renders words meaningless.⁶ As such, 37 C.F.R. § 108(c) is best understood to require that at least one claim in the petition meet the minimum threshold, not one claim in each asserted ground.

In exercising our discretion under 37 C.F.R. § 42.108, we grouped the grounds in the Petition along the lines of where we perceived a significant overlap or meaningful distinction in terms of the references relied upon. *Cf. Shaw Indus. Grp, Inc. v. Automated Creel Sys., Inc.*, 817 F.3d 1293, 1298–99 (Fed. Cir. 2016) (expressing concern with Board’s exercise of discretion where it “made no specific findings that the three grounds overlapped with one another”). We found that some grounds overlapped significantly in terms of the primary reference relied upon, while other grounds differed sufficiently despite some overlap of secondary references. Specifically, we divided the grounds into three groups—(1) the grounds that overlap in terms

⁶ Each word must have meaning and purpose. An interpretation that would render a word in our rules redundant or meaningless is rarely, if ever, correct.

of Bednar as a key reference, (2) the grounds that overlap in terms of Kelly as a key reference without Bednar, and (3) the ground that includes Gatherar and Fisher. Inst. Dec. 4, 7, 8, respectively. At the outset, we denied review of the claims challenged in the group that relied on Kelly without Bednar because FMC failed, first, to show that Kelly possessed all elements of independent claim 1, and, second, to comply with the requirements under 37 C.F.R. § 42.104(b) for independent claims 34 and 38. *Id.* at 7–8. We then analyzed the merits of one claim in each of the two remaining groups—claim 1 as challenged in the Bednar-based grounds (*id.* at 4–6), and claim 34 as challenged in the Gatherar and Fisher ground (*id.* at 8–9)—and found that they met the “reasonable likelihood” standard for institution.

Upon determining that at least one claim in each group met the statutory threshold, we then explained our reason for exercising discretion to institute on all the remaining claims under challenge—to achieve consistency and efficiency between the related district court action and the instant proceeding. *See id.* at 6; *cf. Shaw Indus.*, 817 F.3d at 1304 (concurring op.) (expressing concern that the Board’s institution decision “say[s] nothing about efficiency” as rationale for exercising discretion); *see also Synopsys, Inc. v. Mentor Graphics Corp.*, 814 F.3d 1309, 1325 (Fed. Cir. 2016) (dissenting op.) (expressing concern that partial institution “negates the AIA’s purpose of providing an alternative and efficient forum for resolving patent validity issues”). We further explained that “concerns of fairness and efficiency in this case” persuade us to institute on grounds of anticipation *and* obviousness that rely on Bednar as a basis of the challenge. Inst. Dec. 6–7 (citing *HP Inc. v. MPHJ Tech. Inv., LLC*, 817 F.3d 1339, 1347 (Fed. Cir. 2016) (holding that petitioner was “not estopped from

raising the obviousness of claim 13 in a subsequent court or Board proceeding” where Board instituted only on grounds of anticipation of claim 13)).

An analysis of each and every claim, and each and every ground, in the petition is not a prerequisite to institution. *See Genzyme Therapeutic Prods. Ltd. v. Biomarin Pharm. Inc.*, 825 F.3d 1360, 1366 (Fed. Cir. 2016) (“There is no requirement, either in the Board’s regulations, in the APA, or as a matter of due process, for the institution decision to anticipate and set forth every legal or factual issue that might arise in the course of the trial.”) (citing *Boston Carrier, Inc. v. ICC*, 746 F.2d 1555, 1560 (D.C. Cir. 1984) (quotation omitted)). In granting institution, we addressed FMC’s first ground and explained why Bednar sufficed as proof of a reasonable likelihood of anticipation of claim 1. Inst. Dec. 4–6. And, because that first ground overlapped significantly with FMC’s other grounds relying on Bednar, we exercised our discretion under 37 C.F.R. § 42.108 to institute on *all* claims challenged within those grounds, namely, claims 1–9, 14, and 34–38. *Id.* at 6–7. Similarly, with respect to FMC’s last ground, we explained how Gatherar and Fisher sufficed to show a reasonable likelihood of obviousness with respect to claim 34, and again exercised our discretion to review *all* claims challenged within that ground, namely, claims 34–38. *Id.* at 8–9. Our decision to streamline the institution proceeding by analyzing substantively only a subset of the challenged claims is fully within our statutory and regulatory authority, as discussed above, and, thus, is reasonable.

Moreover, our institution decision provided the parties with full notice of “the matters of fact and law asserted” to permit them “to submit rebuttal

evidence, and to conduct such cross-examination as may be required for a full disclosure of the facts.” *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1080 (Fed. Cir. 2015) (citations omitted). The Board is not precluded from “relying on arguments made by a party and doing its job, as adjudicator, of drawing its own inferences and conclusions from those arguments . . . *subject, of course, to the provision of adequate notice and opportunity to be heard.*” *Rovalma, S.A. v. Bohler-Edelstahl Gmbh & Co. KG*, Appeal No. 2016-2233, slip op. at 14 (Fed. Cir. May 11, 2017) (emphasis added). In the preliminary proceeding, we considered the parties’ arguments and concluded they warranted exercising our discretion to institute on all the challenged claims. That our institution decision came at the outset of the proceeding, and informed the parties of the claims and grounds on which trial would center, gave the parties adequate notice and opportunity to be heard on the pertinent facts and issues that would be ultimately resolved at trial. *See* Inst. Dec. 10 (“Order” specifying grounds for trial).

Our final written decision today does not depart from, nor is it inconsistent with, the initial theory laid out in our institution decision. *See Belden*, 805 F.3d at 1080 (“[A]n agency may not change theories in midstream without giving respondents reasonable notice of the change’ and ‘the opportunity to present argument under the new theory.’”) (quoting *Rodale Press, Inc. v. FTC*, 407 F.2d 1252, 1256–57 (D.C. Cir. 1968)).

B. Claim Construction

In an *inter partes* review, we give claim terms in an unexpired patent their broadest reasonable construction in light of the specification of the patent in which they appear. *Cuozzo Speed Techs. LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016). Under that standard, we ascribe claim terms their

ordinary and customary meaning, as understood by a skilled artisan in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Our construction of claim terms “cannot be divorced from the specification and the record evidence.” *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015) (quoting *In re NTP, Inc.*, 654 F.3d 1279, 1288 (Fed. Cir. 2011)).

In its Petition, FMC does not propose any claim terms for construction. Pet. 6. OneSubsea, in turn, proposes six claim terms for construction, relying primarily on constructions advanced in the related district court case. PO Resp. 8–13. FMC replies that two of the constructions proposed by OneSubsea are improper because they differ from what OneSubsea argued in the district court case and are narrower than the “broadest reasonable interpretation” mandated by our proceedings. Pet. Reply 3–6; *see Cuozzo*, 136 S. Ct. at 2144–46. We address each of the claim terms in question as follows.

1. “assembly”

Claims 1–9 recite the term “diverter assembly,” while claims 34–38 include simply the term “assembly.” The Petition addresses neither of these terms. Because OneSubsea raises them in its Patent Owner Response, we consider the proper construction of, first, the term “assembly,” and next, the term “diverter assembly.”

OneSubsea argues that the term “assembly” should be interpreted as “a *complete structure* composed of fitted together parts.” PO Resp. 8 (emphasis added). In support, OneSubsea proffers a general definition of “assembly” from Webster’s Dictionary—“the fitting together of manufactured parts into a complete machine, structure, or unit of a

machine.” *Id.* (citing Ex. 2008, 69). OneSubsea also proffers a definition of “assembly” from an oil industry handbook—“A term to describe a number of special pieces of equipment fitted together to perform a particular function” *Id.* (citing Ex. 2007, 18).

FMC replies that OneSubsea’s construction is “narrower” than an interpretation of “assembly” proposed by OneSubsea in the related district court action. Pet. Reply 3. There, OneSubsea represented that the term “diverter assembly” means simply “a multipart device for directing,” whereas now OneSubsea argues for a more comprehensive meaning—“a complete structure of fitted together parts for directing.” *Compare* Ex. 1021, 2–4 *with* PO Resp. 8–11. In that regard, FMC complains that OneSubsea is attempting to interpret an “assembly” as a “unitary structure.” *Id.* We agree.

At the outset, we note that OneSubsea’s citation from Webster’s Dictionary leaves out the additional definition of “assembly” as “a collection of parts.” Ex. 2008, 69. That definition is more in alignment with the one OneSubsea proffers from the oil industry handbook, which defines “assembly” as “a number of special pieces of equipment fitted together to perform a particular function” Ex. 2007, 18. Neither of those definitions requires that an “assembly” be a “complete structure,” as OneSubsea now urges. Even OneSubsea’s expert admitted that the term “complete” is an “arbitrary” term that adds nothing “about what [to] decide is going to be an assembly and what’s not going to be an assembly.” Ex. 1015, 80:1–5. As such, OneSubsea’s addition of the term “complete” sheds no light on how a skilled artisan would have understood the relationship of parts that make up an “assembly.” We reject OneSubsea’s attempt now to

construe the term more narrowly than it did in the district court action. As such, we construe “assembly” as “a multipart device.”

2. “*diverter assembly*”

With respect to the term “diverter assembly,” FMC argues it means “a multipart device *for directing*” because that was the interpretation OneSubsea proposed in the district court action. Pet. Reply 3 (citing Ex. 1021, 2–4). OneSubsea argues the term should be construed as “a complete structure composed of fitted together parts *for directing fluid*.” PO Resp. 10–11. OneSubsea’s construction, however, is premised on its previous construction of the term “assembly” as a “complete structure,” which we have already rejected. Thus, the only remaining issue is construction of the term “diverter.”

Both parties agree that the term “diverter” means “directing.” PO Resp. 10; Pet. Reply 5. We note that the district court construed the term “divert,” after conducting a *Markman* hearing, to mean “the direction of the fluid’s flow is forced to change from its current flowpath to a different flowpath.”⁷ Ex. 2012, 7. That construction is consistent with the plain and ordinary meaning of “divert” as “to turn in opposite directions . . . to turn aside : DEVIATE . . . to turn from one course or use to another : DEFLECT.” Ex. 3002 (Webster’s Dictionary). While the terms “forced” and “different flowpath” may not be necessary under our BRI⁸ standard, neither party explains why we should disregard the district court’s

⁷ The district court only had an opportunity to construe several but not all of the terms in dispute here before the case was stayed pending completion of our proceedings.

⁸ BRI stands for “broadest reasonable interpretation.”

construction entirely. We view the parties' proposed construction of "diverter," i.e., "directing," as unreasonably broad when viewed in the context of the claim and specification as a whole. Accounting for the district court's construction, with an eye toward the BRI standard of our proceedings, we construe the term "diverter assembly" to mean "a multipart device that changes the course or direction of a fluid's current flowpath."

3. *"bypass conduit"*

Claims 1, 3, 8, and 14 recite the term "bypass conduit." The '018 patent does not impart any special definition to the term. Ex. 1001, 5:57–59, 6:17–22, 31:27–29. In our institution decision, we determined that "[b]y definition, a bypass carries fluid 'around a part and back to the main stream.' . . . In other words, a bypass serves as an alternative flow path for the fluid." Inst. Dec. 7 (citing Ex. 3001 (Webster's Dictionary)). We see no reason to change that construction now. Accordingly, we construe "bypass conduit" to mean "a conduit that serves as an alternative flow path for the fluid."

4. *"within"*

Dependent claim 2 recites the term "within." OneSubsea proposes a construction to mean "inside." PO Resp. 11–12. That construction comports with the dictionary definition of "within" as "in or into the interior: inside." Ex. 2008, 1359. FMC proposes a construction that relies on extrinsic evidence, which we do find helpful. *See* Pet. Reply 5. Adopting the plain and ordinary meaning of the term as found in the dictionary, we construe the term "within" to mean "inside or into the interior of."

5. *"tree"*

Claims 34, 37, and 38 recite the term "tree." The specification of the '018 patent explains that:

Christmas trees are well known in the art of oil and gas wells, and generally comprise *an assembly of pipes, valves and fittings installed in a wellhead* after completion of drilling and installation of the production tubing to control the flow of oil and gas from the well.

Ex. 1001, 1:53–57 (emphasis added). To that end, the parties agreed in the related district court action that the proper construction of “tree” is “an assembly of pipes, valves and fittings installed between the wellhead and the flowline.” Ex. 1021, 1; Ex. 2009, 3. We see no reason depart from the parties’ agreed-upon construction of the term “tree” in the district court action, which comports with the specification’s definition of the term. As such, we adopt that same construction here.

6. “*flowline*”

Claims 14, 34, 37, and 38 recite the term “flowline.” The ’018 patent does not impart any special definition to this term. Ex. 1001, 30:61–63. At the district court, the parties agreed that the proper construction is “a pipeline extending outbound of the terminus of a subsea tree.” Ex. 2009, 3. OneSubsea’s expert testifies that this construction is consistent with how a skilled artisan would have understood the term. Ex. 2006 ¶ 67. We see no reason to depart from the parties’ agreed-upon construction in the district court action of the “flowline” term. As such, we adopt that same construction here.

C. *Obviousness Over Kelly and Bednar (Claims 1–6, 9, and 14)*

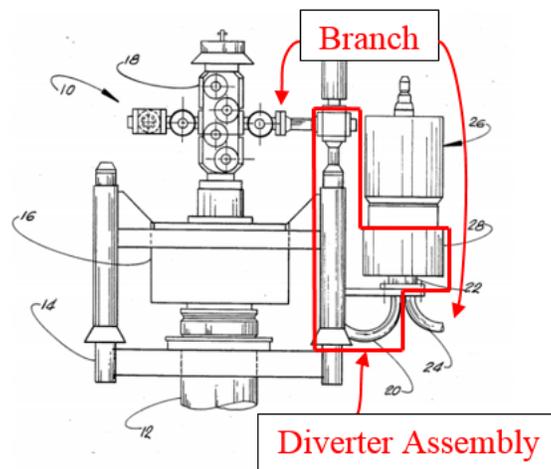
FMC challenges independent claim 1 and dependent claims 2–6, 9, and 14 as obvious over Kelly in view of Bednar. Pet. 27–35. FMC relies on Kelly to disclose all the elements of claim 1, with the exception of the

claimed “bypass conduit,” for which FMC relies on Kelly as modified by Bednar. *Id.*

1. *Independent Claim 1*

a. “manifold” and “branch”

Claim 1 begins by reciting a “manifold” connected to a well bore, wherein the manifold has a “branch.” FMC relies on figure 1 of Kelly, shown below, to illustrate how Kelly discloses the manifold and branch elements of claim 1.



Kelly, FIG. 1 (annotated)

Figure 1 of Kelly depicts a subsea tree with a branch extending outward and downward from the tree. According to FMC, Kelly’s “Christmas tree 18” is a manifold, and “line 20” and “line 24,” which extend laterally and vertically from the tree are a branch. Pet. 8–9 (citing Ex. 1004, 2:16–29, 2:58–62, Fig.1). FMC explains that branch line 20 provides a flow path to diverter assembly 22, while branch line 24 provides a flow path from diverter assembly 22 to the production flowline (not shown) at the terminus of line 24. *Id.*; see also Ex. 1003 ¶¶ 15–16.

FMC’s identification of Kelly’s tree as a manifold and lines 20 and 24 as a branch comports with the specification of the ’018 patent, which provides that “the manifold may comprise a christmas tree” and that “by ‘branch’ we mean any branch of the manifold, other than a production bore of a tree.” *Id.* at Ex. 1001, 2:62–65. Consistent with those definitions, we find that Kelly’s tree 18 comprises a manifold and that the flowpaths extending laterally and vertically from tree 18, including lines 20 and 24, represent a branch of the tree, which connects with a production flowline at the outlet of line 24.

b. “diverter assembly”

Central to this dispute is the “diverter assembly” of claim 1, which must be “directly coupled to the branch.” Although claim 1 does not further describe the diverter assembly, the specification explains that:

The diverter assembly could be located in a branch of the manifold (or a branch extension) in series with a choke. For example, in an embodiment where the manifold comprises a tree, the diverter assembly could be located between the choke and the production wing valve or between the choke and the branch outlet. Further alternative embodiments could have the diverter assembly located in pipework coupled to the manifold, instead of within the manifold itself. . . .

* * *

The invention provides the advantage that fluids can be diverted from their usual path between the well bore and the outlet of the wing branch.

Ex. 1001, 3:5–26.

FMC identifies Kelly’s “collet body 22” as meeting the claimed “diverter assembly.” Pet. 9. As shown above in figure 1 of Kelly, collet body 22 is coupled between branch lines 20 and 24. Ex. 1004, 2:22–25, Fig. 1. And, as shown below in figure 3 of Kelly, collet body 22 has a first

fluid path (“passage 64”) for directing fluid in a direction away from branch line 20 and a second fluid path (“passage 66”) for directing fluid in an opposite direction toward branch line 24. *Id.* at 2:58–65, Fig. 3. Figure 3 of Kelly, reproduced below, is an annotated sectional view of collet body 22 connected to a bypass conduit that directs fluid flow through a processing apparatus.

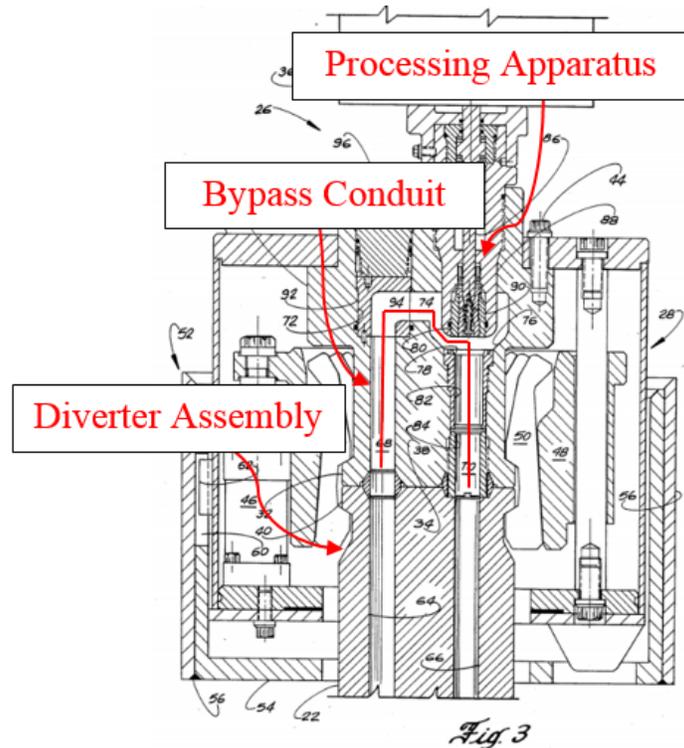


Fig 3
Kelly, FIG. 3 (annotated)

We construed a “diverter assembly” to mean “a multipart device that changes the course or direction of a fluid’s current flowpath.” In that regard, FMC explains that, “[r]ather than flowing directly from the ‘Christmas tree 18’ to the outlet of ‘line 24,’ the flow of fluids is turned, i.e., diverted, by ‘line 20’ and ‘collet body 22’ to flow into ‘subsea choke assembly 26,’ and fluids exiting ‘subsea choke assembly 26’ are returned by ‘collet body 22’ to the branch at ‘line 24.’” Pet. 9–10 (citing Ex. 1003 ¶ 16). We agree.

As illustrated in figures 1 and 3 of Kelly, fluids that would normally flow in a *direct* pathway from branch line 20 to branch line 24, and thereupon exit to the production flowline (not shown) at the outlet of line 24, instead are turned in a different direction to flow upward through choke assembly 26 before returning in an opposite direction and exiting through the outlet of branch line 24 to the production flowline. *See* Ex. 1003 ¶ 20 (“The separate flow paths of ‘collet body 22’ prevent direct flow between the branch inlet and the branch outlet by directing flow into ‘subsea choke assembly 26’ and from there to a portion of the branch near the end of ‘line 24’ in communication with the branch outlet.”). That evidence persuades us that Kelly’s collet body, which changes the flow path of the fluid in opposite directions, is a “diverter assembly,” as properly construed. Moreover, the diversion of the fluid from a direct pathway between branch lines 20 and 24 to a different pathway through Kelly’s collet body 22 is made clearer when Kelly is considered in the context of the modification taught by Bednar, as explained below.

c. “processing apparatus”

Claim 1 requires that the manifold be “connected to a processing apparatus.” According to the dependent claims, the “processing apparatus” may comprise a “flow rate measurement apparatus” (claim 7) or a “pressure regulation apparatus” (claim 36).

FMC identifies Kelly’s choke assembly 26 as a processing apparatus. Pet. 12–14. As described, Kelly’s subsea choke 26 is removably mounted between opposing pathways 64 and 66 in the diverter assembly and includes valve member 80 “to control the flow of production fluids therethrough.” *Id.* at 1:43–59, 2:66–3:9, Fig. 3. FMC’s expert further explains that valve

member 80 “is adjustable to control the fluid flow and pressure of the production fluids.” Ex. 1003 ¶ 17. Because the ’018 patent defines “pressure regulation” as a type of processing (*see, e.g.*, Ex. 1001, 36:61–66), FMC argues that Kelly’s choke, which controls pressure of the fluids, is a processing apparatus. Pet. 13–14.

OneSubsea responds that “nowhere is the choke referred to as a processing apparatus” in the specification of the ’018 patent. PO Resp. 55. Instead, according to OneSubsea, it discusses chokes and processing apparatuses “as separate concepts,” and “it never states that a choke is a type of processing apparatus.” *Id.* at 55–56 (citing Ex. 1001, 23:15–17). Relying on the testimony of its expert, OneSubsea explains that “[a] choke is simply a device that the operator can adjust to regulate how fast the oil/gas will flow from the well,” but “[a] choke does not provide any ‘processing’ functions.” *Id.* at 56 (citing Ex. 2006 ¶¶ 111–113).

We are not persuaded by OneSubsea’s arguments. Although the ’018 patent may refer to a choke and a processing apparatus separately, OneSubsea does not direct us to any language in the ’018 patent, or any other evidence for that matter, that precludes a choke from being a processing apparatus. On the other hand, FMC points to credible testimony from both its expert and OneSubsea’s expert as showing that Kelly’s choke is a processing apparatus. Pet. Reply 21; *see also* Pet. 14. For instance, FMC’s expert explains that Kelly’s choke assembly 26 is a processing apparatus because it “processes fluid by reducing fluid flow and pressure” between the well bore and the production flowline. Ex. 1003 ¶ 17. OneSubsea’s expert likewise agrees that Kelly’s choke is “used to control the well’s flow” (Ex. 2006 ¶ 67) and also acts to regulate pressure—“it’s

adjusting the choke which in turn will change your pressure of the well control, the pressure of the well” (Ex. 1016, 138:22–139:2). That testimony persuades us that Kelly’s choke assembly equates to a “processing apparatus,” especially given that claim 36 of the ’018 patent itself identifies “pressure regulation” as a type of processing.

d. “bypass conduit”

Claim 1 also requires “a bypass conduit coupled to the diverter assembly” for “bypassing at least a part of the branch.” For this element, FMC relies on Kelly as modified by Bednar. Pet. 31–32. First, FMC points out that Kelly has a conduit that mates with collet body 22 (i.e., the diverter assembly) and passes through choke assembly 26 (i.e., the processing apparatus) before returning to branch line 24. *Id.* at 11, 31. Annotated figure 3 of Kelly, shown below, illustrates the bypass conduit.

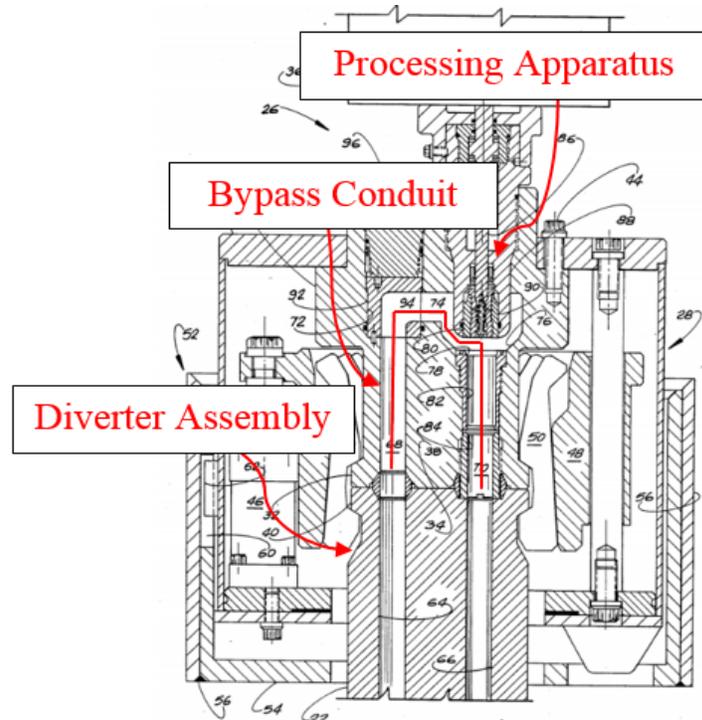


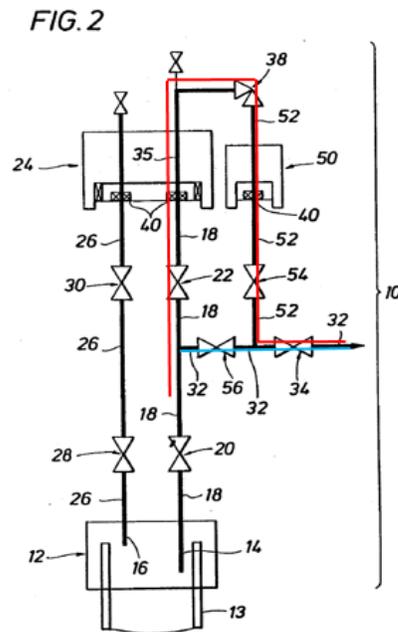
Fig 3
Kelly, FIG. 3 (annotated)

According to FMC, Kelly's bypass conduit begins at inlet 68, extends through passage 74, and exits at outlet 70. Ex. 1004, 2:58–3:11; 3:20–28; *see also* Ex. 1003 ¶ 16. As shown, the conduit changes the flowpath direction of the fluid as it passes through choke assembly 26. FMC acknowledges, however, that the conduit does not *bypass* a part of the branch, as required by claim 1, because there is no “established path” for fluid “to flow directly” from branch line 20 to branch line 24 without first passing through choke assembly 26. *Id.* at 10.

For teaching a more direct, alternative path between the branch lines, FMC turns to Bednar. Pet. 27–30. Like Kelly, Bednar teaches a “subsea tree assembly” having a retrievable choke. Ex. 1007, 2:55–3:2, 3:61–4:10, 4:58–5:17. For instance, Bednar describes an “improved design and piping arrangement [to] allow a choke to be incorporated into or removed from a subsea tree without requiring significant changes in an existing, typical tree design.” Ex. 1007, 2:57–61. The choke “may be easily retrieved” via a tree cap module incorporating the choke. *Id.* at 4:51–54; *see also id.* at 5:1–11 (describing that tree cap 24 permits “ease of choke retrieval” from subsea tree assembly 10 for “repair and replacement”).

Notably, in the “Background of Invention,” Bednar mentions “Kelly” as an existing design in which the choke can be “removed . . . without requiring the entire tree to be retrieved.” *Id.* at 1:42–55. While Kelly only has a single flowpath through its removable choke, Bednar improves upon Kelly by providing an alternative, direct flowpath to the production flow line in the event the subsea choke experiences a failure. *Id.* at 5:7–11. As explained by Bednar, its “improved design offers a significant advantage” over Kelly and other removable chokes because it can “continue producing

the well even after the choke experiences a failure, by isolating the failed choke from the main production flowstream.” *Id.* at 2:3–9. Bednar does this by providing alternative flowpaths from the wellhead to the production flowline, which as illustrated below in figure 2 of Bednar, include either a direct path to the production flowline (shown in blue) or an indirect path through the choke before proceeding to the production flowline (shown in red).

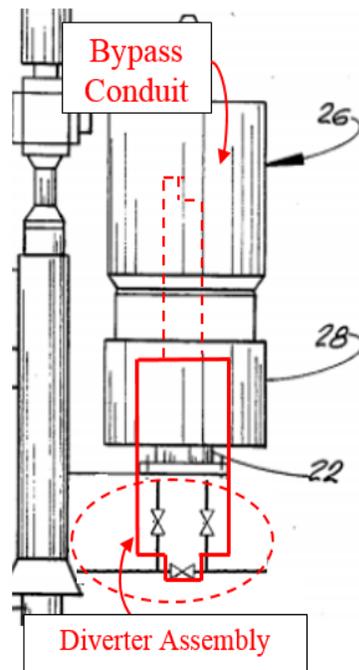


Bednar, FIG. 2 (annotated)

Annotated figure 2 of Bednar, reproduced above, depicts alternative flowpaths within Bednar’s subsea tree assembly. In particular, fluid from wellhead 13 can take a direct path (shown in blue) from “tree flow passage 18” to “production line 32” “directly through valves 20, 56, and 34”; or alternatively, fluid can take different course (shown in red) through valve 22, choke assembly 38, “return line 52,” and valve 54 before returning to “production line 32.” *Id.* at 2:66–3:2, 3:33–40, 3:61–4:10, 4:58–5:17, Fig. 2; Ex. 1003 ¶¶ 30, 42, 44.

FMC argues that a skilled artisan would have readily modified the system of Kelly, to add an alternative flow path, as taught by Bednar, because “it was commonly known to provide a selectively accessible alternative flow path in parallel with a retrievable choke to allow fluid production without passing through the choke.” Pet. 28–29 (citing Ex. 1003 ¶ 31). Specifically, FMC’s expert testifies that a skilled artisan would have simply incorporated “an additional conduit and series of valves,” such as Bednar’s “production crown valve 22,” “hub isolation valve 54,” and “flow loop isolation valve 56,” between Kelly’s branch lines 20 and 24, so as to “allow[] fluid to flow directly to the flowline in the event ‘subsea choke assembly 26’ has failed.” Ex. 1003 ¶¶ 31–33.

FMC submits an annotated figure from Kelly to illustrate how a skilled artisan would have modified Kelly’s branch lines 20 and 24 to provide a direct flow path to the production flowline, as taught by Bednar.



Kelly in view of Bednar, FIG. 2 (annotated)

Annotated figure 2 of Kelly, reproduced above, depicts Kelly's modified system incorporating Bednar's teaching of a direct flowpath to the production flowline without undergoing further processing. As shown, Kelly's modified system provides, first, a flowpath that bypasses a portion of the branch line and diverts fluid for processing through choke 26, and, second, a more direct, alternative flowpath that passes fluid directly to the production flowline. Ex. 1003 ¶¶ 34–35. As such, we find that Kelly as modified by Bednar teaches a bypass conduit coupled to a diverter assembly for bypassing a part of the branch and diverting fluid through a choke assembly for further processing.

e. Reason to Combine

According to FMC, a skilled artisan would have undertaken to modify Kelly's system with the alternative flowpath from Bednar because Kelly recognized the problem of "high wear rates" in wellhead chokes, and Bednar expressly describes that an advantage of its dual flowpaths is to permit production "even after subsea choke 38 experiences a failure." *Compare* Ex. 1004, 1:17–19 *with* Ex. 1007, 5:7–11; *see also* Ex. 1003 ¶¶ 32–33. In other words, adding the additional flow path of Bednar would have enabled Kelly's system to continue to operate when the choke was worn or removed for replacement.

We find FMC's reason to combine persuasive. A skilled artisan would have been motivated to modify the system of Kelly with the alternative flow path of Bednar because Bednar expressly teaches the benefit of having an alternative flow path in a subsea choke system. Ex. 1007, 5:5–17. And, given the simplicity of the structure of a direct flowpath, a skilled artisan would have reasonably expected to succeed in adding Bednar's

straightforward direct flow path between the branch lines already found in Kelly. A simple modification of that sort would have resulted in increased production from the well, as confirmed by FMC's expert. Ex. 1003 ¶¶ 32–33. Accordingly, we find that Kelly as modified by Bednar discloses a “bypass conduit” that is coupled to the diverter assembly and “bypass[es] at least a part of the branch,” as called for by claim 1.

In sum, we find that the combination of Kelly and Bednar teaches each of the elements of claim 1, and we further find that a skilled artisan would have combined those teachings in a manner that would have resulted in the claimed invention.

f. OneSubsea's Arguments in Rebuttal

OneSubsea faults FMC's combination of Kelly and Bednar because (1) a skilled artisan would not have combined the references, (2) the combination fails to teach the claimed “diverter assembly,” and (3) the combination also fails to teach the claimed “bypass conduit.” We address each argument in turn.⁹

Reason to Combine

In arguing that that a skilled artisan would not have combined Bednar with Kelly, OneSubsea argues that the modification of Kelly's flowpath to include Bednar's alternative flow path is “not a simple combination” because of Bednar's identification of the valves and piping in his arrangement of a subsea choke system. PO Resp. 31–34. We disagree that a

⁹ OneSubsea also argues that the combination fails to teach a “processing apparatus.” PO Resp. 55–56. However, given that we rely equally on the testimony of both OneSubsea's expert and FMC's expert to support our finding that Kelly discloses this element, we do not find this argument persuasive.

difference in labeling necessarily teaches against a reason to combine. OneSubsea's focus on labels disregards Bednar's broader suggestion of utilizing an alternative flowpath to maintain flow from the well bore in the event of a choke failure. Pet. 28–30. The combination would not require “reincorporating . . . components in Kelly at a different location when they already exist,” as OneSubsea urges. PO Resp. 31. OneSubsea's own expert admits that a valve has a particular name only because of its location, and that valve 22 serves as a crown valve in Bednar would not constrain a skilled artisan to only see it as a production crown valve in other contexts. Ex. 1015, 71:8–72:4. The same reasoning applies to tree flow passage 18. Further, OneSubsea's expert illustrates that the selection of “pipes, valves, and fittings” to provide a flowpath is routine. Ex. 1015, 19:4–9.

Ultimately, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference, but rather what the combined teachings of those references would have suggested as a whole to the skilled artisan. *In re Keller*, 642 F.2d 413, 425, (CCPA 1981). Bednar expressly suggests an alternative flowpath in parallel with a choke flowpath such as Kelly's, even referencing Kelly in the process. Contrary to what OneSubsea argues, we find persuasive the testimony of FMC's expert that a skilled artisan would have easily understood the appropriate “pipes, valves, and fittings” necessary to create such an alternative flowpath in Kelly without undue experimentation.

OneSubsea next argues that a skilled artisan would not incorporate Bednar's alternative flowpath into Kelly's system because “Kelly teaches away from operating its system without a choke.” PO Resp. 34–35.

According to OneSubsea, “Kelly’s system is designed to *always* operate with a choke” in order “to permit the combination of each well’s production flowlines into a single, subsea gathering flowline.” *Id.* In support of this argument, OneSubsea relies on the testimony of its expert that a skilled artisan “would not be motivated to build a flow path around Kelly’s choke, because when the choke needed to be replaced, Kelly’s well would have been shut down and the choke retrieved to the surface.” *Id.* at 35 (citing Ex. 2006 ¶¶ 88–89).

We do not find that testimony persuasive because Kelly states, at the outset, that the purpose of its retrievable choke is to avoid “the time and expense involved in ‘killing’ the well and retrieving the tree.” Ex. 1004, 1:13–17. Nowhere does OneSubsea’s expert address Kelly’s express disclosure of using “redundant pressure containing valves” to avoid turning off the well when the choke is in need of repair. *Id.* Nor does OneSubsea’s expert address Kelly’s express recognition that, depending on the well, different arrangements of flowlines “would be routed from the subsea tree, along the ocean floor, to a gathering ship or platform.” *Id.* at 1:20–24. In that regard, Kelly recognizes that “since various wells in a given field may not all have the same pressure[,] their production cannot be commingled into one flow line.” *Id.* at 1:24–27. Although Kelly mentions one advantage of its choke assembly is that it can be used where wells are comingled into a “single gathering line” (*id.* at 1:35–40), Kelly never forecloses its use in a multiple gathering system where flowlines “cannot be comingled” (*id.* at 1:24–27). In other words, Kelly leaves open the possibility of using its retrievable choke in either a single line gathering system or a multiple line gathering system. OneSubsea’s expert never addresses Kelly’s recognition

of the latter type of system. As such, we are not persuaded by his testimony that Kelly's system has no need for an alternative path because it would have been shut down.

OneSubsea argues that Bednar "explicitly rejected" the idea of its alternative flowpath being used with Kelly. PO Resp. 36. We disagree, as the evidence indicates otherwise. In the "Background of Invention," Bednar discusses two prior art subsea trees, one by "Kelly" and another by "Lochte," in which the choke assembly can be "removed . . . without requiring the entire tree to be retrieved." Ex. 1007, 1:42–55. Bednar then concludes that its "improved design offers a significant advantage" over those prior art subsea chokes because it can "continue producing the well even after the choke experiences a failure, by isolating the failed choke from the main production flowstream." *Id.* at 2:3–9; *see also id.* at 5:7–17 ("the advantages of the arrangement shown in FIG. 2 is that the wellbore may be produced through tree assembly 10 even after subsea choke 38 experiences a failure."). We do not view Bednar's disclosure as discouraging its combination with Kelly. Certainly Bednar finds fault with Kelly's system, but Bednar offers a solution—"isolating the failed choke from the main production flowstream." *Id.* at 2:3–9. In that regard, a skilled artisan would have understood Bednar to be suggesting application of his solution to the only two retrievable choke assemblies mentioned in the background of invention, namely Kelly and Lochte. Thus, we find that Bednar's solution has clear application to Kelly and that a skilled artisan would have viewed it as such.

Diverter Assembly

OneSubsea next argues that Kelly and Bednar fail to disclose the claimed “diverter assembly” because their “individual components are neither a complete structure nor are they fitted together.” PO Resp. 37–42. That argument hinges on OneSubsea’s proposed construction of the term “assembly,” which we rejected as discussed above. *See supra* section III.B.1. In any event, OneSubsea mischaracterizes FMC’s combination of Kelly and Bednar as “arbitrarily designating several individual, unconnected parts” to be an assembly. *Id.* at 37–38. In doing so, OneSubsea focuses on the *entire* arrangement of parts making up Bednar’s system, without ever addressing FMC’s actual assertion of combining simply the few parts making up Bednar’s alternative flow path with Kelly’s clear disclosure of a complete and integral assembly of fitted together parts. *Id.* at 39–41. OneSubsea ignores that a skilled artisan would have understood the importance of maintaining the integrity and relationship of Kelly’s assembly when incorporating Bednar’s alternative flow path, as attested to by FMC’s expert. Accordingly, we reject OneSubsea’s argument that a skilled artisan would not have understood how to combine Kelly and Bednar to form a “diverter assembly” of fitted together parts.

OneSubsea argues that even if Kelly discloses a diverter assembly, it is not “coupled to the branch,” as required by claim 1. PO Resp. 41–52. According to OneSubsea, Kelly’s diverter assembly is “attached to flowlines 20 and 24 and not the branch of [] Kelly’s tree because they extend outside the subsea tree.” *Id.* at 42. First, that argument is premised on Kelly’s lines 20 and 24 not comprising a “branch” of the manifold. In the related district court action, both parties agreed that the term “branch” is properly construed

to mean “an offshoot from a flowpath such as the production bore or the annulus bore, but does not include the production bore or the annulus bore.” Ex. 2012, 7. That construction is consistent with the specification of the ’018 patent, which equates a “branch of the manifold” to a “branch extension” or “pipework coupled to the manifold, instead of within the manifold itself.” Ex. 1001, 3:5–14. In other words, the “branch” is not limited necessarily to the confines of the manifold, but may encompass pipework coupled to the manifold. Here, Kelly’s lines 20 and 24 comprise a branch because they are pipework coupled to and extending from manifold 18. Ex. 1004, Fig. 1. Thus, we find that a skilled artisan would have considered Kelly’s lines 20 and 24 to be branches of subsea tree 18, to which Kelly’s collet body 22, i.e., diverter assembly, is coupled.¹⁰

Bypass Conduit

OneSubsea argues that Kelly as modified by Bednar “does not bypass anything, let alone a branch.” PO Resp. 52. In making this argument, OneSubsea ignores the very feature of Bednar that is incorporated into Kelly from the modification, namely, the alternative path. Moreover, OneSubsea

¹⁰ We also reject OneSubsea’s argument that lines 20 and 24 of Kelly cannot be a branch “because they extend outside the subsea tree.” PO Resp. 42; *see also id.* at 44 (“they are pipelines extending outside the tree”). According to OneSubsea, Kelly’s tree is defined by guideposts 14. PO Resp. 44–45. We disagree. Kelly states that “adjustable chokes could be installed directly onto the subsea trees” and identifies collet body 22 as the place where choke 26 is installed. Ex. 1004, 1:35–36. That Kelly’s choke is installed on collet body 22, which lies outside of guide posts 14, runs counter to OneSubsea’s definition of the bounds of a tree. *Id.*, Figs. 1, 2 (depicting collet body 22 outside of frame 14). As such, OneSubsea does not persuade us that Kelly’s branch lines 20 and 24 are not part of tree 18.

imports extraneous limitations into the claim by reading the requirement that the bypass conduit is “configured to couple to the wellbore” as requiring that it be “configured to *directly* couple to the wellbore.” But nowhere does claim 1 recite such a requirement, despite using that modifier elsewhere in the claim, i.e., “a diverter assembly directly coupled to the branch.” Ex. 1001, 34:35. That the bypass conduit of Kelly as modified by Bednar is coupled indirectly, and not directly, to the well bore is of no matter because the claim makes no such distinction. Thus, we are not persuaded by OneSubsea’s argument that the modification of Kelly in view of Bednar would not have taught a bypass conduit in the manner recited by claim 1.

2. *Dependent Claim 2*

Claim 2 requires that the diverter assembly have “an internal passage” that “extends within an interior of the branch.” FMC points to Kelly’s collet body 22 as showing internal passages in fluid-tight connection with branch line 20 and choke assembly 26. Pet. 14–15, 32–33; *see also* Ex. 1004, Fig. 3. As described, the internal passages include “suitable sealing means . . . provided to maintain sealed communication between these connections.” Ex. 1004, 2:61–65. Figure 3 of Kelly shows passages 64 and 68, as well as passages 66 and 70, mating with one another via the sealing means to provide a fluid-tight connection between the abutting passages.

OneSubsea responds that the internal passage of the diverter assembly in the modified Kelly system “simply abuts next to, but does not extend within or inside, an interior of the branch.” PO Resp. 57. We disagree. A skilled artisan would have understood that the internal passages of Kelly’s collet body 22 (i.e., the diverter assembly) must mate with branch lines 20 and 24 in a manner that avoids leakage, similar to Kelly’s teaching of an

overlapping, fluid-tight connection at the opposite end of collet body 22. This would have been the natural inference arising from Kelly's teaching and well within the grasp of a skilled artisan. As such, we find that a skilled artisan would have fully understood the necessity of providing a fluid-tight connection at both ends of collet body 22, including where it connects with branch lines 20 and 24. As such, we determine that claim 2 is unpatentable for obviousness over Kelly and Bednar.

3. *Dependent Claims 3–6, 9, and 14*

FMC argues that the dependent limitations of claims 3–6, 9, and 14 would have been obvious over the combination of Kelly and Bednar. Pet. 15–19, 33–35. OneSubsea does not dispute FMC's evidence of obviousness with respect to claims 3–6, 9, and 14, except to argue these dependent claims are patentable "for the same reasons as claim 1."¹¹ PO Resp. 57. We have considered fully the evidence and arguments presented by FMC explaining how Kelly and Bednar teach each of the dependent limitations, and why a skilled artisan would have combined their teachings in the manner asserted. *See* Pet. 15–19 (citing Ex. 1003 ¶¶18–22), 28–30 (reason to combine), 33–35 (citing Ex. 1003 ¶¶ 37–40). We adopt FMC's reasoning as our own. Thus, we determine that the preponderance of the evidence weighs in favor of FMC's proof that dependent claims 3–6, 9, and 14 are unpatentable for obviousness over Kelly and Bednar.

¹¹ OneSubsea also includes claim 2 within this argument, however, we recognize that OneSubsea argues claim 2 separately from claim 1, as discussed previously.

D. Obviousness Over Kelly, Bednar, and Fenton (Claim 1, 7, 9, and 14)

FMC presents this ground as an alternative challenge to claims 1, 9, and 14 in the event that Kelly's choke assembly 26 is not considered a processing apparatus. Pet. 19, 35. This ground also serves as a challenge in the first instance to claim 7, which was not part of FMC's challenge based on Kelly and Bednar. As discussed above, claim 1 requires a processing apparatus. Claim 7 further defines the processing apparatus of claim 1 by providing a number of examples.

FMC relies on Fenton as teaching that processing apparatuses were commonly used in subsea wellhead installations. Pet. 19. For example, Fenton describes a choke assembly that includes one or more temperature and pressure measurement devices (sensors) to monitor fluid flow such that the choke could be appropriately adjusted. Ex. 1005, Abstract, [03], [05]–[07], [11]–[14]. FMC's expert testifies that a skilled artisan would have modified Kelly's choke assembly to include a pressure sensor, temperature sensor, or flow sensor, as taught by Fenton, or would have simply substituted Kelly's choke assembly with Fenton's choke module, which is already equipped with such sensors. Ex. 1003 ¶¶ 23–27, 41.

OneSubsea does not dispute FMC's evidence and arguments that claims 1, 7, 9, and 14 would have been obvious over Kelly, Bednar, and Fenton, except to rely on "the reasons [] with respect to the Kelly/Bednar combination for claim 1." PO Resp. 58; *see also* Pet. Reply 22. We have considered fully the evidence and arguments presented by FMC explaining how Kelly, Bednar, and Fenton teach each of the limitations of claims 1, 7, 9, and 14, and why a skilled artisan would have combined their teachings in the manner asserted. *See* Pet. 19–23 (reason to combine), 35 (claim chart),

43–47 (claim chart and reason to combine). We adopt FMC’s reasoning as our own. Accordingly, we determine that the preponderance of the evidence weighs in favor of FMC’s proof that dependent claims 1, 7, 9, and 14 are unpatentable for obviousness over Kelly, Bednar, and Fenton.

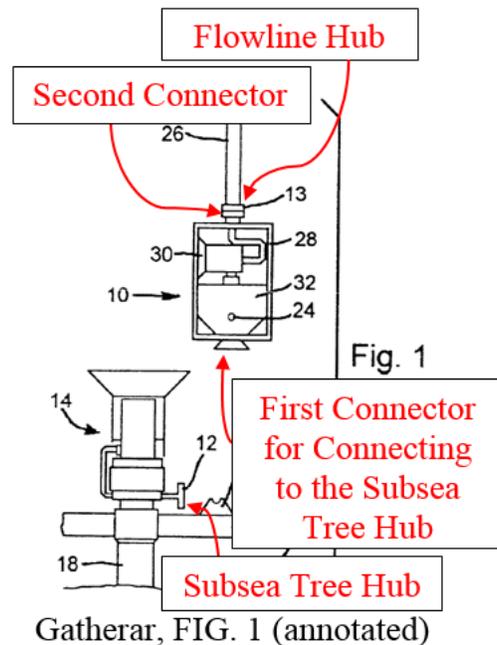
E. Obviousness Over Gatherar and Fisher (Claims 34–38)

FMC challenges claims 34–38 as unpatentable over Gatherar and Fisher. Pet. 51–59. Claims 34 and 38 are independent. The parties do not make any distinction between these two claims, and each comprises essentially the same five elements:

- (1) a “first connector” for connecting to a subsea tree hub;
- (2) a “second connector” for connecting to a production flowline hub;
- (3) a “fluid flow passageway” between the first and second connectors;
- (4) a “choke” for controlling fluid flow through the connectors; and
- (5) a “flow measuring device.”

Ex. 1001, 36:44–58, 37:8–23.

FMC relies on Gatherar as teaching all five elements of claims 34 and 38. Pet. 51–58. Specifically, Gatherar describes a flowline connector assembly having a “first portion” for mating with a first piece of subsea equipment, such as a Christmas tree, and a “second portion” for attachment to a production flowline. Ex. 1006, 1:51–59. FMC submits an annotated figure from Gatherar, shown below, to illustrate how it discloses each of the five elements of claims 34 and 38. Pet. 51.



Annotated figure 1 of Gatherar illustrates a flowline connector assembly for mounting between a subsea wellhead and a production flowline. As illustrated, connector assembly 10 includes a first connector at an upstream end and a second connector at the downstream end. The first connector connects to hub 12 on subsea wellhead 14 and the second connector connects to production flowline hub 13 on the end of production flowline 26. *Id.* at 1:51–56, 2:52–66. And, although flowline connector assembly 10 is described in conjunction with a subsea wellhead, Gatherar says it is equally applicable to “subsea Christmas trees, manifolds and flow control or processing equipment.” *Id.* at 1:22–26; 2:28–32; 3:34–38. In that vein, Gatherar teaches that hub 12 may comprise a subsea tree hub. Based on these disclosures, we find that Gatherar teaches the first and second connector elements of claims 34 and 36.

Furthermore, we find that Gatherar discloses the claimed “choke” and “flow measuring” elements. Notably, according to Gatherar, connector assembly 10 includes a “frame” that houses “one or more components

commonly found in the vicinity of a subsea wellhead,” such as a “*production choke 30*, or gas/fluid separators, gas liquification equipment, chemical/gas injection ports, *flow meters*, detectors, sensors, pumps and the like.” *Id.* at 3:11–17 (emphasis added). Gatherar’s choke and flow meter are no different than the similarly-identified elements of claims 34 and 38.

Finally, claims 34 and 38 recite that the connector assembly forms a “fluid flow passageway” between the subsea tree and the production flowline. Similarly, Gatherar discloses that connector assembly 10, when attached to tree hub 12 and flowline hub 13, provides “a fluid tight connection therebetween.” *Id.* at 2:14–19. With that disclosure, we find that Gatherar teaches all the elements of claim 34 and 38.

OneSubsea argues that Gatherar fails to disclose connecting the first connector to a “subsea tree,” as recited by claim 34. PO Resp. 75–79. According to OneSubsea, “Gatherar specifically teaches that it is designed to connect to wellheads and not trees.” *Id.* at 76. We disagree. Nowhere does Gatherar preclude the first connector from being attached to a subsea tree. In fact, Gatherar suggests just the opposite by explaining that its “subsea equipment package can be mounted upon or connected to a manifold or *other subsea structure besides a wellhead*” and “is equally applicable for the connection of flowlines to *other subsea equipment*.” Ex. 1006, 2:28–30, 3:34–38. In that regard, Gatherar provides: “Examples of subsea equipment that may be interconnected using flowlines or jumpers *include subsea Christmas trees*, manifolds and flow control or processing equipment located on the seabed.” *Id.* at 1:22–25. Thus, contrary to OneSubsea’s argument, we find that a skilled artisan would have understood Gatherar’s

flow connector assembly as not limited to a wellhead, but rather as applying equally to a subsea tree. *See* Ex. 1003 ¶¶ 70–75.

Indeed, FMC’s expert points to Fisher as evidence that a skilled artisan would have understood Gatherar’s disclosure of a wellhead to encompass a subsea tree. *Id.* ¶¶ 71–72. FMC’s expert further explains that a skilled artisan would have readily utilized Gatherar’s flowline connector with a tree “to improve reliability by positioning one or more processing functions with the ‘flowline connector’ such that they are ‘readily retrievable for servicing and repair.’” *Id.* ¶ 73 (quoting Ex. 1007, 2:20–28). According to FMC’s expert, “the results of such a combination would have been predictable to the [skilled artisan] based on Gatherar’s expressly teaching of the ‘general applicability’ of its ‘flowline connector.’” *Id.* We find that testimony more credible than the testimony of OneSubsea’s expert, who never addresses Gatherar’s express teaching of using the connector with “other subsea structure besides a wellhead” before concluding that Gatherar’s connector is limited to a “simplified wellhead.” *See* Ex. 2006 ¶ 139.

After considering the parties’ evidence and arguments, we determine that FMC has demonstrated by preponderant evidence that claims 34 and 38 would have been obvious over Gatherar and Fisher. Also, we have considered FMC’s evidence and arguments that Gatherar teaches the dependent limitations of claims 35–37. Pet. 58–59. OneSubsea does not argue dependent claims 35–37 separately, but instead relies on the same arguments it made with respect to claim 34. PO Resp. 79. We rejected those arguments. Accordingly, we determine that FMC has proven by a

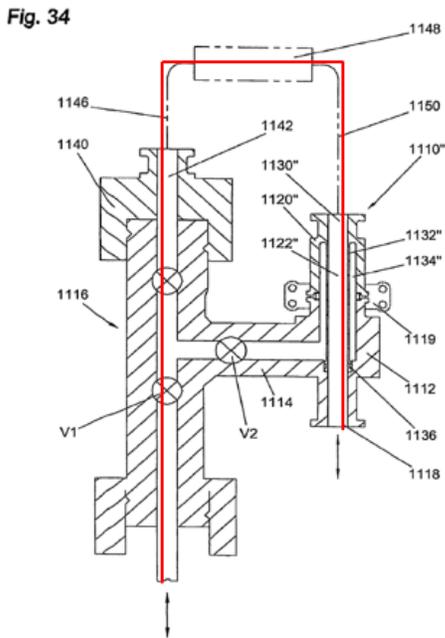
preponderance of the evidence that claim 34–38 are unpatentable for obviousness over Gatherar and Fisher.

C. Anticipation by Bednar (Claims 1–6, 8, 9, and 14)

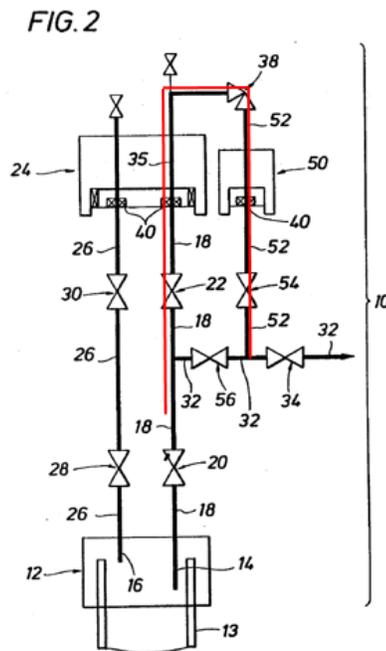
FMC challenges claims 1–6, 8, 9, and 14 as anticipated by Bednar. Pet. 35–43; Pet. Reply 22–25. We are persuaded that Bednar anticipates each of these claims.

1. Claim 1

Notably, Bednar describes a “subsea tree assembly” equipped with flowpaths that can be altered by selectively opening and closing various valves, including a flowpath that diverts fluid away from the production line branch of the tree for further processing. Ex. 1007, 3:61–4:10; 4:58–5:17, Fig. 2. A comparison of figure 34 of the ’018 patent to figure 2 of Bednar depicts the identity of the claimed invention to Bednar’s subsea tree assembly.



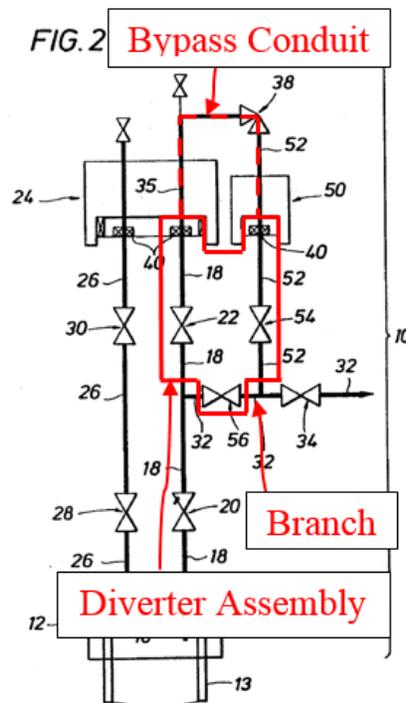
'018 Patent, Fig. 34 (annotated)



Bednar, Fig. 2 (annotated)

Each of the above figures depicts a subsea tree assembly equipped with a series of valves for diverting fluid flow (shown in red) from a production line branch of the tree to a processing apparatus. More specifically, in Bednar, fluid may either pass directly through and out “production line 32” by closing valves 22 and 54 and opening valve 56, or, instead, be diverted along a flowpath through choke assembly 38 by closing valve 56 and opening valves 22 and 54. Ex. 1007, 3:66–4:10, 4:58–5:17; Ex. 1003 ¶¶ 42, 44. “Although not shown, production line 32 continues . . . to a manifold or flow line for the gathering of the produced fluids.” *Id.* at 3:38–40.

Furthermore, FMC annotates figure 3 of Bednar, shown below, to illustrate its disclosure of a “diverter assembly” and a “bypass conduit.” Pet. 37–39.



Bednar, FIG. 2 (annotated)

Annotated figure 3 is a schematic diagram of the pipe and valve arrangement comprising Bednar's diverter assembly and bypass conduit. Bednar discloses that the schematic diagram represents an "improved design and piping arrangement" that can be incorporated into "an existing, typical tree design." Ex. 1007, 2:55–61. FMC persuades us that Bednar's pipe and valve arrangement discloses a diverter assembly and bypass conduit.

With respect to the claimed "processing apparatus," FMC's expert testifies that Bednar's choke assembly 38 processes fluid from wellhead 13 "by reducing fluid flow and pressure." Ex. 1003 ¶¶ 49–50. Indeed, Bednar describes that "chokes" are "pressure control assemblies" that "help control production rates" – a type of "processing apparatus" expressly contemplated by the '018 patent. *Compare* Ex. 1007, 1:19–21 *with* Ex. 1001, 36:65–66 (reciting that a processing apparatus includes "a pressure regulation apparatus"). As such, we find that Bednar discloses a "processing apparatus," as claimed.

In sum, we find that Bednar's subsea tree assembly meets each and every element of claim 1. *See* Pet. 36–39. We are not persuaded by OneSubsea's arguments to the contrary. In particular, OneSubsea argues that Bednar lacks three elements of claim 1—the diverter assembly, the bypass conduit, and the processing apparatus. PO Resp. 58. We address each of OneSubsea's arguments in turn.

First, OneSubsea accuses FMC of "arbitrarily mislabeling several discrete, unconnected components" from Bednar to show a diverter assembly. PO Resp. 58. In that vein, OneSubsea argues that "these individual parts [from Bednar] are neither a complete assembly nor are they fitted together, as they must be under any reasonable construction of the

term ‘assembly.’” *Id.* at 59. OneSubsea’s argument, however, is premised on an unreasonably narrow construction of the term “assembly,” given our construction of the term as simply a “multipart device.” *See* section III.B.1 *supra*. Nonetheless, even under OneSubsea’s narrow construction that the diverter assembly must be a complete structure, Bednar clearly and plainly describes a “subsea tree *assembly*” of “passages and valves” for directing fluids along flowpaths that utilize “sealing devices suitable for . . . subsea environments.” Ex. 1007, 3:50–65. OneSubsea cannot ignore that a skilled artisan would have fully appreciated the functional and structural relationship of Bednar’s fittings to form a complete, fluid-tight structure that prevents leakage in a subsea environment.

OneSubsea further argues that Bednar’s system requires “valve 56” to divert fluid, while somehow the claimed invention does not. PO Resp. 59–60. But, in doing so, OneSubsea ignores that the specification of the ’018 patent, which likewise requires a valve as part of the diverter operation—“fluids . . . cannot pass into through [sic] the wing branch 1114 *because of the V2 valve which is closed, and they are instead diverted into the cap 1140.*” Ex. 1001, 31:12–15. Yet, OneSubsea now attempts to narrowly interpret the “diverter assembly” in a way that excludes a valve, contrary to the specification of the ’018 patent. Thus, we are not persuaded that Bednar lacks a diverter assembly as claimed.

Second, OneSubsea argues that Bednar lacks the claimed bypass conduit. PO Resp. 64–67. According to OneSubsea, Bednar “does not ‘bypass’ anything” because conduit 52, on which FMC relies for the bypass, “goes from the alleged diverter assembly to the alleged bypass conduit and then back to the alleged diverter assembly.” *Id.* at 64–65. Similarly,

OneSubsea faults Bednar for being “only coupled to the alleged diverter assembly.” *Id.* at 66. Those arguments lack merit for the simple reason that claim 1 requires that the bypass conduit be “coupled to the diverter assembly” whilst bypassing the branch. That is what is shown in Bednar, i.e., conduit 52 is coupled to the portion of Bednar’s system identified as the diverter assembly and bypasses the portion identified as the branch. *See* Pet. 37 (“Bednar, Fig. 2 (annotated)”). As such, OneSubsea does not persuade us that Bednar lacks the claimed bypass conduit.

We also are not persuaded by OneSubsea’s third argument that Bednar’s choke is not a “processing apparatus,” as claimed. PO Resp. 68. As discussed above, Bednar expressly discloses that “chokes” are “pressure control assemblies,” and the ’018 patent likewise recognizes that “a pressure regulation device” is a type of “processing apparatus.” *Compare* Ex. 1007, 1:19–21 *with* Ex. 1001, 36:65–66. Thus, we determine that FMC’s evidence clearly outweighs OneSubsea’s evidence on this point.

In sum, OneSubsea’s evidence that claim 1 is patentable over Bednar does not outweigh the evidence proffered by FMC showing that Bednar meets each and every element of claim 1.

2. *Dependent Claim 2*

OneSubsea argues Bednar does not include “an internal passage of the diverter assembly [that] extends within an interior of the branch.” PO Resp. 68. As discussed above, Bednar clearly discloses that its “subsea tree assembly” of “passages and valves” utilizes “sealing devices suitable for . . . subsea environments.” Ex. 1007, 3:50–65. We find that disclosure to be persuasive evidence that *all* of the passage connections in Bednar extend

within each other's interior. Accordingly, we determine that Bednar anticipates claim 2.

3. *Dependent Claim 8*

Dependent claim 8 recites that “the bypass conduit connects the diverter assembly to the well bore via an aperture in a cap.” FMC relies on Bednar for teaching a tree cap with a flow passage between a wellbore and a bypass conduit. Pet. 43. Specifically, as shown in figure 2, Bednar discloses tree cap 24 with passage 35 in fluid connection with wellbore 13 via tree flow passage 18. Tree cap 24 and passage 35 also connect with bypass conduit 52 and various parts of diverter assembly 18, 22, 54, 56. Ex. 1007, Fig. 2. FMC's expert testifies that a skilled artisan would understand that fluid enters and exits tree cap 24 via apertures at either end of passage 35. Ex. 1003 ¶ 57.

OneSubsea's only argument with respect to claim 8 is that Bednar's bypass conduit does not connect to the wellbore because only the diverter assembly is “directly connected” to the well bore. PO Resp. 68–69. That argument fails because it imports an additional limitation into the claim by reading the more general term “connects” as “*directly* connects.” But nowhere does claim 8 require a direct connection between any of the elements, despite the use of that modifier in claim 1 from which it depends, i.e., “a diverter assembly directly coupled to the branch.” Ex. 1001, 34:35. As such, we are persuaded that Bednar discloses this limitation, and thus, anticipates claim 8.

4. *Dependent Claims 3–6, 9, and 14*

FMC argues that Bednar anticipates the dependent limitations of claims 3–6, 9, and 14. Pet. 41–43. OneSubsea does not dispute FMC's

evidence of anticipation with respect to those claims, except to argue these dependent claims are patentable “[f]or at least the same reasons set forth [] for independent claim 1.” PO Resp. 71. We have considered fully the evidence and arguments presented by FMC explaining how Bednar discloses each and every one of the dependent limitations of claims 3–6, 9, and 14. Pet. 41–43 (citing Ex. 1003 ¶¶ 52–56). We adopt FMC’s reasoning as our own. Accordingly, we determine that the preponderance of the evidence weighs in favor of FMC’s proof that dependent claims 3–6, 9, and 14 are anticipated by Bednar.

V. CONCLUSION

After considering the evidence and arguments presented in the Petition and Response, as well as the Reply and Sur-Reply, we determine that FMC has demonstrated by a preponderance of the evidence that claims 1–9, 14, and 34–38 of the ’018 patent are unpatentable.

V. ORDER

Accordingly, it is hereby:

ORDERED that claims 1–9, 14, and 34–38 of the ’018 patent are *unpatentable*;

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

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