

***SCOUT ENERGY MANAGEMENT, LLC, AND
CHEVRON U.S.A. INC.***

V.

PILOT INTELLECTUAL PROPERTY, LLC

IPR2024-00385

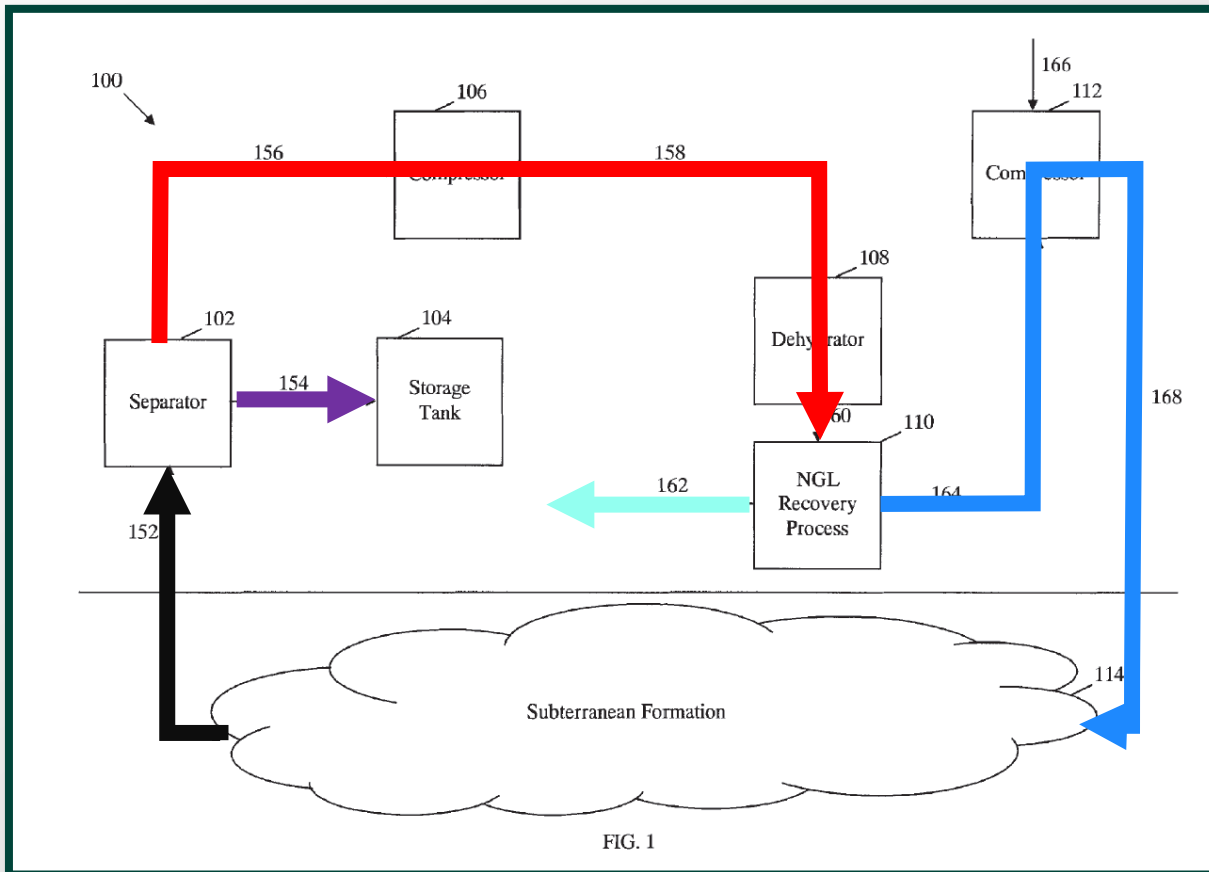


May 13, 2025



DEMONSTRATIVE EXHIBIT—NOT EVIDENCE

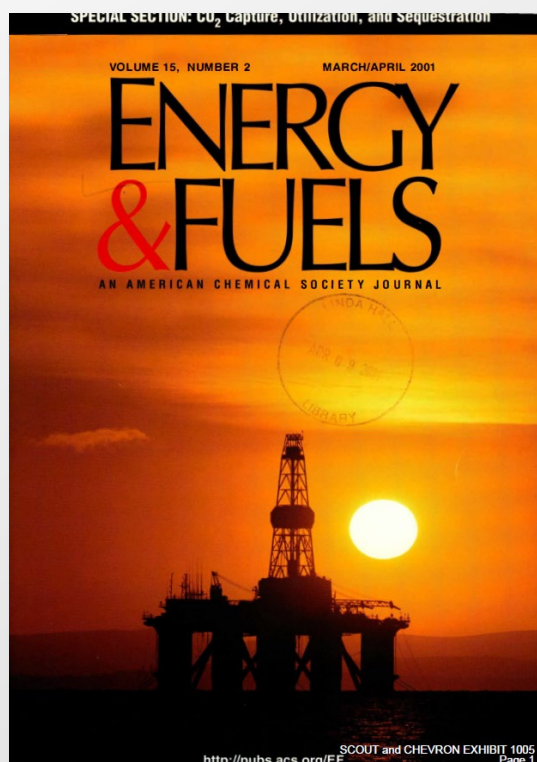
NATURAL GAS LIQUID (NGL) RECOVERY/PURIFICATION



EX1001 ('332 Patent) at Fig. 1

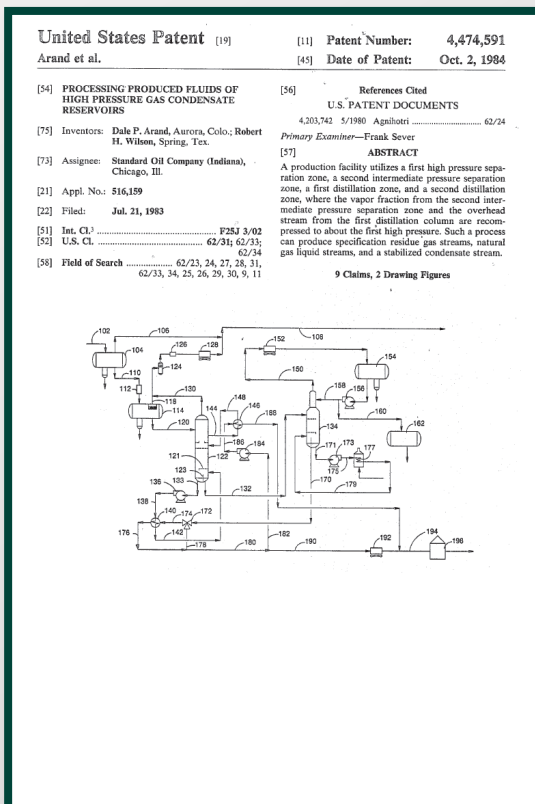
PETITIONER'S ASSERTED REFERENCES

Aycaguer



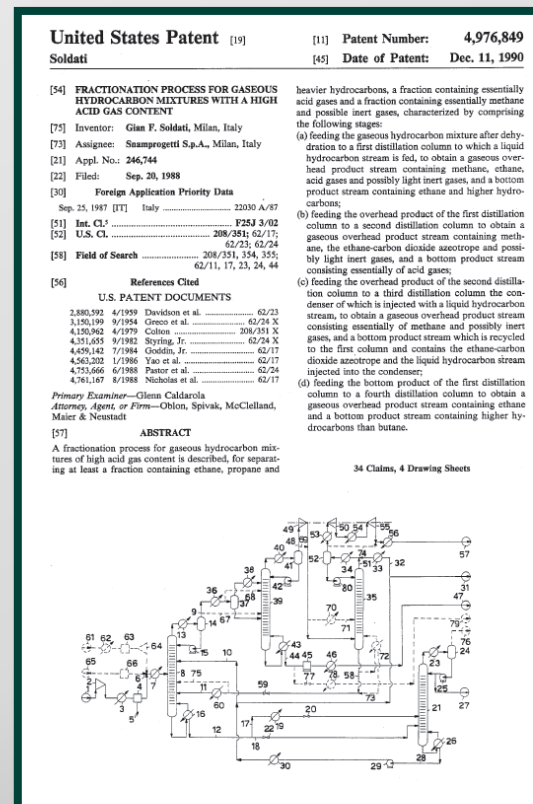
EX1005

Arand



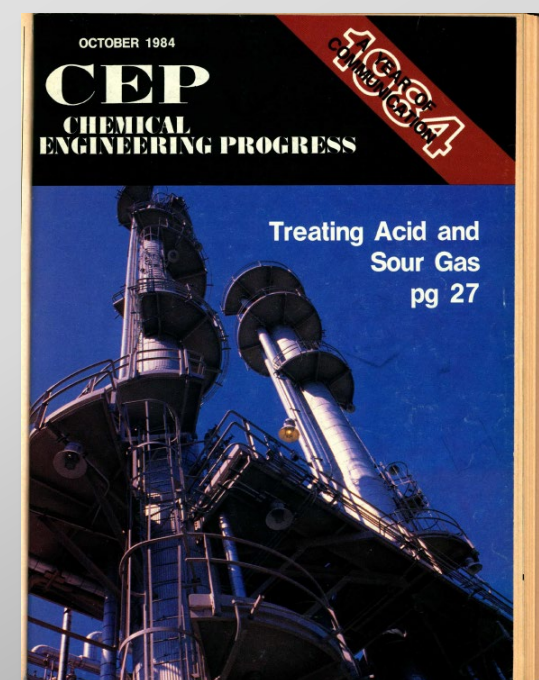
EX1004

Soldati



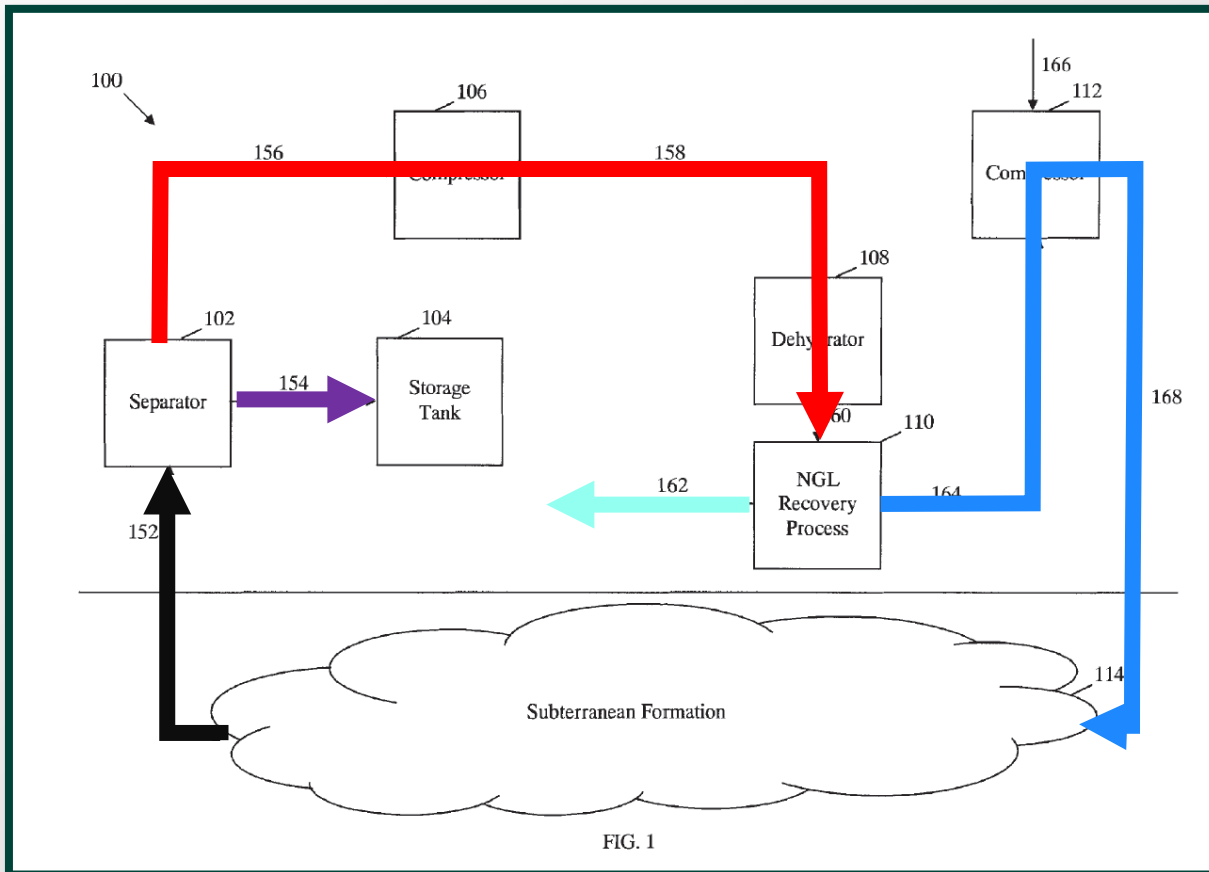
EX1006

Ryan

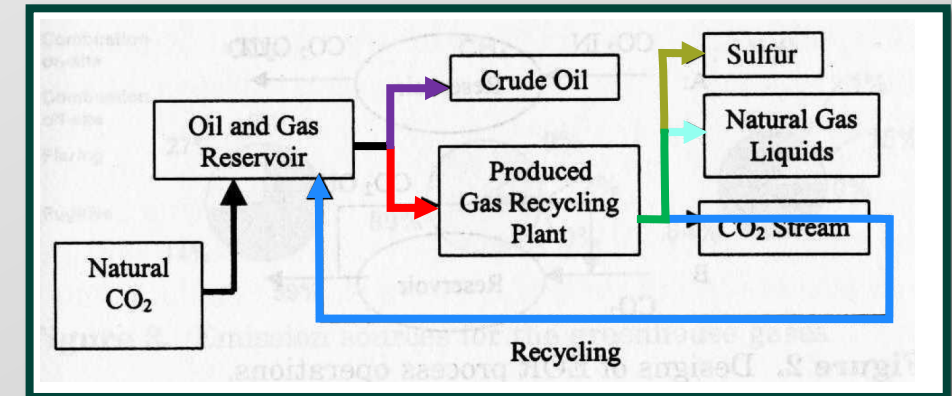


EX1007

NATURAL GAS LIQUID (NGL) RECOVERY/PURIFICATION



EX1001 ('332 Patent) at Fig. 1



EX1005 (Aycaguer) at Fig. 1

NATURAL GAS LIQUID (NGL) RECOVERY/PURIFICATION

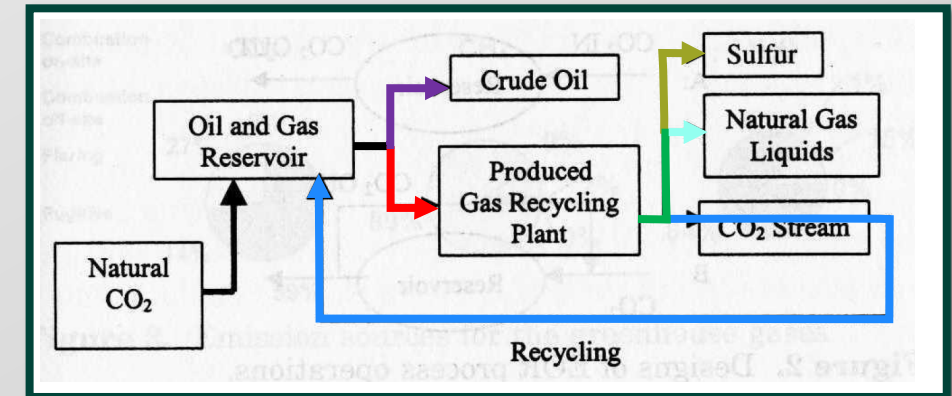
1. A method comprising:

receiving a hydrocarbon feed stream, wherein the hydrocarbon feed stream comprises carbon dioxide, natural gas liquid (NGL), heavy hydrocarbons, and acid gas, wherein the NGL comprises C_3 - C_8 hydrocarbons, and wherein the heavy hydrocarbons comprise C_{9+} hydrocarbons;

separating the hydrocarbon feed stream into a heavy hydrocarbon rich stream and a carbon dioxide recycle stream, wherein the heavy hydrocarbon rich stream comprises the C_{9+} hydrocarbons, and wherein the carbon dioxide recycle stream comprises the carbon dioxide, the C_3 - C_8 hydrocarbons, and the acid gas;

separating the carbon dioxide recycle stream into a sour NGL rich stream and a purified carbon dioxide recycle stream, wherein the sour NGL rich stream comprises the C_3 - C_8 hydrocarbons and the acid gas, and wherein the purified carbon dioxide recycle stream comprises the carbon dioxide; and

separating the sour NGL rich stream into a sweet NGL rich stream and an acid gas stream, wherein the sweet NGL rich stream comprises the C_3 - C_8 hydrocarbons, and wherein the acid gas stream comprises the acid gas, wherein the carbon dioxide is not removed from the hydrocarbon feed stream and is not removed from the carbon dioxide recycle stream prior to separating the carbon dioxide recycle stream into the sour NGL rich stream and the purified carbon dioxide recycle stream, and wherein the hydrocarbon feed stream, the carbon dioxide recycle stream, and the sour NGL rich stream are not subjected to cryogenic conditions, membranes, and carbon dioxide recovery solvents between being received and being separated into the heavy hydrocarbon rich stream, the purified carbon dioxide recycle stream, the sweet NGL rich stream, and the acid gas stream.



EX1005 (Aycaguer) at Fig. 1

EX1001 ('332 Patent) at Claim 1

NATURAL GAS LIQUID (NGL) RECOVERY/PURIFICATION

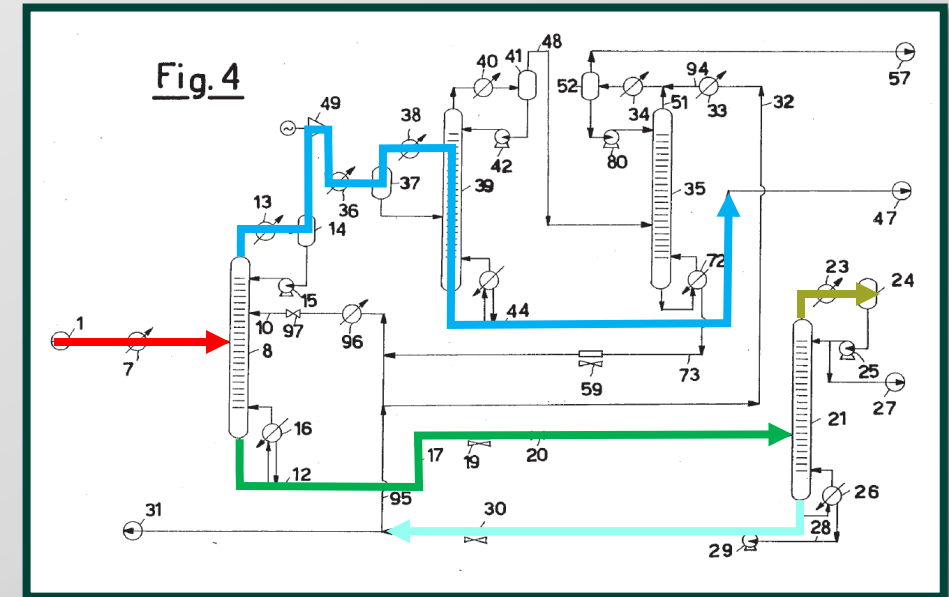
1. A method comprising:

receiving a hydrocarbon feed stream, wherein the hydrocarbon feed stream comprises carbon dioxide, natural gas liquid (NGL), heavy hydrocarbons, and acid gas, wherein the NGL comprises C_3 - C_8 hydrocarbons, and wherein the heavy hydrocarbons comprise C_{9+} hydrocarbons;

separating the hydrocarbon feed stream into a heavy hydrocarbon rich stream and a carbon dioxide recycle stream, wherein the heavy hydrocarbon rich stream comprises the C_{9+} hydrocarbons, and wherein the carbon dioxide recycle stream comprises the carbon dioxide, the C_3 - C_8 hydrocarbons, and the acid gas;

separating the carbon dioxide recycle stream into a sour NGL rich stream and a purified carbon dioxide recycle stream, wherein the sour NGL rich stream comprises the C_3 - C_8 hydrocarbons and the acid gas, and wherein the purified carbon dioxide recycle stream comprises the carbon dioxide; and

separating the sour NGL rich stream into a sweet NGL rich stream and an acid gas stream, wherein the sweet NGL rich stream comprises the C_3 - C_8 hydrocarbons, and wherein the acid gas stream comprises the acid gas, wherein the carbon dioxide is not removed from the hydrocarbon feed stream and is not removed from the carbon dioxide recycle stream prior to separating the carbon dioxide recycle stream into the sour NGL rich stream and the purified carbon dioxide recycle stream, and wherein the hydrocarbon feed stream, the carbon dioxide recycle stream, and the sour NGL rich stream are not subjected to cryogenic conditions, membranes, and carbon dioxide recovery solvents between being received and being separated into the heavy hydrocarbon rich stream, the purified carbon dioxide recycle stream, the sweet NGL rich stream, and the acid gas stream.



EX1001 ('332 Patent) at Claim 1

EX1006 (Soldati) at Fig. 4

THE DISPUTES

1. Is there a motivation to combine/modify the Asserted References?
2. Are cryogenic conditions required by the Asserted References?
3. Do the Asserted References use carbon dioxide recovery solvents?
4. Are streams 12 and 28 of *Soldati* Sour and Sweet NGL Rich Streams, respectively?
5. Secondary Considerations

PATENT OWNER'S RESPONSE

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SCOUT ENERGY MANAGEMENT, LLC, and
CHEVRON U.S.A. INC.,
Petitioners,

v.

PILOT INTELLECTUAL PROPERTY, LLC,
Patent Owner.

Case IPR2024-00385
Patent 8,505,332 B1

PATENT OWNER'S RESPONSE

DISPUTE 1: MOTIVATION TO COMBINE/MODIFY

Grounds 1-6

Is there a motivation to combine/modify the Asserted References?

Do the Asserted References “teach away” from the Claimed Invention?

DISPUTE 1: MOTIVATION TO COMBINE/MODIFY

Ground 1: Modification of Aycaguer

Petition

Based on their background understanding of the technology, a POSITA would understand that “natural gas liquids” is a term that includes C₃-C₈ hydrocarbons. *See, e.g.*, EX1002, ¶¶34-36; EX1004, 5:44-45. A POSITA reading Aycaguer would have thus understood, and at the very least found it obvious, that the “natural gas liquids” disclosed by Aycaguer include the entire range of C₃-C₈—and not just a subset of C₃-C₈—because Aycaguer discloses a hydrocarbon feed stream from an oil and natural gas reservoir that contains methane (C₁), natural gas liquids, and crude oil (C₉₊). Hydrocarbon feed streams from an oil and natural gas

Petition at 21

Patent Owner's Response

Petitioners make no attempt to meet their burden to show a motivation to modify or combine Aycaguer with other teachings to develop the Prim '332 Patent process. While Petitioners at least attempt to present a case for motivation to combine for Grounds 2-6, Petitioners completely neglect to address this required showing for Ground 1.

POR at 60

DISPUTE 1: MOTIVATION TO COMBINE/MODIFY

Grounds 2, 5, and 6: Combination of Aycaguer and Arand

Petition

Aycaguer teaches that heavy hydrocarbons, such as the crude oil, should be separated from a hydrocarbon feed stream derived from the oil well before further processing. EX1005 at 305. Aycaguer also teaches that natural gas liquids are a valuable product of oil and gas wells. *Id.* However, Aycaguer does not explicitly disclose the particular hydrocarbons that would be found in the components of natural gas liquids or heavy hydrocarbons.

Arand provides such teachings. Arand teaches that natural gas liquids are hydrocarbons that have between three and eight carbon atoms (C₃₋₈). EX1004, 5:44-45. Arand also teaches that heavy hydrocarbons contain nine or more carbon atoms (C₉₊). EX1004, 5:44-45.

Petition at 36–37

Patent Owner's Response

Petitioners assert that a POSITA would be motivated to combine Aycaguer and Arand because “because both references relate to methods of natural gas liquid separation.” (Petition, 36.) A general motivation to combine two references because they are in the same field is not sufficient. Petitioners must show a motivation to combine to make the Prim ‘332 Patent process. *See, e.g., William Wesley Carnes,*

POR at 62

DISPUTE 1: MOTIVATION TO COMBINE/MODIFY

Grounds 3–6: Combination of Aycaguer and Soldati

Petition

Aycaguer explains that the gas phase is processed in a plant to separate its constituent natural gas liquids, CO₂, and H₂S. *Id.* Aycaguer discloses already-known processes that could be used to perform that separation. *Id.* (describing the “Ryan/Holmes process” as a method of gas processing and citing to 1982 and 1984 articles outlining the Ryan/Holmes process). *Id.*

Petition at 42-43

Soldati teaches variations of and improvements on the Ryan/Holmes process, which it described as being used to separate the different components of natural gas liquid mixtures. EX1006, 1:6-58; EX1002, ¶131. The Ryan/Holmes variations disclosed by Soldati further include a sweetening step adapted for use in its process, in which hydrogen sulfide is removed from the natural gas liquid stream through distillation. EX1002, ¶131; *see infra* IX.C.2.c.

Because Aycaguer instructs the reader to use a Ryan/Holmes process, and because Soldati teaches a version of the Ryan/Holmes process, Aycaguer provides an explicit teaching, suggestion, or motivation to combine Aycaguer with Soldati.

Petition at 43

DISPUTE 1: MOTIVATION TO COMBINE/MODIFY

Grounds 3–6: Combination of Aycaguer and Soldati

Petition

Additionally, the combination of the system of Aycaguer with the processes of Soldati is a simple substitution of one known element for another to obtain predictable results. *See MPEP* §2143.B; *KSR*, 550 U.S. at 416. Aycaguer generally describes the use of a Ryan/Holmes process to process a natural gas stream into natural gas liquids and carbon dioxide. EX1005 at 305; EX1002, ¶133. Soldati discloses a known Ryan/Holmes method to process a natural gas stream into natural gas liquids and carbon dioxide. EX1006, 1:6-13; EX1002, ¶133. A POSITA would have understood that the method of Soldati when applied to the natural gas streams disclosed in Aycaguer would predictably result in the processing of that natural gas stream as described in Soldati and would have had a reasonable expectation of success in doing so. EX1002, ¶133.

Petition at 44

Thus, a POSITA would have been motivated to implement Aycaguer's Produced Gas Recycling Plant using the natural gas liquid processing methods described by Soldati. This straightforward modification of Aycaguer's oil and natural gas processing system uses a known process (e.g., the processing steps described in Soldati) to improve a similar system (e.g., the gas processing plant described in Aycaguer) in the same way (using the Ryan/Holmes process, which is the process used by the gas processing plant in Aycaguer). EX1002, ¶¶128-134.

Petition at 44

DISPUTE 1: MOTIVATION TO COMBINE/MODIFY

Grounds 3–6: Combination of Aycaguer and Soldati

Petition

A POSITA would have been motivated to combine Aycaguer with Soldati, and would have a reasonable expectation of success in doing so, because both references relate to methods of processing natural gas liquid streams, and for the reasons discussed below. *See* EX1005 at 305; EX1006, 1:59-66; EX1002, ¶¶129-131.

Petition at 42

Patent Owner's Response

Petitioners once again merely assert that a POSITA would be motivated to combine Aycaguer and Soldati because “because both references relate to methods of processing natural gas liquid streams.” (Petition, 42.) As stated noted, a general motivation to combine two references because they are in the same field is not sufficient (citing *Carnes* at 18).

Petitioners further assert that a POSITA would be motivated to combine Aycaguer and Soldati because they both describe the use of “a Ryan/Holmes process to process a natural gas stream into natural gas liquids and carbon dioxide.” (Petition, 44.) But once again, a general motivation to combine two references because they are in the same field is not sufficient. Petitioners must show a motivation to combine

POR at 64

DISPUTE 1: MOTIVATION TO COMBINE

The Asserted References do not “teach away”

Considering that the Prim ‘332 process conserves costs by “disregarding the recovery” of methane and ethane from the carbon dioxide recycle stream, it would make no sense for a POSITA to use the Ryan/Holmes methane/ethane recovery process as a starting point to modify it or combine with other teachings to develop the Prim ‘332 Patent process. The Ryan/Holmes process focus on recovery of

* * *

The Ryan/Holmes process thereby “teaches away” from the Prim ‘332 Patent process. A POSITA would not be motivated to modify or combine the Ryan/Holmes

POR at 31; *see also, e.g., id.* at 59–60

PATENT OWNER’S RESPONSE

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SCOUT ENERGY MANAGEMENT, LLC, and
CHEVRON U.S.A. INC.,
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v.

PILOT INTELLECTUAL PROPERTY, LLC,
Patent Owner.

Case IPR2024-00385
Patent 8,505,332 B1

PATENT OWNER’S RESPONSE

DISPUTE 1: MOTIVATION TO COMBINE

Methane and Ethane are allowed in each claimed stream

1. A method comprising:

receiving a hydrocarbon feed stream, wherein the hydrocarbon feed stream comprises carbon dioxide, natural gas liquid (NGL), heavy hydrocarbons, and acid gas, wherein the NGL comprises C_3 - C_8 hydrocarbons, and wherein the heavy hydrocarbons comprise C_{9+} hydrocarbons;

separating the hydrocarbon feed stream into a heavy hydrocarbon rich stream and a carbon dioxide recycle stream, wherein the heavy hydrocarbon rich stream comprises the C_{9+} hydrocarbons, and wherein the carbon dioxide recycle stream comprises the carbon dioxide, the C_3 - C_8 hydrocarbons, and the acid gas;

separating the carbon dioxide recycle stream into a sour NGL rich stream and a purified carbon dioxide recycle stream, wherein the sour NGL rich stream comprises the C_3 - C_8 hydrocarbons and the acid gas, and wherein the purified carbon dioxide recycle stream comprises the carbon dioxide; and

separating the sour NGL rich stream into a sweet NGL rich stream and an acid gas stream, wherein the sweet NGL rich stream comprises the C_3 - C_8 hydrocarbons, and wherein the acid gas stream comprises the acid gas, wherein the carbon dioxide is not removed from the hydrocarbon feed stream and is not removed from the carbon dioxide recycle stream prior to separating the carbon dioxide recycle stream into the sour NGL rich stream and the purified carbon dioxide recycle stream, and wherein the hydrocarbon feed stream, the carbon dioxide recycle stream, and the sour NGL rich stream are not subjected to cryogenic conditions, membranes, and carbon dioxide recovery solvents between being received and being separated into the heavy hydrocarbon rich stream, the purified carbon dioxide recycle stream, the sweet NGL rich stream, and the acid gas stream.

EX1001 ('332 Patent) at Claim 1

DISPUTE 1: MOTIVATION TO COMBINE

Methane and Ethane are allowed in each claimed stream

4. The method of claim 3, wherein the sweet NGL rich stream comprises no more than 1 molar percent methane, no more than 1 molar percent ethane, and no more than 1 molar percent acid gases.

7. The method of claim 6, wherein the sour NGL rich steam comprises no more than 5 molar percent carbon dioxide, no more than 1 molar percent methane, and no more than 5 molar percent ethane, and wherein the sweet NGL rich stream is substantially free of carbon dioxide.

EX1001 ('332 Patent) at Claims 4 & 7

DISPUTE 2: PRESENCE OF CRYOGENIC CONDITIONS

The Asserted Combinations do not require cryogenic conditions

Because the Prim '332 Patent process at issue in this case is related to the oil and gas industry, and in particular the field of gas processing, Patent Owner proposes that the term be construed as set forth in the GPS "Engineering Data Book" definition of "below minus 50°F." (EX2028 ¶¶60-61.)

POR at 9

DISPUTE 2: PRESENCE OF CRYOGENICS

Aycaguer does not mention cryogenic conditions (Grounds 1 and 2)

110. Aycaguer does not disclose the use of cryogenic conditions, membranes, or carbon dioxide recovery solvents being used at any step. While

EX1002 (Rockstraw Declaration) at ¶ 110

DISPUTE 2: PRESENCE OF CRYOGENICS

Aycaguer does not require cryogenic conditions (Grounds 1 and 2)

While these Ryan/Holmes 1982 journal articles described their proposed configurations to operate at non-cryogenic conditions by increasing the flow of CO₂ recovery solvents (“NGL-based additives”), by 1984 Ryan and Holmes were teaching away from this configuration by promoting their new four-column process, and criticizing their old increased additives three-column process. (EX2028 ¶80.)

POR at 13

“In assessing whether prior art teaches away, that ‘better alternatives exist in the prior art does not mean that an inferior combination is inapt for obviousness purposes.’”

Bayer Pharma AG v. Watson Labs., Inc., 874 F.3d 1316, 1327 (Fed. Cir. 2017)

DISPUTE 2: PRESENCE OF CRYOGENICS

Aycaguer does not require cryogenic conditions (Grounds 1 and 2)

While these Ryan/Holmes 1982 journal articles described their proposed configurations to operate at non-cryogenic conditions by increasing the flow of CO₂ recovery solvents (“NGL-based additives”), by 1984 Ryan and Holmes were teaching away from this configuration by promoting their new four-column process, and criticizing their old increased additives three-column process. (EX2028 ¶80.)

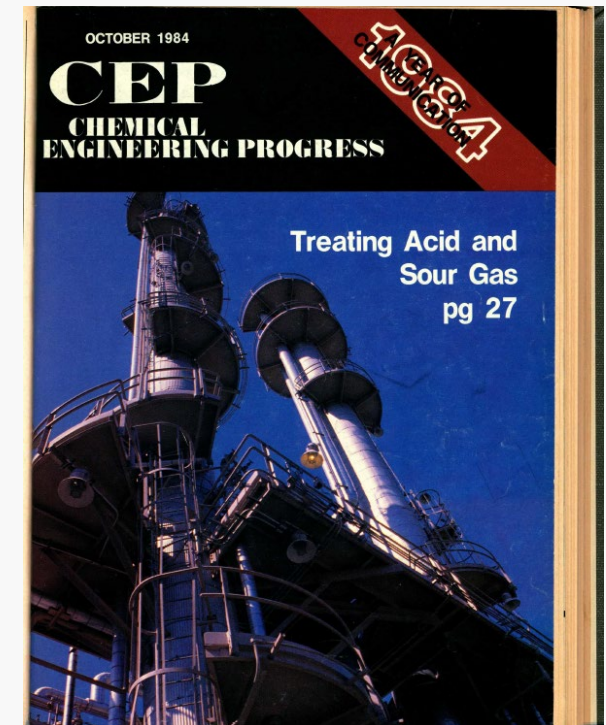
POR at 13

Three- vs. four-column approach

A general comparison between the three-column and the four-column processes is shown in Table 2. The first column seen by feed in the three-column process is run at a temperature of -40 to -120°F (-40 to -84°C). In the four-column process, the coldest conditions in the first column are -10 to $+40^{\circ}\text{F}$ (-23 to $+4^{\circ}\text{C}$). Because the process tends to frac-

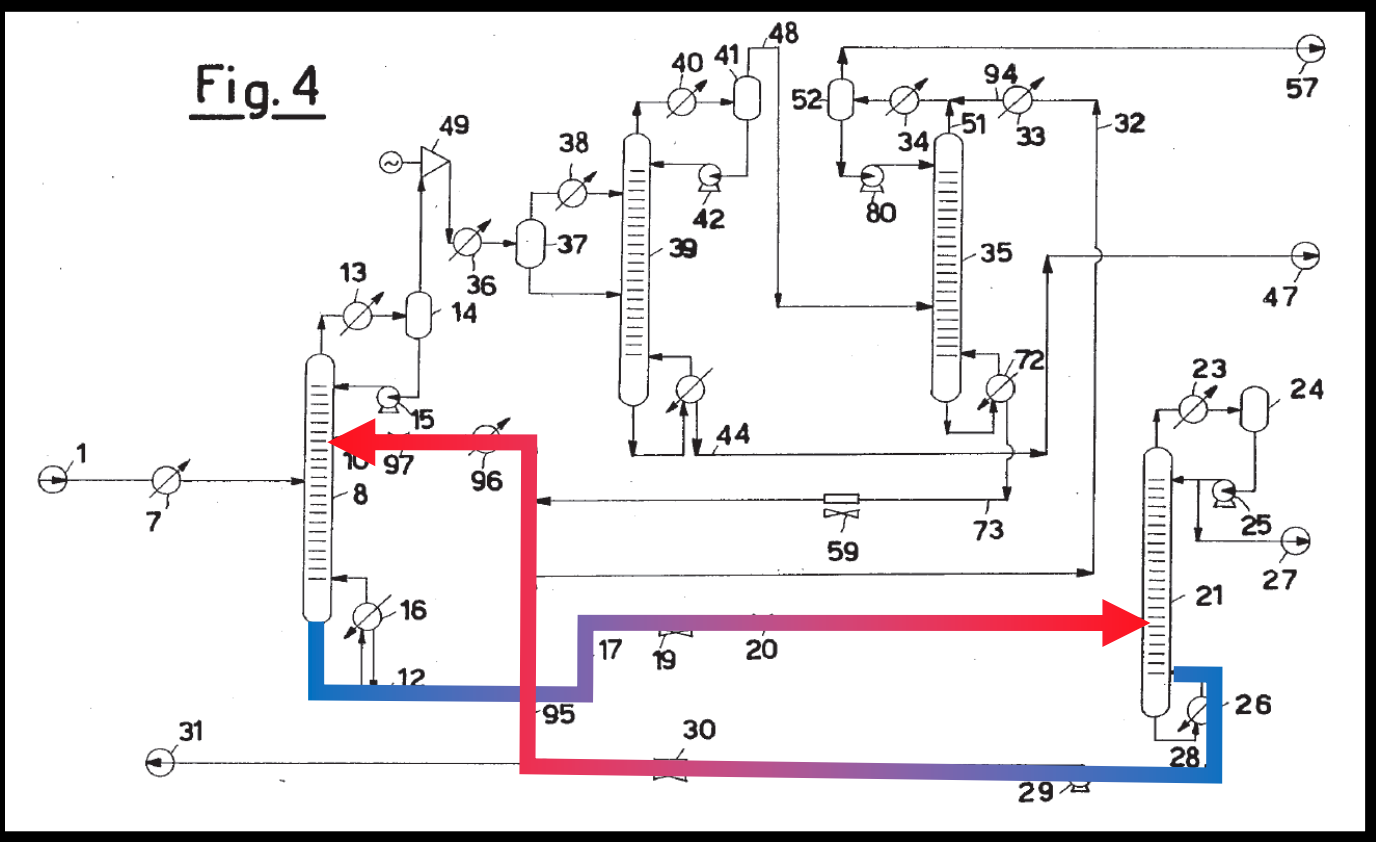
EX1007 (Ryan) at 5

EX1007 (“RYAN”)



DISPUTE 3: PRESENCE OF CO2 RECOVERY SOLVENTS

No Asserted Art discloses CO2 Recovery Solvents



EX1006 (Soldati) at Fig. 4

COMPONENT THROUGHPUT KMOLS/H	STREAM		
	28	10	95
NITROGEN	—	—	—
HYDROGEN SULPHIDE	—	—	—
CARBON DIOXIDE	—	46.64	—
METHANE	—	7.03	—
ETHANE	—	10.54	—
PROPANE	12.11	11.97	12.00
N-BUTANE	1092.03	1081.98	1082.60
N-PENTANE	81.06	80.26	80.25
THROUGHPUT KMOLS/H	1513.37	1563.53	1500.00
PHASE	L	L	L
TEMPERATURE °C.	122.0	16.0	48.0
PRESSURE ATA	19.2	39.6	44.0

EX1006 (Soldati) at Table 3

DISPUTE 3: PRESENCE OF CO2 RECOVERY SOLVENTS

Patent Owner presents an incorrect definition of “carbon dioxide recovery solvent”

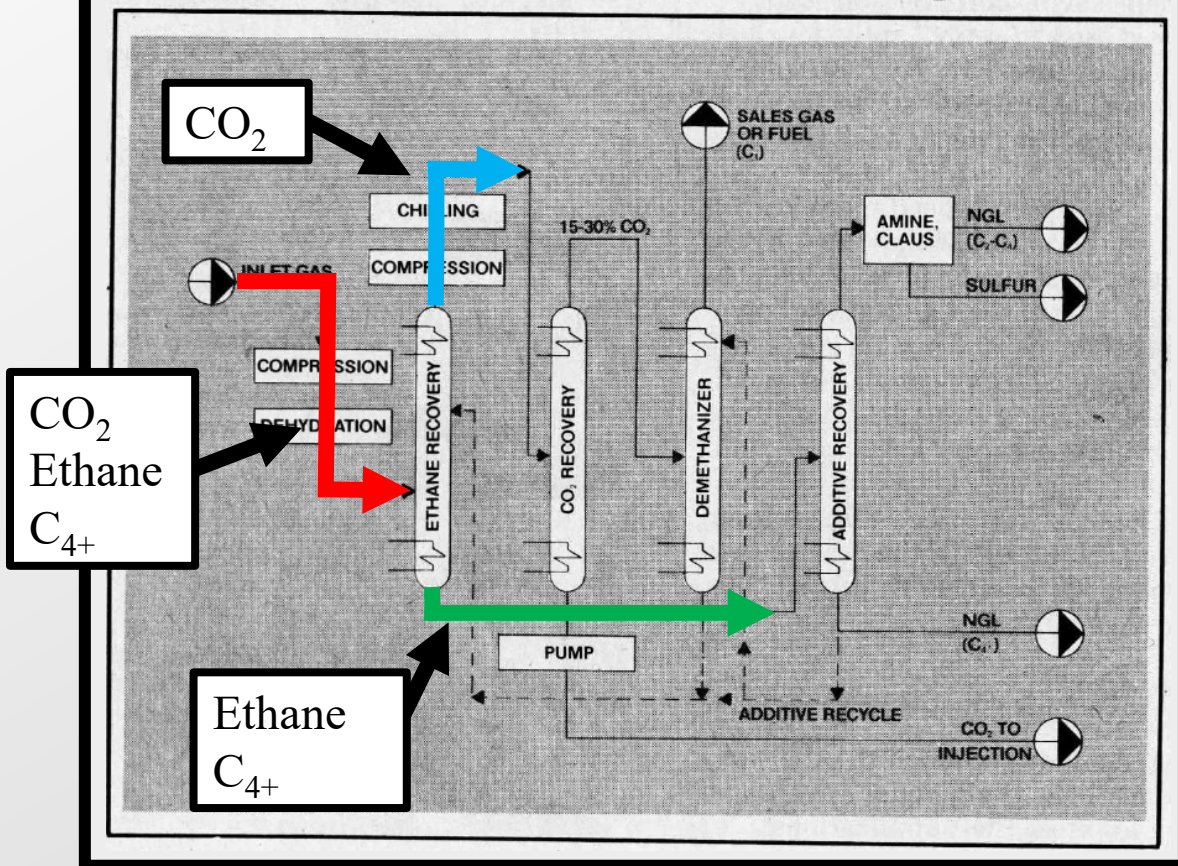
Goddin, col. 7, ll. 24-33 (emphasis added). As shown above, *Goddin* subjects its streams to membranes, cryogenic fractionation, and CO₂ solution absorption (i.e., carbon dioxide recovery solvents). Thus, *Goddin* and *Daus* subject the hydrocarbon feed stream, the carbon dioxide recycle

EX1003 at 257

DISPUTE 3: PRESENCE OF CO2 RECOVERY SOLVENTS

The Asserted Art does not recover CO2

Figure 3. Four-column Ryan/Holmes process.



EX1007 (Ryan) at Fig. 3

A Well, I guess it depends upon your definition of "recovered." If you mean something that is removed from the inlet stream and disposed of other than in the injection stream. Is that --

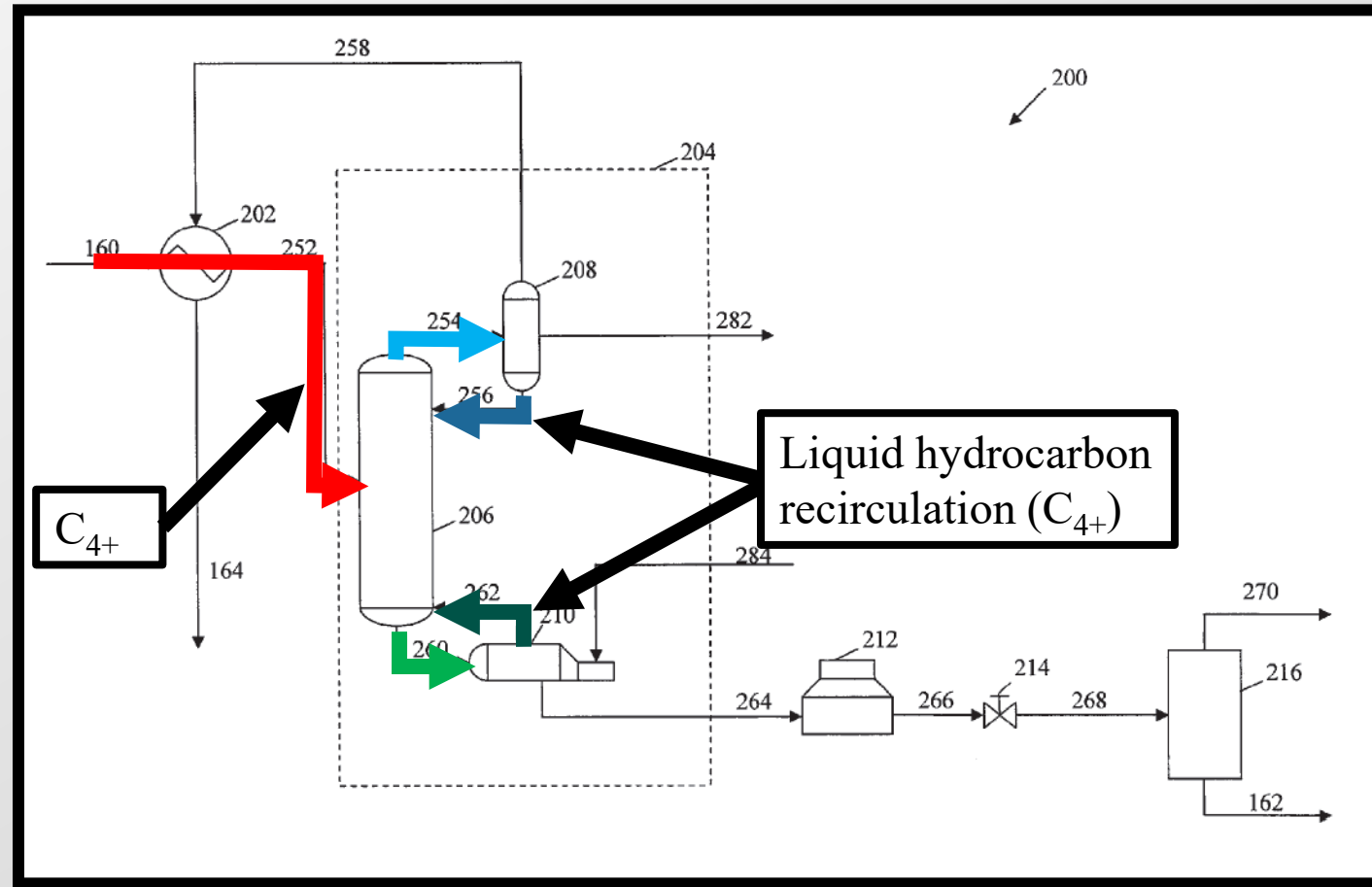
Q Whatever you understand recovered to mean.

A That's what it means to me. I'm just not sure if that's what it means to you.

EX1025 (Bors Deposition) at 40:4-11

DISPUTE 3: PRESENCE OF CO2 RECOVERY SOLVENTS

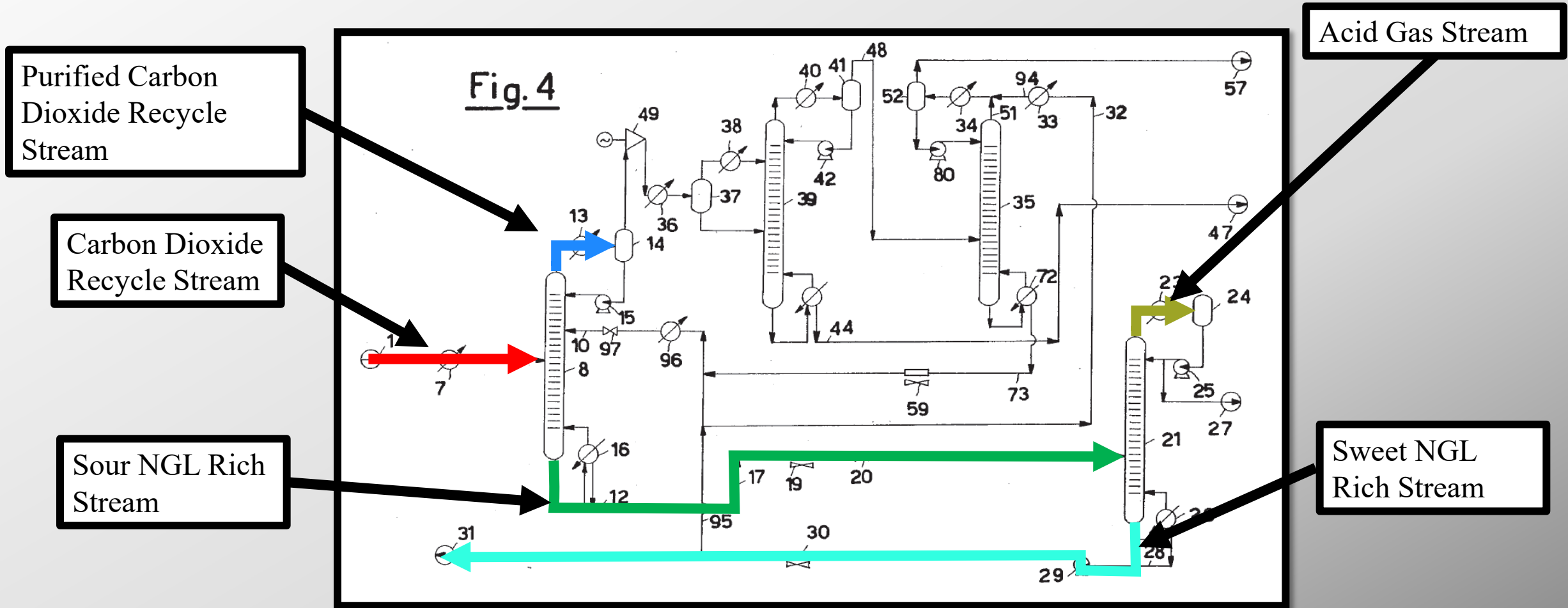
PO's argument contradicts the '332 Patent



EX1001 ('332 Patent) at Fig. 1

DISPUTE 4: IDENTITY OF SWEET AND SOUR NGL RICH STREAMS

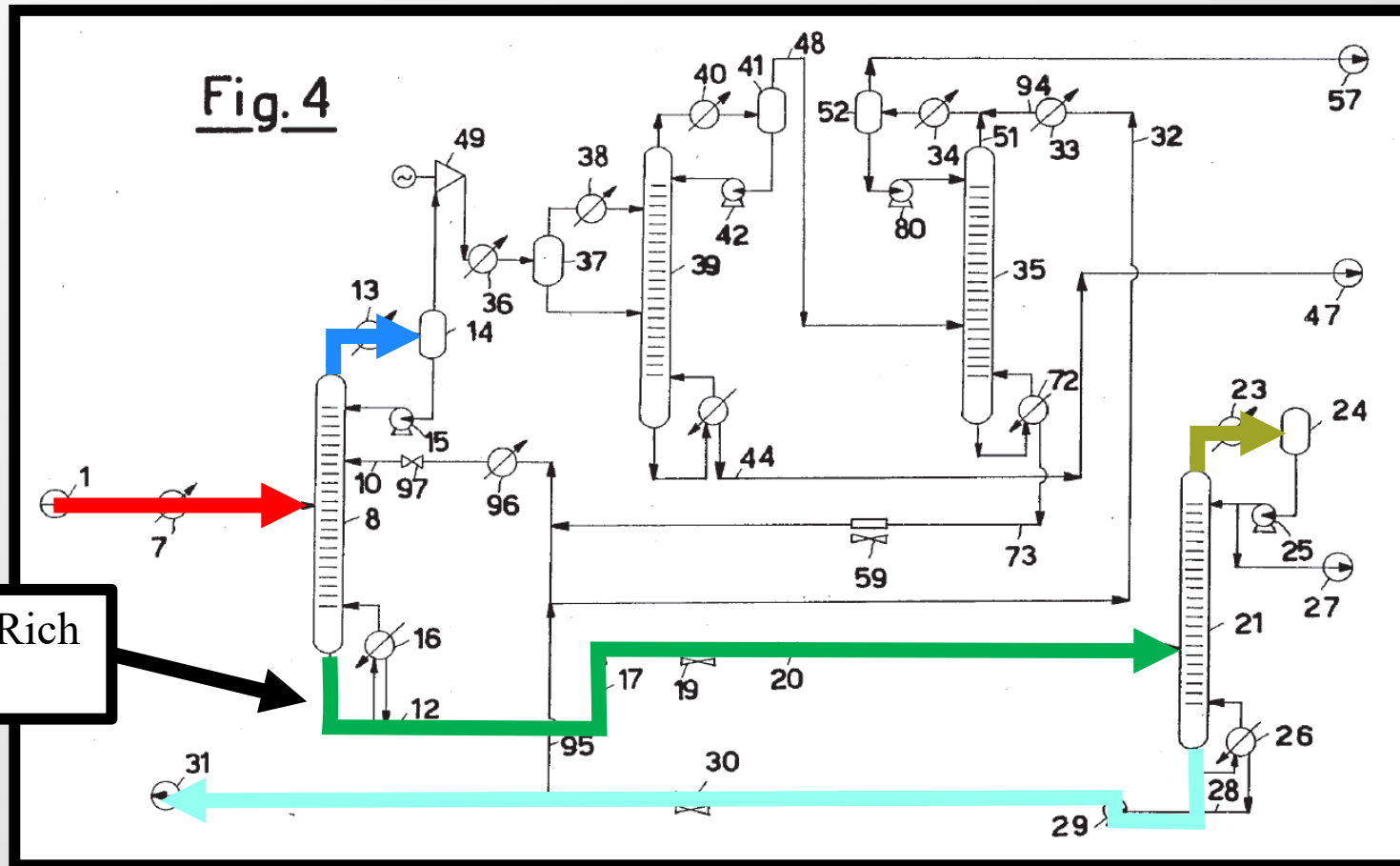
Are streams 12 and 28 sour and sweet NGL rich streams? (Grounds 3 and 5)



EX1006 (Soldati) at Fig. 4

DISPUTE 4: IDENTITY OF SWEET AND SOUR NGL RICH STREAMS

Stream 12 is a sour NGL rich stream (Grounds 3 and 5)



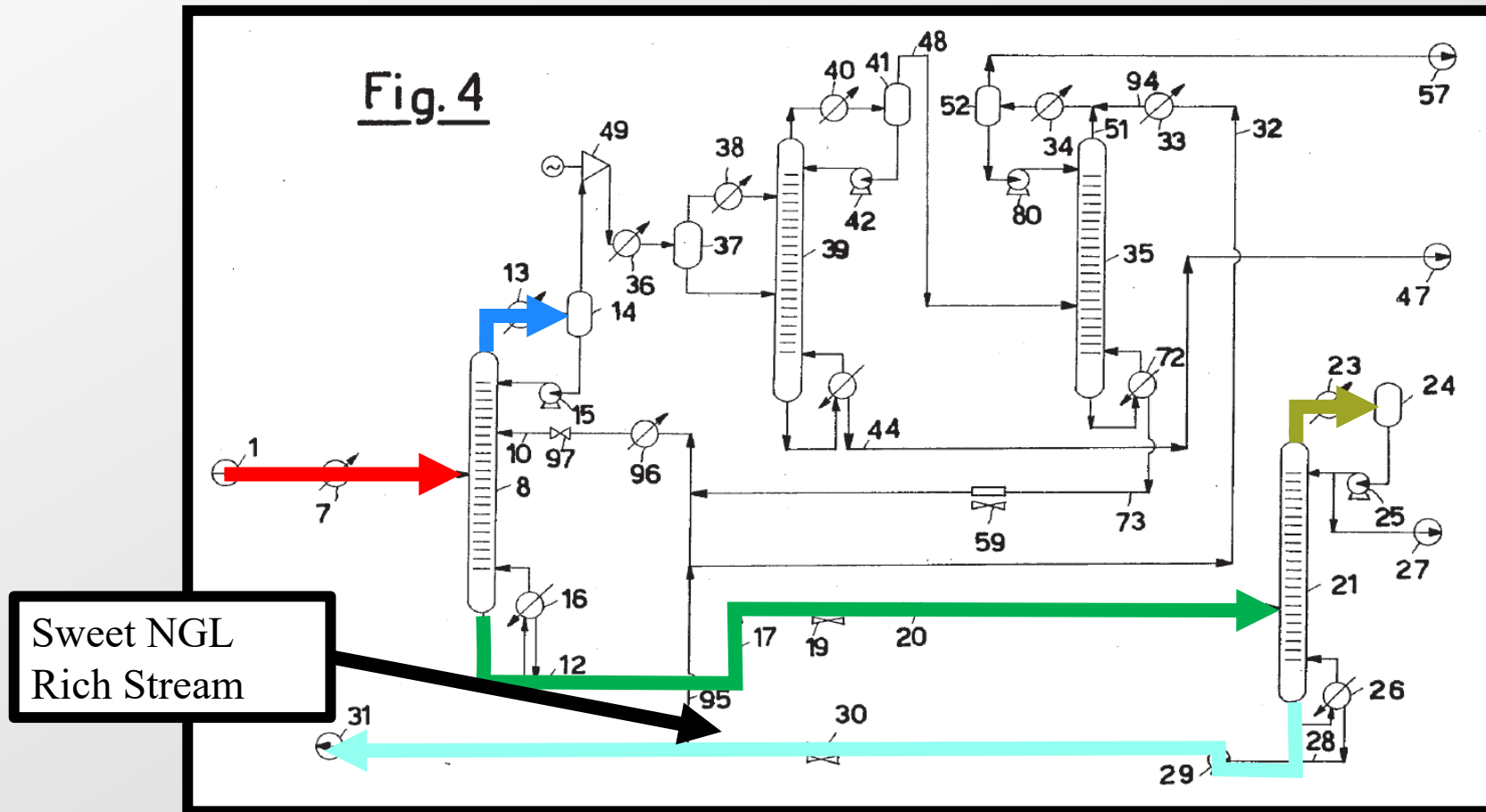
Claim 1.b:

separating the carbon dioxide recycle stream into a sour NGL rich stream and a purified carbon dioxide recycle stream, wherein the sour NGL rich stream comprises the C3-C8 hydrocarbons and the acid gas

EX1006 (Soldati) at Fig. 4

DISPUTE 4: IDENTITY OF SWEET AND SOUR NGL RICH STREAMS

Stream 28 is a sweet NGL rich stream (Grounds 3 and 5)



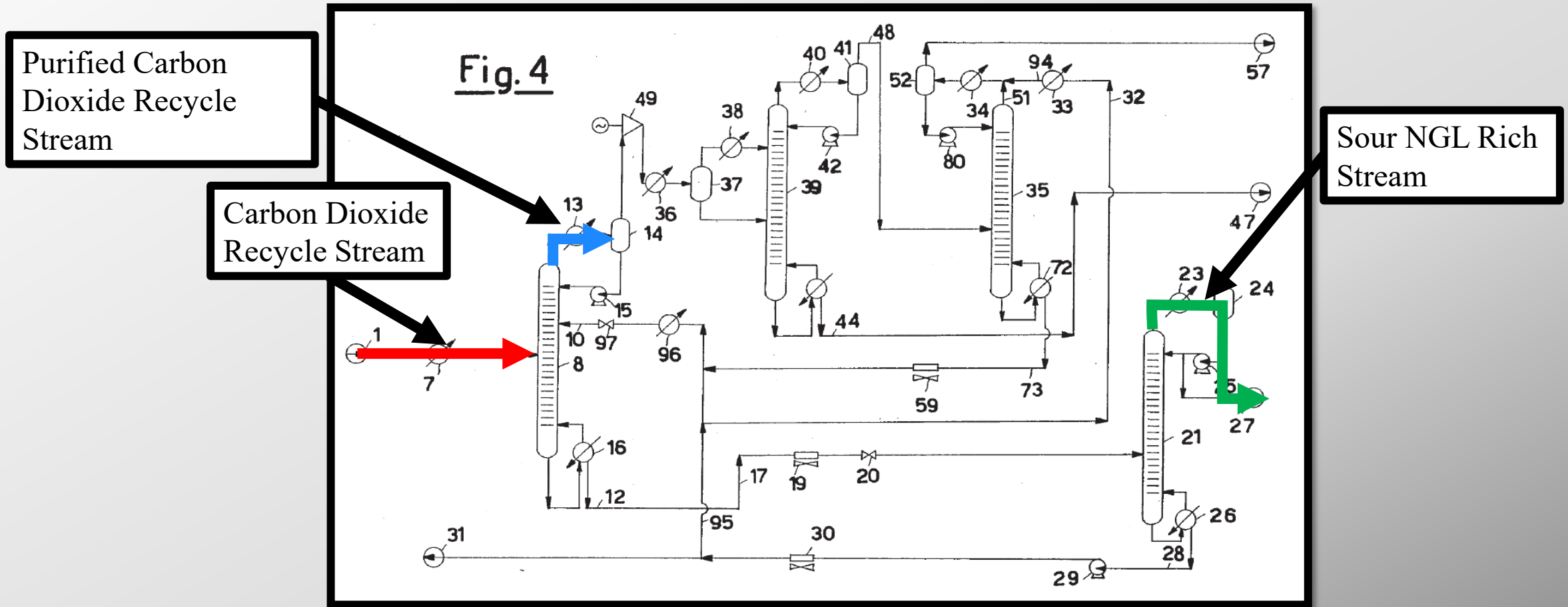
EX1006 (Soldati) at Fig. 4

Claim 1.c:

separating the sour NGL rich stream into a sweet NGL rich stream and an acid gas stream, wherein the sweet NGL rich stream comprises the C3-C8 hydrocarbons, and wherein the acid gas stream comprises the acid gas,

DISPUTE 4: IDENTITY OF SWEET AND SOUR NGL RICH STREAMS

PO's alternate mapping does not mean Petitioner's mapping is wrong (Grounds 3 and 5)



EX1006 (Soldati) at Fig. 4

SECONDARY CONSIDERATIONS

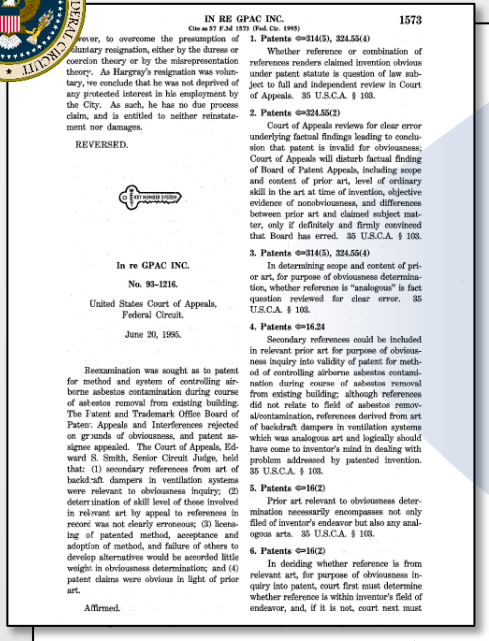
- Legal Standard
- No Nexus
- Pilot's Arguments Regarding:
 - Unexpected Results
 - Copying
 - Long Felt but Unmet Need
 - Failure of Others
 - Skepticism of Experts
 - Industry Praise
 - Commercial Success

LEGAL STANDARD

Secondary Considerations Require Nexus



IN RE GPAC INC.
Cite as 57 F.3d 1573 (Fed. Cir. 1995)



at 17–18, 86 S.Ct. at 693–94. For objective evidence to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed invention. *Stratoflex*, 713 F.2d at 1539, 218 USPQ at 879. “A prima facie case of nexus

GPAC at 1580

LEGAL STANDARD

Nexus Is a Sufficient Connection Between the Secondary Consideration and the Patent Claims



DEMACO CORP. v. F. VON LANGSDORFF LICENSING LTD. 1387
Cite as 851 F.2d 1387 (Fed. Cir. 1988)

in the interim to avoid laches longer than one unable to find employment. Finally, since the amount of back pay is directly related to the length of time that the military claimant has been discharged, the prior determination of the unreasonableness of the delay implicitly takes the length of the delay into account. Time should not be a factor in both prongs of the laches analysis.

For the above reasons, I cannot join section 11-3-2 of the opinion and would simply hold that potential receipt of back pay regardless of amount cannot be used at all in showing prejudice to the government.

DEMACO CORPORATION,
Plaintiff-Appellee,
v.
F. VON LANGSDORFF LICENSING LIMITED and **F. Von Langsdorff Bauverfahren GmbH,** Defendants-Appellants.
No. 86-1429.
United States Court of Appeals,
Federal Circuit.
June 21, 1988.

Alleged infringer brought action against patentee for declaratory judgment to invalidate patent on paving stone with ten-sided elongated shape and appearance of octagon joined to square across dummy groove. Patentee brought infringement action against counterclaim defendants. The United States District Court for the Middle District of Florida, William J. Castagna, J., invalidated patent on basis of obviousness and inequitable conduct. Patentee appealed. The Court of Appeals, Pauline Newman, Circuit Judge, held that: (1) patent was not obvious under prior art, and (2) clear and convincing evidence failed

DEMACO CORP. v. F. VON LANGSDORFF LICENSING LTD. Cite as 851 F.2d 1387 (Fed. Cir. 1988)

The term “nexus” is often used, in this context, to designate a legally and factually sufficient connection between the proven success and the patented invention, such that the objective evidence should be considered in the determination of nonobviousness. The burden of proof as to this connection or nexus resides with the patentee. See, e.g., *Cable Electric Products, Inc. v. Genmark, Inc.*, 770 F.2d 1015, 1027, 226 USPQ 881, 888 (Fed.Cir.1985).

Demaco at 1392

LEGAL STANDARD

No Presumption Where Unclaimed Features Are Critical

FOX FACTORY, INC. v. SRAM, LLC

Cite as 944 F.3d 1366 (Fed. Cir. 2019)



944 FEDERAL REPORTER, 3d SERIES

56-66. Syngenta responds that Willowood's cross-appeal is procedurally improper because it does not seek to expand the scope of the judgment below. Appellant's Resp. Br. 49-51. We need not decide these issues because Willowood's cross-appeal is conditional on our reversal of the judgment concerning the Compound Patents, and we affirm the district court in that respect.

CONCLUSION

We have considered the parties' remaining arguments and find them unpersuasive. We conclude that the district court did not provide an adequate analysis of the potential conflict between FIFRA and the Copyright Act for us to determine whether such a conflict truly exists. We also conclude that the district court erred by imposing a single-entity requirement on the performance of a patented process under § 271(g). We agree with the district court in all other respects. We therefore affirm, in part, reverse-in-part, vacate-in-part, and remand for further proceedings consistent with this opinion.

AFFIRMED-IN-PART, REVERSED-IN-PART, VACATED-IN-PART, AND REMANDED

COSTS

Each party shall bear its own costs.



FOX FACTORY, INC., Appellant
v.
SRAM, LLC, Appellee
2018-2024, 2018-2025
United States Court of Appeals,
Federal Circuit.

Decided: December 18, 2019

Background: Challenger filed petition for inter partes review of patent related to a solitary chainring for use with a conventional chain in a bicycle drivetrain system that included a bicycle crank. The United States Patent and Trademark Office, Patent Trial and Appeal Board, Cherry, Administrative Patent Judge, 2018 WL 1023357, and, 2019 WL 1880661, determined that claims were not unpatentable as obvious. Challenger appealed.

Holdings: The Court of Appeals, Prost, Chief Judge, held that patentee was not entitled to presumption of nexus between secondary considerations of nonobviousness and patent claims.

Vacated and remanded.

1. Patents ¶¶1128

The Court of Appeals reviews the Patent Trial and Appeal Board's (PTAB) factual findings for substantial evidence and its legal conclusions de novo.

2. Evidence ¶¶297

"Substantial evidence" is something less than the weight of the evidence but more than a mere scintilla of evidence, meaning that it is such relevant evidence as a reasonable mind might accept as adequate to support a conclusion.

See publication Words and Phrases for other judicial constructions and definitions.

[11] We have reaffirmed the importance of the “coextensiveness” requirement in subsequent opinions. *See, e.g., Sight-Sound Techs., LLC v. Apple Inc.*, 809 F.3d 1307, 1319 (Fed. Cir. 2015) (“If a product both embodies the claimed features and is coextensive with the claims at issue, a nexus is presumed. In other words, a nexus exists if the commercial success of a product is limited to the features of the claimed invention.” (citation and quotation marks omitted)); *Therasense*, 593 F.3d at 1299.² Whether a product is coextensive

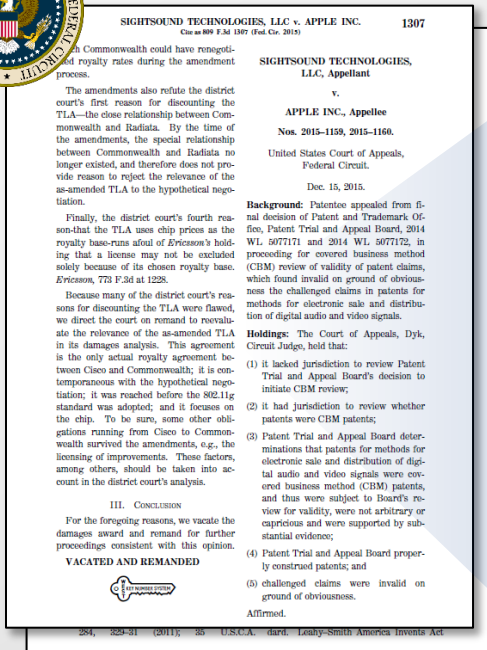
Fox Factory at 1373

It is undisputed that the X-Sync chainrings include unclaimed features that the patentee describes as “critical” to the product’s ability to “better retain the chain under many conditions” and that go to the “heart” of another one of SRMA’s patents.

Fox Factory at 1374-75

LEGAL STANDARD

No Nexus for Unclaimed Features



SIGHTSOUND TECHNOLOGIES, LLC v. APPLE INC.

Cite as 809 F.3d 1307 (Fed. Cir. 2015)

liamson, 229 F.3d at 1130. In other words, a nexus exists if the commercial success of a product is limited to the features of the claimed invention. But “if the commercial success is due to an unclaimed feature of the device” or “if the feature that creates the commercial success was known in the prior art, the success is not pertinent.” *Ormco Corp. v. Align Technology, Inc.*, 463 F.3d 1299, 1312 (Fed.Cir. 2006). Here the Board found that “iTMS

SightSound at 1319

PILOT'S NEXUS ARGUMENTS

No Presumption – Pilot Relies on Claim Charts

G. Rebuttable Presumption of Nexus

Patent Owner is entitled to the rebuttable presumption of a nexus between the objective evidence of nonobviousness and the challenged claims of the '332 Patent because the evidence is tied to a specific process, Pilot's CO2Flex® process, and that process is the invention disclosed and claimed in the challenged claims of the patent. The CO2Flex® process embodies the claimed features and is coextensive with the claims at issue.

Exhibits 2053 (Monell 20), 2057 (Goldsmith), 2061 (Weyburn), 2064 (Wellman), and 2069 (Monell 120) are charts demonstrating one-to-one correspondence between the Challenged '332 Patent Claims 1-4, 6-7 and each of these five CO2Flex® plants, which confirm that the CO2Flex® plants are “coextensive” (essentially the claimed invention). (EX2029 ¶¶69.)

disclosed in the '332 Patent and claimed in the Challenged Claims. As demonstrated in Pilot's Response, Pilot's CO2Flex® process embodies the claimed features and is coextensive with the Challenged Claims.

POR at 43

Sur-reply at 12

U.S. Patent No. 8,505,332 Claims 1-4, 6-7 Summary														
Claims 1-4, 6-7	Monell 20	Goldsmith	Weyburn	Wellman	Monell 120	Monell 160	Claims 1-4, 6-7	Monell 20	Goldsmith	Weyburn	Wellman	Monell 120	Monell 160	
Claim 1 [1] A method comprising: [1.1] receiving a hydrocarbon feed stream, wherein the hydrocarbon feed stream comprises carbon dioxide, natural gas liquid (NGL), heavy hydrocarbons, and acid gas, wherein the NGL comprises C ₃ -C ₄ hydrocarbons, and wherein the heavy hydrocarbons comprise C ₅ -hydrocarbons; [1.2] separating the hydrocarbon feed stream into a heavy hydrocarbon rich stream and a carbon dioxide recycle stream, wherein the heavy hydrocarbon rich stream comprises the C ₃ -hydrocarbons, and wherein the carbon dioxide recycle stream comprises the carbon dioxide, the C ₃ -C ₄ hydrocarbons, and the acid gas;	✓	✓	✓	✓	✓	✓	Claim 2 [2.1] The method of claim 1, further comprising: compressing the carbon dioxide recycle stream prior to separating the carbon dioxide recycle stream; [2.2] dehydrating at least part of the carbon dioxide recycle stream using a dehydration solvent prior to separating the carbon dioxide recycle stream;	✓	✓	✓	✓	✓	✓	
[1.3] separating the carbon dioxide recycle stream into a sour NGL rich stream and a purified carbon dioxide recycle stream, wherein the sour NGL rich stream comprises the C ₃ -C ₄ hydrocarbons and the acid gas, and wherein the purified carbon dioxide recycle stream comprises the carbon dioxide; and [1.4] separating the sour NGL rich stream into a sweet NGL rich stream and an acid gas stream, wherein the sweet NGL rich stream comprises the C ₃ -C ₄ hydrocarbons, and wherein the acid gas stream comprises the acid gas;	✓	✓	✓	✓	✓	✓	[2.3] combining a carbon dioxide makeup stream external to the method with the purified carbon dioxide recycle stream; and [2.4] injecting the combined carbon dioxide makeup stream and the purified carbon dioxide recycle stream into a subterranean formation.	✓	✓	✓	✓	✓	✓	
[1.5] wherein the carbon dioxide is not removed from the hydrocarbon feed stream and is not removed from the carbon dioxide recycle stream prior to separating the carbon dioxide recycle stream into the sour NGL rich stream and the purified carbon dioxide recycle stream; and [1.6] wherein the hydrocarbon feed stream, the carbon dioxide recycle stream, and the sour NGL rich stream are not subjected to cryogenic conditions, membranes, and carbon dioxide recovery solvents between being received and being separated into the heavy hydrocarbon rich stream, the purified carbon dioxide recycle stream, the sweet NGL rich stream, and the acid gas stream.	✓	✓	✓	✓	✓	✓	Claim 3 [3] The method of claim 1, further comprising cooling the carbon dioxide recycle stream with the purified carbon dioxide recycle stream. Claim 4 [4] The method of claim 3, wherein the sweet NGL rich stream comprises no more than 1 molar percent methane, no more than 1 molar percent ethane, and no more than 1 molar percent acid gases. Claim 6 [6.1] The method of claim 1, wherein separating the carbon dioxide recycle stream into the sour NGL rich stream and the purified carbon dioxide recycle stream comprises: refluxing part of the purified carbon dioxide recycle stream; [6.2] reboiling part of the sour NGL rich stream; and [6.3] cooling and throttling the sour NGL rich stream.	✓	✓	✓	no Inlet Exchanger to cool the CO ₂ recycle stream with the purified CO ₂ recycle stream	no Inlet Exchanger to cool the CO ₂ recycle stream with the purified CO ₂ recycle stream	✓	✓
							Claim 7 [7] The method of claim 6, wherein the sour NGL rich stream comprises no more than 5 molar percent carbon dioxide, no more than 1 molar percent methane, and no more than 5 molar percent ethane, and wherein the sweet NGL rich stream is substantially free of carbon dioxide.	✓	✓	more than 5 molar percent carbon dioxide	more than 5 molar percent carbon dioxide	more than 5 molar percent carbon dioxide	more than 5 molar percent carbon dioxide	
								✓	✓	✓	✓	✓	✓	

EX2052

PILOT'S NEXUS ARGUMENTS

No Presumption – Pilot Relies on Claim Charts



TEVA PHARMA. INT'L GMBH v. ELI LILLY AND CO. 1349

Pharm. Inc., 982 F.2d 494, 498 (Fed. Cir. 1992) (“The statutory presumption of validity under 35 U.S.C. § 282 puts the burden of proving invalidity on the party asserting it and the burden never shifts to the patentee.”); see also *Honeywell*, 865 F.3d at 1355 (“In an *inter partes* reexamination involving obviousness, the standard is not whether the patent owner can persuasively show that one of ordinary skill would have expected *failure*. Rather, the burden is on the Examiner to show that one of ordinary skill would have had a motivation to combine the references with a reasonable expectation of success.”).

To the extent that the blood-brain barrier dispute was relevant to the expectation of success in this case, which neither party appears to dispute, it was Lilly’s burden to demonstrate that despite any unpredictability in the literature, a skilled artisan nevertheless would have had a reasonable expectation of success. Both sides presented numerous pieces of evidence on the blood-brain barrier issue, including prior art references and expert testimony. The Board weighed the evidence supporting each side of the factual dispute and found that sufficient uncertainty and unpredictability remained—i.e., that Lilly’s evidence failed to demonstrate enough certainty that migraine treatment does not have to cross the blood-brain barrier to give a skilled artisan a reasonable expectation of success. That finding is consistent with our past holdings that “[i]mpredictability of results equates more with nonobviousness than obviousness.” *Honeywell*, 865 F.3d at 1356.

Unsurprisingly, Lilly would have preferred that the Board accept its expert’s opinion that Petersen 2005 settled the question regarding the blood-brain barrier. But in view of the Board’s extensive analysis of the evidence, it is impossible for us to conclude that the Board’s finding on the blood-brain barrier issue is unsupported

by substantial evidence. We are therefore not persuaded that the Board erred in analyzing the blood-brain barrier issue and its impact on whether a skilled artisan would have had a reasonable expectation of success in combining the prior art teachings to achieve the claimed invention.

CONCLUSION

We have considered Lilly’s remaining arguments but we find them unpersuasive. Accordingly, we affirm the Board’s final written decision upholding the patentability of the claims of the challenged patents.

AFFIRMED



TEVA PHARMACEUTICALS
INTERNATIONAL GMBH,
Appellant

v.

ELI LILLY AND COMPANY, Appellee

Andrew Hirshfeld, Performing the
Functions And Duties of the Under
Secretary of Commerce for Intellectual
Property and Director of the United
States Patent and Trademark Office,
Intervenor

2020-1747, 2020-1748, 2020-1750

United States Court of Appeals,
Federal Circuit.

Decided: August 16, 2021

Background: Petition for *inter partes* review was filed to challenge validity of patents directed to humanized antagonist antibodies that targeted calcitonin gene-related peptide (CGRP). The Patent Trial and Appeal Board (PTAB), 2020 WL

TEVA PHARMA. INT’L GMBH v. ELI LILLY AND CO.

Cite as 8 F.4th 1349 (Fed. Cir. 2021)

Much has been written discussing the “coextensiveness” requirement for the presumption of nexus, and in *Fox Factory* we attempted to summarize the current state of the law. We rejected attempts “to reduce the coextensiveness requirement to an inquiry into whether the patent claims broadly cover the product that is the subject of the evidence of secondary considerations.” *Id.* at 1377. Rather, we explained,

Teva at 1360-1361

PILOT'S NEXUS ARGUMENTS

Pilot Relies on Unclaimed Disregarding Methane and Ethane

And finally, with a proper recognition that each of the Challenged Claims recites the disregard for recovery of methane and ethane, Petitioners' attack on the substantial evidence of secondary considerations of non-obviousness, including the tremendous commercial success of Pilot's CO2Flex® process, miserably fails.

Sur-reply at 4

Each of the Challenged Claims recites the disregard for recovery of methane and ethane, confirming that this is a claimed (not "unclaimed") feature of the commercially successful CO2Flex® process. As explained above, the disregarding

Sur-reply at 13

This "comparison" Petitioners demand in their Reply makes it clear why CO2Flex® has achieved tremendous commercial success, directly resulting from the CO2Flex® process disregarding the recovery of methane and ethane as specified in independent Claim 1, and dependent Claims 4 and 7, to provide a more economical solution compared to the alternatives. In sharp contrast to Ryan/Holmes, for which

Sur-reply at 32-33

PILOT'S NEXUS ARGUMENTS

Claims Do Not Recite Disregarding Methane and Ethane

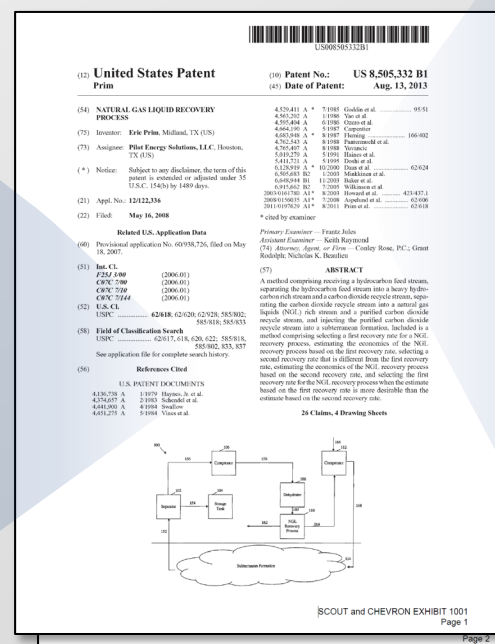
(12) **United States Patent**
Prim

(10) **Patent No.:** **US 8,505,332 B1**
(45) **Date of Patent:** **Aug. 13, 2013**

4. The method of claim 3, wherein the sweet NGL rich stream comprises no more than 1 molar percent methane, no more than 1 molar percent ethane, and no more than 1 molar percent acid gases.

7. The method of claim 6, wherein the sour NGL rich stream comprises no more than 5 molar percent carbon dioxide, no more than 1 molar percent methane, and no more than 5 molar percent ethane, and wherein the sweet NGL rich stream is substantially free of carbon dioxide.

EX1001 at 18:35-58



1. A method comprising:
receiving a hydrocarbon feed stream, wherein the hydrocarbon feed stream comprises carbon dioxide, natural gas liquid (NGL), heavy hydrocarbons, and acid gas, wherein the NGL comprises C₃-C₈ hydrocarbons, and wherein the heavy hydrocarbons comprise C₉₊ hydrocarbons;
separating the hydrocarbon feed stream into a heavy hydrocarbon rich stream and a carbon dioxide recycle stream, wherein the heavy hydrocarbon rich stream comprises the C₉₊ hydrocarbons, and wherein the carbon dioxide recycle stream comprises the carbon dioxide, the C₃-C₈ hydrocarbons, and the acid gas;
separating the carbon dioxide recycle stream into a sour NGL rich stream and a purified carbon dioxide recycle stream, wherein the sour NGL rich stream comprises the C₃-C₈ hydrocarbons and the acid gas, and wherein the purified carbon dioxide recycle stream comprises the carbon dioxide; and
separating the sour NGL rich stream into a sweet NGL rich stream and an acid gas stream, wherein the sweet NGL rich stream comprises the C₃-C₈ hydrocarbons, and wherein the acid gas stream comprises the acid gas, wherein the carbon dioxide is not removed from the hydrocarbon feed stream and is not removed from the carbon dioxide recycle stream prior to separating the carbon dioxide recycle stream into the sour NGL rich stream and the purified carbon dioxide recycle stream, and wherein the hydrocarbon feed stream, the carbon dioxide recycle stream, and the sour NGL rich stream are not subjected to cryogenic conditions, membranes, and carbon dioxide recovery solvents between being received and being separated into the heavy hydrocarbon rich stream, the purified carbon dioxide recycle stream, the sweet NGL rich stream, and the acid gas stream.

EX1001 at 17:52-18:19

PILOT'S NEXUS ARGUMENTS

Pilot Relies on Economical Propane Recovery, But Then Abandons in Sur-reply

But when Chevron addressed these problems, and the need for a solution, it failed to come up with the Prim '332 Patent process, which recovers an economical amount of C3 Propane. Chevron's solution to these problems was to focus on

POR at 35

recover a high amount of propane. The plan then shifted with modifications (improvements) to "low (25%) propane recovery." This improvement was referred to in two of the proposals (found in Prim's files), on December 17, 2002 (EX2037) and March 27, 2003 (EX2040), which state as follows:

The optimized results from the means processing proposal have yielded results that are a little unexpected. Optimization of the system has demonstrated that the best economics are found with an inlet flow of 50 MMSCFD with relatively low propane recovery. Small increases in the propane recovery rate result in major increases in the capital cost.

(emphasis added).

POR at 39

Pilot Concedes Unclaimed Feature

4. Unexpected results

Petitioners note that the "unexpected results" that Prim encountered in his early development of the CO2Flex® process, which led to Prim proposing a "relatively low propane recovery" to Exxon, is not recited in the Challenged Claims.

Pilot concedes that these "unexpected results" are neutral for the Challenged Claims.

Sur-reply at 21

ALLEGED UNEXPECTED RESULTS

Pilot Argues Unexpected Results Based on Low Propane Recovery But Then Abandons in Sur-reply

Over the past two years, the Means processing proposal has undergone many modifications. The original plant was intended to be a high recovery 60MMSCFD plant that was estimated to cost \$12MM to \$15MM. Next the plant size was reduced to 25 MMSCFD, also with high propane recovery. The 25MM option was estimated to cost around \$5MM. The current case is designed for 60MMSCFD with low (25%) propane recovery and is estimated to cost around \$7MM. The advantage of this case is that it will provide higher recovery at lower gas flows, but will still operate with gas flow rates as high as 50MM of 60MM.

POR at 38-39 (quoting EX2043)

(improvements) to “low (25%) propane recovery.” This improvement was referred to in two of the proposals (found in Prim’s files), on December 17, 2002 (EX2037) and March 27, 2003 (EX2040), which state as follows:

The optimized results from the means processing proposal have yielded results that are a little unexpected. Optimization of the system has demonstrated that the best economics are found with an inlet flow of 50 MMSCFD with relatively low propane recovery. Small increases in the propane recovery rate result in major increases in the capital cost.

(emphasis added).

POR at 39 (quoting EX2037)

Pilot Concedes Unclaimed Feature

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Petitioners note that the “unexpected results” that Prim encountered in his early development of the CO2Flex® process, which led to Prim proposing a “relatively low propane recovery” to Exxon, is not recited in the Challenged Claims.

Pilot concedes that these “unexpected results” are neutral for the Challenged Claims.

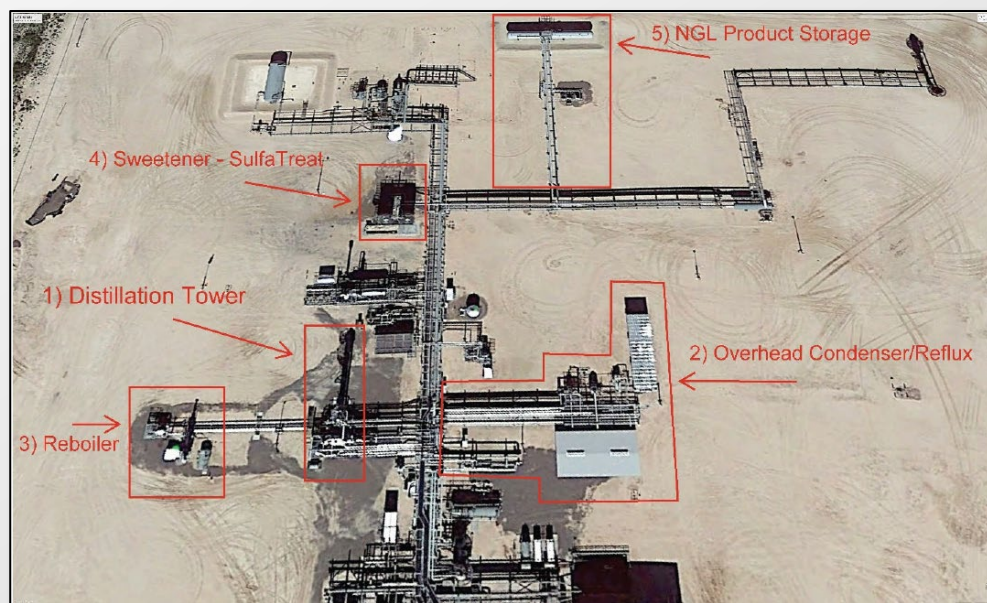
Sur-reply at 21

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- Pilot's Arguments
 - Five Main Components
 - Propane Recovery
 - Hydrate Formation Paper
 - Comparison with Pastor
 - Sweetener
 - Hydrate Formation Paper
 - Comparison with Pastor
- No Copying Because No “Acid Gas Stream”

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Pilot Argues “Five Main Components,” But Admits “Architecturally Identical” is Insufficient



POR at 47 (annotating EX2075)

had built at their Rangely, Colorado facility in the early 1990s. Chevron is expected to continue this position by asserting that the NGL Recovery Plant it built at Mabee is “architecturally identical” to the Rangely, Colorado plant. Chevron may demonstrate that the Rangely, Colorado plant built in the early 1990s has each of the five main components of the CO2Flex® process. But being “architecturally identical” and having each of the components when merely viewed from the outside does not conclude the inquiry. The next question to ask is how the components are

POR at 52

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Pilot Relies on Propane Recovery in the Hydrate Formation Paper

First, the Hydrate Formation Paper discloses the material composition for the NGL Product at Chevron's Mabee NGL Recovery Plant. A review of the Table 1 stream composition for Chevron's Mabee NGL Product shows a significant amount of C3 Propane in the NGL Product. This C3 Propane in the Chevron Mabee NGL

POR at 53-54

Table 1: Model Validation of Plant Data

	Field	Model
Condenser Temp, F	5.7	5.7
Reboiler Temp, F	260	260
NGL Composition, mol %		
Propane	6.02	5.48
i-Butane	17.11	16.75
n-Butane	41.78	38.39
i-Pentane	14.57	14.20
n-Pentane	9.50	8.96
Hexane +	10.84	10.96

POR at 55 (annotating EX2012 at 4)

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Propane Recovery % Unclaimed

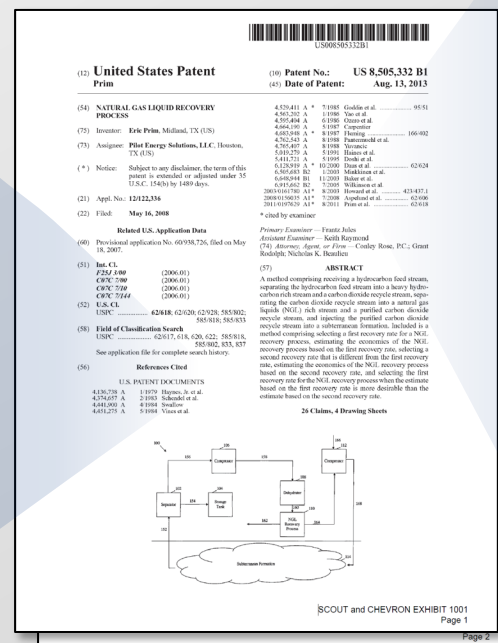
(12) **United States Patent**
Prim

(10) **Patent No.:** US 8,505,332 B1
(45) **Date of Patent:** Aug. 13, 2013

4. The method of claim 3, wherein the sweet NGL rich stream comprises no more than 1 molar percent methane, no more than 1 molar percent ethane, and no more than 1 molar percent acid gases.

7. The method of claim 6, wherein the sour NGL rich steam comprises no more than 5 molar percent carbon dioxide, no more than 1 molar percent methane, and no more than 5 molar percent ethane, and wherein the sweet NGL rich stream is substantially free of carbon dioxide.

EX1001 at 18:35-58



1. A method comprising:

- receiving a hydrocarbon feed stream, wherein the hydrocarbon feed stream comprises carbon dioxide, natural gas liquid (NGL), heavy hydrocarbons, and acid gas, wherein the NGL comprises C_3 - C_8 hydrocarbons, and wherein the heavy hydrocarbons comprise C_{9+} hydrocarbons;
- separating the hydrocarbon feed stream into a heavy hydrocarbon rich stream and a carbon dioxide recycle stream, wherein the heavy hydrocarbon rich stream comprises the C_{9+} hydrocarbons, and wherein the carbon dioxide recycle stream comprises the carbon dioxide, the C_3 - C_8 hydrocarbons, and the acid gas;
- separating the carbon dioxide recycle stream into a sour NGL rich stream and a purified carbon dioxide recycle stream, wherein the sour NGL rich stream comprises the C_3 - C_8 hydrocarbons and the acid gas, and wherein the purified carbon dioxide recycle stream comprises the carbon dioxide; and
- separating the sour NGL rich stream into a sweet NGL rich stream and an acid gas stream, wherein the sweet NGL rich stream comprises the C_3 - C_8 hydrocarbons, and wherein the acid gas stream comprises the acid gas,

wherein the carbon dioxide is not removed from the hydrocarbon feed stream and is not removed from the carbon dioxide recycle stream prior to separating the carbon dioxide recycle stream into the sour NGL rich stream and the purified carbon dioxide recycle stream, and

wherein the hydrocarbon feed stream, the carbon dioxide recycle stream, and the sour NGL rich stream are not subjected to cryogenic conditions, membranes, and carbon dioxide recovery solvents between being received and being separated into the heavy hydrocarbon rich stream, the purified carbon dioxide recycle stream, the sweet NGL rich stream, and the acid gas stream.

EX1001 at 17:52-18:19

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Pilot's Comparison of Mabee to Pastor's Simulation Ignores Pastor's Optimization

	Stream Name		
	Feed	Overhead Product	Bottoms Product
Rate	110 MMSCF	107 MMSCF	2620 BPD
H ₂ S (ppmv)	500	514	—
	Mole Percent		
N ₂	3.4	3.5	—
CO ₂	83.9	86.3	—
C ₁	6.6	6.9	—
C ₂	1.4	1.4	—
C ₃	1.1	1.1	0.02
iC ₄	0.5	0.4	3.1
nC ₄	0.7	0.3	16.7
iC ₅	0.4	0.001	16.0
nC ₅	0.6	—	23.3
C ₆	0.6	—	24.4
C ₇₊	0.4	—	16.4

POR at 56 (annotating EX2016 at Table 1)

Most of the C₂ and C₃ and a significant fraction of the C₄ go overhead with the CO₂ injection gas. By leaving the C₂, C₃, and a portion of the C₄ (mostly isobutane) in the CO₂, the negative effects of C₁ on the miscibility of the CO₂ injection gas are overcome. The recovery of C₃/C₄ can be monitored to control the miscibility of the CO₂ injection gas and optimize the economical operation of the plant.

EX2016 at 3:4-11

Table 1: Model Validation of Plant Data

	Field	Model
Condenser Temp, F	5.7	5.7
Reboiler Temp, F	260	260
NGL Composition, mol %		
Propane	6.02	5.48
i-Butane	17.11	16.75
n-Butane	41.78	38.39
i-Pentane	14.57	14.20
n-Pentane	9.50	8.96
Hexane +	10.84	10.96

POR at 55 (annotating EX2012 at 4)

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Mabee's NGL Propane % Is Closer to Pastor than Pilot's Plant, Undermining Pilot's Argument

Pastor

	Stream Name		
	Feed	Overhead Product	Bottoms Product
Rate	110 MMSCF	107 MMSCF	2620 BPD
H ₂ S (ppmv)	500	514	—
	Mole Percent		
N ₂	3.4	3.5	—
CO ₂	83.9	86.3	—
C ₁	6.6	6.9	—
C ₂	1.4	1.4	—
C ₃	1.1	1.1	0.02
iC ₄	0.5	0.4	3.1
nC ₄	0.7	0.3	16.7
iC ₅	0.4	0.001	16.0
nC ₅	0.6	—	23.3
C ₆	0.6	—	24.4
C ₇₊	0.4	—	16.4

POR at 56 (annotating EX2016 at Table 1)

Mabee

Table 1: Model Validation of Plant Data		
	Field	Model
Condenser Temp, F	5.7	5.7
Reboiler Temp, F	260	260
NGL Composition, mol %		
Propane	6.02	5.48
i-Butane	17.11	16.75
n-Butane	41.78	38.39
i-Pentane	14.57	14.20
n-Pentane	9.50	8.96
Hexane +	10.84	10.96

POR at 55 (annotating EX2012 at 4)

Monell 20

Composition, mol%	Treated Product
H ₂ S	0.00%
Nitrogen	0.00%
CO ₂	0.00%
Methane	0.00%
Ethane	0.00%
Propane	29.68%
i-Butane	13.66%
n-Butane	31.66%
i-Pentane	7.28%
n-Pentane	6.24%
n-Hexane	5.20%
n-Octane	6.24%
H ₂ O	0.04%

POR at 55
(values from EX2056 at 2 (stream 9))

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Pilot's Sur-reply Math Does Not Show Mabee is Closer to Pilot's Plant than Pastor

recovery is closer to Pastor than CO2Flex.” In raw numbers the 5.48% for Mabee may be closer to the 0.02% for Pastor than to the 29.68% for Monell 20 CO2Flex[®] ($5.48 - 0.02 = 5.46$ and $29.68 - 5.48 = 24.2$). But the true measure of the difference confirms that the propane recovery in the recovered NGLs at Mabee is 250 times closer to Monell 20 CO2Flex[®] than to Pastor ($29.68 / 5.48 = 5.936$, $29.68 / 0.02 = 1,484$, and $1,484 / 5.936 = 250$).

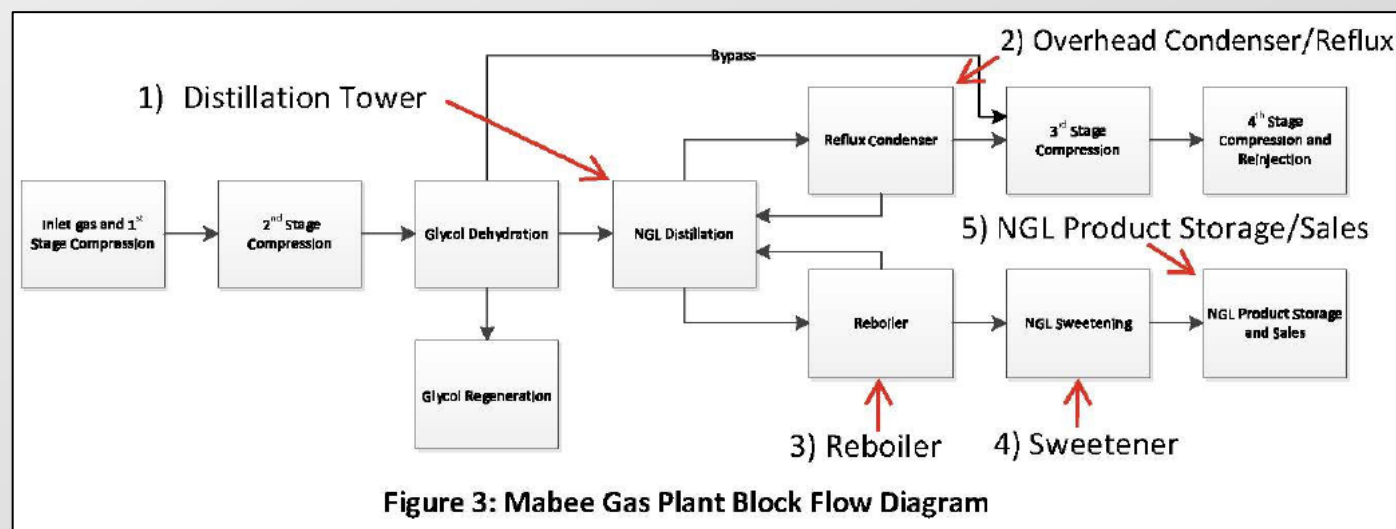
Sur-reply at 34

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Pilot Relies on the Existence of a Sweetener in the Hydrate Formation Paper

Second, the Hydrate Formation Paper further confirms Chevron's copying of the CO2Flex[®] process by showing the **existence of a Sweetener** [4] to remove H₂S acid gas from the NGL stream. (EX2012, Page 4, Figure 3.) The EX2023 Air Permit

POR at 57



POR at 57 (annotating EX2012 at 4)

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Sweetening Cannot Evidence Copying



816 FEDERAL REPORTER, 3d SERIES

foreign sale. This suggests an accommodation between the interests of the rights holder and the unsuspecting buyer must be found.

Even the majority recognizes the need for such an accommodation. The majority acknowledges that the law should accommodate the potential of "unintended infringement by buyers of goods in foreign countries who bring them into the United States," but believes that problem could be solved by the availability of an express or a vague implied license defense. See Maj. Op. at 771, 772-74. That defense provides little comfort, however, because it places the burden on the purchaser to obtain a statement from each patentee of a patent component in a product that it has permission to import the component into the United States, or else prove in court that the circumstances of each patentee's sale of its component to the manufacturer constituted an implied license to import into the United States.

In my view, the necessary accommodation between the interests of the rights holder and the unsuspecting buyer can only be achieved by the government's proposal to put the burden on the U.S. rights holder to provide notice of a reservation of U.S. rights to the purchaser, an approach supported by the earlier lower court decisions and legislative action.

In other words, the country-to-country differences in patent laws, and the different economic choices patentees must make as a result, suggest that patentees should be able to reserve their U.S. patent rights when making or authorizing foreign sales.¹⁶ But *Kirtsaeng's* policy concerns indicate that that right should not extend to situations where the patentee is silent

or unclear. If a patentee wishes to reserve its U.S. rights, it should be required to do so unmistakably. The patentee is in a better position to reserve its rights than the purchaser is to inquire into any reservation. A rule requiring reservation would protect both the interests of the authorized seller and the unsuspecting buyer.

* * * * *

In conclusion, I would overrule our decision in *Molins* as inconsistent with governing Supreme Court authority and overrule *Jazz Photo* to the extent that it imposes a blanket ban on foreign exhaustion. I would recognize foreign exhaustion where the U.S. rights holder has not notified the buyer of its retention of the U.S. patent rights. I respectfully dissent from the majority's contrary holdings.



APPLE INC., A California Corporation, Plaintiff-Cross-Appellant

v.

SAMSUNG ELECTRONICS CO., LTD., A Korean Corporation, Samsung Electronics America, Inc., A New York Corporation, Samsung Telecommunications America, LLC, A Delaware Limited Liability Company, Defendants-Appellants.

Nos. 2013-1171, 2013-1195, 2013-1994.
United States Court of Appeals,
Federal Circuit.

Feb. 26, 2016.

Background: Owner of patents related to smartphone technology brought infringement suits against Apple and Samsung in the U.S. District Court for the District of Delaware. Apple and Samsung moved for summary judgment, claiming that the patents were invalid as a matter of law. The district court granted summary judgment in favor of Apple and Samsung. The Federal Circuit affirmed.

16. There is significant uniformity and reciprocity in international copyright law, see *Kirtsaeng*, 133 S.Ct. at 1359-60 (observing that American copyright law protect "works first published in any one of the nearly 180

nations that have signed a copyright treaty with the United States"), but as the majority describes, the availability and scope of patent protection differ from country to country. See Maj. Op. at 761-62.

Affirmed in part and reversed in part.

Rehearing denied. 35 U.S.C.A. § 100(a).

APPLE INC. v. SAMSUNG ELECTRONICS CO., LTD.

Cite as 816 F.3d 788 (Fed. Cir. 2016)

user "accepts or hits space." *Id.* This feature is exactly what was disclosed in Robinson. When the feature that is copied is present in the prior art, that copying is not relevant to prove nonobviousness. See *Amazon.com*, 239 F.3d at 1366; *Wm. Wrigley Jr. Co.*, 683 F.3d at 1363; see also *In re Huai-Hung Kao*, 639 F.3d 1057, 1068 (Fed.Cir.2011) ("Where the offered secondary consideration actually results from something other than what is both claimed and *novel* in the claim, there is no nexus to the merits of the claimed invention.").

Apple at 810

ALLEGED COPYING

Sweetening Cannot Evidence Copying

Notice of Allowability	Application No. 12/122,336	Applicant(s) PRIM, ERIC	
	Examiner KEITH RAYMOND	Art Unit 3744	AIA (First Inventor to File) Status No

Notice of Allowability	Application No. 12/122,336	Applicant(s) PRIM, ERIC
	Examiner KEITH RAYMOND	Art Unit 3744
– The MAILING DATE of this communication appears on the cover sheet with the correspondence address– All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL 45) or other appropriate communication will be mailed in due course. THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS. This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1306. 1. ☒ This communication is responsive to <u>After Final Amendment filed 04/11/2013</u> ☐ A declaration(s) (if advantage(s) under 37 CFR 1.130(b)) was/were filed on: _____ 2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action. 3. ☒ The allowed claim(s) is/are <u>1,2,4,9-11,21-33,35-37,38 and 40-43</u>. As a result of the allowed claim(s), you may be eligible to benefit from the Patent Prosecution Highway program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/paths/index.jsp or send an inquiry to pph@uspto.gov. 4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f). Certified copies: a) ☐ All b) ☐ Some c) ☐ None of the: 1. ☐ Certified copies of the priority documents have been received. 2. ☐ Certified copies of the priority documents have been received in Application No. _____. 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)). * Certified copies not received: _____ Interim copies: a) ☐ All b) ☐ Some c) ☐ None of the: Interim copies of the priority documents have been received. Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. THIS THREE-MONTH PERIOD IS NOT EXTENDABLE. 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted. ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____. Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d). 6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL. Attachment(s) 1. ☐ Notice of References Cited (PTO-892) 2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____ 3. ☐ Examiner's Current Requirement for Deposit of Biological Material 4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ 5. ☐ Examiner's Amendment/Comment 6. ☐ Examiner's Statement of Reasons for Allowance 7. ☒ Other <u>After Final Amendment</u> _____/KEITH RAYMOND/ Examiner, Art Unit 3744 PTOL 37 (Rev. 03-13) Notice of Allowability Part of Paper No./Mail Date 20130501		

sweetening process for sweetening the sour CO₂. The examiner would like to point out that sweetening processes are a well-known method in the art and can be applied to any sour process streams (including a sour NGL stream as claimed by the applicant). However, neither Goddin nor Daus provide for the separation steps in the order claimed by the applicant and none of the prior art of record provide for the multiple separation steps wherein the carbon dioxide is not removed from the feed stream and the recycle stream prior to separating the carbon dioxide recycle stream into a sour NGL rich stream and a purified carbon dioxide recycle stream. Further, none of the prior art of record provide for utilizing

EX1003 at 270

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Mabee's Sweetener Does Not Show Dissimilarity to Chevron's Prior Plant

had built at their Rangely, Colorado facility in the early 1990s. Chevron is expected to continue this position by asserting that the NGL Recovery Plant it built at Mabee is “architecturally identical” to the Rangely, Colorado plant. Chevron may demonstrate that the Rangely, Colorado plant built in the early 1990s has each of the five main components of the CO2Flex® process. But being “architecturally identical” and having each of the components when merely viewed from the outside does not conclude the inquiry. The next question to ask is how the components are

POR at 52

REMOTE DEPOSITION

OF

ERIC PRIM

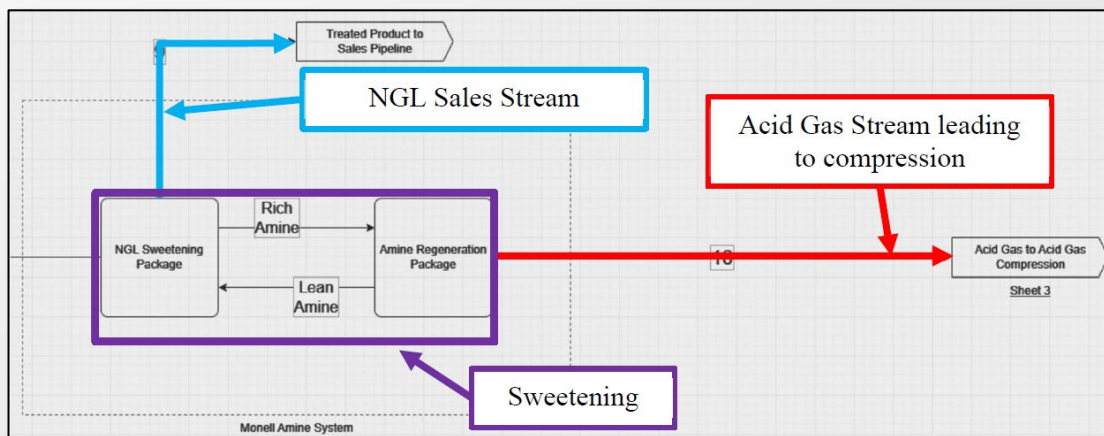
Thursday, February 13, 2025

23 Q. Do you know if the Rangely
24 Plant has a sweetener?
25 A. I don't. They might. And
2 there's all kinds of reasons why it would
3 need one even though what -- even if
4 Rangely actually built the '666 patent,
5 then that means they're not recovering
6 propane and the whole -- you know, the
7 whole purpose of Pastore, it's a pretty
8 smart idea.

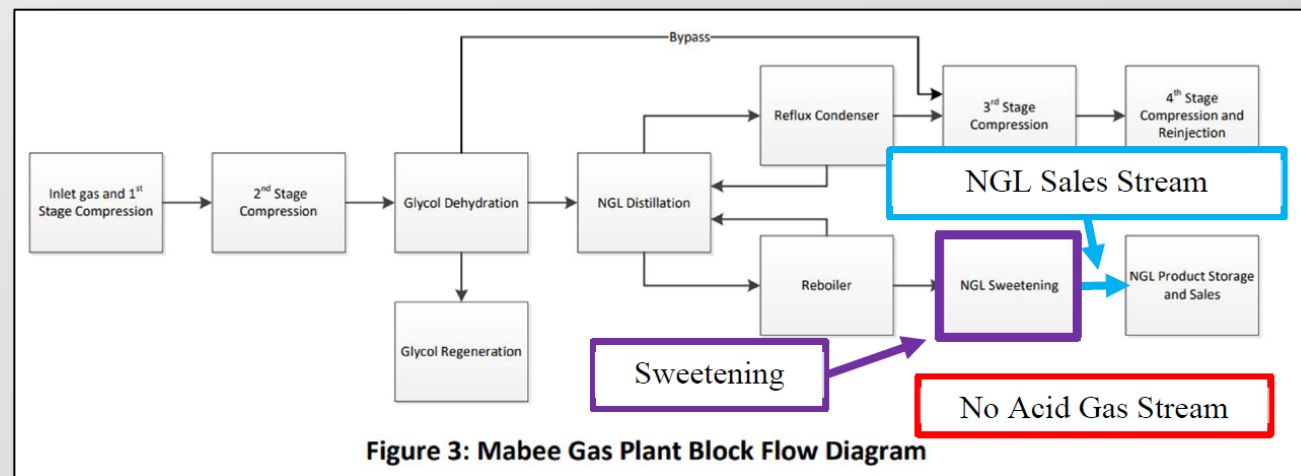
EX1026 at 76:23-77:8

ALLEGED COPYING

No Copying Because Mabee Has No “Acid Gas Stream”



Reply at 28 (annotating EX2055 at 1)



Reply at 29 (annotating EX2012 at Fig. 3)

ALLEGED COPYING

No Copying Because Mabee Has No “Acid Gas Stream”

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Protecting Texas by Reducing and Preventing Pollution

condenser duty will be supplied by a hot oil furnace and propane refrigeration unit. The tower bottoms product NGL undergoes COS hydrolysis, air cooling, water separation, SulfaTreat, and storage before being pumped to the West Texas LPG Pipeline. H₂S removed by the Sulfa-treat tower produces solid waste sulfur cakes. The addition of one 500 HP electric compressor along

EX2023 at 15

STENOGRAPHIC DEPOSITION OF

TREVOR BORS

HOUSTON, TEXAS

WEDNESDAY, FEBRUARY 5, 2025

23	Q	And then the SulfaTreat column media has
24		to be replaced every so often, correct?
25	A	That is correct.
1	Q	The spent media inside the column is not
2		a gas, is it?
3	A	It is not.

EX1025 at 51:23-52:3

ALLEGED LONG FELT BUT UNMET NEED

Pilot Fails to Establish How Pilot's Claims Meet the Alleged Need

Pilot Argues Need for "More Economical Alternative"

A. Long Felt but Unmet Need

Petitioner Chevron itself recognized the long felt need to develop a **more economical alternative** to the Ryan/Holmes and Mechanical Refrigeration Unit technologies for processing carbon dioxide recycle streams in enhanced oil recovery ("EOR") operations. In Chevron's Pastor '666 Patent, filed in 1986, Chevron

POR at 33

Pilot Argues Achieved by Unclaimed Disregarding Methane/Ethane

Considering that the Prim '332 process **conserves costs by "disregarding the recovery" of methane and ethane** from the carbon dioxide recycle stream, it would make no sense for a POSITA to use the Ryan/Holmes methane/ethane recovery process as a starting point to modify it or combine with other teachings to develop the Prim '332 Patent process. The Ryan/Holmes process focus on recovery of

POR at 31

as detailed in Chevron's Pastor '666 Patent dating back to 1986. Chevron attempted to solve the problem, but left the problem unresolved by failing to reach the Prim '332 Patent solution, which bridges the gap by **disregarding recovery of methane and ethane**, to allow for a significantly more economical recovery of NGLs (including C3 propane).

Sur-reply at 18-19

ALLEGED LONG FELT BUT UNMET NEED

Pilot Fails to Establish How Pilot's Claims Meet the Alleged Need

Pilot Argues Need for “More Economical Alternative”

A. Long Felt but Unmet Need

Petitioner Chevron itself recognized the long felt need to develop a **more economical alternative** to the Ryan/Holmes and Mechanical Refrigeration Unit technologies for processing carbon dioxide recycle streams in enhanced oil recovery (“EOR”) operations. In Chevron’s Pastor ‘666 Patent, filed in 1986, Chevron

POR at 33

Pilot Abandoned Nexus for Economical Propane Recovery

But when Chevron addressed these problems, and the need for a solution, it failed to come up with the Prim ‘332 Patent process, which recovers an **economical amount of C3 Propane**. Chevron’s solution to these problems was to focus on

POR at 35

4. Unexpected results

Petitioners note that the “unexpected results” that Prim encountered in his early development of the CO2Flex® process, which led to Prim proposing a **“relatively low propane recovery”** to Exxon, **is not recited in the Challenged Claims**. Pilot concedes that these “unexpected results” are neutral for the Challenged Claims.

Sur-reply at 21

ALLEGED FAILURE OF OTHERS

Pilot Fails to Explain What Chevron Failed to Achieve

- Pilot Argues:
 - No Maintenance Fees on Pastor
 - “Prim solution”
 - “Could have done better”
 - Copying

By at least June of 1992, Chevron apparently had recognized its Pastor ‘666 process as a failure, letting the patent expire by not paying the first maintenance fee that was due June 29, 1992 at the four-year anniversary of the issuance of the patent. (EX2073.) At the July 2012 industry conference where Chevron presented the

POR at 36-37

2. Failure of Others

Petitioner Chevron’s failure, as described immediately above, is its failure to achieve the Prim solution, which as also described above is directly tied to each of the Challenged Claims. Petitioners assert that Chevron did not fail, because its Pastor Rangely plant is commercially successful. Chevron’s failure is its failure to reach the Prim solution, regardless of whether Chevron may have had some commercial success. The point is that they could have done better, and apparently recognized that when they copied the Prim process including the recovery of propane when they built their Mabee facility, rather than using their Pastor process and continuing to disregard recovery of propane.

Sur-reply at 20

ALLEGED SKEPTICISM OF EXPERTS

Pilot Presents No Basis for Skepticism – Single Unsupported Sentence in Prim Declaration

SCOUT ENERGY MANAGEMENT, LLC, and
CHEVRON U.S.A. INC.,
Petitioners,

v.

PILOT INTELLECTUAL PROPERTY, LLC,
Patent Owner.

Case IPR2024-00385
Patent 8,505,332 B1

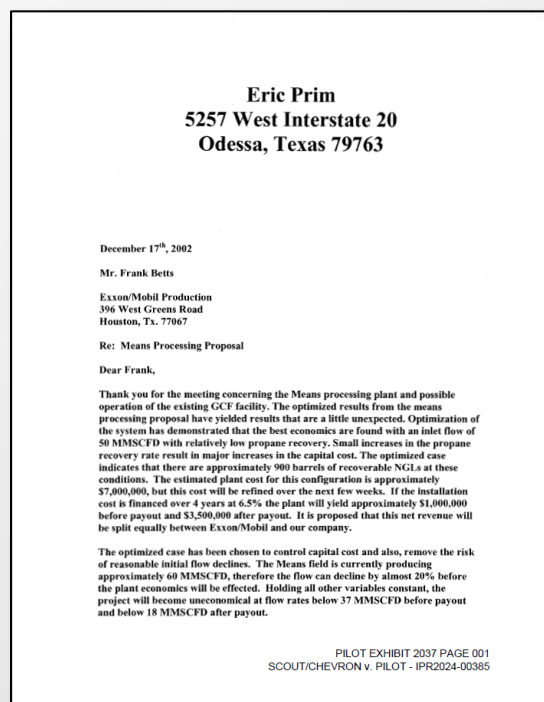
DECLARATION OF ERIC PRIM

34. Despite my best efforts to convince Exxon to join with me and Holloman to build my proposed “proof of concept” gas processing plant, Exxon was skeptical of the proposed process and rejected my proposals. My last attempt to work with Exxon on the Means NGL recovery plant was in February of 2023. At this time, Exxon was still not processing the reinjection gas stream at the Means field. To this day, it is my understanding that Exxon is continuing to re-inject the produced hydrocarbon gas along with the produced and purchased CO2 at its Means field facility, with no processing of the produced gas to recover natural gas liquids.

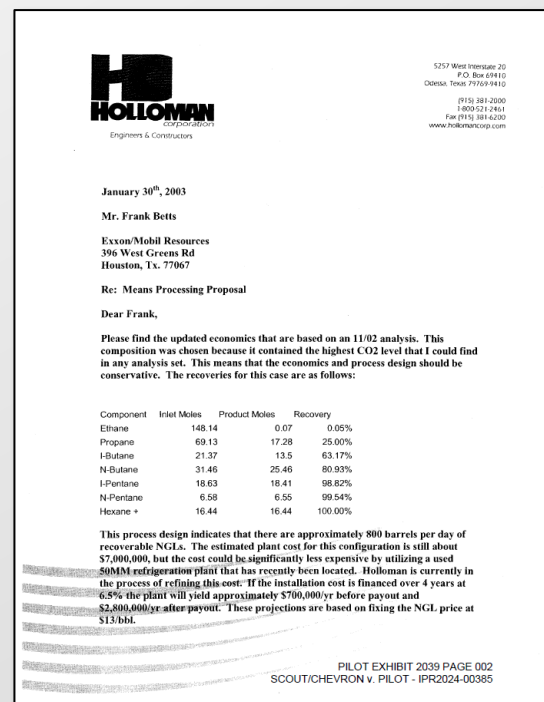
EX2029 at ¶ 34

ALLEGED SKEPTICISM OF EXPERTS

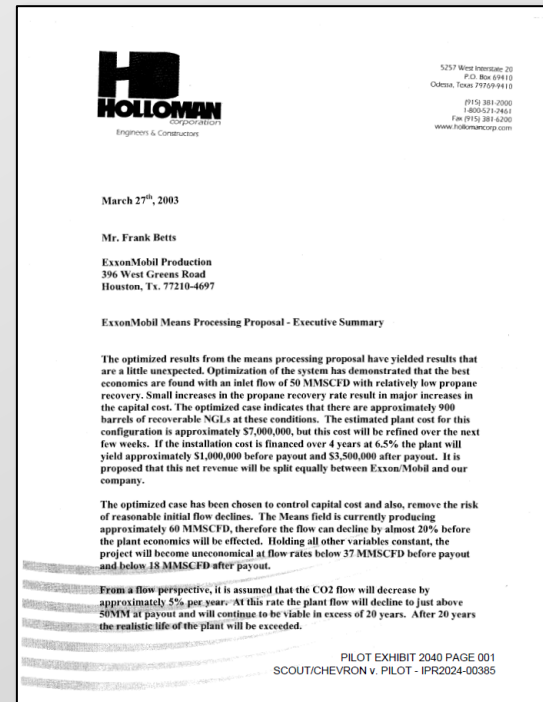
Pilot Includes Prim's Proposals, But No Responses



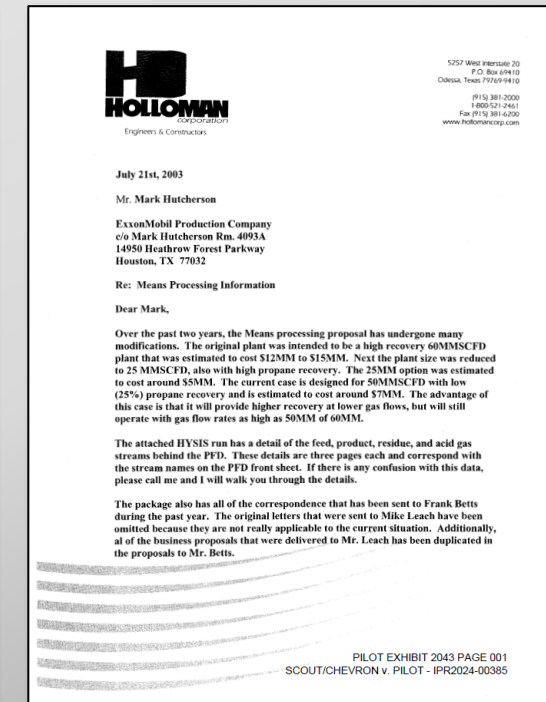
EX2037



EX2039



EX2040



EX2043

ALLEGED SKEPTICISM OF EXPERTS

Prim's Proposals Are Tied to Low Propane Recovery Which Has No Nexus

Re: Means Processing Proposal

Dear Frank,

Thank you for the meeting concerning the Means processing plant and possible operation of the existing GCF facility. The optimized results from the means processing proposal have yielded results that are a little unexpected. Optimization of the system has demonstrated that the best economics are found with an inlet flow of 50 MMSCFD with **relatively low propane recovery**. Small increases in the propane recovery rate result in major increases in the capital cost. The optimized case indicates that there are approximately 900 barrels of recoverable NGLs at these conditions. The estimated plant cost for this configuration is approximately \$7,000,000, but this cost will be refined over the next few weeks. If the installation cost is financed over 4 years at 6.5% the plant will yield approximately \$1,000,000 before payout and \$3,500,000 after payout. It is proposed that this net revenue will be split equally between Exxon/Mobil and our company.

EX2037 at 1

ExxonMobil Means Processing Proposal - Executive Summary

The optimized results from the means processing proposal have yielded results that are a little unexpected. Optimization of the system has demonstrated that the best economics are found with an inlet flow of 50 MMSCFD with **relatively low propane recovery**. Small increases in the propane recovery rate result in major increases in the capital cost. The optimized case indicates that there are approximately 900 barrels of recoverable NGLs at these conditions. The estimated plant cost for this configuration is approximately \$7,000,000, but this cost will be refined over the next few weeks. If the installation cost is financed over 4 years at 6.5% the plant will yield approximately \$1,000,000 before payout and \$3,500,000 after payout. It is proposed that this net revenue will be split equally between Exxon/Mobil and our company.

EX2040 at 1

Re: Means Processing Proposal

Dear Frank,

Please find the updated economics that are based on an 11/02 analysis. This composition was chosen because it contained the highest CO2 level that I could find in any analysis set. This means that the economics and process design should be conservative. The recoveries for this case are as follows:

Component	Inlet Moles	Product Moles	Recovery
Ethane	148.14	0.07	0.05%
Propane	69.13	17.28	25.00%
I-Butane	21.37	13.5	63.17%
N-Butane	31.46	25.46	80.93%
I-Pentane	18.63	18.41	98.82%
N-Pentane	6.58	6.55	99.54%
Hexane +	16.44	16.44	100.00%

EX2039 at 2

Re: Means Processing Information

Dear Mark,

Over the past two years, the Means processing proposal has undergone many modifications. The original plant was intended to be a high recovery 60MMSCFD plant that was estimated to cost \$12MM to \$15MM. Next the plant size was reduced to 25 MMSCFD, also with high propane recovery. The 25MM option was estimated to cost around \$5MM. **The current case is designed for 50MMSCFD with low (25%) propane recovery** and is estimated to cost around \$7MM. The advantage of this case is that it will provide higher recovery at lower gas flows, but will still operate with gas flow rates as high as 50MM of 60MM.

EX2043 at 1

ALLEGED SKEPTICISM OF EXPERTS

Prim's Proposals Are Tied to Low Propane Recovery Which Has No Nexus

Petitioners note that the “unexpected results” that Prim encountered in his early development of the CO2Flex[®] process, which led to Prim proposing a “relatively low propane recovery” to Exxon, is not recited in the Challenged Claims. Pilot concedes that these “unexpected results” are neutral for the Challenged Claims.

Sur-reply at 21

ALLEGED SKEPTICISM OF EXPERTS

Prim Admits Reasons Other Than Skepticism For Exxon Not Accepting Proposals

REMOTE DEPOSITION

OF

ERIC PRIM

Thursday, February 13, 2025

2 Q. So they're still skeptical even
3 in 2023?

4 A. I don't think they're skeptical
5 anymore. I think that they are -- they
6 just choose not to recover the NGLs out of
7 the stream.

8 There's probably some reservoir
9 reasons why they wouldn't want to do that.

10 I don't know what they are. I'm not a
11 reservoir guy. If it's underground, I
12 don't understand it.

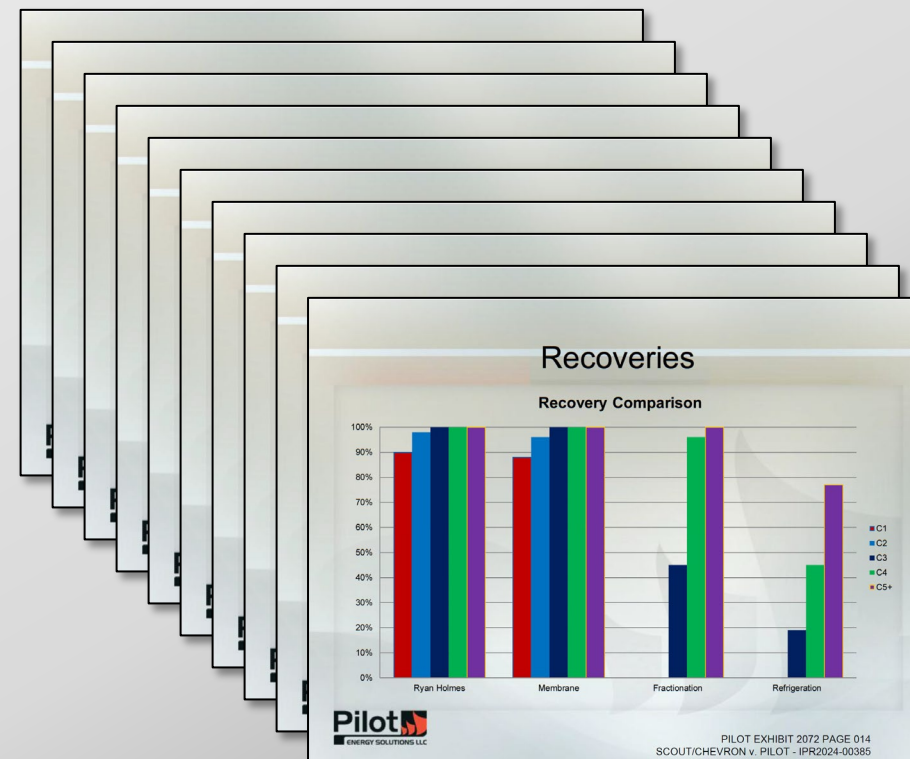
EX1026 at 35:2-12

ALLEGED INDUSTRY PRAISE

Pilot's Single 2012 Hearsay Statement to a Conference Speaker Is Insufficient

47. After I had finished my presentation on NGL recovery, the Chevron presenter, Rory Clark came up to me to talk about our presentation. He made the statement: “wow, I sure wish we could get your recoveries at our Rangely NGL plant.” As Chevron has stated, the Rangely facility utilizes the Pastor ‘666 Patent process, U.S. Patent No. 4,753,666 (EX2016.). According to the Pastor ‘666 Patent, this process recovers no propane, 20% of the I-C4, 55% of the N-C4 and essentially all of the C5+. In contrast, the ‘332 Patent process typically recovers around 25% of the propane, 70% of the I-C4, 90% of the N-C4, and essentially all of the C5+. Therefore, to Chevron’s point, the differences in recovery are substantial and impressive.

EX2029 at ¶ 47; see also POR at 41



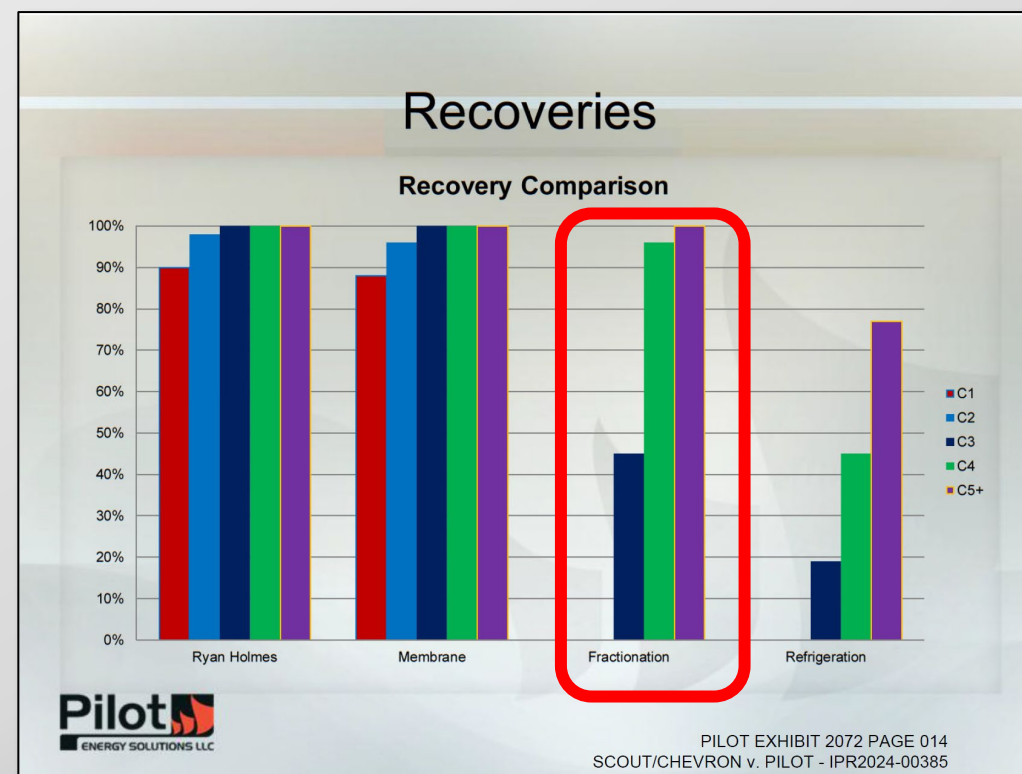
EX2049 at 14

ALLEGED INDUSTRY PRAISE

Pilot's Single 2012 Hearsay Statement to a Conference Speaker Is Insufficient

Petitioners assert that there is no nexus between the praised “recoveries” of the CO2Flex® process and the Challenged Claims. A review of the CO2Flex® process (“Fractionation”) recoveries shown in Prim’s “Recovery Comparison” slide confirms the nexus with each of the Challenged Claims, including the Claim 1 disregard for recovery of methane and ethane, the Claim 1 inclusion of C3 propane in the NGL Rich streams, and the Claims 4 and 7 very low upper limits for the percentages of methane and ethane in the NGL Rich streams. The CO2Flex® process recoveries presented in the slide show zero recovery of methane and ethane.

Sur-reply 22



EX2049 at 14 (red annotation added)

ALLEGED COMMERCIAL SUCCESS

Pilot's Argument Hinges on Unclaimed Methane/Ethane Disregarding

carbon dioxide recycle streams. This innovative process leaves all (or almost all) of the methane and ethane in the carbon dioxide recycle streams, to produce NGLs, having little to no methane and ethane, while using significantly less process equipment and energy, and thereby recovers NGLs with significantly less costs. (EX2028 ¶182.)

POR 30-31

This “comparison” Petitioners demand in their Reply makes it clear why CO2Flex[®] has achieved tremendous commercial success, directly resulting from the CO2Flex[®] process disregarding the recovery of methane and ethane as specified in independent Claim 1, and dependent Claims 4 and 7, to provide a more economical solution compared to the alternatives. In sharp contrast to Ryan/Holmes, for which

Sur-reply 32-33

ALLEGED COMMERCIAL SUCCESS

Claims Do Not Recite Methane/Ethane Disregard

(12) **United States Patent**
Prim

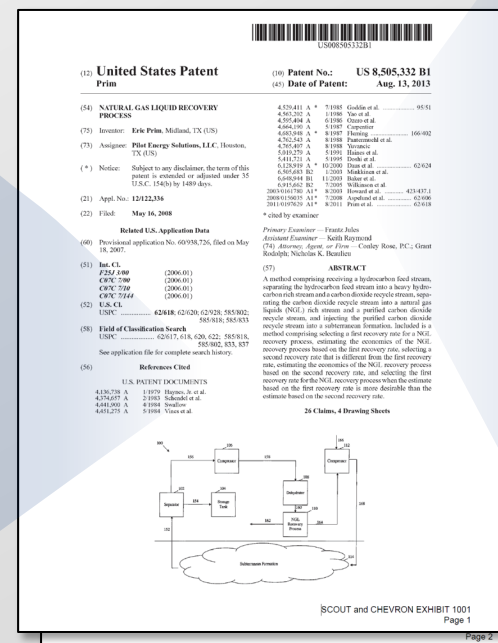
(10) **Patent No.:** **US 8,505,332 B1**
(45) **Date of Patent:** **Aug. 13, 2013**

Specifies Low Methane/Ethane in NGL Streams

4. The method of claim 3, wherein the sweet NGL rich stream comprises no more than 1 molar percent methane, no more than 1 molar percent ethane, and no more than 1 molar percent acid gases.

7. The method of claim 6, wherein the sour NGL rich stream comprises no more than 5 molar percent carbon dioxide, no more than 1 molar percent methane, and no more than 5 molar percent ethane, and wherein the sweet NGL rich stream is substantially free of carbon dioxide.

EX1001 at 18:35-58



No Mention of Methane/Ethane

1. A method comprising:
receiving a hydrocarbon feed stream, wherein the hydrocarbon feed stream comprises carbon dioxide, natural gas liquid (NGL), heavy hydrocarbons, and acid gas, wherein the NGL comprises C_3 - C_8 hydrocarbons, and wherein the heavy hydrocarbons comprise C_{9+} hydrocarbons;
separating the hydrocarbon feed stream into a heavy hydrocarbon rich stream and a carbon dioxide recycle stream, wherein the heavy hydrocarbon rich stream comprises the C_{9+} hydrocarbons, and wherein the carbon dioxide recycle stream comprises the carbon dioxide, the C_3 - C_8 hydrocarbons, and the acid gas;
separating the carbon dioxide recycle stream into a sour NGL rich stream and a purified carbon dioxide recycle stream, wherein the sour NGL rich stream comprises the C_3 - C_8 hydrocarbons and the acid gas, and wherein the purified carbon dioxide recycle stream comprises the carbon dioxide; and
separating the sour NGL rich stream into a sweet NGL rich stream and an acid gas stream, wherein the sweet NGL rich stream comprises the C_3 - C_8 hydrocarbons, and wherein the acid gas stream comprises the acid gas, wherein the carbon dioxide is not removed from the hydrocarbon feed stream and is not removed from the carbon dioxide recycle stream prior to separating the carbon dioxide recycle stream into the sour NGL rich stream and the purified carbon dioxide recycle stream, and wherein the hydrocarbon feed stream, the carbon dioxide recycle stream, and the sour NGL rich stream are not subjected to cryogenic conditions, membranes, and carbon dioxide recovery solvents between being received and being separated into the heavy hydrocarbon rich stream, the purified carbon dioxide recycle stream, the sweet NGL rich stream, and the acid gas stream.

EX1001 at 17:52-18:19

ALLEGED COMMERCIAL SUCCESS

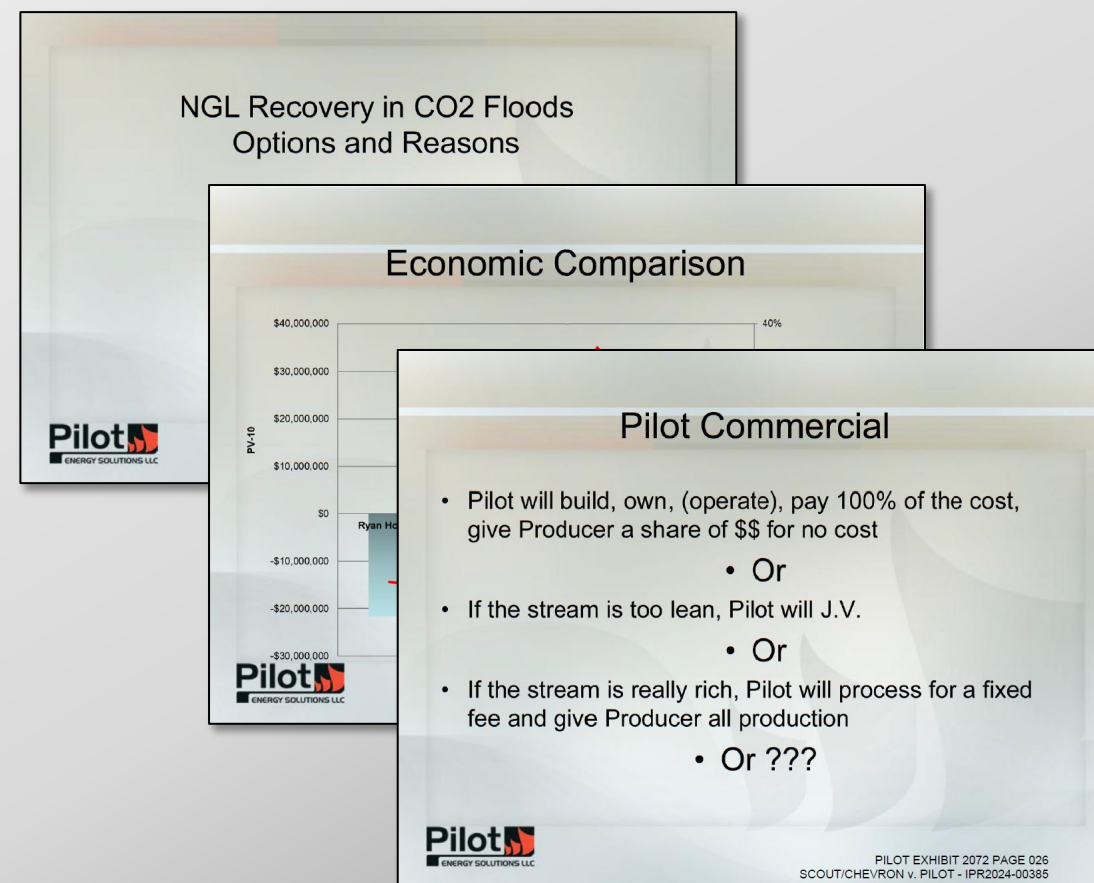
No Specific Comparisons With Prior Art – Only Revenues and Unexplained Sales Pitch “Economics”

The first page of EX2072 summarizes the financial numbers for each plant, including the total revenues and operating profits through the end of 2023, the annual numbers for 2023, and the projected numbers through the expected remaining life of the reservoirs.

POR at 42

Totals						
	2008-2011 Monell 20	2013-2023 Goldsmith	2013-2023 Weyburn	2014-2023 Wellman	2015-2023 Monell 120/160	2008-2023 Total
Gross Revenue	\$16,575,600	\$57,709,021	\$124,836,776	\$51,043,804	\$81,955,126	\$332,120,327
Operating expense	\$1,657,560	\$19,483,969	\$22,000,000	\$19,271,978	\$23,696,818	\$86,110,324
Operating Profit	\$14,918,040	\$38,225,052	\$102,836,776	\$31,771,826	\$58,258,308	\$246,010,002
Over \$330 million total revenue						
Over \$245 million total operating profits						
Current Annual (2023)						
Gross Revenue		\$3,843,540	\$4,020,068	\$4,847,960	\$9,947,908	\$22,659,476
Operating expense		\$1,178,654	\$2,000,000	\$1,763,202	\$2,613,859	\$7,555,714
Operating Profit		\$2,664,886	\$2,773,847	\$3,084,758	\$7,334,050	\$15,857,541
~\$23 million Current Annual Revenue						
~\$16 million Current Annual Operating Profits						
Hydrocarbon Barrels						
Total	247,032	927,994	2,751,124	1,442,243	1,566,199	6,934,593
2023		58,166	273,008	83,392	132,801	547,367
~7 million barrels of hydrocarbons recovered						
~273K Current Annual barrels recovered						
Projections						
	10 yrs remaining 5% annual decline	20 yrs remaining 1% annual decline	5 yrs remaining 5% annual decline	20 yrs remaining 5% annual decline	Total for Current Plants	Assuming Level Growth 5 more plants built in next 10 yrs
Gross Revenue	\$35,332,888	\$227,845,292	\$29,248,974	\$134,588,526	\$427,015,679	\$759,136,006
Operating expense	\$10,953,195	\$70,632,040	\$9,067,182	\$41,722,443	\$132,374,861	\$218,485,185
Operating Profit	\$24,379,692	\$157,213,251	\$20,181,792	\$92,866,083	\$294,640,819	\$540,650,821
						\$1,081,301,642

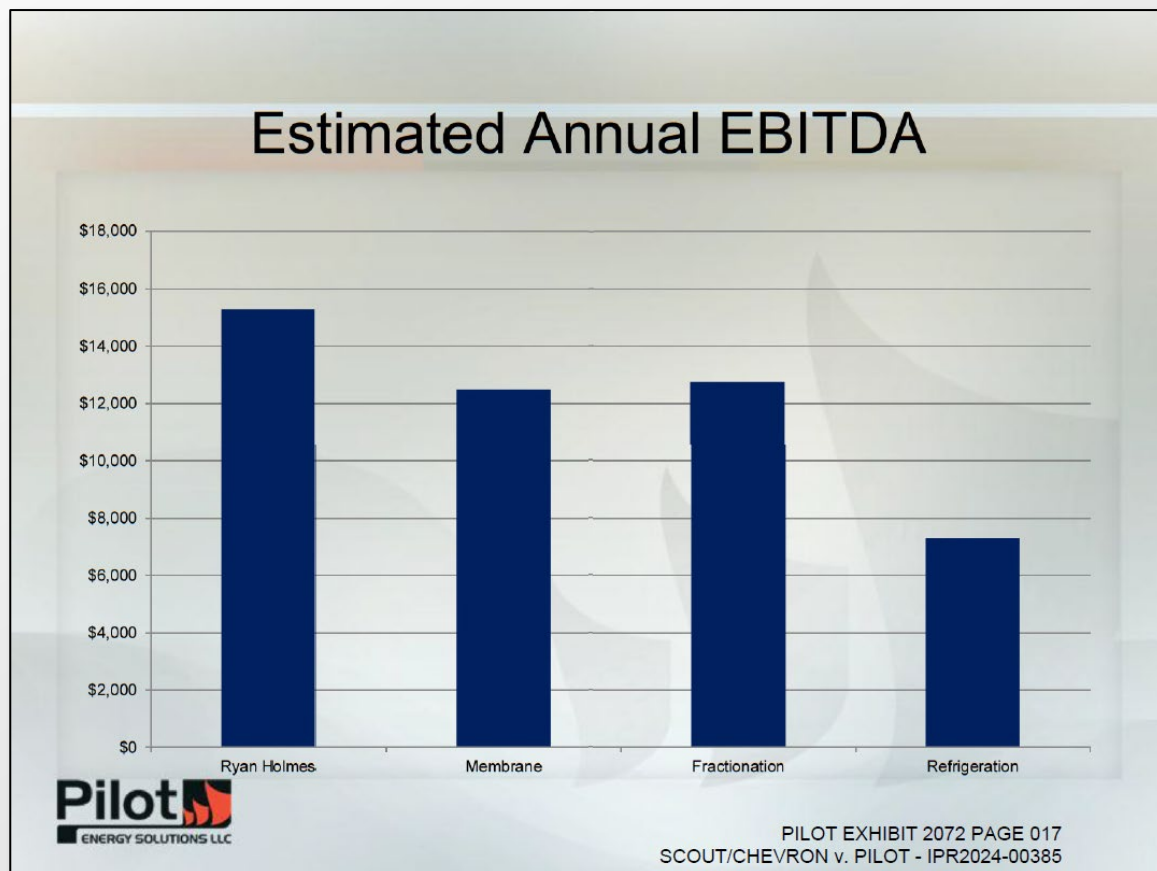
EX2072 at 1



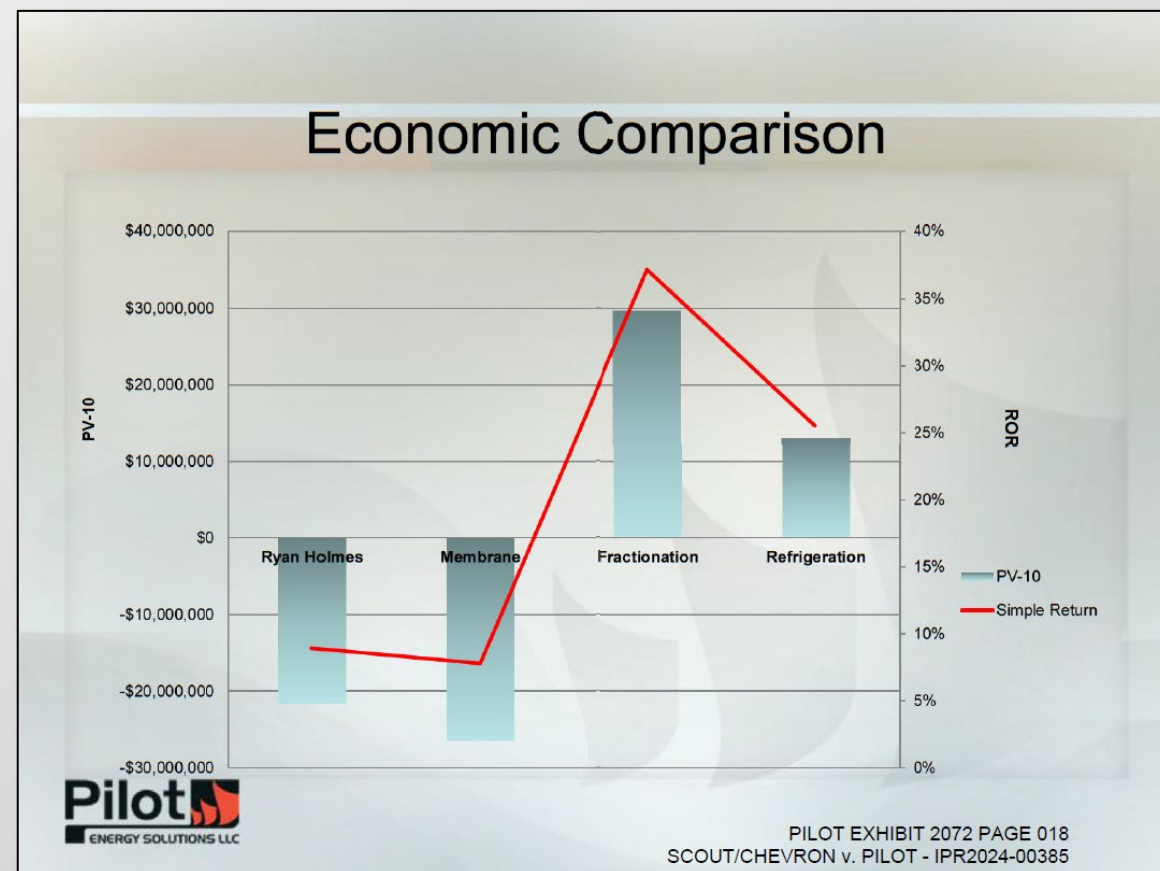
EX2049 at 1, 18, 26; Sur-reply at 24-33

ALLEGED COMMERCIAL SUCCESS

No Specific Comparisons With Prior Art – Only Revenues and Unexplained Sales Pitch “Economics”



EX2049 at 17; Sur-reply at 31



EX2049 at 18; Sur-reply at 32