

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 No. IPR2024-00385
U.S. PATENT NO. 8,505,332 B1

**PETITIONERS' REPLY TO
PATENT OWNER'S PRELIMINARY RESPONSE**

Pursuant to the Board's email of June 6, 2024, Petitioners file this authorized reply to Patent Owner's ("PO") Preliminary Response ("POPR"). This Reply addresses PO's arguments that the Board should deny institution under 35 U.S.C. § 325(d) for allegedly being too similar to the Examiner's consideration of *Goddin*. But *Goddin* is different from the asserted prior art, and PO's arguments of similarity are based on erroneous and unexpected claim constructions. The Board should reject PO's arguments and institute this proceeding.

I. AYCAGUER, SOLDATI AND RYAN ARE NOT CUMULATIVE WITH GODDIN, AND THEREFORE INSTITUTION IS PROPER UNDER § 325(d)

Each ground of invalidity in the Petition raises prior art that was not considered during examination. The POPR focuses on three unconsidered references, *Aycaguer*, *Soldati* and *Ryan* (together, the "Asserted Art"), but each materially differs from *Goddin* because they do not utilize the three forbidden elements of the Challenged Claims that were excluded from the scope of the claims to overcome *Goddin*. In other words, unlike *Goddin*, the Asserted Art does not utilize "cryogenic conditions", "membranes", or "carbon dioxide recovery solvents." Thus, the first part of the *Advanced Bionics* framework is not met.

PO argues that all four references are cumulative because each discloses a variation of the "Ryan/Holmes" process, and thus must contain at least one of the three negative limitations. POPR at 51. In doing so, however, PO ignores the

specific teachings of each reference and the substance of the prosecution history.

The Examiner's rejections focused on specific references—including *Goddin*—not a broader category of “Ryan/Homes” processes. In fact, neither the word “Ryan” nor the word “Holmes” show up in PO's arguments/amendments or the Examiner's responses in the prosecution history. Instead, as discussed above, the prosecution was narrowly focused on *Goddin*'s use of three elements—membranes, cryogenics, and CO₂ recovery solvents—two of which are emphasized in the POPR. Not only did the term “Ryan/Holmes” go unmentioned during prosecution, but *Goddin*'s use of cryogenic conditions and solvents (whose purpose is to dissolve and remove CO₂) is entirely different from the Asserted Art's use of distillation to remove CO₂.

A. Unlike *Goddin*, the Asserted Art Does Not Use Membranes

All of the disclosed embodiments of *Goddin* include a “permeator.” EX2003 at Figs. 11 & 12. The “permeators compris[e] differentially permeable membranes selectively permeable to CO₂.” EX2003 at 8:25–27. The PO used this disclosure to distinguish *Goddin* from the Challenged Claims during prosecution by adding a negative limitation to claim 1 that excludes the use of membranes. POPR at 15.

The Asserted Art does not utilize or mention membranes, and the PO does not assert that it does. Pet. at 34–35, 54–55. Thus, the Asserted Art and *Goddin* are different, non-cumulative, and do not overlap with respect to this element.

B. Unlike *Goddin*, the Embodiments of the Asserted Art Relied on By the Petitioner Do Not Use Cryogenic Conditions

Goddin discloses the use of a “cryogenic” process in its embodiment shown in Figure 11. EX2003 at 16:12–15; Figure 11. The PO used this to distinguish *Goddin* from the Challenged Claims by adding a negative limitation to claim 1 that excludes the use of cryogenic conditions. POPR at 15.

In the POPR, PO proposed a definition of “cryogenic conditions” of temperatures below -50 °F (-45 °C). POPR at 19. As an initial matter, this definition contradicts the definition PO advocated for in district court. EX1011 at 8–9.¹ Moreover, *Goddin* does not disclose the temperature of its cryodemethanizer column, and thus it is not clear if *Goddin*’s method is cryogenic as defined by the PO in its POPR. In any event, however, there is no question that the embodiments

¹ PO’s newly chosen POPR definition is also at odds with the definition applied by the Canadian Patent Office in conducting a reexamination of a related patent between February 2020 and September 2021, which PO failed to disclose with its POPR. EX2013 at 6, 137. There, the Canadian Patent Office noted “the scope of the phrase ‘cryogenic conditions’ is not evident from the claim language itself or the specification” and repeatedly applied a definition of -150 °C (-238 °F) to -273°C (-460 °F). Ex. 2013 at 10, 261, 304–305, 370. PO had no rebuttal to this definition, and instead distinguished and amended the claims on other bases.

of the Asserted Art used in the Petition do not use cryogenic conditions under PO's proposed definition. The lowest temperature disclosed in the *Soldati* embodiment used by the Petitioner is -35 °C. EX1006 at Table III, Stream 57. Similarly, the lowest temperature disclosed in the *Ryan* embodiment used by Petitioner (the 4-column process) is -50 °F. EX1007 at Table 2. *Aycaguer* does not refer to a specific temperature, but it does state that it uses the Ryan/Holmes process which is disclosed in *Ryan*. Thus, even assuming *arguendo* that PO's definition of "cryogenic" is correct, the Asserted Art and *Goddin* are different and non-cumulative with respect to this element.

C. Unlike *Goddin*, the Embodiments of the Asserted Art Relied on by the Petitioner Do Not Disclose CO₂ Recovery Solvents

As PO discussed with the Examiner during prosecution of the '332 Patent, *Goddin* discloses the use of solvents to dissolve and recover CO₂ from a natural gas liquid (NGL) stream. The Asserted Art, by comparison, separates CO₂ from an NGL stream using distillation. Since distillation does not use a CO₂ recovery solvent, the Asserted Art is not cumulative with *Goddin*.

1. CO₂ Recovery Solvents as Disclosed by *Goddin*

Goddin teaches two different methods of separating CO₂ from a NGL stream: one represented by Figure 11, and one represented by Figure 12. EX2003 at Abstract; *see also* EX2003 at Figures 11 & 12. "FIG. 11 represents an integration in accordance with the invention of membrane permeators and

cryogenic fractionation for CO₂ removal.” EX2003 at 16:12–15. Figure 12

“represents schematically an integration in accordance with the invention of membrane permeators and chemical absorption for CO₂ removal.” EX2003 at 18:27–30 (emphasis added). As explained by the PO during prosecution, the use of CO₂ absorption and the use of CO₂ recovery solvents are synonymous. EX1003 at 257 (“*Goddin* subjects its streams to . . . **CO₂ solution absorption (i.e., carbon dioxide recovery solvents)**.”) (emphasis added). *Goddin* does not describe CO₂ absorption in the embodiment described by Figure 11.

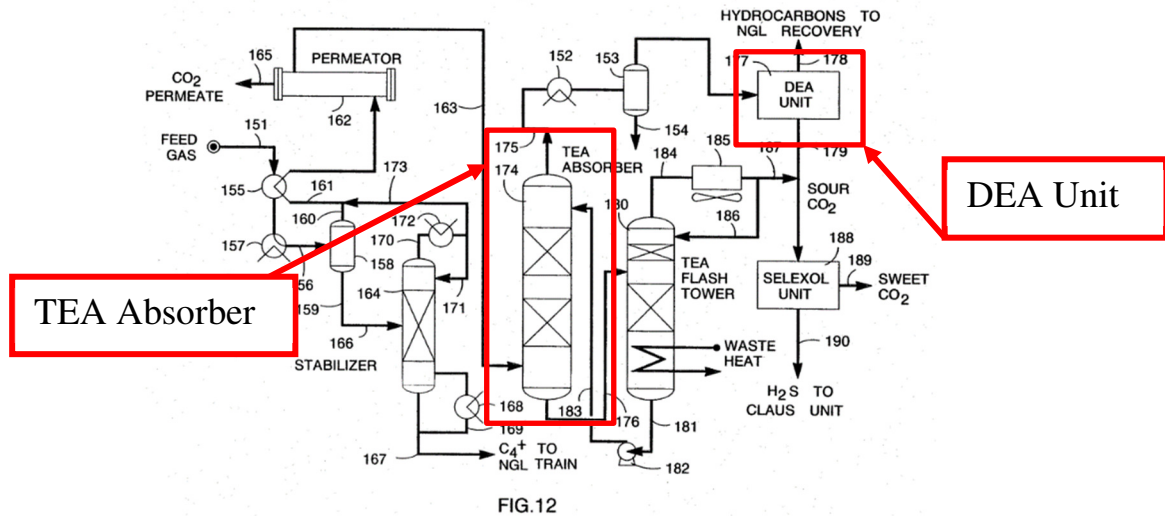
Goddin’s CO₂ solution absorption process preferably includes “two or more absorber stages or zones with solution(s) effective for CO₂ removal from the process stream.” EX2003 at 6:20–23. The “first absorber zone” includes “an aqueous tertiary alkanolamine, for example, triethanolamine (TEA)”. EX2003 at 6:26–29. The “subsequent (second) absorber zone” uses “a primary or secondary alkanolamine, such as, . . . diethanolamine (DEA)”. EX2003 at 6:46–49. In the embodiment described by Figure 12, a TEA absorber is “is designed to remove CO₂ from its feed to yield an overhead vapor stream 175.” The TEA—now laden with CO₂—is then passed to the “TEA flash tower 180” which “strips CO₂ and H₂S from rich TEA stream 176”, thus recovering the CO₂. EX2003 at 20:17–19. Overhead vapor stream 175 is then passed to DEA unit 177. EX2003 at 19:53–54. “DEA unit 177 is functional for removal of most all of the remaining CO₂ to

produce a lean sweet hydrocarbon stream 178.” EX2003 at 20:11–13. Thus, *Goddin* uses two different CO₂ recovery solvents—TEA and DEA.

In a different embodiment shown in Figure 11, *Goddin* uses a cryogenic CO₂ separation that includes the addition of “lean oil.” EX2003 at 18:4–21. The lean oil “enhances the volatility of CO₂ relative to H₂S”—i.e., it makes CO₂ more likely to remain a gas. EX2003 at 18:7–8. Lean oil is “preferably C₄-C₅ hydrocarbons.” EX2003 at 18:4. *Goddin* does not teach that the lean oil acts as a solvent.

2. Discussion of *Goddin* in the Prosecution History

During prosecution, the Examiner rejected the Challenged Claims as obvious in light of the embodiment disclosed in Figure 12, involving solvents TEA and DEA. EX1003 at 195 (Examiner pointing to “DEA unit 177”); *see also id.* at 252–56 (PO’s arguments in response pointing to Fig. 12 for describing *Goddin*). To overcome the rejection, the PO excluded the use of CO₂ recovery solvents from the Challenged Claims and argued that the embodiment disclosed in Figure 12 of *Goddin* included “CO₂ solution absorption (i.e., carbon dioxide recovery solvents).” EX1003 at 257. Figure 12 shows both a TEA Absorber and a DEA Unit, which are the CO₂ solution absorption systems:



EX2003 at Fig. 12 (Petitioner annotations in red).

During prosecution, neither PO nor the Examiner suggested that the C₄ or C₅ in the stabilizer column in Figure 12 were CO₂ recovery solvents. Likewise, the term “lean oil”—which is only used in the embodiment of Figure 11, discussed above as using cryogenic conditions—was not discussed during prosecution as being a CO₂ recovery solvent. *Id.* at 18:4.

3. The Asserted Art Does Not Use CO₂ Recovery Solvents

None of the Asserted Art discloses a system that uses CO₂ solution absorption, and PO does not point to any such system. Instead, the Asserted Art uses distillation-based approaches to remove CO₂. *See* EX1006 at Abstract; EX1007 at 53 (“The Ryan/Holmes technology represents a unique, distillative approach to the recovery of CO₂”); EX1005 at 305. And, while the distillation-based approaches disclosed in the Asserted Art include C₄ and C₅—the very NGLs

that are being separated in the processes disclosed in the Asserted Art—neither C₄ nor C₅ (or lean oil, which comprises C₄ and C₅) are CO₂ recovery solvents.

PO attempts to rewrite history by proffering a definition of “CO₂ recovery solvent” that includes all fluids that could aid in the recovery of CO₂. POPR at 20. For example, PO argues that “liquid hydrocarbon streams, recycled hydrocarbon stream . . . recirculating hydrocarbon[s], lean oil, among others, amounts to the use of carbon dioxide recovery solvents.” POPR at 20 and 21. However, not only is such a broad definition inconsistent with PO’s characterization of the term during prosecution, but it would exclude from the Challenged Claims every embodiment described in the ’332 Patent, as discussed below.

First, during prosecution, the PO stated that “*Goddin* subjects its streams to . . . **CO₂ solution absorption (i.e., carbon dioxide recovery solvents).**” EX1003 at 257 (emphasis added). Thus, the PO used CO₂ absorption to define a CO₂ recovery solvent. That “lean oil,” C₄, C₅, or any other hydrocarbon could be a CO₂ recovery solvent was never addressed during prosecution and is inconsistent with PO’s characterization of that term during prosecution.

The POPR’s discussion of similarities between Figure 11 of *Goddin* and the three-column Ryan/Holmes process (*see* POPR at 26–31) is also divorced from the prosecution. The Examiner never discussed the Figure 11 embodiment of *Goddin*. Instead, the Examiner discussed the embodiment described in Figure 12. EX1003

at 195. Figure 12 separates CO₂ using solution absorption, while Figure 11 uses cryogenic fractionation instead of solution absorption. EX2003 at Figure 11 (not disclosing a TEA absorber); *see also* EX2003 at 16:12–15; 18:27–30.

Second, the PO's proffered definition directly contradicts the teachings of the '332 Patent and is incompatible with the Challenged Claims. As noted above, the POPR argues that "liquid hydrocarbon streams, recycled hydrocarbon stream . . . recirculating hydrocarbon[s], lean oil, among others, amounts to the use of carbon dioxide recovery solvents." POPR at 20 and 21. But such hydrocarbons are present in every step of the method described by the Challenged Claims. *See, e.g.*, EX1001 at Claim 1. Construing "CO₂ recovery solvents" as proposed by the PO would result in claims with no written description support. In fact, Figure 2 of the '332 Patent shows the recirculation/recycling of hydrocarbon streams during the distillation process:

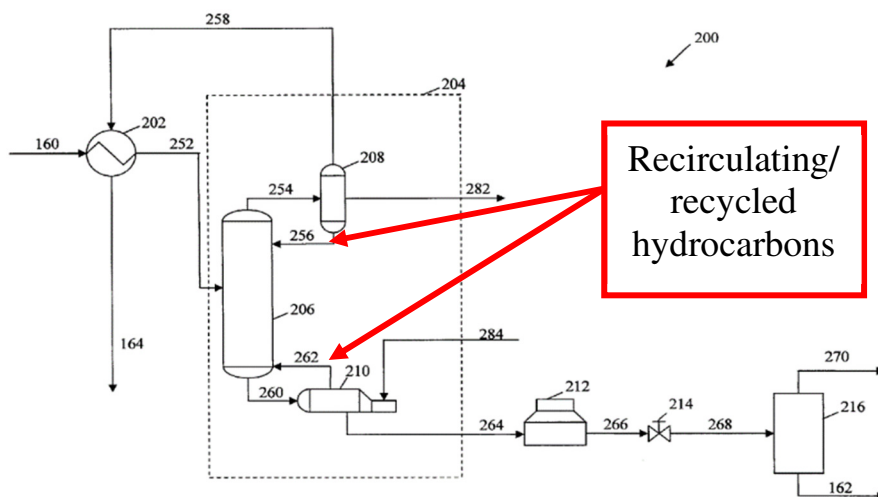


FIG. 2

EX1001 at Figure 2 (Petitioner's annotations in red) *see also* EX1001 at 7:9–11

(“. . . produce the cooled, purified carbon dioxide recycle stream 258 and a reflux stream 256, which is returned to the separator 206.") (emphasis added); 22–24

(“and produce a sour NGL rich stream 264 and a boil-up stream 262, which is returned to separator 206.") (emphasis added).

Thus, PO's argument that the Asserted Art is cumulative of *Goddin* because both add or recirculate NGLs (lean oil or other similar hydrocarbons) is misplaced because such NGLs are not CO₂ recovery solvents. Instead, the Asserted Art is *not* cumulative of *Goddin* because *Goddin* uses CO₂ recovery solvents (TEA and DEA) while the Asserted Art does not.

II. CONCLUSION

In conclusion, the Asserted Art is materially different from *Goddin*. The similarities the PO points to in its POPR are not material and were never considered by the Examiner as a basis for rejection. Since the Asserted Art does not disclose systems system that separate CO₂ from a process stream by using cryogenic conditions, membranes, or by absorbing it into a solvent, the Asserted Art is different from and non-cumulative with *Goddin*.

Date: June 13, 2024

Respectfully submitted,

/Brian W. Oaks/

Brian W. Oaks (Reg. No. 44,981)

McDERMOTT WILL & EMERY LLP
303 Colorado Street, Suite 2200
Austin, TX 78701
TEL: 512-726-2600
FAX: 512-532-0002
boaks@mwe.com

*Attorneys for Petitioner,
Scout Energy Management, LLC.*

CERTIFICATE OF SERVICE

In accordance with 37 C.F.R. § 42.6(e), the undersigned certifies that on the 13th day of June, 2024, a complete and entire copy of the foregoing

PETITIONERS' REPLY TO PATENT OWNER'S PRELIMINARY

RESPONSE was served on Patent Owner via email to counsel of record for the

Patent Owner at the following addresses:

CRogers@conleyrose.com

TWarden@conleyrose.com

Date: June 13, 2024

Respectfully submitted,

/Brian W. Oaks/

Brian W. Oaks (Reg. No. 44,981)

McDERMOTT WILL & EMERY LLP
303 Colorado Street, Suite 2200
Austin, TX 78701
TEL: 512-726-2600
FAX: 512-532-0002
boaks@mwe.com

*Attorneys for Petitioner,
Scout Energy Management, LLC.*