

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WEATHERFORD INTERNATIONAL, LLC;
WEATHERFORD/LAMB, INC.;
WEATHERFORD US, LP; and WEATHERFORD
ARTIFICIAL LIFT SYSTEMS, LLC
Petitioners

v.

PACKERS PLUS ENERGY SERVICES INC.,
Patent Owner

Case IPR2016-01509
Patent 7,861,774

EXCLUSIVE LICENSEE RAPID COMPLETIONS LLC'S SURREPLY¹

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¹ On September 15, 2017, Respondent requested authorization to file a motion to strike Petitioners' reply and new supporting evidence or in the alternative submit a surreply and supplemental expert declaration. On September 25, 2017, the Board denied Respondent's request to file a motion and authorized a 6 page surreply limited to addressing the new Yost theory, Overbey, and McLellan without an accompanying expert declaration.

I. Response to Petitioners' New Yost Theory.

In their reply, Petitioners now attempt to offer a new reason as to why a POSITA would perform open hole multi-stage fracturing (“OHMS”)—attempting OHMS in a low pressure, naturally fractured formation to fracture across zones.

Reply at 10. According to Petitioners, this was the true goal of Yost. *Id.*

However, before Petitioners developed their new theory, Dr. Rao had testified: “Q. And when Yost pumped fluid into a zone, the goal was to open fractures and create fractures *in that particular zone, correct?* A. To open fractures -- *yes*. You were in that zone and that's the zone in which you would either create or open up existing fractures, correct.” Ex. 2044 at 63:11-16 (emphasis added). He did not testify that the goal was to frack around the packers. Thus, Petitioners fail to show that a POSITA would view fracking around the packers as an accomplishment to be desired. The weight of the evidence confirms that such a result can be detrimental to effective fracturing. Resp. at 13-15, 21-26.

Regardless, even if a POSITA sought to interconnect fractures throughout a wellbore, Dr. Rao explained why a POSITA would not attempt OHMS for that goal. During his first deposition he testified that, prior to 2001, most horizontal wells were drilled in a low pressure, naturally fractured formation—the Austin Chalk formation. Ex. 2044 at 32:4-12. Despite that, POSITA did not use OHMS:

In fact, Austin Chalk has the vast majority of all horizontal wells in the world. Did not require the sophistication of zonal isolation. They were

able to get what they needed to do with lower cost approaches of either what's called a "Hail Mary frac" [i.e., "bull-heading"] or just to be able to direct it to certain spots. But zonal isolation was not seen as needed in that time frame.

Ex. 2044 at 31:14-32:3. That makes sense. Resp. at 14-15. If a POSITA were motivated to fracture a formation in a way that intermingled fractures throughout the wellbore, Petitioners have offered no evidence that the POSITA would divide the wellbore into multiple, sequentially opened, open hole stages. After all, if the zone 1 treatment fractured part of zone 2, the zone 2 treatment is likely to flow into the already opened fractures and not complete the fracturing of zone 2. Ex. 2051 at 28. ("If the subsequent fractures grow into the earlier fractures, the subsequent fracture treatments are wasted.")² A POSITA would have also been concerned about problems such as screenouts. *See infra* II. Thus, Petitioners' new theory fails to provide a motivation for a POSITA to diverge from the conventional approaches acknowledged by Dr. Rao.

There is also a further problem with Petitioners' new theory. In their Petition, they assert that a POSITA would have been motivated to replace the inflatable packers of Yost with Ellsworth packers. Ellsworth teaches that its packers are preferable to inflatable packers for maintaining long term isolation of fluids in the formation adjacent different zones, i.e. for water shut off. Ex. 1004 at

² This could explain why Yost reported an initial 15 to 1 improvement ratio in zone 1, but significantly less improvement in subsequent zones.

5. But Petitioners now contend that the POSITA's goal is to intermingle those fluids in interconnected fractures. This defeats Petitioners' original basis for combining Yost and Ellsworth. Moreover, if a POSITA anticipated a fracturing operation to open numerous natural fractures, Petitioners fail to offer evidence that this would motivate a POSITA to use Ellsworth or Thomson packers. For example, they offer no evidence that a POSITA would expect such a packer to maintain isolation rather than expecting the dynamic fracturing operation to breach the packer seal in the annulus or induce fractures in the formation that could more easily extend across the shorter packer seals connecting two zones. In short, Petitioners' new theory fails to show that a POSITA would operate against the conventional wisdom that fractures should be placed at precise intervals using perforations in a cased hole with a cemented annulus. Moreover, even if a POSITA did seek to induce fractures irrespective of location, Petitioners only show that he would bull-head, or at most, use inflatable external casing packers.

II. Response to Overbey

Despite the problems outlined above, Petitioners contend that Yost would have motivated a POSITA to attempt OHMS in a commercial well. As an initial matter, Petitioners identify no support in Overbey for their theory that a POSITA would employ OHMS to frack across zones. Regardless, Overbey does not demonstrate the commercial viability of Yost. Even if Petitioners had qualified

Overbey as prior art—they have not—it supports the opposite conclusion.

Overbey explains that the Yost well was “an experimental well.” Ex. 1036 at 46.

The purpose of the Overbey report was to test a modified Yost strategy that is “more likely to be used in a purely commercial well.” *Id.* The result: a well that failed to meet its minimum commercial target. *Id.* at 104.

Moreover, Overbey detailed precisely the types of problems that would be concerning to a POSITA. For example, it recounted “the extreme difficulty encountered in fracing Zone 2,” which resulted in a screenout. Ex. 1036 at 66. Overbey theorized that: “If these fractures are in clusters of relatively closely-spaced fractures, then it may have been almost impossible to drive one or more fractures perpendicular to the wellbore and of a width sufficient to accept a high density sand-laden fluid.” Ex. 1036 at 66. In other words, Overbey concluded that the multiple natural fractures in this open interval competed for fluid and made it impossible to effectively fracture the zone. Overbey also reported a screenout in zones 3 and 4, and he explained that the cost of remediating these screenouts forced the DOE to abandon stimulation of a planned fifth stage. *Id.* 65-69, 99.

In short, Overbey would have reinforced the conventional wisdom in favor of using bullheading or plug and perf. This is particularly true given that Overbey partially cemented the wellbore and it reported cementing costs that were less than the costs of purchasing and operating the packers and port collars. *Id.* at 109.

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