

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTELLIGENT WELLHEAD SYSTEMS, INC.,
Petitioner,

v.

DOWNING WELLHEAD EQUIPMENT, LLC,
Patent Owner.

IPR2024-00256
U.S. Patent 11,401,779

PATENT OWNER PRELIMINARY RESPONSE

Patent Owner's Exhibit List

Exhibit	Description
Ex.2001	Wayback Machine - Downing Continuous Pumping Web Page
Ex.2002	Downing Continuous Pumping WordPress Page
Ex.2003	Tim Marvel Email RE Continuous Pumping Webpage with Attachment
Ex.2004	Marvel LinkedIn Post 1/12/2020
Ex.2005	Declaration of Tim Marvel
Ex.2006	Declaration of John Hughett
Ex.2007	CV of John Hughett
Ex.2008	US2014/0352968 to Pitcher

The claims of the '779 Patent are directed to continuous pumping. The claims recite limitations directed to pumping a second well while a first well is open, and, while pumping in the second well, closing the first well. *See, e.g.*, limitations 1.5, 1.7, and 1.8. On October 12, 2020, Patent Owner published on its public-facing website a webpage describing continuous pumping. Ex.2002; Ex.2005, ¶¶5, 11. The Internet Archive Wayback Machine archived a copy of this webpage on October 20, 2020, eight days after it was originally published. Ex.2001; Ex.2005, ¶5.³ Patent Owner thus publicly disclosed continuous pumping on October 12, 2020, and no later than October 20, 2020.

Given its October 2020 publication date, Patent Owner's continuous pumping webpage was published four months before the Krupa Provisional was filed (February 25, 2021) and over one year before Krupa was filed (February 18, 2022). Accordingly, Patent Owner publicly disclosed continuous pumping before either the Krupa Provisional or Krupa had been filed.

³ The Internet Archive Wayback Machine archived copy is captured in Ex.2001 and accessible at <https://web.archive.org/web/20201020115107/https://downingusa.com/freedomseries/continuouspumping>.

information on continuous pumping he obtained from Mr. Johnson Ex.2005, ¶10; Ex.2003. Mr. Johnson provided Mr. Marvel feedback on the draft webpage, which Mr. Marvel incorporated into the final version of the webpage. Ex.2005, ¶10. On October 12, Mr. Marvel published the webpage describing continuous pumping on Patent Owner’s public facing website. Ex.2005, ¶¶5, 11; Ex.2001; Ex.2002. Accordingly, Patent Owner—through Mr. Marvel—publicly disclosed information regarding continuous pumping that was obtained directly from a joint inventor of the ’779 Patent.

iii. The continuous pumping webpage discloses the same subject matter relied upon in Krupa.

The limitations related to continuous pumping include limitations [1.5]/[8.7], [1.7]/[8.9], [1.8]/[8.10], [15.4]/[25.6], and [15.5]/[25.7], which recite the process of opening a second well while a first well is still open, and subsequently closing the first well. The Petition relies entirely on Krupa for these limitations. *See* Petition, 25–29, 38–39, 41–42, 83–85. Patent Owner’s continuous pumping webpage, however, discloses the same subject matter relied upon in Krupa related to continuous pumping.

Limitations [1.5]/[8.7] recite “opening a second valve associated with a second well.” The Petition asserts that:

are thereby conducted between multiple wellhead assemblies by continuously pumping hydraulic fracturing fluid from a manifold to the valves associated with each wellhead assembly.

Petition, 39 (citing Ex.1Ex.1003, [0005], [0043], [0046], Fig. 2A). For the same reasons discussed with respect to limitations [1.8]/[8.10], Patent Owner’s webpage discloses the same subject matter related to “continuously pumping” as discussed in Krupa. Ex.2006, ¶¶120-24.

Accordingly, Patent Owner’s continuous pumping webpage discloses the same subject matter the Petition relies on in Krupa.

iv. Without Krupa’s continuous pumping disclosure, Petitioner fails to carry its burden.

Each independent claim in the Krupa Grounds recites limitations related to continuous pumping. Because (i) Patent Owner publicly disclosed continuous pumping—via information obtained from an inventor—before any filing date associated with Krupa, and (ii) the publicly-disclosed subject matter is the same subject matter relied upon in Krupa by the Petition, the continuous pumping disclosure of Krupa is disqualified as prior art under § 102(b)(2)(B). Without this disclosure, the Petition fails to address all the claim limitations of the independent claims and Petitioner cannot establish a reasonable likelihood of prevailing on the Krupa Grounds.

1. Prosecution History of the '779 Patent

The '779 Patent issued on August 2, 2022, from Application No. 17/388,716 (“’716 Application”), filed July 29, 2021, as a continuation-in-part application of Application No. 17/319,854.

During prosecution, the Examiner rejected pending independent claims 15 and 23 as being anticipated by Kajaria. Ex.1009, 112-115. With respect to pending dependent claims 17 and 25, the Examiner combined Kajaria with a second reference, U.S. App. Pub. 2014/0352968 to Pitcher, because Kajaria “does not specifically disclose measuring a flow rate of the fluid being pumped into the second well.” *Id.* at 115. In making the combination, the Examiner stated that “it would be obvious to one of ordinary skill in the art before the effective filing date to modify the method and system disclosed by Kajaria to measure a flow rate of the fluid being pumped into the second well in view of the teachings of Pitcher.” *Id.*

In response to these rejections, Downing amended the rejected claims to recite the subject matter that the Examiner indicated was allowable: “determining that the flow rate of the fluid being pumped into the first well is below a flow rate threshold and has been below the flow rate threshold for a threshold amount of time.” Ex.1009, 116, 81-103. The claims were subsequently allowed. *Id.* at 49-52.

Pitcher with the substantially similar disclosure of Jackson does not support institution because neither describe the subject matter the Examiner found allowable: “determining that the flow rate of the fluid being pumped into the first well is below a flow rate threshold and has been below the flow rate threshold for a threshold amount of time.” Ex.1009, 116; *see Intelligent BioSystems, Inc. v. Illumina Cambridge Ltd.*, IPR2013-00324, Paper 19 at 6–7 (Nov. 21, 2013) (informative) (institution denied where the cited references contained “substantially the same” teachings as the references in the first petition).

Jackson’s cumulative nature is illustrated by the language in the Petition that closely mirrors the language in the Office Action. The Examiner and Petitioner respectively rely upon Pitcher and Jackson to disclose flow rate measurement, and both assert that such disclosure would have been obvious to combine with Kajaria:

Examiner’s application of Pitcher	Petitioner’s application of Jackson
“Pitcher teaches <i>measuring a flow rate of the fluid being pumped into the well</i> ” Ex.1009, 115.	“It would have been obvious to a POSITA to <i>measure flowrate of fluid being pumped into a well</i> , as Jackson discloses.” Petition, 57
“[I]t would have been obvious...to modify the method and system disclosed by Kajaria to measure a flow rate of the fluid being pumped into the	“It would have been obvious ... to combine Jackson and Kajaria to measure flowrate of fluid being pumped into a well.” Petition, 58.

second well in view of the teachings of Pitcher.” Ex.1009, 115.	
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Petitioner’s use of the same disclosure (flow rate measurement) in the same way (in combination with Kajaria) is, by definition, cumulative. *See Motorola Mobility LLC v. Maxell, LTD*, IPR2022-01287, Paper 11 at 18-19 (Feb. 2, 2023) (“Petitioner is therefore relying on [the second prior art reference] to teach the same thing as [the first prior art reference], making Petitioner’s use of [the second prior art reference] for this purpose cumulative to [the first prior art reference].”).

Petitioner further relies upon Jackson for its alleged disclosure of flowrate thresholds. Petition, 59-62. But Pitcher also discloses flowrate thresholds—which the Examiner no doubt considered in her evaluation. For example, Pitcher includes detailed description about calculating a desired “volumetric flow rate” (denoted as Q in the below equation) and a desired “fracturing time” (denoted as t):

Further, full flow (e.g., twenty-five barrels per minute) can be provided to the well 14 and a desired fracturing time for a given zone can be calculated based on:

$$V_{frac} = Qt + V_p,$$

where V_{frac} the volume of fracturing fluid to pump into the fracturing zone, Q is the volumetric flow rate at which fluid is pumped into the well 14 from the fracturing manifold 44, t is the desired fracturing time for the zone, and V_p is the volume of

the passageway (i.e., fluid conduit) from the ball launcher 40 (of the well 14) to the far end of the zone being fractured.

Ex.2008, [0036]. Once calculated, Pitcher teaches using the desired flow rate and desired time as thresholds to trigger a subsequent fracturing stage. Ex.2008, [0037]. Specifically, the next stage is triggered when it is determined (via a sensor) that the flow rate is at the desired flow rate for the desired amount of time:

The manifold valve 48 that controls flow to the well 12 can then be adjusted to set the flow rate (which can be measured by a sensor 62) to the calculated amount. Once the desired fracturing time has elapsed, the ball launchers 40 may be activated to drop balls 42 into the wells 12 and 14 to isolate the next fracturing stages for stimulation.

Ex.2008, [0037]. The Examiner correctly recognized, however, that Pitcher's disclosure is not sufficient to meet the specific claim requirement of "determining that the flow rate of the fluid being pumped into the first well is *below a flow rate threshold* and *has been below the flow rate threshold for a threshold amount of time*," as indicated in the reasons for allowance. Ex.1009, 116.

The portions of Jackson regarding flowrate thresholds relied upon in the Petition "teach[] no more than what a reasonable examiner would consider to be taught by" Pitcher, and are thus cumulative. *See Roku, Inc. v. Universal Elecs., Inc.*, IPR2019-01619, Paper 11 at 16 (Apr. 2, 2020). In fact, Jackson's disclosure is

even *more limited* than Pitcher's relative to the claim requirements. For example, Petitioner points to Jackson's disclosure of a "relaxation" stage for claim elements [1.3] and [1.4]. Petition, 59-61. But this portion of Jackson fails to describe even the baseline requirement of "*determining*" the flow rate to ensure that it's "*under*" a threshold for a certain amount of time. Instead, it appears that the "inflow of frac gas" is set to a diminished level at the beginning of the relaxation period and that "pressure" (not flow rate) is the monitored parameter determined to be at a "lesser value P_2 " over the "time period t_2 ":

Following this rise, the period of relaxation R1 may occur in which the inflow of frac gas may be greatly diminished or stopped to a rate of less than 300 scm, and **during which the pressure is permitted to decline over a time period, t_2** of less than 24 hours or possibly less than 12 hours and in one embodiment less than one hour, **to some lesser value P_2 .**

Ex.1005, [0061]. Moreover, this disclosure in Jackson is limited to operations in a *single* well, whereas Pitcher at least describes a multi-well system (like the one claimed by the '779 patent). Compare Ex.2008, [0030]-[0031], [0037]-[0038], with Ex.1005, [0051]-[0052], Figs. 1-2..

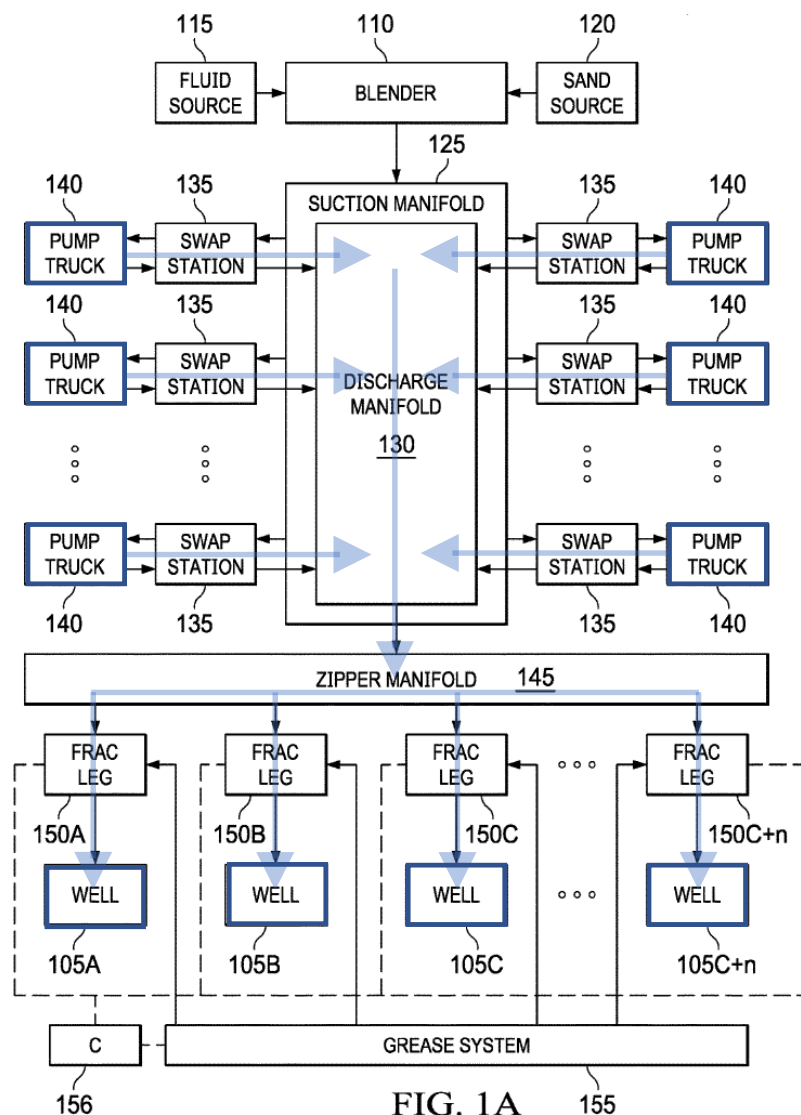
Accordingly, Jackson is even less relevant to the '779 patent claims and "adds no teaching that was not before the Examiner." *Dr. Reddy's Labs. S.A., v. Indivior UK Ltd.*, IPR2019-00328, Paper 21 at 16 (June 3, 2019). Given that the

zipper manifold includes valves that can be closed to isolate the well. *Id.*, ¶94.

Thus, pumping into a given well may be accomplished by closing the valves to all but one well, so that fluid is directed to the desired well. *Id.*

Hydraulic fracturing and perforating operations on a particular well may take hours to perform, resulting in significant idle time for pumping and wireline personnel while one crew waits for the other to finish. *Id.*, ¶95. Zipper fracturing reduced this downtime by allowing one well to be fractured while the next well in the series is perforated. *Id.* When both operations are complete, the newly fractured well can be isolated, fluid may be rerouted through the zipper manifold to the newly perforated well for fracturing, and wireline operations can begin immediately in the next well in the series. *Id.* In this manner, operations move through a series of wells in assembly-line fashion, cutting the time to complete wells nearly in half.

Figure 1A of the '779 Patent shows a diagram of a conventional zipper fracturing setup:



Ex.1001, Fig. 1A (annotated).

The dramatic reduction in non-productive time enabled by zipper fracturing resulted in its widespread adoption in the industry. *See, e.g.*, Ex.1008, 1. But operators accustomed to significant downtime between pumping operations had to adapt to the relatively fast-paced pumping schedule in zipper fracturing operations. *Id.*, 2. One Journal of Petroleum Technology article from 2014 described this