United States Court of Appeals for the Federal Circuit

IN RE: MAGNUM OIL TOOLS INTERNATIONAL, LTD.,
Appellant

2015-1300

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board, in No. IPR2013-00231.

Decided: July 25, 2016

NATHANIEL ST. CLAIR, II, Jackson Walker LLP, Dallas, TX, argued for appellant. Also represented by JOHN MARTIN JACKSON, CHRISTOPHER J. ROURK.

KRISTI L.R. SAWERT, Office of the Solicitor, United States Patent and Trademark Office, Alexandria, VA, argued for intervenor Michelle K. Lee. Also represented by THOMAS W. KRAUSE, SCOTT WEIDENFELLER, MICHAEL SUMNER FORMAN.

Before NEWMAN, O'MALLEY, and CHEN, *Circuit Judges*.

O'MALLEY, *Circuit Judge*.

McClinton Energy Group, LLC filed a petition for *inter partes* review ("IPR") of U.S. Patent No. 8,079,413 (the

"'413 patent"), owned by Magnum Oil Tools International, Ltd. ("Magnum"). The Patent Trial and Appeal Board ("Board") instituted review and issued a final written decision holding all challenged claims of the '413 patent obvious under 35 U.S.C. § 103. Subsequently, McClinton and Magnum settled their dispute over the '413 patent and other patents not at issue here. Magnum now appeals the Board's judgment regarding the '413 patent. The Director of the U.S. Patent and Trademark Office ("PTO") intervened in the appeal pursuant to 35 U.S.C. § 143. For the following reasons, we *reverse*.

I. FACTUAL BACKGROUND

A. The '413 Patent

The '413 patent is directed to technology in the field of oil drilling through use of hydraulic fracturing, commonly known as "fracking." Fracking is a technique used to extract natural gas and oil from natural shale formations. During the fracking process, a hole known as a "wellbore" is drilled into the earth. Then, a fluid mixture is injected down the wellbore into the shale at high pressure to release the gas or oil.

Downhole plugs divide the wellbore into separate sections so that different sections of the wellbore may be fracked at different times. A setting tool is used to insert the downhole plugs into their appropriate positions in the wellbore. The body of the plug is then secured in place via the radial expansion of "slips" and "malleable elements" that contact the sidewalls of the wellbore. The expanded plug forms an airtight barrier, blocking movement of liquid or gas around the plug. *See* '413 patent, at col. 8, l. 46–col. 9, l. 13.

The setting tool can connect either to the top of the plug facing the opening of the wellbore ("top-set"), or to the bottom of the plug ("bottom-set"). The '413 patent teaches a bottom-set plug in which the setting tool fits

through a hollow passageway in the body of the plug and attaches near the bottom of the plug. *See id.* at col. 9, ll. 29-46. The setting tool exerts an axial force upward on the body of the plug while a "setting sleeve" exerts an axial force downward on the plug. The resulting axial compression causes the plug to set in place via radial expansion. *Id.*

Once the downhole plug is set, the setting tool must be disengaged from the plug and extracted from the wellbore. The '413 patent at issue describes a mechanism for releasing the setting tool from the downhole plug. *Id.* at col. 3, ll. 47-57.

The '413 patent teaches the use of an insert having a "lower shear or shearable mechanism" for releasing a setting tool. '413 patent, at col. 2, ll. 54-56. The patent teaches that the insert is placed within the plug body and contains both shearable and nonshearable threads. The inner threads connected to the setting tool shear when exposed to sufficient stress, but the outer threads connected to the plug body do not shear. The stress level required to shear the shearable threads is lower than that required to dislodge the plug body, so that the setting tool may be released without dislodging the plug from its set position. *Id.* at col. 2, ll. 59-63. Figure 1A of the '413 patent depicts the claimed insert:

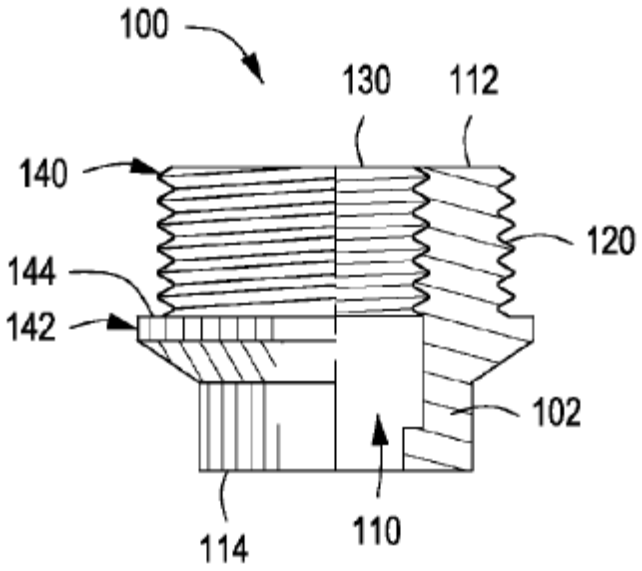

FIG. 1A

The ’413 patent has twenty claims, three of which are independent (claims 1, 7, and 17). All of the claims of the ’413 patent recite that the “shearable threads” of the release mechanism are part of an insert that is placed within the central bore of the plug. Claim 1 of the ’413 patent is representative, and is reproduced below in its entirety:

> 1. A plug for isolating a wellbore, comprising:
>
> a body having a first end and a second end;
>
> at least one malleable element disposed about the body;
>
> at least one slip disposed about the body;

> at least one conical member disposed about the body; and
>
> *an insert screwed into an inner surface of the body proximate the second end of the body and adapted to receive a setting tool that enters the body through the first end thereof, wherein:*
>
> *the insert comprises one or more shearable threads disposed on an inner surface thereof;*
>
> the insert has a passageway extending therethrough;
>
> the one or more shearable threads are adapted to engage the setting tool; and
>
> the one or more shearable threads are adapted to deform to release the setting tool when exposed to a predetermined axial force, thereby providing a flow passage through the insert and the body.

'413 patent, at col. 13, l. 57-col. 14, l. 7 (emphasis added).

B. Overview of the Prior Art

The Board instituted IPR based on the following three primary references: U.S. Patent Application Publication No. 2007/0151722 to Lehr et al. ("Lehr"); U.S. Patent No. 4,437,516 to Cockrell ("Cockrell"); and U.S. Patent No. 4,595,052 to Kristiansen ("Kristiansen"). J.A. 8. In its petition for institution, McClinton had also relied on a reference known as the Alpha Oil Tools Catalog (1997), "Standard Frac Plug" ("Alpha"). J.A. 136-38. Specifically, McClinton argued that both Alpha and Lehr disclose downhole plugs that include the standard features of a typical downhole plug and all the limitations of claim 1 except for (1) shearable threads on the inside of an insert that shear in response to a predetermined axial force; and (2) non-shearable threads on the outside of the insert that screw into the inner surface of the plug body. *Compare* J.A. 98-100 (Alpha), *with* J.A. 115-18 (Lehr).

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