DRAFTING ENFORCEABLE PATENT CLAIMS IN THE OILFIELD

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Presented by:
C. Erik Hawes
Morgan, Lewis & Bockius LLP
C. Erik Hawes
Houston
T +1.713.890.5165
E erik.hawes@morganlewis.com

C. Erik Hawes serves intellectual property clients in patent litigation and pre-litigation counseling, patent prosecution, management of patent and trademark portfolios, trade secrets and confidentiality issues, due diligence concerning IP issues in transactions, and day-to-day counseling concerning IP issues of every size and shape.

Erik works primarily with clients in the oil & gas industry, where he has experience in a wide variety of upstream technologies, including hydraulic fracturing and other methods of completion and stimulation, wellhead isolation, directional drilling, downhole monitoring and measurement, mud-pulse and EM telemetry, OCTG (tubulars and connections), power sections, milling and clean-out tools, elastomeric components, drill bits, and offshore (HPHT) applications. He has also worked in the midstream sector, where he has extensive experience relating to pipeline inspection technologies.
Overview

1. Patent-eligibility rules for high-tech inventions

2. Divided/joint infringement

3. Extraterritoriality of US patent laws
PATENTABLE SUBJECT MATTER – LIMITS ON PATENT PROTECTION FOR HIGH-TECH INNOVATION

ERIK HAWES
During the ‘80s and ‘90s, there was uncertainty about patentability of “business methods,” especially involving use of computers.

1998: Any business method was eligible for a patent as long as it involved a “useful, concrete and tangible result” → “golden age” of software patents.

2011-2014: Supreme Court changes standard so that “abstract ideas” cannot be patented just because they are implemented on a computer.

Much confusion about what is or is not too “abstract” to be patent-eligible.

2014: Supreme Court decides *Alice Corp. v. CLS Bank* and attempts to establish a two-part framework for patent-eligibility:

1. “First, we determine whether the claims at issue are directed to [a] patent-ineligible concept” – i.e., to an “abstract idea”
2. Step two involves “a search for an ‘inventive concept’ – i.e., an element or combination of elements that is ‘sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.’”
Why Does This Matter for the Oil & Gas Industry?

- No secret that the oilfield is becoming increasingly high-tech
  - MWD/LWD – not just how to use the data that is gathered but how to gather the data in the first place
  - Directional drilling
  - Wireless communications
  - Seismic exploration
  - High-level uses of “big data”

- This trend is accelerating given emphasis on efficiency and innovation caused by recent industry conditions.
Why Does This Matter for the Oil & Gas Industry?

- Why does this matter for the oil & gas industry?
  - Historically, oil & gas patents (particularly for upstream) involved apparatus claims – the structure of a new tool, rig design, or other physical piece of equipment.
  
  - But many – probably most – of these new high-tech solutions are implemented using computer technology (software, firmware, and electronics)
    
    - So these innovations can typically be patented, if at all, using computer-implemented method claims – precisely the area where the law is:
      1. rapidly evolving and
      2. significantly restricting the scope of what can be patented.
Why Does This Matter for the Oil & Gas Industry?

Patent-eligibility of computer-implemented inventions will be the most important intellectual property issue for the oil & gas industry over the next decade.
Sample Claim #1

- A method of seismic data acquisition comprising:
  - providing a plurality of seismic data acquisition units, each unit comprising a transceiver configured to wirelessly communicate seismic data with one or more of the other seismic data acquisition units in the plurality of seismic data acquisition units;
  - providing a one or more concentrator units each comprising a receiver configured to wirelessly receive seismic data from at least one of the seismic data acquisition units; and
  - wirelessly communicating acquired data from the acquisition units to the concentrator units;
  - wherein the step of wirelessly communicating acquired data from the acquisition units to the concentrator unit comprises using a string of the seismic data acquisitions units to wirelessly communicate acquired seismic data; and
  - wherein, during the step of wirelessly communicating acquired data from the acquisition units to the concentrator units, a first pair of acquisition units communicate with each other at the same time that a second pair of acquisition units communicate with each other;
  - and further comprising: assigning first and second transmission parameters to the first and second pairs of acquisition units to substantially prevent communication interference between the first and second pairs.

- Who thinks this is patent-eligible? Just an “abstract idea”?
**Sample Claim #1 – ELIGIBLE**

  - Step 1 – is the claim directed to an “abstract concept”?  **Maybe**
    - Not clear – “any claim, described at a certain level of generality, can be challenged as directed to an abstract idea.”
    - But did not matter, because...
  - Step 2 – is there an “inventive concept” such that the claim covers “significantly more” than the abstract concept?  **Yes**
    - “The claims outline a specific method of data transmission that is a new and useful application of a generic relay system. ... Although the claim rests upon the idea of a relay system, the claim builds upon this concept by adding nonconventional elements, such as the assignment of different transmission parameters to avoid jumbled communications.”
    - Also important that claims recited use of seismic acquisition units, which did not just perform “their typical function ... but also serve the additional function of receiving and transmitting data from neighboring acquisition units.”
Sample Claim #2

- An automated method for determining the state of a well operation, comprising:
  - storing a plurality of states for a well operation;
  - receiving mechanical and hydraulic data reported for the well operation from a plurality of systems;
  - and determining that at least some of the data is valid by comparing the at least some of the data to at least one limit, the at least one limit indicative of a threshold at which the at least some of the data do not accurately represent the mechanical or hydraulic condition purportedly represented by the at least some of the data;
  - and when the at least some of the data are valid, based on the mechanical and hydraulic data, automatically selecting one of the states as the state of the well operation.

- Who thinks this is patent-eligible? Just an “abstract idea”?

Morgan Lewis
Sample Claim #2 – NOT ELIGIBLE

  - Step 1 – is the claim directed to an “abstract concept”? **Yes**
    - “The steps ... that are at the core of the ‘812 Patent ... are simple steps of storing data, receiving data, and using mathematics or a computer to organize that data and generate additional information.”
  - Step 2 – is there an “inventive concept” such that the claim covers “significantly more” than the abstract concept? **No**
    - Claim 1 did not include “meaningful limitations” because it requires only “more than one state, more than one system from which to receive data, and more than one state of well operation. Thus, there are essentially no limits.”
    - Potential use of a computer did not help because only advantage was performing the analysis faster, which is **not** enough for patent-eligibility.
    - Connection to an oil rig was not enough because, “[w]hile certainly the use of an oil rig is central to the claims, it does nothing to impose meaningful limits on the claim’s scope.”
Sample Claim #2 – NOT ELIGIBLE (cont.)

- **TDE Petroleum Data Solutions v. AKM Enterprise** – on appeal
    - Step 1 – is the claim directed to an “abstract concept”? **Yes**
      - “The steps of claim 1 recite operations performed by any general purpose computer.”
    - Step 2 – is there an “inventive concept” such that the claim covers “significantly more” than the abstract concept? **No**
      - “TDE does not and cannot argue that storing state values, receiving sensor data, validating sensor data, or determining a state based on sensor data is individually inventive.”
      - “While the specification arguably provides specific embodiments for the step of ‘automatically selecting one of the states as the state of well operation,’ claim 1 recites none of those details.”
  - Supreme Court
    - TDE petitioned for cert, arguing that Federal Circuit’s approach to deciding subject matter eligibility was “rudderless and hopelessly fractured,” and received significant amicus support
    - Petition denied – March 6, 2017
Sample Claim #3

• A drilling method comprising:
  – monitoring the rotation of a drill string with a sensor;
  – transmitting said rotational information to a computer;
  – controlling a motor that rotates said drill string with said computer; and
  – oscillating said drill string between predetermined angles.

• Who thinks this is patent-eligible? Just an “abstract idea”? 
Sample Claim #3 – ELIGIBLE

  - Step 1 – is the claim directed to an “abstract concept”?  No
    - Patent claims “are not an attempt to patent the abstract concept of rotation.  ... Nor does Canrig attempt to patent generally all computer-assisted rotation.  The subject matter of Canrig’s patent claims is much more narrow and covers processes, not abstract ideas.”
    - “The patent claims are directed to a physical apparatus and drilling process of controlled rotation by a specific amount (the predetermined angle).  Such tangible, industrial processes have long been considered eligible to receive patent protection.”
  - Step 2 – not reached
Take-Away Points for Claim Drafting

• All is not lost – there are still strategies to get patent protection for this type of high-tech invention
  – Don’t rely too heavily on method claims (not fool-proof)
  – Include as much detail as possible, but that detail must be in the claims
  – Try to recite specific or unique structural components (the more, the better)
    – This is key for most oil & gas-related inventions – specific structure is likely to be there, just need to make sure you sufficiently tie it into the elements of the claims
    – Will result in claims that are narrower but also (hopefully) valid & enforceable
  – If you’re going to recite fairly generic structural components, try to make clear that the components are performing functions beyond their normal operation
  – Ensure that you’re not simply claiming the use of a general purpose computer to improve speed or efficiency of “conventional” or “routine” tasks that historically have been (or could be) performed by a human
  – Don’t be greedy by trying to get overly broad claims
Take-Away Points for Claim Drafting

- **TDE Petroleum** claim
  - An automated method for determining the state of a well operation, comprising:
    - storing a plurality of states for a well operation;
    - receiving mechanical and hydraulic data reported for the well operation from a plurality of systems;
    - and determining that at least some of the data is valid by comparing the at least some of the data to at least one limit, the at least one limit indicative of a threshold at which the at least some of the data do not accurately represent the mechanical or hydraulic condition purportedly represented by the at least some of the data;
    - and when the at least some of the data are valid, based on the mechanical and hydraulic data, automatically selecting one of the states as the state of the well operation.

- How could this have been made patent-eligible?
  - Re-write as system, rather than method claims? No, patentee tried that.
  - Further definition of the “plurality of systems” – specification mentioned lifting gear system, fluid system, rotary system, and operator system, but claim was silent
  - Further definition of “plurality of states” – again, specification mentions drilling, tripping, testing, reaming, and conditioning, but none of that detail made it into the challenged claim
DIVIDED/JOINT INFRINGEMENT – NEW RULES FOR DRAFTING AND ENFORCING PATENT CLAIMS.
• Direct vs. indirect infringement
  – Method claim covers steps A + B
  – Direct infringement
    – Single entity performs both steps
    – Single entity performs step A and directs or requires another to perform step B (joint infringement)
    – Both steps performed independently by two different entities → NO infringement ("divided infringement")
  – Indirect (induced) infringement
    – Single entity induces another entity to perform both steps
    – Still requires that there is one party responsible for direct infringement
Akamai v. Limelight

- 2012 (Federal Circuit): Indirect (induced) infringement can occur even if there is no single entity responsible for performing all steps of the claimed method (no ruling on direct infringement)
- 2014 (Supreme Court): No, indirect infringement still requires that someone must be responsible for direct infringement
- May 2015 (Fed Circuit panel): No liability in this case because defendant did not direct or control actions of third party
- August 2015 (Fed Circuit en banc):
  - Direct infringement may exist when two entities form a “joint enterprise” (overruling years of precedent)
  - Joint enterprise = agreement among group members with a common interest and “an equal right to a voice in the direction of the enterprise”
Effects on the Oil & Gas Industry

• How does joint/divided infringement affect the oil & gas industry?
  – Method claim covers steps A + B
  – Oilfield service company sells or rents to E&P a tool that is used to perform steps A+B – is there direct infringement?
    – If tool provider uses the tool to perform both steps, it has infringed the patent
    – If E&P uses the tool to perform both steps, it has infringed the patent (probably owned by one of its other suppliers)
  – If tool provider performs step A but E&P operating well chooses to use the tool to also perform step B?
    – Is there direct infringement? Even under Akamai, probably not (no “equal right of control”).
    – What about indirect infringement?
      – Inducement
      – Contributory
Effects on the Oil & Gas Industry (cont.)

- Example – MWD patent that covers three steps:
  1. Gathering data downhole,
  2. sending the data to the surface, and
  3. analyzing the data to draw certain conclusions or make certain decisions

- Competing MWD operator offers a tool that is used to perform all three steps – is there direct infringement?
  - MWD company runs the tool that performs steps 1 and 2
  - What about step 3?
    - Could possibly be performed by same entity (e.g., if also providing directional drilling services)
    - But could also easily be performed by third party → no direct infringement unless part of a “joint enterprise” in which MWD operator has an “equal right of control”

- Solutions
  - Limit the claim to either just 1 + 2 or just 3 (difficult but probably not impossible)
  - Which would be preferable?
EXTRATERRITORIALITY OF US PATENT LAWS
Introduction

• As a general rule, U.S. patent laws are interpreted in a way as to minimize international effects of the laws.
  – Minimizes conflicts of laws between countries
  – Prevents overreach of U.S. laws

• U.S. patent laws may cover international activity when part of the activity occurs within the U.S.
  – Importing patented or infringing goods
  – Importing goods made by a patented process
  – Offering to sell from the U.S. across a border
Offer to Sell

• 35 U.S.C. § 271(a) – “Except as otherwise provided in this title, whoever without authority ... offers to sell ... any patented invention, within the United States ... infringes the patent.”

• Before the Transocean case, the analysis to determine infringement for an offer to sell was primarily based on the location of the offer.
  – District courts were split on whether the location of the contemplated sale should also be considered.
  – Some district courts also required the location of the contemplated sale to be within the U.S.
Offer to Sell – *Transocean v. Maersk*

- Both Transocean and Maersk bid for a contract to supply services from a dual-activity oil rig to a customer.
- Maersk’s negotiations with the customer were performed in Norway and Denmark. The final offer was made and signed in Norway.
- The contract was to provide services using Maersk’s dual-activity rig in the Gulf of Mexico, including areas that would be in the U.S.-controlled waters.
Offer to Sell – Transocean v. Maersk

- Transocean owned three patents related to a dual-activity oil rig.
- Maersk had a dual-activity rig design that allegedly infringed the Transocean patents, and this design was used in Maersk’s bid.
  - Maersk had not built the rig at the time the contract was signed.
  - Eventually, a non-infringing version of the rig was produced to fulfill the contract.
  - Significantly, no infringing rig was ever made by Maersk.
Offer to Sell – Transocean at District Court

• Transocean sued Maersk for patent infringement, alleging that the offer to sell an infringing product for use in the U.S. violated Section 271(a).

• District court determined there was no infringement—
  – The contract negotiations and offer occurred in Norway, not in the U.S.
  – While the offer included the use of an allegedly infringing rig design, no infringing rig was ever made.
  – The only U.S. activity—use of a non-infringing rig under the contract—did not infringe.
Offer to Sell – Transocean on Appeal

- *Transocean v. Maersk* – 699 F.3d 1340 (Fed. Cir. 2012)
  - Federal Circuit reversed and determined infringement, stating that *the location of the contemplated sale*, not the location of the offer, was key to determining infringement.
  - Completely changed the law—previous district court cases turned on whether the offer was made within the U.S.
  - This situation was also unique in that no infringing product was ever made.
- Thus, Maersk was held liable for infringement even though no infringing activities were ever completed within the U.S.

- Post-script: The Supreme Court granted Maersk’s petition for certiorari but later dismissed the case in 2014 after the parties settled.
<table>
<thead>
<tr>
<th>Offer to sell inside U.S.</th>
<th>Contemplated Sale inside U.S.</th>
<th>Contemplated Sale outside U.S.</th>
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<tbody>
<tr>
<td>Infringing</td>
<td></td>
<td>Not infringing</td>
</tr>
<tr>
<td>Offer to sell outside U.S.</td>
<td>Infringing</td>
<td>Not infringing</td>
</tr>
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</table>
Post-Transocean Summary

• An offer made in the U.S.—when sale is contemplated outside the U.S.—is no longer infringing.

• An offer made for a sale in the U.S.—irrespective of where the offer is made—is infringing.
  – It does not matter if sale is ever consummated.

• Prior to this case, patents could effectively be enforced against competitors based in the U.S. by obtaining U.S. protection only
  – Even if offer was to sell in a foreign country (with manufacturing to occur there), infringement would exist if the offer originated from the U.S.

• Now, foreign protection is much more important for the countries in which the sales would potentially occur
  – So patents should be obtained in countries where potential customers are located, rather than only where competitors are located
Location of Infringing Use – WesternGeco

- WesternGeco owned four patents covering improvements in offshore seismic imaging and used the technology to perform surveys for customers outside the U.S.

- ION Geophysical manufactured a competing product within the U.S. and exported those systems to competitors of WesternGeco who used them to bid on the same surveys

- In 2009, WesternGeco sued ION Geophysical for infringement

- District Court found that WesternGeco could recover lost profits for infringement occurring outside the U.S.
  - Based on 35 USC § 271(f), which creates infringement liability for anyone who exports components of a patented invention with the knowledge or intent that the components will be combined abroad in a way that would infringe if it occurred within the U.S.
Location of Infringing Use – *WesternGeco*

- Federal Circuit reversed – 791 F.3d 1340 (July 2, 2015)
  - Presumption against extraterritorial application of U.S. laws “applies with particular force in patent law.”
  - “Section 271(f) does not eliminate the presumption against extraterritoriality. Instead, it creates a limited exception.”
  - Lost profits could not be recovered because liability under 271(f) “attaches in the United States. It is the act of exporting the components from the United States which creates the liability.”
  - So activities occurring abroad cannot create liability for infringement, even under 271(f).
  - *WesternGeco* was still able to recover for infringement, but only a reasonable royalty based on ION’s domestic activities in making and selling the products within the U.S.
  - Federal Circuit also noted “[t]he extent to which these royalties may be affected by lost profits suffered abroad is an issue not presented here.”
Location of Infringing Use – WesternGeco

- As with *Transocean*, the result in *WesternGeco* suggests that patent owners should focus on obtaining protection not only in jurisdictions where competitors are based, but also where customers are located and/or where products will be used or methods will be performed.

- For activities occurring on the high seas, as in this case, enforceable patent rights are difficult to obtain – but maybe not impossible.
Elbit owned patent covering satellite communications technology

Hughes manufactured system that allegedly used the patented technology and sold it to a number of oil & gas companies, including Black Elk, which used the Hughes system on five offshore platforms within 200 nautical miles of the Texas coast.

Elbit sued Hughes for infringement in the Eastern District of Texas

Hughes argued venue was improper because the platforms where the accused systems were installed were outside the court’s jurisdiction.
• Motion denied – 2016 WL 3675590 (E.D.Tex. Mar. 30, 2016)
  – Jurisdiction (and thus venue) existed under the Outer Continental Shelf Lands Act (“OCSLA”)
  – OCSLA extends federal jurisdiction to the outer Continental Shelf for “all installations and other devices permanently or temporarily attached to the seabed … for the purpose of exploring for, developing, or producing resources therefrom.”
  – Because the five platforms were within 200 miles of Port Arthur (which is within the E.D.Tex.), they were within the OCSLA thus within the court’s jurisdiction.
  – Contrary decision in *WesternGeco* was distinguished because that case did not involve devices “permanently or temporarily attached to the seabed.”

• No claim drafting tips, but don’t just assume that activities offshore – especially within GOM – are outside the reach of U.S. patent laws.
Law of the Flag – *M-I Drilling*

- M-I Drilling owned a patent covering a system for collecting and transporting cuttings from a well.
- Dynamic Air sold a competing system to Petrobras, which was used on the *HOS Resolution* and *HOS Pinnacle*, two U.S.-flagged vessels operating off the coast of Brazil (unclear whether in Brazilian or international waters).
- M-I Drilling filed an infringement suit, which Dynamic Air challenged, arguing that activities on the two vessels were outside the reach of U.S. patent laws.
Law of the Flag – *M-I Drilling*

  - Court cited an 1865 district court decision from Massachusetts (*Gardiner*) which held that the jurisdiction of U.S. patent laws “extends to the decks of American vessels on the high seas, as much as it does to all the territory of the country ....”
  - “The law of the flag doctrine traditionally states that ‘a merchant ship is part of the territory of the country whose flag she flies, and that actions aboard that ship are subject to the laws of the flag state.’”
  - *Gardiner* was never overruled and was implicitly approved by the court in *WesternGeco*
  - “[P]rotection of M-I Drilling’s pneumatic conveyance system under the Patent Act extends to the U.S.-flagged ships .... The doctrine of the flag must be saluted under the facts of this case.”
Law of the Flag – *M-I Drilling*

- Although *M-I Drilling* was an interesting decision, many (most?) drillships and other oil & gas-related vessels sail under a “flag of convenience” from Panama, the Marshall Islands, the Bahamas or other smaller jurisdictions without robust systems of patent protection.

- Accordingly, for inventions designed to be used offshore, it is generally a good idea to draft claims with several basic points in mind:
  - Stay away from method claims, as they may never be enforceable under the laws of any country
  - Seek broad protection in home countries of both customers and competitors
  - Consider how – and where – products are manufactured, shipped, and assembled
THANK YOU
Our Global Reach
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Europe
Latin America
Middle East
North America

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Boston
Brussels
Chicago
Dallas
Dubai
Frankfurt
Hartford
Houston
London
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