

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PETROLEUM GEO-SERVICES INC.
Petitioner

v.

WESTERNGECO LLC
Patent Owner

Case IPR2014-01478
U.S. Patent No. 7,293,520

PETITIONER'S EXHIBIT LIST

IPR2014-01478 ('520) APPENDIX OF EXHIBITS

| Exhibit No. | Description |
|--------------------|---|
| PGS 1001 | U.S. Patent 7,293,520 B2 (Hillesund) |
| PGS 1002 | Declaration of Dr. Brian J. Evans, Ph.D. |
| PGS 1003 | Declaration of Dr. Jack H. Cole, Ph.D. |
| PGS 1004 | U.S. Patent 5,790,472 (Workman) |
| PGS 1005 | U.S. Patent 3,581,273 (Hedberg) |
| PGS 1006 | WO 98/28636 ('636 PCT) |
| PGS 1007 | WO 84/03153 ('153 PCT) |
| PGS 1008 | U.S. Patent 4,890,568 (Dolengowski) |
| PGS 1009 | U.S. Patent 3,605,674 (Weese) |
| PGS 1010 | U.S. Patent 4,231,111 (Neeley) |
| PGS 1011 | U.S. Patent 4,486,863 (French) |
| PGS 1012 | David H. Johnston <i>et. Al.</i> , "Time-Lapse Seismic analysis of the North Sea Fulmer Field," SEG Extended Abstracts (1997). [supplemented with Ex. PGS 1084] |
| PGS 1013 | Jury Verdict in re: <i>WesternGeco L.L.C. v. Ion Geophysical Corporation</i> , Civil Action No. 4:09-CV-01827, DE 536, dated August 16, 2012. |
| PGS 1014 | Memorandum and Order in re: <i>WesternGeco L.L.C. v. ION Geophysical Corporation</i> , Civil Action No. 4:09-CV-01827, DE 634, dated June 19, 2013 |
| PGS 1015 | Memorandum and Order in re: <i>WesternGeco L.L.C. v. ION Geophysical Corporation</i> in re: Civil Action No. 4:09-CV-01827, DE 120, dated July 16, 2010 |
| PGS 1016 | WesternGeco's Opposition to ION's Motion for a New Trial on Invalidity Under 35 U.S.C. §§ 102 and 103 in re: <i>WesternGeco L.L.C. v. ION Geophysical Corporation</i> Civil Action No.4:09-CV-01827, DE 574, dated October 26, 2012 |
| PGS 1017 | U.S. Patent 5,532,975 (Elholm) |
| PGS 1018 | U.S. Patent 6,011,752 (Ambs) |

| | |
|----------|--|
| PGS 1019 | WesternGeco's Opposition to Defendants' Motion for Summary Judgment of Invalidity of the Bittleston Patents in re: <i>WesternGeco L.L.C. v. ION Geophysical Corporation</i> , Civil Action No. 4:09-CV-01827, DE 287, dated April 20, 2012 |
| PGS 1020 | WesternGeco's Reply Claim Construction Brief in re: <i>WesternGeco L.L.C. v. ION Geophysical Corporation</i> Civil Action No. 4:09-CV-01827, DE 77, dated March 12, 2010 |
| PGS 1021 | Richard C. Dorf & Robert H. Bishop, <i>Modern Control Systems</i> (8th ed. 1998) at 2, 3, 4, and 9-11 [supplemented with Ex. PGS 1100] |
| PGS 1022 | WesternGeco's Motion for Summary Judgment of Willful Infringement of Valid Claims of the '520 Patent in re: <i>WesternGeco L.L.C. v. ION Geophysical Corporation</i> Civil Action No. 4:09-CV-01827, DE 276, dated March 30, 2012 |
| PGS 1023 | Memorandum and Order in re: <i>WesternGeco L.L.C. v. ION Geophysical Corporation</i> , Civil Action No. 4:09-CV-01827, DE 345, dated June 11, 2012 |
| PGS 1024 | Jury Instructions in re: <i>WesternGeco L.L.C. v. Ion Geophysical Corporation</i> , Civil Action No. 4:09-CV-01827, DE 530, dated August 14, 2012. |
| PGS 1025 | INTENTIONALLY LEFT BLANK |
| PGS 1026 | U.S. Patent 4,671,235 (Hosaka) |
| PGS 1027 | U.S. Patent 4,408,292 (Nakatani) |
| PGS 1028 | Louis Whitcomb et al., <i>Towards Precision Robotic Maneuvering Survey, and Manipulation in Unstructured Undersea Environments</i> , Robotics Research – The Eighth International Symposium (1998) at 5-6 [supplemented with Ex. PGS 1085] |
| PGS 1029 | Kenneth M. Sobel & Eliezer Y. Shapiro, <i>Eigenstructure Assignment for Design of Multimode Flight Control Systems</i> , 5 <i>Control Systems Mag.</i> (1985) at 9 and 14 |
| PGS 1030 | U.S. Patent 4,885,726 (Myers) |
| PGS 1031 | U.S. Patent 3,412,704 (Buller) |
| PGS 1032 | U.S. Patent 4,033,278 (Waters) |
| PGS 1033 | U.S. Patent 4,404,664 (Zachariadis) |
| PGS 1034 | Stuart Bennett, <i>A Brief History of Automatic Control</i> , 16 <i>Inst. Of Electrical and Electronics Control Systems Magazine</i> (June 1996) at 17 |

| | |
|----------|---|
| PGS 1035 | Karl J. Åström & Björn Wittenmark, <i>Computer-Controlled Systems: Theory and Design</i> (3d ed. 1997) at 1-8, 12 and 28 |
| PGS 1036 | U.S. Patent 5,200,930 (Rouquette) |
| PGS 1037 | U.S. Patent 6,011,753 (Chien) |
| PGS 1038 | Brian J. Evans, <i>A Handbook for Seismic Data Acquisition in Exploration</i> (David V. Fitterman & William H. Dragoset, Jr. eds., (1997) |
| PGS 1039 | E. J. W. Jones, <i>Marine Geophysics</i> (1999) at 89 |
| PGS 1040 | W.R. Cotton & J.I. Sanders, <i>The Reality of Trace Binning in 3-D Marine Surveying</i> (1983) at 565 [supplemented with Ex. PGS 1086] |
| PGS 1041 | Biondo L. Biondi, <i>3D Seismic Imaging</i> (2006) at 123-124 |
| PGS 1042 | Christopher L. Liner, <i>Elements of 3-D Seismology</i> (1999) at 104-105, 206-209 |
| PGS 1043 | Gerald H.F. Gardner & Anat Canning, <i>Effect of irregular sampling on 3-D prestack migration</i> , SEG Abstracts (1994) at 1553-1556 [supplemented with Ex. PGS 1087] |
| PGS 1044 | Christopher L. Liner & Ralph Gobeli, <i>Bin Size and Linear $v(z)$</i> , Society of Exploration Geophysics Technical Program Expanded Abstracts (1996) at 47 [supplemented with Ex. PGS 1088] |
| PGS 1045 | <i>Towed Streamer Seismic – More Efficiency</i> , Petroleum Geo-Services, http://www.pgs.com/Geophysical-Services/Towed-Streamer-Seismic/More-Efficiency/ (last visited April 22, 2014) |
| PGS 1046 | International Application No. PCT/IB99/01590 (September 28, 1999) |
| PGS 1047 | WesternGeco filed continuation application No. 11/455,042 on June 16, 2006 |
| PGS 1048 | August 18, 2006 Office Action in re: '520 Patent |
| PGS 1049 | October 18, 2006 Terminal Disclaimer filed by Applicant in re: '520 Patent |
| PGS 1050 | January 5, 2007 Information Disclosure Statement (IDS) in re: '520 Patent |
| PGS 1051 | May 24, 2007 Notice of Allowability in re: '520 Patent |
| PGS 1052 | U.S. Patent 6,932,017 (Hillesund) |
| PGS 1053 | Defendants' Amended Response in Opposition to Westerngeco LLC's Motion for Summary Judgment of Willful Infringement of Valid Claims of the '520 Patent (DE 298) |
| PGS 1054 | Franklyn K. Levin, "The Effect of Binning on Data From a |

| | |
|----------|--|
| | Feathered Streamer,” Geophysics, Vol. 49, No. 8 (1984); pp. 1386-1387 |
| PGS 1055 | U.S. Patent 4,992,990 (Langeland) |
| PGS 1056 | INTENTIONALLY LEFT BLANK |
| PGS 1057 | Vassilis N. Gikas, [Full Thesis] (Aug. 1996) [supplemented with Ex. PGS 1099 and Ex. PGS 1101] |
| PGS 1058 | Gikas et al., Hydrographic J., Vol. 77; pgs. 11-24 (1995) |
| PGS 1059 | U.S. Patent 4,809,005 (Counselman) |
| PGS 1060 | Thor Fossen, Guidance and Control of Ocean Vehicles 288 (1994) |
| PGS 1061 | Gregory E. Upchurch., Intellectual Property Litigation Guide: § 15:5 Overview – Effective filing date, 2 IP Litigation Guide: Patents & Trade Secrets [supplemented with Ex. PGS 1089] |
| PGS 1062 | Shashank Upadhye, Generic Pharmaceutical Patent and FDA Law § 1:71 Section 119 Claiming foreign priority – Section 102(b) [supplemented with Ex. PGS 1090] |
| PGS 1063 | Simon Bittleston Trial Transcript in re: <i>WesternGeco L.L.C. v. Ion Geophysical Corporation</i> , Civil Action No. 4:09-CV-01827, ECF 433, dated July 25, 2012 at 578. |
| PGS 1064 | U.S. Patent 6,144,342 (Bertheas) |
| PGS 1065 | David E. Lumley <i>et al.</i> , “Assessing the Technical Risk of a 4D Seismic Project,” SEG Technical Program Expanded Abstracts (1997) [supplemented with Ex. PGS 1091] |
| PGS 1066 | U.S. 4,191,328 (Isaacs) |
| PGS 1067 | U.S. 4,493,067 (Thomas) |
| PGS 1068 | U.S. 4,646,528 (Marcade) |
| PGS 1069 | U.S. 4,599,712 (Chelminski) |
| PGS 1070 | P.M Krail & H. Brysk, “The Shape of a Marine Streamer in a Cross Current,” Geophysics Vol. 54, No. 3 (1989) |
| PGS 1071 | Karl J. Åström and Björn Wittenmark, Computer-Controlled Systems: Theory and Design (1984) |
| PGS 1072 | R.P. Loweth, Manual of Offshore Surveying for Geoscientists and Engineers (1997) |
| PGS 1073 | Mamdouh R. Gadallah, Reservoir Seismology: Geophysics in Nontechnical Language (1994) |
| PGS 1074 | J.W. Bedenbender, R.C. Johnston, & E.B. Neitzel, “Electroacoustic Characteristics of Marine Seismic Streamers,” Geophysics, Vol. 35, No. 6 (1970). |

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.