**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

BUSH SEISMIC TECHNOLOGIES LLC, Plaintiff, v. PARADIGM LTD. and PARADIGM GEOPHYSICAL CORP., Defendants.	Civil Action No. _____ **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Bush Seismic Technologies, LLC ("Bush" or "Plaintiff"), for its Complaint

against Defendants Paradigm Ltd. ("Paradigm") and Paradigm Geophysical Corp. ("Paradigm

Geophysical") (collectively referred herein as "Defendants"), alleges the following:

NATURE OF THE ACTION

1.   This is an action for patent infringement arising under the Patent Laws of the United

States, 35 U.S.C. § 1 *et seq*.

THE PARTIES

2.   Plaintiff Bush Seismic Technologies LLC is a Limited Liability Company organized

under the laws of the State of Texas.

3.   Upon information and belief, Paradigm is a corporation organized and existing under

the laws of the Cayman Islands, with a place of business at Two Memorial Plaza, 820 Gessner

Road, Suite 400, Houston, Texas 77024.

4.   Upon information and belief, Paradigm Geophysical is a corporation organized and

existing under the laws of the State of Delaware, with a place of business at Two Memorial

Plaza, 820 Gessner Road, Suite 400, Houston, Texas 77024 and can be served through its

registered agent The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street,

Wilmington, Delaware 19801.

JURISDICTION AND VENUE

5.   Upon information and belief, Defendants sell and offer to sell products and

services throughout the United States, including in this judicial district, and introduce products

and services into the stream of commerce and that incorporate infringing technology knowing

that they would be sold in this judicial district and elsewhere in the United States.

6.   This is an action for patent infringement arising under the Patent Laws of the

United States, Title 35 of the United States Code.

7.   This Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

8.   Venue is proper in this judicial district under 28 U.S.C. §§ 1391(b), (c), (d) and/or

1400(b). On information and belief, Defendants conduct business in this District, the claims

alleged in this Complaint arise in this District, and the acts of infringement have taken place and

are continuing to take place in this District.

9.   On information and belief, Defendants are subject to this Court's general and

specific personal jurisdiction because Defendants have sufficient minimum contacts within the

State of Texas and this District, pursuant to due process and/or the Texas Long Arm Statute

because Defendants purposefully availed themselves of the privileges of conducting business in

the State of Texas and in this District, because Defendants regularly conduct and solicit business

within the State of Texas and within this District, and because Plaintiff's causes of action arise

directly from Defendants' business contacts and other activities in the State of Texas and this

District.

COUNT I – INFRINGEMENT OF U.S. PATENT NO. 6,411,903

10.   The allegations set forth in the foregoing paragraphs 1 through 9 are incorporated into this First Claim for Relief.

11.   On June 25, 2002, U.S. Patent No. 6,411,903 ("the '903 patent"), entitled "System and Method for Delineating Spatially Dependent Objects, Such As Hydrocarbon Accumulations from Seismic Data" was duly and legally issued by the United States Patent and Trademark Office. A true and correct copy of the '903 patent is attached as Exhibit 1.

12.   The inventions of the '903 patent resolve technical problems related to the use of artificial neural networks, a type of special purpose computer, in the exploration of oil, gas and/or minerals. For example, the inventions disclose how artificial neural networks can be used to discriminate between different regions, accumulations, or clusters of hydrocarbon deposits that can be detected from patterns present in seismic data.

13.   The claims of the '903 patent do not merely recite the performance of some business practice known from the pre-Internet world along with the requirement to perform it on the Internet. Instead, the claims of the '903 patent recite one or more inventive concepts that are rooted in specialized computer technology such as artificial neural networks, and overcome problems specifically arising in the realm of the exploration of oil, gas and/or minerals.

14.   The claims of the '903 patent recite an invention that is not merely the routine or conventional use of seismic or similar data, computer hardware or neural networks. Instead, the invention discloses a system, method, and process for utilizing artificial neural networks whether or not known data is available for training the neural network. The '903 patent claims thus specify how artificial neural networks can be applied to data from a sensing process in the exploration of oil, gas, and/or minerals.

15.   The technology claimed in the '903 patent does not preempt all ways of using artificial neural networks in the exploration of oil, gas, and/or minerals, nor preempt the use of all neural networks, nor preempt any other well-known or prior art technology.

16.   Accordingly, each claim of the '903 patent recites a combination of elements sufficient to ensure that the claim in practice amounts to significantly more than a patent on an ineligible concept.

17.   Plaintiff is the assignee and owner of the right, title and interest in and to the '903 patent, including the right to assert all causes of action arising under said patents and the right to any remedies for infringement of them.

18.   Upon information and belief, Defendants have and continue to directly infringe at least claims 1 and 6 of the '903 patent by making, using, selling, importing and/or providing and causing to be used products and services embodied by one or more claims of the '903 patent, including the use of neural networks or specialized computer technologies in the exploration of oil and gas and/or minerals, which products and services, by way of example, include Paradigm's Paradigm 15/15.5 software (the "Accused Instrumentalities").

19.   In particular, claim 1 of the '903 patent generally recites an apparatus for predicting oil producing and non-producing areas in a field from seismic data comprising a computer and software which includes a neural network trained using seismic data relating to both oil producing and non-producing areas and wherein the neural network is applied to the seismic data to predict the locations of oil producing and non-producing areas.

20.   The Accused Instrumentalities infringe claim 1 of the '903 patent. (*See, e.g.*, http://www.pdgm.com/solutions/data-management-and-interoperability/system-requirements/; http://www.pdgm.com/products/Paradigm 15/15.5/; http://www.pdgm.com/solutions/reservoir-

characterization/reservoir-modeling/; http://www.pdgm.com/getattachment/Promotional-

Sites/Paradigm-15-5-Release/Paradigm-Education-Series/Quantitative-Seismic-

Interpretation/QSI-LNL-Feb-2016-final.pdf.aspx?lang=en-US at p. 46;

http://www.pdgm.com/promotional-sites/paradigm-15-5-release/.)

21.   Claim 6 of the '903 patent generally recites system for predicting oil producing

and non-producing areas in a field from seismic data comprising a computer and software which

includes a neural network trained using seismic data relating to both oil producing and non-

producing areas and wherein the neural network is applied to the seismic data to predict the

locations of oil producing and non-producing areas.

22.   The Accused Instrumentalities infringe claim 6 of the '903 patent. (*See, e.g.*,

http://www.pdgm.com/products/Paradigm 15/15.5/; http://www.pdgm.com/solutions/reservoir-

characterization/reservoir-modeling/; http://www.pdgm.com/getattachment/Promotional-

Sites/Paradigm-15-5-Release/Paradigm-Education-Series/Quantitative-Seismic-

Interpretation/QSI-LNL-Feb-2016-final.pdf.aspx?lang=en-US at p. 46;

http://www.pdgm.com/promotional-sites/paradigm-15-5-release/.)

23.   On information and belief, these Accused Instrumentalities are used, marketed,

provided to, and/or used by or for each Defendant's partners, clients, customers and end users

across the country and in this District.

24.   Defendants were made aware of the '903 patent and its infringement thereof at

least as of the filing and/or service of this Complaint.

25.   Upon information and belief, since at least the time Defendants received notice,

each Defendant has induced and continues to induce others to infringe at least one claim of the

'903 patent under 35 U.S.C. § 271(b) by, among other things, and with specific intent or willful

blindness, actively aiding and abetting others to infringe, including but not limited to each Defendant's partners, clients, customers, and end users, whose use of the Accused Instrumentalities constitutes direct infringement of at least one claim of the '903 patent.

26.   In particular, each Defendant's actions that aid and abet others such as its partners, customers, clients, and end users to infringe include advertising and distributing the Accused Instrumentalities and providing instruction materials, training, and services regarding the Accused Instrumentalities. On information and belief, each Defendant has engaged in such actions with specific intent to cause infringement or with willful blindness to the resulting infringement because each Defendant has had actual knowledge of the '903 patent and knowledge that its acts were inducing infringement of the '903 patent since at least the date each Defendant received notice that such activities infringed the '903 patent.

27.   Upon information and belief, each Defendant is liable as a contributory infringer of the '903 patent under 35 U.S.C. § 271(c) by offering to sell, selling and importing into the United States oil and gas exploration products and services using neural networks to be especially made or adapted for use in an infringement of the '903 patent. The Accused Instrumentalities are a material component for use in practicing the '903 patent and are specifically made and are not a staple article of commerce suitable for substantial non-infringing use.

28.   Upon information and belief, since at least the time each Defendant received notice, Defendants' infringement has been willful.

29.   Plaintiff has been harmed by Defendants' infringing activities.

COUNT II – INFRINGEMENT OF U.S. PATENT NO. 6,236,942

30.   The allegations set forth in the foregoing paragraphs 1 through 29 are incorporated into this Second Claim for Relief.

31.   On May 22, 2001, U.S. Patent No. 6,236,942 ("the '942 patent"), entitled "System and Method for Delineating Spatially Dependent Objects, Such As Hydrocarbon Accumulations from Seismic Data" was duly and legally issued by the United States Patent and Trademark Office. A true and correct copy of the '942 patent is attached as Exhibit 2.

32.   The inventions of the '942 patent resolve technical problems related to the use of artificial neural networks, a type of special purpose computer, in the exploration of oil, gas and/or minerals. For example, the inventions disclose how artificial neural networks can be used to discriminate between different regions, accumulations, or clusters of hydrocarbon deposits that can be detected from patterns present in seismic data.

33.   The claims of the '942 patent do not merely recite the performance of some business practice known from the pre-Internet world along with the requirement to perform it on the Internet. Instead, the claims of the '942 patent recite one or more inventive concepts that are rooted in specialized computer technology such as artificial neural networks, and overcome problems specifically arising in the realm of the exploration of oil, gas and/or minerals.

34.   The claims of the '942 patent recite an invention that is not merely the routine or conventional use of seismic or similar data, computer hardware or neural networks. Instead, the invention discloses a system, method, and process for utilizing artificial neural networks whether or not known data is available for training the neural network. The '942 patent claims thus specify how artificial neural networks can be applied to data from a sensing process in the exploration of oil, gas, and/or minerals.

35.   The technology claimed in the '942 patent does not preempt all ways of using artificial neural networks in the exploration of oil, gas, and/or minerals, nor preempt the use of all neural networks, nor preempt any other well-known or prior art technology.

36.   Accordingly, each claim of the '942 patent recites a combination of elements sufficient to ensure that the claim in practice amounts to significantly more than a patent on an ineligible concept.

37.   Plaintiff is the assignee and owner of the right, title and interest in and to the '942 patent, including the right to assert all causes of action arising under said patents and the right to any remedies for infringement of them.

38.   Upon information and belief, Defendants have and continue to directly infringe at least claims 1 and 2 of the '942 patent by making, using, selling, importing and/or providing and causing to be used products and services embodied by one or more claims of the '942 patent, including the use of neural networks or specialized computer technologies in the exploration of oil and gas and/or minerals, which products and services, by way of example, include Paradigm's Paradigm 15/15.5 software (the "Accused Instrumentalities").

39.   In particular, claim 1 of the '942 patent generally recites a method for the automated prediction of locations of hydrocarbon producing areas and non-producing areas directly from seismic data gathered in an area. The method contains the following steps: developing a neural network using seismic training data relating to one or more hydrocarbon producing areas and seismic training data relating to one or more non-producing areas; and applying the neural network to at least a portion of the seismic data to generate predictions of locations of hydrocarbon producing areas and non-producing areas of the area.

40.   The Accused Instrumentalities infringe claim 1 of the '942 patent. (*See, e.g.*, http://www.pdgm.com/products/Paradigm 15/15.5/; http://www.pdgm.com/solutions/reservoir-characterization/reservoir-modeling/; http://www.pdgm.com/getattachment/Promotional-

Sites/Paradigm-15-5-Release/Paradigm-Education-Series/Quantitative-Seismic-Interpretation/QSI-LNL-Feb-2016-final.pdf.aspx?lang=en-US at p. 46.)

41.   Claim 2 of the '942 patent generally recites the method of claim 1, wherein the method contains the steps of developing the neural network to distinguish sub-regions within hydrocarbon producing areas and applying the neural network to at least a portion of the seismic data to distinguish sub-regions within the hydrocarbon producing areas.

42.   The Accused Instrumentalities infringe claim 2 of the '942 patent. (*See, e.g.*, http://www.pdgm.com/getattachment/Promotional-Sites/Paradigm-15-5-Release/Paradigm-Education-Series/Quantitative-Seismic-Interpretation/QSI-LNL-Feb-2016-final.pdf.aspx?lang=en-US at p. 46; http://www.pdgm.com/products/Paradigm 15/15.5/; http://www.pdgm.com/solutions/reservoir-characterization/reservoir-modeling/.)

43.   On information and belief, these Accused Instrumentalities are used, marketed, provided to, and/or used by or for each Defendant's partners, clients, customers and end users across the country and in this District.

44.   Defendants were made aware of the '942 patent and its infringement thereof at least as of the filing and/or service of this Complaint.

45.   Upon information and belief, since at least the time Defendants received notice, each Defendant has induced and continues to induce others to infringe at least one claim of the '942 patent under 35 U.S.C. § 271(b) by, among other things, and with specific intent or willful blindness, actively aiding and abetting others to infringe, including but not limited to each Defendant's partners, clients, customers, and end users, whose use of the Accused Instrumentalities constitutes direct infringement of at least one claim of the '942 patent.

46.   In particular, each Defendant's actions that aid and abet others such as its partners, customers, clients, and end users to infringe include advertising and distributing the Accused Instrumentalities and providing instruction materials, training, and services regarding the Accused Instrumentalities. On information and belief, each Defendant has engaged in such actions with specific intent to cause infringement or with willful blindness to the resulting infringement because each Defendant has had actual knowledge of the '942 patent and knowledge that its acts were inducing infringement of the '942 patent since at least the date each Defendant received notice that such activities infringed the '942 patent.

47.   Upon information and belief, each Defendant is liable as a contributory infringer of the '942 patent under 35 U.S.C. § 271(c) by offering to sell, selling and importing into the United States oil and gas exploration products and services using neural networks to be especially made or adapted for use in an infringement of the '942 patent. The Accused Instrumentalities are a material component for use in practicing the '942 patent and are specifically made and are not a staple article of commerce suitable for substantial non-infringing use.

48.   Upon information and belief, since at least the time each Defendant received notice, Defendants' infringement has been willful.

49.   Plaintiff has been harmed by Defendants' infringing activities.

COUNT III – INFRINGEMENT OF U.S. PATENT NO. 7,991,717

50.   The allegations set forth in the foregoing paragraphs 1 through 49 are incorporated into this Third Claim for Relief.

51.   On August 2, 2011, U.S. Patent No. 7,991,717 ("the '717 patent"), entitled "Optimal Cessation Of Training And Assessment Of Accuracy In A Given Class Of Neural

Networks," was duly and legally issued by the United States Patent and Trademark Office. A

true and correct copy of the '717 patent is attached as Exhibit 3.

52.   The inventions of the '717 patent resolve technical problems related to the use of

iterative, self-correcting algorithms, such as artificial neural networks, in the exploration of oil,

gas and/or minerals. For example, the inventions disclose how to dynamically determine the

point at which iterative, self-correcting algorithms, such as artificial neural networks, no longer

need to be trained with data sets, resulting in optimal performance and improved accuracy.

53.   The claims of the '717 patent do not merely recite the performance of some

business practice known from the pre-Internet world along with the requirement to perform it on

the Internet. Instead, the claims of the '717 patent recite one or more inventive concepts that are

rooted in specialized computer technology such as artificial neural networks, and overcome

problems specifically arising in the realm of the exploration of oil, gas and/or minerals.

54.   The claims of the '717 patent recite an invention that is not merely the routine or

conventional use of seismic or similar data, computer hardware or neural networks. Instead, the

invention discloses a system, method, and process for providing a way to configure iterative,

self-correcting algorithms, such as artificial neural networks, and carry out the optimal cessation

of training without resorting to the use of test and validation data sets. The '717 patent claims

thus specify how iterative, self-correcting algorithms, such as artificial neural networks, can be

optimized in fields including, but not limited to, the exploration of oil, gas, and/or minerals.

55.   The technology claimed in the '717 patent does not preempt all ways of using

iterative, self-correcting algorithms in the exploration of oil, gas, and/or minerals, nor preempt

the use of all iterative, self-correcting algorithms, nor preempt any other well-known or prior art

technology.

56.   Accordingly, each claim of the '717 patent recites a combination of elements sufficient to ensure that the claim in practice amounts to significantly more than a patent on an ineligible concept.

57.   Plaintiff is the assignee and owner of the right, title and interest in and to the '717 patent, including the right to assert all causes of action arising under said patents and the right to any remedies for infringement of them.

58.   Upon information and belief, Defendants have and continue to directly infringe at least claims 1, 2, 3, 11, and 12 of the '717 patent by making, using, selling, importing and/or providing and causing to be used products and services embodied by one or more claims of the '717 patent, including the use of iterative, self-correcting algorithms, such as neural networks, or specialized computer technologies in the exploration of oil and gas and/or minerals, which products and services, by way of example, include Paradigm's Paradigm 15/15.5 software (the "Accused Instrumentalities").

59.   In particular, claim 1 of the '717 patent generally recites a method for configuring an iterative, self-correcting algorithm having an objective function. The method contains the following steps: selecting training data; iterating the algorithm on the selected training data to modify weights in the algorithm; and relying on characteristics of the objective function to determine when the solution to the algorithm has been reached.

60.   The Accused Instrumentalities infringe claim 1 of the '717 patent. (*See, e.g.*, U.S. Pat. No. 7,991,717 at 8:37-39; 41-60; 64-67; http://www.pdgm.com/getattachment/Promotional-Sites/Paradigm-15-5-Release/Paradigm-Education-Series/Quantitative-Seismic-Interpretation/QSI-LNL-Feb-2016-final.pdf.aspx?lang=en-US at p. 46;

http://www.pdgm.com/products/Paradigm 15/15.5/;

http://www.pdgm.com/products/stratimagic/; U.S. Pat. No. 7,991,717 at 3:8-12.)

61.   Claim 2 of the '717 patent generally recites the method of claim 1, wherein the

iterative, self-correcting, algorithm is a neural network.

62.   The Accused Instrumentalities infringe claim 2 of the '717 patent. (*See, e.g.*, U.S.

Pat. No. 7,991,717 at 8:37-39; 64-66; http://www.pdgm.com/getattachment/Promotional-

Sites/Paradigm-15-5-Release/Paradigm-Education-Series/Quantitative-Seismic-

Interpretation/QSI-LNL-Feb-2016-final.pdf.aspx?lang=en-US at p. 46.)

63.   Claim 3 of the '717 patent generally recites the method of claim 1, wherein the

iterative, self-correcting, algorithm is used to predict producing and non-producing hydrocarbon

areas from seismic data.

64.   The Accused Instrumentalities infringe claim 3 of the '717 patent. (*See, e.g.*, U.S.

Pat. No. 7,991,717 at 8:37-39; 64-66; http://www.pdgm.com/getattachment/Promotional-

Sites/Paradigm-15-5-Release/Paradigm-Education-Series/Quantitative-Seismic-

Interpretation/QSI-LNL-Feb-2016-final.pdf.aspx?lang=en-US at p. 46;

http://www.pdgm.com/products/Paradigm 15/15.5/; http://www.pdgm.com/solutions/reservoir-

characterization/reservoir-modeling/.)

65.   Claim 11 of the '717 patent generally recites a method for configuring an

iterative, self-correcting algorithm having an objective function. The method contains the

following steps: selecting training data; using back propagation to train the algorithm by iterating

the algorithm on the selected training data to modify weights in the algorithm; and relying on

characteristics of the objective function to determine when the solution to the algorithm has been

reached.

66.   The Accused Instrumentalities infringe claim 11 of the '717 patent. (*See, e.g.*, U.S. Pat. No. 7,991,717 at 8:37-39; 41-60; 64-67; http://www.pdgm.com/products/Paradigm 15/15.5/; http://www.pdgm.com/getattachment/Promotional-Sites/Paradigm-15-5-Release/Paradigm-Education-Series/Quantitative-Seismic-Interpretation/QSI-LNL-Feb-2016-final.pdf.aspx?lang=en-US at p. 46; http://www.pdgm.com/products/stratimagic/; U.S. Pat. No. 7,991,717 at 3:8-12.)

67.   Claim 12 of the '717 patent generally recites the method of claim 11, wherein the iterative, self-correcting, algorithm is a neural network.

68.   The Accused Instrumentalities infringe claim 12 of the '717 patent. (*See, e.g.*, U.S. Pat. No. 7,991,717 at 8:37-39; 64-66; http://www.pdgm.com/products/Paradigm 15/15.5/; http://www.pdgm.com/getattachment/Promotional-Sites/Paradigm-15-5-Release/Paradigm-Education-Series/Quantitative-Seismic-Interpretation/QSI-LNL-Feb-2016-final.pdf.aspx?lang=en-US at p. 46.)

69.   On information and belief, these Accused Instrumentalities are used, marketed, provided to, and/or used by or for each Defendant's partners, clients, customers and end users across the country and in this District.

70.   Defendants were made aware of the '717 patent and its infringement thereof at least as of the filing and/or service of this Complaint.

71.   Upon information and belief, since at least the time Defendants received notice, each Defendant has induced and continues to induce others to infringe at least one claim of the '717 patent under 35 U.S.C. § 271(b) by, among other things, and with specific intent or willful blindness, actively aiding and abetting others to infringe, including but not limited to each

Defendant's partners, clients, customers, and end users, whose use of the Accused

Instrumentalities constitutes direct infringement of at least one claim of the '717 patent.

72.   In particular, each Defendant's actions that aid and abet others such as its

partners, customers, clients, and end users to infringe include advertising and distributing the

Accused Instrumentalities and providing instruction materials, training, and services regarding

the Accused Instrumentalities. On information and belief, each Defendant has engaged in such

actions with specific intent to cause infringement or with willful blindness to the resulting

infringement because each Defendant has had actual knowledge of the '717 patent and

knowledge that its acts were inducing infringement of the '717 patent since at least the date each

Defendant received notice that such activities infringed the '717 patent.

73.   Upon information and belief, each Defendant is liable as a contributory infringer

of the '717 patent under 35 U.S.C. § 271(c) by offering to sell, selling and importing into the

United States oil and gas exploration products and services using neural networks to be

especially made or adapted for use in an infringement of the '717 patent. The Accused

Instrumentalities are a material component for use in practicing the '717 patent and are

specifically made and are not a staple article of commerce suitable for substantial non-infringing

use.

74.   Upon information and belief, since at least the time each Defendant received

notice, Defendants' infringement has been willful.

75.   Plaintiff has been harmed by Defendant's infringing activities.

JURY DEMAND

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, Plaintiff demands a trial by

jury on all issues triable as such.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff demands judgment for itself and against Defendants as follows:

A.   An adjudication that Defendants have infringed the '903 patent, '942 patent, and '717 patent;

B.   An award of damages to be paid by Defendants adequate to compensate Plaintiff for Defendants' past infringement of the '903 patent, '942 patent, and '717 patent, and any continuing or future infringement through the date such judgment is entered, including interest, costs, expenses and an accounting of all infringing acts including, but not limited to, those acts not presented at trial;

C.   A declaration that this case is exceptional under 35 U.S.C. § 285, and an award of Plaintiff's reasonable attorneys' fees; and

D.   An award to Plaintiff of such further relief at law or in equity as the Court deems just and proper.

Dated: January 30, 2017   DEVLIN LAW FIRM LLC

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