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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PETROLEUM GEO-SERVICES INC.
Petitioner

v.

WESTERNGECO LLC
Patent Owner

Case IPR2014-00688
U.S. Patent No. 7,080,607

PATENT OWNER PRELIMINARY RESPONSE

Pursuant to 37 C.F.R. § 42.107(a), Patent Owner, WesternGeco L.L.C ("WesternGeco" or "Patent Owner"), submits this Preliminary Response to the Petition for *Inter Partes* Review ("Petition") of U.S. Patent No. 7,080,607 (the "'607 patent") filed by Petitioner, Petroleum Geo-Services, Inc. ("PGS" or "Petitioner").

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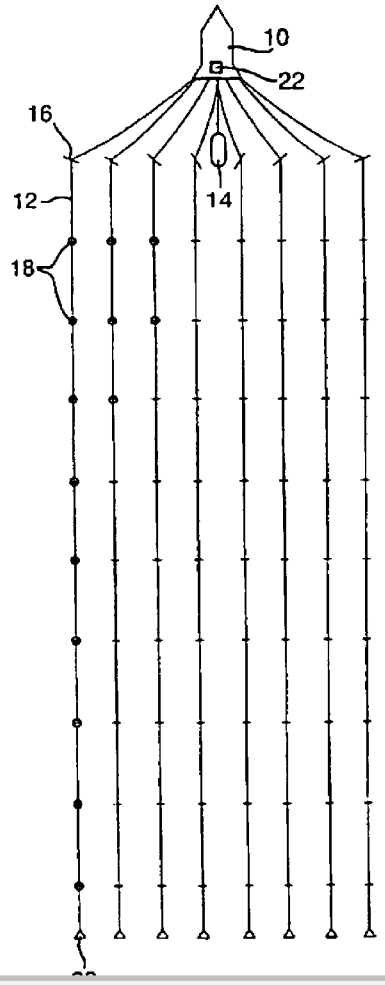
I. The '607 Patent Claims Predictive Steering of Streamer Arrays

The '607 patent covers methods and apparatus for using predicted positions of streamer positioning devices to calculate steering commands in order to steer miles-long streamer arrays despite limited location data in order to better image geological structures, improve the streamers' effectiveness, repeat surveys over time to manage resource recovery, and more safely and rapidly deploy and turn the arrays.

Fig.1.
Prior Art



Marine seismic surveys use reflections of sound waves to analyze underwater natural resource formations. (Ex. 1001, at Fig. 1.) Seismic streamers (12) are cables up to many miles in length that are towed behind survey vessels. An acoustic source (14), such as an air gun, is used to generate an acoustic signal towards the ocean floor. Seismic sensors, such as hydrophones (18), are spaced along the length of each streamer and are used to detect the reflected acoustic signal. The resulting data can be used to map the subsurface geology for natural resource exploration and management.

Historically, a single streamer was towed behind the ship for a few hundred meters. This yielded a short cross-section or "2-D" image of the subsurface geology. As the industry evolved, arrays of multiple side-by-side streamers have been deployed, allowing the capture of more robust "3-D" maps—as Petitioner's art shows, some of these approaches date back to 1967.

Early streamer positioning involved rudimentary devices such as deflectors and tail buoys. (Ex. 1001, at 3:34-39; Fig. 1 elements (16) and (20, respectively). Deflectors were associated with the front end of the streamer and used to horizontally spread the end of the streamer nearest the seismic survey vessel. (*Id*. at 1:34-41.) Tail buoys were associated with ropes or cables secured to the end of the streamer furthest from the seismic survey vessel, and created drag on that end of the streamer. (*Id*. at 1:39-41; 3:37-39.) The tension created on the seismic streamer by the deflector and tail buoy resulted in a roughly linear shape. (*Id*. at 1:34-41.) Both tail buoys and deflectors floated at the surface and could rely on GPS to determine their positions. No steering was provided for the miles of length along the streamer.

Streamer positioning devices are generally spaced every 200 to 400 meters along the length of a streamer. (Ex. 1001, at 1:48-49.) For a modest streamer array, this means hundreds, sometimes over a thousand, separate streamer

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