

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HALLIBURTON ENERGY SERVICES, INC.,
Petitioner,

v.

ADELOS, INC., and THE UNITED STATES OF AMERICA,
AS REPRESENTED BY THE DEPARTMENT OF THE NAVY,
Exclusive Licensee and Patent Owner.

Case IPR2017-02109
Patent 7,030,971 B1

Before SALLY C. MEDLEY, MATTHEW R. CLEMENTS, and
AMBER L. HAGY, *Administrative Patent Judges*.

MEDLEY, *Administrative Patent Judge*.

DECISION

Denying Institution of *Inter Partes* Review
35 U.S.C. § 314(a) and 37 C.F.R. § 42.108

I. INTRODUCTION

Halliburton Energy Services, Inc. (“Petitioner”) filed a Petition for *inter partes* review of claims 1–3, 6–16, and 18–22 of U.S. Patent No. 7,030,971 B1 (Ex. 1001, “the ’971 patent”). Paper 1 (“Pet.”). The United States of America, as Represented by the Department of the Navy and exclusive licensee Adelos, Inc. (herein collectively “Patent Owner”), filed a Preliminary Response. Paper 6 (“Prelim. Resp.”).¹ Institution of an *inter partes* review is authorized by statute when “the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a); *see* 37 C.F.R. § 42.108. Upon consideration of the Petition and Preliminary Response, we conclude the information presented does not show there is a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of any of claims 1–3, 6–16, and 18–22 of the ’971 patent.

A. Related Matters

The parties state that the ’971 patent is the subject of a court proceeding styled *Adelos, Inc. v. Halliburton Company et al.*, Case No. 9:16-cv-119-DLC (D. Mon.). Pet. 1; Paper 3, 1.

B. The ’971 Patent

The ’971 patent is directed to time-domain reflectometers. Ex. 1001, 1:40–41. Specifically, the ’971 patent “relates to such reflectometers which

¹ The United States of America, as Represented by the Department of the Navy and exclusive licensee Adelos, Inc., jointly submit the Preliminary Response. Prelim. Resp. 1. Accordingly, we herein refer to the two collectively as Patent Owner.

are a part of a photonic system application in which the object of the reflectometry is a span of fiber which has an interrogation signal launch end and a remote end.” *Id.* at 1:41–45. Figure 3 is reproduced below.

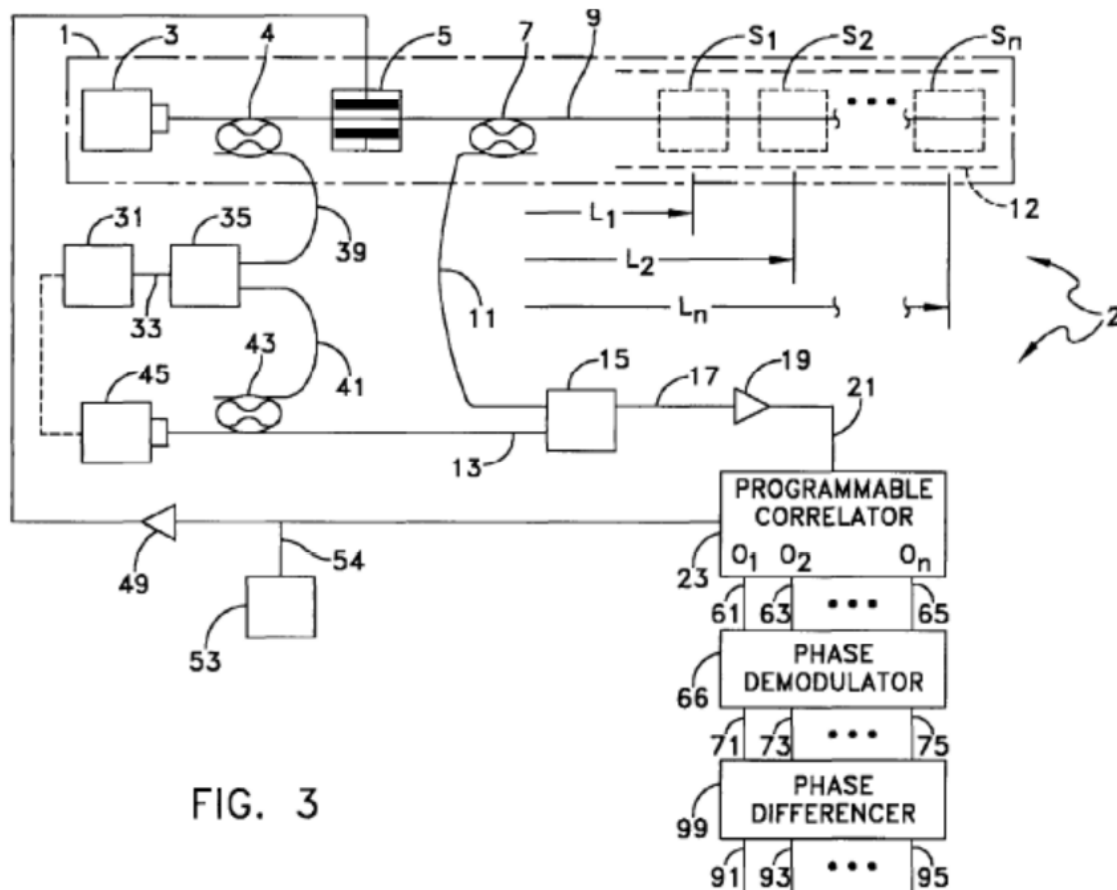


FIG. 3

Figure 3 of the '971 patent shows a block diagram of a time-domain reflectometer system.

Figure 3 shows a transmitter laser 3 connected to coupler or beamsplitter 4, which in turn is connected to optical modulator 5. *Id.* at 15:53–60. Optical modulator 5 is connected to optical coupler, beamsplitter or circulator 7, which in turn is connected to optical fiber 9. *Id.* at 16:1–5. Master correlation code generator 53 is connected to modulator 5 by amplifier 49. *Id.* at 15:62–65.

The propagation of the signal in optical fiber 9 “causes a back-propagating composite optical signal, which is the linear summation, or integration spatially, of all of the individual, continuous, or continuum of back-reflections along the span of the optical fiber.” *Id.* at 16:21–24. Optical pathway 11 is connected to optical coupler, beamsplitter, or circulator 7 to receive backscattered light from optical fiber 9 and relay it to heterodyne optical receiver 15. *Id.* at 17:10–14, 21:28–32. Optical receiver 15 receives an input from local oscillator laser 45. *Id.* at 18:64–66. Transmitter laser 3 and local oscillator laser 45 are also connected to receiver 35 through optical couplers 4 and 43 and optical pathways 39 and 41. *Id.* at 15:51–58, 18:64–19:4. Optical receiver 35 is connected back to local oscillator laser 45 through phase locking circuitry 31. *Id.* at 19:14–27. Correlator system 23 receives RF signal 21 and an input from correlation code generator 53. *Id.* at 20:60–62, 21:16–18. Correlator system 23 is connected to phase demodulation system 66 which in turn is connected to phase differencer 99. *Id.* at 22:32–39, 23:55–60. Phase demodulation system 66 is comprised of a plurality of phase demodulators 81, 83, and 85. *Id.* at 26:9–12, Fig. 7.

C. Illustrative Claim

Petitioner challenges claims 1–3, 6–16, and 18–22 of the '971 patent. Claims 1, 21, and 22 are independent claims. Claim 22, reproduced below, is illustrative of the claimed subject matter:

22. Signal sensing apparatus for sensing input signals at an array of a plurality of sensing stations along an optical fiber span, wherein at respective sensing station of the array the apparatus senses input signals of a type having the property of inducing light path changes within regions influenced by such signals, said apparatus comprising:

an optical wave network comprising a transmitter laser and a lightwave directional coupler, said network being operative to illuminate an optical fiber span with a CW optical signal and to retrieve portions of the illumination back-propagating from a continuum of locations along the fiber span;

a modulator operative to modulate the CW optical signal in accordance with a reiterative autocorrelatable form of modulation code;

a heterodyner which, in phase locked synchronism with said transmitter laser, receives said retrieved back-propagated portions of illumination and derives therefrom a radio frequency (r.f.) counterpart; and

a corresponding plurality of autocorrelation detectors operative upon said r.f. counterpart of the retrieved optical signal in respective timed relationships of a corresponding plurality of different timed relationships with respect to said reiterative autocorrelatable form of modulation code.

Id. at 38:6–31.

D. Asserted Grounds of Unpatentability

Petitioner asserts that claims 1–3, 6–16, and 18–22 are unpatentable based on the following grounds (Pet. 3–4):

Reference(s)	Basis	Challenged Claim(s)
Everard ²	§ 102	1–3, 6, 12, 14, 15, and 18–22
Everard	§ 103	7 and 8
Everard and Fredin ³	§ 103	9

² UK Patent Application No. GB2190186A, published Nov. 11, 1987 (Ex. 1004) (“Everard”).

³ U.S. Patent No. 6,606,148 B2, issued Aug. 12, 2003 (Ex. 1008) (“Fredin”).

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