

Search query (8): [SP]: 1. a method comprising assigning a respective unique identifier to each of a plurality of detonators which are connected, in parallel to one another, to respective connection points on two elongate signal-transmitting conductors of a harness which extends from a reference location to a plurality of boreholes in which the detonators are respectively positioned, the method including the steps of: (1) for each detonator, directly or indirectly measuring a parameter which is associated with the two conductors and which varies with the lengths of the two conductors between the reference location and the respective two connection points and (2) using the parameter measurement to generate a unique identifier for the respective detonator characterized in that a signal with a reference voltage (v_r) is impressed on the conductors at the reference location, at each pair of connection points, a measurement of the voltage prevailing at the pair of connection points, or a value derived therefrom, is used to control the operation of a voltage-controlled oscillator which is associated with the respective detonator, and in that the frequency (f_p) of the voltage-controlled oscillator is used to generate the unique identifier. 2. a method according to claim 1 wherein the unique identifier is transferred to a memory unit in the detonator. 3. a method according to claim 1 wherein the unique identifier is recorded in a mobile device for subsequent use in establishing a blasting system. 4. a method according to claim 1 wherein the signal-transmitting conductors are such that the parameter varies with the lengths of the conductors from the reference location. 5. a method according to claim 4 wherein the conductors are electrically conductive and the parameter is selected from the following: a resistance value, a capacitance value and an inductance value, of the conductors. 6. a method according to any one of claims 1 to 4 and 15 wherein the parameter is a value in a signal which is impressed on the conductors. 7-9. (canceled) 10. a method according to any one of claims 1 to 5 and 15 which includes the step of applying a correction factor to the voltage-controlled oscillator to counter the effect of temperature drift on the functioning of the oscillator. 11. a detonator which includes at least two connection points for connection to respective conductors in a harness, a memory unit, a voltage-controlled oscillator which generates a signal at an output frequency the value of which is dependent on a voltage applied to the two connection points, and a processor which uses the value of the frequency or a value derived therefrom to generate a unique identifier for the detonator which is transferred to the memory unit. 12. a detonator according to claim 11 includes a temperature-compensating circuit for controlling the operation of the voltage-controlled oscillator in a manner which is substantially independent of ambient temperature. 13. a detonator according to claim 11 which includes a switching mechanism, responsive to the processor which is operable to turn the voltage-controlled oscillator off, or on. 14. a detonator according to claim 11 which includes a switching mechanism to disconnect the voltage-controlled oscillator from the remainder of the detonator when the voltage-controlled oscillator is off in order to minimise current consumption by the detonator. 15. a method according to claim 2 wherein the unique identifier is recorded in a mobile device for subsequent use in establishing a blasting system. 16. a method according to claim 6 which includes the step of applying a correction factor to the voltage-controlled oscillator to counter the effect of temperature drift on the functioning of the oscillator.

PatBase PDF Export - Page: 1 21/05/2020

EP3134703 B1	20180307	EP20150784540	20150408
ES2666239 T3	20180503	ES20150784540T	20150408
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MX2016009413 A1	20160916	MX20160009413	20150408
US2017030695 AA	20170202	US20150110918	20150408
US9658045 BB	20170523	US20150110918	20150408
WO15168709 A2	20151105	WO2015ZA00021	20150408
WO15168709 A3	20160211	WO2015ZA00021	20150408
ZA201602928 A	20170329	ZA20160002928	20160429

Priority:

ZA20140002861 20140422 EP20150784540 20150408 WO2015ZA00021 20150408

Probable Assignee: DETNET SOUTH AFRICA PTY LTD

Assignee(s): (std): DETNET SOUTH AFRICA PTY LTD

Assignee(s): KRUGER MICHEL JACOBUS ; DETNET SOUTH AFRICA PTY LTD

Inventor(s): (std): KRUGER MICHEL JACOBUS ; KRUGER MICHEL JACOBUS ; MICHEL JACOBUS KRUGER

Agent(s): GRIFFITH HACK; MADDEN'S PATENT AND TRADE MARK ATTORNEYS; MADDEN'S PTY LTD; OYEN WIGGS GREEN AND MUTALA LLP; ALESSANDRI Y COMPANIA; HASBLEYDI LIZBETH CALVO ROJAS; PATENTANWAELE RUFF WILHELM BEIER DAUSTER AND PARTNER MBB; ELZABURU SLP ELZABURU SLP; MIFTAHUL HILMI SH MH; MICHAEL BEST AND FRIEDRICH LLP; MCCALLUM RADEMEYER AND FREIMOND ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

2) Family number: 2603025 (EP0443221A1)

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Title: METHOD AND APPARATUS FOR A CALIBRATED ELECTRONIC TIMING CIRCUIT.

Abstract: A timing circuit 64 includes a variable frequency oscillator 106 which has a control signal that determines the output frequency of the oscillator. The control signal is stored in the circuit. A reference signal is further stored in the circuit. A precision calibration pulse 36 is applied to the timing circuit 64 which counts the output cycles of the variable frequency oscillator (106) during the period of the pulse. This count is stored and compared to the reference count to produce an error count. This error count is combined with the previously stored control signal to produce a new control signal that drives the output of the oscillator 106 to a new frequency which is closer to a predetermined timing relation with the time reference which produced the calibration pulse (36). Additional calibration pulses (A,B,C,D) are sequentially applied to the timing circuit 64 to cause the frequency of the oscillator (66) to converge toward a predetermined relation with the time reference. The timing circuit 64 can be utilized as a part of a delay circuit in an electronic blasting system wherein a control unit 12 transmits the calibration pulse concurrently to each of the delay circuits to cause each circuit to calibrate its local oscillator in accordance with the calibration pulse. One or more of such pulses can be transmitted to cause all of the delay circuit oscillators to be brought to within a required degree of synchronization of rates. The control unit transmits a delay count to each of the delay ignition circuits: A fire command is transmitted from the control unit to each of the delay ignition circuits to cause the outputs of the calibrated local oscillators to be compared to the previously received delay count until a predetermined relation is reached. When this relation is reached, each delay ignition circuit generates a fire signal which ignites a corresponding explosive element.

Classifications:

International (IPC 8-9): F42C 11/06 F42D 1/055

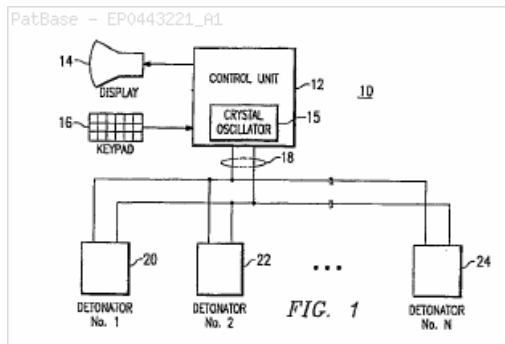
H03L 7/181 (Advanced/Invention);

F42C 11/00 F42D 1/00 H03L 7/16 (Core/Invention)

International (IPC 1-7): F42C 11/06 F42D 1/055 H03L 7/181

CPC: F42C 11/06 F42D 1/055 G05B 2219/25055 G05B 2219/2665 H03L 7/181

European: F42C 11/06 F42D 1/055 H03L 7/181 S05B 219/25055 S05B 219/2665



Family:

Publication number	Publication date	Application number	Application date
EP0443221 A1	19910828	EP19900250050	19900214

Priority:

EP19900250050 19900214

Probable Assignee: ATLAS POWDER CO

Assignee(s): (std): ATLAS POWDER CO

Assignee(s): ATLAS POWDER COMPANY

Inventor(s): (std): GOFFIN GLENN PETER II

Designated states: AT BE CH DE DK ES FR GB GR IT LI LU NL SE

3) Family number: 68507173 (US2019186885A)

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Title: DETONATOR IDENTIFIER ASSIGNMENT

Abstract: A plurality of detonators (22A-N) and a method of assigning a unique identifier to each of the detonators comprises connecting the detonators in parallel to one another at respective connection points on each of two signal-

transmitting conductors of a harness which extends from a reference location to a plurality of boreholes in which the detonators are respectively positioned. The method includes measuring a parameter which varies with the lengths of the two conductors between the reference location and the respective two connection points, and generating a unique identifier for each respective detonator based on the measured parameter. The detonators include a memory unit (58), a voltage-controlled oscillator (60, 60P) which generates a signal at an output frequency determined by voltage applied to the two connection points, and a processor (50) which uses the output frequency to generate a unique identifier for the detonator, which identifier is transferred to the memory unit (58).

Classifications:

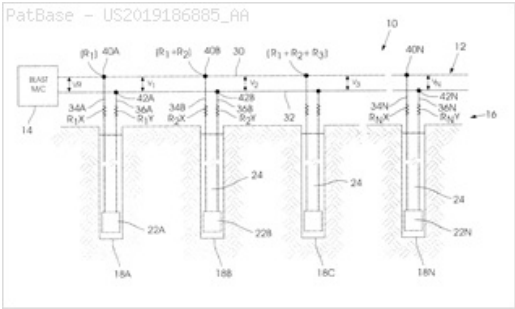
International (IPC 8-9): F42D F42D1/055

F42D1/06 (Advanced/Invention)

International (IPC 1-7): F42D1/055 F42D1/06

CPC: F42D1/055

US: 1/1



Family:

Publication number	Publication date	Application number	Application date
AU2017307636 AA	20190228	AU20170307636	20170802
AU2017307636 BB	20190822	AU20170307636	20170802
AU2019201020 AA	20190307	AU20190201020	20190214
BR112019002135 A2	20190514	BR20191102135	20170802
BR112019002145 A2	20190514	BR20191102145	20170802
CA3032722 AA	20190131	CA20173032722	20170802
CL2019000239 A1	20190422	CL20190000239	20190130
CL2019000240 A1	20190422	CL20190000240	20190130
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EP3517882 A3	20191204	EP20190161105	20170802
ID201901569 A	20190301	ID2019P0000956	20170802
ID201901599 A	20190301	ID2019P0000957	20170802
MX2019001305 A1	20190624	MX20190001305	20170802
MX2019001306 A1	20190624	MX20190001306	20170802
US2019186885 AA	20190620	US20170322332	20170802
WO18027247 A2	20180208	WO2017ZA50040	20170802
WO18027247 A3	20180426	WO2017ZA50040	20170802
ZA201900643 A	20190925	ZA20190000643	20190130

Priority:

ZA20160005321 20160802 AU20170307636 20170802 WO2017ZA50040 20170802
EP20170817637 20170802 AU20190201020 20190214

Probable Assignee: DETNET SOUTH AFRICA PTY LTD

Assignee(s): (std): DETNET SOUTH AFRICA PTY LTD

Assignee(s): KRUGER MICHEL JACOBUS

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Agent(s): MADDERNS PTY LTD; OYEN WIGGS GREEN AND MUTALA LLP; ALESSANDRI AND COMPANIA LIMITADA; PATENTANWALTE RUFF WILHELM BEIER DAUSTER AND PARTNER MBB; MIFTAHUL HILMI SH MH; RADEMEYER MONTAGUE AMPIE JOHN ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

4) Family number: 41784247 (WO08055274A1) © PatBase

Title: BLASTING SYSTEM AND METHOD

Abstract: The invention provides a blasting system which includes a plurality of electronic detonators (14) which are configured in a blast array (18) which has at least one row (20) and a plurality of detonators (14) in the row (20), each detonator (14) including a memory (34) in which is stored at least respective firing time information and a respective identity code (86) which is dependent, at least, on the row (20) in which the detonator (14) is, and on the detonator's (14) position in the row (20), a harness (16) which interconnects the detonators (14), and at least one control unit (70), connected to the harness (16), which generates a signal to fire the detonators (14).

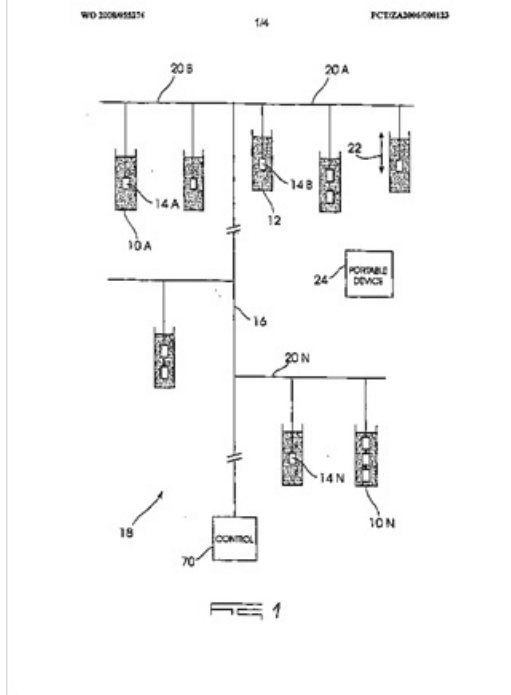
Classifications:

International (IPC 8-9): F42D1/055 (Advanced/Invention);

F42D1/00 (Core/Invention)

CPC: F42D1/055

European: F42D1/055

**Family:**

Publication number	Publication date	Application number	Application date
AU2006350184 AA	20080508	AU20060350184	20061030
AU2006350184 BB	20111006	AU20060350184	20061030
CA2668327 AA	20090430	CA20062668327	20061030
CA2668327 C	20120925	CA20062668327	20061030
DE602006030489 D1	20120830	DE200660030489T	20061030
EP2082184 A1	20090729	EP20060846887	20061030
EP2082184 B1	20120627	EP20060846887	20061030
WO08055274 A1	20080508	WO2006ZA00123	20061030

Priority:

EP20060846887 20061030 WO2006ZA00123 20061030

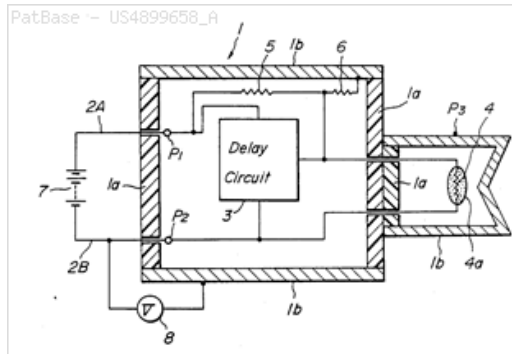
Probable Assignee: DETNET SOUTH AFRICA PTY LTD**Assignee(s):** (std): DETNET SOUTH AFRICA PTY LTD ; KOEKEMOER ANDRE ; LABUSCHAGNE ALBERTUS A ; SCHLENTER CRAIG CHARLES**Assignee(s):** DETNET SOUTH AFRICA LTD ; DETNET SOUTH AFRICA PTY LIMITED**Inventor(s):** (std): KOEKEMOER ANDRE ; LABUSCHAGNE ALBERTUS A ; SCHLENTER CRAIG CHARLES ; ANDRE KOEKEMOER ; CHARLES SCHLENTER CRAIG**Inventor(s):** CRAIG CHARLES SCHLENTER ; ALBERTUS A LABUSCHAGNE**Agent(s):** COLLISON AND CO; GOWLING LAFLEUR HENDERSON LLP; PATENTANWAELTE RUFF WILHELM BEIER DAUSTER AND PARTNER; MCCALLUM RADEMEYER AND FREIMOND**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW**5) Family number: 3331328 (US4899658A)**

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Title: Delay type electric detonator

Abstract: An electric detonator of the delay type including a housing having a metal portion and an insulating portion, a pair of leg wires extending outside through the housing, a delay circuit connected across the leg wires and generating an ignition current at a predetermined timing, and an igniting resistor connected to an output terminal of the delay circuit and one of the leg wires. In order to check the resistance value of the igniting resistor even after the detonator has been assembled, a by-pass resistor is connected between the other of the leg wires and a junction point between the delay circuit and the igniting resistor. A small measuring current is conducted through the igniting resistor via the by-pass resistor to generate a voltage drop across the igniting resistor. This voltage drop is measured by connecting a voltage measuring device between the leg wire and the metal portion of the housing.

Classifications:**International (IPC 8-9):** F42B3/16 (Advanced/Invention)**International (IPC 1-7):** F42B3/16 F42C11/00 F42C11/06 F42C21/00**CPC:** F42B3/122 F42C21/00**European:** F42B3/12B2 F42C21/00**US:** 102/206



Family:

Publication number	Publication date	Application number	Application date
CA1311152 A1	19921208	CA19880580015	19881013
DE3835115 A1	19890511	DE19883835115	19881014
DE3835115 C2	19900322	DE19883835115	19881014
JP1102300 A2	19890419	JP19870259779	19871016
JP2634824 B2	19970730	JP19870259779	19871016
US4899658 A	19900213	US19880254811	19881007

Priority:

JP19870259779 19871016

Probable Assignee: HARADA ELECTRONICS IND

Assignee(s): (std): HARADA ELECTRONICS IND ; HARADA ELECTRONICS IND SA ; NIPPON OILS AND FATS CO LTD

Assignee(s): NIPPON OIL AND FATS CO LTD ; NIPPON YUSHI KK ; NIPPON OIL AND FATS COMPANY LIMITED ; NIPPON OIL AND FATS CO LTD TOKIO TOKYO JP ; HARADA ELECTRONICS INDUSTRY ; HARADA ELECTRONICS INDUSTRY SAPPORO HOKKAIDO JP ; HARADA ELECTRONICS INDUSTRY SAPPORO HOKKAIDO JP ; HARADA DENSHI KOGYO KK

Inventor(s): (std): HARADA AKIHIDE ; HARADA MASAHIDE ; OCHI KOJI

Inventor(s): OCHI KOJI IWAMIZAWA HOKKAIDO JP ; HARADA MASAHIDE SAPPORO HOKKAIDO JP ; HARADA TSUKUHIDE

6) Family number: 61850467 (US2017276466A)

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Title: ELECTRONIC DETONATOR LEAKAGE CURRENT RESTRICTION

Abstract: A detonator system wherein a detonator is connected via a down-hole harness to a bus extending from a blast controller and wherein a component is connected in series with the down-hole harness to limit leakage current in the harness to a level which can be accommodated by the blast controller.

Classifications:

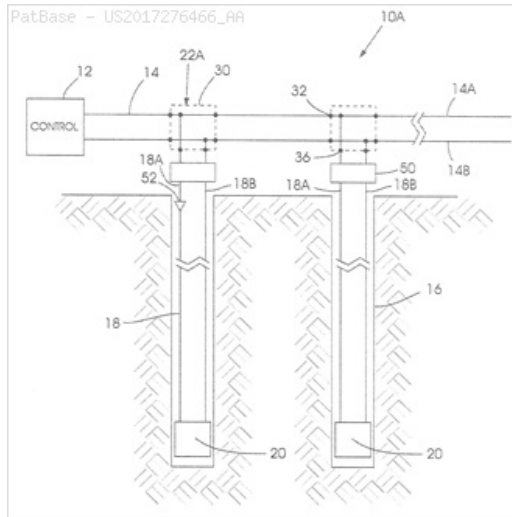
International (IPC 8-9): F42D F42D1/04 F42D1/05 F42D1/055

F42D5/00 H03K17/08 (Advanced/Invention)

International (IPC 1-7): F42D1/055

CPC: F42D1/055 F42D1/043 H03K17/08

US: 1/1 102/218



Family:

Publication number	Publication date	Application number	Application date
AP201709792 A0	20170331	AP20170009792	20150901
AU2015311664 AA	20170330	AU20150311664	20150901
AU2015311664 AA	20160310	AU20150311664	20150901
AU2015311664 BB	20200514	AU20150311664	20150901
BR112017004366 A2	20171205	BR201711104366	20150901
CA2960068 AA	20170302	CA20152960068	20150901
CL2017000508 A1	20170908	CL20170000508	20170303
CO20170002535 A2	20170531	CO20170002535	20170317
DE602015041302 D1	20191128	DE201560041302T	20150901
EP3189299 A1	20170712	EP20150820422	20150901
EP3189299 B1	20191106	EP20150820422	20150901
MX2017002869 A1	20170530	MX20170002869	20150901
MX358627 B	20180829	MX20170002869	20150901

US2017276466 AA	20170928	US20150508717	20150901
US10267613 BB	20190423	US20150508717	20150901
WO16037196 A1	20160310	WO2015ZA00057	20150901
ZA201701497 A	20180425	ZA20170001497	20170228

Priority:

ZA20140006453 20140903 EP20150820422 20150901 WO2015ZA00057 20150901

Probable Assignee: DETNET SOUTH AFRICA PTY LTD

Assignee(s): (std): DETNET SOUTH AFRICA PTY LTD

Assignee(s): SCHLENTER CRAIG CHARLES

Inventor(s): (std): CRAIG CHARLES SCHLENTER ; SCHLENTER CRAIG CHARLES

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Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

7) Family number: 12330570 (US6079333A)

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Title: GPS controlled blaster

Abstract: A blasting system using the global positioning system (GPS) for timing the detonations for a shaped blast. The blasting system includes a master station including a master GPS receiver for determining a GPS-based time and a master transceiver in communication with several charge control stations. Each charge control station includes a charge control transceiver for communicating with the master transceiver, a charge control GPS receiver for tracking the GPS-based time, and a detonator for detonating an explosive charge. In operation, the master transceiver uses the GPS-based time determined at the master station for computing detonation times and transmits these times to the charge control stations. The charge control stations then detonate the respective explosive charges when the GPS-based times determined at the charge control stations match the detonation times. Location information determined by the charge control GPS receivers may be used by the master station for detecting errors in the placements of the explosive charges and for refining the detonation times.

Classifications:

International (IPC 8-9): F42D1/05 (Advanced/Invention);

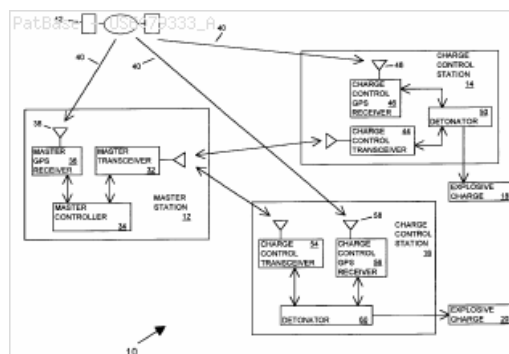
F42D1/00 (Core/Invention)

International (IPC 1-7): F23Q7/02

CPC: F42D1/05

European: F42D1/05

US: 102/200 102/214 102/215 102/332 102/420



Family:

Publication number	Publication date	Application number	Application date
US6079333 A	20000627	US19980096894	19980612

Priority:

US19980096894 19980612

Probable Assignee: TRIMBLE NAVIGATION LTD

Assignee(s): (std): TRIMBLE NAVIGATION LTD

Assignee(s): TRIMBLE NAVIGATION LIMITED

Inventor(s): (std): MANNING CHARLES DAVID HOPE

8) Family number: 60818589 (ZA201602946A)

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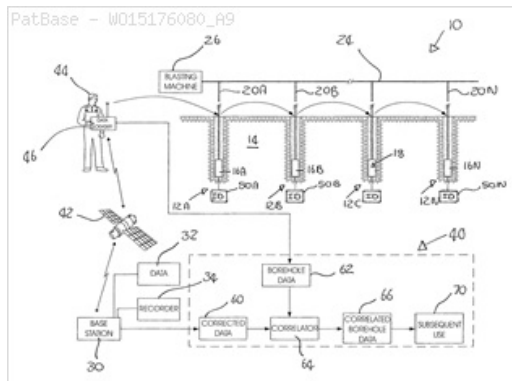
Title: BOREHOLE LOCATION IDENTIFICATION

Abstract: in a blasting system positional data for a borehole or detonator generated by the use of a remote reference source is corrected by applying thereto a correction factor, determined by comparing absolute positional information of a reference location to positional information of the reference location generated by the use of the remote reference source.

Classifications:

International (IPC 8-9): F42D1/02 G01S19/14 (Advanced/Invention)

CPC: F42D1/02



Family:

Publication number	Publication date	Application number	Application date
■ AU2015101869 AD	20160804	AU20150101869	20150512
■ AU2015101869 AF	20160818	AU20150101869	20150512
■ AU2015258825 AA	20160609	AU20150258825	20150512
■ WO15176080 A2	20151119	WO2015ZA00034	20150512
■ WO15176080 A3	20160107	WO2015ZA00034	20150512
■ WO15176080 A9	20160714	WO2015ZA00034	20150512
■ ZA201602946 A	20170628	ZA20160002946	20160503

Priority:

ZA20140003506 20140515 WO2015ZA00034 20150512

Probable Assignee: DETNET SOUTH AFRICA PTY LTD

Assignee(s): (std): DETNET SOUTH AFRICA PTY LTD

Inventor(s): (std): SCHLENTER CRAIG CHARLES

Agent(s): GRIFFITH HACK; MCCALLUM RADEMEYER AND FREIMOND ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW