

Diego Gonzalez

1) Family number: 49004975 (US2011127031A)

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**Title:** SYSTEM AND METHOD FOR INCREASING PRODUCTION CAPACITY OF OIL, GAS AND WATER WELLS

**Abstract:** The invention provides an apparatus, method and system for stimulating production of a natural resource (e.g., Oil, gas or water) producing well using vibrational energy delivered to the geological formation through a device that maybe permanently installed, and continuously or periodically operated even during recovery of the natural resource. The apparatus is of a downhole type. The apparatus is constructed to resist corrosion and provides one or more heat sink chambers for controlling heat dissipation during operation. The system provided by the invention is capable of monitoring production, adapting stimulation parameters based on user input and other pertinent parameters.

**Classifications:**

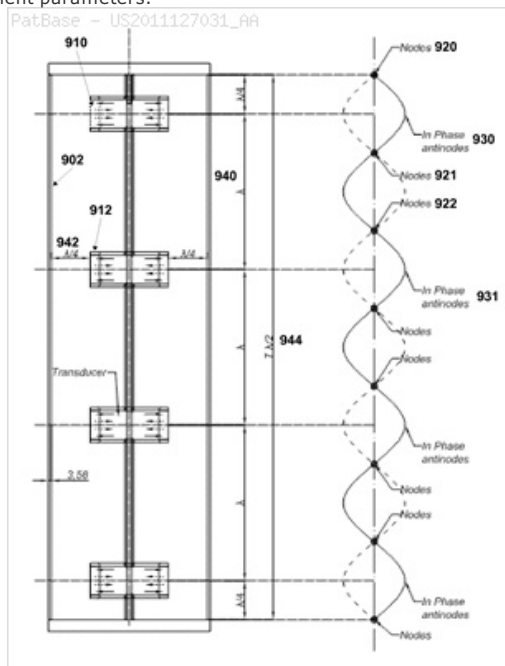
**International (IPC 8-9):** E21B28/00 E21B43/00  
E21B43/25 (Advanced/Invention)

**International (IPC 1-7):** E21B28/00 E21B43/00

**CPC:** E21B43/003 E21B28/00

**European:** E21B28/00 E21B43/00C

**US:** 166/177.1 166/177.100S 166/177.6 166/249



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AR079228 AA        | 20120104         | AR2010P104430      | 20101201         |
| CA2782408 AA       | 20120530         | CA20102782408      | 20101129         |
| GC4026 A           | 20160310         | GC2010P017198      | 20101129         |
| US2011127031 AA    | 20110602         | US20100954906      | 20101128         |
| US2012132416 AA    | 20120531         | US20110029108      | 20110216         |
| US2014246191 AA    | 20140904         | US20140197086      | 20140304         |
| US8746333 BB       | 20140610         | US20100954906      | 20101128         |
| WO11064375 A2      | 20110603         | WO2010EP68446      | 20101129         |
| WO11064375 A3      | 20111201         | WO2010EP68446      | 20101129         |

**Priority:**

US20090283195P 20091130 US20100954906 20101128 WO2010EP68446 20101129  
US20110029108 20110216 US20140197086 20140304

**Probable Assignee:** AIC ENERGY LLC

**Assignee(s):** (std): BARLOCCI PENNATI ANNA ; TECHNOLOGICAL ORGANIZATION NAME RES LTD ; ZOLEZZI GARRETON ALFREDO ; TECHNOLOGICAL RES LTD

**Assignee(s):** TECHNOLOGICAL ORGANIZATION NAME RESEARCH LTD ; TECHNOLOGICAL RESEARCH LTD ; GARRETON ALFREDO ZOLEZZI ; KLAMATH FALLS INC ; AIC ENERGY LLC ; AIC LLC

**Inventor(s):** (std): ZOLEZZI GARRETON ALFREDO

**Inventor(s):** ALFREDO ZOLEZZI GARRETON

**Agent(s):** RIDOUT AND MAYBEE LLP; SULEIMAN I AL AMMAR LAW OFFICE; KARIM; ZBM PATENTS ZEA BARLOCCI AND MARKVARDSEN

**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ 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 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 PE PG PH PL PT RO RS RU 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

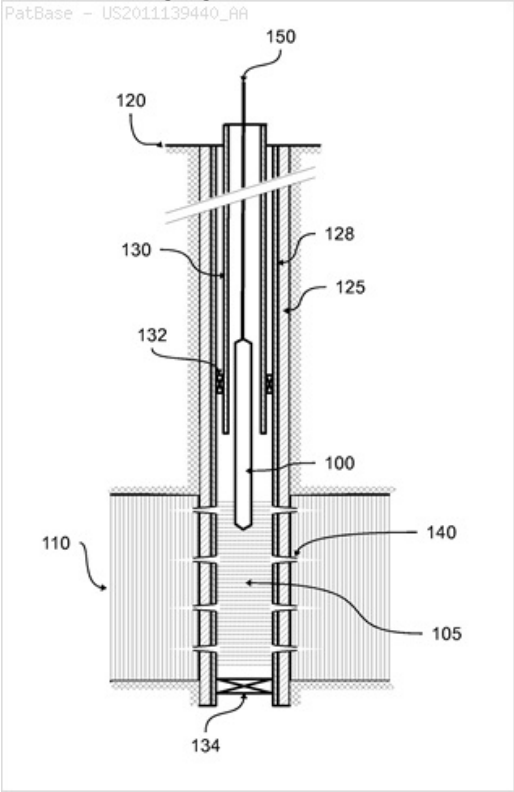
2) Family number: 49081887 (US2011139440A)

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**Abstract:** The invention provides an apparatus and method for stimulating a borehole of a well. The invention provides an apparatus that generates low-frequency seismic type elastic waves that propagate to the geologic formation and in order to enhance the movement of fluids in the geologic formation toward a well. The apparatus may operate automatically driven by a power source that may be located on the ground surface. The regime of operation may be determined by user input. Operation of the apparatus may be carried out while production of a natural resource is ongoing.

**Classifications:**

**International (IPC 8-9):** E21B28/00 E21B43/00 E21B43/25  
E21B47/18 G01V1/00 (Advanced/Invention)  
**International (IPC 1-7):** E21B28/00 E21B43/00  
**CPC:** E21B28/00 E21B43/003  
**European:** E21B28/00 E21B43/00C  
**US:** 166/177.1 166/177.100S 166/177.2 166/248 166/249 166/65.1  
166/66 166/66S 181/108 181/113 181/206 367/38 367/38S 367/83  
367/83S



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AR081233 AA        | 20120718         | AR2010P104612      | 20101214         |
| AR084664 AA        | 20130605         | AR2010P104613      | 20101214         |
| BR112012014018 A2  | 20190820         | BR20121114018      | 20101210         |
| CA2783931 AA       | 20120608         | CA20102783931      | 20101210         |
| CA2783931 C        | 20180102         | CA20102783931      | 20101210         |
| CA2783932 AA       | 20120608         | CA20102783932      | 20101210         |
| CL2012001555 A1    | 20130125         | CL20120001555      | 20120611         |
| CO6561794 A2       | 20121115         | CO20120116455      | 20120711         |
| GC4019 A           | 20160308         | GC2010P017304      | 20101211         |
| GC4028 A           | 20160310         | GC2010P017303      | 20101211         |
| MX2012006689 A1    | 20121009         | MX20120006689      | 20101210         |
| US2011139440 AA    | 20110616         | US20100962436      | 20101207         |
| US2011139441 AA    | 20110616         | US20100963638      | 20101209         |
| US8613312 BB       | 20131224         | US20100962436      | 20101207         |
| WO11070142 A2      | 20110616         | WO2010EP69357      | 20101210         |
| WO11070142 A3      | 20110818         | WO2010EP69357      | 20101210         |
| WO11070143 A2      | 20110616         | WO2010EP69358      | 20101210         |
| WO11070143 A3      | 20110922         | WO2010EP69358      | 20101210         |

**Priority:**

US20090285541P 20091211 US20100962436 20101207 US20100963638 20101209  
WO2010EP69357 20101210 WO2010EP69358 20101210 CL20120001555 20120611

**Probable Assignee:** AIC ENERGY LLC

**Assignee(s):** (std): BARLOCCI PENNATI ANNA ; TECH RESEARCH LTD ; TECHNOLOGICAL RES LTD ; ZOLEZZI GARRETON ALFREDO

**Assignee(s):** TECHNOLOGICAL RESEARCH LTD ; GARRETON ALFREDO ZOLEZZI ; KLAMATH FALLS INC ; AIC ENERGY LLC ; AIC LLC

**Inventor(s):** (std): ZOLEZZI GARRETON ALFREDO ; ALFREDO ZOLEZZI GARRETON

**Agent(s):** RIDOUT AND MAYBEE LLP; ESTUDIO CONSULTORA HOLTHEUER; HUMBERTO RUBIO CAMACHO; SULEIMAN I AL AMMAR LAW OFFICE; KARIM; ZBM PATENTS ZEA BARLOCCI AND MARKVARDSEN

**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ 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 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 PE PG PH PL PT RO RS RU 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

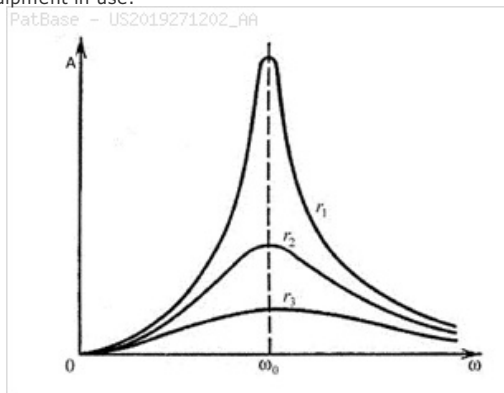
**Abstract:** The invention relates generally to the field of oil production. More specifically, the present invention relates to the method of oil production stimulation and enhancing oil recovery. The present method is mostly applicable for old oil fields with a low reservoir pressure, marginal wells and heavily clogged wells. The method of achieving the technical result is based on clogging materials crush and their removal from the bottom-hole oil formation zone and its stimulation of oil recovery by means of recurring impact on the bottom-hole zone by an oscillatory field of elastic vibrations within the ultrasonic range and by low-frequency pulse acoustic impact with simultaneous creation of rarefaction space in the perforation zone of the well. The equipment for stimulation of oil production is structurally represented by three basic devices: an ultrasonic generator, a downhole acoustic device and a jet pump. The acoustic generator provides automatic preset output voltage maintaining and automatic selection of resonating vibration frequency of downhole emitter piezoceramic packages. The downhole emitter has a modular design providing a uniform continuous and pulse radiation along the entire housing of the emitter. Additionally to the ultrasonic equipment, if necessary, a log recorder with a geophysical downhole device is used. A jet pump with a big axial hole for passage of downhole devices is used to provide pressure drawdown in the bottom-hole formation zone and to remove crushed colmatant materials. The use of the invention allows to increase the efficiency and successfulness of oil production stimulation and effect longevity after the treatment by equipment in use.

**Classifications:**

**International (IPC 8-9):** E21B28/00 E21B43/00 E21B43/16

E21B43/25 (Advanced/Invention)

**CPC:** E21B28/00 E21B43/16 E21B43/25 E21B43/003



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| RU2630012 C1       | 20170905         | RU20160130667      | 20160726         |
| US2019271202 AA    | 20190905         | US20170320099      | 20170818         |
| WO18021949 A1      | 20180201         | WO2017RU50076      | 20170818         |

**Priority:**

RU20160130667 20160726 WO2017RU50076 20170818

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**Assignee(s):** LIABILITY ILMASONIK SCIENCE LTD ; ILMASONIC SCIENCE LIABILITY CO LTD

**Inventor(s):** (std): SALTYSKOV ALEXANDR ALEXEEVICH ; SALTYSKOV YURIY ALEXEEVICH ; SALTYSKOV ALEKSANDR ALEKSEEVICH ; SALTYSKOV YURIY ALEKSEEVICH

**Agent(s):** KOTLOV DMITRY VLADIMIROVICH

**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 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: 6454638 (SU898367T)**

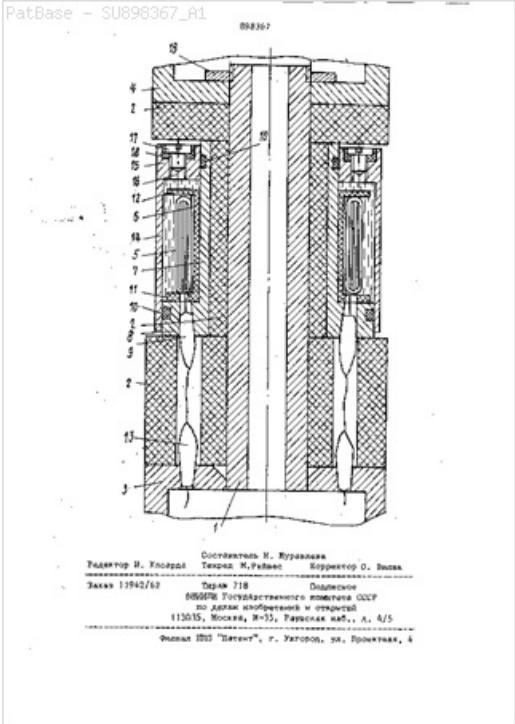
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**Title:** CONVERTER FOR ACOUSTIC WELL-LOGGING WELL INSTRUMENT

**Abstract:** Source: SU898367T **Machine translation:** Invention relates to geophysical. cal studies m wells and can be used in geophysical studies of wells by acoustic logging. Known transducer for sonic logging instrument, and comprising a cylindrical piezoceramic magnetostrictive transducers arranged one inside the other and placed in an oil-filled rubber boot (1. However this transducer has a low mechanical strength and, consequently, reliability and wells tion assays. Also known emitter for acoustic logging apparatus comprising two acoustic transducer mounted on the piston x detail with conical surfaces facing each other, separated prokladkoyiz elastic material. These parts are seal and form a sealed volume filled with liquid, to eliminate the influence of the hydrostatic pressure of the entire assembly placed in a robust housing 2. However, the presence of the pressure hull, capable of withstanding the pressure in the wells (. 100-150 MPa), with a minimum thickness of 10 mm causes a significant weakening of the radiated signals. Furthermore, this arrangement has considerable length and weight that reduces the performance of characteristic equipment. The closest to the proposed is a radiator, comprising an annular electromechanical transducer such as a magnetostrictive, mounted on a tubular sleeve by means of sound-insulating linings. The transducer is fixed on the sleeve between the two ring parts E and placed in a cylindrical housing - a container having an inner wall formed of a dielectric ma389 the material, and a metal outer wall and two end caps. Ner container filled with converter epoxy compound Sydney, and conclusions are made transducer through openings in the tubular sleeve. At the outer end faces PoWER Nost x covers and converts them surfaces machined concentric annular members agree concerted grooves and ridges, and the design used for sealing insulating gasket pinched melodies container lids and the details of the end 31. Disadvantages of this transducer with periodic exposure to more th hydrostatic pressure and temperature in the well IU CDS epoxy and outer metal wall formed microgaps dramatically reduces the intensity of the emitted and received signals. Furthermore, during operation inevitable for ud ry converter, causing cracking of the epoxy compound and the occurrence of said gaps. Single bay compound complex technology, as it is known that to obtain good adhesion of the compound and the outer creiiKH necessary evacuation after zapivki and smooth decline in the solidification temperature (about). The purpose of the invention increase nadezhns) STK devices work by com pensation external hydrostatic pressure and the effect of temperature. Said aim is achieved in that the converter for a P-krbora downhole sonic logging comprising annular electromechanical active element placed in a container having an inner and outer metallic walls, and a tubular sleeve ustanov.penny by using sound insulating spacers LKAU two end parts Mi the inner and outer walls of the container, further provided with protrusions on which are mounted the candle provided with openings and bushings for filling the liquid container, the inner wall is formed by lengthwise 5-10 percent greater, than the external, which has the ability to move relative to the inner diameter of the protrusion and on the inner wall of the container is comparable with the diameter of its walls, and the diameter of the protrusion on the outer wall of the container is comparable with the diameter of the inner wall at the opposite end of the ledge and the inner wall of grooves in which sealing rings are arranged between the inner surface of the active element of its ends and the container are additional insulating gasket made of a material having an acoustic stiffness equal to the acoustic impedance is not material container inner wall, wherein the inner

wall is secured to the container through the tubular sleeve, insulating pr okladki. The drawing shows a general view of the converter. Transmitter for a downhole tool is mounted on the tubular sleeve 1 through the insulating gasket 2mezhdru end piece 3 and 4. Pre educational consists of an annular electro-active element 5, which is set through the sound insulation gasket 6 on the inner wall 7 of the container. The inner wall 7 is provided with a projection 8, which bushings are installed spark plug 9 and the O-ring in groove 10. Such a groove with a sealing ring located at the opposite end of the inner wall of the container. The ends of the active element 5 located insulating spacers 12 and JI. § Electrical connection reactance element 5 is through candlestick entries 9 and continue through the spark plug bushings 13 in the end piece 3.7 on the inner wall 5 with an active element mounted outer wall 14 provided with a projection 15 which is provided openings 16 for filling of the container with liquid, for instance transformer oil. After filling the holes are closed with plugs 17 with seals 18. Length of the inner wall 7 more than the length of the outer wall 14 by 5-10 percent. When installing the inner wall of the converter 7, sound-insulating gaskets are clamped between the details of the third terminal 4 by a nut 19. Acoustic signals pass from the active element through the liquid within the container and a relatively thin wall 14 to, the wall of the through hole is filled liquid or its guide in the reverse direction in the receiving mode of the acoustic signals. With increasing pressure during descent of the device into the well the outer wall moves along the inner wall, providing a reduction in volume of the container and the pressure within the container and aligned in the well. The same thing happens when lifting device, but the movement of the outer wall occurs in the opposite direction. When the temperature increases, so the liquid in the container expands and the outer wall 14 moves along the inner wall 7 and also of Exodus pressure equalization inside and outside the container. Further insulating spacers 6,11, 12 reduce the passage of acoustic signals through the body of the downhole tool to a downhole transducer acoustic logging tool allows to obtain a constant acoustic contact with the external medium in any wells zhinnyyh conditions. As the pressure inside and outside transducer so vceg same, the outer cylinder is manufactured relatively thin and creates slight loss in acoustic devices, while at the same time providing sufficient mechanical strength. Furthermore, such an arrangement is simple to manufacture and assemble. CLAIMS transducer for sonic logging downhole tool comprising an annular electro-active element is placed into a container having an inner and an outer metal wall and mounted on a tubular sleeve by means of soundproofing seals between the two end parts Mi, characterized in that in order to increase the reliability working devices on the inner and outer walls of the container are projections which are mounted on the bushings and the spark plug openings are made for the liquid filling the container, the inner wall is formed by lengthwise 5-10 percent greater than the external, which has the ability to move relative to the inner diameter of the protrusion and on the inner wall of the container.. commensurate with the diameter of the outer wall, a diameter of the protrusion on the outer wall of the container is comparable with the diameter of the inner wall at the opposite end of the ledge and the inner wall of grooves defined therein O-rings between the inner surface of the active element of its ends and additional container arranged insulating gasket 21zgotovlennyye material with an acoustic stiffness equal to the acoustic impedance is not material container inner wall, the inner wall of the container is secured to the tubular sleeve via insulating spacers. Sources of information received into account in the examination of U.S. 1.Patent number 3407384, cl. 340-10, published 1968. 2.Avtorskoe USSR certificate number 405094, cl. G 01 V 1/40, 1972. 3.Avtorskoe USSR certificate number 3733677, cl. G 01 V 1/40, 1971 (prototype).

**Classifications:**  
**International (IPC 8-9):** G01V1/40 G01V1/52 (Advanced/Invention);  
G01V1/40 (Core/Invention)  
**International (IPC 1-7):** G01V1/40 G01V1/52



**Family:**

| Publication number                                                                              | Publication date | Application number | Application date |
|-------------------------------------------------------------------------------------------------|------------------|--------------------|------------------|
|  SU898367 A1 | 19820115         | SU19802864216      | 19800104         |
|  SU898367 T  | 19820115         | SU19802864216      | 19800104         |

**Priority:**

SU19802864216 19800104

**Probable Assignee:** VNII NEFTEPROMY GEOFIZ

**Assignee(s):** (std): ALL UNION SCIENTIFIC RESEARCH INST OF GEOPHYSICAL METHODS OF PROSPECTING ; VNII NEFTEPROMY GEOFIZ

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**Inventor(s):** (std): PERTSEV GERMAN M ; KALUGIN NIKOLAJ I ; IDRISOVA ALEKSANDRA K ; PRYAMOV PETR A

**Inventor(s):** PRYAMOV PETR A SU ; IDRISOVA ALEKSANDRA K SU ; PERTSEV GERMAN M SU ; KALUGIN NIKOLAJ I SU

**5) Family number: 1358511** (US3790930A)

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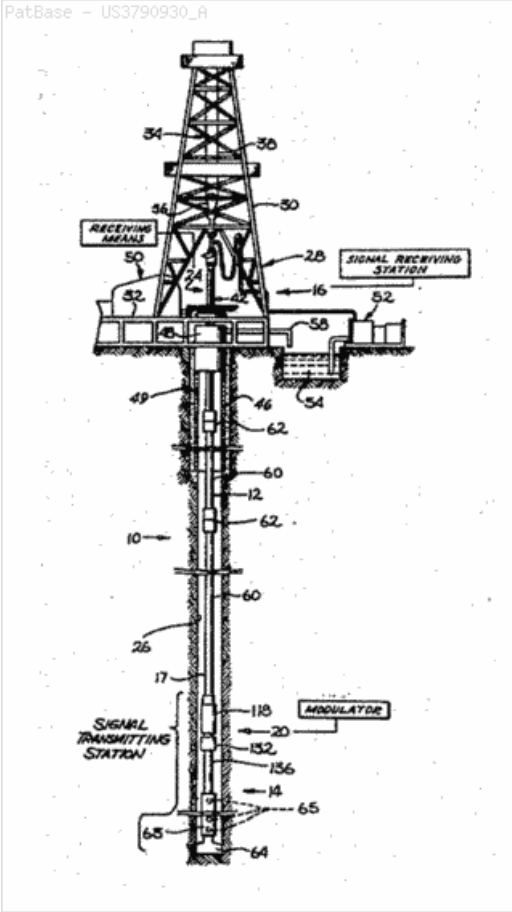
**Title:** TELEMETERING SYSTEM FOR OIL WELLS

**Abstract:** An acoustic communication method and system for transmitting information through a well bore drill string or

other pipe by establishing in the pipe modulated torsional acoustic waves, preferably of zero order, which contain the information to be transmitted and travel from a signal transmitting station to a signal receiving station spaced along the pipe, and for demodulating the modulated waves arriving at the receiving station to recover the transmitted information. The modulated waves may be established in the pipe either by driving the pipe in torsional oscillation and modulating the resulting torsional waves in the pipe at the transmitting station or by launching modulated torsional waves through the pipe at the transmitting station. In its principal application, the invention is utilized to monitor selected well drilling parameters, such as temperature, formation pressure, formation porosity, drill string orientation, and/or to operate devices within the well bore. Primary advantages of the invention are reduced acoustic transmission losses from acoustic coupling to the drilling fluid and well bore wall and the ability to transmit information while drilling is in progress. According to the preferred practice of the invention, when monitoring drilling parameters, the torsional acoustic waves are launched downwardly through the drill string from the surface by exciting the upper end of the string in a zero order torsional acoustic oscillation at frequencies within the base band of the drill string acoustic transmission characteristics so as to minimize attenuation of the acoustic waves by the couplings between the drill string pipe sections. These torsional acoustic waves are modulated at a subsurface signal-transmitting station along the drill string and returned back through the string to a surface signal-receiving station where the modulated waves are demodulated to recover the transmitted information.

**Classifications:**

**International (IPC 8-9):** E21B47/16 G01H1/10  
G01V11/00 (Advanced/Invention);  
E21B47/12 G01H1/00 G01V11/00 (Core/Invention)  
**International (IPC 1-7):** G01V1/02 G01V1/14 G01V1/40 G01V3/18  
G08C17/00  
**CPC:** E21B47/16 G01H1/10 G01V11/002  
**European:** E21B47/16 G01H1/10 G01V11/00B  
**US:** 166/113 175/39 175/40 175/50 181/106 340/18LD 340/18NC  
367/81 367/82



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US3790930 A        | 19740205         | US19710113147      | 19710208         |
| US3900827 A        | 19750819         | US19730396411      | 19730912         |
| US3906434 A        | 19750916         | US19730396403      | 19730912         |
| US3906435 A        | 19750916         | US19730396400      | 19730912         |
| US4001773 A        | 19770104         | US19750599836      | 19750728         |

**Priority:**

US19710113147 19710208 US19730396400 19730912 US19730396411 19730912  
US19730396403 19730912 US19750599836 19750728

**Probable Assignee:** AMERICAN PETROSCIENCE CORP

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**Assignee(s):** AMERICAN PETROSCIENCE CORP US

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**Inventor(s):** LAMEL A US ; SQUIRE W US ; WHITEHOUSE H US

**6) Family number: 61132491 (US2017089181A)**

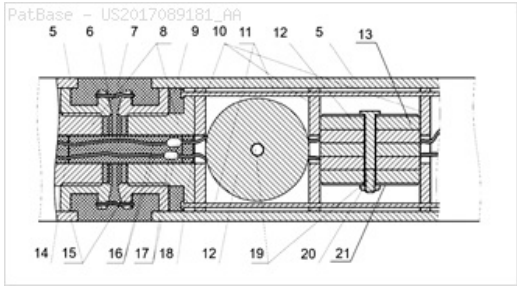
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**Title:** DOWNHOLE ACOUSTIC APPARATUS FOR TREATING THE BOTTOMHOLE REGIONS OF OIL AND GAS RESERVOIRS

**Abstract:** This invention relates to the oil and gas industry and can be used for intensifying the production of well fluids. The present downhole acoustic apparatus comprises an upper head for attachment to a logging cable or coiled tubing, an acoustic emitter and a lower guiding head. The emitter consists of a body with piezoelectric transducers, comprised of piezoceramic discs, arranged perpendicular to the axis of the body. Emitter bodies are formed in the shape of cylinders from a metal with a milled surface and are connected to each other by means of a rubber-plastic filler. This provides an increase in the acoustic power of radiation in a radial direction and makes it possible to treat horizontal and lateral wells.

**Classifications:**

**International (IPC 8-9):** B06B1/06 E21B28/00 E21B43/00  
E21B43/25 (Advanced/Invention)



Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2017089181 AA    | 20170330         | US20160373973      | 20161209         |
| US10253601 BB      | 20190409         | US20160373973      | 20161209         |
| WO15190944 A1      | 20151217         | WO2014RU00426      | 20140610         |

Priority:

WO2014RU00426 20140610      US20160373973 20161209

Probable Assignee: LIABILITY CO ILMASONIK SCIENCE LTD

Assignee(s): (std): LLC ILMASONIK SCIENCE ; OBSHHESTVO S OGRANICHENNOJ OTVETSTVENNOST YU ILMASONIK NAUKA ; OBSHHESTVO S OGRANICHENNOJ OTVETSTVENNOSTYU ILMASONIK NAUKA

Assignee(s): LIABILITY CO ILMASONIK SCIENCE LTD

Inventor(s): (std): DEMENT EV SERGEJ SERGEEVICH ; SALTYSKOV ALEKSANDR ALEKSEEVICH ; SALTYSKOV YURIJ ALEKSEEVICH ; SALTYSKOVA DARINA YUR EVNA

Agent(s): BCF LLP; KOTLOV DMITRY VLADIMIROVICH

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

7) Family number: 73547438 (CN109488268A)

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Title: DOWNHOLE HIGH-POWER ACOUSTIC WAVE EXCITATION ENHANCED MINING-ASSISTING TRANSDUCER

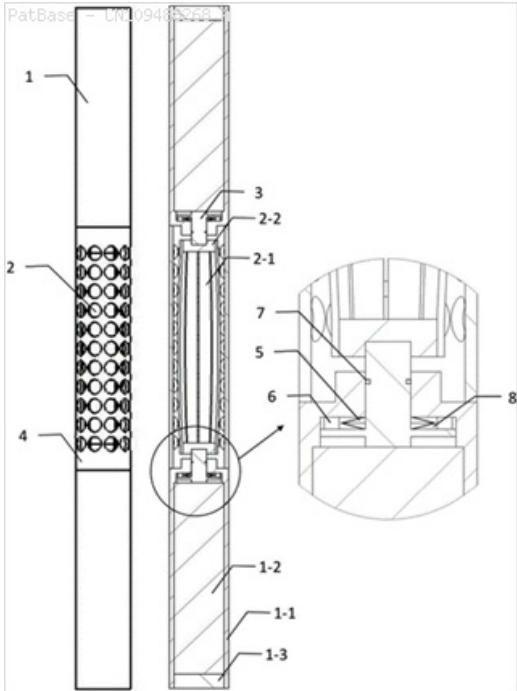
**Abstract:** The invention relates to a downhole high-power acoustic wave excitation enhanced mining-assisting transducer. The problem of low power of existing downhole acoustic wave mining-assisting transducers is solved, the transducer is of a unique downhole sealing structure, an interference enhanced acoustic wave radiation position can be designed according to an interference principle of acoustic waves, and the action effect of the acoustic waves is improved. Magnetostrictive actuators are connected with each other through an intermediate mesh barrel and kept on the same axis. An acoustic radiator is connected to the magnetostrictive actuators at both ends through connection jacking rods and installed in the middle of the mesh barrel. The magnetostrictive actuators at both ends axially output displacement, and the intermediate acoustic radiator is driven by the actuators to carry out bending movement, so that the axial displacement is amplified into radial displacement, and energy is radiated outward. The cylindrical mesh barrel serving as a connector between the magnetostrictive actuators is stable in structure and high in deformation resistance, the mesh barrel structure avoids the radial dimension waste of rod-shaped connecting parts, the radial dimension of the whole transducer is greatly decreased, and thus the size limit on the inner diameter of an actual oil well is satisfied.

Classifications:

International (IPC 8-9): B06B1/08 E21B28/00

E21B43/16 (Advanced/Invention)

CPC: B06B1/08 E21B28/00 E21B43/16



Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN109488268 A      | 20190319         | CN201811336952     | 20181112         |

**Priority:**

CN201811336952 20181112

**Probable Assignee:** UNIV BEIHANG**Assignee(s):** (std): BEIHANG UNIV ; UNIV BEIHANG**Inventor(s):** (std): JIANG CHENGBAO ; ZHANG MEICHAO ; ZHANG TIANLI**8) Family number: 30361991** (US2005034857A)

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**Title:** OPTICAL FIBER CONVEYANCE, TELEMETRY, AND/OR ACTUATION

**Abstract:** Methods and apparatus comprise a conveyance structure to carry a tool into a wellbore. The conveyance structure contains an optical fiber line to enable communication between the tool and well surface equipment. In one implementation, the conveyance structure comprises a slickline. In another implementation, the conveyance structure includes another type of conveyance device that does not convey power and data separate from the fiber optic line.

**Classifications:**

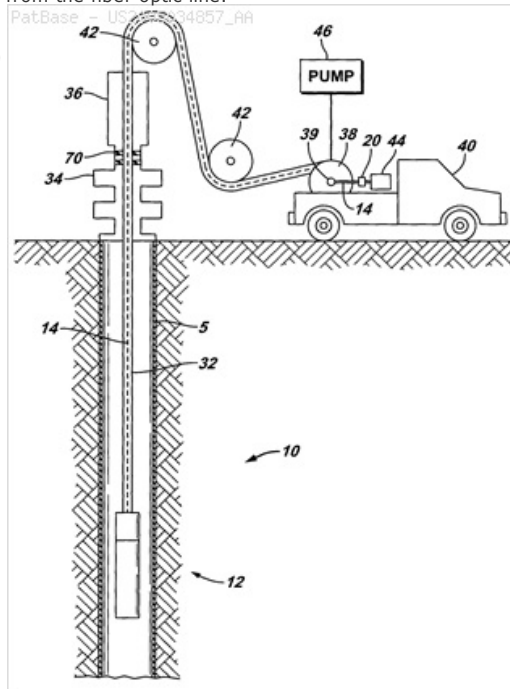
**International (IPC 8-9):** E21B23/14 E21B47/00 E21B47/01 E21B47/09 E21B47/10 E21B47/12 E21B47/135 G01N21/00 G01V8/00 G01V8/16 G02B26/00 G02B6/00 (Advanced/Invention)

**International (IPC 1-7):** E21B23/14 E21B47/00 E21B47/09 E21B47/10 E21B47/12 G01V8/00

**CPC:** E21B47/123 E21B47/09 E21B23/14 E21B47/10 G05B2219/45129

**European:** E21B47/09 E21B47/10 E21B47/12M2

**US:** 166/250.01 166/250.010P 166/254.2 166/254.200P 166/255.1 166/65.1 166/65.100S 166/66 166/66.5 166/66S 340/854.1 356/72 356/72S 385/102

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU2003267555 AA    | 20040319         | AU20030267555      | 20030829         |
| AU2003267555 AH    | 20040319         | AU20030267555      | 20030829         |
| CA2439026 AA       | 20040229         | CA20032439026      | 20030829         |
| CA2439026 C        | 20081125         | CA20032439026      | 20030829         |
| CA2636896 AA       | 20040229         | CA20032636896      | 20030829         |
| CN1723332 A        | 20060118         | CN20038024747      | 20030829         |
| CN1723332 B        | 20101027         | CN20038024747      | 20030829         |
| GB200320203 A0     | 20031001         | GB20030020203      | 20030829         |
| GB200507356 A0     | 20050518         | GB20050007356      | 20030829         |
| GB2392462 A1       | 20040303         | GB20030020203      | 20030829         |
| GB2392462 B2       | 20050615         | GB20030020203      | 20030829         |
| GB2409871 A1       | 20050713         | GB20050007356      | 20030829         |
| GB2409871 B2       | 20051109         | GB20050007356      | 20030829         |
| NO327961 B1        | 20091026         | NO20030003838      | 20030829         |
| RU2003126582 A     | 20050220         | RU20030126582      | 20030829         |
| RU2269144 C2       | 20060127         | RU20030126582      | 20030829         |
| US2005034857 AA    | 20050217         | US20030652845      | 20030829         |
| US2006157239 AA    | 20060720         | US20030525562      | 20030829         |
| US2011139447 AA    | 20110616         | US20110024490      | 20110210         |
| US7140435 BB       | 20061128         | US20030652845      | 20030829         |
| US790699 BB        | 20110308         | US20030525562      | 20030829         |
| US8074713 BB       | 20111213         | US20110024490      | 20110210         |
| WO04020789 A2      | 20040311         | WO2003GB03785      | 20030829         |
| WO04020789 A3      | 20040701         | WO2003GB03785      | 20030829         |

**Priority:**

US20020407084P 20020830

CA20032636896 20030829

US20030652845 20030829

US20020434093P 20021217

GB20030020203 20030829

US20050525562 20051003

CA20032439026 20030829

WO2003GB03785 20030829

US20110024490 20110210

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**Agent(s):** SMART AND BIGGAR; SCHLUMBERGER RESERVOIR COMPLETIONS; SCHLUMBERGER OILFIELD SERVICES; TROP PRUNER AND HU PC; BRYAN P; JAIME A; JIANGUANG

**Designated states:** AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NE NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

9) Family number: 43745422 (RU2353759C)

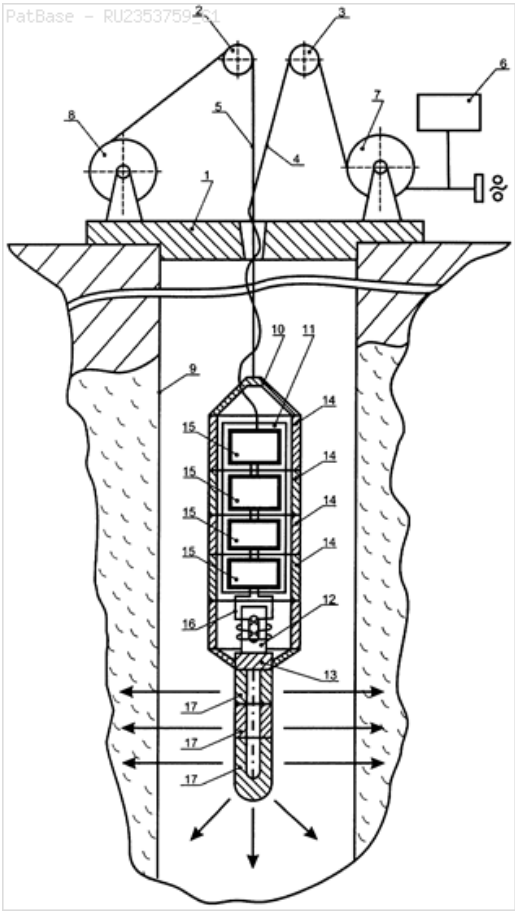
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**Title:** FACILITY FOR ACOUSTIC EFFECT ONTO WALLS OF WELL BORE

**Abstract:** FIELD: oil and gas industry. SUBSTANCE: invention refers to operation of well bores, particularly to means of acoustic effect onto walls of well bore and can be implemented, for example, at oil extraction. The facility for acoustic effect onto walls of well bore includes an ultrasonic generator created by several electrically connected between them functional blocks, a downhole apparatus in form of a hollow case and an ultrasonic converter, mainly magnetostrictive. The ultrasonic converter is mechanically connected with the downhole apparatus and also with the ultrasonic generator by means of a field coil. The functional blocks of the ultrasonic generator are successively arranged one after another and installed in the downhole apparatus, the case of which is made sectional. The ultrasonic generator is installed in one of the sections of the downhole apparatus and is additionally equipped with at least one radiating link, which is output from the case of the downhole apparatus. EFFECT: reduction of power losses. 12 cl, 1 dwg

**Classifications:**

**International (IPC 8-9):** E21B28/00 E21B43/16 (Advanced/Invention); E21B28/00 E21B43/16 (Core/Invention)



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| RU2353759 C1       | 20090427         | RU20080103387      | 20080201         |

**Priority:**

RU20080103387 20080201

**Probable Assignee:** SUCHKOV ALEKSANDR GEORGIEVICH

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**Inventor(s):** (std): SUCHKOV ALEKSANDR GEORGIEVICH

10) Family number: 53985835 (RU95107913A)

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**Title:** DOWNHOLE ACOUSTIC DEVICE FOR TREATMENT OF BOTTOM-HOLE PRODUCING FORMATION ZONE

**Abstract:** FIELD: oil gas producing industry; treatment of bottom-hole producing formation zone of oil and gas wells. SUBSTANCE: the offered device has surface power source, power supply cable, downhole instrument lowered into well to the

level of perforation of bottom-hole producing formation zone. Down-hole instrument located in protective housing with definite wall thickness and filled with heatproof vacuum-treated matching fluid contains power generator and cylindrical magnetostrictive transducer presenting sectionalized acoustic radiator core assembled of circular plates of magnetostrictive material into single pack. With device reaching the zone, surface power source is actuated and D.C. signal arrives at generator, which converts it into electric signal of the preset frequency and amplitude, which is transmitted to transducers. Arrangement of generator and transducers in form of single downhole instrument excludes power losses in transmitting of a.c. from generator to transducers and prevents distortion of electric signal in conductors which connect them. EFFECT: reduced losses of electric and acoustic energy, higher efficiency of operation in cleaning of bottom-hole formation zone and recovery of well production rate due to provision of directed radial radiation of acoustic energy into formation. 3 dwg

#### Classifications:

**International (IPC 8-9):** E21B28/00 E21B43/25 (Advanced/Invention)

#### Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| RU95107913 A       | 19970420         | RU19950107913      | 19950516         |

#### Priority:

RU19950107913 19950516

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**Assignee(s):** BARANOV I.I.

**Inventor(s):** (std): BARANOV I I ; BATRACHENKO A JA ; DARISHCHEV V I ; DEMIRCHJAN K S ; GORSHKOV V I ; KONOVALOV V A ; NURKATOV A A ; SMIRNOV L V ; SMIRNOVA N V ; ZAMAKHAEV V S

**Inventor(s):** ZAMAKHAEV V.S. ; SMIRNOVA N.V. ; SMIRNOV L.V. ; NURKATOV A.A. ; KONOVALOV V.A. ; GORSHKOV V.I. ; DEMIRCHJAN K.S. ; DARISHCHEV V.I. ; BATRACHENKO A.JA. ; BARANOV I.I.

**11) Family number: 23121155** (GB1050421A)

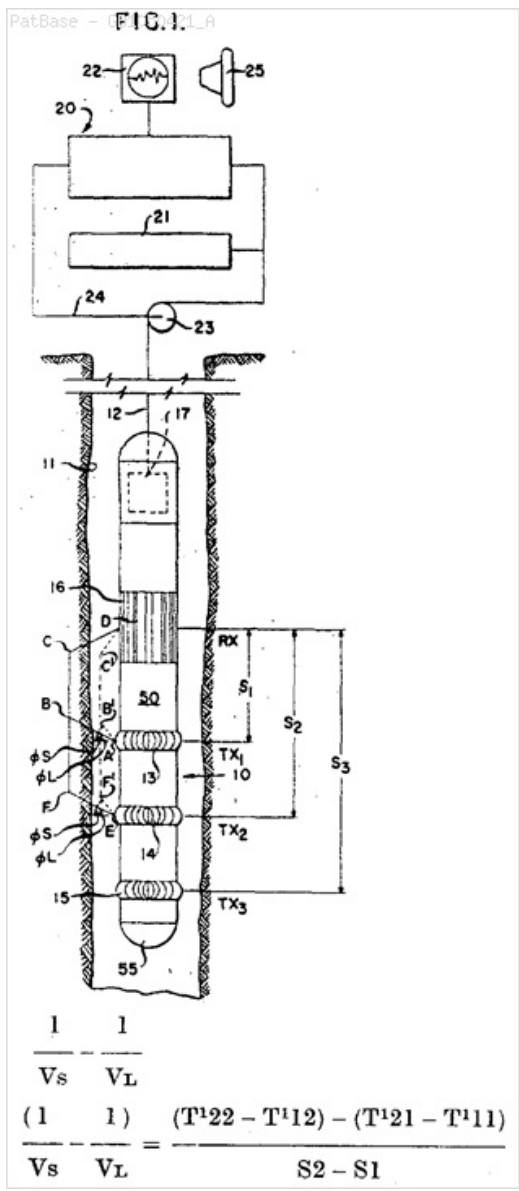
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**Title:** Acoustic well logging.

**Abstract:** 1,050,421. Acoustic well logging. SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ N.V. Feb. 24, 1964 [Feb. 25, 1963], No. 7619/64. Headings H4D. An acoustic well logging tool comprises, Fig. 1, a plurality of transmitting transducers 13, 14 and 15 each of which is formed from a cylindrical shaped section 51, Fig. 3 (not shown), of magnetostrictive material, e.g. barium titanate, with a coil 52 disposed thereon, each transducer generating an acoustical impulse when a current is passed through the coil, a single receiver 16, formed, Fig. 2 (not shown), of a slab of piezo-electric material 42, and a link member 50, on which the transducers and receiver are mounted along a common axis in a spaced relationship, the transducers being mounted all on one side of the receiver. The supply to the transmitter transducers may be by means of conductors 53 lying in a spiral groove on the surface of the link member 50. The link member 50 may comprise a rubber tube surrounding a stress absorbing chain 54 having electrically insulating portions to render it non-conductive. The receiver may comprise a stack of piezo-electric tourmaline discs having a resonant period that is shorter than the time interval between the arrivals at the receiver of the compressional waves and the shear waves produced by the transmitters, and mounted on a conductor 41 and housed in a flexible plastic boot 43 filled with silicon grease or oil and with a block of Neoprene 40 forming the base. The plastic boot 43 c. are housed in turn in a container comprising upper and lower heads 30 and 31 joined by a plurality of circularly spaced tubes 32, the bores of the tubes forming passages for the cables connected to the transmitter transducers c. Plugs 33 are provided for external electrical connections. The above ground equipment may comprise an oscilloscope 22 displaying the output of the receiver and a camera 25 for photographing the resulting trace. A programming device 21 controls the energizing of the transmitters. A selsyn device 23 coupled to the cable lowering the logging tool is connected to the oscilloscope circuitry 20 so that an indication of the tool's depth may be given on the oscilloscope. The use of a plurality of transmitting transducers and a single receiver, as against the normal vice versa arrangement, is said to overcome interference in cable 12 between the outputs of the plurality of receivers. It is also stated that later arriving acoustical waves, e.g. shear waves, may be recorded as against the early arriving compressional waves. A method of determining the quantity where  $V_s$  and  $V_L$  are the shear wave and compressional wave velocities respectively of the bore hole material, is described, based on measurements taken off displaced tracer, Fig. 4A and Fig. 4B (both not shown), resulting from transmissions from transmitters 13 and 14 and by use of the equation where  $T^{122}$  and  $T^{112}$  are the times of reception of the first shear wave pulse and the first compressional wave pulse respectively, shown in Fig. 4A, and  $T^{121}$  and  $T^{111}$  are the corresponding shear and compression times shown in Fig. 4N, and  $S1$  and  $S2$  are the respective spacings between the receiver 16 and each of the transmitters 13 and 14. A method of identifying the first shear wave pulse in the traces by further such measurements is also described by determining the first pulse which follows the preceding pulse by a period different in the two traces Figs. 4A and 4B.

#### Classifications:

**International (IPC 1-7):** G01V1/40



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| GB1050421 A        | 00000000         |                    | 00000000         |

**12) Family number: 67490247 (US2019226302A)**

**Title:** DOWNHOLE ACOUSTIC EMITTER

**Abstract:** A downhole acoustic emitter including a support housing with a cavity and ports, in which housing are disposed a rod-type magnetostrictive transducer with an electrical coil on the rods, and an acoustic waveguide in the form of a cylinder which transitions into a tapering cone. The cylindrical portion of the acoustic waveguide is disposed inside the support housing, and the conical portion is disposed outside the housing. The upper end surface of the acoustic waveguide is coaxially joined to the lower emitting surface of the magnetostrictive transducer by soldering, and the acoustic waveguide is joined at its middle portion, which coincides with the zero vibration point of the waveguide, to the support housing by a threaded joint. The downhole acoustic emitter is provided with an emitting element, the upper end of which is coaxially joined to the lower end of the acoustic waveguide by a threaded joint. The magnetostrictive transducer has a length of 200–280 mm and is made of Permendur, and the ports are arranged around the perimeter of the support housing in two rows, the first of which is level with the top turns of the electrical coil of the magnetostrictive transducer, and the second row is level with the bottom turns of the coil. The emitting element is in the form of a cylinder or a prism with a square cross-section.

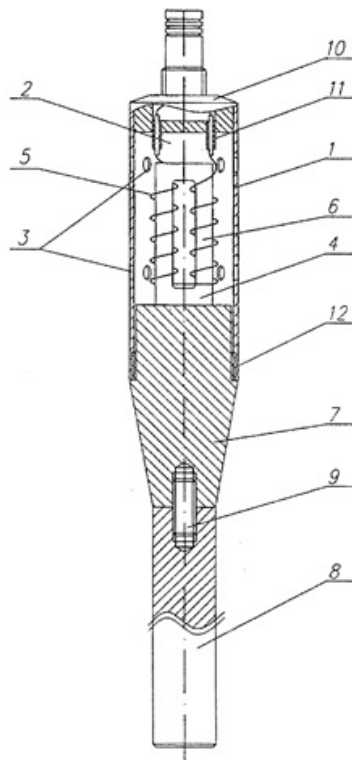
### Classifications:

**International (IPC 8-9):** B06B1/08 E21B28/00 E21B43/00 E21B43/25  
H01L41/20 (Advanced/Invention)

**International (IPC 1-7):** B06B1/08 E21B28/00 E21B43/25

**CPC:** B06B1/08 E21B28/00 E21B43/25 E21B43/003 B06B2201/73

H01L41/20 B06B3/00

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| BR112019001629 A2  | 20190507         | BR20191101629      | 20170511         |
| CA3052972 AA       | 20190129         | CA20173052972      | 20170511         |
| CO20190001122 A2   | 20190219         | CO20190001122      | 20190206         |
| RU2634769 C1       | 20171103         | RU20160134572      | 20160823         |
| US2019226302 AA    | 20190725         | US20170314233      | 20170511         |
| WO18038635 A1      | 20180301         | WO2017RU00301      | 20170511         |

**Priority:**

RU20160134572 20160823 WO2017RU00301 20170511

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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 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 JP KE KG KH KM KN KP KR KW 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