

#### Search history

Search (IC = G01N1/10) AND (PD<20180711) AND (CC = CO) (Results 12)

1:

Search (IC = G01N1/10) AND (PD<20180711) AND (FT = water W4 (sample# OR collect#)) AND (FT = vessel OR bottle OR container OR recipient) AND (FT = valve OR vent\*) (Results 794)

2: AND (FT = valve OR vent\*) (Results 794)

Search (IC = G01N1/10) AND (PD<20180711) AND (FT = (water W4 (sample# OR collect#)) NEAR (device OR apparatus OR system)) AND (FT = vessel OR bottle OR container OR recipient) AND (FT = valve OR vent\*) (Results 181)

3: AND (FT = valve OR vent\*) (Results 181)

Search 3 AND (FT = air NEAR (inlet OR flow\* OR control\* OR allow\*)) (Results 29)

4:

5) Family number: 50551840 (US2013145867A)

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Title: CONTAMINATION FREE WATER SAMPLER AND SYSTEM

**Abstract:** A water sampling system, device and method of sampling are provided. Water sampling system includes triggering mechanism, at least one water sampling device and pumping mechanism. Water sampling device is configured to cooperate with triggering mechanism and includes removable sampling container and pinch mechanism. Removable sampling container is disposed in water sampling device and includes inlet, inlet tube and sampling bag attached to inlet tube. Pinch mechanism is located adjacent to and surrounding inlet tube and proximate to sampling bag. Pinch mechanism, when closed, prevents water from entering inlet tube and sampling bag. Pinch mechanism, when open, allows water from inlet into inlet tube and sampling bag. Pumping mechanism creates a flow of water to cause sampling bag to collect water when pinch mechanism is in an open position.

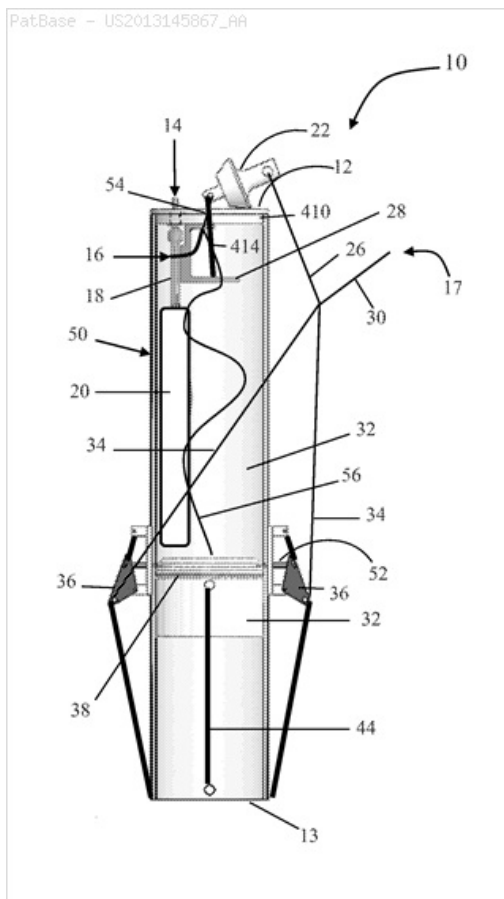
#### Classifications:

**International (IPC 8-9):** G01N1/10 G01N1/12  
G01N1/14 (Advanced/Invention)

**CPC:** G01N1/10 G01N1/14 G01N33/18 G01N2001/2078

**European:** G01N1/14 S01N1/20B7A S01N33/18

**US:** 73/863.01 73/864.63



#### Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2013145867 AA    | 20130613         | US20110808103      | 20110728         |
| WO201206063 A1     | 20120202         | WO2011US45755      | 20110728         |

#### Priority:

US20100369345P 20100730 US20110808103 20110728 WO2011US45755 20110728

**Probable Assignee:** BATTELLE MEMORIAL INST

**Assignee(s):** (std): BATTELLE MEMORIAL INST ; BATTELLE MEMORIAL INSTITUTE ; MICHELIN DEREK ; MICHELIN DEREK M

**Inventor(s):** (std): MICHELIN DEREK ; MICHELIN DEREK M

**Agent(s):** MAAG ELIZEBETH M ET AL

**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 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 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

**6) Family number: 63860820 (US2016313237A)** © PatBase

**Title:** SYSTEMS, APPARATUSES, AND METHODS FOR FLUID ANALYSIS AND MONITORING

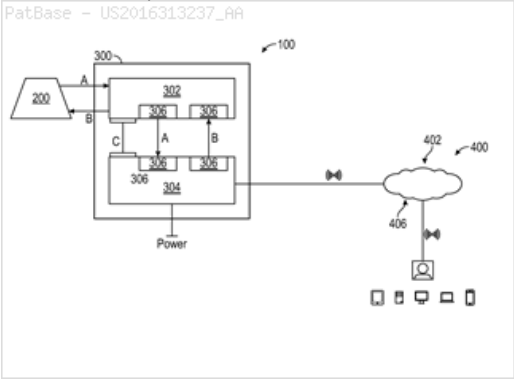
**Abstract:** Embodiments of the present disclosure provide for systems, apparatuses, and methods for real-time fluid analysis. Embodiments include a removable and replaceable sampling system and an analytical system connected to the sampling system. A fluid may be routed through the sampling system and real-time data may be collected from the fluid via the sampling system. The sampling system may process and transmit the real-time data to the analytical system. The analytical system may include a command and control system that may receive and store the real-time data in a database and compare the real-time data to existing data for the fluid in the database to identify conditions in the fluid.

**Classifications:**

**International (IPC 8-9):** F01M11/10 G01J3/44 G01N G01N1/10 G01N1/16 G01N1/18 G01N1/20 G01N1/42 G01N15/00 G01N15/06 G01N15/14 G01N21/31 G01N21/3577 G01N21/64 G01N21/65 G01N21/85 G01N33/28 G01N35/00 G06F17/14 G06N3/04 G06N3/08 (Advanced/Invention); G01N1/02 G01N15/00 G01N21/35 G01N21/64 G01N21/65 G01N21/84 G01N33/18 G01N33/28 (Advanced/Non-invention); G01N (Subclass/Invention)

**CPC:** G01N21/31 G06N3/08 G06N3/04 G01N33/18 G01N33/28 G01N2201/062 G01N2201/12 G01N21/645 G01N21/65 G01N1/02 G01N15/06 G01N15/1459 G01N15/1463 G01N21/85 G01N33/2858 G01N33/2876 G01N33/2888 G01N35/00871 G01N2015/0065 G01N2015/0088 G01N2015/0693 G01N2021/3595 G01N2035/00881 G01N1/10 F01M11/10 G06F17/141 F01M2011/1466 F01M2011/148 F01M2011/1493 F01M2011/1473 F01M2011/1446 F01M2011/144 G01N21/64 G01N15/0656 G01N15/1404 G01J3/4406 G01N21/3577 G01N21/643 G01N21/94 G01N2021/6417 G01N2015/003 G01N2015/0053 G01N2015/0662 G01N2015/0687

**US:** 702/50



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU2016255744 AA    | 20161103         | AU20160255744      | 20160427         |
| AU2016255744 BB    | 20181108         | AU20160255744      | 20160427         |
| BR112017023320 A2  | 20180814         | BR20171123320      | 20160427         |
| CA2983936 AA       | 20171025         | CA20162983936      | 20160427         |
| CN107709998 A      | 20180216         | CN201680036752     | 20160427         |
| EA201792358 A1     | 20180831         | EA20170092358      | 20160427         |
| EP3289365 A1       | 20180307         | EP20160721328      | 20160427         |
| IL255251 A0        | 20171231         | IL20160255251      | 20160427         |
| IN201717040647 A   | 20180112         | IN201717040647     | 20171114         |
| JP2018526614 T2    | 20180913         | JP20170556989T     | 20160427         |
| KR20170139663 A    | 20171219         | KR20177034055      | 20160427         |
| MX2017013761 A1    | 20180323         | MX20170013761      | 20160427         |
| US2016313237 AA    | 20161027         | US20160139771      | 20160427         |
| US2018299355 AA    | 20181018         | US20180000616      | 20180605         |
| US2018299375 AA    | 20181018         | US20180997612      | 20180604         |
| US10151687 BB      | 20181211         | US20160139771      | 20160427         |
| WO16176293 A1      | 20161103         | WO2016US29500      | 20160427         |
| WO18223147 A1      | 20181206         | WO2018US35915      | 20180604         |

**Priority:**

US20150153263P 20150427 US20150205315P 20150814 US20150237694P 20151006  
US20160139771 20160427 WO2016US29500 20160427 US20170514572P 20170602  
US20170569384P 20171006 US20170596708P 20171208 US20170598912P 20171214  
US20180997612 20180604 US20180000616 20180605

**Probable Assignee:** VIRTUAL FLUID MONITORING SERVICES LLC

**Assignee(s):** (std): VIRTUAL FLUID MONITORING SERVICES LLC

**Assignee(s):** YOUNG DUSTIN ; CHMIELEWSKI MARK ; MORTON CHRIS ; RUDDER SCOTT ; SIERS MICHAEL

**Inventor(s):** (std): CHMIELEWSKI MARK ; CHRIS MORTON ; DUSTIN YOUNG ; MARK CHMIELEWSKI ; MORTON CHRIS ; SIERS MICHAEL ; YOUNG DUSTIN ; RUDDER SCOTT

**Agent(s):** SHELSTON IP PTY LTD; SMART AND BIGGAR; BOULT WADE TENNANT; ONO SHINJIRO; YAMAMOTO OSAMU; MIYAMAE TORU; NAKANISHI MOTOHARU; NAKAMURA SHOGO; MUELLER JASON P; ADAMS AND REESE LLP

**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

**7) Family number: 28167198 (US2002019058A)** © PatBase

**Title:** DEVICE TO ALTERNATELY SUPPLY A FLUID TO AN ANALYZER

**Abstract:** Apparatus and methods for supplying a portion of a fluid stream and, alternately, a fluid of known composition and concentration to an analyzer are provided. The fluid stream is directed through a series of connected chambers formed in an integral housing. A sampling needle has an inlet in one of the chambers and an outlet in fluid communication with the analyzer. When desired, a tube or vial containing a known fluid may be inserted into a chamber containing the sampling needle, so that the known fluid will be supplied to the analyzer. A second needle provides **ventilation** to the vial to prevent the formation of a vacuum as the known fluid is drained from the vial.

**Classifications:**

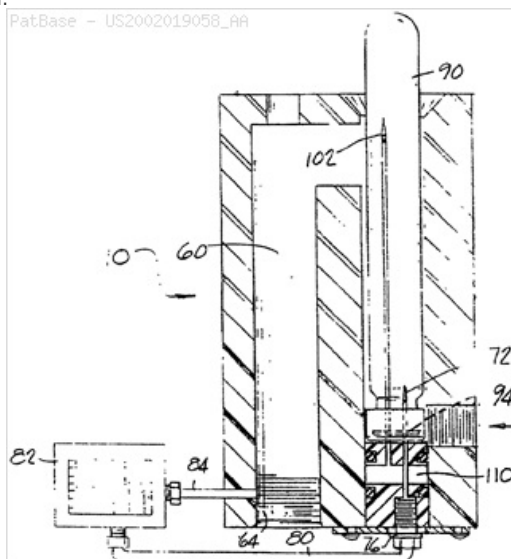
**International (IPC 8-9):** G01N1/00 G01N1/10 G01N31/00 G01N33/18 G01N35/10 (Advanced/Invention)

**International (IPC 1-7):** B01L3/00 B01L3/02 B32B27/04 G01N1/00 G01N1/10 G01N1/12 G01N1/14 G01N1/20 G01N31/00

**CPC:** G01N2001/2893 G01N35/1079 Y10T436/10 Y10T436/11 Y10T436/235 Y10T436/25 Y10T436/2575 Y10T436/117497

**European:** G01N1/00B1A1 G01N35/10P

**US:** 422/100 422/100S 422/103 422/400 422/400S 422/501 422/509 422/58 422/63 422/63P 422/63S 422/68.1 422/79 436/146 436/174 436/180 436/180P 436/43 436/52 436/62 436/8 73/563.81 73/863.81 73/864.31 73/864.34 73/864.51 73/864.52 73/864.74 73/864.86



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE69702516 D1      | 20000817         | DE19976002516      | 19970408         |
| DE69702516 T2      | 20001116         | DE19976002516T     | 19970408         |
| EP0897530 A1       | 19990224         | EP19970926380      | 19970408         |
| EP0897530 A4       | 19990519         | EP19970926380      | 19970408         |
| EP0897530 B1       | 20000712         | EP19970926380      | 19970408         |
| US2002019058 AA    | 20020214         | US20010894313      | 20010627         |
| US2003138970 AA    | 20030724         | US20030352516      | 20030128         |
| US2004005719 AB    | 20040108         | US20030352516      | 20030128         |
| US2008031775 AA    | 20080207         | US20070811913      | 20070612         |
| US5837203 A        | 19981117         | US19960629609      | 19960409         |
| US5976468 A        | 19991102         | US19980191610      | 19981113         |
| US6271043 BA       | 20010807         | US19990368990      | 19990805         |
| US7247498 BB       | 20070724         | US20030352516      | 20030128         |
| WO9738295 A1       | 19971016         | WO1997US06814      | 19970408         |

**Priority:**

US19960629609 19960409 WO1997US06814 19970408 US19980191610 19981113  
US19990368990 19990805 US20010894313 20010627 US20030352516 20030128  
US20070811913 20070612

**Probable Assignee:** SIEVERS INSTRUMENTS INC

**Assignee(s):** (std): GODEC RICHARD D ; SIEVERS INSTR INC ; IONICS INSTR BUSINESS GROUP ; BATEMAN BLAINE R ; GE ANALYTICAL INSTR ; SILVESTER FRANK J

**Assignee(s):** UBS STAMFORD BRANCH COLLATERAL AG AS ; GE ANALYTICAL INSTRUMENTS ; IONICS INSTRUMENT BUSINESS GROUP ; SIEVERS INSTRUMENTS INC ; UBS AG

**Inventor(s):** (std): BATEMAN BLAINE R ; GODEC D ; SILVESTER FRANK J ; SILVESTER FRANK ; GODEC RICHARD D ; BATEMAN BLAINE

**Inventor(s):** GODEC RICHARD

**Agent(s):** ANDOVER-IP-LAW; ANDOVER IP LAW; DAVID

**Designated states:** AT BE CA CH DE DK ES FI FR GB GR IE IT JP LU MC NL PT SE

**8) Family number: 53038883 (US2013045540A)**

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**Title:** METHOD AND APPARATUS FOR CAPTURING AND RETESTING AN ONLINE TOC EXCURSION SAMPLE

**Abstract:** An aspect provides an analyzer for validating a measurement of total organic carbon in a sample of water, including: one or more processors; and a memory storing program instructions including: instructions for measuring an amount of total organic carbon in a first sample of water using and obtaining a first measurement thereof; instructions for identifying a potential excursion event when an amount of total organic carbon in the first sample is above a predefined threshold; instructions for capturing a second sample of water in a **bottle** responsive to detecting the potential excursion event; instructions for introducing the second sample into the analyzer; instructions for measuring an amount of total organic carbon in the second sample using the analyzer and obtaining a second measurement thereof; and instructions for comparing the first measurement and second measurement. Other aspects are described and claimed.

**Classifications:**

**International (IPC 8-9):** B01L3/00 G01N1/10 G01N31/00 G01N33/18 G01N35/00 G01N35/02 (Advanced/Invention)

**CPC:** G01N33/1846 Y10T436/235

**US:** 422/556 422/80 436/146

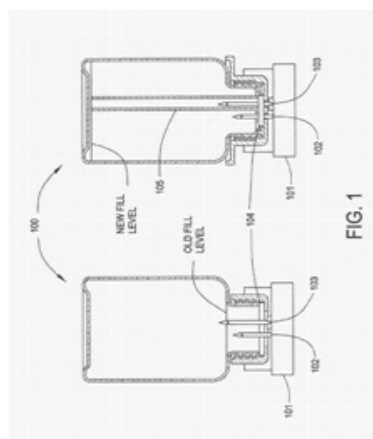


FIG. 1

**Family:**

| Publication number | Publication date | Application number | Application date |
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| BR102012020682 A2  | 20160823         | BR20121020682      | 20120817         |
| CN102955020 A      | 20130306         | CN201210296011     | 20120817         |
| CN102955020 B      | 20160203         | CN201210296011     | 20120817         |
| DE602012045259 D1  | 20180517         | DE201260045259T    | 20120817         |
| EP2559997 A2       | 20130220         | EP20120180914      | 20120817         |
| EP2559997 A3       | 20130313         | EP20120180914      | 20120817         |
| EP2559997 B1       | 20180418         | EP20120180914      | 20120817         |
| JP2013044750 A2    | 20130304         | JP20120181162      | 20120817         |
| JP6027369 B2       | 20161116         | JP20120181162      | 20120817         |
| US2013045540 AA    | 20130221         | US20120588755      | 20120817         |

**Priority:**

US20110525530P 20110819 EP20120180914 20120817 US20120588755 20120817

**Probable Assignee:** HACH CO

**Assignee(s):** (std): COLLIER MATTHEW GRANT ; GARVIN ROBERT LEE ; HACH CO ; HACH CORP ; STANGE TERRY GENE ; HAQ CO

**Assignee(s):** HAQ COMPANY ; HACH CORP LOVELAND

**Inventor(s):** (std): TERRY GENE STANGE ; TERRY GANE STANGE ; STANGE TERRY GENE ; STANGE TERRY GANE ; ROBERT LEE GARVIN ; MATTHEW GRANT COLLIER ; LEE GARVIN ROBERT ; GRANT COLLIER MATTHEW ; GENE STANGE TERRY ; GARVIN ROBERT LEE ; COLLIER MATTHEW GRANT

**Inventor(s):** COLLIER MATTHEW GRANT LOVELAND ; GARVIN ROBERT LEE LOVELAND ; STANGE TERRY GANE LOVELAND

**Agent(s):** LUCAS BRIAN RONALD; SANDRI SANDRO

**Designated states:** AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

**9) Family number: 28691789 (US2005226783A)**

© PatBase

**Title:** **DEVICE** FOR SIMULTANEOUSLY **COLLECTING** FILTERED **WATER** AND FILTER PAPER

**Abstract:** The present invention relates to filtering a collected sample for water analysis, and a **device** where filtered **water** is **collected** so that filtered water can be contained in a sample **container** and where the collecting rate of the sample can be controlled. The collecting device comprises at least one filter funnel part, an upper plate on which the funnel part placed, mounting means comprising a supporting rod wherein one side of the supporting rod is combined with the edge of the upper plate and a waste box fixing the supporting rod, several base **container** parts wherein the sample **container** is inserted and an outlet port is formed, and a vacuum pump connected to the vacuum connecting port by a pump tube. Accordingly, the step of transferring filtered water into the sample **container** can be omitted, and the collection time can be reduced by controlling the collecting rate of the sample.

**Classifications:**

**International (IPC 8-9):** B01D29/00 B01D63/00 C02F1/00 G01N1/00 G01N1/10 G01N1/28 G01N33/18 (Advanced/Invention);

G01N1/00 (Advanced/Non-invention);

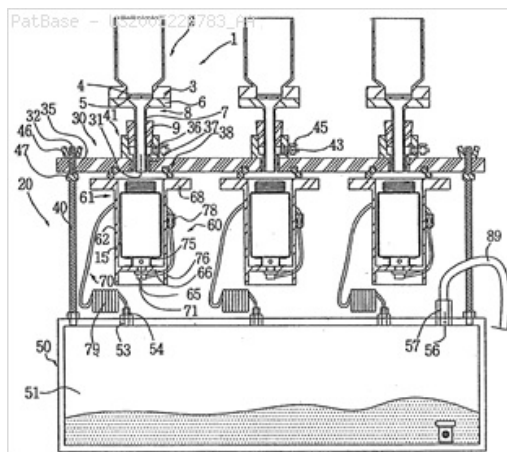
G01N1/00 G01N1/10 G01N1/28 G01N33/18 (Core/Invention)

**International (IPC 1-7):** B01L11/00 G01N1/00 G01N1/10 G01N33/18

**CPC:** G01N1/4077 G01N2001/4088

**European:** G01N1/40V S01N1/40V3

**US:** 210/323.1 210/416.1 210/455 210/650 422/101 422/400 422/400P



#### Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU2002359968 AA    | 20030630         | AU20020359968      | 20021218         |
| CN1320343 C        | 20070606         | CN20028025519      | 20021218         |
| CN1606689 A        | 20050413         | CN20028025519      | 20021218         |
| DE60241057 D1      | 20111110         | DE20026041057      | 20021218         |
| EP1466155 A1       | 20041013         | EP20020793488      | 20021218         |
| EP1466155 A4       | 20080820         | EP20020793488      | 20021218         |
| EP1466155 B1       | 20110914         | EP20020793488      | 20021218         |
| JP2005513435 T2    | 20050512         | JP20030553224T     | 20021218         |
| JP3943547 B2       | 20070711         | JP20030553224T     | 20021218         |
| KR100411946 B1     | 20031218         | KR20010080942      | 20011218         |
| KR20030050508 A    | 20030625         | KR20010080942      | 20011218         |
| US2005226783 AA    | 20051013         | US20020499192      | 20021218         |
| US7820113 BB       | 20101026         | US20020499192      | 20021218         |
| WO03052384 A1      | 20030626         | WO2002KR02388      | 20021218         |

#### Priority:

KR20010080942 20011218 KR2001080942 20011218 EP20020793488 20021218  
WO2002KR02388 20021218

**Probable Assignee:** KOREA OCEAN RESEARCH AND DEVELOPMENT INST

**Assignee(s):** (std): CHUL SOO MING ; KOREA OCEAN RES AND DEV I ; KOREA OCEAN RES DEV INST ; MING CHUL SOO ; MYUNG CHEOL SOO ; YOO SINJAE ; YOO SIN JAE

**Assignee(s):** KOREA OCEAN RESEARCH AND DEVELOPMENT INST ; KOREA OCEAN RESEARCH AND DEVELOPMENT INSTITUTE

**Inventor(s):** (std): MYUNG CHEOL SOO ; SHIN JAI MING CHUL SOO YOO ; YOO SINJAE ; YOO SIN JAE ; SHIN JAI YOO ; CHUL SOO MING

**Inventor(s):** SINJAE YOO ; YOO SHIN JAI ; CHEOL SOO MYUNG ; MING CHUL SOO ; MING CHUL SOO YOO SHIN JAI

**Agent(s):** WPTHOMPSON AND CO; W P THOMPSON AND CO; RATNERPRESTIA

**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 KZ LC LI LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NE NL NO NZ OM PH PL PT RO RU SC SD SE SG SI SK SL SN SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

**10) Family number: 47544353** (US2012134140A)

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**Title:** SAMPLING DEVICE FOR OILFIELD APPLICATIONS

**Abstract:** A sample collecting device including an outer casing and a **valve** assembly disposed at least partially within the outer casing and configured to obtain a sample of a sample material. A method of sampling sediment including entering a sample collecting device into a fluid storage **container**, contacting a surface of a sample material with the sample collecting device, obtaining a sample of the sample material, and removing the sample collecting device from the fluid storage **container**.

#### Classifications:

**International (IPC 8-9):** B63B22/00 F21V33/00 G01N1/00 G01N1/08

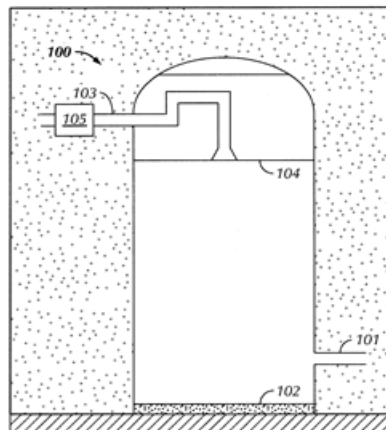
G01N1/10 G01N1/12 (Advanced/Invention);

G01N1/10 (Advanced/Non-invention)

**CPC:** B63B22/00 G01N1/10 G01N1/08 G01N2001/1025

**European:** G01N1/08 S01N1/10A1L

**US:** 1/1 362/101 362/101P 73/864.51 73/864.510S 73/864.63 73/864.630S

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| GB201120539 A0     | 20120111         | GB20110020539      | 20100427         |
| GB2484213 A1       | 20120404         | GB20110020539      | 20100427         |
| GB2484213 B2       | 20140312         | GB20110020539      | 20100427         |
| US2012134140 AA    | 20120531         | US20100266155      | 20100427         |
| US9188511 BB       | 20151117         | US20100266155      | 20100427         |
| WO10129286 A2      | 20101111         | WO2010US32588      | 20100427         |
| WO10129286 A3      | 20110407         | WO2010US32588      | 20100427         |

**Priority:**

US20090173047P 20090427      US20100266155 20100427      WO2010US32588 20100427

**Probable Assignee:** OILFIELD MINERAL SOLUTIONS LTD

**Assignee(s):** (std): KEATCH RICHARD ; MI LLC ; OILFIELD MINERAL SOLUTIONS LTD

**Assignee(s):** OILFIELD MINERAL SOLUTIONS LIMITED ; M I L L C ; M I LLC

**Inventor(s):** (std): KEATCH RICHARD

**Inventor(s):** RICHARD KEATCH

**Agent(s):** OSHA LIANG LLP; BERGMAN JEFFREY S ET AL

**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 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

**11) Family number: 1466000 (US4224281A)**

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**Title:** Dosaging device for liquid media

**Abstract:** A multiple liquid metering device of the type used in liquid analysis assemblies includes a **valve** block having an intermediate liquids storage **vessel** and a moving piston measurement burette. The **valve** block is provided with a plurality of inlet and outlet nozzles each of which is independently controlled by a **valve**. Internal passageways in the **valve** block allow the inlet nozzles to be selectively placed in communication with the burette and the burette to be selectively placed in communication with the intermediate receptacle. Stroke length of the piston and the burette is controlled by a program generator via a piston rod carried perforated disc supplying counting pulses to the program generator in response to activation of the piston motor to move the piston.

**Classifications:**

**International (IPC 8-9):** B01L3/02 G01N1/10

G01N35/10 (Advanced/Invention);

B01L3/02 G01N35/10 (Core/Invention)

**International (IPC 1-7):** B01L3/02 F04B13/00 F04B23/02 F04B49/06

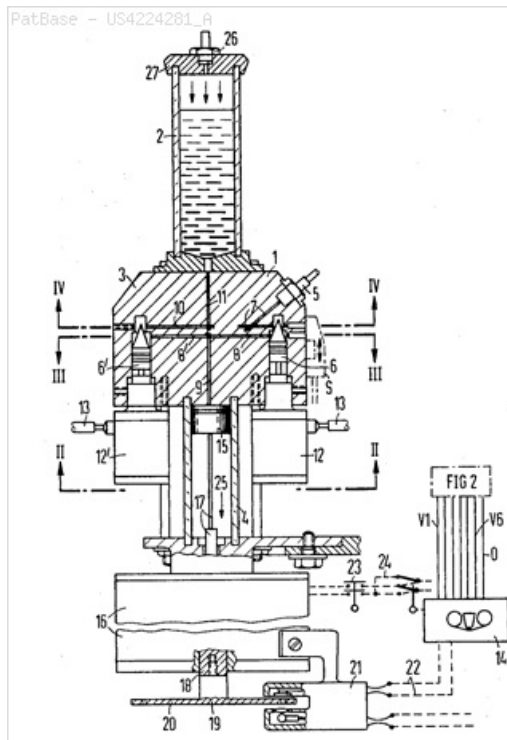
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G01N33/18 G05D11/00

**CPC:** B01L3/0206

**European:** B01L3/02B2

**US:** 222/52 222/71 422/100 422/103 422/509 422/538 422/540 422/921 73/864.18



#### Family:

| Publication number | Publication date | Application number | Application date |
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| SE7900809 L        | 19790802         | SE19790000809      | 19790130         |
| US4224281 A        | 19800923         | US19790004372      | 19790118         |

#### Priority:

DE19782804316 19780201 CA19790320622 19790131

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**Inventor(s):** G HEYNEMANN ; R THIEME

**Agent(s):** FETHERSTONHAUGH AND CO

**12) Family number: 2783340** (US4790197A)

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**Title:** Liquid sampling apparatus

**Abstract:** Liquid sampling apparatus for sampling liquid at a controlled depth within the tanks of an ocean going oil tanker comprises a sampling chamber having outwardly opening inlet and outlet **valves**. The inlet **valve** 114 is arranged to be actuated by a projecting **valve** actuator 132 through a lever mechanism and is adjustable by means of a spring clip 136 so as to permit sampling at varying distances from the bottom of the tank. The outlet **valve** is a pressure-relieving ball **valve** 138 permitting automatic escape of air during filling of the sampling chamber, but preventing entry of liquid. The apparatus is lowered in use through an MMC stand on a wire carried by a support 140 at the top of the apparatus.

#### Classifications:

**International (IPC 8-9):** G01N1/12 (Advanced/Invention);

G01N1/10 (Advanced/Non-invention);

G01N1/12 (Core/Invention);

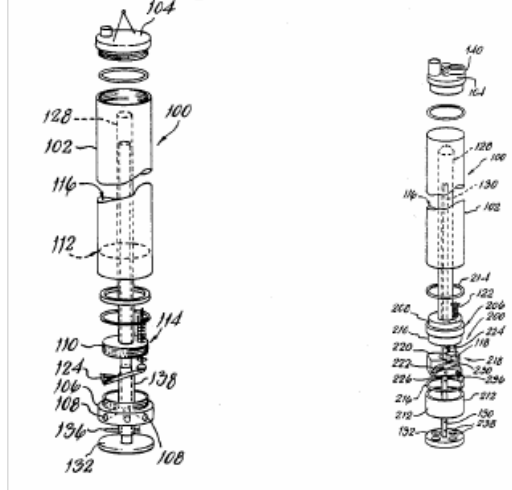
G01N1/10 (Core/Non-invention)

**International (IPC 1-7):** G01N1/12

**CPC:** G01N1/12 G01N2001/1037

**European:** G01N1/12 S01N1/10D1

**US:** 73/864.65

**Family:**

| Publication number | Publication date | Application number | Application date |
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| US4790197 A        | 19881213         | US19870079104      | 19870729         |

**Priority:**

US19870079104 19870729

**Probable Assignee:**

KIMONIDES RIGINOS

**Assignee(s): (std):**

KIMONIDES RIGINOS

**Inventor(s): (std):**

KIMONIDES RIGINOS

**13) Family number: 13084767 (US5091863A)**

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**Title:** Automatic fluid sampling and flow measuring apparatus and method

**Abstract:** An automatic liquid sampling and flow measuring apparatus provided as a unitary structure within a case, and capable of collecting liquid samples at selected intervals, measuring flow rate through a channel at selected intervals, and collecting and storing sampling and flow rate data for later retrieval. The apparatus is provided with its own self-contained microprocessor for automatically controlling sampling operations, calculating flow rate on the basis of signals from a sensor, and storing data relating to sample collection and flow rate measurement. The stored data can be called up on a display of the apparatus, or can be transferred via a portable transfer unit to an external output device, such as a printer capable of producing a hard copy of the data.

**Classifications:**

**International (IPC 8-9):** E03F7/00 G01D5/26 G01F1/00 G01F23/16 G01F23/18 G01F23/24 G01F23/26 G01F23/296 G01F23/44 G01N1/00 G01N1/10 G01N1/14 G01N1/18 G01N1/20 G01N33/18 G02B6/36 G02B6/42 (Advanced/Invention); G01N1/10 G01N1/18 G01N1/20 G01N33/18 (Advanced/Non-invention)

**International (IPC 1-7):** B65B3/00 G01F11/00 G01F11/28 G01N1/00 G02B6/00 G02B6/36 G06F17/00

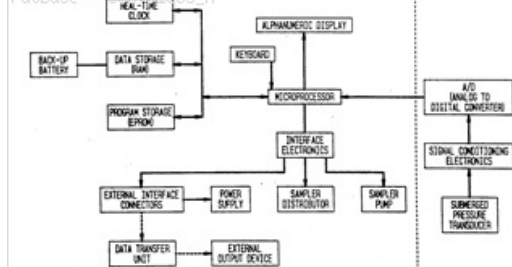
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**European:** E03F7/00 G01D5/26F G01F1/00A G01F1/00A2

G01F23/16D4 G01F23/18 G01F23/24 G01F23/24B G01F23/26B G01F23/296 G01F23/44 G01N1/14 G01N1/18 G01N33/18 G02B6/42C2B G02B6/42C3 G02B6/42C3B S01N1/10D2 S01N1/10T3 S01N1/10X2A S01N1/14N1 S01N1/18A S01N1/20B S01N33/18 S02B6/36H4

**US:** 141/1 250/227.14 364/510 385/12 385/31 422/82.11 700/267 700/283 702/142 702/179 702/45 702/49 702/50 702/76 73/861.23 73/861.25 73/863.01

PatBase - US5091863\_A

**Family:**

| Publication number | Publication date | Application number | Application date |
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| CA2073512 AA       | 19920708         | CA19912073512      | 19911106         |
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| US5172332 A        | 19921215         | US19900612832      | 19901113         |
| US5274721 A        | 19931228         | US19920846602      | 19920305         |
| US5299141 A        | 19940329         | US19920954288      | 19920930         |
| US5506791 A        | 19960409         | US19940219097      | 19940329         |
| US5587926 A        | 19961224         | US19940348050      | 19941201         |
| US5633809 A        | 19970527         | US19960635054      | 19960419         |
| WO9208963 A1       | 19920529         | WO1991US08301      | 19911106         |

**Priority:**

|                        |                        |                        |
|------------------------|------------------------|------------------------|
| US19890455981 19891222 | US19900612832 19901113 | WO1991US08301 19911106 |
| US19920846602 19920305 | US19920954288 19920930 | US19940219097 19940329 |
| US19940348050 19941201 | US19950547718 19951026 | US19960635054 19960419 |

**Probable Assignee:** HACH CO**Assignee(s): (std):** AMERICAN SIGMA INC**Assignee(s):** DH HOLDINGS CORP ; GRIFFITH CARL ; HACH CO ; HUNGERFORD WILLIAM G ; KAISER DONALD ;

MILLER DONALD

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**Inventor(s):** DONALD KAISER ; DONALD MILLER ; CARL GRIFFITH ; WILLIAM G HUNGERFORD

**Agent(s):** MALCOLM JOHNSTON AND ASSOCIATES

**Designated states:** AT AU BE CA CH DE DK ES FR GB GR IT JP KR LU NL SE

**14) Family number: 1909280** (GB2170477A)

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**Title:** Method and apparatus for liquid sampling

**Abstract:** Liquid sampling apparatus for sampling liquid at a controlled depth within the tanks of an ocean going oil tanker comprises a sampling chamber having inlet and outlet **valves**. The inlet **valve** 114 is arranged to be actuated by a projecting **valve** actuator 132 which is adjustable by means of a spring clip 136 so as to permit sampling at any desired height from the bottom of the tank. An outlet **valve** (top left) permits automatic escape of air during use but prevents entry of liquid. The apparatus is lowered in use through an MMC stand on a wire carried by a support 140 at the top of the apparatus.

**Classifications:**

**International (IPC 8-9):** G01N1/12 (Advanced/Invention);

G01N1/10 (Advanced/Non-invention);

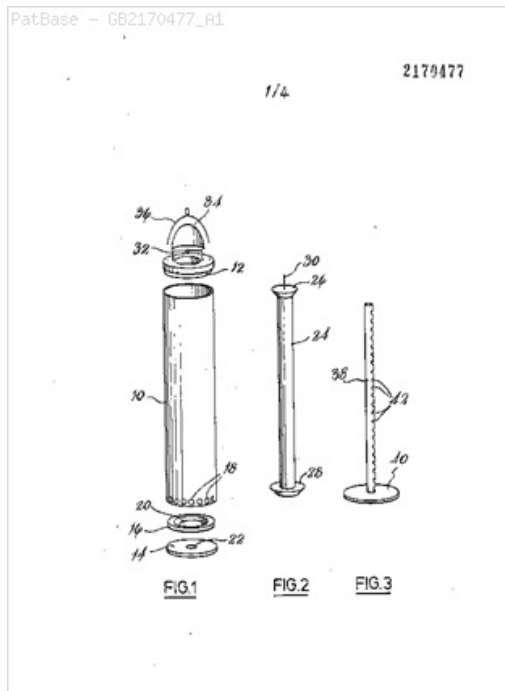
G01N1/12 (Core/Invention);

G01N1/10 (Core/Non-invention)

**International (IPC 1-7):** G01N1/12

**CPC:** G01N1/12 G01N2001/1037

**European:** G01N1/12 S01N1/10D1



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| GB2170477 A1       | 19860806         | GB19860000457      | 19860109         |
| GB2170477 B2       | 19881123         | GB19860000457      | 19860109         |
| GB8500990 A0       | 19850220         | GB19850000990      | 19850115         |
| GB8600457 A0       | 19860212         | GB19860000457      | 19860109         |

**Priority:**

GB19850000990 19850115

**Probable Assignee:**

KIMONIDES R

**Assignee(s):** (std):

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**Assignee(s):**

RIGINOS KIMONIDES

**Inventor(s):** (std):

KIMONIDES RIGINOS

**Inventor(s):**

RIGINOS KIMONIDES

**15) Family number: 46843781** (US2010231904A)

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**Title:** Method and Device for Measuring Hydrocarbons in Aqueous Solutions

**Abstract:** The present invention relates to a method and device for conducting the analysis of hydrocarbons in aqueous solutions, accurately matching the EPA Test Method 1664 HEM, without the need for a solvent extraction step. The solvent extraction step is eliminated by: 1) delivering the aqueous solution directly to a standard cuvette in a controlled and convenient manner, and 2) correlating the analyzer's output reading to a predetermined calibration curve. The predetermined calibration curve is generated by having a duplicate sample of aqueous solution tested by Method 1664 and the present device and the two values correlated. The sample delivery system is comprised of a standard 1-liter sample **bottle**, a flow control section, and an analyzer adapting section. The sample **bottle** contains the aqueous solution to be analyzed. The flow control section has various conduits which allow the user to regulate the rate at which the sample flows through to the analyzer using gravity and contains an optional fill line which can be connected directly to the process that generates the aqueous media being tested. The analyzer adapting section connects the flow control section to a standard round glass cuvette and provides a sealing means. A method for using the device is presented which calls for taking multiple analyzer readings at timed intervals as the aqueous solution flows through the cuvette. The values are then averaged and

compared to the Method 1664 calibration data. Accuracy of this method to the Method 1664 can be maintained with periodic recalibration, typically monthly.

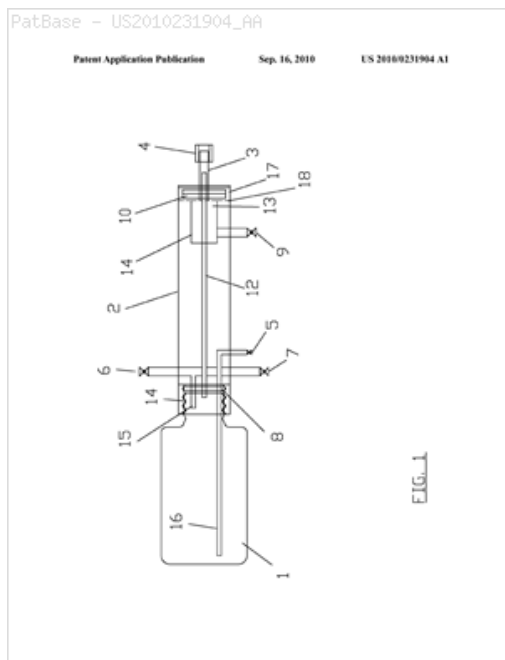
**Classifications:**

**International (IPC 8-9):** G01J3/42 G01N1/10 (Advanced/Invention);  
G01J3/42 G01N1/10 (Core/Invention)

**CPC:** G01N1/14

**European:** G01N1/14

**US:** 356/246 356/246S 356/319 356/319P



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2010231904 AA    | 20100916         | US20090402860      | 20090312         |

**Priority:**

US20090402860 20090312

**Probable Assignee:** KEATHLEY JEFFERSON D

**Assignee(s):** (std): KEATHLEY JEFFERSON D ; TYRIE COLIN C

**Inventor(s):** (std): KEATHLEY JEFFERSON D ; TYRIE COLIN C

**Agent(s):** MARK O LOFTIN

**16) Family number: 30117447 (US2001019106A)**

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**Title:** PROCESS AND DEVICES FOR CHARACTERISING GROUND WATER MEASUREMENT POINTS BY DISTINGUISHING GROUND WATER FROM SUBTERRANEAN WATER ACCUMULATION

**Abstract:** The invention describes a method and apparatuses for characterizing groundwater measuring sites by differentiating between groundwater and static water and serves, for example, for determining the pumping-out times of groundwater measuring sites, optimum for investigations of the representative nature, as well as for identifying and localizing defects at groundwater measuring sites. The invention is based on measuring the radon activity concentration or the total activity concentration of the groundwater samples. The measurement of the concentrations by offline or online methods permits the ratio of groundwater to static water in a groundwater measuring site to be determined reliably. A novel flow-through measurement cell, as well as a borehole probe are described. The invention can be employed wherever investigations of the nature of groundwater are carried out.

**Classifications:**

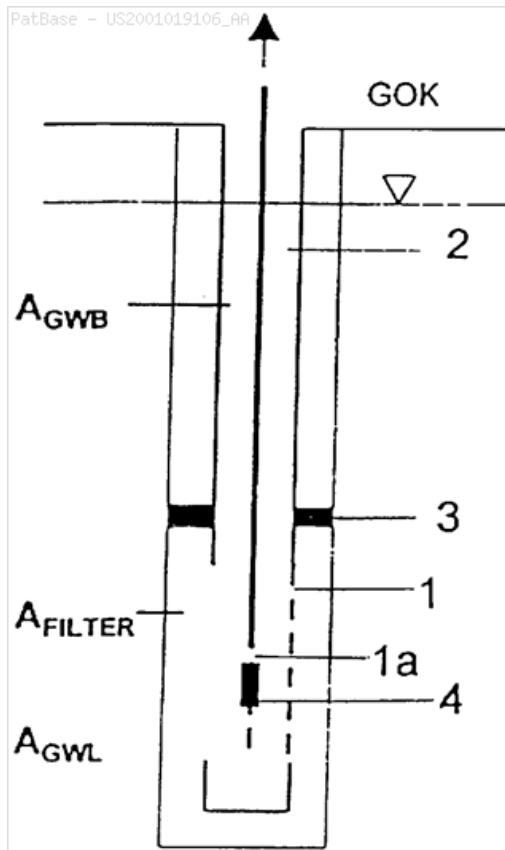
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G01T1/167 G01T1/169 G01V9/00 G01V9/02 (Advanced/Invention);  
G01N1/22 (Advanced/Non-invention);  
B01D53/22 E02D1/00 G01N1/00 G01N33/00  
G01N33/18 (Core/Invention);  
G01N1/22 (Core/Non-invention)

**International (IPC 1-7):** B01D53/00 B01L3/00 E02D1/06 E21B47/01  
E21B47/08 G01N1/10 G01N1/14 G01N27/06 G01N33/00 G01N33/18  
G01N33/24 G01T1/167 G01T1/178 G01V5/00 G01V5/06  
G01V9/00 G01V9/02

**CPC:** E21B47/1015 E21B47/102 G01N1/14 B01D53/22 G01N33/0055  
G01N1/22 G01N33/18 G01N2001/2232

**European:** B01D53/22 E21B47/10G E21B47/10K G01N1/14  
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**US:** 250/255 250/255P 250/256 250/304 250/435 73/152.23

**Family:**

| Publication number | Publication date | Application number | Application date |
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| EP1208374 B1       | 20040721         | EP20010933666      | 20010307         |
| HU9901318 AB       | 19990830         | HU19990001318      | 19970514         |
| HU9901318 AC       | 20021128         | HU19990001318      | 19970514         |
| PL191617 B1        | 20060630         | PL19970329879      | 19970514         |
| PL329879 A1        | 19990412         | PL19970329879      | 19970514         |
| SK147398 A3        | 19990611         | SK19980001473      | 19970514         |
| SK285033 B6        | 20060504         | SK19980001473      | 19970514         |
| US2001019106 AA    | 20010906         | US20010809679      | 20010315         |
| US2002148958 AA    | 20021017         | US20020009451      | 20020429         |
| US6232598 BA       | 20010515         | US19980180706      | 19981113         |
| US6498341 BB       | 20021224         | US20010809679      | 20010315         |
| US6847033 BB       | 20050125         | US20020009451      | 20020429         |
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| WO0166227 A3       | 20020314         | WO2001EP02566      | 20010307         |
| WO9743637 A1       | 19971120         | WO1997EP02450      | 19970514         |

**Priority:**

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| US20020009451 20020429 |                        |                         |

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**Assignee(s):** (std): DEHNERT JOERG ; FREYER KLAUS ; JUST GUENTHER ; JUST GUNTHER ; NESTLER WOLFGANG ; TREUTLER HANNS CHRISTIAN ; UFZ LEIPZIGHALLE GMBH ; UFZ UMWELTFORSCHUNGSZENTRUM LE ; UFZ UMWELTFORSCHUNGSZENTRUM LEIPZIG HALLE GMBH

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**Inventor(s):** (std): DEHNERT JOERG ; FREYER KLAUS ; FREYER KLAUS DR ; JUST GUENTHER ; JUST GUNTHER ; NESTLER WOLFGANG ; NESTLER WOLFGANG PROF DR ; TREUTLER HANNES CHRISTIAN ; TREUTLER HANNES CHRISTIAN DR ; WOLFGANG NESTLER ; KLAUS FREYER ; JOERG DEHNERT ; HANNES CHRISTIAN TREUTLER

**Inventor(s):** FREYER KLAUS DR 04454 HOLZHAUSEN DE ; DEHNERT JOERG 01819 BERGGIESHUEBEL DE ; TREUTLER HANNES CHRISTIAN DR HABIL ; DEHNERT JORG ; GUNTHER JUST ; TREUTLER HANNES CHRISTIAN DR HABIL 04683 NAUNHOF DE ; NESTLER WOLFGANG PROF DR 01277 DRESDEN DE

**Agent(s):** MBM AND CO

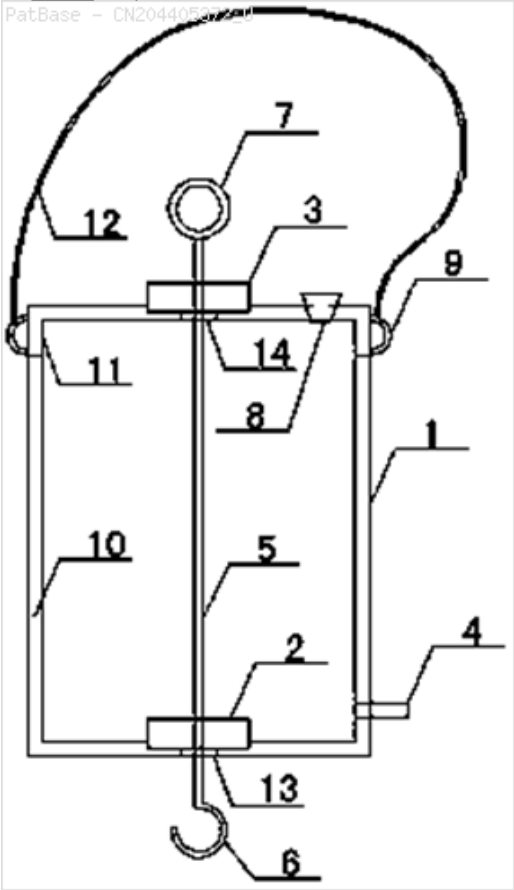
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17) Family number: 59545719 (CN204405372U) © PatBase

**Title:** WATER QUALITY MONITORING SAMPLING DEVICE

**Abstract:** The utility model relates to a water quality monitoring sampling device. The water quality monitoring sampling device comprises a sampling bottle which comprises a bottle cap and a bottle body; the top of the bottle cap is provided with an air outlet and an air vent; an air outlet plug is arranged above the air outlet; the bottle body comprises a bottle bottom and a bottle wall; the bottle bottom is provided with a water inlet hole; a water inlet hole plug is arranged above the water inlet hole; the lower portion of the bottle wall is provided with a water outlet; the air outlet and the water inlet hole are formed coaxially; the air outlet plug and the water inlet hole plug are connected with each other through a connecting rod; two ends of the connecting rod extend out of the sampling bottle; the top end of the connecting rod is provided with a weight hanging device; the sampling pull ring is connected with a pull rope; the sampling bottle is also provided with a lifting device. According to the water quality monitoring sampling device, the structure is simple, the operation is simple and convenient, the sampling process is easy to exhaust, the water quality monitoring sampling device is free of electronic device, the damage is not easy to cause, and accordingly the product cost, the use cost and the maintenance cost are low and the bottle body is easy to clean due to the sampling bottle is formed by the bottle cap and the bottle body.

**Classifications:**  
**International (IPC 8-9):** G01N1/10 (Advanced/Invention)



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN104729881 A      | 20150624         | CN201510076131     | 20150213         |
| CN204405372 U      | 20150617         | CN201520103902U    | 20150213         |

**Priority:**

CN201510076131 20150213 CN201520103902U 20150213

**Probable Assignee:** CN RAILWAY SIYUAN SURVEY AND DES

**Assignee(s):** (std): CN RAILWAY SIYUAN SURVEY AND DES

**Assignee(s):** CHINA RAILWAY FOURTH SURVEY AND DESIGN INST GROUP CO LTD ; CHINA RAILWAY SIYUAN SURVEY AND DESIGN GROUP CO

**Inventor(s):** (std): ZHU XIAOMIN ; ZHANG YUAN ; WU FANG ; WANG ZHONGHE ; LIU JIA ; LEI BIN ; GONG PING ; DU YONGXIN