



New connection on: : 06-12-2017 : 22:45:35 - Last disconnection on: : 06-12-2017 : 22:37:57

V 4.0.0.44164(LP,U,linux) (Rev:43856 2017-04-27 09:03:29 +0200#(D201714)) (RPM D201714)

Welcome to EPOQUE Rebuild under the Production Environment

[EPODOC: SS 12] ..er

[SS 11] ..fi

Select a database: ..FI EPODOC

 Database: EPODOC

[EPODOC: SS 11] /ic B01D17/02

Results in EPODOC **17.701**

[SS 12] DENSITY SAMPLER APPARATUS

Results in EPODOC **0**

EPODOC: term 'DENSITY SAMPLER APPARATUS' not found in index 'BI'. WARNING(1)

[SS 13] DENSITY and SAMPLER and APPARATUS

Results in EPODOC **38**

[SS 14] 11 and 13

Results in EPODOC **1**

[SS 15] ..li



1/1 © EPODOC / EPO

PN - [US2016178499](#) A1 20160623

PNFP - US9494504 B2 20161115

PR - US201514955262 20151201; US201462092995P 20141217

AP - US201514955262 20151201

DT - **

CT - || R141 (A1)

[US2009139345](#) A1 20090604 [] (XIE CHENG-GANG [GB]);

[US2009199653](#) A1 20090813 [] (KITAMI HIROKAZU [JP], et al);

	US2012111571 A1 20120510 [] (ERIKSEN EGIL [NO]); US2014083950 A1 20140327 [] (USHER DAVID [US]); KR101413302B B1 20140627 [] (DSK CO LTD [KR]); CN203976539U U 20141203 [] (CHINA PETROLEUM & CHEMICAL, et al)
	- STSE (B2) US2009139345 A1 20090604 [] (XIE CHENG-GANG [GB]); US2009199653 A1 20090813 [] (KITAMI HIROKAZU [JP], et al); US2012111571 A1 20120510 [] (ERIKSEN EGIL [NO]); US2014083950 A1 20140327 [] (USHER DAVID [US]); CN203976539U U 20141203 [] (CHINA PETROLEUM & CHEMICAL, et al); KR101413302B B1 20140627 [] (DSK CO LTD [KR])
CCI	- B01D17/0208 ; G01F1/74 ; G01F1/8477 ; G01N9/32
CUI	- B01D17/02 ; G01F1/84
CCA	- G01N9/002 ; G01N33/2823
PA	- (A1 B2) MCCRICKARD JAMES P [US]; PETERSON RONALD G [US]; BECK THOMAS L [US]; MACDONALD MICHAEL A [US]; DRY MICHAEL D [US]; UNICO [US]
TI	- (A1) DUALCOMPONENT DENSITY SAMPLER APPARATUS - (B2) Dual component density sampler apparatus
AB	- (A1 B2) A dual component density sampler determines at least one of a density of water and a density of oil in a mixture of oil and water extracted from an oil well during production. A three-way valve is coupled to the oil well, with the three-way valve having a first output port and second output port. A dual-in-single-out manifold is coupled to the first output port. A segregation tank separates the water and oil, and has an entrance tank and exit tank. An entrance of the entrance tank is coupled to the second output port, and an exit of the entrance tank is coupled to an entrance end of the exit tank. An exit end of the exit tank is coupled to the dual-in-single-out manifold. A coriolis meter is coupled to the dual-in-single-out manifold, and is configured to selectively measure a density of the fluid mixture, the oil, and the water.

[SS 15] ..vi

Unknown command or preparation. [More info](#) ERROR(-104000)

[SS 15] ..v

[EPODOC: SS 15] oil and density and meter and device

Results in EPODOC 96

[SS 16] 11 and 15

Results in EPODOC 0

[SS 17] 15

[SS 18] ..li



1/96 © EPODOC / EPO

PN - [CN106869903](#) A 20170620

PR - CN2017167748 20170207

AP - CN2017167748 20170207

DT - I

CNOI - [E21B47/00](#)

PA - SHAANXI AEROSPACE DELIN TECH GROUP CO LTD

TI - Metering **device**

AB - The invention discloses a metering **device** which is used for metering the **oil-water** ration and the daily output of crude **oil** produced by an **oil** well. The metering **device** comprises an in-and-out pipe, a separating tank, a gas flow **meter**, a weight measuring tank, a weighing unit, a liquid level **meter** and a datum treatment unit; an inlet of the separating tank communicates with the in-and-out pipe, the gas flow **meter** is installed a gas outlet of the separating tank, and the weight measuring tank communicates with a liquid outlet of the separating tank; the weighing unit is used for weighing the weight measuring tank, the liquid level **meter** is installed in the weight measuring tank, and the datum treatment unit is simultaneously in signal connection with the gas flow **meter**, the weighing unit and the liquid level **meter**; and after data of the gas flow **meter**, the weighing unit and the liquid level **meter** are received by the datum treatment unit, and the **oil-water** ration and the daily output of the crude **oil** produced by the **oil** well can be obtained through calculation of an existing formula. According to the metering **device** provided by the invention, weighing type metering is adopted, the metering precision is high, the metering **device** is not influenced by other factors, such as the viscosity and the **density**, of the crude **oil**, and accuracy is improved.

2/96 © EPODOC / EPO

PN - [CN106742893](#) A 20170531

PR - CN201611120947 20161130

AP - CN201611120947 20161130

DT - I

CNOI - [B65D90/00](#) ; [B65D90/32](#) ; [B65D90/48](#)

PA - JIZHOU SAFE EXPLOSION-PROOF EQUIPMENT CO LTD

TI - Floating disc type oxygen isolating **device**

AB - The invention discloses a floating disc type oxygen isolating **device** and relates to the field of oxygen isolating devices. A sealed pocket is filled with a high-strength low-**density** floating plate, and the sealed pocket and high-strength waterproof cloth are bonded in a water tank to form a circular floating bed covering the whole water surface; a proper interference amount is reserved at the edge of the floating bed, the sealed pocket and the high-strength waterproof cloth are fixed on a stainless steel floating disc through a supporting plate, and the stainless steel floating disc is composed of a floating disc and a floating cylinder; a positioning **device** is arranged on one side of the floating disc, a deflation valve is arranged in the middle of the floating disc, and an electronic remote transmission liquid level **meter** is installed

on one side of the floating cylinder; and the high-strength waterproof cloth is provided with a pressing plate, the pressing plate is fixedly connected with the cloth through nuts, and an inlet hole is formed in one side of the lower portion of the water tank. Through the high-strength waterproof cloth, the anti-aging life of the floating disc type oxygen isolating **device** reaches five years or above in clear water or **oil**-containing sewage; by arranging the positioning **device** on the floating disc, the floating disc can be prevented from rotating along with water flow; and the liquid level can be accurately tested by installing the electronic remote transmission liquid level **meter**.

3/96 © EPODOC / EPO

- PN - [RU2602558](#) C1 20161120
- PR - RU20150136005 20150825
- AP - RU20150136005 20150825
- DT - I
- CNOI - [E21B21/01](#) ; [E21B21/08](#)
- PA - MALJUGA ANATOLIY GEORGIEVICH [RU]
- TI - **DEVICE** FOR REMOTE CONTROL OF SOLUTION PARAMETERS IN A CHUTE OF A DRILLING UNIT
- AB - FIELD: **oil** industry.SUBSTANCE: invention relates to drilling **oil** and gas wells, namely to ground geological and technological systems of control of drilling mud parameters. **Device** contains solution level **meter** sensor mounted on quick-detachable hatch cover and submersible and suspended container divided into two parts, the front of which is equipped with electro-acoustic converter of flow rate **meter** with a coaxial cable tightly inserted into the auxiliary air cavity of the container and facing with its receiving-emitting surface the chute inner lower surface. Rear part of the container is equipped with a temperature sensor, led from the auxiliary air cavity to the lower surface of container with installed gamma-radiation source, interacting with the **density meter** detection unit, fixed on the outer lower surface of the chute. Electroacoustic transducer is installed on external lower surface of the front part of container made in the form of a truncated cylinder, facing chute inner lower surface with its elliptical surface opposite to the flow of solution. Electroacoustic transducer is placed in the enveloping it on sides U-shaped longitudinal slits on cylinder surface and its emitting surface is aligned with elliptic surface of the latter one.EFFECT: providing measurement of speed of solution movement at its maximum low level of output from the well into chute, increasing accuracy of measuring of flow speed of solution, its volume and mass flow rate, simplified servicing.1 cl, 2 dwg

4/96 © EPODOC / EPO

- PN - [CN205861159U](#) U 20170104
- PR - CN20162723730U 20160711
- AP - CN20162723730U 20160711
- DT - I
- PA - CHINA PETROLEUM & CHEM CORP; OIL PRODUCTION FACTORY OF NORTH CHINA OIL AND GAS BRANCH COMPANY SINOPEC GROUP
- TI - Metering **device** and use this metering **device's oil** storage tank
- AB - The utility model discloses a metering **device** and use this metering **device's oil** storage tank. Metering **device** includes transparent **meter** buret, and **meter** buret's top is equipped with the atmosphere opening, and **meter** buret's bottom is equipped

with the opening intercommunication opening of intercommunication container bottom. The utility model discloses buret and the container of falling into a trap passes through bottom intercommunication and forms the linker of U-shaped, mix the liquid level an of liquid like this in liquid level b and the container in being counted buret after, calculate the container and count the liquid level difference triangle $h=a$ between the buret B to poor triangle h brings into to the formula with this liquid level: $M=S \rho_o \rho_w \Delta h (\rho_w \rho_o)$ (m wherein: upper liquid's quality, S: the floor space of container, ρ_o : upper liquid's **density**, ρ_w : the **density** of lower floor's liquid), calculate upper liquid's quality m, does quality m with upper liquid bring formula $h_2=a$ into again $M \rho_o S$ calculates the high h_2 of mixed liquid interface, consequently the utility model discloses well metering **device** has convenient to use's advantage.

5/96 © EPODOC / EPO

- PN - [CN105890839](#) A 20160824
- PR - CN20161186363 20160329
- AP - CN20161186363 20160329
- DT - I
- CNOI - [G01L11/00](#) ; [G01N27/041](#) ; [G01N9/04](#)
- PA - UNIVCHINA PETROLEUM
- TI - Apparatus and method for measuring cloud point pressure and **density** of supercritical CO₂ microemulsion system
- AB - The invention discloses an apparatus and method for measuring the cloud point pressure and **density** of a supercritical CO₂ microemulsion system. A magneton is arranged in a visual container, an electronic stirrer is arranged under the visual container, and the upper portion of the visual container is connected with a five-way valve. A quartz window is arranged on each of two parallel sides on the lower portion of the visual container, a light source is arranged on the outer side of one quartz window, and an opaque chamber is arranged on the outer side of the other quartz window. A photoresistor connected with a universal **meter** is arranged in the opaque chamber, and a CO₂ gas cylinder is connected with the five-way valve. A second pressure transducer is connected to the five-way valve, one end of an intermediate container is connected to the five-way valve, and the other end of the intermediate container is connected with a three-way valve. A gas tank is connected with the five-way valve, one end of a high-pressure plunger pump is connected to the three-way valve, and the other end of the high-pressure plunger pump is connected with a water storage tank. A liquid volume metering **device** is connected with the three-way valve. The cloud point pressure of a supercritical CO₂ microemulsion system and the **density** of the supercritical CO₂ microemulsion system under the cloud point pressure can be obtained under same condition, the influence of minimal difference in parallel experiment processes can be minimized, and important basic data for designing construction scheme of an **oil** field can be provided.

6/96 © EPODOC / EPO

- PN - [CN105891614](#) A 20160824
- PR - CN20161364927 20160526
- AP - CN20161364927 20160526
- DT - I
- CNOI - [G01R29/24](#)

PA - UNIV SOUTH CHINA TECH

TI - Charge **density** measuring **device** of liquid in storage tank

AB - The invention discloses a charge **density** measuring **device** of liquid in a storage tank. The **device** comprises a grounded shielding cover, an **oil** pump, a liquid storage container and a nano-ampere **meter**, wherein the **oil** pump and the liquid storage container are arranged in the shielding cover in an insulating manner, the **oil** pump, adopted as a power **device**, pumps out liquid at a specific location in the storage tank through a conductive pipeline and outputs the liquid into the liquid storage container, the liquid storage container is communicated with the storage tank through a conductive **oil** return pipeline, and the nano-ampere **meter** is connected between the liquid storage container and the grounding end of the shielding cover through a wire and is used for measuring electrostatic current between the liquid storage container and the shielding cover. According to the **device** of the invention, the liquid at the specific location in the storage tank can be pumped into the liquid storage container, and the charge **density** value of the liquid at the specific location in the storage tank can be calculated based on the reading of the nano-ampere **meter** connected between the liquid storage container and the shielding cover, and the charge **density** value of the liquid at different locations in the storage tank at different time can be measured. The charge **density** measuring **device** of the liquid in the storage tank has the advantages of simple structure, convenient operation and cost low, and is mainly used for measuring the charge **density** of the liquid in the storage tank.

7/96 © EPODOC / EPO

PN - [CN105869503](#) A 20160817

PR - CN20161214341 20160407

AP - CN20161214341 20160407

DT - I

CNOI - [G09B25/02](#)

PA - PETROCHINA CO LTD

TI - Experiment system and method for measuring influence of rock wettability on foam **oil**

AB - The invention provides an experiment system for measuring an influence of rock wettability on foam **oil**. The experiment system comprises a rock wettability simulation apparatus, and the first end of the rock wettability simulation apparatus is connected with a vacuum pump, an **oil** distribution **device** and a cleaning **device** through a first four-way valve and a corresponding pipeline; the second end of the rock wettability is successively connected with a viscometer, a densitometer, a flow speed control apparatus and a crude **oil meter** through the pipeline; and the crude **oil meter** is connected with a gas **meter** through the pipeline. The invention further provides an experiment method employing the experiment system. Rocks with different wettability are simulated by use of visual sand filling pipes, exhaustion exploitation experiments are respectively carried out, the formation process of bubbles in the sand filling pipes with different wettability can be observed through a video camera, and features of the foam **oil** under different wettability conditions can be obtained through measurement of the viscosity, **density** and gas-**oil** ratio of the foam **oil**. According to the invention, the influence of the rock wettability on the foam **oil** can be reflected.

8/96 © EPODOC / EPO

PN - [RU2593674](#) C1 20160810
 PR - RU20150115202 20150422
 AP - RU20150115202 20150422
 DT - I
 PA - SAFAROV RAUF RAKHIMOVICH [RU]
 TI - **DEVICE** FOR MEASURING FLOW RATE OF **OIL** WELLS (VERSIONS)
 AB - FIELD: **oil** industry. SUBSTANCE: invention relates to **oil** industry and can be used for measurement of flow rate of wells. First version: the input liquid line before the separator is equipped with hydraulic cyclone connected via liquid pipe with the lower part of separator and via gas pipe with the upper part of separator. Inside the separator in its upper part there is inner hydraulic cyclone with inlet branch pipe and gate. In the lower internal part of the separator there are two annular vessels forming a siphon, between which there is a splitter coupled with internal hydraulic cyclone by gas pipe. Output liquid line separator is connected to a mist Eliminator, inside of which in its middle part the cyclone, in upper part **density meter**, pressure and temperature sensors connected to the computing element. Lower part of demister through the gate valve is connected to the common measuring line, and its top is directly connected to the common measuring line, where there is compensation vessel mounted before shutoff valve interconnected with the gathering collector. According to the second option inside upper part of demister there is a **density meter**, pressure and temperature sensors connected to the computing element, in the middle part there are hydraulic cyclone, circular vessels with splitter, forming a siphon, while the lower part of demister is connected with the gathering collector through the pipe and gate valve. Upper part of demister is connected directly to the common measuring line, where there is compensation vessel mounted before shutoff valve interconnected with the gathering collector. EFFECT: technical result is aimed at improvement of accuracy of measuring flow rate in **oil** wells. 2 cl, 2 dwg

9/96 © EPODOC / EPO

PN - [CN105782690](#) A 20160720
 PR - CN20141817025 20141225
 AP - CN20141817025 20141225
 DT - I
 PA - TIANJIN CHENGYUAN PRINTING MACHINERY CO LTD
 TI - Novel **oil** cup for die cutting machine based on digital display **device**
 AB - The invention provides a novel **oil** cup for a die cutting machine based on a digital display **device**. The **oil** cup comprises a handle, a pressure spring, an end cover, a glass cup, the digital display **device**, a liquid level **meter**, **oil**, a filter screen, a blockage rod, an **oil** hole, a joint and an inner pipe; the handle is arranged at the upper part of the pressure spring; the end cover is arranged at the upper part of the glass cup; the digital **device** is arranged on the left side of the glass cup; the liquid level **meter** is arranged in the **oil**; the filter screen is arranged at the lower part of the **oil**; the blockage rod is arranged in the inner pipe; the **oil** hole is formed in the lower part of the inner pipe; and the joint is arranged at the lower part of the glass cup. Through arrangement of the digital display **device**, a **density** sensor and an inner net, the **oil** quantity control is precise, the filtering effect is better, the loss is reduced, the manpower is saved, the cost is reduced, and the popularization and the application are convenient.

10/96 © EPODOC / EPO

PN - [CN105738969](#) A 20160706

PR - CN20161110156 20160229

AP - CN20161110156 20160229

DT - I

CT - || STSE (A)
[CN101839899](#) A 20100922 [A] (PETROCHINA CO LTD)
 [A] 1-10
 * 全文 *;
[CN103670388](#) A 20140326 [A] (PETROCHINA CO LTD)
 [A] 1-10
 * 全文 *;
[CN103926388](#) A 20140716 [A] (UNIV CHINA PETROLEUM)
 [A] 1-10
 * 全文 *;
[CN103926389](#) A 20140716 [Y] (UNIV CHINA PETROLEUM)
 [Y] 1-10
 * 权利要求1-6、说明书第[0010]-[0096] *;
[CN104656162](#) A 20150527 [A] (UNIV XI AN SHIYOU)
 [A] 1-10
 * 全文 *;
[CN104950080](#) A 20150930 [A] (PETROCHINA CO LTD)
 [A] 1-10
 * 全文 *

CTNP - || STSE (A)
 [Y] - 庞雄奇 等编著,《油气成藏定量模拟》,(20050731)
 [Y] 1-10
 * 第194页最后1段-200页最后1段、附图7-12和7-14 *
 [A] - 马行陟 等,“辽东湾地区下第三系有效烃源岩分布定量研究”,《西南石油大学学报(自然科学版)》
 [A] 1-10
 * 第64-70页 *

PA - UNIV CHINA PETROLEUM BEIJING

TI - Hydrocarbon source rock evaluation method and **device**

AB - The invention provides a hydrocarbon source rock evaluation method and **device**. The hydrocarbon source rock evaluation method comprises steps of calculating the hydrocarbon generation quantity of the hydrocarbon source rock per cubic **meter** according to the organic matter abundance, the organic matter **oil** gas generation rate and the hydrocarbon source rock **density**, calculating the residual hydrocarbon critical saturation quantity of the hydrocarbon source rock per cubic **meter** according to the absorption residual gas quantity, the water soluble residual gas quantity, the **oil** soluble residual gas quantity and the residual liquid hydrocarbon quantity, calculating the hydrocarbon source rock index SRI according to the optimal hydrocarbon source rock hydrocarbon discharge quantity, the hydrocarbon generation quantity of the hydrocarbon source rock per cubic **meter** and the residual hydrocarbon critical saturation quantity, establishing a hydrocarbon source rock quantitative evaluation theory plate according to the hydrocarbon source rock index SRI, quantitatively evaluating the quality of the hydrocarbon source rock, calculating the hydrocarbon discharge property index KSRI of the hydrocarbon source rock according to the hydrocarbon rock source index SRI, and establishing a hydrocarbon source rock property determination theory plate

according to the hydrocarbon source rock property index KSRI, and performing qualitative evaluation on the property of the hydrocarbon source rock. The technical scheme of the hydrocarbon source rock evaluation method and **device** improves the accuracy of evaluating the hydrocarbon source rock.

11/96 © EPODOC / EPO

PN - [RU2585778](#) C1 20160610
 PR - RU20150102245 20150126
 AP - RU20150102245 20150126
 DT - I
 PA - SAFAROV RAUF RAKHIMOVICH [RU]
 TI - **DEVICE** FOR MEASUREMENT OF FLOW RATE OF **OIL** AND GAS
 AB - FIELD: **oil** industry. SUBSTANCE: invention relates to **oil** industry and can be used for measurement of flow rate of wells. **Device** comprises separation vessel, inlet fluid line and output liquid line, on which there are, connected to computing unit, volume displacement **meter** and shutoff fluid valve interconnected with collecting manifold, gas line with gas phase pressure and temperature sensors, also connected to computing unit. Sump is installed on the outlet fluid line as a container equipped with annular vessel in lower part, where there is a separator mounted in upper part of the sump, while the separator and annular vessel together form siphon with possibility for separation of liquids of different densities. Sump is equipped with **density** gage, pressure and temperature sensors of liquid phase, connected to computing unit. Separation vessel contains a gate, after which the gas line has compensating reservoir, and connected to computing unit volumetric gas **meter** and stop gas valve communicated with collecting manifold. Communications of fluid and gas shut-off valves with volumetric liquid and gas meters are mounted in contact with position indicators of liquid and gas shut-off valves connected to computing unit, in order to lock liquid and gas volume meters readings in closed positions of liquid and gas gate valves. EFFECT: technical result of the invention is increased measurement accuracy of **oil** and gas flow rates. 1 cl, 2 dwg

12/96 © EPODOC / EPO

PN - [CN205192906U](#) U 20160427
 PR - CN201521034866U 20151211
 AP - CN201521034866U 20151211
 DT - I
 PA - TIANJIN CHENGKE MECH AND ELECTRICAL TRANS TECH INC LTD
 TI - Online **oil** viscosity detection appearance
 AB - The utility model discloses an online **oil** viscosity detection appearance, including setting gradually peristaltic pump, buffer tube, temperature sensor, the **density** detection **device** on conveying line to and dynamic viscosity **meter**, the buffer tube be at least one, its for vertical set up that the upper end is sealed and the lower extreme with the blind pipe of conveying line intercommunication, the buffer tube compressibility that utilizes the air offset the pulsation of peristaltic pump, temperature sensor, **density** detection **device** and dynamic viscosity score be connected with the treater communication. The utility model discloses an online **oil** viscosity detection appearance measures an organic whole with temperature measurement, measurement of **density** and pressure viscosity, but viscosity measurement under the developments is carried out to the various parameters of direct assay, measures simple structure, electron degree height, the industrial

production of being convenient for.

13/96 © EPODOC / EPO

- PN - [CN105501733](#) A 20160420
- PR - CN2016162324 20160129
- AP - CN2016162324 20160129
- DT - I
- CT - || STSE (A)
[CN2385160Y](#) Y 20000628 [A] (OIL REFINING PLANT OF JILIN CH [CN])
[A] 1-6
* 全文 *;
[CN2398233Y](#) Y 20000927 [A] (CHANGLING OIL REFINING CHEMIC [CN])
[A] 1-6
* 全文 *;
[CN2562835Y](#) Y 20030730 [A] (ZHANG SHOUZHENG [CN])
[A] 1-6
* 全文 *;
[US2012152950](#) A1 20120621 [A] (AL-SUBAIEY NASSIR S [SA])
[A] 1-6
* 全文 *;
[CN102828869](#) A 20121219 [X] (LIUGONG CHANGZHOU EXCAVATOR CO LTD, et al)
[X] 1-5
* 说明书第0001-0004,0012,0016-0019段、附图1-5 *;
[CN203741017U](#) U 20140730 [A] (JIANG YU)
[A] 1-6
* 全文 *;
[CN205381590U](#) U 20160713 [R] (WUHAN INST TECHNOLOGY, et al)
[R] 1-5
* 权利要求1-5 *
- CNOI - [B65D88/54](#) ; [B65D90/48](#)
- PA - WUHAN INST TECHNOLOGY; WUHAN JEHOO HIGH TECH CO LTD
- TI - Automatic dewatering **device** of **oil** storage tank and application method of automatic dewatering **device**
- AB - The invention relates to an automatic dewatering **device** of an **oil** storage tank and an application method of the automatic dewatering **device**. The **device** comprises a differential pressure gauge and a sealed tank body, wherein the tank body is internally provided with a floating ball with the **density** between densities of **oil** and water and a tapered groove is formed in the bottom of the tank body; the bottom of the floating ball can be completely matched with the tapered groove; the bottom of the tapered groove is communicated with a water drainage pipe; the top of the tank body is communicated with an **oil** inlet pipe and an **oil** returning pipe respectively; valves are arranged on the water drainage pipe, the **oil** inlet pipe and the **oil** returning pipe respectively; a flow **meter** is arranged on each of the water drainage pipe and the **oil** inlet pipe; and two measuring ends of the differential pressure gauge are located in the tank body and the water drainage pipe respectively. The **device** has good reliability, accuracy in dewatering and low cost.

14/96 © EPODOC / EPO

- PN - [CN205157527U](#) U 20160413
- PR - CN20152833179U 20151026

AP - CN20152833179U 20151026

DT - I

PA - SINOPEC PETROLEUM ENG TECHNOLOGY SERVICE CO LTD; SINOPEC SHENGLI PETROLEUM ENG CO LTD; GEOLOGICAL LOGGING COMPANY OF SINOPEC SHENGLI PETROLEUM ENG CO LTD

TI - Drilling fluid performance and **oil** gas content dependence experimental apparatus

AB - The utility model provides a drilling fluid performance and **oil** gas content dependence experimental apparatus, it is annotated the steam pipe line and is located reation kettle bottom outer wall, connect the inside gas injection mouth of reation kettle in order to go into gaseously to pump wherein, mixing system is located this reation kettle's top kettle cover, the blade stretches into the gas that will pour into into and evenly dissolves in this reation kettle, the circulation pipeline lies in this reation kettle outer wall, connects gradually at this reation kettle's top, the sampler, mass flow **meter**, circulating pump and this reation kettle's bottom, through this circulation pipeline, it is abundant with the drilling fluid circulation to use this circulating pump, this sampler is arranged in measuring the gaseous solubility of drilling fluid, this mass flow **meter** detects the drilling fluid **density** in this circulation pipeline of flowing through. The **device** can be accurate measure the drilling fluid parameter under the various gas condition of invading, the discovery has important meaning to **oil** gas, has apparent economic benefits and social simultaneously.

15/96 © EPODOC / EPO

PN - [CN105352849](#) A 20160224

PR - CN20151932137 20151211

AP - CN20151932137 20151211

DT - I

CT - || STSE (A)

[CN2347157Y](#) Y 19991103 [A] (CHINA PETROCHEMICAL LANZHOU OI [CN])

[A] 1-6

* 全文 *;

[US2008228424](#) A1 20080918 [YX] (GROSSER RICHARD W [US], et al)

[Y] 2-3

* 说明书第8段、第24-38段，附图2 *

[X] 1、4-6;

[CN102384884](#) A 20120321 [Y] (YUJUAN YANG)

[Y] 2-3

* 说明书第58-63段，附图3 *;

[CN102866082](#) A 20130109 [A] (UNIV CHINA PETROLEUM, et al)

[A] 1-6

* 全文 *;

[CN103900933](#) A 20140702 [A] (SHANGHAI BASF POLYURETHANE COMPANY LTD, et al)

[A] 1-6

* 全文 *;

[CN104165823](#) A 20141126 [A] (UNIV SICHUAN)

[A] 1-6

* 全文 *;

[CN205192906U](#) U 20160427 [R] (TIANJIN CHENGKE MECH AND ELECTRICAL TRANS TECH INC LTD)

[R] 1-6

* 权利要求1-6 *

CTNP - || STSE (A)
 [A] - 刘敏丽,《流体流动与传热》,(20110331),
 [A] 1-6
 * 第115-116页 *
 [A] - 陈惠钊,《粘度测量》,(19940630),
 [A] 1-6
 * 第231-238页 *

CNOI - [G01D21/02](#) ; [G01N11/00](#)

PA - TIANJIN CHENGKE MECHANICAL AND ELECTRICAL TRANSMISSION TECHNOLOGY INC LTD

TI - Online **oil** viscosity detector

AB - The invention discloses an online **oil** viscosity detector. The online **oil** viscosity detector comprises a peristaltic pump, at least one buffer tube, a temperature sensor, a **density** detection **device** and a dynamic viscosity **meter**, wherein the peristaltic pump, the at least one buffer tube, the temperature sensor, the **density** detection **device** and the dynamic viscosity **meter** are arranged on a conveying pipeline in sequence, the at least one buffer tube is a blind tube which is vertically arranged, the upper end of the blind tube is closed, the lower end of the blind tube is communicated with the conveying pipeline, the pulsation of the peristaltic pump is offset by the at least one buffer tube by utilizing the compressibility of air, and the temperature sensor, the **density** detection **device** and the dynamic viscosity **meter** are respectively in communication connection with a processor. According to the online **oil** viscosity detector, temperature measurement, **density** measurement and pressure viscosity measurement are integrated, all parameters can be directly determined for dynamic viscosity measurement, a measurement structure is simple, the electronic degree is high, and industrial production is facilitated.

16/96 © EPODOC / EPO

PN - [CN205014719U](#) U 20160203

PR - CN20152680648U 20150902

AP - CN20152680648U 20150902

DT - I

PA - TCL AIR CONDITIONER ZHONGSHAN

TI - **Oil** -gas separation **device** and refrigeration plant

AB - The utility model discloses an **oil** -gas separation **device** and refrigeration plant, wherein, the **oil** -gas separation **device** is used for separating follow compressor exhaust **oil** -gas mixture, including **oil** storage tank, first detection **meter**, collection **device** and **oil** supplementing **device**, the **oil** storage tank is provided with first **oil** -out, second **oil** -out, **oil** gas entry and gas vent, the entry and the export of compressor communicate with second **oil** -out and **oil** gas entry respectively in proper order, collection **device** and first **oil** -out intercommunication, when collection **device** is used for the **density** of lubricating **oil** in first detection **meter** detects the **oil** storage tank to exceed the default, collect the lubricating **oil** of **oil** storage tank bottom, **oil** supplementing **device** is used for to supplying new lubricating **oil** in the **oil** storage tank. The utility model discloses a lubricating **oil** that ages is collected through set up a collection **device** on the **oil** storage tank to the **oil** -gas separation **device** in the **oil** storage tank, make the operation of compressor more smooth and easy to through the additional new lubricating **oil** of **oil** supplementing **device**, prevented the emergence of the phenomenon of collaborating, improved the work efficiency of compressor greatly.

17/96 © EPODOC / EPO

- PN - [CN105298472](#) A 20160203
- PR - CN20151869374 20151202
- AP - CN20151869374 20151202
- DT - I
- CT - || STSE (A)
[CN202788815U](#) U 20130313 [A] (PETROCHINA CO LTD)
[A] 1-3
* 全文 *;
[CN103032064](#) A 20130410 [A] (UNIV SOUTHWEST PETROLEUM)
[A] 1-3
* 全文 *;
[CN103061753](#) A 20130424 [A] (UNIV SOUTHWEST PETROLEUM)
[A] 1-3
* 全文 *;
[CN103291284](#) A 20130911 [A] (CHINA NAT OFFSHORE OIL CORP, et al)
[A] 1-3
* 全文 *;
[US2015034384](#) A1 20150205 [A] (LEUCHTENBERG CHRISTIAN [SG])
[A] 1-3
* 全文 *;
[CN104428485](#) A 20150318 [A] (PRAD RES & DEV LTD)
[A] 1-3
* 全文 *;
[CN104712320](#) A 20150617 [A] (UNIV CHINA PETROLEUM, et al)
[A] 1-3
* 全文 *
- PA - UNIV CHINA PETROLEUM
- TI - Gas cutting early stage monitoring method
- AB - The invention belongs to the technical field of monitoring methods, and relates to a gas cutting early stage monitoring method. The method is implemented through a gas cutting early stage monitoring **device**. A lower pressure **meter** and an upper pressure **meter** are installed on an underground drill rod according to a set interval, the annulus fluid pressure at the positions where the lower pressure **meter** and the upper pressure **meter** are located is measured and the annulus fluid **density** is further calculated. The installation distance between the lower pressure **meter** and the upper pressure **meter** can be adjusted, and the problem that the annulus fluid pressure between two close distance points cannot be measured due to the low underground fluid **density** is solved. The method does not depend on well logging during drilling equipment, production cost is lowered, applicability is improved, underground gas cutting is monitored through a conventional MWD or EMWD or ATWD in the **oil** and natural gas drilling process, and the purposes of early discovery, timely coping, avoiding of property and personnel losses are achieved. The technological process is simple, the principle is scientific and reasonable, operation is convenient, practicability is good, the using environment is friendly, universality is high, and the method is safe, reliable and easy to apply and popularize.

18/96 © EPODOC / EPO

- PN - [CN204679155U](#) U 20150930
- PR - CN20152424392U 20150618

AP - CN20152424392U 20150618
 DT - I
 PA - SHENYANGMETROLOGYTESTINGINSTITUTION
 TI - Portable tanker aircraft calibrating **device**
 AB - The utility model provides a portable tanker aircraft calibrating **device**, belongs to **meter** technical field, including field generator and flux **density** detector, the field generator all is connected to the controller with the flux **density** detector, be provided with display and button on the controller, the field generator is the annular with the flux **density** detector, and can set up outside the rubber **oil** pipe of tanker aircraft, the outside of flux **density** detector inner core is provided with annular iron -clad, the field generator can produce 800 volts positive potential relatively bigly. The utility model discloses measure convenient, safety, and measuring result is accurate.

19/96 © EPODOC / EPO

PN - [RU2560737](#) C1 20150820
 PR - RU20140121962 20140529
 AP - RU20140121962 20140529
 DT - I
 PA - SAFAROV RAUF RAKHIMOVICH [RU]
 TI - **OIL WELL GAGING DEVICE**
 AB - FIELD: **oil** and gas industry.SUBSTANCE: **oil** well gaging **device** includes separator, inlet and outlet fluid lines made as siphon pipes, gas line with gas phase pressure and temperature sensors mounted at it, digital clock coupled to a computing element, to which volume displacement **meter** and isolation valve are connected, the above **meter** and valve are mounted at the common line upstream its entry to gathering manifold. The separator is made as two vertical cylindrical containers, which are interconnected in below part. At junction between vertical cylindrical containers there is mounted fluid siphon and top parts of vertical cylindrical containers are connected by gas siphon. At the separator output there is a **density** gage coupled to the computing element with digital clock and containing microcontroller.EFFECT: fulfilment of complete compositional analysis of fluid, water and **oil** due to constructive configuration of the separator, assembly of **density** gage, gas and fluid siphons.7 dwg

20/96 © EPODOC / EPO

PN - [CN104763409](#) A 20150708
 PNFP - CN104763409B B 20170801
 PR - CN2015194621 20150303
 AP - CN2015194621 20150303
 DT - I
 CT - || STSE (A)
[CN87107613](#) A 19880427 [A]
 [A] 1-10
 * 全文 *;
[US4800752](#) A 19890131 [A] (PIERS GEORGE E [US])
 [A] 1-10
 * 全文 *;
[CN2361831Y](#) Y 20000202 [A] (OIL PROD TECH INST DAQING PET [CN])

[A] 1-10
 * 全文 *;
[CN2585191Y](#) Y 20031105 [A] (DAQING OIL FIELD CO LTD [CN])
 [A] 1-10
 * 全文 *;
[CN2685832Y](#) Y 20050316 [Y] (DAQING OIL FIELD CO LTD [CN])
 [Y] 1-6
 * 说明书第1-3页 *;
[CN101205806](#) A 20080625 [A] (CHINA NAT PETROLEUM CORP [CN])
 [A] 1-10
 * 全文 *;
[CN201241689Y](#) Y 20090520 [A] (XI AN SITAN INSTR CO LTD [CN])
 [A] 1-10
 * 全文 *;
[CN201265407Y](#) Y 20090701 [Y] (SHUANGHU YANG [CN])
 [Y] 1-6
 * 说明书第1-2页，图1 *;
[CN101649733](#) A 20100217 [A] (OIL PRODUCTION ENGINEERING TEC)
 [A] 1-10
 * 全文 *;
[CN201730608U](#) U 20110202 [A] (JIPING FU)
 [A] 1-10
 * 全文 *;
[WO2011020017](#) A2 20110217 [A] (BAKER HUGHES INC [US], et al)
 [A] 1-10
 * 全文 *;
[US2011214498](#) A1 20110908 [A] (REZGUI FADHEL [FR], et al)
 [A] 1-10
 * 全文 *;
[CN102562026](#) A 20120711 [A] (PETROCHINA CO LTD, et al)
 [A] 1-10
 * 全文 *;
[CN202970693U](#) U 20130605 [A] (SUN TAISHENG, et al)
 [A] 1-10
 * 全文 *;
[CN103233723](#) A 20130807 [A] (WANG TONG)
 [A] 1-10
 * 全文 *;
[CN203321494U](#) U 20131204 [A] (WANG TONG)
 [A] 1-10
 * 全文 *

CNOI	- (A) E21B47/00
PA	- (A) XI AN WELL SUN ELECTRONIC INSTR CO LTD
TI	- (A) Device and method for measuring underground flow rate of petroleum well
AB	- (A) The invention discloses a device and a method for measuring underground flow rate of a petroleum well. The device comprises a ground logging truck, and an instrument string which is connected through a cable and arranged in a sleeved oil pipe of an underground sleeve, wherein the instrument string comprises a halter, a first

centering **device**, a magnetic positioning shot, a second centering **device**, a pressure difference **density meter**, a flow logger, a third centering **device** and a plug; a circuit system control motor or a hydraulic driving arm is mounted on the flow logger; static pressure sampling openings are respectively formed in the control motor or the hydraulic driving arm and the pressure difference **density meter**; the control motor or the hydraulic driving arm is opened or closed to measure underground flow rate of the petroleum well. According to the **device**, minimum annular section area between the arm and the sleeve is adjusted through the flow logger, so that the flow logger can be adapted to **oil** wells with various size and aperture; the construction processes are decreased; the working cost is saved; the working hours are reduced; the flow logger is applied to measuring of flow rate of a vertical shaft and a large-inclination-degree well, and the measuring precision is high.

21/96 © EPODOC / EPO

- PN - [CN204374025U](#) U 20150603
- PR - CN2015255912U 20150127
- AP - CN2015255912U 20150127
- DT - I
- PA - ZHENGZHOU YONGBANG MEASUREMENT AND CONTROL TECHNOLOGY CO LTD
- TI - Online liquid **density** measuring **device**
- AB - The utility model discloses an online liquid **density** measuring **device**. The **device** comprises a magnetostriction liquid level **meter** and a **density** floater, wherein a permanent magnet is arranged inside the **density** floater, a protecting tube of the magnetostriction liquid level **meter** is sleeved with the **density** floater which is located between a height floater and an interface floater of the magnetostriction liquid level **meter**, and the **density** floater slides up and down along the protecting tube. Due to the fact that the **density** floater is added to an original magnetostriction liquid level **meter**, online liquid **density** measurement is achieved, and great convenience is brought to **oil** product retailers for liquid **density** measurement.

22/96 © EPODOC / EPO

- PN - [RU2541991](#) C1 20150220
- PR - RU20140106100 20140218
- AP - RU20140106100 20140218
- DT - I
- PA - SAFAROV RAUF RAKHIMOVICH [RU]
- TI - METHOD OF MEASURING WELL FLOW RATE OF **OIL** WELL PRODUCTS AND **DEVICE** TO THIS END
- AB - FIELD: **oil** and gas industry. SUBSTANCE: out of **oil** well products in the form of **oil**-water mixture clean water is extracted by the system of siphons due to creation of hydraulic gate for **oil** and emulsion flow. **Oil** and emulsion passing through the hydraulic gate are accumulated by switching and creating hydraulic gate for clean water flow for the purpose of further identification by **density** gage and measurement by volumetric displacement **meter**. When liquid is accumulated up to certain level hydraulic gate is created for gas flow. Under action of increasing gas pressure liquid is squeezed from settlers when combined flow-rate controller is open. When liquids level drops in settlers the hydraulic gate is removed and gas flow is started through combined flow gage, combined flow-rate controller. Pressure and temperature is measured during discharge to common header. Volume-flow rate is measured for components of **oil**, emulsion, water and gas. Pressure of the medium

is maintained within the specified interval of its values. Parameters are calculated for measurement process and flow rate of **oil** wells, at that ratios of liquid or gas flow rates to ascending speed of **oil** and emulsion bubbles in water or gas bubbles in liquid are ensured by selecting cross-section of hydraulic gate tubing. Arrangement where gas line comprises gas flow **meter** and gas flow regulator. Gas separator in the lower part is coupled to the common head by combined flow gage, combined flow-rate controller and **density** gage through a buffer tank, which is connected to a separating tank by gas pipeline and liquid pipeline. Separating tank and buffer tank interconnected by gas pipeline form direct and opposite siphon while separating tank and buffer tank interconnected by liquid pipeline form opposite siphon. The buffer tank is coupled to the common head by measuring line. The separating tank is coupled to the main gas line by gas pipeline and to gas separator through a vertical settler and pipeline forming two direct siphons and two opposite siphons. Bafflers are installed in gas separator between the zone of vertical settler and vertical pipeline. The microprocessor is coupled to gas flow **meter**, gas flow regulator, combined flow gage, combined flow-rate controller and **density** gage. EFFECT: improved quality and efficiency of flow rate measurement for **oil** well products. 2 cl, 1 dwg

23/96 © EPODOC / EPO

PN - [CN104634697](#) A 20150520

PR - CN20131571934 20131113

AP - CN20131571934 20131113

DT - I

CT - || STSE (A)

[CN101477020](#) A 20090708 [X] (BEIJING BOOTES ELECTRIC POWER [CN])

[X] 1-2

* 说明书第2页第3段-第3页第4段, 第4页第1段-第6页第5段、附图1 *;

[CN201407024Y](#) Y 20100217 [A] (JIANHU COUNTY HONGDA VALVE & PIPE FITTING CO LTD)

[A] 1-2

* 全文 *;

[CN201512428U](#) U 20100623 [A] (SHANDONG QILU PETROCHEMICAL ENG CO LTD)

[A] 1-2

* 全文 *;

[CN102435256](#) A 20120502 [A] (SHENHUA GROUP CORP LTD, et al)

[A] 1-2

* 全文 *;

[CN202942685U](#) U 20130522 [X] (GANSU LANPEC TECHNOLOGIES CO)

[X] 1-2

* 说明书第3-6段, 第10-15段、附图1 *;

[CN203948082U](#) U 20141119 [L] (PETROCHINA CO LTD)

[L] 1-2

* 全文 *

PA - PETROCHINA CO LTD

TI - Externally-connected **oil**-gas-water three-phase separator **device** and liquid **density** measuring method

AB - The invention discloses an externally-connected **oil**-gas-water three-phase separator **device** and a liquid **density** measuring method, and belongs to the chemical technical field. The liquid **density** measuring method is used for measuring the **density** of liquid in a container in real time, and comprises the following steps:

designing a double-flange liquid level **meter** in the container, measuring pressure difference of the double-flange liquid level **meter** under the liquid-level full range of the liquid and pressure difference of the double-flange liquid level **meter** under the liquid-level zero-range of the liquid by measuring practical working pressure and temperature, and obtaining the **density** of the measured liquid according to the following formula: $P_{\text{full difference}} - P_{\text{zero difference}} = \rho_{\text{liquid}} g \Delta h$, wherein the $P_{\text{full difference}}$ is difference pressure of the full-range flange liquid level **meter** when the liquid level exceeds an upper drawing pressure hole in the double-flange liquid level **meter**, the $P_{\text{zero difference}}$ is the difference pressure of the flange liquid level **meter** when the liquid level is lower than a lower drawing pressure hole in the double-flange liquid level **meter**, the ρ is the measured liquid **density**, the g is the gravitational acceleration, and Δh is the vertical height (m) between the two drawing pressure holes in the double-flange liquid level **meter**.

24/96 © EPODOC / EPO

- PN - [CN104420847](#) A 20150318
- PNFP - CN104420847B B 20170613
- PR - CN20131385329 20130829
- AP - CN20131385329 20130829
- DT - I
- CNOI - (A)
[B28C5/386](#) ; [B28C5/388](#)
- PA - (A)
CHINA PETROLEUM & CHEMICAL; SINOPEC RES INST PETROLEUM
- TI - (A)
Method for preparing foamed cement slurry
- AB - (A)
The invention discloses a method for controlling a mixing ratio of foam and cement slurry in preparation of formed cement slurry. The method comprises the steps of: i), providing a foam and cement slurry mixing **device**, wherein the **device** comprises foamed cement slurry equipment, a first volume flow **meter**, cement slurry mixing equipment and foam equipment of which the pressure is controlled by a pressure gauge; ii), controlling a first flow F1 of the foam cement slurry flowing into an **oil** well by using the first volume flow **meter**, and controlling a second flow F2 of the cement slurry flowing into the foamed cement slurry equipment by using the second volume flow **meter**; and iii), measuring slurry **density** ρ_2 , fixing the first flow F1, and adjusting the **density** of the foamed cement slurry according to a formula that ρ_1 is equal to $\rho_2 * F2/F1$ until the ρ_1 reaches a target value, wherein the pressure in a foam tank is constant.

25/96 © EPODOC / EPO

- PN - [CN104459046](#) A 20150325
- PNFP - CN104459046B B 20160601
- PR - CN20141722820 20141202
- AP - CN20141722820 20141202
- DT - I
- CT - || STSE (A)
[CN103924955](#) A 20140716 [Y] (SHAANXI YANCHANG PETROLEUM GROUP CO LTD RES INST)
[Y]

[CN204255930U](#) U 20150408 [R] (CHANGQING DOWNHOLE TECHNOLOGY OPERATION CO OF CNPC CHUANQING DRILLING ENG CO LTD)
[R]
[CN202467834U](#) U 20121003 [A] (GANSU LANPEC TECHNOLOGIES CO, et al)
[A]
[US2011232368](#) A1 20110929 [A] (AL-DHAFEERI ABDULLAH M [SA], et al)
[A]
[CN102322251](#) A 20120118 [Y] (CHANGQING UNDERGROUND TECHNOLOGY OPERATION CO LTD CHUANQING DRILLING ENGINEERING CO LTD CNPC)
[Y]
[US4848461](#) A 19890718 [A] (LEE WELLINGTON S [US])
[A]

PA - (A)
CHANGQING DOWNHOLE TECHNOLOGY OPERATION CO OF CNPC CHUANQING DRILLING ENG CO LTD

TI - (A)
Online detecting system for fracturing fluid performances

AB - (A)
The invention belongs to the technical field of **oil** and gas field exploration and development and particularly relates to an online detecting system for fracturing fluid performances. The online detecting system comprises a liquid inlet in a collecting end (2) of a suction tube of a sand mixing truck, wherein the liquid inlet is connected to a straight-through part (3) with an inductive probe connector; the other connector of the straight-through part (3) is connected to one end of a low-pressure pipeline (4); the other end of the low-pressure pipeline (4) is connected to a suction end (6) of the sand mixing truck or an exhaust end (7) of a liquid storage tank; the inductive probe connector is connected to a viscosity induction probe (9), an acidity and alkalinity inductive probe (10) and a **density** inductive probe (11), each inductive probe is electrically connected to a signal acquirer (5); the signal acquirer (5) is in wireless connection to a remote receiving **device** (1) on a **meter** truck (8). The online detecting system for fracturing fluid performances can be used for improving the fracturing fluid viscosity measuring precision, also can be used for measuring the fracturing fluid pH value and the **density** value, has the functions of acquiring and transmitting measured data, and is convenient for the construction staff to grasp the fracturing fluid performances.

26/96 © EPODOC / EPO

PN - [CN104198125](#) A 20141210

PNFP - CN104198125B B 20160907

PR - CN20141457546 20140910

AP - CN20141457546 20140910

DT - I

PA - (A)
STATE GRID CORP CHINA; STATE GRID FUJIAN ELECTRIC POWER CO LTD; ELECTRIC POWER RES INST OF STATE GRID FUJIAN ELECTRIC POWER CO LTD

TI - (A)
Sealing monitoring method for simulating sealing conditions of transformer bushing

AB - (A)
The invention relates to a sealing monitoring method for simulating sealing conditions of transformer bushing. The sealing monitoring method includes the following steps: providing a **device** for simulating the sealing conditions of the

transformer bushing; oiling and sealing; installing an SF6 gas **density meter** and a silicone pot; installing an SF6 gas online testing sensor; for connecting a vacuum pump with SF6 gas injection equipment, vacuumizing the **device** with a vacuum pump, injecting SF6 gas into the **device** prior to well sealing; utilizing the SF6 gas **density meter** to monitor changes of SF6 gas **density**, and judging the sealing conditions of the **device** by monitoring the SF6 gas **density**. Poor sealing of the transformer bushing and internal water inflowing conditions of the transformer bushing are simulated by sealing of the position of an **oil** filling port and dripping to the interior of the **device**, temperature of the **device** can be regulated through external measures, changes of internal **oil** temperature can be simulated during operation of the transformer bushing, the changes of SF6 gas state quantity and silica gel can be acquired when sealing of the transformer bushing is not good, and active role is played in study of preventing failure of the bushing from occurring.

27/96 © EPODOC / EPO

- PN - [CN203999040U](#) U 20141210
- PR - CN20142333607U 20140618
- AP - CN20142333607U 20140618
- DT - I
- PA - SUZHOU CHANGBANG ENVIRONMENTAL PROT TECHNOLOGY CO LTD
- TI - **Oil-water** layering **device** for sewage hoisting equipment
- AB - The utility model relates to an **oil-water** layering **device** for sewage hoisting equipment. The **oil-water** layering **device** comprises a water collecting part, a sludge collecting part and an **oil** collecting part, wherein the columnar water collecting part is provided with an upper end surface and a lower end surface, the upper end surface is smaller than the lower end surface, and a water inlet pipe is mounted at the bottom of the side surface of the water collecting part; the sludge collecting part is integrally sealed and connected with the lower end surface of the water collecting part and adopts an inverted cone shape, and a sludge discharge pipe is mounted at the bottom of the sludge collecting part; the conical **oil** collecting part is integrally sealed and connected with the upper end surface of the water collecting part, and the top of the **oil** collecting part is communicated with a vertical pipe provided with a branch pipe; and a **density meter** electrically connected with an alarm is mounted in a position where the vertical pipe and the **oil** collecting part are communicated, and a water guide pipe extending to a connecting position with the sludge collecting part is mounted at the **oil** collecting part. On one hand, the sludge collecting part is designed into an inverted conical structure to facilitate collection and discharge of sludge; and on the other hand, the **density meter** electrically connected with the alarm is mounted in the position where the vertical pipe and the **oil** collecting part are communicated, so that the alarm can give an alarm when the value fluctuation of the **density meter** is larger.

28/96 © EPODOC / EPO

- PN - [GB2529902](#) A 20160309
- PR - GB20140015840 20140908
- AP - GB20140015840 20140908
- DT - *; Rep
- CT - || STSE (A)
[WO2009102763](#) A1 20090820 [] (INTEGRATED SENSING SYSTEMS INC [US], et al)
[WO2005010467](#) A2 20050203 [] (FTI FLOW TECHNOLOGY INC [US], et al)

[WO2005003690](#) A2 20050113 [] (INVENSYS SYS INC [US], et al)
[US6279386](#) B1 20010828 [] (NITECKI JEAN-PIERRE [FR], et al)
[US2010199749](#) A1 20100812 [] (HEINRICH STEPHAN [DE], et al)
[US2004267465](#) A1 20041230 [] (SANCHEZ PINA JOSE L [MX], et al)

- CCI - [G01F25/0084](#) ; [G01F1/90](#) ; [G01F22/00](#)
- CNOI - [G01F1/00](#) ; [G01F1/05](#) ; [G01F1/053](#) ; [G01F1/06](#) ; [G01F1/10](#) ; [G01F1/78](#) ; [G01F1/86](#) ;
[G01F1/90](#) ; [G01N11/00](#) ; [G01N11/10](#) ; [G01N11/14](#)
- CCA - [G01F1/053](#) ; [G01F15/00](#)
- PA - PARKER SIMON [GB]
- TI - Flow **meter** and aircraft
- AB - According to an aspect of the invention, there is provided an aircraft comprising a fuel system. The fuel system comprises a flow **meter** , a control unit coupled thereto and a means for measuring volumetric flow rate of flowing fuel within the fuel system. Additionally, the flow **meter** comprises a viscosity measurement **device** which is disposed within the fuel system such that it is exposed in use, at least in part, to fuel. The viscosity measurement **device** is for measuring, in real time, a value indicative of the viscosity of the fuel. In this way, the control unit can accurately determine a **density** of the flowing fuel and can accurately determine a mass of the flowing fuel as it is loaded onto, used by or distributed about the aircraft. Also claimed is an **oil** lubrication system for a vehicle comprising a viscosity measurement **device** configured and arranged for measuring a value indicative of the viscosity of the **oil** for use in indicating when an **oil** change is required, the viscosity measurement **device** comprising: a housing having an inlet and an outlet for enabling ingress and egress of **oil** into and out of the housing and a cantilevered arm secured within the housing, the cantilevered arm being affixed at one end and having a moveable second end, said value indicative of the viscosity of the **oil** is intermittently measured by deflecting the cantilevered arm when disposed within substantially static **oil** held within the housing, the viscosity measurement **device** having means for outputting said value indicative of the viscosity of the **oil** to a control unit configured to determine the absolute viscosity and configured to determine that an **oil** change is required due to a decrease in the absolute viscosity of the **oil** below an acceptable threshold viscosity.

29/96 © EPODOC / EPO

- PN - [CN203796249U](#) U 20140827
- PR - CN20142150248U 20140331
- AP - CN20142150248U 20140331
- DT - I
- PA - GUDAO OIL PRODUCTION FACTORY SINOPEC SHENGLI OILFIELD CO
- TI - Baffle type **oil** and sand prevention **device** for liquid level meters of **oil** well metering separators
- AB - The utility model discloses a baffle type **oil** and sand prevention **device** for liquid level meters of **oil** well metering separators. The baffle type **oil** and sand prevention **device** comprises a shell, a water feed inlet, valves, an **oil** drain outlet, an inlet, an upper baffle, a lower baffle, a blowdown opening and an outlet. The shell is a cylindrical closed barrel, the upper baffle and the lower baffle are arranged inside the shell, the blowdown opening is formed in the middle of the bottom of the shell, the inlet is formed in the upper portion of the shell and is close to the upper baffle, the outlet is formed in the lower portion of the shell and is close to the lower baffle, the **oil** drain outlet is formed in the top of the shell and is positioned above the inlet,

the water feed inlet is formed in the top of the shell and is positioned above the outlet, and the valves are arranged at the water feed inlet, the **oil** drain outlet, the inlet, the blowdown opening and the outlet. The baffle type **oil** and sand prevention **device** has the advantages that the baffle type **oil** and sand prevention **device** is applicable to the **oil** well metering separators, the liquid level meters can be effectively prevented from being affected by **oil** and sand, the water **density** of liquid in each liquid level **meter** is 1 assuredly, the average cleaning period of the liquid level meters can be prolonged and is seventy days instead of the original thirty days, accordingly, the labor intensity of staffs can be relieved, the **oil** well metering accuracy can be guaranteed, and the baffle type **oil** and sand prevention **device** has an important significance in oilfield development.

30/96 © EPODOC / EPO

- PN - [CN203593610U](#) U 20140514
- PR - CN20132533651U 20130829
- AP - CN20132533651U 20130829
- DT - I
- PA - BEIJING AUTOMOBILE RES GENERAL INST CO LTD
- TI - **Oil** tank and automobile
- AB - The utility model provides an **oil** tank and an automobile, and relates to the technical field of automobiles. The **oil** tank comprises an **oil** tank body, a **density meter**, a control **device**, and an alarm **device**, wherein the **oil** tank body is arranged in an **oil** pipe inside an **oil** filler and is provided with accommodating space; the **density meter** is arranged inside the **oil** tank body for measuring the **density** of the **oil** in the **oil** tank; the control **device** is connected with the **density meter**; the alarm **device** is connected with the control **device**; and when the **density** of the **oil** measured by the **density meter** is not the preset value and the preset value is 0.84 g/ml to 0.88g/ml, the control **device** controls the alarm **device** to send an alarm signal. Therefore, the problem that diesel is mistakenly filled in a gasoline vehicle to damage the motor can be solved, direct economic loss of the user is reduced, the structure is simple, and the cost is low.

31/96 © EPODOC / EPO

- PN - [JP2014054996](#) A 20140327
- PR - JP20120199019 20120911
- AP - JP20120199019 20120911
- DT - I
- FI - B67D7/32&C; G01F23/62&P
- FT - 2F013/BC10; 2F013/BG01; 2F013/BG11; 2F013/CA15; 3E083/AA13; 3E083/AD12; 3E083/AJ10
- PA - TATSUNO CORP
- TI - **OIL MIXTURE PREVENTION DEVICE FOR LIQUID LEVEL MEASUREMENT DEVICE**
- AB - PROBLEM TO BE SOLVED: To prevent **oil** mixture in a storage tank by positively utilizing a function of a liquid level **meter** with a **density** measurement function. SOLUTION: An **oil** mixture prevention **device** for a liquid level measurement **device** includes: a float 6 for **density** detection which is guided by a stem 3 and which sinks and floats according to the **density** of fuel **oil**; a float 5 for water detection which is guided by the stem 3 and which sinks and floats according to the level of water; an elastic body 7 which connects the float 6 for **density** detection and the float 5 for

water detection; means 11 for detecting a distance between the float 6 for **density** detection and the float 5 for water detection; reference temperature **density** calculation means 13 which calculates the **density** of the fuel **oil** on the basis of the distance, and which calculates reference temperature **density** at a reference temperature; and **density** determination update means 14 which notifies the mixture of **oil** when the **density** from the reference temperature **density** calculation means 13 is out of a threshold value with respect to the reference temperature **density** which is registered for each **oil** type from the reference temperature **density**.

32/96 © EPODOC / EPO

PN - [CN103776400](#) A 20140507

PNFP - CN103776400B B 20160629

PR - CN20131688709 20131217

AP - CN20131688709 20131217

DT - I

CT - || STSE (A)

[CN101032410](#) A 20070912 [Y] (UNIV BINZHOU MEDICAL [CN])
[Y] 1-3、6-9

* 说明书第1页第11-12行、第2页第1行-第3页第7行、附图1 *;

[CN201681787U](#) U 20101222 [A] (HANGZHOU WANDONG ELECTRON CO LTD)
[A] 1-10

* 全文 *;

[JP2013102837](#) A 20130530 [A] (HITACHI MEDICAL CORP)
[A] 1-10

* 全文 *;

[CN201277905Y](#) Y 20090722 [Y] (HANGZHOU WANDONG ELECTRON CO L [CN])
[Y] 1-3、6-9

* 说明书第3页第2行-第4页倒数第一行、附图1 *;

[CN201345777Y](#) Y 20091111 [A] (TIANJIN DEV ZONE SHENGHONG MED [CN])
[A] 1-10

* 全文 *

PA - (A)
HANGZHOU KAILONG MEDICAL INSTR CO LTD

TI - (A)
X ray tube focus check **meter** and verification method thereof

AB - (A)
The invention relates to an X ray tube focus check **meter** and a verification method applying same. The equipment method is used in X ray tube production for shooting and verification of the focus of an X ray tube. The X ray tube focus check **meter** comprises an **oil** tank provided with an upper cover, wherein the **oil** tank upper cover is provided with a visual window. The X ray tube focus check **meter** is characterized by further comprising a positioning frame, a clamp, an angle motor, a horizontal planker, a horizontal motor and an imaging viewer. A focus shooting position can be accurately positioned through the imaging viewer and a focus shooting **device**, the focus size, shape, **density** and clearness shooting precision are improved, the production working efficiency is enhanced by more than 50%, at the same time, a ray point of an actual focus on the X ray tube is correctly positioned through a focus pointing **device** so that the whole machine assembling precision of the X ray tube is guaranteed, and a correct basis for the design and improvement of improved product quality is provided.

33/96 © EPODOC / EPO

- PN - [CN203498331U](#) U 20140326
- PR - CN20132494204U 20130814
- AP - CN20132494204U 20130814
- DT - I
- PA - UNIV EAST CHINA SCIENCE & TECH
- TI - Water injection **device** applicable to **oil** refining **device**
- AB - The utility model provides a water injection **device** applicable to an **oil** refining **device**. The water injection **device** is suitable for mixing various components of multi-phase fluids such as gas-liquid, liquid-liquid and gas-liquid-solid in various **oil** refining devices. The water injection **device** comprises a three-way pipeline type shell, a water-injection and spraying system and a contact washing unit, wherein the three-way pipeline type shell is provided with two inlets and an outlet, the water-injection and spraying system comprises a flow **meter**, a regulation valve, a rotational flow micro-distribution **device** and the like, and the contact washing unit comprises a liquid falling trough, an efficient mixer and the like. According to the complete set of water injection **device**, a contact washing manner in the same flow direction of the gas (liquid) is utilized, water drops are uniformly distributed in a spraying section, the distribution **density** of the water drops is adjustable, and the water injection rate is controllable; by subsequently utilizing an efficient multiphase flow mixing element, the mixing strength is effectively improved, the mixing time is effectively prolonged, the water injection washing efficiency is effectively improved, and a drift current phenomenon caused due to the non-uniform mixing in a water injection pipeline is avoided, so that the problem caused, by the ammonium salt corrosion, to the efficient, economic and long-period running of a system is effectively solved.

34/96 © EPODOC / EPO

- PN - [CN203443940U](#) U 20140219
- PR - CN20132515876U 20130822
- AP - CN20132515876U 20130822
- DT - I
- PA - PETROCHINA CO LTD
- TI - Online chromatographic decompressing sample-injection **device**
- AB - The utility model provides an online chromatographic decompressing sample-injection **device**. The **device** at least comprises a cavity, an outer lead screw, an inner lead screw, a movable piston body, a check valve, a visual window, an upper end cover, a lower end support, a gas measuring chromatographic instrument, a vacuum pump, a PVT (pressure-volume-temperature) fluid phase state analyzer, an **oil** measuring chromatographic instrument sampling bottle, an **oil** measuring chromatographic instrument, a **density meter**, a controller, a pressure sensor, a stepping motor and an electric heater, wherein the outer lead screw, the movable piston body and the check valve are located inside the cavity, and the inner lead screw is partially located inside the cavity; the visual window is located on the side surface of the cavity; the upper end cover and the lower end support are located at the top and the bottom of the cavity; the gas measuring chromatographic instrument, the vacuum pump, the **oil** measuring chromatographic instrument sampling bottle, the **density meter** and the PVT fluid phase state analyzer are connected with the cavity respectively; and the controller is connected with the pressure sensor, the electric heater and the stepping motor. With the adoption of the **device**, online

sampling, online sample transferring and automatic sample loading of high-pressure formation fluids are realized, and technical support is provided for high-pressure analysis of oil and gas reservoir fluids.

35/96 © EPODOC / EPO

- PN - [KR20130119099](#) A 20131031
- PNFP - KR101370524B B1 20140306
- PR - KR20120041993 20120423
- AP - KR20120041993 20120423
- DT - I
- CT - || STSE (B1)
[JP2002243613](#) A 20020828 [] (OVAL CORP);
[JP2008107298](#) A 20080508 [] (OVAL CORP);
[JP2007163481](#) A 20070628 [] (KROHNE AG)
- CNOI - (A)
[G01F1/84](#) ; [G01N9/002](#) ; [G01N33/26](#)
- PA - (A)
 DAEWOO SHIPBUILDING & MARINE [KR]
- TI - (A)
 METHOD AND SYSTEM DETERMINING CRUDE OIL QUANTITY OF FPSO OIL STORAGE TANK USING CORIOLIS FLOWMETER
 - (B1)
 FPSO
- AB - (A)
 PURPOSE: A floating production storage and offloading (FPSO) is provided to be unnecessary to install a **density** value measuring **device**, thereby ensuring the maintenance space on a deck and reducing the cost of installation. CONSTITUTION: A method for measuring the amount of crude oil in an FPSO oil storage tank (10) comprises the following steps of: installing a Coriolis flow **meter** (20) in a discharging passage (L) through which crude oil is discharged; and measuring the **density** value and flux value of the crude oil based on the vibration displacement of the Coriolis flow **meter** without a separate **density** measurement **device**. The Coriolis flow **meter** includes a pair of tubes and sensors. The pair of tubes is provided in the discharging passage to be spaced apart from each other, and the crude oil flows in the tubes. The sensor is provided to contact with the pair of tubes, respectively. And the sensor converts the period of vibration of the pair of tubes into a sine wave. The **density** value of the crude oil is measured based on the period of vibration of the sine wave.

36/96 © EPODOC / EPO

- PN - [CN202900200U](#) U 20130424
- PR - CN20122561472U 20121030
- AP - CN20122561472U 20121030
- DT - I
- PA - SHAANXI LIANMENG LOGISTICS CO
- TI - Ultrahigh pressure perforating gun
- AB - The utility model discloses an ultrahigh pressure perforating gun, and relates to a **device** which extracts oil, gas, water, dissoluble or meltable substances or mineral slurry, in particular to a bullet perforating gun or an energy-gathered jet flow

perforator. The ultrahigh pressure perforating gun comprises a hollow barrel-shaped gun body. A plurality of gun perforations are formed in the gun body. Hole **density** of the gun perforations is 16-26 holes per **meter**, phase position is 400 degrees-100 degrees, and pitch of the holes is 25-85 mm. The ultrahigh pressure perforating gun is connected with a flying ring, a gun head and a gun breech and is placed into an experimental **device**, the pressure is stabilized for 30 minutes, and the ultrahigh pressure perforating gun can work normally under the conditions of 180 DEG C and 170 MPa. And the temperature is continuous to be increased to 195 DEG C and at the same time the pressure is increased to 195 MPa in the experimental **device**, the pressure is stabilized for 30 minutes, and the perforating gun can work normally, and the ultrahigh pressure perforating gun is detected to be normal after the pressure relief is tripped out from the ultrahigh pressure perforating gun. Test results show that the ultrahigh pressure perforating gun is not deformed under the conditions of 195 DEG C and 195 MPa, and the demands of work load of 175 MP a and 180 DEG C are met.

37/96 © EPODOC / EPO

- PN - [CN202788800U](#) U 20130313
- PR - CN20122464711U 20120913
- AP - CN20122464711U 20120913
- DT - I
- PA - WU BO
- TI - Pressure water adding **device** of oil gauging separator
- AB - The utility model relates to a water adding **device** of an oil gauging separator, in particular relates to a pressure water adding **device** of the oil gauging separator. The pressure water adding **device** comprises a water container, an air outlet pipe, a water adding pipe, a lower connecting pipe and a pressure balancing pipe, wherein an air outlet gate is arranged on the air outlet pipe, and the air outlet pipe is communicated with the water container; a water adding gate is arranged on the water adding pipe, and the water adding pipe is communicated with the water container; a drainage gate is arranged on the lower connecting pipe, and the lower connecting pipe is communicated with the water container; and a joint is fixedly connected to each of the two ends of the pressure balancing pipe. The pressure water adding **device** is simple in structure and convenient to use, and can be used for adding pure bottom water for a separator conveniently, quickly and safely to ensure that the liquid **density** in a liquid level **meter** is kept to be 1g/ml, so that individual well measurement errors are reduced, and a certain beneficial effect is achieved.

38/96 © EPODOC / EPO

- PN - [CN202748106U](#) U 20130220
- PR - CN20122380231U 20120802
- AP - CN20122380231U 20120802
- DT - I
- PA - CHINA NAT PETROLEUM CORP
- TI - Oil and water level magnetostriction double-float liquid level **meter** of liquid storage tank
- AB - The utility model discloses an oil and water level magnetostriction double-float liquid level **meter** of a liquid storage tank. The oil and water level magnetostriction double-float liquid level **meter** is designed for timely monitoring and managing the oil level and the water level in the liquid storage tank of a gas gather station,

a **meter** head of the liquid level **meter** is connected with a measuring port of the liquid storage tank through a flange, a float guide rod is connected at the lower end of the **meter** head and connected with an **oil** level float and a water level float which are different in **density** and capable of moving freely along the guide rod. When the liquid level **meter** works, the **oil** level float and the water level float respectively float on an **oil**-air interface and an **oil**-water interface, and the height of the **oil** level float and the water level float can change along with the liquid level height of **oil** and water to perform real-time measuring on the two liquid levels and provide accurate and reliable data for the following **oil** and water separation. The liquid level **meter** can be installed on an opening portion of the liquid storage tank and requires no other auxiliary **device**. The error of the liquid level **meter** is about 1%, the measuring accuracy is high, and remote management of hydrocarbonaceous sewage is facilitated. Only the floats of the liquid level **meter** are movable, so that maintenance is small, accuracy calibration can be performed directly on the **meter** head, and operation is convenient.

39/96 © EPODOC / EPO

PN - [CN102818762](#) A 20121212

PNFP - CN102818762B B 20140806

PR - CN20111156239 20110610

AP - CN20111156239 20110610

DT - I

CT - || STSE (A)
[CN201662525U](#) U 20101201 [A] (TIANJIN WATER RESOURCES RES INST)
 [A]
[JP3664624B](#) B2 20050629 [A]
 [A]
[CN202153206U](#) U 20120229 [R] (PETROCHINA CO LTD)
 [R]
[CN201319014Y](#) Y 20090930 [A] (JIAXING CHEN [CN])
 [A]

CTNP - || STSE (A)
 [] 薛致远等,
 "东北管网阴极保护通电/断电电位测量与分析", <<油气储运>>, (20101231), vol. 29, no. 10
 [] 杨义军等,
 "极化探头在埋地钢质管道阴极保护的应用", <<煤气与热力>>, (20100430), vol. 30, no. 4
 [] 韩磊等,
 "便携式接地网腐蚀电化学检测系统及其应用", <<腐蚀科学与防护技术>>, (20090531), vol. 21, no. 3

PA - (A B)
 CHINA NAT PETROLEUM CORP

TI - (A B)
Oil-gas pipeline polarization potential monitoring device

AB - (A)
 The invention discloses an **oil-gas** pipeline polarization potential monitoring **device**, and relates to the technical fields of general corrosion prevention of a metal material, and pipeline systems. The **device** comprises a current interrupter, a couple corrosion **meter**, an adjustable resistor, a data collector, a probe, a portable reference electrode and a computer, wherein the negative end of the current

interrupter is connected to the cathode of a pipeline test pile or a constant potential instrument, the positive end of the current interrupter is connected to one end of the couple corrosion **meter**, and the other end of the couple corrosion **meter** is connected with a rod-shaped tube steel electrode lead of the probe, and AI8 and AI9 of the data collector respectively through the adjustable resistor; AI GND 3 and AI GND 6 of the data collector are connected together, and then are connected with the AI9 of the data collector, or go through the adjustable resistor and then are connected with the AI9; and AI0 and AI1 of the data collector are connected with the long-acting reference electrode lead of the probe and the portable reference electrode respectively, and the USB interface of the data collector is connected with the USB interface of the computer. The **device** can realize the long-term monitoring of the real polarization potential, and the accurate calculating of the polarization current **density** of the probe.

40/96 © EPODOC / EPO

- PN - [CN202576125U](#) U 20121205
- PR - CN20122198798U 20120507
- AP - CN20122198798U 20120507
- DT - I
- PA - TIANJIN HAIBIN NEW ZONE JINPING BUCKET MFG FACTORY
- TI - **Device** for removing emulsified **oil** from degreased waste liquid
- AB - The utility model provides a **device** for removing emulsified **oil** from degreased waste liquid. The **device** for removing the emulsified **oil** from the degreased waste liquid mainly comprises a degreased waste liquid tank, a reaction tank, a medicine feeding case, an aeration tank, a cone-shaped pool, a waste **oil** collecting pool, an **oil**-liquid separator and a comprehensive waste water treatment pool. The **device** for removing the emulsified **oil** from the degreased waste liquid is characterized in that the medicine feeding case, the aeration tank and the degreased waste liquid tank are respectively connected with the reaction tank through a pipeline, and pumps are utilized to provide motive power, a stirring **device** is arranged in the middle of the reaction tank, the other end of the aeration tank connected with the reaction tank is connected with the cone-shaped pool through a pipeline, the upper portion the cone-shaped pool is a cylindrical body and the lower portion of the cone-shaped pool is a conical body, a waste **oil** exhaust port is arranged at a position which is 10 centimeters away from the joint of the cylindrical body and the conical body, the waste **oil** exhaust port is connected with the waste **oil** collecting pool through a pipeline, a **density** detecting **meter** is arranged at the joint of the cylindrical body and the conical body, a waste water exhaust port is arranged at a position of the conical body fifteen to twenty centimeters away from the bottom of the conical body, the waste water exhaust port is connected with the **oil**-liquid separator through a pipeline and then sequentially connected to the comprehensive waste water treatment pool. The **device** for removing the emulsified **oil** from the degreased waste liquid has the advantages that degreased waste liquid is collected separately and then treated, simple equipment is used, investment is low, and waste **oil** removing effect is obvious.

41/96 © EPODOC / EPO

- PN - [CN202533343U](#) U 20121114
- PR - CN20122227510U 20120518
- AP - CN20122227510U 20120518

DT - I

PA - PETROCHINA CO LTD

TI - Continuous sample transferring **device** for measuring **density** of volatile **oil**

AB - The utility model relates to a continuous sample transferring **device** for measuring the **density** of volatile **oil**. Two ends of a sealed pipe column filled with an **oil** sample to be tested are respectively sealed to be connected with a sample inlet and a sample outlet of a general crude **oil density meter** to form a sealed circulation loop, the **oil** sample to be tested in the sealed pipe column can be injected into the sample inlet continuously and repeatedly, and the **density meter** is started to measure the **density** of the **oil** sample injected every time. The two ends of the sealed pipe column are respectively sealed to be connected with the sample inlet and the sample outlet of the **density meter** to form the sealed circulation loop so as to continuously inject samples of volatile **oil** in sealed environment and measure respectively. Furthermore, in a measurement process, the **oil** sample to be tested can avoid volatilization in a full testing process, so that the true **density** of the **oil** sample to be tested is obtained, and testing accuracy of **oil** deposit fluid high pressure physical property **density** can be improved.

42/96 © EPODOC / EPO

PN - [CN202453268U](#) U 20120926

PR - CN2012279247U 20120305

AP - CN2012279247U 20120305

DT - I

PA - YAO TAN

TI - **Device** for measuring **density** of liquid by using floating type **density meter** method

AB - The utility model discloses a **device** for measuring the **density** of liquid by using a floating type **density meter** method. The **device** comprises a heat-preserving **density** measuring cylinder with an inner cavity, wherein a waste liquid outlet which is communicated with the inner cavity is formed at the bottom of the heat-preserving **density** measuring cylinder. The **device** is characterized in that the cylinder wall of the heat-preserving **density** measuring cylinder has an interlayer structure; a circulating water inlet is formed on the outer side wall of the heat-preserving **density** measuring cylinder, which is adjacent to the bottom of the heat-preserving **density** measuring cylinder; at least one circulating water outlet is formed on the outer side wall of the upper end of the heat-preserving **density** measuring cylinder; and the circulating water inlet and the circulating water outlet are communicated with an interlayer and connected to a constant temperature **device**. The interlayer is arranged inside the **density** measuring cylinder, and constant temperature circulating water can be filled into the interlayer, so constant temperature environment can be conveniently provided when the **density** of a product such as the liquid with high viscosity and **density**, crude **oil** and liquid **oil** is measured, and the **device** is clean and convenient to operate.

43/96 © EPODOC / EPO

PN - [CN102659211](#) A 20120912

PNFP - CN102659211B B 20140305

PR - CN20121148765 20120515

AP - CN20121148765 20120515

DT - I

- CT - || STSE (A)
[CN102259950](#) A 20111130 [A]
 [A] 1-7
 说明书具体实施方式
[CN102092868](#) A 20110615 [A] (GUIGANG ZHIHONG ENVIRONMENTAL TECHNOLOGY CO LTD)
 [A] 1-7
 说明书第0005-0021段及附图1
[SU1237637](#) A1 19860615 [] (BRETSKIJ INSTR I [SU])
[JP2005034752](#) A 20050210 [A] (NIPPON CLEAN OIL KK)
 [A] 1-7
 说明书第0009-0019段及图1和2
- PA - (A B)
 UNIVTAISHAN MEDICAL; SHANDONG DAYU WATER TREAT CO LTD
- TI - (A B)
 Method and **device** for automatically removing floating **oil** and settled sand from **oil**-containing wastewater
- AB - (A)
 The invention belongs to the technical field of wastewater purification devices, and provides a method and a **device** for automatically removing floating **oil** and settled sand from **oil**-containing wastewater. The method comprises the following steps of: putting a hydraulic indicator into the **oil**-containing wastewater based on the measurement principle of a double-channel ultrasonic liquid level difference **meter** and the liquid statics principle, detecting the internal and external liquid level difference delta H of the hydraulic indicator, comparing the liquid level difference delta H with a calculated value, and performing automatic control through the liquid level difference to automatically separate the **oil** and the sand from the wastewater. Even if the **oil** content of the wastewater is low, the floating **oil** can be separated from the water; the hydraulic indicator can display the liquid level difference of the **oil** and the water due to **density** difference, the internal and external liquid level difference delta H of the hydraulic indicator is detected in real time by adopting the double-channel ultrasonic liquid level difference **meter**, and a plurality of electromagnetic valves are automatically opened and closed under the control of a central controller, so that the **device** is high in automation degree, convenient to install in field and convenient to maintain; the purification and separation efficiency of the **oil**-containing wastewater is improved; and the method and the **device** have high popularization and application value.

44/96 © EPODOC / EPO

- PN - [CN202153206U](#) U 20120229
- PR - CN20112195700U 20110610
- AP - CN20112195700U 20110610
- DT - I
- PA - PETROCHINA CO LTD
- TI - Polarization potential monitoring **device** for **oil** gas pipeline
- AB - The utility model discloses a polarization potential monitoring **device** for an **oil** gas pipeline, which relates to the technical field of normal corrosion prevention of metal materials and pipeline systems, and comprises a current interrupter, a galvanic couple corrosion **meter**, an adjustable resistor, a data collecting **device**, a probe, a portable reference electrode and a computer, wherein the negative end of the current interrupter is connected with a pipeline testing pile or the negative electrode of a

constant potential rectifier, the positive end of the current interrupter is connected with one end of the galvanic couple corrosion **meter**, the other end of the galvanic couple corrosion **meter** is connected with a bar-shaped pipe steel electrode lead of the probe, and an AI8 and an AI9 of the data collecting **device** respectively by the adjustable resistor, an AI GND3 and an AI GND6 of the data collecting **device** are connected together, and then connected with the AI9 of the data collecting **device** or connected with the AI9 of the data collecting **device** by the adjustable resistor, an AI0 and an AI1 of the data collecting **device** are respectively connected with a long-acting reference electrode lead of the probe and the portable reference electrode, and a USB interface of the data collecting **device** is connected with a USB interface of the computer. The polarization potential monitoring **device** can realize long-term monitoring of real polarization potentials, and accurate calculation of probe polarization current **density**.

45/96 © EPODOC / EPO

- PN - [CN202052513U](#) U 201111130
- PR - CN20112157384U 20110517
- AP - CN20112157384U 20110517
- DT - I
- PA - BAOSTEEL ENG & TECH GROUP CO
- TI - **Density** adjusting **device** for emulsified liquid of rolling mill
- AB - The utility model relates to a **density** adjusting **device** for an emulsified liquid of a rolling mill, which comprises a petroleum tank, a desalted water tank, an emulsified liquid liquid-supplying box, a petrol pump, a desalted water pump, flow meters, an **oil-water-mixing device** and connecting pipelines. One end of the petrol pump is connected with the petroleum tank, and the outlet of the other end is connected with a flow **meter** connected with the **oil-water-mixing device** through an outlet pipeline. One end of the desalted water pump is connected with the desalted water tank, and the outlet of the other end is connected with another flow **meter** connected with the **oil-water-mixing device** through an outlet pipeline. The **oil-water-mixing device** is connected with the emulsified liquid liquid-supplying box through a mixture outlet pipeline. The **density device** for the emulsified liquid of the rolling mill is high in accuracy of **density** control, sufficient in **oil** water mixture, and capable of greatly reducing rolling **oil** loss during a process of liquid supplementation, subsequently reducing **oil** consumption of the system, improving emulsification capability of **oil** water mixture by setting the temperatures of the petroleum tank and the desalted water tank in a proper range according to the properties of **oil** and the fact that the **oil** has different capability of mixture and emulsification under different temperatures.

46/96 © EPODOC / EPO

- PN - [CN201924913U](#) U 20110810
- PR - CN20102655237U 20101210
- AP - CN20102655237U 20101210
- DT - I
- PA - CHINA NAT OFFSHORE OIL CORP; CHINA OILFIELD SERVICES LTD
- TI - **Density** logging calibration **device** with multiple borehole diameters
- AB - The utility model provides a **density** logging calibration **device** with multiple borehole diameters, which comprises a well and a well core. The well made of rock is a column; the height of the well ranges from 1 **meter** to 1.5 meters; the minimum

distance from the outer edge of the column to the central line ranges from 0.5 **meter** to 1 **meter**; the well core includes more than two boreholes with sector sections; and the sum of the central angles of the boreholes is 360 degrees. As the sector boreholes are arranged in the well, a logging instrument is capable of simultaneously calibrating different boreholes of a plurality of wells with the same **density** in the **density** logging calibration **device**, huge financial resources are saved, calibration for different boreholes is facilitated, accuracy of calibration values is improved, and accurate data support is supplied for further **oil** exploitation.

47/96 © EPODOC / EPO

PN - [CN102121891](#) A 20110713

PR - CN20101592495 20101216

AP - CN20101592495 20101216

DT - I

CT - || STSE (A)
[CN1773246](#) A 20060517 [] (CHEN WEIJUN ZHENG [CN])
[US4426879](#) A 19840124 [] (HUMPHRIES CURTIS L [US], et al)
[CN101363813](#) A 20090211 [] (RENYAN QIN [CN], et al)

CTNP - || STSE (A)
 [] <<化学工程>> 20031231
 孙长宇等
 二氧化碳在正十四烷中与浓度有关的扩散系数 61-65 1-2 第31卷, 第2期 2
 [] <<西南石油大学学报(自然科学版)>> 20100228 郭平等 高温高压气体-原油分子扩散系数研究 73-79 1-2 第32卷, 第1期 2
 [] <<中国优秀博硕士学位论文全文数据库(博士) 工程科技I辑(月刊)>> 20060415 史云清 含水汽凝析气藏开启动态分析方法研究 全文 1-2, 第4期 2
 [] <<中国优秀博硕士学位论文全文数据库(博士) 工程科技I辑(月刊)>> 20061115 汤勇 深层凝析气藏多相流体复杂相态理论及提高气井产能新方法研究 第2章第2.1至2.3.1节 1-2, 第11期 2
 [] <<Journal of Petroleum Science and Engineering>> 19960531
 Mohammad R. Riazi A new method for experimental measurement of diffusion coefficients in reservoir fluids 235-250 1-2 第14卷, 第3-4期 2

PA - UNIVSOUTHWESTPETROLEUM

TI - **Device** and method for testing molecular diffusion coefficients in multi-component **oil**-gas system under high temperature and high pressure

AB - The invention relates to a **device** and method for testing molecular diffusion coefficients in a multi-component **oil**-gas system under high temperature and high pressure. The **device** consists of an inlet pump 1, an outlet pump 2, an intermediate container, a PVT (pressure-volume-temperature) cylinder 6, an **oil**-gas separator 7, a gas volume flow **meter** 8, a liquid phase **density** analyzer 10 and a chromatographic analyzer 9, wherein, one end of the intermediate container is connected with the inlet pump 1, and the other end of the intermediate container is connected with the PVT cylinder 6; the PVT cylinder is connected with the **oil**-gas separator 7; the separator is connected with the gas volume flow **meter** 8 and the liquid phase **density** analyzer 10; the gas volume flow **meter** and the liquid phase **density** analyzer are respectively connected with the chromatographic analyzer 9; and the other end of the PVT cylinder is connected with the outlet pump 2. The **device** has the advantages of reasonable principle and simple structure, and is convenient in operation; and by utilizing the method, the molecular diffusion coefficients of each

component in a multi-component injected gas and actual crude **oil** system in gas phase and **oil** phase under the conditions of different reservoir temperature and pressure can be determined, thereby providing reasonable basic data for quantitative evaluation of influence of molecular diffusion effect on the enhancement of the recovery ratio by means of gas injection.

48/96 © EPODOC / EPO

PN - [CN201885756U](#) U 20110629
 PR - CN20102632168U 20101124
 AP - CN20102632168U 20101124
 DT - I
 PA - PETROCHINA CO LTD
 TI - Differential pressure type crude **oil** production volume metering **device**
 AB - The utility model discloses a differential pressure type crude **oil** production volume metering **device**, belonging to the field of production volume metering in an **oil** well. The differential pressure type crude **oil** production volume metering **device** comprises an **oil**-gas metering separator body; a bottom water area and a crude **oil** outlet pipe are arranged at the bottom of the body; a gas outlet pipe is arranged at the top of the body; a glass pipe liquid level **meter** is arranged on the body; the upper end of the glass pipe liquid level **meter** is communicated with a cavity above raw **oil** in the body, and the lower end of the glass pipe liquid level **meter** is communicated with the bottom water area; the body is provided with a gas-liquid mixture inlet that is located above the glass pipe liquid level **meter**; a first pressure sensor is arranged between the communication position of the cavity and the glass pipe liquid level **meter** and the glass pipe liquid level **meter**; a second pressure sensor is arranged between the communication position of the bottom water area and the glass pipe liquid level **meter** and the glass pipe liquid level **meter**; the first sensor and the second pressure sensor are both connected with the input end of a differential pressure transmitter; and the output end of the differential pressure transmitter is connected with the input end of a controller. With the metering **device**, the differential pressure of liquid at different time periods is used for calculating crude **oil** production volume and is not influenced by factors such as bottom water **density**, so that the calculation result is accurate; data is transmitted by the pressure sensors and the differential pressure transmitter, so that the manual metering is not needed, and no artificial reading errors exist, therefore, the accuracy and reliability of the metering result can be further ensured, and human resources can be saved.

49/96 © EPODOC / EPO

PN - [CN102033170](#) A 20110427
 PNFP - CN102033170B B 20150506
 PR - CN20091196801 20090929
 AP - CN20091196801 20090929
 DT - I
 PA - (A B)
 EAST CHINA ELECTRIC POWER TEST & RES INST CO LTD
 TI - (A B)
 Online measuring **device** of charge **density** of **oil** electrification in transformer
 AB - (A)
 The invention relates to an online measuring **device** of the charge **density** of **oil** flow

electrification in a transformer, comprising a plurality of static electricity quantity probes, a plurality of static potential measuring meters and a set of real-time data collection analyzer. The static electricity quantity probes are connected with a circulation **oil** pipe of the transformer; **oil** flow in the circulation **oil** pipe flows through the static electricity quantity probes; the plurality of static potential measuring meters are connected with the plurality of static electricity quantity probes in one-to-one correspondence; the static potential measuring meters measure the static potential generated by induction of the static electricity quantity probes; and the real-time data collection analyzer is connected with the plurality of static potential measuring meters and is used for collecting, analyzing and processing the measuring data of each static potential measuring **meter**. The online measuring **device** of the charge **density** of **oil** flow electrification in the transformer ensures online real-time measurement of the charge **density** of **oil** electrification in the transformer, reflects the true condition of **oil** flow electrification in the transformer and achieves the purpose of monitoring the operation state of the transformer in real time.

50/96 © EPODOC / EPO

- PN - [CN201739776U](#) U 20110209
- PR - CN20102254331U 20100706
- AP - CN20102254331U 20100706
- DT - I
- PA - CHINA NAT PETROLEUM CORP; CN PETROLEUM PIPELINE BUREAU; CHINA PETROLEUM PIPELINE ENGINEERING CORP
- TI - On-line **density** measuring **device** for **oil** delivery pipelines
- AB - The utility model provides an on-line **density** measuring **device** for **oil** delivery pipelines. A process main pipeline (6) with a thermostatic electric trace heating and heat preservation part (17) is connected in series in a tested pipeline through a flange 1 (1) and a flange 2 (35) at two outer ends of the process main pipeline (6); a filter 1 (2) and a filter 2 (38), which are arranged in parallel, and a differential pressure transmitter (10), a flow valve (11), a series-connected process valve 6 (23), a side-joint hand-operated sampling valve (14), a side-joint on-line test port 1 (8), a side-joint grounded pressure gauge (12), a side-joint blow down pipeline (7), a sampling pump (3), a series-connected process valve 7 (24), a side-joint on-line test port 2 (37), a side-joint thermal dilatation safety valve (5), an on-line densimeter (4), a side-joint exhaust valve (15), another side-joint blow down pipeline (7), and an intelligent pressure transmitter (9) which are connected in sequence are arranged on the process main pipeline (6) from the inlet; and a **meter** connection box (16) is connected with an SCADA (supervisory control and data acquisition) system.

51/96 © EPODOC / EPO

- PN - [CN201407028Y](#) Y 20100217
- PR - CN2009213722U 20090515
- AP - CN2009213722U 20090515
- DT - I
- PA - PANJIN LETAI MACHINERY CO LTD
- TI - Fully automatic **oil** well metering **device**
- AB - The utility model belongs to a crude **oil** metering **device** of an **oil** production well of an **oil** field and particularly relates to a fully automatic **oil** well metering **device**, which consists of a gas flowmeter, a metering separator, an electric signal liquid

indicator, a multiported valve, a water separating bag, a crude **oil** water cut analyzer and a control display, and is characterized in that the top of the metering separator is provided with the gas flow **meter**, the lower part of the metering separator is provided with the electric signal liquid indicator and the crude **oil** water cut analyzer, the lower part in the metering separator is provided with the water separating bag, water-fast antifreezing medium with known **density** is arranged in the water separating bag, the **density** of the antifreezing medium is larger than that of the water, the multiported valve is arranged at the inlet of the metering separator, and the control display is connected with the gas flow **meter**, the electric signal liquid indicator, the multiported valve and the crude **oil** water cut analyzer via wires. The utility model has the advantages of simple structure, safe and reliable operation and strong adaptability, can overcome the influence caused by the changes of factors such as temperature, pressure, viscosity and the like, and raises the automation level of **oil** well metering.

52/96 © EPODOC / EPO

- PN - [CN201396139Y](#) Y 20100203
- PR - CN20092108043U 20090521
- AP - CN20092108043U 20090521
- DT - I
- PA - PETROCHINA CO LTD
- TI - Cluster well automatic well-selecting on-line metering **device**
- AB - A cluster well automatic well-selecting on-line metering **device** is applied to metering well productivity, and is characterized in that a multi-way valve is connected with an inlet of a gas-liquid separator, a pipeline of the gas-liquid separator is connected with an electric three-way regulating valve and is fixed with an orifice flow **meter**, a liquid outlet of the gas-liquid separator is connected with a liquid inlet of the electric three-way regulating valve, the pipeline is fixed with a wedge flow **meter** and a **density** gauge, an outlet of the electric three-way regulating valve is connected with an outlet pipeline of the multi-way valve, the orifice flow **meter**, the wedge flow **meter** and the **density** gauge are connected with an acquisition controller via signal wires, and the multi-way valve and the electric three-way regulating valve are connected with the acquisition controller via control conducting wires. The cluster well automatic well-selecting on-line metering **device** has the advantages of eliminating influence of gas on metering precision by separating **oil** and gas at first and then metering, and simultaneously increasing metering precision.

53/96 © EPODOC / EPO

- PN - [CN201269093Y](#) Y 20090708
- PR - CN2008291181U 20081023
- AP - CN2008291181U 20081023
- DT - I
- PA - DAQING PETROLEUM ADMIN [CN]
- TI - Well-control blowout prevention early-warning apparatus
- AB - The utility model relates to a well control blowout prevention warning **device**, which mainly solves the problems that leakage false alarm, overflow and well kick are easy to happen during the **oil** field petroleum drilling well control monitoring in the prior art. The **device** is characterized in that an inlet electromagnetic flow **meter** (2) is connected between a slurry pump (1) and a vertical pipe (3); an outlet flow **meter** (6)

is connected between a water outlet (5) of a shaft (4) and a vibrating screen (7); a mud tank (8), a mud tank (10) and a mud tank (12) are respectively provided with an ultrasonic level instrument (15), an ultrasonic level instrument (11) and an ultrasonic level instrument (13); and the mud tank (8) and the mud tank (12) are respectively provided with a **density** instrument (9) and a **density** instrument (14). The **device** has the characteristic of accurate alarm for leakage and overflow, and can find the phenomena of leakage and overflow in time and effectively prevent the blowout from happening.

54/96 © EPODOC / EPO

PN - [CN201241681Y](#) Y 20090520
 PR - CN2008280336U 20080430
 AP - CN2008280336U 20080430
 DT - I
 PA - ANTON OILFIELD SERV GROUP LTD [CN]
 TI - Horizontal even acid distributing experimental apparatus
 AB - The utility model discloses a horizontal uniform acid distributing comprehensive experimental **device**, belonging to the petroleum production technical field, which is composed of two **oil** pipe sections and a casing, wherein the two **oil** pipe sections are sealed and separated by an inflatable packer and are sheathed by the casing, having a clearance therebetween, the two **oil** pipe sections and the casing are uniformly distributed with micro flow control valves, the two **oil** pipe sections are respectively mounted with a flow **meter**, the casing is mounted with two pressure meters at two ends corresponding to the two **oil** pipe sections. The horizontal uniform acid distributing comprehensive experimental **device** can simulate the heterogeneity character of oilfield reservoir and reasonably distribute the micro flow control valves on an acid distributing pipe according to the permeability of reservoir, to control the distribution **density** and aperture of the micro flow control valves, therefore, the horizontal acid distributing pipe can uniformly distribute acid and realize uniform acidification. The horizontal uniform acid distributing comprehensive experimental **device** has simple structure, practicality, actual and reliable simulation effect.

55/96 © EPODOC / EPO

PN - [CN201196083Y](#) Y 20090218
 PR - CN20082108151U 20080523
 AP - CN20082108151U 20080523
 DT - I
 PA - ANTON OIL SERVICES GROUP CO LTD [CN]
 TI - **Oil**, gas and water three-phase on-line non-separation flux measurement system
 AB - The utility model relates to an **oil**-gas-fluid online non-separation flow metering system, comprising a three-phase non-separation flow **meter**, an on-site secondary instrument and an industry control machine, wherein the three-phase non-separation flow **meter** comprises a main pipe, a venturi **device** provided on the main pipe for measuring fluid flow in the main pipe, an electrical conductivity measurement sensor provided in the main pipe for calculating the gas phase score ratio of small bubbles, **oil** phase score ratio, gas phase score ratio and fluid phase score ratio, gas flow speed and fluid flow speed, a capacitor measurement sensor provided in the main pipe for calculating gas phase score ratio of large and small bubbles, **oil** phase score ratio, gas phase score ratio, fluid phase score ratio, gas

flow speed and fluid flow speed, and a gamma **density meter** provided in the main pipe for calculating fluid **density**. The oil-gas-fluid online non-separation flow metering system can accurately measure the water content of condensate oil of a high pressure condensate gas well and realize gas well online detection, thus is practical.

56/96 © EPODOC / EPO

- PN - [CN201196082Y](#) Y 20090218
- PR - CN20082108150U 20080523
- AP - CN20082108150U 20080523
- DT - I
- PA - ANTON OIL SERVICES GROUP CO LTD [CN]
- TI - **Oil** gas water flow measurement system with automatic control apparatus
- AB - The utility model relates to an oil-gas-fluid flow metering system with an automatic control **device**, comprising a metering manifold for transmitting the mixture of **oil**, fluid and gas, a high-low pressure controller provided on the metering manifold, a three-phase non-separation flow **meter** provided on metering manifold at the back of the high-low pressure controller, a on-site secondary instrument connected with the three-phase non-separation flow **meter** for providing power for the three-phase non-separation flow **meter** and collecting the electric signals of the three-phase non-separation flow **meter** to calculate the flows of **oil**, gas and fluid, and an industrial control machine connected with the on-site secondary instrument via a communication cable for real-timely displaying and storing the flows of **oil**, fluid and gas. The three-phase non-separation flow **meter** comprises a venturi **device**, an electrical conductivity measurement sensor, a capacitor measurement sensor and a gamma **density meter**. The oil-gas-fluid flow metering system can accurately measure the water content of condensate **oil** of a high pressure condensate gas well and realize gas well online detection, thus is practical.

57/96 © EPODOC / EPO

- PN - [CN201196080Y](#) Y 20090218
- PR - CN20082108143U 20080523
- AP - CN20082108143U 20080523
- DT - I
- PA - ANTON OIL SERVICES GROUP CO LTD [CN]
- TI - Three-phase flow **meter**
- AB - The utility model relates to a three-phase flow metering **device**, comprising a main pipe for transmitting an object oil-gas-fluid mixture, a venturi **device** provided on the main pipe for measuring the fluid flow on the main pipe for measuring fluid flow in the main pipe, an electrical conductivity measurement sensor provided in the main pipe for measuring gas phase score ratio of small bubbles, **oil** phase score ratio, gas phase score ratio and fluid phase score ratio, gas flow speed and fluid flow speed, a capacitor measurement sensor provided in the main pipe for measuring gas phase score ratio of large and small bubbles, **oil** phase score ratio, gas phase score ratio, fluid phase score ratio, gas flow speed and fluid flow speed, and a gamma **density meter** provided in the main pipe for measuring the **density** of the mixture. The three-phase flow metering **device** can accurately measure the water content of condensate **oil** of a high pressure condensate gas well and realize gas well online detection, thus is practical.

58/96 © EPODOC / EPO

PN - [CN201196041Y](#) Y 20090218
PR - CN2008221992U 20080515
AP - CN2008221992U 20080515
DT - I
CCA - [Y02P90/02](#)
PA - SHENGLI OIL FIELD HAISHENG IND [CN]
TI - Automatic grouting liquid level monitoring apparatus for well drilling
AB - The utility model relates to a system **device** for monitoring and controlling the automatic grout filling, the slurry liquid level and hydrogen sulfide used for drilling engineering of industries, such as **oil**, gas, geology, salt and the like, which is combined by two parts of a mechanical structure and a monitoring part, and the monitoring part takes a computer as a core, the periphery is connected with a collecting module, a PLC processing unit, a flow totalizer and a display through an interface, wherein the collecting module is connected with an ultrasonic liquid level sensor, a hydrogen sulfide detector and a slurry **density** sensor, the PLC processing unit is connected with switching signals, the ultrasonic liquid level sensor and an upright post sensor, and an electrical flow **meter** is connected on the flow totalizer. The **device** can timely and automatically fill slurry according to the current working conditions, can timely and continuously detect the content of the hydrogen sulfide and fuel gas, the slurry intensity, the slurry gross and the slurry variable quantity, and can provide TXT, audible and visible alarming information and alarming records of the generation of well kick and well leakage. The **device** gains processing time for preventing the expanding of the well kick and the well leakage and provides reliable guarantees for the safe production.

59/96 © EPODOC / EPO

PN - [RU2006143243](#) A 20080620
PNFP - RU2344288 C2 20090120
PR - RU20060143243 20061207
AP - RU20060143243 20061207
DT - I
CCI - [E21B47/10](#)
PA - (C2)
SCHLUMBERGERTECHNOLOGYBV[NL]
TI - (C2)
METHOD OF DETERMINING PRODUCTION CAPACITY OF WELL FIELD
AB - (C2)
FIELD: physics; measurement. ^ SUBSTANCE: present invention pertains to measurement technology, and specifically to measurement of flow characteristics of liquid and/or gaseous media, and can be used for controlling streams with varying flow rate, particularly when designing control of **oil** and gas deposits by measuring production capacity of each well in a group. Flow meters are fitted in pipes carrying the product of the well and connected to a recording **device**. Signals from the flow meters are recorded. The flow meters used have accuracy of not more than 18% and sensors for measuring **density** of the well product can also be fitted. The **density** sensors are fitted if the signal from the low accuracy flow **meter** deviates by a value exceeding a preset value. ^ EFFECT: lower cost price of the system for monitoring operation parameters of a well field with increased efficiency and information

content of measurements at the same time. ^ 7 cl, 4 dwg, 1 ex

60/96 © EPODOC / EPO

PN - [CN101333925](#) A 20081231

PNFP - CN101333925B B 20130213

PR - CN20081112559 20080523

AP - CN20081112559 20080523

DT - I

PA - (A)
ANTON OIL SERVICES GROUP CO LTD [CN]

- (B)
ANTON OIL SERVICES GROUP CO LTD

TI - (A B)
Oil gas water three phase on-line inseparate flow measurement system

AB - (A)
The invention relates to an integrated **oil**-gas-water three-phase online flow measurement system which comprises an integrated three-phase flow **meter**, a site secondary instrument and an industrial control computer. The three-phase integrated flow **meter** includes a main pipe, a venturi **device** which is arranged on the main pipe and used for measuring the flow of the fluids in the main pipe, a conductivity measuring sensor which is arranged in the main pipe and used for calculating the gas phase fraction of the small gas bubble, the gas phase fractions of **oil**, gas and water, and the flow rate of the gas and liquid, a capacitance measuring sensor which is arranged in the main pipe and used for calculating the gas phase fractions of the big and small bubbles, the gas phase fractions of **oil**, gas and water, and the flow rate of gas and liquid and a Gamma densimeter which is arranged in the main pipe and used for calculating the **density** of the fluids. The integrated **oil**-gas-water three-phase online flow measurement system has the advantages of accurately measuring the water content of the condensate **oil** of the high-pressure condensate gas well, realizing the online monitoring of the **oil** gaswell and becoming more practical.

61/96 © EPODOC / EPO

PN - [CN101333924](#) A 20081231

PNFP - CN101333924B B 20130213

PR - CN20081112558 20080523

AP - CN20081112558 20080523

DT - I

PA - (A)
ANTON OIL SERVICES GROUP CO LTD [CN]

- (B)
ANTON OILFIELD SERV GROUP LTD

TI - (A B)
Oil gas water flow measurement system

AB - (A)
The invention relates to an **oil**-gas-water flow measurement system which comprises an integrated three-phase flow **meter**, a metering separator used for the three-phase separation of **oil**, gas and water, an **oil** flow **meter**, a gas flow **meter** and a water flow **meter** for the separate metering of **oil**, gas and water after the separation. The

integrated three-phase flow **meter** includes a main pipe, a venturi **device** which is arranged on the main pipe and used for measuring the flow of the fluids in the main pipe, a conductivity measuring sensor which is arranged in the main pipe and used for calculating the gas phase fraction of the small gas bubble, the gas phase fractions of **oil**, gas and water, and the flow rate of the gas and liquid, a capacitance measuring sensor which is arranged in the main pipe and used for calculating the gas phase fractions of the big and small bubbles, the gas phase fractions of **oil**, gas and water, and the flow rate of gas and liquid and a Gamma densimeter which is arranged in the main pipe and used for calculating the **density** of the fluids. The **oil**-gas-water flow measurement system has the advantages of accurately measuring the water content of the condensate **oil** of the high-pressure condensate gas well, realizing the online monitoring of the **oil** gas well and becoming more practical.

62/96 © EPODOC / EPO

- PN - [RU2336500](#) C1 20081020
- PR - RU20070104873 20070208
- AP - RU20070104873 20070208
- DT - I
- PA - OAO TEKHPRIBOR [RU]
- TI - SYSTEM OF MEASUREMENT OF COMPONENT-WISE MASS FLOW RATE OF THREE-COMPONENT FLOW OF **OIL** WELLS
- AB - FIELD: physics, measurement. ^ SUBSTANCE: invention may be used for control of **oil** wells debit. System contains two high frequency resonators installed on dielectric pipe, every of which represents short-circuited conductor in the form of meander with two mutually orthogonal inlets-outlets, short-circuited limiting and limiting-separating coils, Coriolis acceleration flow **meter** with electronic transducers of flow and **density**, pressure sensor and temperature detector, computer control unit, controlled high-frequency generator and switching **device**, controller of flow modes, the first and the second controllers of Coriolis acceleration flow **meter**, two input amplifiers, four transmitting tracks and eight dividing condensers. Relative volume content of flow components is measured on the basis of method of high-frequency probing of flow in two mutually orthogonal directions, method of autocorrelated measurement is used to measure flow rate, and Coriolis acceleration flow **meter** and calibration controllers are used for measurement of mass flow rate and **density** of controlled medium. Selection of valid calibration makes it possible to perform precise measurements of mass flow rate and medium **density** in unstable condition of non-uniform gas-liquid flow. ^ EFFECT: provision of accurate measurements of mass flow rate and **density** of medium. ^ 5 dwg

63/96 © EPODOC / EPO

- PN - [RU2007111246](#) A 20081010
- PNFP - RU2352905 C2 20090420
- PR - RU20070111246 20070327
- AP - RU20070111246 20070327
- DT - I
- PA - (C2)
GOBRAZOVATEL NOE UCHREZHDENIE [RU]
- TI - (C2)
METER OF FLUID MASS TRANSPORTED IN **OIL** PIPELINE
- AB - (C2)

FIELD: physics, measurement. ^ SUBSTANCE: invention is related to controlling and measuring equipment and may be used for measurements of mass flow of liquids transported in **oil** pipeline. **Device** comprises two sets from N reversible electroacoustic transformers, two sets from N timers, generator, two amplifiers of high-frequency electric oscillations, four demultiplexers, demultiplexer - decoder "one of 2", four multiplexers, electronic key, two microcomputers. **Device** is also equipped with meters of **density** and temperature of **oil** and **meter** of **oil** pressure in pipeline. ^ EFFECT: higher accuracy of liquid mass measurement due to account of correction for deformation of pipeline cross section stipulated by action of temperature and pressure. ^ 2 dwg

64/96 © EPODOC / EPO

- PN - [US2006131033](#) A1 20060622
- PNFP - US7296633 B2 20071120
- PR - US20040013863 20041216
- AP - US20040013863 20041216
- DT - **
- CT - || STSE (B2)
[US4109725](#) A 19780829 [] (HALLIBURTON CO)
[US4134454](#) A 19790116 [] (OTIS ENG CO)
[US4576235](#) A 19860318 [] (S & B ENGINEERS [US])
[US4611974](#) A 19860916 [] (HOLLAND JOHN H)
[US5676208](#) A 19971014 [] (HALLIBURTON CO [US])
[US6059038](#) A 20000509 [] (HALLIBURTON ENERGY SERV INC [US])
[US6422317](#) B1 20020723 [] (HALLIBURTON ENERGY SERV INC [US])
[US6883613](#) B2 20050426 [] (WEATHERFORD LAMB [US])
[US7059401](#) B2 20060613 [] (WEATHERFORD LAMB [US])
[US2004154806](#) A1 20040812 [] (WEATHERFORD LAMB [US])
[US2005189106](#) A1 20050901 [] (WEATHERFORD LAMB)
[US2006070744](#) A1 20060406 [] (WEATHERFORD LAMB)
[US2006131033](#) A1 20060622 [] (BODE JEFFREY [US], et al)
- || R141 (A1)
[US4134454](#) A [];
[US4576235](#) A [];
[US6883613](#) B2 [];
[US2006070744](#) A1 [];
[US6059038](#) A [];
[US7059401](#) B2 [];
[US6422317](#) B1 [];
[US4109725](#) A [];
[US2004154806](#) A1 [];
[US4611974](#) A [];
[US2005189106](#) A1 [];
[US5676208](#) A [];
[US6371210](#) B1 [];
[US6644412](#) B2 []
- CCI - [E21B34/08](#) ; [E21B43/08](#) ; [E21B43/12](#)
- PA - (B2)
WEATHERFORD LAMB [US]
- TI - (A1 B2)
Flow control apparatus for use in a wellbore

- AB - (A1)
Methods and apparatus for use in a wellbore to **meter** and choke certain components from being produced, based upon their **density** relative to the **density** of **oil** are disclosed. The **device** includes an inner tubular body portion having apertures in the wall thereof for passing **oil**, an outer tubular body and at least one metering orifice therebetween to **meter** production. Disposed around the inner body is an axially movable member to selectively cover and expose the apertures of the inner body, thereby permitting fluid to flow therethrough.
- (B2)
Methods and apparatus for use in a wellbore to **meter** and choke certain components from being produced, based upon their **density** relative to the **density** of **oil** are described herein. The **device** includes an inner tubular body portion having apertures in the wall thereof for passing **oil**, an outer tubular body and at least one metering orifice therebetween to **meter** production. Disposed around the inner body is an axially movable member to selectively cover and expose the apertures of the inner body, thereby permitting fluid to flow therethrough.

65/96 © EPODOC / EPO

- PN - [RU2331058](#) C1 20080810
- PR - RU20070111780 20070402
- AP - RU20070111780 20070402
- DT - I
- PA - GOU VPO SARATOVSKIY GU IM N G [RU]
- TI - METHOD OF EVALUATION OF BENZINE OCTANE NUMBER AND **DEVICE** FOR APPLICATION OF THIS METHOD
- AB - FIELD: **oil** and gas industry. ^ SUBSTANCE: invention can be used in **oil** processing industry. According to the suggested method a cuvette is probed with an optical beam of a distant ultra violet or violet radiation with a wave length in the range of $370 \leq \lambda \leq 420$ nm, then intensity of radiation passed through an empty cuvette and the cuvette filled with analysed benzene is measured, optical **density** is calculated from the ratio, and octane number is determined with a calibration curve, uniting values of benzene optical **density** or absorption coefficient with a corresponding value of benzene octane number. Also there is suggested a **device** for evaluation of benzene octane number; the said **device** contains an optical irradiator, an optical beam generator, a probed cuvette with benzene, a detector of passed optic radiation, a **meter** for intensity of passed optic radiation at the outlet of the cuvette, and a detector of absorption coefficient on the base of an analog digital converter and a processor. As an irradiator, a light emitting diode or laser diode is taken with a wave length of $370 \leq \lambda \leq 420$ nm, and injection current source for diode supply is made with a built-in current modulator. The invention facilitates on-line control of benzene octane number, simplicity of analysis of measurement results and upgraded accuracy, compactness and mobility of inexpensive and explosion-proof **device**. ^ EFFECT: making a **device** for on-line control of benzene octane number. ^ 2 cl, 3 dwg

66/96 © EPODOC / EPO

- PN - [WO2007133120](#) A2 20071122
- PNFP - WO2007133120 A3 20080502
- PR - RU20060116762 20060515
- AP - WO2007RU00235 20070514

DT - *; Rep

CT - |RU| ISR (A3)
[SU1687577](#) A1 19911030 [A] (INZH TS TRUBOPROVOD [SU]);
[SU1386223](#) A1 19880407 [A] (PEREYASLOVA GALINA A [SU], et al);
[US5132010](#) A 19920721 [A] (OSSENKOP WILHELM [DE])

CCI - [B01D17/0208](#) ; [B03D1/1406](#) ; [B03D1/1412](#) ; [B03D1/26](#)

PA - (A2 A3)
 POGADAEV EVGENIJ ANATOLJEVICH [RU]

TI - (A2 A3)
DEVICE FOR CONTINUOUSLY SEPARATING TWO FLUIDS HAVING DIFFERENT DENSITIES

AB - (A2 A3)
 The invention relates to devices for separating mixtures of fluids having different densities, mainly for separating water and petroleum products, and can be used in the petroleum-refining and petrochemical industries and in painting and galvanic process for separating water-oil emulsions and degreasing solutions. The inventive **device** makes it possible to simplify the structural design, to improve the quality and to increase the performance of cleaning of fluids having different densities. The **device** for continuously separating two fluids having different densities comprises a container provided with a lid and a supplying line and drain pipes which are connected thereto and disposed on the opposite sides thereof, lower vertical continuous baffles fixed to the container bottom and overflow launders for evacuating the top layer of a fluid outside the baffles. The lid of the container is embodied in such a way that it is removable and is provided with top continuous baffles which are fixed to the internal surface thereof and are connected to said overflow launders, a gas line, which is provided with nozzles and whose end surface is arranged between the end surfaces of the container top and lower baffles, is places therebetween and a lever **meter** for the fluid having a smaller **density** is mounted between each adjacent pair of the lower baffles.

67/96 © EPODOC / EPO

PN - [RU2300429](#) C1 20070610

PR - RU20060127024 20060725

AP - RU20060127024 20060725

DT - I

PA - VISHNJAKOV VLADIMIR PETROVICH [RU]

TI - METHOD OF CLEANING DIRTYING FROM SURFACES OF ELECTRICAL MACHINES

AB - FIELD: electrical industry; methods of cleaning. ^ SUBSTANCE: method can be used for cleaning dirtying from surfaces of electrical machines, which machines have as metal surfaces and surfaces with temperature-resistant insulation. Mixture of air and solid particles of carbon dioxide is prepared and ready airflow is directed onto surfaces of electrical machines at **density** of flow of 0,3-0,6 kilos of carbon dioxide for 1 cubic **meter** of air and at discharge of supplied airflow of 2,8-3,5 cubic meters per minute. Solid particles of dioxide are taken at temperature of -78,2 to - 90 degrees Celsius. Surfaces cover with temperature-sensitive insulation is cleaned at sizes of particles of carbon dioxide of 1,2-1,7 mm in airflow and under pressure of 4,5-5,5 atmospheres. Metal surfaces are subject to cleaning at sizes of particles of carbon dioxide being equal to 1,2-3,0 mm in airflow and under pressure of 6,0-6,5 atmospheres. Air mixture flow is supplied into nozzle **device** along single hose. Method provides express cleaning of dirtying like **oil**, dust, soot, copper plaques and copper dust. Drying of isolation and metal surfaces of equipment is excluded which

helps to restore serviceability of electrical machines in total and to prolong their service life. ^ EFFECT: improved efficiency of cleaning; reduced risk of surface voltage onto insulation.

68/96 © EPODOC / EPO

PN - [RU2307930](#) C1 20071010
 PR - RU20060106372 20060301
 AP - RU20060106372 20060301
 DT - I
 PA - PIK I KO AOZT [RU]
 TI - **DEVICE FOR MEASURING OIL, GAS AND WATER DEBIT OF OIL WELLS**
 AB - FIELD: measuring equipment, possible use for measuring **oil**, gas and water debit of **oil** wells, and also for calibration (verification) of measuring devices. ^
 SUBSTANCE: the **device** contains separator in form of cylindrical vessel with cyclone, sedimentation and outlet sections, separated from each other by walls, two level meters positioned in sedimentation section, a cyclone mounted at the entrance of cyclone section, measuring lines for gas and liquid with sensors of pressure and temperature and pipeline binding positioned inside, hardware block. The **device** is provided with two semi-trailers, liquid heating unit in cyclone section, compressor and pumping **device** with frequency motors, injector and electric power equipment. Separator is made horizontally oriented. The wall between cyclone and sedimentation sections is made in form of a set of pipes. The wall between sedimentation and outlet sections is made in form of overflow wall. Measuring line for liquid is made in form of water measuring line and **oil** measuring line, combined at the exit into outlet pipeline for **oil**-gas mixture, mounted serially on which are pumping **device** and injector with a unit for connection of gas measuring line. Compressor with frequency drive is mounted in gas measuring line. Positioned on one of semi-trailers are separator, measuring line, pipeline binding and hardware block, and on another one - outlet pipeline, pumping **device**, injector, compressor, and electric power equipment. Installed serially in water measuring line are **density meter**, **device** for measuring **oil** content in water, automatic and manual sampling apparatuses, binding for connection of free gas content measuring **device**, turbine flow **meter**, temperature and pressure sensors and an adjusting valve. Installed serially in **oil** measuring line are **density meter**, **device** for measuring content of water in **oil**, manual and automatic sample apparatuses, binding for connection of free gas detection plant, turbine flow **meter**, pressure and temperature sensors and an adjusting valve. Installed serially in gas measuring line are pressure sensors, **device** for measuring liquid drops, manual sampling apparatus, mass flow **meter** and adjusting valve. ^ EFFECT: increased degree of separation of **oil**-gas mixture onto different phases - gas, water and **oil**, reduced layer between these substances in separator after division, ensured mobility of **device**. ^ 10 cl, 1 dwg

69/96 © EPODOC / EPO

PN - [RU2285119](#) C1 20061010
 PR - RU20050106517 20050309
 AP - RU20050106517 20050309
 DT - I
 PA - LUK JANOV EHDUARD EVGEN EVICH [RU]; NPP GEOFIZICHESKOJ APPARATURY [RU]
 TI - **SYSTEM FOR MEASURING FLOW AND PROPERTIES OF DRILLING AND CEMENTING AGENT**
 AB - FIELD: measuring equipment engineering, possible use for measuring flow and

properties of solutions, in particular, in **oil**-gas extractive industry for controlling flow and properties of drilling and cementing agent during drilling of wells and their cementing. ^ SUBSTANCE: system contains indicators of pressure and temperature, **device** for measuring **density** of solution, **device** for measuring conductivity of solution, computing **device**, information display. Indicators of pressure and temperature, **device** for measuring solution **density**, solution conductivity **meter** and computing **device** are positioned in compact manner within one measuring module, installed in main pipeline; measuring module contains additionally **device** for measuring pressure drop on narrowing **device**, solution **density meter** is made in form of two-probe gamma **density meter** with low-background source of gamma-radiation, computing **device** provides, in accordance to given algorithm, for determining and computation of volumetric flow of solution, of mass flow of solution, of solution **density**, of electric conductivity or mineralization of solution, of solution temperature, of system pressure, content of solid phase in solution, well hydraulic losses coefficient; measuring module via information cable is connected to information display for controlling the process of drilling or cementing. ^ EFFECT: increased parameters being measured, increased reliability of system operation and decreased costs of same. ^ 9 cl, 2 dwg

70/96 © EPODOC / EPO

PN - [RU2004100877](#) A 20050620

PNFP - RU2270472 C2 20060220

PR - RU20040100877 20040115

AP - RU20040100877 20040115

DT - I

TI - (C2)

METHOD FOR CONTROLLING OILS COMPOUNDING PROCESS WITH SEVERAL QUALITY PARAMETERS AND SYSTEM FOR REALIZATION OF SAID METHOD

AB - (C2)

FIELD: engineering of means for automation of **oil** transportation process along different pipelines with different quality of **oil** and joining **oil** flows with control over quality parameters of **oil** mixture. ^ SUBSTANCE: in the method for controlling **oil** compounding process, flow values for transported **oil** flows are measured and also flow of mixed **oil** flow, content in transported flows and in mixed **oil** flow of sulfur and/or water is determined, relations of aforementioned contents in each of transported flows are determined and in mixed flow and relations of losses of each of transported flows and mixed flow and these relations are compared to given values, if all relations of flows correspond to given values and in case of deviation of relation of aforementioned contents for at least one transported flow **oil** flow is adjusted for appropriate flow, process for determining sulfur and/or water content in each of transported flows is performed by measuring **density** of **oil** in appropriate flow with consideration of correlation dependency between **density** and content of aperture component. System for controlling **oil** compounding process having , mounted in each **oil** pipe for transporting **oil**, flow **meter**, **oil density meter** and means for adjusting **oil** flow, mounted in **oil** pipe for mixed flow, **oil flow meter**, sulfur and/or water content **meter**, and also calculating **device** for coefficients of relation of **oil** flows in each transported flow and in mixed flow and/or **device** for calculating coefficients of relation of water contents in **oil** for each transported flow and in mixed flow, inputs of first of aforementioned calculating devices are connected to flow meters, and outputs of each one of aforementioned calculating devices are connected to appropriate inputs of comparison block, outputs of which are connected to means for adjusting **oil** flow, is provided with **device** for calculating

sulfur content and/or **device** for calculating water content in **oil**, made with possible calculating of content of appropriate component with consideration of correlation dependency between **oil density** and content of aforementioned component, inputs of each of calculating devices are connected to **oil density** meters of transported flows, and outputs are connected to appropriate inputs of appropriate **device** for calculating relation coefficients. ^ EFFECT: increased efficiency. ^ 2 cl, 1 dwg, 3 tbl

71/96 © EPODOC / EPO

PN - [RU94027482](#) A 19970427

PNFP - RU2085726 C1 19970727

PR - RU19940027482 19940719

AP - RU19940027482 19940719

DT - I

PA - (A)
VOLCHENKO JU A
- (C1)
VOLCHENKO YURIJ A [SU]

TI - (A)
DEVICE FOR SIMULTANEOUS MEASUREMENTS OF DRILLING LIQUID PARAMETERS
- (C1)
DEVICE FOR SIMULTANEOUS MEASURING OF DRILL MUD PARAMETERS

AB - (A)
FIELD: **oil** and gas industry. SUBSTANCE: this relates to measuring parameters directly in process of drilling gas and **oil** holes with practically required accuracy. **Device** has sensors installed in measuring pipeline connected with trough, and among them: temperature sensor, gamma-ray **density** sensor, electromagnetic flow-rate **meter**, and additional neutron-type level sensor installed on trough upflow of measuring pipeline. Outputs of all sensors are connected with inputs of switching unit with its output connected with input of microcomputer. Located between source and detector of neutron-type level sensor is layer of material absorbing slow neutrons. EFFECT: high efficiency. 2 cl, 3 dwg

72/96 © EPODOC / EPO

PN - [JP2001215145](#) A 20010810

PNFP - JP4113647B B2 20080709

PR - JP20000023046 20000131

AP - JP20000023046 20000131

DT - I

FI - G01F25/00&C; G06F13/00&530A

PA - (A)
TOKIKO TECHNO KK

TI - (A)
FLOWMETER CALIBRATION SYSTEM

AB - (A)
PROBLEM TO BE SOLVED: To precisely calibrate a flowmeter which measures the flow rate of an **oil** liquid. SOLUTION: The flowmeter calibration system 10 is constituted of a storage tank 12. The calibration system is constituted of an **oil**-liquid supply line 14 which supplies the **oil** liquid in the storage tank 12. The calibration system is constituted of a bypass line 16 which is branched from the **oil**-liquid supply line 14.

The calibration system is constituted of a **density meter** 18 which is attached to the bypass line 16. The calibration system is constituted of a commutation **device** 20 which distributes the **oil** liquid flowing into from the **oil**-liquid supply line 14. The calibration system is constituted of a metering tank 22 which meters the **oil** liquid supplied from the commutation **device** 20. The calibration system is constituted of a collection tank 24 for circulation, which stores the **oil** liquid supplied from the commutation **device** 20 at a time when a measurement is not performed. The calibration system is constituted of a weight mechanism 26 which is suspended from the metering tank 22. The calibration system is constituted of a reference balance 28 which measures the mass of the **oil** liquid stored in the metering tank 22. One end of the bypass line 16 is branched so as to be connected to the **oil**-liquid supply line 14 formed between a first pump 30 and the flowmeter 34, and the other end is opened to the air inside the collection tank 24 for circulation. Weight plates 581 to 58n are removed one by one so as to correspond to the flow rate of the **oil** liquid supplied to the metering tank 22 so that a change in a load acting on the reference balance 28 can be reduced.

73/96 © EPODOC / EPO

PN - [JPH09101824](#) A 19970415
 PR - JP19950261538 19951009
 AP - JP19950261538 19951009
 DT - I
 FI - G01N9/18&Z; G05D9/00&A
 FT - 5H309/AA02; 5H309/BB01; 5H309/BB09; 5H309/BB18; 5H309/CC09; 5H309/DD08; 5H309/DD12; 5H309/DD24; 5H309/DD27; 5H309/EE05; 5H309/FF01; 5H309/GG04; 5H309/GG06; 5H309/HH21; 5H309/JJ06
 PA - IDEMITSU KOSAN CO; YOKOGAWA ELECTRIC CORP
 TI - METHOD FOR CONTROLLING LIQUID LEVEL OF SALTING **DEVICE**
 AB - PROBLEM TO BE SOLVED: To provide a desalting **device** liquid face controlling method capable of solving problems such as the variation of operation by correcting the indication error of a floating type liquid-level **meter** arranged in a desalting **device** even when an **oil** sort is changed by the switching of crude **oil**.
 SOLUTION: In the method for arranging floating type liquid-level meters 31, 41 for detecting the liquid level of a water layer in desalting **device** 11, 12 for desalting crude **oil** under the existence of water and separating the crude **oil** into a water layer including minerals and an **oil** layer, and controlling the liquid level of the water layer based upon the indication values of the liquid-level meters 31, 41, the **density** of a mixed solution consisting of crude **oil** and water which is supplied to each desalting **device** is measured by a densitometer 24, the indication values of the meters 31, 41 are corrected based upon the measured **density** of the mixed liquid and the liquid level of the water layer is controlled based upon each corrected value.

74/96 © EPODOC / EPO

PN - [JPS63126214](#) A 19880530
 PNFP - JPH0381296B B2 19911227
 PR - JP19870123561 19870520
 AP - JP19870123561 19870520
 DT - I
 CCA - [Y02E10/50](#)

FI - H01L21/205; H01L31/04&V; H01L31/04&X

FT - 5F045/AA03; 5F045/AB02; 5F045/AC01; 5F045/AC02; 5F045/AC15; 5F045/AC16; 5F045/AC17; 5F045/AC19; 5F045/AF07; 5F045/CA09; 5F045/DA06; 5F045/DA09; 5F051/AA03; 5F051/AA04; 5F051/AA05; 5F051/AA16; 5F051/CA07; 5F051/CA08; 5F051/CA15; 5F051/CA24; 5F051/CA34; 5F051/CA35; 5F051/CA36; 5F051/CA37; 5F051/DA04; 5F051/GA03; 5F151/AA03; 5F151/AA04; 5F151/AA05; 5F151/AA16; 5F151/CA07; 5F151/CA08; 5F151/CA15; 5F151/CA24; 5F151/CA34; 5F151/CA35; 5F151/CA36; 5F151/CA37; 5F151/DA04; 5F151/GA03

PA - (A)
AGENCY IND SCIENCE TECHN; TOA NENRYO KOGYO KK

TI - (A)
MANUFACTURE OF SILICON THIN FILM

AB - (A)
PURPOSE:To obtain a silicon thin film containing fluorine and hydrogen in a highly efficient manner by a method wherein, using SiF₄-SiH₄ mixed gas, fluorine and hydrogen are introduced while the film is being formed by maintaining electric discharge stably at low gas pressure and low power **density**. CONSTITUTION:The entire **device** including a mixing container 1 is evacuated to the degree of vacuum of 10<-6> torr using an **oil**-sealed rotary vacuum pump 2 and an **oil** diffusion pump 3. Gas is introduced into the container 1 at the prescribed rate from an SiF₄ cylinder 4 and an SiH₄ cylinder 5, and the gas is mixed. The mixed gas is introduced into a vacuum container 9 at a constant flow rate through a flow **meter** 8. The necessary pressure is maintained while the degree of vacuum inside the container 9 is being monitored using a vacuum gauge 11 by operating a main valve 10. Voltage is applied between electrodes 13 and 13' by a high frequency oscillator 12 and a glow discharge is performed as a result, a silicon thin film containing fluorine and hydrogen is formed on a substrate 15.

75/96 © EPODOC / EPO

PN - [JPH07285599](#) A 19951031

PNFP - JP3019133B B2 20000313

PR - JP19940095922 19940408

AP - JP19940095922 19940408

DT - I

FI - B67D5/32&C; B67D7/32&C

FT - 3E083/AA06; 3E083/AC19; 3E083/AC23; 3E083/AD13; 3E083/AD15; 3E083/AG11

PA - (A)
TATSUNO CO LTD

TI - (A)
SUSPENSION TYPE **OIL** FEEDER

AB - (A)
PURPOSE:To simply indicate a result of judging a kind of **oil** by indicating a result of judging a kind of **oil** by a symbol mark adjacently to an **oil** feed amount display means. CONSTITUTION:A fuel in an **oil** storage tank is drawn up by a pump 8 driven by a motor 5 through an **oil** feed tube 6 and measured by a flow **meter** . The measured data is transmitted from a flow rate pulse transmitter 9 to a control means 11. The fuel is further fed to a rising/lowering **device** 2 provided upward of an **oil** feed area to reach an **oil** feed nozzle 20 through a hose 21 hung down from the rising/lowering **device** 2. An operator operates the **oil** feed nozzle 20 to replenish a fuel tank of a motorcar. At this time, an **oil** kind sensor 28 is provided in the **oil** feed

nozzle 20, and a judgement level signal based on a vapor **density** in the tank or the like is transmitted to the controller 11. The controller 11 judges a kind of **oil** on the basis of the level signal as well as calculates an **oil** feed amount based on the measured flow rate data. On a display 12, a kind of **oil** is indicated by a symbol mark in an **oil** kind judgement result display means 14 together with an **oil** feed amount.

76/96 © EPODOC / EPO

- PN - [JPH01252979](#) A 19891009
- PNFP - JP2703922B B2 19980126
- PR - JP19880080015 19880331
- AP - JP19880080015 19880331
- DT - I
- CT - || STSE (A)
[JPS57165866](#) A 19821013 [] (TOKYO SHIBAURA ELECTRIC CO);
[JPS54115245](#) A 19790907 [] (RICOH KK);
[JPS57181569](#) A 19821109 [] (RICOH KK)
- FI - G03G15/08; G03G15/08&235; G03G15/08&501D
- FT - 2H077/AD06; 2H077/AE04; 2H077/FA13; 2H077/FA22; 2H077/FA25
- PA - (A)
TOSHIBA CORP; TOKYO ELECTRIC CO LTD
- TI - (A)
DEVELOPING **DEVICE**
- AB - (A)
PURPOSE:To attain a high definition image with use of one-component containing developer by providing a specific conductive layer and a specific elastic body layer to a developing roller. CONSTITUTION:The developing roller is provided with the conductive layer 4 mainly constituted of polyurethane resin and is >10<10>OMEGA.cm in resistant value on a periphery, and the elastic body layer 3 constituted of **oil** resistance rubber >40 deg. inside the layer, preferably 35 deg. in hardness measured by a JIS K6301 A type hardness **meter** , and >10<10>OMEGA.cm in resistant value. For the **oil** resistant rubber, NBR (acrylonitrile butadiene rubber) or 'Neoprene(R)' (chloroprene rubber) are suitable. The high definition image without **density** unevenness nor base fogging is thus obtained, therefore, an one-component containing devel oping **device** without the occurrence of deterioration in image quality even in a long period use is available.

77/96 © EPODOC / EPO

- PN - [JPS54150714](#) A 19791127
- PR - JP19780059669 19780519
- AP - JP19780059669 19780519
- DT - I
- FI - F17D5/02; G01M3/04&M
- FT - 2G067/AA12; 2G067/AA15; 2G067/AA16; 2G067/AA17; 2G067/BB11; 2G067/BB25; 2G067/CC02; 2G067/CC03; 2G067/DD17; 2G067/DD18; 3J071/AA13; 3J071/BB11; 3J071/CC06; 3J071/CC25; 3J071/DD36; 3J071/EE28; 3J071/EE37; 3J071/FF02
- PA - MITSUBISHI HEAVY IND LTD
- TI - TRANSPORT PIPE
- AB - PURPOSE:To discover early a damage to a transport pipe, by providing an opening

part around the pipe, providing a cover around it so as to prevent the diffusion of a leakage from the pipe, and further by providing a **device** to detect a leakage into the opening part. CONSTITUTION: On both ends of pipe proper 4 are provided flanges 7 to seal the pipe. By means of pump 8, sea water is poured from an inlet provided at the flange on one end into opening part 9 between pipe proper 4 and flexible hose 5 inserted into pipe proper 4. The **density** of the **oil** content in opening part 9 is monitored at all times by precision **oil** content **density meter** 10 provided at the flange on the other end. By operating the inspection of the **oil** content in the sea water inside opening part 9 by means of the **oil** content **density meter**, it is possible to discover an **oil** leakage early and take the necessary measure. Further, even if **oil** is leaked from flexible hose 5, it is not diffused outside pipe proper 4. This insures a double- safety measure.

78/96 © EPODOC / EPO

- PN - [GB2335494](#) A 19990922
- PR - GB19980005626 19980316
- AP - GB19980005626 19980316
- DT - *
- CT - [GB2186981](#) A []; [EP0749004](#) A1 [];
[US4403514](#) A []
- CCI - [G01F1/44](#)
- PA - ABB SEATECLTD [GB]
- TI - Venturi Flow **Meter**
- AB - A Venturi flow **meter** comprises generally an inlet section 1, a divergent cone 2, a mixer section 3, a convergent cone 4 and an outlet section 5. The divergent cone 2 provides a gradual progression from the circular cross-section of the inlet section 1 to an elliptical cross-section of a larger cross-sectional area than the inlet section 1. The mixer section 3 maintains this elliptical cross-section for the whole of its length. The convergent cone 4 provides a shallow progression from the elliptical cross-section of the mixer section 3 to the circular cross-section of the outlet section 5. This feature makes the flow **meter** particularly suitable for use in **oil** production tubing in locations where there is limited space, such as within a borehole. By locating a channel 8 and a channel 13 at positions where fully developed flow would be experienced under usual flow conditions, measurement transducers 10 and 12 will experience substantially constant static pressures. Electronic flow measurement means 14 comprises means to detect the pressure differential between the first position and the second position and means to derive from this pressure differential a measurement of the flow rate of a fluid through the insert. This is achieved by applying Bernoulli's equation to the detected pressure differential having regard to the **density** of the fluid and the known internal dimensions of the insert. The **device** is arranged such that the inlet and outlet sections are inserted in sections of well casing, whilst the middle section is located against the walls of the borehole.

79/96 © EPODOC / EPO

- PN - [GB2286686](#) A 19950823
- PNFP - GB2286686 B 19971217
- PR - GB19940002544 19940210
- AP - GB19940002544 19940210
- DT - *

CT - (A B)
[GB1179566](#) A []; [SU714232](#) A1 [];
[US3853006](#) A []

CCI - [G01N9/18](#) ; [G01N9/26](#) ; [G01N9/36](#) ; [G01N33/2823](#)

PA - (A B)
 ATHERTON ERIC JOHN [GB]

TI - (A B)
 Fluid **density** measurement

AB - (A)
 A **device** for measuring the **density** of a subject fluid 13 flowing in a well bore 11 comprises a sealed container constituted by a tube 14 and two bellows 17, 19 containing a working fluid column made up of two fluids 21, 22 of different densities (e.g. **oil** and water) providing an interface C. Insulated plates 23, 24 within the tube form an electrical capacitor and are connected to a **meter** 25. The position of the interface C will change with changes in the **density** of the subject fluid 13, and will thus change the output of the capacitor. The **device** may be installed in a protective housing provided with ports so that at the bellows the subject fluid may be flowing at a minimal velocity. <IMAGE>

80/96 © EPODOC / EPO

PN - [GB1270320](#) A 19720412

PR - US19680765219 19681004

AP - GB19690045005 19690911

DT - **

CCI - [G01N9/06](#)

PA - BYRON JACKSON INC [US]

TI - **DENSITY METER**

AB - 1,270,320. Measuring liquid **density**. BYRON JACKSON Inc. Sept. 11, 1969 [Oct. 4, 1968], No.45005/69. Heading G1S. A fluid whose **density** is to be measured is circulated through a U tube 21 pivoted on hinges 27, Figs. 1, 2, and provided with flexible seals and couplings 34. An actuator 39 adjustably movable on a base rail 15, Fig. 3, counterbalances the unladen weight of the U tube, and a second **device** in the form of a load cell 41, Fig. 4, is a force balance mechanism that restores the U tube to its neutral position V provides a signal that is related to the variations in the weight of the tube V the **density** of the liquid therein. The actuator 39, Fig. 3, has an **oil** filled bellows 48 provided with a damping spring which exerts a force on an arm 58 and the U tube 21 when air-pressure is applied to the surface of **oil** in a reservoir 44. The air is supplied via a conduit 46 and pressure regulators 112, 118, Fig. 1, so that the **oil** in the reservoir 44 and bellows 48 is pressurized via **oil** filled ducts 62, 63, 64. The actuator is initially set and zeroized so that the empty U tube is counterbalanced with a tang portion 119, Fig. 2, positioned midway between a pad 123 and a movable conical locking head 126. The load cell 41, Fig. 4 which is also movable along the rail 15, has an air supply conduit 77 and an air line 84 leading to an airpressure gauge 116. The air-pressure in the chamber 82 registered by the gauge 116 is proportional to the **density** of the liquid flowing in the U tube. Variation of the **density** of the liquid being measured causes movement of a piston 85 attached to the U tube and movement of a dumb-bell shaped valve 105. This valve controls the supply of air to the signal line 84 via conduit 77 and may also allow the air in chamber 82 to escape through ducts 94, 95 to the atmosphere. Eventually the piston 85 is restored to its neutral position and the resultant pressure in the chamber 82

registered as a **density** on the gauge 116.

81/96 © EPODOC / EPO

- PN - [GB1010448](#) A 19651117
- PR - GB19600038893 19601111
- AP - GB19600038893 19601111
- DT - **
- CCI - [B01F15/0408](#) ; [G05D11/132](#)
- CCA - [Y10T137/2499](#)
- PA - MOBIL OIL COMPANY LTD
- TI - Improved blending apparatus
- AB - 1,010,448. Mixing liquids in flow. MOBIL **OIL** CO. Ltd. Nov. 10, 1961 [Nov. 11, 1960], No. 38893/60. Heading B1C. In a system for blending liquid there is a positive displacement pump for each fluid, at least one of which is driven through variable speed gears controlled by a **device** responsive to a property of the mixture whereby the ratio of the constituents is kept constant ; and an overriding variable speed gearbox adjusts the speed of all the pumps under control of a flowmeter at the outlet of the mixture. As shown in an apparatus for blending oils, pumps 2a, 2b draw the constituents from pipes 1a, 1b and discharge them through pipes 4a, 4b to a mixing chamber 8 and outlet 3. The pumps 2a, 2b are driven by a motor 9 through fixed ratio gears 11 and gearboxes 12, 13 of which the box 12 is variable and controlled through a connection 15 by a **device** 14 (which may be a viscosity **meter** , **density meter** , colorimeter or Geiger counter) connected to the outlet pipe 3. In the event of the flow rate of the mixture being altered by adjustment of the outlet valve 26, the flowmeter 16 acting through the connection 17 alters the setting of the over-riding variable speed gearbox 10 to vary the speed of both pumps 2a, 2b while maintaining the ratio of their speeds unchanged. A dangerous rise in back pressure due to sudden closure of the valve 26 is obviated by the relief by-pass valves 27a, 27b. Automatic variable orifices 18a, 18b equalize the input pressure of the constituents. Specification 916,493 is referred to.

82/96 © EPODOC / EPO

- PN - [GB735184](#) A 19550817
- PR - US19500177418 19500803
- AP - GB19510018439 19510803
- DT - *
- CCI - [A21C1/003](#) ; [A21C1/00](#) ; [A21D8/00](#)
- PA - WALLACE AND TIERNAN PROCESS CO
- TI - Manufacture of dough and baked products
- AB - 735,184. Mixing appliances. WALLACE & TIERNAN PROCESS CO. Aug. 3, 1951 [Aug. 3, 1950], No. 18439/51. Class 86. [Also in Groups V and VI] In an apparatus for producing a fully developed dough, dry ingredients, namely flour from feeders 21, 22, Fig. 1A, and sugar, salt and powdered milk from feeders 23, 24, 25 respectively, are fed to a main inlet hopper 20, Fig. 1B, which delivers them to a pre-mixing and degassing unit 30, Fig. 2, where they are joined by broth, premelted shortening and one or more improving agents in solution from feeding devices 34, 35, 36 respectively. The premixed dough is discharged from unit 30 to a dough pump 32 which advances it into and through a closed developer 40, Fig. 1B, provided with power-driven mixing elements. All the driving elements of the apparatus may be

subject to remote control, e.g. by means of regulators on a panel 50, Figs. 1B and 9, which would normally be set to obtain a substantially continuous flow of dough to the developer and, while the feeding devices can be operated in exact correspondence with the dough pump, additional means may be provided for controlling the feeders to correct overloading or underloading of the premixer.

Ingredient feeders. The flour feeders, which may vary in number, each comprise a hopper such as 52, Fig. 1A, and a motor-driven endless conveyer having its centre forming part of or resting on a platform or balance mechanism whereby the weight of the flour can be counterbalanced by a scale beam and counterpoise 58, 59, which may be adapted to regulate a valve or gate between the hopper and the belt. The feeders 23, 24, 25, which are driven by electric motors 78, 84, 85 respectively, may be screw feeders as described in Specification 653,622, [Group XXX], or the feeder 23 may be like the flour feeders. The broth feeder 34 comprises a tank 97 having a thermostatically controlled water jacket 98 for controlling the temperature of the fermented liquor, which is fed to a spray inlet 108, Fig. 2, in the pre-mixing chamber 30 by a motor-driven pump 106 and pipe 107. Normally the broth is stirred by a motor-driven stirring **device**. Shortening material, e.g. lard or hydrogenated vegetable **oil**, and one or more improving agents are similarly fed to the premixing unit 30 through nozzles 122, 130 from containers 115, 126, the shortening material being kept molten in its container by thermostatically controlled heating means.

Pre-mixing. The pre-mixing unit 30 comprises an open topped vessel 95 traversed by two parallel motor-driven shafts 143, 144 having angularly disposed interfitting blades 173 which mix and advance the dough mixture from the ingredient feeding end towards a baffle 176 and an outlet spout 142 leading to a pump 32, the early part of the pre-mixing causing a substantial amount of gas (chiefly air) to be released from the mixture and a substantially uniform high-**density** dough to be delivered to the spout 142. By displacing the ingredient inlet spouts and nozzles collectively towards the outlet end of the pre-mixer the dough may be left with a higher content of gas.

Supplementary control of the feeding means and of the loading of the pre-mixing vessel 95 is obtained by supporting the whole of the pre-mixing unit, together with a platform 168 for the driving motor 160, on frame members 171, 172, Figs. 1B and 3B, which are pivoted on brackets 187, 188 on the main frame so that the vessel can rock with variations in loading and thereby influence a weightsensitive **device** extending between a fixed support and the underside of a platform 192 connecting members 171, 172. When the weight of the contents of vessel 95 decreases or increases the platform 192 rises or falls and moves a switch arm 198 to effect acceleration or deceleration of the ingredient feeding devices. A dash pot 204 may be provided to damp fluctuations.

Developing. The dough from the unit 30 is advanced to the developer 40, by way of conduit 227 and preferably under pressure, by means of interfitting rotors 214, 215, Figs. 2 and 3, which are driven by a variable-speed motor 218, the conduit 227 having a thermometer 228 and a pressure gauge 229 with their sensitive elements exposed to the passing dough. The developer, Figs. 4 and 5, comprises a body 230 enclosing an upright oval chamber 232 closed top and bottom and having inlet and outlet ports 240, 239 respectively. Within the developer are two mixer elements 242, 243, Fig. 5, each provided with solid blades arranged to swing past those of the other on counter rotation of their supporting shafts 224, 245 which have intermeshing gears 246, 247 and are driven through bevel gearing by an electric motor 42, Fig. 1B. The developer has a pressure gauge 259 and a thermometer near its outlet 237 to record the condition of the dough about to be delivered; it also has a valve-controlled opening 262 at the top for venting the chamber during filling. In a modified developer, Figs. 6 and 7, the mixing chamber 280 is a single cylinder traversed by a unitary impeller 282 and surrounded by a cylindrical wall 299 jacketed for temperature control. The impeller

has four perforated blades which have very close clearance with a different number of vertical ribs on the inner face of the chamber. The developer also has a supply line 312, 315, 317 embodying a **meter** 314 and a back pressure valve 316, through which air or other gas under pressure may be introduced into the mixing chamber. An alternative form of developer, Fig. 8 (not shown), has four impellers carried by parallel shafts and located in a housing shaped as if constituted by four intersecting cylinders, the projections between cylinders being structurally embodied in the internal wall. In all the developers shown, the direction of flow of the dough, the impeller shafts, the blades and their edges and the chamber walls are all parallel and it is stated that this applies such a strain to the dough as to obtain its efficient development. Delivery arrangements. The outlet 237 leads to a conduit 265, Fig. 1B, embodying a manually operative valve 267, which can be adjusted to vary the dough pressure during mixing in the developer, and an orifice structure including a gate 269 for adjusting the size of the opening by displacement of a lead screw 270. The dough is extruded from orifice 268. At the outset of a given run, some dough may be extruded in an underdeveloped state and this dough may be fed back into the pre-mixer at a controlled rate through a feeding **device** 330, Fig. 1B, driven by an electric motor 336 and supplying the vessel 95 by means of a conduit 337. When dough is being prepared by the sponge process, the apparatus is provided with a sponge feeder 340, Fig. 1B, comprising a hopper 342, a mixing, advancing and degassing vessel 344, e.g. equipped like vessel 95, and a sponge pump 346 driven by a variable speed motor 350. The sponge is delivered to the vessel 95 through a conduit 354 at a controlled rate determined by adjustment of the motor 350, e.g. by means of the pivoted pre-mixer vessel 95. Driving and control arrangements. As shown in Fig. 9, the control circuits of the several motors 56, 70, 78, 84, 85, 336, 112, 124 and 132 individually extend, through a corresponding pair of contacts 56a, 70a ..., and include speed control devices 78b, 84b . . ., for the ingredient feeder motors 78, 84, 85, 112, 124 and 132. The motor 218 for the dough pump 32 is controlled by a circuit which includes a speedadjusting **device** 382. The developer motor 42 is connected to a circuit which includes a speedadjusting **device** 392. The sponge feeder motor 340 may have its motor 350 controlled in similar fashion to the motors of other feeding devices. The pairs of contacts 56a, 70a . . . are made and broken by movement of an armature 365 of relay winding 360 which is connected through switch contacts 197, 198 which are closed and opened according to the weighting of the pivoted vessel 95. The feed of the ingredients is thus more or less intermittent, i. e. it stops and starts with the opening and closing of the contacts 197, 198, the main consideration being that a continuous feed of dough is supplied to the pump 32. In an alternative driving arrangement, Fig. 10 (not shown), the ingredient feeders are operated by a single master motor through a master speed control unit which is adjustable by an electric position sensitive **device**, including a motor and tap resistors, influenced by movement of the vessel 95. The feeders are all geared to a single line shaft and, apart from those supplying flour, the feeders may be adjusted individually through a variable speed gear box. The position sensitive **device** may also be used with the relay 362, Figs. 1B and 9B. Specification 735,218, [Group VI], also is referred to.

83/96 © EPODOC / EPO

PN - [GB654231](#) A 19510613

PR - US19430495311 19430719

AP - GB19440015165 19440809

DT - **

CCI - [H01H1/605](#) ; [H02H7/00](#) ; [H02H9/04](#)

IDT	- 99D8
PA	- RAPHAELSCHEIRMANN
TI	- Improvements in testing and protection of electrical distribution systems
AB	- 654,231. Resistance measurements. SCHEIRMANN, R. Aug. 9, 1944, No. 15165. Convention date, July 19, 1943. [Class 37] The condition of the contact between conducting parts is permanently or intermittently supervised, tested, indicated, or controlled while they are traversed by the working currents. Fig. 1 shows a system for testing, indicating, and controlling the variations in the contact resistance between the electrode 3 and its holder 2 in an electrical melting furnace. The primary winding 11 of a voltage transformer 10 is connected between points 6, 7 on the holder 2 and electrode 3, the secondary winding 12 being connected to opposite corners of a bridge rectifier 22 through contacts 147, 150 which are normally closed by contacts 15, 17 of a controller in its normal position A. The rectifier output terminals are connected through a contact 27 and a range-changing series resistance 29 to the voltage coil 25 of a cross-coil ohm-meter 26. In the supply lead 164 to the electrode 3 is the primary winding 33 of a current transformer 32, the secondary winding of which is connected through an ammeter 36 and rectifier 42 to a variable shunt resistance 48, across which is connected the current coil 53 of the ohmmeter 26. The ohmmeter measures the ratio of the potential across the contact between the electrode 3 and holder 2 and the current through the electrode and hence indicates the resistance of the contact. Should this become higher than a predetermined limit the pointer 161 of the ohmmeter closes the circuit of a relay 56 through contacts 54, 59, closing the relay contact 64 and actuating an acoustic or optical signalling device 66. A time relay, resistance, and circuit-breaker may be connected to the signalling device 66 by leads 67, 68 in order first to reduce and then to cut out the current supply. A relay 130 in parallel with the voltage coil 25 opens the contact 27 in the event of excess voltage. The controller has test positions B, C for testing the contacts of the testing circuit. A separate A.C. source feeds a low-tension transformer 70, the secondary winding 72 of which is connected through a regulating resistance 73 and ammeter 75 to controller contacts 155, 156 which in position B of the controller are connected to contacts 147, 148 so that the testing current is applied to the terminals of the transformer winding 12, thereby inducing current in the winding 11. The resistance 73 is adjusted to give a predetermined reading on a voltmeter 77 when a known reading should be obtained on the ammeter 75 if the contacts are in order. In position C of the controller the contacts 155, 156 are connected to the contacts 148, 150 and the testing voltage is applied to the rectifier 22, the deflection of the ohmmeter pointer 161 being noted. Modifications are described for testing the contact between bus-bars. In one of these the bus-bar carries D.C. and the testing device is traversed by the working current, a separate D. C. source being employed for testing the contacts of the test circuit. In another the bus-bar carries A.C. and a separate D.C. is employed for testing, choking coils being provided to prevent the A.C. drop of potential across the contact from influencing the testing apparatus. In a third modification the bus-bar carries D.C. and is tested from a separate A.C. source. Fig. 5 shows a modification for the protection of a double-pole D.C. circuit-breaker 511, in which an auxiliary switch in the potential circuit of the ohmmeter prevents the testing instruments from being subjected to the full working voltage before the circuit-breaker has been thrown in fully or to excess voltage when the breaker is thrown out. The circuit-breaker comprises switch blades 503, 508 fed from leads 501, 506, the output terminals being shown at 504, 509. Across the output terminals 504, 509 is connected a solenoid coil 516 in series with a normally closed contact 513. Closure of the circuit-breaker applies the full voltage between the terminals 504, 509 and excites the coil 516 which pulls down its plunger and closes an auxiliary switch 519. The rod 539 of the solenoid is

suspended by a pull-spring 526. A pivoted catch 527 can move upwardly only, being prevented from turning downwardly by a stop 529. On the solenoid 516 being actuated, the catch 527 meets the arm 530 pivoted at 531 and after having been turned upwardly, moves underneath the arm 530. Closure of the switch 519 connects the potential coil 25, Fig. 1, across the input and output terminals of one pole of the circuit-breaker through leads 205, 207, the current coil 53 being connected across a shunt 523 in the output circuit through leads 219, 232. If great deterioration of the circuitbreaker contacts occurs the leads 67, 68 are energized, as shown in Fig. 1, and open the relay contact 513 and interrupt the circuit of the coil 516, the spring 526 then opening the switch 519 so that the connection to the ohmmeter voltage coil is the first to be interrupted. In its upward movement the catch 527 turns the arm 530 and causes it to engage a contact 534. This closes the circuit of a trip coil and opens the circuit - breaker. Manually - operated switches may be similarly protected, the auxiliary switch being operated manually or mechanically, as by forcing down an auxiliary switch by the lever switch bridge. A modification for three-phase current is shown in Fig. 6. Hightension leads 601, 602, 603 are connected to contacts 604, 609, 639. The primary winding 616 of a voltage transformer 614 is connected to the breaker terminals of two phases on the output side of the high-tension oil switch. The secondary winding 619 of this transformer feeds the auxiliary low-voltage switch 519. When the main high-tension oil breaker switch is thrown in, the primary 616 is excited from the breaker terminals 606, 611 and the secondary winding 619 feeds the solenoid coil 516 closing the switch 519. This closes a circuit from lowtension leads 621, 624 through a solenoid coil 623, which closes a switch 628 and thereby applies the voltage drop across the contacts 604, 606 to the primary winding 633 of a voltage transformer 632, the secondary winding 636 of which feeds the potential coil 25, Fig. 1, of the ohmmeter through leads 13, 14. A current transformer 639 in the output circuit of the high-tension system feeds the current coil of the ohmmeter through leads 35, 43. Fig. 7 shows a transformer for transforming the low voltage across the primary winding 633 to the secondary winding 636 without allowing any high voltage that may arise to reach this winding and also keeping the magnetizing current of the primary winding within predetermined limits. The transformer has four limbs 701, 702, 703, 704. The limb 702 carries the primary winding 633 while the limb 701, which has a very small cross-sectional area, carries the secondary winding 636. A third limb 703 having a large cross-section is formed with an air gap 707. The fourth limb 704 having a large cross-section is formed with a large air gap 714 which is adapted to be closed by a core 710 when a solenoid 713 is excited from leads 67, 68. With a normal primary voltage of a fraction of a volt the entire flux traverses the small limb 701 because the large limbs with their air gaps at so low a **density** offer too great a reluctance. The dimensions of the small limb 701 are so chosen that at a few volts full saturation is obtained, thereby limiting the voltage that may arise in the secondary winding 636. At a predetermined voltage the coil 713 is excited through leads 67, 68 from the signalling contact 66, Fig. 1, and causes the core 710 to close the gap 714 in the limb 704, which then takes the greater part of the flux and prevents rise of voltage in the secondary winding 636. Specifications 654,287 and 654,290, [Group XXXV], are referred to.

84/96 © EPODOC / EPO
 PN - [GB2401070](#) A 20041103
 PNFP - GB2401070 B 20071205
 PR - GB20030009606 20030428
 AP - GB20030009606 20030428
 DT - *; Rep

CT	- STSE (A) EP1046420 A1 20001025 [] (MUENZING JOHANNA [AT], et al) US3339897 A 19670905 [] (DAVIS JR PHILIP E) US4345841 A 19820824 [] (DAY ROGER W) US4498819 A 19850212 [] (EL-SAIE AHMED A [US]) US5213414 A 19930525 [] (RICHARD BENNETT M [US], et al) - STSE (B) GB2389094 A 20031203 [] (DELVES JAMES EDWARD [GB], et al) EP1046420 A1 20001025 [] (MUENZING JOHANNA [AT], et al) US3339897 A 19670905 [] (DAVIS JR PHILIP E) US4053142 A 19771011 [] (JOHANNES WALTER) US4282172 A 19810804 [] (MCKNIGHT WILLIAM J) US4345841 A 19820824 [] (DAY ROGER W) US4498819 A 19850212 [] (EL-SAIE AHMED A [US]) US5213414 A 19930525 [] (RICHARD BENNETT M [US], et al) US2002093875 A1 20020718 [] (RONDEAU JOEL [FR], et al)
CCI	- B01F5/0662 ; B01F5/0057 ; B01F5/0475 ; B01F15/00136 ; B01F15/00233 ; B01F3/12
CNOI	- (B) B01F5/08 ; E21B21/06 ; E21B21/062
PA	- (A) DYNAMIC PROC SOLUTIONS PLC [GB] - (B) DYNAMIC PROC SOLUTIONS PLC [GB]; KCC GROUP LTD [GB]
TI	- (A) Swirl mixer suitable for mixing drilling fluids - (B) Mixing device
AB	- (A) A mixing device comprising a mixing chamber 32 having a flow inlet 34, a flow outlet 36, and swirl means 2 associated with the flow inlet 34 for imparting a swirling motion to flow entering the mixing chamber 32 through the flow inlet 34. Tangential slots (Fig 2, 22a-f) in the upper portion 20 of flow guide 18 may be used to impart swirl to the fluid. The mixer is particularly suitable for the mixing of a weighting agent in powder form such as barite with drilling fluid for oil and gas well drilling to form a slurry. A densitometer or Coriolis meter may be placed downstream of mixing chamber 32 to measure the viscosity, density or relative density of the slurry.

85/96 © EPODOC / EPO

PN	- GB1092446 A 19671122
PR	- GB19660009190 19660302
AP	- GB19660009190 19660302
DT	- *
CCI	- G01N9/12 ; G01N9/36
PA	- EXXON RESEARCH ENGINEERING CO
TI	- A liquid mixture analyser
AB	- 1,092,446. Determining the proportion of a liquid in an immiscible mixture. ESSO RESEARCH & ENGINEERING CO. March 2, 1966, No. 9190/66. Heading B1X. The percentage by weight of one liquid in a mixture of that liquid and another liquid, e.g. water in a water and oil mixture, is determined by passing the mixture firstly through

a **density meter** 11, then into a selector 13 where a membrane 14 blocks the passage of the one liquid, the remaining stream of liquid flowing through line 21 to a second **density meter** 12. A comparator **device** 18 determines the difference between the readings of meters 11 and 12, or from this and knowing the **density** of the blocked liquid, e.g. water, the required percentage can be calculated. The **density** meters may be buoyant plummets housed in a vessel to which they are connected by chains, see Figs. 1 and 2 not shown, or alternatively may comprise a radioactive source and a sensitive radiation detector on opposite sides of the flow of liquid. A differential pressure controller 15 maintains a positive pressure difference across the selector, which may contain a fabric or paper membrane coated with a water repellant material.

86/96 © EPODOC / EPO

- PN - [EP1857633](#) A2 20071121
- PNFP - EP1857633 A3 20090624
- EP1857633 B1 20110126
- PR - EP20050112026 20051213; US20040013863 20041216
- AP - EP20070115567 20051213
- DT - **
- CT - || STSE (A3)
[US6371210](#) B1 20020416 [AD] (BODE JEFFREY [US], et al)
 [AD] 1-15
 * column 3, line 66 - column 5, line 46 *
 * figures 3-7 *;
[US4134454](#) A 19790116 [A] (TAYLOR DONALD F)
 [A] 1-15
 * the whole document *
- CCI - [E21B34/08](#) ; [E21B43/08](#) ; [E21B43/12](#)
- PA - (A2 A3 B1)
 WEATHERFORD LAMB [US]
- TI - (A2 A3 B1)
 Flow control apparatus for use in a wellbore
- AB - (A2)
 Methods and apparatus for use in a wellbore to **meter** and choke certain components from being produced, based upon their **density** relative to the **density** of **oil** are disclosed. The **device** includes an inner tubular body portion having apertures in the wall thereof for passing **oil**, an outer tubular body and at least one metering orifice therebetween to **meter** production. Disposed around the inner body is an axially movable member to selectively cover and expose the apertures of the inner body, thereby permitting fluid to flow therethrough.

87/96 © EPODOC / EPO

- PN - [EP1672167](#) A1 20060621
- PNFP - EP1672167 B1 20080213
- PR - US20040013863 20041216
- AP - EP20050112026 20051213
- DT - *; Rep
- CT - || STSE (A1)
[US6371210](#) B1 20020416 [XD] (BODE JEFFREY [US], et al)

[XD] 1-6,8,14-19

* column 3, line 66 - column 5, line 46 *

* figures 3-7 *;

[US4134454](#) A 19790116 [A] (TAYLOR DONALD F)

[A] 1,9,14,18

* the whole document *

CCI - [E21B34/08](#) ; [E21B43/08](#) ; [E21B43/12](#)

PA - (A1 B1)
WEATHERFORD LAMB [US]

TI - (A1 B1)
Flow control apparatus for use in a wellbore

AB - (A1)
Methods and apparatus for use in a wellbore to **meter** and choke certain components from being produced, based upon their **density** relative to the **density** of **oil** are disclosed. The **device** includes an inner tubular body portion having apertures in the wall thereof for passing **oil**, an outer tubular body and at least one metering orifice therebetween to **meter** production. Disposed around the inner body is an axially movable member to selectively cover and expose the apertures of the inner body, thereby permitting fluid to flow therethrough.

88/96 © EPODOC / EPO

PN - [CN200979430Y](#) Y 20071121

PR - CN20062167735U 20061128

AP - CN20062167735U 20061128

DT - I

PA - LU JIUQING [CN]

TI - A flow measurement **device** for two-phase and three-media of gas-water-oil

AB - A gas-water-oil two-phase three-dielectric flow measuring **device** of the utility model belongs to a flow measuring field, solving the on-line continuous automatic self-scaling problem. The utility model comprises a filter, a pressure transmitter, a wedge-shaped flow gage, a temperature sensor, a **density meter** and a flow computer, wherein the upper end on the vertical section of an **oil** admitting pipe is connected with the standard container, the standard container is arranged with a level gage and an **oil**-water measuring instrument, the top of the standard container is connected with a gas discharging pipe, the gas discharging pipe is arranged with a gas flow gage and a pressure **meter** and is connected with an **oil** discharging pipe through a triple valve, and the flow computer are separately connected with the pressure transmitter, wedge-shaped flow gage, gas flow gage, triple valve, temperature sensor, **density meter**, **oil**-water measuring instrument and the level gage through circuit. The utility model is suitable for the on-line continuous automatic self-scaling of an unattended measuring station and a single-well flowing system, thereby improving the automation level, accuracy and reliability of the on-line phase-splitting measurement.

89/96 © EPODOC / EPO

PN - [CN101139927](#) A 20080312

PR - CN20061153219 20060906

AP - CN20061153219 20060906

DT - I

PA - ZHANZHONG AN [CN]
 TI - High-**density** sampling point storing flow gage measuring inside **oil** conduit
 AB - A memory-type flow **meter** to log high-**density** sample points inside **oil** pipes, is characterized in that, on the basis of flow rate and pressure test instruments inside **oil** pipes, the invention replaces a large-capacity memorizer and adjusts a single-chip computer arrangement program, so that recording speed can be higher than 0.5 data per second; thus, the invention can fulfill measurement on high-**density** sample points for the flow **meter**. If organized into pairs with pressure data groups at the corresponding high-**density** sample points, the **device** can provide a flow rate response relationship for corresponding records in the **oil** pipes when water charging pressure changes very fast, in order to adapt to new demands for testing and adjustment techniques.

90/96 © EPODOC / EPO

PN - [CN2741015Y](#) Y 20051116
 PR - CN2004297048U 20041012
 AP - CN2004297048U 20041012
 DT - I
 PA - WANGYANJIANG [CN]
 TI - **Meter** on well top
 AB - The utility model relates to an **oil**, gas and water metering **device** of an **oil** well, which is mainly composed of an **oil**-gas separator, a gas-liquid inlet, a temperature transmitter, a **density meter**, a gas outlet, a liquid outlet, a gas flow **meter** and a liquid flow **meter**, wherein, the gas-liquid inlet and the temperature transmitter are arranged on the separator, the gas flow **meter** is arranged on the gas outlet, and the liquid flow **meter** is arranged on the liquid outlet. The utility model is characterized in that a whirlwind extended current divider and a current stabilizing plate are arranged at the inner end of the gas-liquid inlet in the **oil**-gas separator, and the inner end of the gas outlet is provided with a pressure control valve of liquid level. The pressure control valve adopted by the utility model is used for directly controlling the gas discharging flow quantity and can also be used for indirectly controlling the liquid discharging flow quantity, so the control of the liquid level and the pressure is realized. When the **oil**, gas and water metering **device** controls and is connected with a computer, a suite of complete three-phase metering **device** of an **oil** well is combined. The **oil**, gas and water metering **device** has the advantages of simple **device**, compact structure, reliable operation and no repair, and can work for a long time without faults.

91/96 © EPODOC / EPO

PN - [CN1217353](#) A 19990526
 PNFP - CN1058737C C 20001122
 PR - CN1997119459 19971113
 AP - CN1997119459 19971113
 DT - I
 PA - (A)
 SINO PETRO CHEMICAL CORP [CN]
 - (C)
 CHINA PETROCHEMICAL CORP [CN]
 TI - (A)

Resin composition for self-temp.-controlled heating cable

- (C)

Resin compsn. for self-temp-controlled heating cable

AB

- (A)

The present invention discloses a low-temp. (below 90 deg.C) resin composition with PTC property. It is mainly comprises 10-70 wt% of linear low-**density** polyethylene and cohesive resin, less than 10 wt% of polyester resin or fluororesin and 10-25 wt% of graft or surface-treated acetylene carbon black, in which the fluoroelastic body and other working adjuvant can be added. The automatical temp.-controlled heating cable made of said resin composition possess stable PTC property in the long-period powered or powered on-off circulation use, and said product is applicable to cold-resisting heat-insulation, temp.-limiting and promoting flowing of fluid of **oil** pipeline, valve and monitoring **meter**, and also can be used to produce automatic temp.-controlled inflatable mattress, water bed, heatingfloor, winter wear and hand-warming **device**,etc..

92/96 © EPODOC / EPO

PN - [CN2274763Y](#) Y 19980218

PR - CN1996215413U 19960710

AP - CN1996215413U 19960710

DT - I

PA - BENTE INSTR FACTORY CHENGDE CI [CN]

TI - Portable **device** for immersing **oil meter** for vehicle tanker

AB - The utility model relates to a portable **device** for an immersing **oil meter** for **oil** tank cars. The utility model has the structure that a first pressure sensor, a temperature sensor and a second pressure sensor are separately installed in a steel pipe, wherein, lower end of which is provided with a weight dropper which can make the three sensors immersed into the **oil** tank car, and the three sensors are separately connected with respective signal conducting wires which are led to a displaying instrument from the steel pipe. The utility model has the advantages that the utility model can be conveniently carried into an **oil** tank and a tanker and actually and promptly take out the parametric indicated values of the **oil** height, the temperature, the **density**, the quality, etc. of a required measuring point in the **oil** tank, and accordingly, measuring declination existing in traditionally manual measuring methods (namely, samples are required to be taken out of the **oil** tank) can be overcome.

93/96 © EPODOC / EPO

PN - [CN2558966Y](#) Y 20030702

PR - CN2002262103U 20020815

AP - CN2002262103U 20020815

DT - I

PA - WANG ZENGZHAI [CN]

TI - Volume metering **device** for liquid phase medium during petroleum production

AB - The utility model relates a volumetric gauging **device** of measuring production, which comprises a gas-liquid two-phase separator, a gas flow **meter** connected with the gas-liquid two-phase separator and an adjusting valve of gas and liquid. A pressure transmitter is arranged at the upper part of the gas-liquid two-phase separator. A high and low liquid levels transmitter is arranged inside the pressure

transmitter. An electromagnetic valve and a **density** measuring **device** are connected to an outlet pipeline at the bottom. The gas flow **meter**, the pressure transmitter, the high and low liquid levels transmitter, the electromagnetic valve, and the **density** measuring **device** are connected with a control part of a computer. The gauging **device** confirms measurement of liquid medium in the process of petroleum production in a constant-volume way and realizes correct measuring of production of **oil**, gas and water in the medium without the influences of the **oil** gas medium change and impurity in the **oil** well.

94/96 © EPODOC / EPO

- PN - [CN2541821Y](#) Y 20030326
- PR - CN2002214630U 20020505
- AP - CN2002214630U 20020505
- DT - I
- PA - ZHANG DONG [CN]
- TI - Three-phase metering **device** for **oil** well
- AB - The utility model relates to an **oil**, gas and water three-phase metering **device** for an **oil** well, which is mainly composed of an **oil**-gas separator, a gas-liquid inlet, a temperature transmitter, a **density meter**, a gas outlet, a liquid outlet, a gas flow **meter** and a liquid flow **meter**, wherein the gas-liquid inlet and the temperature transmitter are arranged on the separator, the gas flow **meter** is arranged on the gas outlet, and the liquid flow **meter** is arranged on the liquid outlet. The utility model is characterized in that a whirlwind extended current divider and a current stabilizing plate are arranged at the inner end of the gas-liquid inlet in the **oil**-gas separator, and the inner end of the gas outlet is provided with a pressure control valve of liquid level. The pressure control valve adopted by the utility model is used for directly controlling the gas discharging flow quantity and can also be used for indirectly controlling the liquid discharging flow quantity, so the control of the liquid level and the pressure is realized. When the **oil**, gas and water three-phase metering **device** controls and is connected with a computer, a suite of complete three-phase metering **device** of an **oil** well is combined. The **oil**, gas and water three-phase metering **device** has the advantages of simple **device**, compact structure, reliable operation and no repair, and can work for a long time without faults.

95/96 © EPODOC / EPO

- PN - [CN2435387Y](#) Y 20010620
- PR - CN2000223658U 20000705
- AP - CN2000223658U 20000705
- DT - I
- PA - ZENG JINHUA [CN]
- TI - **Oil**-water separator for treatment and reuse of **oil**-containing sewage
- AB - The utility model provides an **oil**-water separator for treatment and reuse of **oil**-containing sewage. The utility model is composed of a tank body, a driving mechanism, filter medium, a pressure **meter**, a water inlet pipe and a water outlet pipe. The utility model is characterized in that two mesh pressing plates are arranged in a hollow cavity of the tank body; the filtering medium is filled between the two mesh pressing plates; the driving mechanism pressurizes and adjusts the bulk **density**; a water distribution **device** is arranged on the driving mechanism and is connected with a water inlet pipe, and a water distribution **device** is arranged

under the driving mechanism and is connected with a water outlet pipe. The utility model has the advantages of large filtering flow capacity, high **oil** removal efficiency, good separation effect, **oil** content of outlet water which is smaller than or equal to 2.5 mg/L, high purifying precision, small volume, light weight, low cost, and less investment, and is suitable for purifying, treating and reusing the oily sewage in the **oil** production of **oil** fields, and the cleaned oily sewage of **oil** tankers, **oil** depots, **oil** stations, tank cans, etc.

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PA - (A1 C)
WEATHERFORD LAMB [US]

TI - (A1 C)
FLOW CONTROL APPARATUS FOR USE IN A WELLBORE

AB - (A1)
Methods and apparatus for use in a wellbore to **meter** and choke certain components from being produced, based upon their **density** relative to the **density** of **oil** are disclosed. The **device** includes an inner tubular body portion having apertures in the wall thereof for passing **oil**, an outer tubular body and at least one metering orifice therebetween to **meter** production. Disposed around the inner body is an axially movable member to selectively cover and expose the apertures of the inner body, thereby permitting fluid to flow therethrough.

- (C)
Methods and apparatus for use in a wellbore to **meter** and choke certain components from being produced, based upon their **density** relative to the **density** of **oil** are described herein. The **device** includes an inner tubular body portion having apertures in the wall thereof for passing **oil**, an outer tubular body and at least one metering orifice therebetween to **meter** production. Disposed around the inner body is an axially movable member to selectively cover and expose the apertures of the inner body, thereby permitting fluid to flow therethrough.