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(54) Titre : SYSTEME ARTIFICIEL DE PRODUCTION ET D'ENTRETIEN SIMULTANE ASSISTE PAR POMPAGE MECANIQUE A CONDUITE FLEXIBLE POUR L'EXTRACTION DE FLUIDES

(54) Title: ARTIFICIAL SYSTEM FOR SIMULTANEOUS PRODUCTION AND MAINTENANCE WITH MECHANICAL PUMPING WITH FLEXIBLE PIPE FOR FLUID EXTRACTION

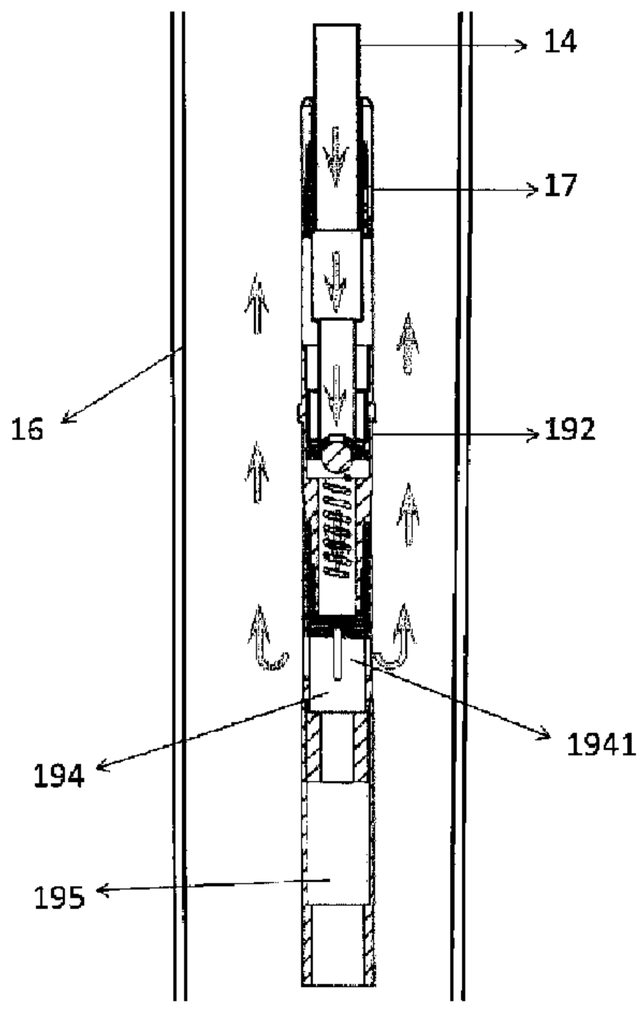


Fig. 4

(57) Abrégé/Abstract:
The invention relates to an artificial system for simultaneous production and maintenance with mechanical pumping with flexible tubing for fluid extraction, which includes: a surface assembly that includes a sub-base, a hydraulic traction head, a stuffing box, an annular seal blowout preventer, a slip blowout preventer and a means for connecting and coupling; a production string extending vertically down into a well from the surface assembly; a well casing; a flexible pipe located inside the production string, extending the entire length thereof, the well casing, the production string and the flexible pipe remaining one inside the other concentrically; and a pumping assembly that includes a connector, a check valve, a cleaning tool and a stationary pump. The system enables production with a mechanical pump for the extraction of fluids, and maintenance by the simultaneous pumping of chemical products to said well to modify the physical properties of the fluid to be extracted and to clean the deposit of organic and inorganic material in the well.

SUMMARY OF THE INVENTION

A simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction, comprising: an assembly of surface including a sub-base, a hydraulic head system, a gland with annular seals preventer, wedges preventer and a connecting and splicing means; from the assembly surface extends vertically downward into a well production tubing, a casing, a flexible tubing located inside the tubing, extending along its entire length being the casing, production tubing and flexible tubing one inside the other and positioned concentrically each other; and a pumping assembly including a connector, a check valve, a cleaning tool and stationary pump. The system allows the production assisted by mechanical pumping fluid extraction, and maintenance for simultaneous pumping of chemicals to such wells to modify the physical properties of the fluid to remove and clean the reservoir of organic and inorganic material in the well.

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Declaraciónes según la Regla 4.17:

— *sobre la identidad del inventor (Regla 4.17(i))*

— *sobre el derecho del solicitante para solicitar y que le sea concedida una patente (Regla 4.17(ii))*

— *sobre el derecho del solicitante a reivindicar la prioridad de la solicitud anterior (Regla 4.17(iii))*

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Un sistema artificial de producción y mantenimiento simultaneo asistido por bombeo mecánico con tubería flexible para extracción de fluidos, el cual comprende: un ensamble de superficie que incluye una sub-base, un cabezal de tracción hidráulico, un prensaestopas, un preventor con sellos anulares, un preventor de cuñas y un medio de conexión y empalme; proveniente del ensamble de superficie se extiende verticalmente hacia abajo al interior de un pozo una tubería de producción; una tubería de revestimiento; una tubería flexible ubicada en el interior de la tubería de producción, extendiéndose en toda su longitud quedando la tubería de revestimiento, la tubería de producción y la tubería flexible una dentro de la otra y colocadas concéntricamente entre si; y un ensamble de bombeo que incluye un conector, una válvula check, una herramienta de limpieza, una bomba estacionaria. El sistema permite la producción asistida por bombeo mecánico para extracción de fluidos, y mantenimiento por bombeo simultáneo de productos químicos a dicho pozo para modificar las propiedades físicas del fluido a extraer y limpiar el depósito de material orgánico e inorgánico en el pozo.

ARTIFICIAL SYSTEM FOR SIMULTANEOUS PRODUCTION AND MAINTENANCE WITH MECHANICAL PUMPING WITH FLEXIBLE PIPE FOR FLUID EXTRACTION

Technical Field

The present invention relates to a system for extracting fluids from a oil well that does not have enough energy to raise oil deposit produced fluids to the surface, in particular an artificial production system assisted by mechanical pumping with flexible tubing for fluid extraction, and maintenance for simultaneous pumping of chemicals to said oil well to modify the physical properties of the fluid to be extracted and clean the organic and inorganic materials deposited in the well.

Background of the Invention

The oil is extracted by means of the drilling of a well on a petroleum reservoir. In case the pressure in the well is enough naturally force the oil out through the well for further treatment and/or distillation. When there is not enough pressure in the oil deposit for the oil to flow to the surface and to maintain production in the same system is used a rod pump (also known as pump jack, horsehead pump, beam pump, sucker rod pump , etc.), which is the surface portion of the piston pressure pump.

The rod pump systems are common in the oil extraction oil and its size is determined by the depth, the inner diameter of the tubing in the well and the density or viscosity of the oil to be extracted, wherein a deeper extraction requires more energy to move greater fluid column lengths. A rod-crank mechanism converts the motor rotary motion to a vertical reciprocating motion that moves the pump rod, and produces up and down repetitive motion.

Rod pumps are driven by a motor. Said motor moves a pulley system, which in turn is connected to a piston rod, to balance the weight of the rod string that reaches the well bottom. The piston rod raises and low a crank attached to the end of a beam, at the other end of the beam, is the head. A wire made of steel connecting the head with the polished rod passing through a sealed box, leaving move it in and out of the tubing without fluid leaks out the well (tubing runs to the bottom of the well). In the down-hole reciprocating pump is located, which contains two valves: motionless valve and a valve on the piston connected to the end of the rods with upper and lower path, known as the "traveling valve."

After installing the rod pump systems for oil extraction, production is maintained until problems arise, usually at the bottom of the well, start to accumulate

substances such as carbonates, paraffins, asphaltenes, sand, formation waste and corrosion and among others.

By accumulating these substances wear begins to generate on fixed and traveling valve seat, as well as the spaces between the traveler container and tube polished outer wall of the reciprocating pump, causing a lack of seal and avoiding production to rise effectively to the surface or even coming to stay stuck impeding their functioning. Also, the gas in the reservoir can result in cavitation that locks the pump, where due to the high gas compressibility, the accumulated pressure is not enough to open the valves and pumps little or nothing.

When this occurs it is necessary to subtract the whole equipment from well subsurface to the surface for repair or replacement. This operation is performed by a rod string consisting of a tower with a winch sufficient capacity to carry all the rods in the well. The extraction, substitution and insertion operation are carried out in a time ranging from 2 to 24 hours depending on well depth. It is advisable to wait between each extraction and introduction to conduct a down hole cleaning to prevent damage to occur more frequently. The hole cleaning is carried out in a time ranging from one to seven days depending on the equipment used for cleaning (repair equipment, line equipment or flexible tubing equipment);

this implies costly operations and a loss of production for quite some time.

It is common in the prior art to find information related to cleaning oil wells as U.S. Patent No. 5,095.976, same that gives protection to well-cleaning equipment using a internal piping and reciprocating components. US 7,475,731 disclose an apparatus and method for cleaning an underground well by fluid injection and subsequent suction of the sediment.

The use of a device to clean wells comprising a tubular transport that extends from the surface to the region of the well that is required to clean by means of pumps at the bottom of the well is known from document EP 1852571.

In addition to systems and/or methods of cleaning wells included in the prior art, there are also documents that protect systems for more efficient production of rod pumped wells. However, these systems are susceptible to the accumulation of substances that cause seal failure and therefore need full equipment is removed for repair or maintenance.

A pumping system suitable for dual displacement fluid production from a well is proposed in U. S. 6,585.049. This document discloses a pump and a pumping system dual displacement, wherein the system includes a

subsurface pump, a column of production tubing in a pumping unit connected to the pump surface of ground by means transmits reciprocal movements. Said document includes the presence of a string of casing and has a production therein and in its annular portion, i.e. the string of casing. As in the hydrocarbon extraction system including inner piping in the string of casing, the system of U. S. Patent '049 necessarily require disassemble and separating the elements of the surface and subsurface structure for preventive maintenance, predictive or corrective translating into lost production.

While the system disclosed by U. S. Patent No. 6,502,639 provides an improved pumping system which includes a subsurface pump, a string of casing and surface pumping unit. The subsurface pump is attached to the well and is driven by repetitive movements up and down the tube. Subsurface pump pumps fluids to the surface through the string of casing. This patent describes a system that uses a tube to "move" reciprocating pump, however the system is unique to extract oil and in case of failures or breakdowns that prevent its operation all equipment must be dismantled, including the one located in the basement, for repair. The system also extracts oil exclusively freeing the annulus string of casing.

Thus, there is no mention in the prior art about mechanical pumping system with flexible tubing for extraction from a well and simultaneous cleaning of said well, improving the production process and avoiding costs for repair or maintenance.

Objects of the Invention

It is an object of the present invention to provide a simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction from a well and simultaneous cleaning of said well.

Another object of the present invention is to provide a simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction from a well wherein said well has no reservoir energy required to raise the produced fluids to surface.

Another object of the present invention is to provide a simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction, wherein the inner tubing is flexible.

It is an object of the present invention to provide a simultaneous production and maintenance

artificial system assisted by mechanical pumping with flexible tubing for fluid extraction, which perform maintenance and cleaning of well without dismantling the equipment and subsurface or surface extraction accessories.

Another object of the present invention is to provide a simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction, which reduces logistics and installation costs to be easily maneuverable.

It is another object of the present invention to provide a simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction to replace the steel bars or rods by flexible tubing that supports the circulation of fluids and to permit the coupling of a piston pump.

It is still another object of the present invention to provide a simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction, wherein the flexible tubing supports the injection of chemical fluids for cleaning, deposits descaling from piping, remove the sand of well and production system and reduce viscosity.

A further object of the present invention is to provide a simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction, in which production is obtained through tubing in its annular space with the flexible tubing.

It is still another object of the present invention to provide a simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction, wherein the flexible tubing admit chemical fluids injection to well cleaning.

Another object of the present invention is to provide a simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction, which allow pumping fluids from the inside surface or through the flexible tubing to provide an efficient cleaning and external displacement, out of the flexible tubing, to ensure an optimum speed in the annular area for cleaning and production of hydrocarbons.

BRIEF DESCRIPTION OF THE FIGURES

The invention will be described in greater detail with respect to the accompanying Figures, wherein:

Figure 1 shows a front view of a simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction.

Figure 2 shows a front view of a down-hole assembly which is part of the simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction.

Figure 3 shows a front view of a surface assembly of forming part of the simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction.

Figure 4 shows a schematic view of the chemical fluid flow or cleaning system of the simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction and simultaneous cleaning of a well.

Figure 5 shows a schematic of view of the simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction.

Figure 6 shows a front view of the drive hydraulic head assembly forming part of the simultaneous production and maintenance artificial system assisted by

mechanical pumping with flexible tubing for fluid extraction.

Follows is a list of the technical elements embodying the present invention.

Invention technical elements list

- artificial system simultaneous production and maintenance assisted by mechanical pump tubing for fluid extraction (100)
- reservoir (11)
- well (10)
- casing (12)
- surface assembly (30)
- means of connection and splicing (15)
- production tubing (16)
- flexible tubing (14)
- Connector (17)
- pumping assembly (19)
- anchoring shoe (197)
- check valve (192)
- cleaning tool (194)
- circulation ports (1941)
- blind plug (195)
- production holes (200)
- annular space (20)

- piston pump (21)
- discharge pipe (201)
- Hydraulic head system (50)
  - hydraulic connection (501)
  - hydraulic pistons (502)
  - pulleys (503)
  - pumping connection type 1502 (504)
  - guide carriage (505)
  - jaw (506)
  - High pressure connector (507)
  - traveling hydraulic connection (508)
  - pumping flexible tubing (509)
  - gland system (510)
  - preventer with O-rings (511)
  - wedges preventer (512)
  - sub-base (513)
  - Steel wire (514)
  - head structure (515)
  - stroke sensor (516)
  - stationary hydraulic connection (517)
  - pumping tube (518)

Detailed Description of the Invention

Referring to the attached figures, specifically to figure 1, there is illustrated a simultaneous production

and maintenance artificial system 100 assisted by mechanical pumping with flexible tubing for fluid extraction. In said Figure 1 is shown a well 10 extending from the ground surface through the ground to connect to the reservoir 11.

The oil or hydrocarbon reservoir 11 is drawn through the well 10. Inside of the well 10 is installed simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction 100 of the present invention, which includes a casing 12 extending along the well 10 from surface to the reservoir 11.

The simultaneous production and maintenance artificial system assisted by mechanical pumping 100 with flexible tubing for fluid extraction of the present invention works in conjunction with a equipment mounted on the surface of the well through an assembly surface 30 for such purposes includes a sub-base 513 and drive hydraulic head 50. The equipment is part of the state of the art and is responsible for supporting the weight of the piping for the circulation of the fluids to the surface and into the well. Surface assembly 30 which is part of the simultaneous production and maintenance artificial system assisted by mechanical pumping 100 with flexible tubing 100 for fluid extraction comprising: a gland system 510 for controlling

the production fluids to the outside, as well as a preventer 511 with O-rings, and wedges 512 preventer to ensure the flexible tubing. In the top hole of the well 10, as part of surface assembly 30 is a connecting and splicing means 15 which consists of a flange connecting said assembly surface 30 with a production tubing 16. The connecting and splicing means 15 allows the fastening and securing the production tubing 16. Said production tubing 16 extends vertically down inside the casing 12, leaving the production tubing 16 within the casing 12 and arranged concentrically each other. Similarly, from the surface equipment extends vertically downwards, a flexible tubing 14 of which projects again to resume its original direction down into the well 10.

The flexible tubing 14 is located directly inside the production tubing 16, extending throughout its length, thus leaving the casing 12, the production tubing 16 and flexible tubing 14 concentric with each other.

Figure 2 shows a pump assembly 19 in according the present invention, the pump assembly 19 is secured to the lower end of the flexible tubing 14, seated and anchored at the bottom end by an anchoring shoe 197 of the production tubing 16. Ensuring between the pump assembly 19 and the flexible tubing 14, is effected through a connector

17, binding element is located in the upper pump assembly 19.

Also other elements included in the pump assembly 19 is the check valve 192 having the function of preventing the fluids that are extracted from the well will flow through the interior of the flexible tubing 14. In the pump assembly 19, the check valve 192 in turn is connected with a cleaning tool 194. The cleaning tool 194 includes on its surface a plurality of circulation ports 1941. Said circulation ports consist of outlets for chemicals and fluids to be pumped from the surface through the interior flexible tubing 14.

The cleaning tool 194 is the element of the pump assembly 19 through which flow fluids pumped from the surface. Said cleaning tool 194 is coupled by means of a blind plug 195 directly to the stationary pump 21 of the pump assembly 19. The blind plug 195 is the only element of the pump assembly 19 where there is no fluid flow, either of flexible tubing from the surface or from the extracted directly from the reservoir 11.

Blind plug 195 is connected by a thread to the piston pump 21 having the function to allow production through the production holes 200, exit flow from the reservoir 11 and this is pumped down the annulus 20 to the surface.

As mentioned in the background of the invention section one of the most common problems in the mechanical pumping system is the dragging of sand from the reservoir 11 through the production tubing that directly affects the pumping system and transporting of crude oil or any hydrocarbon oil to the surface. Sand deposits in the pump or any of the elements of the mechanical pumping extraction system produce loss efficiency and component wear reduced, breaking the wear tolerances for its operation and consequently the well stops producing.

As a consequence derived from the above, the well is often scheduled for preventive and corrective maintenance to the extraction system, requiring the disabling of the complete system for cleaning, pump changes, pipes, "fittings" or other accessories, which implies losses stoppages of the production process and production times.

In contrast to the above and referring to Figure 4, there is illustrated the circulation pattern of chemicals and fluids within the simultaneous production and maintenance artificial system 100 assisted by mechanical pumping with flexible tubing for fluid extraction. Said fluids are pumped from the well surface, by the surface equipment through the flexible tubing 14 and to the cleaning tool 194 through which the pumped fluid output

through circulation ports 1941. As can be seen from the arrows that illustrate the flow of fluid in Figure 4, the flow being pumped through the interior of the flexible tubing 14 back to the surface again flowing through the annular area 20, which is formed by the flexible tubing 14 and the production tubing 16. The variety of fluids that can be pumped for well maintenance may include: fluids required to clean and remove the sand of the well, chemicals for dissolving deposits of paraffin, asphalt and scale caused by carbonates, chemical fluids to modify some fluid parameters from the reservoir as viscosity, density, etc.

With regard to the above, the simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction 100 enables continuous injection of viscosity reducing agents to enhance production during operation of the pump 21. It is important to mention that the pumping of any of the above chemicals can be carried out during the extracting process of oil or hydrocarbon from reservoir 11. Thus maintenance can be applied to the simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction 100 into the well 10 by pumping chemicals from the surface equipment to clean, dissolve paraffin deposits,

asphalts, descaling salts and reduce viscosity. Said chemicals flow inside of the flexible tubing 14, without removing the mechanical pumping rig including pump, which means significant savings in the idling of equipment well 10. Equally possible dragging of sand and solids to the surface in an efficient manner by making flow annular area of the simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction 100 of the present invention. All this helps in preventing failures of the simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction 100 significantly increasing well production time 10 before repair or major maintenance.

Importantly, the simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction 100 is a novel system that requires less time for installation and removal of any conventional mechanical pumping system. For example, the flexible tubing string 14 can be designed according to the needs of depth, pressure and expected loads during operation, varying the diameter, wall thickness and material stiffness. In this manner provides for the displacement in the flexible tubing 14 to provide efficient cleaning and/or maintenance and external

displacement in the flexible tubing 14 together with the internal displacement of the production tubing 16 to keep the annular area 20 for optimum hydrocarbon production.

Furthermore, and because the flexible tubing 14 is bent or folded with ease and is continuous without connections or links, makes installation and/or removal is substantially faster than a system of rods or coupled pipes.

For the characteristics of the flexible tubing 14 and the equipment in general the simultaneous production and maintenance artificial system 100 assisted by mechanical pumping with flexible tubing for fluid extraction is possible to maintain pressure control, allowing maneuvers during production in the well 10 without the use of pressure control fluids.

Relative to the well production 10, referring to Figure 5, which illustrates the flow of fluid from the reservoir 11 within the simultaneous production and maintenance artificial system 100 assisted by mechanical pumping with flexible tubing for fluid extraction. Said fluid is pumped from the reservoir 11 to the well surface, through the pump assembly 19. Producing the fluid from the reservoir 11 enters the piston pump 21, located at the bottom of the pump assembly 19 and out through production holes 200 into the annular space 20 and subsequently flow

to the surface through said annular space 20 formed between the inside of the production tubing 16 and flexible tubing 14. In this way has an internal fluid displacement by the flexible tubing 14 into the well to provide efficient cleaning and maintenance outside the flexible tubing 14 to maintain the annular space 20 optimal for the production of hydrocarbons.

The simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction 100 including a flexible tubing 14 significantly reduces maintenance costs in the well 10 due to the ease of pumping the chemicals and reduce frequency of interventions to repair the well. With the simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction 100 times suspension of operation of the well and sand removal cleanings are very short, by virtue that it is possible to add chemicals, like any of those referred to in the present application, during the operation of the pumping; thus allowing the optimization of the production of 10 well and consequently saving costs in the operation of the well.

It will also be apparent that depending on the depth and characteristics of the well 10, and the capacity of the site, the type of oil to be extracted and/or the

type of terrain you will locate the well 10, the simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction 100 of the present invention may vary in length, thickness and/or capabilities of each of the elements of said simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction 100.

Finally, regarding the operation of the hydraulic head system, referring to Figure 6, it shows that the objective of the head which is to transmit the mechanical motion generated by a hydraulic power unit to the flexible tubing 14 to that it has a movement both up and down while the production tubing in the well remains static. At the same time serves to hold the entire weight of the flexible tubing 14 and bottom hole assembly 19 shown in Figure 2.

Upward movement produced by the hydraulic head system 50 is generated by hydraulic flow received from a power unit not shown in the figures, the hydraulic flow is received through hydraulic connections 501, said hydraulic flow causes the hydraulic pistons 502 extend longitudinally making the steel wires 514 extend through a set of pulleys 503 and lift the guide carriage 505 for this in turn lift the flexible tubing 14 which is secured to the guide carriage by a set of jaws 506.

The downward movement produced by the hydraulic head system 50 is generated when draining hydraulic fluid from the hydraulic pistons 502 as controlled by the same hydraulic power unit; the movement is done in reverse the upward movement previously described.

Another function of the hydraulic head system 50 is to allow the introduction of fluids or chemicals into the well through flexible tubing 14, this is accomplished by pumping said fluids or chemicals via a pumping connection 504 known as type 1502, the fluid is transmitted to a fixed metal tube 518 secured to the metal structure 515, the tube is connected to a flexible tubing by a swivel connection 517 and the other end of the flexible tubing 509 is connected to the flexible tubing 14 by means of another connection swivel connection 508 and high pressure connector 507, and pointing to a basic element to the discharge pipe 201, which is through which the end product (derived from the flow obtained in the well).

From the foregoing it will be appreciated that, although specific embodiments of the invention have been described herein for purposes of illustration, various modifications may be made without affecting the scope of the invention. Therefore, the invention is not limited except by the appended claims.

CLAIMS

1. A simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction comprising:

a) a well casing (12);

b) an assembly surface (30) supporting the weight of the piping and allowing the circulation of fluids inside and outside the well, the assembly comprises a sub-surface (513), a hydraulic head system (50), and connecting and splicing means (15);

c) a flexible tubing (14);

d) a production tubing (16) and

e) a pump assembly (19) comprising a valve (192), and stationary pump (20);

the system characterized by:

in the hydraulic head system (50) hydraulic fluid is received through a hydraulic connection (501) which causes hydraulic pistons (502) extend longitudinally causing steel connection wires (514) extend and pass through a set of pulleys (503) to lift a guide carriage (505) and this in turn lift the flexible tubing (14) to produce the upward movement of the flexible tubing and drain the hydraulic fluid from the hydraulic pistons producing the downward movement flexible tubing, hydraulic head system also comprises a pump connection (504) through

which fluids or chemicals are pumped into the well through flexible tubing (14);

pumping connection (504) is coupled to a fixed metal tube (518) secured to a metal structure (515), said tube is connected to one end of a flexible tubing (509) by a swivel connection (517) and the other end of the flexible tubing (509) connects to the flexible tubing (14) through another swivel connection (508) and a high pressure connector (507);

the sub base (513) includes a gland system (510) for controlling the output of the production fluids to the outside preventer with O-ring seals (511) and a wedge-preventer (512) securing the flexible tubing (14) and a discharge pipe (201) for circulation of the final product;

and connection and splicing means (15) is securing the production tubing (16) located inside the casing (12) and into the production tubing is located flexible tubing (14);

flexible tubing (14) coming from the assembly surface extends vertically downwards along the entire production line, said flexible tubing is continuous;

the pump assembly (19) at the top is secured to the lower end of the flexible tubing (14) and the bottom of the pump assembly is seated or anchored to the production tubing (16), the pump assembly includes a valve (192) which

prevents the reservoir fluids to flow through the interior of the flexible tubing, the check valve is connected to a cleaning tool (194) including a plurality of flow ports (1941) through which produce the fluids and chemicals originating from the well surface through the tubing and returned to the well surface through the annular space (20), the cleaning tool is coupled to a stationary pump (21), which enables through holes production (200) flow from the reservoir is pumped through the annular space (20) to the surface of the well, the fluids and chemicals may be pumped during the extraction process of the reservoir, so the maintenance and production of well fluids are simultaneous.

2. The simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction according to claim 1, wherein the upper pump assembly is secured to the lower end of the tubing via a connector (17) and the bottom of the pump assembly is seated or anchored to the production tubing by means of an anchoring shoe (197).

3. The simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction according to claim 1, wherein the plurality of circulation ports consists of outlet holes.

4. The simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction according to claim 1, wherein the annular space (20) is formed between the flexible tubing (14) and production tubing (16).

5. The simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction according to claim 1, wherein the cleaning tool is coupled to the stationary pump by means of a blind plug (195).

6. The simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction according to claim 1, wherein said blind plug (195) is connected via a thread with the stationary pump (21).

7. The simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction according to claim 1, wherein the casing, production tubing and flexible tubing are located concentrically each other.

8. The simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction according to claim 1, wherein the pump connection (504) is of the type 1502.

9. The simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction according to claim 1, wherein the cleaning tool (194) of the flexible tubing (14) is located above the production holes (200), which makes possible cleaning and maintenance of the annular space (20) and an optimum flow of reservoir fluids.

10. The simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction according to claim 1, wherein the fluids and chemicals are selected from fluids to clean and remove sand of the well, products for dissolution deposits of paraffin, asphalt, and scaling caused by minerals, chemicals that modify some parameters of the reservoir fluids such as viscosity and density.

11. The simultaneous production and maintenance artificial system assisted by mechanical pumping with flexible tubing for fluid extraction according to claim 1, wherein the diameter, length and thickness wall and material stiffness of the flexible tubing (14) is a function of well depth, pressure and loads expected during extraction, as well as the annular space (20) required for better production of the reservoir fluids.

12. The simultaneous production and maintenance artificial system assisted by mechanical pumping with

flexible tubing for fluid extraction according to claim 1, wherein during installation and handling of the system dispenses with the use of fluids for reservoir pressure control.

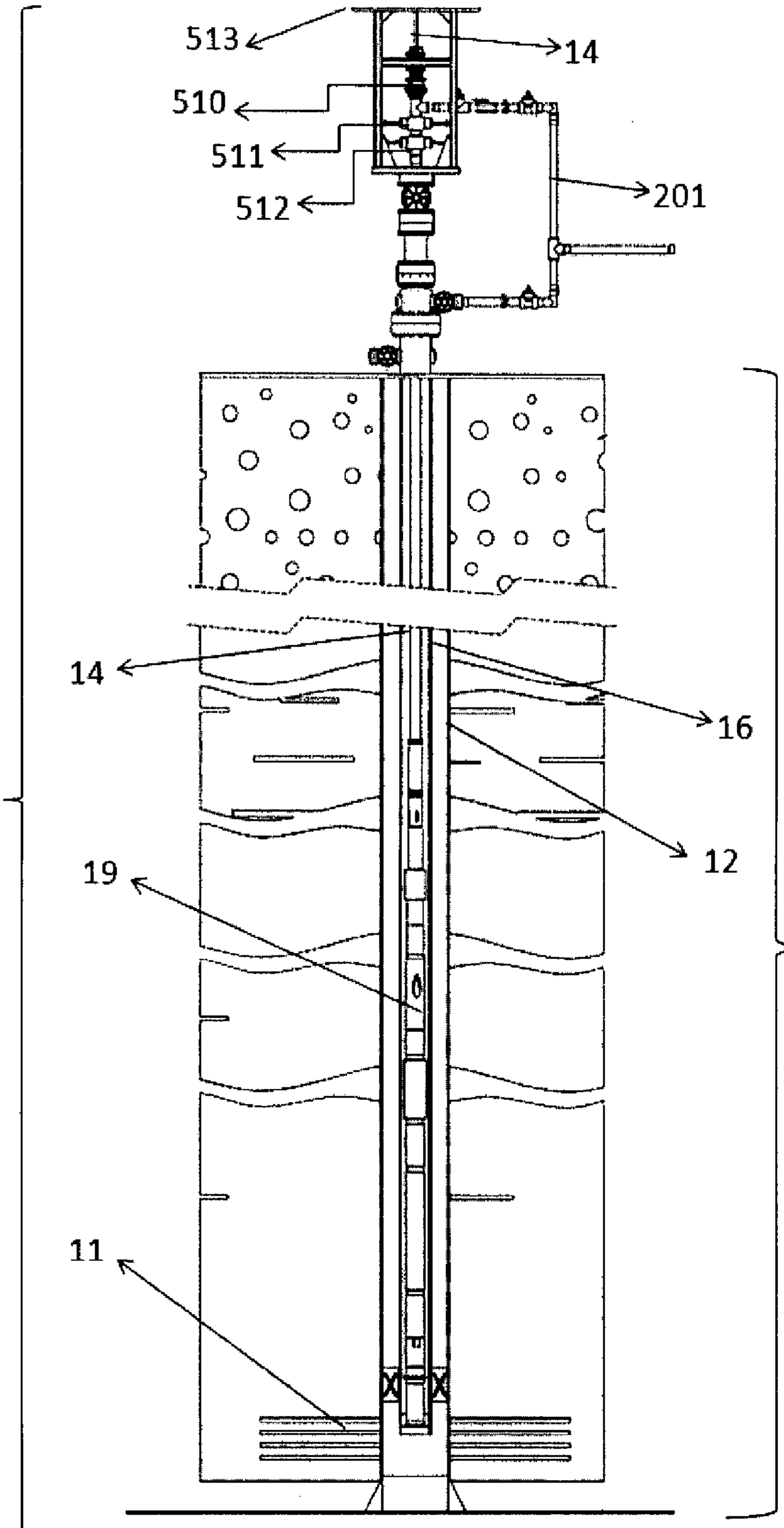


Fig. 1

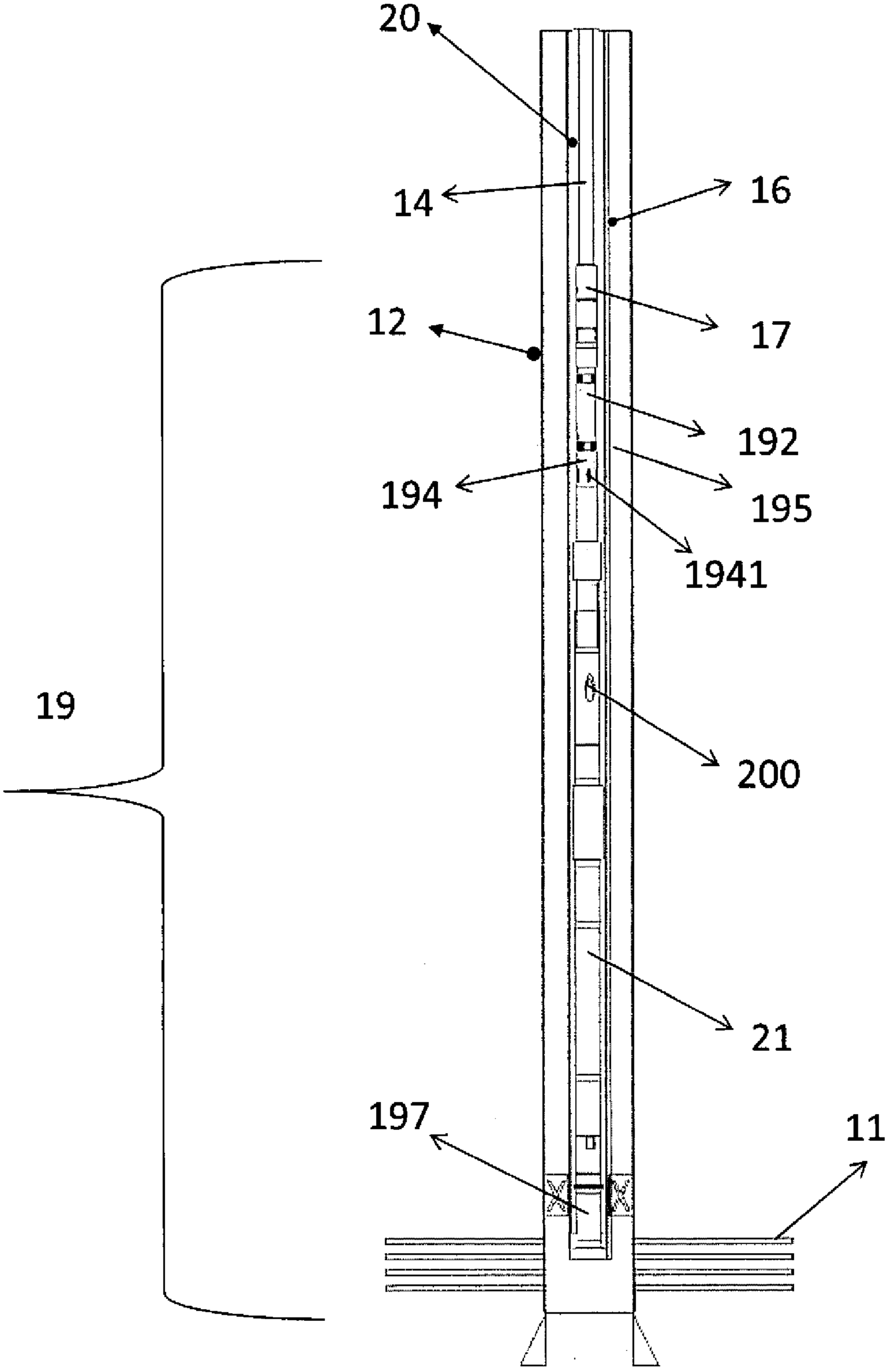


Fig.2

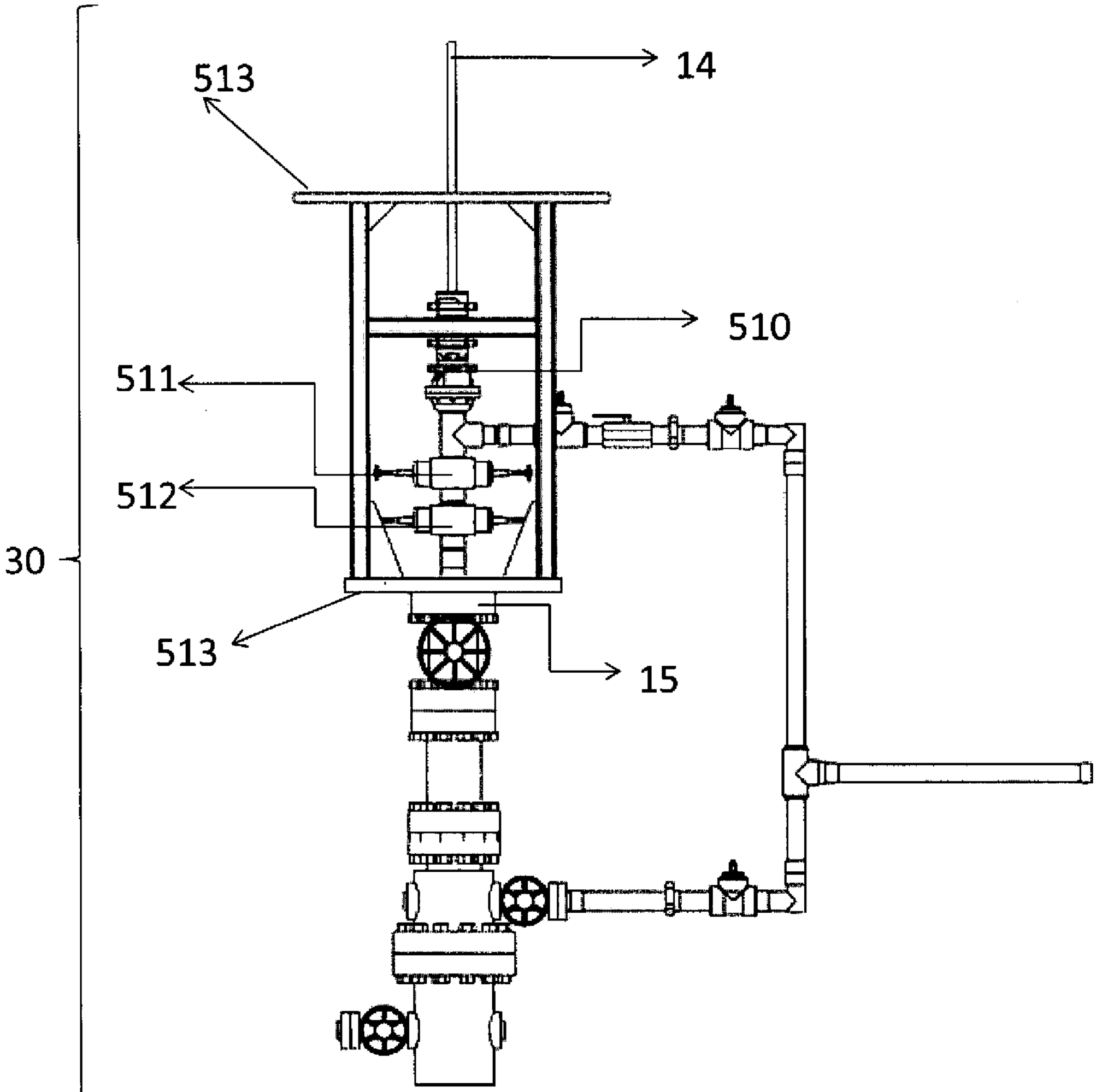


Fig. 3

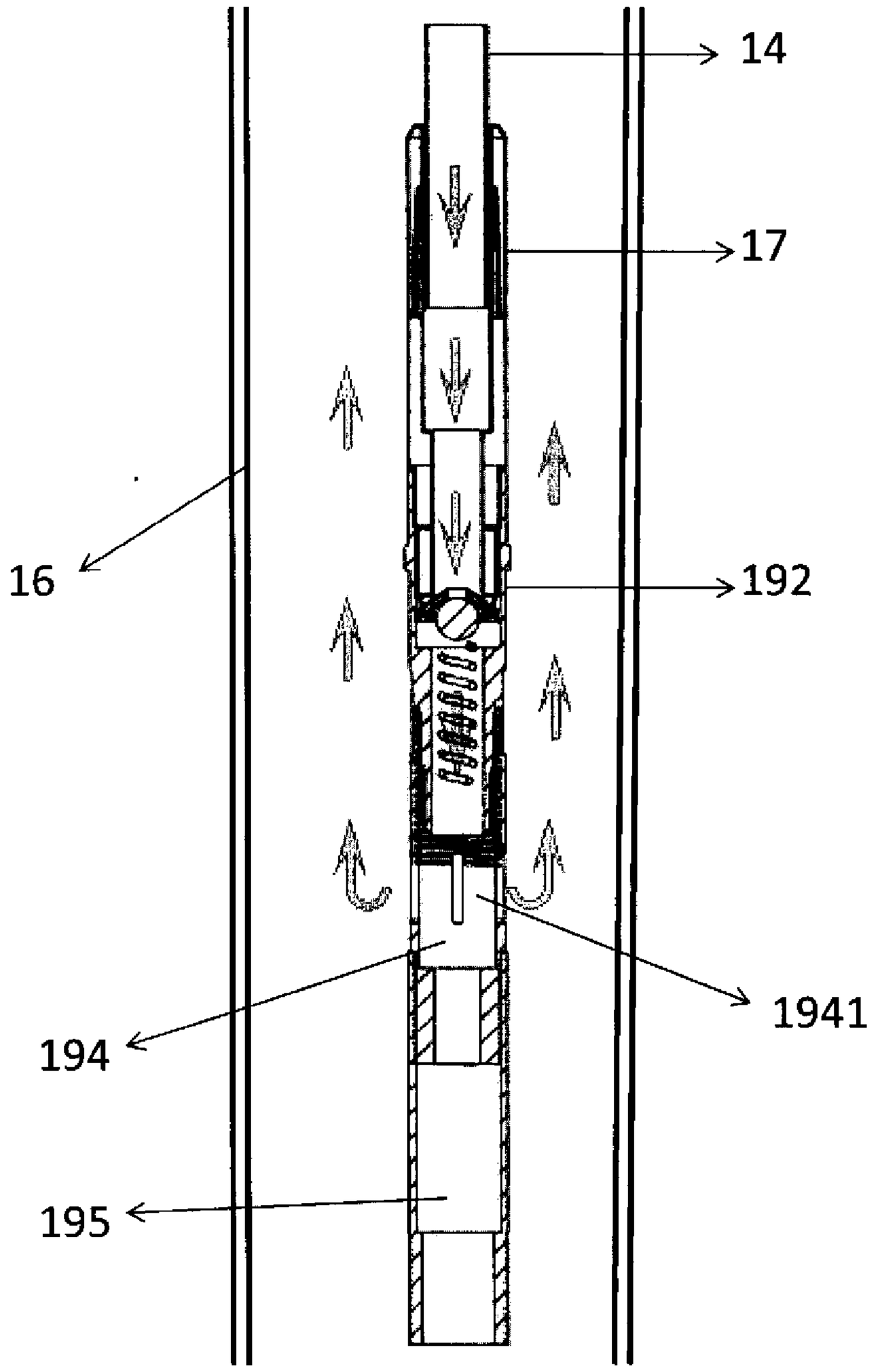


Fig. 4

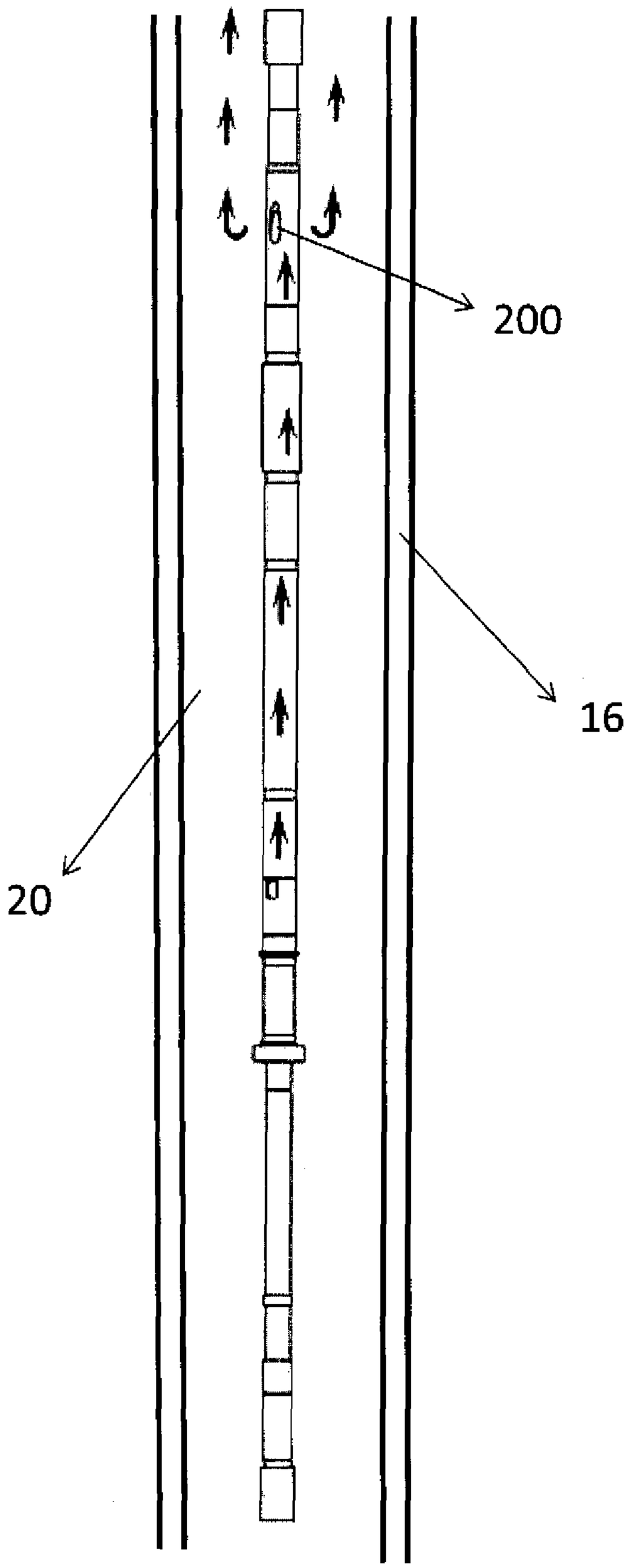


Fig.5

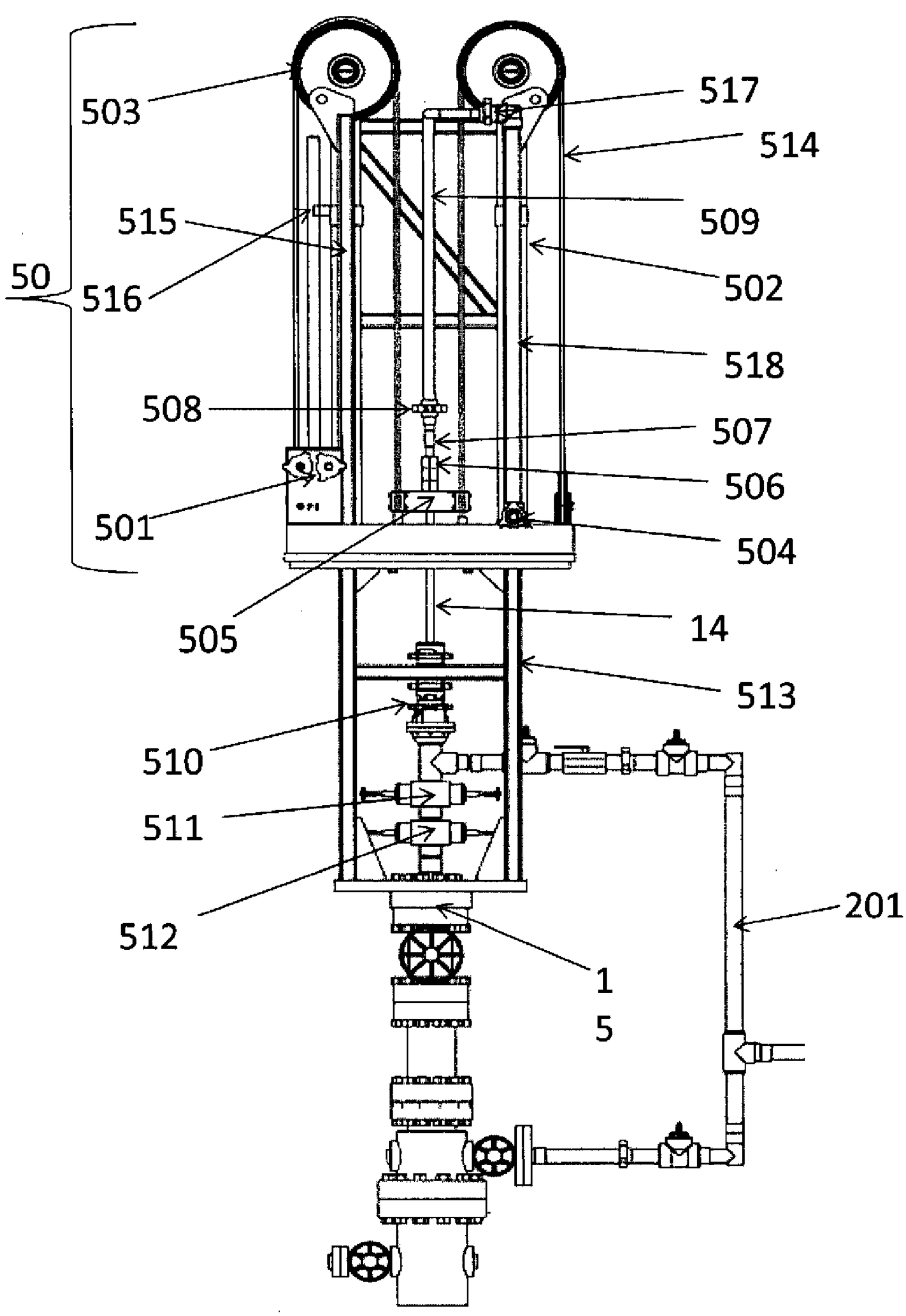

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Fig. 6

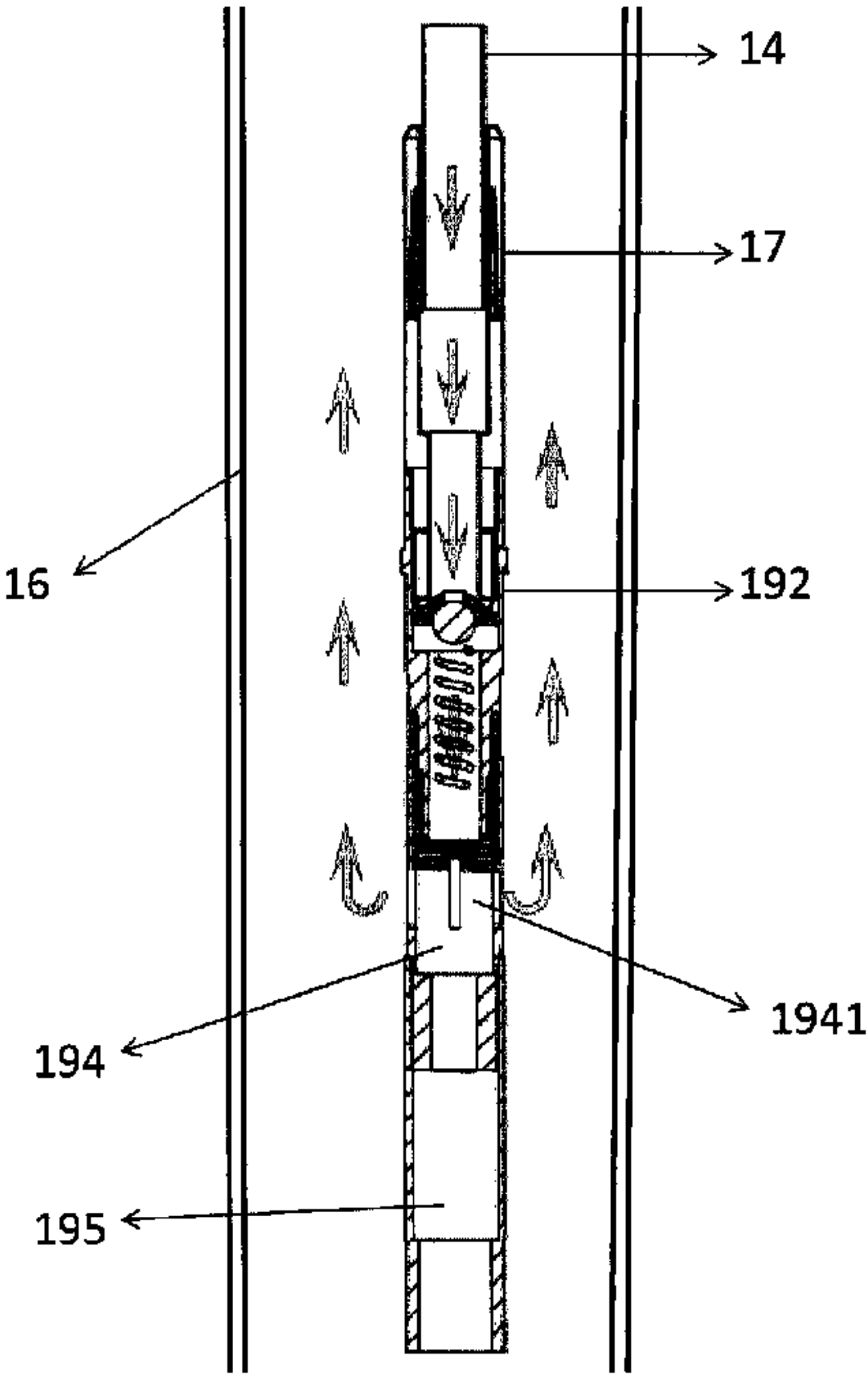


Fig. 4