PROPOSAL FOR CONTROLLING DISFUNCTIONAL 'BLOW OUT PREVENTER'

Of shore of Louisiana, Golf of Mexico

Apparatus for Controlling Oil Pipe Leak in Extreme Situations (3)

June 3, 2010

Technical field

This invention relates generally to the effective method for controlling oil leak in extreme situations under water when 'blow out preventer' have failed such as resent oil leak of shore of Louisiana, Golf of Mexico.

Previous attempts

So far, it has not been much failure of blowout preventer, but when it happens results are catastrophic. There have been several unsuccessful attempts to stop recent leak in Golf of Mexico. One was lowering four story tower, hundred tones of weight, to capture leak over fallen raiser pipe;
Second was similar attempt with smaller dome;
Third was to insert tube of smaller diameter into end of fallen raiser pipe;
Unsuccessful attempt was made to insert heavy mud into 'blow out preventer';
Recently, after unsuccessful attempt to make clean cut of the fallen raiser pipe, finally on day 45 of the accident rough cut was made with powerful shear (cutting tool) just above 'blow out preventer';
Today was first attempt to position modified small dome over rough cut on top of the 'blow out preventer'. Modified small dome is lowest part of the pipe line which supposedly will capture and transport most of the oil to the tanker on the surface. It might reduce leakage but substantial amount of oil is expected to continue to leak.

After recently disclosed information that inside fallen raiser pipe there is still a drilling pipe, which makes my two previous solutions with special harpoon-alike plugs unusable, and after recently disclosed information that successful, at leas rough, cut-off of the raiser pipe, just above 'blow out preventer' was made, I am sending the present invention as a new solution for sealing damaged well considering information of most recent development.

DISCLOSURE OF THE INVENTION

The present invention is a new method for temporally controlling oil pipe leak in extreme situations under water when 'blow out preventer' have failed.

The present solution/method for controlling oil pipe leak under water in extreme situations consists of:

1. A special flapper valve which can be operated and controlled by hydraulic and/or electrical means;

2. A special seal positioned inside wall of lower section of the valve connector which consist of: A bladder; and Fluid delivery system.

3. A special in-line pump for producing sucking force necessary during installation of the valve and pushing force necessary if fluids needs to be pumped up to the surface; and

4. Submarine robots (Remote Operated Vehicles) as observers and participant.

1. A special flapper valve consists of: Valve housing; Valve flap; Rubber seal ring; Operating mechanism; Lower connection section; and Upper connection section. Diameter of the valve housing is enlarged enough to accommodate hinged flap. The valve housing also has extended compartments to accommodate operating mechanisms for opening, closing and securing hinged flap inside valve housing. At this presentation operating mechanism is illustrated as common hydraulic cylinder with piston rod and locking solenoid switch although alternative mechanisms could be applied. One end of the hydraulic cylinder is pivotally secured inside wall of the extended compartment and one end of the piston rod is pivotally engaged to the hinged flap. At closed position the flap pushes against rubbery seal ring.

2. The special seal positioned inside wall of lower section of the valve connector consist of: A bladder; and Fluid delivery system. The bladder is a sealed enclosure with provided channels or tubes which expends when filled with fluid. The bladder is connected with a fluid container and an inline pump through a tube. When pump is activated the bladder is rapidly filled with fluid which then rapidly increases the volume and consequently seals the space between two critical surfaces - inside wall of lower section of the valve connector and radial surface at the top of the dysfunctional 'Blow Out Preventer' on which lower section of the valve connector is sited.

3. The in-line pump is an electro motor which consists of a rotor and a stator. The rotor consists of a hollow shaft which is fixedly engaged with an electromagnetic coil. The stator consists of a cylinder which is also housing of the motor and is fixedly engaged with electromagnetic coil. Stator and rotor are engaged through two sets of ball bearings and additional set of seal bearings. The cylinder of the motor has diameter reduction on each end and is aligned with the segments of the main, new, raiser pipe. The hollow shaft has continues spiral blades formed on the inner side of the shaft. When electro motor is activated the hollow shaft which is central element of the rotor rotates and provides suction force at the lower end, necessary during installation of the valve, and push force on the upper end of the in-line pump, necessary if fluids needs to be pumped up to the surface. The oil and gas are pumped up through raiser pipe to the next in-line pump for

farther pumping. The in-line pump segments are repetitively installed as needed for fluids to reach Ocean surface.

4. At locations such as depths of Ocean flour where tremendous hydrostatic pressure exist where humans can not operates then submarine robots are solutions for providing lights, video, operating tools, moving apparatus at the appropriate location with robotic arms, providing pushing, puling, cutting or rotating functions. They are controlled from the control center on the surface.

BREAF DESCRIPTION OF THE DRAWINGS

FIG. 1. is a cross sectional view taken along line **1-1'** of FIG. 2 of an apparatus, for temporally controlling oil pipe leak on the dysfunctional 'Blow Out Preventer' at the bottom of the Ocean, of shore of Louisiana, Golf of Mexico.

FIG. 2. is a cross sectional view taken along line **2-2'** of FIG. 1 of an apparatus, the valve, for temporally controlling oil pipe leak.

FIGS. 3. is a plain view of a special seal assembly with fluid delivery system used at lower connection section of the valve illustrated in FIGS. 1-2.

FIG. 4. is a cross sectional view taken along line **4-4'** of FIG. 3 of an empty bladder.

FIG. 5. is a cross sectional view taken along line **4-4'** of FIG. 3 of an fluid filled bladder.

FIG. 6. is an enlarged cross sectional view of an alternative sealing method of the lower connection section of the valve assembly illustrated in FIG. 1.

FIG. 7. is a plain view of a special sealing elements used in an alternative sealing method illustrated in FIG. 6.

FIG. 8. is a cross sectional view taken along line **8-8'** of FIG. 9 of an in-line pump assembly used, in this instance, to support installation of the valve illustrated in FIGS. 1-7 and to transport fluids to the surface.

FIG. 9. is a cross sectional view taken along line **9-9'** of FIG. 8 of an in-line pump assembly used, in this instance, to support installation of the valve illustrated in FIGS. 1-7 and to transport fluids to the surface.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to **FIG.1**; here is illustrated a new method/solution for temporally controlling oil pipe leak in extreme situations under water when blowout preventer have failed. The present assembly **10** for controlling oil pipe leak consists of: Valve housing **22**; Valve flap **24**; Rubber seal ring **26**; Operating mechanism **30**; Lower connection section **40**; Upper connection section **50;** and in-line pump **90**.
Diameter of the valve housing **22** is enlarged enough to accommodate flap **24** which is engaged to hinge **25**. The valve housing **22** also has extended compartment **60** to accommodate operating mechanisms **30** which consist of common hydraulic cylinder **32,** fluid container **34,** and pump **36** (tubes not illustrated) for opening and closing flap **24.** The valve housing **22** on the other side also has extended compartment **62** to accommodate alternative locking device which can be solenoid switch **64.** One end of the hydraulic cylinder **32** is pivotally secured inside wall of the extended compartment **60** to pivot **33.** One end of the piston rod **35** is engaged to the hinged flap **24** through pivot **38**. At closed position the flap **24** pushes against rubbery seal ring **26**.

Here is also illustrated a section of a special in-line pump **90** for producing sucking force necessary during installation of the valve **20** and pushing force necessary if fluids needs to be pumped up to the surface. The in-line pump **90** is explained in FIGS. 8 and 9.

Here is also illustrated upper portion of the 'Blow Out Preventer' **15;** section of the fallen raiser pipe **16** (in dash line) which is already cut-off; and remaining section of the raiser pipe **17**.

Here is also illustrated a special seal assembly **70** positioned inside wall of lower section of the valve connector **40.** The special seal assembly **70** consists of: bladder **80**; fluid container **72;** in-line pump **74** and tube **76.** The bladder **80** is a sealed enclosure with provided channels or tubes **82** which increases the volume when filled with fluid and consequently seals the space between two critical surfaces - inside wall of lower section of the valve connector **40** and radial surface at the top of the dysfunctional 'Blow Out Preventer' **15** on which lower section of the valve connector is sited.

Referring now to **FIG. 2;** here is illustrated a cross sectional view taken along line **2-2'** of FIG. 1 of an apparatus, the valve, for temporally controlling oil pipe leak Here are illustrated most of elements described in FIG 1. Here are visible: valve housing **22;** extended compartment **60** which accommodate operating mechanisms **30** with cylinder **32,** piston rod **35,** pivot **33,** valve flap **24,** hinge **25;** extended compartment **62** which accommodate alternative locking device solenoid switch **64;** Rubber ring seal **26;** Also, here is illustrated remaining section of the raiser pipe **17**.

Referring now to **FIG. 3;** here is illustrated a plain view of a special seal assembly **70** with fluid delivery system used at lower connection section **40** of the valve **20** illustrated in FIGS. 1-2. The bladder **80** is sealed enclosure with provided channels or tubes **82** at the mid section **84**. The space between seals **83** which forms channels **82** is reduced towards each end of the section **84** to provide smooth transition to the rubbery sections **86** and **88** to provide better seal. The bladder **80** is connected with a fluid container **72** and an in-line pump **74** through a tube **76**. When pump **74** is activated then the bladder **80** is rapidly filled with fluid which then rapidly increases the volume and consequently seals the space between two critical surfaces - inside wall of lower section of the valve connector **40** and radial surface at the top of the dysfunctional 'Blow Out Preventer' **15** on which lower section of the valve connector is sited.

Referring now to **FIG. 4;** here is illustrated a cross sectional view taken along line **4-4'** of FIG. 3. of the bladder **80** in an empty stage.

Referring now to **FIG. 5;** here is illustrated a cross sectional view taken along line **4-4'** of FIG. 3 of the bladder **80** in a fluid filled stage.

Referring now to **FIG. 6;** here is illustrated an enlarged cross sectional view of an alternative method **11** for sealing the lower connection section **40** of the valve assembly **10** illustrated in FIG. 1 to the upper portion of the 'Blow Out Preventer' **15**. The alternative sealing method **11** consist of inserting several radial sections **12** at space between inside wall of lower section of the valve connector **40** and radial surface at the top of the dysfunctional 'Blow Out Preventer' **15** on which lower section of the valve connector is sited and then welded. The radial sections **12** when assembled forms a circle and have triangle profile to provide better conditions for welding.

Referring now to **FIG. 7;** here is illustrated a plain view of several special sealing elements **12** used in an alternative sealing method **11**illustrated in FIG. 6. The radial sections **12** when assembled forms a circle and have triangle profile to provide better conditions for welding between inside wall of lower section of the valve connector **40** and radial surface at the top of the dysfunctional 'Blow Out Preventer' **15** on which lower section of the valve connector is sited.

Referring now to **FIG. 8;** here is illustrated a cross sectional view taken along line **8-8'** of FIG. 9 of an in-line pump assembly **90** used, in this instance, to support installation of the control valve **20** illustrated in FIGS. 1-7 and to transport fluids to the surface. The in-line pump **90** is an electro motor **91** which consists of a rotor **92** and a stator **94**. The rotor **92** consists of a hollow shaft **240** which is fixedly engaged with an electromagnetic coil **93**. The stator **94** consists of a cylinder **96** which is also housing of the motor **91** and is fixedly engaged to electromagnetic coil **95**. Stator **94** and rotor **92** are engaged through two sets of ball bearings **97** and additional set of seal bearings **98**. The cylinder the housing **96** of the motor **91** has diameter reduction on each end and is aligned with the segments of the main, new, raiser pipe **71**. The hollow shaft **240** has continues spiral blades **242** formed on the inner side of the shaft. When electro motor is activated the hollow shaft **240** which is central element of the rotor rotates and provides suction force at the lower end, necessary during installation of the valve, and push force on the upper end of the in-line pump **90**, necessary if fluids needs to be pumped up to the surface. The oil and gas are pumped up through raiser pipe **71** to the next in-line pump for farther pumping. The in-line pump segments **90** are repetitively installed as needed for fluids to reach Ocean surface.

There are two brackets **99** secured on each end of the in-line pump **90** with recesses **118** provided for additional supply line, tubes. Although in-line pump **90** is a part of my still developing project, still patent pending application, I am including it in this proposal because of perfect fit for present mission to speed up recovery process in Gulf of Mexico.

Referring now to **FIG. 9;** here is illustrated a cross sectional view taken along line **9-9'** of FIG. 8 of an in-line pump assembly **90** used, in this instance, to support installation of the control valve **20** illustrated in FIGS. 1-7 and to transport fluids to the surface. The excavation pump **90** is an electro motor **91**. Here is illustrated a hollow shaft **240** with continues spiral blades **242** formed on the inner side of the shaft **240**. The hollow shaft **240** is fixedly engaged with an electromagnetic coil **93** which represent rotor **92**. Also, here is illustrated a stator **94** which consists of a cylinder **96** which is housing of the motor **91;** and electromagnetic coil **95**. Also, here is illustrated bracket **99** with extra recesses **118** provided for additional line, if needed. Also, here is illustrated transformer box **190** with electric cable line **45** for supplying electric power to the in-line pump **90,** various sensors, cameras, lights, etc. (not illustrated).

OBJECTIVES OF THE INVENTION

1. Main objective of the present invention is that the apparatus consisting of: control valve, suction in-line pump and special seal(s) for connecting apparatus to the top of the dysfunctional 'Blow Out Preventer' is workable solution at the present situation and can be used in similar situations in the future.

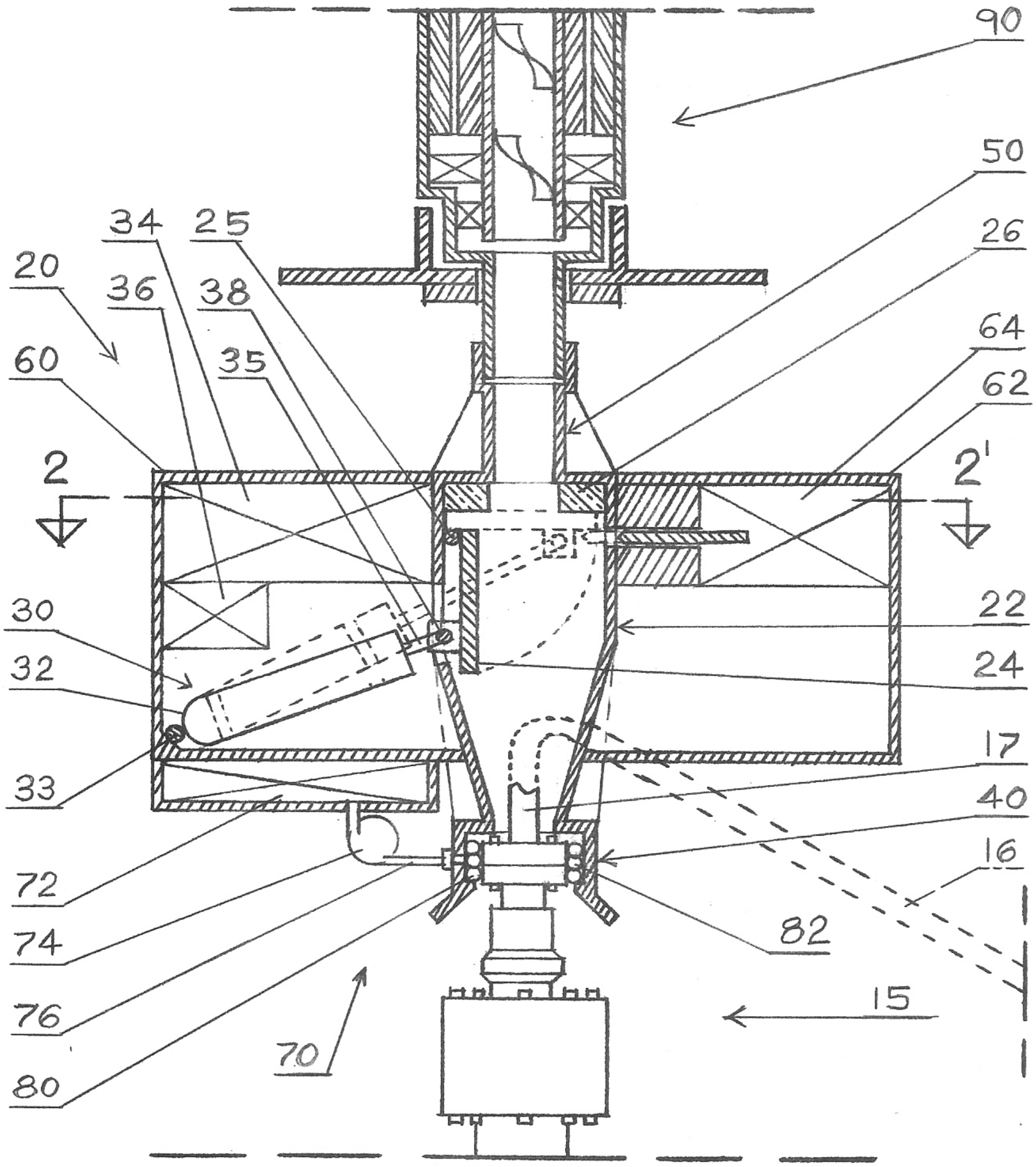
90
50
26
64
62
34
25
20
36
38
60
35
2
2'
30
22
32
24
33
17
40
72
16
74
82
76
15
70
80

FIG. 1

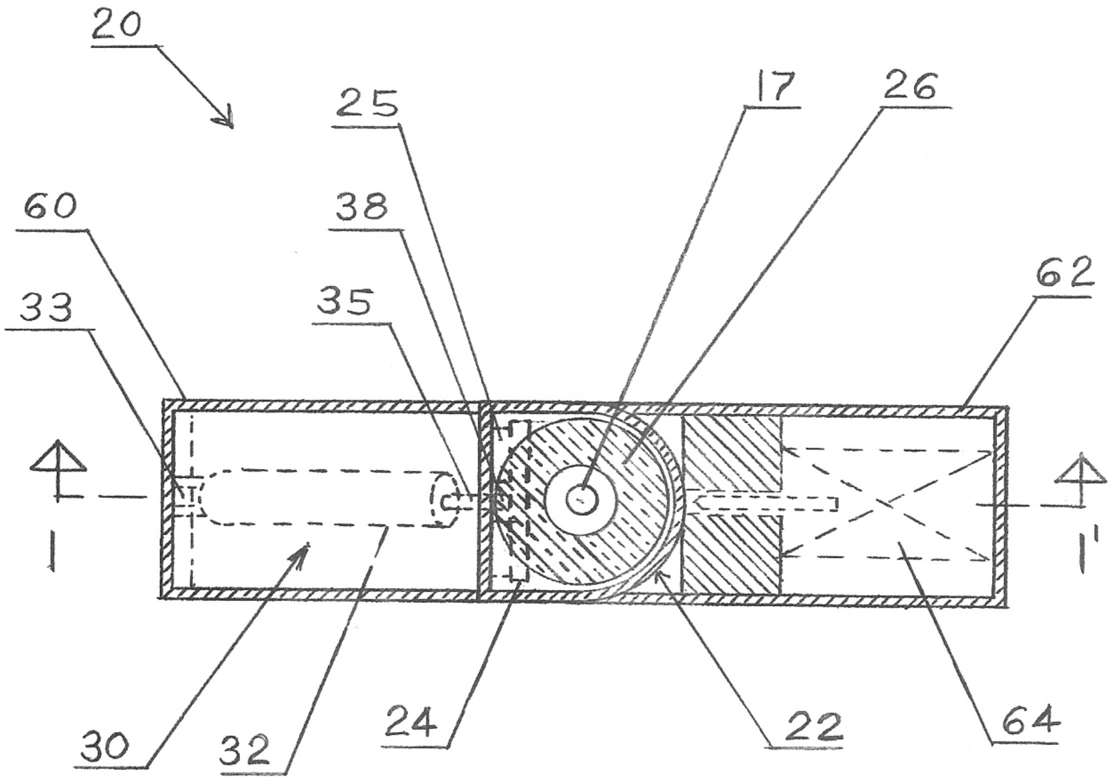

FIG. 2

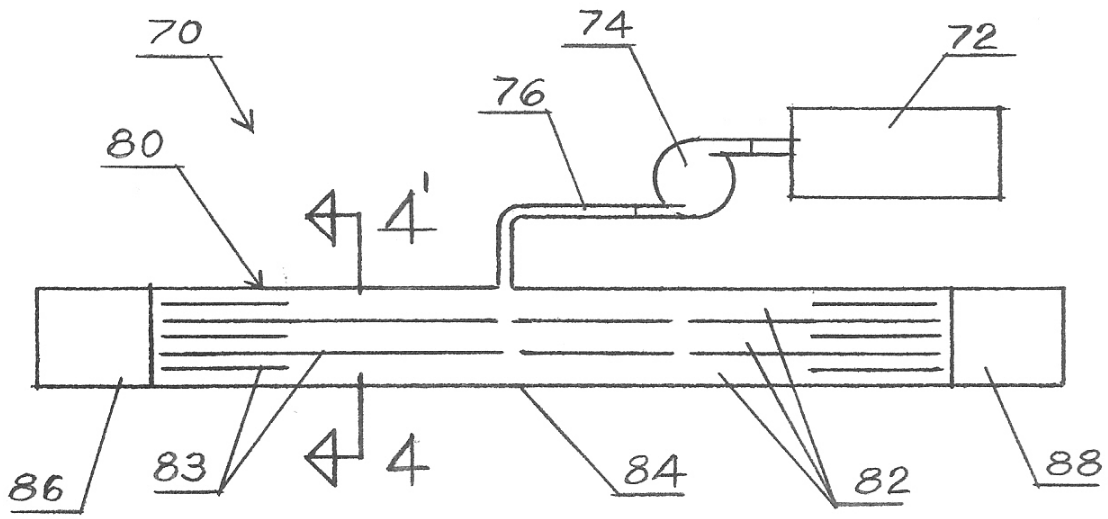

FIG. 3

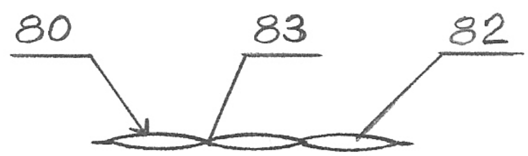

FIG. 4

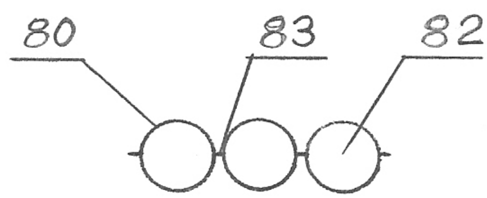

FIG. 5

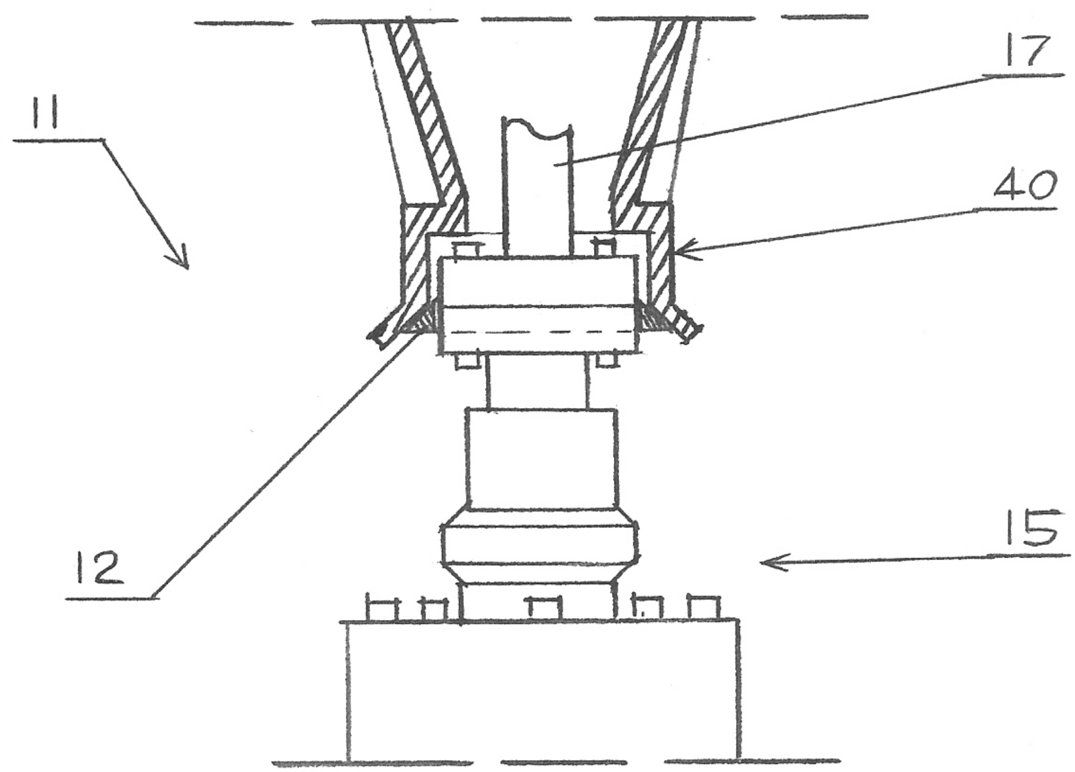

FIG. 6

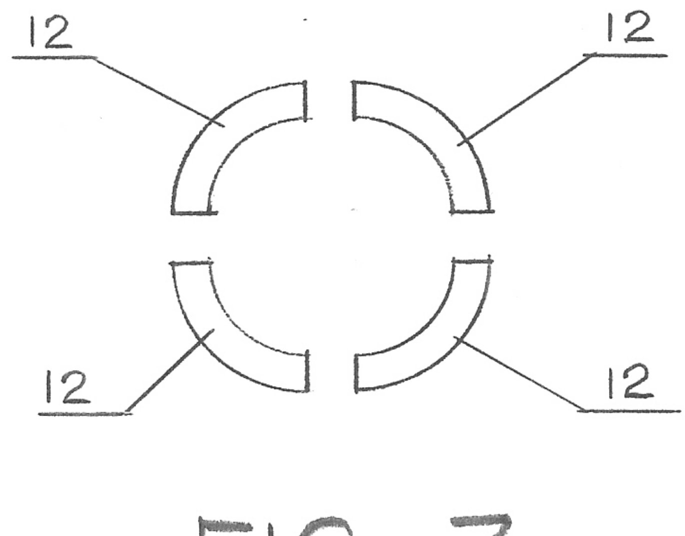

FIG. 7

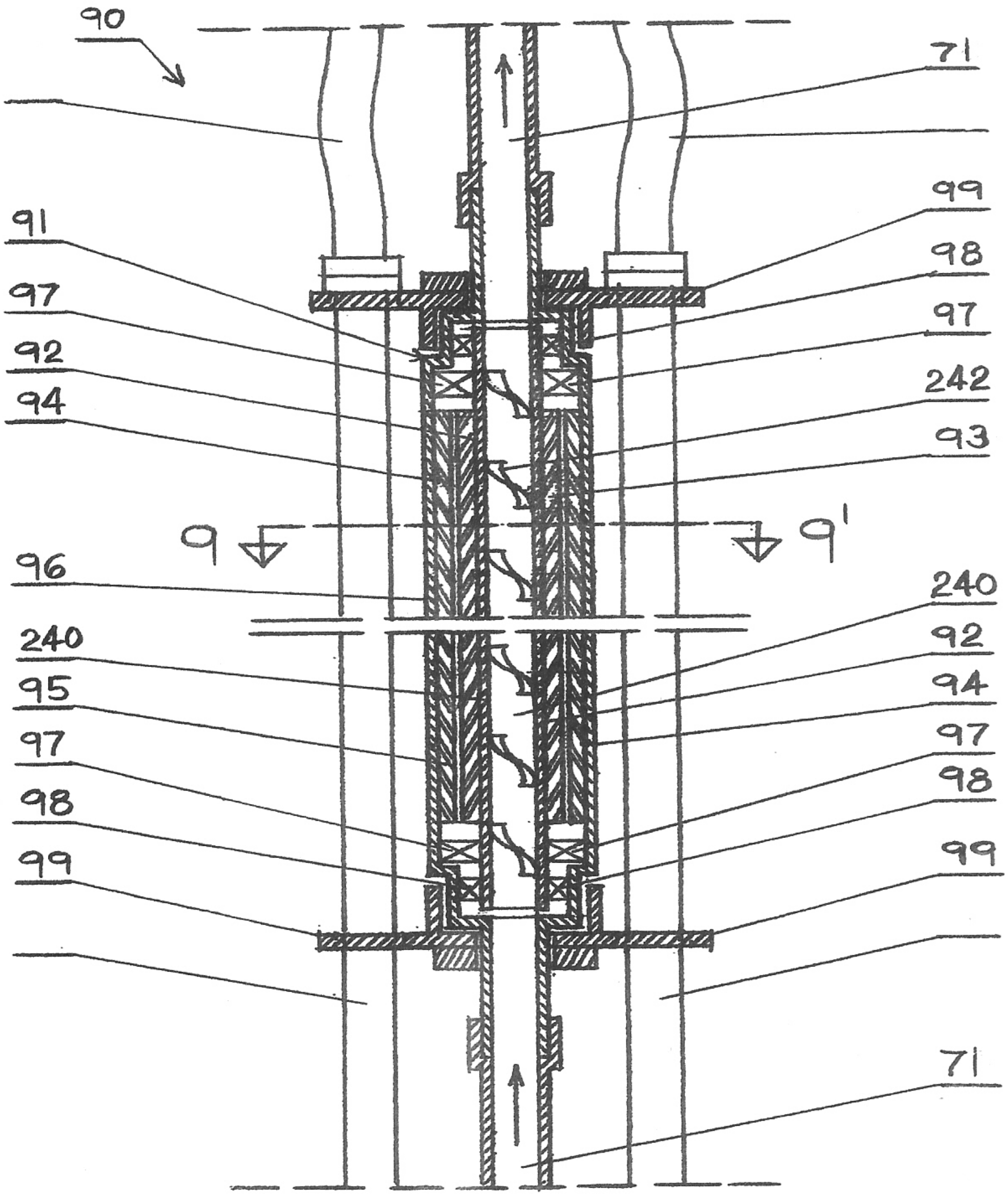
90
71
99
91
98
97
97
92
242
94
93
9
9'
96
240
240
92
95
94
97
97
98
98
99
99
71

FIG. 8

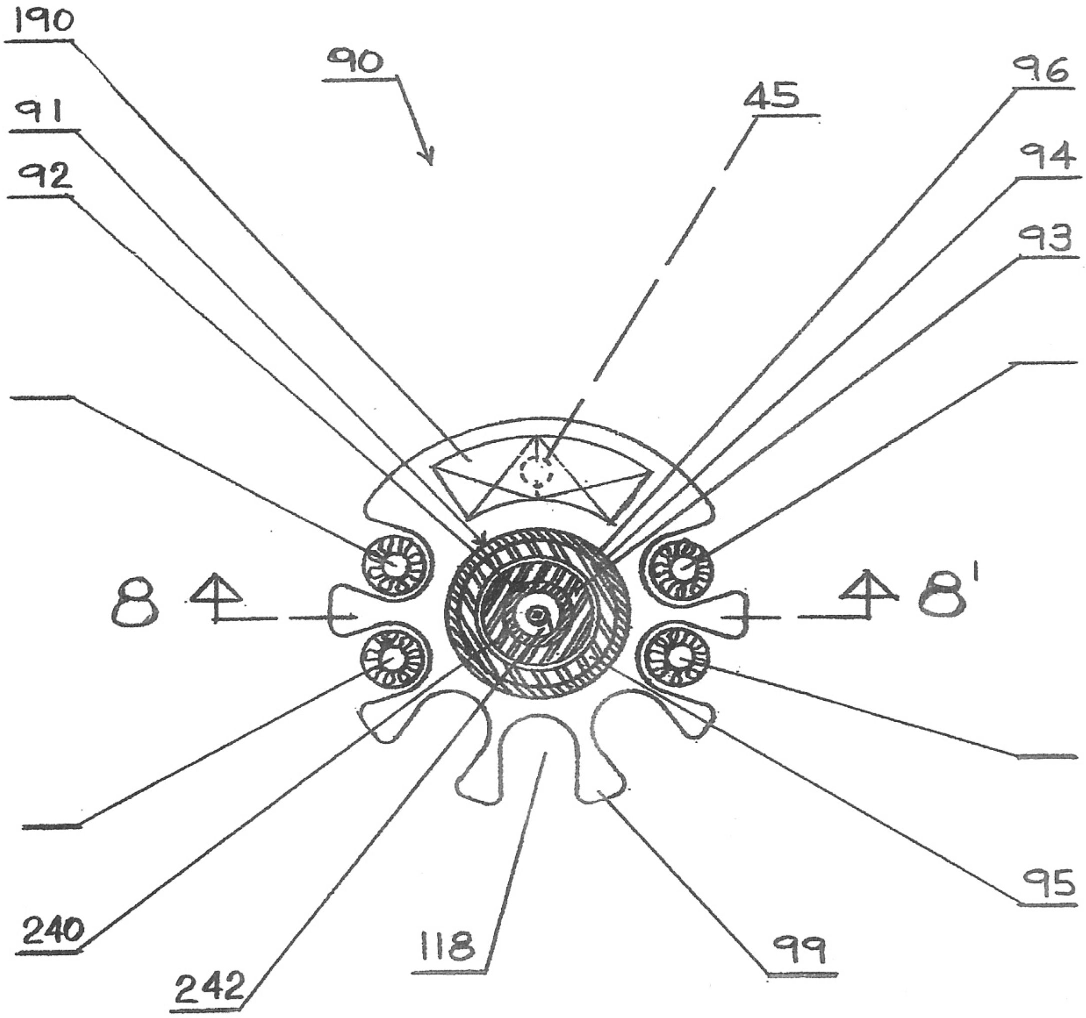

FIG. 9