A system and method for gathering and recovering natural and artificial accumulations of crude oil from natural emanations and capped oil wells, respectively. For a natural emanation or leak from capped oil wells, a vertical well is drilled in the vicinity of the accumulated crude oil. The migration of the crude oil through the cracks and fractures of the rocks are attracted to the interior of the vertical well. The crude oil is then gathered and collected through the use of an air compressor. For multiple natural emanations, a horizontal well is placed in the vicinity of the accumulated crude oil and gathered and collected through the use of a pumping system. The present invention removes environmental hazards to underwater, surface underground water and soil, wildlife, while providing a cost efficient method to transform otherwise wasted crude oil accumulations to a commercially viable product.
SYSTEM AND METHOD FOR CRUDE OIL PRODUCTION STEMMING FROM NATURAL EMANATIONS AND LEAKS FROM CAPPED OIL WELLS

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] Applicant’s invention relates to the field of crude oil production, and more specifically to a system and method of increasing crude oil production through collections of same from natural emanations and leaks from capped oil wells through the use of vibration signals and pumping systems. The terms “oil” and “petroleum” are used synonymously throughout this application.

[0003] 2. Background Information

[0004] Natural emanation of crude oil is a phenomenon that occurs in nature. Leaks from capped oil wells give an addition source of crude oil by artificial means, i.e., the capped oil wells are man-made. When a well ceases to be productive or becomes a dry hole, efforts are made to abandon the well. Commonly what occurs is that the oil well is capped by placing concrete in its interior. Nevertheless, on occasions this concrete does not arrive to the crude oil deposit. Corrosion or deterioration then damages the pipes of the capped well causing leaks which, like the natural emanations, migrate through cracks and fractures in the rock.

[0005] These natural emanations and leaks from capped oil wells yield uncontrollable amounts of crude oil, which migrate from the oil source towards the surface. The migration of crude oil (whether from the crude oil bed or from a leaking capped oil well) occurs through cracks and fractures of rocks. Continuous natural and artificial emanations of this nature lead to the unsightly accumulation of crude oil on the ground surface. This uncollected, accumulated crude oil loses any economic value and becomes a hazard to the environment, adversely affecting the surface and underground water and soil, thus producing a negative environmental impact. There is no known economically feasible current practice of collecting crude oil resulting from natural emanations or leaks from capped oil wells. This process, until the present invention, was cost prohibitive. The present invention takes advantage of the ostensibly worthless crude oil, and, by an efficient process, recovers such otherwise wasted crude oil.

[0006] There exists in the prior art several related patents. U.S. Pat. No. 3,776,032 discloses protection of an inflow of either gas or liquid into a well. The detection occurs during the drilling of the well for the prevention of blowouts. The detection process involves the use of pressure mud pulses from a pair of acoustical transducers, which generate signals in the form of pressure waves, both before the drilling mud is circulated to the drill bit and after drilling mud is circulated through the drill bit. The difference, if any, in the two signals are then converted to a signal then transmitted to the surface.

[0007] U.S. Pat. No. 4,114,721 discloses a pair of acoustic detectors moving through a well to detect sound which is indicative of a through casing leak, i.e., a leak that goes through the casing. The acoustic noise generated by the noise sources is monitored at two spaced-apart locations within the borehole. The signals, representing the monitored acoustic noise at each location, are transmitted uphole.

[0008] U.S. Pat. No. 4,101,827 discloses the detection of leaks in an underground pipe which is made of electrically insulating material, i.e., material that does not conduct electricity. The detection process involves partially filling the pipe with an electrically conductive fluid, such as tap water, passing an electrical current through the fluid to establish a voltage gradient along the length of the fluid in the pipe, and then analyzing the gradient to determine the location of the leak. The voltage source is electronically connected to one electrode which is immersed in the liquid at one pipe end, and to a second electrode which is driven into the ground. The method disclosed in this patent involves inserting a wire inside the underground pipe in order to properly determine the potential drop and the determination of the location of the leak or leaks is done by measuring the length of wire inserted into the underground pipe at the point where there is a potential drop, i.e., the point of minimal voltage.

[0009] U.S. Pat. No. 5,548,530 discloses a non-intrusive high-precision ultra-sonic leak detector system for pipelines for identification of the development of even very minute, i.e., millimeter size, leaks and locates them within several meters of their actual location in a segment between two site stations of the overall leak detection. Leaks are located and their locations determined by their effect on the pressure of the pipeline, and the effect of the pressure change on liquid density.

[0010] U.S. Pat. No. 6,442,999 discloses the same technology that is disclosed in U.S. Pat. No. 5,548,530 regarding detection of leaks in an underground pipeline system. However, U.S. Pat. No. 6,442,999 adds a master station to which site stations transmit sonic wave data in order to perform calculations to determine the presence of a leak and also their location.

[0011] U.S. Pat. No. 6,530,263 discloses a system for finding and locating leaks in a pipeline using loggers positioned along the pipeline at spaced intervals. These loggers detect and store sound data produced within the pipeline and download the stored sound data to a computer system to determine the location of the leaks.

[0012] U.S. Pat. No. 6,595,038 discloses an apparatus for determining the position of a leak in an underground pipe for fluid or gas using two acoustic sensors. The first sensor is coupled to the pipe with the second sensor being movable above the pipe. Both sensors detect sound either carried along the walls of the pipe or along fluid in the pipe.

[0013] U.S. Pat. No. 6,668,619 discloses a method and apparatus for locating the source of a leak in a pipeline using match pattern filtering techniques. These match pattern filters discriminate against background noise and pressure disturbances generated by other non-leak sources. This method uses acoustic signals to determine whether a leak exists and where it is located.

[0014] Finally, U.S. Pat. No. 6,650,125 discloses locating leaks of conductive fluids, such as ionized water, from non-conductive structures, such as pipes, through the use of a charge generator employed to charge and discharge the conductive fluid, and a capacitive type detector that can
detect the variable charge that is induced in the fluid. This detector is handheld and portable.

0015 The current art does not disclose locating and collecting leak(s) of crude oil which are naturally occurring. Nor does the current art disclose detecting leaks from otherwise capped or dry hole wells. Until the present invention, such activity was cost prohibitive. Therefore a need exists for a cost efficient system and method for crude oil production coming from natural emanation and leaks from capped oil wells.

SUMMARY OF THE INVENTION

0016 It is an object of the present invention to provide a simple method of gathering and collecting crude oil.

0017 It is another object of the present invention to provide a simple method of gathering and collecting crude oil production coming from natural emanations.

0018 It is another object of the present invention to provide a method for gathering and collecting crude oil from leaks from capped oil wells.

0019 It is another object of the present invention to eliminate environmental concerns such as contamination of surface and underground water and soil.

0020 It is another object of the present invention to eliminate environmental concerns such as endangering wildlife.

0021 It is another object of the present invention to provide a cost efficient method to transform otherwise wasted crude oil accumulations to a commercially viable product.

0022 It is another object of the present invention to avoid crude oil accumulations at the surface.

0023 It is another object of the present invention to increase public awareness of the negative environmental impact uncontrolled artificially and naturally occurring crude oil accumulations pose.

0024 It is another object of the present invention to create an accurate method of leak detection for artificially and naturally occurring crude oil accumulations.

0025 It is another object of the present invention to decrease the risk of false positives associated with other leak detection methods.

0026 It is another object of the present invention to reduce dangerous conditions caused by accumulation of crude oil.

0027 In satisfaction of these related objectives, applicant’s present invention provides a system and method of gathering and collecting crude oil coming from natural emanations and leaks from capped oil wells in a cost efficient and environmentally conscious manner.

0028 Collection of crude oil resulting from natural emanations begins with determining where the natural emanations are located. The process is simple. The presence of accumulation of crude oil on the ground surface is visually determined. Once this accumulation of crude oil is discovered, a vertical well is drilled in this zone. The diameter of the vertical well is approximately six (6) to eight (8) inches.

The depth of the vertical well is a maximum of two hundred (200) meters. Once the vertical well has been drilled, the bore created by the vertical well, exploiting the principles of pressure, creates a center of low pressure. Because of this low pressure, the crude oil which originally migrated to the ground surface is now attracted towards the vertical well.

0029 To determine the location of the point at which the natural emanations enter the vertical well, a mechanical vibration sensor is introduced. This mechanical vibration sensor is lowered into the vertical well and suspended by a tripod at ground level. The mechanical vibration sensor then sends voltage signals through a cable which is connected to a voltage data acquisition card. The voltage data is then collected and a graph is generated wherein the x-axis represents the intensity of the voltage signal and the y-axis represents depth.

0030 The interpretation of the graphical representation is based on the principle that the flow of crude oil is directed towards the interior of the vertical well. Vibrations generated by the flow of crude oil are picked up by the mechanical vibration sensor in proportion to the quantity of oil that flows around the mechanical vibration sensor. This mechanical vibration sensor produces a high voltage intensity resulting from the flow of crude oil as the mechanical vibration sensor descends the vertical well. Once the mechanical vibration sensor passes by the naturally emanating crude oil, the crude oil no longer flows over the mechanical vibration sensor.

The depth location where the crude oil naturally emanates into the interior of the vertical well is identified when the intensity of the voltage signal diminishes significantly. This depth location is called the contribution point.

0031 Once the contribution point is identified, the stimulation for increase crude oil production in the vertical well begins. An injection tube is placed in the interior of the vertical well. The maximum diameter of the injection tube is one third (1/3) that of the diameter of the vertical well. The injection tube is lowered down the vertical well to a depth of one (1) meter below the contribution point of the naturally emanating crude oil. An exiting tube at the upper part of the vertical well connects to a conduction pipe, through which crude oil accumulated within the vertical well is discharged into a storage tank.

0032 A cap covers the top of the vertical well. This cap seals the space between the outside of the injection tube and the interior of the vertical well. This seal permits a high pressure air generated by an air compressor to push through the interior of the injection tube in order to drag the crude oil through the exiting tube and through the conduction pipe for ultimate discharge into a storage tank.

0033 As with natural emanations, detecting leaks in, and capturing and collecting crude oil from, a capped oil well begins with ascertaining the location of the leaking capped oil well. The presence of accumulation of crude oil on the ground surface in proximity to a capped oil well is visually determined. Once this accumulation of crude oil is discovered, a vertical well is drilled in this zone.

0034 In order to capture the leaking crude oil from a capped oil well, a vertical well is drilled parallel to the capped well to a depth of a maximum of two hundred (200) meters. The diameter of the vertical well is approximately six (6) to eight (8) inches. As before, this vertical well
becomes a center of lower pressure, attracting the flow of the leaking crude oil toward the vertical well instead of the ground surface.

[0035] To determine the depth location where the leaking crude oil enters into the interior of the vertical well, a mechanical vibration sensor is introduced. This mechanical vibration sensor is lowered into the vertical well and suspended by a tripod at ground level. This mechanical vibration sensor then sends voltage signals through a cable which is connected to a voltage data acquisition card. The voltage data is then collected and a graph is generated wherein the x-axis represents the intensity of the voltage signal and the y-axis represents depth.

[0036] The interpretation of the graphical representation is based on the principle that the flow of crude oil is directed toward the interior of the vertical well. Vibrations generated by the flow of crude oil are picked up by a sensor in proportion to the quantity of oil that flows around said sensor. This mechanical vibration sensor produces a high voltage intensity resulting from the flow of crude oil as the mechanical vibration sensor descends the vertical well. Once the mechanical vibration sensor passes by the leaking crude oil, the crude oil no longer flows over the mechanical vibration sensor. The depth location where the crude oil leaks into the interior of the vertical well is identified when the intensity of the voltage signal diminishes significantly. This depth location is called the contribution point.

[0037] To stimulate the production of the leaking crude oil from the capped oil well, an injection tube is placed down the interior of the vertical well. The injection tube has a maximum diameter of one third (1/3) of that of the vertical well. The air injection tube is lower down to a depth of one (1) meter below the maximum contribution point. Once the position of the air injection tube is in place, an exiting tube is connected in the upper part of the vertical well. This exiting tube is connected to a conduction pipe which will carry the collected crude oil to be discharged in a storage tank.

[0038] A cap is placed on the top of the vertical well, sealing the ring space which exists between the outside of the injection tube and the interior of the vertical well. This seal permits high pressure air generated from a compressor to push through the interior of the injection tube, forcing the crude oil through the exiting tube and conduction pipe and finally discharging the crude oil into a storage tank.

[0039] There may be occasions where more than one natural emanation occurs. In such event, it is necessary to have in place a system and method to gather and collect these quantities of naturally accumulated crude oil. As with natural emanations and leaks from capped oil wells, determining whether multiple emanations exist is performed by visual inspection.

[0040] When there are multiple natural emanations present, a horizontal well is drilled in the vicinity of the accumulated crude oil. The presence of the horizontal well creates, again, a center of lower pressure, attracting the migration of crude oil in the cracks and fractures of the rock toward the interior of the horizontal well. The crude oil which accumulates in the interior of the horizontal well is then extracted using a pumping system for crude oil. The crude oil collected by this pumping system is transported to the surface by a discharge pipe which leads to a storage tank located at ground level.

[0041] The pumping system used to drive the crude oil to the ground surface comprises a general pumping system housing within which a hydraulic piston, fed by two high pressure oil hoses, drives a hydraulic chamber and controls the advance and return of a rod. A fixed ring cover expands or restricts the area of the hydraulic chamber as the rod advances then returns. The two high pressure hoses are oil conduits of a hydraulic system located on the ground surface. The hydraulic system is driven by an internal combustion motor.

[0042] The rod has a movable cap on the end and travels through a six (6) inch crude oil collector tube. The space between the movable cap and the crude oil collector tube is 0.004 inches. As the rod moves from one end of the crude oil collector tube, the rod forces the movable cap toward crude oil access conduits and a discharge pipe at the opposing end of the crude oil collector tube. A cover seal at this opposing end impedes the exit of crude oil that enters into the crude oil collector tube.

[0043] Both the crude oil access conduits and the discharge pipe function by means of an opening and closing system which consists of a sphere located in the interior of a cone which has an aperture or opening on one end and a grid on the other end. The opening serves as either an entrance or exit for crude oil, depending on whether the cone is located within the crude oil access conduits or the discharge pipe. The opening is of a smaller diameter than the sphere. On the opposite end of the cone is a grid. When crude oil flows through the cone, the force of the flow forces the sphere against the surface of the grid. This grid permits the flow of crude oil to pass while simultaneously retaining the sphere in a semi-fixed location. The grid is three (3) times the diameter of the sphere.

[0044] In the preferred embodiment, the sphere, cone, and grid are all made up of a metallic substance. The crude oil passes through the opening of the cone, circumventing the sphere, and ultimately passing through the grid for displacement either within the crude oil collector tube or toward the storage tank via the discharge pipe. The cone in the discharge pipe is located in the ring cap which closes the space between the six (6) inch crude oil collector tube and the exterior sixteen (16) inch pipe.

[0045] To refill the six (6) inch crude oil collector tube, a return system is activated by the high pressure hoses. This return system permits the rod to return toward the hydraulic chamber. The movable cap creates a vacuum which pulls the spheres within the cones within the crude oil access conduits toward the grid and allows crude petroleum to enter into the interior of the six (6) inch crude oil collector tube. Simultaneously, within the cone, sphere, and grid system located within the discharge pipe, the sphere is drawn up against the opening of the cone preventing back flow of any crude oil which exited the six (6) inch crude oil collector tube. This reverse stroke permits crude oil to fill the interior of the six (6) inch crude oil collector tube. Repeating this action of advance and return of the rod maintains and sustains crude oil production operation with the pumping system.

BRIEF DESCRIPTION OF THE DRAWINGS

[0046] FIG. 1 is a subterranean side view of a typical crude oil migration pattern from a crude oil deposit to the soil surface.
FIG. 2 is a subterranean side view of the migration of crude oil into the interior of a vertical well.

FIG. 3 is a subterranean elevation view of the preferred embodiment of the present invention for determining the depth of a natural emanation along side a graphical representation for determining the point where the natural emanation flows into the vertical well.

FIG. 4 is an elevation view of the preferred embodiment of the present invention for collecting accumulation of crude oil from a natural emanation.

FIG. 5 is an elevation view of the preferred embodiment of the present invention in collecting crude oil from a leak in a capped oil well.

FIG. 6 is a subterranean view of migration patterns of crude oil towards the interior of a horizontal well.

FIG. 7 is an elevation view of the preferred embodiment of the present invention in collecting leaks from multiple natural emanations.

FIG. 8 is a perspective view of the pumping system used to collect crude oil accumulation from natural emanations within a horizontal well.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1, stemming from a crude oil deposit 2, a naturally occurring crude oil accumulation 4 on the ground surface 1 is visually determined. A vertical well 5 is drilled in this zone, as illustrated in FIG. 2. The diameter of the vertical well 5 is approximately six (6) to eight (8) inches. The depth of the vertical well 5 is a maximum of two hundred (200) meters. Once the vertical well 5 has been drilled, the bore created by the vertical well 5 creates a center of low pressure. Because of this low pressure, the crude oil natural emanation 3 which originally migrated to the ground surface 1 is now attracted towards the vertical well 5.

To determine the location at which the crude oil natural emanations 3 enter the vertical well 5, a mechanical vibration sensor 6 is lowered into the vertical well 5 and suspended by tripod 7 at ground surface 1, as illustrated in FIG. 3. The mechanical vibration sensor 6 sends voltage signals 12 through a cable 8 which is connected to a voltage data acquisition card 9. The voltage data is then collected and a graph is generated wherein the x-axis 10 represents the intensity of the voltage signal 12 and the y-axis 11 represents depth.

Still referring to FIG. 3, the interpretation of the graphical representation is based on the principle that the flow of crude oil is directed towards the interior of the vertical well 5. Vibrations generated by the flow of crude oil natural emanations 3 are picked up by the mechanical vibration sensor 6 in proportion to the quantity of crude oil that flows around the mechanical vibration sensor 6. This mechanical vibration sensor 6 produces high voltage intensity resulting from the flow of crude oil as the mechanical vibration sensor 6 descends the vertical well 5. The location of the depth where the crude oil naturally emanates into the interior to the vertical well 5 is identified when the intensity of the voltage signal diminishes significantly. This depth location is called the contribution point 13.

Once the contribution point 13 is identified, an injection tube 15 is placed in the interior of the vertical well 5, as depicted in FIG. 4. The maximum diameter of the injection tube 15 is one third (1/3) that of the diameter of the vertical well 5. The injection tube 15 is lowered down the vertical well 5 to a depth of one (1) meter below the contribution point 13 of the naturally emanating crude oil. An exiting tube 19 at the upper part of the vertical well 5 connects to a conduction pipe 17, through which crude oil accumulated within the vertical well 5 is discharged into a storage tank 18.

A cap 14 covers the top of the vertical well 5. This cap 14 seals the space between the outside of the injection tube 15 and the interior of the vertical well 5. This seal permits a high pressure air generated by an air compressor 16 to push through the interior of the injection pipe 15 in order to drag the crude oil through the exiting tube 19 to the conduction pipe 17, and ultimately discharging it into the storage tank 18.

FIG. 5 illustrates the preferred embodiment of the system and method of the present invention for locating and collecting crude oil leak 22 from a capped oil well 20 filled with concrete 21. As with natural emanations, the accumulation of crude oil 4 on the ground surface 1 stemming from leaks from a capped oil well is visually determined. For such a leak, a vertical well 5 is drilled parallel to the capped well 20 to a depth of a maximum of two hundred (200) meters. As before, this vertical well 5 becomes a center of lower pressure, attracting the flow of the crude oil leak 22 from the capped oil well 20. The crude oil leak 22 then migrates toward the vertical well 5 instead of the ground surface 1.

FIG. 3 shows the method for determining the depth location, and thus the contribution point 13, of a crude oil leak 22 from a capped oil well as being the same as determining the contribution point 13 of a crude oil natural emanation 3. The only difference is the presence of the capped oil well 20. Therefore, reference is made to FIG. 3 for the following discussion.

To determine the depth location where the crude oil leak 22 enters into the interior of the vertical well 5, a mechanical vibration sensor 6 is introduced. This mechanical vibration sensor 6 is lowered into the vertical well 5 and suspended by a tripod 7 at ground surface 1. This mechanical vibration sensor 6 then sends voltage signals 12 through a cable 8 which is connected to a voltage data acquisition card 9. The voltage data is then collected and a graph is generated wherein the x-axis 10 represents the intensity of the voltage signal 12 and the y-axis 11 represents depth.

Still referring to FIG. 3, the interpretation of the graphical representation is based on the principle that the flow of crude oil leaks 22 is directed towards the interior of the vertical well 5. Vibrations generated by the flow of crude oil leaks 22 are picked up by the mechanical vibration sensor 6 in proportion to the quantity of crude oil leak 22 that flows around the mechanical vibration sensor 6. This mechanical vibration sensor 6 produces a high voltage intensity resulting from the flow of crude oil as the mechanical vibration sensor 6 descends the vertical well 5. Once the mechanical vibration sensor 5 passes by the crude oil leak 22, the crude oil leak 22 no longer flows over the mechanical vibration sensor 6. The depth location where the crude oil leak 22 flows into the interior of the vertical well 5 is identified when the
intensity of the voltage signal 12 diminishes significantly. This depth location is called the contribution point 13.

[0063] To stimulate the production of the crude oil leak 22 from the capped oil well 20, an injection tube 15 is placed down the interior of the vertical well 5. The injection tube 15 has a maximum diameter of one third (1/3) that of the vertical well 5. The air injection tube 15 is lower down to a depth of one (1) meter below the contribution point 13 of the crude oil leak 22. Once the position of the air injection tube 15 is in place, an exiting tube 19 is connected in the upper part of the vertical well 5. This exiting tube 19 is connected to a conduction pipe 17 which will carry the collected crude oil to be discharged in a storage tank 18.

[0064] A cap 14 is placed on the top of the vertical well 5, sealing the ring space which exists between the outside of the injection tube 15 and the interior of the vertical well 5. This seal permits a high pressure air generated by a compressor 16 to push through the interior of the injection pipe 15, forcing the crude oil through the exiting tube 19 and conduction pipe 17 and finally discharging the crude oil into the storage tank 18.

[0065] Referring now to FIG. 6, when there are multiple natural emanations, a horizontal well 23 is drilled in the vicinity of the crude oil accumulation 4. The presence of the horizontal well 23 creates, again, a center of lower pressure, which attracts the migration of crude oil 3 in the cracks and fractures of the rock toward the interior of the horizontal well 23. The crude oil 24 which accumulates in the interior of the horizontal well 23 is then extracted using a pumping system, as illustrated in FIG. 7. The crude oil 24 collected by this pumping system is transported to the ground surface 1 by a discharge pipe 25 which leads to a storage tank 18 located at ground surface 1.

[0066] The pumping system used to drive the crude oil 24 to the ground surface 1 comprises a general pumping system housing—a sixteen (16) inch diameter pipe 30—within which a hydraulic piston 29, fed by two high pressure oil hoses 28, drives a hydraulic chamber 41 and controls the advance and return of a rod 40. A fixed ring cover 42 expands or restricts the area of the hydraulic chamber 41 during the advance and return strokes of the rod 40. The two high pressure hoses 28 are oil conduits of a hydraulic system 27 driven by an internal combustion motor 26.

[0067] The rod 40 has a movable cap 39 on the end and travels through a six (6) inch crude oil collector tube 31. The space 43 between the movable cap 39 and the crude oil collector tube 31 is 0.004 inches. As the rod moves from one end of the crude oil collector tube 31, the rod 40 forces the movable cap 39 toward a plurality of crude oil access conduits 32 and the discharge pipe 25 at the opposing end of the crude oil collector tube 31. A cover seal 37 at this opposing end impedes the exit of the crude oil 24 that enters into the crude oil collector tube 31.

[0068] Both the plurality of crude oil access conduits 32 and the discharge pipe 25 function by means of an opening and closing system. This opening and closing system consists of a sphere 34 located in the interior of a cone 35 which has an opening 36 which serves as either an entrance or exit for crude oil 24, depending on whether the cone 35 is located within the plurality of crude oil access conduits 32 or the discharge pipe 25. The opening 36 is of a smaller diameter than the sphere 34. On the opposite end of the cone 35 is a grid 33. When crude oil 24 flows through the cone 35, the force of the flow forces the sphere 34 against the surface of the grid 33. This grid 33 permits the flow of crude oil 24 to pass while simultaneously retaining the sphere 34 in a semi-fixed location. The grid 33 is three (3) times the diameter of the sphere 34.

[0069] In the preferred embodiment, the sphere 34, cone 35, and grid 33 are all made up of a metallic substance; however, other durable and resistant materials may be used. The crude oil 24 passes through the opening 36 of the cone 35, circumventing the sphere 34, and ultimately passing through the grid 33 for displacement either within the crude oil collector tube 31 or toward the storage tank 18 via the discharge pipe 25. The cone 35 in the discharge pipe 25 is located in the ring cap 38 which closes the space between the six (6) inch crude oil collector tube 31 and the exterior sixteen (16) inch diameter pipe 30.

[0070] To refill the six (6) inch collector pipe 31, a return system is activated by the two high pressure hoses 28. This return system permits the rod 40 to return toward the hydraulic chamber 41. The movable cap 39 creates a vacuum which pulls the spheres 34 within the cones 35 towards the grids 33 and allow the crude oil 24 to enter into the interior of the six (6) inch crude oil collector tube 31. Simultaneously, within the cone 35, sphere 34, and grid 33 system located within the discharge pipe 25, the sphere 34 is drawn up against the opening 36 of the cone 35, preventing any back flow from any crude oil 24 which has exited the six (6) inch collector tube 31. This reverse stroke permits crude oil 24 to fill the interior of the six (6) inch crude oil collector tube 31. Repeating this action of advance and return of the rod 40 maintains and sustains crude oil production operation with the pumping system.

I claim:

1. A method of crude oil production stemming from natural emanations comprising the steps of:
   - locating an accumulation of crude oil on the ground surface, such accumulation defining a zone within which this method is conducted;
   - drilling a vertical well within said zone;
   - detecting vibrational signals produced by said natural emanations within said vertical well;
   - transmitting said vibrational signals to a signal transducer;
   - converting said vibrational signals for display;
   - determining a depth for entry of said natural emanations into said vertical well;
   - placing a tubularly shaped device within the interior of said vertical well;
   - causing high pressure air to flow through said tubularly shaped device; and
   - collecting said natural emanations.

2. A method of crude oil production stemming from crude oil leaks of a capped well comprising the steps of:
   - locating an accumulation of crude oil on the ground surface, such accumulation defining a zone within which this method is conducted;
drilling a vertical well within said zone;
detecting vibrational signals produced by said crude oil leaks within said vertical well;
transmitting said vibrational signals to a signal transducer;
converting said vibrational signals for display;
determining a depth for entry of said crude oil leaks into said vertical well;
placing a tubularly shaped device within the interior of said vertical well;
causing high pressure air to flow through said tubularly shaped device; and
collecting said crude oil leaks.
3. A method of crude oil production stemming from multiple natural emanations of crude oil comprising the steps of:
locating an accumulation of crude oil on the ground surface, such accumulation defining a zone within which this method is conducted;
drilling a horizontal well within said zone; and
collecting said accumulation of crude oil within said horizontal well.
4. A method of crude oil production stemming from multiple natural emanations of crude oil as recited in claim 3 wherein said collecting step is performed with a pumping system.
5. A pumping system for collecting accumulations of multiple natural emanations of crude oil comprising:
a housing;
a collector tube;
a hydraulic piston;
a plurality of hoses;
a hydraulic chamber;
a rod; and
a motor.
6. A pumping system for collecting accumulations of multiple natural emanations of crude oil as recited in claim 5, wherein said collector tube contains apertures for entry and exit of crude oil, within which said apertures further contain a cone, sphere, and grid device whereby said cone, sphere, and grid device control the direction of flow of said crude oil within said collector tube.
7. A pumping system for collecting accumulations of multiple natural emanations of crude oil as recited in claim 6, wherein said motor is an internal combustion motor.

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