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(54) **METHOD FOR INJECTING A FLUID**

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(57) **ABSTRACT**

A method and a device for injecting a fluid into a layer of rock or earth, such as a crude oil-containing layer of rock or earth, for example, for the tertiary crude oil production by means of a suitable line, wherein the line is introduced into the layer of rock or earth. The line consists of an inner pipe and an outer pipe. The inner pipe is provided with injection nozzles. The injection nozzles are positioned and thus ensure a pressing of the fluid into the surrounding layer of rock or earth via the openings in the outer pipe in a positioned manner. Means which allow for a selective impacting of the individual injection nozzles, are located in the interior of the inner pipe. The fluid is pressed into the surrounding layer of rock or earth in a positioned manner.

Figure 1

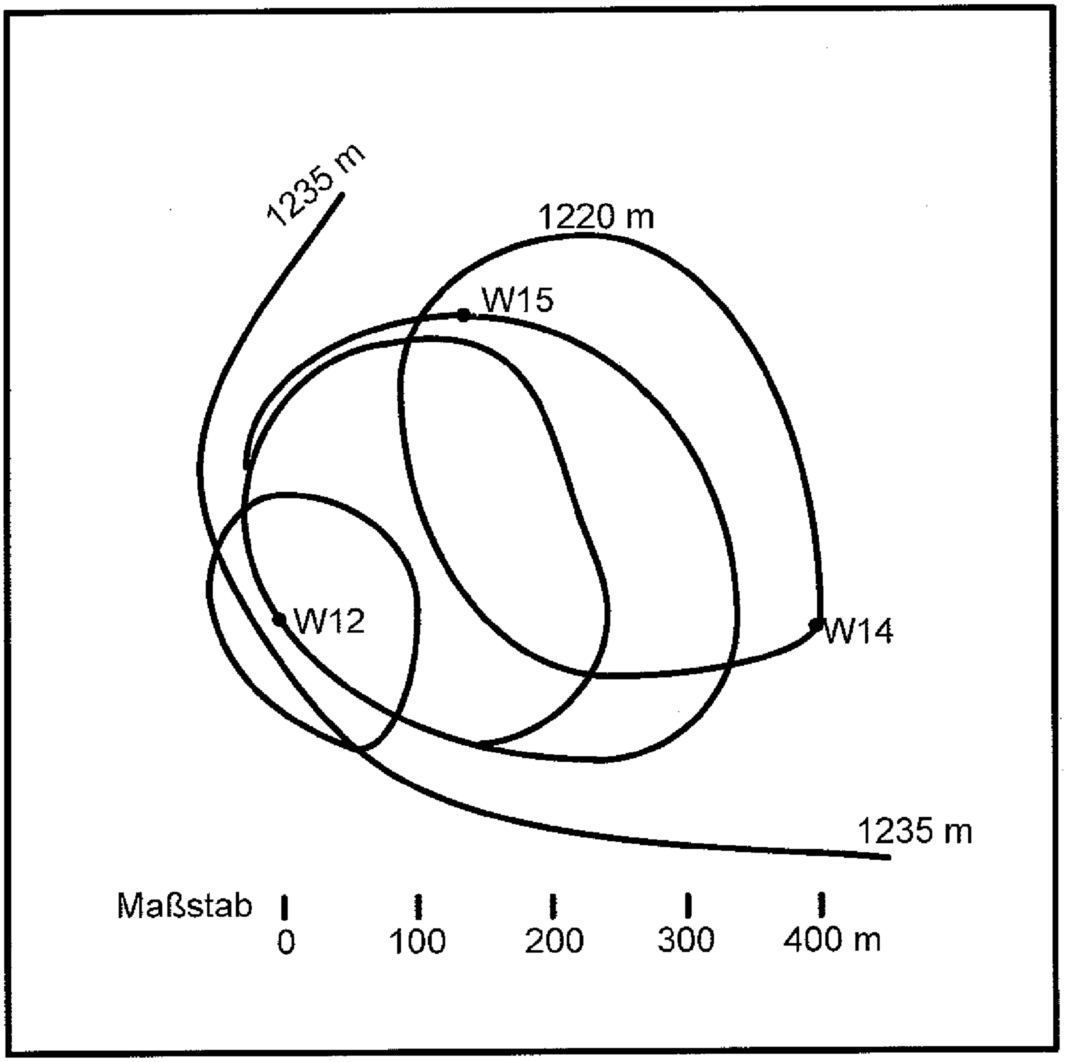


Figure 2

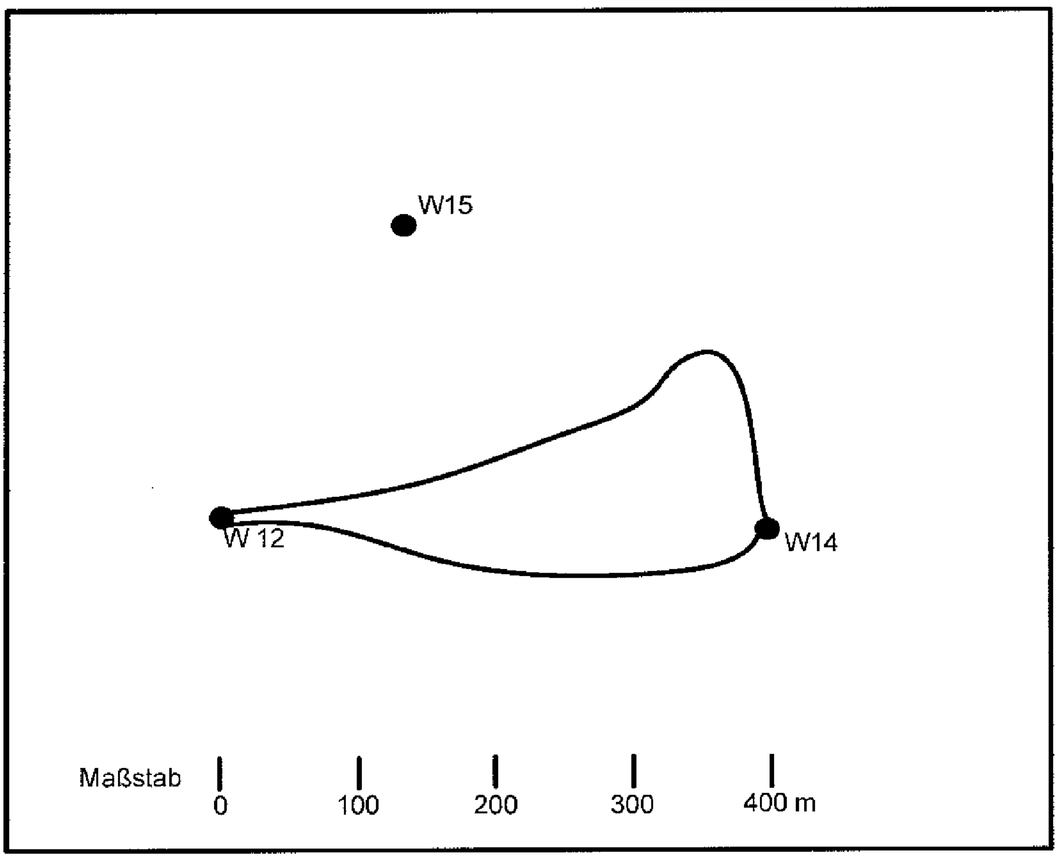
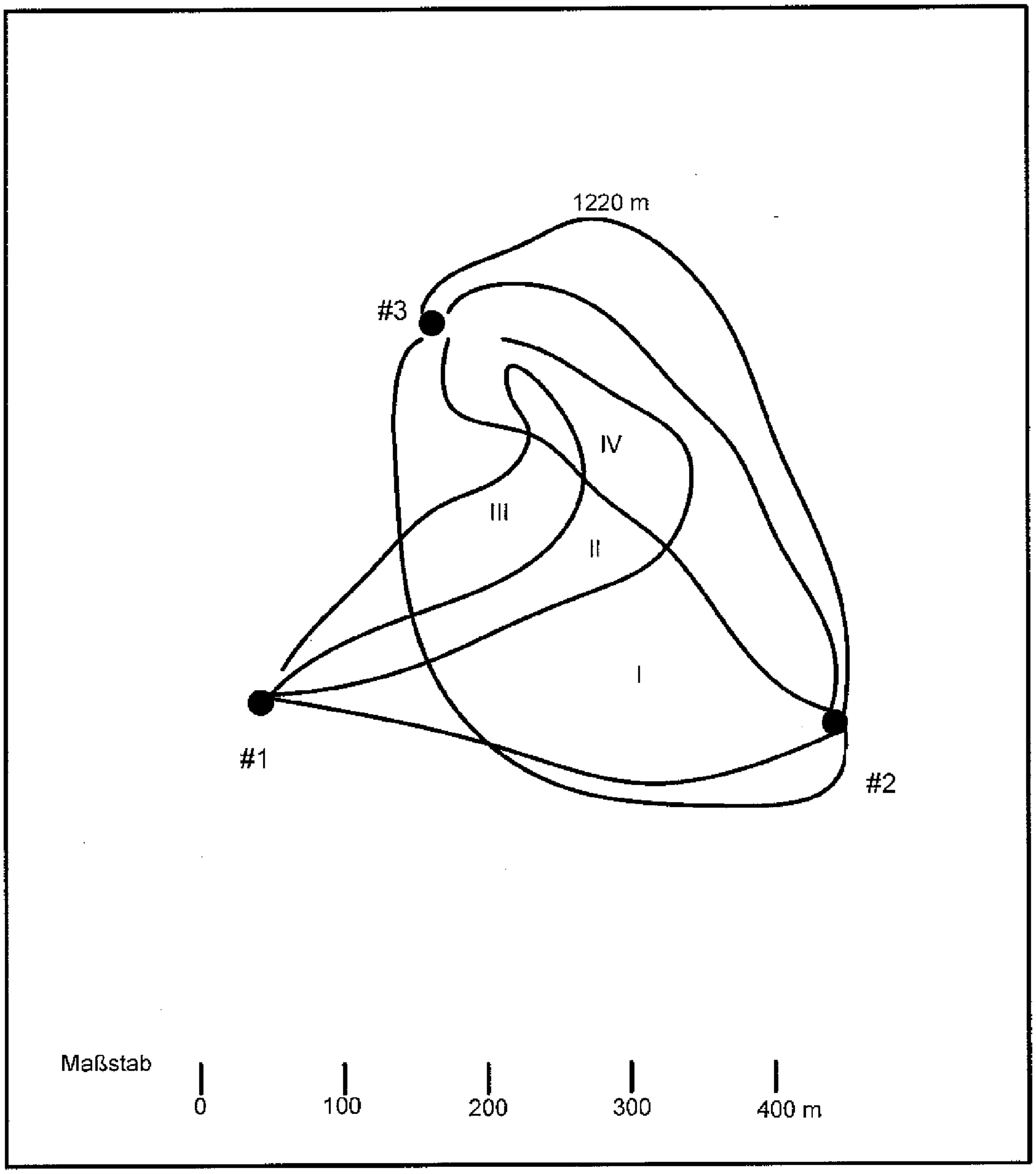
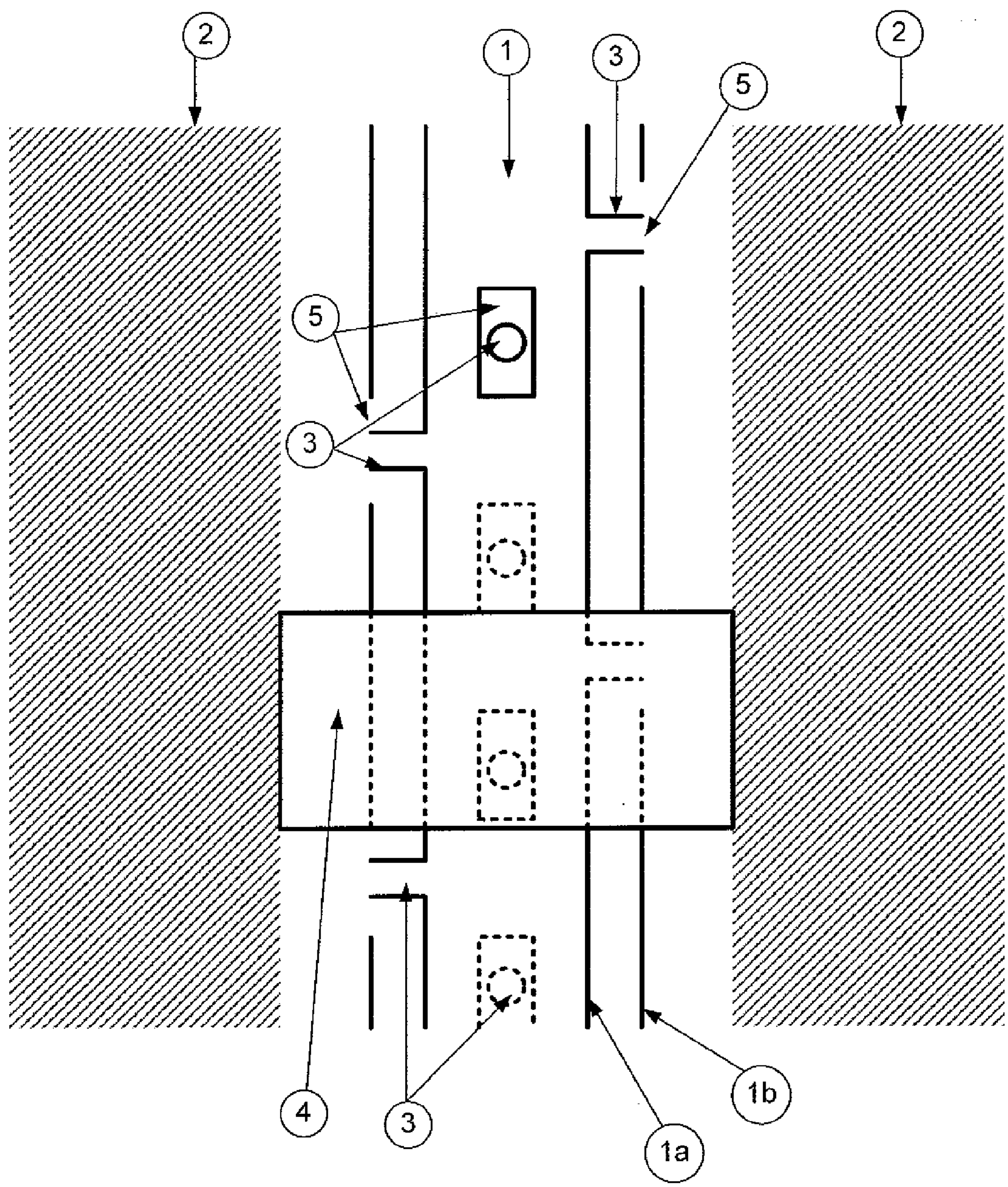


Figure 3



Figue 4



METHOD FOR INJECTING A FLUID

[0001] The present application claims priority from German Patent Application Serial No. DE 102009006572.5 filed Jan. 29, 2009 and from German Patent Application Serial No. De 102009006571.7 filed Jan. 29, 2009.

BACKGROUND OF THE INVENTION

[0002] The invention relates to a method for injecting a fluid into a layer of rock or earth by means of a suitable line, wherein the line is introduced into the layer of rock or earth, as well as to a device for carrying out the method. The method is primarily described by means of the injection of a fluid into a crude oil-containing layer of rock or earth for producing crude oil, but is not limited to such applications, but is generally suitable for injecting a fluid into a layer of rock or earth.

[0003] Contaminated layers of rock or earth are often cleaned or revived by means of injecting fluids. Depending on the contamination, different fluids such as gases, like oxygen or nitrogen, for example, or chemical solutions are thereby introduced into the contaminated layers of rock or earth.

[0004] A further field of application in the case of injecting fluids into layers of rock or earth is the pressing-in of gaseous carbon dioxide for the purpose of avoiding air contamination.

[0005] According to the state of the art, lines are thereby introduced into the layers of rock or earth and the fluid is pressed out of the lines in a spherical manner into the surrounding layer of rock or earth.

[0006] This method according to the state of the art has different disadvantages. On the one hand, contaminated grounds often have a different degree of contamination in different locations. A spherical pressing-in of the fluid, which leads to a uniform distribution of the fluid in the surrounding layer of rock or earth, thus causes an underdose in the areas of higher contamination and in the areas of weaker contamination it causes an overdose of the cleaning fluid, which may, in turn, have negative impacts on the surrounding layer of rock or earth. In the case of the storing of carbon dioxide in layers of rock or earth, local differences in the condition of the layers of rock or earth lead to differences in the ability of the rock to store carbon dioxide. A uniform spherical pressing-in thus leads to a differently good bonding of the carbon dioxide in the soil.

[0007] Crude oil is typically located in crude oil reservoirs close to and below the earth's surface. Depending on the depth of the reservoir, the crude oil is recovered from these reservoirs in open cast drilling, as in the case of the Canadian oil sand fields, but mostly in drift drilling or by means of drilling platforms, which provide for a production in the middle of the ocean. Crude oil is mainly recovered in drift drilling. For this purpose, conveyor lines are introduced underneath the earth's surface as far as the depth of the crude oil reservoir by means of boreholes. The crude oil is recovered from the crude oil reservoir via this conveyor line.

[0008] The production thereby substantially takes place in three phases. In a greater depth, the crude oil is under the pressure of the superimposed load of the layers of earth and of the associated crude oil carrier gas, if applicable. In the first phase, the crude oil can often be produced without additional measures by means of the inherent pressure in the reservoir. In response to the decrease of the inherent pressure, the oil can be conveyed to the surface by means of technical resources, such as subsurface pumps.

[0009] As a rule, the inherent pressure of the crude oil reservoir alone is no longer sufficient for transporting the crude oil to the earth's surface after a production of from 10% to 15% of the quantity available in the reservoir. This phase of the primary crude oil production is thus followed by the phase of the secondary production. In this second phase, the reservoir pressure is increased by pumping water, steam or gas via lines, which have been introduced into the earth by means of boreholes. According to the state of the art, water is typically re-pumped in this phase, whereby it is possible to convey between 30% and 40% of the oil, which is originally present in the reservoir (original oil in place or OOIP) to the earth's surface. The residual oil, which remains in the reservoir and which is increasingly ductile and dense, complicates a further constant production. Here, additional oil can be conveyed out of the reservoir only via special methods.

[0010] According to the state of the art, different fluids are pressed under pressure into the vicinity or directly into the reservoir, respectively, by means of suitable lines in this phase of the crude oil production. Among others, heat methods such as the press-in of hot water or superheated steam or the press-in of gases such as nitrogen and carbon dioxide are known hereby. On the one hand, carbon dioxide increases the pressure in the reservoir, but on the other hand also dissolves in the crude oil under suitable conditions. The viscosity of the crude oil is considerably reduced by means of the carbon dioxide dissolved in the crude oil and the production is thus improved.

[0011] Such a method for the tertiary crude oil production is described in patent publication GB 2 379 685. In the state of the art described in GB 2 379 685, a second line is introduced into the crude oil reservoir parallel to the conveyor line of the crude oil for supplying a fluid. A fluid consisting of water, steam, steam foam or foam, nitrogen and/or carbon dioxide is pressed into the crude oil reservoir via this second line. Preferably, water or an aqueous solution or foam, respectively, is hereby used. According to the state of the art disclosed in GB 2 379 685, the line for injecting the fluid consists of two different sections. Both sections are separated by means of stoppers, which are typically called "packer" in the oil industry and which can be separately exposed to the fluid. The fluid is pressed into the different areas of the crude oil reservoir via the two different sections in such a manner that the supplied quantity of the fluid varies cyclically and asynchronously. The method is described as being particularly suitable for crude oil reservoirs, which appear in geological formations, which encompass cracks or gaps. By means of the method described in GB 2 379 685, the proportion of water in the water-crude oil mixture conveyed via the conveyor line is to be maintained below a certain threshold. The cyclical admission and the cracks or gaps present in the crude oil reservoir prevent a water quantity, which is too large, from reaching into the conveyor line. In the case of a suitable variation of the conveying rates, the cracks and gaps work like drainages, which divert the water from the surrounding layers. The injection of the fluid into the crude oil reservoir thereby simply takes place via horizontal holes in the supply line, which are distributed across the entire periphery of the line. The fluid is thus pressed out of the supply line so as to be distributed in all spatial directions in a spherically even manner.

SUMMARY OF THE INVENTION

[0012] The instant invention is based on the object of embodying a method as well as a device for injecting a fluid into a layer of rock or earth in such a manner that the efficiency of such a method or of such a device, respectively, is increased.

[0013] With reference to the method, the instant object is solved in that the fluid is pressed out of the line into the surroundings under pressure in a positioned manner.

[0014] The basic idea of the invention is not to spherically press the fluid out of the line in all directions in a uniformly distributed manner, as is the case in the state of the art, but to ensure an escape of the fluid in a positioned manner. In terms of the invention, this creates a rather finger-shaped expansion front of gas, which pushes the oil, instead of a spherical gas front, as in the case of the method according to the state of the art, for example in response to the injection of a fluid into a crude oil-containing layer of rock or earth. In the case of a spherical injection as in the state of the art, pressure is exerted so as to be uniformly distributed in all directions of space as a first approximation. According to the method as in the state of the art, pressure is thus exerted onto the crude oil not only in the direction of the conveyor line, but in all spatial directions in a uniformly distributed manner, that is, also in all directions past the conveyor line. However, the crude oil field can be exploited only via the conveyor line. According to the method of the state of the art, several boreholes are thus necessary so as to cover all directions of space. The crude oil field can be exploited by means of a conveyor line using the method according to the invention, because pressure can be injected into the crude oil field in a specific manner in the direction of the conveyor line and not in all directions of space.

[0015] Within the scope of this invention, an escape of the fluid in a positioned manner refers to a flow of the largest part of the fluid along a preferred axis. Contrary thereto, an escape, in the case of which the fluid quantity flows in a solid angle of 360° so as to be uniformly distributed, that is, when it flows out of the line in all directions of space in a uniform manner, is an undirected escape. In the case of an escape in a positioned manner in terms of the invention, the fluid directly around the segment of the line from which the fluid escapes is not uniformly distributed in an imaginary cone volume, but mainly within a certain solid angle of 180° at most. In the case of such an escape in a positioned manner, the flowing fluid is limited at least within a hemispherical segment, but for the most part within a cone segment within an imaginary sphere volume around the line.

[0016] In the state of the art, the fluid is simply pressed out of the pressure line in an undirected manner into the surrounding layer of rock or earth via holes, which are uniformly distributed across the periphery of the line. Due to the large pressure difference between the pressure line for the fluid supply and the surrounding rock, it is assumed that the fluid expands from the line into the surroundings in a spherical and uniformly distributed manner. However, tests in practice reveal that this is not the case. A uniform expansion of the fluid from the line in all directions of space requires the geological surroundings of the pressure line to have approximately the same conditions. However, this is not the case in most of the geological surroundings.

[0017] Surprisingly, it became apparent that the directional characteristic remains in the case of the positioned escape of the fluid out of the line according to the invention. Due to the high pressure loss in the layer of rock or earth, one would expect that the expansion of the fluid in the layer of rock or earth would again take place in a spherical manner after only a short period of time even in the case of an escape from the line in a positioned manner. However, new measurements reveal that this is not the case and that pressing the fluid into the surrounding layer of rock or earth in a positioned manner in terms of the invention also leads to an expansion of the fluid in the layer of rock or earth in a positioned manner, which also remains across greater distances of above 200 m.

[0018] As a rule, one or several pressure lines are used for pressing in the fluid, wherein an effect is to be attained at points, such as one or several conveyor lines, for example, which are located at a distance from one another. Pressing a fluid into a geological surrounding is thereby not necessarily successful. When using such a method for the tertiary crude oil production, for example, an effect in terms of an increased production of crude oil in the conveyor line can often only be established after several weeks and after a high consumption of fluid. In the most disadvantageous case, the fluid expands to a considerably improved extent in the direction away from the conveyor line than in the direction towards the conveyor line. According to a method of the state of the art, a large quantity of fluid is used in such a case, possibly without thereby attaining an increased delivery rate.

[0019] The effects caused by the fluid injection into a geological surrounding can be detected much earlier by means of the method according to the invention. In accordance with the method according to the invention, the fluid is pressed out of the pressure line into the surroundings in a positioned manner. The fluid can hereby be positioned to a point, where the presumed effect is to be attained, such as the conveyor line in the case of the tertiary crude oil production. In this case, the fluid expands much more rapidly in the direction of the conveyor line than in the case of a method according to the state of the art. With the same quantity of pressed-in fluid, a considerably higher quantity of fluid is pressed in in the direction of the conveyor line by means of the orientation of pressing in the fluid according to the invention, than in the case of the spherical press-in according to the method of the state of the art. In accordance with the method according to the invention, the effect at a conveyor line for the tertiary crude oil production can thus be detected much earlier. In addition, the consumption of pressed-in fluid is reduced. This becomes evident in particular in the case of oil fields, where a sufficient quantity of the fluid is not available in the immediate vicinity. In the case of a positioned escape, where the fluid escapes within a hemisphere in a solid angle of 180°, the quantity of required fluid already decreases drastically. In the event that 1000 m^3 of fluid are required, for example, to attain a conveying effect in the case of the spherical escape, only 500 m^3 are required for the same effect in the case of a positioned escape.

[0020] Contaminated grounds can thus be cleaned to a considerably higher degree by means of the method according to the invention. Depending on the degree of contamination, the fluid can be pressed into the different areas with different strengths. In the case of the storing of carbon dioxide in layers of rock or earth, the carbon dioxide can be pressed into regions of high storage capability in a specific manner.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] The invention will be defined below in more detail by means of the exemplary embodiment illustrated in the figure.

[0022] FIG. **1** shows a gas distribution in the case of spherical press-in according to the state of the art.

[0023] FIG. 2 shows a gas distribution in the event of positioned press-in according to the invention.

[0024] FIG. 3 shows an embodiment of the invention comprising two lines and one conveyor line.

[0025] FIG. 4 shows an exemplary embodiment of the device according to the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0026] The method according to the invention is in particular suitable for injecting a fluid into a crude oil-containing layer of rock or earth.

[0027] According to the invention, a positioned pressing of the fluid into the layer of rock or earth can be attained in several ways. The simplest possibility for ensuring a positioned press-in in terms of the invention are one-sided holes in the line, that is, the line encompasses holes for the fluid escape, which are only distributed across a part of the periphery, maximally across half of the periphery. Further preferred embodiments of the invention will be described below.

[0028] In a preferred embodiment of the invention, the fluid is pressed out of the line into the surroundings via an injection nozzle. Injection nozzles are means, which have been well-proven in the state of the art for establishing a fluid flow in a positioned manner. Advantageously, the fluid is thereby pressed into the surroundings of the line mainly within a solid angle of 90°, preferably of 45°, particularly preferably between 10° and 30°. The smaller the solid angle, which is formed by the escaping fluid, the better the directive efficiency of the fluid. Accordingly, much more fluid can be introduced along a certain chosen direction in the geological surroundings of the pressure line than in the case of a spherical uniform distribution. Vice versa, considerably less fluid is consumed for the same effect along a certain direction of space.

[0029] Advantageously, the direction of escape of the fluid, preferably the angle between main axis of the line and direction of escape, is changed chronologically, preferably step by step. The geological factors, where the greatest desired effect is attained by means of the fluid supply, can be ascertained particularly quickly by means of a step by step variation of the angle between main axis of the line and fluid escape. In addition, it is thus possible, for example, to press in the fluid from a point of injection into the entire crude oil field. The number of the boreholes can be reduced as compared to a method according to the state of the art. The angle is thereby preferably changed by means of controlling the orientation of the free moving nozzle.

[0030] Advantageously, the direction of escape of the fluid is oriented on the structure of the rock in the surroundings, preferably deviates not more than 45° from the rock structure and is particularly preferably oriented parallel to the rock structure.

[0031] The invention is preferably used to press in gases, such as oxygen, nitrogen and/or carbon dioxide and/or to press in gaseous and/or fluid chemical solutions.

[0032] When using the method according to the invention for the tertiary crude oil production, nitrogen or carbon dioxide in gaseous state is preferably used as fluid. The use of carbon dioxide as liquid gas is likewise advantageous as fluid in the overcritical state. When using nitrogen or carbon dioxide, the advantages of the method according to the invention become particularly apparent. Both gases must be provided for the tertiary crude oil production. This is difficult, for example in the case of the crude oil production via production platforms in the ocean. Here, the gases must be transported to the production platform in tanks via ships. With the same effect, a considerably quantity of gas is saved with the press-in of the gases in a positioned manner according to the invention. As compared to a spherical press-in in a solid angle of 360°, the press-in of the gas with a positioned cone within a solid angle of 20° only requires a gas quantity, which is less by several magnitudes. This drastically reduces the gas quantity, which is to be supplied via ship, for a production platform and leads to considerable cost savings.

[0033] In another embodiment of the invention, fluid is pressed in via two different lines in a positioned manner, wherein the press-in direction of the gas of the first line encompasses an angle to the press-in direction of the fluid of the second line. In this embodiment of the invention, with a suitable angle, it is possible to press oil, which is driven in a direction between the conveyor line and the second line by pressing in the fluid via the first line, in the direction of the conveyor line by pressing fluid via the second line in a positioned manner.

[0034] Advantageously, fluid is pressed into a crude oil-containing layer of rock or earth via a first line and via a second line, wherein the second line is not located on the connecting line between the first line and the conveyor line, and the fluid is pressed out of the second line in a positioned manner such that oil, which is displaced out of the first line by means of pressing in fluid in a positioned manner, is displaced in the direction of the conveyor line.

[0035] It has proven to be particularly advantageous to change the angle between press-in direction of the fluid from the first line and the connecting line between first line and conveyor line in such a manner that the angle area between the connecting line of first line and conveyor line and the connecting line of first line and second line is passed successively. In this embodiment of the invention, all of the oil in a triangle, which is formed by the three lines, can be exploited in a specific manner by means of two lines for pressing in gas in a positioned manner and by means of one conveyor line. By pressing in the fluid out of the second line, the first fluid flow is diverted in such a manner that the oil is always pressed in the direction of the conveyor line from each point within the triangle. Pressing in the fluid out of the first line in an arbitrary angle between the connecting lines between first line and conveyor line or between first line and second line, respectively, drives the oil away from the first line and quasi past the conveyor line. Due to the superimposed press-in of fluid out of the second line, this deviation, however, is again corrected in the direction of the conveyor line.

[0036] The dynamic press-in of the fluid is particularly advantageous, wherein the press-in by means of a pressure wave is particularly preferred. By nature, crumbled rock can often be found around the line rather than undisturbed rock. In the event that the fluid is pressed in dynamically, preferably as a temporary pressure wave, and in the event that this process is repeated several times, the rock is blown away at the injection point and is compressed in the immediate surroundings of the injection point. A free space is thus created immediately in front of the injection point. The rock, which is originally present at that location, leads to the compression in the immediate surroundings of the injection point. A type of nozzle is thus additionally created around the injection point, whereby the positioned escape of the gas is improved.

[0037] With reference to the device, the assigned object is solved in that, in the area of the layer of rock or earth, the line encompasses means, which are suitable to let the fluid flow out of the line in a positioned manner.

[0038] In an embodiment of the invention, the line consists of an inner pipe and an outer pipe, wherein the inner pipe encompasses at least one injection nozzle, which is in flow-connection with the fluid, which is under pressure and the outer pipe, at locations where injection nozzles are located on the inner pipe, is provided with openings, which are preferably slit-shaped. The fluid is pressed into the surrounding layer of rock in a positioned manner through the openings in the outer pipe via the injection nozzles at the inner pipe, which is in flow-connection with the fluid, which is under pressure.

[0039] In another embodiment of the invention, the line encompasses openings, which are arranged only across a part of the periphery of the line and which are preferably slit-shaped.

[0040] Advantageously, the injection nozzle(s) or the opening(s) are located between adjacent packers. The packers, which are freely movable on the line or on the outer pipe, allow for the blocking of openings comprising injection nozzles or an opening and to thus select areas and press-in directions.

[0041] Particularly preferably, the device according to the invention is used for the tertiary crude oil production.

[0042] The instant invention encompasses a series of advantages. Due to the positioned pressing of the fluid into the surrounding layer of rock or earth, the quantity of fluid, which is introduced into a contaminated layer of rock or earth, can be controlled very well locally. Different quantities of fluid can thereby be applied locally to an entire contaminated area by means of the positioned press-in of the fluid with a single line. The entire fluid consumption during the cleaning of contaminated grounds thus decreases. Areas, which are well-suited for storage, can specifically be chosen when using the method according to the invention for storing gaseous carbon dioxide underneath the earth's surface. Due to the positioned pressing of the fluid into the surrounding layer of rock or earth, effects can be attained at the conveyor line in the case of the tertiary crude oil production much more rapidly than in the state of the art. The often open question whether an increase in the production quantity can be attained in the respective crude oil field by pressing in a fluid, can be answered much earlier due to the method according to the invention and due to the device according to the invention, In addition, the effects can be attained with the use of a considerably smaller quantity of fluid. In the case of fluids, which must be generated or obtained, this leads to considerable cost savings in the case of the tertiary crude oil production.

[0043] The invention or the state of the art, respectively, is defined in FIGS. **1** to **3** by means of the example of pressing a fluid into a crude oil-containing layer of rock or earth. The exemplary embodiment of the device according to the invention illustrated in FIG. **4** is suitable for pressing a fluid into any layer of rock or earth as well as into a crude oil-containing layer of rock or earth.

[0044] FIG. **1** shows the gas distribution in the case of spherical press-in according to the state of the art via the injection line W**12**. The undirected gas expansion, which neither takes place in the direction of the conveyor line W**15** nor in the direction of the conveyor line W**14**, is visible.

[0045] FIG. **2** shows the positioned pressing in of gas out of the line W**12** in the direction of the conveyor line W**14** according to the invention. The gas quantity, which is pressed in, is thereby considerably smaller than in the state of the art.

[0046] FIG. **3** shows an embodiment of the method according to the invention. The oil is pressed into a plane between the conveyor line #**3** and the second line #**2** via the line #**1** by means of the positioned pressing into the sections I, II and III. All of the residual oil can be exploited via the conveyor line #**3** by means of the positioned pressing into section IV out of line #**2**. In this embodiment of the invention, all of the oil in the area between the three lines can be exploited via a single conveyor line #**3**. First, fluid is pressed into the region I for a long period of time via the line #**1**. The oil is displaced out of the area I in the direction of the conveyor line #**3** by means of the subsequent, simultaneous, superimposed press-in of fluid out of line #**1** into the region I and out of line #**2** into the region IV. Subsequently, the crude oil is displaced out of the areas II and III in the direction of the conveyor line in the same manner. However, the time period of the exclusive pressing into the areas II or III, respectively, can be shortened as compared to the time period of the exclusive pressing into the area I. It became apparent that the fluid remains stored in the rock for a certain period of time. Due to the overlap of the individual regions, shorter press-in in times are thus required for the regions, into which fluid is pressed into at a later time.

[0047] FIG. **4** shows an embodiment of the device according to the invention with a section of a line **1** comprising an inner pipe **1***a* and an outer pipe **1***b* in a layer of rock or earth **2**. The inner pipe **1***a* is provided with injection nozzles **3**. The injection nozzles **3** are positioned and thus ensure a positioned pressing of the fluid into the surrounding layer of rock or earth **2** via the openings **5** in the outer pipe **1***b*. Means (not illustrated), which allow for a selective impacting of the individual injection nozzles **3**, are located in the interior of the inner pipe **1***a*. According to the invention, the fluid is pressed into the surrounding layer of rock or earth in a positioned manner. It is possible, for example, to impact only all of the injection nozzles **3**, which are illustrated in the drawing so as to be oriented towards the right, with the fluid. In the alternative, the openings **5** above the injection nozzles **3** can also be blocked or left open, respectively, by means of the packers **4**. In this embodiment of the invention, the packers **4** are gas bags, which can be inflated. These can be moved freely across the outer pipe **1***b* when not inflated. When inflated, they fill out the space between outer pipe **1***b* and the layer of rock or earth **2** and thereby block the openings **5** above the injection nozzles **3**. It is thus possible to only leave open openings **5** above injection nozzles **3** of an orientation in sections and to block all of the other openings **5** above injection nozzles **3** of other orientations.

[0048] In the case of an alternative embodiment of the invention (not illustrated), simple, slit-shaped openings are used instead of the injection nozzles **3**. Each partial section of the line **1** thereby encompasses only slit-shaped openings on a part of its periphery. Openings of a given orientation of the line **1** to the layer of rock or earth **2** can thus be blocked or left open by means of packers **4**. In this embodiment of the invention, the dynamic press-in of the fluid provides a particularly high number of advantages. To improve the positioned flow, the fluid is initially pressed in as a pressure wave, that is, under high pressure. The pressure wave is then allowed to die down and this process is repeated several times. Crumbled rock around the slit in the line is thus blown away so that a relatively free space is created immediately in front of the slit. However, the material around this space compresses, because the crumbled rock in front of the slit is displaced by means of the pressure wave. In so doing, a type of nozzle is created around the slit in the rock itself, which improves the directive efficiency of the press-in even more.

Having thus described the invention, what we claim is:

1. A method for injecting a fluid into a crude oil-containing layer of rock or earth by means of a suitable line, wherein the line is introduced into the layer of rock or earth, characterized in that the fluid is pressed out of the line into the surroundings under pressure in a positioned manner under pressure.

2. The method according to claim **1**, characterized in that the fluid is introduced into a crude oil-containing layer of rock or earth.

3. The method according to claim **1**, characterized in that the fluid is pressed out of the line into the surroundings via an injection nozzle.

4. The method according to claim **1**, characterized in that pressing into the surroundings of the line is mainly carried out within a solid angle of 90°.

5. The method according to claim **1**, characterized in that pressing into the surroundings of the line is mainly carried out within a solid angle of 45°.

6. The method according to claim **1**, characterized in that pressing into the surroundings of the line is mainly carried out within a solid angle between 10° and 30°.

7. The method according to claim **1**, characterized in that the direction of escape of the fluid is changed chronologically

8. The method according to claim **7**, characterized in that the direction of escape of the fluid is the angle between the main axis of the line and direction of escape.

9. The method according to claim **7**, characterized in that the direction of escape of the fluid is changed step by step.

10. The method according to claim **1**, characterized in that nitrogen or carbon dioxide in gaseous state is used as fluid.

11. The method according to claim **1**, characterized in that carbon dioxide as liquid gas is used as fluid in the overcritical state.

12. The method according to claim **1**, characterized in that the direction of escape of the fluid is oriented on the structure of the rock in the surroundings.

13. The method according to claim **12**, characterized in that the direction of escape of the fluid does not deviate more than 45° from the rock structure.

14. The method according to claim **12**, characterized in that the direction of escape of the fluid is oriented parallel to the rock structure.

15. The method according to claim **2**, characterized in that the fluid is pressed in in a positioned manner via two different lines, wherein the press-in direction of the fluid of the first line encompasses an angle to the press-in direction of the fluid of the second line.

16. The method according to claim **15**, characterized in that fluid is pressed into a crude oil-containing layer of rock or earth via a first line and via a second line, wherein the second line is not located on the connecting line between the first line and the conveyor line, and the fluid is pressed out of the second line in a positioned manner such that oil, which is displaced out of the first line by means of pressing in fluid in a positioned manner, is displaced in the direction of the conveyor line.

17. The method according to claim **16**, characterized in that the angle between press-in direction of the fluid out of the first line and the connecting line between first line and conveyor line is changed in such a manner that the angle area between the connecting line of first line and conveyor line and the connecting line of first line and second line is passed successively.

18. The method according to claim **1**, characterized in that the fluid is pressed in dynamically.

19. The method according to claim **18**, characterized in that the fluid is pressed in dynamically as a pressure wave.

20. A device for pressing a fluid into a layer of rock or earth, wherein the device encompasses a suitable line, which is introduced into the layer of rock or earth, characterized in that the line, in the area of the layer of rock or earth, encompasses means, which are suitable to allow the fluid to flow out of the line in a positioned manner.

21. The device according to claim **20**, characterized in that the line consists of an inner pipe and an outer pipe, wherein the inner pipe encompasses at least one injection nozzle, which is in flow-connection with the fluid, which is under pressure, and the outer pipe, at locations where injection nozzles are located on the inner pipe, is provided with openings,

22. The device according to claim **21**, characterized in that said openings are slit-shaped.

23. The device according to claim **20**, characterized in that the line encompasses openings, which are arranged only across a part of the periphery of the line.

24. The device according to claim **23**, characterized in that said openings are slit-shaped.

25. The device according to claim **20**, characterized in that the injection nozzles or the opening are located between adjacent packers.

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