US 20040112605A1

(19) United States
(12) Patent Application Publication (10) Pub. No.: US 2004/0112605 A1
Nguyen et al. (43) Pub. Date: Jun. 17, 2004

(54) DOWNHOLE SYSTEMS AND METHODS FOR REMOVING PARTICULATE MATTER FROM PRODUCED FLUIDS

(76) Inventors: **Philip D. Nguyen**, Duncan, OK (US); **Johnny A. Barton**, Marlow, OK (US)

Correspondence Address:
Robert A. Kent
Halliburton Energy Services
2600 South 2nd Street
Duncan, OK 73536-0440 (US)

(21) Appl. No.: **10/322,319**

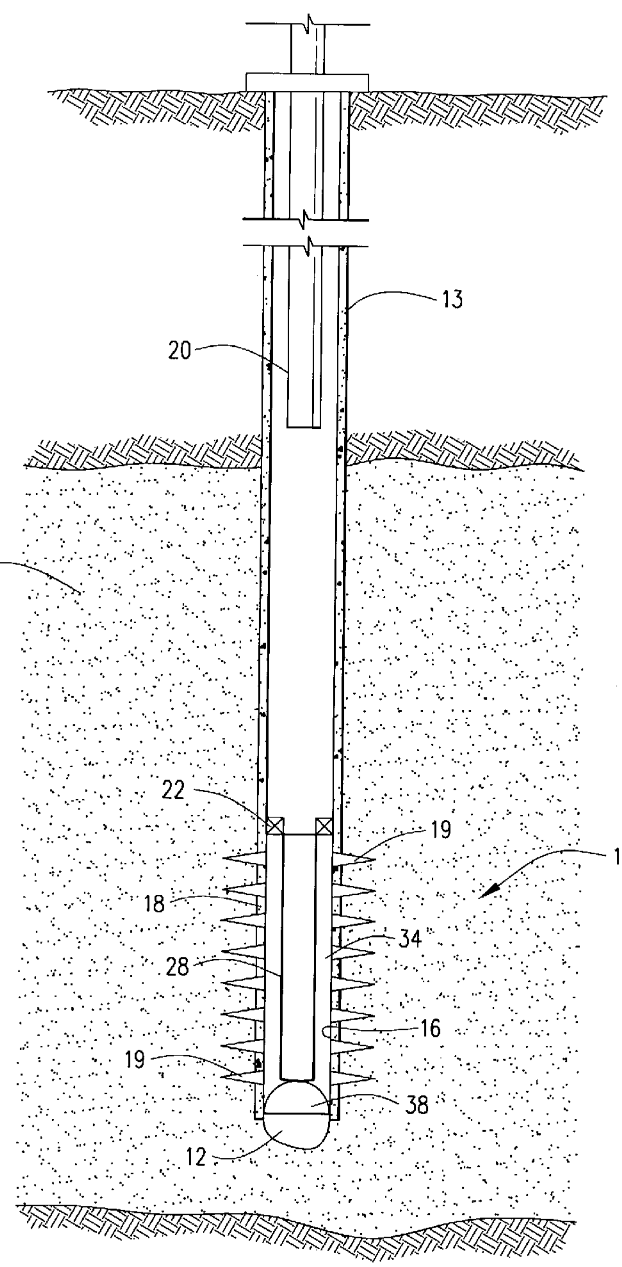
(22) Filed: **Dec. 17, 2002**

Publication Classification

(51) **Int. Cl.**[7] **E21B 43/04**
(52) **U.S. Cl.** **166/369**; 166/278; 166/230

(57) **ABSTRACT**

The current invention provides methods and systems for producing fluids, substantially free of particulate matter, from subterranean formation. The current invention is particular suitable for use in uncased boreholes penetrating unconsolidated subterranean formations.



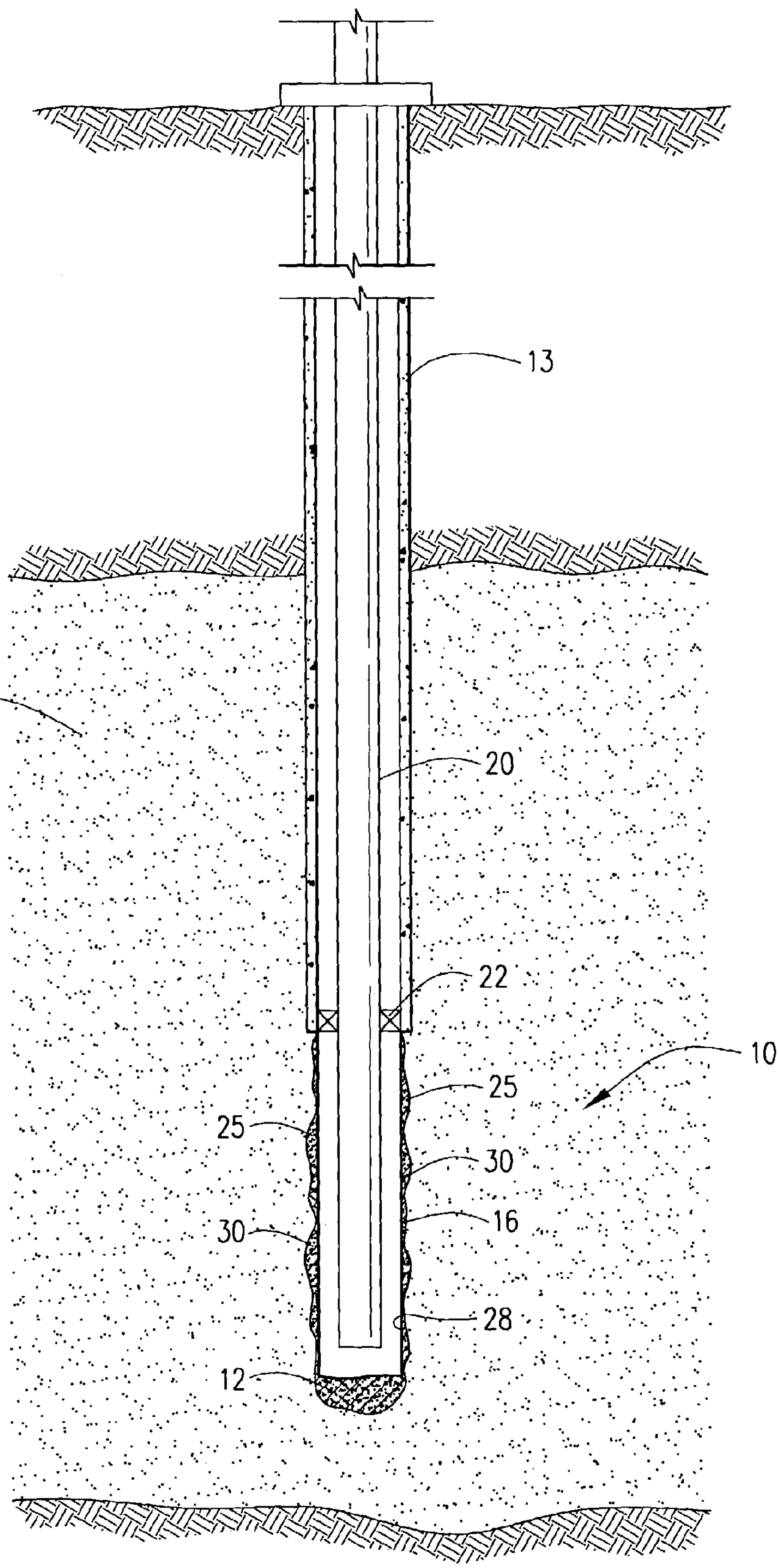


FIG. 1

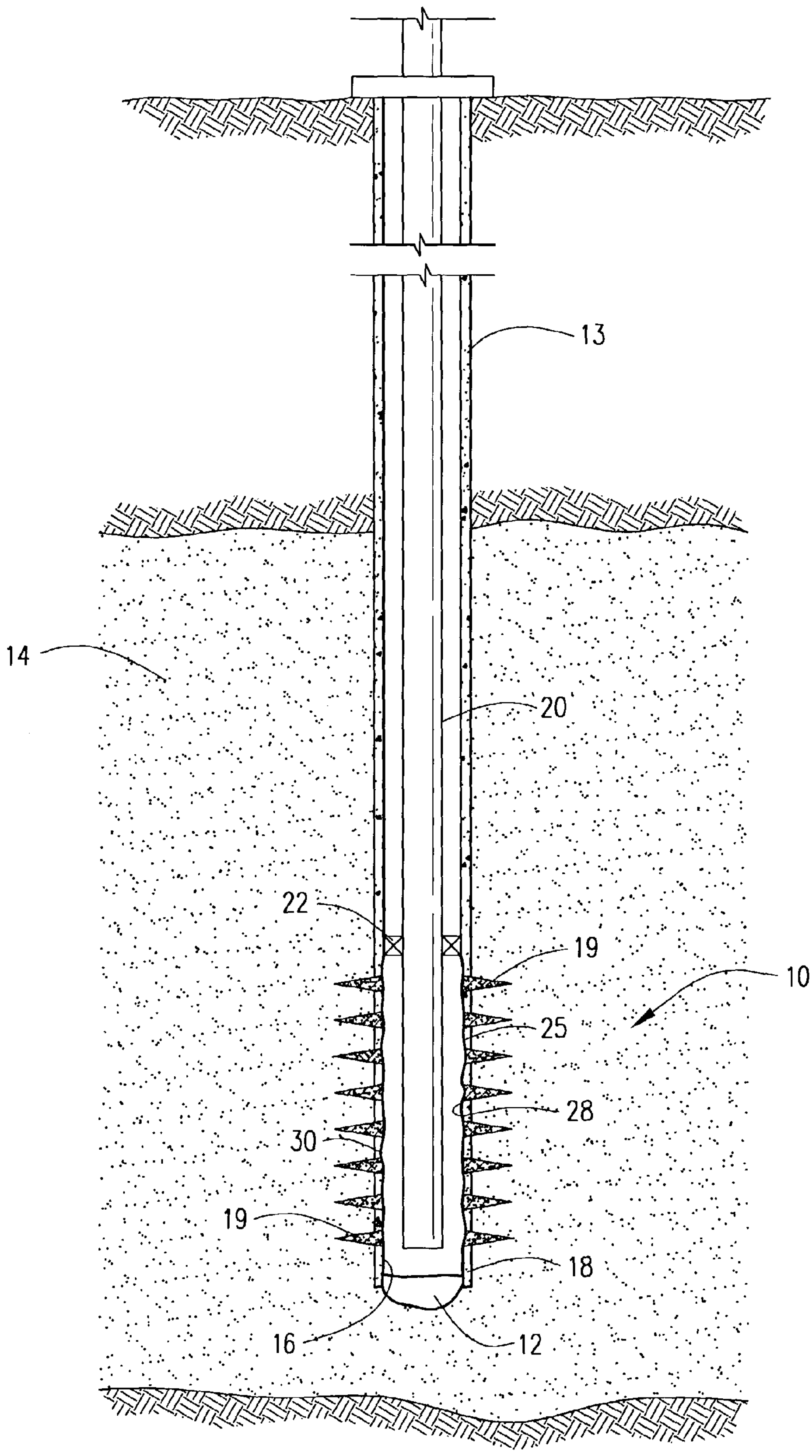


FIG-2

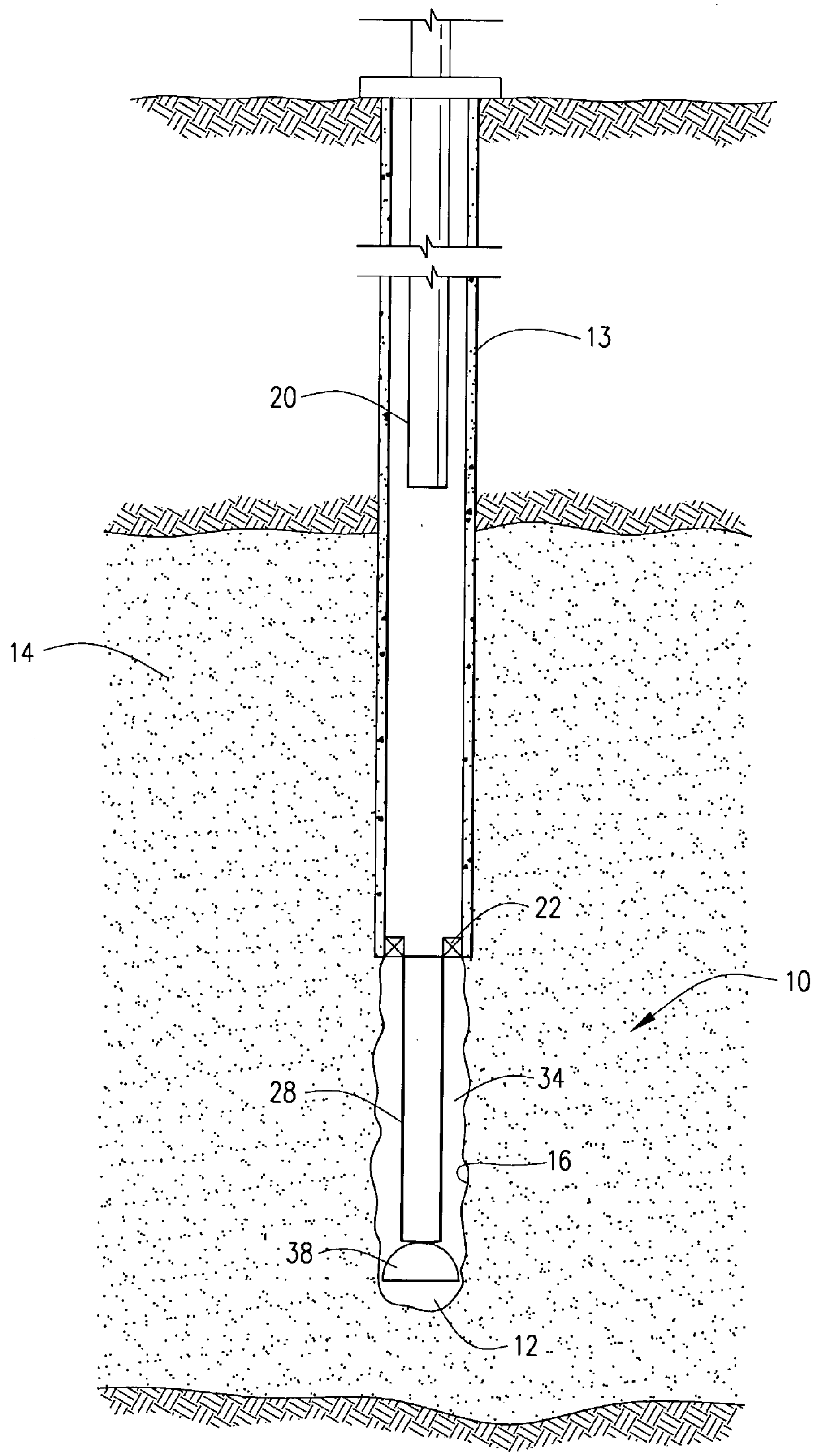


FIG-3

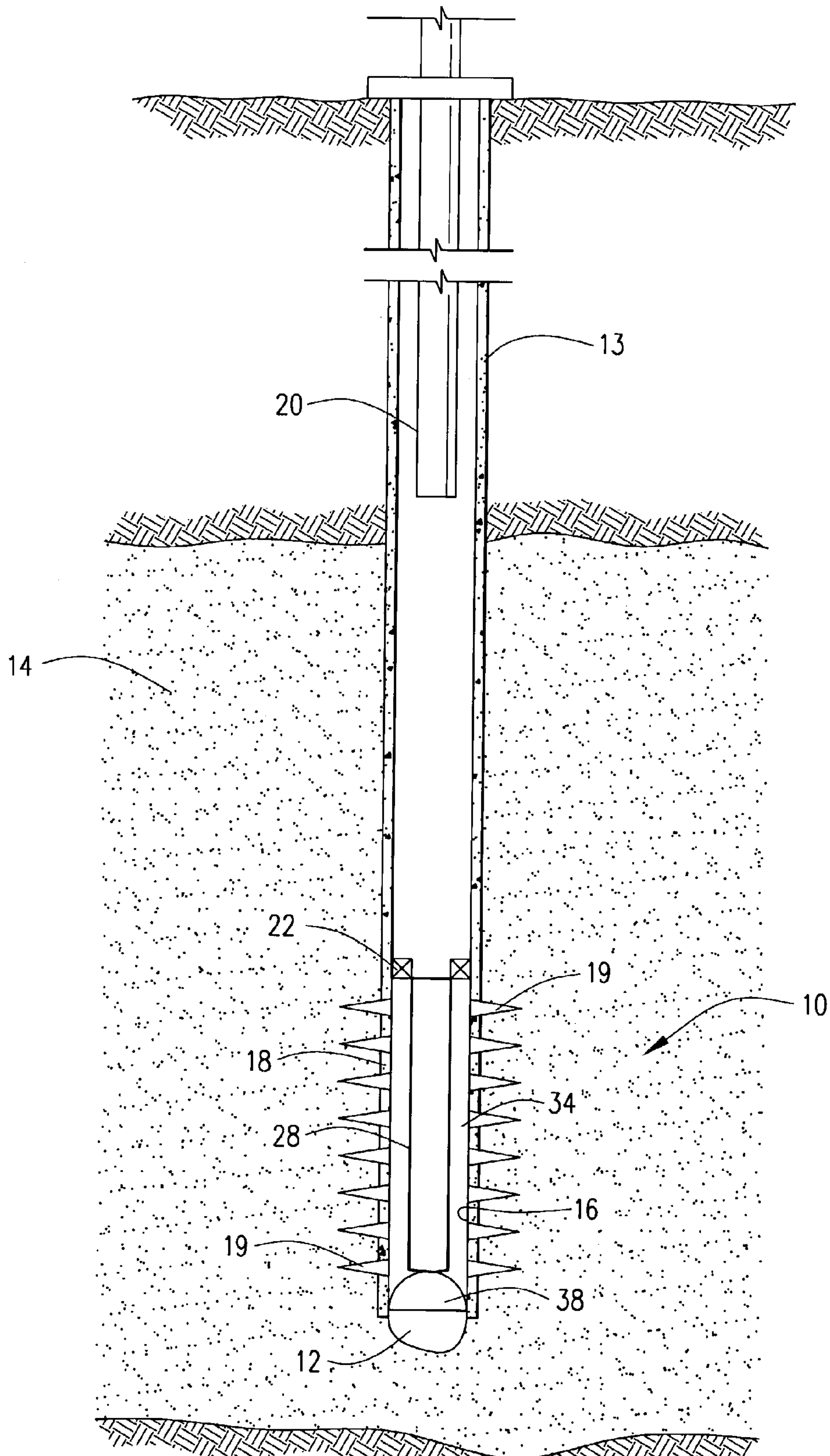


FIG. 4

DOWNHOLE SYSTEMS AND METHODS FOR REMOVING PARTICULATE MATTER FROM PRODUCED FLUIDS

BACKGROUND OF THE INVENTION

[0001] The present invention provides improvements in the production of hydrocarbons and other fluids from subterranean formations. More precisely, the present invention provides methods and systems for reducing or precluding the migration of sand and other particulate matter with fluid produced from a subterranean formation.

[0002] Oil, gas and water producing wells are often completed in unconsolidated subterranean formations. These formations commonly contain loose or incompetent sand capable of flowing into the wellbore with the produced fluids. The presence of the sand in the produced fluids rapidly erodes metal tubulars and other production equipment substantially increasing the costs of operating the wells.

[0003] Unconsolidated filter systems known as gravel packs have been used for several years to prevent the production of formation sand. In gravel packing operations, the operator places material such as graded sand in the annulus between a perforated or slotted liner or screen and the walls of the wellbore in the producing interval. The resulting structure, known as a gravel pack, acts as a barrier or filter to preclude the production of sand from the producing formation while allowing the flow of produced fluids.

[0004] While gravel packs successfully prevent the production of sand with formation fluids, they often fail and require replacement. The initial installation of a gravel pack adds considerable expense to the cost of completing a well and the removal and replacement of a failed gravel pack is even more costly.

[0005] As an alternative to gravel packs, expandable screens have been used to control sand production from unconsolidated subterranean formations. Several versions of expandable well screens are available for use downhole as demonstrated by U.S. Pat. Nos. 6,315,040, 6,263,966 and 5,901,789, each of which are incorporated herein by reference. Following placement downhole in a compressed or retracted state, the screen is expanded by passing a plug or other similar device through the screen. Once expanded, the screen precludes nearly all sand production by acting as a filter and by applying pressure to the wellbore wall. Typically, particles smaller than 50 microns will pass through the expanded screen as particles this small do not normally damage the production equipment. However, wellbore walls frequently contain gaps and other irregularities precluding consistent contact of the expanded screen with the wellbore. As formation sand collects in these gaps it blocks a portion of the production zone and reduces flow of fluid into the wellbore.

[0006] Thus, there is a continuing need for improved devices and methods of preventing the production of formation sand, fines and the like with produced subterranean formation fluids.

SUMMARY OF THE INVENTION

[0007] Downhole conditions vary significantly from well to well. Accordingly, the current invention provides the adaptability necessary to permit application under various operating conditions. The current invention provides downhole systems for removing particulate matter from fluids produced from a subterranean formation. Additionally, the current invention provides methods for producing fluid from a subterranean formation while substantially eliminating the production of particulate matter with the produced fluid.

[0008] In one embodiment, the downhole system of the current invention provides a means for removing particulate matter from fluids produced from a subterranean formation. The downhole system comprises a borehole penetrating at least a portion of a subterranean formation, an expandable screen positioned within the borehole. A permeable composition secures and seals the screen within the borehole. The downhole system may also include a perforated well casing positioned in the portion of the wellbore penetrating the subterranean formation.

[0009] In another embodiment, the current invention provides a method for producing fluid from a subterranean formation. In this embodiment, a borehole is extended from the earth's surface into at least a portion of a subterranean formation. Subsequently, an expandable well screen is placed in the borehole, preferably in the portion of the borehole penetrating the subterranean formation, followed by placement of a curable composition within the borehole. The screen is expanded and the curable composition allowed to cure or set, thereby forming a substantially solid permeable composition. Following curing, fluid is produced from the subterranean formation through the permeable composition. This embodiment optionally provides for the step of placing a perforated casing in the region of the borehole penetrating the subterranean formation.

[0010] In yet another embodiment, the current invention provides a method for producing fluid from a subterranean formation. In this embodiment, a borehole is extended from the earth's surface into at least a portion of a subterranean formation. Subsequently, a curable composition is placed in the borehole, preferably in the portion of the borehole penetrating the subterranean formation, followed by placement of an expandable well screen within the curable composition. The expandable screen is then expanded and the curable composition is allowed to cure or set thereby forming a substantially solid permeable composition. Following curing, fluid is produced from the subterranean formation through the permeable composition. This embodiment optionally provides for the step of placing a perforated casing in the region of the borehole penetrating the subterranean formation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] **FIG. 1** is a side cross-sectional view of an openhole or uncased wellbore penetrating an unconsolidated subterranean producing zone and having an expanded well screen encased in a permeable composition disposed therein.

[0012] **FIG. 2** is a side cross-sectional view of a wellbore penetrating an unconsolidated subterranean producing zone with a perforated casing cemented therein, the perforations contain a permeable composition and an expanded well screen is located within the perforated casing.

[0013] **FIG. 3** is a side cross-sectional view of the wellbore of **FIG. 1** prior to expansion of the expandable screen.

[0014] **FIG. 4** is a side cross-sectional view of the wellbore of **FIG. 2** prior to the expansion of the expandable screen.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0015] 1. Downhole System for Removing Particulate Matter from Produced Fluids

[0016] The current invention provides a system for removing sand and other particulate matter from fluid produced from unconsolidated or poorly consolidated subterranean formations. Preferably, the current invention precludes production of particles larger than 50 microns. The current invention is useful in all types of wells including but not limited to cased and uncased as well as vertical and directionally drilled wells.

[0017] The term "earth's surface" refers to any solid surface penetrated by the wellbore including the ocean floor, lake beds and river beds.

[0018] The term "fluid" includes liquids, gases and mixtures thereof.

[0019] The current invention, identified as system **10**, will now be described in detail with reference to the drawings. System **10** provides the means for precluding migration of particulate matter with produced fluid into wellbore **12**. As depicted in **FIGS. 1 and 2**, system **10** may be installed in cased and uncased wellbores **12**. Inasmuch as the processes and components used in wellbore **12** above the producing subterranean formation **14** are generally well known to those skilled in the art, this description will focus primarily on system **10**.

[0020] Turning first to **FIG. 1**, system **10** comprises an expandable well screen **28** positioned within an uncased wellbore **12** passing through at least a portion of subterranean formation **14**. As depicted in **FIG. 1**, well screen **28** is in the expanded state. Well screen **28** is generally in contact with a wellbore wall **16**. However, because drill bits do not create perfectly parallel wellbore walls **16**, gaps **30** exist between expanded well screen **28** and wellbore wall **16**. As previously noted, formation particulate matter will accumulate within gaps **30** inhibiting fluid flow from subterranean formation **14** into wellbore **12**. The current invention alleviates this problem by sealing expanded well screen **28** to wellbore wall **16** and filling gaps **30** with a permeable composition **25**.

[0021] **FIG. 2** depicts an alternative embodiment of the current invention wherein system **10** is installed in an uncased wellbore **12**. As shown in **FIG. 2**, the portion of wellbore **12** passing through subterranean formation **14** is completed with a casing **18**. Casing **18** forms a part of system **10**. Preferably, casing **18** is cemented into place and perforated by methods familiar to those skilled in the art. The embodiment of the invention depicted in **FIG. 2** further comprises an expanded well screen **28** located within perforated casing **18**. Further, the perforations **19** of casing **18** are filled with permeable composition **25**. Permeable composition **25** provides a barrier to the migration of particulate matter from subterranean formation **14** into casing **18**. Although not a necessary configuration, permeable composition **25** preferably encases expanded well screen **28** positioned within casing **18**.

[0022] As used herein, the term "curable composition"**25** refers to the composition prior to curing or setting and the term "permeable composition"**25** refers to the same composition after curing or setting.

[0023] Curable compositions **25** suitable for use in the current invention include any flowable or plastic material capable of curing or setting to form a substantially solid, yet permeable, material. Typically, fluid and gas producing unconsolidated subterranean formations will have permeability ratings of 0.01 darcy to a few darcies. In order to promote production from subterranean formation **14**, the permeability rating of permeable composition **25** should be greater then the permeability of subterranean formation **14**. Preferably, permeable composition **25** has a permeability rating 5 to 20 times the permeability of subterranean formation **14** or greater. Additionally, permeable compositions **25** having permeability ratings between about 0.1 to about 400 darcies will perform satisfactorily in the current invention.

[0024] Curable compositions **25** suitable for use in the current invention include permeable cements, curable resin-coated particulates or mixtures thereof. For example, a blended curable composition **25** may comprise from about 10 to about 90% by weight permeable cement and from about 10 to about 90% by weight resin-coated particulate.

[0025] Permeable cements are well known to those skilled in the art as demonstrated by U.S. Pat. Nos. 6,202,751, 6,390,195, 5,358,047, 5,339,902, 5,598,890 and 3,862,663 all of which are incorporated herein by reference. In general, permeable cement suitable for use in the current invention will have sufficient strength to stabilize wellbore wall **16** and will meet the aforemention levels of permeability. A preferred permeable cement is disclosed in co-pending U.S. application Ser. No. ______, filed on even date herewith entitled "Improved Permeable Cement Compositions and Method for Preparing the Same".

[0026] As noted above resin-coated particulate will also form an adequate permeable composition **25** when cured. Resin-coated particulate and other resin-coated compositions are well known to those skilled in the art as demonstrated by U.S. Pat. Nos. 6,016,870, 5,964,289, 6,047,772, 5,232,961 and 4,829,100 all of which are incorporated herein by reference. Preferably, the resin-coated particles will have mesh sizes ranging from 10 to 70. More preferably, the resin-coated particles will have mesh sizes of 20 to 40. Finally, the preferred resin-coated particles will have a specific gravity between about 0.85 and 3.3 grams per milliliter.

[0027] Finally, expandable well screens **28** suitable for use in the current invention include those disclosed in U.S. Pat. Nos. 5,901,789, 6,263,966 and 6,315,040 all of which are incorporated herein by reference. The screens disclosed therein are merely representative of screens suitable for use in the current invention and do not limit the range of screens available for use in the current invention. Thus, with only minor variations, system **10** may be adapted for cased and uncased wellbores **12**. Each embodiment of the current invention provides an effective barrier or filter precluding production of particulate matter with the produced fluid.

[0028] 2. Methods for Removing Particulate Matter from Produced Fluids

[0029] The current invention also provides methods for reducing or precluding the migration of particulate matter from subterranean formation **14** to the interior of wellbore **12**. The methods of the current invention are adaptable to a wide variety of downhole environments and thus comprise several embodiments consistent with the teaching provided by this disclosure. One embodiment of the current invention relates to production of fluids from an uncased wellbore **12** as depicted in **FIGS. 1 and 3**. Another embodiment of the current invention relates to production of fluids through a perforated casing cemented in place as depicted in **FIGS. 2 and 4**.

[0030] Turning first to **FIGS. 1 and 3**, the method of the current invention is suitable for use with any method of completing wellbore **12**. As shown in the Figs., wellbore **12** is extended from the earth's surface into at least a portion of subterranean formation **14**. The portion of wellbore **12** above subterranean formation **14** includes a production pipestring **20** passing through a casing **13**. Typically, casing **13** is cemented into wellbore **12**. Production pipestring **20** commonly passes through a packer **22** and enters the uncased portion of wellbore **12** passing through subterranean formation **14**.

[0031] As known to those skilled in the art, wellbore wall **16** passing through subterranean formation **14** commonly has a filtercake (not shown) disposed thereon. Prior to production of fluid from subterranean formation **14**, the filtercake must be removed. The process of filtercake removal requires use of chemicals commonly known as "breakers". As described below, these chemicals may be included with one of the steps of the current invention thereby reducing the number of overall steps required to complete the well.

[0032] The method of the current invention provides for the installation of an expandable well screen **28** within the region of wellbore **12** passing through subterranean formation **14**. Expandable well screen **28** is initially installed in the unexpanded state by hanging from packer **22** or other suitable downhole device. Expandable well screen **28** may optionally carry a plug **38** at its lower end. When expanded, the preferred expandable well screen **28** will have openings sized to permit production of formation fluid while preferably precluding the production of formation particulate larger than 50 microns.

[0033] Following installation of expandable well screen **28**, a pumpable mixture of curable composition **25** is injected downhole into the annulus **34** formed between expandable screen **28** and wellbore wall **16** passing through subterranean formation **14**. The pumpable mixture may be selected from any composition capable of forming a slurry or other pumpable mixture and subsequently curing or setting to form a substantially solid permeable structure. Optionally, the pumpable mixture may also include chemicals suitable for breaking the filtercake and/or treating other downhole conditions.

[0034] Preferred mixtures include permeable cements, resin-coated particulate or mixtures thereof. Permeable cements and resin-coated particulate suitable for use in the current invention are discussed above. The permeable composition **25**, upon curing, should have a permeability rating at least 5 times greater than the permeability rating of subterranean formation **14**. More preferably, permeable composition **25** will have a permeability rating from about 10 to at about 20 times greater than the permeability of subterranean formation **14**. Thus, permeable compositions **25** having permeability ratings between about 0.1 to about 400 darcies will perform satisfactorily in the current invention. Accordingly, one step of the current invention includes measuring or estimating the permeability of subterranean formation **14** by conventional means known to those skilled in the art.

[0035] In a preferred embodiment, well screen **28** is expanded after injecting, but prior to setting or curing curable composition **25**. If well screen **28** carried optional expanding device or plug **38**, then a tool (not shown) is run downhole to engage plug **38** and pull it upwards through expandable screen **28**. Movement of plug **38** through well screen **28** expands well screen **28** and removes excess curable composition **25** from the interior of expanded well screen **28**. Alternatively, plug **38** or other suitable expanding device may be run downhole from the surface expanding well screen **28** as it passes downward through well screen **28**.

[0036] In another embodiment of the current invention, the pumpable mixture of curable composition **25** is used to force plug **38** downward through well screen **28**. After plug **38** has reached the end of well screen **28**, it is retrieved thereby forcing curable composition **25** outward through well screen **28** into annulus **34** and gaps **30**. Retrieval of plug **38** in this manner also removes excess curable composition **25** from the interior of well screen **28**.

[0037] After expansion of expandable screen **28**, the method of the current invention allows or causes the curable composition **25** to set or cure. The process for setting or curing substances suitable for use as permeable compositions **25** is well known in the art.

[0038] Following expansion, well screen **28** has an outer diameter substantially equal to the interior diameter of wellbore **12**. While irregular regions within wellbore **12** are not contacted by well screen **28**, the resulting gaps **30** are filled with permeable composition **25**. Thus, once the permeable composition **25** has cured, it forms an effective barrier to particulate matter while allowing passage of fluids through well screen **28** and into production pipestring **20**. In this manner, the methods of the current invention preclude the blockage of well screen **28** by formation fines or sand in the irregular regions of wellbore **12**.

[0039] The foregoing method may be modified in many ways to accommodate downhole conditions and available equipment. For example, the order of installing expandable well screen **28** and injecting curable composition **25** may be reversed. Thus, curable composition **25** may be injected into wellbore **12** and well screen **28** installed within curable composition **25**. Well screen **28** will then be expanded prior to setting or curing curable composition **25**. Preferably, expansion is achieved by retrieving plug **38** from the end of well screen **28**. Removal of plug **38** upwards through well screen **28** wipes excess curable composition **25** from the interior of well screen **28** and/or forces curable composition into annulus **34** between wellbore wall **16** and well screen **28**.

[0040] Turning now to FIGS. 2 and 4, the current invention provides methods for precluding the migration of particulate matter from subterranean formation 14 through perforated casing 18 into production pipestring 20. As described above, wellbore 12 is extended from the earth's surface into at least a portion of subterranean formation 14 by conventional means. The portion of wellbore 12 above subterranean formation 14 includes a production pipestring 20 passing through casing 13. Typically, casing 13 is cemented into wellbore 12. Production pipestring 20 commonly passes through packer 22. Additionally, as shown in FIGS. 2 and 4, the method of the current invention installs casing 18 in the portion of wellbore 12 penetrating subterranean formation 14. Preferably, casing 18 is cemented in place and subsequently perforated by a perforating gun (not shown) or other similar device known to those skilled in the art. Perforated casing 18 substantially enhances the stability of unconsolidated subterranean formation 14. Following perforation, perforations 19 permit fluid communication between formation 14 and the interior of casing 18.

[0041] Following the step of perforating casing 18, the current invention fills perforations 19 with curable composition 25. Several processes known to those skilled in the art may achieve the step of filling perforations 19. Particularly suitable processes include, but are not limit to use of a pinpoint injector (not shown) and fluid circulation processes. Pinpoint injectors are particularly preferred and are well known to those skilled in the art of completing wells. One such device commonly used by Halliburton Energy Services, Inc. includes a retrievable fluid control valve, a retrievable test-treat-squeeze (RTTS) circulating valve, a pinpoint injection packer and a collar locator. The assembled pinpoint-injecting device is a retrievable, treating, straddle packer capable of focusing a treatment or injection fluid at a precise location downhole. Other commonly available devices such as CHAMP® III and CHAMP® IV Packers can be obtained from Halliburton Energy Services, Inc.

[0042] Preferred curable compositions 25 include permeable cements, resin-coated beads and mixtures thereof. Permeable cements and resin-coated beads suitable for use in the current invention are discussed above. As noted above, curable composition 25, upon curing, should have a permeability rating at least five times greater than the permeability rating of subterranean formation 14. More preferably, permeable composition 25 will have a permeability rating about 10 to about 20 times greater than the permeability of subterranean formation 14. Accordingly, prior to injecting curable composition 25, the current invention includes the step of measuring or estimating the permeability of subterranean formation 14 and selecting a curable composition 25 having the proper permeability rating when cured or set.

[0043] Following injection of curable composition 25 into perforations 19, expandable well screen 28 is positioned within casing 18. Typically, expandable well screen 28 is initially hung or attached to packer 22 or other suitable device in the unexpanded state. Expandable well screen 28 may optionally carry plug 38 at its lower end. Following expansion, the preferred expandable well screen 28 will have openings sized to preclude passage of particles larger than 50 microns. In this embodiment of the current invention, permeable composition 25, once cured or set, provides the primary filtering of produced fluids. Well screen 28 acts as a secondary filter and further stabilizes permeable composition 25 within perforations 19.

[0044] In a preferred embodiment, well screen 28 is expanded prior to setting or curing curable composition 25. If well screen 28 included optional plug 38, then a tool (not shown) is run downhole to engage plug 38 and pull it upwards through expandable screen 28. Movement of plug 38 through well screen 28 expands well screen 28 and removes excess curable composition 25 from the interior of expanded well screen 28. Alternatively, plug 38 or other suitable device may be run downhole from the surface expanding well screen 28 as it passes downward through well screen 28.

[0045] The foregoing method may be modified in many ways to accommodate downhole conditions and available equipment. For example, the order of installing expandable well screen 28 and injecting curable composition 25 may be reversed. Thus, well screen 28, carrying plug 38, may be installed downhole in the un-expanded state prior to injection of curable composition 25. Following injection of curable composition 25, plug 38 is retrieved upwards through well screen 28 expanding well screen 28 and wiping excess curable composition 25 from the interior of well screen 28. This embodiment has the advantage of ensuring encapsulation of well screen 28 within permeable composition 25 while simultaneously filling perforations 19.

[0046] While the present invention has been described with reference to FIGS. 1-4, other embodiments of the current invention will be apparent to those skilled in the art. Therefore, the foregoing specification is considered exemplary with the true scope and spirit of the invention being indicated by the following claims.

What is claimed is:

1. A downhole system for removing particulate matter from fluids produced from a subterranean formation comprising:

an expandable screen, in the expanded state, located within a borehole penetrating at least a portion of the subterranean formation;

a substantially solid permeable composition binding the screen to the walls of the borehole.

2. The system of claim 1, wherein the permeable composition has a permeability rating between about 0.1 darcies and about 400 darcies.

3. The system of claim 1, wherein the permeable composition has a permeability rating between about 0.1 and about 100 darcies.

4. The system of claim 1, wherein the permeable composition is selected from the group consisting of permeable cement, resin-coated particulate and mixtures thereof.

5. The system of claim 1, wherein the permeable composition comprises from about 10 to about 90% by weight permeable cement and from about 10 to about 90% by weight resin-coated particulate.

6. A downhole system for removing particulate matter from fluids produced from a subterranean formation comprising:

a perforated casing located within a borehole penetrating at least a portion of the subterranean formation;

an expandable screen located within the perforated casing; and,

a substantially solid permeable composition located within the perforations of the perforated casing.

7. The system of claim 6, wherein the permeable composition has a permeability between about 0.1 darcies and about 400 darcies.

8. The system of claim 6, wherein the permeable composition has a permeability rating between about 0.1 and about 100 darcies.

9. The system of claim 6, wherein the permeable composition is selected from the group consisting of permeable cement, resin-coated particulate and mixtures thereof.

10. The system of claim 6, wherein the permeable composition comprises from about 10 to about 90% by weight permeable cement and from about 10 to about 90% by weight resin-coated particulate.

11. A method for producing fluid from a subterranean formation comprising the steps of:

a) extending a borehole from the earth's surface into at least a portion of the subterranean formation;

b) placing a casing within the borehole;

c) perforating the casing;

d) placing a curable composition in the resulting perforations;

e) allowing the curable medium to cure thereby forming a permeable composition; and,

f) producing fluid from the subterranean formation through the permeable composition.

12. The method of claim 11, wherein the curable composition has a permeability rating between about 0.1 and 400 darcies when cured and is selected from the group consisting of permeable cement, resin-coated particulate and mixtures thereof.

13. The method of claim 11, wherein the curable composition has a permeability rating between about 0.1 and 100.0 darcies when cured.

14. The method of claim 11, including the step of selecting a curable composition having a permeability rating when cured between about 10 to about 20 times greater than the permeability rating of the subterranean formation.

15. The method of claim 11, further comprising placing an expandable well screen within the casing in the region of the perforations and expanding the expandable well screen.

16. The method of claim 11, wherein the curable composition is selected from the group consisting of permeable cement, resin-coated particulate and mixtures thereof.

17. A method for producing fluid from a subterranean formation comprising the steps of:

a) extending a borehole from the earth's surface into at least a portion of the subterranean formation;

b) placing a casing within the borehole;

c) perforating the casing;

d) placing a curable composition within the borehole;

e) placing an expandable well screen in the curable composition;

f) expanding the expandable screen;

g) allowing the curable composition to cure thereby forming a permeable composition; and,

h) producing fluid from the subterranean formation.

18. The method of claim 17, wherein the curable composition has a permeability rating between about 0.1 and 400.0 darcies when cured.

19. The method of claim 17, wherein the curable composition has a permeability rating between about 0.1 and 100.0 darcies when cured.

20. The method of claim 17, wherein the curable composition is selected from the group consisting of permeable cement, resin-coated particulate and mixtures thereof.

21. The method of claim 17, wherein the expandable screen is encased within the curable composition following expansion.

22. The method of claim 17, including the step of selecting a curable composition having a permeability rating when cured between about 10 to about 20 times greater than the permeability rating of the subterranean formation.

23. A method for producing fluid from a subterranean formation comprising the steps of:

a) extending a borehole from the earth's surface into at least a portion of the subterranean formation;

b) placing a casing within the borehole;

c) perforating the casing;

d) placing a curable composition within the resulting perforations;

e) placing an expandable well screen in the portion of the borehole adjacent to the perforations;

f) expanding the expandable screen;

g) allowing the curable composition to cure thereby forming a permeable composition; and,

h) producing fluid from the subterranean formation.

24. The method of claim 23, wherein the curable composition has a permeability rating between about 0.1 and 400.0 darcies when cured.

25. The method of claim 23, wherein the curable composition has a permeability rating between about 0.1 and 100.0 darcies when cured.

26 The method of claim 23, wherein the curable composition is selected from the group consisting of permeable cement, resin-coated particulate and mixtures thereof.

27. The method of claim 23, wherein the expandable screen is encased within the curable composition following expansion.

28. The method of claim 23, including the step of selecting a curable composition having a permeability rating when cured between about 10 to about 20 times greater than the permeability rating of the subterranean formation.

29. A method for producing fluid from a subterranean formation comprising the steps of:

a) extending a borehole from the earth's surface into at least a portion of the subterranean formation;

b) placing an expandable well screen in the borehole;

c) placing a curable composition within the borehole;

d) expanding the expandable screen;

e) allowing the curable composition to cure thereby forming a permeable composition; and,

f) producing fluid from the subterranean formation.

30. The method of claim 29, wherein the curable composition has a permeability rating between about 0.1 and 400.0 darcies when cured.

31. The method of claim 29, wherein the curable composition has a permeability rating between about 0.1 and 100.0 darcies when cured.

32. The method of claim 29, wherein the curable composition is selected from the group consisting of permeable cement, resin-coated particulate and mixtures thereof.

32. The method of claim 29, wherein the expandable screen is encased within the curable composition following expansion.

33. The method of claim 29, including the step of selecting a curable composition having a permeability rating, when cured, between about 10 to about 20 times greater than the permeability rating of the subterranean formation.

34. The method of claim 29, wherein the permeable composition of step c) further comprises a filter cake breaker.

35. A method for producing fluid from a subterranean formation comprising the steps of:

a) extending a borehole from the earth's surface into at least a portion of the subterranean formation;

b) placing a curable composition within the portion of the borehole penetrating the subterranean formation;

c) placing an expandable well screen in the permeable composition;

d) expanding the expandable screen;

e) permitting the permeable composition to cure thereby forming a permeable composition; and,

f) producing fluid from the subterranean formation.

36. The method of claim 35, wherein the curable composition has a permeability rating between about 0.1 and 400.0 darcies when cured.

37. The method of claim 35, wherein the curable composition has a permeability rating between about 0.1 and 100.0 darcies when cured.

38. The method of claim 35, wherein the curable composition is selected from the group consisting of permeable cement, resin-coated particulate and mixtures thereof.

39. The method of claim 35, wherein the expandable screen is encased within the curable composition following expansion.

40. The method of claim 35, including the step of selecting a curable composition having a permeability rating when cured between about 10 to about 20 times greater than the permeability rating of the subterranean formation.

41. The method of claim 35, wherein the permeable composition of step b) further comprises a filter cake breaker.

* * * * *