(51) International Patent Classification:
E21B 17/06 (2006.01)

(21) International Application Number:
PCT/CA2018/050312

(22) International Filing Date:
15 March 2018 (15.03.2018)

(25) Filing Language:
English

(26) Publication Language:
English

(30) Priority Data:

(71) Applicant: HEAL SYSTEMS LP [CA/CA]; 125 9th Avenue S.E., Suite 200, Calgary, Alberta T2G 0P6 (CA).

(72) Inventors: SAPONJA, Jeffrey Charles; c/o Heal Systems LP, 125 9th Avenue S.E., Suite 200, Calgary, Alberta T2G 0P6 (CA). HARI, Robbie Singh; c/o Heal Systems LP, 125 9th Avenue S.E., Suite 200, Calgary, Alberta T2G 0P6 (CA). KEITH, Tim; c/o Heal Systems LP, 125 9th Avenue S.E., Suite 200, Calgary, Alberta T2G 0P6 (CA). KIMERY, Dave; c/o Heal Systems LP, 125 9th Avenue S.E., Suite 200, Calgary, Alberta T2G 0P6 (CA). WALL, Trystan; c/o Heal Systems LP, 125 9th Avenue S.E., Suite 200, Calgary, Alberta T2G 0P6 (CA). DEUGO, Shawn; c/o Heal Systems LP, 125 9th Avenue S.E., Suite 200, Calgary, Alberta T2G 0P6 (CA).

(74) Agent: RIDOUT & MAYBEILL LLP et al.; 250 University Avenue, 5th Floor, Toronto, Ontario M5H 3E5 (CA).


(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

(54) Title: RELEASABLE TOOL FOR EFFECTING COUPLING WITHIN A WELLBORE

(57) Abstract: There is provided a connecting device includes first and second device counterparts. The first device counterpart and the second device counterpart are co-operatively configured such that: releasable coupling between the first device counterpart and the second device counterpart is effected, while the first device counterpart is releasably coupled to the second device counterpart in a releasably coupled position: (i) displacement of the first device counterpart, relative to the second device counterpart, along an axis in a first direction, is prevented or substantially prevented; and (ii) the first device counterpart is displaceable, relative to the second device counterpart, along an axis in a second direction that is opposite, or substantially opposite, to the first direction, for effecting release of the first device counterpart from the coupling to the second device counterpart, with effect that the first device counterpart becomes disposed in a released position. The release of the first device counterpart from the releasable coupling to the second device counterpart is effectible in absence, or substantial absence, of torque applied to the first device counterpart about an axis that is parallel, or substantially parallel, to the central longitudinal axis of the first device counterpart.

[Continued on next page]
Published:
— without international search report and to be republished upon receipt of that report (Rule 48.2(g))
— in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE
RELEASABLE TOOL FOR EFFECTING COUPLING WITHIN A WELLBORE

FIELD

[0001] The present disclosure relates to artificial lift systems, and related apparatuses, for use in producing hydrocarbon-bearing reservoirs, and associated methods of manipulating such apparatuses and systems.

BACKGROUND

[0002] Gas interference is a problem encountered while producing wells, especially wells with horizontal sections. Gas interference results in downhole pumps becoming gas locked and/or low pump efficiencies. Gas interference reduces the operating life of the pump. Downhole packer-type gas anchors or separators are provided to remedy gas lock. Generally, downhole pumps must be retrieved from the wellbore in order to perform maintenance operations. Existing gas separator configurations create challenges for retrieving downhole pumps. Accumulated solid debris, separated out from the wellbore fluids by existing gas separator configuration, interfere with such retrievability. As well, in the horizontal section of a wellbore, mechanical devices are, generally, difficult to set and unset, especially when rotation is required.

SUMMARY

[0003] In one aspect, there is provided parts of a connecting device assembly, comprising: a first device counterpart; and a second device counterpart; wherein: the first device counterpart and the second device counterpart are co-operatively configured such that: releasable coupling between the first device counterpart and the second device counterpart is effectible; while the first device counterpart is releasably coupled to the second device counterpart in a releasably coupled position: (i) displacement of the first device counterpart, relative to the second device counterpart, along an axis in a first direction, is prevented or substantially prevented; and (ii) the first device counterpart is displaceable, relative to the second device counterpart, along an axis in a second direction that is opposite, or substantially opposite, to the first direction, for effecting release of the first device counterpart from the coupling to the second device counterpart, with effect that the first device counterpart becomes disposed in a released position and, in the released position, is disposed for separation from the second device counterpart in response to a
separating displacement of the first device counterpart, relative to the second device counterpart, along an axis in the first direction; and the release of the first device counterpart from the releasable coupling to the second device counterpart is effectible in absence, or substantial absence, of torque applied to the first device counterpart about an axis that is parallel, or substantially parallel, to the central longitudinal axis of the first device counterpart.

[0004] In another aspect, there is provided parts of a connecting device assembly, comprising: a first device counterpart; and a second device counterpart; wherein: the first device counterpart and the second device counterpart are co-operatively configured such that: releasable coupling between the first device counterpart and the second device counterpart is effectible in absence, or substantial absence, of torque applied to the first device counterpart about, or substantially about, an axis that is parallel, or substantially parallel, to the central longitudinal axis of the first device counterpart; and while the first device counterpart is releasably coupled to the second device counterpart: (i) displacement of the first device counterpart, relative to the second device counterpart, along an axis in a first direction, is prevented or substantially prevented; and (ii) the first device counterpart is displaceable, relative to the second device counterpart, along an axis in a second direction that is opposite, or substantially opposite, to the first direction, for effecting release of the first device counterpart from the coupling to the second device counterpart, with effect that the first device counterpart becomes disposed in a released position and, in the released position, is disposed for separation from the second device counterpart in response to a separating displacement of the first device counterpart, relative to the second device counterpart, along an axis in the first direction.

[0005] In another aspect, there is provided Parts of a connecting device assembly, comprising: a first device counterpart; a second device counterpart; wherein: the first device counterpart and the second device counterpart are co-operatively configured such that: releasable coupling between the first device counterpart and the second device counterpart is effectible; while the first device counterpart is releasably coupled to the second device counterpart in a releasably coupled position: (i) displacement of the first device counterpart, relative to the second device counterpart, along an axis in a first direction, is prevented or substantially prevented; and (ii) the first device counterpart is displaceable, relative to the second device counterpart, along an axis in a second direction that is opposite, or substantially opposite, to the
first direction, for effecting release of the first device counterpart from the releasable coupling to
the second device counterpart, with effect that the first device counterpart becomes disposed in a
released position and, in the released position, is disposed for separation from the second device
counterpart in response to a separating displacement of the first device counterpart, relative to
the second device counterpart, along an axis in the first direction; and the first device counterpart
and the second device counterpart are further co-operatively configured for defining a j-tool
configured for mediating the release of the first device counterpart from the releasable coupling
to the second device counterpart.

[0006] In another aspect, there is provided parts of a connecting device assembly,
comprising: a first device counterpart; and a second device counterpart; wherein: the first device
counterpart and the second device counterpart are co-operatively configured such that, while the
first device counterpart is releasably coupled to the second device counterpart in a releasably
coupled position: (i) displacement of the first device counterpart, relative to the second device
counterpart, along an axis in a first direction, is prevented or substantially prevented; and (ii) the
first device counterpart is displaceable, relative to the second device counterpart, along an axis in
a second direction that is opposite, or substantially opposite, to the first direction, for effecting
release of the first device counterpart from the releasable coupling to the second device
counterpart, with effect that the first device counterpart becomes disposed in a released position
and, in the released position, is disposed for separation from the second device counterpart in
response to a separating displacement of the first device counterpart, relative to the second
device counterpart, along an axis in the first direction; and the first device counterpart and the
second device counterpart are further co-operatively configured for defining a j-tool configured
for mediating the releasable coupling between the first device counterpart and the second device
counterpart.

[0007] In another aspect, there is provided parts of a
connecting device assembly, comprising: a first device counterpart; a guide tool, mounted to the
first device counterpart for rotation relative to the first device counterpart, and including a guide;
a second device counterpart including a receptacle for receiving insertion of the first device
counterpart with effect that the first device counterpart is disposed within the second device
counterpart; and a follower extending from the second device counterpart and disposed for
guided movement via the guide; wherein: the first device counterpart, the second device counterpart, the guide tool, and the follower are co-operatively configured such that: releasable coupling between the first device counterpart and the second device counterpart is effectible while the first device counterpart is disposed within the second device counterpart; while the first device counterpart is releasably coupled to the second device counterpart in a releasably coupled position: (i) displacement of the first device counterpart, relative to the second device counterpart, along an axis in a first direction, is prevented or substantially prevented; and (ii) the first device counterpart is displaceable, relative to the second device counterpart, along an axis in a second direction that is opposite, or substantially opposite, to the first direction, for effecting release of the first device counterpart from the coupling to the second device counterpart, with effect that the first device counterpart becomes disposed in a released position and, in the released position, is disposed for withdrawal from the second device counterpart in response to a withdrawing displacement of the first device counterpart, relative to the second device counterpart, along an axis in the first direction; and the release of the first device counterpart from the releasable coupling to the second device counterpart is mediated via interaction between the guide and the follower.

[0008] In another aspect, there is provided Parts of a connecting device assembly, comprising: a first device counterpart; a guide tool, mounted to the first device counterpart for rotation relative to the first device counterpart, and including a guide; a second device counterpart including a receptacle for receiving insertion of the first device counterpart with effect that the first device counterpart is disposed within the second device counterpart; and a follower extending from the second device counterpart and disposed for guided movement via the guide; wherein: the first device counterpart, the second device counterpart, the guide tool, and the follower are co-operatively configured such that: while the first device counterpart is aligned with the receptacle, the first device counterpart is insertable within the second device counterpart, via the receptacle, by displacement of the first device counterpart, relative to the second device counterpart, in a first direction along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the first device counterpart; releasable coupling between the first device counterpart and the second device counterpart is effectible while the first device counterpart is disposed within the second device counterpart; while the first device counterpart is releasably coupled to the second device counterpart in a releasably coupled
position: (i) displacement of the first device counterpart, relative to the second device counterpart, along an axis in a first direction, is prevented or substantially prevented; and (ii) the first device counterpart is displaceable, relative to the second device counterpart, along an axis in a second direction that is opposite, or substantially opposite, to the first direction, for effecting release of the first device counterpart from the coupling to the second device counterpart, with effect that the first device counterpart becomes disposed in a released position and, in the released position, is disposed for withdrawal from the second device counterpart in response to a withdrawing displacement of the first device counterpart, relative to the second device counterpart, along an axis in the first direction; and the releasable coupling between the first device counterpart and the second device counterpart is mediated via interaction between the guide and the follower.

[0009] In another aspect, there is provided a system including a wellbore string disposed within a wellbore, wherein the wellbore string comprises the parts as described in any one of the above aspects, wherein the first connecting part is releasably coupled to the second connecting part, and the first direction is a downhole direction.

[0010] In another aspect, there is provided a reservoir fluid conduction assembly for disposition within a wellbore string, that is lining a wellbore that is extending into a subterranean formation, such that an intermediate wellbore space is defined within a space that is disposed between the wellbore string and the assembly, wherein the assembly includes

a reservoir fluid-supplying conductor for receiving reservoir fluid from a downhole wellbore space of the wellbore;

a flow diverter body including (a) a diverter body-defined reservoir fluid conductor for conducting reservoir fluid, that is supplied from the reservoir fluid-supplying conductor, to a reservoir fluid separation space of an uphole wellbore space of the wellbore, the uphole wellbore space being disposed uphole relative to the downhole wellbore space, and (b) a diverter body-defined gas-depleted reservoir fluid conductor for receiving gas-depleted reservoir fluid and conducting the received gas-depleted reservoir fluid for effecting supplying of the gas-depleted reservoir fluid to a gas-depleted reservoir fluid-producing conductor; and
a sealed interface effector for co-operating with the wellbore string for establishing a sealed interface for preventing, or substantially preventing, flow communication, via the intermediate wellbore space, between the downhole wellbore space and the uphole wellbore space;

wherein:

the flow diverter body, the sealed interface effector, and the reservoir fluid conductor are co-operatively configured such that, while the assembly is disposed within the wellbore string, such that the sealed interface is defined, and the reservoir fluid-supplying conductor is receiving reservoir fluid from the downhole wellbore space that has been received within the downhole wellbore space from the subterranean formation:

(i) the reservoir fluid is conducted to the diverter body-defined reservoir fluid conductor via the reservoir fluid-supplying conductor;

(ii) the reservoir fluid is conducted by the diverter body-defined reservoir fluid conductor and discharged to a reservoir fluid separation space of the uphole wellbore space;

(iii) within the reservoir fluid separation space, a gas-depleted reservoir fluid is separated from the discharged reservoir fluid, in response to at least buoyancy forces; and

(iv) the separated gas-depleted reservoir fluid is conducted to the diverter body-defined gas-depleted reservoir fluid conductor, via the intermediate wellbore space, for conduction to the surface via a gas-depleted reservoir fluid producing conductor;

the reservoir fluid separation space defines a separation-facilitating space portion of the intermediate wellbore space; and

the reservoir fluid-supplying conductor includes a connecting device disposed uphole relative to the sealed interface effector for connecting an uphole-disposed portion of the reservoir fluid-supplying conductor to a downhole-disposed portion of the
reservoir fluid supplying-conductor, the connecting device includes the parts as described in any one of the above aspects, the first connecting part is releasably coupled to the second connecting part; and the first direction is a downhole direction.

[0011] In another aspect, there is provided a reservoir fluid conduction assembly for disposition within a wellbore string, that is lining a wellbore that is extending into a subterranean formation, such that an intermediate wellbore space is defined within a space that is disposed between the wellbore string and the assembly, wherein the assembly includes:

a reservoir fluid-supplying conductor for receiving reservoir fluid from a downhole wellbore space of the wellbore;

a flow diverter body including (a) a diverter body-defined reservoir fluid conductor for conducting reservoir fluid, that is supplied from the reservoir fluid-supplying conductor, to a reservoir fluid separation space of an uphole wellbore space of the wellbore, the uphole wellbore space being disposed uphole relative to the downhole wellbore space, and (b) a diverter body-defined gas-depleted reservoir fluid conductor for receiving gas-depleted reservoir fluid and conducting the received gas-depleted reservoir fluid to a gas-depleted reservoir fluid-producing conductor; and

a sealed interface effector for co-operating with the wellbore string for establishing a sealed interface for preventing, or substantially preventing, bypassing of the diverter body-defined gas-depleted reservoir fluid conductor by, the separated gas-depleted reservoir fluid;

wherein:

the flow diverter body, the sealed interface effector, and the reservoir fluid conductor are co-operatively configured such that, while the assembly is disposed within the wellbore string, such that the sealed interface is defined, and the reservoir fluid-supplying conductor is receiving reservoir fluid from the downhole wellbore space that has been received within the downhole wellbore space from the subterranean formation:
(i) the reservoir fluid is conducted to the diverter body-defined reservoir fluid conductor via the reservoir fluid-supplying conductor;

(ii) the reservoir fluid is conducted by the diverter body-defined reservoir fluid conductor and discharged to a reservoir fluid separation space of the uphole wellbore space;

(iii) within the reservoir fluid separation space, a gas-depleted reservoir fluid is separated from the discharged reservoir fluid, in response to at least buoyancy forces; and

(iv) the separated gas-depleted reservoir fluid is conducted to the diverter body-defined gas-depleted reservoir fluid-diverting conductor, via the intermediate wellbore space, for conduction to the surface via a gas-depleted reservoir fluid producing conductor;

the reservoir fluid separation space defines a separation-facilitating space portion of the intermediate wellbore space; and

the reservoir fluid-supplying conductor includes a connecting device disposed uphole relative to the sealed interface effector for connecting an uphole-disposed portion of the reservoir fluid-supplying conductor to a downhole-disposed portion of the reservoir fluid supplying-conductor, the connecting device includes the parts as described in any one of the above aspects, the first connecting part is releasably coupled to the second connecting part; and the first direction is a downhole direction.

[0012] In another aspect, there is provided a system comprising either one of the assemblies described above, wherein the assembly is disposed within a wellbore.

[0013] In another aspect, there is provided a process for sensing of an indication of establishment of a sealed interface, within a wellbore, between a first device counterpart and a
second device counterpart, comprising: while displacing the first device counterpart, relative to the second device counterpart, in the uphole direction, monitoring for overpull.

[0014] In another aspect, there is provided a process for sensing of an indication of establishment of a co-operative disposition of a first device counterpart relative to a second device counterpart, such that the first device counterpart is disposed in a sealed-interface precursor position, wherein, displacement of the first device counterpart, relative to the second device counterpart, from the sealed-interface precursor position and in the uphole direction is with effect that a sealed interface is established between the first and second device counterparts: while displacing the first device counterpart, relative to the second device counterpart, in the uphole direction, monitoring for overpull.

[0015] In another aspect, there is provided a process for sensing of an indication of completion of a wellbore operation in response to actuation, within a wellbore, by a first tool via a second tool, comprising: while displacing the first tool, relative to the second tool, in an uphole direction, monitoring for overpull.

BRIEF DESCRIPTION OF DRAWINGS

[0016] The preferred embodiments will now be described with reference to the following accompanying drawings:

[0017] Figure 1A is a schematic illustration of an embodiment of a reservoir fluid production assembly disposed within a wellbore;

[0018] Figure 1B is a schematic illustration of an embodiment of a flow diverter of embodiments of the system of the present disclosure;

[0019] Figure 2A is a side view of an embodiment of a first device counterpart of the reservoir fluid production assembly illustrated in Figure 1;

[0020] Figure 2B is a sectional view of the first device counterpart illustrated in Figure 2A, taken along lines B-B;
Figure 2C is a sectional view towards one end of the first device counterpart illustrated in Figure 2A, taken along lines D-D;

Figure 3A is a side view of an embodiment of a second device counterpart of the reservoir fluid production assembly illustrated in Figure 1;

Figure 3B is a sectional view of the second device counterpart illustrated in Figure 3A, taken along lines B-B;

Figure 3C is an end view from one end of the second device counterpart illustrated in Figure 3A;

Figure 4A is a side view of an overshot of another embodiment of the second device counterpart illustrated in Figures 6C and 6D;

Figure 4B is a sectional view of the overshot illustrated in Figure 4A; taken along lines F-F;

Figure 4C is a sectional view towards one end of the overshot illustrated in Figure 4A, taken along lines AB-AB;

Figure 4D is a sectional view towards one end of the overshot illustrated in Figure 4A, taken along lines AD-AD;

Figure 5A is a side view of an embodiment of the collar (j-slot counterpart) of the first device counterpart illustrated in Figure 2A;

Figure 5B is an unrolled view of the j-slot defined within the collar illustrated in Figure 5A, illustrating the path along which the follower moves through the j-slot, and the various positions of the associated follower as the follower moves through the j-slot;

Figure 6A is a side view of the first device counterpart illustrated in Figures 2A and 2B disposed within the second device counterpart illustrated in Figures 3A and 3B, with the follower disposed in the position 233B within the j-slot;
Figure 6B is a sectional view of the assembly illustrated in Figure 6A, taken along lines G-G;

Figure 6C is a side view of another embodiment of an first device counterpart coupled to another embodiment of a second device counterpart, with the follower disposed in the position 233B within the j-slot;

Figure 6D is a sectional view of the assembly illustrated in Figure 6C, taken along lines A-A;

Figure 7A is a side view of the first device counterpart, illustrated in Figures 2A and 2B, releasably coupled to the second device counterpart illustrated in Figures 3A and 3B (i.e. in the releasably coupled position), with the follower disposed in the position 233C within the j-slot;

Figure 7B is a sectional view of the assembly illustrated in Figure 6A, taken along lines F-F;

Figure 8A is a side view of the first device counterpart illustrated in Figures 2A and 2B, in the released position, with the follower disposed in the position 233D;

Figure 8B is a sectional view of the assembly illustrated in Figure 6A, taken along lines E-E;

Figure 9A is a side view of the first device counterpart illustrated in Figures 2A and 2B disposed within the second device counterpart illustrated in Figures 3A and 3B, with the follower disposed in position 233E, outside of the j-slot, while sealing engagement between the first and second device counterparts is defined; and

Figure 9B is a sectional view of the assembly illustrated in Figure 6A, taken along lines H-H.

**DETAILED DESCRIPTION**

As used herein, the terms "up", "upward", "upper", or "uphole", mean, relativistically, in closer proximity to the surface 106 and further away from the bottom of the
wellbore, when measured along the longitudinal axis of the wellbore 102. The terms "down", "downward", "lower", or "downhole" mean, relativistically, further away from the surface 106 and in closer proximity to the bottom of the wellbore 102, when measured along the longitudinal axis of the wellbore 102.

[0042] Referring to Figures 1A and 1B, there are provided systems 8, with associated apparatuses, for producing hydrocarbons from a reservoir, such as an oil reservoir, within a subterranean formation 100, when reservoir pressure within the oil reservoir is insufficient to conduct hydrocarbons to the surface 106 through a wellbore 102.

[0043] The wellbore 102 can be straight, curved, or branched. The wellbore 102 can have various wellbore portions. A wellbore portion is an axial length of a wellbore 102. A wellbore portion can be characterized as "vertical" or "horizontal" even though the actual axial orientation can vary from true vertical or true horizontal, and even though the axial path can tend to "corkscrew" or otherwise vary. The term "horizontal", when used to describe a wellbore portion, refers to a horizontal or highly deviated wellbore portion as understood in the art, such as, for example, a wellbore portion having a longitudinal axis that is between about 70 and about 110 degrees from vertical. The term "vertical", when used to describe a wellbore portion, refers to a vertical or highly deviated vertical portion as understood in the art, such as, for example, a wellbore portion having a longitudinal axis that is less than about 20 degrees from the vertical.

[0044] "Reservoir fluid" is fluid that is contained within an oil reservoir. Reservoir fluid may be liquid material, gaseous material, or a mixture of liquid material and gaseous material. In some embodiments, for example, the reservoir fluid includes water and hydrocarbons, such as oil, natural gas condensates, or any combination thereof.

[0045] Fluids may be injected into the oil reservoir through the wellbore to effect stimulation of the reservoir fluid. For example, such fluid injection is effected during hydraulic fracturing, water flooding, water disposal, gas floods, gas disposal (including carbon dioxide sequestration), steam-assisted gravity drainage ("SAGD") or cyclic steam stimulation ("CSS"). In some embodiments, for example, the same wellbore is utilized for both stimulation and production operations, such as for hydraulically fractured formations or for formations subjected to CSS. In
some embodiments, for example, different wellbores are used, such as for formations subjected to SAGD, or formations subjected to waterflooding.

[0046] A wellbore string 113 is employed within the wellbore 102 for stabilizing the subterranean formation 100. In some embodiments, for example, the wellbore string 113 also contributes to effecting fluidic isolation of one zone within the subterranean formation 100 from another zone within the subterranean formation 100.

[0047] The fluid productive portion of the wellbore 102 may be completed either as a cased-hole completion or an open-hole completion.

[0048] A cased-hole completion involves running wellbore casing down into the wellbore through the production zone. In this respect, in the cased-hole completion, the wellbore string 113 includes wellbore casing.

[0049] The annular region between the deployed wellbore casing and the oil reservoir may be filled with cement for effecting zonal isolation (see below). The cement is disposed between the wellbore casing and the oil reservoir for the purpose of effecting isolation, or substantial isolation, of one or more zones of the oil reservoir from fluids disposed in another zone of the oil reservoir. Such fluids include reservoir fluid being produced from another zone of the oil reservoir (in some embodiments, for example, such reservoir fluid being flowed through a production tubing string disposed within and extending through the wellbore casing to the surface), or injected fluids such as water, gas (including carbon dioxide), or stimulations fluids such as fracturing fluid or acid. In this respect, in some embodiments, for example, the cement is provided for effecting sealing, or substantial sealing, of flow communication between one or more zones of the oil reservoir and one or more others zones of the oil reservoir (for example, such as a zone that is being produced). By effecting the sealing, or substantial sealing, of such flow communication, isolation, or substantial isolation, of one or more zones of the oil reservoir, from another subterranean zone (such as a producing formation), is achieved. Such isolation or substantial isolation is desirable, for example, for mitigating contamination of a water table within the oil reservoir by the reservoir fluid (e.g. oil, gas, salt water, or combinations thereof) being produced, or the above-described injected fluids.
In some embodiments, for example, the cement is disposed as a sheath within an annular region between the wellbore casing and the oil reservoir. In some embodiments, for example, the cement is bonded to both of the production casing and the oil reservoir.

In some embodiments, for example, the cement also provides one or more of the following functions: (a) strengthens and reinforces the structural integrity of the wellbore, (b) prevents, or substantially prevents, produced reservoir fluid of one zone from being diluted by water from other zones, (c) mitigates corrosion of the wellbore casing, (d) at least contributes to the support of the wellbore casing, and e) allows for segmentation for stimulation and fluid inflow control purposes.

The cement is introduced to an annular region between the wellbore casing and the oil reservoir after the subject wellbore casing has been run into the wellbore. This operation is known as "cementing".

In some embodiments, for example, the wellbore casing includes one or more casing strings, each of which is positioned within the well bore, having one end extending from the well head. In some embodiments, for example, each casing string is defined by jointed segments of pipe. The jointed segments of pipe typically have threaded connections.

Typically, a wellbore contains multiple intervals of concentric casing strings, successively deployed within the previously run casing. With the exception of a liner string, casing strings typically run back up to the surface 106. Typically, casing string sizes are intentionally minimized to minimize costs during well construction. Generally, smaller casing sizes make production and artificial lofting more challenging.

For wells that are used for producing reservoir fluid, few of these actually produce through wellbore casing. This is because producing fluids can corrode steel or form undesirable deposits (for example, scales, asphaltenes or paraffin waxes) and the larger diameter can make flow unstable. In this respect, a production string is usually installed inside the last casing string. The production string is provided to conduct reservoir fluid, received within the wellbore, to the wellhead 116. In some embodiments, for example, the annular region between the last casing string and the production tubing string may be sealed at the bottom by a packer.
To facilitate flow communication between the reservoir and the wellbore, the wellbore casing may be perforated, or otherwise include per-existing ports (which may be selectively openable, such as, for example, by shifting a sleeve), to provide a fluid passage for enabling flow of reservoir fluid from the reservoir to the wellbore.

In some embodiments, for example, the wellbore casing is set short of total depth. Hanging off from the bottom of the wellbore casing, with a liner hanger or packer, is a liner string. The liner string can be made from the same material as the casing string, but, unlike the casing string, the liner string does not extend back to the wellhead 116. Cement may be provided within the annular region between the liner string and the oil reservoir for effecting zonal isolation (see below), but is not in all cases. In some embodiments, for example, this liner is perforated to effect flow communication between the reservoir and the wellbore. In this respect, in some embodiments, for example, the liner string can also be a screen or is slotted. In some embodiments, for example, the production tubing string may be engaged or stung into the liner string, thereby providing a fluid passage for conducting the produced reservoir fluid to the wellhead 116. In some embodiments, for example, no cemented liner is installed, and this is called an open hole completion or uncemented casing completion.

An open-hole completion is effected by drilling down to the top of the producing formation, and then lining the wellbore (such as, for example, with a wellbore string 113). The wellbore is then drilled through the producing formation, and the bottom of the wellbore is left open (i.e. uncased), to effect flow communication between the reservoir and the wellbore. Open-hole completion techniques include bare foot completions, pre-drilled and pre-slotted liners, and open-hole sand control techniques such as stand-alone screens, open hole gravel packs and open hole expandable screens. Packers and casing can segment the open hole into separate intervals and ported subs can be used to effect flow communication between the reservoir and the wellbore.

Referring to Figures 1A and 1B, an assembly 10 is provided for effecting production of reservoir fluid from the reservoir 104 of the subterranean formation 100.

In some embodiments, for example, a wellbore fluid conductor 113, such as, for example, the wellbore string 113 (such as, for example, the casing 113), is disposed within the
wellbore 102. The assembly 10 is configured for disposition within the wellbore fluid conductor 113, such that an intermediate wellbore passage 112 is defined within the wellbore fluid conductor 113, between the assembly 10 and the wellbore fluid conductor 113. In some embodiments, for example, the intermediate wellbore passage 112 is an annular space disposed between the assembly 10 and the wellbore string 113. In some embodiments, for example, the intermediate wellbore passage 112 is defined by the space that extends outwardly, relative to the central longitudinal axis of the assembly 10, from the assembly 10 to the wellbore fluid conductor 113. In some embodiments, for example, the intermediate wellbore passage 112 extends longitudinally to the wellhead 116, between the assembly 10 and the wellbore string 113.

[0061] The assembly 10 includes a production string 202 that is disposed within the wellbore 102. The production string 202 includes a pump 300.

[0062] The pump 300 is provided to, through mechanical action, pressurize and effect conduction of the reservoir fluid from the reservoir 104, through the wellbore 102, and to the surface 106, and thereby effect production of the reservoir fluid. It is understood that the reservoir fluid being conducted uphole through the wellbore 102, via the production string 202, may be additionally energized by supplemental means, including by gas-lift. In some embodiments, for example, the pump 300 is a sucker rod pump. Other suitable pumps 300 include screw pumps, electrical submersible pumps, and jet pumps.

[0063] The system also includes a flow diverter 600. The flow diverter 600 is provided for, amongst other things, mitigating gas lock within the pump 300. In some embodiments, for example, the flow diverter 600 is disposed within a vertical portion of the wellbore 102 that extends to the surface 106.

[0064] In some embodiments, the flow diverter 600 includes a wellbore string counterpart 600B and an assembly counterpart 600C. The wellbore string 113 defines the wellbore string counterpart 600B, and the assembly 10 defines the assembly counterpart 600C. The flow diverter 600 defines: (i) a reservoir fluid-conducting passage 6002 for diverting reservoir fluid, received within the downhole wellbore space from the reservoir 104, to a reservoir fluid separation space 112X of the wellbore 102, with effect that a gas-depleted reservoir fluid is separated from the reservoir fluid within the reservoir fluid separation space 112X in response to
at least buoyancy forces; and (ii) a gas-depleted reservoir fluid-conducting passage 6004 for receiving the separated gas-depleted reservoir fluid while the separated gas-depleted reservoir fluid is flowing in a downhole direction, and diverting the flow of the received gas-depleted reservoir fluid such that the received gas-depleted reservoir fluid is conducted by the flow diverter 600 in the uphole direction to the pump 300.

[0065] As discussed above, the wellbore 102 is disposed in flow communication (such as through perforations provided within the installed casing or liner, or by virtue of the open hole configuration of the completion), or is selectively disposable into flow communication (such as by perforating the installed casing, or by actuating a valve to effect opening of a port), with the reservoir 104. When disposed in flow communication with the reservoir 104, the wellbore 102 is disposed for receiving reservoir fluid flow from the reservoir 104.

[0066] The production string inlet 204 is for receiving, via the wellbore, the reservoir fluid flow from the reservoir. In this respect, the reservoir fluid flow enters the wellbore 102, as described above, and is then conducted to the production string inlet 204. The production string 202 includes a reservoir fluid-supplying conductor 206, disposed downhole relative to the flow diverter 600 for conducting the reservoir fluid (such as a reservoir fluid flow), that is being received by the production string inlet, such that the reservoir fluid, that is received by the inlet 204, is conducted to the flow diverter 600 via the fluid-supplying conductor 206. The production string 202 also includes a gas-depleted reservoir fluid-producing conductor 210, disposed uphole relative to the flow diverter 600 for conducting a gas-depleted reservoir fluid (such as a gas-depleted reservoir fluid flow) from the flow diverter 600 to a production string outlet 208, located at the wellhead 116.

[0067] It is preferable to remove at least a fraction of the gaseous material from the reservoir fluid flow being conducted within the production string 202, prior to the pump suction 302, in order to mitigate gas interference or gas lock conditions during pump operation. The flow diverter 600, is provided to, amongst other things, perform this function. In this respect, the flow diverter 600 is disposed downhole relative to the pump 300 and is fluidly coupled to the pump suction 302, such as, for example, by an intermediate fluid conductor that forms part of the fluid-producing conductor 210, such as piping.
In some embodiments, for example, the assembly counterpart 600C includes a fluid diverter body 600A.

In some embodiments, for example, the flow diverter body 600A is configured such that the depletion of gaseous material from the reservoir fluid material, that is effected while the assembly 10 is disposed within the wellbore 102, is effected externally of the flow diverter body 600A within the wellbore 102, such as, for example, within an upright wellbore space 108 of the wellbore 102.

The flow diverter body 600A includes a reservoir fluid receiver 602 for receiving the reservoir fluid (such as, for example, in the form of a reservoir fluid flow) that is being conducted (e.g. flowed), via the fluid-supplying conductor 206 of the production string 202, from the production string inlet 204. In some embodiments, for example, the fluid-supplying conductor 206 extends from the inlet 204 to the receiver 602. In this respect, the fluid-supplying conductor 206 is fluidly coupled to the inlet 204. In some embodiments, for example, the reservoir fluid receiver 602 includes one or more ports 602A for receiving reservoir fluid being conducted by the fluid-supplying conductor 206.

The flow diverter body 600A also includes a reservoir fluid discharge communicator 604 that is fluidly coupled to the reservoir fluid receiver 602 via a reservoir fluid-conductor 603. In this respect, the reservoir fluid conductor 603 defines at least a portion of the reservoir fluid-conducting passage 6002.

The reservoir fluid conductor 603 defines one or more reservoir fluid conductor passages 603A. In some of the embodiments described below, for example, the one or more reservoir fluid-conducting passages 603A.

The reservoir fluid discharge communicator 604 is configured for discharging reservoir fluid (such as, for example, in the form of a flow) that is received by the reservoir fluid receiver 602 and conducted to the reservoir fluid discharge communicator 604 via the reservoir fluid conductor 603. In some embodiments, for example, the reservoir fluid discharge communicator 604 is disposed at an opposite end of the flow diverter body 600A relative to the
reservoir fluid receiver 602. In some embodiments, for example, the reservoir fluid discharge communicator 604 includes one or more ports 604A.

[0074] The flow diverter body 600A also includes a gas-depleted reservoir fluid receiver 608 for receiving a gas-depleted reservoir fluid (such as, for example, in the form of a flow), after gaseous material has been separated from the reservoir fluid (for example, a reservoir fluid flow), that has been discharged from the reservoir fluid discharge communicator 604, in response to at least buoyancy forces. In this respect, the gas-depleted reservoir fluid receiver 608 and the reservoir fluid discharge communicator 604 are co-operatively configured such that the gas-depleted reservoir fluid receiver 608 is disposed for receiving a gas-depleted reservoir fluid flow including gaseous material that has been separated from the received reservoir fluid flow that has been discharged from the reservoir fluid discharge communicator 604, in response to at least buoyancy forces. In some embodiments, for example, the reservoir fluid discharge communicator 604 is disposed at an opposite end of the flow diverter body 600A relative to the gas-depleted reservoir fluid receiver 608. In some embodiments, for example, the gas-depleted reservoir fluid receiver 608 includes one or more ports 608A.

[0075] The flow diverter body 600A also includes a gas-depleted reservoir fluid conductor 610 that defines a gas-depleted reservoir fluid-conducting passage 610A configured for conducting the gas-depleted reservoir fluid (for example, a gas-depleted reservoir fluid flow), received by the receiver 608, to the gas-depleted reservoir fluid discharge communicator 611. In some embodiments, for example, the gas-depleted reservoir fluid discharge communicator 611 is disposed at an opposite end of the flow diverter body 600A relative to the gas-depleted reservoir fluid receiver 608. The gas-depleted reservoir fluid discharge communicator 611 is configured for fluid coupling to the pump 300, wherein the fluid coupling is for supplying the pump 300 with the gas-depleted reservoir fluid received by the receiver 610 and conducted through at least the gas-depleted reservoir fluid conductor 610. In this respect, the gas-depleted reservoir fluid-conducting passage 610A defines at least a portion of the gas-depleted reservoir fluid-conducting passage 6004. In some embodiments, for example, the gas-depleted reservoir fluid discharge communicator includes one or more ports 611A.
Referring to Figure IB, in some embodiments, for example, the reservoir fluid discharge communicator 604 is oriented such that, a ray (see, for example ray 604B), that is disposed along the central longitudinal axis of the reservoir fluid discharge communicator, is disposed in an uphole direction at an acute angle of less than 30 degrees relative to the central longitudinal axis of the wellbore portion within which the flow diverter body 600A is disposed.

Again referring to Figure IB, in some embodiments, for example, the reservoir fluid discharge communicator 604 is oriented such that, a ray (see, for example ray 604B), that is disposed along the central longitudinal axis of the reservoir fluid discharge communicator 604, is disposed in an uphole direction at an acute angle of less than 30 degrees relative to the vertical (which includes disposition of the ray 604B along a vertical axis).

In some embodiments, for example, the flow diverter body 600A includes the reservoir fluid receiver 602, the reservoir fluid discharge communicator 604, and the reservoir fluid conductor 603 (such as, for example, in the form of a fluid passage or a network of fluid passages), for fluidly coupling the receiver 602 and the discharge communicator 604. The flow diverter body 600A also includes the gas-depleted reservoir fluid receiver 608, gas-depleted reservoir fluid discharge communicator 611, and the gas-depleted reservoir fluid conductor 610 (such as, for example, in the form of a fluid passage or a network of fluid passages) for fluidly coupling the receiver 608 to the discharge communicator 611.

The assembly counterpart 600C also includes a wellbore sealed interface effector 400 configured for interacting with a wellbore feature for defining a wellbore sealed interface 500 within the wellbore 102, between: (a) an uphole wellbore space 108 of the wellbore 102, and (b) a downhole wellbore space 110 of the wellbore 102, while the assembly 10 is disposed within the wellbore 102.

In some embodiments, for example, the disposition of the sealed interface 500 is such that flow communication, via the intermediate wellbore passage 112, between an uphole wellbore space 108 and a downhole wellbore space 110 (and across the sealed interface 500), is prevented, or substantially prevented. In some embodiments, for example, the disposition of the sealed interface 500 is such that fluid flow, across the sealed interface 500, in a downhole
direction, from the uphole wellbore space 108 to the downhole wellbore space 110, is prevented, or substantially prevented.

[0081] In such embodiments, for example, the disposition of the sealed interface 500 is effected by the combination of at least: (i) a sealed, or substantially sealed, disposition of the wellbore string 113 relative to a polished bore receptacle 114 (such as that effected by a packer 240A disposed between the wellbore string 113 and the polished bore receptacle 114), and (ii) a sealed, or substantially sealed, disposition of the fluid-supplying conductor 206 relative to the polished bore receptacle 114. In this respect, the sealed interface 500 functions to prevent, or substantially prevented, reservoir fluid flow, that is received within the wellbore 102 (that is lined with the wellbore string 113), from bypassing the reservoir fluid receiver 602, and, as a corollary, the reservoir fluid is directed to the reservoir fluid receiver 602 for receiving by the reservoir fluid receiver 602. As well, the sealed interface 500 functions to prevent, or substantially prevented, gas-depleted reservoir fluid flow, that has been separated from the reservoir fluid discharged into the wellbore 102 from the discharge communicator 604, from bypassing the gas-depleted reservoir fluid receiver 608 and, as a corollary, the gas-depleted reservoir fluid is directed to the gas-depleted reservoir fluid receiver 608 for receiving by the gas-depleted reservoir fluid receiver 608.

[0082] In some embodiments, for example, the sealed, or substantially sealed, disposition of the fluid-supplying conductor 206 relative to the polished bore receptacle 114 is effected by a latch seal assembly. A suitable latch seal assembly is a Weatherford™ Thread-Latch Anchor Seal Assembly™.

[0083] In some embodiments, for example, the sealed, or substantially sealed, disposition of the downhole fluid-supplying conductor 206 relative to the polished bore receptacle 114 is effected by one or more o-rings or seal-type Chevron rings. In this respect, the sealing interface effector 400 includes the o-rings, or includes the seal-type Chevron rings.

[0084] In some embodiments, for example, the sealed, or substantially sealed, disposition of the fluid-supplying conductor 206 relative to the polished bore receptacle 114 is disposed in an interference fit with the polished bore receptacle. In some of these embodiments, for example,
the fluid-supplying conductor 206 is landed or engaged or "stung" within the polished bore receptacle 114.

[0085] In some embodiments, for example, the sealed interface 500 is defined by a sealing member 240 such as, for example, a packer 240A. In some embodiments, for example, the fluid supplying conductor 206 extends from the packer 240A to the reservoir fluid receiver 602. In this respect, in some embodiments, for example, the inlet 204 is defined by the packer 240A and is disposed in flow communication with the fluid-supplying conductor 206 via the threaded coupling of the fluid supplying conductor 206 to the packer 240A.

[0086] The above-described disposition of the wellbore sealed interface 500 provide for conditions which minimize solid debris accumulation in the joint between the downhole fluid-supplying conductor 206 and the polished bore receptacle 114 or in the joint between the polished bore receptacle 114 and the wellbore string 113. By providing for conditions which minimize solid debris accumulation within the joint, interference to movement of the separator relative to the liner, or the casing, as the case may be, which could be effected by accumulated solid debris, is mitigated.

[0087] Referring to Figure 1A, in some embodiments, for example, the sealed interface 500 is disposed within a section of the wellbore 102 whose axis 14A is disposed at an angle "a" of at least 60 degrees relative to the vertical "V". In some of these embodiments, for example, the sealed interface 500 is disposed within a section of the wellbore whose axis is disposed at an angle "a" of at least 85 degrees relative to the vertical "V". In this respect, disposing the sealed interface 500 within a wellbore section having such wellbore inclinations minimizes solid debris accumulation at the sealed interface 500.

[0088] In some embodiments, for example, the flow diverter body 600, the sealed interface effector 400, and the reservoir fluid conductor 206, are co-operatively configured such that, while the assembly 10 is disposed within the wellbore string 113 such that the sealed interface 500 is defined, and the reservoir fluid-supplying conductor 206 is receiving reservoir fluid from the downhole wellbore space 110 that has been received within the downhole wellbore space 110 from the subterranean formation 100:
the reservoir fluid is conducted to the reservoir fluid receiver 602 via the reservoir fluid-supplying conductor 206;

the reservoir fluid is conducted as a flow 802 to the reservoir fluid discharge communicator 604 by the reservoir fluid conductor 603 and discharged as a flow 804 to the reservoir fluid separation space 112X of the uphole wellbore space 108;

within the reservoir fluid separation space 112X, a gas-depleted reservoir fluid is separated from the discharged reservoir fluid, in response to at least buoyancy forces, such that the gas-depleted reservoir fluid is obtained;

the separated gas-depleted reservoir fluid is conducted as a flow 806 to the gas-depleted reservoir fluid receiver 608 via the intermediate wellbore passage 112, and the received gas-depleted reservoir fluid is conducted as a flow 808 from the gas-depleted reservoir fluid receiver 608 to the pump 300 via at least the conductor 610 and the gas-depleted reservoir fluid discharge communicator 611.

[0089] In this respect, in such embodiments, for example, at least a portion of the space within the intermediate wellbore space 112, between the reservoir fluid discharge communicator 604 and the gas-depleted reservoir fluid receiver 608, defines at least a portion of the gas-depleted reservoir fluid-conducting passage 6004.

[0090] Once received by the pump 300, the gas-depleted reservoir fluid is pressurized by the pump 300 and conducted to the surface via the reservoir fluid-producing conductor 210.

[0091] Also, the separation of gaseous material from the reservoir fluid is with effect that a liquid-depleted reservoir fluid is obtained and is conducted uphole (in the gaseous phase, or at least primarily in the gaseous phase with relatively small amounts of entrained liquid) as a flow 810 via the intermediate wellbore passage 112 that is disposed between the assembly 10 and the wellbore string 113 (see above).

[0092] The reservoir fluid produced from the subterranean formation 100, via the wellbore 102, including the gas-depleted reservoir fluid, the liquid-depleted reservoir material, or both,
may be discharged through the wellhead 116 to a collection facility, such as a storage tank within a battery.

[0093] In some embodiments, for example, the flow diverter body 600A is configured such that the gas-depleted reservoir fluid receiver 608 is disposed downhole relative to (such as, for example, vertically below) the reservoir fluid discharge communicator 604, with effect that the separated gas-depleted reservoir fluid is conducted in a downhole direction to the gas-depleted reservoir fluid receiver 608.

[0094] In some embodiments, for example, separation of gaseous material, from the reservoir fluid that is being discharged from the reservoir fluid discharge communicator 604, is effected within an uphole-disposed space 1121X of the intermediate wellbore passage 112, the uphole-disposed space 1121X being disposed uphole relative to the reservoir fluid discharge communicator 604. In this respect, in some embodiments, for example, the reservoir fluid separation space 112X includes the uphole-disposed space 112IX.

[0095] In some embodiments, for example, a flow diverter body-defined intermediate wellbore passage portion 1121Y of the intermediate wellbore passage 112 is disposed within a space between the flow diverter body 600A and the wellbore string 113, and effects flow communication between the reservoir fluid discharge communicator 604 and the gas-depleted reservoir fluid receiver 608 for effecting conducting of the gas-depleted reservoir fluid to the gas-depleted reservoir fluid receiver 608. In this respect, in such embodiments, for example, the flow diverter body-defined intermediate wellbore passage portion 1121Y defines at least a portion of the gas-depleted reservoir fluid-conducting passage 6004.

[0096] In some embodiments, for example, the space between the flow diverter body 600A and the wellbore string 113, within which the flow diverter body-defined intermediate wellbore passage portion 1121Y is disposed, is an annular space. In some embodiments, for example, the flow diverter body-defined intermediate space 1121Y is defined by the entirety, or the substantial entirety, of the space between the flow diverter body 600A and the wellbore string 113. In some embodiments, for example, separation of gaseous material, from the reservoir fluid that is discharged from the reservoir fluid discharge communicator 604, is effected within the flow diverter body-defined intermediate wellbore passage portion 1121Y. In this respect, in some
embodiments, for example, at least a portion of the reservoir fluid separation space 112X is co-located with at least a portion of the flow diverter body-defined intermediate wellbore passage portion 1121Y.

[0097] In some embodiments, for example, the separation of gaseous material, from the reservoir fluid that is being discharged from the reservoir fluid discharge communicator 604, is effected within both of the uphole-disposed space 1121X and the flow diverter body-defined intermediate wellbore passage portion 1121Y. In this respect, in some embodiments, for example, the reservoir fluid is discharged from the reservoir fluid discharge communicator 604 into the uphole wellbore space 112IX, and, in response to at least buoyancy forces, the gaseous material is separated from the discharged reservoir fluid, while the reservoir fluid is being conducted downhole, from the uphole-disposed space 112IX, through the flow diverter body-defined intermediate wellbore passage portion 1121Y, and to the gas-depleted reservoir fluid receiver 608. In this respect, in some embodiments, for example, the uphole-disposed space 112IX is merged with the flow diverter body-defined intermediate wellbore passage portion 1121Y.

[0098] In some embodiments, for example, the reservoir fluid separation space 112X spans a continuous space extending from the assembly to the wellbore string 113, and the continuous space extends outwardly relative to the central longitudinal axis of the assembly 10.

[0099] In some embodiments, for example, the reservoir fluid separation space 112X spans a continuous space extending from the assembly to the wellbore string 113, and the continuous space extends outwardly relative to the central longitudinal axis of the wellbore 102.

[0100] In some embodiments, for example, the reservoir fluid separation space 112X is disposed within a vertical portion of the wellbore 102 that extends to the surface 106.

[0101] In some embodiments, for example, the ratio of the minimum cross-sectional flow area of the reservoir fluid separation space 112X to the maximum cross-sectional flow area of the fluid passage 206A defined by the reservoir fluid-supplying conductor 206 is at least about 1.5.
[00102] In some embodiments, for example, the space, between: (a) the gas-depleted reservoir fluid receiver 608 of the flow diverter body 600A, and (b) the sealed interface 500, defines a sump 700 for collection of solid particulate that is entrained within fluid being discharged from the reservoir fluid discharge communicator 604 of the flow diverter body 600A, and the sump 700 has a volume of at least 0.1 m³. In some embodiments, for example, the volume is at least 0.5 m³. In some embodiments, for example, the volume is at least 1.0 m³. In some embodiments, for example, the volume is at least 3.0 m³.

[00103] By providing for the sump 700 having the above-described volumetric space characteristic, and/or the above-described minimum separation distance characteristic, a suitable space is provided for collecting relative large volumes of solid debris, from the gas-depleted reservoir fluid being flowed downwardly to the gas-depleted reservoir fluid receiver 608, such that interference by the accumulated solid debris with the production of oil through the system is mitigated. This increases the run-time of the system before any maintenance is required. As well, because the solid debris is deposited over a larger area, the propensity for the collected solid debris to interfere with movement of the flow diverter body 600A within the wellbore 102, such as during maintenance (for example, a workover) is reduced.

[00104] As above-described, the reservoir fluid-producing conductor 210 extends from the gas-depleted reservoir fluid discharge communicator 611 to the wellhead 116 for effecting flow communication between the discharge communicator 611 and the earth's surface 106, such as, for example, a collection facility located at the earth's surface 106, and defines a fluid passage 210A. In some embodiments, for example, reservoir fluid-supplying conductor 206 defines a fluid passage 206A. The cross-sectional flow area of the fluid passage 210A is greater than the cross-sectional flow area of the fluid passage 206A. In some embodiments, for example, the ratio of the cross-sectional flow area of the fluid passage 210A to the cross-sectional flow area of the fluid passage 206A is at least 1.1, such as, for example, at least 1.25, such as, for example, at least 1.5.

[00105] In some embodiments, for example, the reservoir fluid-supplying conductor 206 includes a velocity string 207, and, in some embodiments, for example, the entirety, or the substantial entirety of the reservoir fluid-supplying conductor 206 is a velocity string 207. In
some embodiments, for example, the velocity string 207 extends from the production string inlet 204. In some embodiments, for example, at least 25% of the length of the fluid-supplying conductor 206, as measured along the central longitudinal axis of the fluid-supplying conductor 206, is a velocity string 207. In some embodiments, for example, the length of the velocity string 207, measured along the central longitudinal axis of the velocity string, is at least 20 feet. In some embodiments, for example, the velocity string 207 includes a fluid passage 207A, and the cross-sectional area of the entirety of the fluid passage 207A is less than the cross-sectional area of the entirety of the fluid passage 210A of the fluid-producing conductor 210. In this respect, in some embodiments, for example, the maximum cross-sectional area of the fluid passage 207A is less than the minimum cross-sectional area of the fluid passage 210A. In some embodiments, for example, the maximum cross-sectional area of the fluid passage 207A is less than about 75% (such as, for example 50%) of the minimum cross-sectional area of at least 75% (such as, for example, at least 80%, such as, for example, at least 85%, such as, for example, at least 90%, such as, for example, at least 95%) of the length of the fluid-supplying conductor 206, as measured along the central longitudinal axis of the fluid-supplying conductor 206. In some embodiments, for example, the length of the fluid-supplying conductor 206, as measured along the central longitudinal axis of the fluid-supplying conductor 206, is at least 500 feet, such as, for example, at least 750 feet, such as, for example at least 1000 feet.

[00106] In some embodiments, for example, the flow diverter 600 is disposed uphole of a horizontal section 102C of the wellbore 102, such as, in some embodiments, for example, within a vertical section 102A, or, in some embodiments, for example, within a transition section 102B.

[00107] In some embodiments, for example, the central longitudinal axis of the passage 102CC of the horizontal section 102C is disposed along an axis that is between about 70 and about 110 degrees relative to the vertical "V", the central longitudinal axis of the passage 102AA of the vertical section 102A is disposed along an axis that is less than about 20 degrees from the vertical "V", and the transition section 102B is disposed between the sections 102A and 102C. In some embodiments, for example, the transition section 102B joins the sections 102A and 102C. In some embodiments, for example, the vertical section 102A extends from the transition section 102B to the surface 106.
In some of these embodiments, for example, the reservoir fluid-supplying conductor 206 extends from the flow diverter 600, in a downhole direction, into the horizontal section 102C, such that the inlet 204 is disposed within the horizontal section 102C.

In some embodiments, for example, the assembly 10 includes an uphole portion 220 and a downhole portion 230. The uphole portion is releasably coupled to the downhole portion via a connecting device 221, such as, for example, an on/off tool. The connecting device 221 includes an first device counterpart 222 and a second device counterpart 232. The uphole portion includes the first device counterpart 222 (see Figures 2A, 2B, and 2C) that is releasably coupled to the second device counterpart 232 (see Figures 3A, 3B, and 3C) of the downhole portion.

The first device counterpart 222 is disposed downhole relative to the flow diverter 600. The first device counterpart 222 is coupled to the flow diverter 600 via a connecting string portion 212 (such as, for example, by threaded coupling to the connecting string portion 212) of the downhole production string portion 206. The first device counterpart 222 includes an internal surface 226 that defines a passage 224 that is disposed in flow communication with the reservoir fluid receiver 602 of the flow diverter 600 via a fluid passage 214 of the connecting string portion 212.

The second device counterpart 232 includes an internal surface 236 that defines a passage 234 that is disposed for receiving flow of reservoir material the production string inlet 204.

Referring to Figure 1, the sealing member 240 is coupled to the second device counterpart 232 and is disposed for effecting a sealed, or substantially sealed, disposition of the wellbore string 113 (e.g. casing 113) relative to the second device counterpart 232 for defining the sealed interface 500. In some embodiments, for example, the sealing member 240 includes a packer 240A. In some of these embodiments, for example, the second device counterpart 232 is coupled (such as, for example, threadably coupled) to the packer 240A for effecting setting and unsetting of the packer 240A. While the assembly 10 is disposed in the wellbore 14, in the set condition, the packer 240A is disposed in sealing engagement, or substantially sealing engagement, with the casing 113, thereby effecting definition of the sealed interface 500, and in
the unset condition, the packer 240A is spaced apart relative to the casing 113 with effect that the sealed interface 500 is defeated. In some embodiments, for example, the second device counterpart 232 is coupled to the packer 240A such that the setting and unset of the packer 240A is effected by torque applied to the second device counterpart 232 about an axis that is parallel, or substantially parallel, to the central longitudinal axis of the second device counterpart 232 (such as, for example, the central longitudinal axis of the passage 234 of the second device counterpart 232). In some embodiments, for example, the setting and unset of the packer 240A is effected via rotation of the second device counterpart 232 about an axis that is parallel, or substantially parallel, to the central longitudinal axis of the second device counterpart 232 (such as, for example, the central longitudinal axis of the passage 234 of the second device counterpart 232).

[00113] The first device counterpart 222 is releasably coupled to the second device counterpart 232.

[00114] In some embodiments, for example, the releasable coupling between the first device counterpart 222 and the second device counterpart 232 is established in the absence, or substantial absence, of torque applied to the first device counterpart 222 about, or substantially about, an axis that is parallel, or substantially parallel, to the central longitudinal axis of the first device counterpart 222. In some embodiments, for example, the releasable coupling of the first device counterpart 222 and the second device counterpart 232 is mediated via a j-tool (see Figures 5A and 5B).

[00115] In some embodiments, for example, the release of the first device counterpart 222 from the releasable coupling to the second device counterpart 232 is effectible in the absence, or substantial absence, of torque applied to the first device counterpart 222 about an axis that is parallel, or substantially parallel, to the central longitudinal axis of the first device counterpart 222. In this respect, in some embodiments, for example, the release is mediated via the j-tool.

[00116] The j-tool 2231 includes a j-slot counterpart 22220 and a follower counterpart 2331.

[00117] In some embodiments, for example, the j-slot counterpart 22220 is mounted to the first device counterpart 222 for rotation relative to the first device counterpart 222. The j-slot
counterpart 22220 includes a j-slot 223. In some embodiments, for example, the j-slot counterpart 22220 is in the form of a collar 22220 that is mounted to the first device counterpart 222 for rotation relative to the first device counterpart 222. In this respect, the j-slot 223 is defined within the collar 22220. In some embodiments, for example, the collar 22220 is retained relative to the first device counterpart 222. In this respect, in some embodiments, for example, the first device counterpart 222 has a tubular form, and includes outwardly projecting lips 2222A, 2222B that extend about a central longitudinal axis of the first device counterpart 222 (such as, for example, the central longitudinal axis of the passage 224) and are spaced apart along an axis that is parallel to, or substantially parallel to, the longitudinal axis of the first device counterpart 222 (such as, for example, along an axis that is parallel to, or substantially parallel to, the passage 224). The collar 22220 is retained between the lips 2222A and 2222B, thereby limiting axial displacement of the collar 22220.

[00118] The follower counterpart 2331 extends from the second device counterpart 232 and includes a follower 233 disposed for guided displacement, relative to the first device counterpart 222, through the j-slot 223. In some embodiments, for example, the follower 233 extends from the internal surface of the second device counterpart 232. In some embodiments, for example, the follower 233 includes a pair of opposing pins (or lugs) that are receivable by the j-slot 223.

[00119] In some embodiments, for example, the collar 22220 is made of a material (e.g. steel) having a yield strength of at least 50,000 psi. In some embodiments, for example, the follower 233 is made of a material (e.g. steel) having a yield strength of at least 50,000 psi. In some embodiments, for example, the second device counterpart 232 is made of a material (e.g. steel) having a yield strength of at least 50,000 psi. In some embodiments, for example, the first device counterpart 222 is made of a material (e.g. steel) having a yield strength of at least 50,000 psi.

[00120] The j-slot 223 and the follower 233 are co-operatively configured for effecting guided displacement of the first device counterpart 222 relative to the second device counterpart 232.

[00121] In some embodiments, for example, the releasable coupling between the first device counterpart 222 and the second device counterpart 232 is effected while the first device counterpart 222 is disposed within the second device counterpart 232. In this respect, in some
embodiments, for example, the second device counterpart 232 includes a receptacle 235 including an open end 235A for receiving the first device counterpart 222. In some embodiments, for example, the receptacle 235 is defined within the passage 234 of the second device counterpart 232. In some embodiments, for example, the receptacle 235 includes an overshot.

[00122] For effecting insertion of the first device counterpart 222 within the second device counterpart 232 via the receptacle 235, the first device counterpart 222 is moved into alignment with the receptacle 235. While disposed in alignment with the receptacle 235, the first device counterpart 222 is insertable within the second device counterpart 232, via the receptacle 235, by displacement of the first device counterpart 222, relative to the second device counterpart 232, in a downhole direction along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the first device counterpart 222. In some embodiments, for example, the displacement is responsive to application of an axial force (for example, a force along an axis that is parallel, or substantially parallel to the central longitudinal axis of the first device counterpart 222) to the first device counterpart 222 in the downhole direction. In some embodiments, for example, the insertion includes stinging the first device counterpart 222 within the second device counterpart 232. In some embodiments, for example, the first device counterpart 222 includes a slick joint for insertion within the receptacle 235.

[00123] In some embodiments, for example, the releasable coupling is effected in response to a sequence of displacements of the first device counterpart 222 relative to the second device counterpart 232, wherein the sequence of displacements includes:

(i) an insertion of the first device counterpart 222 into the receptacle 235 of the second device counterpart 232, wherein, during the insertion, the first device counterpart 222 is displaced, relative to the first device counterpart 222, along an axis (such as, for example, along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the second device counterpart 232) in the downhole direction such that the first device counterpart 222 becomes disposed in a pre-coupling position (see Figures 6A, 6B, 6C, and 6D); and

(ii) from the pre-coupling position, a releasable coupling-effecting displacement, wherein, during the releasable-coupling effecting displacement, the first device counterpart 222
is displaced, relative to the second device counterpart 232, along an axis (such as, for example, along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the second device counterpart 232) in the uphole direction such that the first device counterpart 222 becomes disposed in the releasably coupled position (see Figures 7A and 7B).

[00124] In some embodiments, for example, the displacement of the first device counterpart 222, relative to the second device counterpart 232, during the releasable coupling-effecting displacement, is responsive to an application of an axial force (for example, a force along an axis that is parallel, or substantially parallel to the central longitudinal axis of the second device counterpart 232) to the first device counterpart 222 in the uphole direction.

[00125] In some embodiments, for example, both of the displacements in (i) and (ii) are guided by the j-tool 2231, and both of the pre-coupling position and the releasably coupled position are determined by the j-tool 2231.

[00126] In this respect, the first device counterpart 222, the second device counterpart 232, the j-slot 223, and the follower 233 are co-operatively configured such that, while the first device counterpart 222 is being inserted into the second device counterpart 232, in parallel, the follower 233 becomes inserted into the j-slot 223 (from position 233A that is outside of the j-slot 223) and, eventually becomes disposed at a terminus within the j-slot 223 defined by position 233B. In this respect, the first device counterpart 222, the second device counterpart 232, the j-slot 223, and the follower 233 are co-operatively configured such that, while the first device counterpart 222 is disposed in the pre-coupling position, application of an axial force (for example, a force along an axis that is parallel, or substantially parallel to the central longitudinal axis of the second device counterpart 232) to the first device counterpart 222 in the downhole direction is opposed, such that displacement of the first device counterpart 222, relative to the second device counterpart 232, along an axis (such as, for example, an axis that is parallel, or substantially parallel, to the central longitudinal axis of the second device counterpart 232) is prevented, or substantially prevented. In some embodiments, for example, the opposition is effected by the abutting engagement of the follower 233, disposed at the position 233B, with a terminus of the j-slot 223. In this respect, in some embodiments, for example, disposition of the follower 233 in position 233B within the j-slot 223 determines the pre-coupling position.
Also, in this respect, the first device counterpart 222, the second device counterpart 232, the j-slot 223, and the follower 233 are co-operatively configured such that, while the first device counterpart 222 is releasably coupled to the second device counterpart 232 in the releasably coupled position, application of an axial force (for example, a force along an axis that is parallel, or substantially parallel to the central longitudinal axis of the second device counterpart 232) to the first device counterpart 222 in the uphole direction is opposed, such that displacement of the first device counterpart 222, relative to the second device counterpart 232, along an axis (such as, for example, along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the second device counterpart 232) in the uphole direction, is prevented or substantially prevented. In some embodiments, for example, the opposition is effected by the abutting engagement of the follower 233, disposed at the position 233C, with a terminus of the j-slot 223. In this respect, in some embodiments, for example, disposition of the follower 233 in position 233C within the j-slot 223 determines the releasable coupling position.

Also in this respect, the first device counterpart 222, the second device counterpart 232, the j-slot 223, and the follower 233 are co-operatively configured such that, while the first device counterpart 222 is releasably coupled to the second device counterpart 232 in the releasably coupled position, the first device counterpart 222 is displaceable, relative to the second device counterpart 232, along an axis (such as, for example, along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the second device counterpart 232) in the downhole direction, for effecting release of the first device counterpart 222 from the coupling to the second device counterpart 232, with effect that the first device counterpart 222 becomes disposed in a released position (see Figures 8A and 8B). In this respect, in some embodiments, for example, the first device counterpart 222, the second device counterpart 232, the j-slot 223, and the follower 233 are co-operatively configured such that, while the first device counterpart 222 is being displaced, relative to the second device counterpart 232, from the releasably coupled position to the released position, in parallel, the follower 233 travels through the j-slot 223 from position 233C to a terminus within the j-slot 223 defined by position 233D. In some embodiments, for example, the displacement of the first device counterpart 222, relative to the second device counterpart 232, from the releasably coupled position to the released position, is responsive to an application of an axial force (for example, a force along an axis that is parallel,
or substantially parallel to the central longitudinal axis of the second device counterpart 232) to the first device counterpart 222 in the downhole direction.

[00129] Upon the follower 233 becoming disposed in position 233D (corresponding to the released position of the first device counterpart 222), application of an axial force (for example, a force along an axis that is parallel, or substantially parallel to the central longitudinal axis of the second device counterpart 232) to the first device counterpart 222 in the downhole direction is opposed, such that displacement of the first device counterpart 222, relative to the second device counterpart 232, along an axis (such as, for example, along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the second device counterpart 232) in the downhole direction, is prevented or substantially prevented. In some embodiments, for example, the opposition is effected by the abutting engagement of the follower 233, disposed at the position 233D, with a terminus of the j-slot 223. In this respect, in some embodiments, for example, disposition of the follower 233 in position 233D within the j-slot 223 determines the released position.

[00130] The first device counterpart 222 and the second device counterpart 232 are further co-operatively configured such that, in the released position, the first device counterpart 222 is disposed for separation from the second device counterpart 232 in response to a separating displacement of the first device counterpart 222, relative to the second device counterpart 232, along an axis in the uphole direction, with effect that the first device counterpart 222 becomes withdrawn from the second device counterpart 232. In this respect, while the first device counterpart 222 is disposed in the released position, application of an axial force (for example, a force along an axis that is parallel, or substantially parallel to the central longitudinal axis of the first device counterpart 222) to the first device counterpart 222 in the uphole direction, effects the separating displacement. Also in this respect, for example, the first device counterpart 222, the second device counterpart 232, the j-slot 223, and the follower 233 are co-operatively configured such that, while the withdrawal of the first device counterpart 222, from the second device counterpart 232, is being effected, in parallel, the follower 233 travels through the j-slot 223 from position 233D to a position where the follower 233 has been withdrawn from the j-slot 223 such that the follower 233 is disposed outside of the J-slot 223 in the position 233E. Further uphole displacement of the first device counterpart 222, relative to the second device counterpart
232, from the position 233E, will eventually effect withdrawal of the first device counterpart 222 from the second device counterpart 232, such that the first device counterpart 222 becomes separated from the second device counterpart 232.

[00131] In this respect, in some embodiments, for example, the first device counterpart 222 and the second device counterpart 232 are co-operatively configured such that, while the first device counterpart 222 is releasably coupled to the second device counterpart 232, withdrawal of the first device counterpart 222 from the second device counterpart 232 is effectible in response to sequence of displacements of the first device counterpart 222 relative to the second device counterpart 232, wherein the sequence of displacements includes:

(i) a release-effecting displacement, wherein in the release-effecting displacement, the first device counterpart 222 is displaced, relative to the second device counterpart 232, from the releasably coupled position along an axis (such as, for example, along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the second device counterpart 232) in the downhole direction, for effecting release of the first device counterpart 222 from the coupling to the second device counterpart 232, with effect that the first device counterpart 222 becomes disposed in a released position (see Figures 8A and 8B); and

(ii) from the released position, a withdrawal-effecting displacement, wherein in the withdrawal-effecting displacement, the first device counterpart 222 is displaced, relative to the second device counterpart 232, from the released position along an axis (such as, for example, along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the second device counterpart 232) in the uphole direction, with effect that withdrawal of the first device counterpart 222 from the second device counterpart 232 is effected.

[00132] By mediating the above-described displacements via the j-tool 2231, rotation of the first device counterpart 222, relative to the second device counterpart 232, into and out of a coupling relationship with the second device counterpart 232, is effectible without applying torque to the first device counterpart 222. By avoiding application of torque to effect such coupling and decoupling, interference to such coupling and decoupling by solid particulate material within the wellbore is mitigated.
Referring to Figures 4A, 4B, 6C, and 6D, in some embodiments, for example, the receptacle 235 includes a plurality of apertures 238 for effecting flow communication between an environment external to the second device counterpart 232 (e.g., the wellbore 102) and the j-slot 223. In this respect, solid debris that is accumulating within the second device counterpart 232, and potentially interfering with movement of the follower 233 through the j-slot 223, is dischargeable from the apertures in response to urging by the moving follower 233. In some embodiments, for example, the first device counterpart 222 and the second device counterpart 232 are co-operatively configured such that the apertures 238 are disposed in alignment with the j-slot 223, while the follower 233 is disposed within the j-slot 223. In some embodiments, for example, the apertures 238 are distributed about a longitudinal axis of the second device counterpart 232, such as, for example, about a longitudinal axis of the passage 234. In some of these embodiments, for example, the apertures 236 are circumferentially distributed. In some embodiments, for example, the apertures define at least a four hole pattern, wherein an external surface portion of the second device counterpart 232, disposed within the space that is intermediate to the four hole pattern, has an area of at least 0.5 square inches, such as, for example, at least 0.75 square inches. In some embodiments, for example, each one of the apertures, independently, defines an area of at least 0.1 square inches, such as, for example, at least 0.2 square inches, such as, for example, at least 0.25 square inches.

In some embodiments, for example, the first device counterpart 222 and the second device counterpart 232 are co-operatively configured such that, while the first device counterpart 222 is releasably coupled to the second device counterpart 232, a sealed interface 250 is defined for preventing, or substantially preventing, bypassing of the first device counterpart 222 fluid passage by material that is flowing through the second device counterpart 232 fluid passage in the uphole direction, such as by egress of material being conducted by the fluid passage 224, across a joint between the first device counterpart 222 and the second device counterpart 232. In some embodiments, for example, the one or more sealing members 252 include one or more bonded seal members.

In some embodiments, for example, the release of the first device counterpart 222 from the releasable coupling to the second device counterpart 232, is with effect that the sealed interface 250 is defeated.
[00136] In some embodiments, for example, the release of the first device counterpart 222 from the releasable coupling to the second device counterpart 232 is with effect that the sealed interface 250 is defeatable in response to a sealed interface-defeating displacement of the first device counterpart 222, relative to the second device counterpart 232, along an axis (for example, an axis that is disposed in parallel, or substantially parallel, relationship to the central longitudinal axis of the second device counterpart 232) in the upheole direction. In this respect, in some embodiments, for example, the first device counterpart 222 and the second device counterpart 232 are co-operatively configured such that the sealed interface 250 is maintained while the first device counterpart 222 is displaced, relative to the second device counterpart 232, from the releasably coupled position to the released position, and upon disposition in the released position, sealed interface 250 is defeatable in response to a sealed interface-defeating displacement of the first device counterpart 222, relative to the second device counterpart 232, along an axis (for example, an axis that is disposed in parallel, or substantially parallel, relationship to the central longitudinal axis of the second device counterpart 232) in the upheole direction.

[00137] In some embodiments, for example, the first device counterpart 222 and the second device counterpart 232 are co-operatively configured such that the sealed interface 250 is maintained for a portion of the sealed interface-defeating displacement. In this respect, in some embodiments, for example, the sealed interface-defeating displacement defines a portion of the separating displacement such that the sealed interface 250 is maintained for a portion of the separating displacement.

[00138] In some embodiments, for example, while the first device counterpart 222 is being displaced, relative to the second device counterpart 232, along an axis (such as, for example, along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the second device counterpart 232) from the released position, denoted by position 233D, such that the follower 233 becomes disposed in a position outside of the j-slot 223, such as position 233E, the sealed interface 250 is maintained. In this respect, in some embodiments, while the first device counterpart 222 is disposed within the second device counterpart 232, and the interaction, via the j-tool 2231, between the first device counterpart 222 and the second device counterpart 232 is defeated, the sealed interface 250 can continue to be maintained.
[00139] In this respect, in some embodiments, for example, the first device counterpart 222 and the second device counterpart 232 are co-operatively configured such that, while the first device counterpart 222 is releasably coupled to the second device counterpart 232, the first device counterpart 222 is positionable, relative to the second device counterpart 232, such that:

(i) the first device counterpart 222 is released from the releasable coupling to the second device counterpart 232, and

(ii) the first device counterpart 222 is disposed for withdrawal from the second device counterpart 232, and

(iii) the sealed interface 250 is maintained, in response to a releasing and sealed interface-maintaining sequence of displacements of the first device counterpart 222 relative to the second device counterpart 232, wherein the a releasing and sealed interface-maintaining sequence of displacements includes:

(i) a release-effecting displacement, wherein in the release-effecting displacement, the first device counterpart 222 is displaced, relative to the second device counterpart 232, from the releasably coupled position (see Figures 7A and 7B) along an axis (such as, for example, along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the second device counterpart 232) in the downhole direction, for effecting release of the first device counterpart 222 from the coupling to the second device counterpart 232, with effect that the first device counterpart 222 becomes disposed in a released position (see Figures 8A and 8B); and

(ii) from the released position, a sealed interface-maintaining displacement, wherein in the sealed interface-maintaining displacement, the first device counterpart 222 is displaced, relative to the second device counterpart 232, from the released position along an axis (such as, for example, along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the second device counterpart 232) in the uphole direction, with effect that: (a) the first device counterpart 222 is disposed for withdrawal from the second device counterpart 232, and (b) the sealed interface 250 is maintained (see Figures 9A and 9B)

[00140] In some embodiments, for example, the sealed interface-maintaining displacement corresponds with displacement of the follower 233 from position 233D to position 233E.

[00141] In some embodiments, for example, the first device counterpart 222 and the second device counterpart 232 are co-operatively configured such that, while the first device counterpart 222 is releasably coupled to the second device counterpart 232, there is an absence, or substantial
absence, of a sealed interface 250 for preventing, or substantially preventing, bypassing of the first device counterpart 222 fluid passage by material that is flowing through the second device counterpart 232 fluid passage in the uphole direction, and the sealed interface 250 is establishable in response to a sealed interface-establishing sequence of displacements of the first device counterpart 222 relative to the second device counterpart 232, wherein the sealed interface-establishing sequence of displacements includes:

(i) a release-effecting displacement, wherein in the release-effecting displacement, the first device counterpart 222 is displaced, relative to the second device counterpart 232, from the releasably coupled position along an axis (such as, for example, along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the second device counterpart 232) in the downhole direction, for effecting release of the first device counterpart 222 from the coupling to the second device counterpart 232, with effect that the first device counterpart 222 becomes disposed in a released position; and

(ii) from the released position, a sealed interface-effecting displacement, wherein in the sealing interface-effecting displacement, the first device counterpart 222 is displaced, relative to the second device counterpart 232, from the released position along an axis (such as, for example, along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the second device counterpart 232) in the uphole direction, with effect that a sealed interface 250 is defined (e.g. established) for preventing, or substantially preventing, bypassing of the first device counterpart 222 fluid passage by material that is flowing through the second device counterpart 232 fluid passage in the uphole direction

[00142] In some embodiments, for example, the sealed interface 250 is established upon the follower 233 becoming disposed outside of the j-slot 223, such as, for example, in position 233E.

[00143] In some embodiments, for example, an overpull, applied to the production string 202 while the first device counterpart 222 is releasably coupled to the second device counterpart 232, provides confirmation that the first device counterpart 222 is disposed relative to the second device counterpart 232 such that the sealed interface 250 is established.
In some embodiments, for example, an overpull, applied to the production string 202 while the first device counterpart 222 is releasably coupled to the second device counterpart 232, provides confirmation that, in response to a predetermined sequence of displacements, such as, for example, the above-described releasing and sealed interface-maintaining sequence of displacements, or the above-described the sealed interface-establishing sequence of displacements, the first device counterpart 222 is disposed relative to the second device counterpart 232 such that a sealed interface 250 is defined for preventing, or substantially preventing, bypassing of the first device counterpart 222 fluid passage by material that is flowing through the second device counterpart 232 fluid passage in the uphole direction.

In this respect, in some of these embodiments, for example, a process for confirming the establishment of the sealed interface 250 is provided, and includes, after the first device counterpart 222 has been deployed downhole for effecting the establishment of the sealed interface 250, applying an uphole pulling force to the production string 202 for effecting displacement of the first device counterpart 222, relative to the second device counterpart 232, in the uphole direction, and while the uphole pulling force is being applied, monitoring the applied uphole pulling force for overpull.

In some embodiments, for example, when overpull is sensed, this is an indication that the releasable coupling of the first device counterpart 222 to the second device counterpart 232, as has been effected (for example, the follower 233 is disposed in position 233C within the J-slot 223), and that the sealed interface 250 has been established.

In some embodiments, for example, when overpull is sensed, this is an indication that the releasable coupling of the first device counterpart 222 to the second device counterpart 232 has been effected (the follower 233 is disposed in the position 233C within the J-slot 223), and that, in response to a predetermined sequence of events, such as the above-described releasing and sealed interface-maintaining sequence of displacements, or the above-described the sealed interface-establishing sequence of displacements, the sealed interface 250 is establishable. In this respect, the release-effecting displacement is sensed by bottoming out of the follower 233 versus the terminus of the slot in position 233D, and the subsequent sealed interface-maintaining displacement, or the subsequent sealed interface-effecting displacement, as the case may be is
established by displacement of the first device counterpart 222, relative to the second device counterpart 232, from the released position along an axis (such as, for example, along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the second device counterpart 232) in the uphole direction by a predetermined distance, measured along the axis along which the first device counterpart 222 is being displaced relative to the second device counterpart 232.

[00148] In some embodiments, for example, the second device counterpart 232 is coupled to the packer 240A such that the setting and unsetting of the packer 240A is effectible by torque applied to the second device counterpart 232 about a longitudinal axis of the second device counterpart 232 (such as, for example, about a longitudinal axis of the passage 234 of the second device counterpart 232). In this respect, in some embodiments, for example, the second device counterpart 232 is threadably coupled to the packer 240A such that the packer 240A is both rotationally and translationally coupled to the second device counterpart 232. In some embodiments, for example, the packer 240A is a mechanical packer, and torque applied to the second device counterpart 232 is transmitted to the packer 240A for, in some embodiments, effecting setting of the packer 240A such that the sealed interface 500 is established, and in some embodiments, effecting unsetting of the packer 240A such that the sealed interface 500 is defeated.

[00149] In this respect, in some embodiments, for example, the first device counterpart 222 includes a torque transmitter 22212 that is engageable to the second device counterpart 232. The torque transmitter 22212 and the second device counterpart 232 are co-operatively configured for rotatable coupling while the torque transmitter 22212 is disposed within the passage 234 of the second device counterpart 232, such that torque, being applied to the first device counterpart 222, is transmittable to the second device counterpart 232 via the torque transmitter 22212. In some of these embodiments, for example, the torque transmitter 22212 includes a plurality of longitudinally-extending splines 2214 that project outwardly from an external surface of the first device counterpart 222, and the second device counterpart 232 includes a splined bore 2321 that defines at least a portion of the passage 234, and the rotatable coupling is effected by meshing of the splines 2214 and the splined bore 2321 while the splines 2214 are aligned with the splined bore 2321. In some embodiments, for example, the rotatable coupling is established while the
first device counterpart 222 is engaged to a stop 2322. The stop 2322 is defined by the second device counterpart 232 and is configured to prevent, or substantially prevent, displacement of the first device counterpart 222, relative to the second device counterpart 232, in the downhole direction. In this respect, the engagement of the first device counterpart 222 to the stop 2322 can be sensed at the surface, thereby providing an indication that the splines 2214 are aligned with the splined bore 2321 for effecting the transmission of torque to the second device counterpart 232. In some embodiments, for example, the transmission of torque to the second device counterpart 232 effects setting or unsettting of the packer 240A, as above-described.

[00150] In some embodiment, for example, a mule shoe is mounted to the first device counterpart 222 for rotation relative to the first device counterpart 222. The purpose of a mule shoe is to allow for the production string 202, including the on/off tool, to orientate itself around any obstacle or ledge that may be present in any well bore or any well bore condition. The configuration of the mule shoe is variable from a diagonal cut to a portion of the circumference down to the body or to the entire circumference cut at an angle. The degree of this angle can also vary, usually from 30 degrees to 45 degrees. The rotatable mule is an independent component of the torque transmitter 22212 and will be allowed to spin into the correct orientating position without having to turn the pipe at surface. The mule shoe is configured such engagement to an obstacle within the wellbore 102 will provide the force to turn the mule shoe.

[00151] In some embodiments, for example, a process is provided for confirming that a wellbore operation, such as, for example, the setting or the unsettting of the packer 240A, in response to manipulation of the first device counterpart 222, has been performed. In this respect, the first device counterpart 222 and the second device counterpart 232 are co-operatively configured such that, actuation of a wellbore operation, in response to transmission of torque from the first device counterpart 222 to the second device counterpart 232, is with effect that the second device counterpart 232 becomes releasably coupled to the wellbore 102, in a post-wellbore operation position, and while the second device counterpart 232 is disposed in the post-wellbore operation position, the first device counterpart 222 is displaceable, relative to the second device counterpart 232, in the uphole direction, with effect that the first device counterpart 222 becomes disposed relative to the second device counterpart 232 such that the first device counterpart 222 becomes releasably coupled to the second device counterpart 232.
While the first device counterpart 222 is releasably coupled to the second device counterpart 232, an overpull can be applied to the production string 202, thereby providing confirmation that the wellbore operation has been successfully performed. In this respect, a process is provided, while the first device counterpart 222 is disposed downhole for effecting performance of a wellbore operation, and includes applying torque to the first device counterpart 222 (such as, for example, via the production string 202) such that the torque is transmittable, via the second device counterpart 232, with effect that a wellbore operation is performed that includes a response to torque that is transmitted via the second device counterpart 232 (such as the setting or unsetting of the packer 240A, wherein, in such case, the packer 240A is coupled to the second device counterpart 232 for receiving the torque transmitted via the second device counterpart 232) and is with effect that the second device counterpart 232 becomes releasably coupled to the wellbore 102. After the application of torque to the first device counterpart 222, such that the second device counterpart 232 is retained relative to the wellbore 102, and such that the first device counterpart 222 becomes displaceable, relative to the second device counterpart 232, in an uphole direction, an uphole pulling force is applied to the production string 202 for effecting displacement of the first device counterpart 222, relative to the second device counterpart 232, in the uphole direction, and while the uphole pulling force is being applied, the uphole pulling force is monitored for overpull. When overpull is sensed, this is an indication that the releasable coupling of the first device counterpart 222 to the second device counterpart 232, as above described, has been effected (for example, the follower 233 is disposed in the releasably coupled position 233C within the j-slot 223), and that the torque applied to the first device counterpart 222, prior to the uphole displacement of the first device counterpart 222, relative to the second device counterpart 232, has been transmitted via the second device counterpart 232 to effect completion of the wellbore operation.

[00152] As discussed above, in some embodiments, for example, the release of the first device counterpart 222 from the releasable coupling to the second device counterpart 232 is mediated by a j-tool 2231, and that, in some of these embodiments, for example, while the first device counterpart 222 is releasably coupled to the second device counterpart 232, the follower 233 is disposed within the j-slot 223 in the position 233C, and the above-described confirmation of a successfully performed wellbore operation is provided by sensing of an overpull when applying an uphole pulling force to the production string while the follower 233 is disposed
within the j-slot 223 in a releasably coupled position 233C, the overpull can be applied to the production string 202, thereby providing confirmation that the wellbore operation has been successfully completed. After this confirmation, withdrawal of the first device counterpart 222 from the second device counterpart 232 may be desirable. However, such withdrawal necessitates displacement of the follower 233 through the j-slot 223. As a necessary incident, relative rotation between the follower 233 and the j-slot 223 counterpart is effected during such displacement. Because the j-slot 223 counterpart is mounted to the first device counterpart 222 for rotation relative to the first device counterpart 222, the rotation of the follower 233 relative to the j-slot 223 counterpart is independent of the torque being transmitted by the first device counterpart 222 to the second device counterpart 232, such that there is an absence, or substantial absence, of interference by the j-slot 223 counterpart to the torque being transmitted by the first device counterpart 222 to the second device counterpart 232.

[00153] A process of deploying the assembly 10, including the first device counterpart 222 and the second device counterpart 232, and producing hydrocarbon material via the assembly 10, is now described, along with the setting of the packer 240A, that is carried by the second device counterpart 232, and subsequent confirmation that the packer 240A has been set. The assembly 10 is run-in-hole into the wellbore 102. While being run-in-hole through the wellbore 102, the collar 22220 is secured to the second device counterpart 232 with one or more frangible members 22222, such that relative displacement between the first device counterpart 222 and the second device counterpart 232 is prevented, or substantially prevented, with effect that the second device counterpart 232 does not become prematurely decoupled from the force transmitter 22210, and so that interaction between the j-slot 223 counterpart (defined by the collar 22220) and the follower 233 (via the J-slot 223) does not affect relative rotatability between the torque transmitter 22212 and the second device counterpart 232. The conveyance of the assembly 10 through the wellbore 102 is with effect that the packer 240A become disposed at a predetermined location within the wellbore 102. By virtue of the drag blocks associated with the packer 240A, the splines 2214 are aligned with the splined bore 2321 when the packer 240A becomes disposed in the pre-determined location. The alignment of the splines 2214 and the splined bore 2321 is with effect that the rotatable coupling of the torque transmitter 22212 and the retaining tool 232 is effected. Torque is applied to the first device counterpart 222, from the surface via the production string 202, such that a rotation of the torque transmitter 22212 about
its axis is effected. The applied torque is transmitted to the packer 240A, via the second device counterpart 232, by virtue of the rotatable coupling of the torque transmitter 22212 to the second device counterpart 232, with effect that the packer 240A is set and the sealed interface 500 is established. After the actuation of the packer, a pulling up force is applied to the first device counterpart 222. Because the collar is secured to the second device counterpart 232 with the one or more frangible members 22222, the pulling up force applied to the first device counterpart 222 is transmitted to the packer 240A via the second device counterpart 232 such that a tensile force is applied to the packer 240A. The applied tensile force maintains setting of the packer 240A.

[00154] In order to effect release of the collar 22220 from the second device counterpart 232 such that the collar 22220 (and, therefore, the force transmitter 222210) becomes displaceable relative to the second device counterpart 232, a force is applied to the first device counterpart 222, sufficient to effect fracturing of the one or more frangible members 22222, such that fracturing of the one or more frangible members is effected. In some embodiments, for example, while the collar 22220 is secured to the second device counterpart 232 by the one or more frangible members, the follower 233 is disposed within the j-slot 223 in position 233A, such that the force being applied to effect fracturing of the one or more frangible members is applied in the downhole direction, with effect that the follower 233 becomes disposed in the pre-coupling position 233B (see Figures 6A-D). While disposed in the pre-coupling position 233B, an uphole pulling force is applied to the force transmitter 22210, effecting displacement of the force transmitter 22210, relative to the second device counterpart 232, in the uphole direction, with effect that the follower 233 moves within the J-slot 223 232 such that the follower 233 becomes disposed in the releasably coupled position 233C (see Figures 7A and 7B), and, concomitantly, releasable coupling of the first device counterpart 222 to the second device counterpart 232 is effected.

[00155] As described above, while the follower 233 is disposed in the releasably coupled position 233C, the previous performance of the wellbore operation can be confirmed by applying an overpull to production string 202 and sensing such overpull. In some embodiments, for example, the first device counterpart 222 and the second device counterpart 232 are cooperatively configured such that the sealed interface 250 is effected while the follower 233 is
disposed in the releasably coupled position 233C within the J-slot 223, such that the sensed overpull is also an indication of the establishment of the sealed interface 250.

[00156] As described above, in some embodiments, for example, the first device counterpart 222 and the second device counterpart 232 are co-operatively configured such that the first device counterpart 222 is displaceable from the released position (for example, while the follower 233 223 is disposed in the position 233D within the J-slot 223), relative to the second device counterpart 232, in an upheole direction such that the first device counterpart 222 becomes disposed in a position that is outside of the j-slot 223 (for example, such that the follower 233 223 becomes disposed in the position 233E within the J-slot 223), and with effect that the sealed interface 250 is defined. This distance by which the first device counterpart 222 is displaced, relative to the second counterpart, from the released position to the position 233E, is less than the distance travelled during the withdrawal-effecting displacement (see Figures 9A and 9B). In some of these embodiments, the first device counterpart 222 is disposed relative to the second device counterpart 232 such that the sealed interface 250 is defined while the follower 233 223 is disposed outside of the J-slot 223 (i.e. the follower 233 has been withdrawn from the J-slot 223 to the position 233E). In this respect, in some embodiments, for example, it is desirable to dispose the first device counterpart 222 relative to the second device counterpart 232 such that the first device counterpart 222 is released from the releasable coupling to the second device counterpart 232, and is disposed for withdrawal from the second device counterpart 232 222 in response to a displacement of the first device counterpart 222, relative to the second device counterpart 232, in the upheole direction, and the disposition is such that the sealed interface 250 is defined. In this way, after the establishment of such sealed interface 250, and after hydrocarbon material is produced via the assembly 10, subsequent withdrawal of the first device counterpart 222 from the second device counterpart 232, after the suspension of such production, is effectible by a single displacement of the first device counterpart 222 relative to the second device counterpart 232 in an upheole direction, in the absence of a prior displacement of the first device counterpart 222 relative to the second device counterpart 232 in the downhole direction. Comparatively, in those embodiments where the hydrocarbon material is produced while the follower 233 is disposed in the releasably coupled position 233C within the j-slot 223, after the suspension of such production, prior to withdrawal of the first device counterpart 222 from the second device counterpart 232 in response to a displacement of the first device counterpart 222
relative to the second device counterpart 232 in the uphole direction, displacement of the first
device counterpart 222 relative to the second device counterpart 232 in the downhole direction is
required to dispose the follower 233 in the released position 233D within the j-slot 223. Accordingly,
producing hydrocarbon material while the first device counterpart 222 is disposed in the position 233E renders subsequent withdrawal of the first device counterpart 222 relative to
the second device counterpart 232 to be simpler. In this respect, while the follower 233 is
disposed in the releasably position 233C within the j-slot 223 (see Figures 7A and 7B), the first
device counterpart 222 is urged downhole, thereby effecting displacement of the first device
counterpart 222, relative to the second device counterpart 232, in the downhole direction such
that the follower 233 becomes disposed in the released position 233D within the j-slot 223 (see
Figures 8A and 8B). In some embodiments, for example, after the follower 233 becomes
disposed in the released position 233D within the J-slot 223, the first device counterpart 222 is
displaced once again relative to the second device counterpart 232, in the uphole direction, such
that the first device counterpart 222 becomes disposed in the position 233E (see Figures 9A and
9B), such that the sealed interface 250 is defined while first device counterpart 222 is disposed
relative to the second device counterpart 232 such that the follower 233 is disposed outside of the
J-slot 223. After the first device counterpart 222 has become positioned such that the follower
233 is disposed in the position 233E, such that the sealed interface 250 is defined while first
device counterpart 222 is disposed relative to the second device counterpart 232 such that the
follower 233 is disposed outside of the J-slot 223, hydrocarbon material is produced from the
subterranean formation 100 via the assembly 10.

[00157] In the above description, for purposes of explanation, numerous details are set forth in
order to provide a thorough understanding of the present disclosure. However, it will be
apparent to one skilled in the art that these specific details are not required in order to practice
the present disclosure. Although certain dimensions and materials are described for
implementing the disclosed example embodiments, other suitable dimensions and/or materials
may be used within the scope of this disclosure. All such modifications and variations, including
all suitable current and future changes in technology, are believed to be within the sphere and
scope of the present disclosure. All references mentioned are hereby incorporated by reference
in their entirety.
What is claimed is:

1. Parts of a connecting device assembly, comprising:

   a first device counterpart; and

   a second device counterpart;

wherein:

   the first device counterpart and the second device counterpart are co-operatively configured such that:

   releasable coupling between the first device counterpart and the second device counterpart is effectible;

   while the first device counterpart is releasably coupled to the second device counterpart in a releasably coupled position: (i) displacement of the first device counterpart, relative to the second device counterpart, along an axis in a first direction, is prevented or substantially prevented; and (ii) the first device counterpart is displaceable, relative to the second device counterpart, along an axis in a second direction that is opposite, or substantially opposite, to the first direction, for effecting release of the first device counterpart from the coupling to the second device counterpart, with effect that the first device counterpart becomes disposed in a released position and, in the released position, is disposed for separation from the second device counterpart in response to a separating displacement of the first device counterpart, relative to the second device counterpart, along an axis in the first direction; and

   the release of the first device counterpart from the releasable coupling to the second device counterpart is effectible in absence, or substantial absence, of torque applied to the first device counterpart about an axis that is parallel, or substantially parallel, to the central longitudinal axis of the first device counterpart.
2. Parts of a connecting device assembly, comprising:

a first device counterpart; and

a second device counterpart;

wherein:

the first device counterpart and the second device counterpart are co-operatively configured such that:

releasable coupling between the first device counterpart and the second device counterpart is effectible in absence, or substantial absence, of torque applied to the first device counterpart about, or substantially about, an axis that is parallel, or substantially parallel, to the central longitudinal axis of the first device counterpart; and

while the first device counterpart is releasably coupled to the second device counterpart: (i) displacement of the first device counterpart, relative to the second device counterpart, along an axis in a first direction, is prevented or substantially prevented; and (ii) the first device counterpart is displaceable, relative to the second device counterpart, along an axis in a second direction that is opposite, or substantially opposite, to the first direction, for effecting release of the first device counterpart from the coupling to the second device counterpart, with effect that the first device counterpart becomes disposed in a released position and, in the released position, is disposed for separation from the second device counterpart in response to a separating displacement of the first device counterpart, relative to the second device counterpart, along an axis in the first direction.

3. The parts as claimed in claim 2;

wherein:

the release of the first device counterpart from the releasable coupling to the second device counterpart is effectible in absence, or substantial absence, of torque applied to the first device counterpart about an axis that is parallel, or substantially parallel, to the central longitudinal axis of the first device counterpart.
4. The parts as claimed in any one of claims 1 to 3;

wherein:

the first device counterpart and the second device counterpart are co-operatively configured such that, while there is an absence, or substantial absence, of releasable coupling between the first device counterpart and the second device counterpart, the releasable coupling is effected in response to a sequence of displacements of the first device counterpart relative to the second device counterpart, wherein the sequence of displacements includes:

(i) a pre-coupling displacement, wherein, during the pre-coupling displacement, the first device counterpart is displaced, relative to the second device counterpart, along an axis in the second direction, such that the second device counterpart becomes disposed in a pre-coupling position; and

(ii) from the pre-coupling position, a releasable coupling-effecting displacement, wherein, during the releasable-coupling effecting displacement, the first device counterpart is displaced, relative to the second device counterpart, along an axis in the first direction such that the first device counterpart becomes disposed in the releasably coupled position.

5. The parts as claimed in claim 4;

wherein:

the first device counterpart and the second device counterpart are further co-operatively configured to define a j-tool configured for mediating each one of: (i) the releasable coupling between the first device counterpart and the second device counterpart, and (ii) the release of the first device counterpart from the releasable coupling to the second device counterpart, independently.

6. The parts as claimed in claim 4;

wherein:
the second device counterpart including a receptacle for receiving insertion of the first device counterpart;

the first device counterpart and the second device counterpart are co-operatively configured such that:

while the first device counterpart is aligned with the receptacle, the first device counterpart is insertable within the second device counterpart, via the receptacle, by displacement of the first device counterpart, relative to the second device counterpart, in a first direction along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the first device counterpart;

the releasable coupling between the first device counterpart and the second device counterpart is effectible while the first device counterpart is disposed within the second device counterpart; and

the separation from the second device counterpart, for which the first device counterpart is disposed, in response to displacement of the first device counterpart, relative to the second device counterpart, in the first direction, includes withdrawal of the first device counterpart from the second device counterpart; and

the pre-coupling displacement includes insertion of the first device counterpart through the receptacle.

7. The parts as claimed in any one of claims 1 to 3;

wherein:

the second device counterpart including a receptacle for receiving insertion of the first device counterpart;

the first device counterpart and the second device counterpart are co-operatively configured such that:
while the first device counterpart is aligned with the receptacle, the first device counterpart is insertable within the second device counterpart, via the receptacle, by displacement of the first device counterpart, relative to the second device counterpart, in a first direction along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the first device counterpart;

the releasable coupling between the first device counterpart and the second device counterpart is effectible while the first device counterpart is disposed within the second device counterpart; and

the separation from the second device counterpart, for which the first device counterpart is disposed, in response to displacement of the first device counterpart, relative to the second device counterpart, in the first direction, includes withdrawal of the first device counterpart from the second device counterpart.

8. The parts as claimed in claim 6 or 7:

wherein:

the first device counterpart and the second device counterpart are further co-operatively configured to define a j-tool configured for mediating each one of: (i) the releasable coupling between the first device counterpart and the second device counterpart, and (ii) the release of the first device counterpart from the releasable coupling to the second device counterpart, independently.

9. The parts as claimed in claim 8:

wherein:

the j-tool includes a j-slot counterpart and a follower counterpart;

the j-slot counterpart is mounted to the first device counterpart for rotation relative to the first device counterpart and includes a j-slot; and
the follower counterpart extends from the second device counterpart and includes a follower disposed for guided displacement, relative to the first device counterpart, through the j-slot.

10. The parts as claimed in claim 9;

wherein the follower counterpart and the second device counterpart are co-operatively configured such that the j-slot counterpart translates axially with the first device counterpart.

11. The parts as claimed in claim 9 or 10;

wherein:

the second device counterpart includes a plurality of apertures for effecting flow communication between an environment external to the second device counterpart and the j-slot of the j-tool; and

the first device counterpart and the second device counterpart are co-operatively configured such that the apertures are disposed in alignment with the j-slot, while the follower is disposed within the j-slot.

12. The parts as claimed in claim 11;

wherein the apertures are distributed about a longitudinal axis of the second device counterpart.

13. The parts as claimed in claim 11 or 12;

wherein the apertures are circumferentially distributed.

14. The parts as claimed in any one of claims 11 to 13;

wherein the apertures include apertures that define a four hole pattern, wherein an external surface portion of the second device counterpart, disposed within the space that is intermediate to the four hole pattern, has an area of at least 0.5 square inches.

15. The parts as claimed in any one of claims 11 to 14;
wherein each one of the apertures, independently, defines an area of at least 0.1 square inches.

16. The parts as claimed in any one of claims 11 to 15;

wherein the follower is made of a material having a yield strength of at least 50,000 psi.

17. The parts as claimed in any one of claims 6 to 16;

wherein the receptacle is defined by an overshot.

18. The parts as claimed in any one of claims 1 to 17;

wherein:

the first device counterpart includes a first device counterpart fluid passage;

the second device counterpart includes a second device counterpart fluid passage; and

the first device counterpart and the second device counterpart are co-operatively configured such that, while the first device counterpart is releasably coupled to the second device counterpart, the first device counterpart fluid passage is disposed in flow communication with the second device counterpart fluid passage.

19. The parts as claimed in claim 18;

wherein the first device counterpart and the second device counterpart are co-operatively configured such that, while the first device counterpart is releasably coupled to the second device counterpart, a sealed interface is defined for preventing, or substantially preventing, bypassing of the first device counterpart fluid passage by material that is flowing through the second device counterpart fluid passage in the first direction.

20. The parts as claimed in claim 19;

wherein the release of the first device counterpart from the coupling to the second device counterpart is with effect that the sealed interface is defeated.

21. The parts as claimed in claim 19;
wherein:

the sealed interface is defined while the first device counterpart is disposed in the released position; and

the release of the first device counterpart from the releasable coupling to the second device counterpart is with effect that the sealed interface is defeatable in response to a sealed interface-defeating displacement of the first device counterpart, relative to the second device counterpart, along an axis in the first direction.

22. The parts as claimed in claim 21;

wherein the first device counterpart and the second device counterpart are co-operatively configured such that the sealed interface is maintained while the first device counterpart is displaced, relative to the second device counterpart, from the releasably coupled position to the released position.

23. The parts as claimed in claim 21 or 22;

wherein the first device counterpart and the second device counterpart are co-operatively configured such that the sealed interface is maintained for a portion of the sealed interface-defeating displacement.

24. The parts as claimed in claim 23;

wherein the sealed interface-defeating displacement defines a portion of the separating displacement such that the sealed interface is maintained for a portion of the separating displacement.

25. The parts as claimed in any one of claims 1 to 24;

wherein:

the first device counterpart includes a torque transmitter; and
the torque transmitter and the second device counterpart are co-operatively configured for rotatable coupling, such that torque, being applied to the first device counterpart, is transmittable to the second device counterpart via the torque transmitter for effecting rotation of the second device counterpart.

26. Parts of a connecting device assembly, comprising:

a first device counterpart;

a second device counterpart;

wherein:

the first device counterpart and the second device counterpart are co-operatively configured such that:

releasable coupling between the first device counterpart and the second device counterpart is effectible;

while the first device counterpart is releasably coupled to the second device counterpart in a releasably coupled position: (i) displacement of the first device counterpart, relative to the second device counterpart, along an axis in a first direction, is prevented or substantially prevented; and (ii) the first device counterpart is displaceable, relative to the second device counterpart, along an axis in a second direction that is opposite, or substantially opposite, to the first direction, for effecting release of the first device counterpart from the releasable coupling to the second device counterpart, with effect that the first device counterpart becomes disposed in a released position and, in the released position, is disposed for separation from the second device counterpart in response to a separating displacement of the first device counterpart, relative to the second device counterpart, along an axis in the first direction; and

the first device counterpart and the second device counterpart are further co-operatively configured for defining a j-tool configured for mediating the release of the first device counterpart from the releasable coupling to the second device counterpart.
27. Parts of a connecting device assembly, comprising:

a first device counterpart; and

a second device counterpart;

wherein:

the first device counterpart and the second device counterpart are co-operatively configured such that, while the first device counterpart is releasably coupled to the second device counterpart in a releasably coupled position: (i) displacement of the first device counterpart, relative to the second device counterpart, along an axis in a first direction, is prevented or substantially prevented; and (ii) the first device counterpart is displaceable, relative to the second device counterpart, along an axis in a second direction that is opposite, or substantially opposite, to the first direction, for effecting release of the first device counterpart from the releasable coupling to the second device counterpart, with effect that the first device counterpart becomes disposed in a released position and, in the released position, is disposed for separation from the second device counterpart in response to a separating displacement of the first device counterpart, relative to the second device counterpart, along an axis in the first direction; and

the first device counterpart and the second device counterpart are further co-operatively configured for defining a j-tool configured for mediating the releasable coupling between the first device counterpart and the second device counterpart.

28. The parts as claimed in claim 27;

wherein:

the j-tool is further configured for mediating the release of the first device counterpart from the releasable coupling to the second device counterpart.

29. The parts as claimed in any one of claims 26 to 28;

wherein:
the first device counterpart and the second device counterpart are co-operatively configured such that, while there is an absence, or substantial absence, of releasable coupling between the first device counterpart and the second device counterpart, the releasable coupling is effected in response to a sequence of displacements of the first device counterpart relative to the second device counterpart, wherein the sequence of displacements includes:

(i) a pre-coupling displacement, wherein, during the pre-coupling displacement, the first device counterpart is displaced, relative to the first device counterpart, along an axis in the second direction, such that the first device counterpart becomes disposed in a pre-coupling position; and

(ii) from the pre-coupling position, a releasable coupling-effecting displacement, wherein, during the releasable-coupling effecting displacement, the first device counterpart is displaced, relative to the second device counterpart, along an axis in the first direction such that the first device counterpart becomes disposed in the releasably coupled position.

30. The parts as claimed in claim 29;

wherein:

the second device counterpart including a receptacle for receiving insertion of the first device counterpart; and

the first device counterpart and the second device counterpart are co-operatively configured such that:

while the first device counterpart is aligned with the receptacle, the first device counterpart is insertable within the second device counterpart, via the receptacle, by displacement of the first device counterpart, relative to the second device counterpart, in a first direction along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the first device counterpart;

the releasable coupling between the first device counterpart and the second device counterpart is effectible while the first device counterpart is disposed within the second device counterpart; and
the pre-coupling displacement includes insertion of the first device counterpart through the receptacle; and

the separation from the second device counterpart, for which the first device counterpart is disposed, in response to displacement of the first device counterpart, relative to the second device counterpart, in the first direction, includes withdrawal of the first device counterpart from the second device counterpart.

31. The parts as claimed in any one of claims 26 to 28;

wherein:

the second device counterpart including a receptacle for receiving insertion of the first device counterpart;

the first device counterpart and the second device counterpart are co-operatively configured such that:

while the first device counterpart is aligned with the receptacle, the first device counterpart is insertable within the second device counterpart, via the receptacle, by displacement of the first device counterpart, relative to the second device counterpart, in a first direction along an axis that is parallel, or substantially parallel, to the central longitudinal axis of the first device counterpart;

the releasable coupling between the first device counterpart and the second device counterpart is effectible while the first device counterpart is disposed within the second device counterpart; and

the separation from the second device counterpart, for which the first device counterpart is disposed, in response to displacement of the first device counterpart, relative to the second device counterpart, in the first direction, includes withdrawal of the first device counterpart from the second device counterpart.

32. The parts as claimed in claim 30 or 31;
wherein:

the j-tool includes a j-slot counterpart and a follower counterpart;

the j-slot counterpart is mounted to the first device counterpart for rotation relative to the first device counterpart and includes a j-slot; and

the follower counterpart extends from the second device counterpart and includes a follower disposed for guided displacement, relative to the first device counterpart, through the j-slot.

33. The parts as claimed in claim 32;

wherein the follower counterpart and the second device counterpart are co-operatively configured such that the j-slot counterpart translates axially with the first second device counterpart.

34. The parts as claimed in claim 32 or 33;

wherein:

the second device counterpart includes a plurality of apertures for effecting flow communication between an environment external to the second device counterpart and the j-slot of the j-tool; and

the first device counterpart and the second device counterpart are co-operatively configured such that the apertures are disposed in alignment with the j-slot, while the follower is disposed within the j-slot.

35. The parts as claimed in claim 34;

wherein the apertures are distributed about a longitudinal axis of the second device counterpart.

36. The parts as claimed in claim 34 or 35;

wherein the apertures are circumferentially distributed.
37. The parts as claimed in any one of claims 33 to 36;

wherein the apertures include apertures that define a four hole pattern, wherein an external surface portion of the second device counterpart, disposed within the space that is intermediate to the four hole pattern, has an area of at least 0.5 square inches.

38. The parts as claimed in any one of claims 33 to 37;

wherein each one of the apertures, independently, defines an area of at least 0.1 square inches.

39. The parts as claimed in any one of claims 32 to 38;

wherein the follower is made of a material having a yield strength of at least 50,000 psi.

40. The parts as claimed in any one of claims 30 to 39;

wherein the receptacle is defined by an overshot.

41. The parts as claimed in any one of claims 26 to 40;

wherein:

    the first device counterpart includes a first device counterpart fluid passage;

    the second device counterpart includes a second device counterpart fluid passage; and

    the first device counterpart and the second device counterpart are co-operatively configured such that, while the first device counterpart is releasably coupled to the second device counterpart, the first device counterpart fluid passage is disposed in flow communication with the second device counterpart fluid passage.

42. The parts as claimed in claim 41;

wherein the first device counterpart and the second device counterpart are co-operatively configured such that, while the first device counterpart is releasably coupled to the second device counterpart, a sealed interface is defined for preventing, or substantially preventing, bypassing of
the first device counterpart fluid passage by material that is flowing through the second device counterpart fluid passage in the first direction.

43. The parts as claimed in claim 42;

wherein the release of the first device counterpart from the coupling to the second device counterpart is with effect that the sealed interface is defeated.

44. The parts as claimed in claim 42;

wherein:

the sealed interface is defined while the first device counterpart is disposed in the released position; and

the release of the first device counterpart from the releasable coupling to the second device counterpart is with effect that the sealed interface is defeatable in response to a sealed interface-defeating displacement of the first device counterpart, relative to the second device counterpart, along an axis in the first direction.

45. The parts as claimed in claim 44;

wherein the first device counterpart and the second device counterpart are co-operatively configured such that the sealed interface is maintained while the first device counterpart is displaced, relative to the second device counterpart, from the releasably coupled position to the released position.

46. The parts as claimed in claim 44 or 45;

wherein the first device counterpart and the second device counterpart are co-operatively configured such that the sealed interface is maintained for a portion of the sealed interface-defeating displacement.

47. The parts as claimed in claim 46;
wherein the sealed interface-defeating displacement defines a portion of the separating displacement such that the sealed interface is maintained for a portion of the separating displacement.

48. The parts as claimed in any one of claims 26 to 47;

wherein:

the first device counterpart includes a torque transmitter; and

the torque transmitter and the second device counterpart are co-operatively configured for rotatable coupling, such that torque, being applied to the first device counterpart, is transmittable to the second device counterpart via the torque transmitter for effecting rotation of the second device counterpart.

49. Parts of a connecting device assembly, comprising:

a first device counterpart;

a guide tool, mounted to the first device counterpart for rotation relative to the first device counterpart, and including a guide;

a second device counterpart including a receptacle for receiving insertion of the first device counterpart with effect that the first device counterpart is disposed within the second device counterpart; and

a follower extending from the second device counterpart and disposed for guided movement via the guide;

wherein:

the first device counterpart, the second device counterpart, the guide tool, and the follower are co-operatively configured such that:
releasable coupling between the first device counterpart and the second device counterpart is effectible while the first device counterpart is disposed within the second device counterpart;

while the first device counterpart is releasably coupled to the second device counterpart in a releasably coupled position: (i) displacement of the first device counterpart, relative to the second device counterpart, along an axis in a first direction, is prevented or substantially prevented; and (ii) the first device counterpart is displaceable, relative to the second device counterpart, along an axis in a second direction that is opposite, or substantially opposite, to the first direction, for effecting release of the first device counterpart from the coupling to the second device counterpart, with effect that the first device counterpart becomes disposed in a released position and, in the released position, is disposed for withdrawal from the second device counterpart in response to a withdrawing displacement of the first device counterpart, relative to the second device counterpart, along an axis in the first direction; and

the release of the first device counterpart from the releasable coupling to the second device counterpart is mediated via interaction between the guide and the follower.

50. Parts of a connecting device assembly, comprising:

a first device counterpart;

a guide tool, mounted to the first device counterpart for rotation relative to the first device counterpart, and including a guide;

a second device counterpart including a receptacle for receiving insertion of the first device counterpart with effect that the first device counterpart is disposed within the second device counterpart; and

a follower extending from the second device counterpart and disposed for guided movement via the guide;

wherein:
the first device counterpart, the second device counterpart, the guide tool, and the
follower are co-operatively configured such that:

while the first device counterpart is aligned with the receptacle, the first device
counterpart is insertable within the second device counterpart, via the receptacle, by
displacement of the first device counterpart, relative to the second device counterpart, in
a first direction along an axis that is parallel, or substantially parallel, to the central
longitudinal axis of the first device counterpart;

releasable coupling between the first device counterpart and the second device
counterpart is effectible while the first device counterpart is disposed within the second
device counterpart;

while the first device counterpart is releasably coupled to the second device
counterpart in a releasably coupled position: (i) displacement of the first device
counterpart, relative to the second device counterpart, along an axis in a first direction, is
prevented or substantially prevented; and (ii) the first device counterpart is displaceable,
relative to the second device counterpart, along an axis in a second direction that is
opposite, or substantially opposite, to the first direction, for effecting release of the first
device counterpart from the coupling to the second device counterpart, with effect that
the first device counterpart becomes disposed in a released position and, in the released
position, is disposed for withdrawal from the second device counterpart in response to a
withdrawing displacement of the first device counterpart, relative to the second device
counterpart, along an axis in the first direction; and

the releasable coupling between the first device counterpart and the second device
counterpart is mediated via interaction between the guide and the follower.

51. The parts as claimed in claim 50;

wherein:

the first device counterpart, the second device counterpart, the guide tool, and the
follower are further co-operatively configured such that the release of the first device
counterpart from the releasable coupling to the second device counterpart is mediated via interaction between the guide and the follower.

52. The parts as claimed in any one of claims 49 to 51;

wherein:

the first device counterpart and the second device counterpart are co-operatively configured such that, while the first device counterpart is separated from the second device counterpart, the releasable coupling is effected in response to a sequence of displacements of the first device counterpart relative to the second device counterpart, wherein the sequence of displacements includes:

(i) an insertion of the first device counterpart into the receptacle of the second device counterpart, wherein, during the insertion, the first device counterpart is displaced, relative to the first device counterpart, along an axis in the second direction, such that the first device counterpart becomes disposed in a pre-coupling position; and

(ii) from the pre-coupling position, a releasable coupling-effecting displacement, wherein, during the releasable-coupling effecting displacement, the first device counterpart is displaced, relative to the second device counterpart, along an axis in the first direction such that the first device counterpart becomes disposed in the releasably coupled position;

and

the guide includes:

a first guide portion for guiding at least a portion of the displacement of the first device counterpart, relative to the second device counterpart, along an axis in the second direction during the insertion, and defining a pre-coupling position stop for becoming disposed in abutting engagement with the follower for determining the pre-coupling position; and

a second guide portion for guiding at least a portion of the releasable coupling-effecting displacement, and defining a releasable coupling position stop for becoming
disposed in abutting engagement with the follower for determining the releasable coupling position.

53. The parts as claimed in claim 52;

wherein the guide includes a third guide portion for: (i) guiding at least a portion of the displacement of the first device counterpart, relative to the second device counterpart, from the releasably coupled position, and along an axis in the second direction, for effecting release of the first device counterpart from the releasable coupling to the second device counterpart, with effect that the first device counterpart becomes disposed in the released position, and (ii) defining a released position stop for becoming disposed in abutting engagement with the follower for determining the released position.

54. The parts as claimed in claim 53;

wherein each one of the first, second and third guide portions, independently, is defined by a respective slot portion.

55. The parts as claimed in any one of claims 49 to 54;

wherein:

the second device counterpart includes a plurality of apertures for effecting flow communication between an environment external to the second device counterpart and the guide; and

the first device counterpart and the second device counterpart are co-operatively configured such that the apertures are disposed in alignment with the guide, while the follower is disposed relative to the guide such that movement of the follower is guidable by the guide.

56. The parts as claimed in claim 55;

wherein the apertures are distributed about a longitudinal axis of the second device counterpart.

57. The parts as claimed in claim 55 or 56;
wherein the apertures are circumferentially distributed.

58. The parts as claimed in any one of claims 55 to 57;

wherein the apertures include apertures that define a four hole pattern, wherein an external surface portion of the second device counterpart, disposed within the space that is intermediate to the four hole pattern, has an area of at least 0.5 square inches.

59. The parts as claimed in any one of claims 55 to 58;

wherein each one of the apertures, independently, defines an area of at least 0.1 square inches.

60. The parts as claimed in any one of claims 49 to 59;

wherein the follower is made of a material having a yield strength of at least 50,000 psi.

61. The parts as claimed in any one of claims 49 to 60;

wherein the receptacle is defined by an overshot.

62. The parts as claimed in any one of claims 49 to 61;

wherein:

the first device counterpart includes a first device counterpart fluid passage;

the second device counterpart includes a second device counterpart fluid passage; and

the first device counterpart and the second device counterpart are co-operatively configured such that, while the first device counterpart is releasably coupled to the second device counterpart, the first device counterpart fluid passage is disposed in flow communication with the second device counterpart fluid passage.

63. The parts as claimed in claim 62;

wherein the first device counterpart and the second device counterpart are co-operatively configured such that, while the first device counterpart is releasably coupled to the second device
counterpart, a sealed interface is defined for preventing, or substantially preventing, bypassing of the first device counterpart fluid passage by material that is flowing through the second device counterpart fluid passage in the first direction.

64. The parts as claimed in claim 63;

wherein the release of the first device counterpart from the releasable coupling to the second device counterpart is with effect that the sealed interface is defeated.

65. The parts as claimed in claim 63;

wherein:

- the sealed interface is defined while the first device counterpart is disposed in the released position; and

- the release of the first device counterpart from the releasable coupling to the second device counterpart is with effect that the sealed interface is defeatable in response to a sealed interface-defeating displacement of the first device counterpart, relative to the second device counterpart, along an axis in the first direction.

66. The parts as claimed in claim 65;

wherein the first device counterpart and the second device counterpart are co-operatively configured such that the sealed interface is maintained while the first device counterpart is displaced, relative to the second device counterpart, from the releasably coupled position to the released position.

67. The parts as claimed in claim 65 or 66;

wherein the first device counterpart and the second device counterpart are co-operatively configured such that the sealed interface is maintained for a portion of the sealed interface-defeating displacement.

68. The parts as claimed in claim 67;
wherein the sealed interface-defeating displacement defines a portion of the withdrawing displacement such that the sealed interface is maintained for a portion of the withdrawing displacement.

69. The parts as claimed in any one of claims 49 to 68;

wherein:

the first device counterpart includes a torque transmitter; and

the torque transmitter and the second device counterpart are co-operatively configured for rotatable coupling, such that torque, being applied to the first device counterpart, is transmittable to the second device counterpart via the torque transmitter for effecting rotation of the second device counterpart.

70. A system including a wellbore string disposed within a wellbore, wherein the wellbore string comprises the parts as claimed in any one of claims 1 to 69, wherein:

the first connecting part is releasably coupled to the second connecting part; and

the first direction is a downhole direction.

71. A reservoir fluid conduction assembly for disposition within a wellbore string, that is lining a wellbore that is extending into a subterranean formation, such that an intermediate wellbore space is defined within a space that is disposed between the wellbore string and the assembly, wherein the assembly includes:

a reservoir fluid-supplying conductor for receiving reservoir fluid from a downhole wellbore space of the wellbore;

a flow diverter body including (a) a diverter body-defined reservoir fluid conductor for conducting reservoir fluid, that is supplied from the reservoir fluid-supplying conductor, to a reservoir fluid separation space of an uphole wellbore space of the wellbore, the uphole wellbore space being disposed uphole relative to the downhole wellbore space, and (b) a diverter body-defined gas-depleted reservoir fluid conductor for receiving gas-depleted reservoir fluid and
conducting the received gas-depleted reservoir fluid for effecting supplying of the gas-depleted reservoir fluid to a gas-depleted reservoir fluid-producing conductor; and

a sealed interface effector for co-operating with the wellbore string for establishing a sealed interface for preventing, or substantially preventing, flow communication, via the intermediate wellbore space, between the downhole wellbore space and the uphole wellbore space;

wherein:

the flow diverter body, the sealed interface effector, and the reservoir fluid conductor are co-operatively configured such that, while the assembly is disposed within the wellbore string, such that the sealed interface is defined, and the reservoir fluid-supplying conductor is receiving reservoir fluid from the downhole wellbore space that has been received within the downhole wellbore space from the subterranean formation:

(i) the reservoir fluid is conducted to the diverter body-defined reservoir fluid conductor via the reservoir fluid-supplying conductor;

(ii) the reservoir fluid is conducted by the diverter body-defined reservoir fluid conductor and discharged to a reservoir fluid separation space of the uphole wellbore space;

(iii) within the reservoir fluid separation space, a gas-depleted reservoir fluid is separated from the discharged reservoir fluid, in response to at least buoyancy forces; and

(iv) the separated gas-depleted reservoir fluid is conducted to the diverter body-defined gas-depleted reservoir fluid conductor, via the intermediate wellbore space, for conduction to the surface via a gas-depleted reservoir fluid producing conductor;

the reservoir fluid separation space defines a separation-facilitating space portion of the intermediate wellbore space; and
the reservoir fluid-supplying conductor includes a connecting device disposed
downhole relative to the sealed interface effector for connecting an uphole-disposed portion
of the reservoir fluid-supplying conductor to a downhole-disposed portion of the
reservoir fluid supplying-conductor;

the connecting device includes the parts as claimed in any one of claims 1 to 69;

the first connecting part is releasably coupled to the second connecting part; and

the first direction is a downhole direction.

72. The assembly as claimed in claim 71;

wherein the sealed interface is disposed for preventing, or substantially preventing, bypassing of
the diverter body-defined gas-depleted reservoir fluid conductor by, the separated gas-depleted
reservoir fluid.

73. A reservoir fluid conduction assembly for disposition within a wellbore string, that is
lining a wellbore that is extending into a subterranean formation, such that an intermediate
wellbore space is defined within a space that is disposed between the wellbore string and the
assembly, wherein the assembly includes:

a reservoir fluid-supplying conductor for receiving reservoir fluid from a downhole
wellbore space of the wellbore;

a flow diverter body including (a) a diverter body-defined reservoir fluid conductor for
conducting reservoir fluid, that is supplied from the reservoir fluid-supplying conductor, to a
reservoir fluid separation space of an uphole wellbore space of the wellbore, the uphole wellbore
space being disposed uphole relative to the downhole wellbore space, and (b) a diverter body-
deefined gas-depleted reservoir fluid conductor for receiving gas-depleted reservoir fluid and
conducting the received gas-depleted reservoir fluid for effecting supplying of the gas-depleted
reservoir fluid to a gas-depleted reservoir fluid-producing conductor; and
a sealed interface effector for co-operating with the wellbore string for establishing a
sealed interface for preventing, or substantially preventing, bypassing of the diverter body-
defined gas-depleted reservoir fluid conductor by, the separated gas-depleted reservoir fluid;

wherein:

the flow diverter body, the sealed interface effector, and the reservoir fluid conductor are co-operatively configured such that, while the assembly is disposed within the wellbore string, such that the sealed interface is defined, and the reservoir fluid-supplying conductor is receiving reservoir fluid from the downhole wellbore space that has been received within the downhole wellbore space from the subterranean formation:

(v) the reservoir fluid is conducted to the diverter body-defined reservoir fluid conductor via the reservoir fluid-supplying conductor;

(vi) the reservoir fluid is conducted by the diverter body-defined reservoir fluid conductor and discharged to a reservoir fluid separation space of the uphole wellbore space;

(vii) within the reservoir fluid separation space, a gas-depleted reservoir fluid is separated from the discharged reservoir fluid, in response to at least buoyancy forces; and

(viii) the separated gas-depleted reservoir fluid is conducted to the diverter body-defined gas-depleted reservoir fluid-diverting conductor, via the intermediate wellbore space, for conduction to the surface via a gas-depleted reservoir fluid producing conductor;

the reservoir fluid separation space defines a separation-facilitating space portion of the intermediate wellbore space;

and
the connecting device includes the parts as claimed in any one of claims 1 to 69;
the first connecting part is releasably coupled to the second connecting part; and
the first direction is a downhole direction.

74. The assembly as claimed in any one of claims 71 to 73;

wherein:

the flow diverter body, the sealed interface effector, and the reservoir fluid conductor are further co-operatively configured such that, while the assembly is disposed within the wellbore string, such that the sealed interface is defined, and the diverter body-defined reservoir fluid conductor is receiving reservoir fluid that is received within the downhole wellbore space from the subterranean formation, and conducted to the diverter body-defined reservoir fluid conductor via the reservoir fluid-supplying conductor:

the conducting of the separated gas-depleted reservoir fluid to the diverter body-defined gas-depleted reservoir fluid conductor, via the intermediate wellbore space, is effected in a downhole direction.

75. The assembly as claimed in any one of claims 71 to 74;

wherein:

the flow diverter body, the sealed interface effector, and the reservoir fluid conductor are further co-operatively configured such that, while the assembly is disposed within the wellbore string, such that the sealed interface is defined, and the diverter body-defined reservoir fluid conductor is receiving reservoir fluid that is received within the downhole wellbore space from the subterranean formation, and conducted to the diverter body-defined reservoir fluid conductor via the reservoir fluid-supplying conductor:

at least a portion of the intermediate wellbore space, through which the separated gas-depleted reservoir fluid is being conducted to the diverter body-defined gas-depleted
reservoir fluid conductor, is co-located with at least a portion of the separation-facilitating space portion.

76. A system comprising the assembly as claimed in any one of claims 71 to 75, wherein the assembly is disposed within a wellbore.

77. The system as claimed in claim 76;

wherein:

the wellbore is lined with a wellbore string; and

a sealed interface is defined by co-operative disposition of the sealed interface-effector relative to the wellbore string.

78. A process for sensing of an indication of establishment of a sealed interface, within a wellbore, between a first device counterpart and a second device counterpart, comprising:

while displacing the first device counterpart, relative to the second device counterpart, in the uphole direction, monitoring for overpull.

79. The process as claimed in claim 78;

wherein the relative displacement is mediated by a J-tool.

80. A process for sensing of an indication of establishment of a co-operative disposition of a first device counterpart relative to a second device counterpart, such that the first device counterpart is disposed in a sealed-interface precursor position, wherein, displacement of the first device counterpart, relative to the second device counterpart, from the sealed-interface precursor position and in the uphole direction is with effect that a sealed interface is established between the first and second device counterparts:

while displacing the first device counterpart, relative to the second device counterpart, in the uphole direction, monitoring for overpull.

81. The process as claimed in claim 80;
wherein the relative displacement is mediated by a J-tool.

82. A process for sensing of an indication of completion of a wellbore operation in response to actuation, within a wellbore, by a first tool via a second tool, comprising:

while displacing the first tool, relative to the second tool, in an uphole direction, monitoring for overpull.

83. The process as claimed in claim 82;

wherein the relative displacement is mediated by a J-tool.

84. The tools as claimed in claim 9, 10, 18, or 19;

further comprising a mule shoe mounted to the first device counterpart for rotation relative to the first device counterpart.