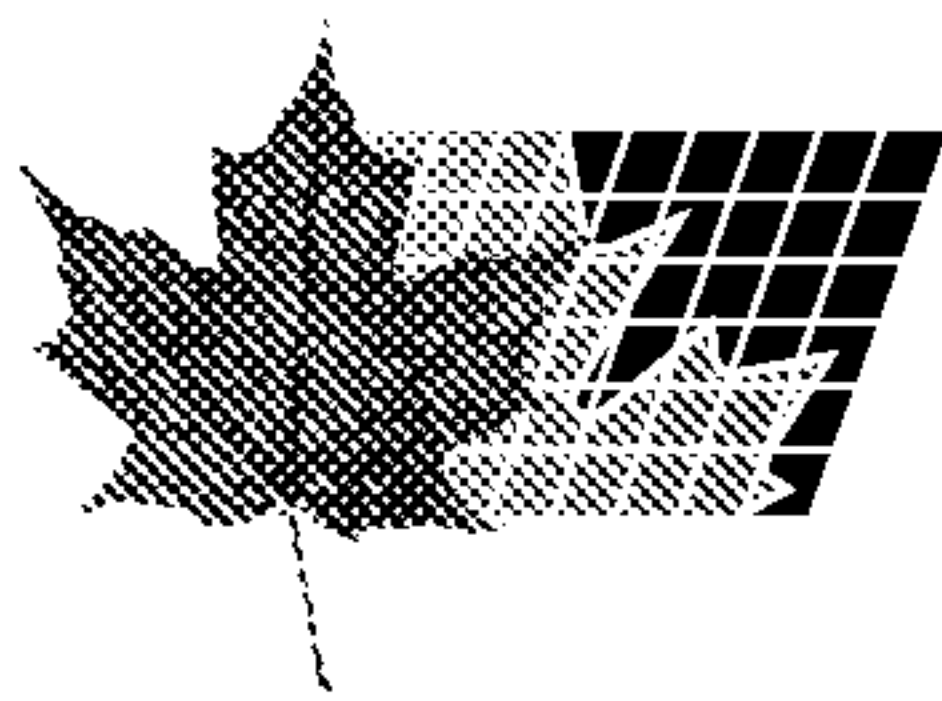




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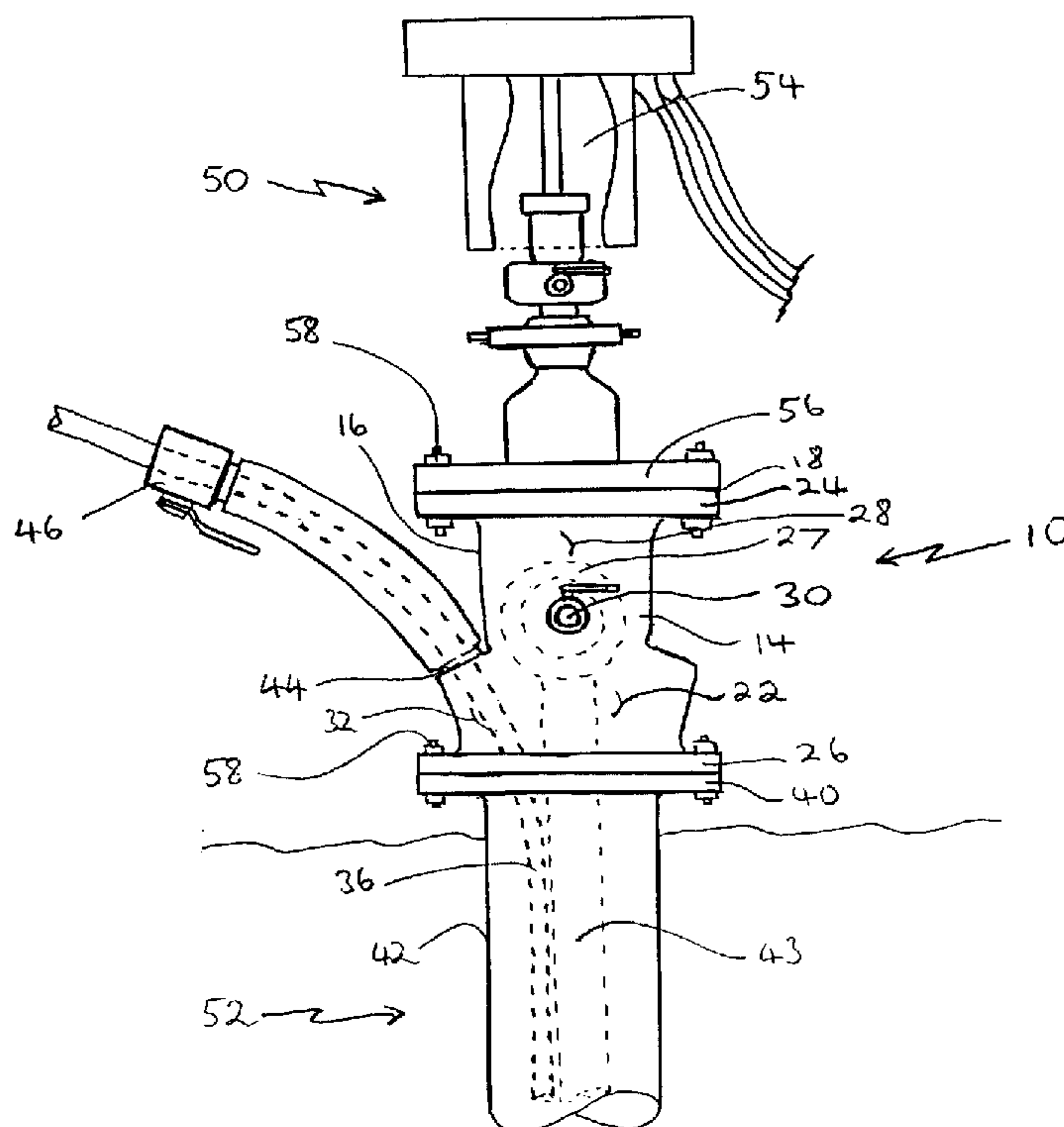
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(54) **METHODE DE NETTOYAGE DE PUIITS CONTAMINE PAR
L'ACCUMULATION DE SABLE**

(54) **A METHOD OF CLEANING A WELL THAT IS
CONTAMINATED BY ACCUMULATIONS OF SAND**



(57) In accordance with a method of servicing a well there is provided a casing spool having an endless tubing access port. The endless tubing access port has a feed passage that extends toward the first end and outwardly from the body. The feed passage terminates in a flow valve. Endless tubing is extended through the endless tubing access port while a tubing hanger is still in position supporting a tubing string. The endless tubing passes along the central flow passage beside the tubing string. Fluids are then pumped through the endless tubing to promote circulation within the well.



ABSTRACT OF THE DISCLOSURE

In accordance with a method of servicing a well there is provided a casing spool having an endless tubing access port. The endless tubing access port has a feed passage that extends
5 toward the first end and outwardly from the body. The feed passage terminates in a flow valve. Endless tubing is extended through the endless tubing access port while a tubing hanger is still in position supporting a tubing string. The endless tubing passes along the central flow passage beside the tubing
10 string. Fluids are then pumped through the endless tubing to promote circulation within the well.

TITLE OF THE INVENTION:

A Method Of Servicing A Well

NAME(S) OF INVENTOR(S):

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FIELD OF THE INVENTION

 The present invention relates to a method servicing a well
10 and, in particular, a method of cleaning a well that is
 contaminated by accumulations of sand.

BACKGROUND OF THE INVENTION

 With many producing wells the incursion of sand into the
15 well is a problem. When it becomes apparent that the incursion
 of sand is adversely affecting the production from the well to
 such an extent that the well is not economical, the well is
 serviced to clean out the accumulated sand. Current procedures
 for cleaning sand from the well involve the use of a service
20 rig to pull the tubing hanger and remove the sucker rods and
 tubing string. A sandline bailing unit or tubing bailing unit
 is then used to remove sand from the wellbore. This is a costly
 and time consuming procedure.

25 **SUMMARY OF THE INVENTION**

 What is required is an alternative method of servicing a
 well.

 According to the present invention there is provided a
30 method of servicing a well. In accordance with the method a
 casing spool is provided having a body with an exterior
 surface, a first end, a second end, and a central flow passage.
 An attachment flange is provided at the first end of the body.
 An internal bowl is positioned at the first end of the body
35 providing a seat for a tubing hanger. At least one endless
 tubing access port is positioned between the internal bowl and
 the second end of the body. The endless tubing access port

extends from the exterior surface to the central flow passage in an angular orientation from the exterior surface toward the second end of the body. The endless tubing access port has a feed passage that extends toward the first end and outwardly from the body. The feed passage terminates in flow valve controls. The casing spool is installed on a well by securing the second end of the body to well casing, and positioning in the internal bowl a tubing hanger supporting a tubing string. When accumulated sand adversely affects the performance of the well, endless tubing is extended through the endless tubing access port while the tubing hanger is still in position supporting the tubing string. The endless tubing passes along the central flow passage beside the tubing string. Fluids are then pumped through the endless tubing to promote fluid circulation.

The method, as described above, eliminates the need for a service rig to attend the well and pull the tubing hanger and tubing string prior to sand cleanout procedures. A less costly endless tubing unit can attend the well and either wash a majority of the accumulated sand back into the formation or up to surface.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the invention will become more apparent from the following description in which reference is made to the appended drawings, wherein:

FIGURE 1 is a side elevation view, in section, of a **PRIOR ART** casing spool.

FIGURE 2 is a side elevation view, in section, of a casing spool constructed in accordance with the teachings of the present invention.

FIGURE 3 is a side elevation view, partly in section, of the casing spool illustrated in **FIGURE 2** installed on a well.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment, a casing spool generally

identified by reference numeral 10, will now be described with reference to **FIGURES 1 and 2**.

Referring to **FIGURE 1**, which is labelled as **PRIOR ART**,
5 there is illustrated a prior art casing spool generally identified by reference numeral 12. Casing spool 12 includes a cylindrical body 14 having an exterior surface 16, a first end 18, a second end 20, and a central flow passage 22, an outline of which is shown as dotted lines. A first attachment
10 flange 24 is at first end 18 of body 14. A second attachment flange 26 is at second end 20 of body 14. An internal bowl 28, an outline of which is shown as dotted lines, is at first end 18 of body 14. Casing spool 12 has a valve 30 that extends radially from internal bowl 28. When in use, second attachment
15 flange 26 is rigidly attached to a flange 40 of well casing 42. A tubing string 43 is suspended by means of a tubing hanger 27 from internal bowl 28.

Referring to **FIGURE 2**, casing spool 10 is illustrated.
20 Those elements that casing spool 10 shares in common with casing spool 12 have been labelled with the identical reference numerals. Casing spool 10 is similar to casing spool 12 in that casing spool 10 has a cylindrical body 14 having an exterior surface 16, a first end 18, a second end 20, and a
25 central flow passage 22. There is a first attachment flange 24 at first end 18 of body 14. There is a second attachment flange 26 at second end 20 of body 14. There is an internal bowl 28 at first end 18 of body 14. A valve 30 extends radially from internal bowl 28. Second attachment flange 24
30 is rigidly attached to flange 40 of well casing 42. A tubing string 43 is suspended by means of a tubing hanger 27 from internal bowl 28.

Casing spool 10 differs from casing spool 12 in that one
35 or more endless tubing access ports 32 is positioned between internal bowl 28 and second end 20 of body 14. Endless tubing access ports 32 extend from exterior surface 16 to central flow

passage 22, in an angular orientation from the exterior surface 16 toward second end 20 of body 14. Although more than one endless tubing access port 32 is provided, it is only contemplated that one will be required at any installation. 5 More than one is provided only to allow access from various sides of the installation. It is expected that in most installations the positioning of other equipment will preclude access from one or more sides. Endless tubing access ports 32 that are not required are sealed by a removable plug 34. 10 Endless tubing access port 32 that is to be used has a feed passage 44 that extends toward first end 18 and outwardly from body 14. Feed passage 44 terminates in flow control valve 46.

Referring to **FIGURE 3**, a wellhead assembly 50 is used for 15 continuous extraction of fluids from a well 52. Wellhead assembly 50 includes casing spool 10 attached to well casing 42 as described above. A fluids extraction equipment 54 to withdraw fluids up tubing string 43 is permanently mounted on casing spool 10. Fluids extraction equipment 54 has a flange 20 56 that is rigidly attached by means of bolts 58 to first attachment flange 24 of casing spool 10.

The use and operation of casing spool 10 will now be described with reference to **FIGURE 2**. When it becomes apparent 25 that the incursion of sand is adversely affecting the production to such an extent that the well is not economical, sand must be cleaned from the well. Endless tubing 36 is passed through endless tubing access port 32 into central flow 22 alongside of tubing string 43 to a selected depth within the 30 well. Water is then passed through endless tubing 36 to force sand in the well back into the formation from which it originated. Alternatively, water is pumped down tubing string 43, in a direction of flow that is the reverse of the normal pattern of flow within said tubing string 43. The incursion 35 of sand within the well mixes with the water, and then flows up endless tubing 36 to the surface, and the sand is thereby removed from the well.

The method, as described above, eliminates the need for a service rig to attend the well and pull the tubing hanger and tubing string during sand cleanout procedures. It is, therefore, a less costly and a less time consuming procedure than the procedure previously required to be used with casing spool 12.

It will be apparent to one skilled in the art that modifications may be made to the illustrated embodiment without departing from the spirit and scope of the invention as hereinafter defined in the Claims.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

- 5 1. A method of servicing a well, comprising the steps of:
providing a casing spool having:
a body having an exterior surface, a first end, a
second end, and a central flow passage;
an attachment flange at the first end of the body;
10 an internal bowl at the first end of the body
providing a seat for a tubing hanger;
at least one endless tubing access port positioned
between the internal bowl and the second end of the body, the
endless tubing access port extending from the exterior surface
15 to the central flow passage in an angular orientation from the
exterior surface toward the second end of the body, the endless
tubing access port having a feed passage that extends toward
the first end and outwardly from the body, the feed passage
terminating in flow control valve;
20 installing the casing spool on a well by securing the
second end of the body to well casing, and positioning in the
internal bowl a tubing hanger supporting a tubing string;
extending endless tubing through the endless tubing access
port while the tubing hanger is still in position supporting
25 the tubing string, such that the endless tubing passes along
the central flow passage beside the tubing string; and
pumping fluids through the endless tubing.

2. A casing spool, comprising:

a body having an exterior surface, a first end, a second end, and a central flow passage;

5 an attachment flange at the first end of the body;

an internal bowl at the first end of the body providing a seat for a tubing hanger;

two or more endless tubing access ports positioned between the internal bowl and the second end of the body, each

10 of the two or more endless tubing access ports extending from the exterior surface to the central flow passage in an angular orientation from the exterior surface toward the second end of the body, each of the two or more endless tubing access ports having a feed passage that extends toward the first end and
15 outwardly from the body, each of the feed passages terminating in one of a flow control valve and a plug.

