

[54] ASEPTIC VACUUM BREAKER

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137/241, 240, 154, 199

[56] References Cited

UNITED STATES PATENTS

1,820,138	8/1931	Hargis.....	137/519.5
3,410,296	11/1968	Bering.....	137/199
3,633,607	1/1972	Werra.....	137/241
3,661,505	5/1972	Frolich.....	137/241 X

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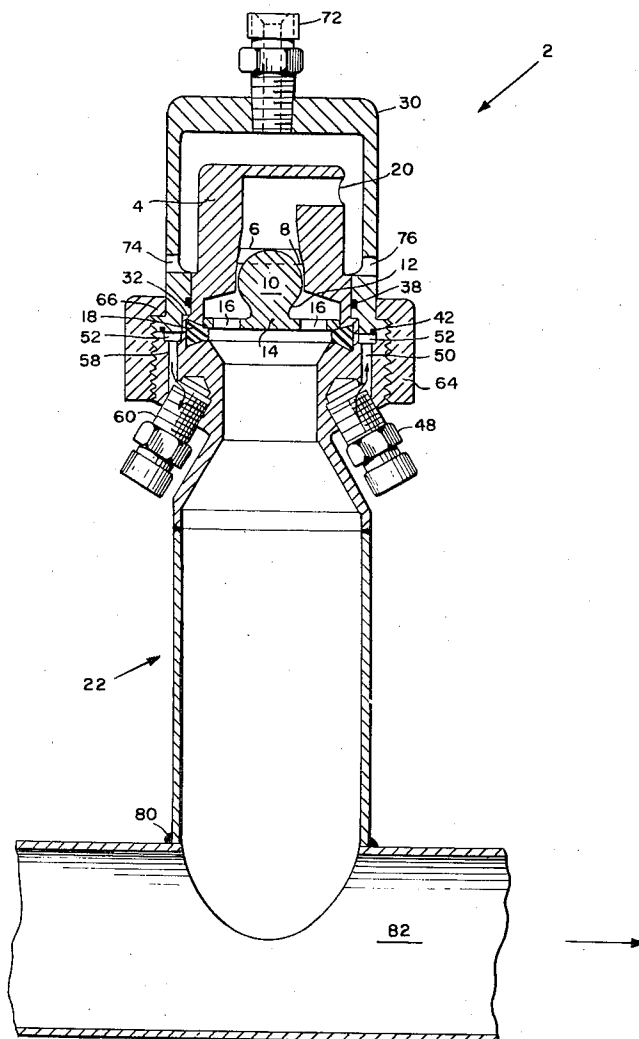
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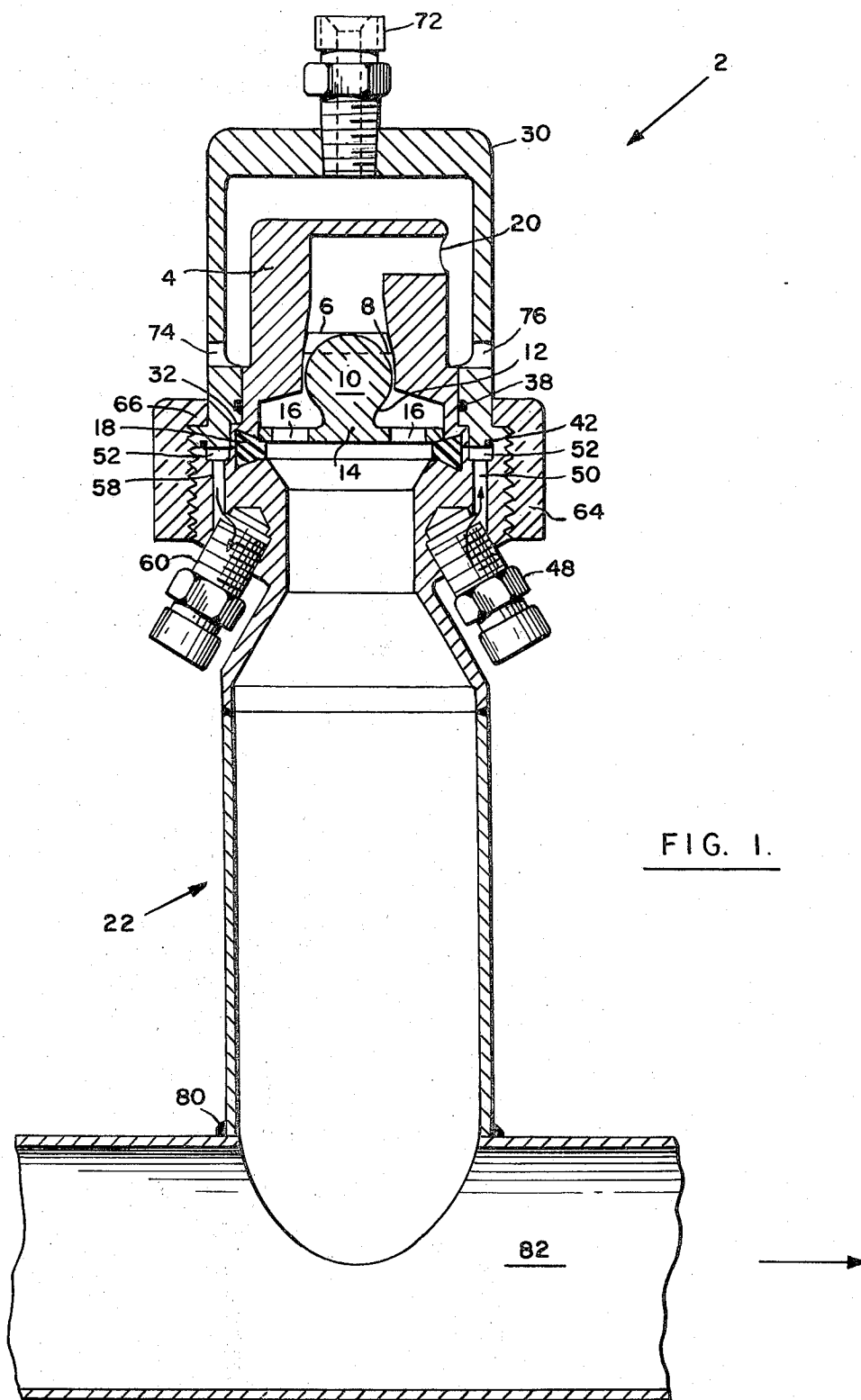
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ABSTRACT

An aseptic vacuum breaker has a hollow valve body having an internal valve seat with a valve plug urged away from said seat by gravity and stop means to limit said movement. The valve body has an opening below the valve plug and an opening above the valve seat. An adapter conduit is removably joined to the lower end of the valve body and a cover overlies the valve body and is joined to the lower end of the valve body. The joint between the adapter conduit and the valve body, the joint between the cover and the valve body and the joint between the cover and the adapter conduit are blanketed with an aseptic gas or liquid and the interior of the cover is supplied with an aseptic gas which flows to the opening in the valve body above the valve seat.

6 Claims, 3 Drawing Figures





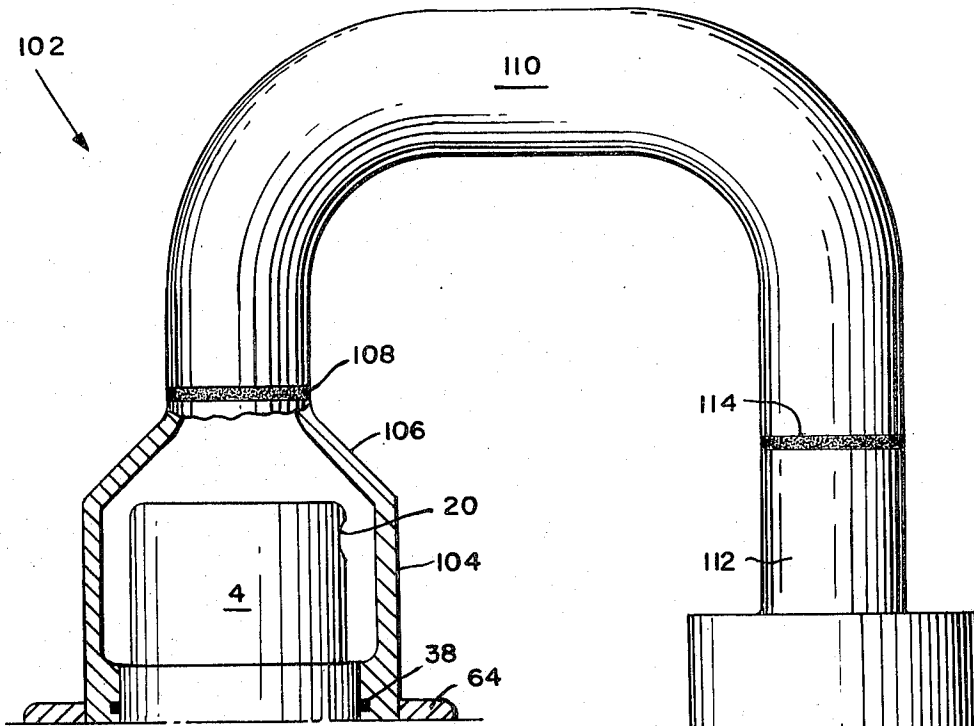


FIG. 3.

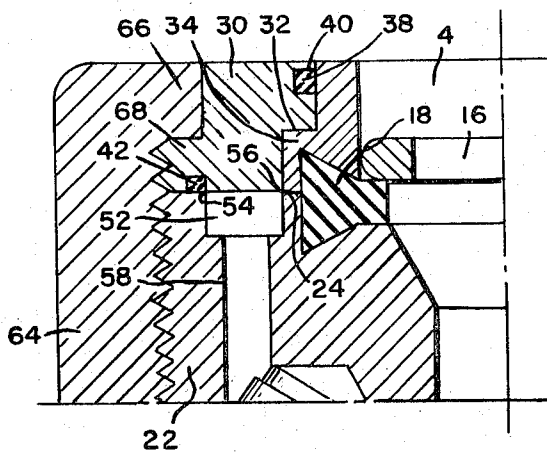
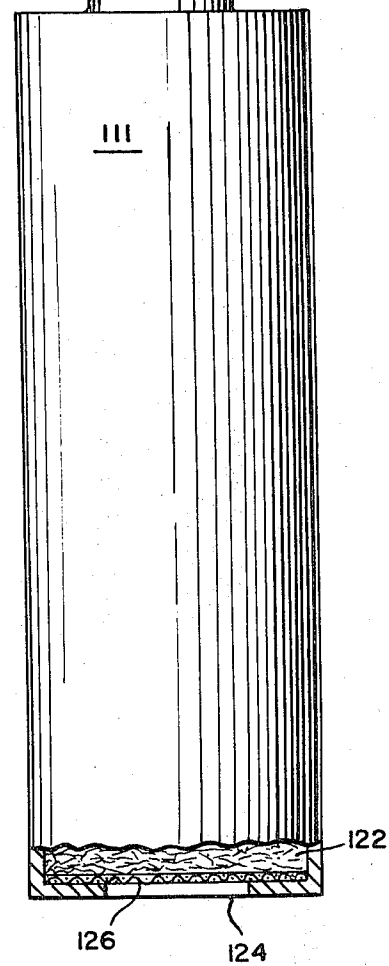


FIG. 2.



ASEPTIC VACUUM BREAKER

BACKGROUND OF THE INVENTION

In handling an aseptic liquid product in a pipeline which may, for example, lead to a holding tank, it is frequently necessary to provide a system which will prevent the building up of a vacuum in the pipeline and which at the same time will prevent the fluid product in the pipeline from being forced out of the system under pressure. Such systems employing check valves are generally well known to the art. In accordance with this invention such a system is provided which meets the highest sanitary standards since it positively precludes the entry of any nonsterile media into the pipeline through the vacuum prevention system.

BRIEF SUMMARY OF THE INVENTION

An aseptic vacuum breaker has a hollow valve body having an internal valve seat with a valve plug urged away from said seat by gravity and stop means to limit said movement. The valve body has an opening below the valve plug and an opening above the valve seat. An adapter conduit is removably joined to the lower end of the valve body and a cover overlies the valve body and is joined to the lower end of the valve body. The joint between the adapter conduit and the valve body, the joint between the cover and the valve body and the joint between the cover and the adapter conduit are blanketed with an aseptic fluid and the interior of the cover is supplied with an aseptic gas which flows to the opening in the valve body above the valve seat.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a vertical section through an aseptic vacuum breaker in accordance with the invention;

FIG. 2 is an enlarged view of a portion of the section of FIG. 1; and

FIG. 3 is a side elevation, partially broken away, of a modified vacuum breaker in accordance with the invention.

DETAILED DESCRIPTION

As shown in FIG. 1, an aseptic vacuum breaker 2 has a valve body 4 having a pair of spaced seats 6 and 8 on which the spherical headed valve plug 10 is adapted to seat. Valve plug 10 has a neck 12 and a base 14 containing openings 16. Base 14 is normally held against gasket 18 by gravity. Any upward flow of fluid in valve body 4 immediately urges plug 10 upwardly to seat against seats 6 and 8. Valve body 4 has an opening 20 for the passage of fluids.

Gasket 18 is seated between valve body 4 and adapter conduit 22. The lower end of valve body 4 and the upper end of adapter conduit 22 meet at a joint indicated at 24 (FIG. 2).

Valve body 4 is encompassed by a cover 30 which engages the lower portion of body 4 and has step portion 32 which overlies a step portion 34 in valve body 4. A gasket 38 in peripheral groove 40 in cover 30 engages the lower portion of valve body 4. The lower end of cover 30 abuts against the upper end of adapter conduit 22. A gasket 42 such as an O-ring gasket is mounted in the lower end of cover 4 and abuts against the upper end of adapter conduit 22. Steam is introduced through an inlet 48 adapted to be connected to a steam hose and passes through a passage 50 in

adapter conduit 22 to a peripheral passage 52 which delivers the steam to blanket, as best seen in FIG. 2, the joint 24 between valve body 4 and adapter conduit 22, and also the joint which is indicated at 54 between cover 30 and adapter conduit 22 as well as the joint indicated at 56 between cover 30 and valve body 4. The steam is exhausted through passage 58 (FIG. 1) and thence through outlet fitting 60 adapted to be connected to a discharge hose. Other gases may be employed such as, for example, aseptic air, oxygen or nitrogen. A sterile liquid compatible with the product being handled can also be employed.

A clamping nut 64 is threadably engaged to adapter conduit 22 and has a flange portion indicated at 66 which engages a step portion 68 of cover 30 to secure cover 30 tightly to adapter conduit 22 and in turn cause cover 30 to secure valve body 4 tightly to adapter conduit 22.

The interior of cover 30 is supplied with steam through a fitting 72 which is adapted to be connected to a steam hose and which is secured in the top of cover 30. Steam will pass into valve body 4 through opening 20 and downwardly through adapter conduit 22. Cover 30 is provided with exhaust openings 74 and 76 to permit excess steam to pass out from inside the cover to the atmosphere. Other gases may be employed such as, for example, aseptic air, oxygen or nitrogen.

Adapter conduit 22 is welded as indicated at 80 to a sterile product pipeline indicated at 82.

In operation, without product and with zero pressure in pipeline 82, steam passes from the interior of cover 30 through opening 20 into valve body 4 and thence downwardly into adapter conduit 22 and into pipeline 82. A low steam pressure of 2 to 5 pounds per square inch will be satisfactory. Excess steam will also pass out to the atmosphere through openings 74 and 76 in cover 30. The steam introduced into fitting 48 will advantageously in the range of from about 2 to 5 pounds per square inch and will absolutely insure that no nonsterile media enters into the interior of the vacuum breaker through any of the joints.

With normal product flow in pipe 82, the pressure in pipeline 82 will cause fluid to flow in conduit 22 and thence into valve body 4, valve plug 10 will be carried upwardly against seats 6 and 8 to prevent discharge through vacuum breaker 2.

In the event of, for example, a pump failure, the product in line 82 will flow back to a low point in the system, inducing a vacuum and thus cause the valve plug 10 to move downwardly to provide for the breaking of the vacuum by admission of a sterile gas through opening 20 and downwardly through conduit 22 into pipe 82.

An alternative embodiment is shown in FIG. 3. Here an aseptic vacuum breaker 102 is identical with the vacuum breaker 2 with the sole exception of cover 104 and the manner of supplying aseptic fluid to the interior of cover 104. Cover 104 is identical with cover 30 with the exception of the elimination of openings 74 and 76 and the adaptation of upper portion 106 to provide for its welding at 108 to a sterile air conduit 110.

A filter 111 has a neck 112 which is welded at 114 to the outer end of conduit 110. Filter 110 is filled with glass wool 122 and has an air inlet opening 124 covered by a screen 126 to retain the glass wool 122. The air passing into cover 104 is made aseptic by first passing through filter 111.

It will be understood that the above described embodiments are intended to be illustrative and not limiting.

I claim:

1. An aseptic vacuum breaker comprising:
a hollow valve body having an internal valve seat,
a valve plug urged away from said seat by gravity,
means to limit the movement of said valve plug away
from said seat to a predetermined distance,
said valve body having a lower opening below the
valve seat and an upper opening above the valve
seat,
an adapter conduit removably joined to the lower
end of the valve body and communicating with the
interior of the valve body,
a cover overlying the valve body, removably joined
to the lower end of the valve body, spaced from the
upper opening of the valve body, and having an
opening to connect the interior thereof to the at-
mosphere,
means to blanket the joint between the adapter con-
duit and the cover with an aseptic fluid, and
means to supply the interior of the cover with an
aseptic gas.
2. A device in accordance with claim 1 in which the
second mentioned means employs a blanket of steam.
3. A device in accordance with claim 2 in which the
aseptic fluid supplied by the last mentioned means is

steam.

4. A device in accordance with claim 1 in which the
blanketing means includes a peripheral passage.

5. A device in accordance with claim 1 in which the
blanketing means additionally blankets the joint be-
tween the cover and the valve body with an aseptic
fluid.

6. An aseptic vacuum breaker comprising:
a hollow valve body having an internal valve seat,
a valve plug urged away from said seat by gravity,
means to limit the movement of said valve plug away
from said seat to a predetermined distance,

said valve body having a lower opening below the
valve seat and an upper opening above the valve
seat,

an adapter conduit removably joined to the lower
end of the valve body and communicating with the
interior of the valve body,

a cover overlying the valve body, removably joined
to the lower end of the valve body, and spaced
from the upper opening of the valve body,

means to blanket the joint between the adapter con-
duit and the cover with an aseptic fluid, and

means including a conduit communicating with the
interior of the cover to supply aseptic air to the in-
terior of the cover.

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