

System for separating double pipelines

The invention relates to a system for separating
5 coaxially arranged double pipelines, comprising two
outer pipe connection elements, two inner pipe
connection elements, an outer connecting element for
detachable connection to the outer pipeline and an
inner connecting element for detachable connection to
10 the inner pipeline, wherein the inner pipe connection
elements are configured as inner flange bushing parts,
wherein the inner connecting element is arranged
detachably connected by means of union nuts to the
inner flange bushing parts, and wherein the outer
15 connecting element is arranged detachably connected by
means of further, outer flange bushing parts and
further, outer union nuts to the outer pipe connection
elements.

20 In pipeline construction, in particular in the
transport of environmentally hazardous media, double
pipelines are used. The media are liquid or gaseous.
Double pipeline systems consist of an outer pipeline,
in which the medium-carrying inner pipeline is
25 integrated. The outer pipeline serves as a protective
jacket for the inner pipeline. The interspace between
the outer and the inner pipeline serves as a collecting
vessel in case of possible leaks from the inner
pipeline. For the inner and outer pipeline, different
30 thermoplastic plastics can be used according to
compatibility with the medium. The interspace serves
either as a monitoring space for leaks from the inner
pipeline, or to stabilize the temperature of the medium
in the inner pipeline. With double pipelines, the
35 hazard potential in the transport of dangerous media is
reduced. In the event of damage, a leak source can be
rapidly discovered with a leak detection system.

From CH 688 971 A5, an arrangement of a fitting in a plastics double pipe system is known. Between the two ends of the outer pipeline there is disposed a T-shaped plastics housing. Two opposite ends of the T-shaped housing are connected to a respective flange region of the outer pipelines. The third end of the T-shaped housing is closed off with a cover, through which a coupling for actuating the spindle of the fitting is rotatably led. The flange regions of the outer pipeline have an internal thread, in which adjusting bushings can be screwed. The adjusting bushings are tubular special components, which on the inner side receive the ends of the inner pipeline, butt at one end against the fitting and, on the other end, have an external thread matching the internal thread of the outer pipeline.

Starting from this prior art, the object of the invention is to define a system for separating coaxially arranged double pipelines, which system can be built with, as far as possible, modular components and, in case of disassembly or reconstruction, can be mechanically separated as simply as possible.

This object is achieved by a system for separating coaxially arranged double pipelines, comprising two outer pipe connection elements, two inner pipe connection elements, an outer connecting element for detachable connection to the outer pipeline and an inner connecting element for detachable connection to the inner pipeline, wherein the inner pipe connection elements are configured as inner flange bushing parts, wherein the inner connecting element is arranged detachably connected by means of union nuts to the inner flange bushing parts, and wherein the outer connecting element is arranged detachably connected by means of further, outer flange bushing parts and further, outer union nuts to the outer pipe connection elements, characterized in that each outer pipe connection element has on the outer periphery a stop

for the outer flange bushing part, in that the outer pipe connection element has on the inner periphery a stop for the inner flange bushing part, and in that the outer pipe connection element has through holes for the medium in the jacket space of the double pipeline system.

Preferred refinements of the invention emerge from the dependent claims.

10

It is advantageous for the system to be able to be adapted as easily as possible to different tasks. This is achieved by virtue of the fact that the inner connecting element is configured as a non-return valve.

15

This is also achieved by virtue of the fact that the inner connecting element is configured as a screwed pipe connection with a flange bushing part and a union nut. This is further also achieved by virtue of the fact that the inner connecting element is configured as a valve housing with a closure part. Even in the case of a different inner connecting element, all other components of the system remain unaltered.

20

The system essentially consists of two housings of a fitting, arranged one inside the other, the inner element being constructed at least two nominal sizes smaller than the outer connecting element.

25

An illustrative embodiment of the invention is described with reference to the figures, wherein:

30

Figure 1 shows a section through a system according to the invention for separating coaxially arranged double pipelines,

35

Figure 2 shows a perspective view of an outer pipe element of the system for separating coaxially arranged double pipelines,

Figure 3 shows a section through the outer pipe element of Figure 2,

Figure 4 shows a section through a further system for
5 separating coaxially arranged double pipelines,

Figure 5 shows a section through a further system for separating coaxially arranged double pipelines, and

10 Figure 6 shows a perspective view of the system for separating coaxially arranged double pipelines of Figure 1.

In Figure 1, a system 1 for separating coaxially
15 arranged double pipelines is represented in section along the pipeline axis. The system 1 comprises two coaxially arranged double pipelines 2, 3, 4, 5, respectively consisting of an outer-lying pipeline 2, 3 and an inner-lying pipeline 4, 5. For the nominal
20 values of the pipeline diameters, standard values are chosen, the outer-lying pipeline having an approximately 1.4 to 2 times larger diameter than the inner-lying pipeline. In the case of smaller pipeline diameters up to about 60 mm, the ratio of outer pipe
25 diameter to inner pipe diameter tends to be about 2 and, in the case of larger pipeline diameters from about 100 mm, the ratio of outer pipe diameter to inner pipe diameter tends to be about 1.4. The result is that standard fittings can be chosen even for fittings which
30 are used to separate or connect the coaxially arranged pipelines 2, 3, 4, 5.

The outer pipelines 2, 3 are fixedly connected by means of bonding or welding to outer pipe connection elements
35 6, 7. The outer pipe connection elements 6, 7 are symmetrically arranged, tubular plastics parts, which in terms of their inner diameter, conform to the outer diameter of the inner-lying pipeline 4, 5 and have a plurality of through holes 20 for the medium in the

jacket space 21 of the double pipeline system. The end of the inner-lying pipeline 4, 5 is likewise fixedly connected by means of welding or bonding to an inner flange bushing part 8, 9 as the inner pipe connection element 8, 9. Between the inner-lying flange bushing parts 8, 9, there is disposed an inner connecting element 11. In the example of Figure 1, the inner connecting element 11 is configured as a valve housing 24 having a ball 26 as the closure part 25. The inner connecting element 11, here the valve housing 24, is detachably secured between the inner-lying flange bushing parts 8, 9.

In the example of Figure 1, the detachable connection is achieved by two inner union nuts 12, 13, as is the case with commercially available ball valves. In order to improve the leak-tightness between the inner connecting element 11 and the flange bushing parts 8, 9, O-rings are used, which are not represented in Figure 1. The detachable connection can also be achieved, however, by a comparable type of connection, such as, for instance, a threaded connection or a flanged or clamped connection.

The outer pipelines 2, 3 are likewise detachably connected to each other with an outer connecting element 10. The outer connecting element 10, too, is configured like a valve housing of a commercially available ball valve. The detachable connection consists of two outer union nuts 16, 17, a flange bushing part 15 and a flange bushing part 14 having a screw-in region 28. For the sake of clarity, in Figure 1 an outer union nut 16 has been omitted. Here too, in order to improve the leak-tightness of the system, O-rings are used at the designated locations. The flange bushing part 14 has in the screw-in region 28 an external thread 29, which fits the internal thread 30 of the outer connecting element 10. Since the outer connecting element 10 is configured as a valve housing

of a ball valve, an internal thread 30 for the securement of the closure part is already present and can be used for screwing-in of the flange bushing part 14.

5

In Figure 2, one of the outer pipe connection elements 6, 7 is shown in perspective representation. The clamping and centring of the system 1 for separating coaxially arranged double pipelines 2, 3, 4, 5 is achieved by the configuration of stops 18, 19 on the outer pipe connection elements 6, 7. A first stop 18 is configured on the outer periphery as a shoulder for the outer flange bushing parts 14, 15. The second stop 19 serves as a support for the inner flange bushing parts 8, 9. In Figure 2, the through holes 20, the stop 19 for the inner flange bushing parts 8, 9, and the stop 18 for the outer flange bushing parts 14, 15 are visible.

20 In Figure 3, a section through the outer pipe connection element 6, 7 is represented. The outer pipe connection element 6, 7 is a tubular plastics part. In the central pipe 31, the inner pipeline 4, 5 of the double pipe system is inserted. At the end 32, the outer pipeline is 2, 3 is fastened by bonding or welding. In the region 33 of the largest outer diameter, the outer connecting element 10 is disposed in sealing arrangement. In the rear region 34, the outer flange bushing part 14, 15 is fastened.

30

In Figures 4 and 5, further illustrative embodiments of the system for separating coaxially arranged double pipelines are represented in section. In Figure 4, in contrast to Figure 1, a non-return valve 27 is fitted instead of a ball valve. The non-return valve 27 is configured with the same external thread 35 on the front and rear side and, according to the direction of flow of the medium in the inner-lying pipeline 4, 5, can be installed between the inner flange bushing parts

8, 9 such that it is detachable and clamps in both directions. The modular construction of the system and the use of existing standard components mean that the double pipeline system can be very flexibly adapted to the different requirements. In the outer connecting element 10, as also in Figure 1, a drain plug 36 is represented. In case of leaks, the double pipeline system can here be drained. In place of the plug 36, a sensor can also be fitted to monitor the conditions in the jacket 21, for instance pressure, vacuum, temperature, gas content or relative humidity.

In Figure 5, as the inner connecting element 11, a simple screw connection, 37 with a union nut 38 is represented in section.

In Figure 6, the system for separating coaxially arranged double pipelines 2, 3, 4, 5 of Figure 1 is shown in perspective representation. For the operation of the closure part 25 or of the ball valve 26, a hand lever or an electric or pneumatic drive motor can be put on. For the actuation of the closure part 25 of the inner-lying valve housing 24, a coupling pin 39 is provided, which establishes the transition from one to the other actuating region of the two inner and outer connecting elements 10, 11. The system is connected, for instance, by means of electric welding sleeves 40 and bonding sleeves 41, to the existing double pipelines. In Figure 6, a spacer 42 for the centring of the coaxially arranged inner and outer pipelines 2, 3, 4, 5 is also visible.

Patent claims

1. System (1) for separating coaxially arranged
5 double pipelines (2, 3, 4, 5), comprising two outer
pipe connection elements (6, 7), two inner pipe
connection elements (8, 9), an outer connecting element
(10) for detachable connection to the outer pipeline
(2, 3) and an inner connecting element (11) for
10 detachable connection to the inner pipeline (4, 5),
wherein the inner pipe connection elements are
configured as inner flange bushing parts (8, 9),
wherein the inner connecting element (11) is arranged
detachably connected by means of union nuts (12, 13) to
15 the inner flange bushing parts (8, 9), and wherein the
outer connecting element (10) is arranged detachably
connected by means of further, outer flange bushing
parts (14, 15) and further, outer union nuts (16, 17)
to the outer pipe connection elements (6, 7),
20 characterized in that each outer pipe connection
element (6, 7) has on the outer periphery a stop (18)
for the outer flange bushing part (14, 15), in that the
outer pipe connection element (6, 7) has on the inner
periphery a stop (19) for the inner flange bushing part
25 (8, 9), and in that the outer pipe connection element
(6, 7) has through holes (20) for the medium in the
jacket space (21) of the double pipeline system.

30 2. System (1) for separating coaxially arranged
double pipelines (2, 3, 4, 5) according to Claim 1,
characterized in that the outer connecting element (10)
is configured as a ball valve housing (10) fitting the
pipeline diameter of the outer pipeline (2, 3).

35

3. System (1) for separating coaxially arranged
double pipelines (2, 3, 4, 5) according to Claims 1 and
2, characterized in that the inner connecting element

(11) is configured as a non-return valve (27) fitting the pipe diameter of the inner pipeline (4, 5).

4. System (1) for separating coaxially arranged
5 double pipelines (2, 3, 4, 5) according to Claims 1 and
2, characterized in that the inner connecting element
(11) is configured as a screwed pipe connection (37),
fitting the pipe diameter of the inner pipeline (4, 5),
with a union nut (38).

10

5. System (1) for separating coaxially arranged
double pipelines (2, 3, 4, 5) according to Claims 1 and
2, characterized in that the inner connecting element
(11) is configured as a valve housing (24), fitting the
15 pipe diameter of the inner pipeline (4, 5), with a
closure part (25).

6. System (1) for separating coaxially arranged
double pipelines (2, 3, 4, 5) according to at least one
20 of Claims 1 or 4, characterized in that the inner
connecting element (11) is configured as a valve
housing (24), fitting the pipe diameter of the inner
pipeline (4, 5), with a ball (26).

25 7. System (1) for separating coaxially arranged
double pipelines (2, 3, 4, 5) according to at least one
of Claims 1 or 4 to 6, characterized in that in the
outer connecting element (10) there is disposed a
coupling pin (39) for the actuation of the closure part
30 (25).

8. System (1) for separating coaxially arranged
double pipelines (2, 3, 4, 5) according to at least one
of the preceding claims, characterized in that the non-
35 detachable connections are configured such that they
can be made by welding methods, in particular electric
welding or bonding methods.

9. System (1) for separating coaxially arranged double pipelines (2, 3, 4, 5) according to at least one of the preceding claims, characterized in that the detachable connections are configured such that they
5 can be made by clamping methods, in particular by screwed clamping connections or union nuts.