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(54) Inspection chamber part and method for preparing such part for installation

(57) The invention relates to an inspection chamber part (3,4,5;103,104,105) comprising a spigot-socket structure (10;110). This spigot-socket structure comprises a spigot shaped first section (11;111) and a socket shaped second section (12;112). The sections are integrally connected to each other, at least initially and at least one of the sections is integrally connected to the inspection chamber part. The first and second section have a compatible shape, such that if the integral connection between the first and second section were to be severed, the first section could closely fit into the second section so as to establish a spigot-socket connection.
The inspection chamber part may be integral part of a monolithic inspection chamber or be a separate part, such as a base, a shaft or a cone from which a modular inspection chamber can be assembled.

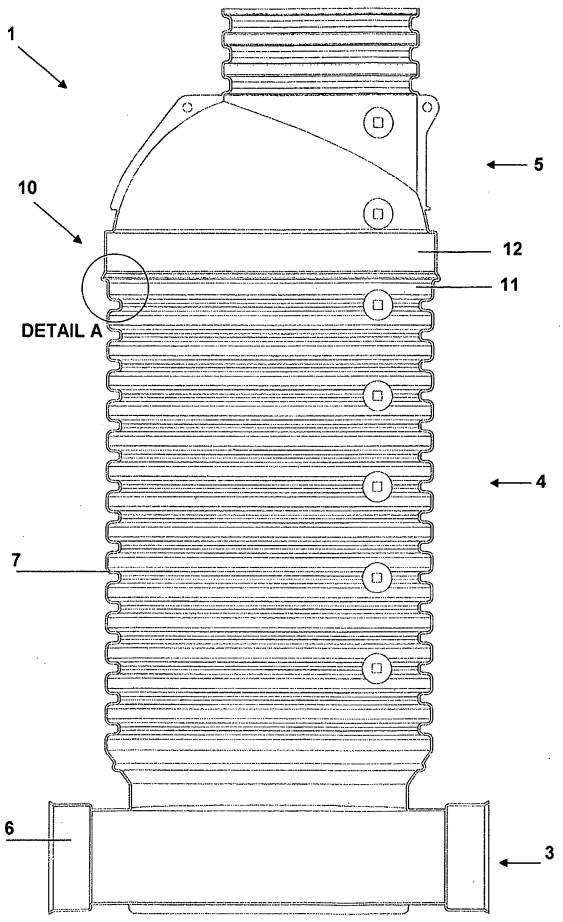

FIG. 1

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Description

[0001] The invention relates to an inspection chamber part.

[0002] Inspection chambers are known. They may for instance be used to collect and drain away rain water to drainage system, e.g. a sewer. The larger chambers may further serve to give access to the drainage system, e.g. for inspection, maintenance or the like purposes. Generally, an inspection chamber comprises a base or bottom part, a shaft or intermediate part and/or a cone or transition part. Two or more of these parts may be integrally connected to each other so as to form an inspection chamber of monolithic design. Alternatively, said parts may be inter-connectable to each other via suitable spigot-socket ends so as to form an inspection chamber of modular design. Monolithic inspection chambers can be readily manufactured, e.g. by rotation moulding, but their use may be limited due to their fxed configuration. This disadvantage is overcome by the modular inspection chambers. Their configuration can be readily varied by combining different parts. However, the choice in available combinations may be limited, since parts to be connected must have compatible spigot and socket ends.

[0003] It is an object of the invention to provide a part for a monolithic or modular inspection chamber, with which the disadvantages of the known inspection chambers are overcome or at least reduced.

[0004] To that end, an inspection chamber part according to the invention is provided with a spigot-socket structure comprising a spigot shaped first section and a socket shaped second section. The sections are integrally connected to each other, at least initially, and at least one of the sections is integrally connected to the inspection chamber part. The first and second section are dimensioned such that if the first section is to be separated from the second section, it can closely fit into said second section so as to establish a spigot-socket connection.

[0005] The spigot-socket structure according to the invention allows the configuration of modular and monolithic inspection chambers to be modified more easily.

[0006] The spigot-socket structure may for instance form part of a monolithic inspection chamber. In such case, the spigot-socket structure effectively enables the monolithic chamber to be transferred into modular inspection chamber parts, with all advantages thereof. This can be achieved by severing the connection between the first and second section of the spigot-socket structure. By doing so, the chamber will be divided into two separate portions, one portion having a spigot end formed by the first section, the other portion having a socket end formed by the second section. These portions can subsequently be connected to other inspection chamber parts with compatible spigot or socket ends.

[0007] The spigot-socket structure may also form part of a modular inspection chamber part. In such case, the spigot-socket structure allows said part to be provided with an end configuration of choice, i.e. a spigot end or a socket end. To that end, the spigot-socket structure may be integrally connected to the inspection chamber part with one section, the other section forming a socket end or a spigot end. This end configuration can be changed into a spigot end, respectively socket end, by severing the connection between the sections.

[0008] According to an aspect of the invention, the first section may have a circumferential groove extending along its outer surface. Such groove can be provided with a sealing means when the first section is to serve as spigot end in a spigot-socket connection.

[0009] According to a further aspect of the invention, the first section of the spigot-socket structure may be adjoined by a portion of the inspection chamber part that is shaped similar to said first section. If, for instance, the first section has a circumferential groove, said adjoining portion may be corrugated with the corrugations forming circumferential grooves that are similar to the groove of the first section. Thanks to such similar shape, the adjoining portion may take over the spigot function of the first section. As a consequence, the inspection chamber part can be shortened by cutting away said first section. The shortened part can subsequently be reconnected to other inspection chamber parts, its cut-off end serving as spigot end. This may for instance be advantageous where the spigot-socket structure is part of a monolithic inspection chamber. The overall height of such chamber can be readily adjusted by dividing the chamber into two separate portions as described before. Next, the portion featuring the first section can be shortened as described before. Next, this shortened portion can be reconnected to the other portion by using the cut-off end as spigot end.

[0010] According to another aspect of the invention, the second section may have a flared end portion. This may facilitate insertion of a spigot end, when said second section is used as socket end.

[0011] According to yet another aspect of the invention, the spigot-socket structure can be provided with guiding means to guide a cutting tool when severing the connection between the first and second section. Such guiding means may for instance include one or more scores or notches. Thanks to the guiding means, severing the structure at the correct location becomes easier and more fool proof, making it feasible to carry out such severing action in situ, at a construction site.

[0012] The invention further relates to various methods for preparing an inspection chamber part for installation. According to these methods, the integral connection between the first and second section of the spigot-socket structure may be severed, either to provide the inspection chamber part with a different end configuration, or to divide de inspection chamber part into two portions, each portion having a suitably shaped end configuration (socket or spigot end) allowing the portions to be re-connected to each other or to other parts, possibly after shortening of one of these portions.

[0013] Further advantageous embodiments of an inspection chamber part according to the invention and of

methods for preparing such part for installation are set forth in the dependent claims.

[0014] To explain the invention, exemplary embodiments thereof will hereinafter be described with reference to the accompanying drawings, wherein:

FIG. 1 shows a monolithic inspection chamber part with a spigot-socket structure according to the invention in its initial, integral condition;
FIG. 2 shows the spigot-socket structure of Figure 1 in further detail;
FIG. 3 shows the inspection chamber of Figure 1 with the spigot-socket structure in severed condition;
FIG. 4 shows an inspection chamber part for a modular inspection chamber, the part being provided with a spigot-socket structure according to the invention in its initial, integral condition;
FIG. 5 shows the spigot-socket structure of Figure 4 in further detail;
FIGG. 6A,B show the inspection chamber part of Figure 4, with the spigot-socket structure in integral, respectively severed condition; and
FIGG. 7A-C show various inspection chamber parts to which the inspection chamber parts of Figures 6A, B can be connected to form a modular inspection chamber.

[0015] In this description the wording 'inspection chamber part' may refer to an integral part of a monolithic inspection chamber. It may further refer to a separate part of a modular inspection chamber, such as a base, a cone or a shaft. It may further refer to an integral part of such separate inspection chamber part.

[0016] Figures 1-3 show an embodiment of an inspection chamber part with a spigot-socket structure 10 according to the invention. The inspection chamber part forms integral part of a monolithic inspection chamber 1, which may for instance be made from plastic through rotation moulding. The illustrated inspection chamber 1 comprises a base 3, a shaft 4 and a cone 5. The base 3 is provided with pipe connectors 6 for connection to pipes of an underground sewer system (not shown). The cone 5 serves to connect the inspection chamber 1 to a street inlet (not shown) and to overcome any differences in diameter that may exist between the two. To that end the cone 5 may have a conical, dome-like or otherwise converging shape, as shown. The shaft 4 serves to increase the overall height of the inspection chamber 1 and with that its permissible installation depth. The shaft 4 may have a corrugated wall 7, as shown. During installation, these corrugations may fill up with soil, thus increasing the chamber's resistance against external loading, such as traffic loads. It may further help to anchor the chamber into the ground. Of course, in an alternative embodiment, the wall may be smooth or profiled differently.

[0017] The spigot-socket structure 10 comprises a first section 11 and a second section 12. The first section 11, in the illustrated embodiment, is formed as an integral extension of the shaft 4 with a similar corrugated wall and a similar outer diameter D_o (see Figure 2). The second section 12, in the illustrated embodiment, is formed as an integral part of the cone 5. It is substantially tubular shaped with an inner diameter D_i and a flared end portion 13. The inner diameter D_i is slightly larger than the outer diameter D_o. In the initial condition shown in Figures 1 and 2, the second section 12 is with its flared end portion 13 integrally connected to the first section 11 via an inter-connecting provision 14. This inter-connecting provision 14 may for instance be a ring shaped wall, extending radially outward, from an end edge of the first section 11 towards an end edge of the flared portion 13 of the second section 12. In an alternative embodiment (not shown), the inter-connecting provision 14 may be slightly inclined upward. There where the inter-connecting provision 14 and the flared end portion 13 meet, notches and/or scores 15 may be provided along the outer circumference of the spigot-socket structure 10.

[0018] The afore-described spigot-socket structure 10 can be used as follows to adapt the configuration of the monolithic inspection chamber 1, for instance its overall height.

[0019] To that end, the spigot-socket structure 10 is first cut in two by severing the inter-connecting provision 14 between the first and second section 11, 12. This cutting step may be facilitated by the scores and/or notches 15, which may help to centre and guide a cutting tool. By cutting the spigot-socket structure 10 in two, the inspection chamber 1 will become divided in two as well: a lower portion LP which in the illustrated embodiment includes the base 3, the shaft 4 and the first section 11 of the spigot-socket structure 10, and an upper portion UP which in the illustrated embodiment includes the cone 5 and the second section 12 of the spigot-socket structure 10.

[0020] Next, the lower portion LP may be shortened by cutting away the first section 11 and part of the shaft 4. The remaining part of the shaft 4 may be provided with a sealing means 18 that can be received in one of the corrugations, preferably the one 17 nearest to the cut-off end 22. After this, the portions LP, UP can be reconnected by inserting the cut-off end 22 in the second section 12 of the upper portion UP. Since the inner diameter D_i of the second section 12 is slightly larger than the outer diameter D_o of the cut-off end 22, the second section 12 can closely fit around said cut-off end 22 and thus serve as socket 20, where the cut-off end 22 serves as spigot.

[0021] Thanks to a spigot-socket structure 10 according to the invention, the overall height of a monolithic inspection chamber 1 can thus be changed without the need for additional parts to assemble the inspection chamber 1 back together.

[0022] In the illustrated embodiment, the spigot-socket structure 10 is located at the junction of two parts, more particularly at the junction of the shaft 4 and the cone 5. In another embodiment, the spigot-socket structure 10 could be located between the shaft 4 and the base 3. In

such case, the first section 11 could be integrally connected to the shaft 4 and the second section 12 could be integrally connected to the base 3. Of course, the inspection chamber 1 may also be provided with several spigot-socket structures 10, which do not necessarily have to be located at the junction of two parts.

[0023] In yet another embodiment (not shown), the monolithic inspection chamber 1 may comprise merely two parts, e.g. a base 3 and a cone 5 (not shown). The spigot-socket structure 10 may be located between said parts 3, 5 and may be used to alter the geometry of the inspection chamber as follows. First, the structure 10 can be severed as described before, causing the inspection chamber 1 to be divided in two portions LP, UP. One of these portions will have a spigot end formed by the first section 11, the other portion will have a socket end formed by the second section 12. Next, said portions LP, UP can be connected to one or more additional parts so as to create a new inspections chamber of modular design. The portions LP, UP may for instance be connected to an intermediate shaft 4 so as to increase the overall height of the inspection chamber. The shaft 4 may have one spigot shaped end and one socket shaped end (cf. Figure 7B) to co-operate with the second section 12, respectively the first section 11 of said portions LP, UP.

[0024] Figures 4-7 show other embodiments of inspection chamber parts according to the invention. These inspection chamber parts are formed as separate parts, e.g. a base 103, a cone 105 and a shaft 104, which can be interconnected to each other to form an inspection chamber of modular design. The inspection chamber parts 103, 104, 105 may for instance be made through rotation moulding or injection moulding. The shafts 104 may also be extruded. Each inspection chamber part 103, 104, 105 can be provided with one or more spigot-socket structures 110 according to the invention. This will now be described in further detail with reference to Figures 4 and 5, showing a cone 105 with a spigot-socket structure 110.

[0025] The spigot-socket structure 110 comprises a first section 111 that with one end is integrally connected to a lower end of the cone 105 and with its other end is integrally connected to a second section 112, via an interconnecting provision 114. The first section 111 has as substantially tubular, more particularly cylindrical shape with an outer diameter D_o. The second section 112 has a substantially tubular, more particularly cylindrical shape, with an inner diameter D_i that is slightly larger than the aforementioned outer diameter D_o. The free end 113 of the second section 112 may be flared, as shown. The first section 111 is provided with a circumferential groove 117 running along its outer surface. This groove 117 may be formed between two circumferential ribs 119, as shown. Alternatively, the wall of the first section 111 may be corrugated, so as to form one or more grooves 117 between the corrugations.

[0026] With the spigot-socket structure 110 according to Figure 4 and 5 the end configuration of the cone 105 can be readily changed from socket type to spigot type, as will be explained with reference to Figures 6A,B.

[0027] Figure 6A shows the cone 105 according to Figure 4, with the spigot-socket structure 110 in its initial condition. In this condition, the second section 112 forms as socket end 120, allowing the cone 105 to be connected to an inspection chamber part with a compatible spigot end 122, for instance a shaft 104 as shown in Figure 7A, or a base with a spigot end (not shown).

[0028] Figure 6B shows the cone 105 according to Figure 4, but now with the second section 112 being cut off (in a similar way as described before). The remaining first section 111 can now serve as spigot end 121, allowing the cone 105 to be connected to an inspection chamber part with a compatible socket end 123, such as for instance a shaft 104' as shown in Figure 7B or a base 103' as shown in Figure 7C. Before making such connection, a sealing means (not shown) may be fitted in the groove 117.

[0029] According to a preferred embodiment, the design of the groove 117 may correspond to that of the corrugations of the shaft 4, 104, 104' so that the same sealing means can be used for all connections.

[0030] As mentioned before, each of the inspection chamber parts 104, 104', 103' shown in Figures 7A-C may be provided with one or more spigot-socket structures 110 according to the invention. Thanks to such a spigot-socket structure 110 the inter-connectability of the said parts will be improved and the available number of part combinations can be greatly increased.

[0031] The invention is not in any way limited to the exemplary embodiments presented in the description and drawing. All combinations (of parts) of the embodiments shown and described are explicitly understood to be incorporated within this description and are explicitly understood to fall within the scope of the invention. Moreover, many variations are possible within the scope of the invention, as outlined by the claims.

Claims

1. Inspection chamber part (3, 4, 5; 103, 104, 105), comprising a spigot-socket structure (10; 110), the spigot-socket structure comprising a spigot shaped first section (11; 111) and a socket shaped second section (12; 112), said sections being integrally connected to each other, at least initially, at least one of the sections being integrally connected to the inspection chamber part (3, 4, 5; 103, 104, 105), wherein the first and second section have a compatible shape, such that if the integral connection (14; 114) between the first and second section were to be severed, the first section (11; 111) could closely fit into the second section (12; 112) so as to establish a spigot-socket connection.

2. Inspection chamber part (3, 4, 5; 103, 104, 105) ac-

cording to claim 1, wherein the first section (11; 111) is integrally connected to a portion (4) of the inspection chamber part of which the outer shape corresponds to that of the first section, so that this portion too could fit into the second section (12; 112) to establish a spigot-socket connection.

3. Inspection chamber part (3, 4, 5; 103, 104, 105) according to claim 1 or 2, wherein the first section (11; 111) along its outer side is provided with a circumferential groove (17; 117).

4. Inspection chamber part (3, 4, 5; 103, 104, 105) according to claim 3, wherein the first section (11; 111) is integrally connected to a corrugated portion (4) of the inspection chamber part, the corrugations (7) forming circumferential grooves (17) which correspond to that of the first section (17; 117).

5. Inspection chamber part (3, 4, 5; 103, 104, 105) according to anyone of the preceding claims, wherein the second section (12; 112) has a flared end portion (13; 113).

6. Inspection chamber part (3, 4, 5; 103, 104, 105) according to claim 5, wherein the second section (12) adjoins the first section (11) with its flared end portion (13).

7. Inspection chamber part (3, 4, 5; 103, 104, 105) according to anyone of the preceding claims, wherein the spigot-socket structure (10; 110) is provided with guiding means (15) for guiding a cutting tool for severing the connection between the first and second section.

8. Inspection chamber part (3, 4, 5) according to anyone of the preceding claims, wherein the spigot-socket structure (10) with its first section (11) is integrally connected to a first portion and with its second section (12) is integrally connected to a second portion of the inspection chamber part.

9. Inspection chamber part (3, 4, 5) according to claim 8, wherein the first portion comprises a shaft (4) and the second portion comprises a cone (5) or a base (3) of an inspection chamber (1).

10. Inspection chamber part (3, 4, 5) according to claim 8, wherein the first portion is a base (3) and the second portion is a cone (5) of an inspection chamber (1).

11. Inspection chamber part (103, 104, 105) according to anyone of claims 1-7, wherein the spigot-socket structure (110) is integrally connected to the inspection chamber part with one section (111; 112), the other section (112; 111) forming a free spigot end or socket end for said inspection chamber part.

12. Inspection chamber part (103, 104, 105) according to claim 11, wherein the inspection chamber part is a base (103), a cone (105) or a shaft (104) of an inspection chamber.

13. Method for preparing an inspection chamber part according to claim 11 or 12 for connection to another inspection chamber part, for instance another inspection chamber part according to claim 11 or 12, comprising the steps of:

a. determining whether the inspection chamber part requires a spigot end or a socket end for realizing the spigot-socket connection; and
b. providing the inspection chamber part with the required spigot or socket end by either leaving the integral connection between the first and second section of the spigot-socket structure intact or by severing it.

14. Method for preparing an inspection chamber part according to anyone of claims 8-10, comprising the steps of:

a. severing the integral connection between the first and second section to divide the inspection chamber part into a first portion comprising the first section and a second portion comprising the second section; and
b. re-connecting at least one of the portions with its first, respectively second section to a compatible socket end, respectively spigot end.

15. Method for preparing an inspection chamber part according to claim 2 or 4 or any claim referring thereto, comprising the steps of:

a. severing the integral connection between the first and second section to divide the inspection chamber part in a first portion comprising the first section and a second portion comprising the second section;
b. shortening the first portion by cutting away the first section and an adjoining portion;
c. re-connecting the cut-off end of the first portion to the second section of the second portion.

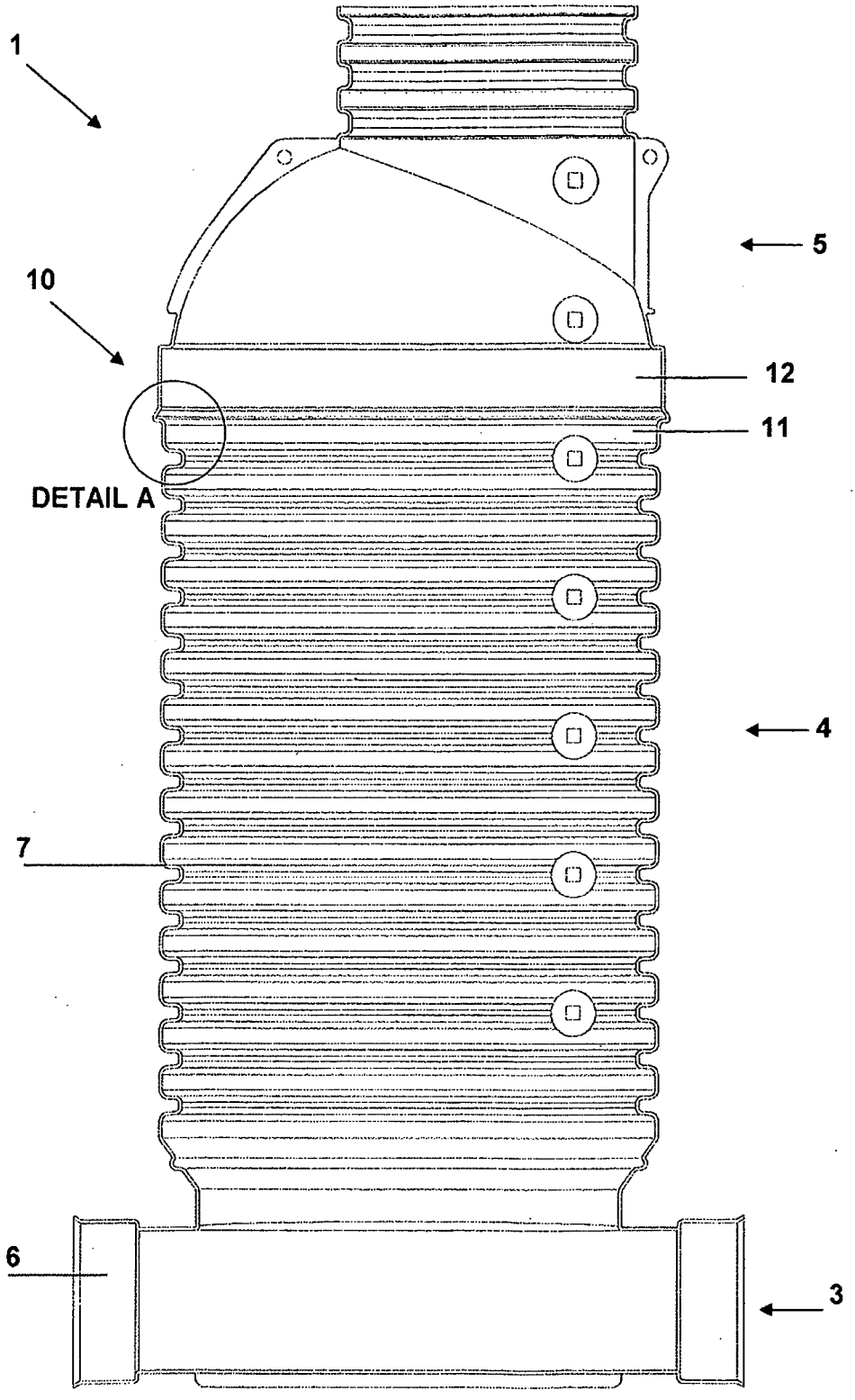

FIG. 1

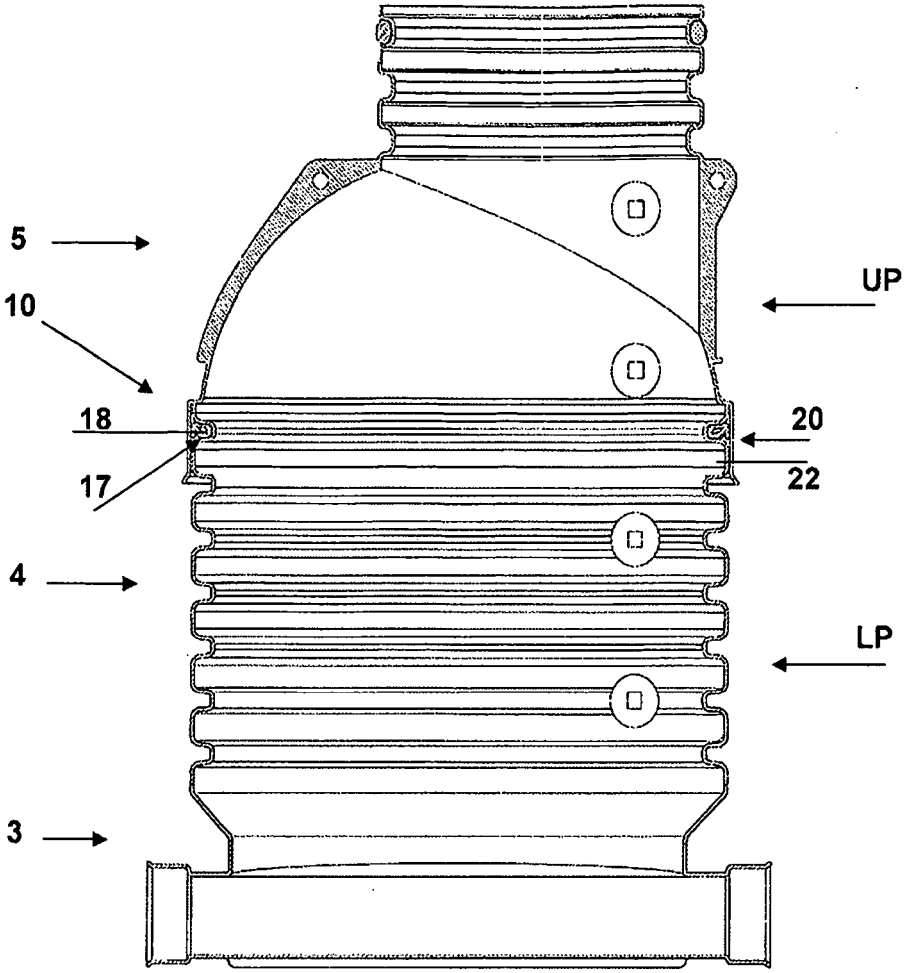

FIG. 3

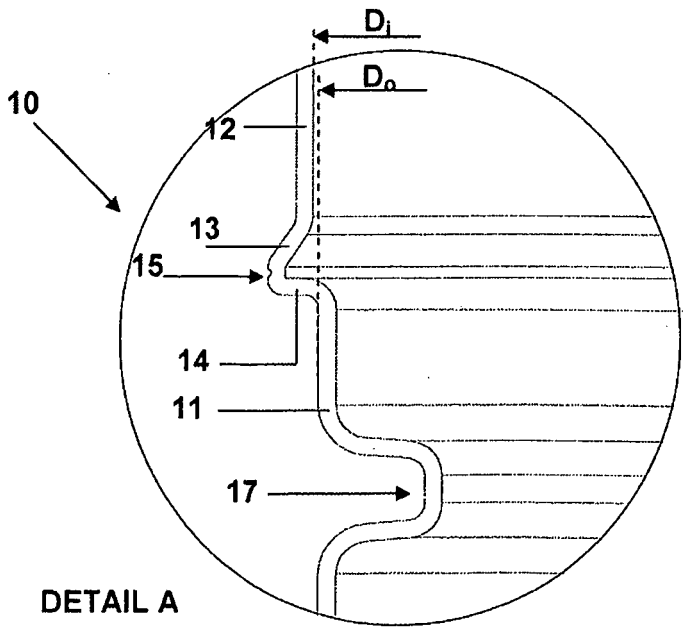

FIG. 2

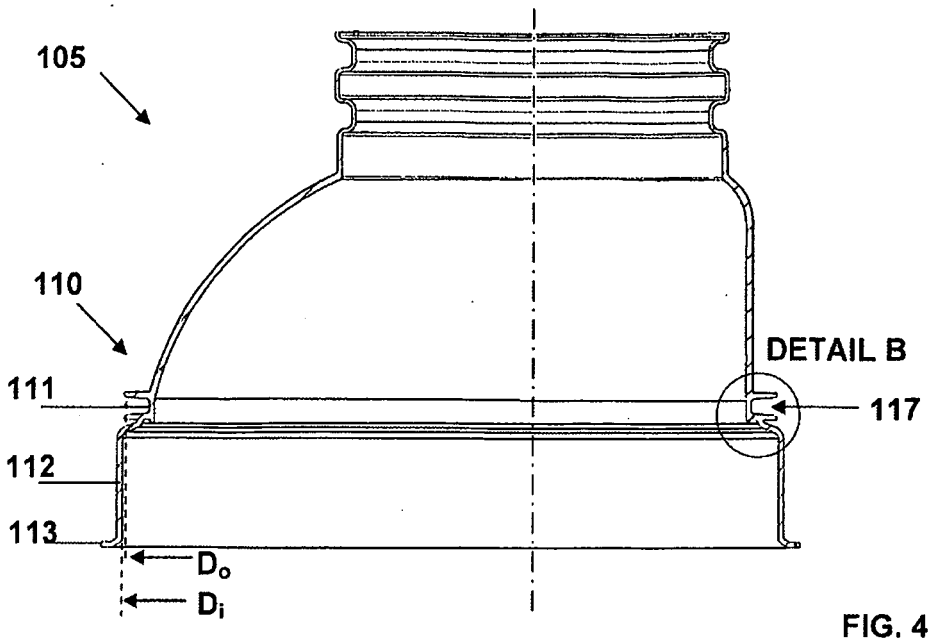
105
110
111
112
113
DETAIL B
117
D_o
D_i

FIG. 4

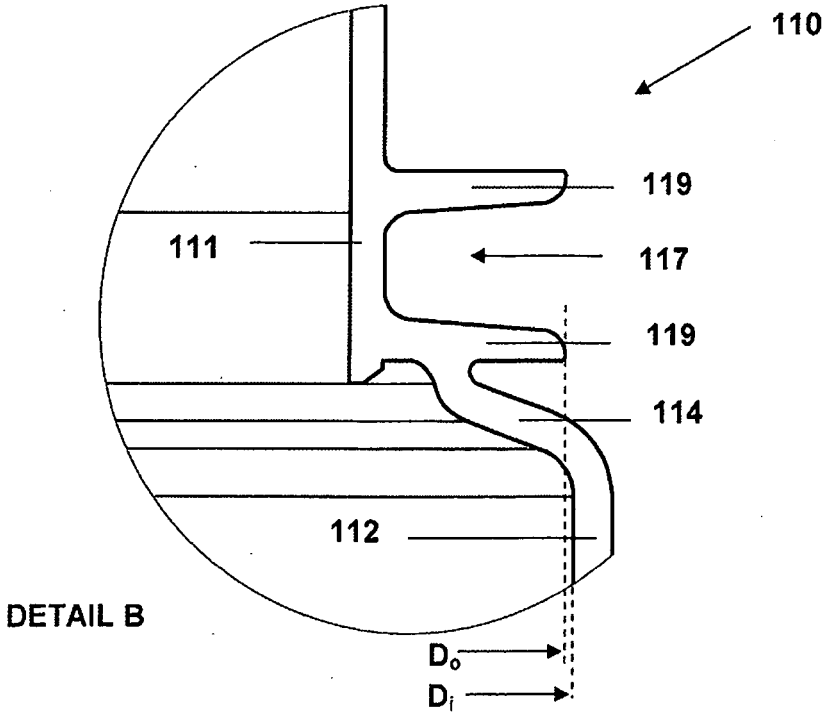
110
119
111
117
119
114
112
DETAIL B
D_o
D_i

FIG. 5

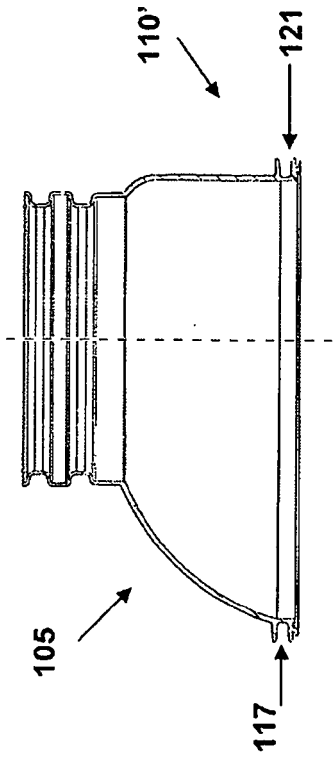

FIG. 6B

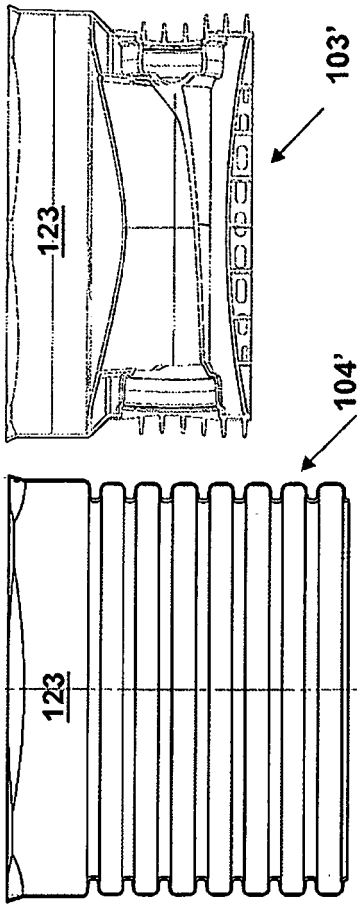

FIG. 7C

FIG. 7B

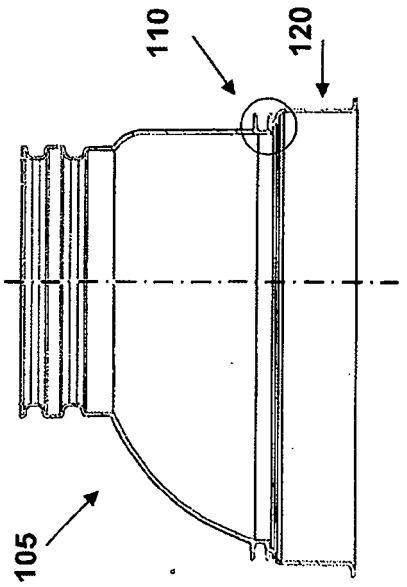

FIG. 6A

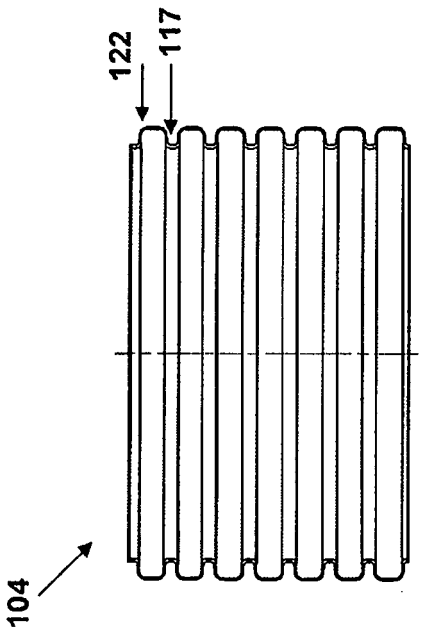

FIG. 7A

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EUROPEAN SEARCH REPORT

Application Number
EP 09 01 4740

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 1 639 495 A (FRAME WILLIAM S) 16 August 1927 (1927-08-16) * figure 2 * -----	1	INV. E03F5/02 ADD. E03F5/04
X	EP 0 913 534 A1 (HEGLER RALPH PETER DR ING [DE] HEGLER RALPH-PETER DR-ING [DE]) 6 May 1999 (1999-05-06) * figure 1 * -----	1-4, 13-15	

TECHNICAL FIELDS SEARCHED (IPC)

E03F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	30 April 2010	Flygare, Esa

CATEGORY OF CITED DOCUMENTS

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L : document cited for other reasons

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1

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 01 4740

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30-04-2010

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