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(54) Covered drainpipe

(57) This invention concerns a covered drain pipe comprising a drain pipe (1) with a length which is enveloped by a sleeve (2) of a knitting of a filter material, whereby the sleeve (2) is fixed to the drain pipe (1) in longitudinal direction of the drain pipe (1). The invention also concerns a process for manufacturing a covered drain pipe.

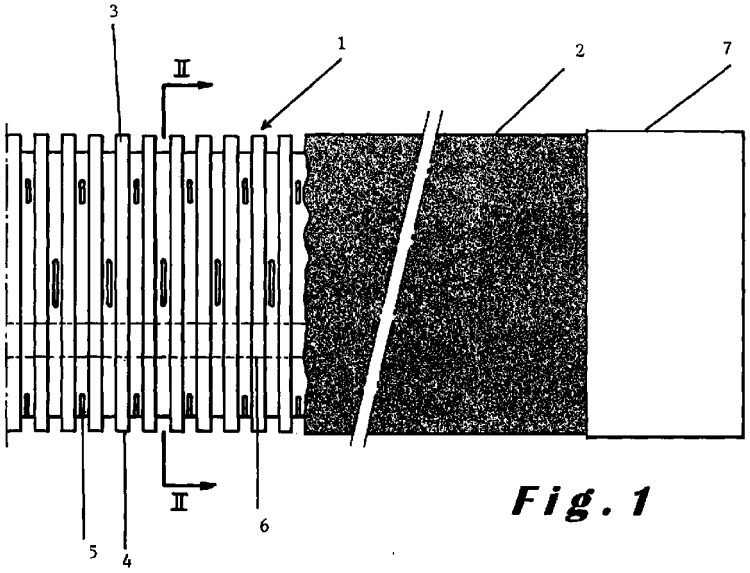

Fig. 1

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Description

[0001] This invention concerns a covered drain pipe comprising a drain pipe which is enveloped by a sleeve of a knitting of a filter material.

[0002] Such a covered drain pipe may among others be used for draining the ground. The drain pipe is mostly a ribbed hose, openings being provided between the ribs through which water may flow into or out of the drain pipe. In order to prevent the openings from being blocked by particles flowing through the openings together with the influent water, the drain pipe is enveloped by a filter to hold up these particles.

[0003] In the covered drain pipe described in EP-A-0,029,713 the filter is formed by a cylindrically shaped sleeve of an elastic knitting, stretched around the drain pipe. The knitting is mostly manufactured previously, in large lengths of 300 m for example, subsequently applied around the drain pipe and attached to the ends of the drain pipe.

[0004] The covered drain pipe known from EP-A-0,029,713 however has the disadvantage that the filter may come loose from the drain pipe, as a consequence of which the drain pipe is no longer enveloped over its entire length by the sleeve, and the filtering action of the sleeve is at least partially lost.

[0005] The aim of this invention consists in providing an improved covered drain pipe.

[0006] This is achieved according to the invention with the measures described in the characterising part of the first claim.

[0007] By fixing the sleeve in longitudinal direction of the drain pipe to the drain pipe, the sleeve is fixed on the drain pipe, so that the sleeve is kept in place, even in case the ends of the sleeve come loose from the ends of the drain pipe. Such a fixing of the sleeve to the drain pipe also allows the covered drain pipe to be cut at any desired length, even after the sleeve has been applied around the drain pipe, without thereby adversely influencing the filtering action of the sleeve.

[0008] The fixing of the sleeve to the drain pipe namely prevents the sleeve, upon the sectioning of the drain pipe, from shrinking and retracting in longitudinal direction of the drain pipe. Because the knitting of the sleeve is stretched around the drain pipe, upon the sectioning of the covered drain pipe, the knitting will namely shrink and retract in longitudinal direction of the drain pipe, in order to re-adopt its original non-stretched shape.

[0009] It was also found that neither the filtering action of the sleeve, nor the permeability of the drain pipe were adversely influenced by the presence of the adhesive.

[0010] A fixing of the sleeve to the drain pipe offers a particular advantage for covered drain pipes which are provided to be applied with their longitudinal axis vertically into the ground. The fixing of the sleeve in longitudinal direction of the drain pipe prevents the sleeve from retracting in longitudinal direction of the drain pipe upon moving the covered drain pipe in the ground.

[0011] From EP-A-208.043 a covered drain pipe is known, the sleeve of which is formed by a sheet of a filter material. The sheet is applied around the drain pipe in such a way, that the edges of the sheet in longitudinal direction of the drain pipe overlap, in order to obtain a circular sleeve which completely envelops the drain pipe. The filter material comprises fibrous peat material which is pressed into a sheet and applied onto a layer of kraft paper. The fixing along the edges is needed to obtain a circular sleeve.

[0012] From EP-A-0.007.045 a covered drain pipe is known, the sleeve of which is formed by strips of a sintered polymer material, which are spirally wound around the drain pipe. The strips are fixed to each other or to the drain pipe to prevent them from shifting with respect to each other, which would result in the loss of their filtering action.

[0013] In order to fix the sleeve to the drain pipe, preferably an adhesive is used, selected such that it shows a good affinity to both the material of the drain pipe and the material of the sleeve. The adhesive may for example be a glue, which is applied in the cold state, or a hot melt glue. The adhesive may also be manufactured from the same material as the drain pipe and/or the sleeve. In that case, the adhesive is preferably applied in the hot, liquid or molten state, so that the adhesive and the material of the sleeve and/or the drain pipe may flow into each other and a continuous transition is formed.

[0014] A very suitable glue is a hot melt glue which remains sticky even after cooling down. The use of such a glue allows that, in case the sleeve comes loose from the drain pipe, the sleeve is again fixed to the drain pipe by contacting the sleeve with the adhesive and exerting some pressure on the sleeve. However, according to the invention also other glues, generally known to the man skilled in the art, may be used.

[0015] It is also possible to fix the sleeve to the drain pipe by means of ultrasonic vibration. In that way an optimal blending of the material of the sleeve and the material of the drain pipe can namely be obtained.

[0016] According to the invention, the sleeve is preferably fixed over substantially its entire length to the drain pipe. This allows the sectioning of the covered drain pipe in any desired site, without thereby adversely influencing the fixing of the sleeve to the drain pipe.

[0017] The sleeve may be fixed in cross direction of the drain pipe, in one or more sites to the drain pipe. The adhesive may also be applied over the entire circumference of the drain pipe.

[0018] According to the invention, the covered drain pipe may further be enveloped by a second sleeve of a filter material. Thereby the first sleeve may show finer or coarser meshes than the second sleeve, or the same. The first and second sleeves may have a same or a different porosity. The second sleeve is preferably fixed in longitudinal direction to the covered drain pipe, as described above for the sleeve.

[0019] The covered drain pipe according to the invention preferably comprises at one end a coupling piece which is applied around the external wall of the drain pipe.

[0020] In the known covered drain pipe, the coupling piece is mostly fixed in the drain pipe, and the end of the sleeve is secured between the wall of the drain pipe and the coupling piece. However, this has the disadvantage that the knitting is stretched over the mostly sharp edge of the drain pipe, as a consequence of which the knitting shows an increased risk of fraying and partially looses its filtering action.

[0021] According to the invention, the coupling piece is fitted over the covered drain pipe, so that the knitting at the end of the drain pipe is covered and protected. This is especially important for drain pipes which are provided to be placed in vertical or substantially vertical direction into the ground.

[0022] The invention also concerns a process for manufacturing the above described drain pipe, whereby the sleeve is knitted around the drain pipe, whereby the drain pipe is preferably used as a core. In the process according to the invention, the adhesive is preferably applied onto the drain pipe simultaneously with the knitting, so that the sleeve can be fixed to the drain pipe as it is being knitted. This process offers the advantage that the size of the sleeve can be adapted to the size of the drain pipe. Moreover, the manufacturing and fixing of the sleeve to the drain pipe may be carried out in one single production step. In this way, it is possible to keep the production costs of the covered drain pipe relatively low, notwithstanding the use of an adhesive which is often somewhat more expensive.

[0023] In the known process, the sleeve is manufactured separately in advance, and wound on a bobbin. The drain pipe is placed into a cylinder, the sleeve is unwound from the bobbin and applied around the cylinder. Subsequently, the drain pipe is removed from the cylinder, the sleeve being carried along by the drain pipe. This process is rather labour-intensive.

[0024] The invention is further elucidated by means of the attached figures and description of the figures.

Figure 1 is a view on the external side of the covered drain pipe according to the invention, whereby the sleeve has been partially omitted.

Figure 2 is a cross section of the covered drain pipe according to the invention.

[0025] The embodiment of the covered drain pipe of this invention shown in figure 1 comprises a drain pipe 1. The drain pipe 1 may be manufactured from a watertight material, a porous material or a material which is permeable to water. The drain pipe 1 may have various shapes. It may be cylindrical, or it may have any other desired shape. The external wall 3 of the drain pipe may be smooth, ribbed or corrugated. If the drain pipe 1 is ribbed, mostly openings 5 are provided between the ribs 4 through which water may flow into or out of the pipe. The drain pipe may be manufactured from various materials, for example polyethylene, polypropylene, polyvinyl chloride, a ceramic material or metal.

[0026] The drain pipe 1 is enveloped by a sleeve 2 of a filter material. The filter material is preferably a knitting, which is permeable to water and possibly other liquids. The sleeve 2 is preferably a cylindrically shaped seamless sleeve. The sleeve 2 may be made from various materials. The sleeve 2 may for example be a knitting of a yarn of natural fibres, a polymer yarn or mixtures thereof. Suitable polymers include polyester, polyacryl, polyethylene, polypropylene. The sleeve 2 may also be made from fibres of viscose, cellulose, acetates, tri-acetates or proteins.

[0027] The drain pipe 1 and sleeve 2 may be constructed from a same or from different materials.

[0028] According to the invention, the covered drain pipe may be enveloped once more by a second sleeve. This second sleeve may be manufactured from a same material as the sleeve 2, or a different material. The second sleeve may be manufactured from a knitting with the same or different meshes and the same or a different porosity as the sleeve 2. The second sleeve is preferably also fixed to the covered drain pipe by means of an adhesive.

[0029] The sleeve 2 is in longitudinal direction of the drain pipe 1 fixed to the drain pipe. This may for example be realised by means of a continuous strip of an adhesive 6, which is for example applied in longitudinal direction or diagonally on the drain pipe. It is also possible to apply two or more strips of an adhesive to the drain pipe, which may be parallel, or not. The adhesive may be applied in the form of a continuous strip, a regularly interrupted strip, or as a series of dots in longitudinal direction of the drain pipe, or as a series of dots which are distributed regularly or randomly over the circumference of the drain pipe.

[0030] The adhesive 6 is thereby preferably selected such, that it shows a good affinity to the material of the drain pipe 1 and the material of the sleeve 2. The adhesive 6 may for example be a cold glue, or a hot melt glue which is applied in a hot state to the drain pipe 1. The adhesive 6 and the drain pipe 1 may also be manufactured from a same material. In that case, the adhesive 6 is preferably applied in the hot, molten state to the external wall 3 of the drain pipe. The hot molten adhesive 6 is capable of melting a surface layer of the external wall 3 of the drain pipe 1, as a consequence of which both phases at least partially blend into each other, so as to obtain a good adhesion of the sleeve 2 to the drain pipe 1.

[0031] The adhesive 6 is preferably coloured in a colour differing from the colour of the sleeve 2. In that case, the sites in which the sleeve 2 is fixed to the drain pipe 1, and thus the sites in which the covered drain pipe may be sectioned without thereby adversely influencing the filtering action of the sleeve 2, become visible.

[0032] The drain pipe 1 of this invention is preferably at least at one end provided with a coupling piece 7. The coupling piece 7 envelops the external wall 3 of the drain pipe 1. The sleeve 2 is secured between the external wall 3 and the internal wall 10 of the coupling piece 7. The coupling piece may be fixed in various ways to the drain pipe. The coupling piece 7 may comprise a cylindrically shaped pipe which is clamped around the covered drain pipe. The coupling piece 7 may be fixed to the drain pipe by means of glueing or in a mechanical way, for example by means of stapling. Staples form a cheap fixing, which may be applied rapidly. The coupling piece 7 may for example also comprise a screw thread, which engages the ribs of the drain pipe.

[0033] The coupling piece 7 may be provided for the sealing of the drain pipe. In that case, one end of the coupling piece 7 is closed. The coupling piece 7 may also be provided for the coupling of two or more drain pipes.

[0034] The covered drain pipe of this invention is suitable for use in different fields of application. It may for example be used for a permanent draining of a ground, a building, or a sports site. In that case, it is mostly applied horizontally in the ground. It may also be used as a discharge pipe to return water to the ground.

[0035] This invention also concerns a process for manufacturing the above described covered drain pipe, whereby the sleeve 2 is knitted around the drain pipe 1, and the drain pipe 1 is used as a core. In the process according to the invention, the adhesive is preferably applied to the drain pipe 1 simultaneously with the knitting of the sleeve 2. Such a process allows to fix the sleeve 2 to the drain pipe, substantially simultaneously with the knitting.

Claims

1. Covered drain pipe comprising a drain pipe with a length, which drain pipe is enveloped by a sleeve of a knitting of a filter material, characterised in that the sleeve is fixed to the drain pipe in longitudinal direction of said drain pipe.

2. Covered drain pipe according to claim 1, characterised in that the sleeve is fixed to the drain pipe over substantially the entire length.

3. Covered drain pipe according to claim 1 or 2, characterised in that said sleeve is fixed to the drain pipe by means of a hot melt glue.

4. Covered drain pipe according to any one of claims 1 to 3, characterised in that said sleeve is fixed to said drain pipe by means of a continuous strip of an adhesive, applied in longitudinal direction of the drain pipe.

5. Covered drain pipe according to any one of claims 1 to 4, characterised in that said sleeve is fixed to said drain pipe by dots of an adhesive applied randomly over the circumference of the drain pipe.

6. Covered drain pipe according to any one of claims 1 to 5, characterised in that the covered drain pipe is enveloped by a second sleeve of a filter material.

7. Covered drain pipe according to any one of claims 1 to 6, characterised in that the drain pipe has an end which is provided with a coupling piece, which is situated around the external wall of the drain pipe.

8. Process for manufacturing a covered drain pipe according to any one of claims 1 to 7, characterised in that the sleeve is knitted around the drain pipe, and the sleeve is substantially simultaneously fixed to the drain pipe as it is knitted.

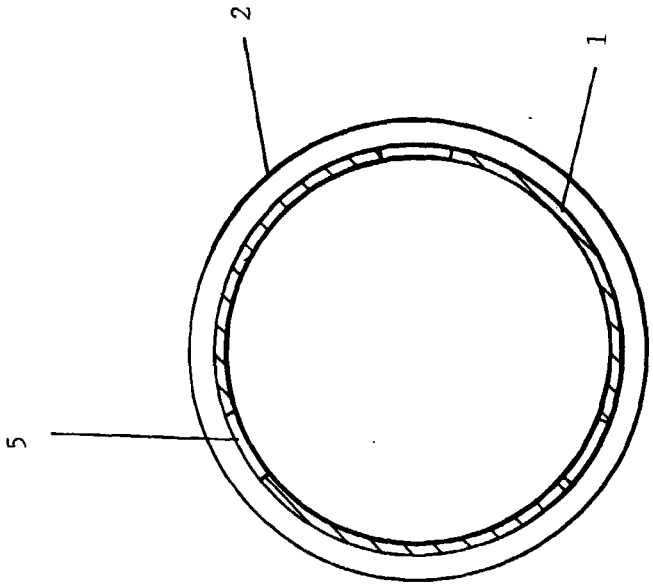

Fig. 2

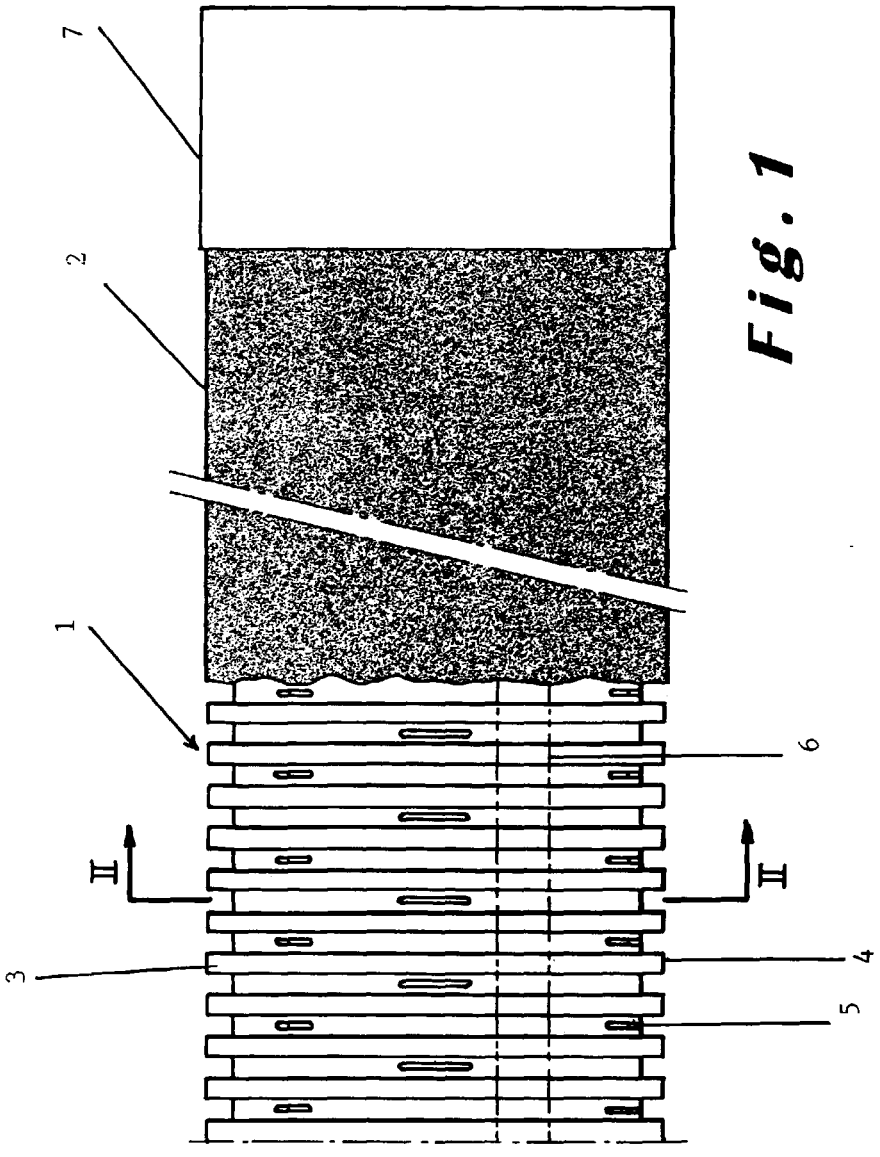

Fig. 1

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EUROPEAN SEARCH REPORT

Application Number
EP 98 20 2189

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TECHNICAL FIELDS SEARCHED (Int.Cl.6)

E02B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	3 December 1998	Van Beurden, J

CATEGORY OF CITED DOCUMENTS

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