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(54) **Insert of a floor gully and method for installing an insert of a floor gully**

(57) The floor gully insert comprises a cup member (10) insert-able into a floor gully and having a bottom (12), sidewall (14) and drain connector (16). The cup member is made of metal, preferably stainless or acid resistant steel. The insert may comprise a drain trap (20) which is removably fixable to the cup member, and fixing means for fixing the drain trap. The fixing means may comprise a grip member arranged on the bottom of the cup member, a support member connected to the drain trap and an elongated fixing member having a first end fixed to the grip member and a second end fixed to the

support member. The floor gully insert installation method employs an insert comprising a cup member made of metal. The method comprises removing the drain trap of the floor gully (200) to be renovated, cleaning the inside of the floor gully to be renovated, installing the cup member of the insert in the floor gully to be renovated, with the free edge of the cup member being substantially flush with the edge of the existing floor gully, and filling the free space between the wall of the floor gully to be renovated and the outer face of the cup member with a water-resistant filling mass (38) containing an adhesive.

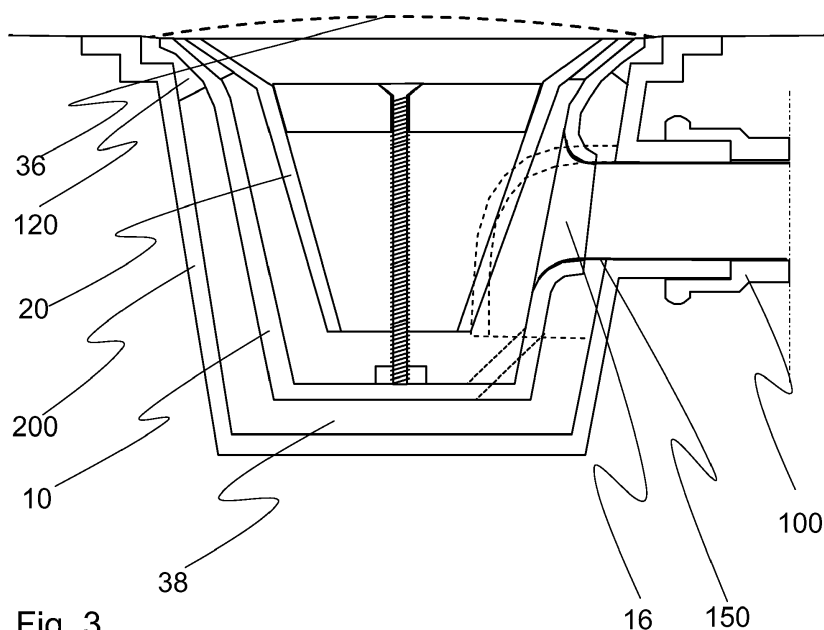


Fig. 3

Description

[0001] The invention relates to an insert of a floor gully comprising a cup member insertable into a floor gully, which cup member has a bottom, sidewall and drain connector. The invention also relates to a method for installing an insert of a floor gully in a floor gully to be renovated.

[0002] In the renovation of the drains of buildings it is possible to use so-called relining instead of completely replacing the pipes. The relining of an existing pipe is carried out by installing a sock impregnated with epoxy resin in the pipe and by then pressing it against the wall of the drain pipe. After the epoxy has hardened, the lining forms a solid and durable surface inside the drain.

[0003] When renovating pipelines, as a rule, the floor gullies are usually renovated as well. An existing floor gully can be removed and replaced with a new one, or it can be cleaned and recoated. If the floor gully is removed, the floor structure surrounding the floor gully must be taken apart partially, thus damaging the waterproofing of the floor. That is, the floor gully replacements always involve extensive floor renewal measures. The coating of the floor gully is carried out by spreading or spraying a layer of epoxy resin onto the wall of the floor gully and then letting it harden. The problem with coating is that it is difficult to achieve an end result which is consistent in quality and technically equal to the rest of the pipeline.

[0004] The objective of the invention is to provide an insert of a floor gully and a method for installing an insert of a floor gully, allowing the problems related to floor gully renovation to be eliminated.

[0005] The objectives of the invention are achieved by means of an insert of a floor gully and method which are characterized in what is set forth in the independent claims. The dependent claims disclose preferred embodiments of the invention.

[0006] The invention relates to an insert of a floor gully comprising a cup member insertable into a floor gully. The cup member has a bottom, sidewall and drain connector. The shape and size of the cup member are chosen to loosely fit into floor gullies generally used in the sanitary units of buildings. Preferably, the wall of the cup member is cylinder or cone shaped. The insert is characterized in that the cup member is made of metal, preferably stainless or acid resistant steel.

[0007] In a preferred embodiment of the insert according to the invention, the insert comprises a drain trap removably fixable to the cup member and fixing means for fixing the drain trap. The removable drain trap makes it easier to fix the cup member to the floor gully. Preferably, said fixing means include a grip member arranged on the bottom of the cup member, a support member in connection to the drain trap and an elongated fixing member having a first end fixable to the grip member and a second end fixable to the support member. That is, the drain trap is connected to the bottom of the cup member by means of the fixing member, thus making the connection firm and reliable.

[0008] In a second preferred embodiment of the insert according to the invention, the drain trap has a cone-shaped wall with an inner face, and the support member is a separate piece having a first support face to be supported at a first location on the inner face of the wall of the drain trap and a second support face to be supported at a second location on the inner face of the wall of the drain trap. That is, the support faces support the support member against the walls of the drain trap and the pressure from the fixing member tightly wedges it into the drain trap.

[0009] In a third preferred embodiment of the insert according to the invention, said grip member is provided with a borehole having an internal thread, and said fixing member is a fixing bolt having an external thread, matching to the internal thread of the said borehole, at its first end. Thus, the thread fastens the fixing bolt to the grip member as the fixing bolt is twisted around its longitudinal axis. Preferably, the support member is provided with a fixing hole that the fixing bolt passes through, and the second end of the fixing bolt is provided with a head larger in diameter than the fixing hole. When screwing the fixing bolt into place, it moves, at the same time, towards the bottom of the cup member with the result that its head pulls the support member and the drain trap down into the cup member.

[0010] In still another preferred embodiment of the insert according to the invention, the free edge of the cup member has an outwardly widening edging and the edge of the drain trap has an encircling collar, respectively. Further, the insert comprises an elastic sealing ring insertable between the collar and the edging. The sealing ring makes the joint between the edging of the cup member and the collar of the drain trap watertight. The sealing ring can be made of any suitable sealing material, such as rubber or silicon.

[0011] In still another embodiment of the insert according to the invention, said drain connector comprises an opening in the sidewall of the cup member, the edges of which are outwardly diverged from the sidewall of the cup member. The outwardly diverged edges of the opening form a short tube as an elongation of the opening, smoothly connected to the sidewall with a curvilinear rounding radius. Thus, no sharp edge interfering with the flow of the liquid is created at the drain connector.

[0012] The invention also relates to a floor gully in which a floor gully an insert according to any of the above-described embodiments is installed. The insert of a floor gully according to the invention is especially intended to be used as a replacement part insertable into an existing floor gully, allowing the existing floor gully to be technically restored to the level of a new floor gully.

[0013] In a preferred embodiment of the floor gully according to the invention, the space between the wall of the floor gully and the wall of the cup member is substantially entirely filled with a water-resistant filling mass containing an adhesive, such as with epoxy. Before installing the insert, the drain trap located on the inside of the wall

of the existing floor gully is removed from the floor gully. Because the existing floor gully does not have to be removed entirely, the installation of the insert does not damage the floor structure surrounding the floor gully or the waterproofing in particular.

[0014] The method for installing an insert of a floor gully according to the invention employs an insert comprising a cup member made of metal, preferably stainless or acid resistant steel. In the method, the drain trap of the floor gully to be renovated is removed, the inside of the floor gully to be renovated is cleaned, the cup member of the insert is installed in the floor gully to be renovated, with the free edge of the cup member being substantially flush with the edge of the existing floor gully, and the free space created between the wall of the floor gully to be renovated and the outer face of the cup member is filled with a water-resistant filling mass containing an adhesive. Suitable filling masses include, for example, epoxy- and cement-based filling masses and, in particular, the certified waterproofing masses marketed under the trade name Ardex.

[0015] Typically, the floor gully to be renovated, in which the insert is installed, is connected to a drain pipe, and the installation of the insert is performed at the same time as the drain pipe is relined. The lining sock installed onto the inner face of the drain pipe extends into the cup member through the drain connector, and the end of the lining sock is attached to the sidewall of the cup member surrounding the opening of the drain connector. The drain pipe thus has a solid watertight lining all the way to the inside of the cup member.

[0016] An advantage of the invention is that it allows a floor gully to be renovated without damaging the waterproofing of the floor. That is, the renovation of the floor gully is technically simple and quick to carry out.

[0017] Another advantage of the invention is that it is extremely resistant to mechanical and chemical stress. A floor gully renovated by employing the invention is thus durable and technically of high level.

[0018] In the following, the invention will be explained in detail. The description refers to the accompanying drawings wherein

Figure 1 is an exemplary section view of the parts of an insert of a floor gully according to the invention, showing them as separated from each other,

Figure 2 is an exemplary section view of an insert of a floor gully according to the invention, showing it in an assembled state, and

Figure 3 is an exemplary section view of an insert of a floor gully according to the invention, showing it as installed in an existing floor gully.

[0019] Figure 1 is an exemplary section view of the parts of an insert of a floor gully according to the invention. Figure 1 is a so-called exploded view of the insert, show-

ing the parts of the insert as separated from each other. Figure 2 shows the insert of a floor gully in an assembled state. The following description refers to the both figures.

[0020] The insert comprises a cup member 10 having a flat bottom 12 and a substantially cone-shaped sidewall 14. The free end of the sidewall is outwardly diverged and forms an encircling edging 15 at the edge of the cup member. The sidewall is provided with an opening the edges of which are outwardly diverged from the plane of the sidewall, with quite a large rounding radius, thus forming a short tube as an elongation of the opening. The opening and the short tube provided as an elongation thereof form a drain connector 16 conveying any liquid collected in the cup member, such as water, to the sewer system. The bottom 10 can be provided, at the drain connector 16, with an inclined portion 40 projecting in an angle from the plane of the bottom and denoted with a dash-line in the figures. The inclined portion of the bottom serves to conduct the liquid running down from the cup member up to the drain connector and prevent an area with a weak flow from being created at the joint between the sidewall and the bottom, below the drain connector.

[0021] The cup member is a rigid piece of metal, preferably stainless or acid resistant steel. The thickness of the bottom and of the sidewall can be in the range of 1 to 3 mm. The cup member is dimensioned to loosely fit into the floor gullies generally used in buildings, after removing the drain traps of the floor gullies. On the inner face of the bottom of the cup member, a metallic grip member 18, having a borehole 19 parallel to the normal of bottom in the middle thereof, is provided. The inside of the borehole is provided with an internal thread. The grip member can be joined to the bottom by welding, soldering or gluing, for example.

[0022] The insert comprises a drain trap 20 which is insertable into the cup member (figure 2) and made of plastic material. The drain trap is a tubular piece which is open at both ends and which has a cone-shaped wall 26. The drain trap is fitted into the cup member, with the narrower end thereof closer to the bottom 12 of the cup member. The edge of the wider end of the drain trap is encircled by an obliquely diverged collar 27. The peripheral diameter of the collar is substantially equal to or somewhat smaller than the inner diameter of the opening of the cup member.

[0023] The drain trap is fitted into the cup member with the collar thereof pressed against the edging of the cup member. In order to ensure the watertightness of the joint between the collar and the edging, a sealing ring 34 made of elastic material is mounted between the above-mentioned parts. The sealing ring can be made of rubber or silicon or any other water-resistant sealing material. The length, i.e. projection, of the drain trap in the longitudinal direction of the drain trap is clearly smaller than the corresponding length of the cup member. Thus, the edge of the narrower end of the drain trap, when in an installed state, lies at a distance from the bottom of the cup member, i.e. there is a distinct gap between the edge of the

narrower end of the drain trap and the bottom. This gap allows the liquid to flow from the drain trap to the space between the drain trap and the sidewall of the cup member and then out of the cup-like member through the drain connector.

[0024] For the purpose of fixing the drain trap in place, the insert is provided with a fixing member, a metallic fixing bolt 28, having an external thread extending over the entire length thereof and matching to the internal thread of the borehole 19 of the grip member 18. A conically widening head 30 is provided at the second end of the fixing bolt. The insert also comprises an elongated support member 22 having a borehole 32 in the middle thereof to receive the rod of the fixing bolt. A conical cavity matching to the shape of the head of the fixing bolt is provided in the outer face of the borehole. The first end of the support member comprises a first support face 24a having a conical shape corresponding the shape of the inner face of the wall of the drain trap. Correspondingly, the second end of the support member comprises a similarly shaped second support face 24b. The support member is made of rigid plastic or soft metal, such as aluminum. The fixing bolt is screwed into the borehole 32 of the support member 22, with the thread of the outer face of the fixing bolt biting into the wall of the borehole and with the head 32 pressed into the cavity of the support member. Thus, a wide handle is formed at the end of the fixing bolt 28 by the support member 22, allowing the fixing bolt to be manually twisted without any tools.

[0025] In an assembled insert (figure 2), the first end of the fixing bolt is screwed in place in the borehole 19 of the grip member 18. The support faces 24a, 24b of the support member 22 are pressed against the inner face of the wall of the drain trap 20 and force the drain trap to move towards the bottom 12 of the cup member 10. The sealing ring 34 is clamped between the edge 15 of the cup member 10 and the collar 27 of the drain trap 20, thereby slightly compressing itself and making the seal watertight. The high friction force acting in the seal prevents the drain trap from moving in the cup member.

[0026] Figure 3 is a section view of an existing floor gully 200 in need of renovation in which an insert of a floor gully according to the invention is installed. It is most appropriate to install the insert of a floor gully in the existing floor gully at the same time as the sewer system undergoes a total renovation and as the drain pipes are relined on the inside. The first step of the installation is to remove the drain trap of the existing floor gully 200 (denoted with a dash-line in the figure). Because the drain trap is located on the inside of the wall of the floor gully, the removal thereof neither breaks up the wall of floor gully nor requires taking apart the floor structure. The waterproofing of the floor remains intact. Thereafter, the inside of the existing floor gully is cleaned thoroughly. Next, the cup member 10 of the insert is installed in the existing floor gully, with the free edge of the cup member being substantially flush with the edge of the existing floor gully and the opening of the drain connector 16 being

aligned with the end of the drain pipe 100 connected to existing floor gully. This causes a free space between the wall of the existing floor gully and the outer face of the cup member which is filled with any suitable water-resistant filling mass 38 containing an adhesive. Suitable filling masses include epoxy- and cement-based filling masses, and, in particular, the certified waterproofing masses marketed under the trade name Ardex. A suitable amount of the filling mass shall be dosed into the existing floor gully before the cup member is fitted into place. When dosing the filling mass, it must be ensured that the connection between the drain connector 16 to the drain pipe 100 remains open. If an empty space is created between the cup member and the upper edge of the wall of the floor gully, it can be filled with any suitable epoxy 120, for example. Once the filling mass has hardened, the cup member stays in place within the existing floor gully.

[0027] After installing the insert, the drain pipes can be relined. Drain relining is known from the prior art and will not be described in more detail herein. In the relining, a lining sock 150 is inserted into the cup member 10 through the drain connector and the end of the lining sock 150 is joined to the inner face of the wall of the cup member by means of epoxy. After the relining, the drain trap 20 is fixed into the cup member in the manner described above, thus finishing the renovation of the floor gully. A separate floor gully cover 36 is mounted on the renovated floor gully.

[0028] The above described preferred embodiments of the insert of a floor gully and the method according to the invention. The invention is not limited to the above-described solutions but the inventive idea is applicable in different ways within the scope defined by the claims.

Claims

1. An insert of a floor gully, comprising a cup member (10) insertable into a floor gully, which cup member has a bottom (12), sidewall (14) and drain connector (16), **characterized in that** the cup member is made of metal, preferably stainless or acid resistant steel.
2. An insert of a floor gully as defined in claim 1, **characterized in that** the insert comprises a drain trap (20) which is removably fixable to the cup member (10), and fixing means (18, 22, 28) for fixing the drain trap.
3. An insert of a floor gully as defined in claim 2, **characterized in that** said fixing means comprise a grip member (18) arranged on the bottom of the cup member (10), a support member (22) in connection to the drain trap (20) and an elongated fixing member (28) having a first end fixed to the grip member and a second end fixed to the support member.

4. An insert of a floor gully as defined in claim 3, **characterized in that** the drain trap (20) has a cone-shaped wall (26) with an inner face, and the support member (22) is a separate piece having a first support face (24a) to be supported at a first location on the inner face of the drain trap and a second face (24b) to be supported at a second location on the inner face of the drain trap. 5
5. An insert of a floor gully as defined in claim 3 or 4, **characterized in that** said grip member (18) is provided with a borehole (19) having an internal thread, and said fixing member (28) is a fixing bolt having at its first end an external thread matching to the internal thread of said borehole. 10 15
6. An insert of a floor gully as defined in claim 5, **characterized in that** the support member (22) is provided with a fixing hole (32) to allow the fixing bolt (28) to pass through, and the second end of the fixing bolt is provided with a head (32) larger in diameter than the fixing hole. 20
7. An insert of a floor gully as defined in any of claims 2-6, **characterized in that** the free edge of the cup member (10) has an outwardly widening edging (15), and the edge of the drain trap (20) has an encircling collar (27), and the insert comprises an elastic sealing ring (34) to be arranged between the collar and the edging. 25 30
8. An insert of a floor gully as defined in any of claims 2-7, **characterized in that** said drain connector (16) comprises an opening in the sidewall (14) of the cup member (10) the edges of which are outwardly diverged from the sidewall of the cup member. 35
9. A floor gully (200), **characterized in that** an insert of a floor gully according to any of claims 1 - 8 is installed therein. 40
10. A floor gully (200) as defined in claim 9, **characterized in that** the space between the wall of the floor gully and the sidewall (14) of the cup member (10) is substantially entirely filled with a water-resistant filling mass (38) containing an adhesive, such as with epoxy. 45
11. A floor gully (200) as defined in claim 9 or 10, **characterized in that** the floor gully (200) is connected to a drain pipe (100) and a lining sock (150) is installed on the inner face of the drain pipe, which lining sock extends into the cup member (10) through the drain connector (16), and the end of which lining sock is attached to the sidewall of the cup member surrounding the opening of the drain connector. 50 55
12. A method of installing an insert of a floor gully in a

floor gully to be renovated, **characterized in that** the method employs an insert having a cup member (10) made of metal, preferably stainless or acid resistant steel, and the method comprises

- removing the drain trap of the floor gully (200) to be renovated,
- cleaning the inside of the floor gully to be renovated,
- installing the cup member (10) of the insert in the floor gully to be renovated, with the free edge of the cup member being substantially flush with the edge of the existing floor gully,
- filling the free space between the wall of the floor gully to be renovated and the outer face of the cup member with a water-resistant filling mass (38) containing an adhesive.

