The invention relates to an arrangement for producing a connection possibility, in particular for a sprinkler on a concrete or reinforced concrete floor, comprising at least one pipeline (1) that is connected to a first connection area (2a) of a fitting (3), a fixing element (4a, 4b) that can be detachably connected to a second connection area (2b) of the fitting (3), a box (5) that surrounds the fixing element (4a, 4b) in parts and that is arranged on a flange (6) of the second connection area (2b) of the fitting (3). Said fixing element (4a, 4b) can be fed through a casing (7) for delimiting the concrete or reinforced concrete floor and can be fixed on the casing (7) of the concrete or reinforced concrete floor by means of a fixing element (8) on its side facing away from the fitting (3).
ARRANGEMENT FOR PRODUCING A CONNECTION POSSIBILITY, IN PARTICULAR FOR A SPRINKLER ON A CONCRETE OR REINFORCED CONCRETE FLOOR, AND METHOD THEREFORE

[0001] The invention relates to an assembly for creating a connection, in particular for a sprinkler on a concrete or reinforced concrete ceiling, and a method for producing the connection.

[0002] Such assemblies are known from the prior art. They include, for example, a lower part of a sprinkler connector box that is attached to a casing with the aid of screws or nails. A connection pipe is connected to a connection interface of a fitting. An adapter having a receptacle for a sprinkler on the side facing away from the fitting is disposed on a second connection interface of the fitting. An upper part of a sprinkler connection box whose purpose is to prevent liquid concrete from penetrating into the sprinkler region of the receptacle during production of the concrete or reinforced concrete ceiling is disposed above this receptacle. Moreover, a brass seal is disposed in the sprinkler receptacle such that the receptacle is protected from dirt. The resulting connection is connected to the lower part in such a way that the upper and lower parts of the sprinkler connection box are connected to one another in a manner which prevents the intrusion of liquid concrete (i.e., in a concrete-tight fashion).

[0003] One disadvantage is that, after multiple assemblies for connecting sprinklers have been arranged on a mold, it is very difficult to ascertain their precise position, also due to the large number of pipes that are placed in the mold, and to monitor whether all connection assemblies have been placed. Moreover, the problem exists that, after the concrete has been cured, the mold is removed and the lower parts of the sprinkler connection boxes are connected to it. Thus, they are removed from the upper parts of the sprinkler connection boxes along with the mold without needing to work with particular care to prevent damage to the upper parts that remain in the concrete ceiling. Moreover, it is not possible in most cases to reuse the lower parts of the sprinkler connection boxes in another ceiling because they have been destroyed or damaged due to the force to which they have been subjected.

[0004] The object of the present invention is to prevent the disadvantages found in the prior art.

[0005] This object is attained according to the invention by a combination of the features of claim 1.

[0006] In the assembly according to the invention, the disadvantages of the prior art are avoided in that the fastening element is inserted through the mold, thus allowing the position of each connection to be monitored at all times from below without a time-consuming search in the pipes and reinforcements laid in the mold.

[0007] Because the box partially surrounding the fastening element rests on the mold and is pressed against the mold by the fastening means via the fastening element, no concrete is able to penetrate into the box during pouring of the concrete, thus keeping the fastening element and the second connection interface of the fitting free of concrete deposits. Thus, the fastening element may be removed and may be replaced after the concrete has cured and the mold has been removed.

[0008] By fastening the assembly via a fastening means disposed on the side of the mold facing away from the fitting, the lower part of a sprinkler connection box may be omitted because it is replaced by the box. Thus, a savings of material is possible as well.

[0009] It has been shown that the use of a two-part fastening element may be favorable. This is especially true if the second connection interface of the fitting is designed with a larger diameter than the connection interface of the sprinkler to be inserted. In attempting to reduce the number of the various fastening elements, it was realized that an adapter adapted to the diameter of the sprinkler may be used to provide a corresponding diameter reduction. Thus, this adapter may be used at the same time for connection to the sprinkler. However, because the sprinkler is disposed on the bottom side of the concrete or reinforced concrete ceiling, the adapter may not be designed with a length that it allows it to be fastened on the side of the mold facing away from the fitting.

[0010] In order to allow the adapter to be fastened, an extension element is therefore provided that is connected to the adapter. The extension elements are therefore still required only for the diameter dimension of the diameters of the connection interfaces of the sprinklers. In this alternate embodiment, the adapter is completely surrounded by the box.

[0011] In the desired fashion, screw connections between the fitting and the fastening element or the fitting and the adapter and/or the adapter and extension element allow for simple installation and removal.

[0012] It has been shown that, if the fastening element has a thread on its side facing away from the fitting, continual fastening using the fastening means becomes possible. Thus, the box may be pressed against the mold in a defined fashion.

[0013] In this context, it has also been shown that it is favorable for the fastening means to be a nut having an inner thread. This inner thread may be screwed onto the threaded section of the fastening means, thus representing a simple and cost-effective fastening option.

[0014] It may be advantageous for a washer to be disposed between the nut and the mold in order to prevent penetration into the mold, which is usually made of wood, and to guarantee simple removal. The washer may also be used to cover an oversized opening in the mold so as to guarantee a secure tightening of the fastening means, in particular the nut.

[0015] The invention further relates to a method for creating a connection for a sprinkler to a concrete or reinforced concrete ceiling bordered by a mold.

[0016] The method provides for a fastening element to first be connected to a first connection interface of a fitting. This fitting may be an elbow or a branch line, in particular a T piece. Then a box is disposed via the fastening element, the box having an essentially cylindrical design and a wall provided with an opening on one end. Here, the opening is structured such that the box may be placed tightly against a collar of the first connection interface of the fitting. The cylindrical region of the box surrounds a part of the fastening element, such that a circular hollow space is enclosed.

[0017] The fastening element protrudes past the box after its placement on the collar of the first connection interface of the fitting. This protruding region of the fastening element is subsequently guided through an opening in the mold. To this end, it is necessary that this opening be inserted in advance into the mold, which is usually made of wood. After the fastening element has been inserted through the opening, it is fastened on the side of the mold facing away from the fitting using a fastening means. Then at least one water pipe is
connected to a second connection interface of the fitting. Now, additional placement work may be performed on the mold. Reinforcement meshes may also be inserted, which increase the stability of the ceiling. Then the concrete is poured into the mold. The concrete is not able to penetrate through the fastening by a fastening means on the side of the mold facing away from the fitting and into the box, which is pressed against the mold by said fastening means, such that no concrete is able to penetrate to the second connection interface of the fitting and fastening element.

[0018] After the concrete has cured, the fastening element may be removed from the fitting. Thus, the mold may be removed from the ceiling without regard to the connections for the sprinklers.

[0019] The sprinkler is subsequently connected to the first connection interface of the fitting. Because the sprinkler body must be disposed below the ceiling, it may be necessary for an adapter to be inserted between the sprinkler and the first connection interface of the fitting. This adapter may be designed such that it is able to bridge differences in diameter between the connection interfaces of the fitting and the sprinkler. Here, it was realized that the adapter is either first connected to the sprinkler and then the two pieces together are connected to the first connection interface of the fitting or the adapter is first connected to the first connection interface of the fitting and then the sprinkler is connected to the adapter.

[0020] Moreover, it was shown that it may be advantageous for the fastening element be comprised of two parts. Here, the fastening element may comprise an adapter and an extension element. Because, in most cases, it is necessary to dispose an adapter between the first connection interface of the fitting and the sprinkler, the adapter may already be inserted as a part of the fastening element.

[0021] Because this adapter is completely surrounded by the box, insertion through the mold is not possible. In order to nevertheless guarantee insertion, the adapter is connected to an extension element that bridges the missing length. It was realized that it is possible to first connect the adapter to the first connection interface of the fitting or to first connect the adapter to the extension element.

[0022] Because the extension element must be removed again after the concrete has cured in order to attach a sprinkler, a detachable connection, in particular a screw connection, is necessary between the adapter and the extension element.

[0023] Thus, it is possible to remove only the extension element after the concrete has cured and then to connect a sprinkler to the adapter.

[0024] In order to be unable to see inside the box after installation of the sprinkler, it has proven useful to dispose a cover on the box on the ceiling that has an opening for the sprinkler. This cover may also be fastened to the box/ceiling by means of the sprinkler.

[0025] The invention shall now be described in greater detail with reference to an exemplary embodiment that is not limiting to the invention. Shown is:

[0026] FIG. 1—Section through an assembly according to the invention for creating a connection, in particular for a sprinkler on a concrete or reinforced concrete ceiling, mounted on a mold.

[0027] FIG. 2 shows a section of an assembly according to the invention for creating a connection mounted on a mold (7). The assembly comprises a fitting (3) designed in a T shape and having three connection interfaces (2a, 2b). However, it is also possible for the fitting (3) to comprise only two connection interfaces (2a, 2b) such that it is not possible to conduct the fluid to additional assemblies. Pipes (1) are disposed on two of the connection interfaces (2b) of the exemplary embodiment which, in this example, are fixed to the fitting (3) with the aid of sliding collars. A fastening element (4a, 4b) comprising an adapter (4a) and an extension element (4b) is fastened in a detachable fashion to the connection interface (2a) of the fitting (3) that is still free.

[0028] Here, the fitting (3) and adapter (4a) as well as the adapter (4a) and the extension element (4b) are connected to one another via a screw connection. In this example, the adapter (4a) is structured in such a way that it represents a sort of reduction adapter because the connection interface (2a) of the fitting (3) has a larger diameter than the sprinkler to be attached later.

[0029] Moreover, the assembly has a box (5) that surrounds the region of the fastening element (4a, 4b). This box (5) is disposed on a collar (6) of the connection interface (2a) of the fitting (3), which is not connected to a pipe (1), in such a way that its position is defined relative to the fitting (3). In this exemplary embodiment, the box (5) is made of metal; however, other materials that comply with fire regulations and do not limit the functionality of the sprinkler in the case of a fire are conceivable as well. It is also possible for a seal (12) to be disposed between the box (5) and the collar (6) of the fitting (3), as in this example, in order to reliably prevent concrete from penetrating at this location.

[0030] FIG. 1 also shows a mould (7) through which the fastening element (4a, 4b), in particular the extension element (4b), protrudes. To this end, the mold (7) has an opening (9) that is essentially identical in its shape and area to the cross-section of the fastening element (4a, 4b), in particular the extension element (4b).

[0031] A fastening means (8) in the form of a nut is disposed on the fastening element (4a, 4b) on the side of the mold (7) facing away from the fitting (3). This fastening means is connected to the fastening element (4a, 4b), in particular the extension element (4b), via the thread located on the end of the extension element (4b) facing away from the fitting (3) in this exemplary embodiment. However, other fastening means (8), such as clamps or the like, are possible as well.

[0032] In addition, it may be seen from FIG. 1 that a washer (10) having a larger diameter than the nut is disposed between the mold (7) and the nut being used as the fastening means (8). This washer prevents the nut from digging into the mold (7), which is usually made of wood, thus impeding later removal.

[0033] In order to be able to easily detach the extension element (4b) from the adapter (4a) when removing it, it has been shown to be advantageous for an easily removable sealing means, in particular a Teflon band, to be inserted into the thread. In contrast, the adapter (4a) should not be unscrewed during the removal of the extension element (4b). The adapter (4a) should also be connected to the fitting (3) in a fluid-tight manner. The use of a sealing means that is difficult to remove, in particular manila, has been shown to be favorable for this purpose.

[0034] This setup shown in FIG. 1 for creating a connection, in particular for a sprinkler on a concrete or reinforced concrete ceiling, is assembled in steps. To this end, a connection interface (2a) of the fitting (3) is first connected to the adapter (4a) via a screw connection. Here, manila, which expands when it absorbs liquid, may be placed in the thread.
for sealing purposes, thus sealing the connection. However, other sealing materials are conceivable as well. In this context, it is also possible for the connection between the adapter (4a) and the connection interface (2a) of the fitting (3) to be connected in a sealing fashion by means of an additional adhesive connection or by means of the adhesive connection alone.

When a one-piece fastening element is used, a detachable connection between the connection interface (2a) of the fitting (3) and the fastening element is necessary because the fastening element must be removed again after completion of the concrete or reinforced concrete ceiling.

In this example, after the adapter (4a) has been connected to the connection interface (2a) of the fitting (3), the extension element (4b) is connected to the adapter (4c) in a removable fashion via a screw connection. Here, the diameter of the connection interface of the connection element (4b) to the adapter (4c) is structured precisely in the same manner as the sprinkler to be inserted later. Due to the fastening element (4a, 4b) having two parts, it is possible to use different adapters (4a) for different dimensions of the connection interfaces (2a) of the fitting (3), while the number of variations for the extension element (4b) need be adapted only to the various sprinkler dimensions.

The box (5) is now slid over the fastening element (4a, 4b) with a seal (12) until the box (5), along with the seal (12), rests against the collar (6) of the connection interface (2a) of the fitting (3). However, it is not strictly necessary to use a seal (12). This is particularly advantageous if the composition of the concrete requires additional sealing. Then the fastening element (4a, 4b), in particular the extension element (4b), is guided through an opening (9) placed in the mold (7). This opening (9) corresponds approximately to the cross section of the fastening element (4a, 4b), in particular the extension element (4b). The fastening element (4a, 4b), in particular the extension element (4b), now protrudes on the one side of the mold (7) and, on the other side of the mold (7), the box (5) is in contact with the mold (7).

Because, when pouring the concrete for a concrete or reinforced concrete ceiling, the fitting (3) would float along with the adapter (4a), the extension element (4b), and the box (5), a fastening means (8) is connected to the fastening element (4a, 4b), in particular to the extension element (4b), on the side of the mold (7) facing away from the fitting (3). In this example, the connection is embodied as a screw connection, with the fastening element (4a, 4b), in particular the extension element (4b), having a thread on its side facing away from the adapter (4a) and with the fastening means (8) being embodied as a nut. In order to simplify the later removal of the nut, a washer (10) is disposed between the mold (7) and the nut.

Now the box (5) is fixed on the mold (7) via the fastening means (8), such that it is not able to float when the concrete is poured and such that no concrete is able to penetrate between the mold (7) and the box (5).

This process is repeated for all assemblies for creating a connection for the concrete or reinforced concrete ceiling to be equipped. This is particularly easy to accomplish because the fastening elements (4a, 4b), in particular the extension elements (4b), and the fastening means (8), are visible on the side of the mold (7) facing away from the fittings (3) and the position is therefore easy to recognize.

After positioning and fastening the fitting (3) with the fastening element (4a, 4b), the box (5), and the fastening means (8), pipes (1) are connected to the connection interface (2b) that are still free. In general, this is accomplished by expanding the end of the pipe and sliding it onto the connection interface (2b) of the fitting (3). Then the end of the pipe is compressed with the fitting (3). This may be accomplished using a radially compressible pressing sleeve or by using a sliding collar (11).

The pipes (1) are usually laid in such a way that a closed ring results between the individual assemblies, said ring having a feed from one side or from two sides, or individual lines that are led from only one side. From these assemblies, the fitting designs result that are to be used for the individual assemblies.

After all the pipes (1) have been connected, a pressure test is conducted, in particular in accordance with VdS CEA 4001. This test allows for any non-tight points to be recognized and repaired before the concrete is poured. Here, the fastening element (4a, 4b) serves as a stopper that seals off the connection interface to which the sprinkler will later be connected from its surroundings, thus allowing the pressure test to be conducted. If no drop in pressure, or a drop in pressure lying within the tolerance range, is detected, then the concrete may be poured into the mold (7).

It is also possible for additional pipes not required for a sprinkler system, as well as cables and reinforcing elements, in particular reinforcement meshes or the like, to be inserted.

After the concrete has been poured, an additional pressure test, in particular in accordance with VdS CEA 4001, is conducted. This test serves to check the impermeability. Then the concrete must dry and cure. Once this has occurred, the fastening means (8), in particular the nuts, may be removed. Now the mold (7) and the fastening elements (4a, 4b), in particular the extension elements (4b), may be removed. Subsequently, a sprinkler is connected to the free connection interface (2a) of the fitting (3) or the adapter (4a).

In cases in which, for visual reasons, the box (5) is not to be openly recognizable in the concrete or reinforced concrete ceiling, it may be covered before the sprinkler is attached.

1. An assembly for creating a connection, in particular for a sprinkler, on a concrete or reinforced concrete ceiling, having at least one pipe (1) that is connected to a first connection interface (2a) of a fitting (3), a fastening element (4a, 4b) that is connected in a detachable fashion to a second connection interface (2b) of the fitting (3), a box (5) that surrounds the fastening element (4a, 4b) in regions and that is disposed on a collar (6) of the second connection interface (2b) of the fitting (3), with the fastening element (4a, 4b) being insertable through a mold (7) for limiting the concrete or reinforced concrete ceiling and being attachable to the mold (7) of the concrete or reinforced concrete ceiling on its side facing away from the fitting (3) using a fastening means (8).

2. The assembly according to claim 1, wherein the fastening element (4a, 4b) is comprised of two parts, in particular an adapter (4a) and an extension element (4b), which are connected to one another in a detachable fashion.

3. The assembly according to claim 1, wherein the fitting (3) and the fastening element (4a, 4b) or the fitting (3) and the adapter (4a) and/or the adapter (4a) and the extension element (4b) are connected by means of a screw connection.

4. The assembly according to claim 1 fastening element (4a, 4b) has a thread on its side facing away from the fitting (3).

5. The assembly according to claim 1, wherein the fastening means (8) is embodied as a nut.
6. A method for the creation of a connection for a sprinkler to a concrete or reinforced concrete ceiling limited by a mold (7), having the following method steps:
   Connecting a fastening element (4a, 4b) to a first connection interface (2a) of a fitting (3),
   Arranging a box (5) that surrounds the fastening element (4a, 4b) in regions on a collar (6) of the first connection interface (2a) of the fitting (3),
   Inserting the fastening element (4a, 4b) through an opening (9) in the mold (7),
   Fastening the fastening element (4a, 4b) to the mold (7) using a fastening means (8) that is disposed on the side of the mold (7) facing away from the fitting (3),
   Producing a connection between at least one water pipe (1) and a second connection interface (2b) of the fitting (3), and
   Pouring the concrete into the mold (7).
7. The method according to claim 6, wherein, after the concrete has cured, the fastening element (4a, 4b) is removed from the fitting (3).
8. The method according to claim 7, wherein a sprinkler is subsequently connected to the first connection interface (2a) of the fitting (3).
9. The method according to claim 8, wherein, before connecting the sprinkler, the sprinkler is connected to an adapter (4a) and the adapter (4a) is connected to the first connection interface (2a) of the fitting (3).
10. The method according to claim 6, wherein the fastening element (4a, 4b) comprises two parts, in particular an adapter (4a) with the first connection interface (2a) of the fitting (3) and an extension element (4b), which are connected to one another in a detachable fashion before connection to the first connection interface (2a) of the fitting (3).
11. The method according to claim 10, wherein, after the concrete has cured, only the extension element (4b) is removed from the adapter (4a) and the adapter (4a) remains connected to the fitting (3).
12. The method according to claim 11, wherein a sprinkler is subsequently connected to the adapter (4a).
13. The method according to claim 8, wherein, before the installation of the sprinkler, a cover is disposed on the box (5) having an opening for the sprinkler.

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