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(54) **A suspended ceiling system and a method for suspending such a ceiling system**

(57) The present invention relates to a suspended ceiling system (1), comprising at least one ceiling tile (2) having a first surface (2a) adapted to face a room and a second surface adapted to face a ceiling structure of a building, at least one fixing member being adapted to be inserted into said at least one ceiling tile (2) and to suspend said at least one ceiling tile (2). Said at least one fixing member comprises a duct adapted to at least partly

extend between the first and second surfaces of said at least one ceiling tile (2). The system further comprises at least one suspension member (3) adapted to at least partly extend in said duct and further extend from said at least one fixing member and through the first surface (2a) of said at least one ceiling tile (2). The present invention further relates to a method for suspending such a ceiling system.

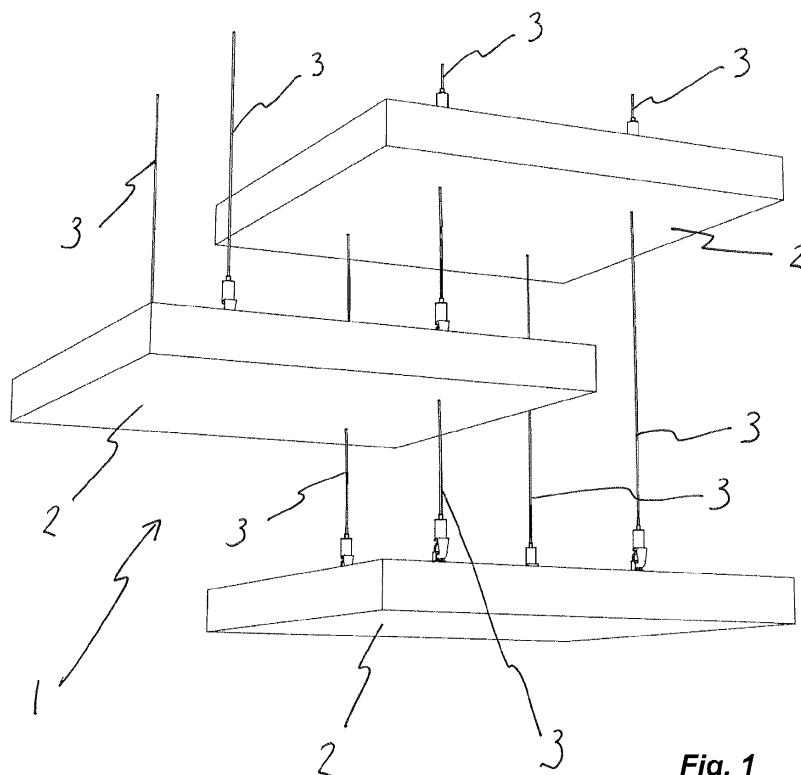


Fig. 1

Description

Field of the invention

[0001] The present invention relates to a suspended ceiling system comprising at least one ceiling tile, at least one fixing member and at least one suspension member. The invention also relates to a method for suspending such a ceiling system.

Technical background

[0002] Suspended ceilings can be installed in many different types of buildings for various reasons, for example to absorb sound, to reflect light, to lower the ceiling height or to conceal installations such as cable arrangements, ventilation equipment, lighting installations and other devices arranged in the space between the suspended ceiling and the ceiling structure of a building.

[0003] In some circumstances, an overall suspended ceiling in the form of a grid and a plurality of ceiling tiles can not be used due to various reasons. Examples are premises where temperature is regulated via the joists (TABS, Thermal Activated Building Systems) or where there are large areas of glass. As an alternative to an overall suspended ceiling, free-hanging units of ceiling tiles forming ceiling islands are one way of creating acceptable acoustic environments. The ceiling tiles may have sound-absorbing and/or sound-insulation properties.

[0004] Free-hanging units can also be installed in large, noisy environments such as open-plan areas, restaurants, shopping centres etc., close to working areas or other locations where acoustical treatment is needed in order to achieve suitable conditions for communication, concentration or recovery.

[0005] Free-hanging units can also be used as a complement to an overall suspended ceiling in order to improve the acoustic environment with a reduction of the sound level and a diminishing of sound as distance increases.

[0006] The use of free-hanging units provides flexibility. Free-hanging units can be arranged in many different ways, for instance creating separate ceiling islands or ceiling islands formed of a plurality of free-hanging units arranged at different levels, overlapping each other.

[0007] Free-hanging units may be suspended to the ceiling structure of the building in different ways. One way of suspending a ceiling island is to use a grid or profiles supporting the ceiling tiles, wherein suspension members are connected to the grid or profiles. Another solution is to suspend the ceiling tiles individually by fastening a suspension member to each ceiling tile. Especially when arranging a plurality of ceiling tiles in an overlapping arrangement, the top ceiling tile have to be provided with a duct for each suspension member which is suspending the lower ceiling tiles to the ceiling structure. Consequently, a number of suspension members have

to extend through the top ceiling tile. Conventionally, each ceiling tile is suspended by a number of suspension members, for example at least three suspension members. Thereby, if three ceiling tiles are arranged above each other, and each ceiling tile is suspended by four suspension members, eight suspension members are extending through the top ceiling tile, and the free-hanging unit is arranged to the ceiling structure at twelve suspension points, four for each ceiling tile.

Summary of the invention

[0008] It is an object of the present invention to provide an improvement over the above described techniques and prior art.

[0009] A further object is to reduce the number of suspension members required to suspend ceiling tiles or other elements arranged below each other.

[0010] At least some of these and other objects and advantages that will be apparent from the description have been achieved by a suspended ceiling system, comprising at least one ceiling tile having a first surface adapted to face a room and a second surface adapted to face a ceiling structure of a building, at least one fixing member being adapted to be inserted into said at least one ceiling tile and to suspend said at least one ceiling tile. Said at least one fixing member comprises a duct adapted to at least partly extend between the second and first surfaces of said at least one ceiling tile. The suspended ceiling system further comprises at least one suspension member adapted to at least partly extend in said duct and further extend from said at least one fixing member and through the first surface of said at least one ceiling tile.

[0011] The first surface may be a front surface of the ceiling tile. The second surface may be a rear surface of the ceiling tile.

[0012] The suspended ceiling system may comprise more than one ceiling tile and other elements. The ceiling tiles and elements may be arranged at the same level or beneath each other. If arranged in different level, the ceiling tiles and elements may be arranged both concentrically or displaced in relation to each other. More than one fixing member and thereby more than one suspension member may be used to suspend an element or ceiling tile arranged below the top ceiling tile. Further, more than one fixing member may be used to suspend the top ceiling tile to the ceiling structure.

[0013] An advantage of the invention is that the system presents a more simple solution for suspending a ceiling system, since a single fixing member is used to both to suspend the ceiling tile to the ceiling structure and to suspend any element or elements arranged below the ceiling tile.

[0014] Another advantage is that the number of suspension members and fixing members are reduced. In a conventional arrangement, a separate suspension member suspends individually the ceiling tile, or any elements

arranged below the ceiling tile, to the ceiling structure, thus resulting in that a number of suspension members extends from the ceiling structure through the top ceiling tile to the elements arranged below the top ceiling tile. For example, in prior art solutions, if each ceiling tile is suspended by four suspension points, and three ceiling tiles are to be arranged at different levels, eight suspension members are extending through the top ceiling tile, in addition to the four suspension members by which the top ceiling tile is suspended. In the inventive suspended ceiling system arranged in similar manner, only four suspension members are extending through the top ceiling tile according to. In the inventive ceiling system, the fixing member both suspends the ceiling tile to the ceiling structure and suspends any element arranged below the ceiling tile.

[0015] Further, the same suspension member may be used to suspend all ceiling tiles or elements.

[0016] Another advantage of the invention is that the number of suspension points in the ceiling structure of the building is reduced. Since the ceiling tile and any elements arranged below the ceiling tile are suspended to the same suspension points, fewer suspension points are required compared to a conventional arrangement. Thereby, the time-consuming task of fixing suspension points to the ceiling structure of the building is reduced.

[0017] Further, the visual appearance of a suspended ceiling system according to the invention is improved, since the suspension of the ceiling system is less noticeable. Due the reduced number of required suspension members, a floating appearance of the suspended ceiling system may be obtained.

[0018] Another advantage is that the resistance against extraction of the fixing member due to the weight of ceiling system is improved compared to prior art solutions.

[0019] Further, a suspended ceiling system according to the present invention allows a faster and easier mounting due to the reduced number of fixing members and suspension members required and due to that the system is suspended to the same suspension points in the ceiling structure.

[0020] Said at least one suspension member may be adapted to suspend said at least one fixing member to a ceiling structure of a building. Thereby, the same suspension member may be used to both suspend the ceiling tile to the ceiling structure and to suspend an element arranged below the ceiling tile. Consequently, several ceiling tiles, or elements, arranged below each other may be suspended by the same suspension member.

[0021] An additional suspension member may be adapted to suspend said at least one fixing member to a ceiling structure of a building. In this embodiment, a first suspension member is used to suspend the ceiling tile to the ceiling structure, and a second suspension member is used to suspend the element arranged below the ceiling tile to said ceiling tile.

[0022] Said at least one fixing member may extend on-

ly partly between the second and first surfaces such that said at least one fixing member is not visible at the first surface. Thereby, when the first surface being a front surface of the ceiling tile, the visual appearance of the suspended ceiling island is further improved. Only the suspension member, for instance a wire, is visible from beneath. The visual impact of the suspension member is reduced and the impression of a floating arrangement of the suspended ceiling system is obtained.

[0023] Said at least one fixing member may be provided with threads and is adapted to be threaded into said ceiling tile from the second surface. By threading the fixing member from the second surface, the fixing member is not visible from the first surface. By using a threaded fixing member, the resistance against extraction of the fixing member is improved.

[0024] A pitch of said at least one fixing member may be at least 6 mm. A pitch of at least 6 mm is particularly favourable in order to improve resistance against extraction of the fixing member out of the ceiling tile, especially when suspending ceiling tiles made of glass wool.

[0025] Said at least one suspension member may be adapted to extend from said at least one fixing member and through the first surface of said at least one ceiling tile in a duct arranged in said at least one ceiling tile. The duct is arranged in the ceiling tile to provide guidance for the suspension member.

[0026] Said at least one fixing member may comprise a flange adapted to abut the first surface of said at least one ceiling tile. The flange is adapted to form a support surface supporting the ceiling tile.

[0027] Said at least one suspension member may be adapted to suspend at least one element below said at least one ceiling tile. The element may be another ceiling tile, a sign, a lightning appliance etc. The suspension member may be adapted to support a plurality of elements arranged below each other. The elements may be arranged concentrically or be offset in relation to each other.

[0028] The suspended ceiling system may further comprise a connecting member adapted to connect the suspension member suspending said at least one fixing member to said at least one fixing member. The connecting member may be adapted to fix the position of the suspension member relative the fixing member. The connecting member may also be used to adjust the length of the suspension member.

[0029] Said at least one ceiling tile may be made of compressed mineral fibres, preferably mineral wool, and most preferably glass wool. Due to the properties of the mineral fibres, it especially difficult to find a suitable fixing member providing sufficient resistance against extraction of the fixing member. By using the fixing member of the inventive system, these difficulties are overcome.

[0030] According to another aspect of the invention, a method for suspending a ceiling system comprising at least one ceiling tile is provided. The method comprising providing at least one ceiling tile having a first surface

adapted to face a room and a second surface adapted to face a ceiling structure of a building, providing at least one fixing member comprising a duct adapted to extend at least partly between the second and first surfaces of said at least one ceiling tile, inserting said at least one fixing member into said at least one ceiling tile, providing at least one suspension member, arranging said at least one suspension member in said at least one fixing member such that said at least one suspension member at least partly extends in said duct and further extends from said at least one fixing member and through the first surface of said at least one ceiling tile, suspending said at least one ceiling tile to a ceiling structure of a building.

[0031] The method according to the second aspect of the present invention incorporates all the advantages of the suspended ceiling system, which previously has been discussed. Thereby, the previous discussion is applicable also for the inventive method.

[0032] The step of suspending said at least one ceiling tile may comprise suspending said at least one ceiling tile by means of said at least one suspension member.

[0033] The method may further comprise suspending an element below said at least one ceiling tile by means of said at least one suspension member.

[0034] The step of inserting said at least one fixing member may comprise threading said at least one fixing member into said at least one ceiling tile from the second surface.

Brief description of the drawings

[0035] The present invention will by way of example be described in more detail with reference to the appended schematic drawings, which show embodiments of the present invention.

Fig. 1 shows a suspended ceiling system comprising a plurality of ceiling tiles in a first arrangement.

Fig. 2 shows a part of a ceiling tile, a fixing member and a suspension member according to a first embodiment in cross section.

Fig. 3 shows the fixing member and the suspension member in fig. 2 in more detail.

Fig. 4 shows a part of a ceiling tile, a fixing member and a suspension member according to a second embodiment in cross section.

Fig. 5 shows the fixing member and the suspension member in fig. 4 in more detail.

Fig. 6 shows a fixing member according to an alternative embodiment.

Fig. 7 shows a fixing member according to an alternative embodiment.

Fig. 8 shows a part of a ceiling tile, a fixing member and a suspension member according to a third embodiment in cross section.

Fig. 9 shows the fixing member in fig. 8 in more detail.

Detailed description

[0036] Fig. 1 shows an arrangement of a suspended ceiling system 1 comprising a plurality of ceiling tiles 2. The ceiling tiles 2 are free-hanging, i.e. they are suspended individually to the ceiling structure and not supported by a grid of profiles. The ceiling tiles 2 are arranged above each other in the vertical direction. The ceiling tiles 2 are concentrically arranged in fig. 1.

[0037] The ceiling tiles 2 may have sound-absorbing and/or sound insulating properties. The ceiling tiles 2 may be made of man-made fibres, for example compressed mineral fibres, preferably mineral wool and most preferably glass wool.

[0038] Further, the ceiling tiles 2 have a first surface 2a adapted to face a room, a second surface 2b adapted to face a ceiling structure of a building and at least one side surface. The first surface 2a is adapted to be facing a person being in the room, i.e. be facing the interior of a room. In the shown embodiment, the first surface 2a is a front surface and the second surface 2b is a rear surface. The first surface 2a is a horizontal surface of the ceiling tile 2, or a surface having at least a component extending in a horizontal direction. The second surface 2b is also a horizontal surface of the ceiling tile 2, or a surface having at least a component extending in a horizontal direction. The first surface 2a and or the second surface 2b may be provided with a surface layer. Said at least one side surface may also be provided with a surface layer. The surface layer may comprise a glass fibre web. The surface layers may be painted. The above described properties of the ceiling tiles 2 are applicable to ceiling tiles described in connection with all embodiments described in the present application.

[0039] The suspended ceiling system 1 further comprises suspension members 3 and fixing members 10. The suspension means 3 are adapted to suspend the ceiling tiles 2 to the ceiling structure of the building. In the arrangement shown in fig. 1, four suspension members 3 are suspending the ceiling tiles 2. The suspension members 3 are attached to the ceiling structure at four suspension points. In a first embodiment, which will be described in more detail with reference to figs. 2-3, each suspension member 3 is extending through the ceiling tiles 2 to the lowermost ceiling tile and suspends all ceiling tiles 2 to the ceiling structure. In a second embodiment, which will be described in more detail with reference to figs. 4-5, a first suspension member 3a is suspending the top ceiling tile 2 to the ceiling structure and a second suspension member 3b is suspending a lower ceiling tile 2 to the top ceiling tile 2. Since both the first and second suspension members 3a, 3b are attached to the fixing member 10, they extend one after the other in the same direction. Thereby, the visual appearance is similar as if one suspension member extends through all ceiling tiles 2. The fixing members 10 are inserted into the ceiling tile

2. The suspension members 3, 3a, 3b and the fixing members 10, 20 will be described in more detailed with reference to figs. 2-9.

[0040] In fig. 1, the ceiling tiles 2 are rectangular. However, the ceiling tiles 2 may have any shape, for example, elliptical, square, circular, triangular, octagonal, heptagonal, hexagonal, and pentagonal. The ceiling tiles 2 may also have an irregular shape or be shaped like any object such as a cloud, star, flower, butterfly etc.

[0041] A person skilled in the art appreciates that the arrangement of the suspended ceiling system 1 may vary from the arrangement shown in fig. 1. The sizes and shapes of the ceiling tiles 2 may vary, the arrangement of the ceiling tiles 2 relative each other may vary, the number of suspension members 3 suspending the system 1 to the ceiling structure may vary etc. Further, in fig. 1, the elements arranged below the top ceiling tile are ceiling tiles. A person skilled in the art appreciates that any element may be arranged below the top ceiling tile 2. The element may be another ceiling tile, but may also be a sign, a lightning appliance, or any other type of object.

[0042] However, common for all arrangements is that the ceiling tile 2 and elements arranged below are suspended to the ceiling structure at suspension points being common for all ceiling tile and elements. The ceiling tiles and elements 2 are not suspended individually to the ceiling structure. Thereby, the number of suspension point to the ceiling structure is reduced and the number of suspension members 3 required is reduced.

[0043] The suspended ceiling system 1 according to a first embodiment will now be described in more detail with reference to figs. 2 and 3. Fig. 2 shows a part of a ceiling tile 2, a fixing member 10 and a suspension member 3. The ceiling tile 2 is of the type described above. The fixing member 10, which is shown in more detail in fig. 3, comprises a threaded portion 11, a top portion 12, a flange 13, and a duct 15. The duct 15 is extending in the longitudinal direction of the fixing member 10. The duct 15 is extending in a central portion of the fixing member 10. The flange 13 has an abutment surface 14 adapted to abut the second surface 2b of the ceiling tile 2. The top portion 12 is provided with an opening in which a hook 5 of the suspension member 3 may be arranged. The threaded portion 11 is provided with threads. The pitch of the fixing member 10 is adapted to be suitable for the material of the ceiling tile. For example, for a ceiling tile 2 of compressed mineral fibres such as glass wool, the pitch of the fixing member 10 may be at least 6 mm in order to provide desired resistance against extraction of the fixing member 10.

[0044] The fixing member 10 is inserted into the ceiling tile 2 from the second surface 2b of the ceiling tile 2. More specifically, the fixing member 10 is threaded into the ceiling tile 2 from the second surface 2b of the ceiling tile 2. Thereby, the fixing member 10 is not visible from the first surface 2a of the ceiling tile 2. Due to the threaded portion of the fixing member 10, the fixing member 10 is

fixed to the ceiling tile 2.

[0045] The fixing member 10 may be made of metal, plastics, or any other suitable material.

[0046] The duct 15 of the fixing member 10 is extending at least partly between the second and first surfaces 2a, 2b of the ceiling tile 2 when the fixing member 10 is inserted into the ceiling tile. In the shown embodiment, the fixing member 10 is extending partly between the second and first surfaces 2a, 2b of the ceiling tile 2. In an alternative embodiment, the fixing member 10 may extend to the first surface 2a.

[0047] When the fixing member 10 is inserted into the ceiling tile 2, the abutment surface 14 is abutting the second surface 2b of the ceiling tile 2.

[0048] The suspension member 3 is extending through the ceiling tile 2. The suspension member 3 may be a wire, rope, cord, pipe or other suitable element. The suspension member 3 extends in the duct 15 of the fixing member 10 and extends further from the fixing member 10 and through the first surface 2a of the ceiling tile 2. The ceiling tile 2 is provided with a duct 19 in which the suspension member 3 extends. The duct 19 of the ceiling tile 2 extends from the fixing member 10 to the first surface 2a. The suspension member 3 further extends from the first surface 2a of the ceiling tile 2 to one or more elements arranged below the ceiling tile 2 in order to suspend said element or elements.

[0049] In the other direction, the suspension member 3 extends from the fixing member 10 to a suspension point arranged in the ceiling structure of the building. The suspension member 3 suspends the fixing member 10 to the ceiling structure. Thereby, since the fixing member 10 is fixed to the ceiling tile 2, the ceiling tile 2 is suspended to the ceiling structure by means of the suspension member 3.

[0050] The suspension member 3 comprises a connecting member 4. The connecting member 4 is provided with a hook 5. The hook 5 is inserted in the opening of the top portion 12 of the fixing member 10 in order to suspend the fixing member 10. The connecting member 4 is further provided with a locking member 6 for fixing and locking the length of the suspension member 3. The locking member 6 may be releasable such that the locking member 6 comprises an unlocked position wherein the length of the suspension member 3 may be adjusted and a locked position wherein the position of the suspension member 3 is fixed.

[0051] Alternatively, the suspension member 3 may be fixedly arranged in the connecting member 4. In a further alternative embodiment, the suspension member 3 does not include any hook, and the securing member 6 for locking the suspension member is arranged in the fixing member 10 instead.

[0052] Consequently, the same suspension member 3 suspends both the ceiling tile 2 and an element arranged below the ceiling tile 2 to the ceiling structure. A further element may be suspended below the element in the same manner as described above with reference to

the ceiling tile 2. A person skilled in the art appreciates that more than one suspension member 3 may be required to suspend the ceiling system 1, and that a fixing member 10 is required for each suspension member 3.

[0053] The suspended ceiling system 1 according to a second embodiment will now be described in more detail with reference to figs. 4 and 5. Fig. 4 shows a part of a ceiling tile 2, a fixing member 10, and a first and a second suspension member 3a, 3b. The ceiling tile 2 is of the type described above. The fixing member 10 is of the type described above with reference to figs. 2 and 3, and it will therefore not be described in detail. The fixing member 10 is arranged in the same manner as described above with reference to fig. 2.

[0054] The second embodiment shown in figs. 4 and 5 only differs from the embodiment shown in figs. 2 and 3 in that two separate suspension member 3a, 3b is used instead of a single suspension member 3. The first suspension member 3a extends from the fixing member 10 to a suspension point arranged in the ceiling structure of the building. The first suspension member 3a comprises a connecting member 4. The connecting member 4 is provided with a hook 5. The hook 5 is inserted in the opening of the top portion 12 of the fixing member 10 in order to suspend the fixing member 10. Thereby, the first suspension member 3a suspends the fixing member 10 to the ceiling structure. Since the fixing member 10 is inserted into the ceiling tile 2, the first suspension member 3a suspends the ceiling tile 2. Further, the connecting member 4 may be provided with a locking member 6 for fixing and locking the length of the suspension member 3a as described above. The locking member 6 may be releasable such that the locking member 6 comprises an unlocked position wherein the length of the suspension member 3 may be adjusted and a locked position wherein the position of the suspension member 3 is fixed. Alternatively, the first suspension member 3a may be fixedly arranged in the connecting member 4.

[0055] The second suspension member 3b extends in the duct 15 of the fixing member 10 and extends further from the fixing member 10 and through the first surface 2a of the ceiling tile 2. The ceiling tile 2 is provided with a duct 19 in which the second suspension member 3b extends. The duct 19 of the ceiling tile 2 extends from the fixing member 10 to the first surface 2a. The second suspension member 3b further extends from the first surface 2a of the ceiling tile 2 to an element arranged below the ceiling tile 2 in order to suspend said element. A further element may be suspended below the element in the same manner as described above with reference to the ceiling tile. A person skilled in the art appreciates that more than one first suspension member may be required to suspend the ceiling system 1, and that a fixing member 10 is required for each suspension member 3a, 3b.

[0056] The fixing member 10 is in this embodiment provided with a locking member 6 for connecting the second suspension member 3b to the fixing member 10 and for locking the length of the second suspension member 3b

in relation to the fixing member. The locking member 6 may be releasable and of the type described above in relation to fig. 2, thereby allowing adjustment of the length of the second suspension member 3b.

[0057] As an alternative to the locking member 6, the second suspension member 3b may be hooked on the hook 5.

[0058] The first and second suspension members 3a, 3b may be wires, ropes, cords, pipes or any other suitable element. Alternatively, the first suspension member 3a may be a bracket adapted to fix the ceiling tile to the ceiling structure.

[0059] As alternatives to providing the fixing member 10 with a locking member as described above, the duct 15 of the fixing member 10 may have a shape adapted to prevent the second suspension member 3b from being extracted from the fixing member 10. As shown in fig. 6, the fixing member 10 may be provided with a step 16. The second suspension member 3b may be provided with a corresponding stop member 17 having a larger radius than the narrow step 16 of the duct 15. The stop member prevents the second suspension member 3b from being extracted from the fixing member 10.

[0060] Alternatively, the duct 15 of the fixing member 10 may be tapered as shown in fig. 7. The second suspension member 3b is clamped in the tapering duct 15 such that it is fixed in the fixing member 10. The second suspension 3b may also be provided with a stop member 17 adapted to be clamped in the tapering duct.

[0061] A suspended ceiling system 1 according to a third embodiment will now be described in more detail with reference to fig. 8 and 9. Fig. 8 shows a part of a ceiling tile 2, a fixing member 20, and a suspension member 3. The ceiling tile 2 is of the type described above. The fixing member 20, which is shown in more detail in fig. 9, comprises a top portion 23, a central portion 25 having a duct 22 and a flange 21. The duct 22 is extending in the longitudinal direction of the fixing member 20. The flange 21 has an abutment surface 24 adapted to abut the first surface 2a of the ceiling tile 2. The top portion 23 is provided with threads.

[0062] The fixing member 20 is inserted into the ceiling tile 2 from the first surface 2a of the ceiling tile 2. When the fixing member 20 is inserted into the ceiling tile 2, the abutment surface 24 of the flange 21 is abutting the first surface 2a of the ceiling tile 2. The fixing member 20 is adapted to support the ceiling tile 2 by means of the abutment surface 24 of the flange 21.

[0063] The duct 22 of the fixing member 20 is extending at least partly between the second and first surfaces 2a, 2b of the ceiling tile 2 when the fixing member 20 is inserted into the ceiling tile 2. In the shown embodiment, the fixing member 20 extends to the second surface 2b.

[0064] The fixing member 20 may be made of metal, plastics, or any other suitable material.

[0065] The suspension member 3 is extending through the ceiling tile 2. The suspension member 3 may be a wire, rope, cord, pipe or any other suitable element. The

suspension member 3 extends in the duct 22 of the fixing member 20. The suspension member 3 extends between the first and second surfaces 2a, 2b of the ceiling tile 2. The suspension member 3 further extends from the first surface 2a of the ceiling tile 2 to an element arranged below the ceiling tile 2 in order to suspend said element.

[0066] In the other direction, the suspension member 3 extends from the fixing member 20 to a suspension point arranged in the ceiling structure of the building. The suspension member 3 suspends the fixing member 20 to the ceiling structure. Thereby, since the fixing member 20 supports the ceiling tile 2, the ceiling tile 2 is suspended to the ceiling structure by means of the suspension member 3. The suspension member 3 comprises a connecting member 30. The connecting member 30 comprises a duct 31 and a threaded portion 32. The suspension member 3 extends in the duct 31. The threaded portion 32 is adapted to engage with the threaded portion 23 of the fixing member 20. When the threaded portion 23 of the fixing member 20 is threaded into the connecting member 30, the connecting member 30 is attached to the fixing member 20. The suspension member 3 may be fixedly arranged in the connecting member 30. The connecting member 30 may be provided with a locking member 6 for fixing and locking the length of the suspension member 3. The locking member 6 may be releasable such that the locking member 6 comprises an unlocked position wherein the length of the suspension member 3 may be adjusted and a locked position wherein the position of the suspension member 3 is fixed.

[0067] Consequently, the suspension member 3 suspends the fixing member 20 to the ceiling structure. Since the fixing member 20 supports the ceiling tile 2, the suspension member 3 suspends the ceiling tile 2.

[0068] A person skilled in the art appreciates that the connecting member described in connection with figs. 2-7 may be replaced by the above described threaded connecting member adapted to engage with mating threads of the fixing member.

[0069] Consequently, the same suspension member 3 suspends both the ceiling tile 2 and any element arranged below the ceiling tile 2 to the ceiling structure. A further element may be suspended below the element in the same manner as described above with reference to the ceiling tile 2. A person skilled in the art appreciates that more than one suspension member may be required to suspend the ceiling system, and that a fixing member is required for each suspension member.

[0070] It is contemplated that there are numerous modifications of the embodiments described herein, which are still within the scope of the invention as defined by the appended claims.

[0071] It is contemplated that the different embodiments may be combined in a system. For example, a first suspension member may be used to suspend the ceiling tile to the ceiling structure of the building, and a second suspension member may be used to suspend two or more elements below the ceiling tile, thus corresponding

to the embodiment with a single suspension member.

[0072] It is further contemplated that not all fixing members may be suspended to the ceiling structure of the building. Some fixing members may be arranged to only suspend an element arranged below the ceiling tile. It is also contemplated that some fixing members only are arranged to suspend the fixing member to the ceiling structure of the building and not to suspend any element arranged below the ceiling tile. A person skilled in the art appreciates that the number of suspension members for the ceiling tile and any elements arranged below the ceiling tile depends on the size and weight of the ceiling tile and elements, respectively.

[0073] It is also contemplated that the connecting member may be formed integrally with the suspension member, or that the suspension member has no connecting member. For example, the suspension member may comprise a loop.

[0074] It is also contemplated that the ceiling tile may be arranged in form of a baffle. In this case, the first surface is in form of an edge surface facing the room, and the second surface is in form of an edge surface facing the ceiling structure of a building. The baffle has two main surfaces extending perpendicular to the ceiling structure of the building. The above description of the ceiling tile is applicable also for a ceiling tile in form of a baffle.

[0075] It is further contemplated that the ceiling tile may also be suspended such that the ceiling tile is angled in relation to the ceiling structure of the ceiling.

Claims

1. A suspended ceiling system (1), comprising
 - at least one ceiling tile (2) having a first surface (2a) adapted to face a room and a second surface (2b) adapted to face a ceiling structure of a building,
 - at least one fixing member (10; 20) being adapted to be inserted into said at least one ceiling tile (2) and to suspend said at least one ceiling tile (2), wherein said at least one fixing member (10; 20) comprises a duct (15; 22) adapted to at least partly extend between the first and second surfaces (2a, 2b) of said at least one ceiling tile (2),
 - at least one suspension member (3; 3b) adapted to at least partly extend in said duct (15; 22) and further extend from said at least one fixing member (10; 20) and through the first surface (2a) of said at least one ceiling tile (2).
2. A suspended ceiling system (1) according to claim 1, wherein said at least one suspension member (3) is adapted to suspend said at least one fixing member (10; 20) to a ceiling structure of a building.
3. A suspended ceiling system (1) according to claim 1, wherein an additional suspension member (3b) is adapted to suspend said at least one fixing member

(10; 20) to a ceiling structure of a building.

4. A suspended ceiling system (1) according to any one of claims 1-3, wherein said at least one fixing member (10) extends only partly between the first and second surfaces (2a, 2b) such that said at least one fixing member (10) is not visible at the first surface (2a). 5
5. A suspended ceiling system (1) according to any one of claim 1-4, wherein said at least one fixing member (10) is provided with threads and is adapted to be threaded into said ceiling tile (2) from the second surface (2b). 10
6. A suspended ceiling system (1) according to claim 5, wherein a pitch of said at least one fixing member (10) is at least 6 mm. 15
7. A suspended ceiling system (1) according to any one of claims 1-6, wherein said at least one suspension member (3; 3b) is adapted to extend from said at least one fixing member (10; 20) and through the first surface (2a) of said at least one ceiling tile (2) in a duct (19) arranged in said at least one ceiling tile (2). 20 25
8. A suspended ceiling system (1) according to any one of claims 1-3, wherein said at least one fixing member (20) comprises a flange (21) adapted to abut the first surface (2a) of said at least one ceiling tile (2). 30
9. A suspended ceiling system (1) according to any one of claims 1-8, wherein said at least one suspension member (3; 3b) is adapted to suspend at least one element below said at least one ceiling tile (2). 35
10. A suspended ceiling system (1) according to any one of claim 1-9, further comprising a connecting member (4; 30) adapted to connect the suspension member (3; 3a) suspending said at least one fixing member (10; 20) to said at least one fixing member (10; 20). 40
11. A suspended ceiling system (1) according to any one of claims 1-10, wherein said at least one ceiling tile (2) made of compressed mineral fibres, preferably mineral wool, and most preferably glass wool. 45
12. A method for suspending a ceiling system (1) comprising at least one ceiling tile (2), the method comprising providing at least one ceiling tile (2) having a first surface (2a) adapted to face a room and a second surface (2b) adapted to face a ceiling structure of a building, 50 55
providing at least one fixing member (10; 20) comprising a duct (15; 22) adapted to extend at least

partly between the first and second surfaces (2a, 2b) of said at least one ceiling tile (2),
inserting said at least one fixing member (10; 20) into said at least ceiling tile (2),
providing at least one suspension member (3; 3b),
arranging said at least one suspension member (3; 3b) in said at least one fixing member (10; 20) such that said at least one suspension member (3; 3b) at least partly extends in said duct (15; 22) and further extends from said at least one fixing member (10; 20) and through the first surface (2a) of said at least one ceiling tile (2),
suspending said at least one ceiling tile (2) to a ceiling structure of a building.

13. A method according to claim 12, wherein the step of suspending said at least one ceiling tile (2) comprises suspending said at least one ceiling tile (2) by means of said at least one suspension member (3).
14. A method according to claim 12 or 13, further comprising suspending at least one element below said at least one ceiling tile (2) by means of said at least one suspension member (3).
15. A method according to any one of claims 12-14, wherein the step of inserting said at least one fixing member (10) comprises threading said at least one fixing member (10) into said at least one ceiling tile (2) from the second surface (2b).

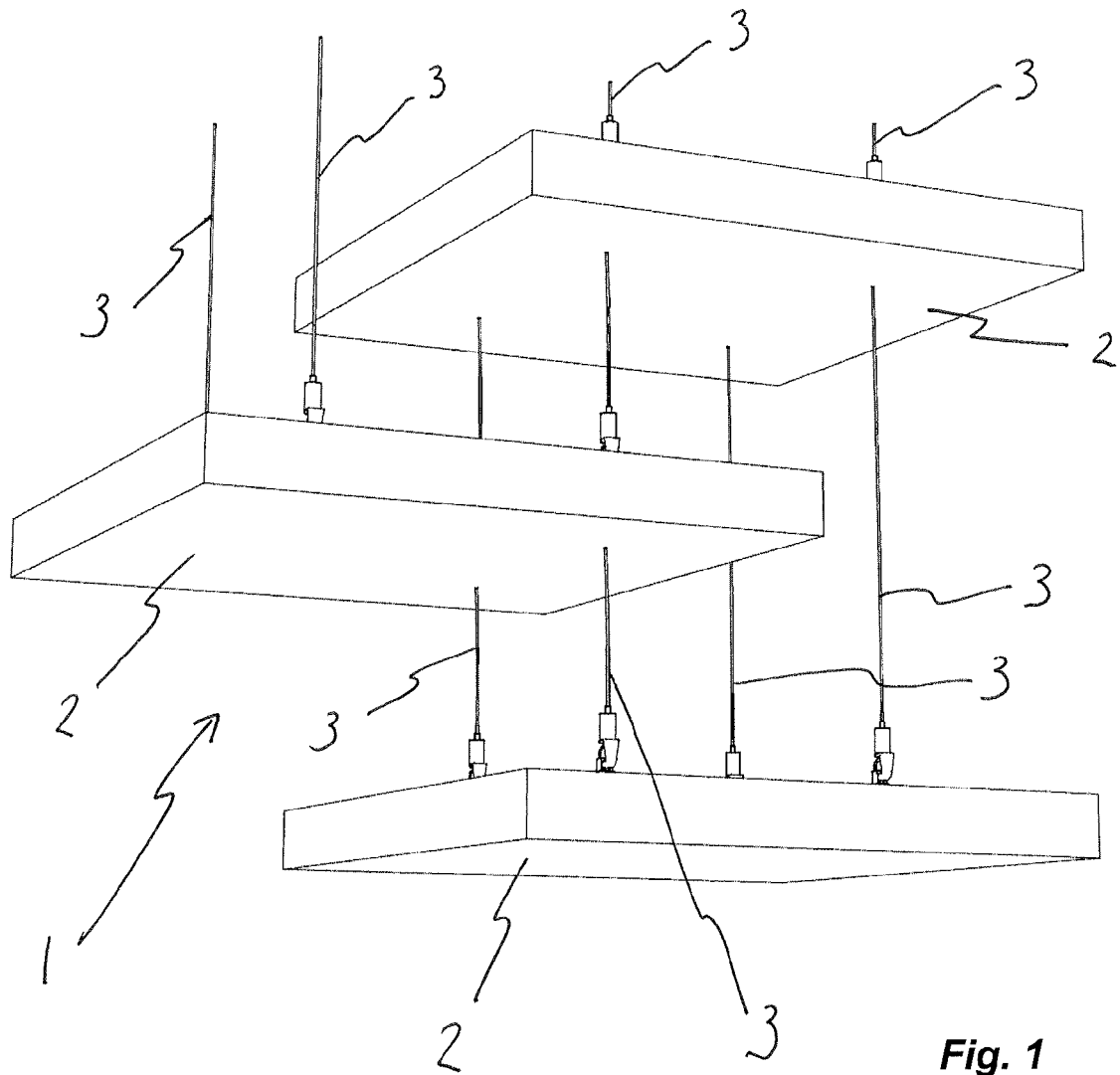
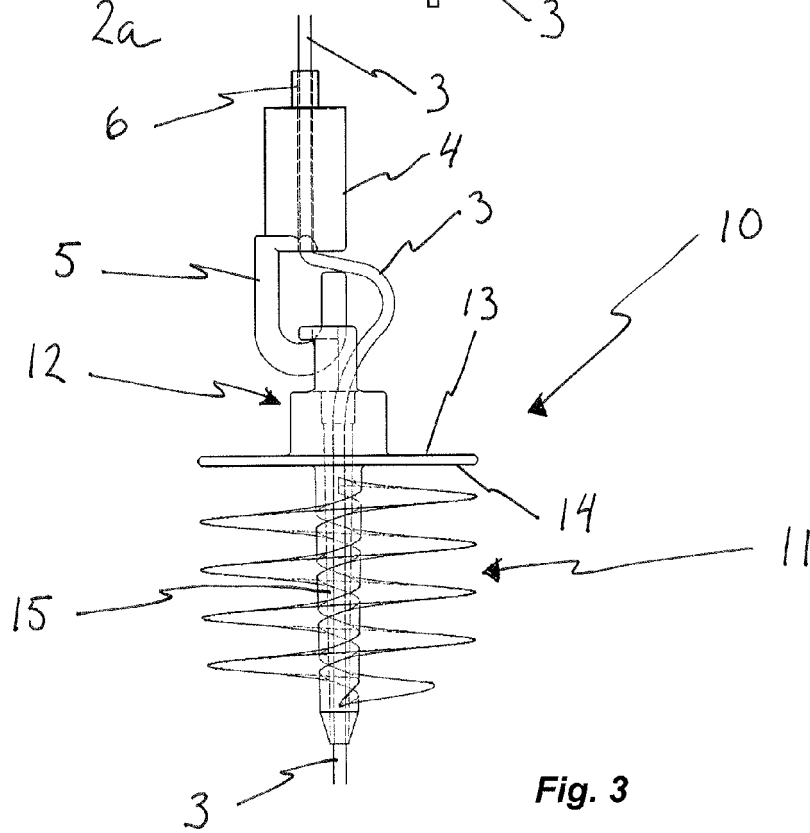
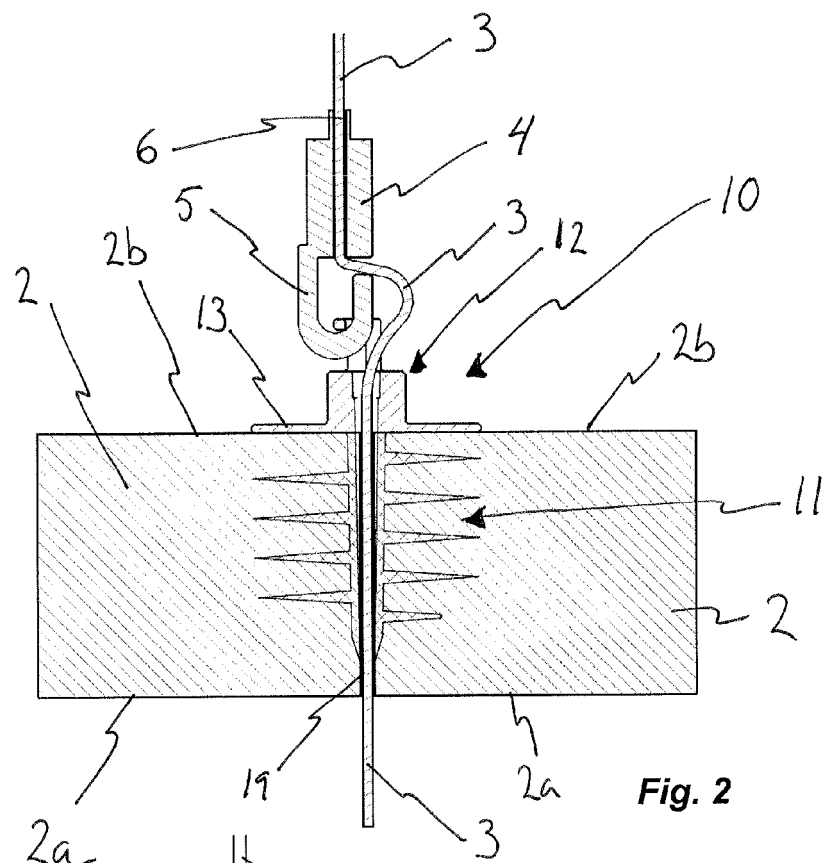
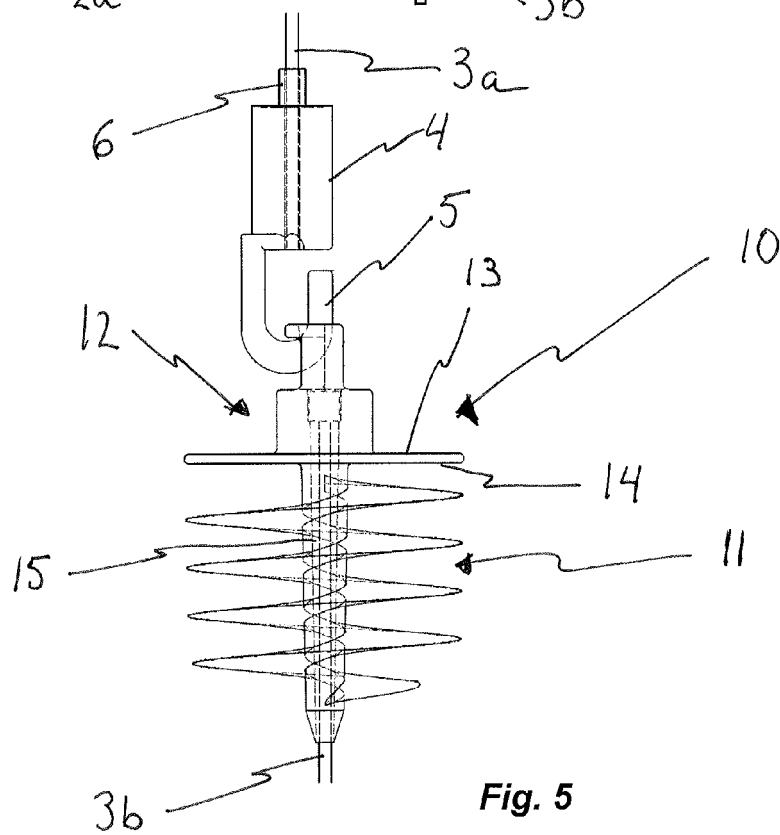
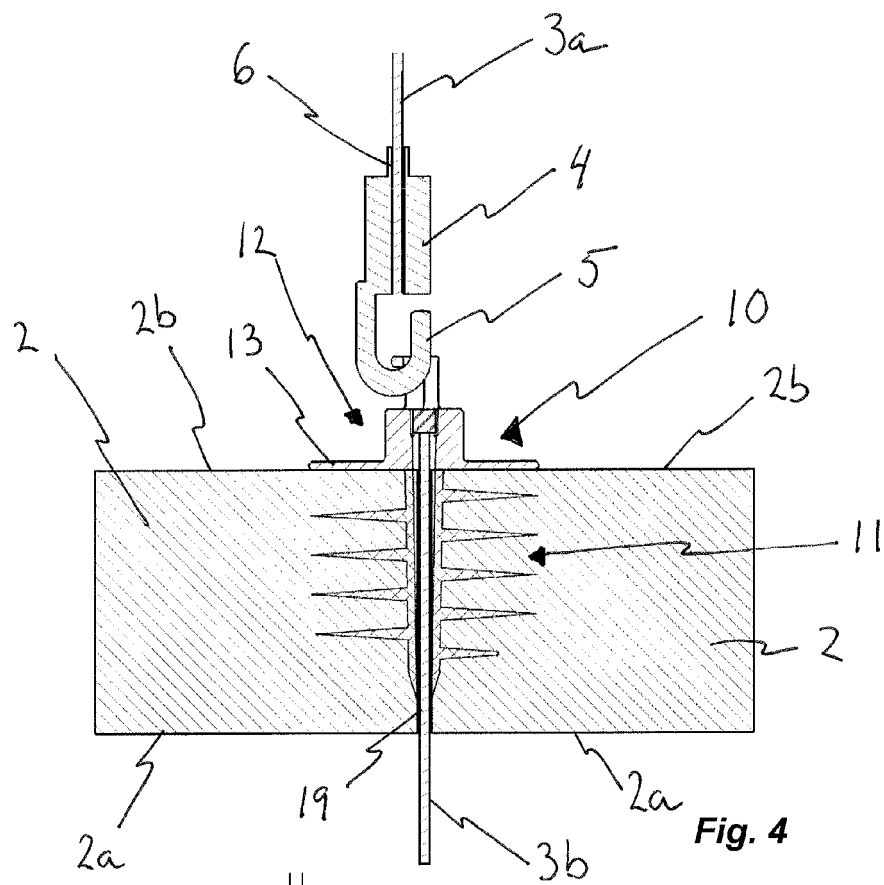
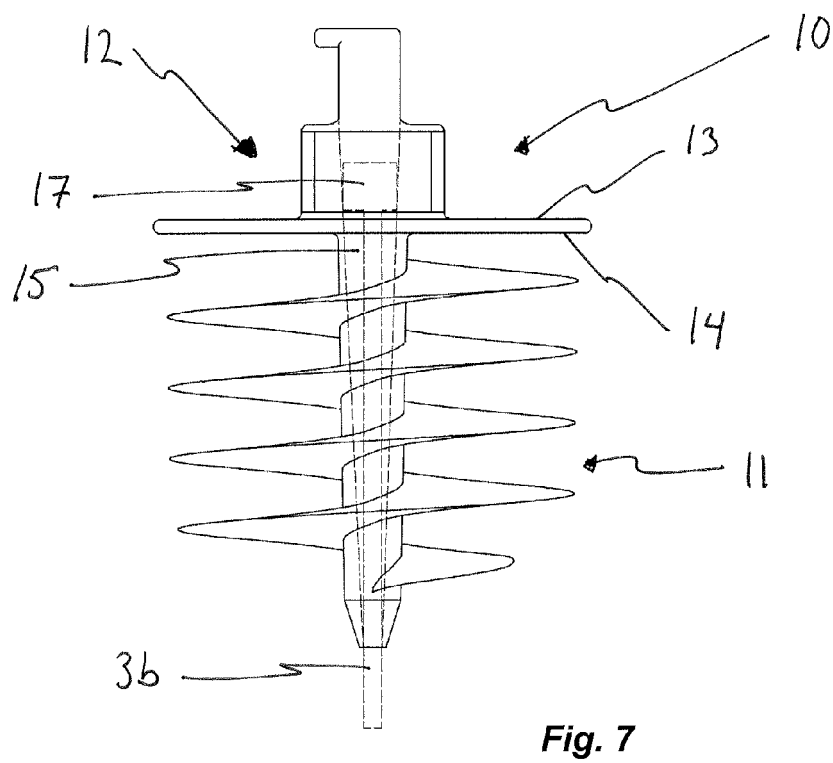
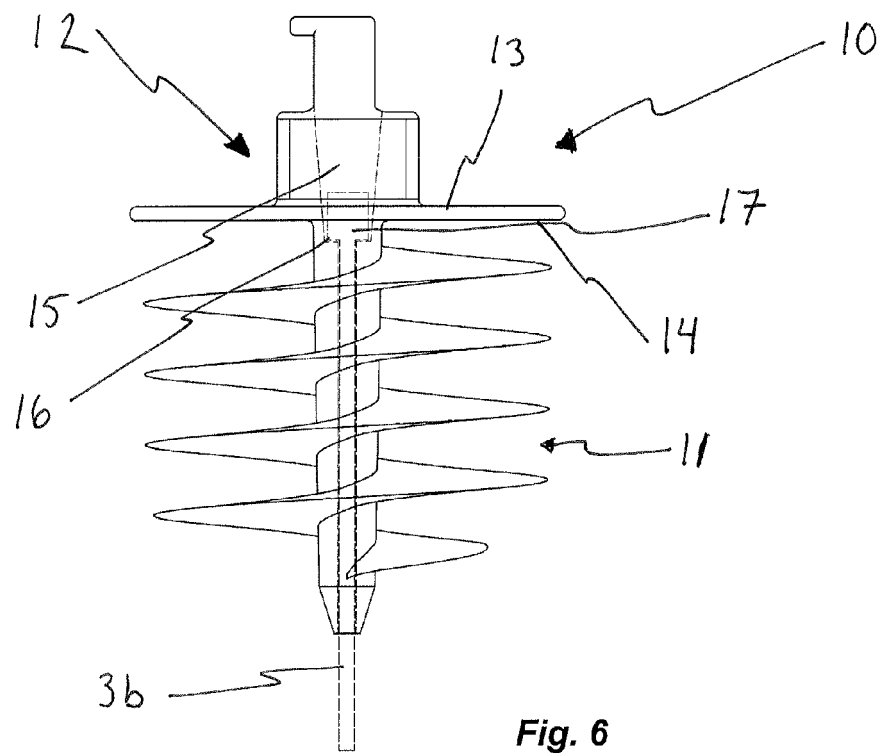
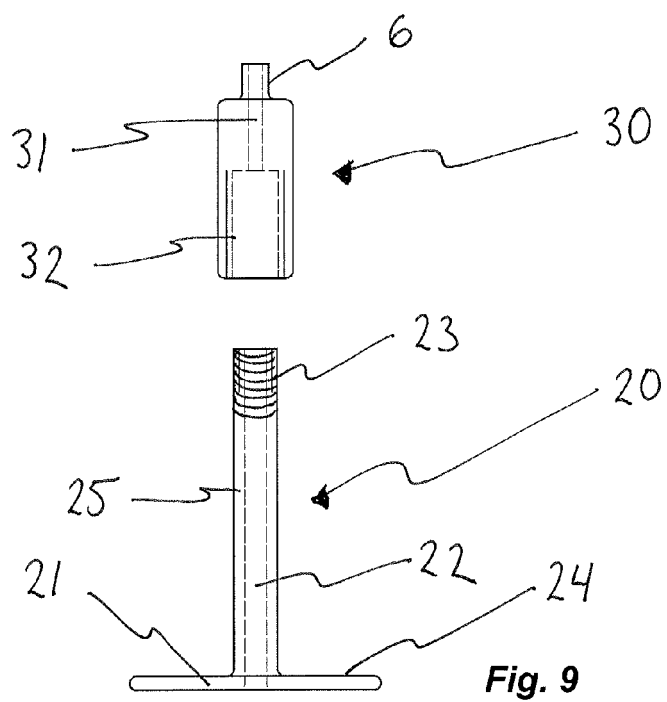
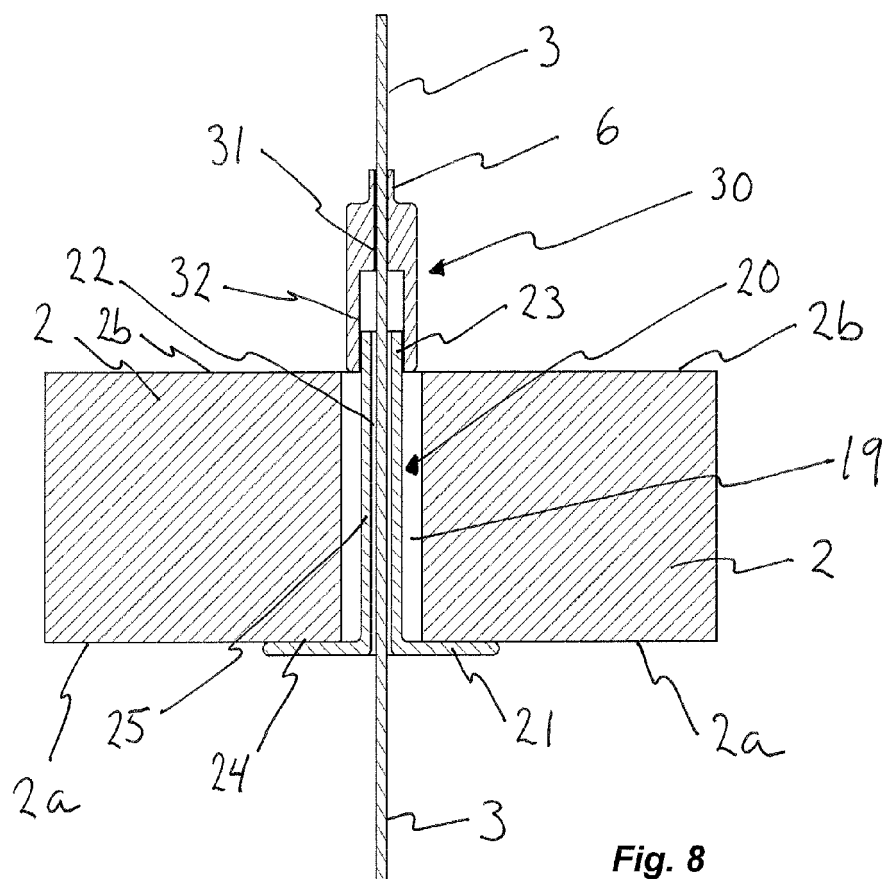


Fig. 1











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EP 11 17 3644

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 9 December 2011	Examiner Bauer, Josef
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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