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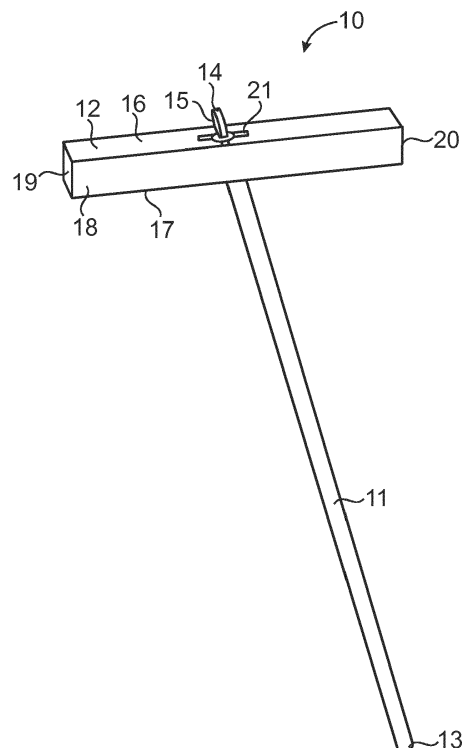
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(54) **A DEVICE, SYSTEM AND METHOD FOR FASTENING A MESH TO A BUILDING STRUCTURE, AND A CONSTRUCTION ELEMENT**

(57) A device (10) for fastening a mesh (28) to a building structure (24), comprising an elongated anchor (11) with a longitudinal axis (A), a first end (13) and a second end (14), wherein the first end (13) is arranged for insertion into the building structure (24) and the second end (14) comprises a through aperture (15) for receiving a locking pin (29) to lock the mesh (28) to the device (10). The device (10) comprises an elongate spacer (12) having an outer part (16) and an inner part (17), wherein the anchor (11) is connected to the spacer (12) so that the first end (13) of the anchor (11) projects from the inner part (17) of the spacer (12) and the second end (14) comprising the aperture (15) projects from the outer part (16) of the spacer (12). The inner part (17) of the spacer (12) is arranged in an oblique angle ( $\alpha$ ) to the longitudinal axis (A) of the anchor. Disclosed is also a corresponding system, method and prefabricated construction element.



*Fig. 1*

## Description

### FIELD OF THE INVENTION

**[0001]** The invention relates to a device for fastening a mesh to a building structure. This type of devices comprises an anchor to be inserted into the building structure, and spacer for providing a gap between the building structure and the mesh. A locking pin is used for locking the mesh to the device. Such devices are generally used for fastening a mesh, such as a wire mesh or reinforcement mesh, with a suitable gap to a surface of a building structure, wherein the building structure is provided with a layer of cementitious material or anhydrite material, such as a plaster layer, render layer or similar, on the mesh.

**[0002]** Such devices can be used for producing prefabricated construction elements, wherein a plurality of anchors is inserted into a building structure comprising unsolidified cementitious or anhydrite materials, such as a concrete layer, and optionally also an insulation layer. Then, the mesh is applied onto the devices and fastened to the devices by means of locking pins, wherein the layer of cementitious material or anhydrite material, such as the plaster or render layer, can be applied onto the building structure and the mesh to enclose the mesh.

**[0003]** The invention also relates to a system for fastening a mesh to a building structure, a method of fastening a mesh to a building structure and a prefabricated construction element comprising the device of the present invention.

### PRIOR ART

**[0004]** There is a plurality of different types of devices for fastening a mesh, such as a plaster reinforcement mesh or a render reinforcement mesh, to a building structure in the prior art. Some of these devices comprise an elongated anchor for insertion into the building structure for fixing the anchor thereto. Said anchor comprises a hole for receiving a locking pin for locking the mesh to the anchor.

**[0005]** In view of the prior art devices for fastening a mesh to a building structure there is a need to improve the strength of a plaster layer or render layer applied on the mesh.

**[0006]** Further, one problem with such prior art devices is that the render layer or plaster layer applied on the mesh is subject to considerable settlement or subsidence.

### SUMMARY OF THE INVENTION

**[0007]** An object of the present invention is to avoid the above mentioned problem of the prior art and provide a device and a method for fastening a mesh to a building structure that counteract settlement and subsidence of a layer of cementitious or anhydrite material, such as a

plaster layer or render layer, while maintaining or improving the strength of such a layer.

**[0008]** The present invention relates to a device for fastening a mesh to a building structure, comprising an elongated anchor with a longitudinal axis, a first end and a second end, wherein the first end is arranged for insertion into the building structure and the second end comprises a through aperture for receiving a locking pin to lock the mesh to the device, characterised in that the device comprises an elongate spacer having an outer part and an inner part, wherein the anchor is connected to the spacer so that the first end of the anchor projects from the inner part of the spacer and the second end comprising the aperture projects from the outer part of the spacer, and wherein the inner part of the spacer is in an oblique angle to the longitudinal axis of the anchor. The spacer results in that the mesh is applied on a favourable distance from the building structure to form a gap between the building structure and the mesh, wherein a layer of plaster, render or similar applied thereon is reinforced efficiently and a strong coating layer is provided. Further, the oblique angle between the inner part of the spacer and the longitudinal axis of the anchor results in that the anchor is inserted obliquely into the building structure, i.e. in an angle that is offset from perpendicular to the surface of the building structure such as offset from horizontal for a wall structure, which counteracts movement of the coating layer downwards due to gravity. Hence, the device is arranged to prevent sinkage of a cementitious or anhydrite layer applied on the surface of the building structure and which layer is reinforced by the mesh. For example, the angle is arranged so that the anchor is inserted obliquely upwards into a building structure in the form of a wall structure, so that the first end of the anchor is arranged below the second end thereof. Hence, the combination of the configuration of the spacer and the angle between the spacer and the anchor results in a strong and durable cementitious coating layer which is subject to less settlement and subsidence over time due to gravity.

**[0009]** The device can be arranged with an angle between the spacer and the anchor, for example between the inner part of the spacer and the longitudinal axis of the anchor or between the longitudinal axis of the spacer and the longitudinal axis of the anchor, of 60-85°, 70-80° or about 75° to provide a favourable angle between the building structure and the anchor during insertion thereof into the building structure while aligning the inner part of the spacer with the surface of the building structure. It has been found that such an angle is particularly effective against downward movement of a cementitious coating layer, such as a plaster or render coating layer.

**[0010]** The spacer, or at least the inner part of the spacer, is formed to provide a visual reference for insertion of the anchor at the favourable oblique angle into the building structure. For example, one or more portions of the inner part of the spacer are level or aligned to form a visual reference of a straight line to be aligned with the

surface of the building structure. The inner part of the spacer can form a straight line or can be flat. For example, a peripheral edge of the inner part can be straight or opposite long side edges thereof can be straight and level. The inner part of the spacer can be flat. The spacer can be formed as a cylinder, a block, a plate or similar.

**[0011]** The spacer can be formed with a through opening for receiving a portion of the anchor. Hence, the spacer can be formed to be mounted on the anchor in a safe and efficient manner on a building site by the construction worker or manually or automatically at an industrial plant for mass production of devices of the present invention. Further, the spacer can easily be formed in another material than the anchor, such as a non-metal material, e.g. plastic materials, to prevent galvanic current between the mesh and the spacer. Alternatively, the spacer can be formed in a material being more noble in galvanic series than the mesh but is then provided with a coating to prevent galvanic current between the mesh and the spacer.

**[0012]** The anchor can be 50-500 mm long, depending on the building structure and, e.g. presence of different layers of said building structure, such as one or more insulation layers.

**[0013]** A width of the inner part of the spacer can be 5-50 mm, 10-20 mm or 10 mm or at least 5 mm or at least 10 mm, and for example flat, to prevent the spacer from easily sinking into the building structure during mounting when the spacer engages the surface and thereby provide a stop for further insertion of the device into the building structure.

**[0014]** A height of the spacer can be 3-20 mm, 4-10 mm, 4-8 mm or 4 mm or at least 3 mm to provide a suitable gap between the mesh and the surface of the building structure and thereby efficient reinforcement to obtain a strong layer of cementitious material applied on the surface of the building structure.

**[0015]** The spacer can be 40-200 mm, 50-100 mm or 70 mm or at least 50 mm long to provide a suitable cooperation with the type of mesh intended for use, i.e. adapted to the mesh size of the mesh to engage the mesh and not fall within an open area of the mesh and lose its function as a spacer. Hence, the length of the spacer can be longer than the openings in the mesh. The mesh size of the mesh can be 10-200 mm, 20-100 mm or 20-50 mm. A considerable length of the spacer results in the possibility of having a long inner part which can provide better visual reference during insertion of the anchor to help obtaining the correct angle to the surface of the building structure. A considerable length of the spacer can also result in a substantial area of the inner part to provide the stop function against a soft surface of the building structure. The spacer can be a solid or non-solid structure. For example, the spacer can be hollow or provided with one or more holes, e.g. to reduce material cost. Such holes can be arranged through the spacer, e.g. from the outer part to the inner part. For example, the spacer is arranged as a framework structure.

**[0016]** Disclosed is also a system for fastening a mesh to a building structure, comprising said device, having the anchor and the spacer, and a locking pin for locking the mesh to the device and prevent the mesh from being disengaged with the spacer. The locking pin can have an elongate straight portion and a radially extending portion, such as a bent portion, so that the locking pin easily can be introduced into the aperture of the anchor and prevented from falling through said aperture by means of the radially extending portion.

**[0017]** Disclosed is also a method for fastening a mesh to a building structure, comprising the steps of

- a) inserting a first end of an elongated anchor having a longitudinal axis into a building structure obliquely to the building structure while aligning an inner surface of a spacer connected to the anchor with an outer surface of the building structure, until a second end of the anchor, comprising a through aperture, is projecting from said building structure and the spacer engages an outer surface of the building structure,
- b) repeating step a) and thereby inserting a plurality of anchors carrying spacers into the building structure,
- c) applying the mesh onto the anchors and bringing portions of the mesh into engagement with the spacers, and
- d) inserting an elongated locking pin in each of the apertures to fasten the mesh to the devices.

**[0018]** Disclosed is also a prefabricated construction element, comprising a layer of cementitious or anhydrite material, such as a concrete layer, an insulation layer, a mesh, a plurality of devices having the anchor and the spacer, and a locking pin for each device, wherein the first end of the anchors are embedded in the concrete layer, and the locking pins are inserted in the aperture to hold the mesh against the spacers.

**[0019]** Further characteristics and advantages of the present invention will become apparent from the description of the embodiments below, the appended drawings and the dependent claims.

## SHORT DESCRIPTION OF THE DRAWINGS

**[0020]** The invention will now be described more in detail with the aid of embodiment examples and with reference to the appended drawings, in which

Fig. 1 is a schematic perspective view illustrating a device for fastening a mesh to a building structure according to one embodiment, illustrating an elongated anchor and an elongated spacer of the device,

Fig. 2 is a schematic side view of a part of the device according to one embodiment, illustrating the spacer in section view,

Fig. 3 is a schematic top view of the device according to one embodiment,

Fig. 4 is a schematic side view of a part of the device according to one embodiment, illustrating the spacer in section view,

Figs. 5-7 are schematic section views illustrating insertion of the device into a building structure and fastening of a mesh to the anchor by means of a locking pin, and

Fig. 8 is a schematic front view of a part of a mesh fastened to a building structure by means of the device and a locking pin.

## THE INVENTION

**[0021]** Referring to Figs. 1-3 a device 10 for fastening a mesh to a building structure is illustrated schematically according to one embodiment. The device 10 is arranged for fastening a mesh, such as a mesh for reinforcing a layer of cementitious material, anhydrite material or similar, to a building structure. For example, the device 10 is arranged for fastening a mesh for reinforcing a render layer or a plaster layer, such as a render or plaster coating layer or façade layer. For example, the device 10 is arranged for fastening a steel wire mesh or a mesh of plastic materials.

**[0022]** The device 10 comprises an anchor 11 and a spacer 12. The anchor 11 is arranged for insertion into the building structure for fastening of the anchor 11 to the building structure, which is described in more detail below. The anchor 11 is elongated and has a longitudinal axis. The anchor 11 has a first end 13 and a second end 14, wherein the second end 14 is provided with a through aperture 15. The first end 13 is arranged for insertion into the building structure, wherein the second end 14 is arranged for projecting from a surface of the building structure. For example, the anchor 11 is substantially straight. According to the illustrated embodiment the anchor 11 is arranged with an invariable diameter along at least a major part of its length. Alternatively, the anchor 11 is pointed towards the first end 13. For example, the first end 13 is arranged with non-level surface to improve engagement to the surrounding material. For example, the first end 13 is arranged with a sinusoidal form, waveform, bend or zigzag shape. For example, the first end 13 is rounded or pointed. The aperture 15 extends through the anchor 11 in a direction across the longitudinal axis of the anchor 11. For example, the aperture 15 extends through the anchor 11 in a direction perpendicular to the longitudinal axis of the anchor 11. The aperture 15 is arranged for receiving a locking pin, which is described more in detail below. According to the illustrated embodiment, the second end 14 with the aperture 15 is arranged as a ring-shaped part for enclosing the locking pin entirely. Alternatively, the aperture 15 is arranged for par-

tially enclosing the locking pin so as to prevent the locking pin from leaving the aperture in a direction along the longitudinal direction of the anchor 11. For example, the anchor 11 is arranged with a length of 50-500 mm.

**[0023]** The spacer 12 is connected to the anchor 11. The spacer 12 is elongated and comprises a longitudinal axis. The spacer 12 comprises an outer part 16 and an inner part 17. In the illustrated embodiment the outer part 16 and the inner part 17 are outer and inner sides, respectively, wherein the spacer 12 is also formed with long sides 18 connecting the inner part 17 and the outer part 16. For example, the spacer 12 is formed as a rectangular parallelepiped. The spacer also has first and second ends 19, 20. Alternatively, the outer part 16 is formed in any suitable manner. For example, the outer part 16 is arched and optionally connected directly to the inner part 17. Alternatively, the inner part 17 is curved. For example, the spacer 12 is formed as a cylinder. For example, the inner part 17 is level or flat or is formed with a uniform and straight periphery in the longitudinal direction of the spacer 12. In the illustrated embodiment the entire inner part 17 is level or flat. For example, at least long side edges of the inner part 17 are parallel and straight. Alternatively, portions of the inner part 17 are arranged in a common plane.

**[0024]** In the illustrated embodiment, the spacer 12 is formed with a through opening 21 for receiving the anchor 11. The opening 21 extends from the outer part 16 to the inner part 17. In the illustrated embodiment the opening 21 is arranged centrally in the spacer 12. Alternatively, the opening 21 is arranged through a portion of the spacer 12 being closer to one of the first and second ends 19, 20. For example, the spacer 12 is manually mounted on the anchor 11 at a building site where the device 10 is to be used. Alternatively, the spacer 12 is mounted on the anchor 11 at a production site for mass production of devices 10. In the illustrated embodiment, the spacer 12 is mounted on the anchor 11. Alternatively, the anchor 11 and the spacer 12 are arranged as a single integrated part, e.g. by moulding. The anchor 12 extends through the opening 21, wherein the second end 14 with the aperture 15 projects from the outer part 16. A portion of the anchor 11 close to the second end 14 extends through the opening 21 in the spacer 12, wherein a major part of the anchor 11 terminated with the first end 13 projects from the inner part 17 of the spacer 12.

**[0025]** According to one embodiment the anchor 11 and the spacer 12 are formed in materials so as to avoid galvanic corrosion of the mesh and/or the device 10. For example, the spacer 12 is formed in a non-metal material, such as plastic materials. Alternatively, the spacer 12 is formed in metal. For example, the spacer 12 is formed in a material being less noble in galvanic series than the mesh. For example, the spacer 12 is formed in a material being less noble in galvanic series than a steel wire mesh or expanded steel mesh used for reinforcing render and plaster layers, so as to avoid galvanic corrosion of the mesh. Alternatively, the spacer 12 is formed in a material

being more noble in galvanic series than the mesh and is provided with a coating, so as to avoid galvanic corrosion of the mesh and/or the device 10. The anchor 11 is, e.g. made of metal, such as steel. Alternatively, the anchor 11 is made of plastic materials.

**[0026]** With reference particularly to Figs. 2 and 3 the opening 21 through the spacer 12 extends from the outer part 16 to the inner part 17, substantially in the direction of the longitudinal axis of the anchor 11, wherein the anchor 11 extends through the opening 21. According to the illustrated embodiment the anchor 11 is formed with one or more projections 22 extending into corresponding grooves 23 in the spacer 12. The projections 22 extend in the radial direction and along the longitudinal axis of the anchor 11 close to the second end 14 of the anchor 11 so as to prevent rotation of the anchor 11 in relation to the spacer 12. Further, according to the illustrated embodiment the projections 22 and the corresponding grooves 23 are tapered along the longitudinal axis of the anchor 11 towards the first end thereof. For example, the anchor 11 is formed with two opposite projections 22 or four projections 22 distributed around the longitudinal axis of the anchor 11. For example, the projections 22 and the grooves 23 are forming a cross-shaped configuration.

**[0027]** With reference to Fig. 4 a part of the device 10 is illustrated, wherein the spacer 12 is illustrated as a section view and a part of the anchor 11 including the second end 14 is illustrated. The longitudinal axis A of the anchor is illustrated by means of a first dash and dot line and the longitudinal axis B of the spacer 12 is illustrated by a second dash and dot line. The inner part 17 of the spacer 12 is arranged in an oblique angle  $\alpha$  to the longitudinal axis A of the anchor 11 to guide the anchor 11 in a corresponding angle into the building structure and thereby reduce the effect of a plaster layer or render layer sinking or moving towards the ground by gravity over time. According to the embodiment of Fig. 4 the anchor 11 is arranged obliquely in relation to the spacer 12, wherein the longitudinal axis A of the anchor 11 is arranged in the angle  $\alpha$  in relation to the longitudinal axis B of the spacer 12. For example, the angle  $\alpha$  is less than  $90^\circ$ . For example, the angle  $\alpha$  is  $60^\circ$ - $85^\circ$ ,  $70^\circ$ - $80^\circ$  or about  $75^\circ$ .

**[0028]** With reference to Figs. 5-7 fastening of the device 10 to the building structure 24 is illustrated schematically. For example, the building structure 24 comprises a first layer 25 of a solidifying or hardening material, such as a layer including a cementitious or anhydrite material. For example, the first layer is a concrete layer or similar. Optionally, the building structure 24 comprises a second layer 26, such as an insulation layer, which e.g. is arranged on the first layer 25. According to one embodiment the device 10 is introduced into the first layer 25 being unsolidified, such as unsolidified or wet concrete. The anchor 11 is inserted into the building structure 24, which is illustrated by means of the arrow C in Fig. 5. In the illustrated embodiment the anchor 11 is inserted into the first layer 25 through the second layer 26. During

insertion of the anchor 11 into the building structure 24 the spacer 12, or at least the inner part 17 of the spacer 12, is aligned with a surface 27 of the building structure 24 to ensure that the anchor 11 is introduced in a correct or favourable angle into the building structure 24. Hence, the inner part 17 of the spacer 12 is arranged obliquely to the anchor 11 so that the anchor 11 is introduced in the correct or favourable angle into the unsolidified material of the building structure 24 while the inner part 17 of the spacer 12 is aligned with the surface 27 of the building structure 24, so that the inner part 17 is parallel to the surface 27. For example, the device 10 is arranged so that the spacer 12 extends vertically, wherein the anchor 11 extends obliquely upwards into the building structure 24. Hence, the first end 13 of the anchor 11 is arranged above the second end 14. The anchor 11 is inserted into the building structure 24 until the inner part 17 of the spacer 12 engages the surface 27 of the building structure 24, which is illustrated in Fig. 6. According to Fig 6, the anchor 11 extends into the building structure 24, such as through the second layer 26 and into the first layer 25, wherein the first end 13 of the anchor 11 is embedded in the building structure 24 or the first layer 25 thereof. After insertion into the building structure 24 the second end 14 of the anchor 11 projects from the surface 27 of the building structure 24 and from the outer part 16 of the spacer 12. After insertion into the building structure 24 the inner part 17 of the spacer 12 engages the surface 27 of the building structure 24 and, e.g. the longitudinal axis B of the spacer 12 is arranged in parallel to the surface 27 of the building structure 24.

**[0029]** With reference to Figs. 7 and 8 the device 10 is illustrated inserted into the building structure 24, wherein a mesh 28 has been arranged onto the spacer 12 and the mesh 28 has been fastened to the device 10 by means of a locking pin 29. Hence, the outer part 16 of the spacer 12 is arranged for engaging the mesh 28 so that the mesh 28 is arranged a suitable distance from the surface 27 of the building structure 24 to form a gap between said surface 27 and the mesh 28. For example, a plurality of devices 10 is inserted into the building structure 24. Then, the mesh 28 is applied onto the spacers 12 and fastened to the devices 10 by means of a single locking pin 29 for each of the devices 10. The locking pin 29 is inserted into the aperture 15 in the anchor 11 in a direction substantially in parallel to a plane of the surface 27 and a plane of the mesh 28, wherein the mesh 28 is arranged between the spacer 12 and the locking pin 29. For example, the locking pin 29 is arranged substantially in parallel to a plane of the outer part 16 and/or a plane of the inner part 17 of the spacer 12. For example, the locking pin 29 is arranged substantially in the angle  $\alpha$  in relation to the longitudinal axis A of the anchor 11. Hence, the locking pin 29 engages the mesh 28 and prevents the mesh 28 from leaving its position on the spacers 12, wherein the mesh 28 extends in parallel to the surface 27 of the building structure 24. For example, the locking pin 29 comprises an elongate straight portion 30 for in-

sertion into the aperture 15, and a radially extending portion, such as a bent portion 31, preventing the locking pin 29 from unintentionally running through the aperture 15. Alternatively to the bent portion 31 the locking pin 29 is tapered to prevent the locking pin 29 from leaving the aperture 15 by means of gravity. For example, the straight portion 30 has a straight longitudinal axis, wherein one of the end parts of the locking pin 29 is formed or provided with a radially extending portion, such as the bent portion 31, a ring, a projection, a flange or a portion with larger diameter or similar. The device 10 and the locking pin 29 form a system for fastening the mesh 28 to the building structure 24.

**[0030]** For example, the building structure 24 with the mesh 28 mounted thereto by means of a plurality of the devices 10 and locking pins 29 is provided with a layer of cementitious or anhydrite material, such as a render or plaster layer, on the mesh 28 to form a construction element, such as a wall element. For example, the construction element is a prefabricated construction element comprising the building structure 24, the mesh 28, a plurality of devices 10, a plurality of locking pins 29 and said layer applied to the mesh 28, wherein the anchors 11 of the devices 10 are inserted into an unsolidified material, such as an unsolidified or wet cementitious or anhydrite material, of the building structure, after which the unsolidified material is solidified.

## Claims

1. A device (10) for fastening a mesh (28) to a building structure (24), comprising an elongated anchor (11) with a longitudinal axis (A), a first end (13) and a second end (14), wherein the first end (13) is arranged for insertion into the building structure (24) and the second end (14) comprises a through aperture (15) for receiving a locking pin (29) to lock the mesh (28) to the device (10),

### characterised in that

the device (10) comprises an elongate spacer (12) having an outer part (16) and an opposite inner part (17), wherein the anchor (11) is connected to the spacer (12) so that the first end (13) of the anchor (11) projects from the inner part (17) of the spacer (12) and the second end (14) comprising the aperture (15) projects from the outer part (16) of the spacer (12), and wherein the inner part (17) of the spacer (12) is arranged in an oblique angle ( $\alpha$ ) to the longitudinal axis (A) of the anchor.

2. A device according to claim 1, wherein the angle ( $\alpha$ ) is 60-85°, 70-80° or 75°.
3. A device according to claim 1 or 2, wherein one or more portions of the inner part (17) of the spacer (12) are level or aligned.

4. A device according to any of the preceding claims, wherein the inner part (17) of the spacer (12) forms a straight line or is flat.

5. A device according to any of the preceding claims, wherein the spacer (12) is formed with a through opening (21) for receiving a portion of the anchor (11).

6. A device according to any of the preceding claims, wherein the spacer (12) is formed in a material being less noble than the anchor (11).

7. A device according to any of the preceding claims, wherein the spacer (12) is formed in a non-metal material.

8. A device according to any of the preceding claims, wherein at least the inner part (17) of the spacer (12) is formed with a width of 5-50 mm, 10-20 mm or 10 mm or at least 5 mm or at least 10 mm.

9. A device according to any of the preceding claims, wherein the spacer (12) is formed with a height of 5-20 mm, 5-10 mm or 8 mm or at least 5 mm.

10. A device according to any of the preceding claims, wherein the spacer (12) is formed with a length of 40-200 mm, 50-100 mm or 70 mm or at least 50 mm.

11. A system for fastening a mesh (28) to a building structure (24), comprising a device (10) according to any of the preceding claims and a locking pin (29) for insertion into the aperture (15).

12. A system according to claim 12, wherein said locking pin (29) comprises an elongate straight portion (30) and a radially extending portion (31).

13. A method for fastening a mesh (28) to a building structure (24), comprising the steps of

- a) inserting a first end (13) of an elongated anchor (11) having a longitudinal axis (A) obliquely into the building structure (24) while aligning an inner part (17) of a spacer (12) connected to the anchor (11) with a surface (27) of the building structure (24), until a second end (14) of the anchor (11), comprising a through aperture (15), is projecting from said building structure (24) and the spacer (12) engages the surface (27) of the building structure (24),
- b) repeating step a) for a plurality of anchors (11), each anchor (11) carrying a spacer (12),
- c) applying the mesh (28) onto the anchors (11) and bringing portions of the mesh (28) into engagement with the spacers (12), and
- d) inserting an elongated locking pin (29) in each

of the apertures (15) to fasten the mesh (28) to the devices (10).

14. A method according to claim 13, comprising the step of inserting the first end (13) of the anchors (11) through an insulation layer (26) and into an unsolidified cementitious layer (25) of said building structure (24).
15. A prefabricated construction element, comprising a layer (25) of cementitious or anhydrite material, an insulation layer (26), a mesh (28), a device (10) according to any of claims 1-15, and a locking pin (29), wherein the first end (13) of the anchor (11) is embedded in the cementitious layer (25), and the locking pin (29) is inserted in the aperture (15) of the anchor (11) in a plane parallel to a plane of the mesh (28).

#### Amended claims in accordance with Rule 137(2) EPC.

1. A device (10) for fastening a mesh (28) to a building structure (24), comprising an elongated anchor (11) with a longitudinal axis (A), a first end (13) and a second end (14), wherein the first end (13) is arranged for insertion into the building structure (24) and the second end (14) comprises a through aperture (15) for receiving a locking pin (29) to lock the mesh (28) to the device (10),  
**characterised in that**  
the device (10) comprises an elongate spacer (12) for providing a gap between the building structure (24) and the mesh (28), said spacer (12) having an outer part (16) and an opposite inner part (17), wherein the anchor (11) is connected to the spacer (12) so that the first end (13) of the anchor (11) projects from the inner part (17) of the spacer (12) and the second end (14) comprising the aperture (15) projects from the outer part (16) of the spacer (12), and wherein the inner part (17) of the spacer (12) is arranged in an oblique angle ( $\alpha$ ) to the longitudinal axis (A) of the anchor to guide the anchor (11) in an oblique angle into the building structure (24).
2. A device according to claim 1, wherein the angle ( $\alpha$ ) is 60-85°, 70-80° or 75°.
3. A device according to claim 1 or 2, wherein one or more portions of the inner part (17) of the spacer (12) are level or aligned.
4. A device according to any of the preceding claims, wherein the inner part (17) of the spacer (12) forms a straight line or is flat.
5. A device according to any of the preceding claims, wherein the spacer (12) is formed with a through opening (21) for receiving a portion of the anchor (11).
6. A device according to any of the preceding claims, wherein the spacer (12) is formed in a non-metal material.
7. A device according to any of the preceding claims, wherein at least the inner part (17) of the spacer (12) is formed with a width of 5-50 mm, 10-20 mm or 10 mm or at least 5 mm or at least 10 mm.
8. A device according to any of the preceding claims, wherein the spacer (12) is formed with a height of 5-20 mm, 5-10 mm or 8 mm or at least 5 mm.
9. A device according to any of the preceding claims, wherein the spacer (12) is formed with a length of 40-200 mm, 50-100 mm or 70 mm or at least 50 mm.
10. A system for fastening a mesh (28) to a building structure (24), comprising a device (10) according to any of the preceding claims and a locking pin (29) for insertion into the aperture (15).
11. A system according to claim 10, wherein said locking pin (29) comprises an elongate straight portion (30) and a radially extending portion (31).
12. A method for fastening a mesh (28) to a building structure (24), comprising the steps of
- a) guiding a first end (13) of an elongated anchor (11) having a longitudinal axis (A) obliquely into the building structure (24) by means of an elongate spacer (12) being connected to the anchor (11) and having an inner part (17) arranged in an oblique angle ( $\alpha$ ) to the longitudinal axis (A) of the anchor (11), while aligning said inner part (17) of the spacer (12) with a surface (27) of the building structure (24), until a second end (14) of the anchor (11), comprising a through aperture (15), is projecting from said building structure (24) and the spacer (12) engages the surface (27) of the building structure (24),
  - b) repeating step a) for a plurality of anchors (11), each anchor (11) carrying a spacer (12),
  - c) applying the mesh (28) onto the anchors (11) and bringing portions of the mesh (28) into engagement with the spacers (12) to provide a gap between the building structure (24) and the mesh (28), and
  - d) inserting an elongated locking pin (29) in each of the apertures (15) to fasten the mesh (28) to the devices (10).

13. A method according to claim 12, comprising the step of inserting the first end (13) of the anchors (11) through an insulation layer (26) and into an unsolidified cementitious layer (25) of said building structure (24). 5
14. A prefabricated construction element, comprising a layer (25) of cementitious or anhydrite material, an insulation layer (26), a mesh (28), a device (10) according to any of claims 1-9, and a locking pin (29), wherein the first end (13) of the anchor (11) is embedded in the cementitious layer (25), and the locking pin (29) is inserted in the aperture (15) of the anchor (11) in a plane parallel to a plane of the mesh (28). 10 15

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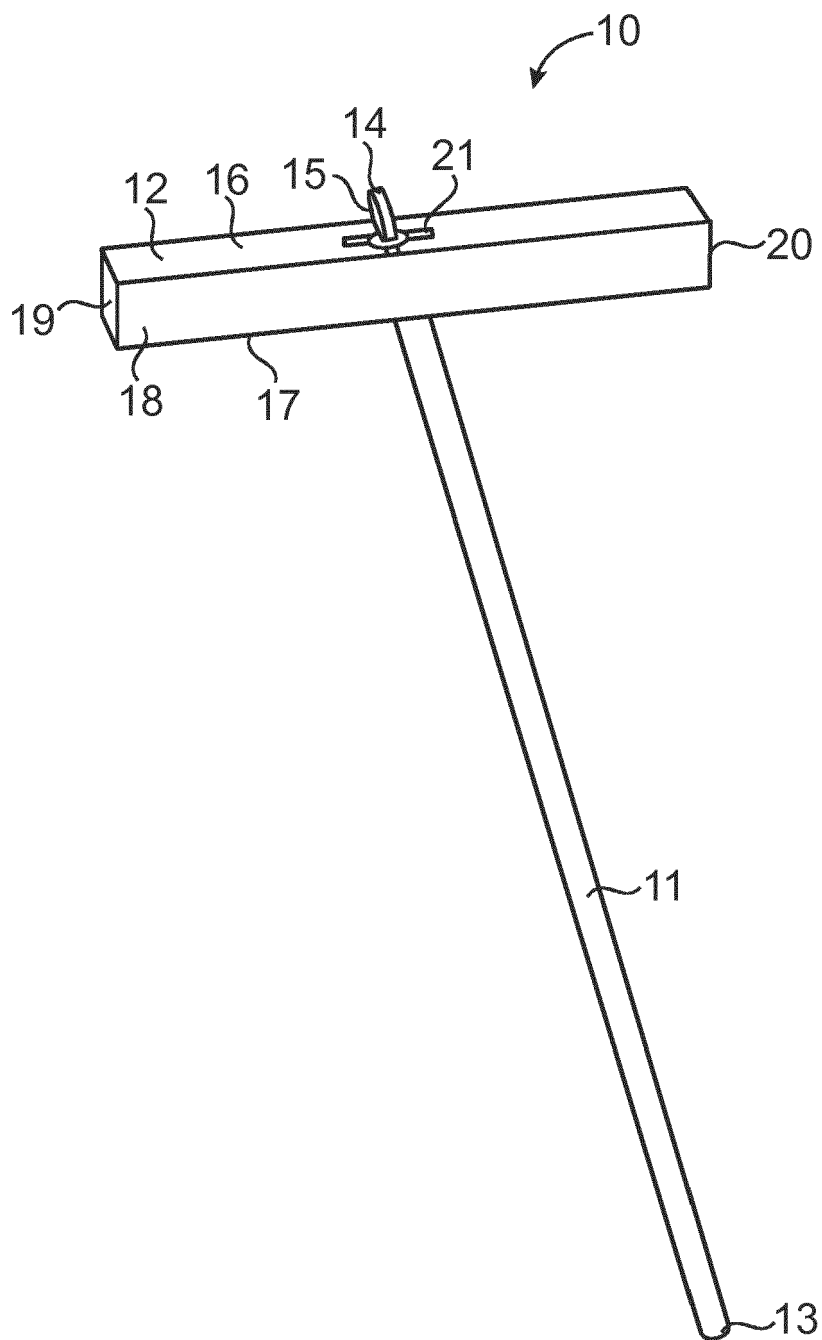
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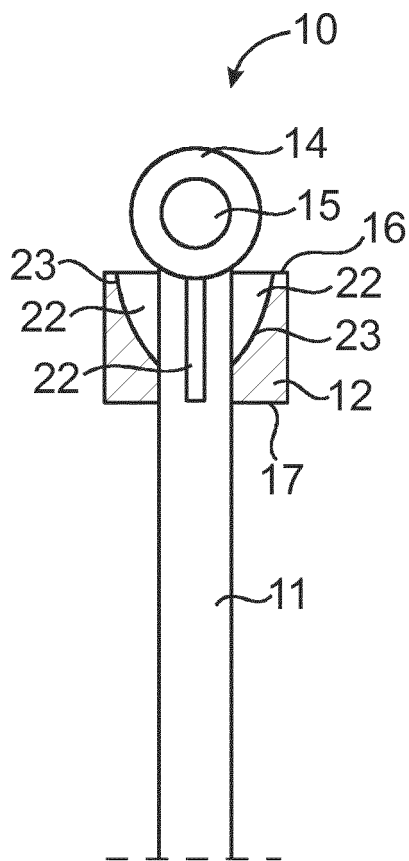
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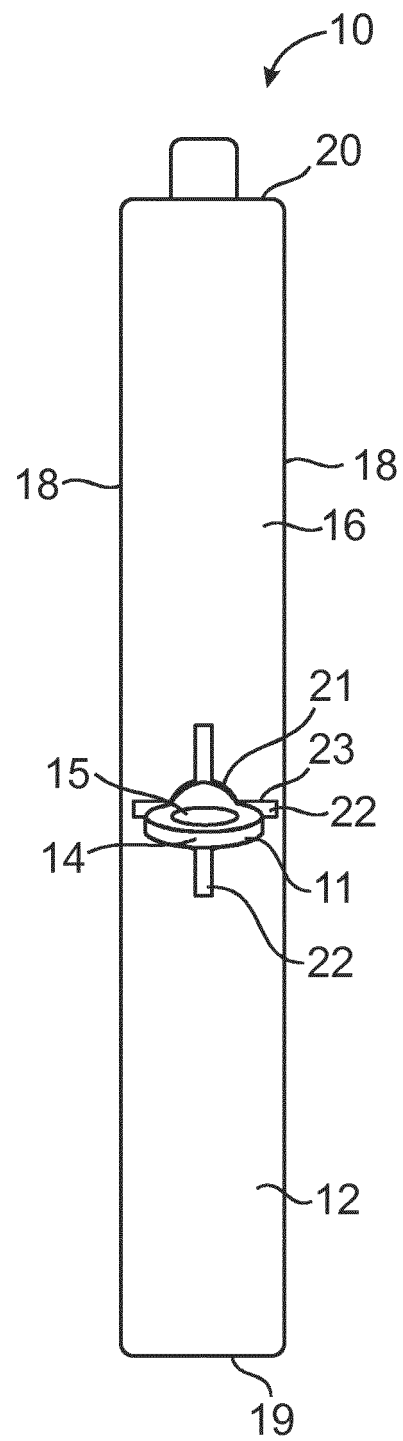




*Fig. 1*



*Fig. 2*



*Fig. 3*

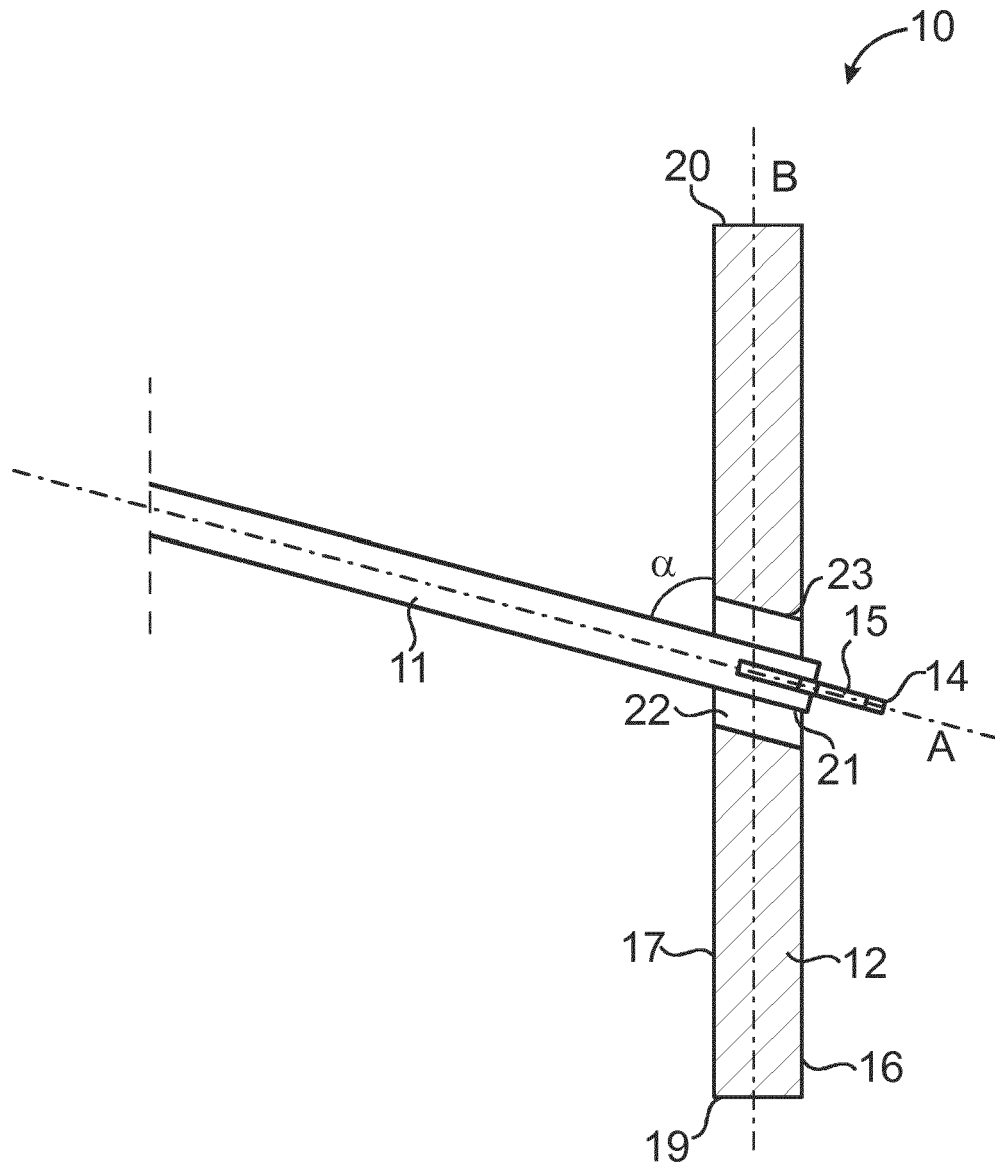
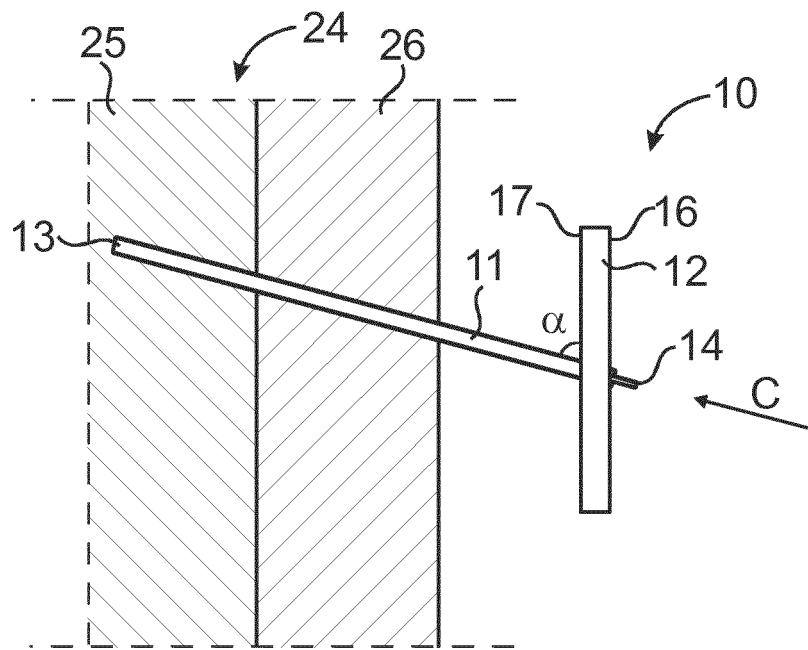
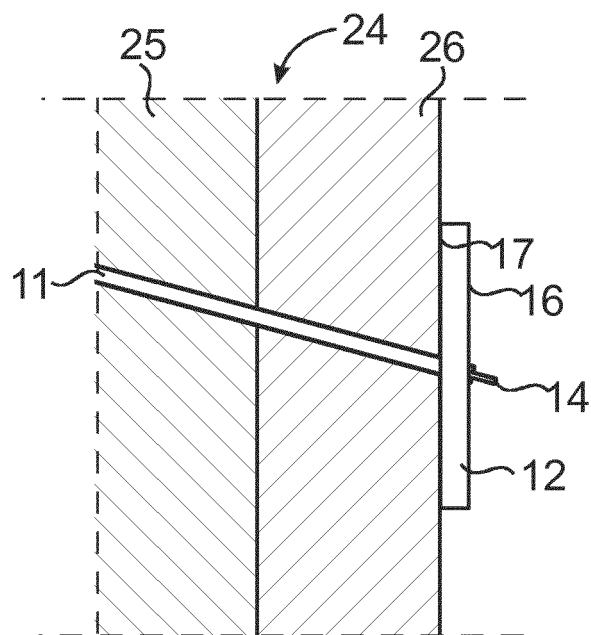


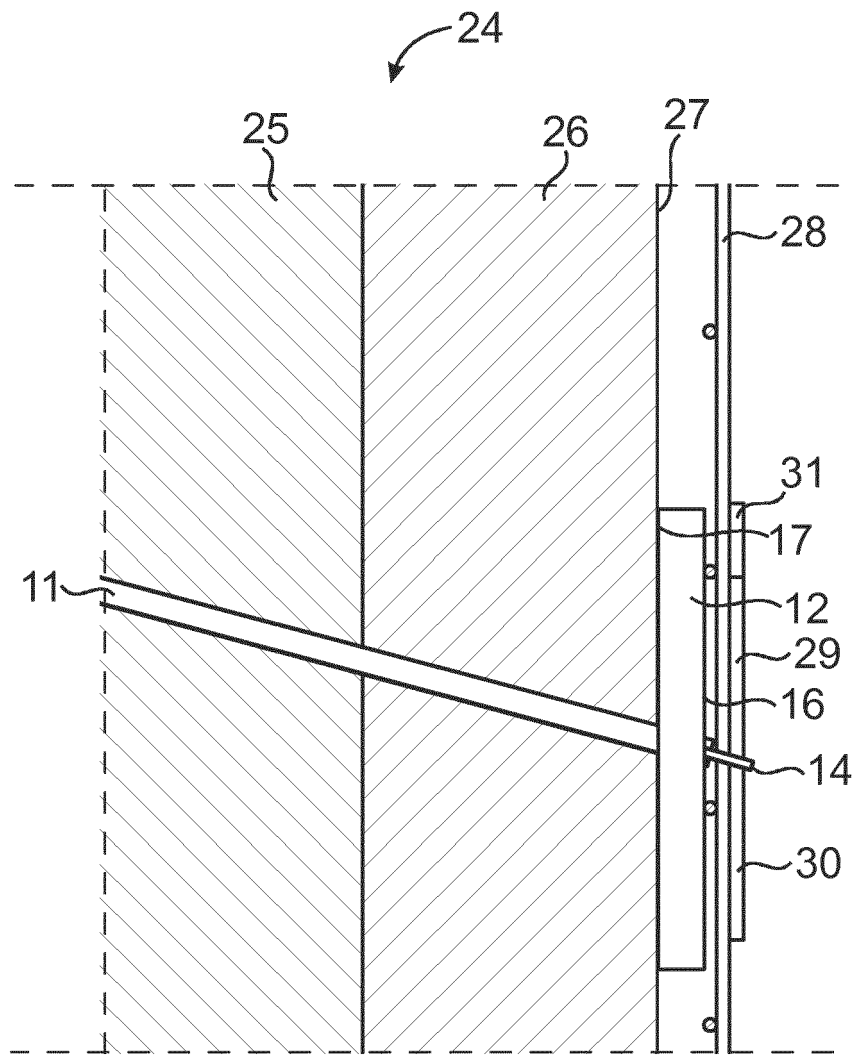
Fig. 4



*Fig. 5*



*Fig. 6*



*Fig. 7*

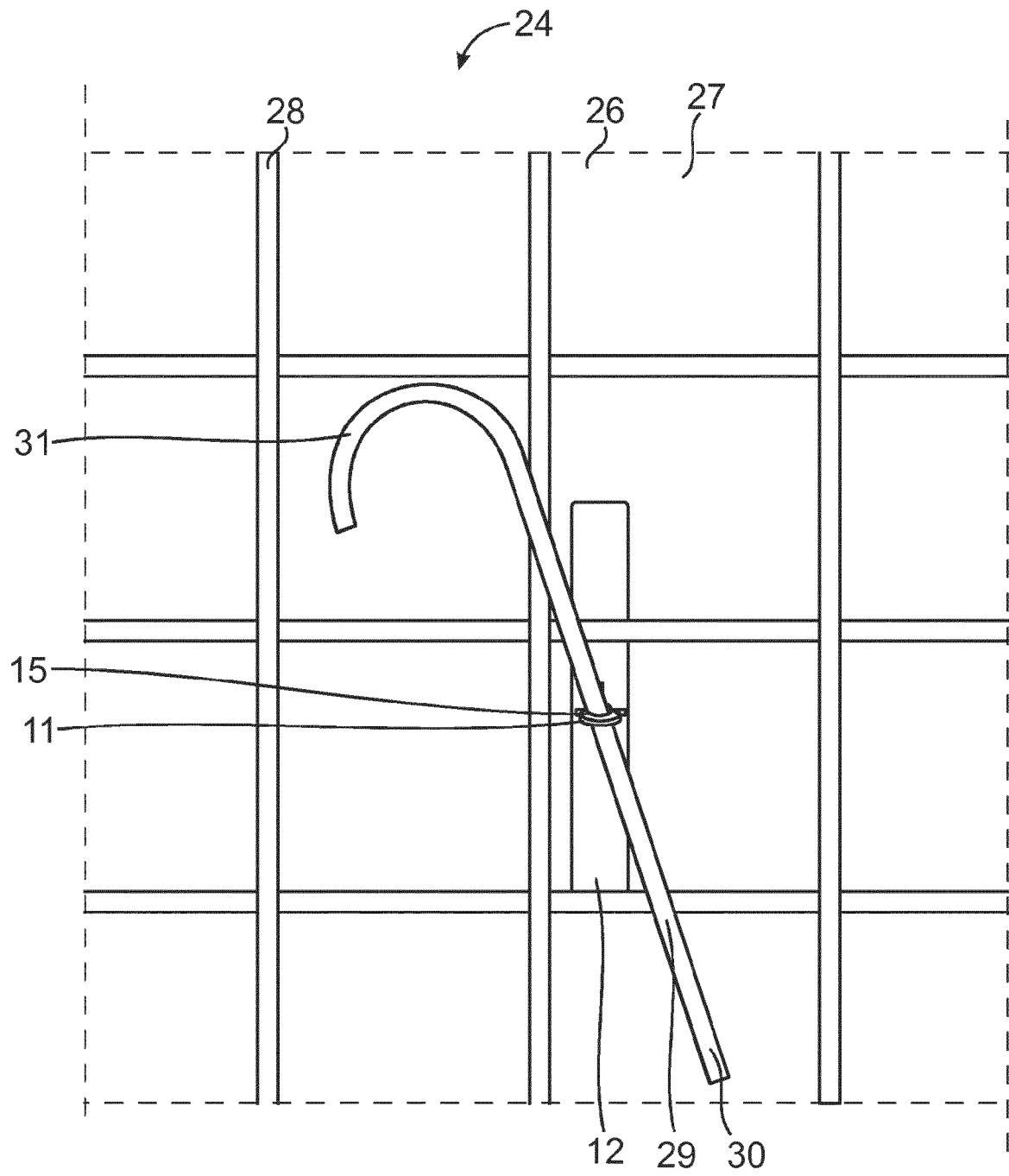


Fig. 8



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| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                  |                                                           |                                         |
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