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(54) ARRANGEMENT OF WIRE LOOP AND BASE AND METHOD FOR ATTACHING WIRE LOOP TO BASE

(57) The disclosure relates to an arrangement of a wire loop (2) and a base (3), comprising a fastener (1); a wire loop (2) connected to the fastener (1); and a base (3) having an opening (31) for allowing the fastener (1) to penetrate the base (3) through the opening (31), wherein the fastener (1) is attached to the base (3) by a bayonet mount between the fastener (1) and the base (3).

The disclosure relates also to a method for attaching a wire loop (2) to a base (3), comprising the steps of providing a wire loop arrangement comprising a fastener (1) and a wire loop (2) connected to the fastener (1), wherein the fastener (1) has a body (10) having at least partially circular shape, the fastener (1) comprises at least one first flange section (11) protruding radially from the body (10), and the fastener (1) comprises at least one second flange section (12) protruding radially from the body (10) and arranged at a distance from the first flange section (11); providing a base (3) having a form of a sheet and comprising an opening (31) for allowing the fastener (1) to penetrate the base (3) through the opening (31), the opening (31) having a such a shape that allows the passage of the first flange section (11) through the opening (31) only in a certain rotational position or in certain rotational positions while the passage of the second flange section (12) through the opening (31) is prevented; aligning the fastener (1) with the hole so that the fastener (1) is in the certain rotational position or in one of the certain rotational positions; inserting the aligned fastener (1) partially through the opening (31) so that the first flange section (11) and the at least one second flange section (12) are at different sides of the base (3); and rotating the fastener (1) inserted partially through the opening (31) in relation to the base (3) for moving the first flange section (11) off from the certain rotational position or one of the certain rotational positions.

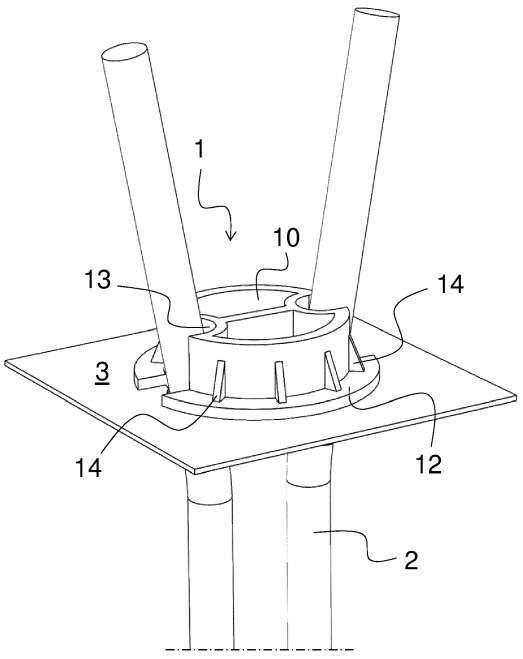

Fig. 1

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Description

FIELD OF THE DISCLOSURE

[0001] The present disclosure relates to wire loops, and particularly to attaching wire loop to a base.

BACKGROUND OF THE DISCLOSURE

[0002] Wire loops are used for connecting two precast concrete construction elements to each other.

[0003] Document WO 96/31671 A1 discloses a support device for at least one elastically deformable securing element such as a wire cable loop, for securing building components such as precast concrete parts, in particular as a concrete connection for section concreting. The device is provided with at least one support box and means for bending the securing element and means for positioning the securing element in relation to the support box. The bending means comprise at least two bending stops and a counter stop. In order to simplify handling, specifically the assembly of such a support device, at least one moulded element is provided which serves as a positioning means and has a bending stop. This moulded element is or can be clicked into the support box in a way which makes it angularly rigid. The bending stop of the moulded element counteracts any bending forces which arise, at least parallel to the surface of the component to be secured. The support box can hold one part of the elastically deformable securing element until the component can be stripped of the outer shell.

[0004] Document WO 98/03751 A1 discloses a device for assembling prefabricated concrete parts has a cable loop anchored at one end to the prefabricated concrete part. The other loop-like end cooperates with a retaining means provided at the front face of the prefabricated concrete part to elastically bend the cable loop approximately at right angle during the fabrication of the prefabricated concrete part, and to release it for assembling. An elongated, U-shaped box having a substantially uniform cross-section is provided as retaining means. The bottom of the box has one or several passages for the cable loop and means arranged in the area of the passages to retain the cable loop perpendicularly to the longitudinal extension of the box.

[0005] Document WO 2009/012827 A1 discloses a rail for accommodating cable loops for connecting prefabricated parts, comprising a rail with a U-shaped profile which has a base plate and two angled side plates, with apertures in the base plate of the U-shaped profile for the through-passage of cable loops and with a surface structure which is intended to improve the grip in the prefabricated part and is in the form of projecting and/or setback wall portions in the base plate and/or on the side walls of the U-shaped profile, and to a method of connecting precast elements with the aid of corresponding rails. In order to configure the connection between precast elements in order to absorb relatively high loads, the invention proposes that the surface structure at least in the base plate of the U-shaped profile, in addition to the apertures for cable loops, has at least one cavity, of which the cross-sectional surface area as measured in the plane of the base plate is at least 4 cm^2 and the minimum length, width and depth dimensions are each at least 1 cm.

BRIEF DESCRIPTION OF THE DISCLOSURE

[0006] An object of the present disclosure is to provide an alternative to the known solution.

[0007] The object of the disclosure is achieved by an arrangement and a method which are characterized by what is stated in the independent claims. The preferred embodiments of the disclosure are disclosed in the dependent claims.

[0008] The disclosure is based on the idea of attaching a fastener carrying the wire loop to a base with a bayonet mount.

[0009] An advantage of arrangement and the method of the disclosure is that the bayonet mount allows easier detaching of the fastener from the base, if this is desired.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] In the following the disclosure will be described in greater detail by means of preferred embodiments with reference to the accompanying drawings, in which

Figure 1 is a schematic angled view of an arrangement according to an embodiment of the disclosure;

Figure 2 is a schematic angled view of a fastener usable in an arrangement according to an embodiment of the disclosure;

Figure 3 is a schematic angled view of a fastener usable in an arrangement according to an embodiment of the disclosure;

Figure 4 is a schematic angled view of a fastener usable in an arrangement according to an embodiment of the disclosure;

Figure 5 is a schematic side view of a fastener usable in an arrangement according to an embodiment of the disclosure;

Figure 6 is a schematic angled view of a fastener usable in an arrangement according to an embodiment of the disclosure;

Figure 7 is a schematic angled view of an arrangement according to an embodiment of the disclosure; and

Figure 8 is a schematic angled view of an arrange-

ment in a detached state according to an embodiment of the disclosure.

DETAILED DESCRIPTION OF THE DISCLOSURE

Arrangement

[0011] The disclosure relates to an arrangement of a wire loop 2 and a base 3.

[0012] The arrangement comprises a fastener 1. For example, the fastener 1 is made of plastic.

[0013] The arrangement comprises a wire loop 2 connected to the fastener 1. In this case, wire loop means a loop made of a wire rope. The ends of the wire loop 2 are preferably attached to each other. The wire loop 2 can be used for joining precast concrete construction elements.

[0014] The arrangement comprises a base 3. Preferably, the base 3 has a form of a sheet. For example, the base is a part of a wire loop box or a wire loop rail arranged to be cast partially into a precast concrete construction element. The base 3 has an opening 31 for allowing the fastener 1 to penetrate the base 3 through the opening 31.

[0015] The fastener 1 is attached to the base 3 by a bayonet mount between the fastener 1 and the base 3. In other words, the fastener 1 is attached to the base 3 by a mount that allows insertion of the fastener 1 to the base 3 only in a certain rotational position or in certain rotational positions, and the fastener 1 can be rotated in relation to the base 3 for moving the fastener 1 off from the certain rotational position or one of the certain rotational positions for preventing removing of the fastener 1 from the base 3 without rotating the fastener 1.

[0016] According to an embodiment, the fastener 1 has a body 10 having at least partially circular shape. The fastener 1 comprises at least one first flange section 11 protruding radially from the body 10. The fastener 1 comprises at least one second flange section 12 protruding radially from the body 10 and arranged at a distance from the first flange section 11. The opening 31 has a shape that allows the passage of the first flange section 11 through the opening 31 only in a certain rotational position or in certain rotational positions while the passage of the second flange section 12 through the opening 31 is prevented. The fastener 1 is rotatable in relation to the base 3 when base 3 is penetrated by the fastener 1 so that the first flange section 11 and the at least one second flange section 12 are at different sides of the base 3 for moving the first flange section 11 off from the certain rotational position or one of the certain rotational positions and for attaching the fastener 1 to the base 3.

[0017] According to an embodiment, the fastener 1 comprises at least one slot 13 for receiving a part of the wire loop 2 without the need for threading the fastener 1 with the wire of the wire loop 2. Preferably, the fastener 1 comprises two slots 13 arranged at opposite sides of the fastener 1, each slot being arranged to receive one part of the wire loop 2 so that the fastener 1 is at least partially inside the wire loop 2. The slot 13 opens radially in a direction away from the middle of the fastener 1. This allows inserting a part of the wire loop 2 in the slot 13 radially in relation to the fastener 1. A part of the wire loop 2 is arranged in the slot 13. The part of the wire loop 2 is retained in the slot 13 between the fastener 1 and the base 3.

[0018] According to an embodiment, the slot 13 is provided with a retaining means 131 for retaining the part of the wire loop 2 in the slot 13. For example, the retaining means 131 comprises at least one tab arranged in the edge of the slot and extending towards the middle of the fastener 1. Preferably, each slot 13 comprises two tabs arranged at opposite sides of the slot 13. This embodiment is illustrated in Figure 6.

[0019] According to an embodiment, the fastener 1 comprises reinforcement members 14 for preventing bending of the second flange section 12 in relation to the body 10. For example, the reinforcement members 14 are triangular parts arranged between the second flange section 12 and the body 10. This embodiment is illustrated in Figures 1, 4 and 5.

[0020] According to an embodiment, the fastener 1 comprises a protrusion 15 arranged to the first flange section 11 towards the second flange section 12 or to the second flange section 12 towards the first flange section 11. Preferably, the protrusion is arranged to connect with a corresponding notch in the base 3 when the fastener 1 is rotated off from the certain rotational position for preventing, or at least limiting, rotating the fastener 1 back to the certain position and thus detaching the fastener 1 from the base 3. This embodiment is illustrated in Figures 5 and 7.

Method

[0021] The disclosure relates also to a method for attaching a wire loop 2 to a base 3.

[0022] The method comprises providing a wire loop arrangement comprising a fastener 1 and a wire loop 2 connected to the fastener 1. Preferably, the wire loop 2 is connected to at least one slot 13 arranged in the fastener 1, the slot 13 opening radially in a direction away from the middle of the fastener 1. The fastener 1 has a body 10 having at least partially circular shape. The fastener 1 comprises at least one first flange section 11 protruding radially from the body 10. The fastener 1 comprises at least one second flange section 12 protruding radially from the body 10 and arranged at a distance from the first flange section 11.

[0023] The method comprises providing a base 3 having a form of a sheet. The base 3 comprises an opening 31 for allowing the fastener 1 to penetrate the base 3 through the opening 31. The opening 31 has a shape that allows the passage of the first flange section 11 through the opening 31 only in a certain rotational position or in certain rotational positions while the passage of the

second flange section 12 through the opening 31 is prevented.

[0024] The method comprises aligning the fastener 1 with the hole so that the fastener 1 is in the certain rotational position or in one of the certain rotational positions. This step is illustrated in Figure 8.

[0025] The method comprises inserting the aligned fastener 1 partially through the opening 31 so that the first flange section 11 and the at least one second flange section 12 are at different sides of the base 3.

[0026] The method comprises rotating the fastener 1 inserted partially through the opening 31 in relation to the base 3 for moving the first flange section 11 off from the certain rotational position or one of the certain rotational positions for preventing removing of the fastener 1 from the base 3 without rotating the fastener 1.

Claims

1. An arrangement of a wire loop (2) and a base (3), comprising

- a fastener (1);
- a wire loop (2) connected to the fastener (1); and
- a base (3) having an opening (31) for allowing the fastener (1) to penetrate the base (3) through the opening (31),

characterized in that
the fastener (1) is attached to the base (3) by a bayonet mount between the fastener (1) and the base (3) so that
the fastener (1) has a body (10) having at least partially circular shape;
the fastener (1) comprises at least one first flange section (11) protruding radially from the body (10);
the fastener (1) comprises at least one second flange section (12) protruding radially from the body (10) and arranged at a distance from the first flange section (11);
the base (3) has a form of a sheet;
the opening (31) having a shape that allows the passage of the first flange section (11) through the opening (31) only in a certain rotational position or in certain rotational positions while the passage of the second flange section (12) through the opening (31) is prevented;
the fastener (1) is rotatable in relation to the base (3) when base (3) is penetrated by the fastener (1) so that the first flange section (11) and the at least one second flange section (12) are at different sides of the base (3) for moving the first flange section (11) off from the certain rotational position or one of the certain rotational positions and for attaching the fastener (1) to the base (3).

2. An arrangement according to claim 1, **characterized in that**
the fastener (1) comprises at least one slot (13) for receiving a part the wire loop (2); the slot (13) opens radially in a direction away from the middle of the fastener (1);
a part of the wire loop (2) is arranged in the slot (13); and
the part of the wire loop (2) is retained in the slot (13) between the fastener (1) and the base (3).

3. An arrangement according to claim 2, **characterized in that** the slot (13) is provided with a retaining means (131) for retaining the wire loop (2) in the slot (13).

4. An arrangement according to any one of the preceding claims, **characterized in that** the fastener (1) comprises reinforcement members (14) for preventing bending of the second flange section (12) in relation to the body (10).

5. An arrangement according to any one of the preceding claims, **characterized in that** the fastener (1) comprises a protrusion (15) arranged to the first flange section (11) towards the second flange section (12) or to the second flange section (12) towards the first flange section (11).

6. A method for attaching a wire loop (2) to a base (3), comprising the steps of

- providing a wire loop arrangement comprising a fastener (1) and a wire loop (2) connected to the fastener (1), wherein the fastener (1) has a body (10) having at least partially circular shape, the fastener (1) comprises at least one first flange section (11) protruding radially from the body (10), and the fastener (1) comprises at least one second flange section (12) protruding radially from the body (10) and arranged at a distance from the first flange section (11);
- providing a base (3) having a form of a sheet and comprising an opening (31) for allowing the fastener (1) to penetrate the base (3) through the opening (31), the opening (31) having a shape that allows the passage of the first flange section (11) through the opening (31) only in a certain rotational position or in certain rotational positions while the passage of the second flange section (12) through the opening (31) is prevented;
- aligning the fastener (1) with the hole so that the fastener (1) is in the certain rotational position or in one of the certain rotational positions;
- inserting the aligned fastener (1) partially through the opening (31) so that the first flange section (11) and the at least one second flange

section (12) are at different sides of the base (3); and

- rotating the fastener (1) inserted partially through the opening (31) in relation to the base (3) for moving the first flange section (11) off from the certain rotational position or one of the certain rotational positions.

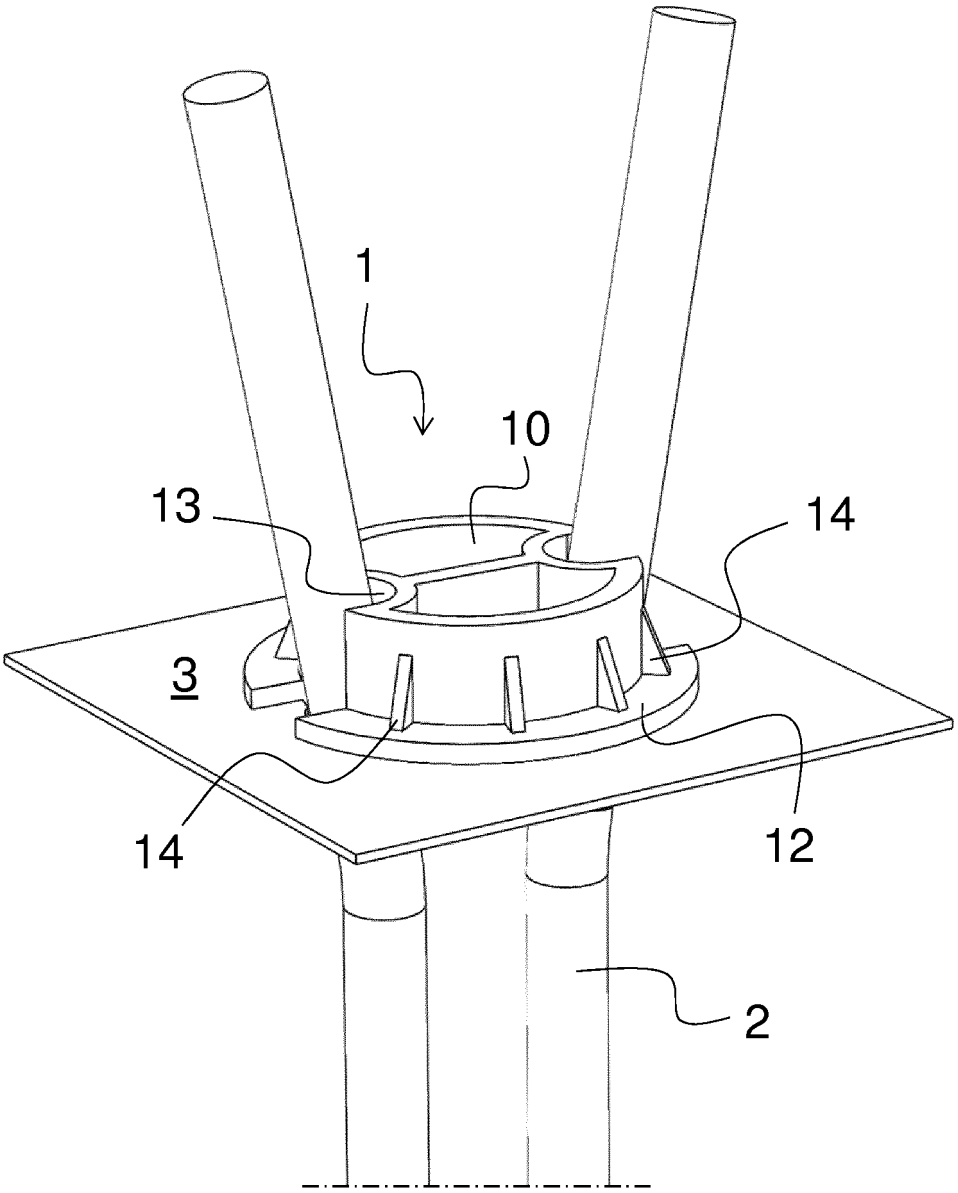

Fig. 1

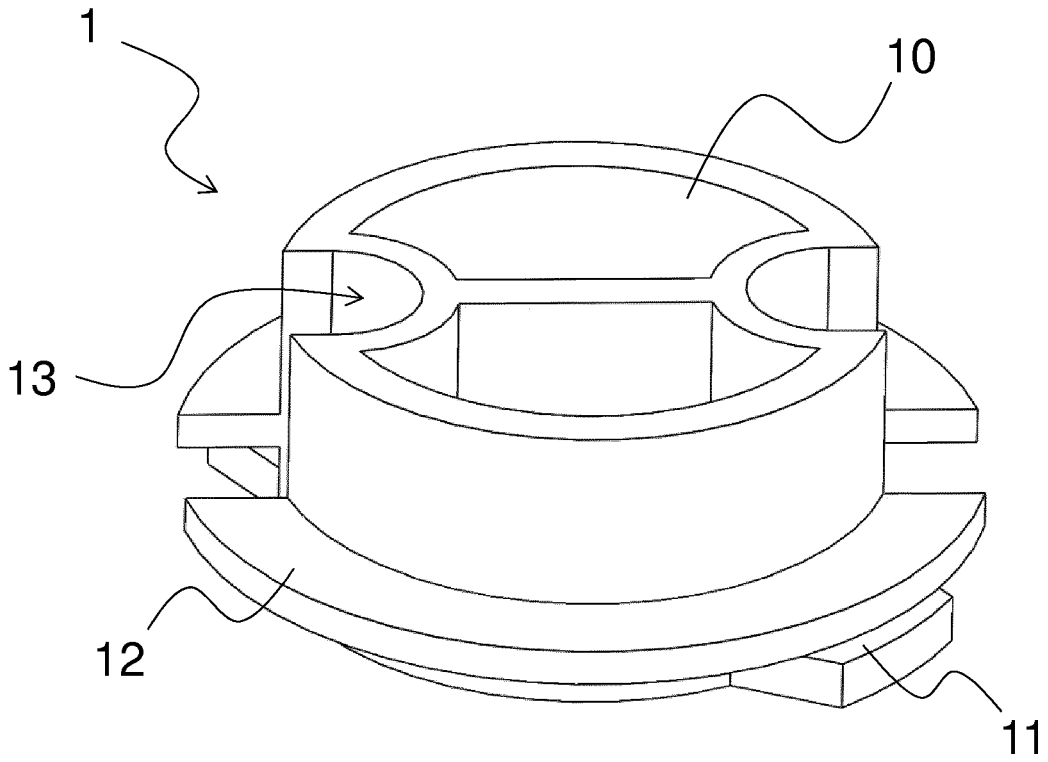

Fig. 2

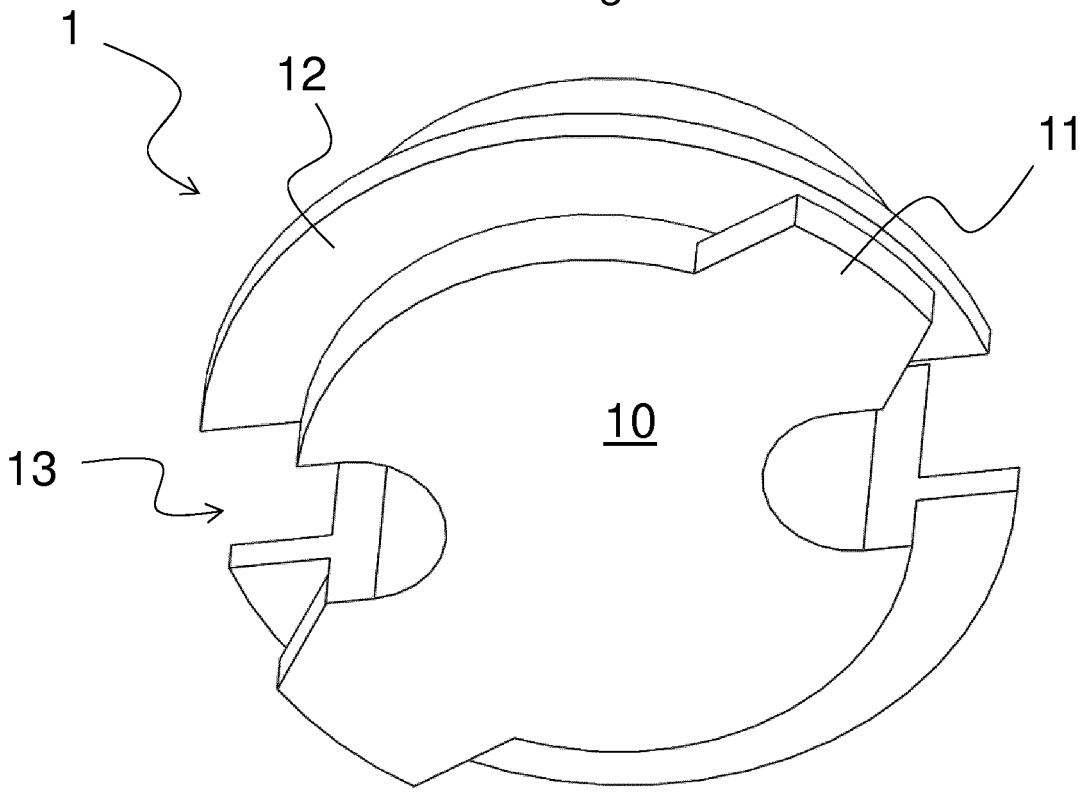

Fig. 3

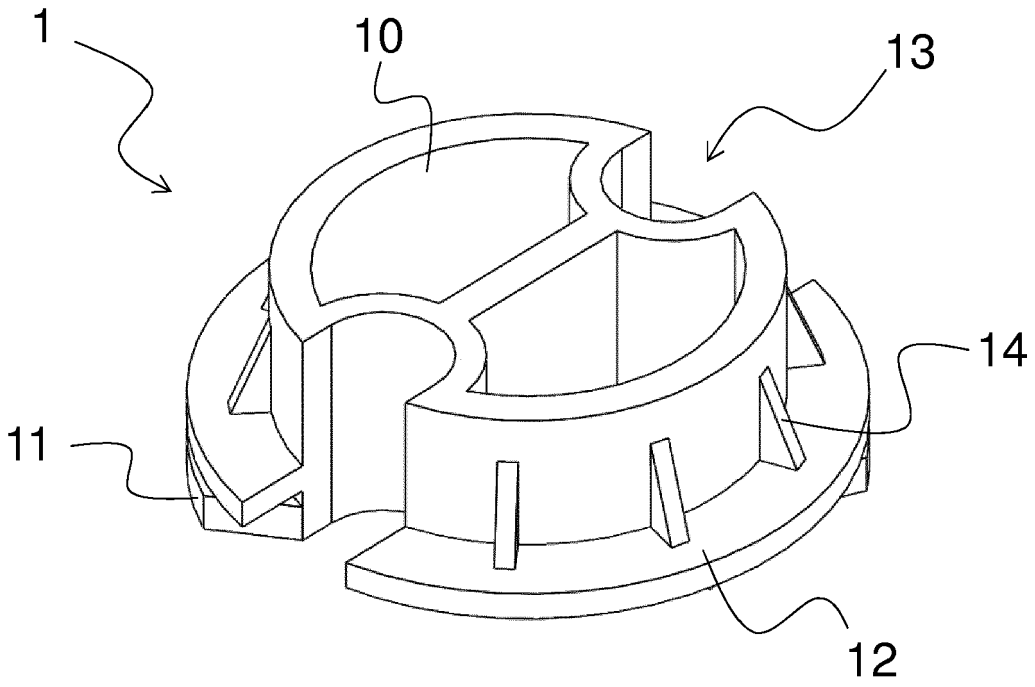

Fig. 4

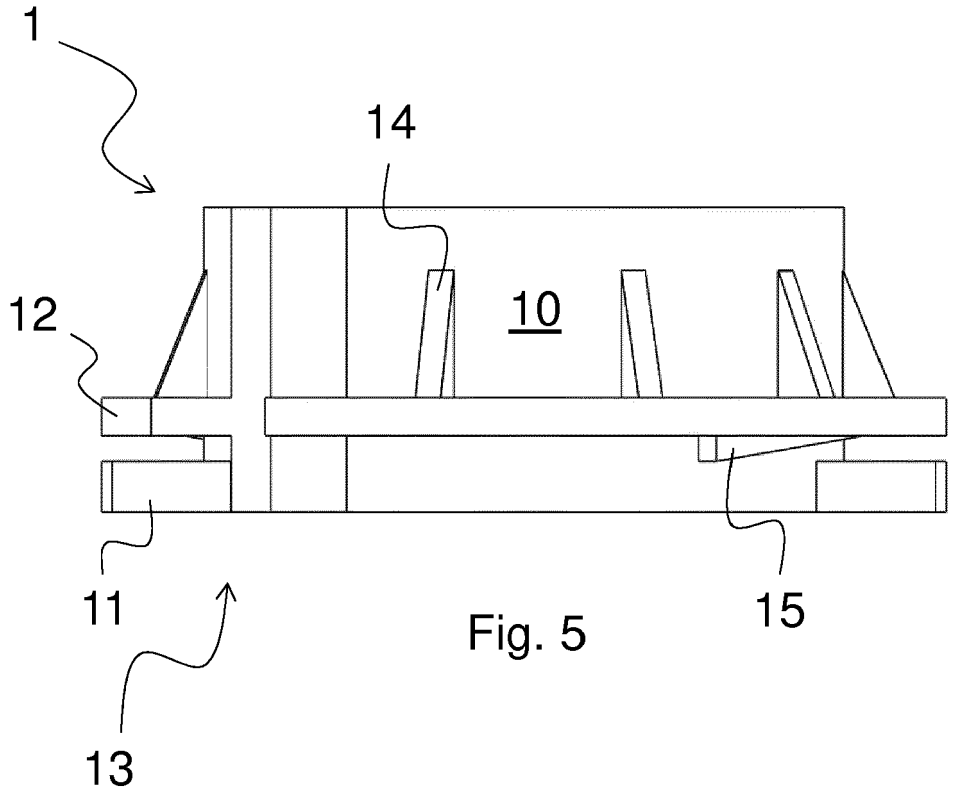

Fig. 5

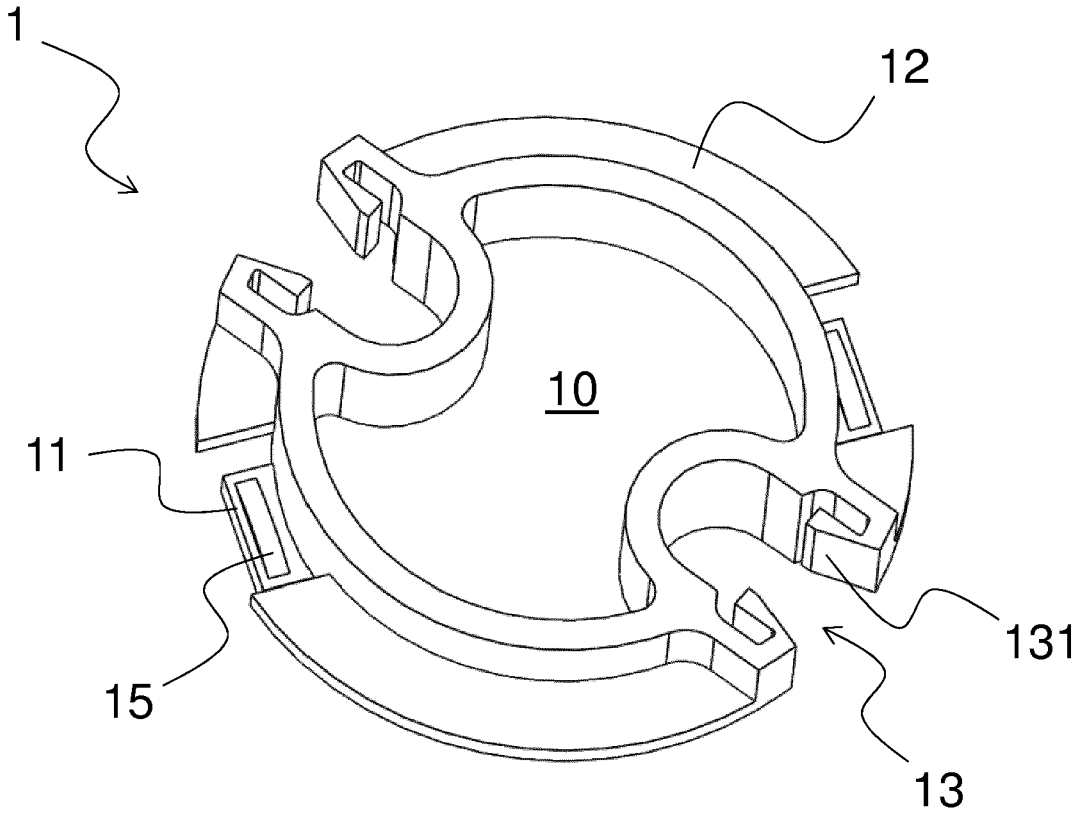

Fig. 6

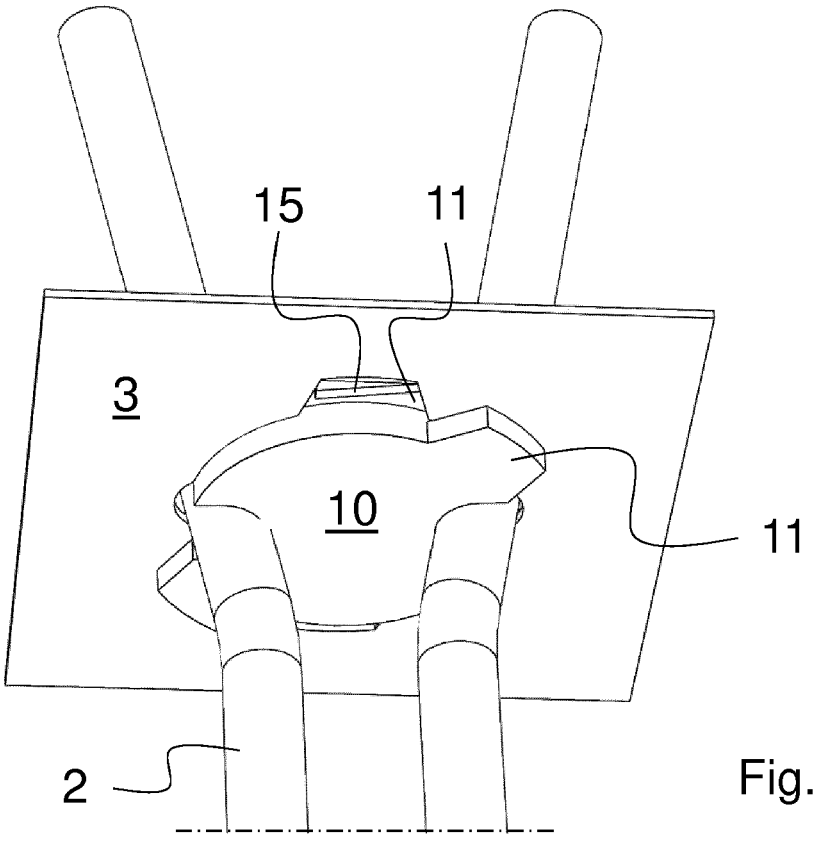

Fig. 7

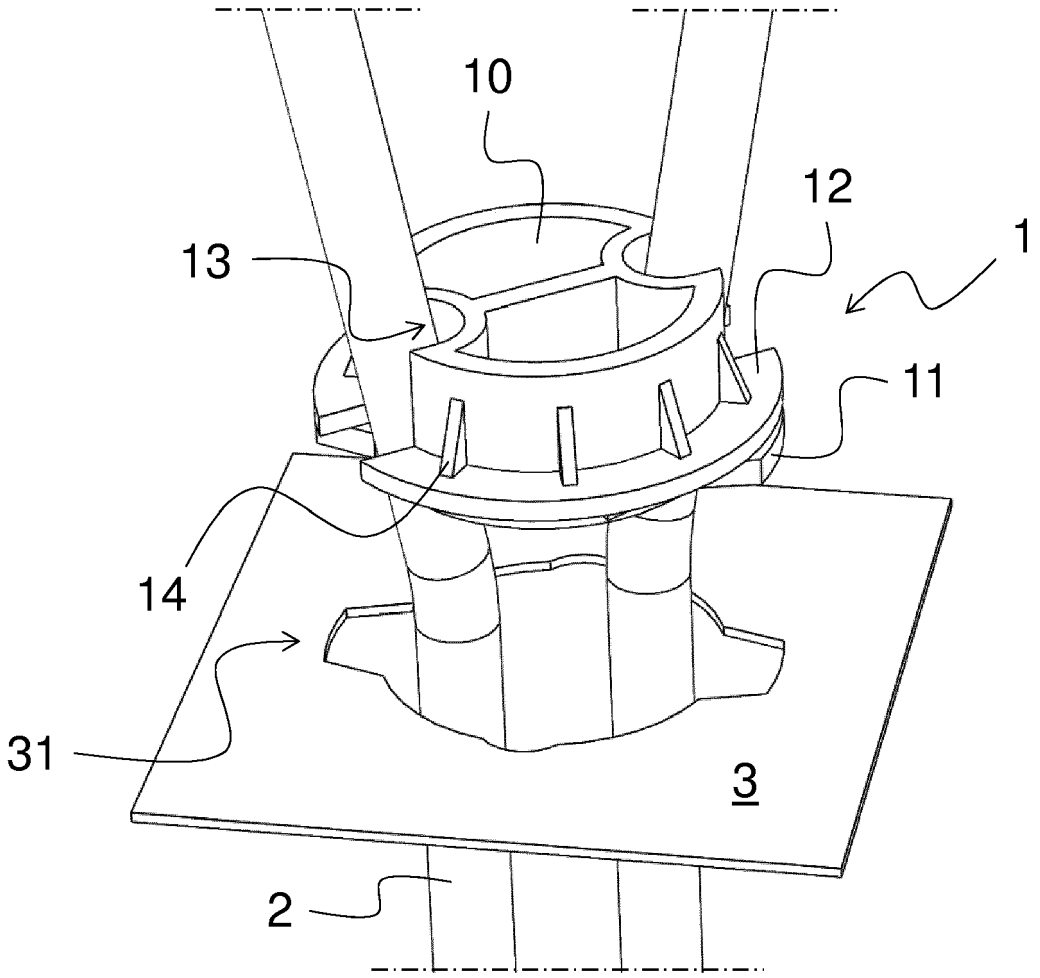

Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 19 18 4354

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,D	WO 98/03751 A1 (PFEIFER SEIL HEBETECH [DE]; KINTSCHER MATTHIAS [DE]) 29 January 1998 (1998-01-29) * page 12, paragraph 2 - paragraph 3; figures 7-9 *	1-6	INV. E04G21/12
X,D	WO 96/31671 A1 (BETOMAX KUNSTSTOFF METALL [DE]) 10 October 1996 (1996-10-10)	1,2,4-6	
A	* page 11, line 22 - line 29; figures 1-8 *	3	

TECHNICAL FIELDS SEARCHED (IPC)

E04G
B66C
B28B
E04B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	13 January 2020	Baumgärtel, Tim

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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13-01-2020

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9803751 A1	29-01-1998	AT 201736 T	15-06-2001
		AU 4377497 A	10-02-1998
		DE 29612573 U1	20-11-1997
		DE 29723989 U1	02-09-1999
		DE 29723990 U1	02-09-1999
		DK 0914531 T3	20-08-2001
		EP 0914531 A1	12-05-1999
		PL 331152 A1	21-06-1999
		US 6102607 A	15-08-2000
		WO 9803751 A1	29-01-1998
WO 9631671 A1	10-10-1996	AT 176510 T	15-02-1999
		CZ 292396 B6	17-09-2003
		DE 29505789 U1	01-08-1996
		DK 0819203 T3	20-09-1999
		EP 0819203 A1	21-01-1998
		HU 9801982 A2	28-12-1998
		PL 322582 A1	02-02-1998
		WO 9631671 A1	10-10-1996

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 9631671 A1 **[0003]**
- WO 9803751 A1 **[0004]**
- WO 2009012827 A1 **[0005]**