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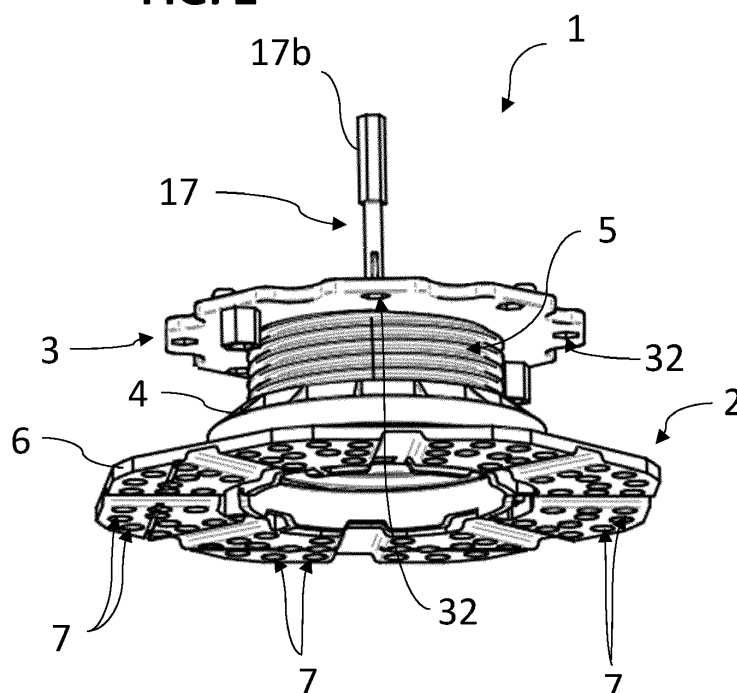
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(54) **SUPPORT DEVICE**

(57) Described is a device for supporting raised floors, comprising a base (2), an annular element (4), threaded internally, supported by the base (2), a cylindrical body (5), threaded externally and designed to en-

gage by screwing with the annular element (4), a support head (3) designed to receive one or more elements of a floor, the head (3) being stably connected to the cylindrical body (5).

FIG. 2



Description

[0001] This invention relates to a support device.

[0002] In particular, the invention relates to a device for supporting raised floors. Yet more specifically, the invention relates to a device for supporting raised floors of an adjustable type.

[0003] There are currently prior art raised floors used both to make temporary treadable surfaces and final floors, in particular in an industrial and/or commercial context. Consider, for example, the installation of an exhibition stand where there is a rough base, for example made of concrete. In this situation, in order to characterise both in functional and aesthetic terms the space for housing the stand, it is common practice to use large panels or tiles, which are supported, at the respective corners, on suitable supports.

[0004] In other contexts, such as, for example, offices or shops, the raised floors are advantageously used both for the ease of installation (which do not normally require the execution of masonry works) and for the ease with which they can be removed or inspected, for example for the passage of service cables or pipes.

[0005] Currently, for making raised floors there is the arrangement of a plurality of support devices on which are rested the panels which define the flooring, either directly or by interposing suitable transversal members. The flooring panels consist of panels made of various materials or simply tiles, also ceramic tiles.

[0006] The majority of the support devices support four corner portions of four respective flooring panels whilst, at the end portions the panels which are rested on a support device can also be only one or two.

[0007] The support devices for raised flooring of known type normally comprise a base for supporting the base, a head for supporting the panels of the flooring and intermediate elements for connecting between the head and the support base.

[0008] Usefully, there are means for adjusting the distance between the head and the base, in such a way as to precisely adjust the height of the floor from the ground, compensate for any irregularities of the ground and/or provide for an inclination of the floor or also compensate for an excessive inclination of the ground. Although widely used, the prior art solutions of support devices are not always efficient at adjusting the height of the support head.

[0009] Moreover, also in the assembly of the various parts which make up the support device, the prior art solutions are sometimes neither practical nor simple to manipulate by the operators.

[0010] Support devices of known type are described in patent documents EP 0 373 088 and EP 3 686 371.

[0011] The aim of the invention is to provide a device for supporting raised floors which is able to overcome the drawbacks of the prior art and which is at the same time practical to use and simple and inexpensive to make.

[0012] A further aim is to provide a device for support-

ing raised floors which is easy and practical to assemble. According to the invention, these aims and others are achieved by a device for supporting raised floors comprising the technical features described in the accompanying claims.

[0013] The technical features of the invention, according to the above-mentioned aims, are clearly described in the appended claims and its advantages are apparent from the detailed description which follows, with reference to the accompanying drawings which illustrate a nonlimiting example embodiment of it, and in which:

- Figure 1 is a schematic perspective view from above of a first embodiment of the support device according to the invention;
- Figure 2 is a schematic perspective view from below of the support device of Figure 1;
- Figures 3 and 4 are respective exploded perspective views from different angles of the support device of the preceding drawings;
- Figure 5 is a schematic plan view from above of the support device of Figures 1 and 2;
- Figure 6 is a cross section view through the line IV-IV of Figure 5;
- Figures 7 and 8 are respective exploded perspective views from different angles of a variant embodiment of the support device of Figures 1 and 2;
- Figure 9 is a schematic perspective view of the variant of Figures 7 and 8.

[0014] As illustrated in Figure 1 the numeral 1 denotes in its entirety a device for supporting raised floors made in accordance with the invention.

[0015] The device 1 for supporting raised floors, hereinafter for brevity also referred to simply as the support device 1, is designed to support flooring elements, not illustrated, such as panels, tiles or the like. Generally speaking, in a known manner and therefore not described or illustrated further, a flooring element with a quadrangular shape is supported at its four corners by four respective support devices 1. Similarly, a support device 1 is designed to support the respective corners of four different flooring elements. As illustrated in the accompanying drawings, the support device 1 according to the invention comprises a base 2 and a support head 3 designed to receive one or more elements, not illustrated, of a floor.

[0016] Interposed between the support head 3 and the base 2 there are an annular element 4, threaded internally, supported by the base 2, and a cylindrical body 5, threaded externally and designed to engage by screwing with the annular element 4.

[0017] The support head 3, hereinafter also referred to simply as head 3, is connected to the cylindrical body 5 to rotate integrally with it during its screwing/unscrewing on the above-mentioned annular element 4. Advantageously, the head 3 and the cylindrical body 5 are made in a single body.

[0018] The base 2 has a plate 6 for resting on the ground extending approximately in the form of a circular crown, except for twists and turns present on the relative outer perimeter edge. In particular, the above-mentioned twists and turns define an octagonal shape of the outer perimeter edge of the plate 6, a shape which is designed to allow a greater approach of two adjacent support devices 1, so as to allow the installation also with flooring elements with small dimensions.

[0019] On the plate 6 there is a plurality of through holes 7 to make it lighter in weight.

[0020] The base 2 also has a cylindrical central portion 8, extending in upward elevation starting from the above-mentioned plate 6 and connected to it also by a plurality of stiffening ribs 9.

[0021] As illustrated in particular in Figure 7, a plurality of openings 10 are made on the central portion 8, distributed at equal angular intervals relative to a central axis A of the device.

[0022] As illustrated in the accompanying drawings, the annular element 4 basically forms a sort of ring nut on which, as mentioned, the cylindrical body 5 engages by screwing. The annular element 4 has an inner cylindrical wall 41 on an inner face of which is made a thread designed to engage, as mentioned, by screwing with the thread present on the cylindrical body 5.

[0023] The thread of the annular element 4 and of the cylindrical body 5 is advantageously of the buttress thread type.

[0024] In effect, the buttress thread has one of the sides inclined by very few degrees (normally approximately 3 sexagesimal degrees) and this allows it to offer excellent resistance to the axial load, as in the case of flooring.

[0025] Moreover, the buttress thread has a high locking capacity, which is very useful in maintaining the height adjustment performed when laying the floor.

[0026] The annular element 4 also comprises an outer cylindrical edge 42.

[0027] Between the inner cylindrical wall 41 and the outer cylindrical edge 42 there is an annular cavity 43, shown in Figure 6, designed to be inserted into and partly superposed on the central cylindrical portion 8 of the base 2.

[0028] Extending downwards from the annular cavity 43 there is a plurality of clip organs 11, distributed at equal angular intervals in a manner similar to the above-mentioned openings 10 made in the central portion 8 of the base 2.

[0029] The clip organs 11 are, in effect, designed, in use, to be inserted in the openings 10 present on the central portion 8 of the base 2, defining respective interlocking seats for the clip organs 11, to prevent the mutual rotation between the annular element 4 and the base 2. According to the embodiments illustrated in the accompanying drawings, the above-mentioned clip organs 11 each comprise two prongs which can be elastically deformed, designed to be inserted in an interlocking fashion inside the respective interlocking seats 10. The above-

mentioned clip organs 11 and respective interlocking seats 10 define, for the support device 1, respective means for coupling between the annular element 4 and the base 2 designed to prevent the reciprocal rotation between the annular element 4 and the base 2.

[0030] As mentioned, the support head 3 is designed to receive one or more elements of a floor, and has an upper supporting surface 31 on which a layer 12 made of a material with a high friction coefficient is advantageously positioned.

[0031] Advantageously, the layer 12 of material with a high coefficient of friction is of a removable type.

[0032] The layer 12 forms a sort of mat on which the above-mentioned and not illustrated elements of the flooring are positioned.

[0033] As illustrated in Figures 1 and 7, the layer 12 of high friction coefficient material has, distributed at angular intervals from each other of 90 sexagesimal degrees, four tabs 13 designed to be interposed, in known manner, between four flooring elements, in the respective spaces which are made between them during laying.

[0034] On the head 3, emerging from it, there are gripping organs 14 designed to allow the engagement with the head 3 for causing the rotation, simultaneously with the cylindrical body 5 integral with it, by screwing/unscrewing relative to the annular element 4. As illustrated in particular in Figures 2 and 6, the gripping organs 14 emerging from the head 3 comprise two hexagonal elements 15 extending below the head 3 and configured for being engaged by an operating tool.

[0035] As clearly illustrated in Figures 1 and 9, on the support head 3 there is advantageously a plurality of holes 32 distributed along its circumferential edge.

[0036] The above-mentioned holes 32 have a hexagonal shape so as to be suitable to be engaged by a hexagonal wrench by which to rotate the head by screwing/unscrewing relative to the annular element 4.

[0037] As illustrated in Figure 6, on the head 3 there is an engagement portion 16, made centrally and configured for engaging by a respective tool 17 for determining the rotation of the head 3, simultaneously with the cylindrical body 5 integral with it, by screwing/unscrewing relative to the annular element 4. The tool 17, which is described in more detail below, is shown in the extracted configuration in Figures 3, 4, 7, 8, whilst in Figures 1, 2 and 6 it is shown in the engaging configuration with the above-mentioned engagement portion 16.

[0038] The engagement portion 16 is positioned below the top supporting surface 31 of the head 3, in such a way as not to emerge from it.

[0039] Advantageously, the positioning of the engagement portion 16 under the support surface 31 means that the twisting moment applied on the head 3 is, axially, at the threaded zone of the cylindrical body 5, thereby not inducing torsional deformations to the head 3 and cylindrical body 5 assembly but also allowing the twisting action to be applied just close to where it is required for the unscrewing/screwing.

[0040] As illustrated in Figure 5, the engagement portion 16 is cross-shaped.

[0041] As illustrated in Figures 1, 2, 7, 8, the above-mentioned operating tool 17 has a blade-shaped operating end 17a and a handgrip 17b with a hexagonal shape designed to engage with an operating tool, of known type and not illustrated.

[0042] This type of operating wrench, also not illustrated, which is designed to engage with nuts and screws with a hexagonal head, is advantageously used for rotating the head 3 and cylindrical body 5 assembly relative to the annular element 4 engaging the wrench in one of the elements 15 with a hexagonal shape and imparting a force which, due to the distance of the hexagonal elements 15 from the central axis of the head 3, determines a twisting moment applied on the head 3 and cylindrical body 5 assembly such as to cause the screwing/unscrewing relative to the annular element 4.

[0043] The above-mentioned gripping organs 14 and engagement portion 16 define, for the support device 1, respective means for adjusting the distance of the support head 3 from the base 2.

[0044] In effect, it is evident that with the screwing/unscrewing of the head 3 and cylindrical body 5 assembly relative to the annular element 4 fixed on the base 2, there is a simultaneous lowering/raising of the support head 3 relative to the base 2, thereby determining a variation in height of the flooring elements relative to the ground.

[0045] As illustrated in the embodiment shown in Figures 7 to 9, the support device 1 comprises a cylindrical spacer element 18 interposed between the annular element 4 and the base 2.

[0046] Figures 7, 8 illustrate an example of a spacer element 18, but there are spacer elements 18 of different lengths, in such a way as to reach even considerable dimensions of the distance between the base 2 and the annular element 4.

[0047] Advantageously, two or more spacer elements 18 may be stacked for being interposed simultaneously between the annular element 4 and the base 2.

[0048] As clearly illustrated in Figures 7 and 8, each spacer element 18, being designed to be interposed between the annular element 4 and the base 2, replicates at its upper and lower end portions 18a, 18b, the interlocking seats 10 and the clip organs 11.

[0049] In this way, the annular element 4 will engage with the relative clip organs 11 in the corresponding interlocking seats 10 made in the upper end portion 18a of the spacer element 18, whilst the interlocking seats 10 on the base 2 will be at the same time engaged by clip organs 11 present in the lower end portion 18b of the spacer element 18.

[0050] In this way, the impediment to the reciprocal rotation of the annular element 4 and base 2 is maintained, thereby contributing to the general stability of the support device 1.

[0051] Advantageously, as illustrated in the accompa-

nying drawings, the support device 1 according to the invention comprises a kit together with a respective operating tool 17. Advantageously, the operating end 17a of the operating tool 17 is shaped like a blade with reduced thickness, in such a way that it can be inserted inside the space existing between two adjacent covering elements supported by the support device 1.

[0052] According to an embodiment, the blade-shaped operating end 17a has a thickness of 2 millimetres.

[0053] The support device 1 according to the invention exceeds the limits of the prior art and brings important advantages.

[0054] A first advantage connected to the invention is due to the fact that it allows a twofold possibility of adjusting the height above the ground (that is, from the base) of the support head of the flooring elements, thanks to the presence of the gripping organs emerging from the head, accessible from below, and the engagement portion, accessible from above by means of the specific operating wrench.

[0055] This dual possibility of adjustment is particularly advantageous since it allows the installer to operate with the maximum freedom, depending on the specific conditions of the assembly.

[0056] A further advantage connected to the support device according to the invention is due to the presence of the particular coupling means between the annular element and the base or also between the annular element, one or more spacer elements and the base.

[0057] In effect, thanks to the clip organs, the reciprocal rotation of the annular element relative to the base is prevented in both directions of rotation, which would not necessarily occur, for example, with normal bayonet coupling elements.

Claims

1. A device for supporting raised floors, comprising:

- a base (2),
- an annular element (4), internally threaded, supported by said base (2),
- a cylindrical body (5), threaded externally and designed to engage by screwing with said annular element (4),
- a support head (3) designed to house one or more elements of a floor, said support head (3) being stably connected to said cylindrical body,
- adjusting means for adjusting the distance of said support head (3) from said base (2), said adjusting means comprising gripping organs (14) emerging from said support head (3) and configured to allow engagement with said support head (3) to cause its rotation, in screwing/unscrewing with respect to said annular element (4), said adjusting means also comprising an engagement portion (16) centrally obtained

- in said support head (3) and configured to be engageable by a tool (17) to cause rotation of said support head (3), in screwing/unscrewing with respect to said annular element (4), **characterised in that** said gripping means (14) emerging from said head comprise at least two hexagonal elements (15) extending below said support head (3) and configured to be engaged by a wrench. 5
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2. Device according to claim 1, **characterized in that** said support head (3) is made in one body with said cylindrical body (5). 15
3. Device according to any one of the preceding claims, **characterized in that** said engagement portion (16) centrally obtained in said support head (3) is arranged under an upper support plane (31) of said support head (3) and configured to be engaged by a counter-shaped operating tool (17) . 20
4. Device according to any one of the preceding claims, **characterized in that** it comprises, disposed leaned on said support head (3), a layer (12) made of a material having a high coefficient of friction. 25
5. The device according to any one of the preceding claims, **characterised in that** it has a plurality of holes (32) distributed along a circumferential edge of said support head (3), said holes (32) having a hexagonal shape so as to be designed to be engaged by a hexagonal wrench. 30
6. Device according to any one of the preceding claims, **characterized in that** it comprises clasp means at least between said annular element and said base, said clasp means comprising clip organs (11) and respective interlocking seats (10) configured to prevent mutual rotation of said annular element (4) and said base (2). 35
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7. Device according to claim 6, comprising at least one cylindrical spacer element (18) interposed between said annular element (4) and said base (2), **characterized in that** said clip organs (11) and interlocking seats (10) are also realized in said at least one spacer element (18). 45
8. Device according to any one of the preceding claims 6 and 7, **characterized in that** said clip organs (11) each comprise two elastically deformable prongs. 50
9. Device according to any one of the preceding claims, **characterized in that** said internally threaded annular element (4) and externally threaded cylindrical body (5) each have buttress threads. 55
10. Kit comprising a device according to any one of the preceding claims 1 to 9 and an operating tool (17) shaped to match said engagement portion (16).
11. Kit according to the preceding claim, **characterized in that** said operating tool (17) presents a hexagonal conformation handle (17b) designed to engage with a wrench.

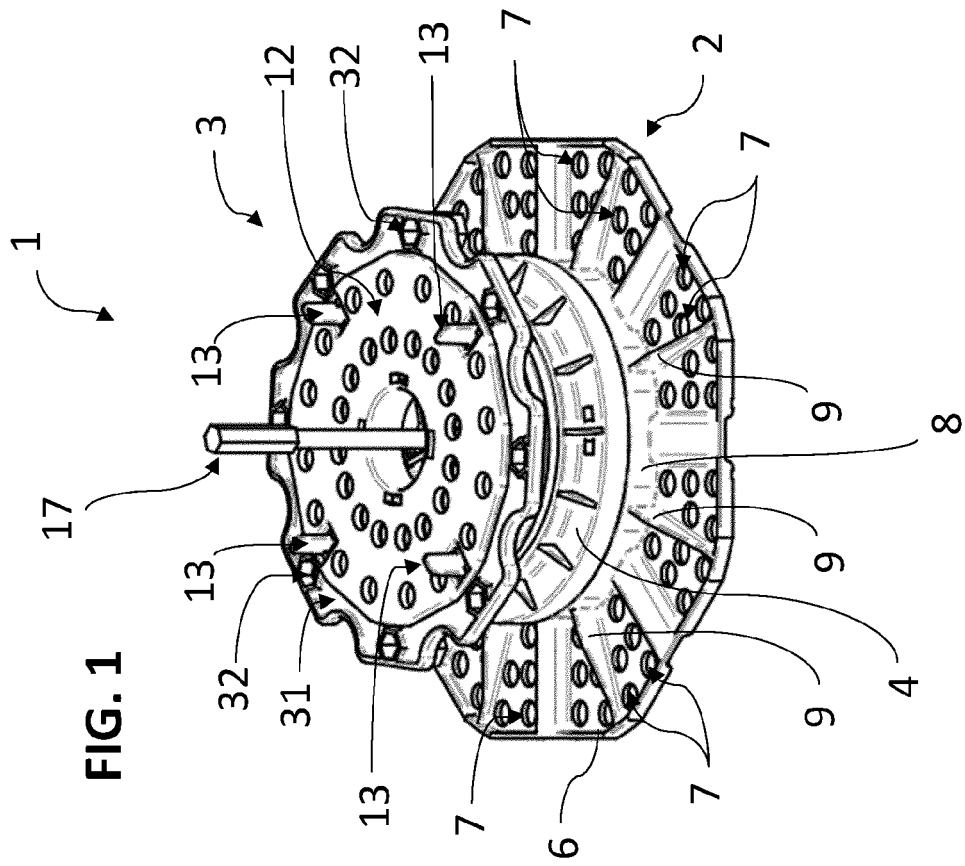
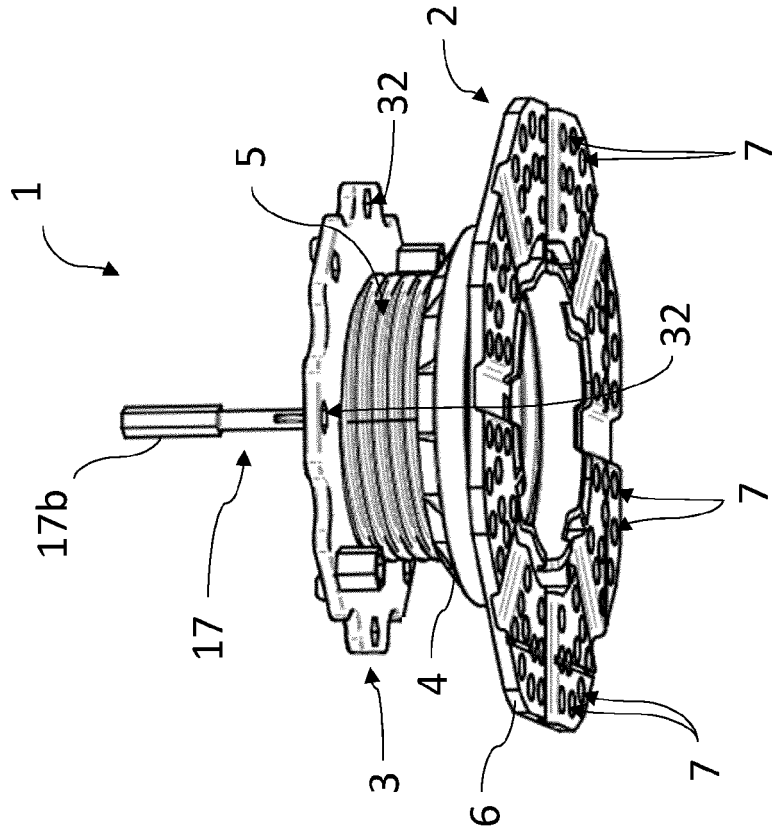


FIG. 2



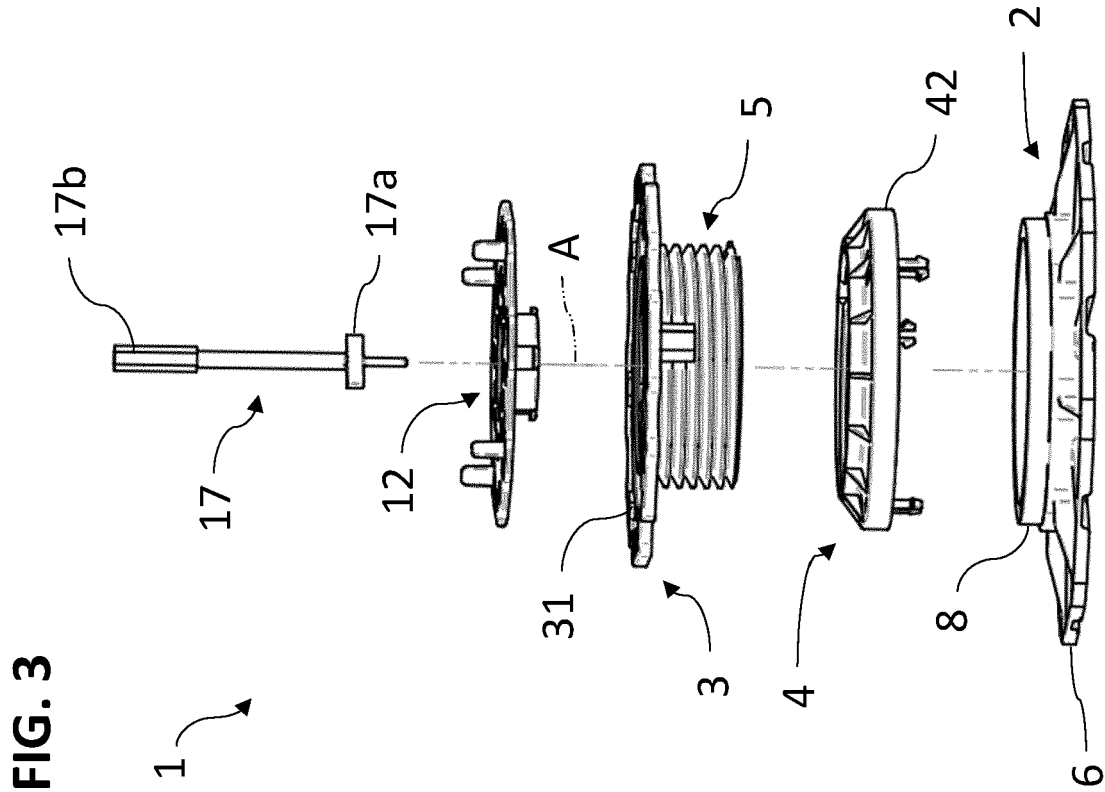
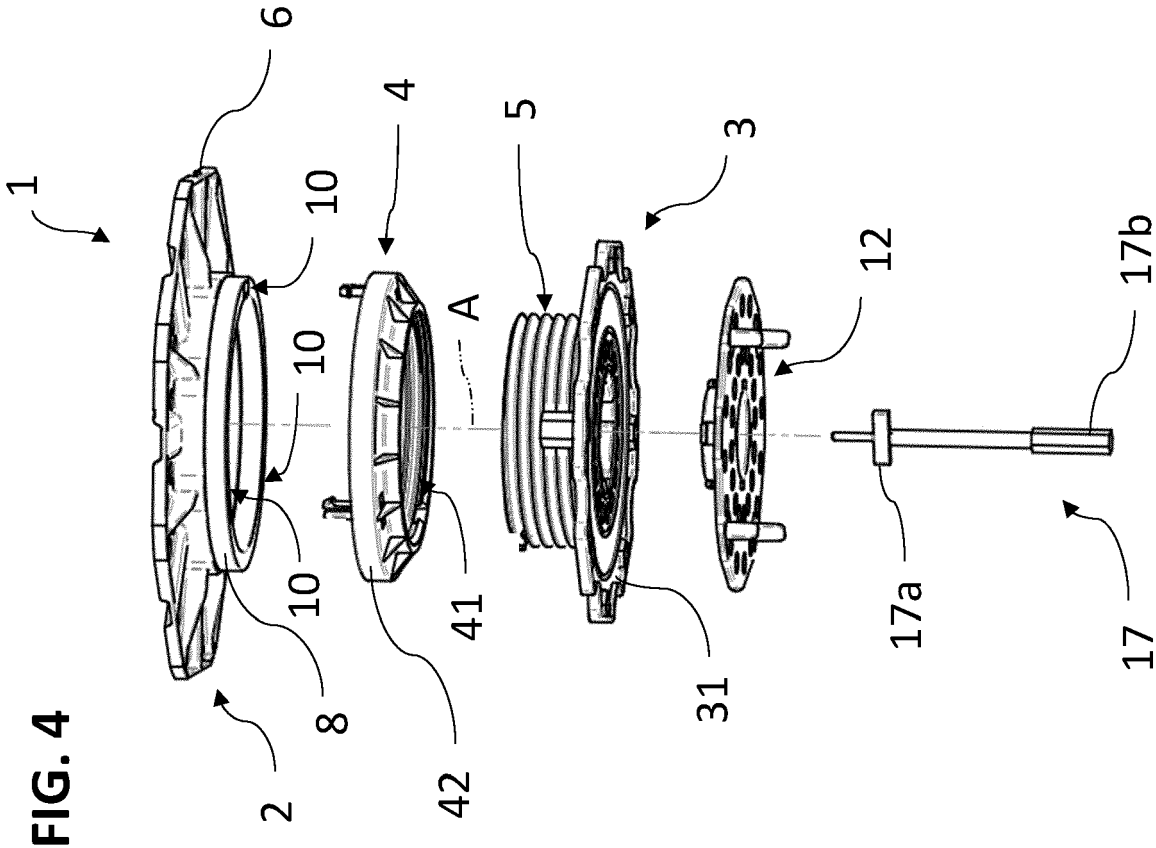


FIG. 5

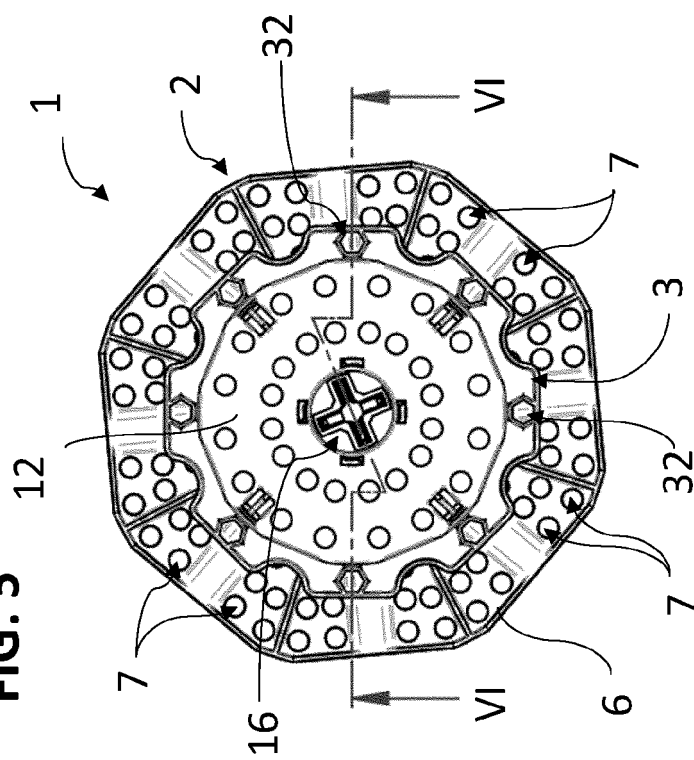
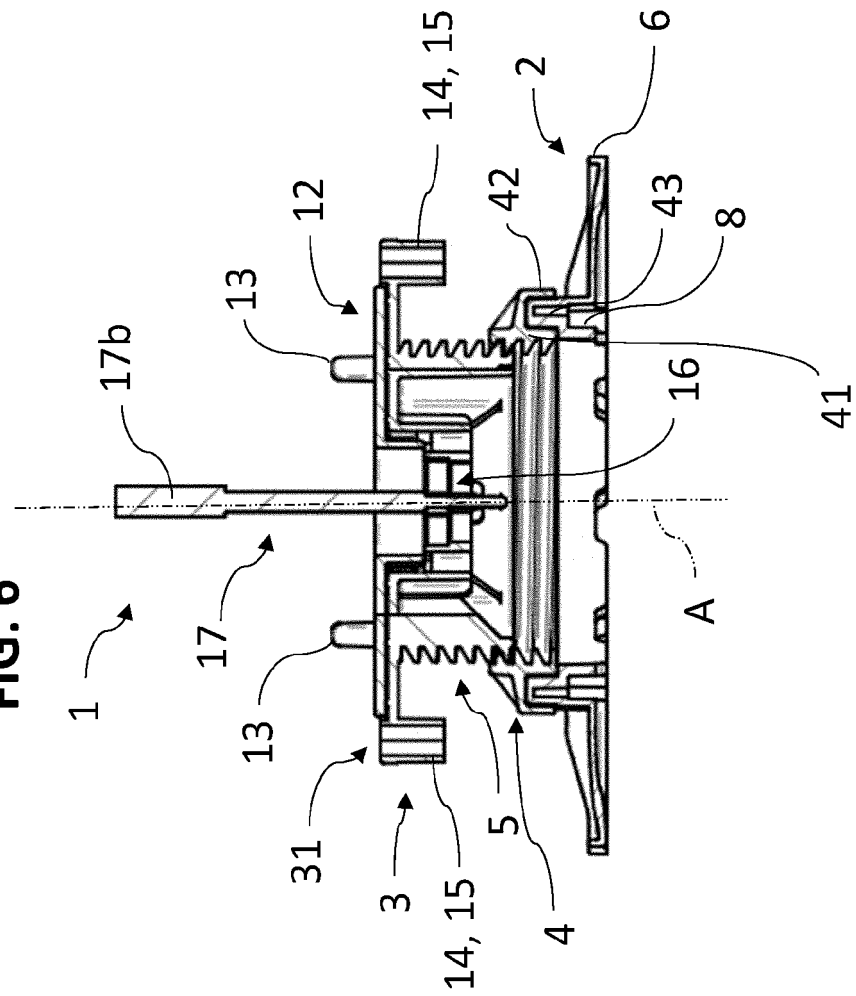


FIG. 6



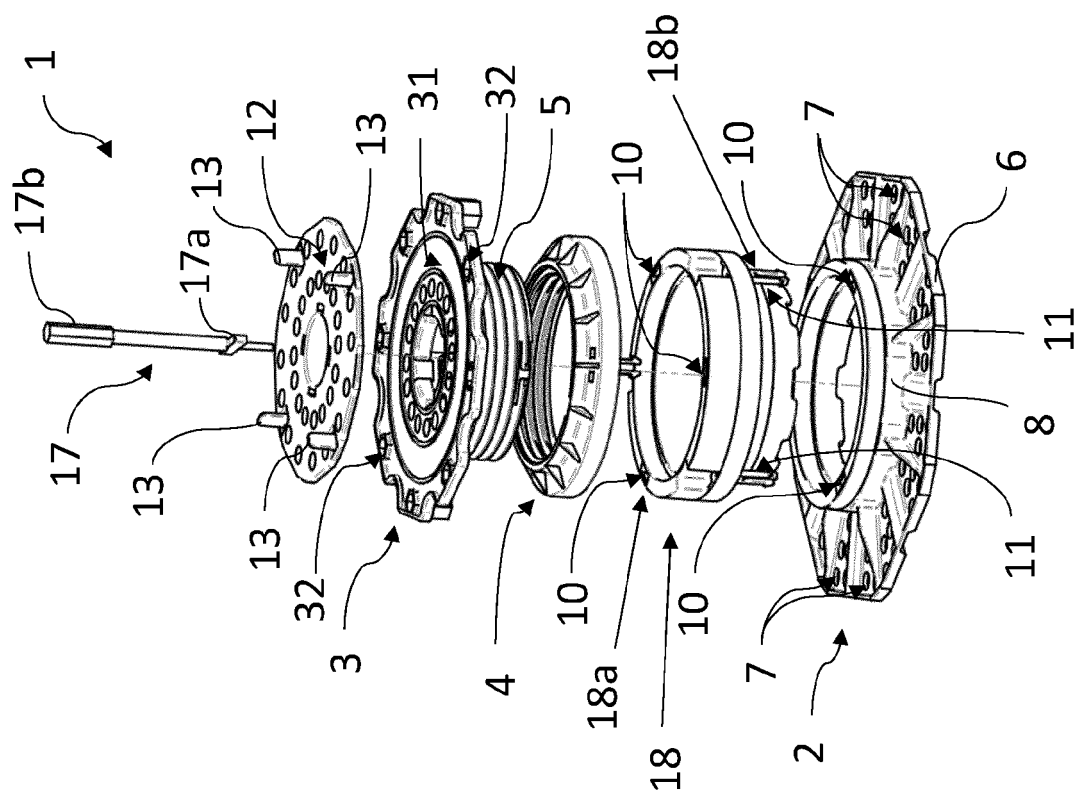
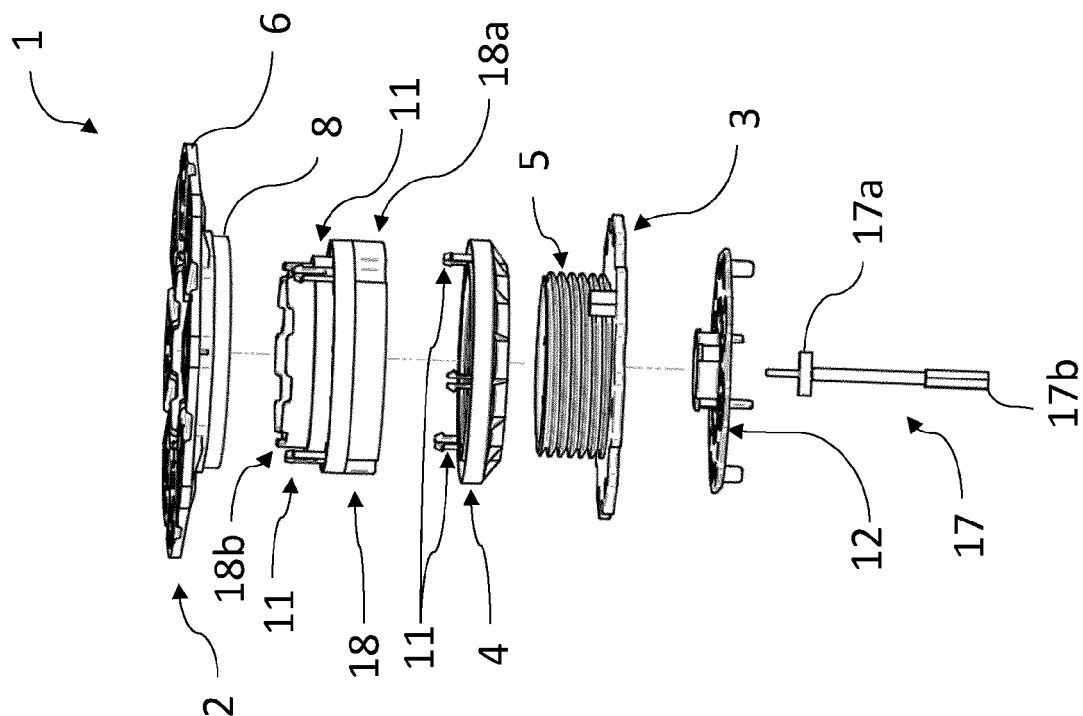
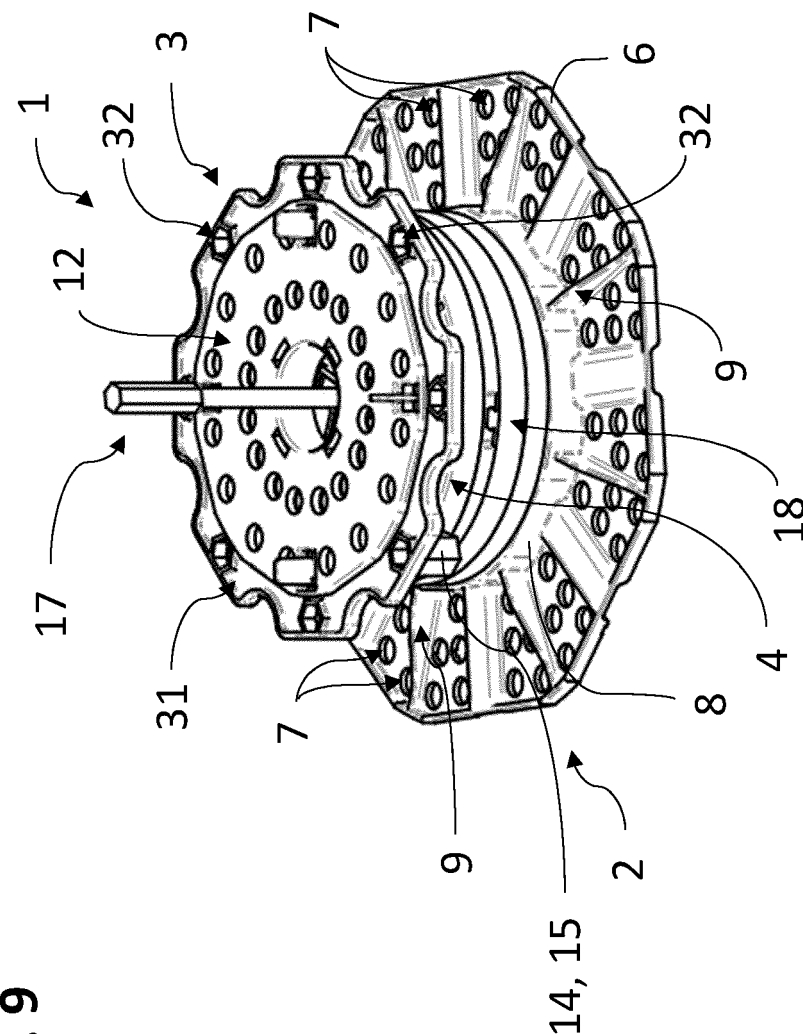


FIG. 9





EUROPEAN SEARCH REPORT

Application Number

EP 23 16 5604

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 0 373 088 B1 (CORRADO DOMINIQUE [FR]; ZAID JEAN EDMOND [FR]; LUCCHINA PASCAL [FR]) 8 April 1992 (1992-04-08) * figures 1-2,5,8 * * column 3, line 57 - column 4, line 12 * * column 4, line 23 - line 26 * * column 5, line 21 - line 26 * * column 6, line 45 - line 55 * -----	1-11	INV. E04F15/024
A	GB 2 586 480 A (ELMDENE GROUP LTD [GB]) 24 February 2021 (2021-02-24) * figure 1 * * page 5, line 28 - page 6, line 4 * * page 6, line 6 - line 7 * * page 6, line 23 - line 28 * -----	1-11	TECHNICAL FIELDS SEARCHED (IPC) E04F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 26 April 2023	Examiner Estorgues, Marlène
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	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 23 16 5604

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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26-04-2023

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0373088	B1	08-04-1992	AT 74647 T
		EP 0373088 A1	15-04-1992
		FR 2640306 A1	13-06-1990
			15-06-1990
GB 2586480	A	24-02-2021	NONE

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 0373088 A [0010]
- EP 3686371 A [0010]