



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
10.08.2022 Bulletin 2022/32

(51) International Patent Classification (IPC):
E04F 15/024 ^(2006.01) **E04F 15/02** ^(2006.01)
E04F 21/00 ^(2006.01) **E04F 21/18** ^(2006.01)
E04F 21/22 ^(2006.01)

(21) Application number: **22165194.6**

(22) Date of filing: **09.07.2018**

(52) Cooperative Patent Classification (CPC):
E04F 21/1877; E04F 15/02022; E04F 21/0092;
E04F 21/22

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR

(30) Priority: **07.07.2017 IT 201700076619**

(62) Document number(s) of the earlier application(s) in
accordance with Art. 76 EPC:
18750490.7 / 3 649 304

(71) Applicant: **Battilà, Ilaria**
24127 Bergamo (IT)

(72) Inventor: **Battilà, Ilaria**
24127 Bergamo (IT)

(74) Representative: **Sach, Greg Robert**
STERAF S.r.l.
Corso di Porta Romana 132
20122 Milan (IT)

Remarks:

This application was filed on 29.03.2022 as a
divisional application to the application mentioned
under INID code 62.

(54) **PRECISION TILE LAYING SYSTEM**

(57) The present invention relates to the technical field of tile laying and in particular describes an innovative tile laying precision system which allows this operation to be carried out in less time with greater precision and with lower costs.

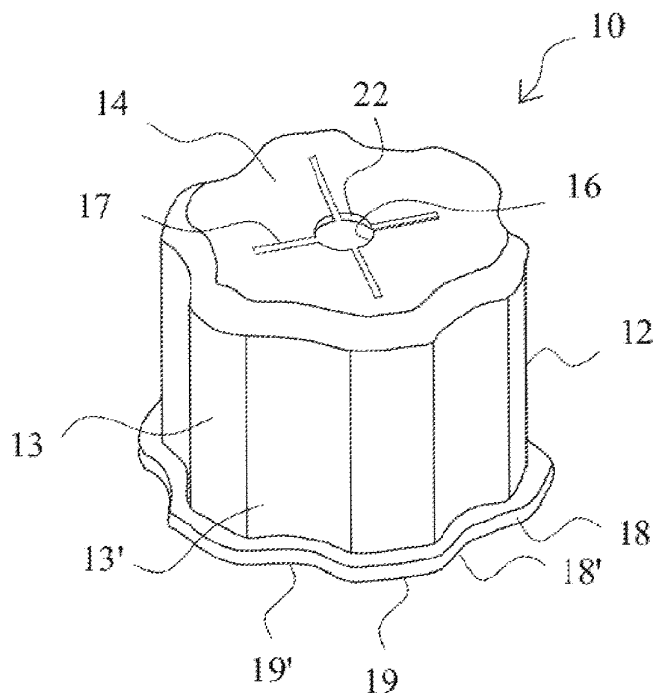


FIG.1

Description

FIELD OF THE INVENTION

[0001] The present invention has as object a precision system which includes at least one precision device, such as a knob, for use in an assembly for spacing and levelling tiles during their laying.

[0002] The term "knob" in this description refers to an element that can be manipulated by a user during the tile laying phases, alternatively known in the sector as "tie rod".

[0003] The term "tiles" is to be understood as including in this description all types of flat elements capable of forming a floor, not excluding briquettes, and the like.

KNOWN PRIOR ART

[0004] As is well known, the laying of tiles involves the laying of an adhesive material on the surface to be covered and the subsequent arrangement of the tiles according to a desired geometry. In the vast majority of cases, space is left between adjacent tiles, commonly called "gap".

[0005] One of the most difficult operations to perform during installation is to align the tiles correctly, i.e. to ensure the consistency of the gaps between adjacent tiles.

[0006] Moreover, another complex operation is to create a correct planar arrangement of the tiles, in order to guarantee a constant level of the covering surface.

[0007] For several years now, to facilitate installation, well-known devices have been used to ensure the constant width of the gaps between the tiles and, at the same time, to level out the tiles evenly.

[0008] A first device, made from two plastic components, is shown for example in patent application WO2009/022359.

[0009] The first of these components consists of a base to be placed on the surface to be covered with tiles. The base has a cross-shaped appendix (or linear or half-cross appendix) on the inside of which are placed the corner portions of four contiguous tiles. The thickness of the arms of the cross determines the width of the gaps between these tiles. Several of these devices are used, with the various bases arranged in the intersections of groups of four contiguous and facing tiles.

[0010] In this way, the tiles are arranged parallel to each other and spaced constantly. From the centre of the cross of the appendix, a threaded column or stem develops upwards.

[0011] The second component consists of a tightening knob (or tie rod), the knob being centrally pierced and threaded and attached to be screwed on the column threaded of the base.

[0012] Screwing this knob, it goes down to press on the corners of the tiles present on the base, which therefore tend to assume a coplanar attitude, bringing the tiles to a common level. This adaptation operation is carried

out with all the various devices in the corner areas of all the tiles, which therefore take on an overall coplanar configuration. When the floor is finished, the knob and appendix are removed and the base remains incorporated in the covered surface, with the parts of the gaps hidden by the grout: it is sufficient to kick the knob in the direction of the gap.

[0013] A further example is patent application PD2011A000295.

[0014] Other products not dissimilar to these are present on the market.

[0015] However, it is noted that all the systems listed have a common disadvantageous defect.

[0016] During installation, the so-called tie rod or knob, or the part of the device used to screw the threaded base, fully covers the view of the gaps underneath the tiles, thus not allowing the user to be sure that the work is well done, even forcing it to make continuous unscrewing to ensure that the tiles are perfectly matched.

[0017] In addition, all the products listed above are overpriced, considering the number of pieces to be used per square meter, in the ratio of expenditure per square meter to the price of the tile itself and of labour. In short, in the case of the known technique, the percentage of incidence of the cost of the product is very high compared to the final price of the work.

[0018] A main purpose of the present invention is to allow the user to have a complete view of the work that is being done, giving the possibility to the same, to carry out a much more precise work in the shortest time possible.

[0019] Another purpose of the present invention is to describe a device that allows a faster and more precise positioning of the same during the work phases.

[0020] A further important purpose of the present invention is to propose a device that allows to significantly reduce the working times with obvious economic saving in terms of working hours for those who commission the installation and consequent saving of time for the user.

BRIEF SUMMARY OF THE INVENTION

[0021] These and other aims that will be clear during the description are achieved by an innovative precision tile laying system comprising at least one knob for use in an assembly for spacing and levelling tiles during their laying, comprising at least one threaded stem adapted to be positioned at the crossing of two or more tiles, wherein said innovative knob comprises at least one body provided with at least one top surface with a thickness in which at least one hole is formed, said hole comprising a threaded portion at least to engage with said threaded stem, said threaded stem being treated with polishing and chroming to present a low surface roughness to allow less friction when screwing the knob hole with said threaded stem, so the knob self-screwing on said self-threaded stem to the base of the threaded stem getting in contact with the tiles.

[0022] This hole includes at least further notches to allow the quick coupling of this knob on said threaded stem, to allow a quick coupling of said knob on said threaded stem and therefore on said tiles; in this case the knob is pushed directly along the body of the threaded stem until in contact with the surface of the tiles without screwing the knob on the threaded stem, but forcing it into place, thus achieving a rapid forced sliding. In this way, at least two different choices to put the system in position quickly and effectively are advantageously provided.

[0023] In a particularly advantageous way, these variants can both be included in the same form of construction of the innovative system and be used as an alternative to each other at the user's convenience.

[0024] In other forms of alternative production, the variants may not be included in the same production variant.

[0025] In any case, in an advantageous and innovative way both these variants allow to considerably speed up the working times as understandable to any expert in the sector.

[0026] Furthermore, in a particularly advantageous way, the body of this knob is at least partially transparent.

[0027] An advantage of this solution is given by the fact that the transparency of the body of the knob allows to remedy the defects of the known technique, in particular allows the skilled person to see the gaps between the tiles at all stages of their installation.

[0028] This knob also includes, in a position opposite to said top surface, a perimetral edge configured with a surface capable of coming into contact with the said tiles.

[0029] A further significant advantage of the present invention is, as mentioned, the possibility of quick coupling of the innovative device described in the present invention.

[0030] According to a form of realization of the present invention, the body of said knob is substantially completely transparent.

[0031] In this description, with the adjective 'transparent' it is meant a sufficient degree of transparency to allow an operator to see or glimpse the edges of the tiles during installation and the relative gaps between them.

[0032] According to a preferred form of realization of the present invention precision system, in the top surface of the precision device or innovative knob, defined from now on for convenience only knob, are obtained said flexible fins preferably defined by notches, where said flexible fins are designed to enlarge the hole during the tightening phase of the knob, in this case, in a preferred form of realization, the thickness of the top surface, which will also be the thickness of the fins obtained from them, can be realized so as to give flexibility to the movement of insertion of the knob of the stem, so in some forms of realization can be for example less than the form of realization with a hole including a thread as described above.

[0033] A particular innovative advantage of this solution is therefore given by the fact that the use of the prod-

uct is faster and more effective than the known technique, as it avoids the screwing of the knob, because the fins pre-cut on the top of the knob allow to push the same until it touches the tiles, thus allowing in a particularly advantageous and innovative way a quick coupling of the knob that allows a significant reduction in working time.

[0034] According to another form of realization of the present invention, the threaded portion inside the hole is configured in such a way as to allow the tightening of the leveling screw for the tiles by making, for example, only one half turn of the knob.

[0035] The advantage of this form of construction is precisely the fact that the tightening of the leveling screw is obtained by making only half a turn to the knob using the internal thread to the hole of the top surface so that it can be tightened more quickly and immediately without the possibility of error. (This is obviously a preferred form of realization, nothing will be taken away from the invention by tightening the knob with a quarter turn, 2/3 turn or a full turn etc....).

[0036] According to a form of realization of the present invention, the material in which the body is made e.g. of a "cup" shape is preferably chosen from transparent virgin polypropylene, polycarbonate, transparent polystyrene, polymethyl methacrylate (PMMA), polyethylene terephthalate (PET), polyvinyl chloride (PVC) or combinations thereof, or other materials suitable for the purpose.

[0037] An advantage of this solution is that it allows a wide choice of materials to realize the transparency of the knob.

[0038] Further characteristics and advantages of the invention can be deduced from the dependent claims.

BRIEF DESCRIPTION OF THE FIGURES

[0039] Further characteristics and advantages of the invention will be evident from the reading of the following description provided as an example and not limited to some forms of realization of the present invention, with the help of the figures illustrated in the attached tables, where:

Figure 1 represents a perspective view of a realization form of the knob device according to a preferred embodiment of the invention; and

Figure 2 represents a top view of the knob of Figure 1; and

Figure 3 represents a top view of a possible application of a knob device embodiment form of figures 1-2; and

fig. 4 shows a detail of a preferred form of realization of the knob of the innovative system described in this invention.

DETAILED DESCRIPTION OF SOME EMBODIMENTS OF THE PRESENT INVENTION

[0040] The references used here are for convenience only and therefore do not limit the scope of protection or the scope of the embodiments.

[0041] Figure 1 shows, in perspective view, a particularly preferred form of realization of the precision system and in particular of the knob 10 according to a preferred realization of the present invention.

[0042] Knob 10 is suitable for use in a system for spacing and levelling 20 tiles during their installation.

[0043] Knob 10 is intended to be used in cooperation with a base 30 equipped with a threaded stem; this set of elements is also referred to here as "leveling screw", so that this innovative precision system includes at least said knob 10 and said base 30 comprising at least said threaded stem.

[0044] The base 30 and the threaded stem are known in themselves in the field and in Figure 3 is represented for simplicity only the trace of the base 30 under the tiles 20 during the laying.

[0045] Knob 10 comprises a body 12 with a top surface 14 in which a hole 16 is cut.

[0046] Preferably, the body 12 of the knob 10 has a substantially "cup" conformation and is equipped with an external surface in which there are highlighted relief portions 13 and recessed portions 13' to facilitate the grip of the knob 10.

[0047] On the top surface 14 of the knob 10, in some preferred embodiments, flexible fins 15 defined by notches 17 are provided, wherein the above flexible fins 15 are designed to enlarge the hole 16 during the tightening phase of the knob 10.

[0048] Inside the hole 16 of the top surface 14 of the body 12 there is a threaded portion 22 that allows the tightening of the leveling screw for tiles 20. This threaded portion, preferably of thickness S, as shown in detail in fig. 4; in a particularly advantageous way, the threaded portion 22 in an embodiment form can be made to engage with the threaded stem, said threaded stem (not represented here because it is known in itself) is in the present form of construction however advantageously treated with polishing and chrome to present a low surface roughness to allow as little friction as possible when screwing the hole 16 of knob 10 with said threaded stem so that the knob 10 in a particularly advantageous and innovative way self-tightens thanks to its weight on said threaded stem independently up to the base of the threaded stem in contact with the tiles.

[0049] The threaded portion 22 inside the hole 16 is configured in some embodiment forms in a particularly advantageous way so as to allow the tightening of the leveling screw for tiles 20 by making only half a turn to the knob 10.

[0050] In addition, the cup body 12 includes, in a position opposite to the said top surface 14, a perimetral edge 18 acting as a contact surface 18' with the tiles 20.

[0051] The perimetral edge 18 is equipped with an external surface in which there are relief portions 19 and recessed portions 19'.

[0052] According to a preferred form of realization of the present invention, the cup body 12 of knob 10 is at least partially transparent.

[0053] The material in which the cup body 12 is made can preferably be chosen from transparent virgin polypropylene, polycarbonate, transparent polystyrene, polymethylmethacrylate (PMMA), polyethylene terephthalate (PET), polyvinyl chloride (PVC) or combinations thereof.

[0054] The use of knob 10 is as follows: the base 30 of the threaded stem is placed on the floor (on the previously laid adhesive for tiles), then the tiles 20 (in the example four tiles) are positioned on their supporting surface, the edges 31 are aligned with each other so as to leave gaps F formed between the tiles 20. Then knob 10 is placed on the threaded stem (not represented for simplicity).

[0055] The fact that the body 12 of the knob 10 is transparent or at least partially transparent at least insofar as this transparency allows an operator to see or at least glimpse the edges 31 of the tiles 20 during installation facilitates advantageously its use.

[0056] Then, in a preferred form, the knob 10 is simply let go and will self-tighten itself by means of thread 22 that will engage with the specially treated threaded stem, until it reaches the base of the threaded stem 30 positioning itself precisely on the tiles 20.

[0057] Alternatively, even with this first form of construction, or in a second form of construction, if there are fins 15 on the knob 10 (as mentioned above the flexible fins may or may not be present), the knob 10 is pushed in a substantially vertical down along the stem thread without screwing, but using the slots 17 in the top surface 14 of the cup body 12 that open the flexible fins 15, widening the hole 16. (This operation and the one described above are considerably faster than the corresponding screwing operations of the known technique, thus bringing a considerable technical advantage).

[0058] Only in the final clamping phase, in some forms of embodiment of the precision system for tile laying, is it necessary to have, for example, just half a turn of the knob 10 using the internal thread 22 to the hole 16 of the top surface.

[0059] In the form of embodiment of in which in a particularly advantageous way the knob 10 thanks to said notches 17 basically self-screws on the threaded stem, the weight of the knob 10 is properly calibrated to screw on the stem in order to couple with the knob in this way, herein the knob ends its run on the surface of the tiles 20 remaining advantageously in place before the final tightening.

[0060] With the final tightening in an advantageous way, the knob 10 is placed with its own contact surface 18' of the perimetral edge 18 in contact with the face in view of the tiles 20 with the desired pressure, so as to

make the latter planar. This is done for all the tiles to be laid.

[0061] Once the adhesive has solidified, the knob 10 is removed and the threaded stem is separated from the base 30 using well-known points having facilitated break-

[0062] It appears evident that said innovative precision system for tile laying allows to solve all the cited known art problems, variants in the form of the knob and/or of the threaded stem, materials that make up the parts, type of coupling between the parts, colour, thickness of the components, methods of assembly and installation of the components, etc., are to be considered included in the object of the present invention; therefore, obviously, modifications or improvements can be made to the invention as described, dictated by contingent or particular reasons, without, however, going beyond the scope of the invention as claimed below and as better defined by the attached claims.

[0063] The following items are also part of the invention:

1. A precision tile laying system comprising at least one knob (10) for use in an assembly for spacing and levelling tiles during their laying, and a base (30) comprising at least one threaded stem adapted to be positioned at the crossing of two or more tiles (20), wherein said knob (10) comprises at least one body (12) provided with at least one top surface (14) in which at least one hole (16) is formed, said hole (16) comprising a threaded portion (22) at least to engage with said threaded stem, the knob (10) screwing on said stem up to the base (30) of the threaded stem getting in contact with the tiles (20), characterized in that the body (12) is at least partially transparent.

2. The precision tiling system according to item 1, wherein the body (12) of said knob (10) is totally transparent.

3. The precision tiling system according to the preceding items, wherein said threaded portion (22) allows the clamping of a levelling screw for the tiles (20).

4. The precision tiling system according to item 3, wherein the threaded portion (22) inside the hole (16) is configured so as to clamp the levelling screw for the tiles (20) by making only one half turn to the knob (10).

5. The precision tiling system according to item 1, wherein the body (12) of the knob (10) has a cup configuration.

6. The precision tiling system according to the preceding items, wherein the material in which the body

(12) of the knob (10) is made is selected from transparent virgin polypropylene, polycarbonate, transparent polystyrene, polymethylmethacrylate (PMMA), polyethylene terephthalate (PET), polyvinylchloride (PVC) or combinations thereof.

7. The precision tiling system according to item 1, wherein the body (12) of the knob (10) is provided with an external surface in which there are relief portions (13) and recessed portions (13') to facilitate the grip of the knob (10).

8. The precision tiling system according to the preceding items, wherein said threaded rod stem is treated with polishing and chroming to present a low surface roughness to allow less friction when screwing the knob hole with said threaded stem, to allow the knob (10) to self-screw on said threaded rod in an autonomous manner until the knob is in contact with the tiles.

9. The precision tiling system according to item 1, wherein in the top surface (14) of the body (12) flexible fins (15) defined by carvings (17) are formed, wherein said flexible fins (15) enlarge the hole (16) during the tightening of the knob (10).

Claims

1. A precision tile laying system comprising at least one knob (10) for use in an assembly for spacing and levelling tiles during their laying, comprising at least one threaded stem adapted to be positioned at the crossing of two or more tiles (20), **characterized in that** said knob (10) comprises at least one body (12) provided with at least one top surface (14) with a thickness (S) in which at least one hole (16) is formed, said hole (16) comprising a threaded portion (22) at least to engage with said threaded stem, said threaded stem being treated with polishing and chroming to present a low surface roughness to allow less friction when screwing the knob hole with said threaded stem, so the knob (10) self-screwing on said self-threaded stem to the base (30) of the threaded stem getting in contact with the tiles (20).
2. The precision tiling system according to claim 1, wherein in the top surface (14) of the body (12) flexible fins (15) defined by carvings (17) are formed, wherein said flexible fins (15) enlarges the hole (16) during the tightening of the knob (10).
3. The precision tiling system according to claim 1, wherein the body (12) of said knob (10) is at least partially transparent.
4. The precision tiling system according to claim 1,

wherein the body (12) of said knob (10) is at least totally transparent.

5. The precision tiling system according in claim 1, wherein said threaded portion (22) allows the clamping of a levelling screw for the tiles (20). 5
6. The precision tiling system according in claim 5, wherein the threaded portion (22) inside the hole (16) is configured so as to clamp the levelling screw for the tiles (20) by making only one half turn to the knob (10). 10
7. The precision tiling system according to claim 1, wherein the body (12) of the knob (10) has a glass configuration. 15
8. The precision tiling system according to claim 1, wherein the material in which the body (12) of the knob (10) is made is selected from transparent virgin polypropylene, polycarbonate, transparent polystyrene, polymethylmethacrylate (PMMA), polyethylene terephthalate (PET), polyvinylchloride (PVC) or combinations thereof. 20
9. The precision tiling system according to claim 1, wherein the thickness of the top surface (14) is variable. 25

30

35

40

45

50

55

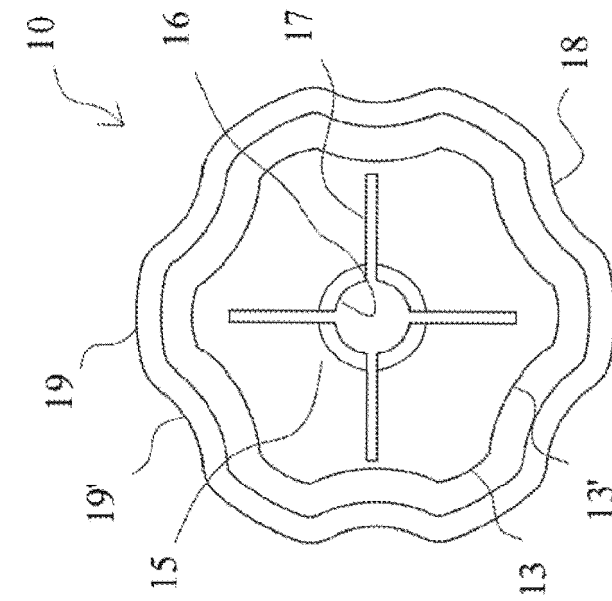


FIG.2

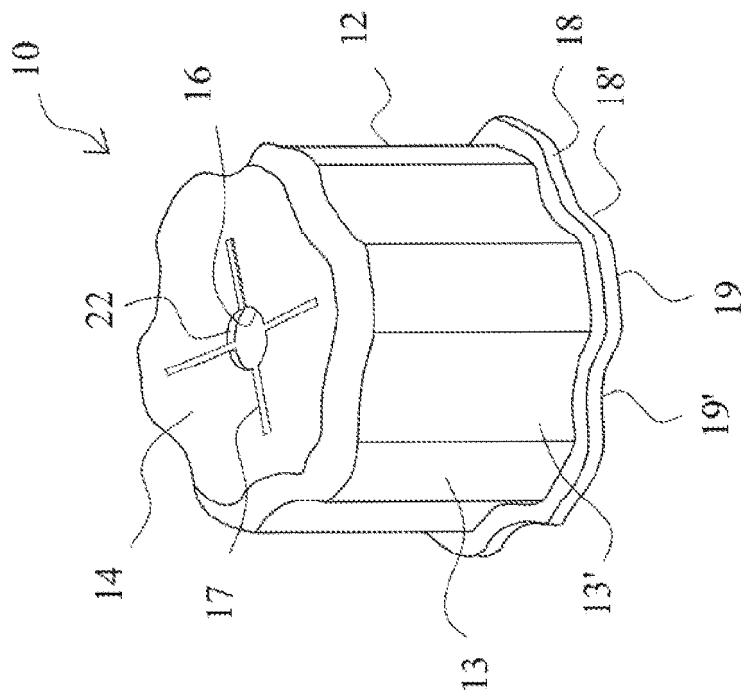


FIG.1

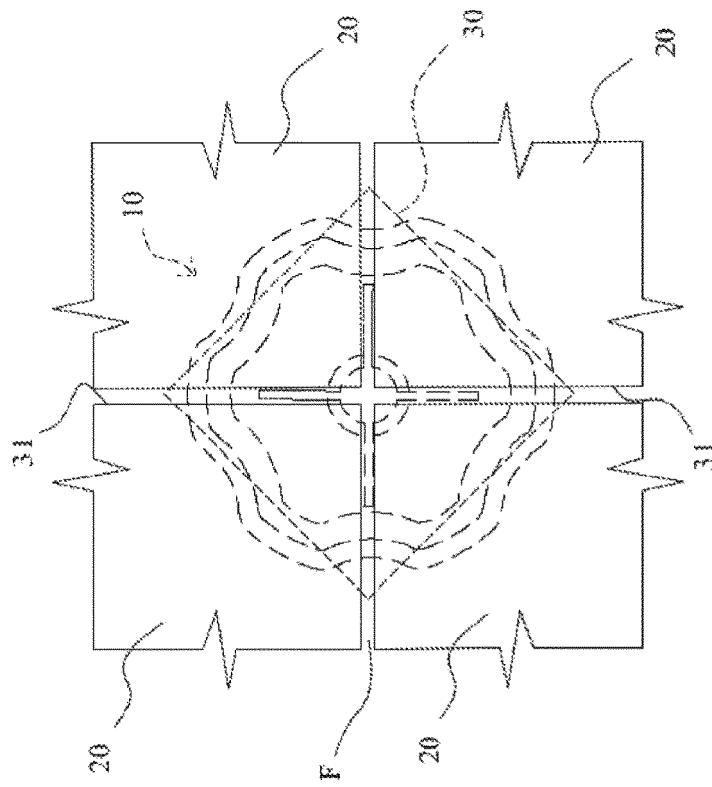


FIG. 3

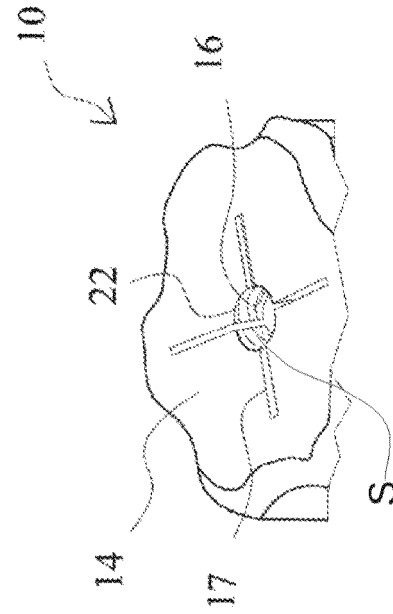


FIG. 4



EUROPEAN SEARCH REPORT

Application Number

EP 22 16 5194

5

10

15

20

25

30

35

40

45

50

55

1

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 2 549 030 A2 (BRUNOPLAST DI ELEUTERI BRUNO [IT]) 23 January 2013 (2013-01-23) * figures 1-5 * * paragraph [0040] - paragraph [0045] * * paragraph [0050] * -----	1-9	INV. E04F15/024 E04F15/02 E04F21/00 E04F21/18 E04F21/22
A	WO 2016/189423 A1 (RAIMONDI SPA [IT]) 1 December 2016 (2016-12-01) * figures 1-4, 7, 12a-12d * * page 30, line 15 - page 31, line 6 * -----	1-9	
			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 25 April 2022	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 22 16 5194

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

25-04-2022

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2549030 A2	23-01-2013	EP 2549030 A2	23-01-2013
		ES 2530622 T3	04-03-2015
		HR P20150155 T1	22-05-2015
		IT MC20110016 U1	20-01-2013
		PL 2549030 T3	30-04-2015
		PT 2549030 E	18-02-2015
		SI 2549030 T1	31-03-2015

WO 2016189423 A1	01-12-2016	EP 3298213 A1	28-03-2018
		ES 2803673 T3	28-01-2021
		PL 3298213 T3	16-11-2020
		US 2018148939 A1	31-05-2018
		WO 2016189423 A1	01-12-2016

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 2009022359 A [0008]
- WO PD2011000295 A [0013]