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DEVICES CONFIGURED TO FACILITATE PREPARATION OF A SURFACE HAVING SPECIFIED LEVEL ATTRIBUTES, INCLUDING SCREEDING LEVEL SETTING DEVICES

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(71) Applicant(s)
SCREEDBRO PTY LTD

(72) Inventor(s)
Kim, Foley

(74) Agent / Attorney
Alder IP Pty Ltd, Suite 302 10 Help Street, Chatswood, NSW, 2067, AU

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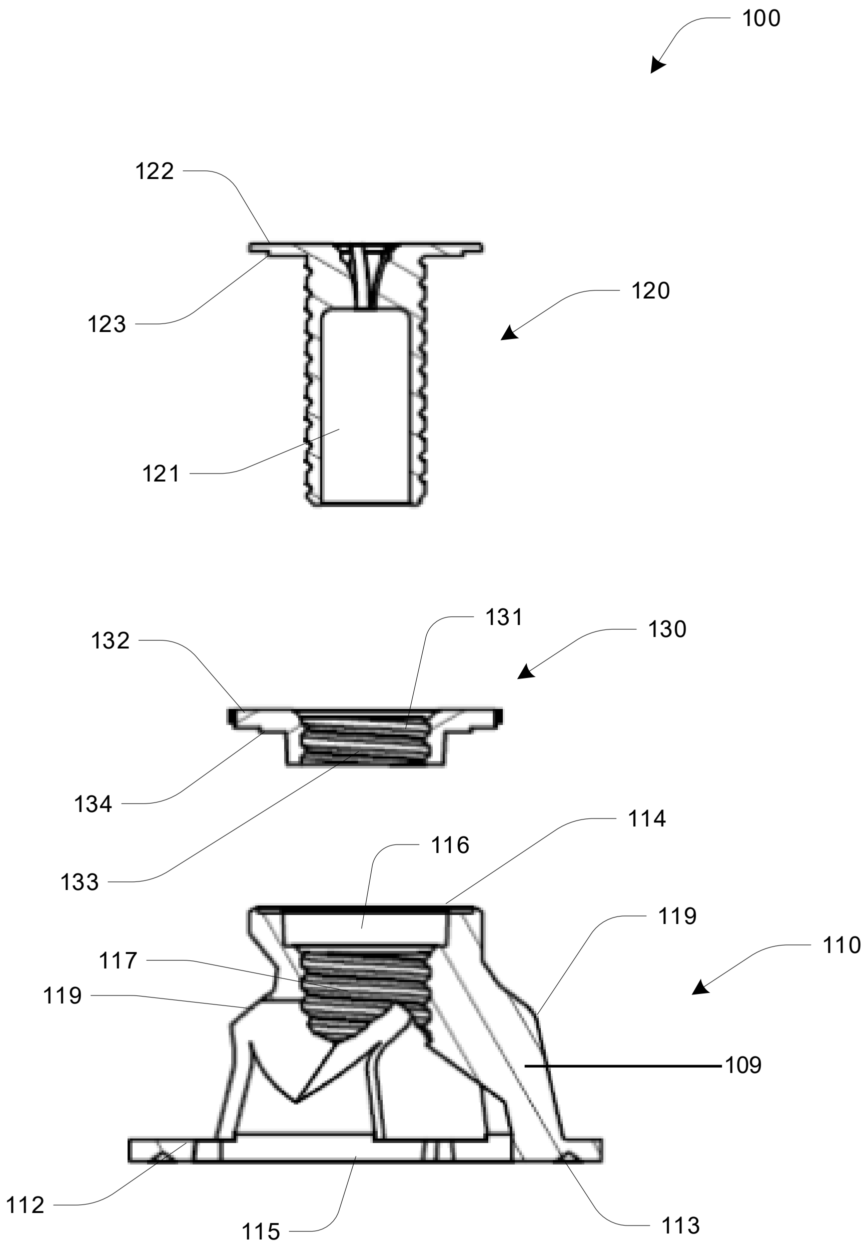
ABSTRACT

A device (100) configured to facilitate preparation of a surface having specified level attributes is provided. The device (100) includes a fixing module (110). The fixing module (110) is configured to be secured to a primary surface. The fixing module (110) includes a base surface (113) and a top surface (114). A sidewall assembly extends upwardly between the base surface (113) and the top surface (114), thereby defining a central core. The central core having: a base aperture (115) defined through the base surface (113); a top aperture (116) defined through the top surface (114); and a threaded core region (117) located between the top aperture (116) and the base aperture (115). The threaded core region (117) has an axis substantially normal to the plane of the base surface (113). The sidewall assembly includes a plurality of apertures (118) which are configured to enable, in use, filling of interior spaces of the device (100) with a surface raising material. The device (100) further includes a level setting module (120) which includes an elongate threaded shaft (121) which is configured to engage with the threaded core region (117) of the fixing module (110). The level setting module (120) has an upper surface (122). Progressive rotational engagement of the level setting module (120) with respect to the fixing module (110) adjusts the separation of the upper surface (122) relative to the base surface (113). The device (100) further includes a locking ring (130) having a locking ring threaded core (131) which is configured to threadedly engage with the level setting module (120) such that, in use, when the level setting module (120) is threadedly engaged with the threaded core region (117), threadedly progressing the locking ring (130) into abutting engagement with respect to the fixing module (110) locks in place the level setting module (120) relative to the fixing module (110).


100
122
120
123
121
131
132
130
134
133
114
116
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110
117
119
109
112
115
113

FIG. 3

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DEVICES CONFIGURED TO FACILITATE PREPARATION OF A SURFACE HAVING SPECIFIED LEVEL ATTRIBUTES, INCLUDING SCREEDING LEVEL SETTING DEVICES

FIELD OF THE INVENTION

[0001] The present invention relates, in various embodiments, devices configured to facilitate preparation of a surface having specified level attributes, including screeding level setting devices. For example, some embodiments are configured to assist in screeding a bathroom or other location based on desired surface fall characteristics.

BACKGROUND

[0002] Any discussion of the background art throughout the specification should in no way be considered as an admission that such art is widely known or forms part of common general knowledge in the field.

[0003] The term "screeding" is used to describe a process whereby a material such as screed is applied to a base surface, thereby to form a new surface that has desired characteristics. These characteristics typically include a slope/fall towards a drain or the like. For example, Australian Standard 3740-2010; 3.13. 5 requires a fall of between 1:80 and 1:50 slope towards a drain. In practice, it can be challenging to apply screed in a manner which results in the desired fall.

SUMMARY OF THE INVENTION

[0004] Example embodiments are described below in the section entitled "claims", and in the section entitled "detailed description".

[0005] One embodiment provides A device configured to facilitate preparation of a surface having specified level attributes, the device including:

[0006] a fixing module, wherein the fixing module is configured to be secured to a primary surface, the fixing module including a base surface and a top surface, wherein a sidewall assembly extends upwardly between the base surface and the top surface, thereby to define a central core having:

[0007] a base aperture defined through the base surface;

[0008] a top aperture defined through the top surface;

[0009] a threaded core region located between the top aperture and the base aperture, the threaded core region having an axis substantially normal to the plane of the base surface;

[0010] wherein the sidewall assembly includes a plurality of apertures which are configured to enable, in use, filling of interior spaces of the device with a surface raising material;

[0011] a level setting module, wherein the level setting module includes an elongate threaded shaft which is configured to engage with the threaded core region of the fixing module, the level setting module having an upper surface, wherein progressive rotational engagement of the level setting module with respect to the fixing module adjusts the separation of the upper surface relative to the base surface; and

[0012] a locking ring having a locking ring threaded core which is configured to threadedly engage with the level setting module such that, in use, when the level setting module is threadedly engaged with the threaded core region, threadedly progressing the locking ring into abutting engagement with respect to the fixing module locks in place the level setting module relative to the fixing module.

[0013] Reference throughout this specification to "one embodiment", "some embodiments" or "an embodiment" means that a particular feature, structure or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, appearances of the phrases "in one embodiment", "in some embodiments" or "in an embodiment" in various places throughout this specification are not necessarily all referring to the same embodiment, but may. Furthermore, the particular features, structures or characteristics may be combined in any suitable manner, as would be apparent to one of ordinary skill in the art from this disclosure, in one or more embodiments.

[0014] As used herein, unless otherwise specified the use of the ordinal adjectives "first", "second", "third", etc., to describe a common object, merely indicate that different instances of like objects are being referred to, and are not intended to imply that the objects so described must be in a given sequence, either temporally, spatially, in ranking, or in any other manner.

[0015] In the claims below and the description herein, any one of the terms comprising, comprised of or which comprises is an open term that means including at least the elements/features that follow, but not excluding others. Thus, the term comprising, when used in

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the claims, should not be interpreted as being limitative to the means or elements or steps listed thereafter. For example, the scope of the expression a device comprising A and B should not be limited to devices consisting only of elements A and B. Any one of the terms including or which includes or that includes as used herein is also an open term that also means including at least the elements/features that follow the term, but not excluding others. Thus, including is synonymous with and means comprising.

[0016] As used herein, the term "exemplary" is used in the sense of providing examples, as opposed to indicating quality. That is, an "exemplary embodiment" is an embodiment provided as an example, as opposed to necessarily being an embodiment of exemplary quality.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

[0018] FIG. 1 provides a side view of a level setting device according to one embodiment.

[0019] FIG. 2 provides a top view of the level setting device of claim 1.

[0020] FIG. 3 is a sectional view along the line A-A of FIG. 2.

[0021] FIG. 4 is a view similar to FIG. 3, but showing the device in an assembled state.

[0022] FIG. 5 provides an exploded view of region B of FIG. 4.

[0023] FIG. 6 provides views of kit components according to further embodiments, these including the device of FIG. 1 to FIG. 5.

[0024] FIG. 7 illustrates an example array for positioning and configuring level setting devices in a room.

[0025] FIG. 8 shows a level setting device according to an alternative embodiment.

DETAILED DESCRIPTION

[0026] The present invention relates, in various embodiments, devices configured to facilitate preparation of a surface having specified level attributes, including screeding level setting

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devices. For example, some embodiments are configured to assist in screeding a bathroom or other location based on desired surface characteristics.

[0027] An example level setting device 100 is illustrated in FIG. 1 to FIG. 5. FIG. 6 illustrates kit components which include device 100. In the present embodiment, device 100 and the other illustrated kit components are configured to assist in screeding of a floor, for example a bathroom floor. As context, a conventional screeding operation involves preparing a primary surface (for example a concrete floor), and then applying a screeding (surface raising) material to that primary surface, thereby to raise the level and define a new surface having specific characteristics. These specified characteristics include fall characteristics, for example a slope towards one or more drainage apertures formed through the primary surface.

[0028] As context, device 100 is used to assist in the screeding operation. In particular, multiple such devices are secured to an existing floor surface (primary surface), and configured to set defined levels above the primary surface. In use, a plurality of devices including device 100 and similar devices (see for example kits in FIG. 6) are secured to the primary surface (e.g. by screws or adhesive) at specific locations, and manipulated to set specified heights as described in more detail further below. The screeding operation is then performed, using the specific heights of the level setting devices as a means to facilitate preparation of the new surface with specified level attributes.

[0029] The level setting devices described herein have various advantages over prior art technology, for example in relation to their reliability (e.g. low susceptibility to being moved out of intended position or configuration) and also ability to achieve desired level heights.

[0030] Device 100 includes a fixing module 110. Fixing module 110 is configured to be secured to a primary surface, for example a concrete floor. In that regard, fixing module preferably has a plurality of apertures 111 formed through a base member 112, such that a base surface 113 abuts with the primary surface. The fixing module may also and/or alternatively have one or more indentations formed therein thereby to facilitate mounting to the primary surface via adhesive. The apertures 111, as shown, can be in form of round holes. Any suitable number of apertures can be provided. In alternative embodiments, the apertures 111 can be in the form of elongated slots which provides the flexibility of allowing the module to be rotated into a desired alignment after insertion of a screw or the like.

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[0031] Fixing module 110 extends from base surface 112 to a top surface 114. A sidewall assembly extends upwardly between the base surface and the top surface, thereby to define a central core. The central core provides:

(i) A base aperture 115 defined through base surface 113.

(ii) A top aperture 116 defined through top surface 114.

(iii) A threaded core region 117 located between the top aperture and the base aperture. The threaded core region having an axis substantially normal to the plane of the base surface.

[0032] The sidewall assembly is formed of a plurality of legs 109 which define a plurality of apertures (e.g. aperture 118) in-between. The apertures are configured to enable, in use, filling of interior spaces of the device with a surface raising material. That is, for instance, during a screeding operation, empty spaces within the device (e.g. empty space within the central core) fills with screed.

[0033] Fixing module can be designed in a variety of ways but retaining the same key features. An alternative embodiment of a fixing module 110′ is illustrated in Fig. 8.

[0034] Device 100 additionally includes a level setting module 120. Level setting module 120 includes an elongate threaded shaft 121 which is configured to engage with threaded core region 117 of fixing module 110. The level setting module has an upper surface 122 defined on a top cap 123. Progressive rotational engagement of level setting module 120 with respect to the fixing module adjusts the separation of upper surface 122 relative to base surface 113.

[0035] Device 100 also includes a locking ring 130. This locking ring 130 has a threaded core 131 which is configured to threadedly engage with the level setting module such that, in use, when level setting module 120 is threadedly engaged with threaded core region 117, threadedly progressing locking ring 130 along the thread of module 120 into abutting engagement with respect to fixing module 110 locks in place the level setting module relative to the fixing module. This is best shown in FIG. 5. Locking ring 130 and fixing module 110 provide mating surfaces which create lock pressure under force from the threads, and hence restrict subsequent rotation of module 120 with respect to module 110 (i.e. the desired height is set and secured). Locking ring 130 is defined by a top cap 132 and a core element 133, with mating surfaces 134.

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[0036] The thread of module 120 and threaded core region 117 is configured such that each 360-degree revolution of module 120 adjusts the separation of upper surface 120 relative to base surface 113 by a known increment. As best shown in FIG. 2, a marker 123 is provided to assist with visual observance of the position of rotation of module 120 relative to module 110, thereby to allow a user to visually measure the distance by which upper surface 120 is moved relative to base surface 113, thereby to achieve a desired height. In the illustrated embodiment, module 110 include equally circumferentially spaced protruding ribs 119, which provide incremental markers against which the extent of in-revolution rotation of module 120 is able to be visually judged.

[0037] In use, a preferred approach is for module 110 to be secured to the primary surface, and then module 120 to be fully threadedly inserted until it will not rotate further (e.g. using a screwdriver aperture 124), with locking ring 130 loosely in place. This defines a known starting height. An installer will know a desired level setting height, and based on knowledge of the per revolution indexing, know how many rotations are required to achieve the desired level setting height.

[0038] For example, in one implementation each revolution of module 120 relative to module 110 results in vertical movement of 3mm, with each 120-degree movement of marker 123 from one rib 119 to the next rib 119 representing a vertical movement of 1mm. So, as a hypothetical example, if an installer wishes to set a height of 27mm, the operator may use a fixing module 110 with a known starting height of 25mm, and progress level setting 120 by two 1/3 revolutions (i.e. 240 degrees) using marker 123 and ribs 119. Preferably, the device is engineered such that upon complete insertion of module 120 into module 110, marker 123 is aligned with one of ribs 119.

[0039] In practice, device 100 may for part of a kit including a plurality of similar fixing modules of varying heights (the fixing modules are different sizes based on spacing between their respective base surfaces and top surfaces). Example components for a kit are provided in FIG. 6. A user is able to select a device with a correct start height from the kit for a given purpose. In one embodiment, the fixing modules of a kit are defined to provide starting heights of 15mm, 25mm, 35mm and 55mm.

[0040] In the present embodiment, fixing module 120 a stacking cavity region, located between the threaded core region and the base surface. The stacking cavity is configured to receive, through the base aperture, a similar fixing module, thereby to enable stacking of the fixing module and one or more similar fixing modules. Preferably, kit components (i.e. the fixing modules) are able to be stacked together, thereby to define a further sizes (i.e. starting heights for the level setting modules), based on the resultant spacing between the separation between the base surface of a first fixing module and the top surface of a second stacked fixing module (these may be the same or different sizes, depending on the objective).

[0041] In one embodiment, the fixing modules of a kit are defined to provide starting heights of 15mm, 25mm, 35mm and 55mm. The overlap on stacking is preferably the same height as the thickness of the locking ring top cap 132 plus the level setting module top cap 122, such that the fixing module sizes combine additively upon stacking (i.e. stacking a 15mm on a 25mm results in a level setting module starting height of 40mm).

[0042] Preferably each fixing module is configured such that, upon stacking of a first fixing module to a second similar fixing module, the threaded core regions are aligned such that the level setting module is able to threadedly progress concurrently through both core regions. Also preferably, upon stacking the floor mounting apertures 111 of the stacked modules are axially aligned, allowing a single screw to pass through both and into the primary surface.

[0043] An example method for using a kit is described below. It will be appreciated that this is an example only. The method includes:

- Preparing the primary surface.

- Generating an array which defines a plurality of points on the primary surface and specifies point-specific heights above the primary surface for the new surface for each of those points on the primary surface. This may be defined using "pencil and paper" approaches, or via computer software. For example, computer software may accept input of a floor size (and optionally shape), and positions of one or more drains, and automatically generate an image of an array, including heights (and optionally which level setting device sizes and/or combinations are to be used at each point). An example array is shown in FIG. 7.

- Securing a plurality of level setting devices according at points defined by the array. For example, the points are measured out, the devices put in place, and screws used to secure the devices to the primary surface.

- For each of the plurality of level setting devices, manipulating their respective level setting modules to correspond with the point-specific heights defined by the array. For example, a device is assembled with the level setting module fully inserted to define the starting height. The level setting module is then wound counterclockwise for the correct number of revolutions / partial revolutions to achieve the point-specific height (e.g. at 3mm per full revolution, 1mm per 120 degrees turn).

- For each of the plurality of devices, manipulating their respective locking rings to secure the position of the respective level setting modules.

- Applying a new material (e.g. screed) to the primary surface and performing a spreading operation such that the new material covers and fills the plurality of devices.

- Performing a screeding/levelling operation thereby to ensure linear fall characteristics between the covered devices.

[0044] The technology above provides various advantages in the context of screeding operations, particularly insofar as the level setting devices are securely located and their heights are able to be locked in position upon setting via the locking rings. This greatly reduces complications that often arise due to persons walking through the area and inadvertently moving/adjusting prior art level setting modules.

[0045] It should be appreciated that in the above description of exemplary embodiments of the invention, various features of the invention are sometimes grouped together in a single embodiment, FIG., or description thereof for the purpose of streamlining the disclosure and aiding in the understanding of one or more of the various inventive aspects. This method of disclosure, however, is not to be interpreted as reflecting an intention that the claimed invention requires more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive aspects lie in less than all features of a single foregoing disclosed embodiment. Thus, the claims following the Detailed Description are hereby expressly incorporated into this Detailed Description, with each claim standing on its own as a separate embodiment of this invention.

[0046] Furthermore, while some embodiments described herein include some but not other features included in other embodiments, combinations of features of different embodiments are meant to be within the scope of the invention, and form different embodiments, as would be understood by those skilled in the art. For example, in the following claims, any of the claimed embodiments can be used in any combination.

[0047] In the description provided herein, numerous specific details are set forth. However, it is understood that embodiments of the invention may be practiced without these specific details.

In other instances, well-known methods, structures and techniques have not been shown in detail in order not to obscure an understanding of this description.

[0048] Thus, while there has been described what are believed to be the preferred embodiments of the invention, those skilled in the art will recognize that other and further modifications may be made thereto without departing from the spirit of the invention, and it is intended to claim all such changes and modifications as falling within the scope of the invention. For example, any formulas given above are merely representative of procedures that may be used. Functionality may be added or deleted from the block diagrams and operations may be interchanged among functional blocks. Steps may be added or deleted to methods described within the scope of the present invention.

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CLAIMS

1. A device configured to facilitate preparation of a surface having specified level attributes, the device including:

a fixing module, wherein the fixing module is configured to be secured to a primary surface, the fixing module including a base surface and a top surface, wherein a sidewall assembly extends upwardly between the base surface and the top surface, thereby to define a central core having:

(i) a base aperture defined through the base surface;

(ii) a top aperture defined through the top surface;

(iii) a threaded core region located between the top aperture and the base aperture, the threaded core region having an axis substantially normal to the plane of the base surface;

wherein the sidewall assembly includes a plurality of apertures which are configured to enable, in use, filling of interior spaces of the device with a surface raising material;

a level setting module, wherein the level setting module includes an elongate threaded shaft which is configured to engage with the threaded core region of the fixing module, the level setting module having an upper surface, wherein progressive rotational engagement of the level setting module with respect to the fixing module adjusts the separation of the upper surface relative to the base surface; and

a locking ring having a locking ring threaded core which is configured to threadedly engage with the level setting module such that, in use, when the level setting module is threadedly engaged with the threaded core region, threadedly progressing the locking ring into abutting engagement with respect to the fixing module locks in place the level setting module relative to the fixing module.

2. A device according to claim 1 wherein the fixing module further includes a stacking cavity region, located between the threaded core region and the base surface, wherein the stacking cavity is configured to receive, through the base aperture, a similar fixing module, thereby to enable stacking of the fixing module and one or more similar fixing modules.

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3. A device according to claim 2 wherein the device forms part of a kit including a plurality of similar fixing modules, wherein the similar fixing modules include fixing modules of different sizes based on spacing between their respective base surfaces and top surfaces, wherein a fixing module of a first size is configured for stacking with a fixing module of a second size, thereby to define a further size configuration based on the resultant spacing between the separation between the base surface of the fixing module of the first size and the top surface of the fixing module of the second size.

4. A device according to claim 2 or claim 3 wherein the fixing module is configured such that, upon stacking of a first fixing module to a second similar fixing module, the threaded core regions are aligned such that the level setting module is able to threadedly progress concurrently through both core regions.

5. A device according to claim 2, 3 or 4 wherein the base surface is defined on a base member, wherein the base member includes a plurality of floor mounting apertures to facilitate mounting via fixings to the primary surface, and wherein upon stacking the floor mounting apertures of the stacked modules are axially aligned.

6. A device according to any one of claims 2 to 5 wherein the stacking region is defined by a plurality of legs, wherein the spacing between the legs is arranged to provide the apertures in the sidewall assembly.

7. A device according to claim any preceding claim wherein the base surface is defined on a base member, wherein the base member includes a plurality of apertures to facilitate mounting via fixings to the primary surface.

8. A device according to any preceding claim wherein the base surface has an indentation formed therein thereby to facilitate mounting to the primary surface via adhesive.

9. A device according to any preceding claim wherein the fixing module includes a recessed channel configured to receive an abutment surface of the locking ring.

10. A device according to any preceding claim wherein upper surface of the level setting module includes a marker, wherein the marker is configured to, in use enable, monitoring of a rotational progression of the level setting module relative to the fixing module, wherein each revolution of the fixing module in a direction downwardly along

the threaded core region reduces the separation between the upper surface and the base surface by a known increment.

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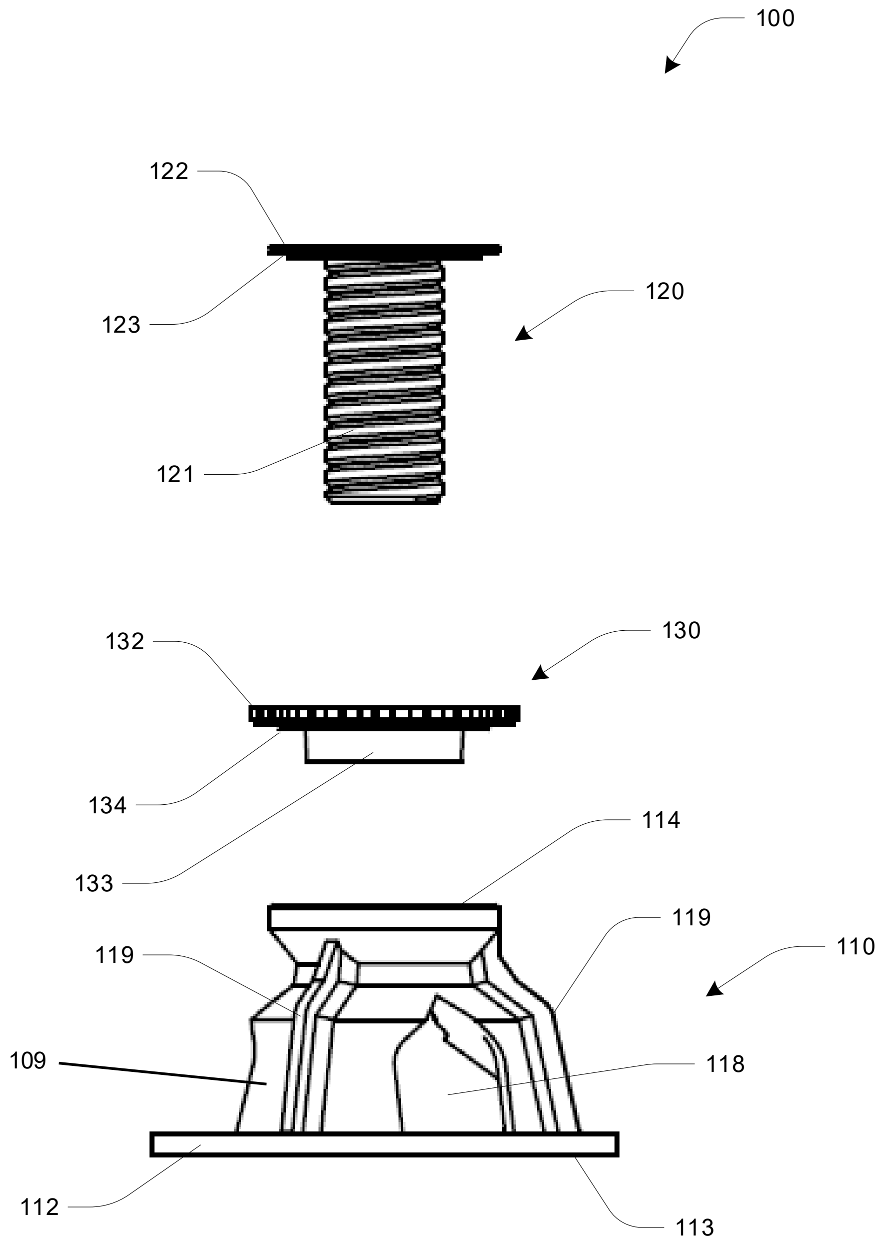

FIG. 1

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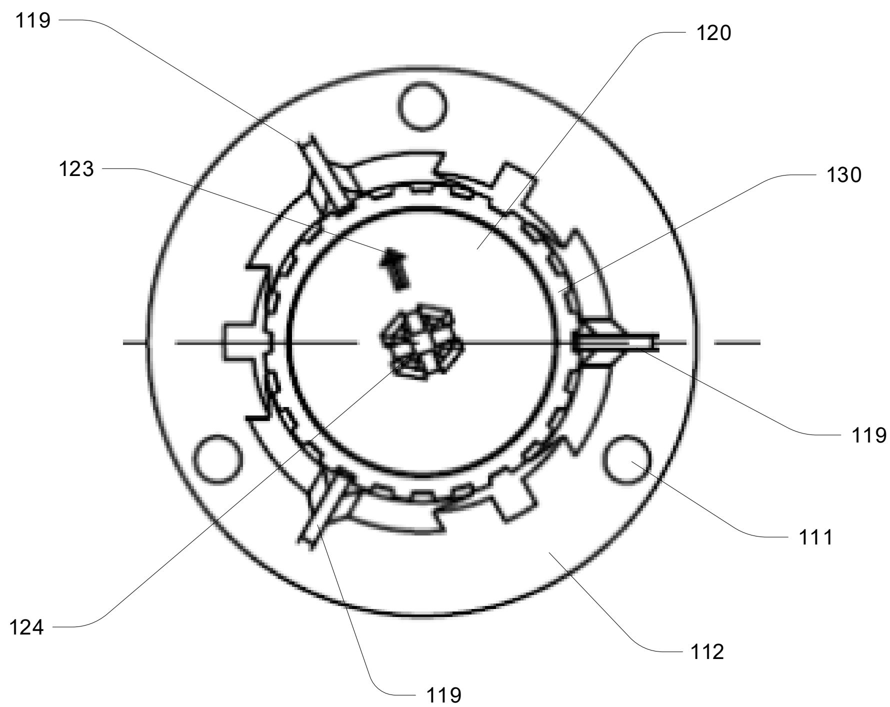

FIG. 2

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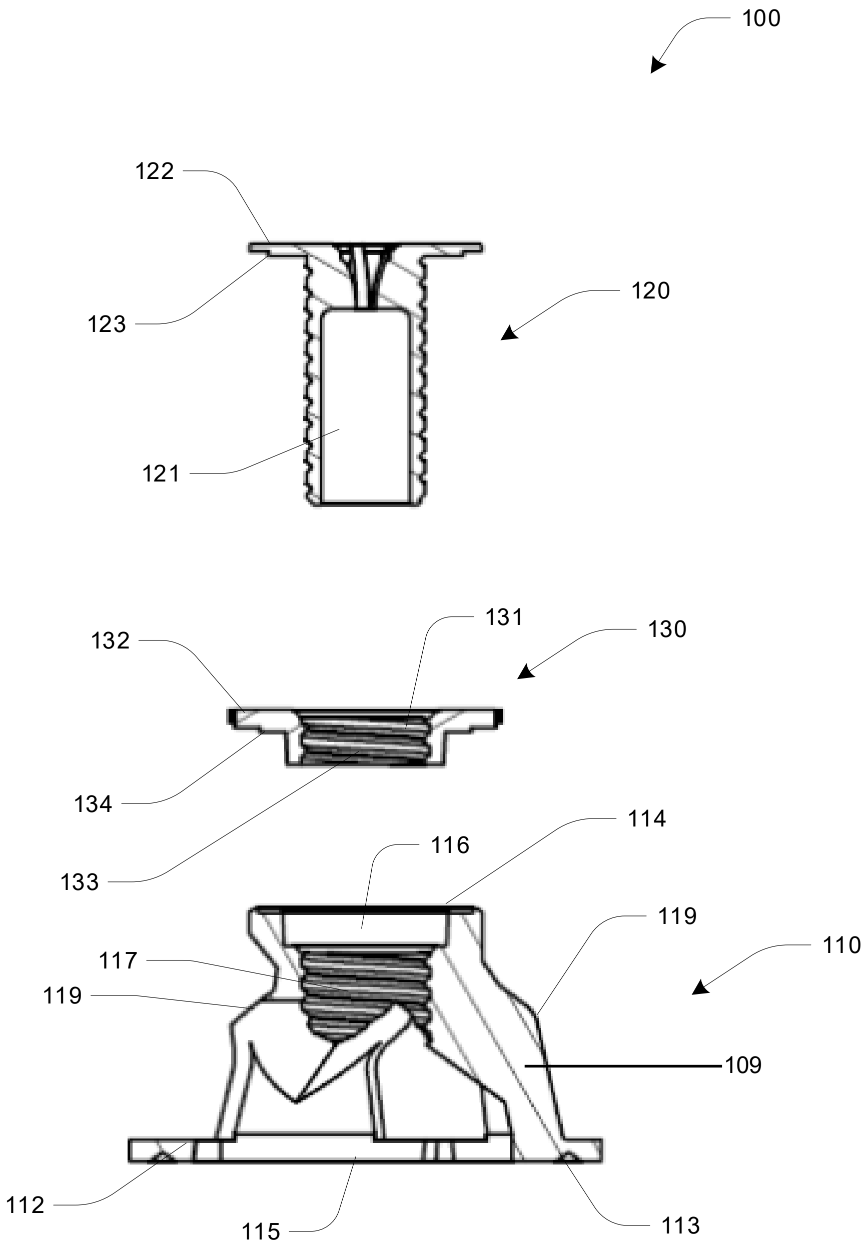

FIG. 3

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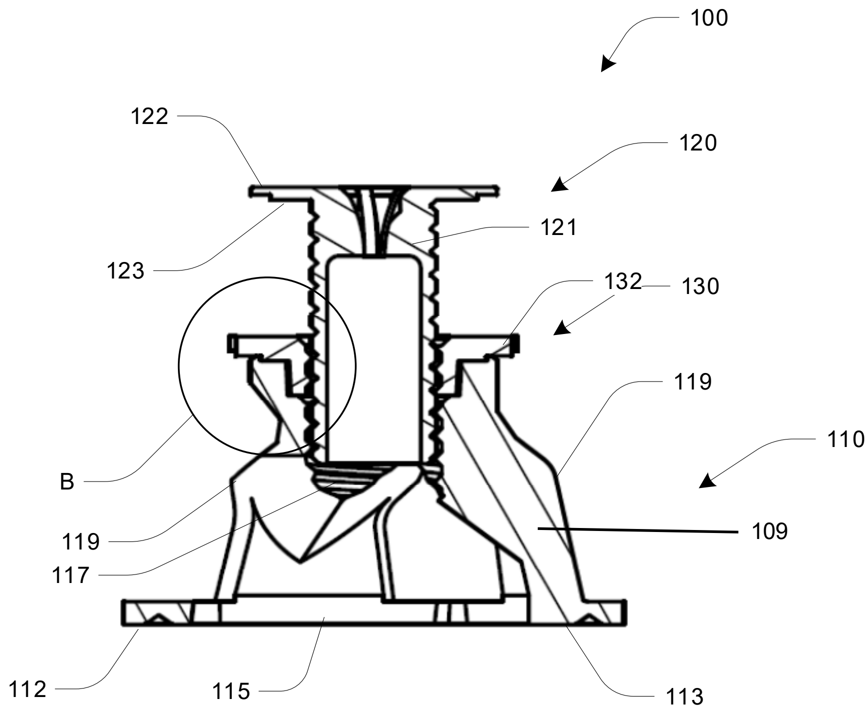

FIG. 4

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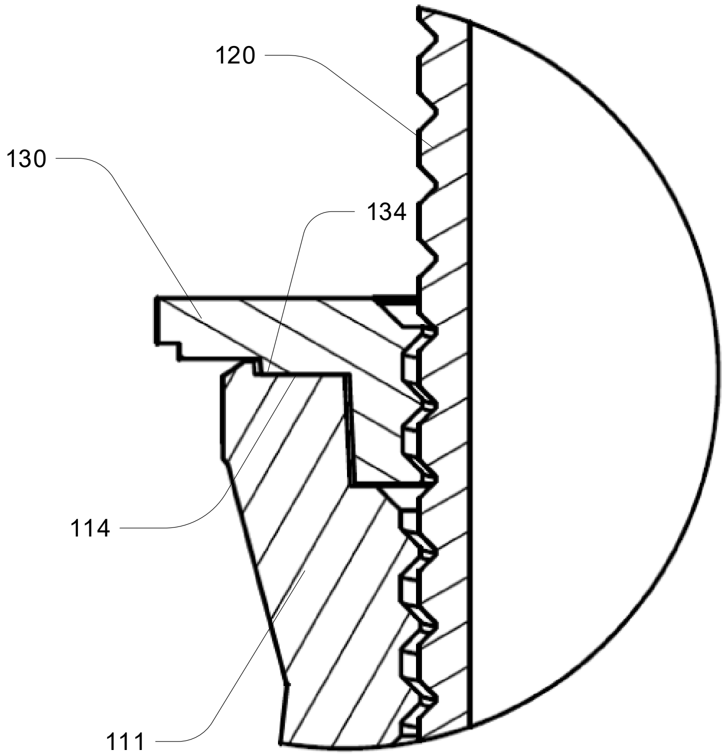

FIG. 5

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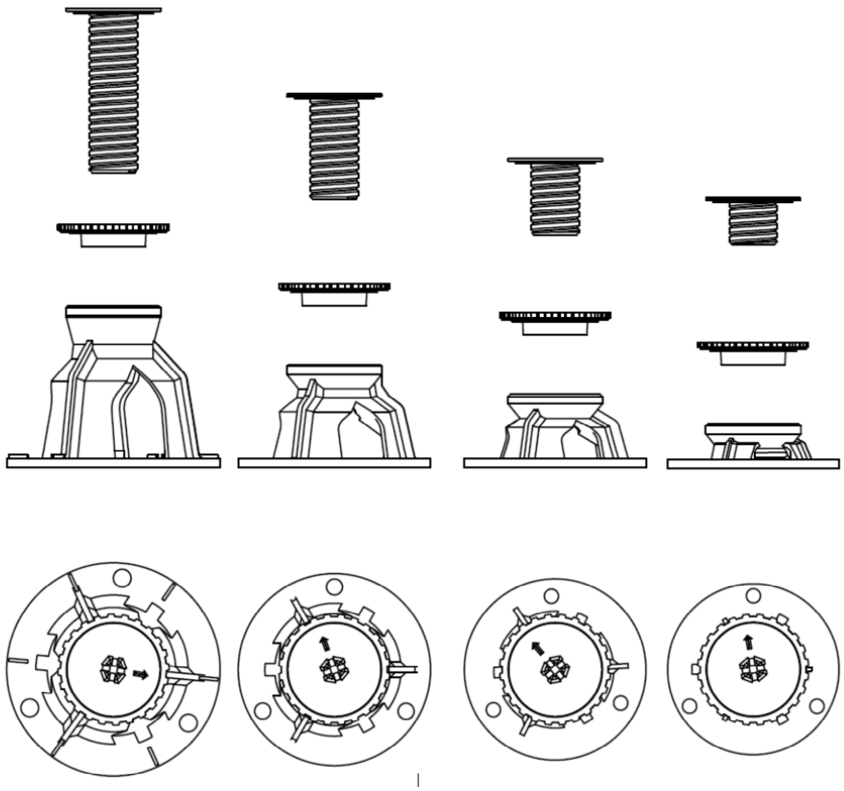

FIG. 6

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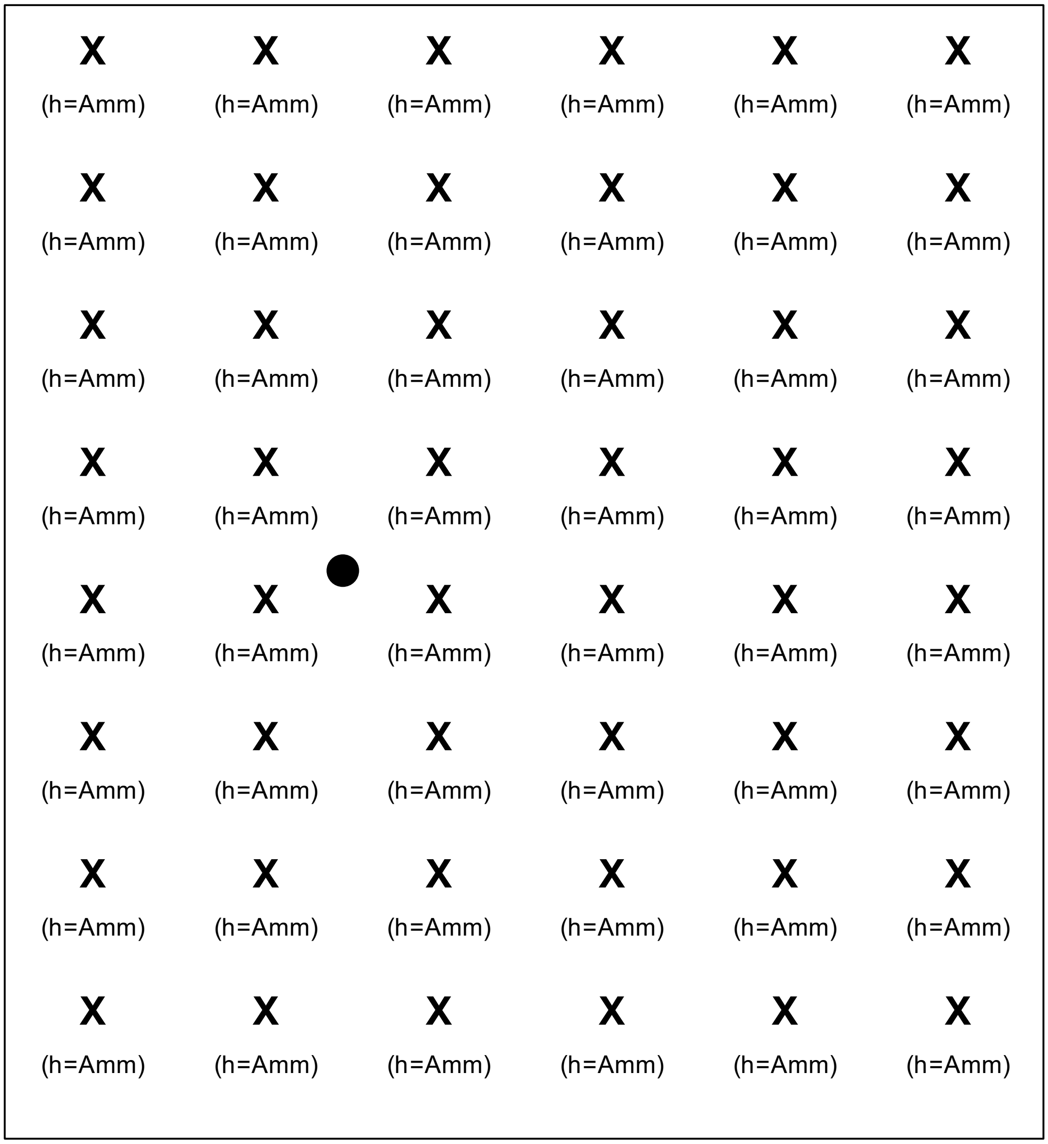

FIG. 7

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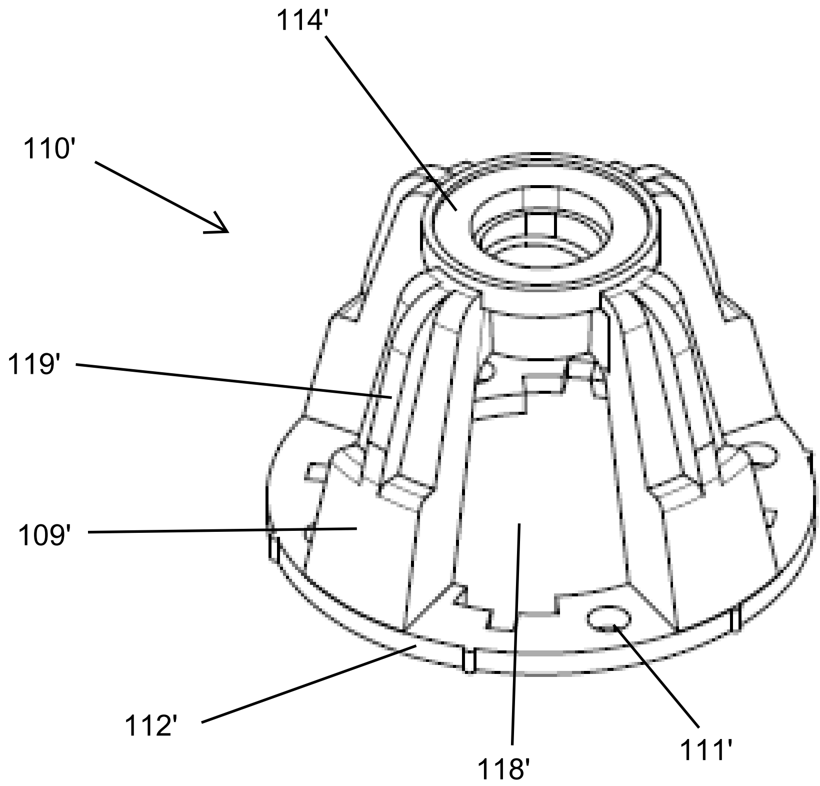

FIG. 8