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(54) Title: TILE LEVELLING DEVICE

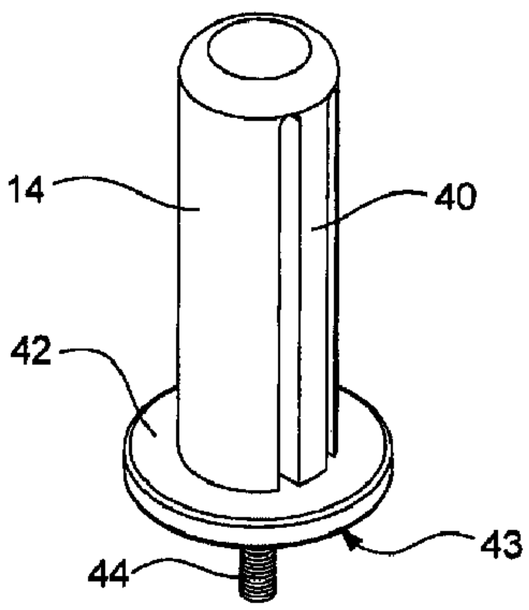
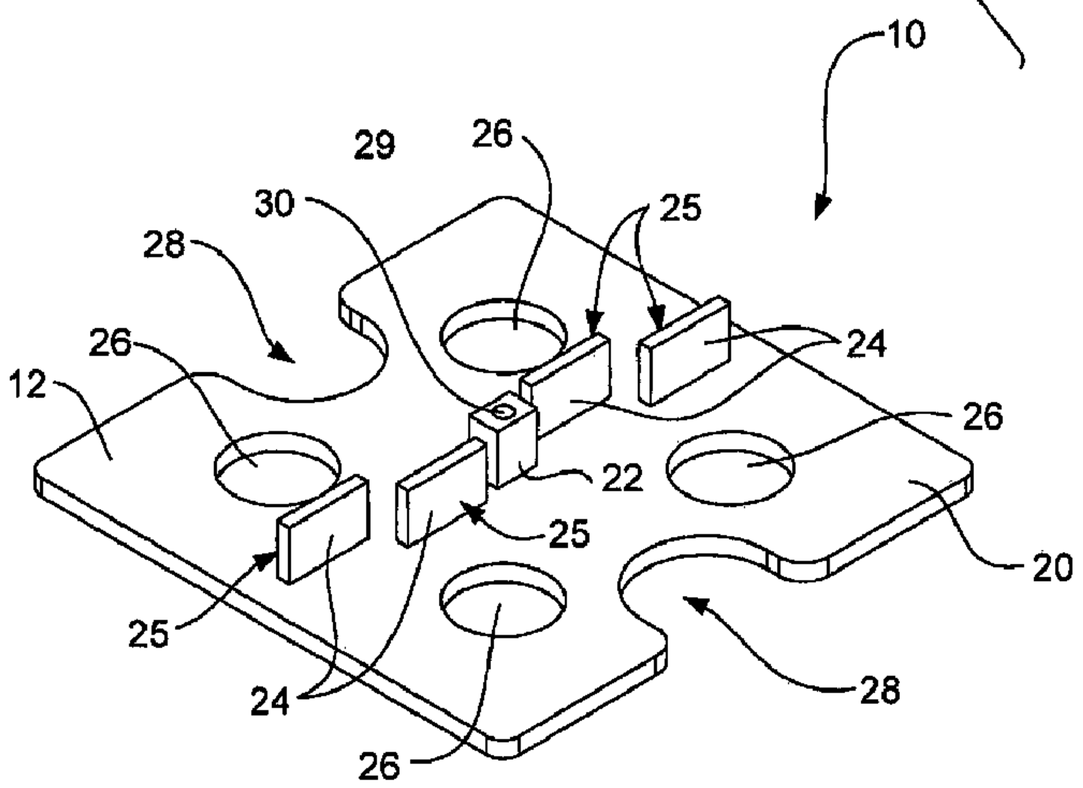


FIG 1



(57) Abrégé/Abstract:
A tile levelling and spacing device (12) including: a base plate (20) having an upper surface (29) and a base surface; a central hub (22) which includes a stem aperture, each centrally located in the base plate (20), the stem aperture including internal threading;

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(57) Abrégé(suite)/Abstract(continued):
and at least one spacer body (24) which extend outwardly from the upper surface (20) of the base plate (20), wherein the at least one spacer body (24) includes: at least one first engagement portion (25) which is configured to abut against a side of a first tile of a pair of adjacent tiles (16) and be spaced away from the side of the second tile of that pair of tiles (16); and at least one second engagement portion (25) which is configured to abut against a side of the second tile of the pair of adjacent tiles (16) and be spaced away from the side of the first tile of that pair of tiles (16).

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(54) Title: TILE LEVELLING DEVICE

(57) Abstract: A tile levelling and spacing device (12) including: a base plate (20) having an upper surface (29) and a base surface; a central hub (22) which includes a stem aperture, each centrally located in the base plate (20), the stem aperture including internal threading; and at least one spacer body (24) which extend outwardly from the upper surface (20) of the base plate (20), wherein the at least one spacer body (24) includes: at least one first engagement portion (25) which is configured to abut against a side of a first tile of a pair of adjacent tiles (16) and be spaced away from the side of the second tile of that pair of tiles (16); and at least one second engagement portion (25) which is configured to abut against a side of the second tile of the pair of adjacent tiles (16) and be spaced away from the side of the first tile of that pair of tiles (16).

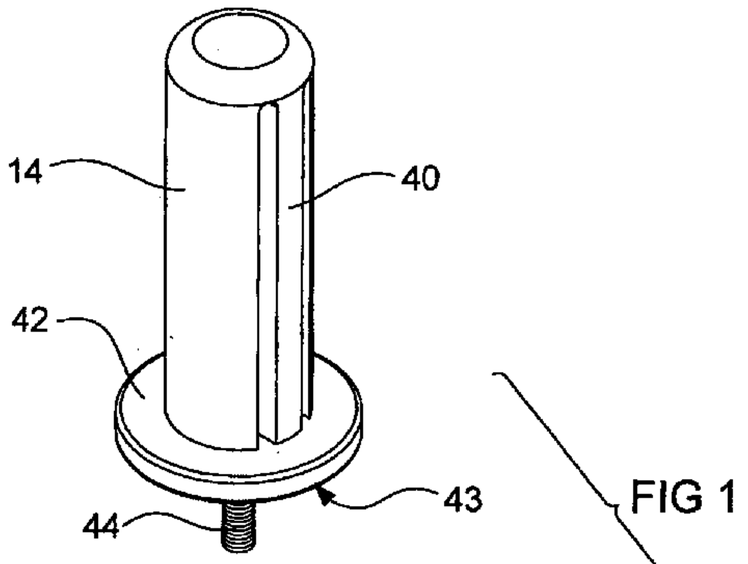
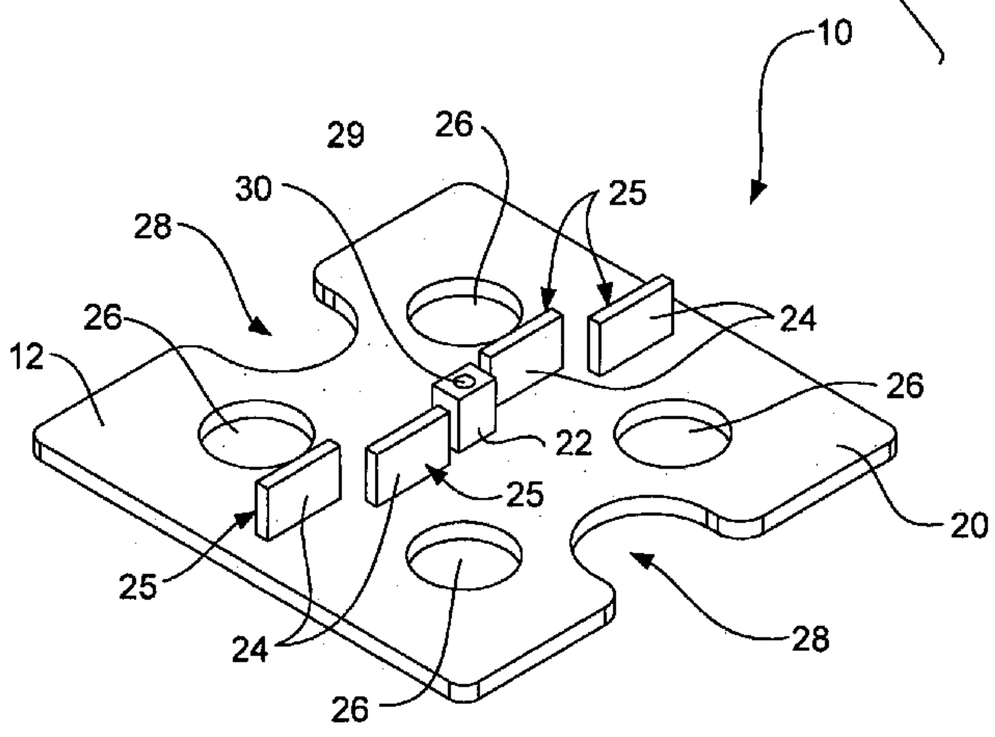


FIG 1



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TILE LEVELLING DEVICE

Field of the Invention

[0001] The present invention generally relates to a tile levelling and spacing device. The invention is particularly applicable for spacing and levelling floor or wall tiles and it will be convenient to hereinafter disclose the invention in relation to that exemplary application. However, it is to be appreciated that the invention is not limited to that application and could be used for any tiling or paving application that requires one or more tiling or paving bodies used in an installation to be properly spaced apart from other tiling or paving bodies and level with other tiling or paving bodies.

Background of the Invention

[0002] The following discussion of the background to the invention is intended to facilitate an understanding of the invention. However, it should be appreciated that the discussion is not an acknowledgement or admission that any of the material referred to was published, known or part of the common general knowledge as at the priority date of the application.

[0003] The installation of tiles on a wall or floor surface requires experience and skill. Aesthetics require that each tile is properly spaced apart, aligned and level with adjoining tiles. However, positioning and levelling a large number of tiles can be difficult. Skewed tiles and raised edges can result if a tile is not properly installed. Additionally, floor and wall tiles are adhered to a surface using an adhesive that has a curing time of about twenty four hours. Tiles may move during that curing period if not properly held in place.

[0004] A number of tile spacing and levelling devices are available to assist a tiler properly space and level tiles during installation.

[0005] One prior tile spacing device is taught in United States Patent No. 7,257,926 B1. This patent discloses a tile levelling and spacing device which includes a circular base plate having two rigid spacing arms. The spacing arms are orientated in normal relation to one another forming an “X”-shape on the

base plate. A post having ratchet teeth is formed integrally with the base plate at the center of the base plate. A disc is also provided which receives the post. The disc includes a pawl which prevents displacement of the disc away from the base plate. In use, preselected corners of four tiles are positioned in overlying relation to the base plate and abut the spacer arms. The spacing arms space the tiles apart from one another a selected distance. The disc is positioned in overlying relation to the four corners of the tiles so that it overlies and holds the tiles level between the base plate and the disc. The tiles are set in an adhesive. After curing of the adhesive, an installer twists the disc in a plane parallel to the tiles until the post breaks off.

[0006] Another prior tile spacing device is taught in British Patent Publication GB2460429A. This patent publication teaches a tile clamping and levelling device having a square base plate, a square top plate and a clamping means, such as a ratchet mechanism or twist-lock key, which clamps the base plate and top plate together. The base plate includes two rigid spacing arms formed on a top surface of the base plate. The spacing arms are orientated in normal relation to one another to form an “X”-shape on the base plate. Again, in use, top plate is positioned in overlying relation to four corners of a set of adjacent tiles so that it overlies and holds the tiles level between the base plate and the top plate.

[0007] However, building regulation for some structures, such as high rise buildings, can require tile levelling and spacing devices to be removed from between tiles prior to filler material being applied between adjoining or adjacent tiles. The rationale for removal is that spacers can create a mechanical connection between adjacent tiles. This connection can transfer forces between the tiles, thereby increasing the probability of damage from cracking or the like. Each of the above described prior tile levelling and spacing devices would not meet this requirement because the rigid spacing arms of these devices bridges the space between adjacent tiles, and thereby create the undesired mechanical connection between adjacent tiles.

[0008] It would therefore be desirable to provide an alternate tile levelling and spacing device which reduces and/or substantially overcomes the foregoing problem.

Summary of the Invention

[0009] In a first aspect, the present invention provides a tile levelling and spacing device. The device includes a base plate which has an upper surface and a base surface. The device also includes a central hub which includes a stem aperture, each centrally located in the base plate. The stem aperture has internal threading. In addition, the device includes at least one spacer body that extends outwardly from the upper surface of the base plate. The spacer body or spacer bodies include at least one first engagement portion which is configured to abut against a side of a first tile of a pair of adjacent tiles and be spaced away from the side of the second tile of that pair of tiles; and at least one second engagement portion which is configured to abut against a side of the second tile of the pair of adjacent tiles and be spaced away from the side of the first tile of that pair of tiles.

[0010] The spacer bodies of the present invention provide a combined configuration which cooperating to extend the distance between and, in use, space apart a pair of adjacent tiles. However, the engagement portions of the spacer bodies are not aligned. Any force from a pair of tiles is therefore not linearly transferred through the spacer body or bodies to the other tile.

[0011] In a first embodiment of the present invention, the spacer body comprises at least two bodies including at least one first spacer body and at least one second spacer body. The first spacer body includes at least one first engagement portion. The second spacer body includes at least one second engagement portion. In this embodiment, the spacer bodies are designed to space adjacent tiles apart from one another a selected distance without bridging the gap between those tiles. This is achieved by configuring the spacer bodies to abut the side of only one tile of a pair of adjacent tiles, and be spaced apart or away from the adjacent tile. It should be appreciated where there are three or more adjacent tiles, the tile levelling and spacing device may include

additional spacer bodies. The spacer bodies would provide at least one pair of spacer bodies between each adjacent pair of tiles of that group of tiles which abut the side of one of that pair of tiles and be spaced away from the side of the adjacent tile of that pair of tiles. This arrangement of spacer bodies does not form a mechanical connection between adjacent tiles.

[0012] In an alternate embodiment of the present invention, at least one of the spacer bodies, and preferably most or all of the spacer bodies includes both a first engagement portion and a second engagement portion. Each of the spacer bodies are therefore configured to extend the distance between and, in use, space apart a pair of adjacent tiles. The first spacer portion and the second spacer portion of the spacer body or bodies are preferably laterally spaced apart relative to a longitudinal axis of the base plate about which the central hub and each spacer body extends. Each of the spacer bodies is preferably flexible allowing the spacer bodies to flex when a load is applied by an abutting tile. Thus, while a mechanical connection is made between the two adjacent tiles, the flexibility of each of the spacer body reduces or limits the transfer of force between these adjacent tiles.

[0013] In this alternate embodiment, the spacer bodies preferably comprise a plurality of spaced apart tabs, each tab having opposite ends, each end extend the distance between and, in use, configured to abut against a respective side of a pair of adjacent tiles. Each central hub and each spacer body preferably extends laterally along a longitudinal axis of the base plate. Each tab preferably has a longitudinal side extending between each end. In order to add further flexibility to the configuration, the longitudinal side each tab is preferably positioned at an angle relative to the longitudinal axis of the base plate. The angle can be between 20 and 70 degrees, preferably between 30 and 50 degrees, and is most preferably about 45 degrees.

[0014] The spacer bodies of each embodiment extend outwardly, preferably generally perpendicularly outwardly, from the upper surface of the base plate. Each spacer body is preferably flexible and can be configured to bend and/or flex relative to the base plate. In some cases, each spacer body is configured to transversely bend and/or flex relative to a longitudinal or

transverse axis that the respective spacer body is aligned. This flexibility allows the spacer bodies to flex when a load is applied by an abutting tile. Loaded parts of the tile levelling and spacing device, such as the spacer bodies, can therefore flex or otherwise move with that applied load. This reduces damage, such as cracks or the like, that may otherwise occur if the tile levelling and spacing device was constructed from a more rigid material.

[0015] In some embodiments, each spacer body is aligned parallel with at least one of a longitudinal or a transverse axis of the base plate. The spacer body may also be axially spaced apart from an adjacent spacer body about that axis by an axial separation distance. Additionally, each spacer body may also be radially spaced apart from an adjacent spacer body about that axis by a particular spacer spacing.

[0016] The spacer bodies can have any suitable configuration. In preferred forms, the spacer bodies may comprise one or more of: tabs, flanges, rods, pimples, spigots, poles, fingers, ribs, flaps, fins, bars, panels, blocks, balls or teeth. In one embodiment, the spacer bodies comprise a plurality of tabs spaced apart lengthwise relative to a longitudinal or transverse axis of the base plate. In another embodiment, the spacer bodies comprise a plurality of elongate bodies, preferably rods, aligned parallel with a longitudinal or a transverse axis of the base plate and axially spaced apart relative to the respective longitudinal or transverse axis of the base plate.

[0017] The dimensions of the spacer bodies can be optimised to minimise mechanical connection between two adjacent tiles. For example, the thickness of the spacer bodies can be selected to be less than 2/3 the tile spacing between adjacent tiles. More preferably, the thickness of the spacer bodies can be selected to be less than less than ½ the tile spacing between adjacent tiles. Similarly, the height of the spacer bodies relative to the upper surface of the base plate can be selected to be less than the thickness of tiles the tile levelling and spacing device has been selected to be used to space and level. Preferably, the height of the spacer bodies relative to the upper surface of the base plate would be less than 2/3 the thickness of those tiles. More

preferably, the height of the spacer bodies relative to the upper surface of the base plate would be less than ½ the thickness of those tiles.

[0018] The tile levelling and spacing device can be configured to fit between any number of adjacent tiles:

[0019] In some applications, the device is configured to fit between the parallel sides of two adjacent tiles. Here, the device would include at least two pairs of spacer bodies, each spacer body being located on opposite sides of the central hub. In some cases, those pairs of spacer bodies located on opposite sides of the central hub would be equidistantly oriented at 180 degrees from each other about the central hub.

[0020] In other applications, the device is configured to fit in the corner between four adjacent tiles. Here, the device would include at least four pairs of spacer bodies, and at least four of those pairs of spacer bodies being equidistantly oriented at 90 degrees from each other about the central hub.

[0021] In yet other applications, the device is configured to fit in the corner between three adjacent tiles. Here, the device would include at least three pairs of spacer bodies oriented in a "T"-shaped configuration about the central hub.

[0022] In each of the these configurations, each pair of spacer bodies located between respective pairs of adjacent tiles includes at least one first spacer body and at least one second spacer body. The first spacer body is configured to abut against a side of a first tile of a pair of adjacent tiles and be spaced away from the side of the second tile of that pair of tiles. The second spacer body is configured to abut against a side of the second tile of the pair of adjacent tiles and be spaced away from the side of the first tile of that pair of tiles.

[0023] The central hub can have any configuration in which the stem aperture can be located. The central hub is preferably configured to bend

and/or flex relative to the base plate. Furthermore, the width of the central hub about the lengthwise axis of the base plate is preferably less than the spacing between adjacent tiles. These dimensions ensure the central hub does not abut the sides of the tiles which in use abut the spacer bodies and thereby bridge the gap between those tiles.

[0024] The base plate can have any suitable configuration. In most embodiments, the base plate is a planar sheet having a selected shape. The plate can have a circular or polygonal shape, for example a generally square shape. The base plate preferably includes at least one opening, cut-out or aperture. These openings, cut-outs or apertures are configured to allow adhesive to pass through when the tile levelling and spacing device is in use. The adhesive can therefore directly join the tile to the flooring or wall through that opening, cut-out or aperture.

[0025] The tile levelling and spacing device preferably comprises a flexible and/or resilient material. The tile levelling and spacing device can be manufactured from a variety of material including metals, such as for example a metal such as iron or alloys thereof, aluminium, paper based products such as cardboard, wood. However, the preferred material of construction is a plastic. Suitable plastics include (but are not limited to) polyethylene terephthalate (PET), polyethylene, Polyvinyl chloride (PVC), High Impact Polystyrene (HIPS), virgin or recycled polypropylene, nylons, polyesters, styrene based plastics, Polyvinylidene chloride (PVDC), polycarbonates or similar.

[0026] The levelling function of the tile levelling and spacing device is provided in cooperation with a clamping device. The clamping device preferably includes a handle configured for manual manipulation by a user, a clamping surface attached to the handle configured to abut a top surface of a tile, and a threaded tubular stem which perpendicularly extends from the clamping surface and is configured to be threadably received within the stem aperture of the central hub. A tile can therefore be clamped between the upper surface of the base plate of the tile levelling and spacing device and the clamping surface of the clamping device.

[0027] According to a second aspect of the present invention, there is provided a method of installing a tile levelling and spacing device for spacing and levelling a plurality of tiles, comprising the following steps:

providing the tile levelling and spacing device according to the first aspect of the present invention;

applying an adhesive onto a top surface of a floor or wall to create an adhesive layer;

applying a first tile onto the adhesive layer;

inserting the tile levelling and spacing device on the adhesive layer and under at least one side of a first tile;

applying additional tiles and additional tile levelling and spacing device s onto the adhesive layer so that a tile levelling and spacing device is located between and under at least one side of all applied tiles;

adjusting a spacing gap width between adjacent tiles by aligning the sides and/or corners of the tiles to abut the spacer body of a respective adjacent tile levelling and spacing device;

inserting a clamping device to each tile levelling and spacing device , the clamping device having handle and a threaded tubular which perpendicularly extends from the handle, the stem being threadably received within the stem aperture;

clamping each tile between the clamping device by means of appropriate directional turning of clamping device for every tile levelling and spacing device;

pressing all tiles firmly into the adhesive layer;

allowing the adhesive layer to dry;

removing clamping device from each tile levelling and spacing device by means of appropriate directional turning of clamping device until detached from the stem aperture.

Brief Description of the Drawings

[0028] The present invention will now be described with reference to the figures of the accompanying drawings, which illustrate particular preferred embodiments of the present invention, wherein:

[0029] Figure 1 is a perspective view of a tile levelling and spacing device and cooperating clamping spindle according to a first preferred embodiment of the present invention.

[0030] Figure 2 is a plan view of the tile levelling and spacing device shown in Figure 1 inserted between two adjacent tiles.

[0031] Figure 3 is a perspective view of a tile levelling and spacing device and cooperating clamping spindle according to a second preferred embodiment of the present invention.

[0032] Figure 4 is a perspective view of a tile levelling and spacing device according to a third preferred embodiment of the present invention.

[0033] Figure 5 is a perspective view of a tile levelling and spacing device according to a fourth preferred embodiment of the present invention.

[0034] Figure 6 is a perspective view of a tile levelling and spacing device according to a fifth preferred embodiment of the present invention.

[0035] Figure 7 is a perspective view of a tile levelling and spacing device according to a sixth preferred embodiment of the present invention.

Detailed Description

[0036] Referring firstly to Figures 1 and 2, there is shown a tile levelling and spacing system 10 according to a first preferred embodiment of the present invention. The tile levelling and spacing system 10 comprises a tile levelling and spacing device 12 and a clamping spindle 14. The tile levelling and spacing device 12 and a clamping spindle 14 act cooperatively to clamp around a tile 16 (Figure 2) when in use.

[0037] The illustrated tile levelling and spacing device 12 comprises a generally square moulded body made of a plastic material fabricated in a plastic injection moulding process or similar. The device 12 includes a rectangular

base plate 20, a square central connection hub 22, and four spacing tabs 24. The base plate 20, central connection hub 22 and spacing tabs are all integrally moulded as part of the device 12 during a plastic moulding process. It should be appreciated that the dimensions of the features of the device 12 can vary to suit a particular tile size and configuration without departing from the scope of the present invention.

[0038] The base plate 20 is a generally rectangular plastic plate which includes four spaced apart openings 26 and two side cut-outs 28 configured to allow adhesive to pass through when the tile levelling and spacing device 12 is in use. It should be appreciated that none or any number of openings 26 and cut-outs 28 could equally be used without departing from the spirit and scope of the present invention.

[0039] The central connection hub 22 comprises a cubic body centrally located on the upper surface 29 of the base plate 20. The central connection hub 22 includes a threaded stem aperture 30 which extends through the central hub 22 and base plate 30. The width of the central connection hub 22 about axis X-X of the base plate 20 is less than the tile spacing D (Figure 2) between adjacent tiles 16. These dimensions ensure the central connection hub 22 does not abut the sides of the tiles 16 and thereby bridge the gap between those tiles 16.

[0040] Four spacer tabs 24 are also provided which extend generally perpendicularly outwardly from the upper surface 29 of the base plate 20. Each spacer tab 24 comprises a thin rectangular tab having an engagement surface 25 which is configured to abut against a side of one of the tiles 16 of an adjacent pair of tiles 16. The spacer tab 24 is also spaced away from the other tile 16 of that pair of tiles 16 (Figure 2). Each spacer tab 24 therefore does not form a mechanical connection between adjacent tiles 16. The distance between the outside faces of adjacent spacer tabs 24 defines the desires tile spacing D between the adjacent tiles 16. As best shown in Figure 2, each spacer tab 24 is aligned parallel with the transverse axis X-X of the base plate 20 and is spaced apart from an adjacent spacer tab 24 about that axis by a

separation distance G. Each of the adjacent spacer tabs 24 is also axially spaced apart relative to the axis X-X. A small gap Z can be provided between axially adjacent spacer tabs 24. However, it should be appreciated that this gap may not be present in some embodiments.

[0041] The height of the spacer tabs 24 is generally less than the thickness of tiles 16 the tile levelling and spacing device 12 has been selected to be used to space and level. This ensures each spacer tab 24 is covered by filler (such as grout) once that the space 27 (Figure 2) between the adjacent tiles 16 is filled with that filler. In the illustrated embodiment, the height of the spacer tabs 24 is around 2/3 the thickness of the tiles 16.

[0042] The plastic material the tile levelling and spacing device 12 is constructed from is preferably selected to ensure each spacer tab 24 is flexible, and can transversely bend and/or flex relative to the transverse axis X-X. Flexibility of the spacer tabs 24 allow the spacer tabs 24 to flex when a load is applied by an abutting tile 16. The thickness of the spacer tabs 24 also assists in this flexibility. In the illustrated embodiment, the thickness of the spacer tabs 24 is about 2/5 the tile spacing D between adjacent tiles 16.

[0043] It should be appreciated that other forms of spacing bodies can also be used to achieve the same function as the spacer tabs 24 shown in Figure 1.

[0044] For example, Figure 3 illustrates a tile levelling and spacing system 10A according to a second preferred embodiment of the present invention. This second system includes a similar tile levelling and spacing device 12A to the tile levelling and spacing device 12 shown in Figures 1 and 2 in which the spacer tabs 24 are substituted with a multitude of spaced apart flexible spacing rods 24A which are aligned parallel with the transverse axis X-X of the base plate 20A and spaced apart lengthwise relative to the respective transverse axis X-X. The spacing rods 24A have engagement surfaces 25A.

[0045] The tile levelling and spacing device 12 also includes a connection spindle 14. The connection spindle 14 shown in Figures 1 and 3 includes a cylindrical handle 40 configured for manual manipulation by a user. The spindle 14 also includes a clamping disc 42 attached to the handle 40 having a clamping surface 43 configured to abut a top surface of a tile 16. A threaded tubular stem 44 is also provided which perpendicularly extends from the clamping surface 43 and is configured to be threadably received within the stem aperture 30, 30A of the central hub 22, 22A. A tile 16 can therefore be clamped between the upper surface 29 of the base plate 20 of the tile levelling and spacing device 12 and the clamping surface 43 of the connection spindle 14 by inserting the tubular stem 44 of the connection spindle 14 into the stem aperture 30 of the tile levelling and spacing device 12 and rotating the spindle relative to the tile levelling and spacing device 12 to threadably tighten the clamping surface 43 and the upper surface 29 around that tile 16.

[0046] The tile levelling and spacing device 12 can be configured to fit between any number of adjacent tiles 16. The devices 20 and 20A shown in Figures 1 to 3 are configured to fit between two parallel sides of adjacent tiles 16. These devices 20 and 20A include pairs of spacer tabs 24, 24A which are equidistantly oriented at 180 degrees from each other. However, the tile levelling and spacing device 12 can also be configured to level and space three adjacent tiles, four adjacent tiles or more.

[0047] Figure 4 illustrates a further embodiment of a tile levelling and spacing device 112 according to the present invention configured to fit in the corner between four adjacent tiles 16. This device 112 has similar features as described for the tile levelling and spacing device 12 illustrated and described in relation to Figure 1, with the difference of having four pairs of spacer tabs 124 being provided equidistantly oriented at 90 degrees from each other around the central hub 122. The spacing tabs 124 have engagement surfaces 125. In use, the four corners of a set of four adjacent tiles are seated in the complementary recesses in the base plate 120 formed between the four pairs of spacer tabs 124, with each side of the relevant tiles abutting the adjacent four pairs of spacer tabs 124. A clamping spindle 14, such as shown in Figures 1 and 3, is

then applied so that the clamping disc 42 overlies and holds the tiles level between the clamping disc 42 and the base plate 120.

[0048] Figure 5 illustrates a yet further embodiment of a tile levelling and spacing device 212 according to the present invention configured to fit in the corner between three adjacent tiles. This device 212 has similar features as described for the tile levelling and spacing device 12A illustrated and described in relation to Figure 3, with the difference of having three linear rows of spacer rods 224 oriented in a "T"-shaped configuration. The spacing rods 224 have engagement surfaces 225. In use, the three corners of a set of three adjacent tiles are seated in the complementary recesses in the base plate 220 formed between the T-shaped arrangement of spacer tabs 224, with each side of the relevant tiles abutting the adjacent three pairs of spacer tabs 224. A clamping spindle 14, such as shown in Figures 1 and 3, is then applied so that the clamping disc 42 overlies and holds the tiles level between the clamping disc 42 and the base plate 220.

[0049] Figure 6 illustrates a yet further embodiment of a tile levelling and spacing device 312 according to the present invention configured to fit in between two adjacent tiles. This device 312 has similar features as described for the tile levelling and spacing device 12 illustrated and described in relation to Figure 1, with the difference of having six angled spacer tabs 324 being laterally aligned about and with the central hub 322 along axis X-X. Unlike the previous embodiments, each of the spacer tabs 324 are configured to extend the distance between and, in use, space apart a pair of adjacent tiles. Each spacer tab 324 includes two spaced apart engagement surfaces 325, each of which is designed to abut against an opposing side of a tile of a pair of tiles (for example tiles 16 as shown in Figure 2). Each of these engagement surfaces 325 are laterally spaced apart along axis X-X. Each spacer tab 324 is flexible allowing each spacer tab 324 to flex when a load is applied by an abutting tile. Each tab is positioned at an angle, in the illustrated embodiment about 50 degrees, relative to the longitudinal axis X-X of the base plate 320.

[0050] In use, the two sides of adjacent tiles are pushed to abut the respective sides of each angled spacer tab 324. A clamping spindle 14, such as shown in Figures 1 and 3, is then applied so that the clamping disc 42 overlies and holds the tiles level between the clamping disc 42 and the base plate 320.

[0051] Figure 7 illustrates a further embodiment of a tile levelling and spacing device 412 according to the present invention configured to fit in between two adjacent tiles. This device 412 has similar features as described for the tile levelling and spacing device 12 illustrated and described in relation to Figure 1, with the difference of having two curved spacer ribs 424 laterally aligned with and spaced apart about the central hub 422 along axis X-X. Like the previous embodiment 312, each of the spacer ribs 424 are configured to extend the distance between and, in use, space apart a pair of adjacent tiles 16. In this respect, each spacer rib 424 includes two spaced apart engagement surfaces 425, each of which is designed to abut against an opposing side of a tile of a pair of tiles (for example tiles 16 as shown in Figure 2). Again, the engagement surfaces 425 on each respective spacer rib 424 is laterally spaced apart along axis X-X on each respective spacer rib 424. Any force from one of the adjacent tiles is not linearly transferred through the spacer rib 424 to the other tile, but rather the spaced apart locations of the engagement surfaces 425 allows that spacer rib 424 to flex when a load is applied by an abutting tile, therefore reduce force transfer therethrough.

[0052] In use, the two sides of adjacent tiles are pushed to abut the respective engagement surface 424 of each angled spacer tab 424. A clamping spindle 14, such as shown in Figures 1 and 3, is then applied so that the clamping disc 42 overlies and holds the tiles level between the clamping disc 42 and the base plate 420.

[0053] It is to be appreciated that all the embodiments of the present system 10, 10A, and associated tile levelling and spacing devices, 12, 112, 212, 312 and 412 may be produced in a variety of different sizes and configurations

depending on the type of flooring material used and the desired spacing gap 120 without departing from the scope of the present invention.

[0054] The illustrated levelling and spacing system 10 is used to level and space adjacent tiles 16. The following steps are described in relation to the system 10 illustrated and described in Figures 1 and 2. However, it should be appreciated that these steps can generally apply to each of the embodiments illustrated in Figures 3 to 5.

[0055] In order to use the device 12 shown Figures 1 and 2, a flooring or wall surface is selected on which tiles 16 are to be applied. The surface is cleaned and prepared and than an adhesive is applied onto that surface to create an adhesive layer. A first tile is then applied onto the adhesive layer in a desired position. A first tile levelling and spacing device 12 is then inserted on the adhesive layer and under at least one side of a first tile 16. One or more additional tiles are laid on the adhesive layer, including a second tile 16 adjacent to the first tile 16, which is placed on top of the first tile levelling and spacing device 12. The first and second tiles are spaced apart a distance D (Figure 2) by the spacing tabs 24 of the device 12. Additional tiles 16 and additional tile levelling and spacing devices 12 can be applied onto the adhesive layer so that a tile levelling and spacing device is located between and under at least one side of all applied tiles 16. The tile spacing distance D between adjacent tiles 16 can be adjusted by aligning the sides and/or corners of the tiles 16 to abut the spacer tabs 44 of a respective adjacent tile levelling and spacing device 12.

[0056] A clamping spindle 14 is then attached to each first tile levelling and spacing device 12 by inserting the tubular stem 44 of the clamping spindle 14 into the stem aperture 30 of the tile levelling and spacing device 12. It should be appreciated that this insertion step could be undertaken prior to insertion of the tile levelling and spacing device 12 under the tiles 16, or once the tile levelling and spacing device 12 is in situ under the tiles 16. Each tile 16 is then clamped between the spindle 24 and tile levelling and spacing device 12 by rotating the clamping spindle 14 relative to the tile levelling and spacing

device 12 to threadably tighten the clamping surface 43 and the upper surface 29 around that tile 16. All the tiles 16 are then pressed firmly into the adhesive layer, and the adhesive layer is allowed to dry. This can take around 24 hours.

[0057] Once the adhesive is dry, the clamping spindle 14 is then from each tile levelling and spacing device 12 by means of appropriate directional turning of clamping spindle 14 until the tubular stem 44 is detached from the stem aperture 30. A suitable filler material, such as grout, can be then inserted in the space 27 between the tiles 16.

[0058] Those skilled in the art will appreciate that the invention described herein is susceptible to variations and modifications other than those specifically described. It is understood that the invention includes all such variations and modifications which fall within the spirit and scope of the present invention.

[0059] Where the terms "comprise", "comprises", "comprised" or "comprising" are used in this specification (including the claims) they are to be interpreted as specifying the presence of the stated features, integers, steps or components, but not precluding the presence of one or more other feature, integer, step, component or group thereof.

Claims:

1. A tile levelling and spacing device including:

a base plate having an upper surface and a base surface;

a central hub which includes a stem aperture, each centrally located in the base plate, the stem aperture including internal threading; and at least one spacer body that extends outwardly from the upper surface of the base plate, wherein the at least one spacer body includes:

at least one first engagement portion which is configured to abut against a side of a first tile of a pair of adjacent tiles and be spaced away from the side of the second tile of that pair of tiles; and

at least one second engagement portion which is configured to abut against a side of the second tile of the pair of adjacent tiles and be spaced away from the side of the first tile of that pair of tiles.

2. A tile levelling and spacing device according to claim 1, including at least two spacer bodies, the spacer bodies including:

at least one first spacer body which includes at least one first engagement portion; and

at least one second spacer body including at least one second engagement portion.

3. A tile levelling and spacing device according to claim 1, including at least one spacer body that includes the first engagement portion and the second engagement portion, the first engagement portion and the second engagement portion of the spacer body being laterally spaced apart relative to a longitudinal axis of the base plate about which the central hub and each spacer body extends.

4. A tile levelling and spacing device according to claim 3, comprising a plurality of spaced apart tabs, each tab having opposite ends, each end extend the distance between and, in use, configured to abut against a respective side of a pair of adjacent tiles.

5. A tile levelling and spacing device according to claim 4, wherein each tab has a longitudinal side extending between each end, the longitudinal side each tab being positioned at an angle relative to the longitudinal axis of the base plate.

6. A tile levelling and spacing device according to claim 5, wherein the angle is between 20 and 70 degrees.

7. A tile levelling and spacing device according to any preceding claim, wherein each spacer body is configured to bend and/or flex relative to the base plate.

8. A tile levelling and spacing device according to any preceding claim, wherein the tile levelling and spacing device comprises a flexible and/or resilient plastic material.

9. A tile levelling and spacing device according to any preceding claim, wherein each spacer body comprise one or more of tabs, flanges, rods, pimples, spigot, poles, fingers, ribs, flaps, fins, bar, panel, block, ball or teeth.

10. A tile levelling and spacing device according to any preceding claim, wherein the height of the spacer bodies relative to the upper surface of the base plate is less than the thickness of tiles the tile levelling and spacing device has been selected to be used to space and level.

11. A tile levelling and spacing device according to claim 10, wherein the height of the spacer bodies relative to the upper surface of the base plate is less than 2/3 the thickness of tiles the tile levelling and spacing device has been selected to be used to space and level, more preferably less than ½ the thickness of tiles the tile levelling and spacing device has been selected to be used to space and level.

12. A tile levelling and spacing device according to any preceding claim, wherein the thickness of the spacer bodies is less than 2/3 the tile spacing

between adjacent tiles, more preferably less than ½ the tile spacing between adjacent tiles.

13. A tile levelling and spacing device according to any preceding claim, further comprising at least two pairs of spacer bodies, each spacer body being located on opposites sides of the central hub.

14. A tile levelling and spacing device according to any preceding claim, including at least two pairs of spacer bodies, at least two of those pairs of spacer bodies being equidistantly oriented at 180 degrees from each other about the central hub.

15. A tile levelling and spacing device according to any preceding claim, including at least four pairs of spacer bodies, at least four of those pairs of spacer bodies being equidistantly oriented at 90 degrees from each other about the central hub.

16. A tile levelling and spacing device according to any preceding claim, including at least three pairs of spacer bodies, the spacer bodies being oriented in a "T"-shaped configuration about the central hub.

17. A tile levelling and spacing device according to any preceding claim, further comprising a clamping device having a handle configured for manual manipulation by a user, a clamping surface attached to the handle configured to abut a top surface of a tile, and a threaded tubular stem which perpendicularly extends from the clamping surface and is configured to be threadably received within the stem aperture of the central hub.

18. A tile levelling and spacing device according to any preceding claim, wherein the central hub is configured to bend and/or flex relative to the base plate.

19. A tile levelling and spacing device according to any preceding claim, wherein each spacer body is aligned parallel with at least one of a longitudinal or a transverse axis of the base plate.

20. A tile levelling and spacing device according to claim 19, wherein each spacer body is configured to transversely bend and/or flex relative to the axis that the respective spacer body is aligned.

21. A tile levelling and spacing device according to claim 19 or 20, wherein the spacer bodies comprise a plurality of tabs axially spaced apart relative to the respective longitudinal or transverse axis of the base plate.

22. A tile levelling and spacing device according to claim 19 or 20, wherein the spacer bodies comprise a plurality of elongate bodies, preferably rods, aligned parallel with a longitudinal or a transverse axis of the base plate and spaced apart lengthwise relative to the respective longitudinal or transverse axis of the base plate.

23. A tile levelling and spacing device according to any one of claims 19 to 22, wherein the width of the central hub about the respective transverse and/or longitudinal axis of the base plate is less than the spacing between adjacent tiles.

24. A tile levelling and spacing device according to any preceding claim, wherein the base plate includes at least one opening, cut-out or aperture configured to allow adhesive to pass through when the tile levelling and spacing device is in use.

25. A tile levelling and spacing device according to any preceding claim, wherein the base plate comprises a generally square shaped plate.

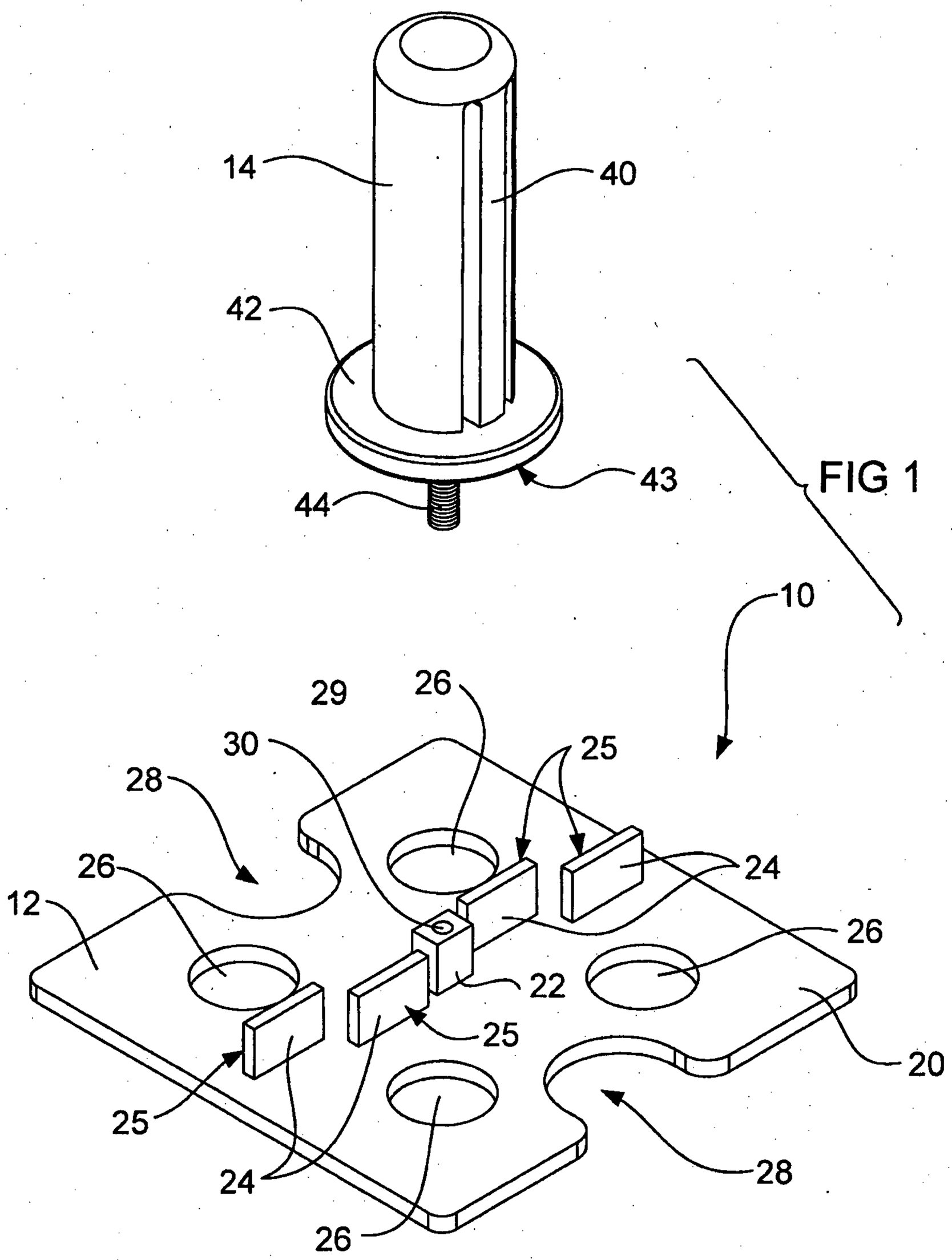


FIG 1

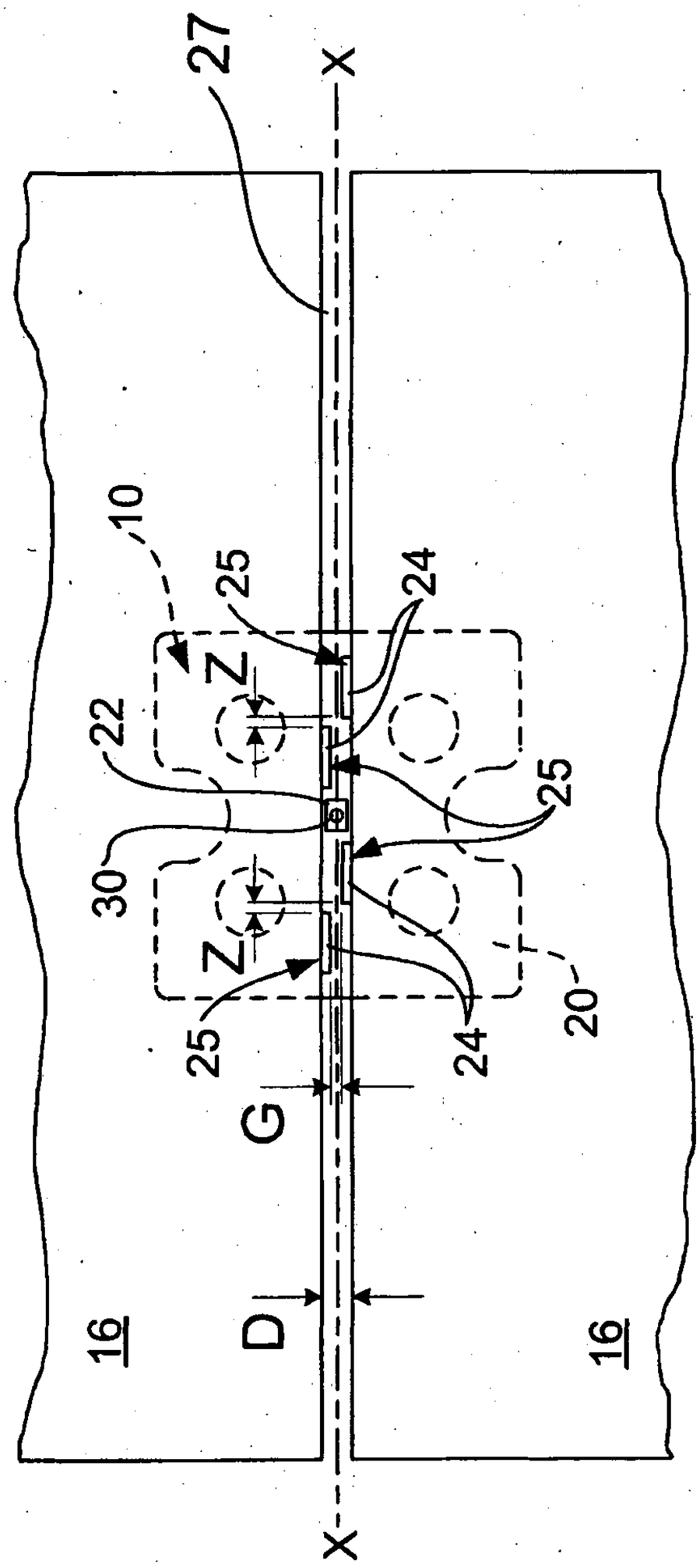


FIG 2

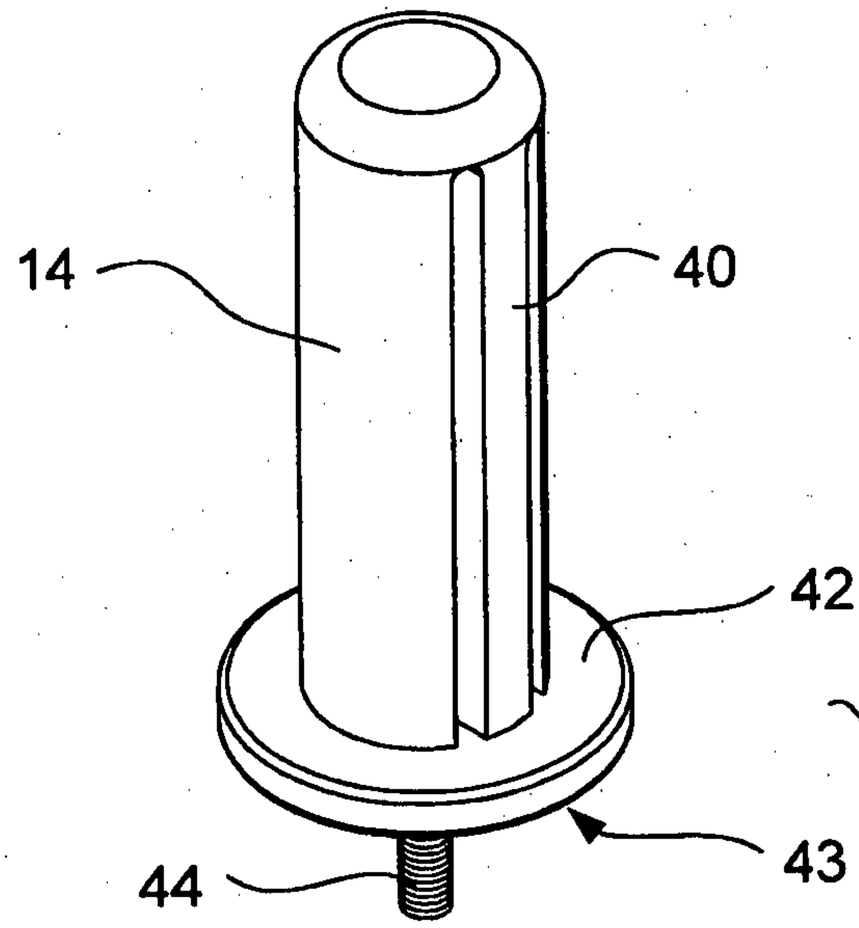
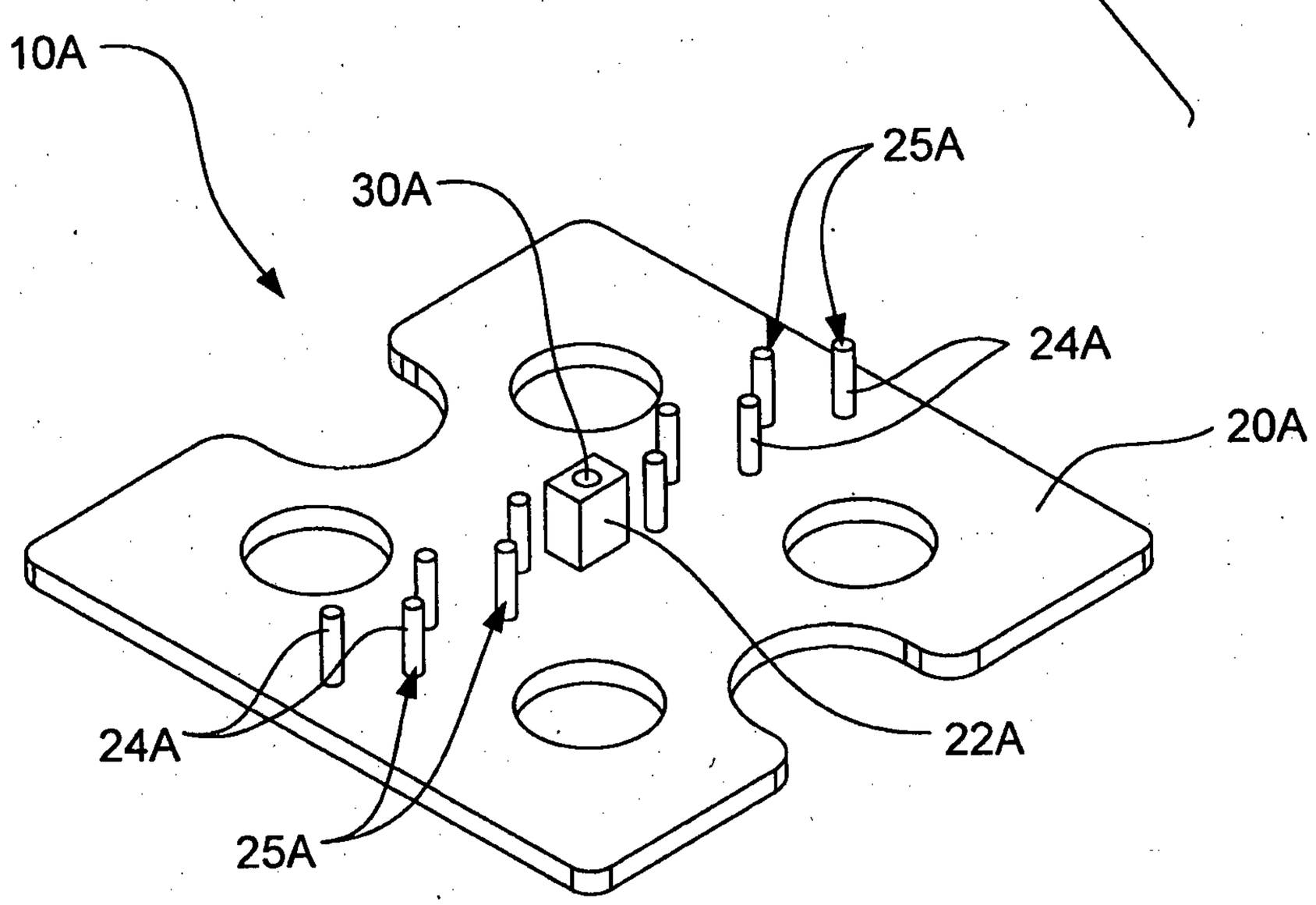


FIG 3



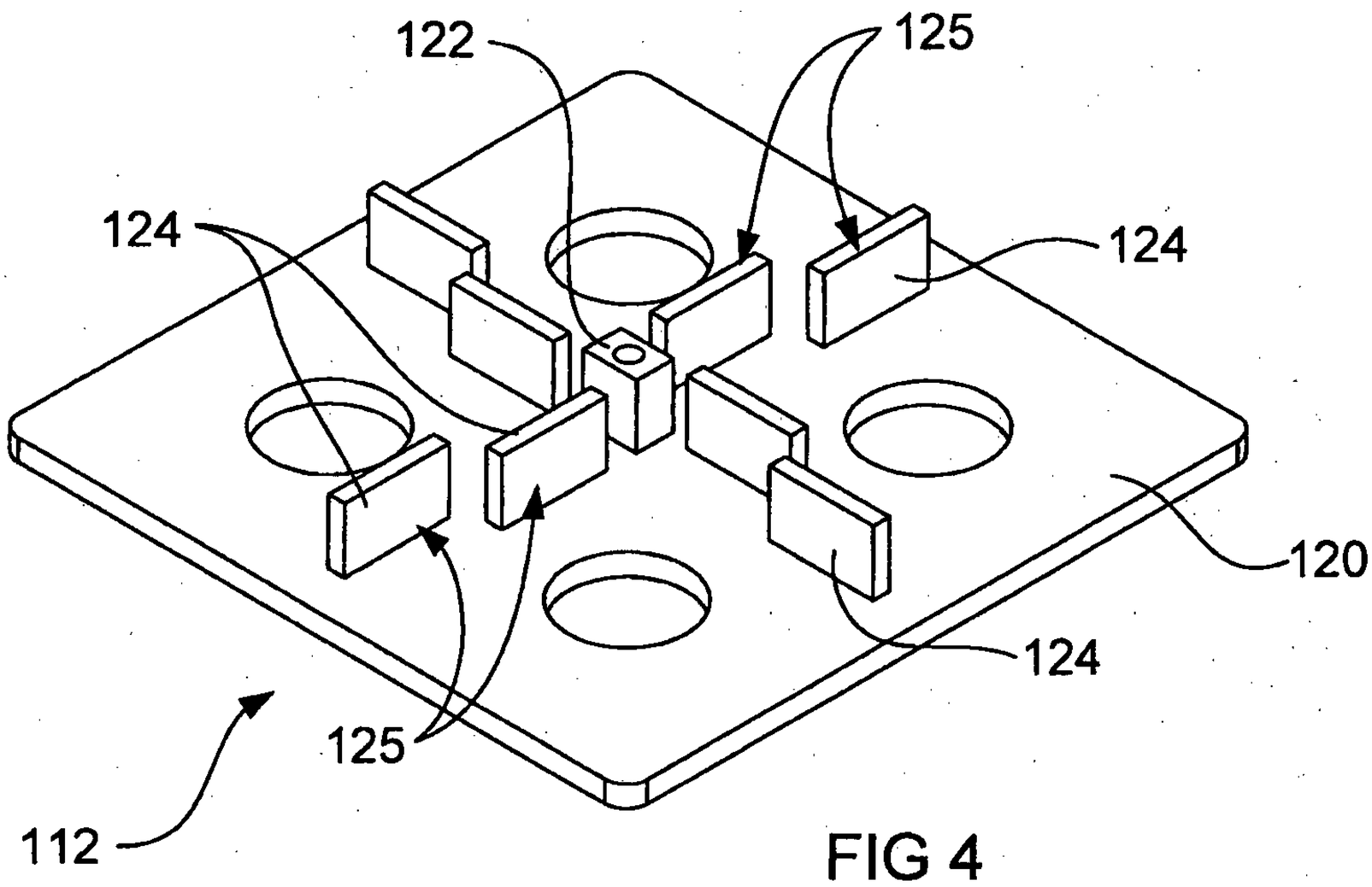


FIG 4

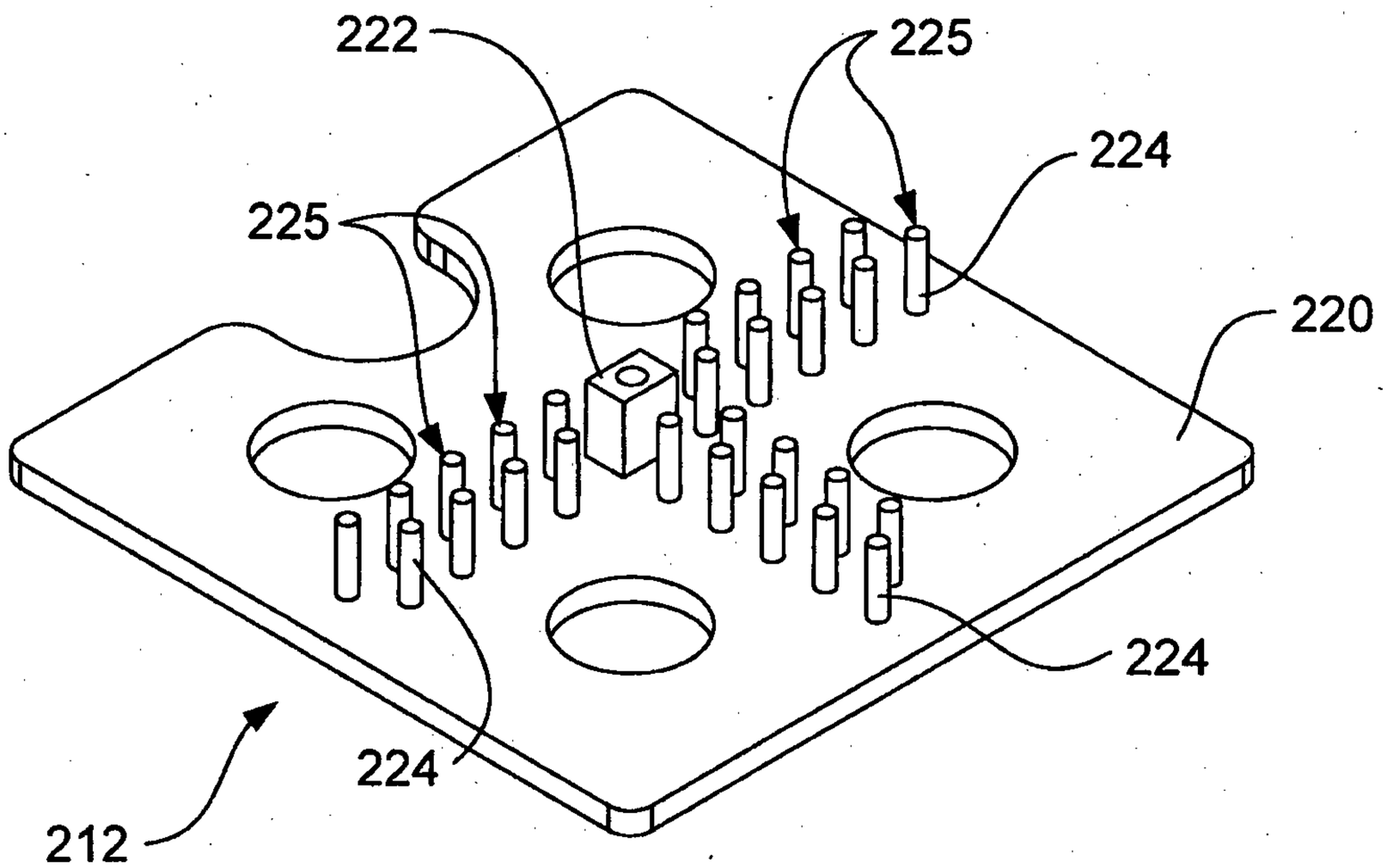


FIG 5

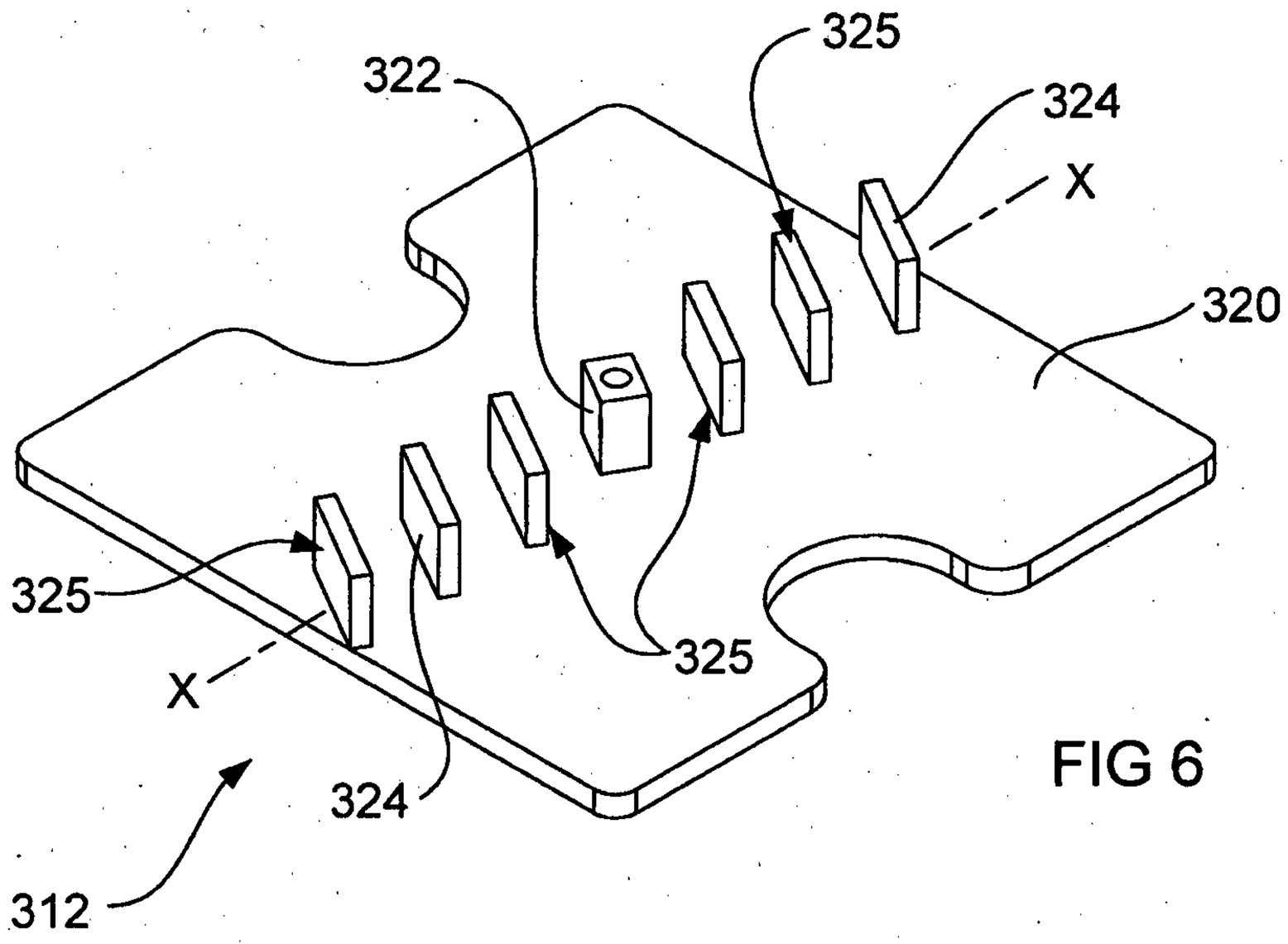


FIG 6

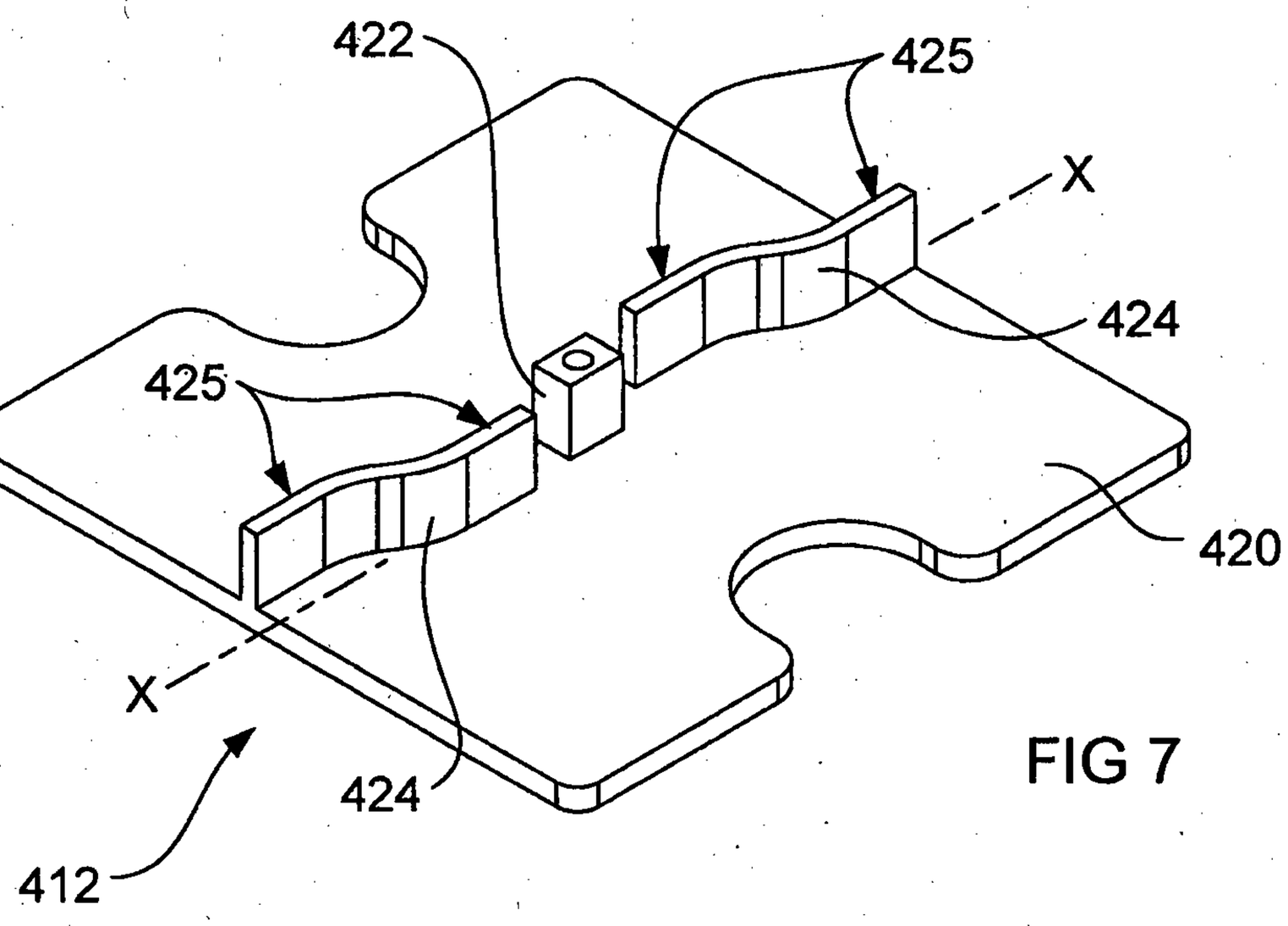


FIG 7

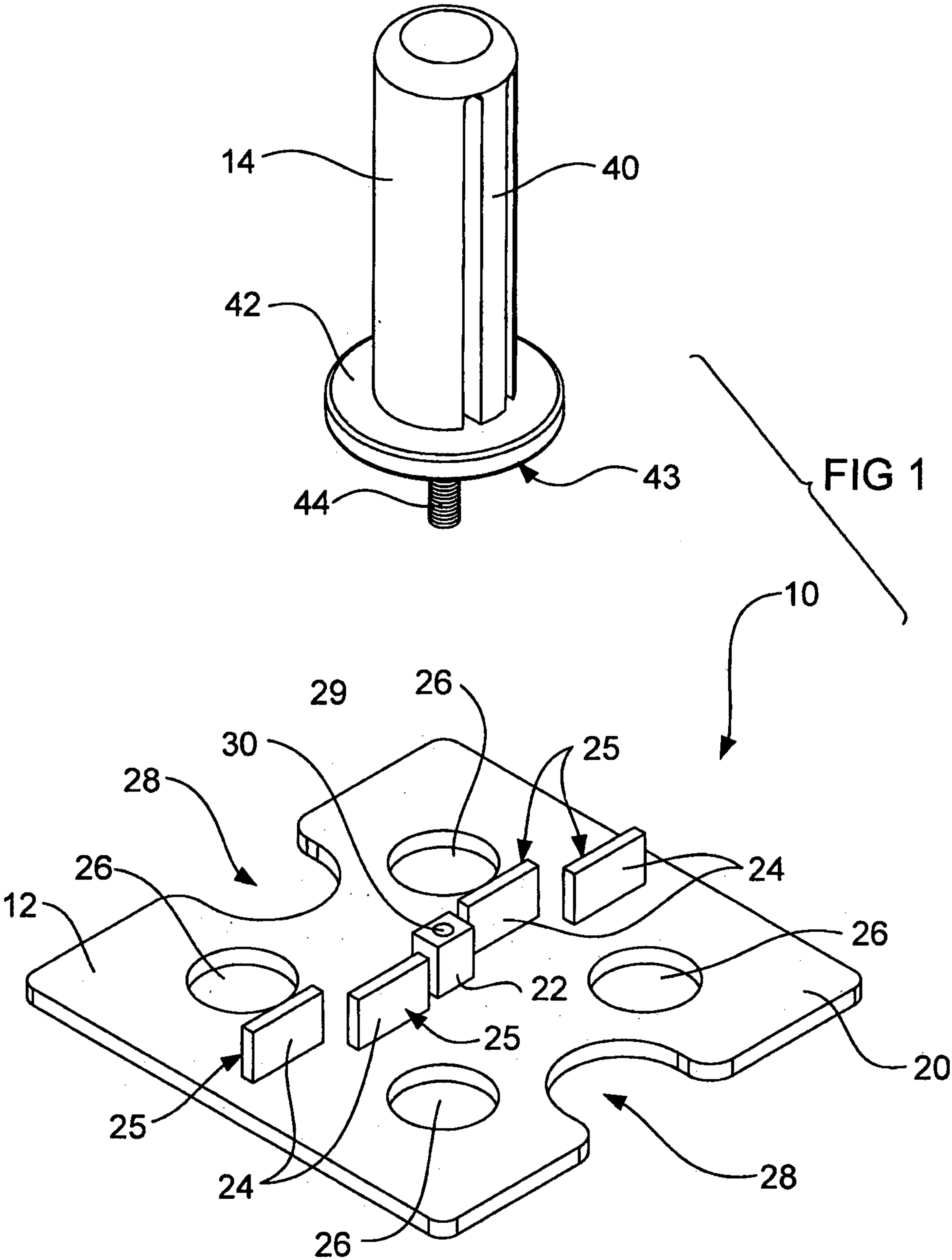


FIG 1