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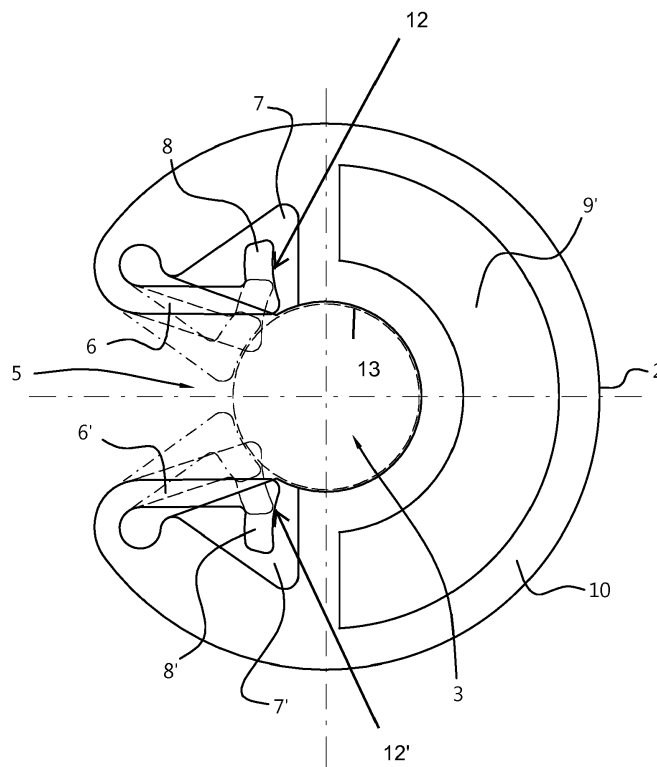
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(54) **SPACING PLATE**

(57) The invention relates to a spacing plate comprising a perimeter, an opening, and a slot providing access to said opening, said slot having an entrance end at said perimeter, an exit end communicating with said

opening, and a non-return means in said slot, wherein said non-return means comprises a resilient blocking arm extending in said slot, said blocking arm at its end provided with a blocking extension.

Fig. 3



Description

BACKGROUND OF THE INVENTION

[0001] The invention relates to a spacing plate.

[0002] In the state of the art different types of spacing plates are used.

[0003] The current applicant, for instance, produces a spacing plate that is marketed under the name "milli Max®". These spacing plates can be used to fill up spacing between parts in a building. Usually, parts are mounted or fixed together using fasteners. The milli max® have a slot that can be fitted around a stem of a fastener such that the spacing plate stays in place. The milli max® can for instance be used to fill up spacing between a framework and a window frame. These parts can be attached together using a fastening screw, and the spacing plate is fitted and placed over the fastening screw.

[0004] Many modifications are suggested on spacing plates. Some of these improvements relate to retaining the fastening plate on a fastener screw. Examples of possible modifications are shown for example in US4558548 and GB2255999.

[0005] GB2255999, published in 1992, for instance comprises an elongated slot for receiving the fastener screw. The elongated slot is closed at both ends, and the elongated slot is connected to a side entry slot which is open at the end remote from the connection to the elongated slot. Formations may be provided to resist passage of the fastening screw out from the elongated slot. To that end, for instance a pair of barbs may be provided that project into the side entry slot at an angle of approximately 45 degrees.

[0006] EP127021 according to its abstract discloses a plate-like flat spacer for the building industry, with a slot which is open to one side, which extends from its open slot entry beyond the centrepont of the plate, and which at its slot end encloses a fastening screw or the like without gripping it, characterised in that the spacer, made of plastics material, has at least one resilient retaining projection which protrudes into the slot and is arranged at a distance (a) in front of the slot end allowing the fastening screw to locate at said slot end without being gripped. The spacer has two parallel planes defining its thickness. Furthermore, due to the embodiment of the resilient projections, they get clamped while inserting the spacer.

[0007] FR2019166 in claim 1 describes a "device for fixing an object to a resiliently deformable support device consisting of a pin that can be inserted through the object to be secured and a clamping disc provided with a receiving opening, the pin having at one end a head and at its other end provided maintenance of a collar for engagement with the retaining disc, said device being characterized in that not only the ankle, forming a single piece with its head, but also the fixing disk, are elastic and tough synthetic material and in that the clamping disc has a notch." This does not relate to a spacer, but to a fixing disc or clamping disc for retaining of fixing elastic material

onto a substrate.

[0008] EP403397 discloses according to its abstract a shim-type device which makes it possible to stabilise or to secure any object. This device is characterised in that it consists of a strip formed from a plurality of segments, said segments being interconnected on at least one side by means of articulation so that said strip is capable of being folded on itself in the manner of an accordion, said means of articulation constituting a precutting line for detaching one or more segments from the strip. The segments have parallel surfaces and are to be folded in a serpentine manner to determine the final thickness.

[0009] NL9300161 discloses according to its abstract a faceplate (baseplate), in particular made from plastic, provided with a slot which extends from one of the edges towards the centre of the plate, a tongue which is directed substantially towards the centre of the slot extending from near the opening to the slot along each longitudinal edge thereof, the first end of each tongue, facing towards the opening of the slot, being further away from the centre of the plate than the second end thereof. According to the invention, the faceplate is characterized in that each first end is a free end, each second end being connected, by means of a resilient bridge section, to that longitudinal edge of the slot which lies on the side of the first end of the tongue in question, and each bridge section including an acute angle with the longitudinal edge in question. The faceplate again has parallel surfaces and the "tongues" may get blocked.

[0010] There is room for improvement of the spacing plate that has been known per se for a long time.

SUMMARY OF THE INVENTION

[0011] It is an object of the invention to provide an improved spacing plate, in particular for filling spaces in building constructions.

[0012] It is a further or additional object of the invention to provide a spacing plate that is easier to use.

[0013] For that purpose the invention provides a spacing plate according to claim 1.

[0014] The spacing plate allows easy application, and remains attached on a shank after placement.

[0015] In this description, the word spacing plate is used. In the art, such an element is also known as 'shim'.

[0016] Often, spacing plates are provided in different thicknesses. Usually, a set is provided that has spacing plates of different thicknesses that may be combined to fill a space. These spacing plates are often produced from plastic. Often, spacing plates are injection moulded. In particular, a spacing plate is injection moulded in one piece. Often, a spacing is made from polyethylene (PE) or polypropylene (PP).

[0017] A spacing plate may be used to surround a shank of, for instance, a fastener, like a nail, a bolt, a screw, or any other suitable fastening element.

[0018] In an embodiment, the opening has an opening perimeter, said spacing plate further comprising a said

blocking arm at each side of said slot, providing opposite blocking arms, said blocking arms together in unbiased state blocking access to said opening in a blocking position. In an embodiment, said blocking extension comprising blocking surfaces which with said blocking arms in said blocking position substantially block said exit end of said slot and defining at least part of said opening perimeter. The two blocking arms effectively provide blocking.

[0019] In an embodiment, the opening substantially is a round hole, defining said opening perimeter as substantially a circle.

[0020] In an embodiment, the blocking arm extends substantially from said spacing plate perimeter towards the opening and into the slot.

[0021] In an embodiment, the spacing plate further comprises a blocking arm receiving recess, in particular at the back surface of the spacing plate, for receiving a blocking arm in a biased, freeing position in which is frees passage to said opening. This allows easy flexing and mounting. In an embodiment, a surface of said blocking arm abuts a surface of the recess, and a rear surface of the blocking arm is in a plane with the rear surface of rear plane of the spacing plate. Thus, secure positioning is provided.

[0022] In an embodiment, the opening and said slot define two legs, wherein said legs end in a wedge portion. In an embodiment, said wedge portion tapers from a line at a distance from a centre line of said spacing plate towards the perimeter of the spacing plate line. In an embodiment, said wedge portions having substantially a thinnest end at said spacing plate perimeter. In a further embodiment, said blocking arm having an end at or near said substantially thinnest end. This allows easy mounting even at difficult places.

[0023] The invention further relates to a method for filling a slit or space between building elements, said method comprising using the spacing plate of any one of the preceding claims, and placing said spacing plate over a shank, in particular a shank of a fastener, like a screw, a nail, a bolt, and the like.

[0024] The invention further relates to the use of the current spacing plate, for instance in a building. More in particular, the use relates to use in a process like placing a window.

[0025] It will be clear that the various aspects mentioned in this patent application can be combined and each individually are eligible for a divisional patent application. The term "substantially" herein, like in "substantially consists", will be understood by and clear to a person skilled in the art. The term "substantially" may also include embodiments with "entirely", "completely", "all", etc. Hence, in embodiments the adjective substantially may also be removed. Where applicable, the term "substantially" may also relate to 90% or higher, such as 95% or higher, especially 99% or higher, even more especially 99.5% or higher, including 100%. The term "comprise" includes also embodiments wherein the term "compris-

es" means "consists of".

[0026] The term "functionally", when used for instance in "functionally coupled" or "functionally direct communication", will be understood by and clear to a person skilled in the art. The term "substantially" may also include embodiments with "entirely", "completely", "all", etc. Hence, in embodiments the adjective substantially may also be removed.

[0027] Furthermore, the terms first, second, third and the like in the description and in the claims, are used for distinguishing between similar elements and not necessarily for describing a sequential or chronological order. It is to be understood that the terms so used are interchangeable under appropriate circumstances and that the embodiments of the invention described herein are capable of operation in other sequences than described or illustrated herein.

[0028] The devices or apparatus herein are amongst others described during operation. As will be clear to the person skilled in the art, the invention is not limited to methods of operation or devices in operation.

[0029] It should be noted that the above-mentioned embodiments illustrate rather than limit the invention, and that those skilled in the art will be able to design many alternative embodiments without departing from the scope of the appended claims. In the claims, any reference signs placed between parentheses shall not be construed as limiting the claim. Use of the verb "to comprise" and its conjugations does not exclude the presence of elements or steps other than those stated in a claim. The article "a" or "an" preceding an element does not exclude the presence of a plurality of such elements.

[0030] In the device or apparatus claims enumerating several means, several of these means may be embodied by one and the same item of hardware. The mere fact that certain measures are recited in mutually different dependent claims does not indicate that a combination of these measures cannot be used to advantage.

[0031] The invention further applies to an apparatus or device comprising one or more of the characterising features described in the description and/or shown in the attached drawings. The invention further pertains to a method or process comprising one or more of the characterising features described in the description and/or shown in the attached drawings.

[0032] The various aspects discussed in this patent can be combined in order to provide additional advantages. Furthermore, some of the features can form the basis for one or more divisional applications.

SHORT DESCRIPTION OF THE FIGURES

[0033] In the attached figures an embodiment of a spacing plate according to the invention is shown in which:

- Figure 1 shows a perspective view from above;
- Figure 2 shows a view in perspective of the spacing

Figure 3 shows a view of the spacing plate of figures 1 and 2 from below, with blocking arms at different positions.

DESCRIPTION OF THE EMBODIMENTS

[0034] Figure 1 shows a perspective view from above of a spacing plate 1, figure 2 shows a perspective view from the opposite, rear surface, and figure 3 shows a view of the spacing plate from below, looking onto the rear surface.

[0035] The spacing plate 1 is usually injection moulded in one piece in an injection moulding process. The spacing plate has a thickness d and can be provided in different thicknesses d . Usually, a set of spacing plates 1 of different thicknesses is provided.

[0036] Spacing plate 1 further has a perimeter 2, has a body with an opening 3, and a slot 5 providing access to the opening 3. Slot 5 has an exit end communicating with the opening 3, and an entrance end at the perimeter (2). The slot 5 allows the spacing plate to be installed on for instance a shank (not shown) by sliding the slot 5 over the shank. At the exit end of the slot, when pushing the spacing plate over the shank, the shank ends into the opening 3. Here, the width of the exit end of the slot 5 is a little smaller than the maximum width of the opening. In that way, of the spacing plate is fitted over a shank that has about the diameter of width of opening 3, this will provide a snap fit. Here, the opening 3 is circular or substantially circular, and the exit end of slot 5 is provided a small distance after the centre line of the largest diameter of the opening 3. The opening 3 here is symmetrical, and the line of symmetry runs radially or substantially radially with respect to opening 3. The exit end of slot 5 is thus a little before a centre of the opening 3. Thus, the width of the exit end of slot 5 is a little smaller than the diameter of opening 3. The opening may also have a different shape, for instance elongated. In such an embodiment, the spacing plates may be described as having two legs, or being U-shaped.

[0037] The perimeter 2 can be imaginary continued at the entrance end of slot 5. Here, the spacing plate is substantially round or circular. Thus, the perimeter in this embodiment, when continued at the entrance end of slot 5, is here a circle. Other shapes of the perimeter are also possible, like square, rectangular, elliptic, a polygon, horseshoe-shaped, and the like.

[0038] The spacing plate 1 has a rear surface 10, visible in figures 2 and 3, and a top surface 11. In order to save material, the top surface is provided with a material-saving recess 9 and the rear surface 10 is provided with a material-saving front surface 11. Here, the rear surface 10 provides a substantially flat abutment plane. The top surface 11 provides a substantially flat abutment plane up to a defined line that is away from the centre of the spacing plate. Beyond that line, the top surface here runs shallow towards the perimeter 2, providing a wedge por-

tion to the spacing plate 1.

[0039] In the current embodiment, the opening 3 and slot 5 define two opposite legs. The wedge portion is provided at the end of the two legs, thus here in fact defining two wedge portions 4, 4'. These two wedge portions 4, 4' together define one wedge portion. Thus, an end of the spacing plate 1 defines a keg portion.

[0040] The spacing plate 1 has a non-return means, in this embodiment in the slot 5. This prevents the spacing plate 1 to get detached from a shank after placement.

[0041] Here, the non-return means comprises a blocking arm 6, 6'. Here, in fact, two blocking arms 6, 6' are provided. These blocking arms 6, 6' are resilient, in particular resilient in the plane of the spacing plate 1 and the opening 3. A blocking arm 6, 6' can thus move between a blocking position, shown for instance in figure 1, to a freeing position. This last position is shown in figure 3 in the solid lines. In fact, in figure 3 an example is shown where the blocking arms move from the blocking position to free position. In the blocking position, a blocking arm 6, 6' is unbiased. A blocking arm 6, 6' is to be urged away to allow for instance a shank to pass through slot 5 and to get into opening 3.

[0042] In the embodiment of figures 1-3, there are two opposite blocking arms 6, 6' provided. These blocking arms 6, 6' are here symmetrically with respect to a line of symmetry of slot 5.

[0043] A blocking arm 6, 6' is at one end attached near the entrance end of slot 5. The design allows a blocking arm 6, 6' to flex from the closed position to the freeing position. Here, blocking arm 6, 6' has an end attached at or near perimeter 2. In this embodiment, a blocking arm 6, 6' extends (in its unbiased state, in its blocking position, at an angle of about 40-50 degrees with respect to a centre line of the slot 5. In this embodiment, the centre line of the slot 5 substantially is on the centre of opening 3.

[0044] The blocking arm 6, 6' has a rear surface. Here, the rear surface of a blocking arm 6, 6' is in plane, or substantially in plane, with the rear surface of rear surface plane of the spacing plate 1. This can be seen in figure 2.

[0045] A blocking arm 6, 6' is provided with a blocking extension 8, 8'. The blocking extension 8, 8' extends in lateral direction from a blocking arm 6, 6'. The blocking extension 8, 8' in fact widens the blocking arm 6, 6' at an end of blocking arm 6, 6'. In particular, it widens an opening exit end blocking arm end of the blocking arm 6, 6'. Blocking extension 8, 8' provides additional blockage of the opening 3. Here, the blocking extension 8, 8' extends in a lateral direction from a blocking arm 6, 6'. In order to allow the blocking arms 6, 6' to close the opening as much as possible at their ends, the blocking extensions 8, 8' here extend in lateral direction away from opening 3. The blocking extension 8, 8' may also be referred to in this embodiment as a blocking foot 8, 8'.

[0046] The opening 3 has a perimeter. Blocking extension 8, 8' comprises a blocking surface 12, 12', directed towards opening 3. Here, the blocking surface 12, 12' of

blocking extension 8, 8' partly continues the perimeter of opening 3. In particular, blocking surface 12, 12' is provided at or near the exit end of slot 5. In the embodiment of figures 1-3, there are opposite blocking arms 6, 6' provided. Each blocking arm 6, 6' has a blocking extension 8, 8'. The blocking extensions 8, 8' extend in opposite direction. Here, the blocking surfaces 12, 12' of the blocking extensions 8, 8' substantially continue the perimeter of the opening 3 at or near the exit end of slot 5. Thus, when a shank is in opening 3, it is more securely retained in opening 3.

[0047] The spacing plate 1 is further provided with a blocking arm receiving recess 7, 7'. The blocking arm receiving recess 7, 7' is adjacent opening 3. The recess 7, 7' is provided to at least partially receive a blocking arm 6, 6' when it is in its freeing position. In figure 3, the blocking arm in solid lines shows a blocking arm 6, 6' in the freeing position where part of the blocking arm 6, 6' is received in the recess 7, 7'. In fact, the recess 7, 7' is here provided to receive the blocking extension. Here, the recess 7, 7' allows the blocking arm 6, 6' to flex away to such an extent that the blocking arm is substantially parallel to a radius of opening 3. It is here parallel to and provides an opening width that is substantially straight. Here, with the two opposite blocking arms 6, 6', the recess 7, 7' allows the blocking arms 6, 6' to flex to a position where the blocking arms 6, 6' are substantially parallel. Thus, they provide and define a straight channel into opening 3. The blocking arms 6, 6' flex to such an extent away from slot 5 to provide a channel width that is substantially equal to or larger than the width of the exit end of opening 3. Here, slot 5 tapes from the perimeter of the spacing plate 1 towards the opening 3.

[0048] In this embodiment, the recess 7, 7' is provided in the rear surface 10 of spacing plate 1. The depth of the recess 7, 7' and the thickness of the blocking arm 6, 6' is adapted that when the blocking arm 6, 6' rests on the bottom of the recess 7, 7', the rear surface of blocking arm 6, 6' is in plane with the further rear surface or rear abutment plane of spacing plate 1. Thus, the spacing plate 1 provides a solid and well-defined, substantially planar rear abutment plane. Large part of the front surface 11 of the spacing plate 1 provides a front abutment plane. Here, the front abutment plane and the rear abutment plane are substantially parallel. Their distance defines the spacing plate thickness d. The wedge portion facilitated placement in narrow slits and spaces.

[0049] The recess 7, 7' is substantially triangular, to be able to easily take up a blocking arm 6, 6' with its blocking extension 8, 8'.

[0050] The blocking arms 6, 6' and the recess 7, 7' allow a spacing plate 1 to be removed from a shank using a tool having two parallel arms that flex the blocking arms 6, 6' to their freeing positions. Thus, easy installation and easy removal if needed can be facilitated. Furthermore, the retaining feature secures the spacing plate 1 after it is installed, preventing it from working itself loose or in other ways displacing from the construction.

[0051] It will be clear that the above description is included to illustrate the working of preferred embodiments, and not to limit the scope of the invention. Starting from the above explanation many variations that fall within the spirit and scope of the present invention will be evident to an expert.

Part list

10 **[0052]**

- 1 spacing plate or shim
- 2 spacing plate perimeter
- 3 opening
- 15 4, 4' keg or wedge portion
- 5 passage
- 6, 6' blocking arm
- 7, 7' blocking arm receiving recess
- 8, 8' blocking extension
- 20 9, 9' material saving recess
- 10 rear surface/rear plane
- 11 front surface/front plane
- 12, 12' blocking surface
- 13 perimeter of the opening
- 25 d spacing plate thickness

Claims

- 30 1. A spacing plate (1) comprising a perimeter (2), an opening (3), and a slot (5) providing access to said opening, said slot having an entrance end at said perimeter (2), an exit end communicating with said opening, and a non-return means in said slot (5), wherein said non-return means comprises a resilient blocking arm (6, 6') extending in said slot, said blocking arm at its end provided with a blocking extension (8, 8'), **characterised in that** said spacing plate (1) further comprises a blocking arm receiving recess (7, 7') for receiving a blocking arm (6, 6') in a biased, freeing position in which it frees passage to said opening (3).
- 35 2. The spacing plate (1) of claim 1, a surface of said blocking arm abuts a surface of the recess, and a rear surface of the blocking arm is in a plane with the rear surface of rear plane of the spacing plate.
- 40 3. The spacing plate (1) of claim 1 or 2, wherein the recess (7, 7') is provided in the rear surface (10) of spacing plate (1), and the depth of the recess (7, 7') and the thickness of the blocking arm (6, 6') are adapted that when the blocking arm (6, 6') rests on the bottom of the recess (7, 7'), the rear surface of blocking arm (6, 6') is in plane with the further rear surface or rear abutment plane of spacing plate (1).
- 45 4. The spacing plate (1) of any one of the preceding

claims, further comprising a wedge portion (4, 4'), in particular said wedge portion (4, 4') tapering from a line at a distance from a centre line of said spacing plate (1) towards the perimeter (2) of the spacing plate (1) line, in particular said wedge portions (4, 4') having substantially a thinnest end at said spacing plate perimeter (2). 5

5. The spacing plate (1) of any one of the preceding claims, wherein said opening (3) has an opening perimeter (13), said spacing plate (1) further comprising a said blocking arm (6, 6') at each side of said slot (5), providing opposite blocking arms (6, 6'), said blocking arms (6, 6') together in unbiased state blocking access to said opening (3) in a blocking position, in particular said blocking extension (8, 8') comprising blocking surfaces (12, 12') which with said blocking arms in said blocking position substantially block said exit end of said slot (5) and defining at least part of said opening perimeter (13). 10 15 20

6. The spacing plate (1) of any one of the preceding claims, wherein said opening (3) substantially is a round hole, defining said opening perimeter (13) as substantially a circle. 25

7. The spacing plate (1) of any one of the preceding claims, wherein the blocking arm (6, 6') extends substantially from said spacing plate perimeter (2) towards the opening (3) and into the slot (5). 30

8. The spacing plate (1) of any one of the preceding claims, wherein said blocking arm receiving recess (7, 7') is provided at the back surface (10) of the spacing plate (1). 35

9. The spacing plate (1) of any one of the preceding claims, wherein said opening (3) and said slot (5) define two legs, wherein said legs end in a wedge portion (4, 4'), in particular said wedge portion (4, 4') tapering from a line at a distance from a centre line of said spacing plate (1) towards the perimeter (2) of the spacing plate (1) line, in particular said wedge portions (4, 4') having substantially a thinnest end at said spacing plate perimeter (2), more in particular said blocking arm having an end at or near said substantially thinnest end. 40 45

10. A method for filling a slit or space between building elements, said method comprising using the spacing plate of any one of the preceding claims, and placing said spacing plate over a shank, in particular a shank of a fastener, like a screw, a nail, a bolt, and the like. 50

11. Use of a spacing plate of any one of the preceding claims in a building. 55

12. A spacing plate (1) comprising a perimeter (2), an

opening (3), and a slot (5) providing access to said opening, said slot having an entrance end at said perimeter (2), an exit end communicating with said opening, and a non-return means in said slot (5), wherein said non-return means comprises a resilient blocking arm (6, 6') extending in said slot, said blocking arm at its end provided with a blocking extension (8, 8').

Fig. 1

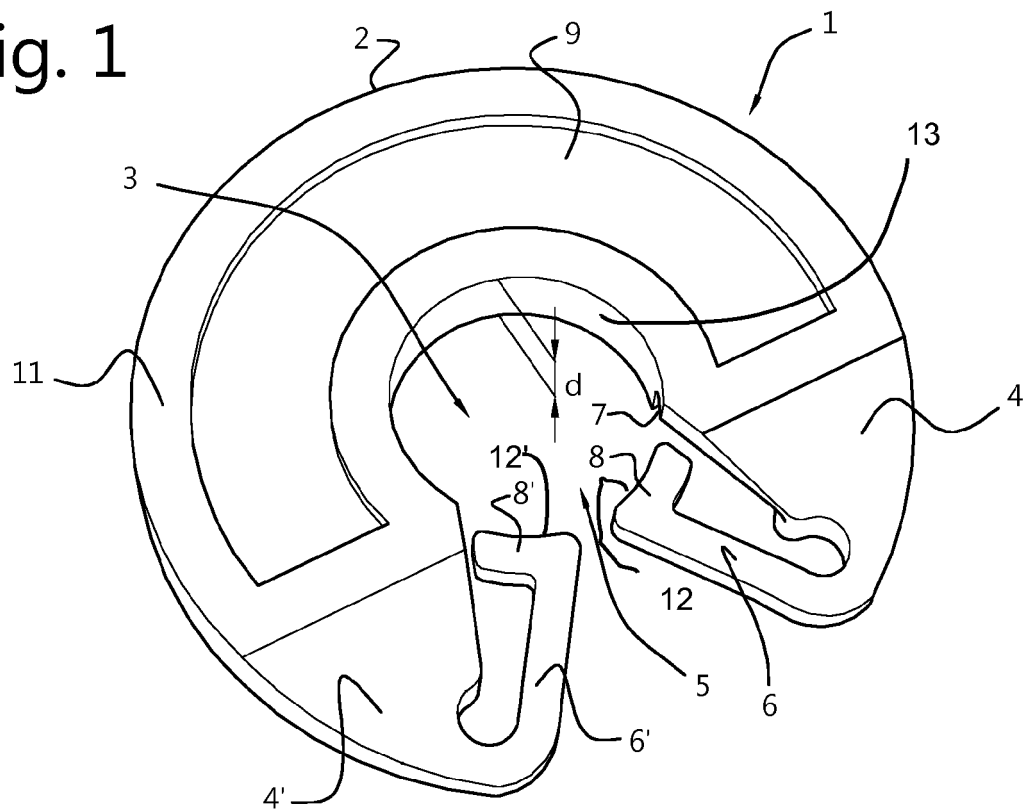


Fig. 2

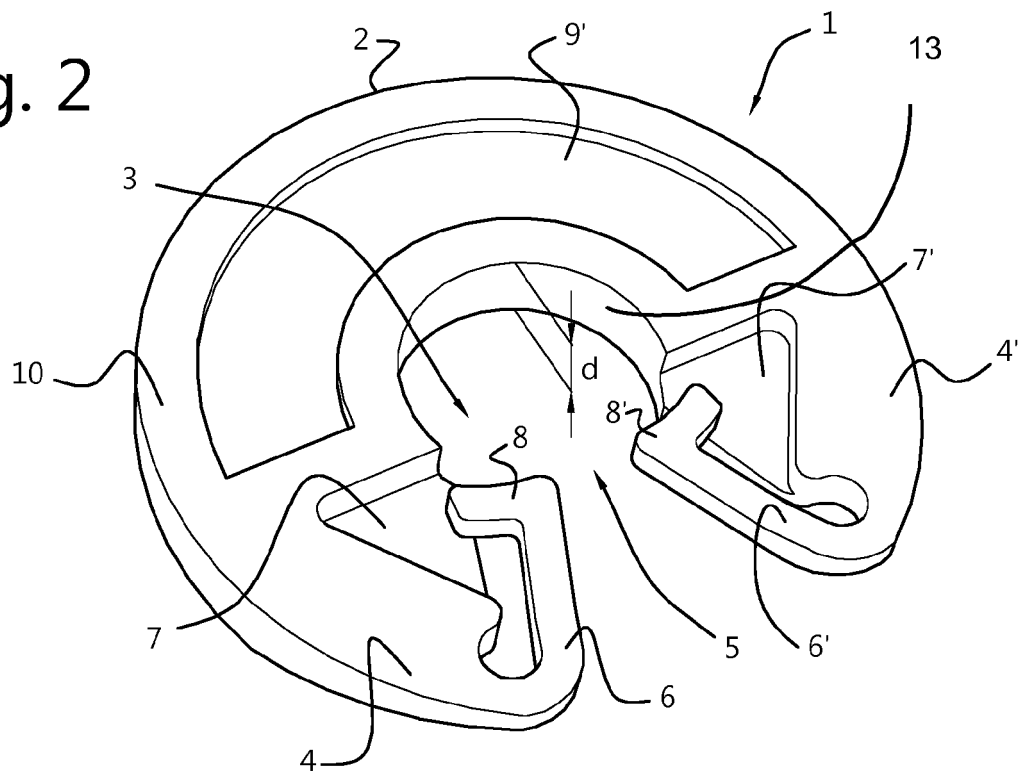
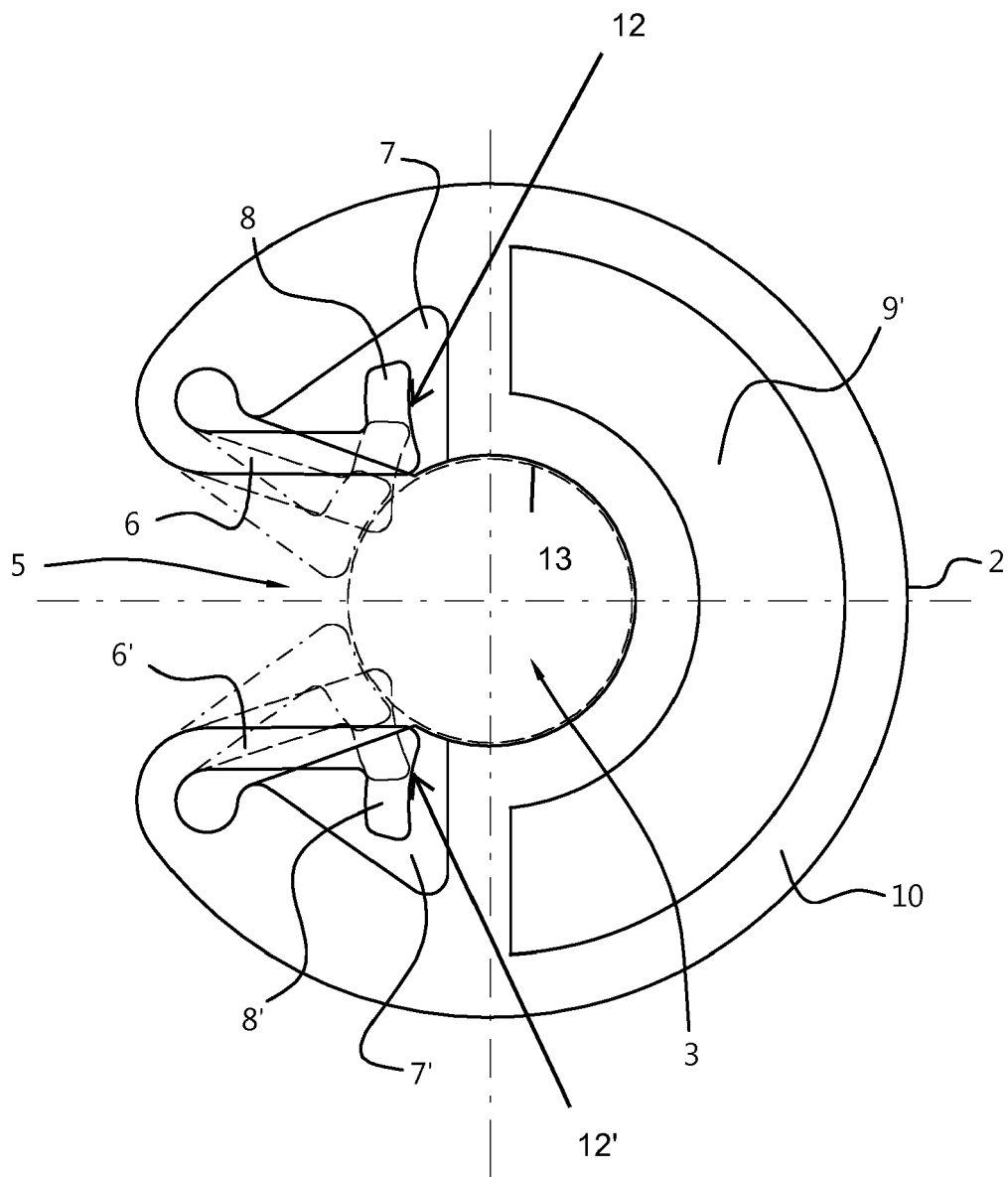


Fig. 3





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Place of search		Date of completion of the search	Examiner
The Hague		26 October 2015	Verdonck, Benoit
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	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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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
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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