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(54) **Movable rack**

(57) The dishwasher basket (1) according to the present invention comprises a couple of fastening elements (4) attached to the wires of mutual walls of the basket (1); a support arm (3) having one end attached to such fastening elements (4) and being rotatable around a horizontal axis; and a rack (2) which is attached to said arm (3) from at least one slot provided at one edge thereof and which can perform rotational motion with re-

spect to said arm (3). Said rack (2) has a grid-like structure with gaps (21) provided on it, into which cutlery such as forks (5), spoons (6) are placed vertically so as to become 'suspended'. The wider sections of such cutlery -which are passed through these gaps (21) by their narrower sections- are leaned against the grids (22) which surround said gaps (21) and become 'suspended' in this way.

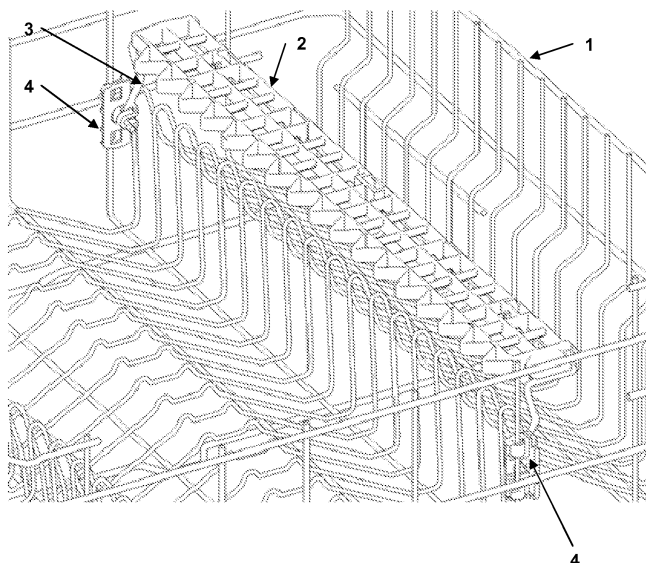


Figure – 1

Description

Technical Field

[0001] The present invention relates to dishwasher baskets and to movable rack arrangements placed in such baskets.

Prior Art

[0002] It is a preferable feature for the dishwashers, as one of the widely-used kitchen equipment nowadays, to efficiently wash relatively more kitchen utensils at one time. Therefore it becomes important to place the voluminous utensils such as pans, pots, plates, glasses, etc. in the most space-efficient way, whereas different placement apparatuses are being developed to efficiently wash other 'smaller' tableware such as forks, spoons, knives, etc. The mostly used one, as it is known, is the baskets to contain forks, spoons, knives, etc. placed in the lower basket of the dishwasher. The cutlery is positioned in the containers provided in this basket vertically, whereas the contact in between of most of them (e.g. forks, spoons, etc.) prevents the achievement of an efficient washing. Therefore the machine producers develop different basket or rack designs for forks, spoons, and knives.

[0003] In the published patent applications EP1275336 and EP1384431 of the prior art is disclosed a cutlery rack, which can be attached to the lateral wires of the dishwasher basket pivoting about an axis. Since the rack embodiment disclosed here can be pivoted around a single axis only, it cannot be closed in different positions in order to gain space. Furthermore, since it can be attached to one side of the basket only, it cannot be placed in the desired position in the basket.

Brief Description of Invention

[0004] The dishwasher basket according to the present invention comprises a couple of fastening elements attached to the wires of mutual walls of the basket; a support arm having one end attached to these fastening elements and being rotatable around a horizontal axis; and a rack which is attached to said arm from at least one slot provided at one edge thereof and which can perform rotational motion with respect to said arm.

[0005] Said rack has a grid-like structure with gaps provided on itself, into which cutlery such as forks, spoons are placed vertically so as to be 'suspended' therein. Put differently, the wider sections of cutlery -which are passed through these gaps by their narrower sections- are leaned against the grids which surround said gaps and become 'suspended' in this position. The fact that such cutleries are 'suspended' by the rack separately ensures a more efficient washing. Furthermore, the spaces left among other kitchen utensils in the basket are made use of.

[0006] One edge of the rack is also provided with a surface having indented sections onto which cups, goblets, etc. are leaned. For instance, a goblet is leaned from its handgrip so as to be placed properly into the basket.

Objective of Invention

[0007] The objective of the present invention is to ensure the proper and safe placement of tableware or cutlery such as goblets, cups, forks, spoons, knives, etc. by means of the same rack in a dishwasher basket.

[0008] A further objective of the present invention is to ensure the placement of glasses of various shapes and sizes by means of a rotatable rack arrangement.

[0009] Another objective of the present invention is to produce a rack which can be folded and closed in different positions while not being used and to provide a structure which would not avoid its placement.

[0010] Yet another objective of the invention is to produce a rack arrangement which would not occupy space and not reduce the basket's utilizable volume.

[0011] Still another objective of the present invention is to ensure the more efficient washing of cutlery such as forks, spoons, etc. by having them 'suspended' vertically and separately from each other in the rack.

[0012] Still a further objective of the present invention is to make use of the spaces left among other kitchen utensils in the basket by 'suspending' the cutlery such as forks, spoons, etc. to the rack in a vertical manner.

[0013] Yet a further objective of the present invention is to produce a rack arrangement, which can be assembled to existing dishwasher baskets and at the same time contains a low number of simple components.

[0014] A further objective of the present invention is to produce an inexpensive and reliable rack arrangement which can be assembled in a quick manner.

Description of Figures

[0015] An exemplary dishwasher basket according to the present invention is illustrated in annexed figures as described below in brief.

Figure 1 is a perspective view of the dishwasher basket.

Figure 2 is a perspective view of the rack from below.

Figure 3 is a perspective view of the arm.

Figure 4 is a side view of the basket, while the rack is positioned for use.

Figure 5 is a side view of a goblet as leaned against the rack.

Figure 6 is a side view of the circumstance in which a spoon and fork are placed in the rack.

Figure 7 is a front view of the rack in the folded position.

Figure 8 is a view of the rack in the closed position on the basket.

Figure 9 is a perspective view of the rack as being

placed on the fastening element.

Figure 10 is a perspective view of the fastening element from the rear.

Figure 11 is a perspective view of the fastening element from the front.

[0016] The parts in said figures are individually enumerated as following.

Dishwasher basket (1)

Rack (2)

Support arm (3)

Fastening element (4)

Fork (5)

Spoon (6)

Goblet (7)

Gap (21)

Grid (22)

Slot (23)

Aperture (24)

Inner cavity (25)

Lower section (26)

Detent (27)

Glass leaning surface (28)

Central section (31)

Lateral support (32)

Foot (33)

Tip section (34)

Rear surface (40)

Detent (41)

Groove (42)

Front surface (43)

Bearing (44)

Channel (45)

Inner cavity (46)

Protrusion (47, 47')

Leaning surface (48, 48')

Detent (49)

Description of Invention

[0017] The dishwasher basket (1) of which the perspective view is given in Figure 1 comprises a couple of fastening elements (4) attached to the wires of mutual walls of the basket (1); a support arm (3) having one end attached to these fastening elements (4) and rotatable around a horizontal axis; and a rack (2) which is attached to said arm (3) from at least one slot (23) (Figure 2) provided at one edge thereof and which can perform rotational motion with respect to said arm (3).

[0018] The rack (2) of which the perspective view is given from below in Figure 2 has a grid-like structure provided with gaps (21) into which cutlery such as forks (5), spoons (6) etc. are placed vertically (Figure 6). Put differently, the wider sections of such cutlery -which are passed through these gaps (21) by their narrower sections- are leaned against the grids (22) which surround said gaps (21) and become 'suspended' in this position.

[0019] The support arm (3) illustrated in Figure 3 has

a wire shaped structure and comprises a central section (31) onto which the rack (2) is attached in a rotatable manner, a couple of lateral supports (32) bent by around right angles at both ends of said central section (31), feet (33) formed by bending one each end of said supports (32) downwards, and tip sections (34) formed at the termination of said feet (33) in a curved fashion.

[0020] At one edge of said rack (2) is provided at least one slot (23) (Figure 2) that is attached to the central section (31) of the arm (3), as mentioned above. An aperture (24) is provided at one edge of the slot (23), so that the central section (31) is passed forcefully through this aperture (24) and placed into the inner cavity (25) of the slot (23). Once the central section (31) is placed into this inner cavity (25), the rack (2) becomes capable to perform rotational motion with respect to the arm (3).

[0021] As illustrated in figures 4 to 6, the lower section (26) of the rack rests against the lateral supports (32) of the arm (3) during use, providing the rack (2) with a substantial horizontal positioning. In order to maintain the rack (2) in this position, i.e. resting tightly on the arm (3) and not swinging, one flexible detent (27) is provided at the lower section (26) of the rack for attachment to each lateral support (32). Thanks to attaching said detents (27) to said lateral supports (32) in a flexible manner, the rack (2) becomes coupled to the arm (3) from the sides as well.

[0022] As illustrated in Figure 2, at the counter edge of the section provided with the slots (23) are provided leaning surfaces for goblets, cups, etc. (28) with indented sections. As illustrated in the exemplary embodiment of Figure 5, a goblet (7) is leaned from its handgrip against these surfaces (28) and it (7) thereby is placed properly into the basket (1).

[0023] When it is not necessary to use the rack (2), it is positioned as illustrated in figures 7 and 8. While the rack (2) is in the horizontal position, the detents (27) are flexibly detached from the lateral supports (32) so that the rack (2) is tipped upwards and brought into vertical position (Figure 7), being suspended from the slots (23). When the rack is not in use, this feature enables to gain space for the placement of other kitchen utensils into the basket (1).

[0024] Similarly, by turning the arm (3) to the side that is opposite to the one which holds the rack (2) in the horizontal position, the rack (2) rests on the base of the basket (1) so that space is gained again for other utensils. Bringing the rack (2) particularly to the position illustrated in Figure 8 (when the rack (2) settles on the basket (1) base) is realized both by means of the rotation of rack (2) with respect to the arm (3), and by means of the rotation of arm (3) with respect to the fastening elements (4).

[0025] Figure 9 is a perspective illustration of a fastening element (4) to the basket (1) wires. As illustrated in Figure 10, at least one groove (42) and detent (41) are provided at the rear surface (40) of the fastening element (4) for attachment to the basket (1) wires. The fastening element (4) is attached to the interior of the basket (1)

so that its rear surface (40) leans against the basket (1) wires. Whilst said grooves (42) rests against the wires and positions said element (4), the detents (41) clutches the wires tightly and avoids the dislocation or removal of the apparatus (4). Said grooves (42) may be formed in a horizontal, vertical, or angular manner so as to intercept each other. If it is desired, the interception points of grooves (42) can be superimposed with the interception points of basket (1) wires so that any horizontal (right-left) or vertical (up-down) displacement of the element (4) is blocked. Thanks to said grooves (42) and detents, the apparatus (4) can be adapted to any kind of dishwasher baskets and any desired vertical and horizontal positioning can be adjusted.

[0026] As shown in Figure 9, fastening elements (4) are connected mutually to the sides of the basket (1) so as to hold the support arm (3). On the front surface (43) of the fastening element (4) illustrated in Figure 11 is provided a rotation bearing (44) to which the foot (33) of the support arm (3) is connected. Said bearing (44) is "U" shaped and extends outwardly from the front surface (43) of the fastening element (4). A channel (45) is provided, which surrounds the side surfaces of the bearing (44) and allows the support arm's (3) foot (33) to make a turn. This channel (45) is adjacent to the inner cavity (46) of said 'U' shaped formation. The tip section (34) of the support arm (3) is supported by means of this inner cavity (46). Thus, while said tip section (34) is capable to rotate around itself within the inner cavity (46), it becomes possible to rotate said foot (33) along said channel (45) so as to sweep an arc. Two protrusions (47, 47') are provided in the inner cavity (46) of said 'U' shaped formation. These protrusions (47, 47') extend outwards to a certain extent in a form that defines a circular surface at the base of said 'U' formation. The distance between the protrusions (47, 47') provides an aperture into which said tip section (34) is introduced forcibly. After the tip section (34) passes through this aperture, it rests against the circular surface at the base of said 'U' shaped formation and is supported here so as to perform rotational motion. Additionally, a couple of leaning surfaces (48, 48') provided on the front surface (43) of the fastening apparatus (4), whereon (48, 48') the foot (33) is leaned, defines the final positions of said foot (33).

[0027] As an alternative embodiment of the present invention, said fastening element (4) further comprises a plurality of detents (49) arranged side by side on the front surface (43) thereof (4). While the support arm (3) rotates on the fastening element (4), said feet (33) become tightened in between said detents (49), fixing the position of said support arm (3). Thanks to placing the foot (33) between any two detents (49) of those arranged side by side, it becomes possible to fix the support arm (3) at more than one position. Thereby, it becomes further possible to position the rack (2) even at different angles. This feature brings an advantage in positioning the goblets and cups of different height.

[0028] In addition to what's been described above, the

fact that the unit according to the present invention comprises a low number of simple components, and the fact that it can be mounted to a basket (1) by means of a plurality of grooves (42) and detents (41) provided on the rear surface (40) of the fastening element (4), makes the subject unit applicable to existing dishwasher baskets as well. Put differently, said fastening element (4) can be attached to baskets of various designs by means of a plurality of grooves (42) provided at the rear surface (40) of said element (4). Thanks to the mutually-intercepting structure of these grooves (42) (transverse or vertical interception), it becomes possible to easily attach the fastening element (4) to the interception points of the basket (1) wires and avoid their lateral dislocation. The detents (41) provided at the rear surface (40) of the fastening element (4) clutches the basket wires, this fact also contributing to the fixation of said element (4).

[0029] The placement of the support arm (3) into the fastening element (4) also provides an easy assembly. The tip part (34) of the arm (3) is passed through said channel (45) and is tightened between the protrusions (47, 47') so as to settle on the circular surface in the inner cavity (46). Both tips (34) of the support arm (3) are attached to the fastening elements (4) in this manner and their feet (33) assume a position by which they can be caught between the detents (49). Thus, the unit according to the present invention is assembled in an easy and quick manner.

Claims

1. A dishwasher basket (1) comprising a couple of fastening elements (4) attached to the wires of mutual walls of the dishwasher basket (1) and a wire-shaped support arm (3) having one end attached to these fastening elements (4) and being rotatable around a horizontal axis, **characterized by** comprising a rack (2) with a grid-like structure, which, by means of at least one slot (23) provided at each one of its edges, is attached to said arm (3), which can rotate with respect to said arm (3), which has gaps (21) on itself, into which cutlery is passed and positioned vertically, and which also has indented leaning surfaces (28) for goblets, cups, etc. on the edge that is opposite to the edge of said slots (23).
2. A dishwasher basket (1) according to Claim 1, **characterized in that** said support arm (3) comprises a central section (31) onto which the rack (2) is attached in a rotatable manner, a couple of lateral supports (32) bent by around right angles at both ends of said central section (31), feet (33) formed by bending one each end of said supports (32) downwards, and tip sections (34) formed by one curve at the termination of said feet (33).
3. A dishwasher basket (1) according to Claim 2, **char-**

acterized in that a slot (23) at one edge of the rack (2) is attached to the central section (31) of the arm (3).

4. A dishwasher basket (1) according to Claim 3, **characterized in that** an aperture (24) is provided at one edge of the slot (23), through which (24) said central section (31) is passed forcibly. 5

5. A dishwasher basket (1) according to Claim 3, **characterized in that** an inner cavity (25) is provided in said slot (23), where (25) the central section is placed and in which the rack (2) can be rotated with respect to the arm (3). 10
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6. A dishwasher basket (1) according to Claim 2, **characterized in that** flexible detents (27) are provided at the lower section of rack (2), one such detent (27) being attached to each lateral support (32). 20

7. A dishwasher basket (1) according to Claim 1, **characterized in that** at least one groove (42) and detent (41) are provided at the rear surface (40) of the fastening element (4) for attachment to the basket (1) wires. 25

8. A dishwasher basket (1) according to Claim 2, **characterized in that** each fastening element (4) comprises a rotation bearing (44) on its front surface (43), the foot (33) of said support arm (3) being fastened to said rotation bearing (44), and the tip sections (34) thereof being supported by the inner cavity (46) of said bearing (44). 30

9. A dishwasher basket (1) according to Claim 8, **characterized in that** a couple of leaning surfaces (48, 48') are provided on the front surface (43) of each fastening apparatus (4), said foot (33) being rested against said surface (48, 48') so that the final position of said foot (33) is defined by means of said surface (48, 48'). 35
40

10. A dishwasher basket (1) according to Claim 8, **characterized in that** a plurality of detents (49) are provided on the front surface (43) of each fastening apparatus (4), said feet (33) being tightened in between such detents (49). 45
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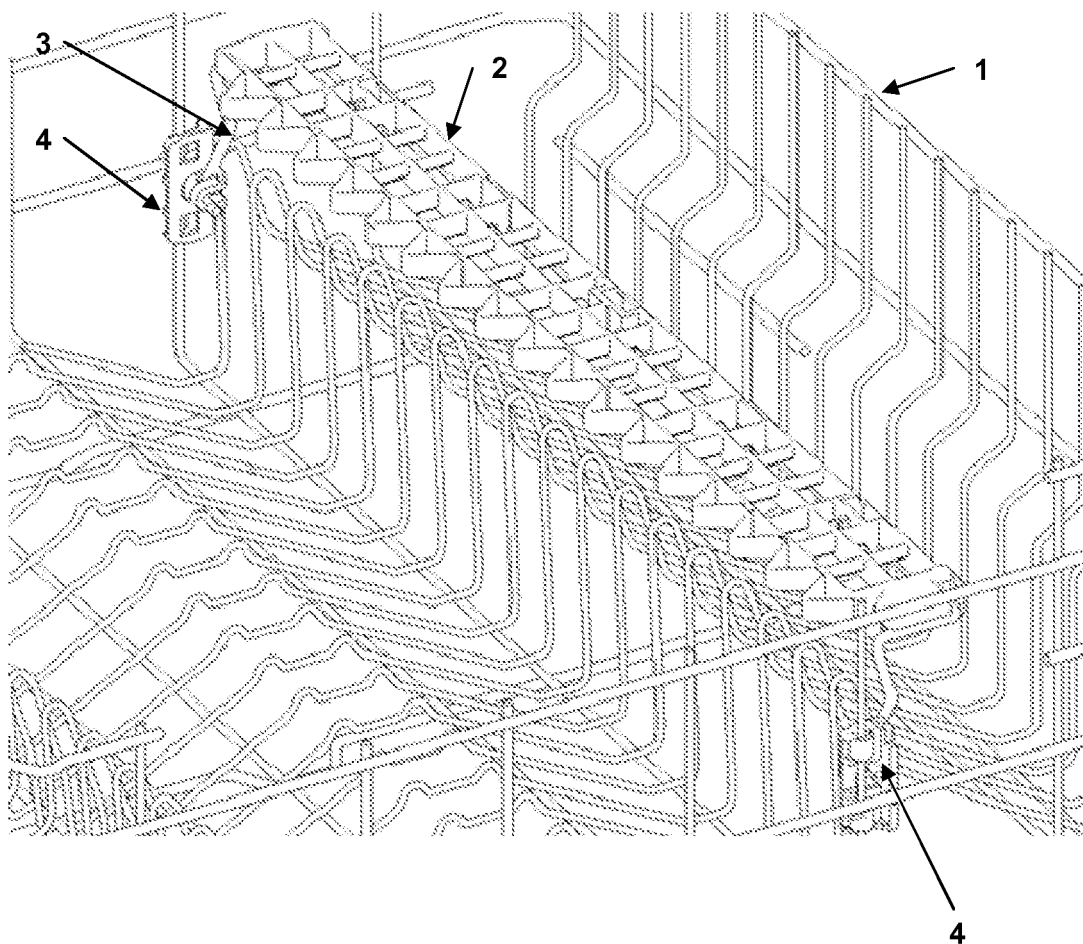
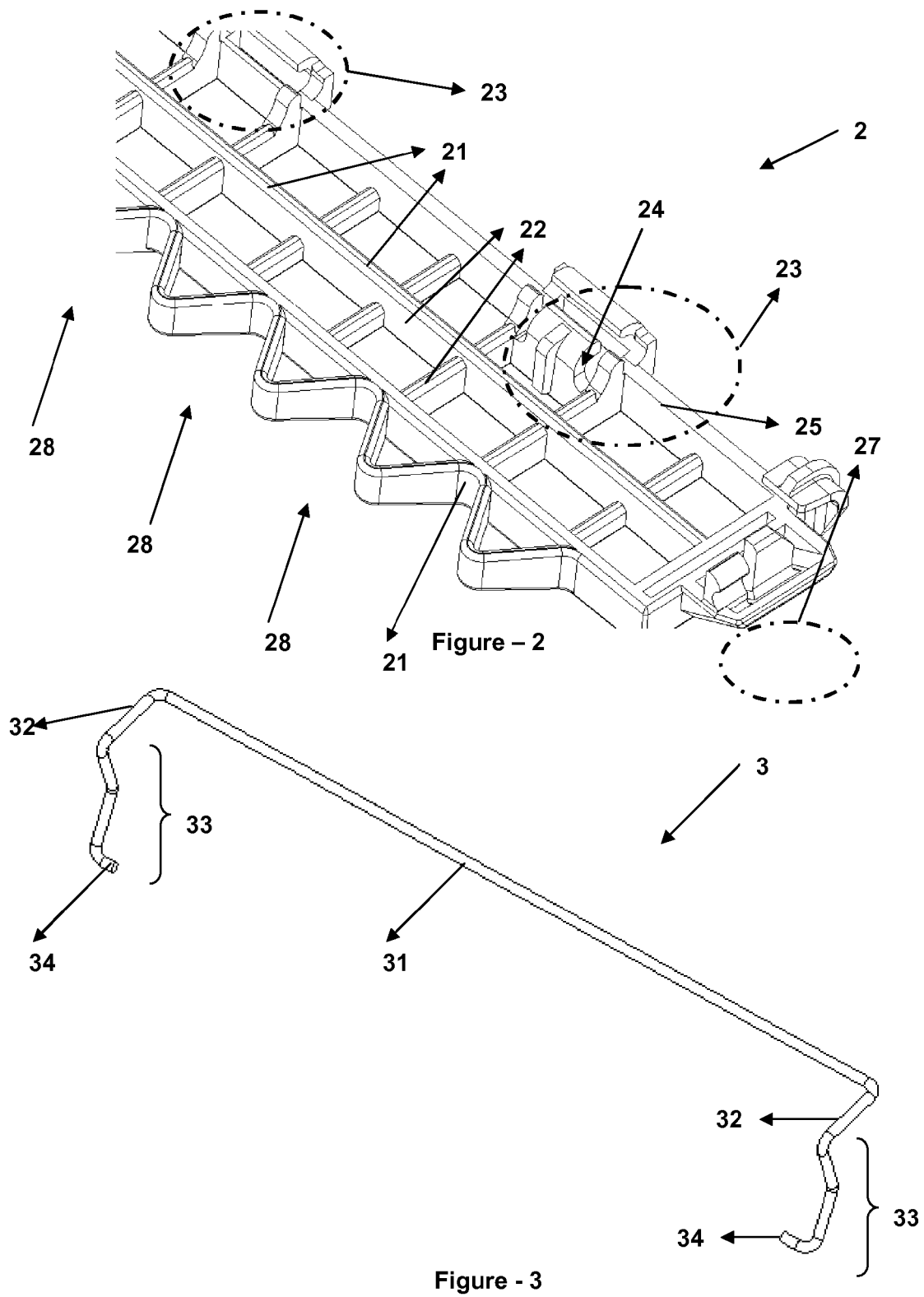


Figure – 1



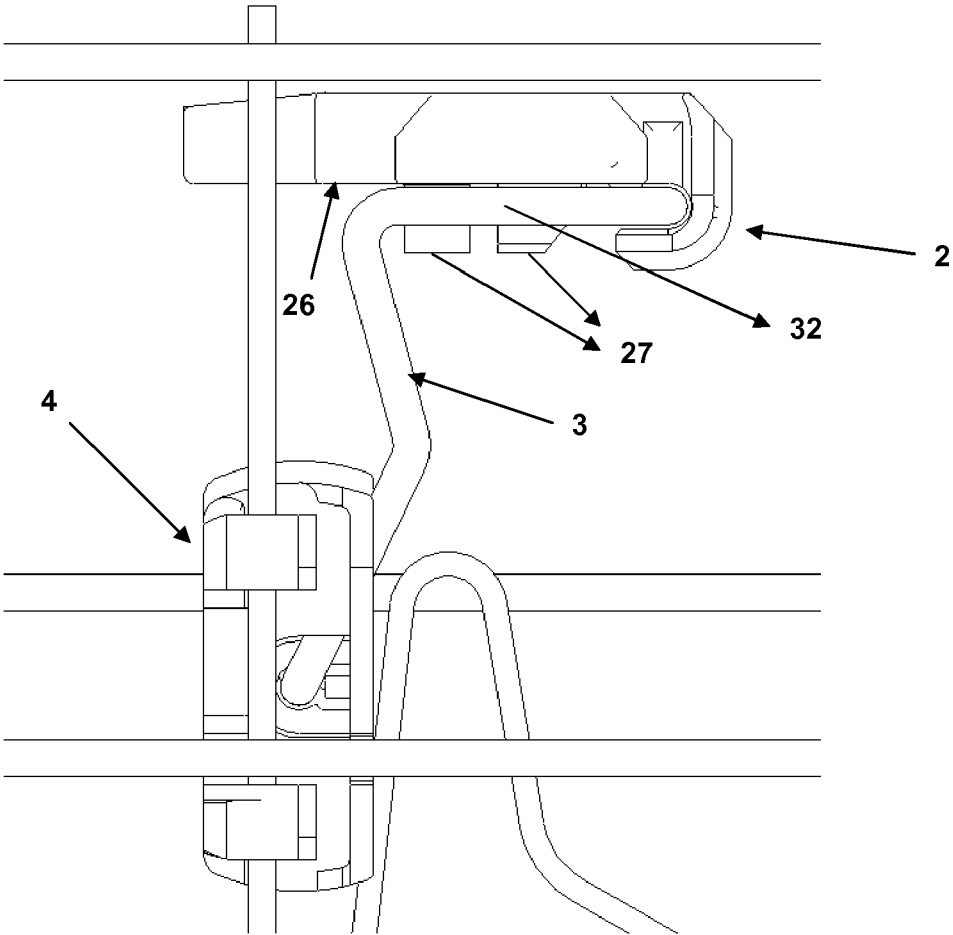


Figure – 4

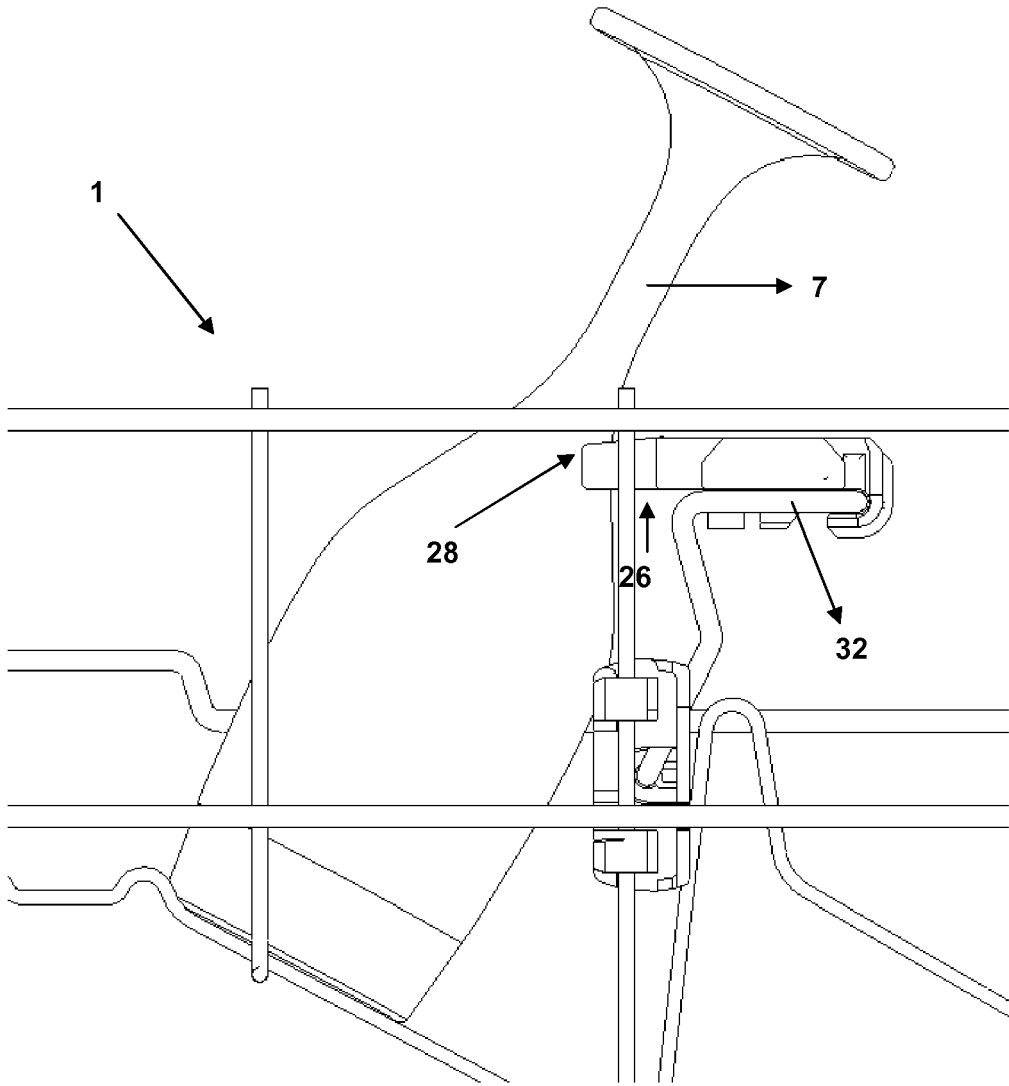


Figure – 5

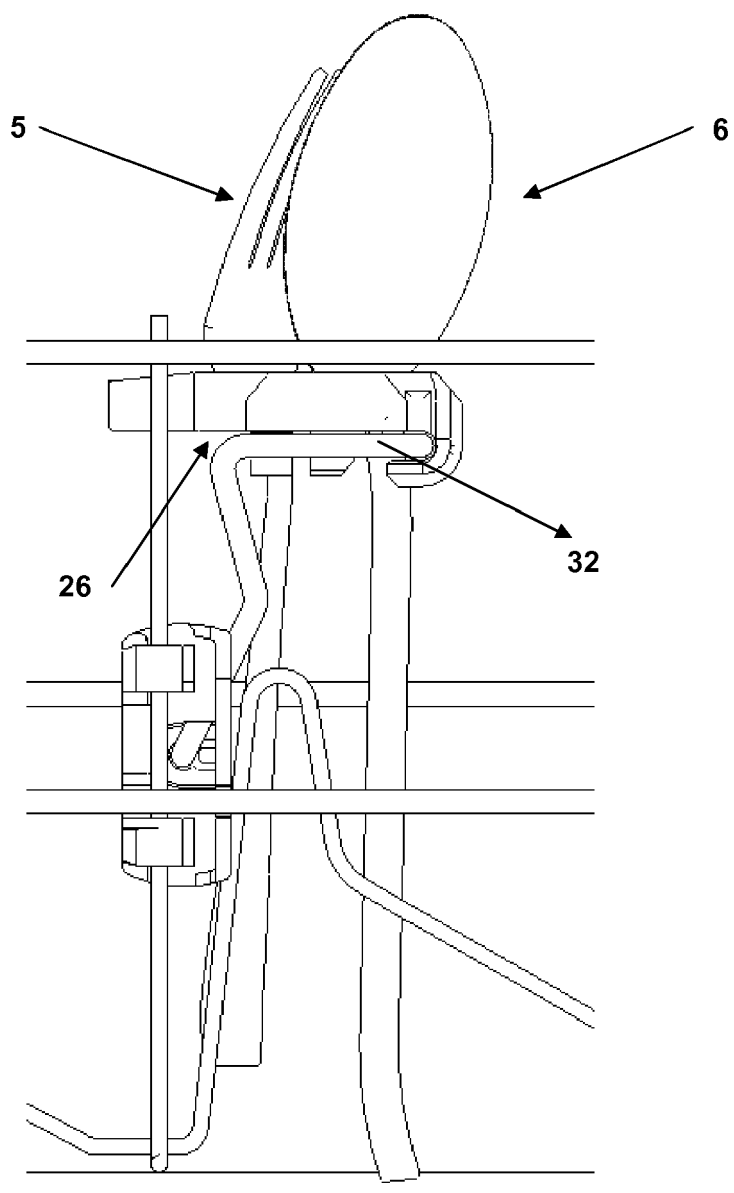


Figure – 6

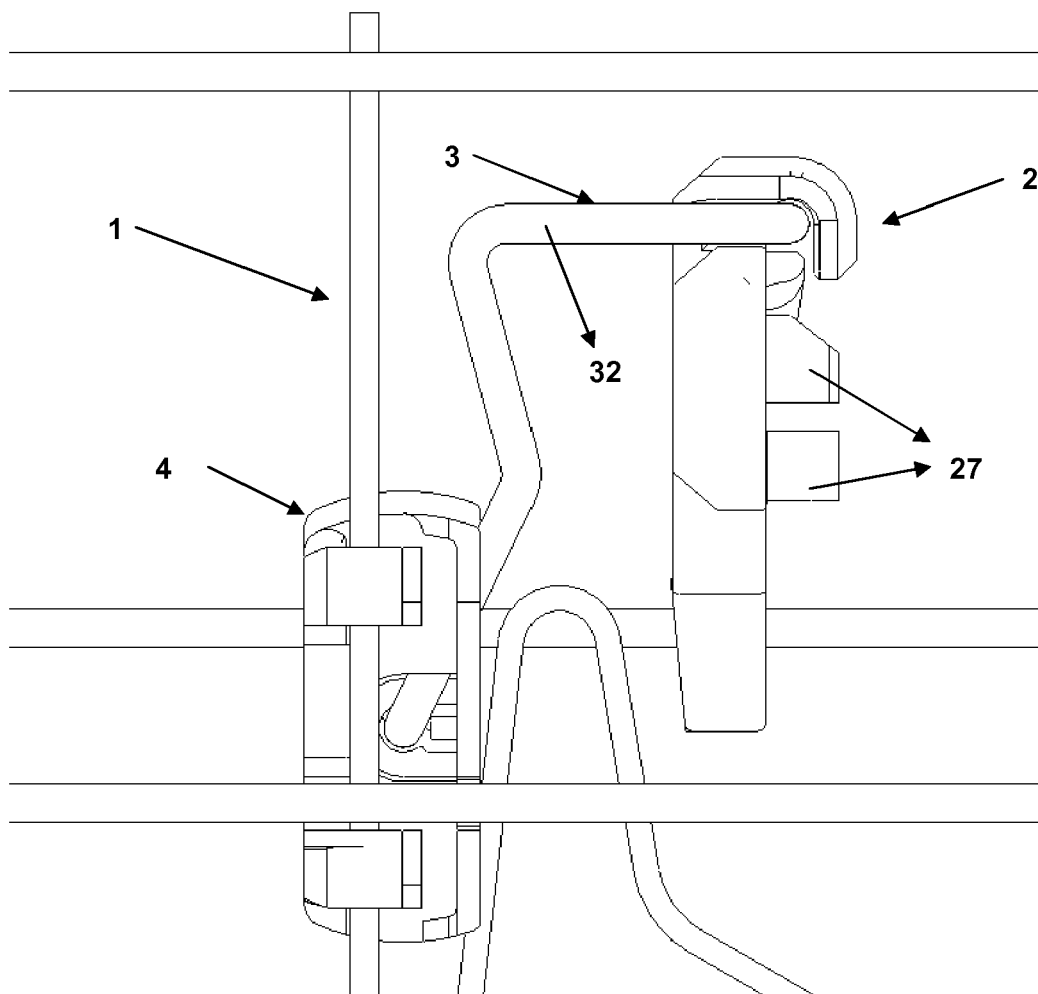


Figure – 7

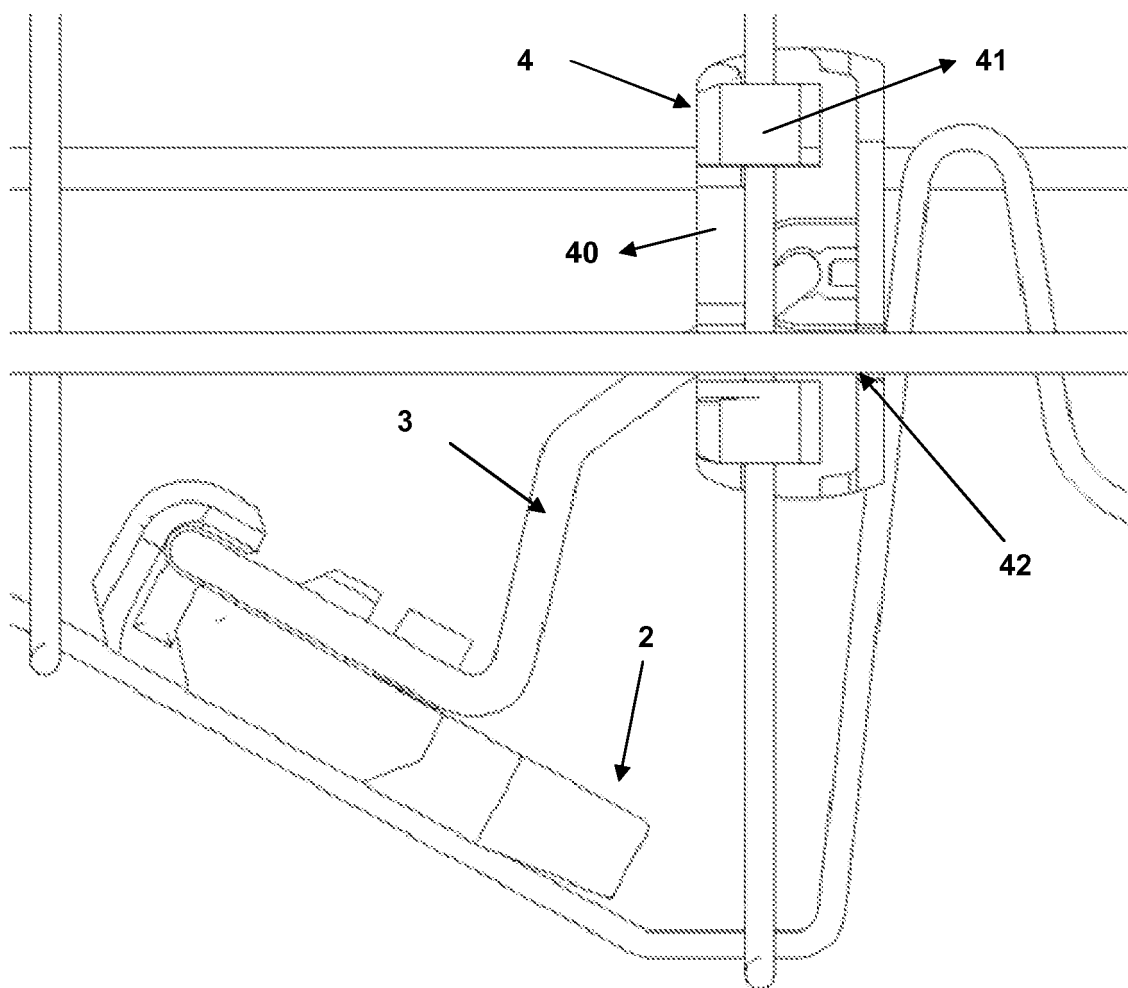


Figure – 8

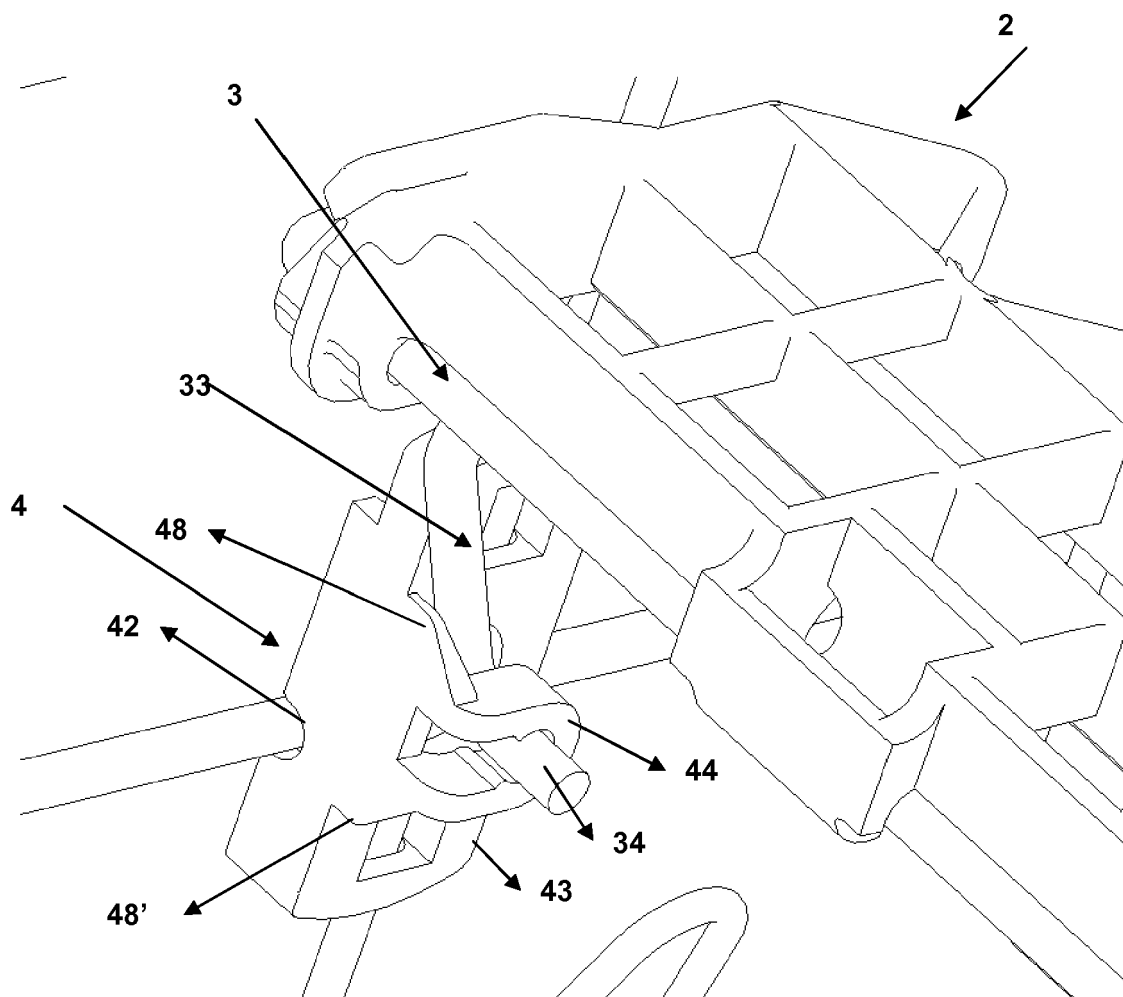


Figure – 9

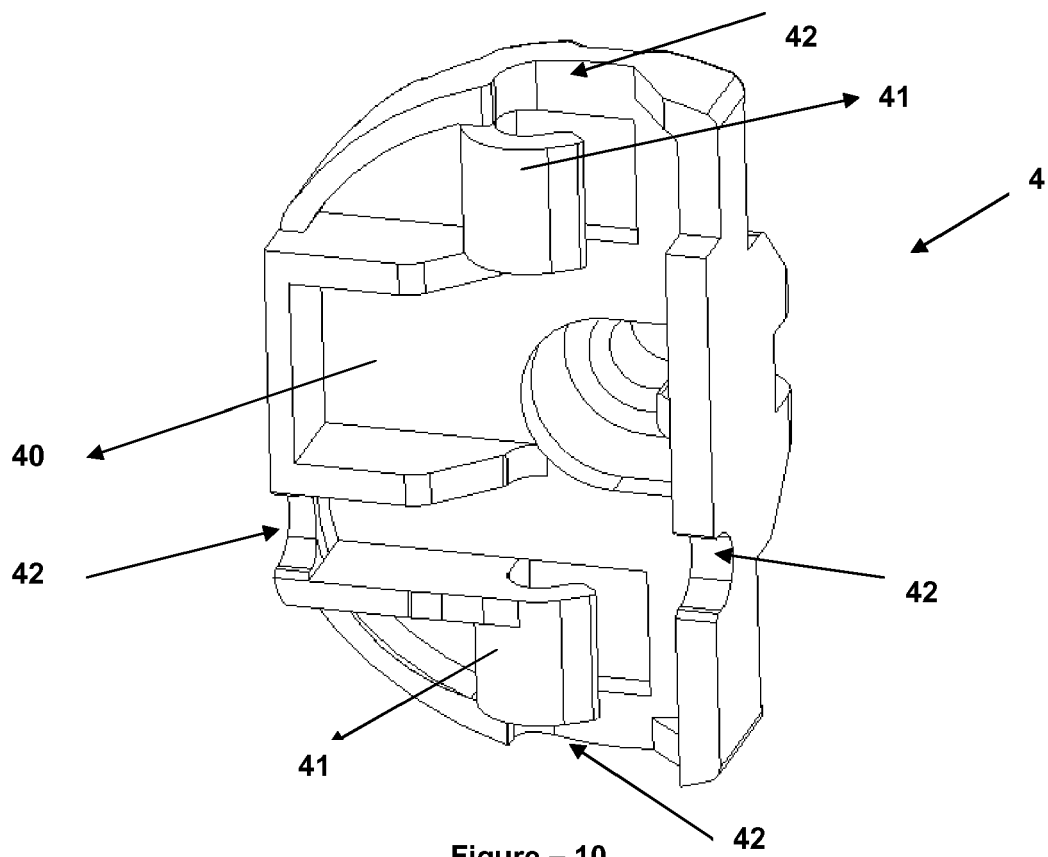


Figure - 10

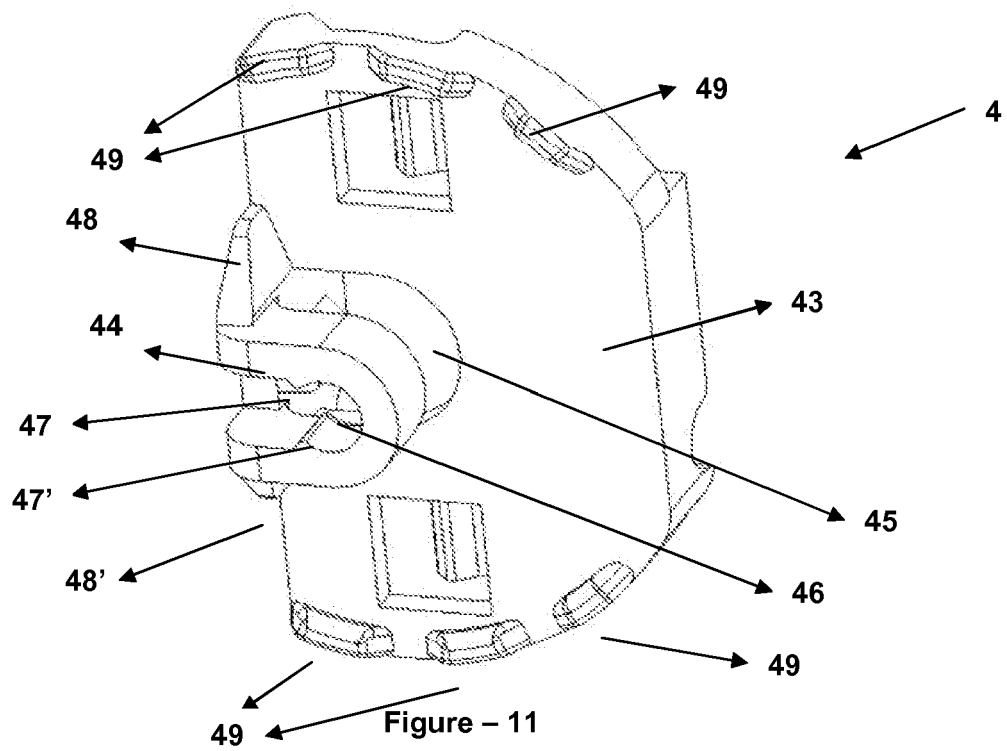


Figure - 11



EUROPEAN SEARCH REPORT

Application Number
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Place of search Munich		Date of completion of the search 17 November 2008	Examiner Hubrich, Klaus
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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