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(54) A dishwasher rack comprising folding/tilting supports and at least a stop element that can be separated from the rack

(57) A dishwasher rack (1) comprising a bottom (30) from which a plurality of walls (31,32,33,34) extend, a first tilting support (3) positioned on the bottom (30) of the rack (1), wherein the first support (3) comprises segments (18) for supporting crockery, and said first support (3) is movable between a raised position, in which the segments (18) extend inside the rack (1), and a lowered position, in which the segments (18) are substantially parallel to the bottom (30), said segments (18) being coupled to a base wire (16) positioned on the bottom (30) of the rack (1) able to rotate about its own axis, and wherein the raised position of the first support (3) is made stable by the interference between the wires of the rack (1) and at least one bent end (17) of the base wire (16), wherein said bent end (17) acts as an end-of-travel element.

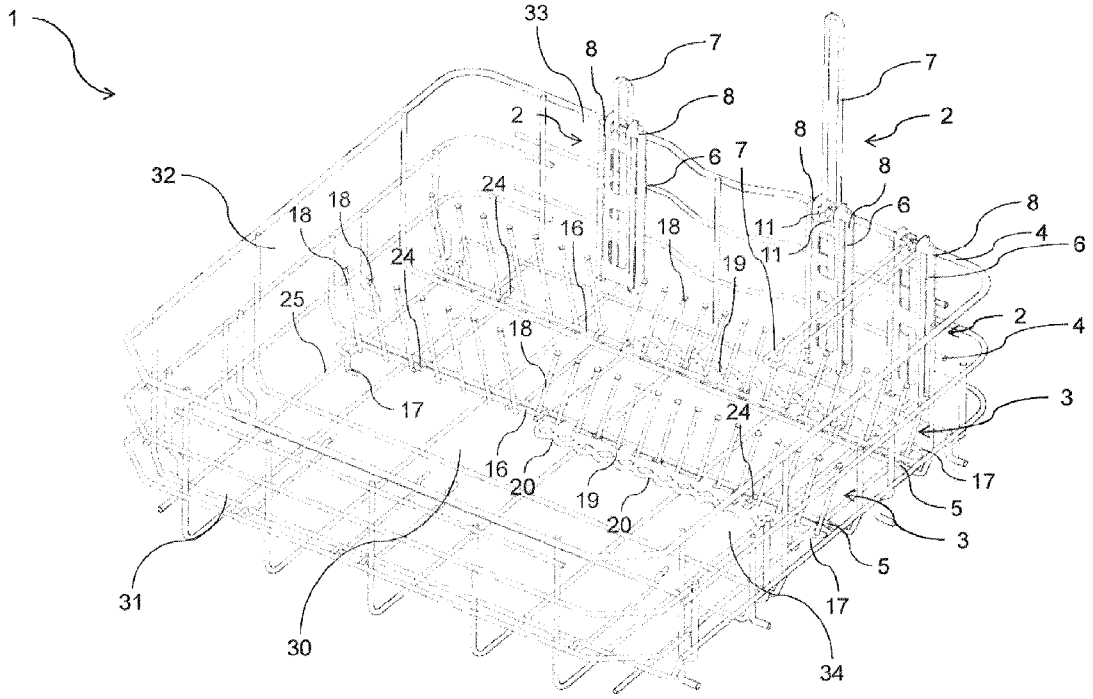

Fig. 1

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Description

[0001] The present invention relates to a dishwasher rack comprising tilting supports.

[0002] As it is known, the positioning of medium/large pots and pans in the rack of a dishwasher is difficult: the positioning of pots with the bottom facing up causes the horizontal surface to be considerably occupied thus reducing the loading capacity of the dishwasher, while the wrong positioning of pots and pans, that is with the axis perpendicular or nearly perpendicular to that of the washing jets, leads to a reduction of the washing and/or drying efficacy.

[0003] The problem of positioning pots and pans inside a dishwasher rack has been already discussed in patent IT1289748 to Merloni Elettrodomestici S.p.A.

[0004] In this prior art document, the problem has been overcome by using rotatable supports, which however have some drawbacks: the supports are difficult to be accomplished when the rack is partially or totally full, making it necessary to put them in the raised position before beginning the rack loading step, thus making this step difficult for the user.

[0005] The handling of the supports requires two movements: a first upward coupling or uncoupling movement and a second upward or downward side movement.

[0006] In addition to that, these supports require sliding guides comprising wires that form the dishwasher rack, and that therefore are statically constrained in a predetermined position, making it impossible to re-position and/or remove them to the detriment of the loading flexibility of the dishwashing machine.

[0007] The present invention provides to solve these and other problems by making available a dishwasher rack comprising tilting supports, preferably for positioning pots and pans, as in the annexed claim 1.

[0008] The idea at the base of the present invention is a pair of supports both being tilting ones, wherein the first is positioned at one side of the rack and the second at the bottom thereof, allowing one or more pots to be supported in an optimal washing/drying position in a dishwasher rack, further allowing the inner volume of the washing tank of the dishwasher to be better exploited.

[0009] Further advantageous characteristics of the present invention are the object of the annexed claims.

[0010] The characteristics of the invention, the effects deriving therefrom and the advantages obtained, will be more clear from the description of a preferred and non-exclusive embodiment of the invention, shown in the annexed drawings wherein:

fig. 1 shows a perspective view of the dishwasher rack comprising the supports for pots and pans, wherein the first support (a frame) is in the raised position;

fig. 2 shows a perspective view of the dishwasher rack of fig. 1, wherein the first support (a frame) is in the lowered position;

fig. 3 shows a detailed perspective view of the first support for pots and pans positioned on the bottom of the dishwasher rack;

fig. 4 shows an horizontal view of a corrugated strip for pots and pans comprised in the first support;

fig. 5 shows a vertical view of the component of fig. 4;

fig. 6 shows a perspective view of the first support (a frame) of fig. 2.

fig. 7 shows a perspective view of a variant of the strip of fig. 4.

[0011] With reference to fig.1, a dishwasher rack 1 will be now described. This rack 1 has a substantially parallelepiped shape, it is made of metal wires suitably shaped and welded together and it comprises a bottom 30 from which a plurality of walls 31, 32, 33, 34 extend, a first support 3 for pots and pans (that for more clarity will be denoted by the term frame) and a second support 2.

[0012] The combined action of these two supports 2, 3 allows pots and pans (such as pans, frying pans, ovenproof dishes, etc.) to be positioned inside a washing tub of a dishwasher (not shown in the figures) in an inclined manner.

[0013] Both these supports 2,3 are equipped with hook devices that will be described below, which allow such supports to be advantageously coupled to wires 4, 5 comprised in the rack 1.

[0014] The support 2 comprises a container 6, preferably having a parallelepiped shape, from which a supporting element 7 protrudes, which is preferably made of the same material as the wire forming the rack 1, and has a shape similar to an elongated omega, wherein the two ends (not shown in the figures) are contained into the container 6.

[0015] This shape allows the two ends of the supporting element 7 to act as guide elements by sliding into sliding guides (not shown in the figures) comprised in the container 7.

[0016] The top of the container 6 is closed by walls 8, thus acting as end-of-travel element upon the deployment of the supporting element 7 due to the interference between the two ends of the element 7 and the inner parts of said walls 8.

[0017] It is possible, for a person skilled in the art, to accomplish the connection between the container 6 and the rack 1 by alternative means than those just described, without anyway departing from the teaching of the present patent.

[0018] As regards the operation of the support 2, figs. 1 and 2 show three supports 2 in three possible positions (from left to the right):

- non-operating position, with the supporting element 7 completely arranged into an housing seat (not shown in the figures) inside the container 6 and away from the inside of the rack 1;
- intermediate position, with the supporting element 7 completely deployed from its housing seat in a ver-

tical position;

- operating position, with the supporting element 7 completely deployed from its housing seat in a locked horizontal position, and extended to the inside of the rack 1 such to allow objects to be supported.

[0019] The locking, in this last position, is accomplished by the action of a pair of housings 11 comprising constraint side walls 12, each of them comprising a coupling tooth 13; these teeth 13 lock the supporting element 7 when it is in the operating position, preventing it from accidentally moving upwardly.

[0020] When the supporting element 7 is reaching the operating position, it is elastically deformed by compression by the coupling teeth 13, then it extends, once it reaches the operating position; this elastic deformation action by compression of the supporting element 7 is repeated during the release operation.

[0021] The release occurs by applying a force from the bottom to the top in a point of the supporting element 7; this force has to have a modulus value sufficient for compressing and deforming the supporting element 7 for allowing it to pass beyond the coupling teeth 13.

[0022] The procedure for deploying and folding the support 2 occurs by moving the supporting element 7 in the positions listed above, in the direct and opposite order described above and repeated here: non-operating position, intermediate position, operating position, or, operating position, intermediate position, non-operating position.

[0023] When a load (for example pots and pans) is put on the supporting element 7, the support 7 behaves like a lever whose fulcrum is the portion of the support 7 positioned in the housings 11, the first arm is the portion of the support 7 upon which the load can be placed, and the second arm is the portion of the support 7 comprised between the housings 11 and the walls 8.

[0024] It is clear that the force applied on the supporting element 7 is released on the inside of the wall 8 from the bottom to the top, and due to the rigidity of the support 2 and the provision of the hook 9 (acting as a further fulcrum for the support 2) it is possible to note how the force is released mainly on the snap-on clips 10 and then on the lower wire 4, with horizontal direction and sense faced to the outside of the rack 1.

[0025] The support 2 is preferably placed on the rear wall 33 of the rack 1, but obviously it is possible, for the person skilled in the art, to find a place suitable for meeting the design requirements by placing this support 2 on one of the other walls 31, 32, 34.

[0026] Figs. 1 and 2 show three supports 2 coupled to the rack 1, but it is again possible for the person skilled in the art to select the number of supports 2 to be included in said rack 1 such to better meet the loading flexibility requirements, necessary for achieving the design objects.

[0027] Now the frame 3 (or first support) will be described with reference to figs. 1-2 and 4-6.

[0028] Figures 1 and 2 show two frames 3, each frame 3 comprises the following parts:

- a base wire 16 comprising at least one bent end 17;
- wire segments 18 arranged parallel to each other and welded to the base wire preferably uniformly spaced and with a predetermined angle with respect to the base wire 16;
- a corrugated strip 19.

[0029] The frame 3 pivots between a raised position, wherein the segments 18 are faced to the inside of the rack 1 while the corrugated strip 19 is substantially parallel to the bottom 30, and a lowered position, wherein the segments 18 are substantially parallel to the bottom 30 while the corrugated strip 19 is substantially vertical.

[0030] The corrugated strip 19 serves for advantageously preventing pots and pans from slipping by means of loops 20 in an horizontal position, thus facilitating the proper positioning already described above; this strip 19 is integral with the base wire 16, and therefore, also with segments 18 (with which it forms a right angle) by fastening means that comprise snap-on hooks 21 and 22, which can match with the base wire 16 and the segments 18 respectively.

[0031] It is possible, for a person skilled in the art, to accomplish the coupling between the corrugated strip 19, the base wire 16, and therefore also the segments 18 by alternative means than those just described, without departing anyway from the teaching of the present patent.

[0032] The bottom 30 of the rack 1 comprises a plurality of constraints suitable for eliminating all the degrees of freedom of the frame 3 except for the rotation about the axis of the base wire 16. Particularly the bottom 30 comprises to this end a plurality of semicircular seats 24, formed by wire portions and arranged along the extension of the base wire 16 with such a shape to stably house the base wire 16, only allowing it to rotate about its own axis. The free rotation of the base wire 16 is limited by the provision of the bent end 17 (clearly shown in fig. 6) that is shaped so as to act as end-of-travel element, interfering with a wire 25, which is comprised in the bottom 30 of the rack 1, when the frame 3 is in a raised position. The bent end 17 comprises a recess (17a), wherein the wire 25 is stably housed thus guaranteeing the interference necessary for firmly keeping the frame 3 in the raised position and for releasing on the rack 1 the weight of the dishes supported on segments 18, without the need of tensioning the base wire 16.

[0033] In fig.1 it is possible to see the frame 3 in the raised position, that is with the segments 18 in a nearly vertical position, which is suitable for positioning the dishes (such as flat dishes) in a proper washing position, which is with the axis of symmetry at an angle of some degrees with respect to the horizontal, such to allow a washing liquid sprayed from a sprayer arm (not shown in the figures) to reach the inside of the cavities of the

dishes, thus allowing this liquid to drain by gravity.

[0034] In this position, the corrugated strip 19 is in a substantially horizontal position and parallel to the bottom 30; said strip, in addition, comprises orifices 23 such to advantageously increase the flow of the washing fluid directly reaching the dishes arranged on the frame 3 and to facilitate the subsequent drainage in the drying step. Fig.2 shows two frames 3, in the lowered position, with the corrugated strips 19 in a nearly vertical position, in this position it is possible to easily arrange pans and pots exploiting also at least one of the supports 2, thus increasing the washing efficiency of the dishwasher, since (as already said above) it is possible to better wash more frying pans or pots than a dishwasher equipped with a conventional rack. In each one of the frames 3, this position is made stable by the segments 18 acting as end-of-travel elements by interfering with the wires of the rack 1 and/or by a particular shape of the bent ends 17 allowing them to act as end-of-travel elements even in the lowered position of the rack 3.

[0035] In this position, the segments 18 of the two frames 3 are arranged on the bottom of the rack 1 at a very close distance one another, such to form an almost supporting surface upon which it is possible to put not only pots and pans but also objects having a certain length (e.g. knives, ladles, etc.).

[0036] Therefore, it is clear, for the person skilled in the art, how the combined action of these two supports 2 and 3 of the movable type, allows pots and pans to be properly positioned, that is having the axis of symmetry of said pots and pans with an angle of some tens of degrees with respect to the horizontal. By using such advantageous positioning, it is possible, for the dishwasher to perform a more efficient washing cycle and at the same time to increase the loading flexibility thereof.

[0037] Moreover, it has to be pointed out the possibility of using two or more supports 2 in the operating position for supporting objects having a certain length (e.g. knives, ladles, etc.) by using the supporting elements 7 as stands.

[0038] Finally, it has to be pointed out how in the example shown in figs. 1 and 2, the frames 3 extend for all the width of the rack 1, but as an alternative these frames can occupy only a portion of the rack width.

Claims

1. A dishwasher rack (1) comprising a bottom (30) from which a plurality of walls (31,32,33,34) extend, a first tilting support (3) positioned on the bottom (30) of the rack (1),
   characterized in that
   the first support (3) comprises segments (18) for supporting crockery, and said first support (3) is movable between a raised position, in which the segments (18) extend inside the rack (1), and a lowered position, in which the segments (18) are substantially parallel to the bottom (30), said segments (18) being coupled to a base wire (16) positioned on the bottom (30) of the rack (1) and able to rotate about its own axis, and wherein the raised position of the first support (3) is made stable by the interference between the wires of the rack (1) and at least one bent end (17) of the base wire (16).

2. A rack (1) according to claim 1, wherein said bent end (17) defines a recess (17a) for housing one element of said rack (1), possibly a wire (25) of the bottom (30) of said rack (1).

3. A rack according to any one of claims 1 to 2, wherein a corrugated strip (19) is coupled to the base wire (16).

4. A rack (1) according to any one of claims 1 to 3, wherein, when said first support (3) is in said raised position, the base wire (16) is subject to substantially no tension.

5. A rack (1) according to any one of claims 3 to 4, wherein the segments (18) are arranged at an angle with respect to the corrugated strip (19).

6. A rack (1) according to any one of claims 3 to 5, wherein the corrugated strip (19) comprises one or more snap-on hooks (21) located near its periphery and adapted to be coupled to the base wire (16).

7. A rack (1) according to any one of claims 3 to 6, wherein the corrugated strip (19) comprises one or more snap-on hooks (22) located near its periphery and adapted to be coupled to the segments (18).

8. A rack (1) according to any one of the preceding claims, wherein said rack (1) comprises at least one second support (2) positioned on one of the walls (31,32,33,34) and co-operating with the first support (3).

9. A rack (1) according to claim 8, wherein said rack (1) comprises a plurality of first (3) and/or second (2) supports.

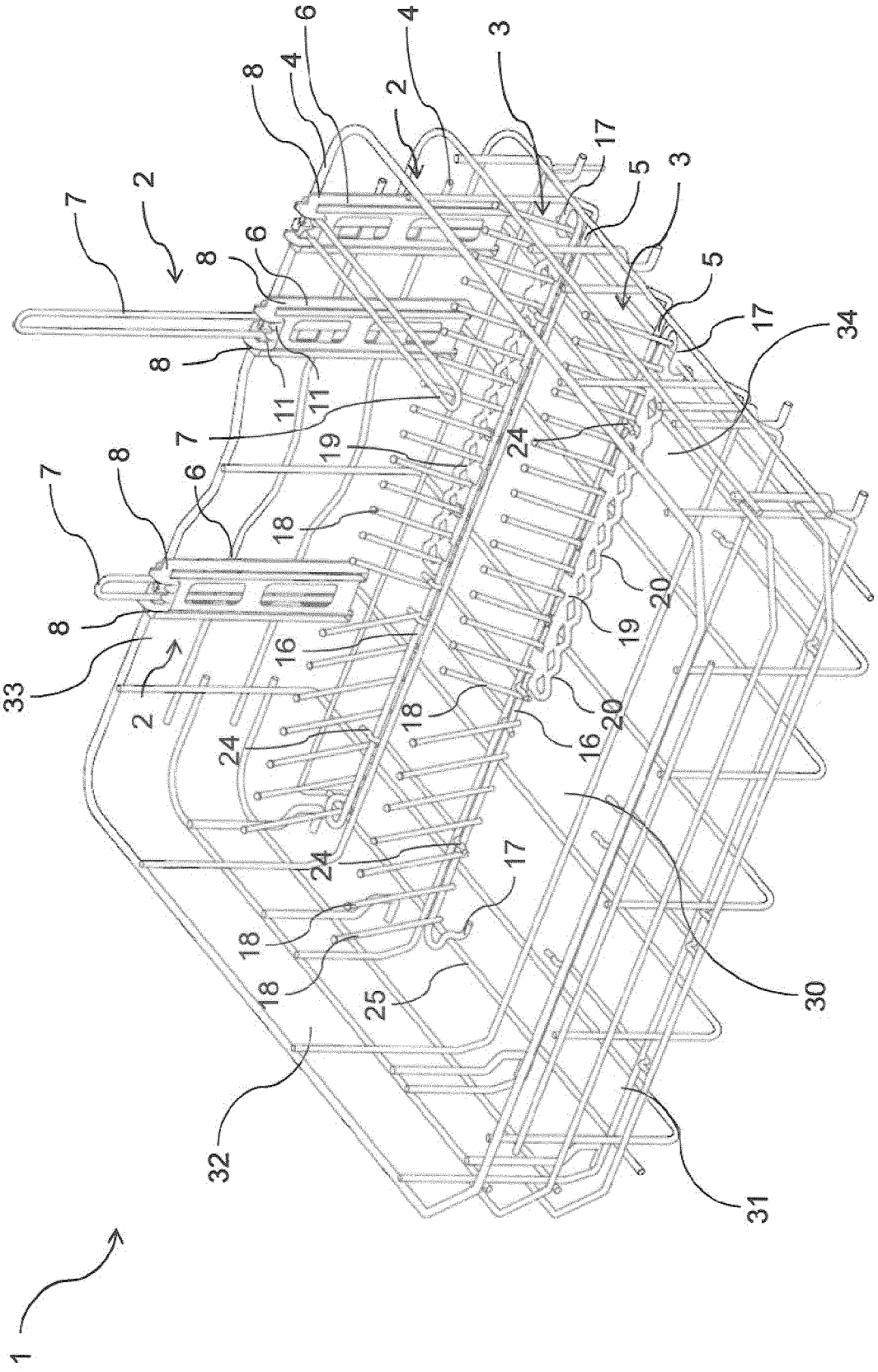

Fig. 1

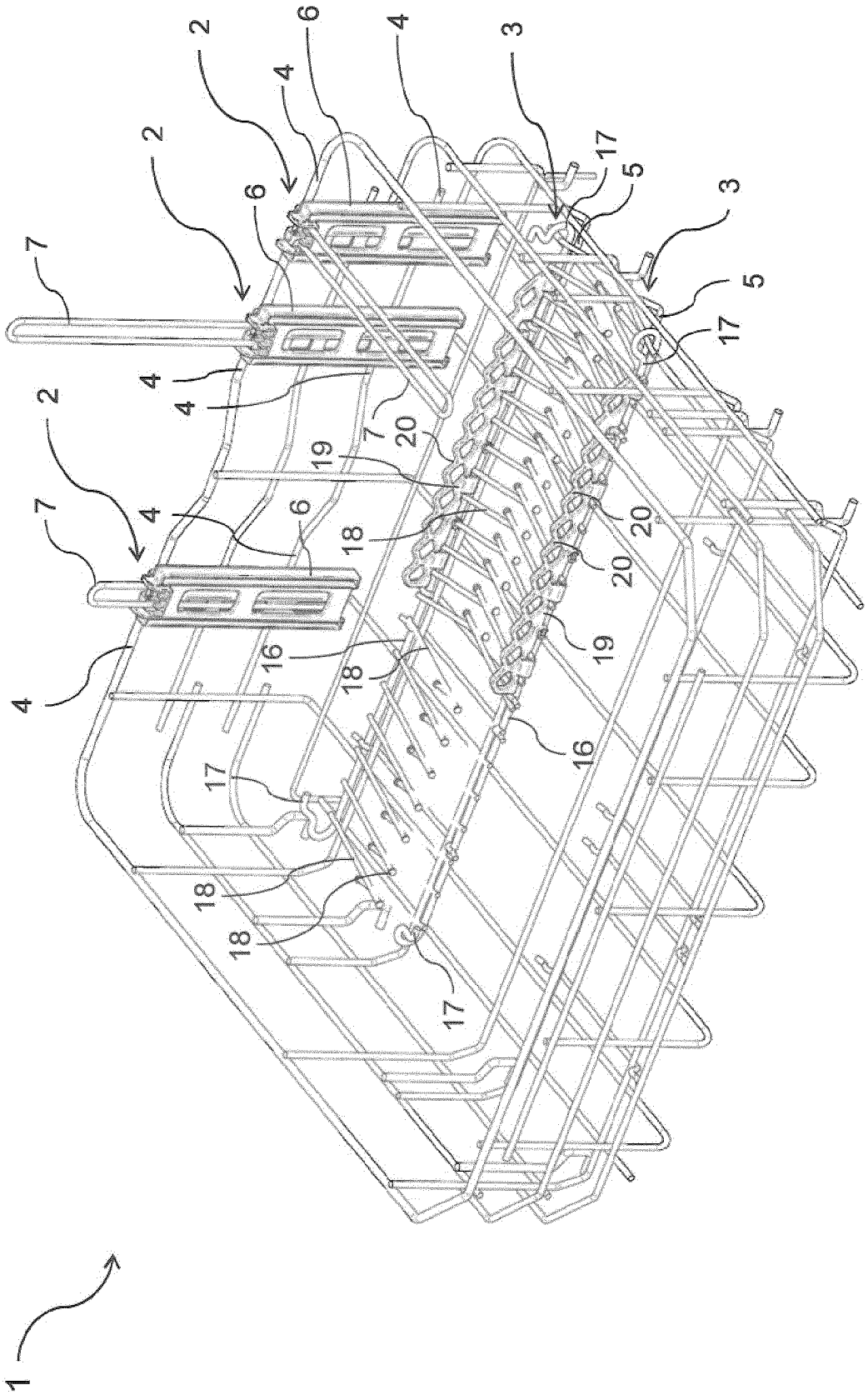

Fig. 2

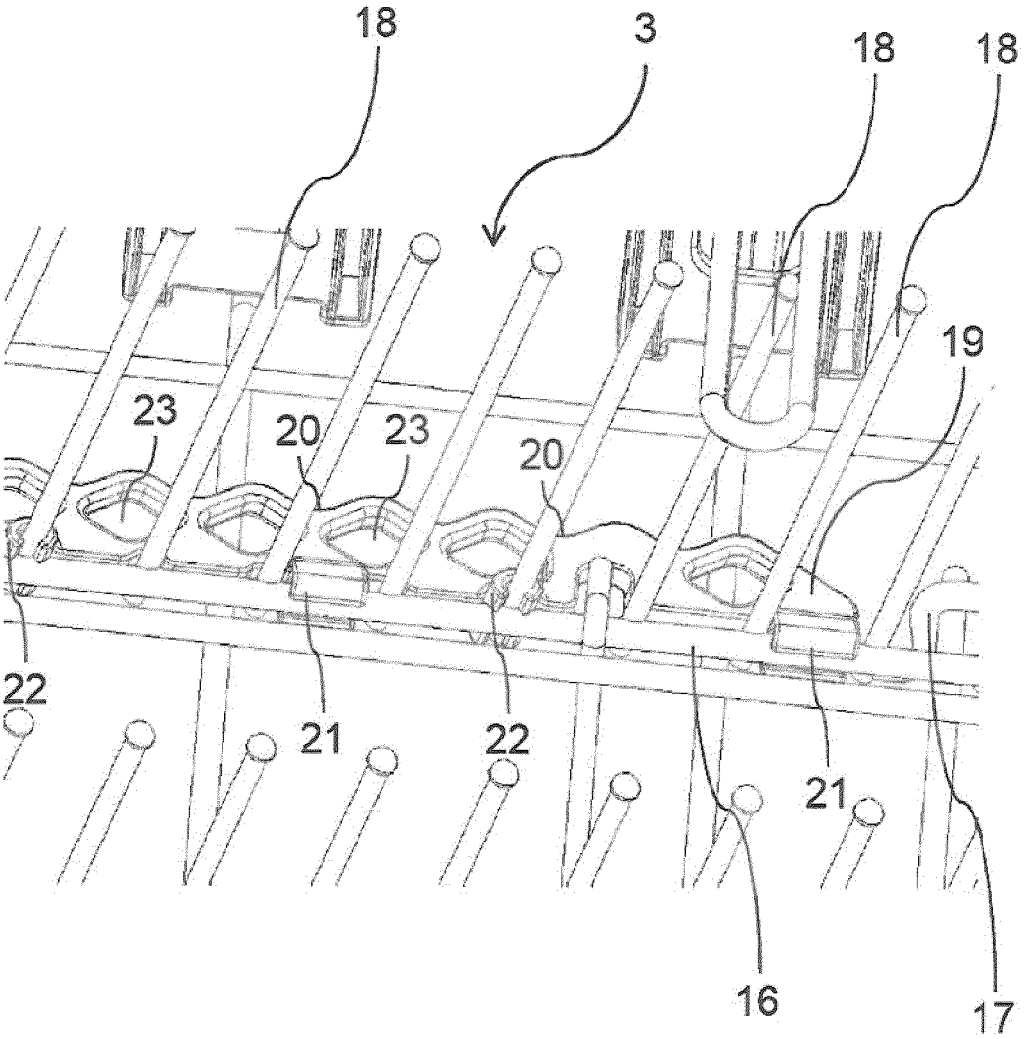

Fig. 3

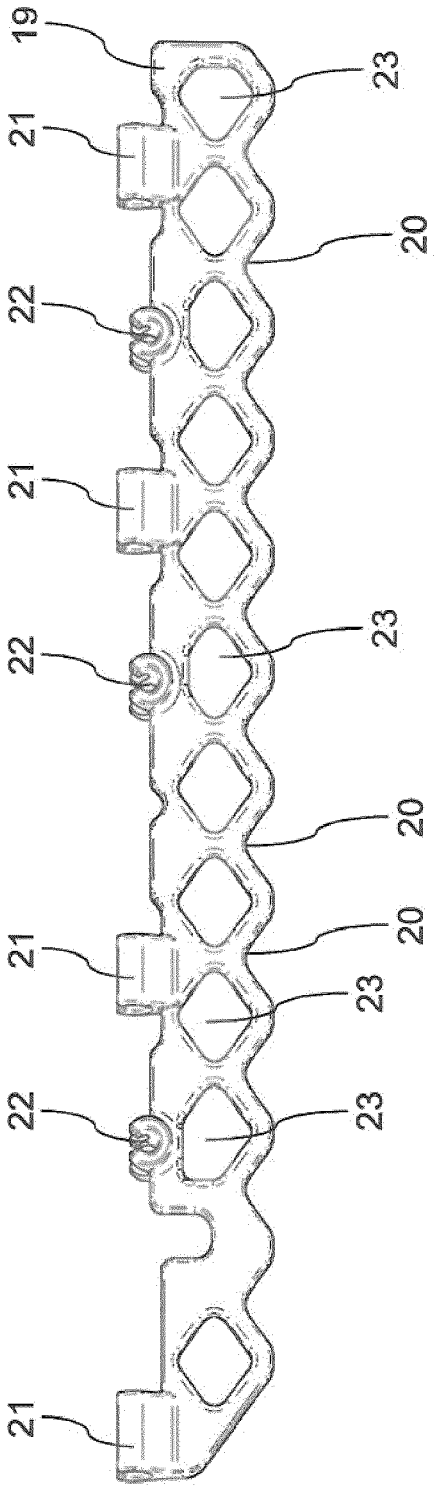

Fig. 4

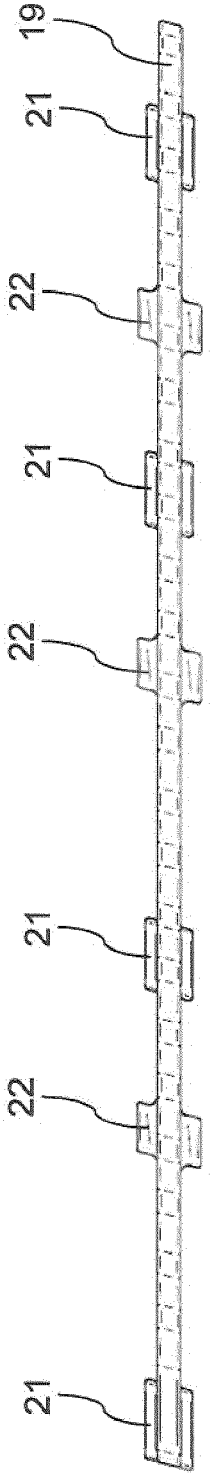

Fig. 5

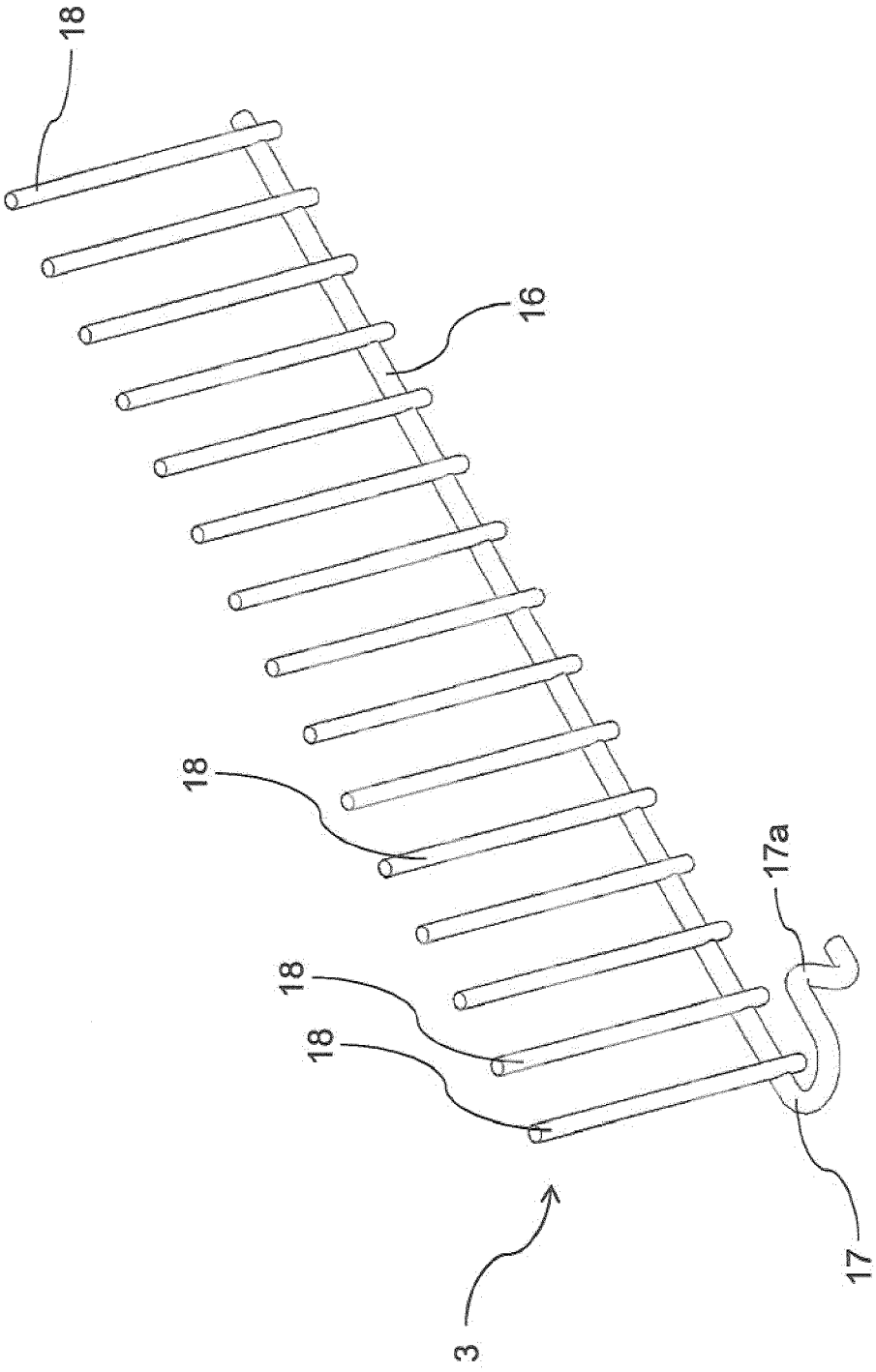

Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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