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(54) Pull-out cutlery tray for dishwasher

(57) A pull-out tray for dishwasher comprises a metal wire frame (1) and two removable and slidable cutlery inserts (2a, 2b) that are supported by separate support crossbars (1a, 1b) of the frame (1), one pair of the support crossbars (2a, 2b) being shaped so as to achieve also a vertical shifting of the insert (2a) supported thereon between an upper level and a lower level of the frame (1). This tray has a greater flexibility of use since it can take multiple configurations that allow an optimal exploitation of the space available in the wash tank, for example decreasing by 50% the area occupied by the tray without reducing its loading capacity or allowing to load also cups and glasses thereon.

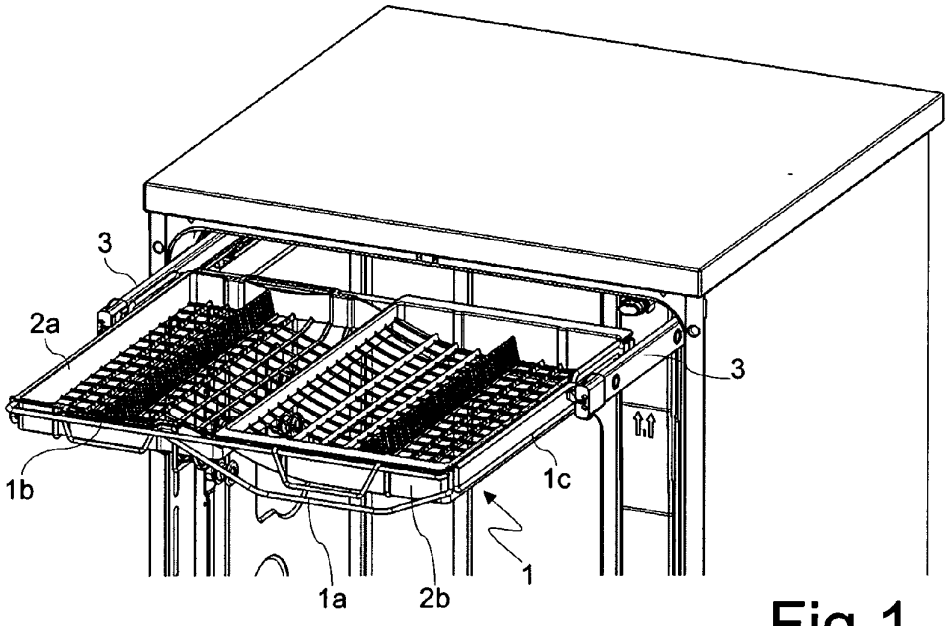

Fig.1

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Description

[0001] The present invention relates to dishwashers, and in particular to a pull-out tray provided with at least two cutlery inserts that are removable and shiftable to different positions in order to obtain multiple configurations of the tray.

[0002] It is known that dishwasher racks are usually made from metal wires coated with plastic and welded together so as to form a supporting structure for the dishes. In order to make the use of said racks more flexible, there are often provided mobile or removable inserts which allow to change the exploitation of the rack according to the need of the moment.

[0003] An example of such a flexibility of use is found in the upper rack which is usually intended to receive the smaller dishes such as cups, glasses and the like. In order to fully exploit its height, there is usually provided a cup-supporting shelf extending along one or both sides of the rack and located at such a level as to allow the positioning of the glasses under the shelf.

[0004] Said shelf may also be used to place thereon large-size cutlery such as kitchen knives, kitchen spoons and the like, or even normal cutlery if the shelf is shaped as a cutlery grid (i.e. a shelf with a plurality of apertures where the cutlery is vertically introduced) or is provided with seats suitable to receive the cutlery arranged horizontally. However, the presence of the shelf is an obstacle when the upper rack has to be used for larger dishes, therefore in order to make possible such a use the shelf can be made completely removable, as a separate insert, or tipped up to a vertical position.

[0005] For an even better exploitation of the space available inside the wash tank it is already known to use a substantially flat third rack, located in the top portion of the dishwasher above the upper rack, acting as a cutlery tray. Said third rack is formed by one or more plastic inserts shaped with cutlery seats and removably introduced in a metal wire frame mounted on pull-out guides, same as the other two dish racks. The removable inserts increase the flexibility of use of the third rack that can be adapted to the amount of cutlery to be washed, for example if the third rack is provided with two inserts it is possible to remove one of them so as to reduce by half the load capacity to the advantage of the height available for the underlying upper rack.

[0006] A further increase in the flexibility of use of the third rack is achieved when it is intended to receive not only cutlery but possibly also cups and the like in case it is provided with one or more mobile portions that can be lowered to sufficiently increase the distance from the ceiling of the wash tank.

[0007] US 2010/0155280 AI illustrates an example of such a cutlery tray comprising three inserts of which two flat lateral inserts, horizontally slidable on the frame and having each a width equal to 40% of the rack width, and a central insert with a trapezoidal cross-section provided at the ends with oblique guide slots so as to translate vertically as a consequence of the horizontal sliding of support hooks that engage said guide slots. In practice, the tray can be configured with the three inserts side-by-side, the central insert being either in the raised or lowered position, or with one of the two lateral inserts overlapping the lowered central insert so as to free 20% of the tray area on one side to allow the placement of higher dishes in the upper rack (but in this configuration the central insert is substantially useless).

[0008] US 2010/078048 A1 illustrates another example of an adjustable cutlery tray comprising two inserts with a triangular cross-section mounted on the frame in such a way that they can independently rotate around a central axis, whereby the outer portion moves away from the ceiling of the wash tank to allow the loading of higher dishes. In this case it is not possible to reduce the area occupied by the third rack to the advantage of the height available for the upper rack other than by removing an insert.

[0009] These known arrangements therefore suffer from two types of drawbacks, namely they are adjustable through operations that are rather inconvenient for the user and they imply a decrease in the load capacity of the tray when it is required to reduce the area of the latter in order to exploit the full available height to the advantage of the upper rack. Moreover, the mechanisms used to adjust the position of the mobile inserts make the tray more complicated, more expensive and less reliable.

[0010] Therefore the object of the present invention is to provide a pull-out tray for dishwasher which overcomes the above-mentioned drawbacks.

[0011] This object is achieved by means of a pull-out tray comprising at least two inserts supported by separate support crossbars of the frame, at least one pair of said support crossbars being shaped such that the horizontal sliding of at least one of the inserts supported thereon results also in a vertical shifting that is sufficient to allow the positioning thereof under another insert.

[0012] The main advantage of the present pull-out tray is that of having a greater flexibility of use since it can take multiple configurations that allow an optimal exploitation of the space available in the wash tank. Moreover, contrary to prior art trays, it is possible to decrease up to 50% the area occupied by the tray without reducing its loading capacity.

[0013] A further advantage of this pull-out tray derives from its structural simplicity, which results in a lower cost, a greater reliability and greater ease of use for the user when changing configuration.

[0014] Further advantages and characteristics of the pull-out tray according to the present invention will be clear to those skilled in the art from the following detailed description of an embodiment thereof, with reference to the annexed drawings wherein:

Fig.1 is a perspective view showing the cutlery tray pulled out of the wash tank, in the "basic configuration" with the inserts side-by-side;

Fig.2 is a front view showing better the position of the tray from the preceding figure inside the wash tank;

Fig.3 is a perspective view of the tray of Fig.1 loaded with normal and large cutlery;

Fig.4 is a view similar to the preceding one that shows a different configuration of the tray with an insert at a lower position in order to load cups and glasses;

Fig.5 is a front view showing better the position of the tray from the preceding figure inside the wash tank; and

Figs.6-9 are front views similar to the preceding one that show further possible configurations of the tray.

[0015] Referring to figures 1 to 5, there is seen that a cutlery tray according to the present invention conventionally includes a metal wire frame 1 housing a plurality of inserts (two inserts 2a, 2b in the illustrated example) shaped with seats for horizontally receiving the cutlery, said frame 1 being mounted in the wash tank of a dishwasher by means of pull-out guides 3 located in the proximity of the wash tank ceiling.

[0016] Inserts 2a, 2b are removable, have substantially the same width and can transversally slide on frame 1, i.e. in a direction perpendicular to guides 3. Only this sliding mode and only for these two inserts will be illustrated in the following, yet it is clear that with a few modifications that are obvious for a person skilled in the art it would be possible to achieve the sliding also in a direction parallel to guides 3 and/or for a greater number of inserts and/or for inserts having different widths.

[0017] The novel aspect of the present tray resides in the fact that frame 1 is provided with two distinct pairs of support crossbars 1a, 1b extending between flanks 1c and respectively supporting inserts 2a, 2b. While the pair of crossbars 1b that support the right insert 2b are simple straight crossbars, whereby insert 2b only slides in a horizontal plane, the pair of crossbars 1a that support the left insert 2a are shaped so as to perform also a vertical shifting of said insert 2a as a consequence of its sliding on frame 1.

[0018] More specifically, each crossbar 1a includes a first horizontal length 1aa that is substantially at the same level of crossbar 1b and a second horizontal length 1ab that is lower than crossbar 1b by a distance greater than the height of insert 2b. This second horizontal length 1ab is connected to the first horizontal length 1aa by a first oblique connecting length 1ac, and to flank 1c by a second oblique connecting length 1ad having an inclination opposite to length 1ac.

[0019] In order to achieve a smoother sliding of inserts 2a, 2b made of plastic material and to prevent risks of jamming, rather than sliding the inserts on the metal wires of frame 1 the present tray preferably includes metal wire support members 4a, 4b in which the two inserts 2a, 2b are introduced. In this way, it's the support members 4a, 4b that are in contact with frame 1 and the sliding occurs metal on metal with greater smoothness.

[0020] It should be noted that although in the illustrated embodiment members 4a, 4b are separate from inserts 2a, 2b it is obvious that they could also be integral therewith or they could be replaced by metal plates co-moulded with the inserts. Furthermore, it is clear that the arrangement illustrated in the drawings with crossbars 1a located inside crossbars 1b by a distance sufficient to allow the passage of the support member 4a, and therefore with insert 2a slightly shorter than insert 2b, could be reversed by providing crossbars 1b inside crossbars 1a and insert 2b consequently slightly shorter than insert 2a.

[0021] As clearly shown in the front view of Fig.2, in the "basic configuration" of the tray illustrated in the first three figures the two inserts 2a, 2b are arranged side-by-side and quite close to the wash tank ceiling, whereby they can only be loaded with cutlery P (both normal and large) which substantially does not project upwards. However, thanks to the shaping of crossbars 1a, the left insert 2a can be lowered by moving it to the right such that the respective support member 4a rests no longer on the first horizontal length 1aa but on the lower second horizontal length 1ab, while insert 2b can be shifted horizontally to the left along the straight crossbar 1b.

[0022] In this way, there is obtained the second configuration illustrated in figures 4 and 5 where insert 2b (which is now on the left) is still loaded with cutlery P whereas insert 2a (which is now on the right) can be loaded also with cups and glasses C thanks to its greater distance from the wash tank ceiling. It should be noted that thanks to the rounding of the internal facing sides of inserts 2a, 2b the shifting of insert 2a between the upper level and the lower level of frame 1 can be performed without touching insert 2b that is moved only afterwards.

[0023] This also means that insert 2a can be positioned under insert 2b without touching the latter, as shown in Fig.6. In this third configuration it is still possible to load cutlery in both inserts 2a, 2b (obviously prior to lowering insert 2a) but the area occupied by the cutlery tray is reduced by 50% whereby in the left half of the underlying upper rack TR the user can exploit the full height of the wash tank to place higher dishes.

[0024] Moreover it is always possible to achieve said 50% reduction also by removing one of the inserts, as shown in figures 7 to 9, selecting which half of the upper rack TR will have a greater height. The present tray offers a greater flexibility to the user even in this case, since insert 2a can be positioned at the upper level of frame 1, as in Fig.7, or at the lower level, as in Fig.8.

[0025] Other configurations not illustrated in the drawings can provide the removal of insert 2a and the shifting of insert 2b to the left, in case the shape of the latter is more convenient to load the cutlery, or a configuration intermediate between those of Fig.5 and Fig.6. In this latter case insert 2b only partially overlaps with insert 2a and the user can select the percentage of tray area reduction according to the space required in the upper rack

TR and to the load of insert 2a. With a load like the one illustrated in Fig.4, for example, insert 2b can be placed at a substantially central position thus reducing the tray area by 25%, since only the right portion of insert 2a requires a greater height to house the cups and glasses C.

[0026] It is therefore clear that the above-described and illustrated embodiment of the pull-out tray according to the invention is just an example susceptible of various modifications. In particular, crossbars 1a can be shaped to obtain the lower level of frame 1 at any position, on the right or on the left, or possibly even in the middle if for example the tray includes three inserts two of which can be alternatively lowered (or vice versa the lower level can be divided between two lengths on the left and on the right with the upper level in the middle if there is only one insert that can be alternatively lowered to the left or to the right).

Claims

1. Pull-out tray for dishwasher comprising a metal wire frame (1) that supports at least two cutlery inserts (2a, 2b) that are removable and horizontally slidable on said frame (1), **characterized in that** said at least two inserts (2a, 2b) are supported by separate support crossbars (1a, 1b) extending between the flanks (1c) of the frame (1), at least one pair of said support crossbars (2a, 2b) being shaped so as to achieve also a vertical shifting of the insert (2a) supported thereon as a consequence of its sliding on the frame (1), said vertical shifting between an upper level and a lower level of the frame (1) being sufficiently great to allow the positioning of said insert (2a) under another insert (2b).

2. Pull-out tray for dishwasher according to claim 1, **characterized in that** it further includes metal wire support members (4a, 4b) in which the inserts (2a, 2b) are introduced, whereby it's said support members (4a, 4b) that slide on the frame (1).

3. Pull-out tray for dishwasher according to claim 1 or 2, **characterized in that** each shaped crossbar (1a) includes a first horizontal length (1aa) that is substantially at the same level of a straight crossbar (1b) and a second horizontal length (1ab) that is lower than said straight crossbar (1b) by a distance greater than the height of an insert (2b) supported by the straight crossbar (1b), said second horizontal length (1ab) being connected to said first horizontal length (1aa) by a first oblique connecting length (1ac) and to a flank (1c) of the frame (1) by a second oblique connecting length (1ad) having an inclination opposite to said first oblique length (1ac).

4. Pull-out tray for dishwasher according to any of the preceding claims, **characterized in that** it includes two inserts (2a, 2b) having substantially the same width whose facing internal sides are rounded such that the shifting of an insert (2a) between the upper level and the lower level of the frame (1) can take place without touching the other insert (2b).

5. Pull-out tray for dishwasher according to any of claims 2 to 4, **characterized in that** the shaped crossbars (1a) are arranged inside the staright crossbars (1b) by a distance sufficient to allow the passage of the support member (4a) of the vertically mobile insert (2a).

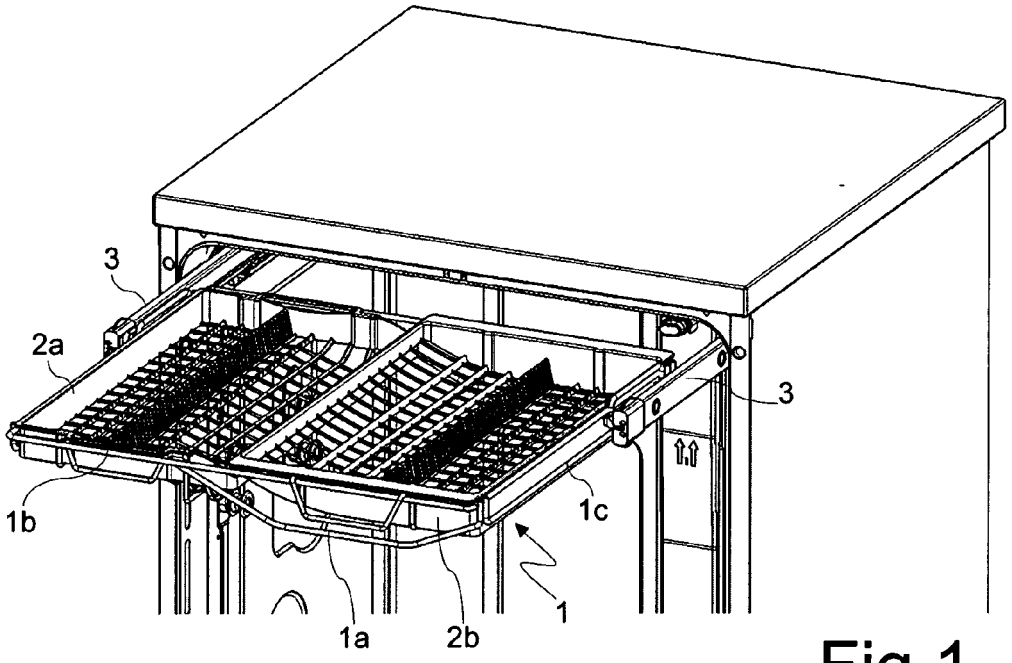

Fig.1

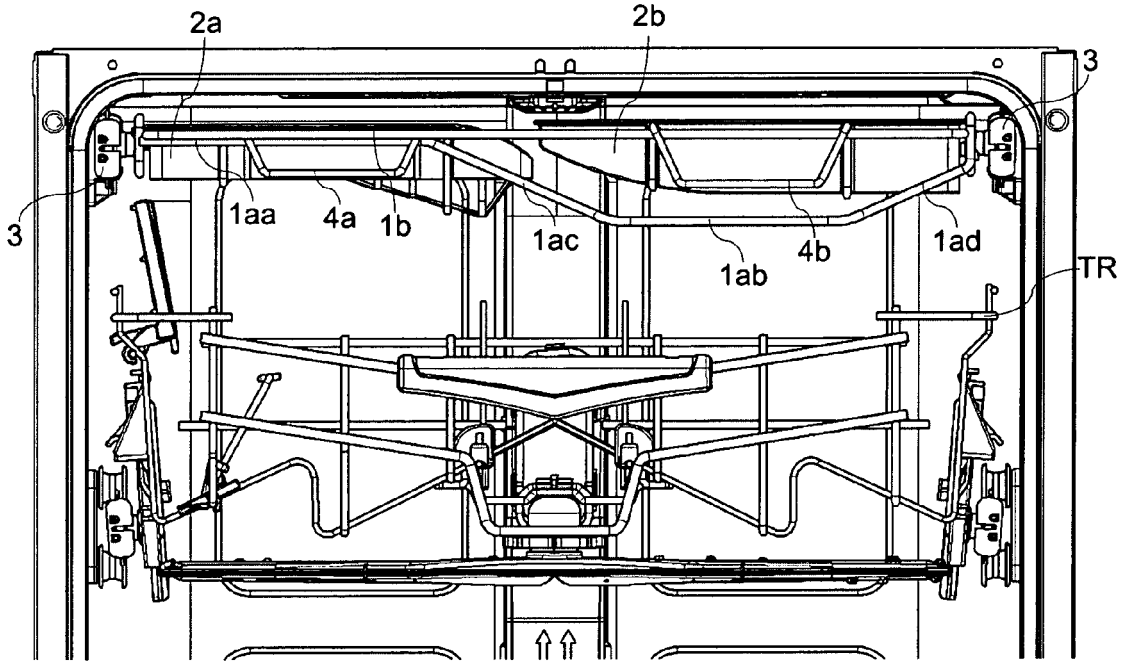

Fig.2

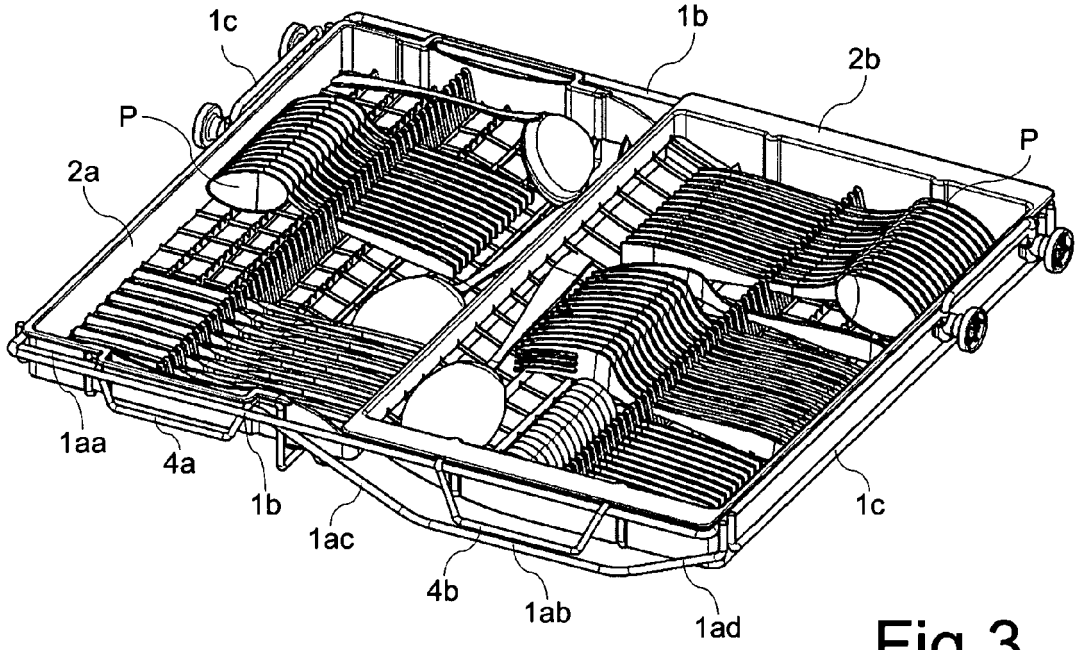
1c
1b
2b
P
P
2a
1aa
4a
1b
1ac
4b
1ab
1ad
1c

Fig.3

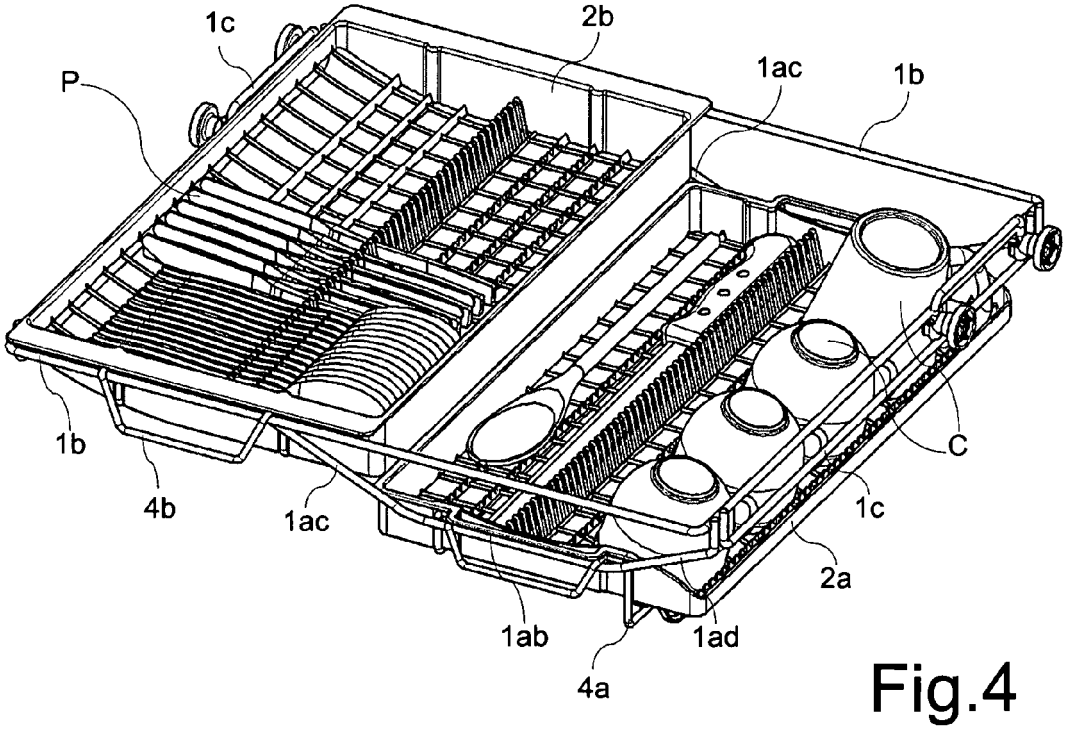
1c
2b
1ac
1b
P
1b
4b
1ac
C
1c
2a
1ab
1ad
4a

Fig.4

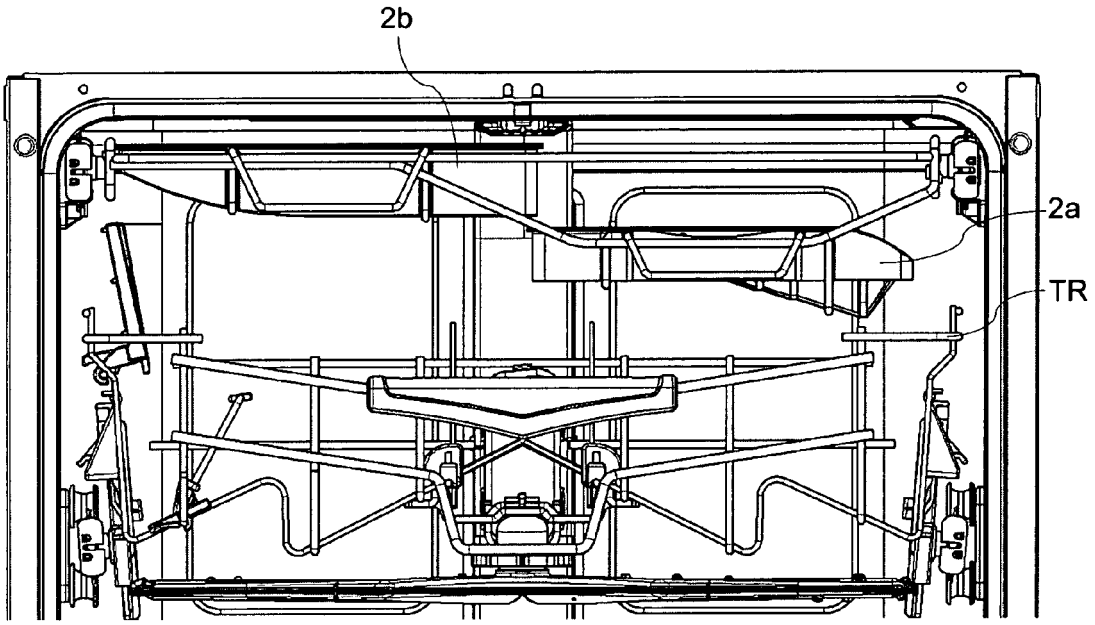

Fig.5

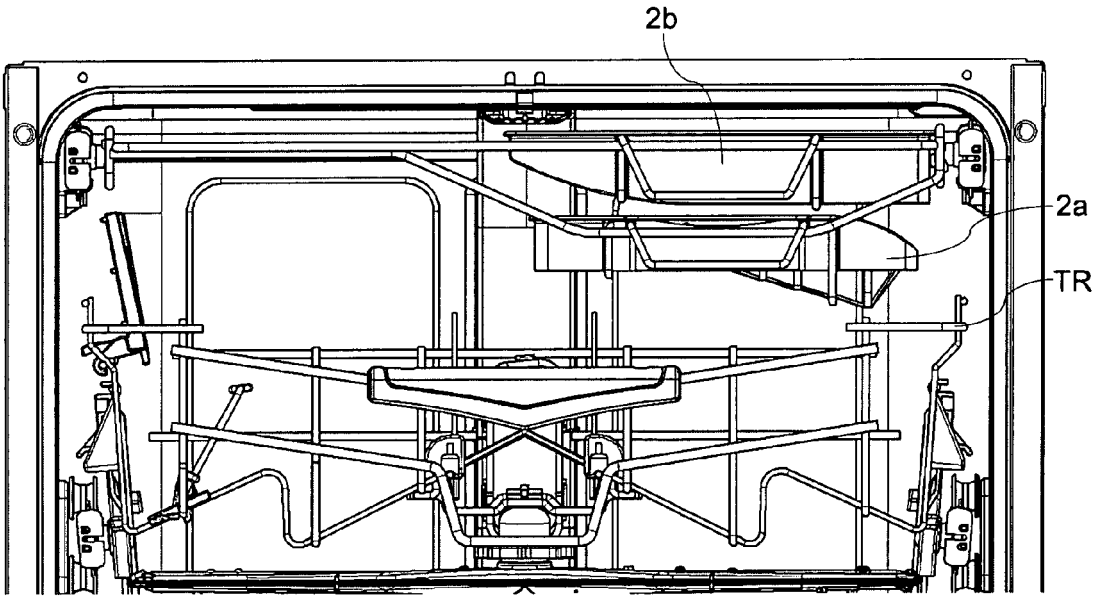

Fig.6

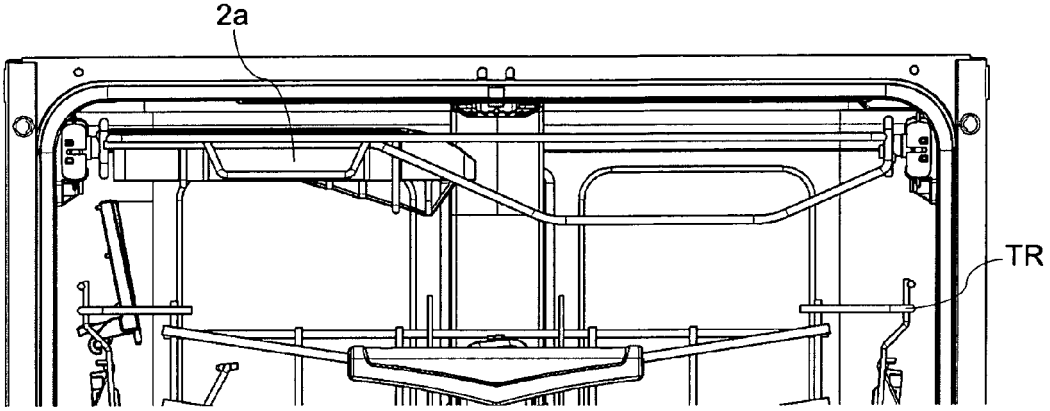

Fig.7

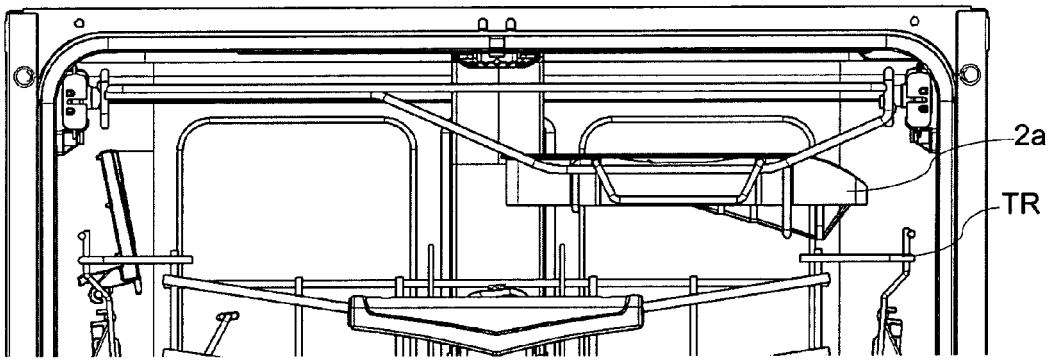

Fig.8

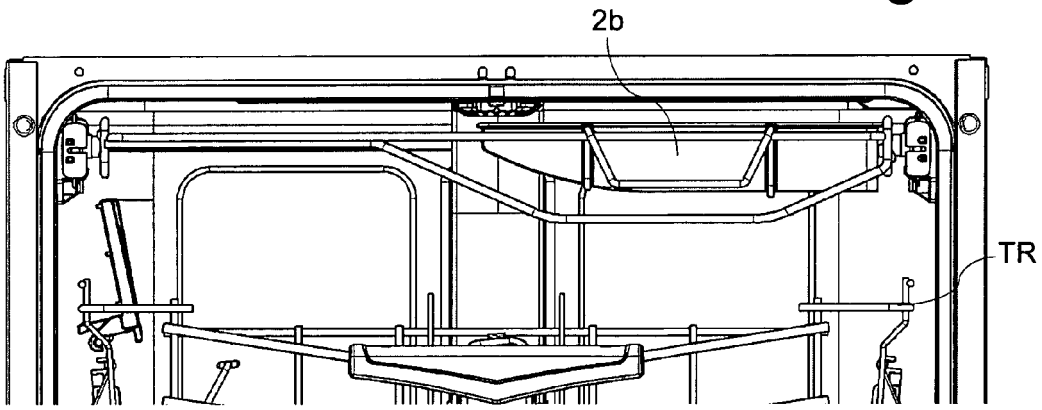

Fig.9

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EUROPEAN SEARCH REPORT

Application Number
EP 11 42 5281

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	19 April 2012	Richmond, Sarah

CATEGORY OF CITED DOCUMENTS

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