Dishwasher rack comprising an extractable perimetric frame

The invention relates to a cutlery drawer (1) for a dishwasher, comprising a peripheral frame (2) adapted to be pulled out of the tub and three trays (4, 5, 70) for receiving objects, such as cutlery and the like, thereon, wherein said drawer (1) further comprises means removably associated with at least one of the trays (4, 5, 70).
The present invention relates to a drawer adapted to be placed in a dishwasher tub, as defined in the preamble of claim 1.

Cutlery and other kitchen items of larger sizes, such as ladles, cleavers, carving knives, sausage knives or the like, are known to be unable to be easily and effectively machine-washed, when these items are placed or the like, are known to be unable to be easily and effectively machine-washed, when these items are placed in a dishwasher tub, as defined in the preamble of claim 1.

In case of a heavy cutlery load, cutlery is often bundled up in a cutlery rack, which reduces the effectiveness of a washing cycle as compared with the case in which cutlery is placed on the bottom of one of these racks, where it is more effectively reached by a washing fluid. Nevertheless, the latter case involves the risk that cutlery may most likely fall to the bottom of the tub, and hence that it may block one of the washing mechanisms, such as the arms or else, or obstruct one of the drain hoses, thereby stopping the running washing cycle. Concerning the position of long kitchen items (e.g. ladles, kitchen knives or else), they must be placed in one of the racks in an inclined position, possibly using part of the washing load for support and/or retention. In this case, it will be easily understood that the fall of any one of these items during rack loading/unloading may cause injury and/or bruises to the user.

Cutlery drawers have been designed to obviate the above drawback.

US 2012/0155280, by MIELE & CIE, KG discloses a cutlery drawer composed of three support trays, which can be stably coupled together but cannot be in a freely overlapping relationship, due to the presence of cutlery racks fixed to the bottom of the trays; these racks interfere with the grid on the bottom of the support elements and prevent the elements from sliding one above the other.

WO 2008/035866 A1, by LG ELECTRONICS, also discloses a cutlery drawer whose support elements are removable but cannot partially be in overlapping relationship in a plurality of positions, thereby limiting the flexibility of load positioning in the dishwasher tub and the versatility of its rack.

The present invention has the object of obviating these and other drawbacks by providing a drawer adapted to be placed in a dishwasher tub, as defined in the annexed claim 1.

The present invention intends to obviate these and other drawbacks by providing a drawer comprising one or more sensors arranged in the tub, as defined in the annexed claim 14.

The idea behind the present invention is the addition of a pull-out drawer in a dishwasher tub, which drawer is designed to receive cutlery and/or kitchen items such as ladles, knives or else, and comprises removable trays possibly having removable rack supports fixed thereon, allowing the trays to overlap in a plurality of positions, for improved tub loading flexibility.

Further advantageous characteristics of the present invention will form the subject of the claims annexed hereto.

These characteristics and further advantages of the present invention will become apparent from the description of an embodiment as shown in the annexed drawings, which are only given by way of non-limiting example, in which:

Fig. 1 shows an exploded perspective view of the drawer;

Fig. 2 shows a perspective view of the drawer of Fig. 1 in an operating, full-load state;

Fig. 3 shows a perspective view of the drawer of Fig. 1 in an operating, reduced-load state;

Fig. 4 shows a perspective view of the drawer of Fig. 3 with the trays at the center;

Fig. 5 shows a perspective view of a concave tray separated from the drawer of Fig. 4;

Fig. 6 shows a perspective view of a flat tray separated from the drawer of Fig. 4;

Fig. 7 shows a perspective view of a rack support separated from the drawer of Fig. 4;

Fig. 8 shows a front view of the rack support of Fig. 7;

Fig. 9 shows a bottom-to-top view of the rack support of Fig. 8;

Fig. 10 shows a perspective view of the drawer of Fig. 3, with an additional support tray.

Referring now to Figs. 1 and 2, a dishwasher drawer 1 comprises a peripheral frame 2, a concave tray 4, a flat tray 5, and one or more cutlery support means.

The peripheral frame 2 comprises a peripheral structure, preferably made of metal, which in turn comprises at least one front bar 21 and one rear bar 21, which are substantially parallel and joined together by side bars 23; these bars 21 include a central part 21b and substantially parallel bent sides 21a, whereas the respective ends of the side bars 23 are preferably electromed together in pairs to the sides 21a, such that the peripheral frame 2 has a rectangular plan shape, compatible with the internal dimension of a dishwasher tub (not shown).

Said peripheral frame 2 is preferably made of metal and is covered with a layer of a waterproofing material, which prevents contact between the metal and the washing water.

The stiffness of the peripheral frame 2 is improved by one or more reinforcement bars 24, which are arranged perpendicular to the side bars 23 and are coupled thereto, preferably by electrowelding.

As also shown by Figs. 5 and 6, both the concave tray 4 and the flat tray 5 have a bottom 43, 53, which in turn comprises a grid, allowing the passage of the washing liquid. As used herein, the term grid is intended as a general support structure, through which the washing water is allowed to flow; therefore, any woven structure or the like that is suitable for the above purpose will fall within the definition of the grid as used herein.
Furthermore, the tray 4 comprises a cavity 41, which is adapted to receive long kitchen tools, such as knives, ladles, etc.; this cavity 41 comprises side openings 42 along one side, which allow the passage of a washing liquid delivered by appropriate supply means (not shown) and positioning of materials having protrusions (e.g. tea cups, coffee cups, etc.). Furthermore, this cavity 41 also comprises a rack 48, preferably located opposite to the side with the side openings 42. Thus, the combined action of the rack 48 and the side openings 42 allows safe positioning of particularly long objects, such as knives or else.

The tray 4 also comprises a flat surface 47 adjacent to the cavity 41. Cutlery or other objects of similar size may be placed above the flat surface 47 and held against the flat surface 47 using support means, which comprise rack supports 6, such that the cutlery can be prevented from being displaced by the relatively high-speed jets of washing liquid, during the washing cycle.

Referring now to Figs. 7, 8 and 9, the rack supports 6 comprise hooks 64, preferably having a snap operation, which allow the trays 4 and 5 to be coupled to the bottom 43,53, and advantageously to be separated therefrom, for increased load flexibility and easy cleaning/maintenance; these means may be preferably made of a soft material, such as TPE rubber. In addition to that, the rack supports 6 further comprise a base 61 comprising the hooks 64, the wings 62 for retaining cutlery, and openings 63 for easier passage of the washing liquid.

For proper positioning of the rack supports 6 on the bottom 43,53, these supports 6 include an abutment 65, preferably having a cylindrical or frustoconical shape, that can be engaged with holes 49,59 of the trays 4 and 5 respectively (see Figs. 5 and 6).

The holes 49 and 59 allow positioning of the rack supports 6 in preset positions, thereby affording effective use of one or more sensors, to be better explained below, that can sense the position and/or the presence of the rack supports 6.

The shape of the tray 4 allow stable positioning thereof, by engagement of the peripheral frame 2, i.e. the central part 21b of the bars 21.

Namely, the tray 4 has a front edge 44 and a rear edge 45, which have a concavity facing toward the bottom of the dishwasher tub, preferably with a V profile, which allows stable accommodation of one of the bent metal bars 21 due to gravity. This allows easy separation of the tray 4 from the peripheral frame 2, for easier cleaning and/or maintenance.

Other means for engagement of the tray 4 with the peripheral frame 2 may be advantageously employed by the skilled person, to meet the design requirements. Furthermore, a handle 46 may be comprised along the front edge 44, and may be formed by extending part of the edge 44 toward the bottom of the tub; such that this handle 46 is preferably formed of one piece with the tray 4.

The handle 46 allows the user to pull the drawer 1 out of the tub along the longitudinal axis of the drawer 1, possibly using slide means (not shown), such as wheels, slide guides or else, which may be advantageously positioned by using the side bars 23.

The flat tray 5 comprises a flat surface 57 whose purpose and size are similar to those of the flat surface 47 of the tray 4, a front edge 54 and a rear edge 55, whose purpose and size are similar to those of the edges 44,45, a flat edge 51 and two rack edges 52,52a, which are useful for stable positioning of the cutlery to be washed; the rack edge 52 advantageously faces the side wall of the tub (not shown), whereas the edge 52a has a rack support 6 located well below the edge 52, whereby the configuration of these two edges 52 and 52a provides a seamless arrangement of the trays 4 and 5 when they are used together.

The width of the tray 4 is preferably equal to about two thirds of the width of the peripheral frame 2, whereas the width of the tray 5 is about one third of the width of said peripheral frame 2, which affords the maximum load capacity of the drawer when both trays 4,5 are being used.

The edges 44,45,54,55 are appropriately shaped, for mutual coupling when the two trays 4, 5 are in a partially or entirely overlapping condition. Thus, as shown in Figs. 3 and 4, when the drawer is not required to have the maximum load capacity, the tray 5 may advantageously overlap any portion of the tray 4, i.e. the flat surface 47 thereof, without requiring the tray 5 to be stored outside the dishwasher tub. For this purpose, the grids of the bottoms 43,53 of the two respective trays 4,5 can advantageously be in overlapping condition, without blocking by their meshes the passage of the washing water.

A third tray 70 may be also employed, as shown in Figure 10, when the trays 4,5 are in such overlapping condition; this third tray 70 will advantageously have characteristics that none of the trays 4 and 5 have. For instance, the third tray 70 has a shape that allows use thereof as a serving tray, such as an oval or elongate shape, and preferably comprises a pair of handles or grips 71,72, which also act as rests on the frame 21. The handles 71,72 may be formed of one piece with the rest of the tray 70 or using inserts of different materials.

As mentioned above, the tub might be advantageously equipped with one or more sensors (e.g. optical, acoustic or other kinds of sensors), capable of sensing at least one of the following properties: presence/position of at least one tray and presence/position of the cutlery support means, in order to improve the efficiency of the washing cycle, by convenient use of the drawer feeding means not shown). Thus, as shown in Fig. 4, the trays 4,5 may be displaced along the lateral axis of the peripheral frame 2 by using the bent metal bars 21 as rails.

This is highly advantageous when loading objects having a considerable height in a lower rack (not shown), as the drawer 1 does not have to be entirely...
removed, but only moved. The skilled person will appreciate that the drawer 1 may be located in the dishwasher tub either below or above any other rack.

Any variant that should become apparent to the skilled person will be part of the scope of the following claims.

Claims

1. A cutlery rack (1) for a dishwasher, comprising a perimetric frame (2) that can be extracted from the tub, a first tray (4) and a second tray (5) on which objects such as cutlery and the like can be laid, supported by said perimetric frame (2), characterized in that it comprises object support means removably associated with at least one of said trays (4,5) and a third tray (70) that can be positioned on said perimetric frame (2) when said first and second trays (4,5) at least partly overlap.

2. A rack (1) according to claim 1, wherein at least one of the trays (4,5,70) is movable relative to said perimetric frame (2).

3. A rack (1) according to claim 1 or 2, wherein at least one of the trays (4,5,70) comprises a cavity (41), which comprises one or more side openings (42).

4. A rack (1) according to any one of the preceding claims, wherein at least one of the trays (4,5,70) comprises a bottom (43,53), and said bottom (43,53) comprises a grid.

5. A rack (1) according to claim 4, wherein the support means comprise hooks (64) which removably engage with the grid.

6. A rack (1) according to any one of claims 1 to 5, wherein the perimetric frame (2) comprises at least one front small bar (21) and one rear small bar (21), which are substantially parallel and constrained to each other by lateral small bars (23).

7. A rack (1) according to any one of the preceding claims, wherein the support means comprise rakes (6).

8. A rack (1) according to any one of the preceding claims, wherein at least one of the trays (4,5,70) comprises a front edge (44,54) and a rear edge (45,55) so shaped as to engage with the perimetric frame (2) for supporting the tray (4,5,70).

9. A rack (1) according to claim 8, wherein the front edge (44,54) comprises a handle (46).

10. A rack (1) according to claim 9, wherein the first and the second trays (4,5) can be at least partly arranged one on top of the other.

11. A rack (1) according to claim 10, wherein the front edges (44,54) and/or the rear edges (45,55) of the respective first and second trays (4,5) are so shaped as to be coupled together when they partially or fully overlap.

12. A dishwasher characterized in that it comprises a rack (1) according to one of the preceding claims 1 to 11.

13. A dishwasher according to claim 12, wherein said dishwasher comprises a tub with a ceiling and at least two dish racks, wherein the cutlery rack (1) is positioned in the proximity of said ceiling or between said dish racks.

14. A dishwasher according to claim 12 or 13, characterized in that it comprises one or more sensors arranged in the tub and able to detect at least one of the following conditions: presence/position of at least one tray (4,5,70) and presence/position of the cutlery support means, so as to improve the efficiency of a wash cycle.
REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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