

DISHWASHER WITH A DISH RACK

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. Patent Application No. 19/039,228, filed on January 28, 2025, which is a continuation of U.S. Patent Application No. 18/535,327, filed on December 11, 2023, now U.S. Patent No. 12,232,681, issued February 25, 2025, which is a continuation of U.S. Patent Application No. 17/830,947, filed on June 2, 2022, now U.S. Patent No. 11,864,712, issued January 9, 2024, which is a continuation of U.S. Patent Application No. 16/833,984, filed March 30, 2020, now U.S. Patent No. 11,375,874, issued July 5, 2022, all of which are incorporated herein by reference in their entirety.

TECHNICAL FIELD

[0002] This disclosure generally relates to a dishwasher, and more specifically to dishwasher including a dish rack.

BACKGROUND

[0003] Household dishwashers typically include one or more dish racks for holding various types of dishes in the dishwasher tub. Traditionally, a dishwasher includes an upper dish rack that holds glassware and small dishes, and a lower dish rack that holds larger dishes, such as plates. The upper and lower dish racks usually consume most of the space inside the dishwasher tub. Some dishwashers can also include a third dish rack, often referred to as a third level rack, of a much shorter height the upper and lower dish racks, with the height being such as to only accommodate silverware or other low profile utensils.

[0004] A utensil caddy is often used to specifically hold silverware. Utensil caddies are normally removably carried by the lower dish rack or on the inner surface of the door closing the dishwasher. These utensil caddies are oriented such that they hold the utensils in an upright or vertical orientation during washing.

[0005] Some dishwashers can have both a utensil caddy and a third level rack. The third level rack can normally accommodate long handle items, such as spatulas, severing

spoons, stirring spoons, which, if put into the utensil caddy, would extend far enough vertically to interfere with the rotation of the sprayer below the upper rack.

SUMMARY

[0006] According to one aspect of the present disclosure, a dishwasher includes a tub that defines a dish treating chamber. A first lower dish rack and a second lower dish rack are located in the dish treating chamber. An upper dish rack is located above the first lower dish rack and the second lower dish rack in the dish treating chamber. The upper dish rack defines a planar portion and a depression. The depression extends below the planar portion and includes a first angled wall and a second angled wall that each extend at an acute angle relative to the planar portion. The first angled wall defines a first set of cup seats and the second angled wall defines a second set of cup seats. A plurality of utensil holders is disposed in the planar portion and is configured to horizontally support utensils.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] In the drawings:

[0008] FIG. 1 is a schematic, cross-sectional view of a dishwasher with a dish rack according to an aspect of the present disclosure.

[0009] FIG. 2 is a schematic diagram of a control system for the dishwasher of FIG. 1.

[0010] FIG. 3 is a side view of a dish rack assembly including the dish rack of FIG. 1 with a utensil caddy according aspects of the disclosure.

[0011] FIG. 4 is a perspective view of the utensil caddy of FIG. 3 in a first position according to aspects of the disclosure.

[0012] FIG. 5A is a perspective view of the utensil caddy of FIG. 3 in a second position according to aspects of the disclosure.

[0013] FIG. 5B is a perspective view of the utensil caddy in the second position of FIG. 5a according to aspects of the disclosure.

[0014] FIG. 6 is a perspective view of the utensil caddy in the second position of FIG. 5 including utensils according to aspects of the disclosure

[0015] FIG. 7 is a perspective view of the dish rack including an exemplary utensil caddy of FIG. 3 which extends across a quarter of the dish rack assembly according to aspects of the disclosure.

[0016] FIG. 8 is a perspective view of the dish rack including an exemplary utensil caddy of FIG. 3 which extends across half of the dish rack assembly according to aspects of the disclosure.

DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0017] Aspects of the present disclosure relate to a utensil caddy including on a dish rack of dishwasher, specifically an automatic dishwasher. The utensil caddy can be configured to include, at least, a first side wall including a first set of utensil holders and a second side wall including a second set of utensil holders. The second side wall can be further configured to be moveable relative to the utensil caddy between a first position and a second position.

[0018] FIG. 1 illustrates a schematic, cross-sectional view of an exemplary dishwasher 10, specifically an automatic dishwasher, according to an embodiment of the present disclosure. The dishwasher 10 shares many features of a conventional automatic dishwasher, which will not be described in detail herein except as necessary for a complete understanding of the disclosure. While the present disclosure is described in terms of a conventional dishwashing unit, it can also be implemented in other types of dishwashing units, such, but not limited to, as in-sink dishwashers, multi-tub dishwashers, or drawer-type dishwashers. A chassis 12 can define an interior of the dishwasher 10 and can include a frame, with or without panels mounted to the frame. For built-in dishwashers, outer panels are typically not needed. For dishwashers that are not built into existing cabinetry, the chassis 12 can include the panels mounted to the frame to form a cabinet for the dishwasher 10. An open-faced tub 14 can be provided within the interior of and mounted to the chassis 12 and can at least partially define a treating chamber 16 or a dish treating chamber for washing or otherwise treating dishes. The open face of the tub 14 defines an access opening for the treating chamber 16.

[0019] A closure element, such as a door assembly 18, can be movably mounted to the dishwasher 10 for movement between opened and closed positions. The door assembly 18 can be configured selectively open and close the treating chamber access opening defined by the open face of the tub 14. Thus, the door assembly 18 provides accessibility to the treating chamber 16 for the loading and unloading of dishes or other washable items. It should be appreciated that the door assembly 18 can be secured to the lower front edge of the chassis 12 or to the lower front edge of the tub 14 via a hinge assembly (not shown) configured to pivot the door assembly 18. When the door assembly 18 is closed, user access to the treating chamber 16 can be prevented, whereas user access to the treating chamber 16 can be permitted when the door assembly 18 is open. Alternatively, the closure element can be slidable relative to the chassis 12, such as in a drawer-type dishwasher, wherein the access opening for the treating chamber 16 is formed by an open-top tub. Other configurations of the closure element relative to the chassis 12 and the tub 14 are also within the scope of the disclosure.

[0020] Dish holders, illustrated in the form of an upper dish rack 22, a lower dish rack 24, and a third level rack 20, can be located within the treating chamber 16 and receive dishes for treatment, such as washing. The third level, upper, and lower dish racks 20, 22, 24 can be vertically oriented with respect to one another. That is, third level, upper, and lower dish racks 20, 22, 24 can be spaced from one another in a vertical direction denoted by a Z-axis. The third level, upper, and lower dish racks 20, 22, 24 are typically mounted for slidable movement in and out of the treating chamber 16 for ease of loading and unloading. Other dish holders can be provided, such as a silverware basket, separate from or combined with third level, upper, and lower dish racks 20, 22, 24. As used in this description, the term “dish(es)” is intended to be generic to any item, single or plural, that may be treated in the dishwasher 10, including, without limitation, dishes, plates, pots, bowls, pans, glassware, and silverware. While the dishwasher 10 is illustrated herein as having three dish racks 20, 22, 24, it will be understood that any suitable number and configuration of dish racks is also within the scope of the disclosure.

[0021] A utensil caddy 70 can be included with the third level rack 20. Specifically, the utensil caddy 70 can be provided on a lateral side of third level dish rack 20. As used herein, the term lateral can denote any direction corresponding to the X-axis. The utensil caddy 70 can be configured to hold a set of utensils so they can be treated within the treating chamber 16. As used herein, the term utensil can refer to any implement, article or container suitable for treatment within the treating chamber 16. For example, the set of utensils can include, but is not limited to, a spoon, a fork, a spork, a knife, a spatula, a baby-bottle nipple, a measuring spoon, a ladle, a tong, or the like. It will be appreciated that there can be any number of one or more utensil caddy's 70 within the treating chamber 16 and included with any of the third level, upper, and lower dish racks 20, 22, 24.

[0022] A spray system can be provided for spraying liquid in the treating chamber 16 and may be provided in the form of, for example, an upper spray assembly 26, a middle spray assembly 28, and a lower spray assembly 30. The upper spray assembly 26, the middle spray assembly 28, and the lower spray assembly 30 are located, respectively, above the third level dish rack 20, beneath the upper dish rack 22, and beneath the lower dish rack 24 and are illustrated as rotating spray arms by example but are not limited to such positions and sprayer type. The spray system can further include a rack spray assembly 32 coupled to the third level dish rack 20; the rack spray assembly 32 will be discussed in further detail below. Furthermore, the spray system can include additional and/or alternative spray assemblies. For example, a distribution header or spray manifold can be located at the rear of the tub 14 at any vertical position. An exemplary spray manifold is set forth in detail in U.S. Patent No. 7,594,513, issued September 29, 2009, and titled "Multiple Wash Zone Dishwasher," which is incorporated herein by reference in its entirety.

[0023] A recirculation system can be provided for recirculating liquid from the treating chamber 16 to the spray system. The recirculation system can include a sump 34 and a pump assembly 36. The sump 34 collects the liquid sprayed in the treating chamber 16 and can be formed by a sloped or recess portion of a bottom wall of the tub 14. The pump

assembly 36 can include both a drain pump 38 and a recirculation pump 40. The drain pump 38 can draw liquid from the sump 34 and pump the liquid out of the dishwasher 10 to a household drain line (not shown). The recirculation pump 40 can draw liquid from the sump 34, and the liquid can be simultaneously or selectively pumped through a supply conduit or tube 42 to each of the upper, middle, lower, and rack spray assemblies 26, 28, 30, 32 for selective spraying. The liquid supply tube 42 extends along a wall of the tub 14 and fluidly connect the pump assembly 36 to the upper, middle, lower, and rack spray assemblies 26, 28, 30, 32. While not shown, a liquid supply system can include a water supply conduit coupled with a household water supply for supplying water to the treating chamber 16.

[0024] While the pump assembly 36 is illustrated herein as having separate drain and recirculation pumps 38, 40, in an alternative embodiment, the pump assembly 36 can include a single pump configured to selectively supply wash liquid to either the spray system or the drain line, such as by configuring the pump to rotate in opposite directions, or by providing a suitable valve system.

[0025] A heating system including a heater 44 can be located, for example, within the sump 34 for heating the liquid contained in the sump 34. The heater 44 can also heat air contained in the treating chamber 16. Alternatively, a separate heating element (not shown) can be provided for heating the air circulated through the treating chamber 16. A filtering system (not shown) can be fluidly coupled with the recirculation flow path for filtering the recirculated liquid.

[0026] A control system including a controller 46 can also be included in the dishwasher 10, which can be operably coupled with various components of the dishwasher 10 to implement a cycle of operation. The controller 46 can be located within the door assembly 18 as illustrated, or it can alternatively be located somewhere within the chassis 12. The controller 46 can also be operably coupled with a control panel or user interface 48 for receiving user-selected inputs and communicating information to the user. The user interface 48 can include operational controls such as dials, lights, switches, and displays

enabling a user to input commands, such as a cycle of operation, to the controller 46 and receive information.

[0027] FIG. 2 is a schematic illustration of the controller 46 of FIG. 1. The controller 46 can be coupled with the heater 44 for heating the wash liquid during a cycle of operation, the drain pump 38 for draining liquid from the treating chamber 16, and the recirculation pump 40 for recirculating the wash liquid during the cycle of operation. The controller 46 can be provided with a memory 50 and a central processing unit (CPU) 52. The memory 50 can be used for storing control software that can be executed by the CPU 52 in completing an automatic cycle of operation using the dishwasher 10 and any additional software. For example, the memory 50 can store one or more pre-programmed cycles of operation that can be selected by a user and completed by the dishwasher 10. A cycle of operation for the dishwasher 10 can include one or more of the following steps: a wash step, a rinse step, and a drying step. The wash step can further include a pre-wash step and a main wash step. The rinse step can also include multiple steps such as one or more additional rinsing steps performed in addition to a first rinsing. The amounts of water and/or rinse aid used during each of the multiple rinse steps can be varied. The drying step can have a non-heated drying step (so called “air only”), a heated drying step or a combination thereof. These multiple steps can also be performed by the dishwasher 10 in any desired combination.

[0028] The controller 46 can also receive input from one or more sensors 54. Non-limiting examples of sensors that can be communicably coupled with the controller 46 include a temperature sensor and turbidity sensor to determine the soil load associated with a selected grouping of dishes, such as the dishes associated with a particular area of the treating chamber 16.

[0029] The dishwasher 10 can include all of the above exemplary systems, a selection of the above exemplary systems, and/or other systems not listed above as desired. Further, some of the systems can be combined with other systems and/or can share components with other systems. Examples of other systems that the dishwasher can further include are a dispensing system that supplies one or more treating agents or chemistries to the

treating chamber 16 and an air supply system that can provide air, which can be heated or not heated, to the treating chamber 16, such as for drying and/or cooling the dishes. An exemplary air supply system is set forth in U.S. Patent Application No. 12/959,673, filed December 3, 2010 and published as U.S. Patent Application Publication No. 2012/0138106 on June 7, 2012, both of which are incorporated herein by reference in their entireties.

[0030] FIG. 3 illustrates a side view of a dish rack assembly 100 including the utensil caddy 70 of FIG. 1 and a dish rack 102. It will be appreciated that the dish rack assembly 100 can include any dish rack 102 as described herein. For example, the dish rack 102 can be any of the upper or lower dish racks 22, 24, or the third level rack 20.

[0031] The dish rack 102 has a wire frame construction forming a bottom wall 104 from which extends a peripheral wall 108 defining the sides of the dishrack. The bottom wall 104 and peripheral wall 108 define an interior where utensils and the like can be placed for washing.

[0032] While the bottom wall 104 can have any shape, including planar, the bottom wall 104 is illustrated as having a planar portion 106 and a depression defined by a first and second angled wall 110, 112. The depression, as illustrated, forms a first set of cup seats 114 and a second set of cup seats 115, which hold cups as illustrated.

[0033] The bottom wall 104 can define multiple planes. For example, the planar portion 106 can define a first plane transverse to the X-axis, while the first angled wall 110 can define a second plane and the second angled wall 112 can define a third plane. The second and the third planes can both be angled with respect to the X-axis such that they intersect with the first plane. Specifically, the second plane can intersect the first plan at the point where the planar portion 106 and the first angled wall 110 meet.

[0034] A spray assembly is carried by the dish rack 102 and includes first and second sprayers 116, 117, with the first sprayer 116 located between the first and second set of cup seats 114, 115 to emit a spray into the open top of the cups, and the second sprayer 117 located to emit a spray into the planar portion 106.

[0035] The utensil caddy 70 can be received within a region of the dish rack 102 adjacent to a portion of the bottom wall 104, specifically the planar portion 106. It is contemplated that the utensil caddy 70 can be removably mounted to a portion of the dish rack 102, specifically the planar portion 106. As such, the utensil caddy 70 can be moved to other portions of the dish rack 102 or to another dish rack 102 altogether. Alternatively, at least a portion of the utensil caddy 70 can be integrally formed with the planar portion 106 and hence the dish rack 102. It is further contemplated that the utensil caddy 70 can be laid on its side or otherwise be defined as a horizontal utensil caddy such that utensils can be received within the utensil caddy 70 in a horizontal fashion transverse to the X-axis. Traditional utensil caddies, on the other hand, are vertically mounted such that they can be defined as a vertical utensil caddy. As such, utensils can be received within the vertical utensil caddy in a vertical fashion transverse to the Z-axis.

[0036] FIG. 4 is a perspective view of the dish rack assembly 100 of FIG. 3 including the utensil caddy 70 in a first position. As used herein, the first position can be defined as a closed configuration of the utensil caddy 70 where at least a portion of the utensil caddy 70 abuts a portion of the bottom wall 104 and does not abut the first angled wall 110. As illustrated, the first and second set of cup seats 114, 115, the first and second sprayers 116, 117, and the utensil caddy 70 can extend along the entirety of the dish rack 102 along the Z-axis.

[0037] The utensil caddy 70 can include a periphery defining an interior with an open top 132. The open top 132 can be defined as a portion of the utensil caddy 70 in which utensils can be passed through. The open top 132 can lie at a junction point between the first plane of the planar portion 106 and the second plane of the first angled wall 110.

[0038] FIG. 5A is a perspective view of the dish rack assembly 100 of FIG. 3 including the utensil caddy 70 in a second position. The second position can be defined as an open configuration of the utensil caddy 70 where at least a portion of the utensil caddy 70 is carried by, received on, or abuts a portion of the bottom wall 104, specifically the first angled portion 112 as illustrated. It will be appreciated that the utensil caddy 70 can be advantageously shaped so that a portion of the utensil caddy 70 can transition from the

closed or first position to the opened or second position and conform with the first angled wall 110.

[0039] FIG. 5B is a perspective view of the utensil caddy 70 in the second position of FIG. 5A without the dish rack 102. The utensil caddy 70 can include a first side wall 120, a second side wall 122, and a set of hinges 124.

[0040] The first side wall 120 can rest on, be directly coupled to, or form a portion of the bottom wall 104 of the dish rack 102, specifically, the planar portion 106. The first side wall 120 can include a first set of utensil holders illustrated as a set of utensil seats 126 or loops 128. The utensil holders can be configured to retain or hold a set of utensils such as, but not limited to, spoons, forks, sporks, knives, ladles, spatulas, or the like. Specifically, the set of utensil seats 126 can be configured to hold smaller utensils (e.g., spoons, forks, sporks, etc.) while the loops 128 can be configured to hold larger utensils (e.g., spatulas, ladles, whisks, etc.). Although illustrated as four separate loops 128 and four sets of utensil seats 126, it will be appreciated that there can be any number of loops 128 or utensil seats 126 provided on the first side wall 120. It will be further appreciated, that one or more of the sets of utensils seats 126 can be provided between adjacent loops 128 as illustrated.

[0041] The second side wall 122 can be configured to rotate along the Y-axis about the set of hinges 124 and with respect to the first side wall 120. As such, the second side wall 122 can be moveable between the first position where at least a portion of the second side wall 122 abuts the first side wall 120, and the second position where at least a portion of the second side wall 122 rests against or abuts the bottom wall 104, specifically against the first angled portion 112. As illustrated, the second side wall 122 can overlie the entire first set of cup seats 114 and not overlie the second set of cup seats 115 when in the second position.

[0042] The second side wall 122 can further include a second set of utensil holders illustrated as a pin 130 and a seat 131. The pin 130 can be formed as a triangular projection extending from a surface while the seat 131 can be formed as a curved projection of the second side wall 122. A space or slot can be included between adjacent

pins 130. As such, the slot can be configured to accept the blade of a knife while the seat 131 accept the handle of the knife, as illustrated. Additionally, or alternatively, the utensil holders of the second side wall 122 can be configured to hold the any suitable utensils such as, but not limited to, a spatula, a ladle, or the like.

[0043] The first side wall 120 and the second side wall 122 can be coupled together through the set of hinges 124, specifically two hinges 124 provided on either distal end of the utensil caddy 70 along the Y-Axis. The set of hinges 124 can act as a method of coupling or a point of connection between first side wall 120 and the second side wall 122 and also provide for rotational movement about the Y-Axis for the second side wall 122 with respect to the first side wall 120. As such, the second side wall 122 can pivot from the first position to the second position.

[0044] FIG. 6 is a perspective view of the dish rack assembly 100 of FIG. 3 in the first position and including various sets of utensils received within the utensil caddy 70 in the first position. As illustrated, a set of cups is received within the first set of cup seats 114, and a set of mugs is received within the second set of cup seats 115. Further, a set of utensils are received within the utensil caddy 70, specifically, a set of knives, forks, and spoons are received within the set of utensil seats 126 and a set of larger knives are received within the second utensil holders, specifically the pins 130 and the seats 131. It will be appreciated, however, that other such as sporks, measuring cups, or the like can be received within the utensil seats 126 and larger utensils such as spatulas, ladles, or the like can be received within the loops 128. It will be further appreciated that although illustrated as cups and mugs either the first or the second set of cup seats 114, 115 can receive other objects to be treated within the treating chamber 16 such as, but not limited to, baby bottles, plates, bowls, pans, or the like.

[0045] A diffuser section can be included within a portion of the utensil caddy 70, specifically a portion of the second side wall 122. The diffuser section can be defined as a portion of the utensil caddy 70 which directly contacts a stream of water from one or more of the first and second sprayers 116, 117. The stream of water emitted from the first and second sprayers 116, 117 can, in some instances, be defined as a straight-line

stream of water. This straight-line stream of water can be used to effectively clean targeted portions of various utensils, cups, mugs, or plates within the treating chamber 16. It is contemplated, however, that placing a portion of the utensil caddy 70, specifically the diffuser section on the second side wall 122, in the path of the stream of water can diffuse the stream of water outward to form a fan pattern covering a larger area than the straight-line stream can be more effective at cleaning various utensils. For example, if it is desired to clean a spatula or other utensils with a large surface area, at least a portion of the stream of water from the first and second sprayers 116, 117 that is directed toward the spatula can impact the diffuser region of the utensil caddy 70. Once the stream of water hits the diffuser section, the stream of water can fan-out or form a cone-shaped spray area which can cover a larger surface area than the straight-line stream of water. This, in turn, can be more effective in cleaning utensils on the utensil caddy 70 which have a large surface area than through the use of non-diffused, straight-line stream of water.

[0046] In operation, the first and second sprayers 116, 117 or any other sprayer within the treating chamber 16 (e.g., upper, lower, or middle spray assemblies 26, 28, 30) can be configured to treat a set of utensils within a spray zone created by the sprayers. As used herein, the term spray zone can be defined as a region or section within the treating chamber which receives a direct or indirect flow of treating fluid. As such, utensils, cups, plates, or the like, placed within the spray zone will be washed or treated. The utensil caddy 70 can be placed in either the first or second position depending on the utensils which need to be treated. For example, if it is desired to clean a set of mugs and a set of cups, the utensil caddy 70 can be positioned in the first position such that cups and mugs can be placed within the first and second sets of cup seats 114, 115 as illustrated in FIG. 6. On the other hand, if it is desired to clean a set of utensils, the utensil caddy 70 can be positioned in the second position and a set of utensils can be placed within the respective utensil holders or seats, as illustrated in FIG. 6. It is further contemplated that when the utensil caddy 70 is positioned in the second position that only the first set of cup seats 114 are covered by the second side wall 122. As such, cups or mugs can still be received within the second set of cup seats 115.

[0047] FIG. 7 is a perspective view of a dish rack assembly 200. The dish rack assembly 200 is similar to the dish rack assembly 100; therefore, like parts will be identified by like numerals in the 200 series, with it being understood that the description of the like parts of the dish rack assembly 100 applies to the dish rack assembly 200 unless otherwise noted.

[0048] The dish rack assembly 200 includes a utensil caddy 270 which includes a second side wall 222 similar to the second side wall 122 except the overall length along the Y-axis of the second side wall 222 is smaller than the overall length of a first side wall 220 along the Y-axis. Specifically, the second side wall 222 is configured to have an overall length that is a quarter of the overall length of the first side wall 220. As such, when the utensil caddy 270 is in the second position as illustrated, an uncovered portion or an opening is formed within the first set of cup seats 114. This, in turn, ensures that at least a portion of the first set of cup seats 114 are free or open regardless of whether the utensil caddy 270 is in the first position or the second position.

[0049] The second side wall 222 can be configured to hold smaller, more delicate utensils than the second side wall 122. For example, the second side wall 222 can be configured to hold baby bottle nipples, caps, burrs, or the like. Additionally, or alternatively, the second side wall 222 can include a utensil holder similar to a utensil loop 228 or a utensil seat 226 to hold a set of utensils.

[0050] FIG. 9 is a perspective view of a dish rack assembly 300. The dish rack assembly 300 is similar to the dish rack assembly 100, 200; therefore, like parts will be identified by like numerals in the 300 series, with it being understood that the description of the like parts of the dish rack assembly 100, 200 applies to the dish rack assembly 300 unless otherwise noted.

[0051] The dish rack assembly 300 includes a utensil caddy 370 which includes a second side wall 322 similar to the second side wall 122, 222 except that the second side wall 322 includes an overall length along the Y-axis that is half the overall length of a first side wall 320 along the Y-axis. This is similar to the second side wall 222 in that a portion of the first set of cup seats 114 are free or open regardless of whether the utensil caddy 370 is

in the first position or the second position. However, the second side wall 322 includes the overall length of half the overall length of the first side wall 320. This, in turn, allows for larger utensils, such as large knives, to be mounted on the second side wall 322 when the utensil caddy 370 is in the second position while still allowing for at least a portion of the first set of cup seats 114 to be open regardless of the position of the utensil caddy 370.

[0052] A set of loops 328 can be provided on the first side wall 320 such that a set of larger utensils, illustrated as three spatulas, can be secured within the utensil caddy 370. It is contemplated, that a set of larger utensils can be secured by the set of loops 328 regardless of whether the utensil caddy 370 is in the first position or the second position. As illustrated, the utensil caddy 370 is in the first position such that a portion of the larger utensils extend beyond the utensil caddy along the X-axis.

[0053] Benefits of the present disclosure include a dish rack assembly which is more versatile when compared to traditional dish rack assemblies. For example, traditional dish rack assemblies can include a vertical utensil caddy in a fixed position on the dish rack and a set of cup seats. Utensils can be secured within the utensil caddy while cups and mugs can be provided within the cup seats. The set of cup seats, however, are not configured to receive a set of utensils, so in cases where it is desired to treat a large amount of utensils there may not be adequate space to secure the utensils. The utensil caddy as disclosed herein, however, can be further as a horizontal utensil caddy in that utensils can be horizontally placed within the utensil caddy through the open top when the utensil caddy is in the first position and be laid horizontally across either the first or second side walls when the utensil caddy is in the second position. This allows for a more versatile dish rack assembly as the utensil caddy can be in either the first position or the second position depending on the utensils which are desired to be treated. For example, if a large amount of cups or mugs are desired to be treated, the utensil caddy can be positioned in the first position such that all the cup seats are opened. If, on the other hand, it is desired to treat a large amount of utensils, the utensil caddy can be positioned in the second

position and allow for a larger amount of utensils to be secured by the first and second side walls.

[0054] Further benefits of this disclosure include the dish rack assembly, specifically the utensil caddy, with an improved washing efficiency of utensils when compared to traditional vertical utensil caddies. For example, in traditional vertical utensil caddies receive or secure the utensils in a vertical fashion. This, in turn, can place portions of the utensils out of the spray zone such that they are not as effectively cleaned. The utensil caddy as described herein, however, ensures that all of the utensils are horizontally secured and that all portions of the utensils which need to be treated are within the spray zone. Further, the utensil caddy can include a diffuser section which can diffuse the streams of water from the sprayers and effectively cover a larger surface area for the treating fluid or water to reach. As such, the washing efficiency of the utensils placed or secured within the utensil caddy can be improved when compared to the traditional vertical utensil caddies.

[0055] It will also be understood that various changes and/or modifications can be made without departing from the spirit of the present disclosure. By way of non-limiting example, although the present disclosure is described for use with a wire dish rack, it will be recognized that the rack height adjustment assembly can be employed with various rack constructions, including molded racks, such as racks molded of plastic.

[0056] To the extent not already described, the different features and structures of the various embodiments may be used in combination with each other as desired. That one feature may not be illustrated in all of the embodiments is not meant to be construed that it cannot be, but is done for brevity of description. Thus, the various features of the different embodiments may be mixed and matched as desired to form new embodiments, whether or not the new embodiments are expressly described. All combinations or permutations of features described herein are covered by this disclosure.

[0057] While the invention has been specifically described in connection with certain specific embodiments thereof, it is to be understood that this is by way of illustration and not of limitation. Reasonable variation and modification are possible within the scope of

the forgoing disclosure and drawings without departing from the spirit of the invention which is defined in the appended claims.

[0058] It is intended that the following concepts can define at least a portion of the scope of the disclosure and that the apparatus and/or method(s) within the scope of these concepts and their equivalents be covered thereby. This disclosure should be understood to include all novel and non-obvious combinations of elements described herein, and the concepts may be presented in this or a later application to any novel and non-obvious combination of these elements. Any aspect of any embodiment can be combined with any aspect of any other embodiments. Moreover, the foregoing embodiments are illustrative, and no single feature or element is essential to all possible combinations that may be included in this or a later application. Further aspects of the invention are provided by the subject matter of the following clauses:

[0059] An automatic dishwasher configured to implement an automatic treating cycle of operation, comprising a tub defining a dish treating chamber, a dish rack located within the dish treating chamber and comprising a bottom wall defining a first cup seat and a second cup seat, a first sprayer, carried by the dish rack, and emitting a spray into the first cup seat and a second sprayer, carried by the dish rack, and emitting a spray into the second cup seat.

[0060] The automatic dishwasher of the preceding clause wherein at least one of the first and second cup seats is defined by a depression.

[0061] The automatic dishwasher of any of the preceding clauses wherein the bottom wall further comprises a substantially planar portion extending across a first portion of the bottom wall and the depression extends across a second portion of the bottom wall.

[0062] The automatic dishwasher of any of the preceding clauses wherein the first substantially planar portion defines a utensil seat.

[0063] The automatic dishwasher of any of the preceding clauses wherein the dish rack is an upper dishrack and located within a top portion of the dish treating chamber.

- [0064]** The automatic dishwasher of any of the preceding clauses wherein the depression is defined by a second and a third planar portion angled with respect to the first planar portion.
- [0065]** The automatic dishwasher of any of the preceding clauses wherein the second planar portion defines the first cup seat and the third planar portion defines the second cup seat.
- [0066]** The automatic dishwasher of any of the preceding clauses further comprising a utensil caddy, removably mounted to the dish rack, and comprising a periphery defining an interior with an open top, the periphery having at least first and second opposing side walls, the first side wall abutting and laying parallel to the bottom wall, and the second side wall movable relative to the utensil caddy between a first position, in opposition to the first side wall, and a second position, abutting the bottom wall.
- [0067]** The automatic dishwasher of any of the preceding clauses further comprising a first set of utensil holders provided on the first side wall comprising loops extending from the first side wall and a second set of utensil holders provided on the second side wall comprising pairs of spaced pins defining a slot to receive at least one of a blade or handle of a utensil.
- [0068]** The automatic dishwasher of any of the preceding clauses wherein the first set of utensil holders is different from the second set of utensil holders.
- [0069]** The automatic dishwasher of any of the preceding clauses wherein the second set of utensil holders is only operationally functional when the second side wall is in the second position.
- [0070]** The automatic dishwasher of any of the preceding clauses wherein the first set of utensil holders is nested within the second set of utensil holders when the second side wall is in the first position.
- [0071]** The automatic dishwasher of any of the preceding clauses wherein the first sprayer is a dedicated sprayer emitting spray into the first cup seat.
- [0072]** A dishrack for a dishwasher comprising a bottom wall defining a first cup seat and a second cup seat, a first sprayer, carried by the dish rack, and emitting a spray into the

first cup seat and a second sprayer, carried by the dish rack, and emitting a spray into the second cup seat.

[0073] The dishrack of the preceding clause wherein at least one of the first and second cup seats is defined by a depression.

[0074] The dishrack of any of the preceding clauses wherein the bottom wall further comprises a substantially planar portion extending across a first portion of the bottom wall and the depression extends across a second portion of the bottom wall.

[0075] The dishrack of any of the preceding clauses wherein the first substantially planar portion defines a utensil seat.

[0076] The dishrack of any of the preceding clauses wherein the dish rack is an upper dishrack and located within a top portion of the dish treating chamber.

[0077] The automatic dishwasher of any of the preceding clauses wherein the depression is defined by a second and a third planar portion angled with respect to the first planar portion.

[0078] The automatic dishwasher of any of the preceding clauses wherein the second planar portion defines the first cup seat and the third planar portion defines the second cup seat.

What is claimed is:

1. A dishwasher, comprising:
 - a tub defining a dish treating chamber;
 - a first lower dish rack and a second lower dish rack located in the dish treating chamber;
 - an upper dish rack located above the first lower dish rack and the second lower dish rack in the dish treating chamber, the upper dish rack defining a planar portion and a depression, the depression extending below the planar portion, wherein the depression includes a first angled wall and a second angled wall that each extend at an acute angle relative to the planar portion, and wherein the first angled wall defines a first set of cup seats, and wherein the second angled wall defines a second set of cup seats; and
 - a plurality of utensil holders disposed in the planar portion, the plurality of utensil holders configured to horizontally support utensils.
2. The dishwasher of claim 1, wherein the plurality of utensil holders is disposed in a utensil caddy operably coupled to the planar portion.
3. The dishwasher of claim 2, wherein the utensil caddy includes a basket that is removably coupled with a bottom wall of the planar portion.
4. The dishwasher of claim 2, wherein the utensil caddy defines a periphery defining an interior with an open top.
5. The dishwasher of claim 2, wherein the utensil caddy includes a first side wall, a second side wall, and a set of hinges.

6. The dishwasher of claim 5, wherein the first side wall and the second side wall are coupled together through the set of hinges.
7. The dishwasher of claim 2, further comprising:
at least one sprayer adjacent to the first set of cup seats and configured to emit a spray of water into a cup held by the first set of cup seats.
8. The dishwasher of claim 7, wherein the at least one sprayer is located between the first set of cup seats and the second set of cup seats.
9. The dishwasher of claim 7, wherein the at least one sprayer extends from a front of the upper dish rack to a back of the upper dish rack.
10. The dishwasher of claim 7, wherein the at least one sprayer is also configured to emit the spray of water into a cup held by the second set of cup seats.
11. The dishwasher of claim 7, wherein the at least one sprayer is configured to provide a straight-line stream of water.
12. The dishwasher of claim 7, wherein the at least one sprayer includes a plurality of spray nozzles, and wherein each of the spray nozzles is configured to rotate as the at least one sprayer emits the spray of water into the cup held by the first set of cup seats.
13. The dishwasher of claim 7, wherein the utensil caddy includes a diffuser that diffuses the spray of water emitted by the at least one sprayer.
14. The dishwasher of claim 7, wherein the at least one sprayer is configured to emit a straight-line steam of water to the planar portion of the upper dish rack.

15. The dishwasher of claim 7, wherein the at least one sprayer is configured to emit a fan pattern of water.
16. The dishwasher of claim 1, wherein the first set of cup seats is configured to support a set of cups and the second set of cup seats is configured to support a set of mugs.
17. The dishwasher of claim 7, wherein the at least one sprayer is located between the first set of cup seats and the second set of cup seats, the at least one sprayer configured to emit the spray of water into drinking vessels held by the first and second sets of cup seats.
18. The dishwasher of claim 7, wherein a portion of the spray of water emitted by the at least one sprayer is directed toward the plurality of utensil holders.
19. The dishwasher of claim 7, wherein the upper dish rack includes a wire frame construction that forms the first angled wall and the second angled wall.
20. The dishwasher of claim 19, wherein the wire frame construction also forms the planar portion and side walls of the upper dish rack.
21. The dishwasher of claim 19, wherein a plurality of spray nozzles of the at least one sprayer are located beneath the wire frame construction.
22. The dishwasher of claim 21, wherein the plurality of spray nozzles are configured to rotate during said dishwasher operation.
23. The dishwasher of claim 21, wherein the wire frame construction includes a raised section disposed between the first set of cup seats and the second set of cup seats.

24. The dishwasher of claim 23, wherein the plurality of spray nozzles are disposed below a portion of the raised section.

25. The dishwasher of claim 7, wherein a lowermost portion of the first set of cup seats and a lowermost portion of the second set of cup seats is disposed below the at least one sprayer.

26. The dishwasher of claim 7, wherein the at least one sprayer is disposed below the planar portion.

ABSTRACT OF THE DISCLOSURE

A dishwasher includes a tub that defines a dish treating chamber. A first lower dish rack and a second lower dish rack are located in the dish treating chamber. An upper dish rack is located above the first lower dish rack and the second lower dish rack in the dish treating chamber. The upper dish rack defines a planar portion and a depression. The depression extends below the planar portion and includes a first angled wall and a second angled wall that each extend at an acute angle relative to the planar portion. The first angled wall defines a first set of cup seats and the second angled wall defines a second set of cup seats. A plurality of utensil holders is disposed in the planar portion and is configured to horizontally support utensils.

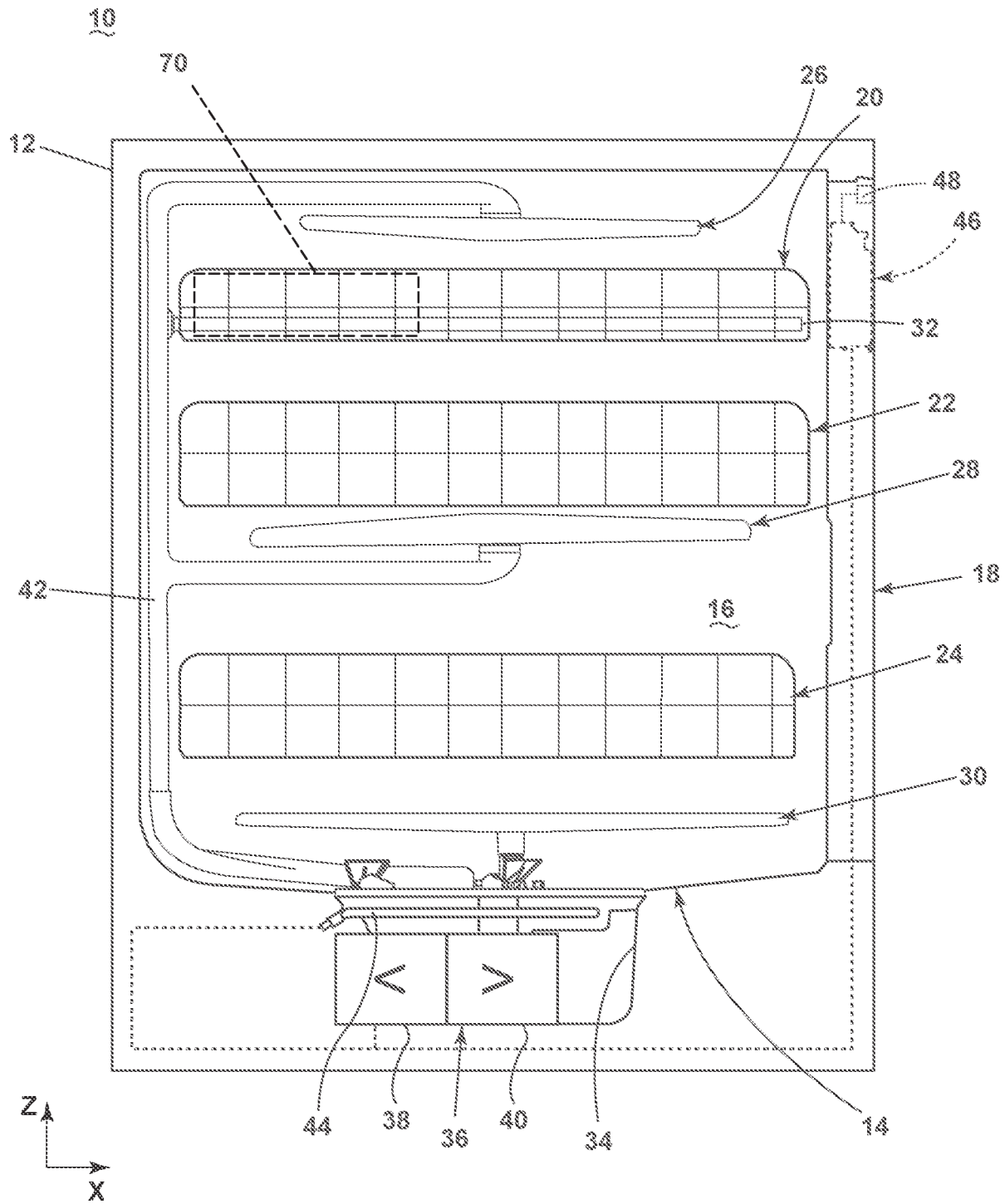


FIG. 1

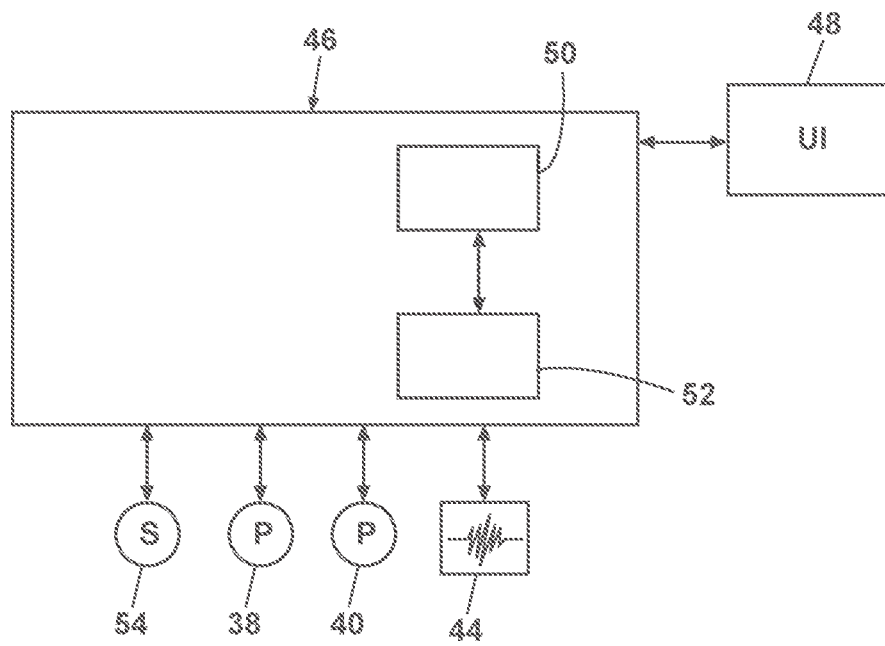


FIG. 2

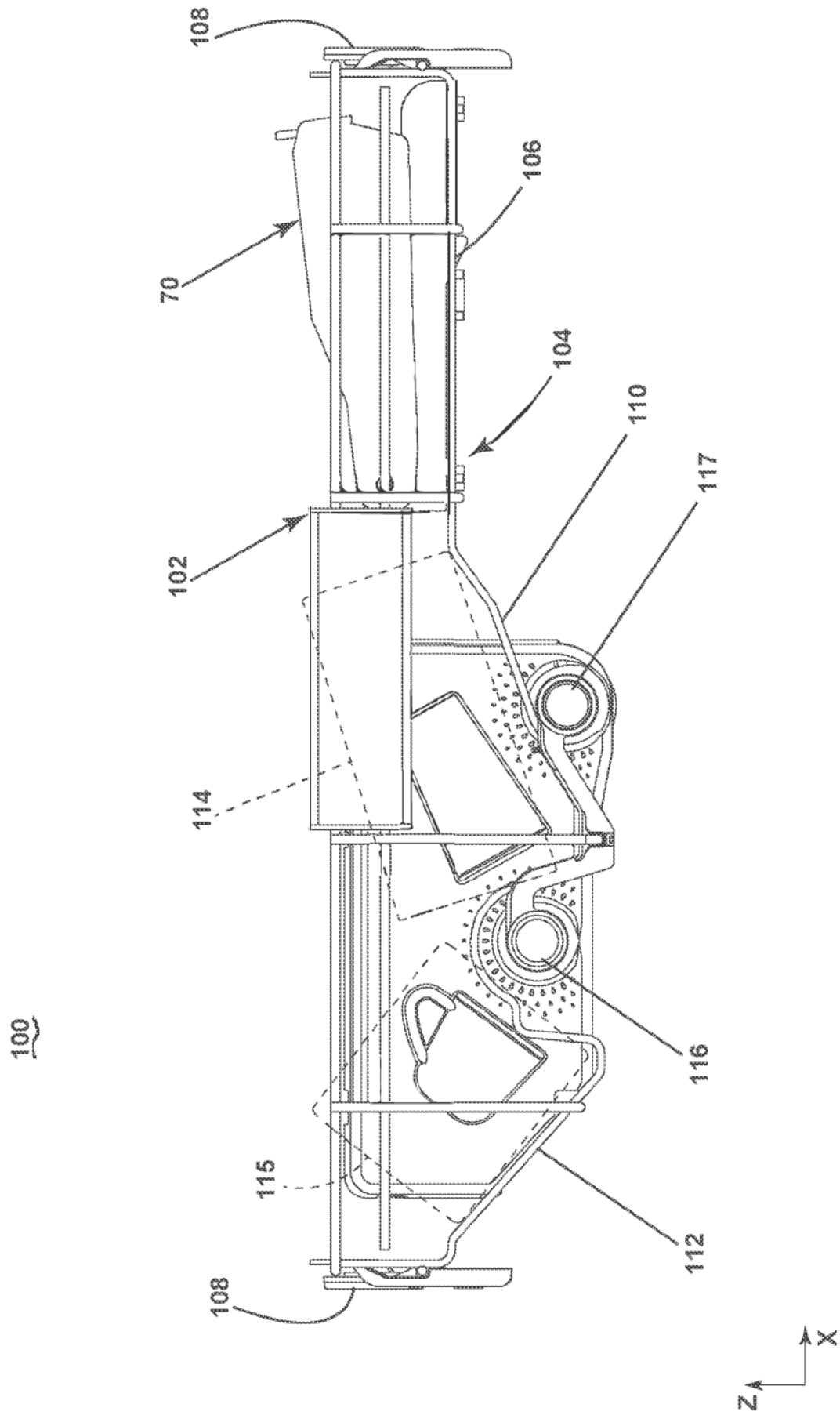


FIG. 3

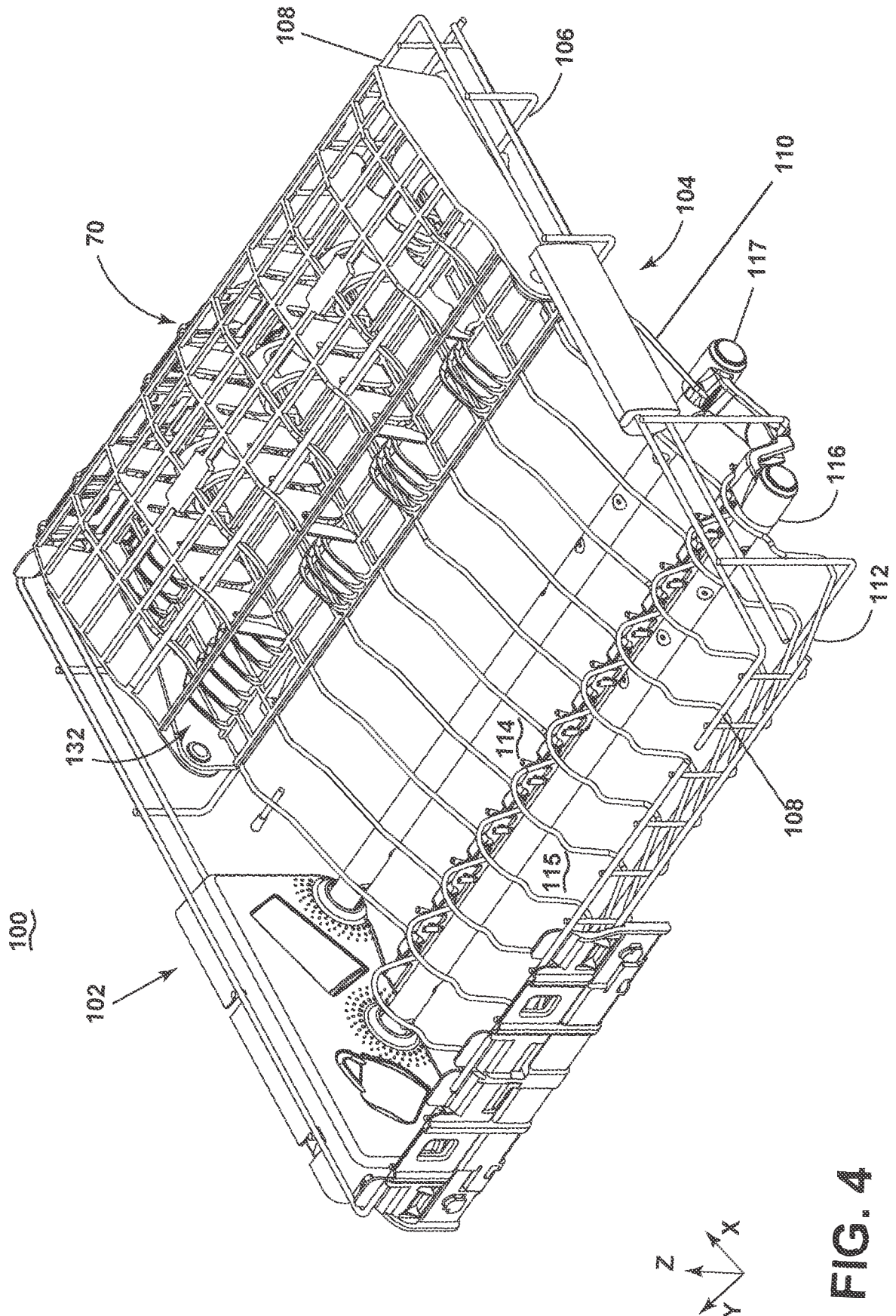


FIG. 4

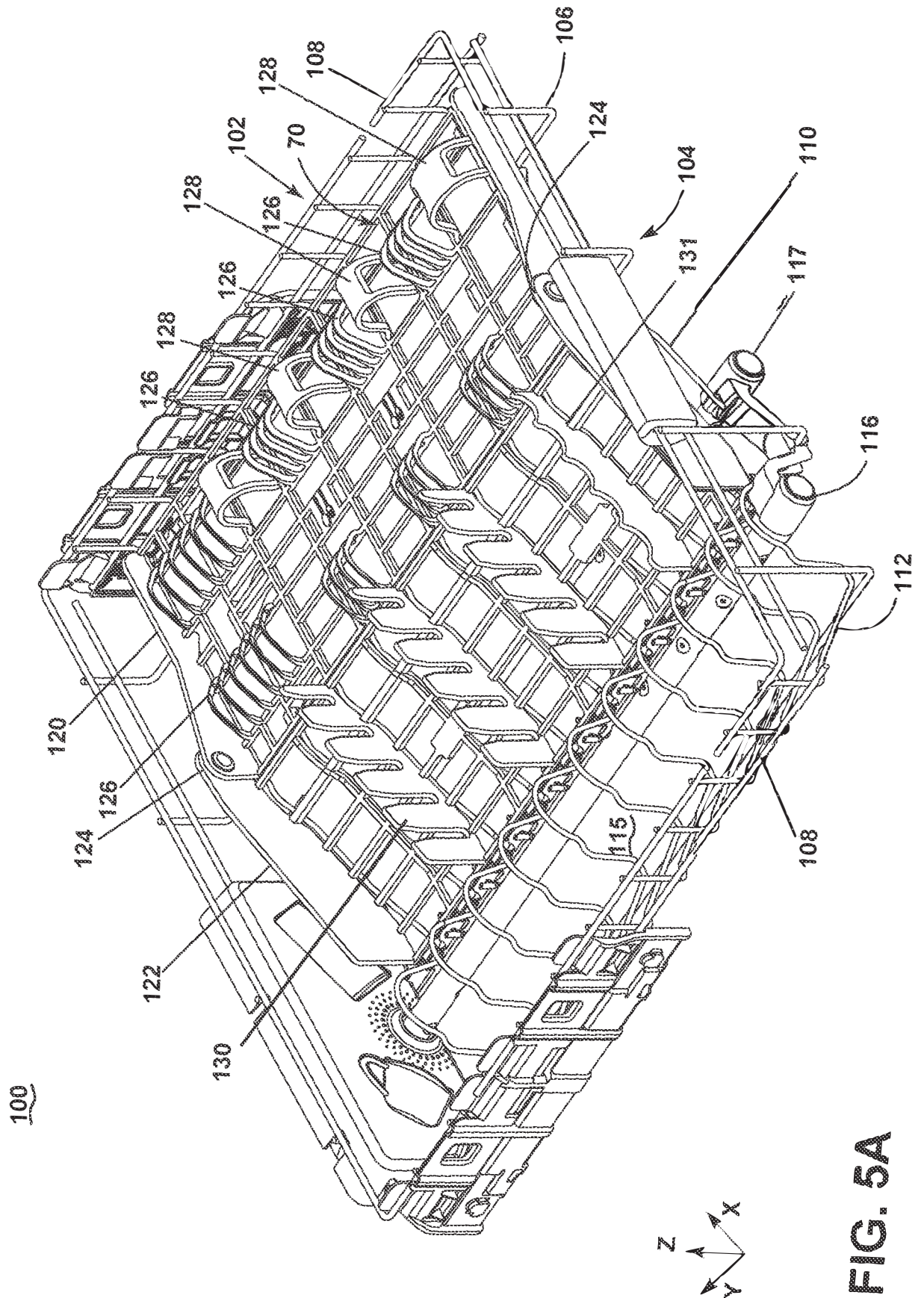


FIG. 5A

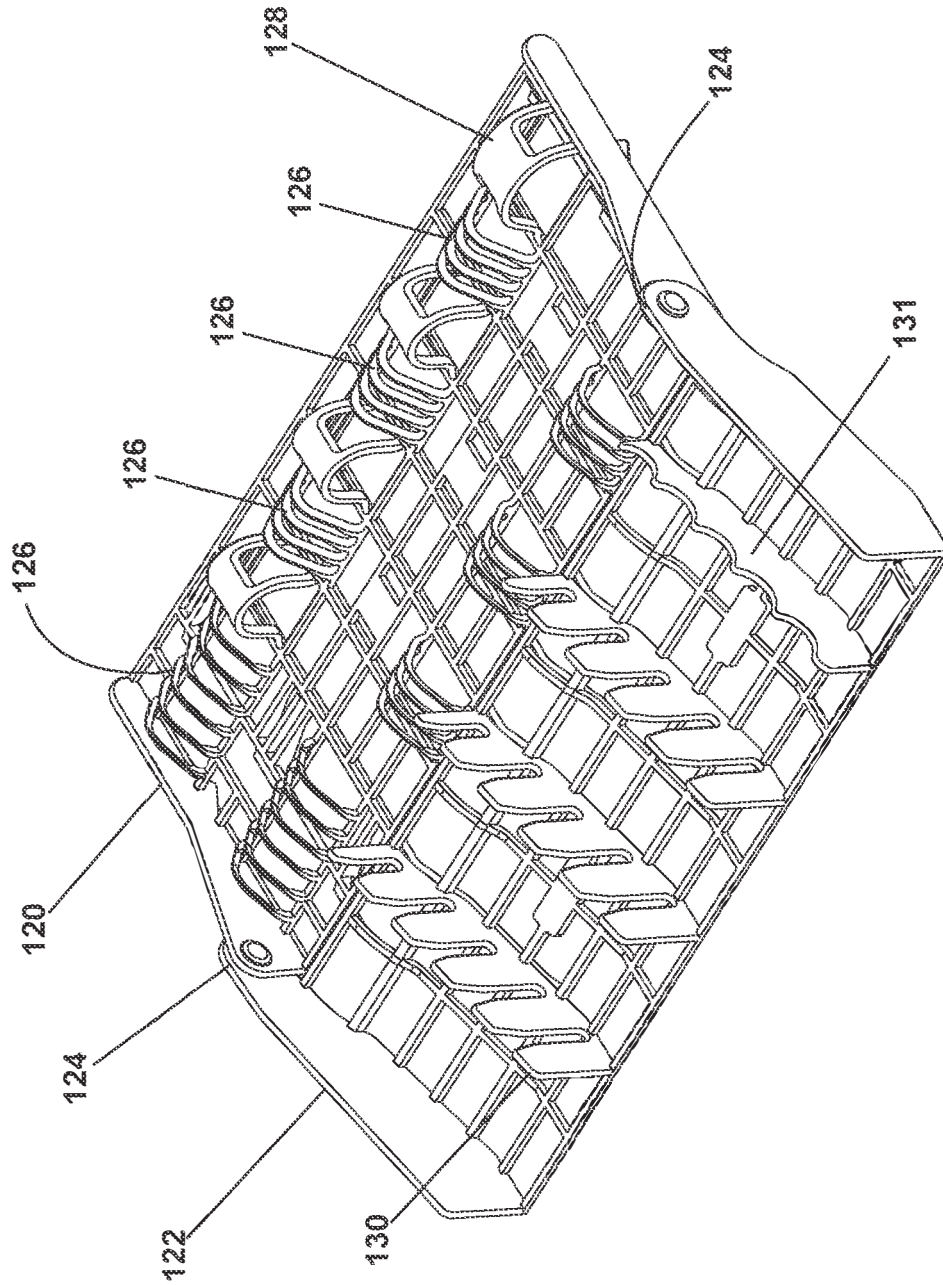


FIG. 5B

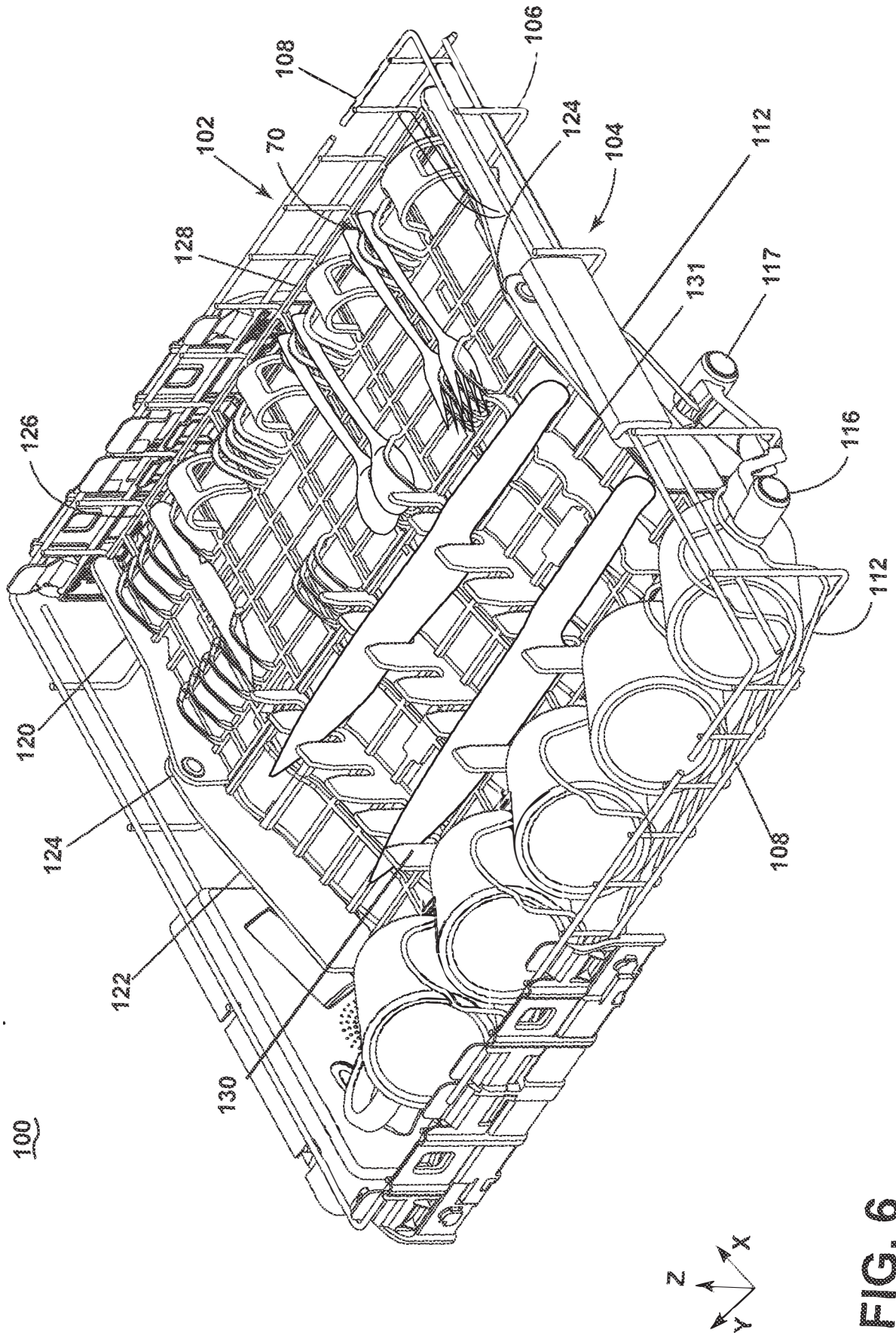
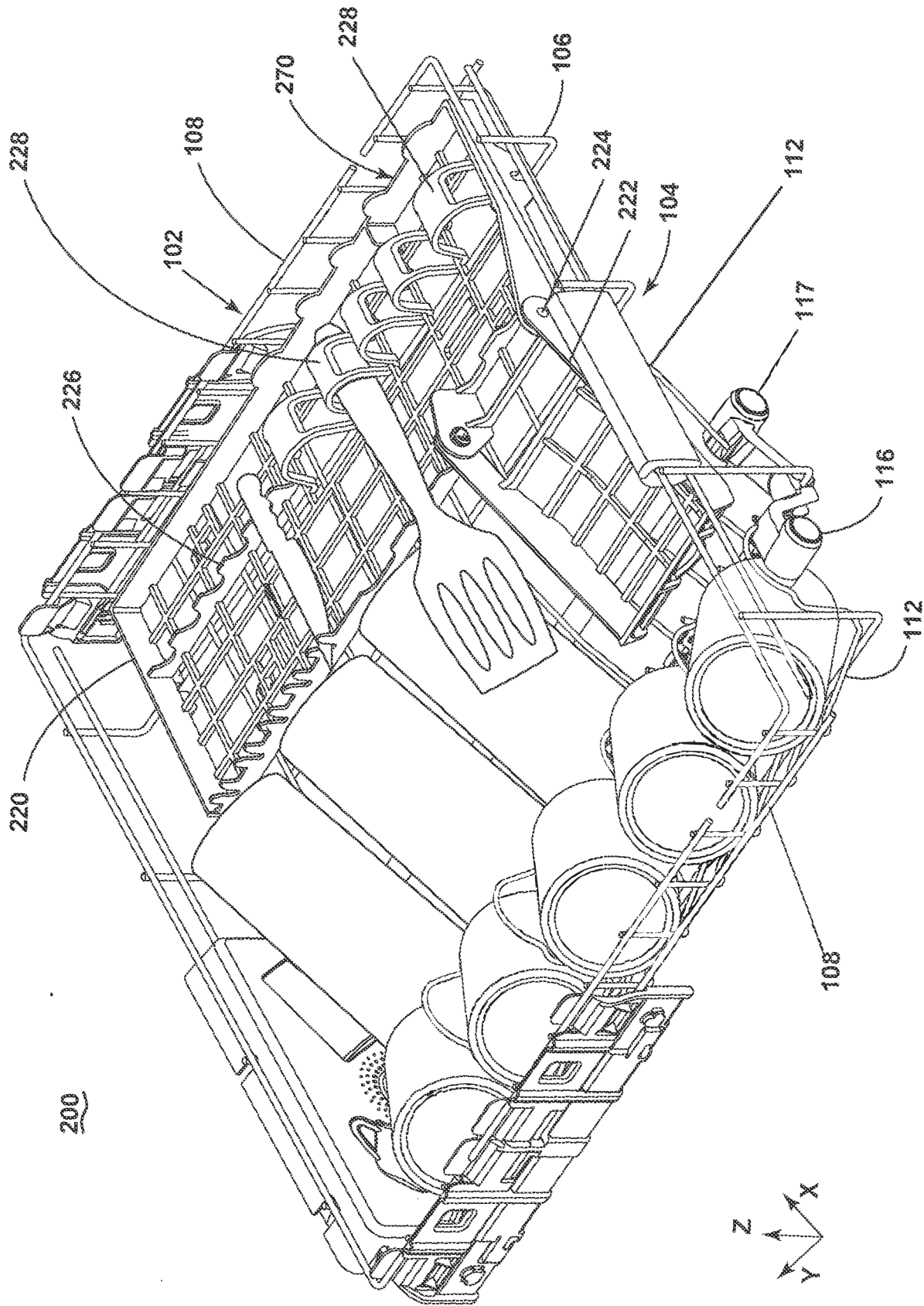


FIG. 6



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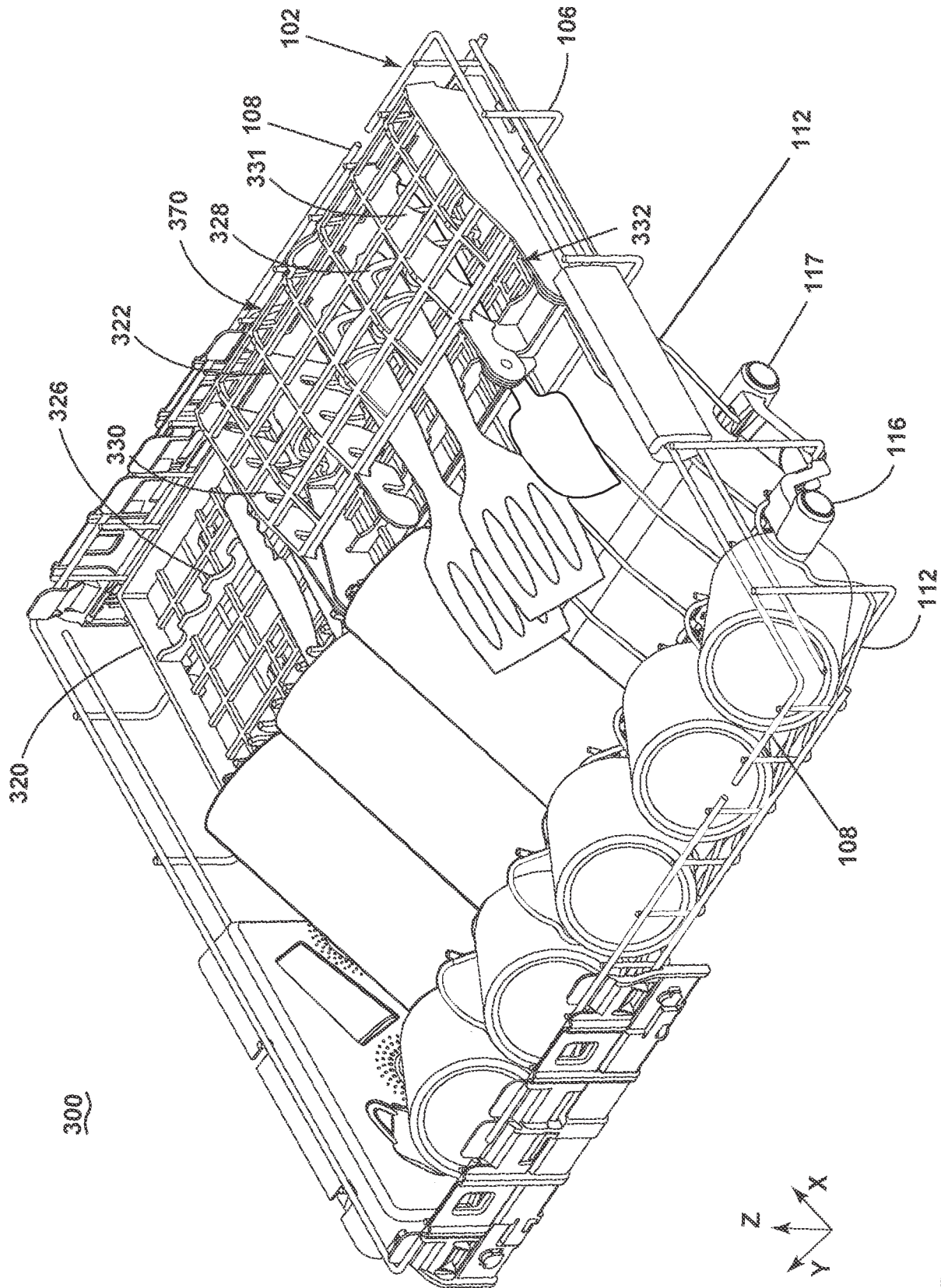


FIG. 8

Petitioner Samsung Ex-1004, 0033

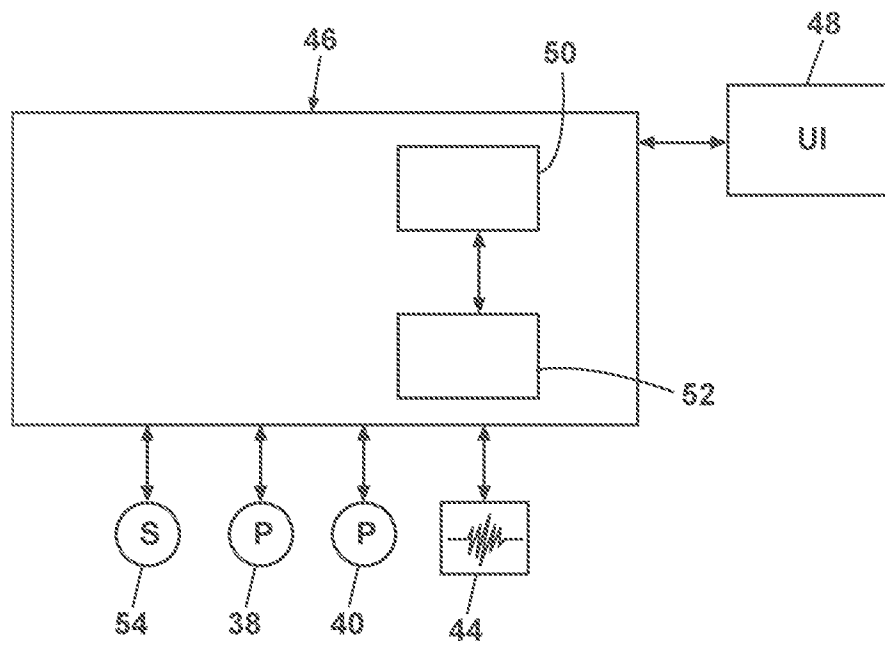
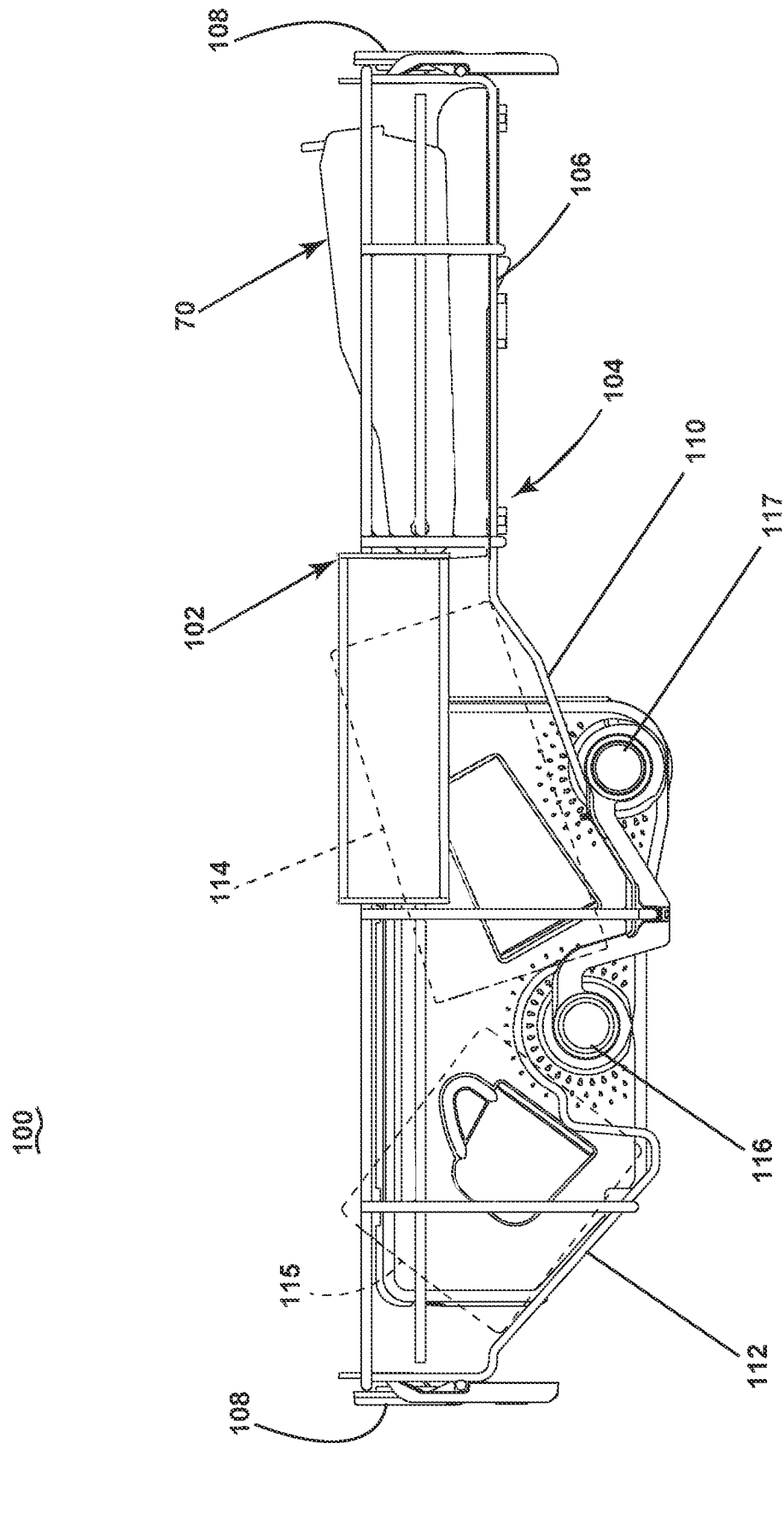


FIG. 2



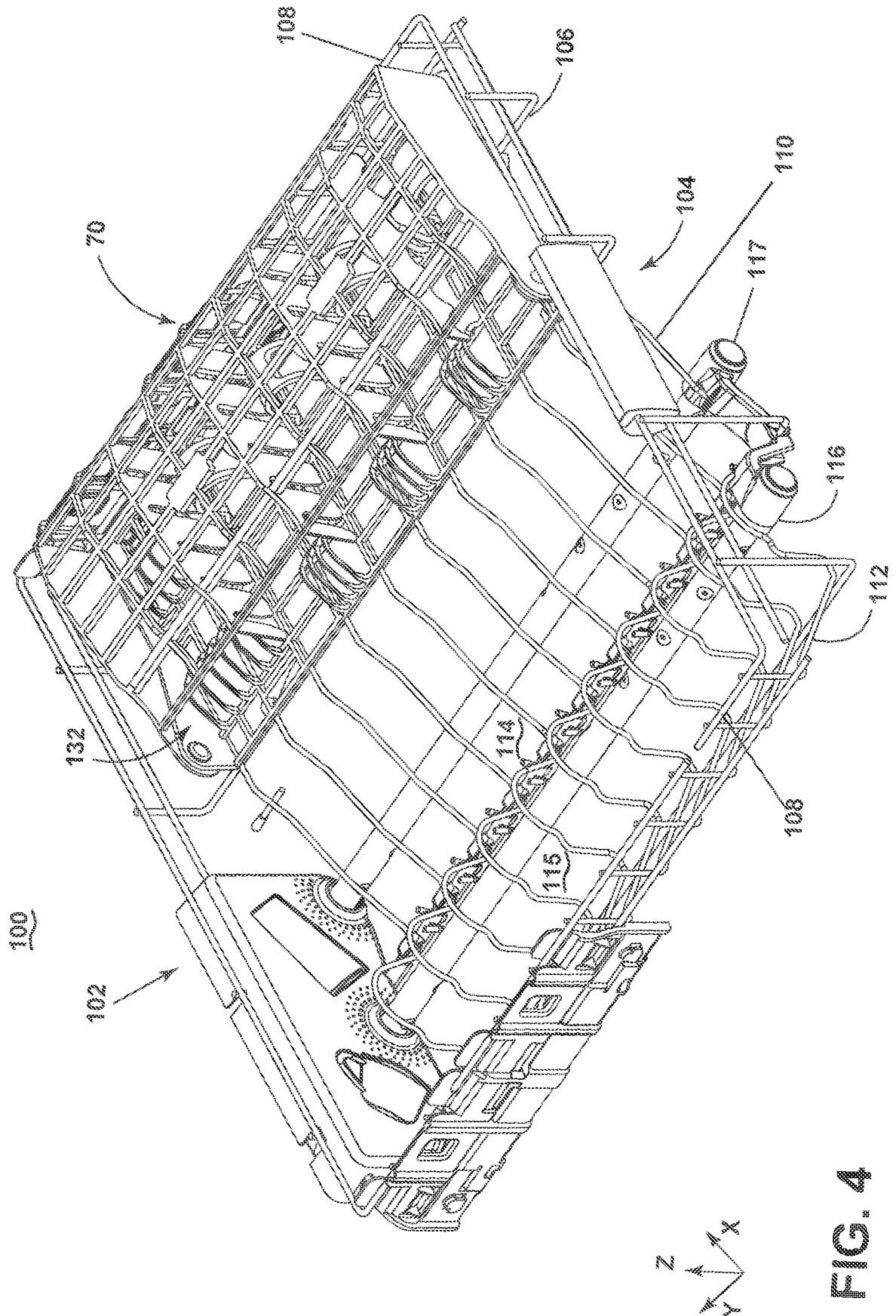


FIG. 4

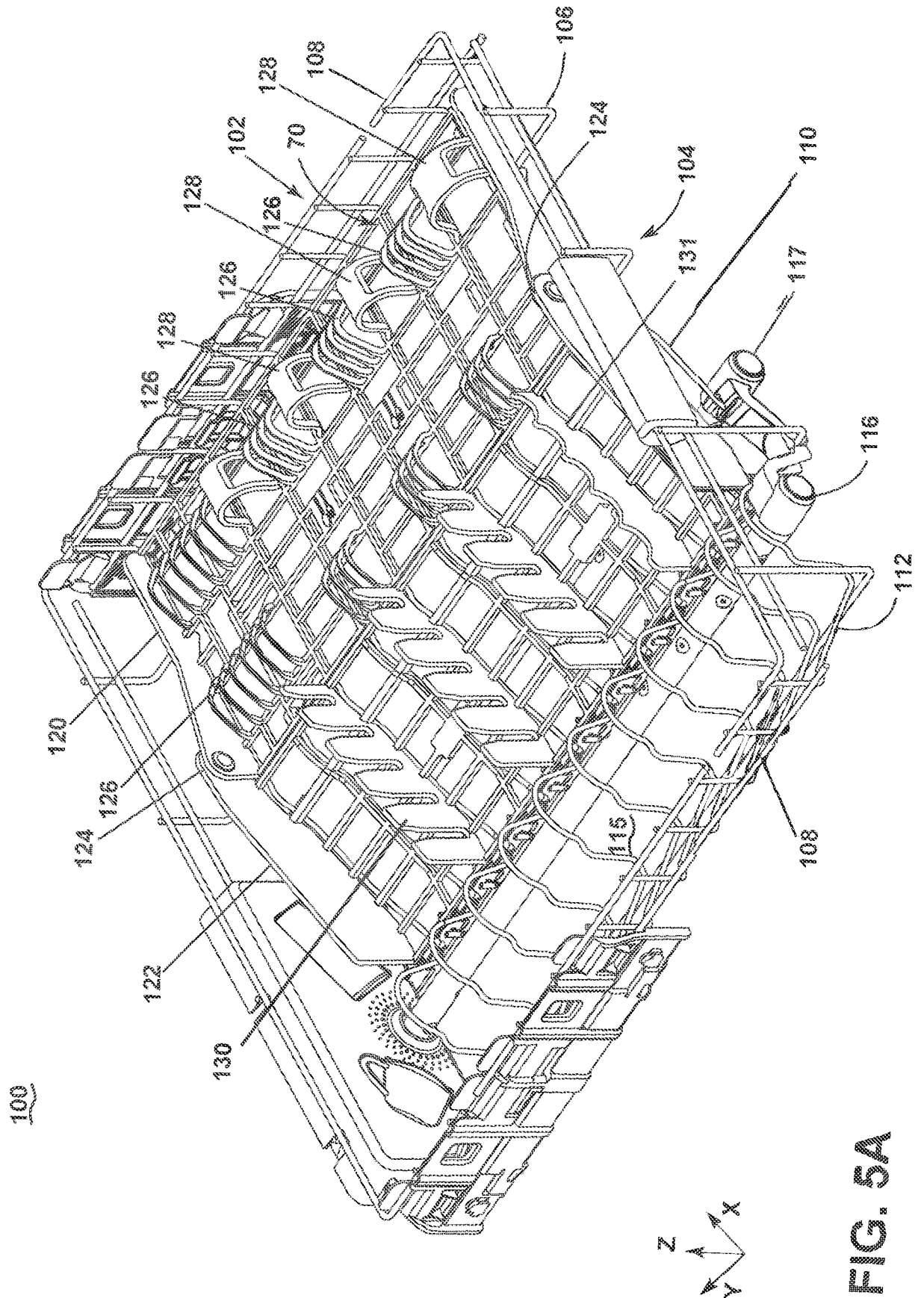
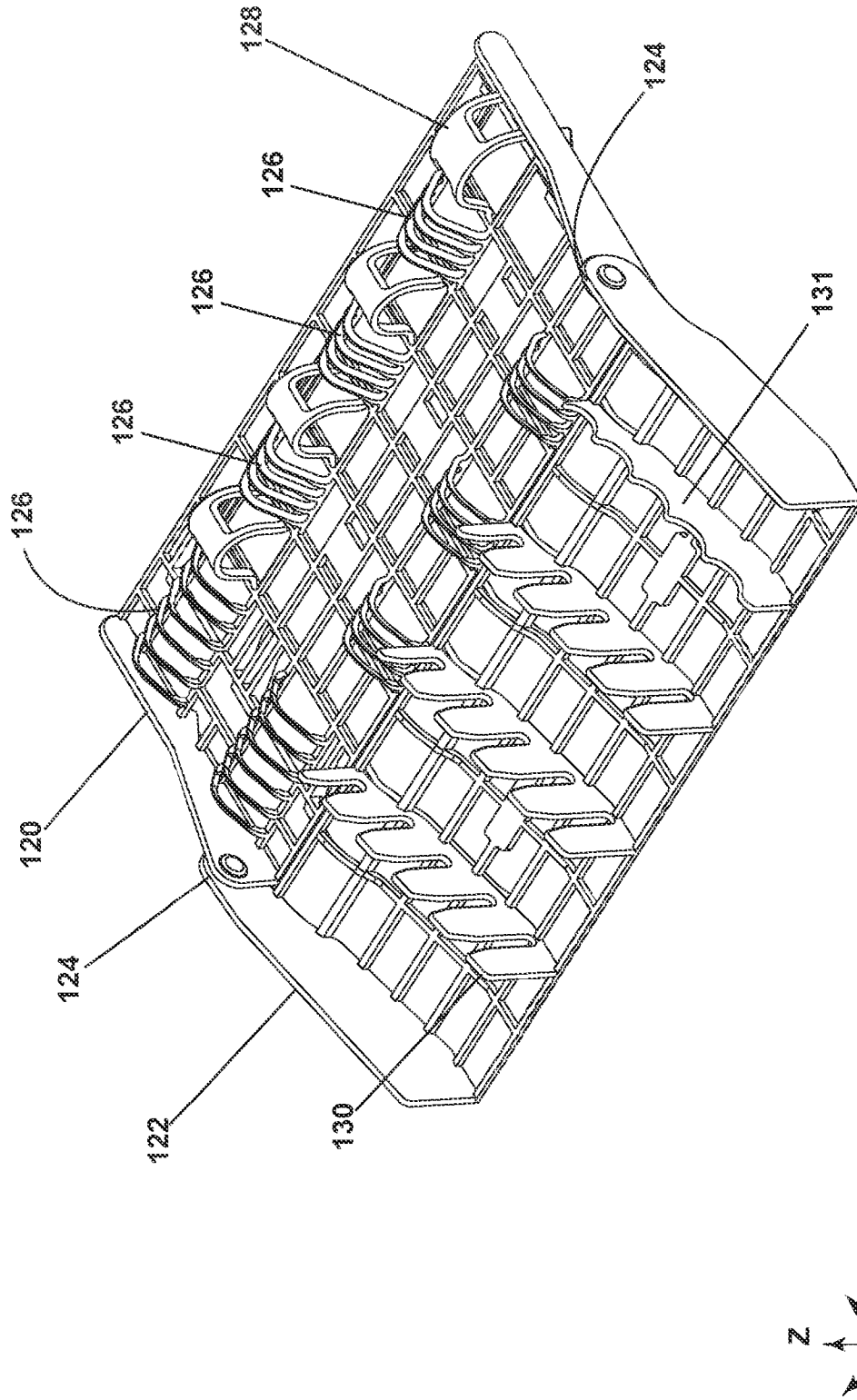


FIG. 5A



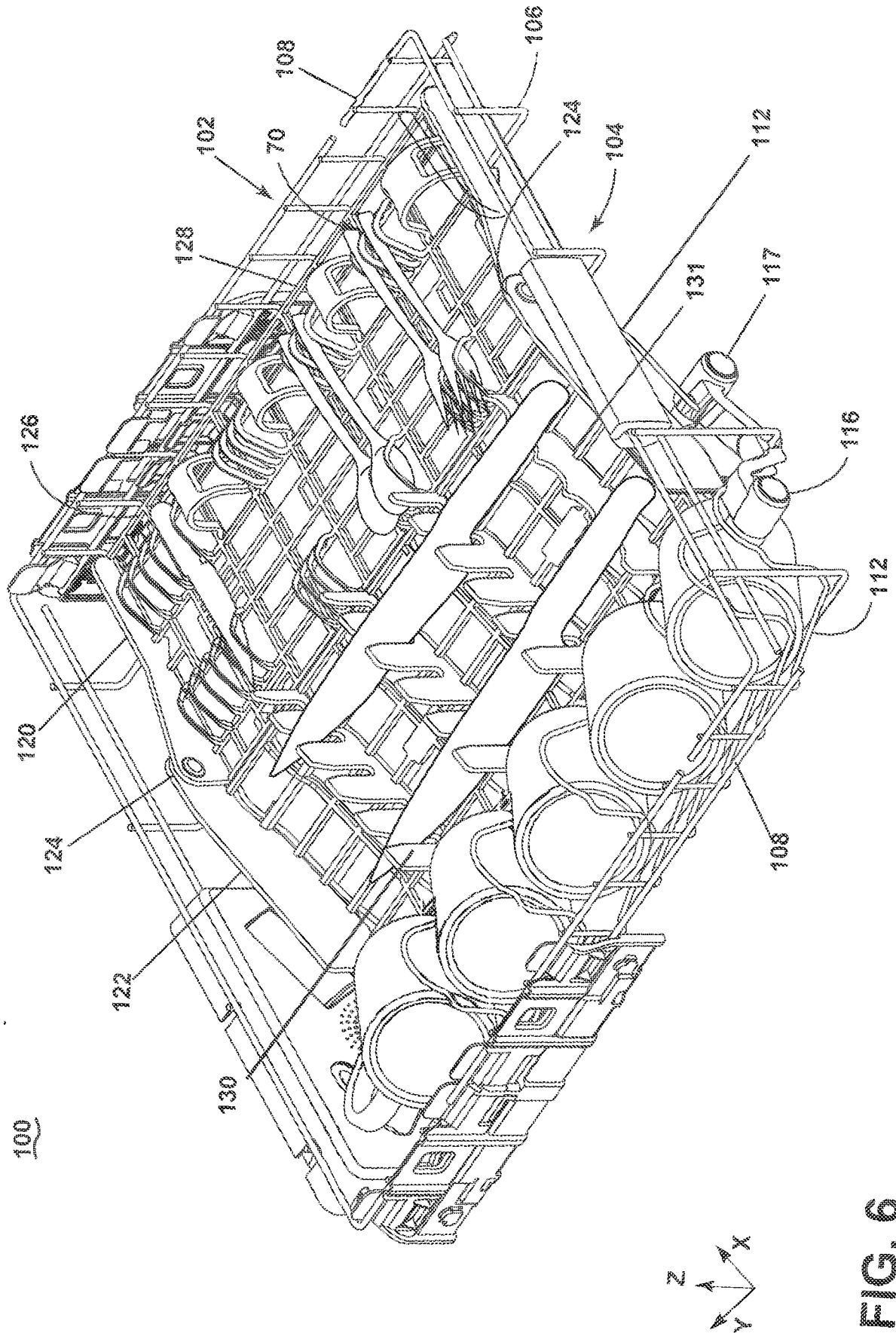
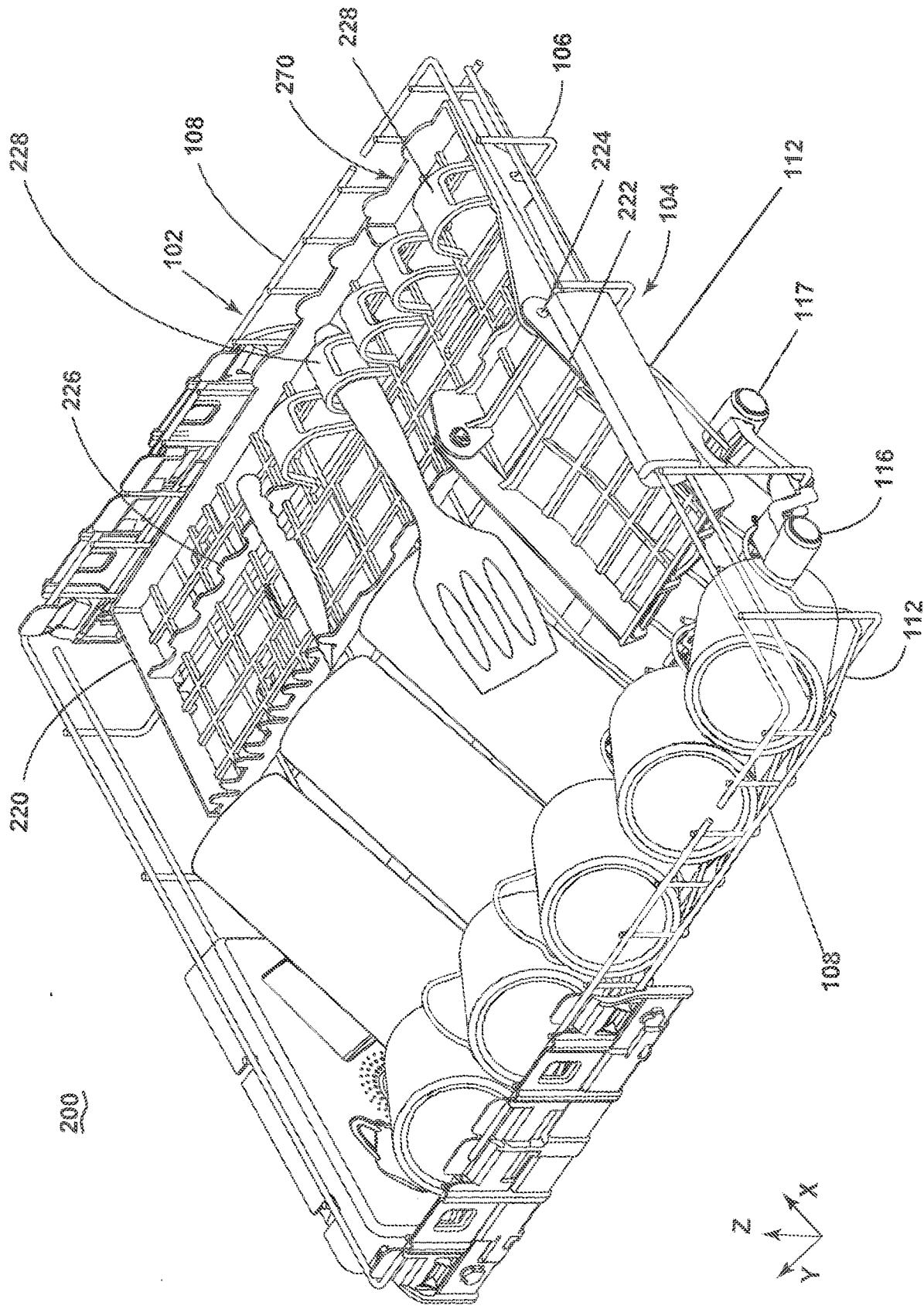


FIG. 6



NO

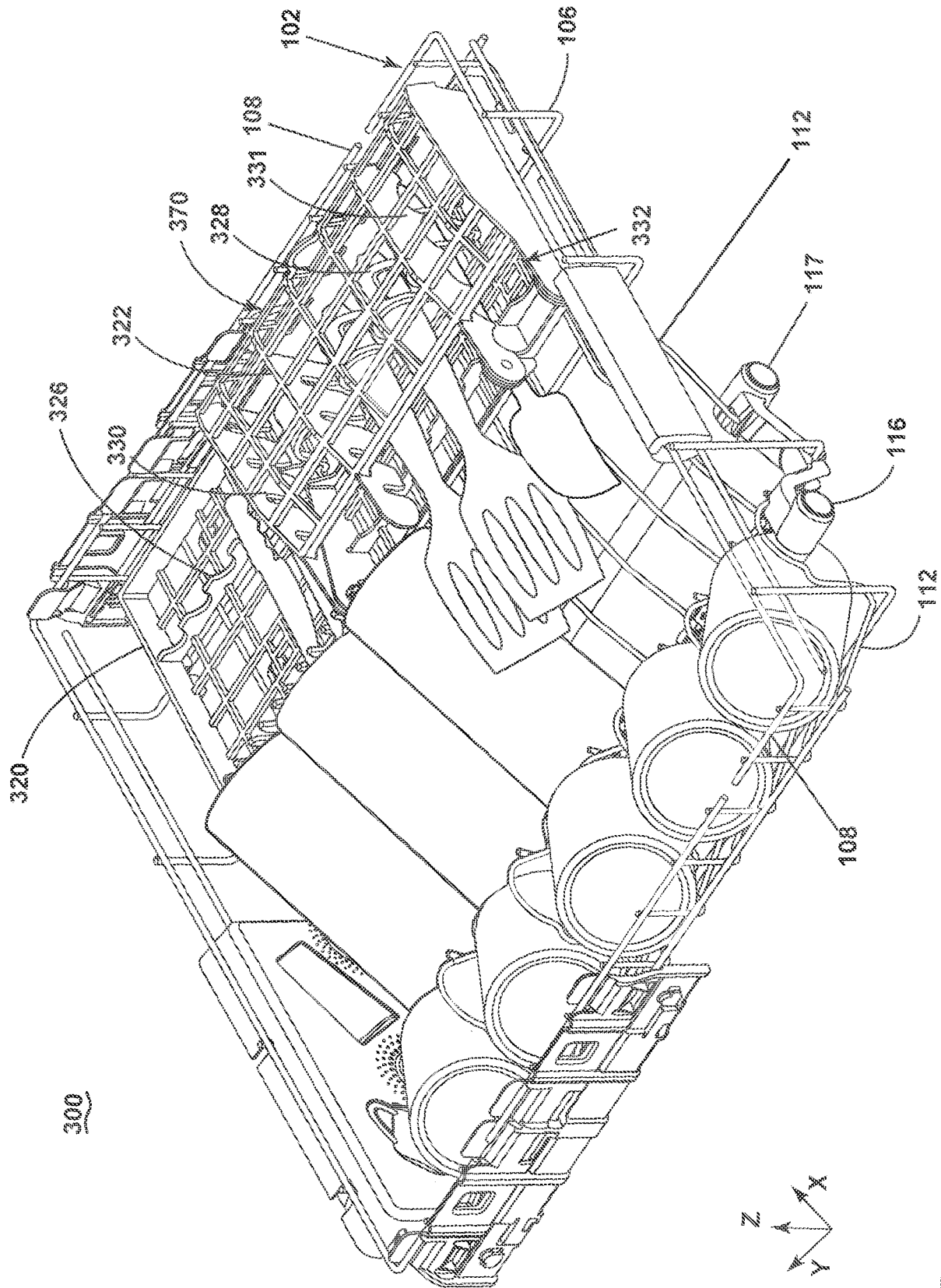


FIG. 8

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	1	20060237051	A1	2006-10-26	Bengston et al.		
	2	20090320883	A1	2009-12-31	Falk		

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3	20110203616	A1	2011-08-25	Berner et al.	
4	20150245762	A1	2015-09-03	Tuller	
5	20180242816	A1	2018-08-30	Cao et al.	
6	20190290094	A1	2019-09-26	Balinski et al.	
7	20190298146	A1	2019-10-03	Gutkowski	

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	1	112018070373	BR	A2	2019-01-29	Michal		☒
	2	101612027	CN	A	2009-12-30	Falk		☒
	3	101966069	CN	A	2011-02-09	Jobst		☒
	4	102215985	CN	A	2011-10-12	Bernhard et al.		☒

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Attorney Docket Number	SUB-13230-US-CON3	

5	109475265	CN	A	2016-04-08	Michal		☒
6	105496336	CN	A	2016-04-20	Li et al.		☒
7	105559725	CN	A	2016-05-11	Cao		☒
8	205697665	CN	U	2016-11-23	Cao et al.		☒
9	108135432	CN	A	2018-06-08	Disch et al.		☒
10	109259690	CN	A	2019-01-25	Wang et al.		☒
11	102013213612	DE	A1	2015-01-15	Oberstaller et al.		☒
12	102014208843	DE	A1	2015-11-12	Doppelbauer		☒
13	102017200272	DE	A1	2018-07-12	Gebauer et al.		☒
14	0963733	EP	A1	1999-12-15	Fumagalli		☐
15	3439527	EP	A1	2019-02-13	Michal		☐

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	16	2643809	FR	A1	1990-09-07	Clavel		☒
	17	2014094897	WO	A1	2014-06-26	Hederstierna et al.		☐
	18	2017176286	WO	A1	2017-10-12	Michal		☐

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¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

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TIMING STATEMENT

Please see 37 CFR 1.97(e) to make the appropriate selection(s):

- ☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

- ☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

- ☐ See attached timing statement under 37 CFR 1.97(e).
- ☒ A timing statement under 37 CFR 1.97(e) is not submitted herewith.

TIMING FEE

- ☐ The fee set forth in 37 CFR 1.17(p) has been submitted herewith.

COPIES

- ☐ An identification of an earlier application pursuant to 37 CFR 1.98(d)(1) is attached.

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- ☐ The IDS is accompanied by the IDS size fee under 37 CFR 1.17(v)(1).
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SIGNATURE

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 11.18. Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/brianrcheslek/	Date (YYYY-MM-DD)	2025-08-12
Name/Print	Brian R. Cheslek	Registration Number	58,329

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Application Number	
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First Named Inventor	Mark S. Feddema
Art Unit	
Examiner Name	
Attorney Docket Number	SUB-13230-US-CON3

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Filing Date:	Attorney Docket Number: SUB-13230-US-CON3	Examiner:

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The Director is authorized to charge the fee indicated above in the amount of \$ _____ for the IDS submitted herewith to deposit account _____.

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If applicant or patent owner is a person or persons, this form may be signed by either a registered practitioner, or the applicant or patentee. Note that if multiple people together are the applicant or patentee (e.g., there are joint inventors who together are the applicant), then a signature is required from each person who is an applicant or patentee. *Submit multiple forms if more than one signature is required, see below*.*

Signature /brianrcheslek/	Date 2025-08-12
Name (Print/Typed) Brian R. Cheslek	Practitioner Registration Number (if applicable) 58,329

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FOLD AWAY CUTLERY RACK

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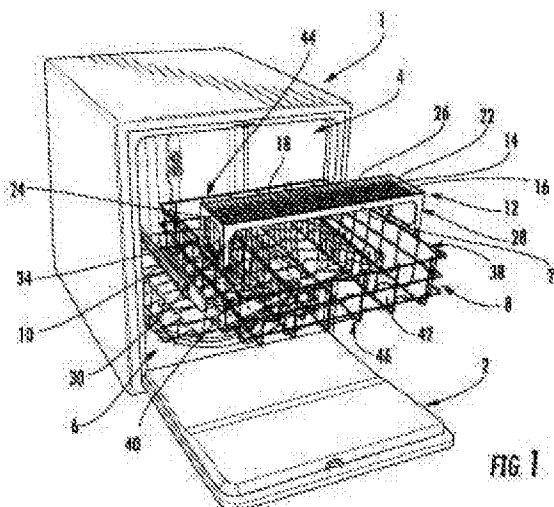
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Provided herein are cutlery racks, dishwashers, and associated methods for manufacturing and cleaning with the same. The dishwasher may include a cutlery rack having a first engaging portion, a second engaging portion, and a shelf. The first and second engaging portions may be respectively slidably attached to a first wall and a second wall of a dishwasher rack. The shelf may extend between the first engaging portion and the second engaging portion, may slide in a longitudinal direction with respect to the first wall and the second wall, and may pivot with respect to the dishwasher rack between a working position and a stowed position. In the working position, a receiving surface of the shelf may align with the longitudinal direction, and in the stowed position, the receiving surface shelf may be pivoted out of alignment with the longitudinal direction and positioned adjacent ends of the first and second walls.





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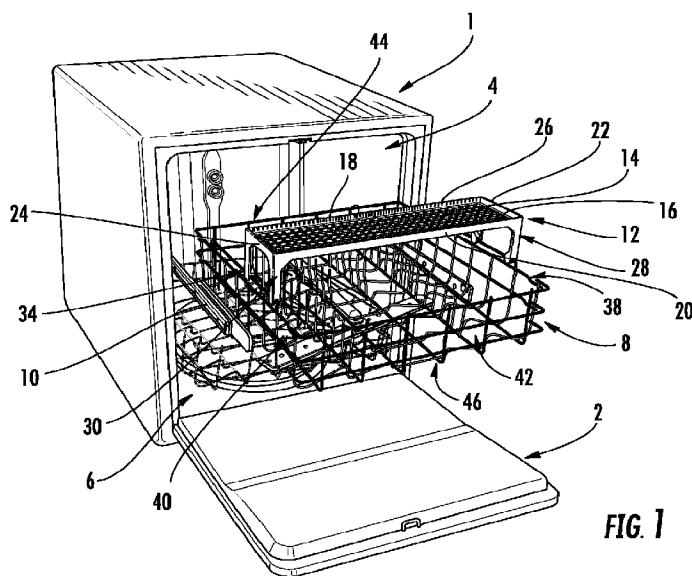


FIG. 1

(57) Abstract: Provided herein are cutlery racks, dishwashers, and associated methods for manufacturing and cleaning with the same. The dishwasher may include a cutlery rack having a first engaging portion, a second engaging portion, and a shelf. The first and second engaging portions may be respectively slidably attached to a first wall and a second wall of a dishwasher rack. The shelf may extend between the first engaging portion and the second engaging portion, may slide in a longitudinal direction with respect to the first wall and the second wall, and may pivot with respect to the dishwasher rack between a working position and a stowed position. In the working position, a receiving surface of the shelf may align with the longitudinal direction, and in the stowed position, the receiving surface shelf may be pivoted out of alignment with the longitudinal direction and positioned adjacent ends of the first and second walls.

FOLD AWAY CUTLERY RACK

FIELD OF THE INVENTION

Embodiments of the present invention relate generally to dishwashers and, more particularly, to cutlery racks for dishwashers and dishwashers comprising at least one cutlery rack.

5

BACKGROUND OF THE INVENTION

Dishwashers are often provided with a cutlery basket or a cutlery tray for stacking cutlery pieces. Traditionally, cutlery baskets may be detachably arranged within the lower rack of the dishwasher, and arranged for essentially vertical reception of cutlery.

10 However, these baskets occupy space in the bottom of the lower rack or must be removed and stored outside the dishwasher. Cutlery trays may be arranged for substantially horizontal reception of cutlery, and are adapted to be extractably arranged in the dishwasher, *e.g.* attached to the wall or top of the tub in the upper part of the dishwasher, above the upper rack. These cutlery trays also occupy substantial vertical
15 space in the tub, even when not in use.

Applicant has identified a number of deficiencies and problems associated with conventional dishwasher cutlery racks and other associated systems and methods.

Through applied effort, ingenuity, and innovation, many of these identified problems have been solved by developing solutions that are included in embodiments of the present

20 invention, many examples of which are described in detail herein.

BRIEF SUMMARY OF THE INVENTION

Generally, some embodiments provided herein include dishwashers, cutlery racks, and associated methods. The dishwasher may include a dishwasher rack
25 disposed in the dishwasher. The dishwasher rack may comprise at least a first wall and a second wall. The first wall may be parallel to the second wall, and each of the first wall and the second wall may define at least one end. The dishwasher may further include a cutlery rack comprising a first engaging portion. The first engaging portion of the cutlery rack may be slidably attached to the first wall of the dishwasher rack. The cutlery rack

may include a second engaging portion, and the second engaging portion of the cutlery rack may be slidably attached to the second wall of the dishwasher rack. The cutlery rack may further include a shelf extending between the first engaging portion and the second engaging portion. The shelf may define a receiving surface for receiving cutlery. The shelf may be configured to slide in a longitudinal direction with respect to the first wall and the second wall, and the shelf may be configured to pivot with respect to the dishwasher rack between a working position and a stowed position. In the working position, the receiving surface of the shelf may be aligned with the longitudinal direction. In the stowed position, the receiving surface shelf may be pivoted out of alignment with the longitudinal direction and may be positioned adjacent an end of the first wall and an end of the second wall.

In some embodiments, the first engaging portion and the second engaging portion may be disposed on a first side of the cutlery rack. The first engaging portion may define a first pivotal attachment member engaging a first rail on the first wall of the dishwasher rack, and the second engaging portion may define a second pivotal attachment member engaging a second rail on the second wall of the dishwasher rack. The cutlery rack may further comprise a second side comprising a third engaging portion configured to be removably and slidably disposed on the first rail in the working position and a fourth engaging portion configured to be removably and slidably disposed on the second rail in the working position. The cutlery rack may be configured to slide along the first rail on the first engaging portion and the third engaging portion and the cutlery rack may be configured to slide along the second rail on the second engaging portion and the fourth engaging portion. The cutlery rack may be configured to be pivoted to the stowed position by lifting the second side of the cutlery rack and rotating the cutlery rack about a first pivotal attachment member of the first engaging portion and a second pivotal attachment member of the second engaging portion.

In some embodiments, in the working position, the receiving surface of the shelf may be configured to be disposed generally parallel to the longitudinal direction. In the stowed position, the receiving surface of the shelf may be configured to be disposed generally perpendicular to the longitudinal direction.

The first wall may further comprise a first rail disposed on an upper edge of the first wall. The first rail may at least partially define a first receiving slot. The first receiving slot may extend parallel to the longitudinal direction, and the first engaging portion may be configured to engage the first receiving slot. In some embodiments, the first engaging portion may include a first leg attached generally perpendicular to the shelf, the first leg defining a length. The first receiving slot may terminate at a distance from the end of the

first wall of the dishwasher rack, and the distance may be equal to the length of the first leg.

In some embodiments, the second wall may further comprise a second rail disposed on an upper edge of the second wall. The second rail may at least partially define a second receiving slot. The second receiving slot may extend parallel to the longitudinal direction, and the second engaging portion may be configured to engage the second receiving slot.

The second engaging portion may comprise a second leg attached generally perpendicular to the shelf, the second leg defining the length. The second receiving slot may terminate at the distance from the end of the second wall of the dishwasher rack.

In some embodiments, the cutlery rack may further comprise a third engaging portion attached to the shelf and a fourth engaging portion attached to the shelf. The third engaging portion may be configured to engage the first wall in the working position, and the fourth engaging portion may be configured to engage the second wall in the working position.

The first engaging portion may define a first slot configured to receive at least a portion of the first wall therein. The first engaging portion may further comprise a first attachment member extending across the first slot, such that the first engaging portion may at least partially surround the portion of the first wall.

The second engaging portion may define a second slot configured to receive at least a portion of the second wall therein. The second engaging portion may further comprise a second attachment member extending across the second slot, such that the second engaging portion may at least partially surround the portion of the second wall. In some embodiments, the shelf may be configured to pivot about an axis spanning the first attachment member and the second attachment member.

In some embodiments, in the stowed position, a portion of the shelf is configured to rest on an upper edge of a third wall of the dishwasher rack, and the third wall may extend between the end of the first wall and the end of the second wall.

The shelf, the first engaging portion, and the second engaging portion may be fixedly connected to each other, and the shelf may be configured to pivot about an axis extending between the first engaging portion and the second engaging portion.

In another embodiment, a cutlery rack may be provided. The cutlery rack may include a first side and a second side. The first side may comprise a first engaging portion configured to pivotally and slidably attach to a first rail of a first wall of a dishwasher rack. The first engaging portion may define a first pivotal attachment member configured to engage the first rail. The first side may include a second engaging portion configured to pivotally and slidably attach to a second rail of a second wall of a

dishwasher rack. The second engaging portion may define a second pivotal attachment member configured to engage the second rail. The second side may comprise a third engaging portion configured to be removably and slidably disposed on the first rail and a fourth engaging portion configured to be removably and slidably disposed on the second rail. The cutlery rack may be configured to slide along the first rail on the first engaging portion and the third engaging portion and the cutlery rack may be configured to slide along the second rail on the second engaging portion and the fourth engaging portion. The cutlery rack may be configured to be pivoted to a stowed position by lifting the second side of the cutlery rack and rotating the cutlery rack about the first pivotal attachment member of the first engaging portion and the second pivotal attachment member of the second engaging portion.

In some embodiments, the cutlery rack may comprise a shelf extending between the first side and the second side, the shelf defining a receiving surface for receiving cutlery. The first engaging portion may comprise a first leg attached generally perpendicular to the shelf, the first leg defining a length. The length may be configured to be equal to a distance a termination point of a first receiving slot defined by the first rail and an end of the first wall.

In some embodiments, the second engaging portion may comprise a second leg attached generally perpendicular to the shelf, the second leg defining the length.

The first engaging portion may define a first slot configured to receive the first rail. In some embodiments, the first attachment member may extend across the first slot, such that the first engaging portion may be configured to at least partially surround the first rail. The second engaging portion may define a second slot configured to receive the second rail, and the second attachment member may extend across the second slot, such that the second engaging portion may be configured to at least partially surround the second rail.

In yet another embodiment, a method of manufacturing a dishwasher with a cutlery rack is provided. The dishwasher may include a dishwasher rack disposed in the dishwasher. The dishwasher rack may comprise at least a first wall and a second wall.

The first wall may be parallel to the second wall, and each of the first wall and the second wall may define at least one end. The dishwasher may further include a cutlery rack comprising a first engaging portion, a second engaging portion, and a shelf extending between the first engaging portion and the second engaging portion. The shelf may define a receiving surface for receiving cutlery. The method may include attaching the first engaging portion of the cutlery rack to the first wall of the dishwasher rack. After attachment, the first engaging portion may be configured to slide relative to the first wall of the dishwasher rack. The method may further include attaching the second engaging

portion of the cutlery rack to the second wall of the dishwasher rack. After attachment, the second engaging portion may be configured to slide relative to the second wall of the dishwasher rack. The shelf may be configured to slide in a longitudinal direction with respect to the first wall and the second wall. The shelf may be configured to pivot with respect to the dishwasher rack between a working position and a stowed position. In the working position, the receiving surface of the shelf may be aligned with the longitudinal direction. In the stowed position, the receiving surface shelf may be pivoted out of alignment with the longitudinal direction and positioned adjacent an end of the first wall and an end of the second wall.

BRIEF DESCRIPTION OF THE DRAWINGS

Having thus described the invention in general terms, reference will now be made to the accompanying drawings, which are not necessarily drawn to scale, and wherein:

FIG. 1 shows a dishwasher having a cutlery rack in a working position according to some embodiments discussed herein;

FIG. 2 shows the dishwasher of FIG. 1 having the cutlery rack in a stowed position according to some embodiments discussed herein;

FIG. 3 shows a cutlery rack in a working position according to some embodiments discussed herein; and

FIG. 4 shows a cutlery rack moving between a working position and a stowed position according to some embodiments discussed herein.

DETAILED DESCRIPTION

Exemplary embodiments of the present invention now will be described more fully hereinafter with reference to the accompanying drawings, in which some, but not all embodiments of the invention are shown. Indeed, the invention may be embodied in many different forms and should not be construed as limited to the exemplary embodiments set forth herein; rather, these embodiments are provided so that this disclosure will satisfy applicable legal requirements. Like reference numerals refer to like elements throughout.

Dishwashers often include dedicated receiving areas for washing cutlery. Cutlery, including knives, forks, spoons, and the like, often has smaller dimensions than traditional dishware and, thus, may fall through the relatively larger openings of a dishwasher rack. Moreover, cutlery includes many, smaller surfaces, which warrant specific positioning in the wash chamber and/or higher spray intensities to ensure that the cutlery is cleaned thoroughly.

Some embodiments discussed herein include an improved cutlery rack that offers space and organization for cutlery, while also obstructing as little of the wash chamber as possible without requiring disassembly or storage. As detailed herein, a cutlery rack may be provided that is slidably attached to a dishwasher rack (e.g., the middle rack of a three-rack dishwasher or the top rack of a two-rack dishwasher), wherein the cutlery tray includes a detachable front connection and is designed to pivot to a vertical stowed position that is aligned with and proximate the back wall of the dishwasher tub when in non-use.

With reference to FIG. 1, a dishwasher 1 is shown in accordance with some embodiments discussed herein. The depicted dishwasher 1 includes a door 2 and a wash chamber 4 in which various articles, including cutlery, may be positioned for cleaning. The depicted embodiment includes a lower dish rack 6 and a middle dish rack 8, each configured to hold crockery, including plates, dishes, cups, pans, and the like, for washing. The dish racks 6, 8 may be movable on rails 10 from a loading position, outside the wash chamber 4, to a working position in the wash chamber.

The embodiment shown in FIGS. 1-2 further includes a cutlery rack 12 disposed on the middle rack 8 of the dishwasher for holding cutlery to be cleaned. The cutlery rack includes a shelf 14 having a receiving surface 16 that may include a grid of support bars. In some embodiments, adjacent, parallel grid bars may be spaced one half inch from each other, defining half inch square holes in the grid. The shelf 14 may include raised side walls 18, 20, 22, 24 surrounding the receiving surface 16 for supporting and containing cutlery on the receiving surface of the shelf. For example, the walls 18, 20, 22, 24 may prevent items lying on the shelf from inadvertently falling into the spray arms or sump of the dishwasher during a wash cycle. In some embodiments, the cutlery rack 12 may be disposed on a lower dish rack 6.

In some embodiments, one or more of the raised side walls 18, 20, 22, 24 may include one or more holders 26 (e.g., grooves, slots, openings, or other holding features) for supporting and securing cutlery. For example, in the embodiment shown in FIGS. 1-2, the shelf 14 includes a plurality of holders 26 spaced along the rear wall 18. These holders 26 may be evenly spaced, or may include variable spacing. For example, in the depicted embodiment of FIG. 1, the holders 26 at outer ends of the rear wall 18 include wider spacing than near a center portion of the rear wall (e.g., outer thirds of the rear wall 18 may include wider spacing than a center third of the rear wall). In other embodiments, either half of any wall 18, 20, 22, 24 of the shelf 14 may include holders 26 at a wider spacing than the other half. One of ordinary skill in the art will appreciate, in view of the present disclosure, that any configuration of additional holders, such as clips, specialized

openings, raised prongs, and the like may be disposed on the shelf to organize and support cutlery.

In some embodiments, the shelf 14 may define a width corresponding to the width of the dishwasher rack. For example, in some embodiments, the width of the shelf 14 may be from 18 inches to 20 inches. For example, the width of the shelf 14 may be 18.41 inches (~467.54 mm). In some embodiments, the length of the shelf 14 in the longitudinal direction A may be from 4 inches to 5 inches. For example, the length of the shelf 14 may be 4.88 inches (~124 mm). In some embodiments, the walls 20, 22, 24, 26 of the shelf 14 may be between half an inch and 1.5 inches tall. For example, the height of the walls 20, 22, 24, 26 of the shelf 14 may be .71 inches (~18 mm).

With reference to FIGS. 1-4, the shelf 14 may include one or more engaging portions 28, 30, 32, 34 that connect the shelf to the dishwasher rack 8. In the depicted embodiment, the engaging portions 28, 30, 32, 34 include four legs extending perpendicularly downward from the shelf to engage the dishwasher rack 8. The engaging portions 28, 30, 32, 34 may engage two or more walls 38, 40, 42, 44 of the dishwasher rack 8. In some embodiments, as shown in FIGS. 1-4, the cutlery rack 12 may engage and slide along rails 48, on two parallel walls (*e.g.*, first side wall 38 and second side wall 40). As used herein, the “walls” do not require a solid or continuous surface, but rather, encompass structures that generally align in different regions of the dishwasher rack 8 and/or cutlery rack 12. For example, the depicted “rear wall” 44 may include a plurality of horizontal and/or vertical grid bars along a rear of the dishwasher rack 8. Each wall 38, 40, 42, 44 may define two ends, an upper edge and a lower edge (*e.g.*, two ends of the second wall 40 are shown at the left and right extremes of the wall in the longitudinal direction A of FIGS. 3-4, with the upper edge shown at the top side of the wall 40 and the lower edge shown at the bottom side of the wall 40 in FIGS. 3-4).

The depicted rails 48 are defined on a top edge of the first side wall 38 and the second side wall 40, such that slots 36 of the engaging portions 28, 30, 32, 34 may slide along the rails at an uppermost edge of the side walls. As detailed below, the rails 48 may define longitudinal receiving slots 52 between the rail and the remainder of the walls (*e.g.*, first side wall 38 and second side wall 40). In some embodiments, the engaging portions may ride on rails disposed on an outside or inside surface of the dishwasher rack walls, and the rails may be disposed at an uppermost edge of the walls or at some intermediate position on the side walls. One of ordinary skill in the art will further appreciate, in light of the present disclosure, that the cutlery rack may ride along any parallel walls of the dishwasher rack (*e.g.*, the first and second side walls 38, 40 or the front and rear walls 42, 44), or the cutlery rack may attach to the bottom 46 of the dishwasher rack.

The shelf 14 may be positioned above the dishwasher rack 8 by the engaging portions 28, 30, 32, 34 to allow sufficient space for crockery in the middle dishwasher rack 8. For example, the shelf 14 may be positioned higher than a wine glass, which may be positioned on the dishwasher rack 8 below. The engaging portions 28, 30, 32, 34 may each define a length L from the attachment members 50, which may engage the underside of the rails 48 in the receiving slot 52, to the top of the side walls 20, 22, 24, 26 of the shelf 14. The sum of the length L and the height of the respective wall 38, 40, 42, 44 from the bottom 46 of the dishwasher rack 8 to the attachment members 50 may define the maximum height of the crockery that may be positioned in the dishwasher rack.

In some embodiments, the length may be from 3 inches to 5 inches. For example, the length L may be approximately 3.78 inches (~96.05 mm) in some embodiments. In some embodiments, the length L may be zero, such that the shelf 14 is generally level with the rail 48. In some embodiments, the shelf 14 may rest on the rails 48, and the engaging portions 28, 30, 32, 34 may define slots, bumpers, abutment mechanisms, or other attachment devices for attaching the shelf directly to the rails. In some embodiments, the engaging portions may define a width, perpendicular to the longitudinal direction, of approximately 0.6 inches (~15 mm).

One or more of the engaging portions 28, 30, 32, 34 may attach to the walls of the dishwasher rack 8 to allow pivotal and sliding movement of the shelf 14 relative to the rack, while limiting or preventing removal of the cutlery rack 12 from the dishwasher rack. In the depicted embodiment, the rear engaging portions 32, 34 attach to the rack 8, while the front engaging portions 28, 30 removably engage the dishwasher rack, such as by resting on the rack or loosely gripping the dishwasher rack in a working position. The depicted engaging portions 28, 30, 32, 34 include the slots 36 at a distal end of the legs for receiving a portion of the side walls (*e.g.*, rails 48 of one or more of the walls 38, 40, 42, 44) therein. The depicted rear engaging portions 32, 34 further include attachment members 50 (*e.g.*, pins, clips, pegs, bolts, or the like) extending across the slots 36 to hold the cutlery rack 12 on the rails 48. In such embodiments, the engaging portions 32, 34 having the attachment members 50 may be on a first side of the cutlery rack 12 and the engaging portions 28, 30 removably and slidably resting on the rails 48 without an attachment member may be on a second side of the cutlery rack 12.

The rails 48 may define a continuous, longitudinal receiving slot 52 in which the attachment members 50 may slide. The receiving slots 52 may allow the rear engaging portions 32, 34 on the first side to remain attached to the dishwasher rack 8 while being pivotable and slidable relative to the dishwasher rack. In some embodiments, the rails may be from 12 to 14 inches long (*e.g.*, 12.62 inches or 320.55 mm), and the rails may be

from one half inch to 1.5 inches tall (*e.g.*, 0.65 inches or 16.53 mm) above the upper edge of the respective walls 38, 40, 42, 44.

In some embodiments, the slots 36 and attachment members 50 (shown in FIGS. 3-4) may combine to surround the rails 48 on a cross-sectional plane. In some other
5 embodiments, the engaging portions may hold the rails without completely surrounding them (*e.g.*, via an open-ended pin extending in the receiving slots 52). In some embodiments, the slots 36 and/or attachment members 50 may be removably attached to the rails 48 (*e.g.*, via removable pin, latch, open-ended pin, or the like), such that the cutlery rack 12 remains attached to the dishwasher rack 8 in normal operation, while also
10 being detachable for cleaning or replacement.

Turning to the embodiment shown in FIGS. 3-4, a dishwasher rack 8 is shown from a right-side view, depicting the second wall 40 of the rack as coplanar with the page. While FIGS. 3-4 depict the structure of the dishwasher and cutlery rack 12 as viewed from the right side, one of ordinary skill in the art will appreciate that the descriptions of
15 FIGS. 3-4 may be applied to the left-side structure in the same manner. In operation, with reference to FIG. 3, the cutlery rack 12 may slide along the dishwasher rack 8 in a longitudinal direction A of the walls to which the cutlery rack is engaged (*e.g.*, first side wall 38 and second side wall 40). For example, the depicted embodiment of the cutlery rack 12 slides left-to-right in the longitudinal direction A along the rails 48 of the upper
20 edge of the side walls 38, 40 of the dishwasher rack 8, generally parallel to the bottom 46 of the dishwasher rack. In this manner, the cutlery rack 12 may be positioned at any desired position along the rails 48 to allow the user to choose the relative positioning of the cutlery in the wash chamber 4 (shown in FIGS. 1-2) and the crockery in the dishwasher rack 8. Similarly, the slidable movement of the cutlery rack 12 may allow the
25 user to load the cutlery rack at a front of the dishwasher rack 8 (*e.g.*, proximate the front wall 42 of the dishwasher rack 8), and subsequently move the loaded cutlery rack to the rear (*e.g.*, proximate the rear wall 44 of the dishwasher rack 8) for loading the dishwasher basket and/or for washing operations.

Turning to FIG. 4, the cutlery rack 12 may further pivot between a working position
30 (shown in dashed line), in which the shelf 14 is positioned to accept cutlery, and a stowed position (showed in solid line), in which the shelf is positioned so as to avoid interfering with the operation of the dishwasher rack 8. In the depicted embodiment, the cutlery rack 12 pivots about an axis spanning the attachment members 50 of the rear engaging portions 32, 34. The front engaging portions 28, 30 on the second side may rest on a
35 portion of the side walls 38, 40 (*e.g.*, the rail 48) in the working position, and the front engaging portions may disconnect from the side walls 38, 40 in the stowed position. One of ordinary skill in the art will appreciate that the front engaging portions may instead be

attached to the walls and may pivot with respect to the dishwasher rack. In such embodiments, the shelf may pivot forward in the stowed position. In some embodiments, the cutlery rack 12 may be configured to slide on parallel front and rear walls 42, 44, and the cutlery rack may pivot to the stowed position at or proximate the first side wall 38 or the second side wall 40.

With continued reference to FIGS. 3-4, the working position may be defined as an in-use position in which the receiving surface 16 of the shelf 14 is at least partially horizontal within the wash chamber 4 (shown in FIGS. 1, 2, and 4). In such embodiments, the receiving surface 16 of the shelf 14 may align with the longitudinal direction A. For example, the receiving surface 16 of the shelf 14 may be generally parallel with a plane spanning the longitudinal direction A of the respective walls on which the cutlery rack slides. For example, in the embodiment shown in FIG. 4, the working position is shown parallel with the longitudinal direction A of the second wall 40 (*e.g.*, with the surface of the shelf oriented left-to-right). In some embodiments, the working position may encompass any position of the shelf in the longitudinal direction A (*e.g.*, any sliding position) in which the shelf is generally parallel to the longitudinal direction. As used herein, the term “generally” when used in combination with orientations or dimensions, such as “generally parallel,” does not require the receiving surface of the shelf to be parallel in a mathematically precise position and is meant to indicate that the shelf is within a moderate range of deviation from absolutely parallel that is commonly acceptable as a level of accuracy for these terms within dishwashing arts.

The stowed position may be defined farther from parallel to the longitudinal direction than the working position. In such embodiments, the receiving surface 16 of the shelf 14 may be pivoted out of alignment with the longitudinal direction when transitioning from the working position to the stowed position. With continued reference to FIG. 4, the shelf 14 is shown pivoting about the rear engagement portion 34 and attachment member 50 between the working and stowed positions. In such embodiments, the shelf 14 may be lifted from the second side and may pivot relative to the pivotal attachment members 50 on the engaging portions 32, 34 of the first side.

In the depicted embodiment, the receiving surface 16 of the shelf 14 is generally perpendicular to the longitudinal direction in the stowed position. In some embodiments, the shelf 14 may be slid to the rear wall 44 in the stowed position to avoid obstructing the dishwasher rack 8. Said differently, the shelf 14 may be slid until the receiving surface 16 is adjacent to an end of the first wall and an end of the second wall (*e.g.*, the left end relative to the page in FIG. 4). For example, in the stowed position, the receiving surface 16 of the shelf 14 may be pivoted generally perpendicular to the longitudinal direction and slid at least to the longitudinal position of the rear wall 44 (*e.g.*, to the end of the first wall

38 and the second wall 40). The rear wall 44 may extend between the end of the first wall 38 and the end of the second wall 40.

In some embodiments, the rear wall 44 and the receiving surface 16 of the shelf 14 may be generally parallel in the stowed position, and in some further embodiments, the rear wall 44 and the receiving surface 16 of the shelf 14 may be generally coplanar in the stowed position. In some other embodiments, the upper edges of the walls 18, 20, 22, 24 may be generally coplanar with the rear wall 44 in the stowed position. In each of the embodiments discussed above, the receiving surface 16 of the shelf 14 may be said to be adjacent the ends of the walls on which the cutlery rack slides. In some embodiments, the shelf may slide past the rear wall 44 (*e.g.*, farther into the wash chamber 4 behind the dishwasher rack 8 and past the ends of the walls). The shelf 14 may rest against the rear wall 44 and/or the side walls 38, 40 of the dishwasher rack 8 in the stowed position.

In some embodiments, the receiving channel 52 of the rail 48 may terminate at a distance equal to the length L from the rear wall 44. In such embodiments, the cutlery rack 12 may be limited from sliding closer than the length L from the rear wall 44 in the working position, and thus, the shelf 14 may be generally coplanar with the rear wall 44 in the stowed position because the engaging portions 28, 30, 32, 34 may also define a length L.

In some embodiments described herein, a method of manufacturing a dishwasher with a cutlery rack may be provided. The dishwasher may include a dishwasher rack removably disposed in the dishwasher. The dishwasher rack may include at least a first wall, a second wall, and a third wall (*e.g.*, first side wall 38, second side wall 40, and rear wall 44, respectively, in the embodiment depicted in FIGS. 1-4). The first wall may be parallel to the second wall, and the third wall may extend between the first wall and the second wall. A cutlery rack may be provided that includes a first engaging portion, a second engaging portion, and a shelf extending between the engaging portions. The method may include attaching the first engaging portion of the cutlery rack to the first wall of the dishwasher rack. After attachment, the first engaging portion may be configured to slide relative to the first wall of the dishwasher rack. The method may further include attaching the second engaging portion of the cutlery rack to the second wall of the dishwasher rack. After attachment, the second engaging portion may be configured to slide relative to the second wall of the dishwasher rack. The shelf may slide in a longitudinal direction with respect to the first wall and the second wall. The shelf may be configured to pivot with respect to the dishwasher rack between the working position and the stowed position. In the working position, the shelf may be disposed closer to parallel

with the longitudinal direction than in the stowed position, and in the stowed position, the shelf may slide at least to a longitudinal position of the third wall of the dishwasher rack.

With reference to FIG. 4, the cutlery rack 12 may be positioned sufficiently close to the top wall of the wash chamber 4 that the rack 12 impinges the top wall during folding
5 between the working position and the stowed position, while allowing the cutlery rack 12 to not impinge the top wall when in the final working and stowed positions. In such embodiments, the cutlery rack may be pivoted between the working position and folded position only when the cutlery rack and dishwasher rack are slid out from the wash chamber 4. For example, in some embodiments, the rails 48 of the dishwasher rack 8
10 may be positioned less than 6.18 inches and greater than 4.88 inches from the top of the wash chamber 4, such that for example in embodiments in which the length L is approximately 3.78 inches and the width of the shelf 14 is approximately 4.88 inches, the cutlery rack 12 may be approximately from 1.1 inches to 2.4 inches from the top of the wash chamber in the working position and approximately from zero inches to 1.3 inches
15 from the top wall of the wash chamber in the stowed position.

Many modifications and other embodiments of the inventions set forth herein will come to mind to one skilled in the art to which these embodiments of the invention pertain having the benefit of the teachings presented in the foregoing descriptions and the associated drawings. Therefore, it is to be understood that the embodiments of the
20 invention are not to be limited to the specific embodiments disclosed and that modifications and other embodiments are intended to be included within the scope of the appended claims. While some drawings and description may omit features described elsewhere for simplicity of explanation, it is understood that these features may nonetheless be present in any of the embodiments in any combination or configuration,
25 as detailed above. Although specific terms are employed herein, they are used in a generic and descriptive sense only and not for purposes of limitation.

CLAIMS

1. A dishwasher comprising:

a dishwasher rack disposed in the dishwasher, the dishwasher rack comprising at least a first wall and a second wall, wherein the first wall is parallel to the second wall,
5 and wherein each of the first wall and the second wall defines at least one end;

a cutlery rack comprising:

a first engaging portion, wherein the first engaging portion of the cutlery rack is slidably attached to the first wall of the dishwasher rack;

a second engaging portion, wherein the second engaging portion of the cutlery rack is slidably attached to the second wall of the dishwasher rack; and
10

a shelf extending between the first engaging portion and the second engaging portion, the shelf defining a receiving surface for receiving cutlery, wherein the shelf is configured to slide in a longitudinal direction with respect to the first wall and the second wall, and wherein the shelf is configured to pivot with respect to the dishwasher rack between a working position and a stowed position;
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wherein in the working position, the receiving surface of the shelf is aligned with the longitudinal direction, wherein in the stowed position, the receiving surface shelf is pivoted out of alignment with the longitudinal direction and positioned adjacent an end of the first wall and an end of the second wall.
20

2. The dishwasher according to Claim 1, wherein the first engaging portion and the second engaging portion are disposed on a first side of the cutlery rack, wherein the first engaging portion defines a first pivotal attachment member engaging a first rail on the first wall of the dishwasher rack, wherein the second engaging portion defines a second pivotal attachment member engaging a second rail on the second wall of the dishwasher rack, and wherein the cutlery rack further comprises:
25

a second side comprising a third engaging portion configured to be removably and slidably disposed on the first rail in the working position and a fourth engaging portion configured to be removably and slidably disposed on the second rail in the working position;
30

wherein the cutlery rack is configured to slide along the first rail on the first engaging portion and the third engaging portion and the cutlery rack is configured to slide along the second rail on the second engaging portion and the fourth engaging portion;
35

and

wherein the cutlery rack is configured to be pivoted to the stowed position by lifting the second side of the cutlery rack and rotating the cutlery rack about a first pivotal attachment member of the first engaging portion and a second pivotal attachment member of the second engaging portion.

5

3. The dishwasher according to Claims 1 or 2, wherein in the working position, the receiving surface of the shelf is configured to be disposed generally parallel to the longitudinal direction.

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4. The dishwasher according to any one of the preceding claims, wherein in the stowed position, the receiving surface of the shelf is configured to be disposed generally perpendicular to the longitudinal direction.

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5. The dishwasher according to any one of Claims 1, 3, or 4, wherein the first wall further comprises a first rail disposed on an upper edge of the first wall, the first rail at least partially defining a first receiving slot, wherein the first receiving slot extends parallel to the longitudinal direction, and wherein the first engaging portion is configured to engage the first receiving slot.

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6. The dishwasher according to Claim 5, wherein the first engaging portion comprises a first leg attached generally perpendicular to the shelf, the first leg defining a length, wherein the first receiving slot terminates at a distance from the end of the first wall of the dishwasher rack, and wherein the distance is equal to the length of the first leg.

25

7. The dishwasher according to Claim 5 or Claim 6, wherein the second wall further comprises a second rail disposed on an upper edge of the second wall, the second rail at least partially defining a second receiving slot, wherein the second receiving slot extends parallel to the longitudinal direction, and wherein the second engaging portion is configured to engage the second receiving slot.

30

8. The dishwasher according to Claim 7, wherein the second engaging portion comprises a second leg attached generally perpendicular to the shelf, the second leg defining the length, wherein the second receiving slot terminates at the distance from the end of the second wall of the dishwasher rack.

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9. The dishwasher according to any one of Claims 1 or 3 to 8, wherein the cutlery rack further comprises a third engaging portion attached to the shelf and a fourth engaging portion attached to the shelf, wherein the third engaging portion is configured to engage the first wall in the working position, and wherein the fourth engaging portion is
5 configured to engage the second wall in the working position.

10. The dishwasher according to any one of Claims 1 or 3 to 8, wherein the first engaging portion defines a first slot configured to receive at least a portion of the first wall therein, and wherein the first engaging portion further comprises a first attachment
10 member extending across the first slot, such that the first engaging portion at least partially surrounds the portion of the first wall.

11. The dishwasher according to Claim 10, wherein the second engaging portion defines a second slot configured to receive at least a portion of the second wall therein, and wherein the second engaging portion further comprises a second attachment
15 member extending across the second slot, such that the second engaging portion at least partially surrounds the portion of the second wall.

12. The dishwasher according to Claim 11, wherein the shelf is configured to pivot
20 about an axis spanning the first attachment member and the second attachment member.

13. The dishwasher according to any one of the preceding claims, wherein in the stowed position, a portion of the shelf is configured to rest on an upper edge of a third wall of the dishwasher rack, and wherein the third wall extends between the end of the
25 first wall and the end of the second wall.

14. The dishwasher according to any one of the preceding claims, wherein the shelf, the first engaging portion, and the second engaging portion are fixedly connected to each other, and wherein the shelf is configured to pivot about an axis extending between the
30 first engaging portion and the second engaging portion.

15. A cutlery rack comprising:
a first side comprising:
a first engaging portion configured to pivotally and slidably attach to a first
35 rail of a first wall of a dishwasher rack, wherein the first engaging portion defines a first pivotal attachment member configured to engage the first rail;

a second engaging portion configured to pivotally and slidably attach to a second rail of a second wall of a dishwasher rack, wherein the second engaging portion defines a second pivotal attachment member configured to engage the second rail;

5 a second side comprising:

a third engaging portion configured to be removably and slidably disposed on the first rail;

a fourth engaging portion configured to be removably and slidably disposed on the second rail;

10 wherein the cutlery rack is configured to slide along the first rail on the first engaging portion and the third engaging portion and the cutlery rack is configured to slide along the second rail on the second engaging portion and the fourth engaging portion; and

15 wherein the cutlery rack is configured to be pivoted to a stowed position by lifting the second side of the cutlery rack and rotating the cutlery rack about the first pivotal attachment member of the first engaging portion and the second pivotal attachment member of the second engaging portion.

16. The cutlery rack according to Claim 15, further comprising a shelf extending
20 between the first side and the second side, the shelf defining a receiving surface for receiving cutlery.

17. The cutlery rack according to Claim 16, wherein the first engaging portion
25 comprises a first leg attached generally perpendicular to the shelf, the first leg defining a length, wherein the length is configured to be equal to a distance a termination point of a first receiving slot defined by the first rail and an end of the first wall.

18. The dishwasher according to Claim 17, wherein the second engaging portion
30 comprises a second leg attached generally perpendicular to the shelf, the second leg defining the length.

19. The dishwasher according to any one of Claims 15 to 18, wherein the first
35 engaging portion defines a first slot configured to receive the first rail, wherein the first attachment member extends across the first slot, such that the first engaging portion is configured to at least partially surround the first rail,

wherein the second engaging portion defines a second slot configured to receive the second rail, and wherein the second attachment member extends across the second

slot, such that the second engaging portion is configured to at least partially surround the second rail.

20. A method of manufacturing a dishwasher with a cutlery rack, the dishwasher comprising a dishwasher rack disposed in the dishwasher, the dishwasher rack comprising at least a first wall and a second wall, wherein the first wall is parallel to the second wall, and wherein each of the first wall and the second wall defines at least one end; a cutlery rack comprising a first engaging portion, a second engaging portion, and a shelf extending between the first engaging portion and the second engaging portion, the shelf defining a receiving surface for receiving cutlery; the method comprising:

attaching the first engaging portion of the cutlery rack to the first wall of the dishwasher rack, wherein after attachment, the first engaging portion is configured to slide relative to the first wall of the dishwasher rack;

attaching the second engaging portion of the cutlery rack to the second wall of the dishwasher rack, wherein after attachment, the second engaging portion is configured to slide relative to the second wall of the dishwasher rack;

wherein the shelf is configured to slide in a longitudinal direction with respect to the first wall and the second wall, and wherein the shelf is configured to pivot with respect to the dishwasher rack between a working position and a stowed position,

wherein in the working position, the receiving surface of the shelf is aligned with the longitudinal direction, wherein in the stowed position, the receiving surface shelf is pivoted out of alignment with the longitudinal direction and positioned adjacent an end of the first wall and an end of the second wall.

1/2

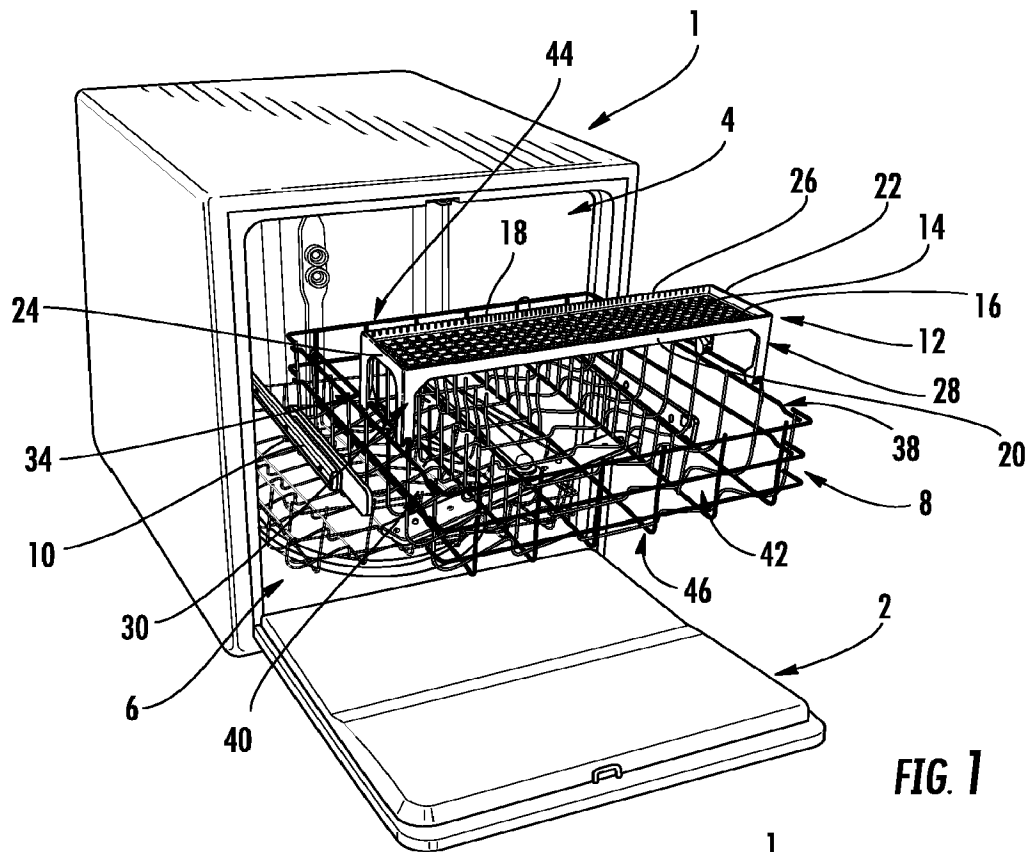


FIG. 1

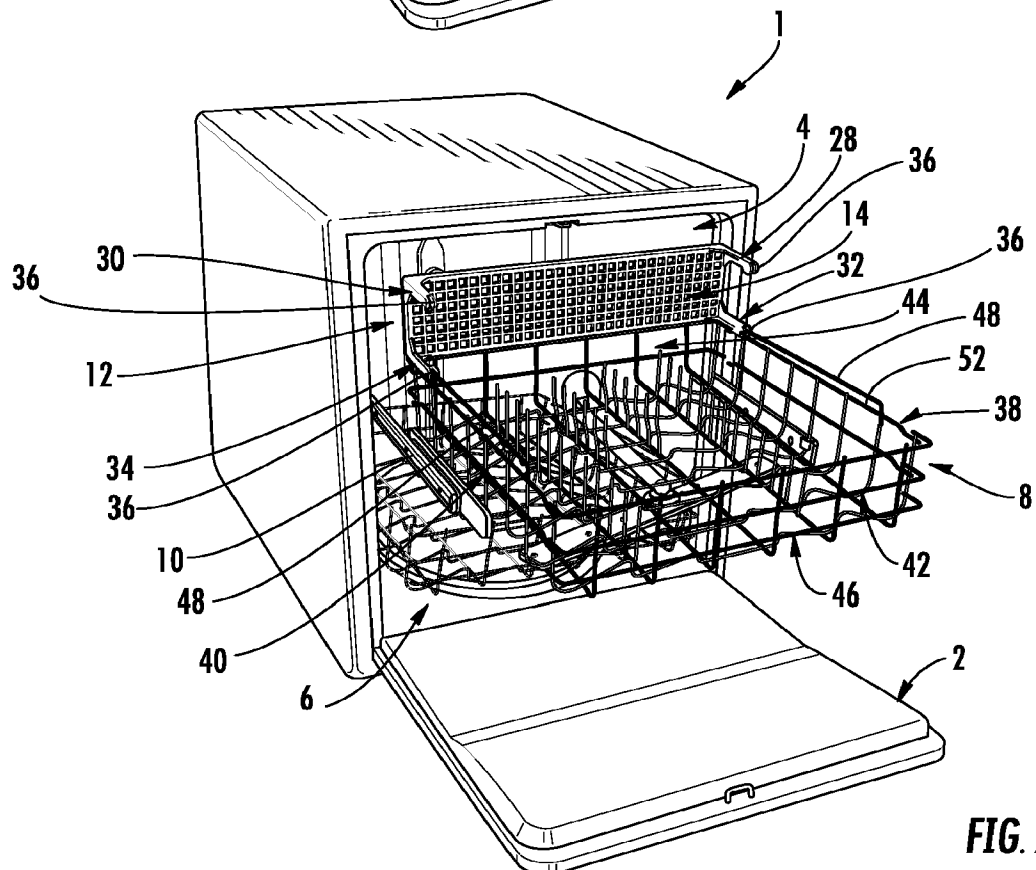
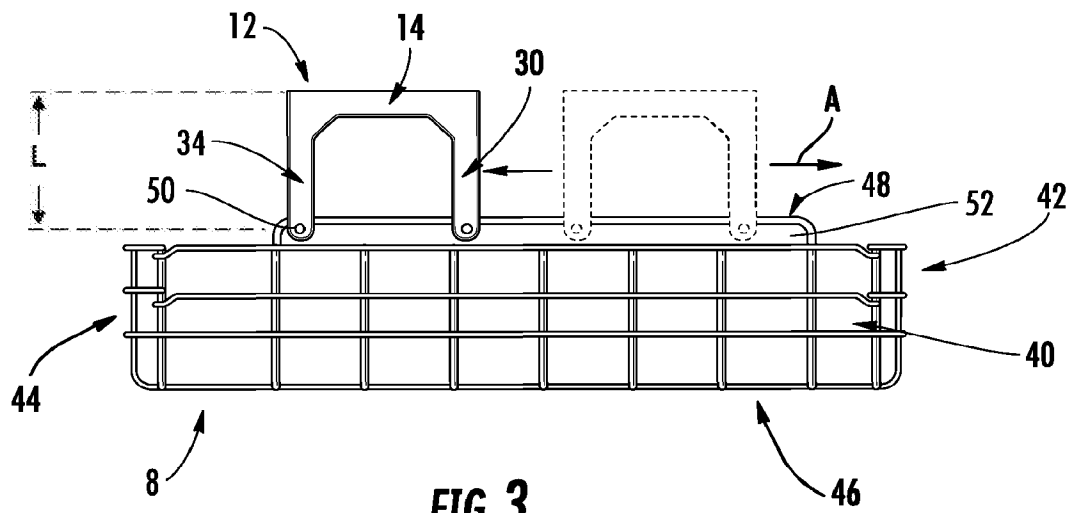
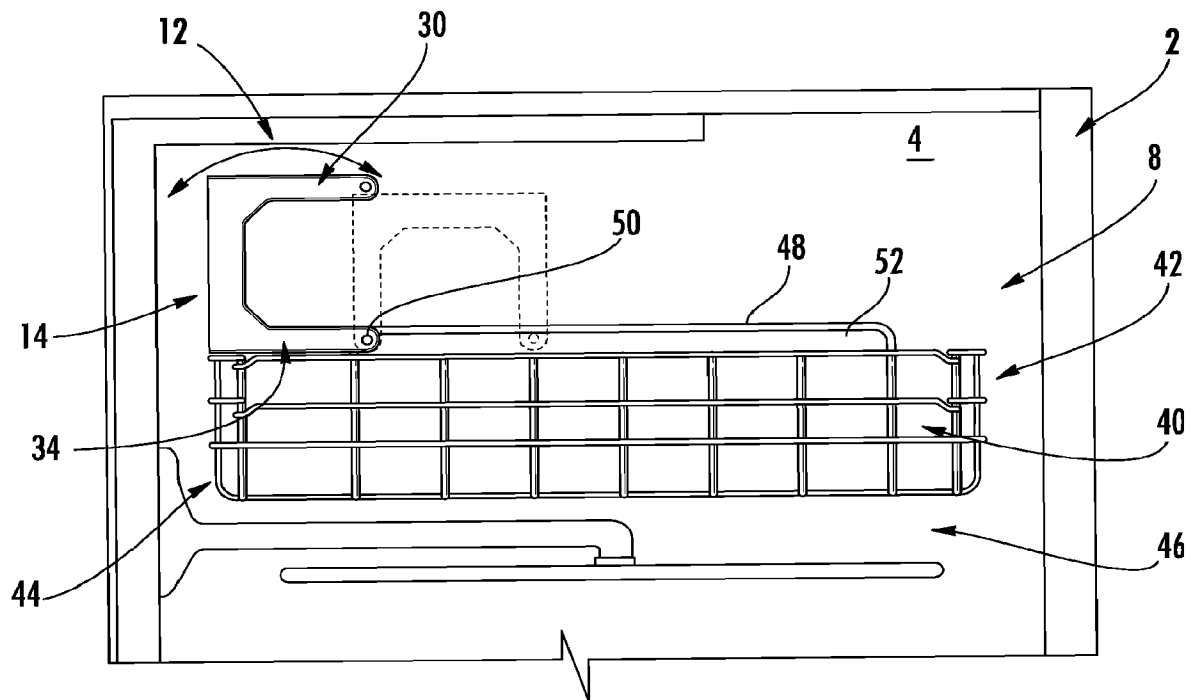


FIG. 2



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2016/026704

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A47L 15/50; A47B 77/14; A47L 15/24; A47L 15/26; A47L 15/33; A47L 15/48 (2016.01)

CPC - A47L 15/507; A47L 15/501; A47L 15/502; A47L 15/503; A47L 15/504; A47L 15/505 (2016.05)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC(8) - A47B 77/14; A47L 15/24; A47L 15/26; A47L 15/33; A47L 15/48; A47L 15/50; B65D 6/16 (2016.01)

CPC - A47L 15/501; A47L 15/502; A47L 15/503; A47L 15/504; A47L 15/505; A47L 15/506; A47L 15/507 (2016.05)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

USPC - 134/183; 211/41.8; 211/70.7; 312/228.1 (keyword delimited)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Patbase, Google Patents, Google, YouTube.

Search terms used: dishwasher, cutlery, utensil, pivot, hinge, rotate, slide, stow.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,462,348 A (ELLINGSON et al) 31 October 1995 (31.10.1995) entire document	1-3, 15, 16, 20
Y	EP 2 322 074 B1 (CANDY S.P.A) 13 March 2013 (13.03.2013) entire document	1-3, 15, 16, 20
A	DE 43 09 915 A1 (LICENTIA PATENT-VERWALTUNGS-GMBH) 29 September 1994 (29.09.1994) machine translation	1-3, 15-20
A	EP 1 475 030 A2 (CANDY S.P.A.) 10 November 2004 (10.11.2004) entire document	1-3, 15-20
A	US 2013/0247944 A1 (FISCHER et al) 26 September 2013 (26.09.2013) entire document	1-3, 15-20

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

25 May 2016

Date of mailing of the international search report

30 JUN 2016

Name and mailing address of the ISA/

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P.O. Box 1450, Alexandria, VA 22313-1450

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Blaine R. Copenheaver

PCT Helpdesk: 571-272-4300

PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (January 2015)

Petitioner Samsung Ex-1004, 0074

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2016/026704

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☒ Claims Nos.: 4-14
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.



Espacenet

Bibliographic data: CN101612027 (A) — 2009-12-30

Dish washer with pivot device

Inventor(s): HERBERT FALK ± (FALK HERBERT)

Applicant(s): MEIKO MASCHB GMBH & CO ± (MEIKO MASCHINENBAU GMBH. & CO)

Classification: - **international:** A47L 15/26
 - **cooperative:** A47L15/0002 (EP, US); A47L15/0081 (EP, US);
A47L15/241 (EP, US); A47L15/501 (EP, US);
A47L15/504 (EP, US); A47L2601/02 (EP, US)

Application number: CN200910142154 20090601

Priority number(s): DE20081030356 20080626

Also published as: DE102008030356 (A1) EP2138085 (A1) US2009320883 (A1)

Abstract of CN101612027 (A)

The invention provides a dishwasher (110), which comprises at least one cleaning chamber (120) subjecting tableware to an action of at least one cleaning liquid. The dishwasher (110) preferably includes a rack support (130) for supporting at least one dish rack (112) loaded with the tableware (126). The dishwasher (110) comprises a pivot device (132), wherein, the pivot device (132) is designed to pivot the dish rack from a first position (136) to a second position (138) inside a cleaning chamber (120).

[19] 中华人民共和国国家知识产权局



[12] 发明专利申请公布说明书

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[51] Int. Cl.

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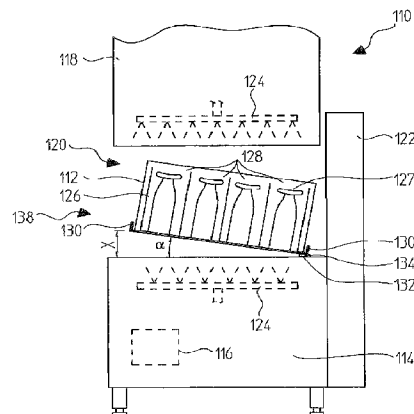
权利要求书 3 页 说明书 13 页 附图 3 页

[54] 发明名称

具有转动装置的洗碗机

[57] 摘要

本发明提供一种洗碗机(110)，其包括至少一个清洗室(120)，餐具在其中受到至少一种清洁液的作用。该洗碗机(110)选地具有一用于支撑至少一个碗碟架(112)的支架支撑(130)，该碗碟架装载有餐具(126)。该洗碗机(110)包括一个转动装置(132)，其中，该转动装置(132)设计成将碗碟架在清洗室(120)内从第一位置(136)转动至第二位置(138)。



1. 一种洗碗机（110），包括至少一个使餐具（126）受到至少一种清洗液作用的清洗室（120），其特征在于，该洗碗机（110）具有一用于支撑至少一个碗碟架（112）的支架支撑（130），该碗碟架（112）装载餐具（126），其中该洗碗机（110）具有一个转动装置（132），其中，该转动装置（132）设计成在清洗室（120）内将碗碟架（112）从至少一个第一位置（136）转动到至少一个第二位置（138）。

2. 如权利要求 1 所述的洗碗机（110），其特征在于，所述洗碗机（110）设计成在第一位置（136）和/或第二位置（138）上固定碗碟架（112）。

3. 如权利要求 2 所述的洗碗机（110），其特征在于，在第二位置（138），碗碟架（112）相对于第一位置（136）以一倾角倾斜。

4. 如权利要求 3 所述的洗碗机（110），其特征在于，所述倾角在 5 度至 40 度之间，优选的在 10 度至 30 度之间。

5. 如在前的任一权利要求所述的洗碗机（110），还包括至少一设计用于保持餐具（126）的碗碟架（112）。

6. 如权利要求 5 所述的洗碗机（110），其特征在于，碗碟架（112）具有多个固定装置，特别是餐具隔间（128），从而以导向的方式保持餐具（126）。

7. 如权利要求 6 所述的洗碗机（110），其特征在于，餐具（126）设置在碗碟架（112）内，并基本垂直于碗碟架（112）的支架底座。

8. 如在前的任一权利要求所述的洗碗机（110），其特征在于，所述转动装置（132）包括一转动轴（134），其中该转动装置（132）设计成通过转动转动轴（134）将支架（112）从第一位置（136）转动至第二位置（138）。

9. 如在前的任一权利要求所述的洗碗机(110), 其特征在于, 所述转动装置(132)包括以下元件中的至少一个: 一杠杆, 特别是具有铰接头的杠杆; 一偏心轮, 特别是一电动操作的偏心轮; 一轴; 一汽缸, 特别是一液压汽缸。

10. 如在前的任一权利要求所述的洗碗机(110), 还包括一控制装置(116), 其中控制装置(116)设计成以至少两个不同的步骤来实施清洗程序, 其中该转动装置(132)设计成至少在第一程序步骤中在第一位置(136)内以及至少在第二程序步骤中在第二位置(138)内固定碗碟架(112)。

11. 如权利要求 10 所述的洗碗机(110), 其中第一程序步骤包括一清洗步骤, 其中第二程序步骤包括一漂洗步骤和/或排水步骤和/或干燥步骤。

12. 如在前的任一权利要求所述的洗碗机(110), 其中第一位置(136)是该碗碟架(112)基本水平取向的位置, 并且其中第二位置(138)是该碗碟架(112)相对于水平面倾斜取向的位置。

13. 如在前的任一权利要求所述的洗碗机(110), 其中该洗碗机(110)具有可以开启的罩(118), 特别地罩(118)可以向上摆动或向上移动, 其中当罩(118)在打开位置时, 碗碟架(112)插入洗碗机(110)的支架支撑(130)中, 其中当罩(118)在关闭位置时碗碟架(112)通过转动装置(132)转动。

14. 如在前任一权利要求所述的洗碗机(110), 其中该洗碗机(110)包括一传送带式洗碗机, 其设计成将碗碟架(112)传送通过至少一清洗区域, 其中该转动装置(132)设计成在传递过程和/或在传递过程中的中断时保护碗碟架(112)。

15. 一种特别使用如在先任一权利要求所述的洗碗机(110)清洗餐具(126)、特别是玻璃杯的方法, 其中餐具(126)被插入至少一碗碟架(112)

并同碗碟架（112）一起被插入洗碗机，其中餐具（126）在洗碗机（110）的至少一个清洗室（120）中受到至少一种清洗液的作用，其中，碗碟架（112）首先移动至清洗室（120）的第一位置（136），接着碗碟架（112）转动至第二位置（138）上。

16. 如权利要求 15 所述的洗碗机（110），其特征在于，餐具（126）在第一位置（136）受到清洗液的作用。

17. 如权利要求 15 或 16 所述的方法，其特征在于，餐具（126）在第二位置（138）暂时不受到清洗液的作用。

18. 如权利要求 17 所述的洗碗机（110），其中餐具（126）在第二位置（138）经受排水过程和/或干燥过程。

19. 如权利要求 17 和 18 所述的方法，其中碗碟架（112）在以下时间之一时从第一位置（136）转动至第二位置（138）：在漂洗过程中，其中，餐具（126）受到漂洗液体、特别是具有或不具有漂洗助剂的水的作用；在漂洗过程之后，其中，餐具（126）受到漂洗液体、特别是具有或不具有漂洗助剂的水的作用；在排水过程之前，其中，清洗液不作用于餐具（126）；在排水过程中，其中，清洗液不作用于餐具（126）；在干燥过程之前，其中，餐具（126）受到高温作用；在干燥过程时，其中，餐具（126）受到高温作用；在干燥过程之前，其中，餐具（126）受到空气流作用；在干燥过程时，其中，餐具（126）受到空气流作用。

20. 如在前的任一权利要求所述的洗碗机（110），其中使用的餐具（126）在直立表面（127）内包括至少一个腔，餐具优选为在直立表面（127）内包括至少一个腔的至少一个玻璃杯（126）和/或至少一平底杯，其中该腔具有一纵向轴，其中该纵向轴在第一位置（136）内基本垂直取向，并且在第二位置（138）处，该纵向轴相对于垂直面以一倾角倾斜。

具有转动装置的洗碗机

技术领域

本发明涉及一种使餐具受到清洗液体作用的洗碗机。本发明还涉及一种清洗餐具(tableware)的方法。该类型的洗碗机和方法可特别用于商业洗碗的领域，特别是餐厅、医院、公司、学校、护理室或类似设施中的具有大量餐具的大型厨房领域。原则上可以清洗各种类型的餐具，也就是说所有的与食物直接或间接接触的器具，例如碟子、盘子、餐具(cutlery)、杯子或在本发明范畴内特别优选的玻璃杯。

背景技术

为了清洗餐具(tableware)，特别是碟子、杯子、盘子、玻璃杯、餐具(cutlery)或类似的物品，在商业上可使用洗碗机，餐具在其中受到以下至少一种液体的作用而被清洗，包括：清洗液体，例如具有和/或不具有清洁剂的洗碗液，漂洗液，例如具有或不具有漂洗助剂的水，或其他的清洗液体。本发明原则上可以应用于各种类型的洗碗机，特别是单室和/或多室的洗碗机。本发明特别优选地用于商业洗碗机中，即具有多个槽的洗碗机中，这样，例如当在一个槽内进行清洗过程时，就可以再第二槽内准备漂洗过程，例如在一单独的锅炉或流加热器(flow heater)中加热漂洗液体。本发明可特别用于罩式洗碗机，在其中，至少一个清洗室具有至少一个可以打开的罩。

碗碟架，例如塑料支架，特别是具有餐具隔间的碗碟架，可用于多种这类的洗碗机中。通常，所有待清洗的物品，例如玻璃杯、碗或塑料

容器被开口朝下的插入到碗碟架进行清洗过程。因此清洗器皿的直立表面，例如玻璃杯的底部通常向上。然而，在许多的情况下，这种类型的碗碟架面对一个难题，当从洗碗机中移除碗碟架时，具有深底座或底部的玻璃杯，或在直立表面具有凹陷的清洗器皿可能被清洗液体、特别是碱性的清洗液体再次污染，特别是在外侧上被再次污染。例如当玻璃杯的底部的直立表面高度凹陷时，留存在饮水杯的底部的残留的清洗液可以造成这种现象。甚至漂洗过程通常也不能有效地抑制液体的积累。因此，当清洗液体蒸发时，导致待清洗的玻璃杯污染的残留物会在许多情况下产生。另一不利的现象在于残留在玻璃杯底部内的液体的数量非常之大，以致它不可能完全蒸发并不得不花费大量费用人工去除。

相似的问题出现在塑料盒形式的清洗器皿中，例如在肉店使用的尺寸为 400mm x 600mm 的塑料盒，其中，该底座通常也是极度向内弯曲的，这样大量的清洗液残留在其中，因此对洗碗结果有相当不利的影响。

为此目的，使用了用于玻璃杯的特别支架，该支架具有倾斜的底座或倾斜的隔间，以使留存在玻璃杯底座内的残留物的数量最小化。然而，这种用于玻璃杯的支架的缺点在于它们通常不能堆叠，因此不适合，例如用于存储餐具、特别是玻璃杯，而这正是公共饮食服务所需要的。

进一步，适用于具有隔间的碗碟架的倾斜装置是已知的。然而，这样的倾斜装置也不能在所有的情况下达到所述的要求，这是由于碗碟架中的碗碟隔间通常不能以这样的方式形成所需的尺寸，使得玻璃杯可以在相对倾斜的位置站立。另外，将倾斜装置插入碗碟架需要额外的操作费用。

除了洗碗机之外，其他类型的用于自动清洗清洗器皿的清洗装置原则上也是现有技术中已知的。例如，用于金属部件、例如金属粒状材料或其他工业制造零件的清洗装置，是市面有售的。例如 Hockh Metall-Reinigungsanlagen GmbH in Neuenburg, 德国，LPW

Reinigungssysteme GmbH in Riederich, 德国, Semmelroth, Anlagentechnik GmbH & Co. KG in Wendelstein, 德国, Pero AG, Reinigungsmaschinen und Oberflächenreinigung in Königsbrunn, 德国, Rosnik GmbH & Co. Maschinenfabrik, Nordhorn, 德国, MTV Forderund Reinigungssysteme GmbH 或 Durr Aktiengesellschaft in Stuttgart, 德国, 售卖这类的清洗装置。这些清洗装置中的设计成特别用于金属粒状材料、例如涂润滑油的螺钉的一些装置, 也具有转动、旋转或摆动装置以从不同的角度清洗粒状材料或机器元件。

然而, 将这些在清洗工业金属粒状材料中已知的震动技术应用至洗碗技术, 既不被技术认知也未被需要。这是由于餐具通常以导向的方式被插入碗碟架, 这样, 通常只需要让餐具从一个方向受到清洗液体的作用, 例如进入玻璃杯的腔内, 这与不进行定向的粒状材料相反。而且, 在餐具中通常技术上不会考虑到或很难考虑到旋转或震动运动, 因为这样的旋转或震动运动在许多情况下将损害餐具。

发明目的

因此, 本发明的一个目的在于提供一种洗碗机和一种用于清洗餐具的方法, 该洗碗机和方法能有效地避免上述的餐具污染的问题, 特别是由在餐具的向上的直立表面内积聚的清洗液而导致的餐具污染, 该洗碗机和方法还可以允许可靠的和可重复的清洗餐具。

发明内容

通过独立权利要求的特征可以达到本发明的目标。在从属权利要求中描述了本发明的有利改进, 其可以单独或组合实现。

本发明提供一种洗碗机和一种清洗餐具的方法。这样, 在下述的一

个或多个实施例中使用根据本发明的洗碗机来执行该方法，并且在所述的一个或多个实施例中洗碗机设计用于执行本发明的方法。这样，方法的有可能的改进可以参照洗碗机的描述，反之亦然。

提出的洗碗机，原则上可以依照上述的洗碗机进行构造，并包括至少一清洗室，使餐具在其中受到至少一种清洗液体的作用。这样，该洗碗机被设计成容纳有一装载餐具的碗碟架。该洗碗机可以包括例如用于保持碗碟架的支架支撑。该支架支撑可以包括例如用于插入一个或多个碗碟架的一个或多个轨。本发明计划该洗碗机具有转动装置，其中，该转动装置被设计成在清洗室内将碗碟架从至少一第一位置转动到至少一不同于第一位置的第二位置。特别的，该转动装置可以设计成在转动过程之前或之后，在第一位置和/或第二位置固定碗碟架。

这样，该转动装置可以完全的或部分地成型成支架支撑的组成部分。然而，可选择的或附加的，也可能整个支架支撑本身成型为一转动装置或作为转动装置的一部分。

特别是，在第二位置，该至少一个碗碟架可以相对于第一位置倾斜一倾角。倾角在 5 度至 40 度之间，特别是 10 度至 30 度之间，这个角度证明是特别适用于上述的用于将清洗液的残留物引导出凹陷表面的排水过程。

根据本发明的方案是基于假如餐具通常在碗碟架内不可能倾斜至有效的程度的想法。该转动装置可以在清洗过程中用于倾斜整个碗碟架，碗碟架可与支架支撑一起倾斜，这样可以使留存的液体残留物的数量最小化，并且当去除支架后，可以极大地阻止对餐具的污染。

在根据本发明的方法中，首先将餐具插入至少一个碗碟架，并且餐具和碗碟架一起被插入洗碗机中，例如在洗碗机的至少一个支架支撑内。然后，餐具在该洗碗机的至少一清洗室内受到至少一种清洗液的作用。

碗碟架首先被移动至清洗室内的至少第一位置，然后通过转动装置移动至至少第二位置。在这种情况下，转动运动原则上是倾斜运动或与平移运动结合的倾斜运动。

该洗碗机包括至少一个碗碟架，所述的碗碟架设计用于保持餐具，特别是以充分固定的方式。为此，可以设置相应的固定元件，例如碗碟隔间。这些固定装置可以以导向的方式保持餐具。特别优选的是将餐具在碗碟架内基本垂直于碗碟架的底座而设置。例如，玻璃杯或杯子具有一基本垂直于支架底座的轴。在这种情况下，“基本垂直”还覆盖了偏离垂直的情况，例如偏离不超过 10 度，优选不超过 5 度。

该转动装置原则上包括至少一转动轴，特别是一基本水平的转动轴，通过围绕转动轴转动，碗碟架可以沿着转动轴从第一位置转动进入第二位置。在这种情况下，该碗碟架例如可与可选的支架支撑或该支架支撑的一部分一起转动，或碗碟架自己转动。

该转动装置包括，例如以下的装置中的至少一个：一杠杆，特别是具有铰接头的杠杆；一偏心轮，特别是一电动操作的偏心轮；一轴；一汽缸，特别是一液压汽缸。然而，所述元件和/或其他用于执行转动运动的元件的组合也是可行的。特别的，该转动装置可以设计成实施一全自动转动运动，例如通过洗碗机的控制装置控制的转动运动，例如在洗碗或清洁程序中的一特别程序步骤。

特别优选的是当控制装置设计成实施具有至少两个不同程序步骤的清洗程序。在这种情况下，该转动装置设计成在至少一个程序步骤中在第一位置固定碗碟架，和在至少第二程序步骤中在第二位置固定碗碟架。例如，餐具在第一位置受到清洗液的作用，并且餐具在第二位置暂时不受到清洗液的作用，这样在该位置可以实施排水程序和/或干燥程序，在排水和/或干燥程序中，清洗液的留存的残留量很容易离开餐具的凹陷区

域，例如杯子的凹陷直立表面。这样，在第一位置处，清洗器皿通过转动装置以最佳的方式受到清洗液的作用，通过所述的转动装置进入第二位置，在第二位置处，清洗液的残留物可以以最佳的方式大部分流出例如餐具的底座区域。

特别优选的是当碗碟架在以下时间之一时从第一位置转动至第二位置：在漂洗过程中或在漂洗过程之后，其中餐具受到漂洗液作用，特别是具有或不具有漂洗助剂的水；在排水过程之前或在排水过程中，其中餐具不受到清洗液的作用；在干燥过程之前或在干燥过程中，其中餐具受到高温的作用；在干燥过程之前或在干燥过程中，其中餐具受到空气流作用，例如一强大的空气流，其温度不能高于或不能显著高于该洗碗机的其他区域内的空气。通过示例，该洗碗机和/或该洗碗机的控制装置可以进行相应编程以在合适的时间实施该类型的转动运动。

特别地，第一位置可以是该碗碟架基本垂直取向的位置。特别地，第二位置可以是该碗碟架相对于水平倾斜取向的位置。

如上所述，特别地，该洗碗机可以包括一个可以打开的罩，特别是可以向上摆动或向上移动的罩。该洗碗机可以设计成这样，当碗碟架在完全插入位置时，该碗碟架可通过转动装置而转动。特别地，当该洗碗机包括一罩型机器或它构造为罩型机器时，该机器如此设计，使得当罩在打开位置时，该碗碟架可以插入洗碗机，并且当罩在关闭位置时，所述碗碟架可以通过转动装置而转动。因此该转动运动可以如此设计，即使罩关闭，它也不会被阻止。然而，作为可选择的或附加的，当罩打开时，原则上也可以实施该转动运动。

作为对罩型洗碗机的替代或补充，该洗碗机还包括一传送带式洗碗机，其中餐具被传送通过至少一清洗区域，优选的以连续或间断的方式通过多个清洗区域。例如，该传送带式洗碗机包括一轨传送带或被设计

成一轨传送带，其中一个或多个支架以连续或间断的方式移动通过至少一清洗区域。在这种情况下，在传递过程中可以基本实现转动运动，例如在排水或干燥区域，在两个清洁区域之间（例如在主清洗区域和漂洗区域之间），在出口或在多个点处。然而，为了在所述的点处实施该转动运动，优选的在传递运动被暂时中断时通过至少一个转动装置转动至少一个碗碟架。

然而，洗碗机的所述类型原则上不限制洗碗机的结构。因此，该洗碗机还包括，例如作为一种替代或附加的，至少一种前载式洗碗机，其中洗碗机例如通过在该洗碗机前部区域内的一挡板或门而进行装填。其他的改进也是可行的。然而，在商业领域洗碗机的应用，也就是说在具有用于不同液体的至少两个彼此分离的槽的商业洗碗机中的应用，是特别优选的。

因此所述的洗碗机和所述的方法意味着在至少一第一位置处，餐具可以以最佳的方式被清洗，例如在以最佳的方式相对于该洗碗机的一个或多个喷嘴和/或清洗臂取向的餐具的位置，以最佳的方式将清洗液喷射进入餐具的腔内。然后在第二位置处，可以进行最佳的排水程序，在其中，积聚在餐具直立表面的凹处、例如在玻璃杯的凹陷底部的液体残留物，可以很大程度的排出。这样防止了例如碱性的残留物。所述的倾斜过程通过设计很容易实现并且可以在一规定的清洗程序中在一个或多个时间段中以各种方式实施。

本发明的其它细节和特征可在以下结合从属权利要求的优选实施例的描述中找到。在这种情况下，相应的特征可以单独地或彼此组合而实施。本发明并不限制于该优选实施例。该优选实施例在附图中示意性的示出。在附图中同样的附图标记代表同样的或功能相同的元件和/或具有相应功能的元件。

附图说明

附图 1A 示出了碗碟架在第一位置处的洗碗机的一优选实施例；

附图 1B 示出了根据附图 1A 的碗碟架在第二位置处的洗碗机；

附图 2 示出了根据本发明的方法的一可能的优选实施例的示意图。

附图标记列表

110	洗碗机	112	碗碟架
114	壳体	116	控制装置
118	罩	120	清洗室
122	后壁	124	喷嘴系统
126	玻璃杯	127	凹陷直立表面
128	隔间	130	支架支撑
132	转动装置	134	转动轴
136	第一位置	138	第二位置
210	负载碗碟架	212	打开罩
214	将碗碟架插入支架支 撑	216	关闭罩
218	清洗程序	220	预清洗程序
222	主清洗程序	224	第一漂洗步骤
226	转动操作	228	第二漂洗步骤
230	排水步骤	232	干燥步骤

具体实施方式

附图 1A 和 1B 以高度示意的方式示出了根据本发明的洗碗机 110 的

一可能的优选实施例。在这种情况下，附图 1A 和 1B 的区别在于碗碟架 112 的位置不同，这一点将在以下详细的描述。

该洗碗机包括一壳体 114，在其中容纳有控制装置 116（仅在附图 1A 和 1B 中示出）。该洗碗机 110 还包括一罩 118，其在附图 1A 和 1B 中是打开的状态，因此允许进入清洗室 120。罩 118 可在垂直的方向沿着后壁 122 设置，罩可以向上摆动或向上移动，并且当清洗室 120 在关闭的状态时罩 118 座落在壳体 114 上。一喷嘴系统 124（其在附图中仅示意性的示出）设置在清洗室 120 内。该喷嘴系统 124 包括，例如，用于预清洗和清洗程序的喷嘴和可选择的一漂洗系统。该喷嘴系统 124 还连接到一个或多个槽，这样所述的系统供应有相应的清洗液。例如，一单独的锅炉，在预清洗程序和清洗程序中漂洗液在其中加热，这样的锅炉也可用于漂洗系统。

该碗碟架 112 在附图中仅示意性的示出，并在该优选实施例中设置为用于玻璃杯 126 的碗碟架。为了在罩 118 处于关闭状态时，使清洗液以最佳的方式从喷嘴系统 124 进入玻璃杯 126 的腔内，在该示出的优选实施例中，玻璃杯 126 垂直取向。为了确保该取向，支架 113 具有例如多个隔间 128，其在附图 1A 和 1B 中也仅示意性的示出。这些隔间 128 通过例如垂直的隔离壁彼此分离。

当罩 118 处于打开状态时，碗碟架 112 被插入一支架支撑 130，支架支撑 130 在附图 1A 和 1B 中也仅示意性的示出。该支架支撑 130 与该碗碟架 112 的特定的特征相匹配，并且包括例如用于该碗碟架的保持轨或其他类型的保持件和/或用于碗碟架 112 的支架。

当支架支撑 130 上的碗碟架 112 位于附图 1A 所示的位置时，将碰到以上所述的问题。清洗液例如酒精积聚在该清洗器皿的底部区域，在这种情况下，特别是积聚在玻璃杯 126 的凹陷直立表面 127 内，并且当碗碟架 112 从洗碗机 110 去除时，这可能导致重新污染餐具（此处为玻璃

杯 126)。

因此,本发明建议为支架支撑 130 配备一转动装置 132,其在附图中也仅象征性的示出。该转动装置 132 允许碗碟架 112 围绕着一转动轴 134 转动,在该优选实施例中,其构造成转动轴 134 平行于后壁 122。在这种情况下,该碗碟架 112 可以通过相应的旋转转动程序从碗碟架 122 水平取向的第一位置(在附图 1A 中示出并以附图标记 136 表示)转动至第二位置(在附图 1B 中示出并以附图标记 138 表示)。在第二位置 138 处,该碗碟架 112 以一相对于水平面的倾角 α 倾斜,这样该碗碟架 112 的前下部边缘相对于转动轴 134 升高一距离 X。与所示实施例不同的是,该转动轴可以以其他方式设置,例如靠近清洗室 120 的前边缘处,和例如平行于所述的前边缘或平行于清洗室 120 的一侧部。

在这方面,参照本发明原则上可以用于所有类型的餐具的事实。当被使用的餐具 126 在至少一个直立表面 127 包括至少一个腔时,它是特别有利的。对玻璃杯 126 和/或平底杯来说,情况就是这样的。该腔具有例如一纵向轴线,其中该纵向轴线在第一位置 136 处基本充分垂直的取向,并且其中,在第二位置 138 处,该纵向轴线相对于垂直面以一倾角倾斜。然而,原则上也可以使用其它类型的清洗器皿或餐具,例如清洗器皿,在其中,水或清洗液体在一凹陷内积聚(例如碗的边缘)并可通过倾斜运动而被排空。相似的,一个没有空腔和凹陷的清洗器皿的碗碟架在该程序过程中也可以倾斜。

在这种情况下,该倾角 α 优选以这样的方式选择,即当罩 118 被关闭时,该碗碟架 112 仍然可以在清洗室 120 中找到空间,而不碰到罩 118 的壁面或碰到清洗室 120 内的其他内部部件。这样,在清洗过程中,可以通过转动将待倾斜的整个碗碟架 112 与支架支撑 130 一起从第一位置 136 转动至第二位置 138,这样实质上不会有清洗液的残留物留存在清洗器皿 126 的凹陷直立表面 127 中,因此当碗碟架 112 从洗碗机 110 中取

出时，餐具的污染被最大程度地阻止了。

该转动装置 132 包括例如一具有铰接头的机械杠杆，或也可以例如通过一偏心轮、一轴、一气缸或类似装置而被电动操作、液压操作或气动操作。另外，像下面将参照附图 2 进行详细描述的那样，可能有这样的—个清洗程序，其中该碗碟架 112 在不同的程序步骤被设置在不同的位置。这样，例如可以仅在漂洗步骤通过液压缸产生倾斜，这样该碗碟架 112 仅在漂洗步骤中被移到倾斜位置。另外，该倾斜可能仅仅在排水间隔产生。在这种情况下，实际的在漂洗和/或排水之前的清洗程序，仍然可以实施于垂直设置的玻璃杯 126，这提高了清洗效果，因为在这种情况下，来自喷嘴系统 124 的清洗液可以最佳的方式进入玻璃杯 126 的腔内。

不用说，倾斜的效果也可以以一种比所示的转动装置 132 操作更复杂的方式达到，例如通过单独的支架框，其具有在倾斜位置保持碗碟架 112 的任务，在该位置为了清洗的目的可以将碗碟架推入机器中。然而，该装置的缺点在于由于碗碟架 112 在插入和取出时安装在罩 118 的导轨上，该支架的倾斜只可能是轻微的。另一缺点在于该清洗器皿，例如高脚杯，在清洗程序中没能以最佳的方式垂直于喷嘴系统 124 取向，这将导致不充分的清洗结果。

需要注意的是，在附图 1A 和 1B 中示出的该罩型洗碗机 110 仅仅代表本发明适用的洗碗机的一种可能的示例。作为可选的或附加的，本发明还可用于例如传送带式洗碗机或前负载式单室洗碗机，或通常特别用于商用洗碗机，也即具有至少两个清洗液的槽的。然而，可以发现所述的污染问题在示出的罩型洗碗机中特别扮演一个相当重要的角色，特别由于在这样的洗碗机 110 中，碗碟架 112 通常手动操作，并且特别是当操作该支架时，留存在清洗器皿的凹陷直立表面内的清洁液残留物的数量可能导致所述的污染。

附图 2 示出了一种根据本发明的方法的可能的优选实施例。该方法包括一个具有多个程序步骤的清洗程序。不言而喻，具有其他类型的程序步骤的其他类型的清洗程序和/或程序步骤的其他顺序也可以根据本发明实施。一种不同于示出的程序步骤的顺序的顺序也是可行的，并且也可以实施附加的未在附图 2 中示出的程序步骤。

在方法步骤 210 中，该碗碟架 112 装载有餐具，例如玻璃杯 126。在方法步骤 212 中，罩 118 打开，如附图 1A 和 1B 中示出的，并且在方法步骤 214 中该碗碟架 112 被插入到支架支撑 130 中。然后该罩 118 在方法步骤 216 中关闭，清洗程序（在附图 2 中通过概括的附图标记 218 表示）开始。

该清洗程序同样仅在附图 2 以示例的方式示意性示出。因此，该清洗程序包括一可选的预清洗步骤 220 和一主清洗步骤 222。然而，这两个清洗步骤 220，222 也可以合并成一个程序步骤。

在清洗步骤 220，222 的过程中，漂洗液体可以在单独的槽中被加热，例如在锅炉中，其中，通常使用具有添加的漂洗助剂的水。因此，漂洗步骤可以紧随清洗步骤 220，222 之后而不中断。该漂洗步骤在附图 2 中被分成两个子步骤 224，228，其中在该示出的优选实施例中一转动步骤 226 被引入到这两个子步骤 224，228 之间，其在时间上也可以彼此相连而不中断。

在该转动步骤 226 中，该碗碟架 112 从第一位置 136（在附图 1A 中示出）倾斜进入第二位置 138（在附图 1B 中示出）。该转动操作 226 不一定会导致漂洗步骤 224，228 的中断，并且漂洗步骤 224，228 也可以合并以形成一个单一的漂洗步骤，从而，可以在漂洗步骤开始之后的一预定时间之后引入转动步骤 226 而不会中断漂洗程序。在该示出的优选实施例中，漂洗步骤的第一部分 224 可以在垂直设置的餐具上实施，例如垂直设置的玻璃杯 126，这样，由于来自喷嘴系统 124 的喷射流可以以

最佳的方式进入垂直设置的玻璃杯的腔内，可以确保最佳的漂洗。

在漂洗步骤 228 的在转动状态进行的第二部分过程中，也就是说碗碟架 112 以倾角 α 倾斜，由于留在碗碟架 112 内的玻璃杯 126 的凹陷直立表面 127 内的液体残留物和因此造成的玻璃杯的污染可通过倾斜碗碟架 112 而最小化，因此获得上述的效果。

在排水步骤 230 和干燥步骤 232 后可选择进行漂洗步骤 224，228。这两个方法步骤 230，232 是可选择和替代的方法步骤，在其中，清洁液（即清洗液或漂洗液）不作用于餐具，例如玻璃杯 126。排水步骤 230 也可以引入到清洗步骤 220，222 之间，和/或清洗步骤 220，222 之间和漂洗步骤 224，228 之间。在该变型中碗碟架 112 也可以在排水过程中倾斜。

如上所述，该示出的顺序仅是该转动步骤 226 时间顺序的一优选实施例，在其中，转动步骤 226 发生在漂洗步骤 224，228 期间。如上所描述的，转动也可以在排水步骤 230 的过程中发生，其中在罩 118 再次开启时尽可能早的实施排水。另外，该旋转操作 226 还可以在漂洗步骤 224，228 之前实施或在漂洗步骤 224，228 之后，或在排水步骤 230 过程中或之前。在清洗程序 218 的过程中，多个转动操作 226 也是可行的，为了获得最佳的清洗器皿在每一程序步骤的定位。

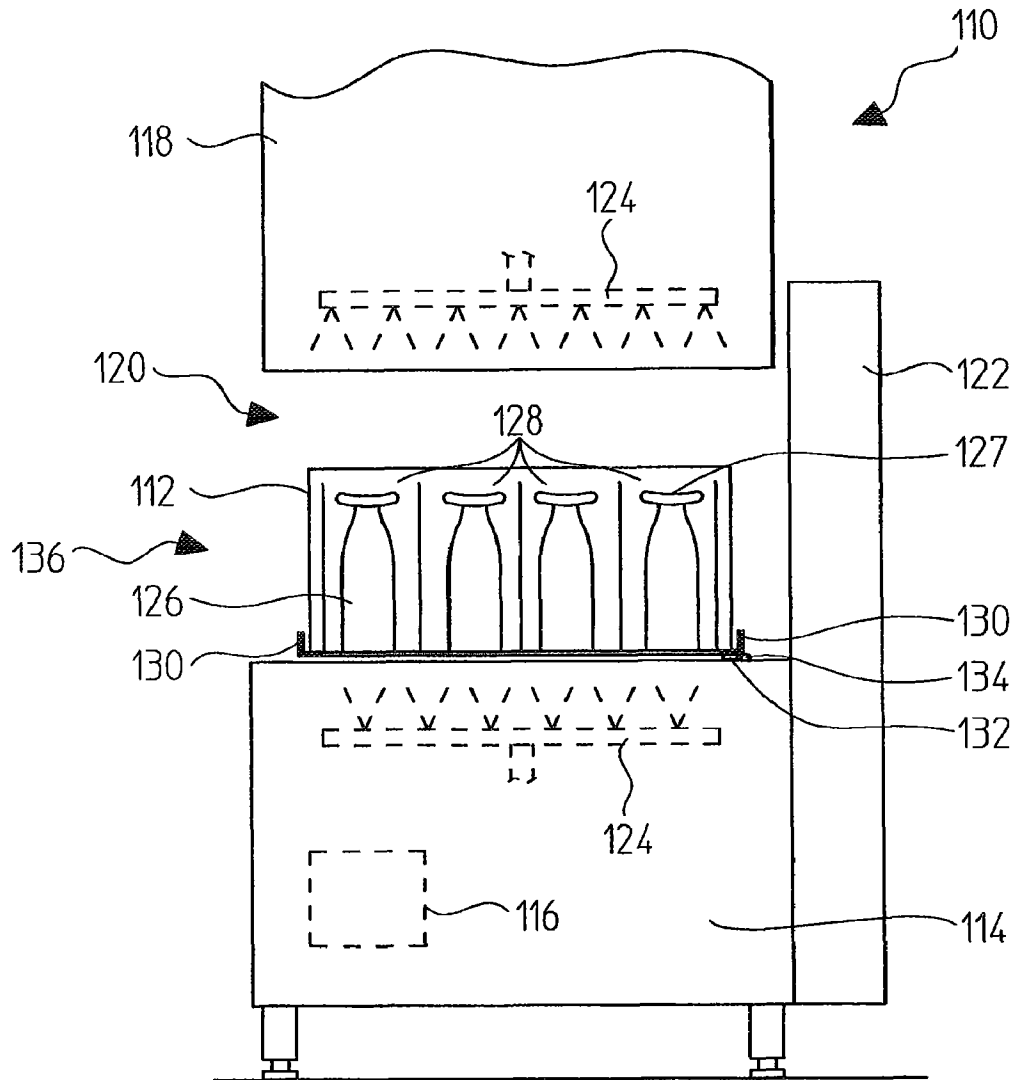


图1A

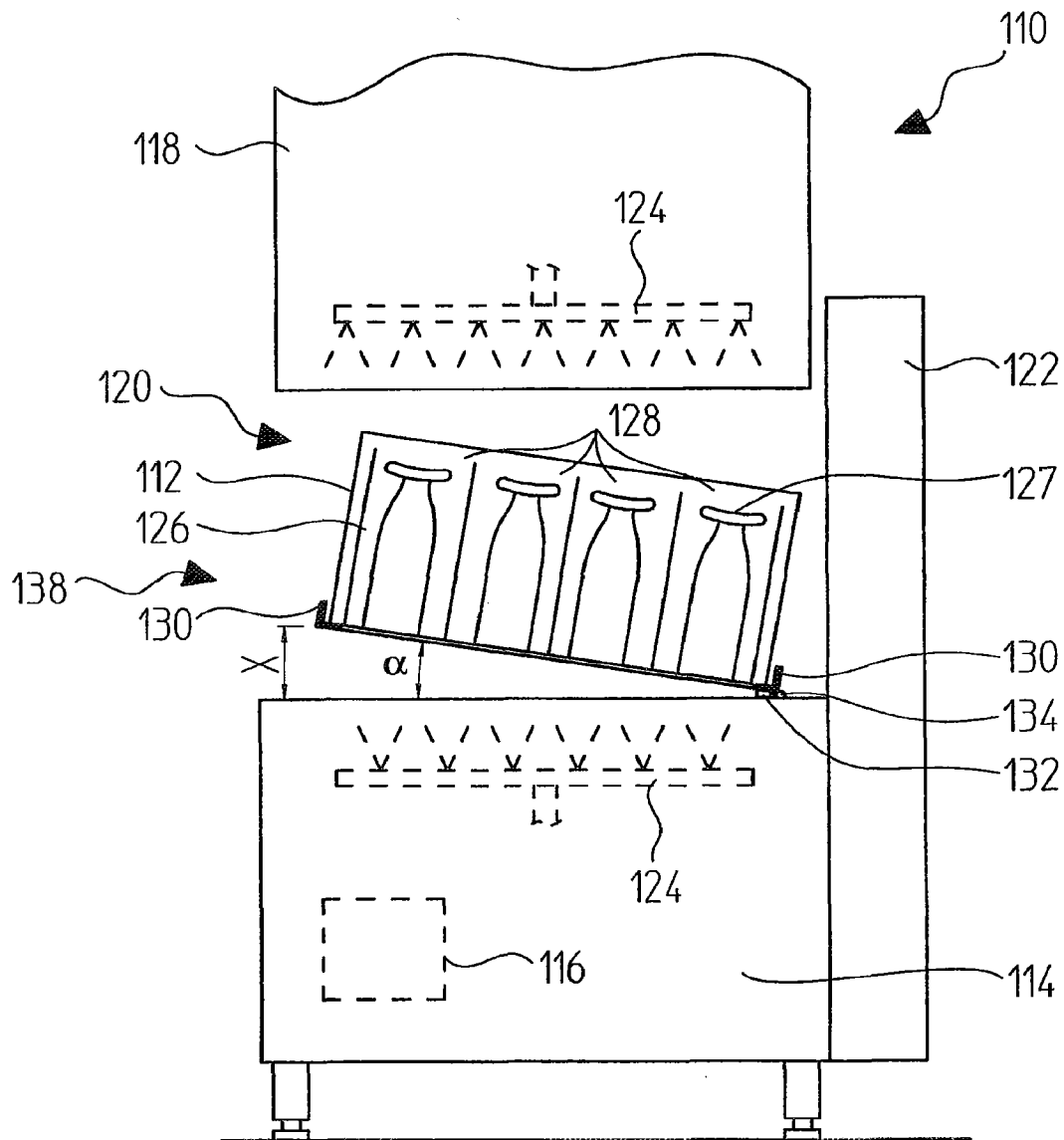


图1B

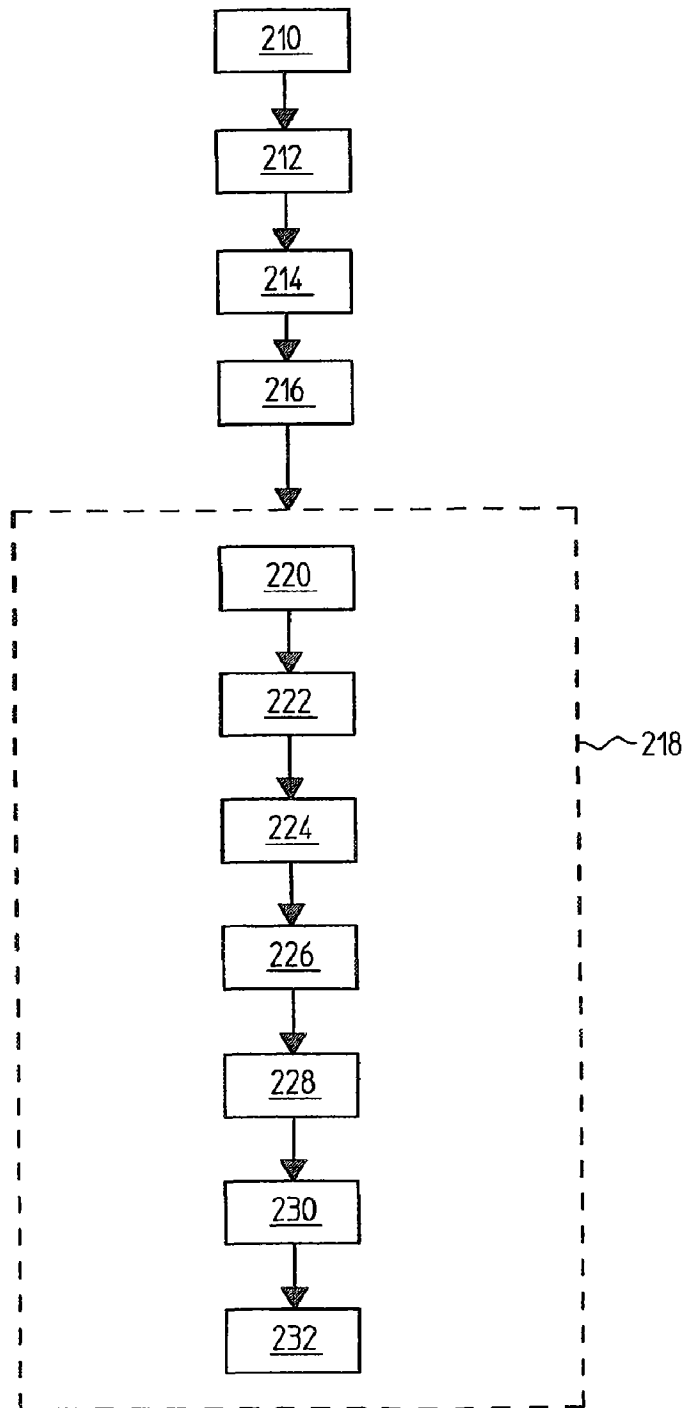


图2

(19)



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(54) Title: FOLD AWAY CUTLERY RACK

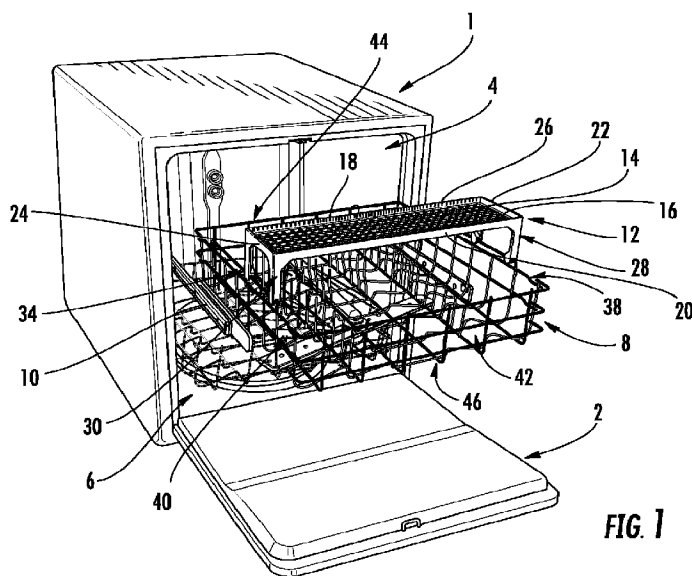


FIG. 1

(57) Abstract: Provided herein are cutlery racks, dishwashers, and associated methods for manufacturing and cleaning with the same. The dishwasher may include a cutlery rack having a first engaging portion, a second engaging portion, and a shelf. The first and second engaging portions may be respectively slidably attached to a first wall and a second wall of a dishwasher rack. The shelf may extend between the first engaging portion and the second engaging portion, may slide in a longitudinal direction with respect to the first wall and the second wall, and may pivot with respect to the dishwasher rack between a working position and a stowed position. In the working position, a receiving surface of the shelf may align with the longitudinal direction, and in the stowed position, the receiving surface shelf may be pivoted out of alignment with the longitudinal direction and positioned adjacent ends of the first and second walls.

FOLD AWAY CUTLERY RACK

FIELD OF THE INVENTION

Embodiments of the present invention relate generally to dishwashers and, more particularly, to cutlery racks for dishwashers and dishwashers comprising at least one cutlery rack.

5

BACKGROUND OF THE INVENTION

Dishwashers are often provided with a cutlery basket or a cutlery tray for stacking cutlery pieces. Traditionally, cutlery baskets may be detachably arranged within the lower rack of the dishwasher, and arranged for essentially vertical reception of cutlery.

10 However, these baskets occupy space in the bottom of the lower rack or must be removed and stored outside the dishwasher. Cutlery trays may be arranged for substantially horizontal reception of cutlery, and are adapted to be extractably arranged in the dishwasher, *e.g.* attached to the wall or top of the tub in the upper part of the dishwasher, above the upper rack. These cutlery trays also occupy substantial vertical
15 space in the tub, even when not in use.

Applicant has identified a number of deficiencies and problems associated with conventional dishwasher cutlery racks and other associated systems and methods.

Through applied effort, ingenuity, and innovation, many of these identified problems have been solved by developing solutions that are included in embodiments of the present

20 invention, many examples of which are described in detail herein.

BRIEF SUMMARY OF THE INVENTION

Generally, some embodiments provided herein include dishwashers, cutlery racks, and associated methods. The dishwasher may include a dishwasher rack
25 disposed in the dishwasher. The dishwasher rack may comprise at least a first wall and a second wall. The first wall may be parallel to the second wall, and each of the first wall and the second wall may define at least one end. The dishwasher may further include a cutlery rack comprising a first engaging portion. The first engaging portion of the cutlery rack may be slidably attached to the first wall of the dishwasher rack. The cutlery rack

may include a second engaging portion, and the second engaging portion of the cutlery rack may be slidably attached to the second wall of the dishwasher rack. The cutlery rack may further include a shelf extending between the first engaging portion and the second engaging portion. The shelf may define a receiving surface for receiving cutlery. The shelf may be configured to slide in a longitudinal direction with respect to the first wall and the second wall, and the shelf may be configured to pivot with respect to the dishwasher rack between a working position and a stowed position. In the working position, the receiving surface of the shelf may be aligned with the longitudinal direction. In the stowed position, the receiving surface shelf may be pivoted out of alignment with the longitudinal direction and may be positioned adjacent an end of the first wall and an end of the second wall.

In some embodiments, the first engaging portion and the second engaging portion may be disposed on a first side of the cutlery rack. The first engaging portion may define a first pivotal attachment member engaging a first rail on the first wall of the dishwasher rack, and the second engaging portion may define a second pivotal attachment member engaging a second rail on the second wall of the dishwasher rack. The cutlery rack may further comprise a second side comprising a third engaging portion configured to be removably and slidably disposed on the first rail in the working position and a fourth engaging portion configured to be removably and slidably disposed on the second rail in the working position. The cutlery rack may be configured to slide along the first rail on the first engaging portion and the third engaging portion and the cutlery rack may be configured to slide along the second rail on the second engaging portion and the fourth engaging portion. The cutlery rack may be configured to be pivoted to the stowed position by lifting the second side of the cutlery rack and rotating the cutlery rack about a first pivotal attachment member of the first engaging portion and a second pivotal attachment member of the second engaging portion.

In some embodiments, in the working position, the receiving surface of the shelf may be configured to be disposed generally parallel to the longitudinal direction. In the stowed position, the receiving surface of the shelf may be configured to be disposed generally perpendicular to the longitudinal direction.

The first wall may further comprise a first rail disposed on an upper edge of the first wall. The first rail may at least partially define a first receiving slot. The first receiving slot may extend parallel to the longitudinal direction, and the first engaging portion may be configured to engage the first receiving slot. In some embodiments, the first engaging portion may include a first leg attached generally perpendicular to the shelf, the first leg defining a length. The first receiving slot may terminate at a distance from the end of the

first wall of the dishwasher rack, and the distance may be equal to the length of the first leg.

In some embodiments, the second wall may further comprise a second rail disposed on an upper edge of the second wall. The second rail may at least partially define a second receiving slot. The second receiving slot may extend parallel to the longitudinal direction, and the second engaging portion may be configured to engage the second receiving slot.

The second engaging portion may comprise a second leg attached generally perpendicular to the shelf, the second leg defining the length. The second receiving slot may terminate at the distance from the end of the second wall of the dishwasher rack.

In some embodiments, the cutlery rack may further comprise a third engaging portion attached to the shelf and a fourth engaging portion attached to the shelf. The third engaging portion may be configured to engage the first wall in the working position, and the fourth engaging portion may be configured to engage the second wall in the working position.

The first engaging portion may define a first slot configured to receive at least a portion of the first wall therein. The first engaging portion may further comprise a first attachment member extending across the first slot, such that the first engaging portion may at least partially surround the portion of the first wall.

The second engaging portion may define a second slot configured to receive at least a portion of the second wall therein. The second engaging portion may further comprise a second attachment member extending across the second slot, such that the second engaging portion may at least partially surround the portion of the second wall. In some embodiments, the shelf may be configured to pivot about an axis spanning the first attachment member and the second attachment member.

In some embodiments, in the stowed position, a portion of the shelf is configured to rest on an upper edge of a third wall of the dishwasher rack, and the third wall may extend between the end of the first wall and the end of the second wall.

The shelf, the first engaging portion, and the second engaging portion may be fixedly connected to each other, and the shelf may be configured to pivot about an axis extending between the first engaging portion and the second engaging portion.

In another embodiment, a cutlery rack may be provided. The cutlery rack may include a first side and a second side. The first side may comprise a first engaging portion configured to pivotally and slidably attach to a first rail of a first wall of a dishwasher rack. The first engaging portion may define a first pivotal attachment member configured to engage the first rail. The first side may include a second engaging portion configured to pivotally and slidably attach to a second rail of a second wall of a

dishwasher rack. The second engaging portion may define a second pivotal attachment member configured to engage the second rail. The second side may comprise a third engaging portion configured to be removably and slidably disposed on the first rail and a fourth engaging portion configured to be removably and slidably disposed on the second rail. The cutlery rack may be configured to slide along the first rail on the first engaging portion and the third engaging portion and the cutlery rack may be configured to slide along the second rail on the second engaging portion and the fourth engaging portion. The cutlery rack may be configured to be pivoted to a stowed position by lifting the second side of the cutlery rack and rotating the cutlery rack about the first pivotal attachment member of the first engaging portion and the second pivotal attachment member of the second engaging portion.

In some embodiments, the cutlery rack may comprise a shelf extending between the first side and the second side, the shelf defining a receiving surface for receiving cutlery. The first engaging portion may comprise a first leg attached generally perpendicular to the shelf, the first leg defining a length. The length may be configured to be equal to a distance a termination point of a first receiving slot defined by the first rail and an end of the first wall.

In some embodiments, the second engaging portion may comprise a second leg attached generally perpendicular to the shelf, the second leg defining the length.

The first engaging portion may define a first slot configured to receive the first rail. In some embodiments, the first attachment member may extend across the first slot, such that the first engaging portion may be configured to at least partially surround the first rail. The second engaging portion may define a second slot configured to receive the second rail, and the second attachment member may extend across the second slot, such that the second engaging portion may be configured to at least partially surround the second rail.

In yet another embodiment, a method of manufacturing a dishwasher with a cutlery rack is provided. The dishwasher may include a dishwasher rack disposed in the dishwasher. The dishwasher rack may comprise at least a first wall and a second wall.

The first wall may be parallel to the second wall, and each of the first wall and the second wall may define at least one end. The dishwasher may further include a cutlery rack comprising a first engaging portion, a second engaging portion, and a shelf extending between the first engaging portion and the second engaging portion. The shelf may define a receiving surface for receiving cutlery. The method may include attaching the first engaging portion of the cutlery rack to the first wall of the dishwasher rack. After attachment, the first engaging portion may be configured to slide relative to the first wall of the dishwasher rack. The method may further include attaching the second engaging

portion of the cutlery rack to the second wall of the dishwasher rack. After attachment, the second engaging portion may be configured to slide relative to the second wall of the dishwasher rack. The shelf may be configured to slide in a longitudinal direction with respect to the first wall and the second wall. The shelf may be configured to pivot with respect to the dishwasher rack between a working position and a stowed position. In the working position, the receiving surface of the shelf may be aligned with the longitudinal direction. In the stowed position, the receiving surface shelf may be pivoted out of alignment with the longitudinal direction and positioned adjacent an end of the first wall and an end of the second wall.

BRIEF DESCRIPTION OF THE DRAWINGS

Having thus described the invention in general terms, reference will now be made to the accompanying drawings, which are not necessarily drawn to scale, and wherein:

FIG. 1 shows a dishwasher having a cutlery rack in a working position according to some embodiments discussed herein;

FIG. 2 shows the dishwasher of FIG. 1 having the cutlery rack in a stowed position according to some embodiments discussed herein;

FIG. 3 shows a cutlery rack in a working position according to some embodiments discussed herein; and

FIG. 4 shows a cutlery rack moving between a working position and a stowed position according to some embodiments discussed herein.

DETAILED DESCRIPTION

Exemplary embodiments of the present invention now will be described more fully hereinafter with reference to the accompanying drawings, in which some, but not all embodiments of the invention are shown. Indeed, the invention may be embodied in many different forms and should not be construed as limited to the exemplary embodiments set forth herein; rather, these embodiments are provided so that this disclosure will satisfy applicable legal requirements. Like reference numerals refer to like elements throughout.

Dishwashers often include dedicated receiving areas for washing cutlery. Cutlery, including knives, forks, spoons, and the like, often has smaller dimensions than traditional dishware and, thus, may fall through the relatively larger openings of a dishwasher rack. Moreover, cutlery includes many, smaller surfaces, which warrant specific positioning in the wash chamber and/or higher spray intensities to ensure that the cutlery is cleaned thoroughly.

Some embodiments discussed herein include an improved cutlery rack that offers space and organization for cutlery, while also obstructing as little of the wash chamber as possible without requiring disassembly or storage. As detailed herein, a cutlery rack may be provided that is slidably attached to a dishwasher rack (e.g., the middle rack of a three-rack dishwasher or the top rack of a two-rack dishwasher), wherein the cutlery tray includes a detachable front connection and is designed to pivot to a vertical stowed position that is aligned with and proximate the back wall of the dishwasher tub when in non-use.

With reference to FIG. 1, a dishwasher 1 is shown in accordance with some embodiments discussed herein. The depicted dishwasher 1 includes a door 2 and a wash chamber 4 in which various articles, including cutlery, may be positioned for cleaning. The depicted embodiment includes a lower dish rack 6 and a middle dish rack 8, each configured to hold crockery, including plates, dishes, cups, pans, and the like, for washing. The dish racks 6, 8 may be movable on rails 10 from a loading position, outside the wash chamber 4, to a working position in the wash chamber.

The embodiment shown in FIGS. 1-2 further includes a cutlery rack 12 disposed on the middle rack 8 of the dishwasher for holding cutlery to be cleaned. The cutlery rack includes a shelf 14 having a receiving surface 16 that may include a grid of support bars. In some embodiments, adjacent, parallel grid bars may be spaced one half inch from each other, defining half inch square holes in the grid. The shelf 14 may include raised side walls 18, 20, 22, 24 surrounding the receiving surface 16 for supporting and containing cutlery on the receiving surface of the shelf. For example, the walls 18, 20, 22, 24 may prevent items lying on the shelf from inadvertently falling into the spray arms or sump of the dishwasher during a wash cycle. In some embodiments, the cutlery rack 12 may be disposed on a lower dish rack 6.

In some embodiments, one or more of the raised side walls 18, 20, 22, 24 may include one or more holders 26 (e.g., grooves, slots, openings, or other holding features) for supporting and securing cutlery. For example, in the embodiment shown in FIGS. 1-2, the shelf 14 includes a plurality of holders 26 spaced along the rear wall 18. These holders 26 may be evenly spaced, or may include variable spacing. For example, in the depicted embodiment of FIG. 1, the holders 26 at outer ends of the rear wall 18 include wider spacing than near a center portion of the rear wall (e.g., outer thirds of the rear wall 18 may include wider spacing than a center third of the rear wall). In other embodiments, either half of any wall 18, 20, 22, 24 of the shelf 14 may include holders 26 at a wider spacing than the other half. One of ordinary skill in the art will appreciate, in view of the present disclosure, that any configuration of additional holders, such as clips, specialized

openings, raised prongs, and the like may be disposed on the shelf to organize and support cutlery.

In some embodiments, the shelf 14 may define a width corresponding to the width of the dishwasher rack. For example, in some embodiments, the width of the shelf 14 may be from 18 inches to 20 inches. For example, the width of the shelf 14 may be 18.41 inches (~467.54 mm). In some embodiments, the length of the shelf 14 in the longitudinal direction A may be from 4 inches to 5 inches. For example, the length of the shelf 14 may be 4.88 inches (~124 mm). In some embodiments, the walls 20, 22, 24, 26 of the shelf 14 may be between half an inch and 1.5 inches tall. For example, the height of the walls 20, 22, 24, 26 of the shelf 14 may be .71 inches (~18 mm).

With reference to FIGS. 1-4, the shelf 14 may include one or more engaging portions 28, 30, 32, 34 that connect the shelf to the dishwasher rack 8. In the depicted embodiment, the engaging portions 28, 30, 32, 34 include four legs extending perpendicularly downward from the shelf to engage the dishwasher rack 8. The engaging portions 28, 30, 32, 34 may engage two or more walls 38, 40, 42, 44 of the dishwasher rack 8. In some embodiments, as shown in FIGS. 1-4, the cutlery rack 12 may engage and slide along rails 48, on two parallel walls (*e.g.*, first side wall 38 and second side wall 40). As used herein, the “walls” do not require a solid or continuous surface, but rather, encompass structures that generally align in different regions of the dishwasher rack 8 and/or cutlery rack 12. For example, the depicted “rear wall” 44 may include a plurality of horizontal and/or vertical grid bars along a rear of the dishwasher rack 8. Each wall 38, 40, 42, 44 may define two ends, an upper edge and a lower edge (*e.g.*, two ends of the second wall 40 are shown at the left and right extremes of the wall in the longitudinal direction A of FIGS. 3-4, with the upper edge shown at the top side of the wall 40 and the lower edge shown at the bottom side of the wall 40 in FIGS. 3-4).

The depicted rails 48 are defined on a top edge of the first side wall 38 and the second side wall 40, such that slots 36 of the engaging portions 28, 30, 32, 34 may slide along the rails at an uppermost edge of the side walls. As detailed below, the rails 48 may define longitudinal receiving slots 52 between the rail and the remainder of the walls (*e.g.*, first side wall 38 and second side wall 40). In some embodiments, the engaging portions may ride on rails disposed on an outside or inside surface of the dishwasher rack walls, and the rails may be disposed at an uppermost edge of the walls or at some intermediate position on the side walls. One of ordinary skill in the art will further appreciate, in light of the present disclosure, that the cutlery rack may ride along any parallel walls of the dishwasher rack (*e.g.*, the first and second side walls 38, 40 or the front and rear walls 42, 44), or the cutlery rack may attach to the bottom 46 of the dishwasher rack.

The shelf 14 may be positioned above the dishwasher rack 8 by the engaging portions 28, 30, 32, 34 to allow sufficient space for crockery in the middle dishwasher rack 8. For example, the shelf 14 may be positioned higher than a wine glass, which may be positioned on the dishwasher rack 8 below. The engaging portions 28, 30, 32, 34 may each define a length L from the attachment members 50, which may engage the underside of the rails 48 in the receiving slot 52, to the top of the side walls 20, 22, 24, 26 of the shelf 14. The sum of the length L and the height of the respective wall 38, 40, 42, 44 from the bottom 46 of the dishwasher rack 8 to the attachment members 50 may define the maximum height of the crockery that may be positioned in the dishwasher rack.

In some embodiments, the length may be from 3 inches to 5 inches. For example, the length L may be approximately 3.78 inches (~96.05 mm) in some embodiments. In some embodiments, the length L may be zero, such that the shelf 14 is generally level with the rail 48. In some embodiments, the shelf 14 may rest on the rails 48, and the engaging portions 28, 30, 32, 34 may define slots, bumpers, abutment mechanisms, or other attachment devices for attaching the shelf directly to the rails. In some embodiments, the engaging portions may define a width, perpendicular to the longitudinal direction, of approximately 0.6 inches (~15 mm).

One or more of the engaging portions 28, 30, 32, 34 may attach to the walls of the dishwasher rack 8 to allow pivotal and sliding movement of the shelf 14 relative to the rack, while limiting or preventing removal of the cutlery rack 12 from the dishwasher rack. In the depicted embodiment, the rear engaging portions 32, 34 attach to the rack 8, while the front engaging portions 28, 30 removably engage the dishwasher rack, such as by resting on the rack or loosely gripping the dishwasher rack in a working position. The depicted engaging portions 28, 30, 32, 34 include the slots 36 at a distal end of the legs for receiving a portion of the side walls (*e.g.*, rails 48 of one or more of the walls 38, 40, 42, 44) therein. The depicted rear engaging portions 32, 34 further include attachment members 50 (*e.g.*, pins, clips, pegs, bolts, or the like) extending across the slots 36 to hold the cutlery rack 12 on the rails 48. In such embodiments, the engaging portions 32, 34 having the attachment members 50 may be on a first side of the cutlery rack 12 and the engaging portions 28, 30 removably and slidably resting on the rails 48 without an attachment member may be on a second side of the cutlery rack 12.

The rails 48 may define a continuous, longitudinal receiving slot 52 in which the attachment members 50 may slide. The receiving slots 52 may allow the rear engaging portions 32, 34 on the first side to remain attached to the dishwasher rack 8 while being pivotable and slidable relative to the dishwasher rack. In some embodiments, the rails may be from 12 to 14 inches long (*e.g.*, 12.62 inches or 320.55 mm), and the rails may be

from one half inch to 1.5 inches tall (*e.g.*, 0.65 inches or 16.53 mm) above the upper edge of the respective walls 38, 40, 42, 44.

In some embodiments, the slots 36 and attachment members 50 (shown in FIGS. 3-4) may combine to surround the rails 48 on a cross-sectional plane. In some other
5 embodiments, the engaging portions may hold the rails without completely surrounding them (*e.g.*, via an open-ended pin extending in the receiving slots 52). In some embodiments, the slots 36 and/or attachment members 50 may be removably attached to the rails 48 (*e.g.*, via removable pin, latch, open-ended pin, or the like), such that the cutlery rack 12 remains attached to the dishwasher rack 8 in normal operation, while also
10 being detachable for cleaning or replacement.

Turning to the embodiment shown in FIGS. 3-4, a dishwasher rack 8 is shown from a right-side view, depicting the second wall 40 of the rack as coplanar with the page. While FIGS. 3-4 depict the structure of the dishwasher and cutlery rack 12 as viewed from the right side, one of ordinary skill in the art will appreciate that the descriptions of
15 FIGS. 3-4 may be applied to the left-side structure in the same manner. In operation, with reference to FIG. 3, the cutlery rack 12 may slide along the dishwasher rack 8 in a longitudinal direction A of the walls to which the cutlery rack is engaged (*e.g.*, first side wall 38 and second side wall 40). For example, the depicted embodiment of the cutlery rack 12 slides left-to-right in the longitudinal direction A along the rails 48 of the upper
20 edge of the side walls 38, 40 of the dishwasher rack 8, generally parallel to the bottom 46 of the dishwasher rack. In this manner, the cutlery rack 12 may be positioned at any desired position along the rails 48 to allow the user to choose the relative positioning of the cutlery in the wash chamber 4 (shown in FIGS. 1-2) and the crockery in the dishwasher rack 8. Similarly, the slidable movement of the cutlery rack 12 may allow the
25 user to load the cutlery rack at a front of the dishwasher rack 8 (*e.g.*, proximate the front wall 42 of the dishwasher rack 8), and subsequently move the loaded cutlery rack to the rear (*e.g.*, proximate the rear wall 44 of the dishwasher rack 8) for loading the dishwasher basket and/or for washing operations.

Turning to FIG. 4, the cutlery rack 12 may further pivot between a working position
30 (shown in dashed line), in which the shelf 14 is positioned to accept cutlery, and a stowed position (showed in solid line), in which the shelf is positioned so as to avoid interfering with the operation of the dishwasher rack 8. In the depicted embodiment, the cutlery rack 12 pivots about an axis spanning the attachment members 50 of the rear engaging portions 32, 34. The front engaging portions 28, 30 on the second side may rest on a
35 portion of the side walls 38, 40 (*e.g.*, the rail 48) in the working position, and the front engaging portions may disconnect from the side walls 38, 40 in the stowed position. One of ordinary skill in the art will appreciate that the front engaging portions may instead be

attached to the walls and may pivot with respect to the dishwasher rack. In such embodiments, the shelf may pivot forward in the stowed position. In some embodiments, the cutlery rack 12 may be configured to slide on parallel front and rear walls 42, 44, and the cutlery rack may pivot to the stowed position at or proximate the first side wall 38 or the second side wall 40.

With continued reference to FIGS. 3-4, the working position may be defined as an in-use position in which the receiving surface 16 of the shelf 14 is at least partially horizontal within the wash chamber 4 (shown in FIGS. 1, 2, and 4). In such embodiments, the receiving surface 16 of the shelf 14 may align with the longitudinal direction A. For example, the receiving surface 16 of the shelf 14 may be generally parallel with a plane spanning the longitudinal direction A of the respective walls on which the cutlery rack slides. For example, in the embodiment shown in FIG. 4, the working position is shown parallel with the longitudinal direction A of the second wall 40 (*e.g.*, with the surface of the shelf oriented left-to-right). In some embodiments, the working position may encompass any position of the shelf in the longitudinal direction A (*e.g.*, any sliding position) in which the shelf is generally parallel to the longitudinal direction. As used herein, the term “generally” when used in combination with orientations or dimensions, such as “generally parallel,” does not require the receiving surface of the shelf to be parallel in a mathematically precise position and is meant to indicate that the shelf is within a moderate range of deviation from absolutely parallel that is commonly acceptable as a level of accuracy for these terms within dishwashing arts.

The stowed position may be defined farther from parallel to the longitudinal direction than the working position. In such embodiments, the receiving surface 16 of the shelf 14 may be pivoted out of alignment with the longitudinal direction when transitioning from the working position to the stowed position. With continued reference to FIG. 4, the shelf 14 is shown pivoting about the rear engagement portion 34 and attachment member 50 between the working and stowed positions. In such embodiments, the shelf 14 may be lifted from the second side and may pivot relative to the pivotal attachment members 50 on the engaging portions 32, 34 of the first side.

In the depicted embodiment, the receiving surface 16 of the shelf 14 is generally perpendicular to the longitudinal direction in the stowed position. In some embodiments, the shelf 14 may be slid to the rear wall 44 in the stowed position to avoid obstructing the dishwasher rack 8. Said differently, the shelf 14 may be slid until the receiving surface 16 is adjacent to an end of the first wall and an end of the second wall (*e.g.*, the left end relative to the page in FIG. 4). For example, in the stowed position, the receiving surface 16 of the shelf 14 may be pivoted generally perpendicular to the longitudinal direction and slid at least to the longitudinal position of the rear wall 44 (*e.g.*, to the end of the first wall

38 and the second wall 40). The rear wall 44 may extend between the end of the first wall 38 and the end of the second wall 40.

In some embodiments, the rear wall 44 and the receiving surface 16 of the shelf 14 may be generally parallel in the stowed position, and in some further embodiments, the rear wall 44 and the receiving surface 16 of the shelf 14 may be generally coplanar in the stowed position. In some other embodiments, the upper edges of the walls 18, 20, 22, 24 may be generally coplanar with the rear wall 44 in the stowed position. In each of the embodiments discussed above, the receiving surface 16 of the shelf 14 may be said to be adjacent the ends of the walls on which the cutlery rack slides. In some embodiments, the shelf may slide past the rear wall 44 (*e.g.*, farther into the wash chamber 4 behind the dishwasher rack 8 and past the ends of the walls). The shelf 14 may rest against the rear wall 44 and/or the side walls 38, 40 of the dishwasher rack 8 in the stowed position.

In some embodiments, the receiving channel 52 of the rail 48 may terminate at a distance equal to the length L from the rear wall 44. In such embodiments, the cutlery rack 12 may be limited from sliding closer than the length L from the rear wall 44 in the working position, and thus, the shelf 14 may be generally coplanar with the rear wall 44 in the stowed position because the engaging portions 28, 30, 32, 34 may also define a length L.

In some embodiments described herein, a method of manufacturing a dishwasher with a cutlery rack may be provided. The dishwasher may include a dishwasher rack removably disposed in the dishwasher. The dishwasher rack may include at least a first wall, a second wall, and a third wall (*e.g.*, first side wall 38, second side wall 40, and rear wall 44, respectively, in the embodiment depicted in FIGS. 1-4). The first wall may be parallel to the second wall, and the third wall may extend between the first wall and the second wall. A cutlery rack may be provided that includes a first engaging portion, a second engaging portion, and a shelf extending between the engaging portions. The method may include attaching the first engaging portion of the cutlery rack to the first wall of the dishwasher rack. After attachment, the first engaging portion may be configured to slide relative to the first wall of the dishwasher rack. The method may further include attaching the second engaging portion of the cutlery rack to the second wall of the dishwasher rack. After attachment, the second engaging portion may be configured to slide relative to the second wall of the dishwasher rack. The shelf may slide in a longitudinal direction with respect to the first wall and the second wall. The shelf may be configured to pivot with respect to the dishwasher rack between the working position and the stowed position. In the working position, the shelf may be disposed closer to parallel

with the longitudinal direction than in the stowed position, and in the stowed position, the shelf may slide at least to a longitudinal position of the third wall of the dishwasher rack.

With reference to FIG. 4, the cutlery rack 12 may be positioned sufficiently close to the top wall of the wash chamber 4 that the rack 12 impinges the top wall during folding
5 between the working position and the stowed position, while allowing the cutlery rack 12 to not impinge the top wall when in the final working and stowed positions. In such embodiments, the cutlery rack may be pivoted between the working position and folded position only when the cutlery rack and dishwasher rack are slid out from the wash chamber 4. For example, in some embodiments, the rails 48 of the dishwasher rack 8
10 may be positioned less than 6.18 inches and greater than 4.88 inches from the top of the wash chamber 4, such that for example in embodiments in which the length L is approximately 3.78 inches and the width of the shelf 14 is approximately 4.88 inches, the cutlery rack 12 may be approximately from 1.1 inches to 2.4 inches from the top of the wash chamber in the working position and approximately from zero inches to 1.3 inches
15 from the top wall of the wash chamber in the stowed position.

Many modifications and other embodiments of the inventions set forth herein will come to mind to one skilled in the art to which these embodiments of the invention pertain having the benefit of the teachings presented in the foregoing descriptions and the associated drawings. Therefore, it is to be understood that the embodiments of the
20 invention are not to be limited to the specific embodiments disclosed and that modifications and other embodiments are intended to be included within the scope of the appended claims. While some drawings and description may omit features described elsewhere for simplicity of explanation, it is understood that these features may nonetheless be present in any of the embodiments in any combination or configuration,
25 as detailed above. Although specific terms are employed herein, they are used in a generic and descriptive sense only and not for purposes of limitation.

CLAIMS

1. A dishwasher comprising:

a dishwasher rack disposed in the dishwasher, the dishwasher rack comprising at least a first wall and a second wall, wherein the first wall is parallel to the second wall,

5 and wherein each of the first wall and the second wall defines at least one end;

a cutlery rack comprising:

a first engaging portion, wherein the first engaging portion of the cutlery rack is slidably attached to the first wall of the dishwasher rack;

10 a second engaging portion, wherein the second engaging portion of the cutlery rack is slidably attached to the second wall of the dishwasher rack; and

a shelf extending between the first engaging portion and the second engaging portion, the shelf defining a receiving surface for receiving cutlery, wherein the shelf is configured to slide in a longitudinal direction with respect to the first wall and the second wall, and wherein the shelf is configured to pivot with respect to the dishwasher rack between a working position and a
15 stowed position;

wherein in the working position, the receiving surface of the shelf is aligned with the longitudinal direction, wherein in the stowed position, the receiving surface shelf is pivoted out of alignment with the longitudinal direction and positioned adjacent an end of
20 the first wall and an end of the second wall.

2. The dishwasher according to Claim 1, wherein the first engaging portion and the second engaging portion are disposed on a first side of the cutlery rack, wherein the first engaging portion defines a first pivotal attachment member engaging a first rail on the first
25 wall of the dishwasher rack, wherein the second engaging portion defines a second pivotal attachment member engaging a second rail on the second wall of the dishwasher rack, and wherein the cutlery rack further comprises:

a second side comprising a third engaging portion configured to be removably and slidably disposed on the first rail in the working position and a fourth engaging portion
30 configured to be removably and slidably disposed on the second rail in the working position;

wherein the cutlery rack is configured to slide along the first rail on the first engaging portion and the third engaging portion and the cutlery rack is configured to slide along the second rail on the second engaging portion and the fourth engaging portion;
35 and

wherein the cutlery rack is configured to be pivoted to the stowed position by lifting the second side of the cutlery rack and rotating the cutlery rack about a first pivotal attachment member of the first engaging portion and a second pivotal attachment member of the second engaging portion.

5

3. The dishwasher according to Claims 1 or 2, wherein in the working position, the receiving surface of the shelf is configured to be disposed generally parallel to the longitudinal direction.

10

4. The dishwasher according to any one of the preceding claims, wherein in the stowed position, the receiving surface of the shelf is configured to be disposed generally perpendicular to the longitudinal direction.

15

5. The dishwasher according to any one of Claims 1, 3, or 4, wherein the first wall further comprises a first rail disposed on an upper edge of the first wall, the first rail at least partially defining a first receiving slot, wherein the first receiving slot extends parallel to the longitudinal direction, and wherein the first engaging portion is configured to engage the first receiving slot.

20

6. The dishwasher according to Claim 5, wherein the first engaging portion comprises a first leg attached generally perpendicular to the shelf, the first leg defining a length, wherein the first receiving slot terminates at a distance from the end of the first wall of the dishwasher rack, and wherein the distance is equal to the length of the first leg.

25

7. The dishwasher according to Claim 5 or Claim 6, wherein the second wall further comprises a second rail disposed on an upper edge of the second wall, the second rail at least partially defining a second receiving slot, wherein the second receiving slot extends parallel to the longitudinal direction, and wherein the second engaging portion is configured to engage the second receiving slot.

30

8. The dishwasher according to Claim 7, wherein the second engaging portion comprises a second leg attached generally perpendicular to the shelf, the second leg defining the length, wherein the second receiving slot terminates at the distance from the end of the second wall of the dishwasher rack.

35

9. The dishwasher according to any one of Claims 1 or 3 to 8, wherein the cutlery rack further comprises a third engaging portion attached to the shelf and a fourth engaging portion attached to the shelf, wherein the third engaging portion is configured to engage the first wall in the working position, and wherein the fourth engaging portion is
5 configured to engage the second wall in the working position.

10. The dishwasher according to any one of Claims 1 or 3 to 8, wherein the first engaging portion defines a first slot configured to receive at least a portion of the first wall therein, and wherein the first engaging portion further comprises a first attachment
10 member extending across the first slot, such that the first engaging portion at least partially surrounds the portion of the first wall.

11. The dishwasher according to Claim 10, wherein the second engaging portion defines a second slot configured to receive at least a portion of the second wall therein, and wherein the second engaging portion further comprises a second attachment
15 member extending across the second slot, such that the second engaging portion at least partially surrounds the portion of the second wall.

12. The dishwasher according to Claim 11, wherein the shelf is configured to pivot
20 about an axis spanning the first attachment member and the second attachment member.

13. The dishwasher according to any one of the preceding claims, wherein in the stowed position, a portion of the shelf is configured to rest on an upper edge of a third wall of the dishwasher rack, and wherein the third wall extends between the end of the
25 first wall and the end of the second wall.

14. The dishwasher according to any one of the preceding claims, wherein the shelf, the first engaging portion, and the second engaging portion are fixedly connected to each other, and wherein the shelf is configured to pivot about an axis extending between the
30 first engaging portion and the second engaging portion.

15. A cutlery rack comprising:
a first side comprising:
a first engaging portion configured to pivotally and slidably attach to a first
35 rail of a first wall of a dishwasher rack, wherein the first engaging portion defines a first pivotal attachment member configured to engage the first rail;

a second engaging portion configured to pivotally and slidably attach to a second rail of a second wall of a dishwasher rack, wherein the second engaging portion defines a second pivotal attachment member configured to engage the second rail;

5 a second side comprising:

a third engaging portion configured to be removably and slidably disposed on the first rail;

a fourth engaging portion configured to be removably and slidably disposed on the second rail;

10 wherein the cutlery rack is configured to slide along the first rail on the first engaging portion and the third engaging portion and the cutlery rack is configured to slide along the second rail on the second engaging portion and the fourth engaging portion; and

15 wherein the cutlery rack is configured to be pivoted to a stowed position by lifting the second side of the cutlery rack and rotating the cutlery rack about the first pivotal attachment member of the first engaging portion and the second pivotal attachment member of the second engaging portion.

16. The cutlery rack according to Claim 15, further comprising a shelf extending
20 between the first side and the second side, the shelf defining a receiving surface for receiving cutlery.

17. The cutlery rack according to Claim 16, wherein the first engaging portion
25 comprises a first leg attached generally perpendicular to the shelf, the first leg defining a length, wherein the length is configured to be equal to a distance a termination point of a first receiving slot defined by the first rail and an end of the first wall.

18. The dishwasher according to Claim 17, wherein the second engaging portion
30 comprises a second leg attached generally perpendicular to the shelf, the second leg defining the length.

19. The dishwasher according to any one of Claims 15 to 18, wherein the first
35 engaging portion defines a first slot configured to receive the first rail, wherein the first attachment member extends across the first slot, such that the first engaging portion is configured to at least partially surround the first rail,

wherein the second engaging portion defines a second slot configured to receive the second rail, and wherein the second attachment member extends across the second

slot, such that the second engaging portion is configured to at least partially surround the second rail.

20. A method of manufacturing a dishwasher with a cutlery rack, the dishwasher comprising a dishwasher rack disposed in the dishwasher, the dishwasher rack comprising at least a first wall and a second wall, wherein the first wall is parallel to the second wall, and wherein each of the first wall and the second wall defines at least one end; a cutlery rack comprising a first engaging portion, a second engaging portion, and a shelf extending between the first engaging portion and the second engaging portion, the shelf defining a receiving surface for receiving cutlery; the method comprising:

attaching the first engaging portion of the cutlery rack to the first wall of the dishwasher rack, wherein after attachment, the first engaging portion is configured to slide relative to the first wall of the dishwasher rack;

attaching the second engaging portion of the cutlery rack to the second wall of the dishwasher rack, wherein after attachment, the second engaging portion is configured to slide relative to the second wall of the dishwasher rack;

wherein the shelf is configured to slide in a longitudinal direction with respect to the first wall and the second wall, and wherein the shelf is configured to pivot with respect to the dishwasher rack between a working position and a stowed position,

wherein in the working position, the receiving surface of the shelf is aligned with the longitudinal direction, wherein in the stowed position, the receiving surface shelf is pivoted out of alignment with the longitudinal direction and positioned adjacent an end of the first wall and an end of the second wall.

1/2

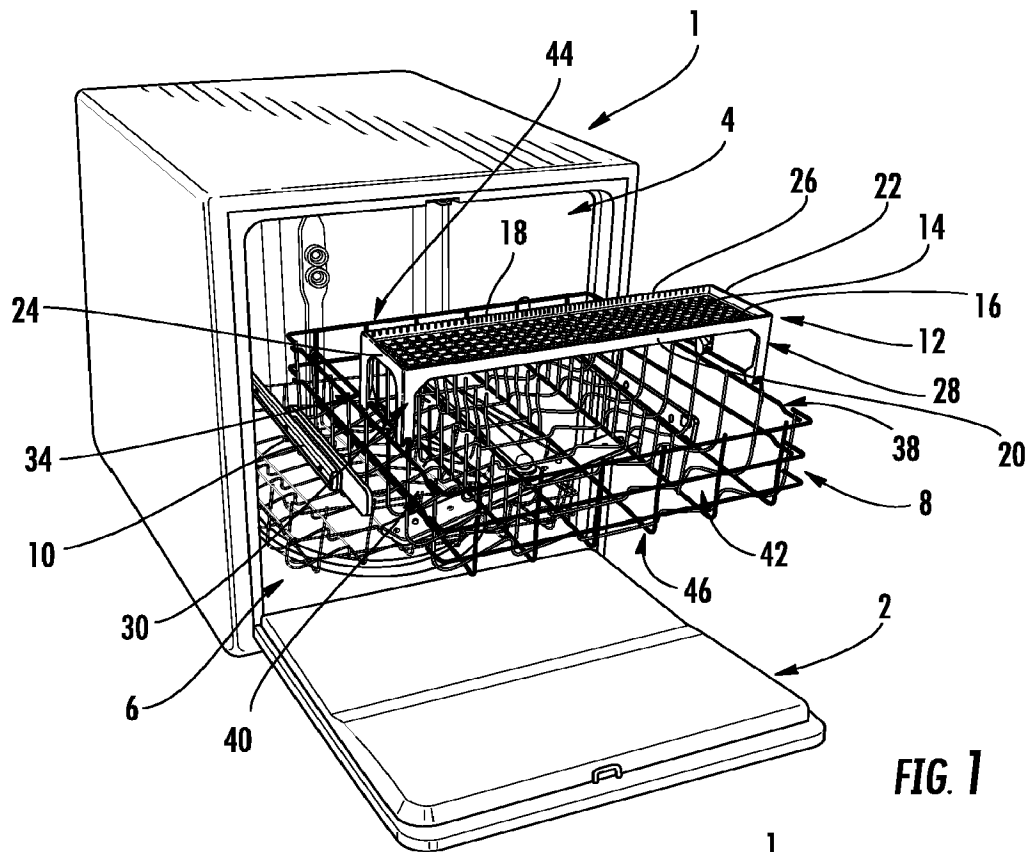


FIG. 1

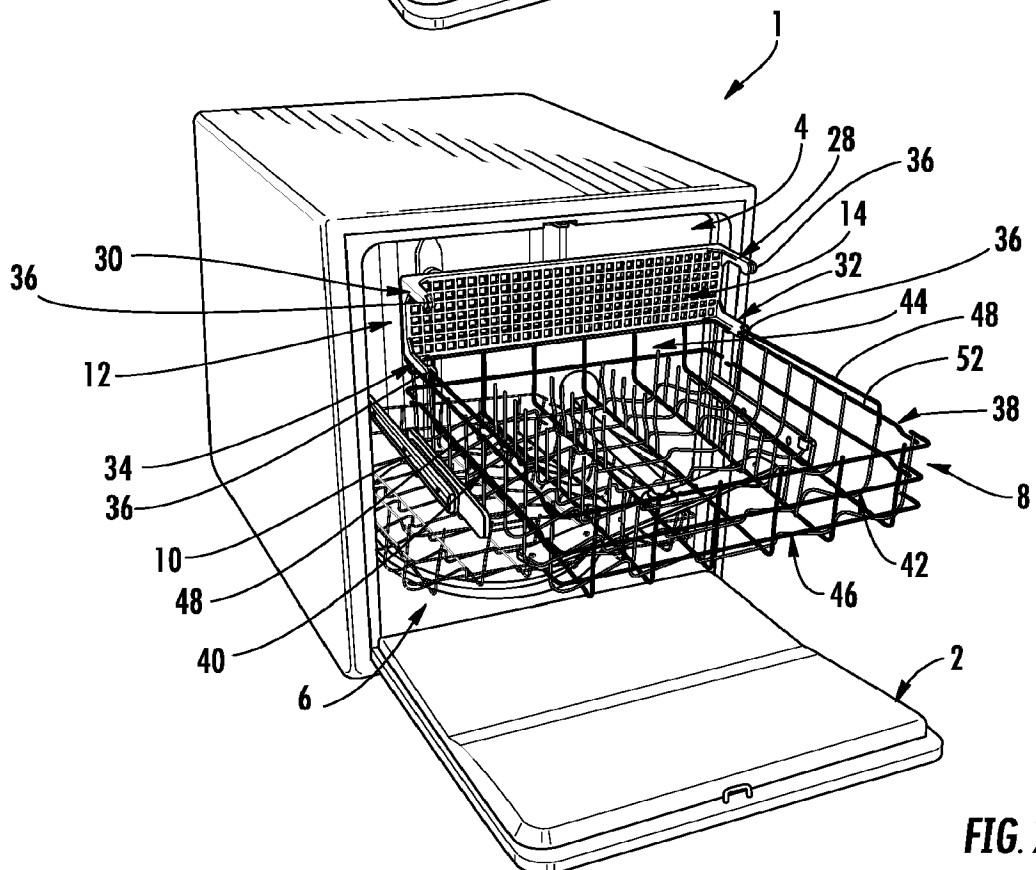
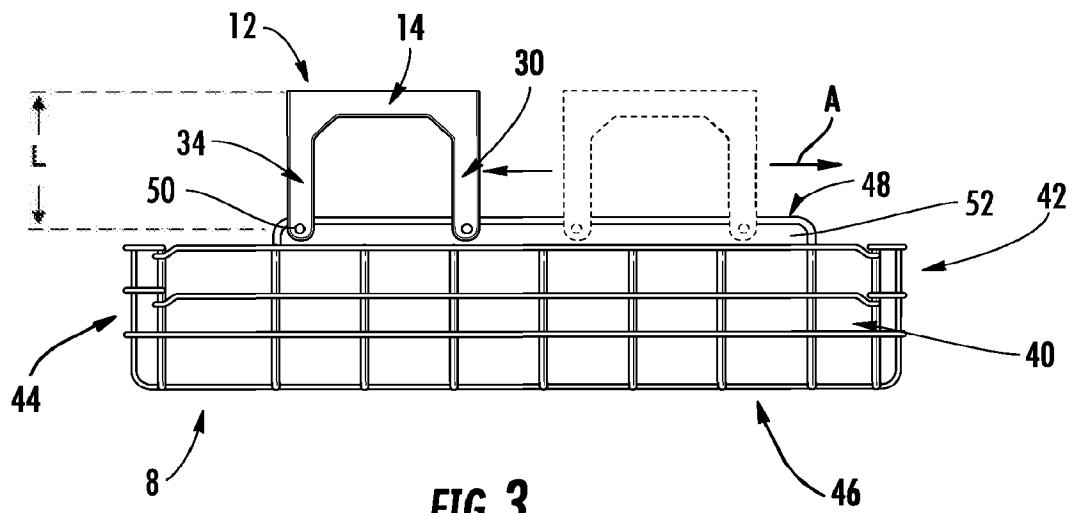
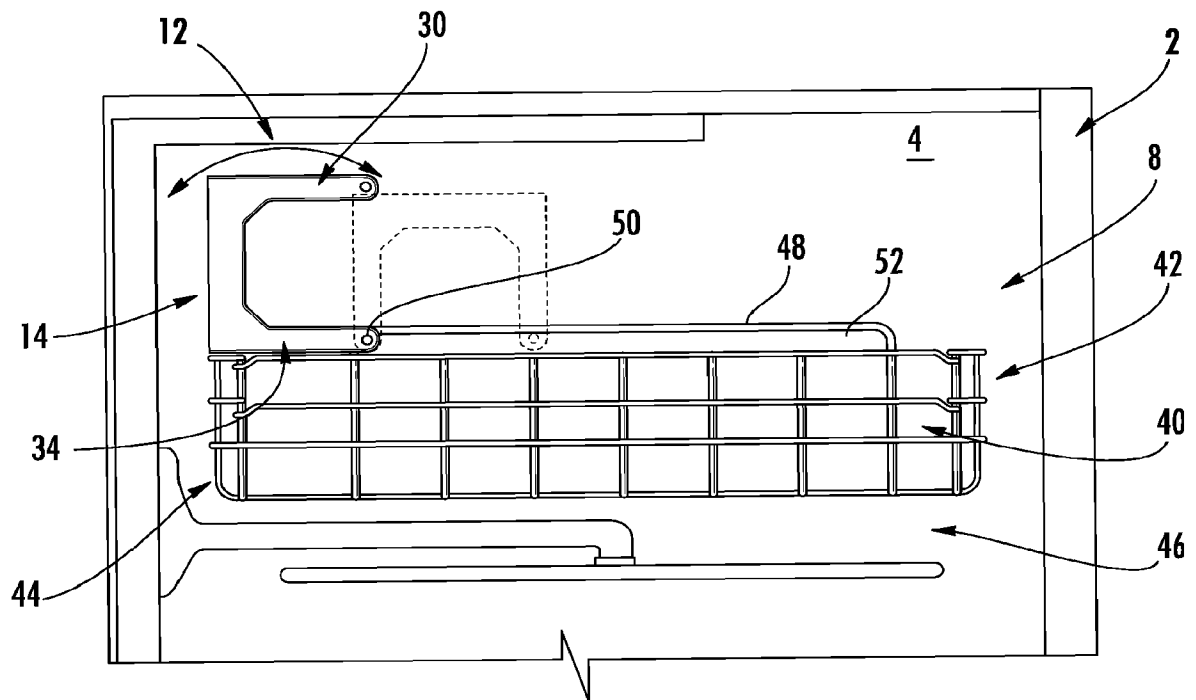


FIG. 2



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2016/026704

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A47L 15/50; A47B 77/14; A47L 15/24; A47L 15/26; A47L 15/33; A47L 15/48 (2016.01)
 CPC - A47L 15/507; A47L 15/501; A47L 15/502; A47L 15/503; A47L 15/504; A47L 15/505 (2016.05)
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC(8) - A47B 77/14; A47L 15/24; A47L 15/26; A47L 15/33; A47L 15/48; A47L 15/50; B65D 6/16 (2016.01)
 CPC - A47L 15/501; A47L 15/502; A47L 15/503; A47L 15/504; A47L 15/505; A47L 15/506; A47L 15/507 (2016.05)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
 USPC - 134/183; 211/41.8; 211/70.7; 312/228.1 (keyword delimited)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Patbase, Google Patents, Google, YouTube.

Search terms used: dishwasher, cutlery, utensil, pivot, hinge, rotate, slide, stow.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,462,348 A (ELLINGSON et al) 31 October 1995 (31.10.1995) entire document	1-3, 15, 16, 20
Y	EP 2 322 074 B1 (CANDY S.P.A) 13 March 2013 (13.03.2013) entire document	1-3, 15, 16, 20
A	DE 43 09 915 A1 (LICENTIA PATENT-VERWALTUNGS-GMBH) 29 September 1994 (29.09.1994) machine translation	1-3, 15-20
A	EP 1 475 030 A2 (CANDY S.P.A.) 10 November 2004 (10.11.2004) entire document	1-3, 15-20
A	US 2013/0247944 A1 (FISCHER et al) 26 September 2013 (26.09.2013) entire document	1-3, 15-20

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

25 May 2016

Date of mailing of the international search report

30 JUN 2016

Name and mailing address of the ISA/

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
 P.O. Box 1450, Alexandria, VA 22313-1450
 Facsimile No. 571-273-8300

Authorized officer

Blaine R. Copenheaver

PCT Helpdesk: 571-272-4300
 PCT OSP: 571-272-7774

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2016/026704

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☒ Claims Nos.: 4-14
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

COMBINED ASSIGNMENT AND DECLARATION FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET

☐ THIS DOCUMENT IS BEING SUBMITTED FOR DUAL PURPOSES

Title of
Invention

DISHWASHER WITH A DISH RACK AND UTENSIL CADDY

As the below named inventor, I hereby declare that:

This declaration ☒ The attached application, or

is directed to: ☐ United States application or PCT international application number _____
filed on _____

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby state that I reviewed and understand the contents of the above-identified specification, including the claims. I acknowledge the duty to disclose information material to patentability of this application in accordance with 37 C.F.R. §1.56.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WHEREAS, WHIRLPOOL CORPORATION (hereinafter referred to as "ASSIGNEE") having places of business at 2000 North M-63, Benton Harbor, Michigan 49022, U.S.A. is desirous of acquiring the entire right, title and interest in and to said invention in the United States and throughout the world;

NOW, THEREFORE, in accord with my obligations by law and/or agreement, and/or for good and valuable consideration, the receipt and sufficiency of are hereby acknowledged, I (hereinafter referred to as "ASSIGNOR") hereby sell, assign and transfer unto said ASSIGNEE, the entire right, title and interest in and to said invention and application throughout the United States, including any and all United States Letters Patent granted on any division, continuation, continuation-in-part, reexamination and reissue of said application; and the entire right, title and interest in and to the said invention throughout the world, including the right to apply for patents and inventor certificates in respect thereof and to claim priority pursuant to rights accorded ASSIGNOR under terms of the Paris International Convention and all other available international conventions and treaties; and the entire right, title and interest in and to any and all patents, patents of addition, utility models, patents of importation, revalidation patents and inventor certificates which may be granted throughout the world in respect of said invention.

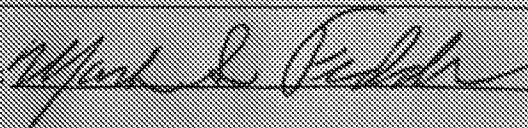
ALSO, ASSIGNOR hereby agrees to execute any documents that legally may be required in connection with the filing, prosecution and maintenance of said application or any other patent application(s) or inventor certificate(s) in the United States and in foreign countries for said invention, including additional documents that may be required to affirm the rights of ASSIGNEE in and to said invention, all without further consideration. ASSIGNOR also agrees, without further consideration but at no expense to ASSIGNOR, to identify and communicate to ASSIGNEE at ASSIGNEE'S request documents and information concerning the invention that are within ASSIGNOR'S possession or control and to provide further assurances and testimony on behalf of ASSIGNEE that lawfully may be required of ASSIGNOR in respect of the prosecution, maintenance and defense of any patent application or patent encompassed within the terms of this instrument. ASSIGNOR'S obligations under this instrument shall extend to ASSIGNOR'S heirs, executors, administrators and other legal representatives.

ASSIGNOR hereby authorizes and requests the Commissioner of Patents and Trademarks to issue any and all United States Letters Patent referred to above to ASSIGNEE, as the ASSIGNEE of the entire right, title and interest in and to the same, for ASSIGNEE'S sole use and behoof; and for the use and behoof of ASSIGNEE'S legal representatives and successors, to the full end of the term for which such Letters Patent may be granted, as fully and entirely as the same would have been held by ASSIGNOR had this agreement and sale not been made.

ASSIGNOR authorizes any member or representative of WHIRLPOOL CORPORATION to insert or complete any information in this document needed to effect its recordal in the U.S. Patent and Trademark Office.

LEGAL NAME OF INVENTOR

Inventor: Mark S. Feddema

Signature: 

Date: 3/26/2020

**COMBINED ASSIGNMENT AND DECLARATION FOR UTILITY OR DESIGN
APPLICATION USING AN APPLICATION DATA SHEET**

☐ THIS DOCUMENT IS BEING SUBMITTED FOR DUAL PURPOSES	
Title of Invention	<u>DISHWASHER WITH A DISH RACK AND UTENSIL CADDY</u>

As the below named inventor, I hereby declare that:

This declaration ☒ The attached application, or
is directed to: ☐ United States application or PCT international application number _____
filed on _____

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby state that I reviewed and understand the contents of the above-identified specification, including the claims. I acknowledge the duty to disclose information material to patentability of this application in accordance with 37 C.F.R. §1.56.

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WHEREAS, WHIRLPOOL CORPORATION (hereinafter referred to as "ASSIGNEE") having places of business at **2000 North M-63, Benton Harbor, Michigan 49022, U.S.A.** is desirous of acquiring the entire right, title and interest in and to said invention in the United States and throughout the world;

NOW, THEREFORE, in accord with my obligations by law and/or agreement, and/or for good and valuable consideration, the receipt and sufficiency of are hereby acknowledged, I (hereinafter referred to as "ASSIGNOR") hereby sell, assign and transfer unto said ASSIGNEE, the entire right, title and interest in and to said invention and application throughout the United States, including any and all United States Letters Patent granted on any division, continuation, continuation-in-part, reexamination and reissue of said application; and the entire right, title and interest in and to the said invention throughout the world, including the right to apply for patents and inventor certificates in respect thereof and to claim priority pursuant to rights accorded ASSIGNOR under terms of the Paris International Convention and all other available international conventions and treaties; and the entire right, title and interest in and to any and all patents, patents of addition, utility models, patents of importation, revalidation patents and inventor certificates which may be granted throughout the world in respect of said invention.

ALSO, ASSIGNOR hereby agrees to execute any documents that legally may be required in connection with the filing, prosecution and maintenance of said application or any other patent application(s) or inventor certificate(s) in the United States and in foreign countries for said invention, including additional documents that may be required to affirm the rights of ASSIGNEE in and to said invention, all without further consideration. ASSIGNOR also agrees, without further consideration but at no expense to ASSIGNOR, to identify and communicate to ASSIGNEE at ASSIGNEE'S request documents and information concerning the invention that are within ASSIGNOR'S possession or control and to provide further assurances and testimony on behalf of ASSIGNEE that lawfully may be required of ASSIGNOR in respect of the prosecution, maintenance and defense of any patent application or patent encompassed within the terms of this instrument. ASSIGNOR'S obligations under this instrument shall extend to ASSIGNOR'S heirs, executors, administrators and other legal representatives.

ASSIGNOR hereby authorizes and requests the Commissioner of Patents and Trademarks to issue any and all United States Letters Patent referred to above to ASSIGNEE, as the ASSIGNEE of the entire right, title and interest in and to the same, for ASSIGNEE'S sole use and behoof; and for the use and behoof of ASSIGNEE'S legal representatives and successors, to the full end of the term for which such Letters Patent may be granted, as fully and entirely as the same would have been held by ASSIGNOR had this agreement and sale not been made.

ASSIGNOR authorizes any member or representative of **WHIRLPOOL CORPORATION** to insert or complete any information in this document needed to effect its recordal in the U.S. Patent and Trademark Office.

LEGAL NAME OF INVENTOR

Inventor: William J. Snell Signature: [Signature]

Date: 3/25/2020

Petitioner Samsung Ex-1004, 0123

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor : Mark S. Feddema
For : DISHWASHER WITH A DISH RACK

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Commissioner:

AUTHORIZATION TO CHARGE DEPOSIT ACCOUNT

The United States Patent and Trademark Office is hereby authorized to charge payment of all fees during the pendency of this application, or credit any overpayment to Deposit Account No. 16-2463.

Pursuant to 37 C.F.R. §1.136(a)(3), the United States Patent and Trademark Office is hereby authorized to treat any concurrent or future reply for this application that requires an extension of time as incorporating a request therefor. Any request or petition for an extension of time should be treated as requesting the appropriate length of time notwithstanding an inadvertent reference in the petition to a shorter period of time.

Respectfully submitted,

PRICE HENEVELD LLP

August 12, 2025

Date

/brianrcheslek/

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Espacenet

Bibliographic data: CN108135432 (A) — 2018-06-08

CONVEYOR DISHWASHER AND METHOD FOR OPERATING CONVEYOR DISHWASHER

Inventor(s): DISCH HARALD; KLUMPP PHILIPP; HEIDT MARKUS ± (哈拉尔德·迪施, ; 菲利普·克隆普, ; 马库斯·海德特)

Applicant(s): ILLINOIS TOOL WORKS ± (伊利诺斯工具制品有限公司)

Classification: - **international:** A47L15/24
 - **cooperative:** A47L15/241 (EP, US); A47L15/248 (US);
A47L15/247 (US); A47L2401/04 (EP, US);
A47L2401/20 (US); A47L2401/30 (EP, US);
A47L2501/24 (EP, US)

Application number: CN20168040593 20160722 Global Dossier

Priority number(s): DE201510214300 20150728 ; WO2016US43473 20160722

Also published as: CN108135432 (B) AU2016297774 (A1) AU2016297774 (B2)
DE102015214300 (A1) EP3328261 (A1) EP3328261 (B1)
US10835098 (B2) US2018213999 (A1) WO2017019477 (A1)
less

Abstract of CN108135432 (A)

A flight-type dishwasher or rack conveyor dishwasher has a conveyor apparatus (20) for conveying washware through individual treatment zones (11, 12, 13, 14, 15) of the conveyor dishwasher (1). The conveyor dishwasher (1) has a detection system (30) designed to detect the presence of washware or a washware carrier (7) in a predefined region (A) at an inlet (10) or at a feed (16) of the conveyor dishwasher (1). A control device (50) is designed to actuate the conveyor apparatus (20) such that the conveyor apparatus (20) is activated when washware or a washware carrier (7) is detected in the region (A) at the inlet (10) or feed (16) of the conveyor dishwasher (1), and that the conveyor apparatus (20) is deactivated when no washware or no washware carrier (7) is detected in the region (A) at the inlet (10) or feed (16) of the conveyor dishwasher (1).



(12)发明专利申请



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W02017/019477 EN 2017.02.02

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(51)Int.Cl.

A47L 15/24(2006.01)

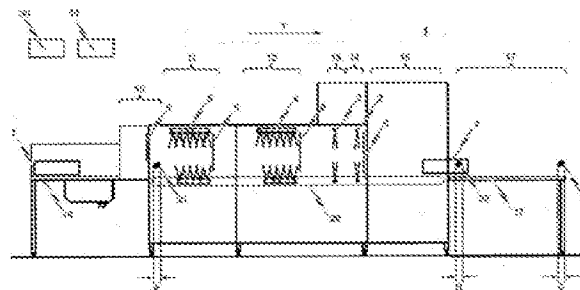
权利要求书4页 说明书10页 附图2页

(54)发明名称

传送式洗碗机和操作传送式洗碗机的方法

(57)摘要

一种长龙式洗碗机或者通道传送式洗碗机具有用于通过传送式洗碗机(1)的各个处理区域(11、12、13、14、15)传送洗涤器皿的传送装置(20)。传送式洗碗机(1)具有检测系统(30)，该检测系统(30)被设计成检测在传送式洗碗机(1)的入口(10)或进给区(16)的预定区域(A)内洗涤器皿或洗涤器皿载体(7)的存在。控制装置(50)被设计成致动传送装置(20)，使得在传送式洗碗机(1)的入口(10)或进给区(16)处的区域(A)内检测到洗涤器皿或洗涤器皿载体(7)时，启动传送装置(20)，在传送式洗碗机(1)的入口(10)或进给区(16)处的区域(A)内没有检测到洗涤器皿或洗涤器皿载体(7)时，停用传送装置(20)。



1. 一种传送式洗碗机(1),特别是长龙式洗碗机或者通道传送式洗碗机的形式,其具有用于通过所述传送式洗碗机(1)的各个处理区域(11、12、13、14、15)传送洗涤器皿的传送装置(20),

其中

所述传送式洗碗机(1)具有检测系统(30),所述检测系统(30)被设计成检测在所述传送式洗碗机(1)的入口(10)或进给区(16)的预定区域(A)内洗涤器皿或洗涤器皿载体(7)的存在;并且其中设置有控制装置(50),所述控制装置被设计成以这样的方式致动所述传送装置(20):

当在所述传送式洗碗机(1)的所述入口(10)或进给区(16)处的所述区域(A)内检测到洗涤器皿或洗涤器皿载体(7)时,所述传送装置(20)被启动;以及

当在所述传送式洗碗机(1)的所述入口(10)或进给区(16)处的所述区域(A)内没有检测到洗涤器皿或洗涤器皿载体(7)时,所述传送装置(20)停用。

2. 根据权利要求1所述的传送式洗碗机(1),其中所述检测系统(30)还被设计为检测所述传送式洗碗机(1)的出口(17)处的预定区域(B)内洗涤器皿或洗涤器皿载体(7)的存在,并且其中所述控制装置(50)进一步被设计成根据在所述传送式洗碗机(1)的所述出口(17)处的所述区域(B)内是否存在洗涤器皿或洗涤器皿载体(7)来致动所述传送装置(20)。

3. 根据权利要求1或2所述的传送式洗碗机(1),其中所述传送式洗碗机(1)的所述出口(17)优选地直接跟随所述传送装置(20),如所述洗涤器皿的传送方向(T)所示,并且其中所述检测系统(30)被设计成检测所述传送式洗碗机(1)的所述出口(17)处的所述预定区域(B)内洗涤器皿或洗涤器皿载体(7)的存在,并且其中所述控制装置50进一步被设计成根据在所述传送式洗碗机(1)的所述出口(17)处的所述区域(B)内是否存在洗涤器皿或洗涤器皿载体(7)来致动所述传送装置(20)。

4. 根据权利要求3所述的传送式洗碗机(1),其中所述传送式洗碗机(1)的所述出口(17)被设计成容纳大量的洗涤器皿单元和/或洗涤器皿载体(7),其中可以借助所述检测系统(30)检测其中是否存在洗涤器皿或洗涤器皿载体(7)的所述出口(17)的所述区域(B)位于所述出口(17)的端部区域(C)的上游,如所述洗涤器皿的传送方向(T)所示。

5. 根据权利要求3或4所示的传送式洗碗机(1),其中可以借助所述检测系统(30)检测其中是否存在洗涤器皿或洗涤器皿载体(7)的所述出口(17)的所述区域(B)位于所述出口(17)的起点的下游0-500mm,优选100-300mm的位置,如所述洗涤器皿的传送方向(T)所示。

6. 根据权利要求1至5中任一项所述的传送式洗碗机(1),其中可以借助所述检测系统(30)检测其中是否存在洗涤器皿或洗涤器皿载体(7)的所述传送式洗碗机(1)的所述入口(10)或进给区(16)处的所述区域(A)位于所述传送式洗碗机(1)的第一处理区域(11)的输入区域处,如所述洗涤器皿的传送方向(T)所示,特别是在所述传送式洗碗机(1)的入口通路中。

7. 根据权利要求2至6中任一项所述的传送式洗碗机(1),其中所述控制装置(50)被设计为在所述传送式洗碗机(1)的第一运行状态下启动所述传送装置(20),不论在所述传送式洗碗机(1)的所述入口(10)或进给区(16)处的所述区域(A)内是否存在洗涤器皿或洗涤器皿载体(7),并且在所述传送式洗碗机(1)的第二运行状态下以这样的方式致动所述传送装置(20):

当在所述传送式洗碗机(1)的所述入口(10)或进给区(16)处的区域(A)内和在所述传送式洗碗机(1)的所述出口(17)处或内的所述区域(B)内分别检测到洗涤器皿或洗涤器皿载体(7)时,所述传送装置(20)被启动;以及

当在所述传送式洗碗机(1)的所述入口(10)或进给区(16)处的所述区域(A)内没有检测到洗涤器皿或洗涤器皿载体(7),而在所述传送式洗碗机(1)的所述出口(17)处或内的所述区域(B)内检测到一件洗涤器皿或洗涤器皿载体(7)时,所述传送装置(20)停用。

8.根据权利要求7所述的传送式洗碗机(1),其中所述控制装置(50)被设计成当借助所述检测系统(30)检测到之前存在于所述传送式洗碗机(1)的所述出口(17)处或内的洗涤器皿或之前存在于所述传送式洗碗机(1)的所述出口(17)处或内的洗涤器皿载体(7)被移除时,自动将所述传送式洗碗机(1)从所述第二运行状态切换至所述第一运行状态。

9.根据权利要求7或8所述的传送式洗碗机(1),其中所述控制装置(50)被设计成当借助所述检测系统(30)检测到在所述传送式洗碗机(1)的所述入口(10)或进给区(16)处存在洗涤器皿或洗涤器皿载体(7)时,在所述传送式洗碗机(1)的第一和主要在第二运行状态中启动所述传送装置(20)。

10.根据权利要求7至9中任一项所述的传送式洗碗机(1),其中所述检测系统(30)还被设计成检测在所述出口(17)的所述端部区域(C)内预定的区域内洗涤器皿或洗涤器皿载体(7)的存在,并且其中所述控制装置(50)还被设计成在所述传送式洗碗机(1)的所述第二运行状态下以这样的方式致动所述传送装置(20):

当在所述传送式洗碗机(1)的所述入口(10)或进给区(16)处的所述区域(A)和在所述传送式洗碗机(1)的所述出口(17)处或内的所述区域(B)内分别检测到洗涤器皿或洗涤器皿载体(7),而另外在所述传送式洗碗机(1)的所述出口(17)的所述端部区域(C)内的所述区域内没有检测到洗涤器皿或洗涤器皿载体(7)时,启动所述传送装置(20);以及

当在所述传送式洗碗机(1)的所述入口(10)或进给区(16)处的所述区域(A)内没有检测到洗涤器皿或洗涤器皿载体(7),而在所述传送式洗碗机(1)的所述出口(17)处或内的所述区域(B)内检测到洗涤器皿或洗涤器皿载体(7)时,所述传送装置(20)停用。

11.根据权利要求10所述的传送式洗碗机(1),其中所述控制装置(50)还被设计为以这样的方式致动所述传送装置(20):

当在所述出口(17)的所述端部区域(C)内的所述区域内检测到洗涤器皿或洗涤器皿载体(7)时,所述传送装置(20)停用;或者

当在所述传送式洗碗机(1)的所述出口(17)处或内的所述区域(B)和在所述出口(17)的所述端部区域(C)内的所述区域内分别检测到洗涤器皿或洗涤器皿载体(7)时,所述传送装置(20)停用。

12.根据权利要求10或11所述的传送式洗碗机(1),其中所述控制装置(50)被设计成当所述检测系统(30)检测到之前存在于所述传送式洗碗机(1)的所述出口(17)的所述端部区域(C)内的洗涤器皿或之前存在于所述传送式洗碗机(1)的所述出口(17)的所述端部区域(C)内的洗涤器皿载体(7)被移除时,或者在所述传送式洗碗机(1)的所述出口(17)处或内的所述区域(B)内没有洗涤器皿或洗涤器皿载体时,自动将所述传送式洗碗机(1)从所述第二运行状态切换至所述第一运行状态。

13.根据权利要求10至12中任一项所述的传送式洗碗机(1),其中所述控制装置(50)被

设计成当借助所述检测系统(30)检测到所述传送式洗碗机(1)的所述出口(17)处或内的所述区域(B)内存在洗涤器皿或洗涤器皿载体(7),并且优选地在所述检测到的洗涤器皿或所述检测到的洗涤器皿载体(7)存在之前的至少一段限定时间内在所述传送式洗碗机(1)的所述出口(17)处或内的所述区域(B)内不存在洗涤器皿或洗涤器皿载体(7)时,自动将所述传送式洗碗机(1)从所述第一运行状态切换至所述第二运行状态,其中所述限定时间优选地反应用来将一件洗涤器皿通过所述传送式洗碗机(1)的所述各个处理区域(11、12、13、14、15)进行传送的时间。

14. 根据权利要求1至13中任一项所述的传送式洗碗机(1),其中所述检测系统(30)具有至少一个光学、电容或电感传感器和/或开关(31、32、33),特别是接触开关。

15. 根据权利要求1至14中任一项所述的传送式洗碗机(1),其中所述控制装置(50)被设计成根据所述传送式洗碗机(1)的加载状态以一定的时间延迟启动或停用所述传送装置(20),其中借助所述检测系统(30)检测所述加载状态。

16. 根据权利要求15所述的传送式洗碗机(1),其中所述控制装置(50)被设计成当在所述传送式洗碗机(1)的所述入口(10)或进给区(16)处的所述区域(A)内检测到洗涤器皿或洗涤器皿载体(7)时以一定的时间延迟启动所述传送装置(20),和/或当在所述传送式洗碗机(1)的所述入口(10)或进给区(16)处的所述区域(A)内没有检测到洗涤器皿或洗涤器皿载体(7)时停用所述传送装置(20)一段时间,优选为0至10秒。

17. 一种操作传送式洗碗机(1)、特别是如权利要求1至16中任一项所述的传送式洗碗机(1)的方法,其中所述方法包括以下步骤:

i) 使用检测系统(30)检测所述传送式洗碗机(1)的入口(10)或进给区(16)处的区域(A)内是否存在洗涤器皿或洗涤器皿载体(7);以及

ii) 当在所述传送式洗碗机(1)的所述入口(10)或进给区(16)处的所述区域(A)内检测到洗涤器皿或洗涤器皿载体(7)时,使用控制装置(50)激活所述传送式洗碗机(1)的传送装置(20),当在所述传送式洗碗机(1)的所述入口(10)或进给区(16)处的所述区域(A)内没有检测到洗涤器皿或洗涤器皿载体(7)时,使用所述控制装置(50)停用所述传送装置(20)。

18. 如权利要求17所述的方法,其中所述方法还包括以下步骤:

使用所述检测系统(30)检测所述传送式洗碗机(1)的出口(17)处的区域(B)内是否存在洗涤器皿或洗涤器皿载体(7);以及

使用所述控制装置(50)在所述传送式洗碗机(1)的所述入口(10)或进给区(16)处的区域(A)内和在传送式洗碗机(1)的所述出口(17)处或内的所述区域(B)内分别检测到洗涤器皿或洗涤器皿载体(7)时,启动所述传送装置(20);在所述传送式洗碗机(1)的所述入口(10)或进给区(16)处的所述区域(A)内没有检测到洗涤器皿或洗涤器皿载体(7),而在传送式洗碗机(1)的所述出口(17)处或内的所述区域(B)内检测到洗涤器皿或洗涤器皿载体(7)时,停用所述传送装置。

19. 根据权利要求18所述的方法,其中所述方法还包括以下步骤:

使用检测系统(30)检测所述洗碗机的所述出口(17)的端部区域(C)内是否存在洗涤器皿或洗涤器皿载体(7);以及

使用所述控制装置(50)在所述传送式洗碗机(1)的所述入口(10)或进给区(16)处的所述区域(A)和在所述传送式洗碗机(1)的所述出口(17)处或内的所述区域(B)内分别检测到

洗涤器皿或洗涤器皿载体 (7) ,而在所述传送式洗碗机 (1) 的所述出口 (17) 的所述端部区域 (C) 内的所述区域内没有检测到洗涤器皿或洗涤器皿载体 (7) 时,启动所述传送装置 (20) ;在所述传送式洗碗机 (1) 的所述入口 (10) 或进给区 (16) 处的所述区域 (A) 内没有检测到洗涤器皿或洗涤器皿载体 (7) ,而在所述传送式洗碗机 (1) 的所述出口 (17) 处或内的所述区域 (B) 内检测到洗涤器皿或洗涤器皿载体 (7) 时,停用所述传送装置。

传送式洗碗机和操作传送式洗碗机的方法

[0001] 本发明涉及一种商用传送式洗碗机,其被设计为长龙式洗碗机或者通道传送式洗碗机,并且具有用于通过传送式洗碗机的各个处理区域传送洗涤器皿的传送装置。

[0002] 这种传送式洗碗机通常具有至少一个洗涤区域,其中来自与洗涤区域相关的洗涤槽的洗涤液体被喷洒到洗涤器皿上。此外,一般提供至少一个最终漂洗区域,其在至少一个所述洗涤区域的下游布置,如洗涤器皿的传送方向所示,并且在最终漂洗区域内最终漂洗液体被喷洒到洗涤器皿上。这种传送式洗碗机通常还具有废气系统,以便将在机器运行期间产生的废气从传送式洗碗机排出。

[0003] 引言部分中引用的传送式洗碗机原则上由现有技术已知并且通常用于商业领域。与所谓的箱式洗碗机(在洗涤过程中待洗涤的洗涤器皿在机器中保持静止)相比,该传送式洗碗机在使用时,洗涤器皿通过传送式洗碗机的各个处理区域被传送。

[0004] 传送式洗碗机通常具有至少一个预洗涤区域和至少一个主洗涤区域作为处理区域,所述主洗涤区域布置在预洗涤区域的下游,如洗涤器皿的传送方向所示。通常在主洗涤区域的下游布置至少一个最终漂洗区域,如传送方向所示。

[0005] 还已知在主洗涤区域和最终漂洗区域之间进一步提供至少一个后洗涤区域或预漂洗区域。

[0006] 如洗涤器皿的传送方向所示,直接保持在传送带上的洗涤器皿或由洗涤器皿载体(特别是碗碟架)承载的洗涤器皿,一般会通过入口通路、与该入口通路邻接的预洗涤区域、主洗涤区域、可能提供的后洗涤区域、最终漂洗区域和干燥区域,进入出口区段中。

[0007] 传送式洗碗机的所述洗涤区域(一个或多个预洗涤区域、一个或多个主洗涤区域和可能提供的一个或多个后洗涤区域)各自具有关联的洗涤系统,该洗涤系统具有洗涤泵和管线系统,该管线系统连接到洗涤泵,并且通过该管线系统将洗涤液体供应到洗涤区域的相应的喷嘴。供应到喷嘴的洗涤液体在相应的洗涤区域中被喷洒到从传送式洗碗机的传送装置通过相应的洗涤区域传送的洗涤器皿上。

[0008] 容纳喷射液体和/或具有用于相关区域的喷嘴的液体的洗涤槽与每个洗涤区域相关。

[0009] 在引言部分引用的这种传送式洗碗机中,纯淡水或混合有添加剂(例如最终漂洗助剂)的淡水形式的最终漂洗液体通过最终漂洗区域的喷嘴喷洒到洗涤器皿上。通过级联系统将至少一些喷射的最终漂洗液体在处理区域之间传送,传送方向与洗涤器皿的传送方向相反。

[0010] 将喷射的最终漂洗液体收集在后洗涤区域的槽(后洗涤槽)中,再借助作为后洗涤区域的一部分的洗涤系统的洗涤泵将其传送至后洗涤区域的喷嘴(后洗涤喷嘴)。在后洗涤区域,洗涤液体从洗涤器皿上被冲洗掉。在该过程中产生的液体流入布置在后洗涤区域上游的至少一个主洗涤区域的洗涤槽中,如洗涤器皿的传送方向所示。在此,液体通常配备有洗涤剂,并借助于主洗涤区域的喷嘴(洗涤喷嘴),通过作为主洗涤区域的洗涤系统的一部分的泵系统(洗涤泵系统)被喷射到洗涤器皿上。

[0011] 如果不再设置主洗涤区域,则液体从主洗涤区域的洗涤槽流入预洗涤区域的预洗

槽。预洗槽中的液体通过作为预洗涤区域的洗涤系统的一部分的泵系统,借助预洗涤区域的预洗涤喷嘴喷射到洗涤器皿上,以去除洗涤器皿上的粗颗粒污物。

[0012] 根据本发明的传送式洗碗机(传送式器皿洗涤器),特别是长龙式洗碗机(长龙式器皿洗涤器)或者通道传送式洗碗机(通道传送式器皿洗涤器)。

[0013] 本文中考虑的这种传送式洗碗机通常用在每小时要洗涤大量洗涤器皿的洗碗槽中。与手动装载的箱式洗碗机相比,从经济角度来看,传送式洗碗机构成了这种应用的唯一实际可行的解决方案。

[0014] 传送式洗碗机通过机器的各个处理区域以两种不同的方式传送洗涤器皿:在通道传送式洗碗机中,洗涤器皿穿过洗涤器皿载体中(特别是碗碟架中)的机器的各个处理区域。然而,在长龙式洗碗机中,洗涤器皿被分拣到指型传送带或通用传送带中。通道传送式洗碗机可以实现每小时洗涤高达大约5400个板。长龙式洗碗机适用于每小时至少洗涤大约1700个板的洗碗输出。在该两个洗碗输出之间,从经济的角度来看,存在一个容量窗,在该容量窗中可以使用通道传送式洗碗机和长龙式洗碗机。

[0015] 当设计洗碗槽和决定应该为洗碗槽选择长龙式洗碗机还是通道传送式洗碗机时,特别是从经济的角度来看,尤其需要考虑是否有足够的洗碗人员可用或可以用于洗碗槽。

[0016] 长龙式洗碗机原则上一般由至少两人操作,因为在机器的操作过程中,待洗涤的洗涤器皿必须由至少一个洗碗人员手动分拣到长龙式洗碗机的入口区域内的指型传送带或通用传送带中,而至少一个其他的洗碗人员必须同时从长龙式洗碗机的出口区域内的指型传送带或通用传送带中移除洗过的洗涤器皿。

[0017] 然而,至少原则上,通道传送式洗碗机也可以至少暂时由仅一个洗碗人员操作,因为与长龙式洗碗机相比,通道传送式洗碗机是“分批”加载的,特别是被放置在洗涤器皿载体(例如碗碟架)中的待洗涤的洗涤器皿,其被供应到洗碗机的入口区域,经过一定时延,在洗涤器皿载体穿过洗碗机的各个处理区域之后,洗碗人员可以再次从洗碗机中移除装有洗过的洗涤器皿的洗涤器皿载体。

[0018] 然而,即使在操作通道传送式洗碗机时,特别是在仅由单一洗碗人员操作的情况下,通常也不可能避免洗碗机在时间上以不规则的方式装载洗涤器皿载体。

[0019] 这种不规则的装载可以(至少原则上)被不止一个打算操作一个通道传送式洗碗机的洗碗人员来抵消。然而,由于实际上经常出现洗碗人员数量的波动,在实践中不可能避免这种情况,所以不可避免地,至少平均随着时间的推移,通道传送式洗碗机通常不以实际上最佳利用的方式运行,这对于这种洗碗机的运行中的运行成本具有负面影响。

[0020] 在实践中,现有技术中已知的常用方法和程序在传送式洗碗机(特别是设计为通道传送式洗碗机的形式)的操作期间在各个洗涤器皿载体或碗碟架之间产生大约30%到40%的空间。当只有一名洗碗人员操作时,这些空间甚至可能是50%或者更多。

[0021] 在本文中使用的术语“空间”或“多个空间”旨在被理解为表示没有洗涤器皿或洗涤器皿载体,并且是在传送式洗碗机的操作期间,当洗涤器皿或洗涤器皿载体(例如碗碟架)通过机器的各个处理区域被传送时产生的区域。即使机器原则上设计为在时间上连续地洗涤洗涤器皿而不存在任何没有洗涤器皿或洗涤器皿载体的区域,这种没有洗涤器皿或洗涤器皿载体的区域仍然降低了实际实施的机器的洗碗能力。

[0022] 这导致在传送式洗碗机的实际操作期间,通常不可能处理在机器的处理区域中每

单位时间可能被处理的碗碟架的最大数量。特别是在仅由一个洗碗人员操作的情况下,这导致对于相同数量的洗涤器皿载体,该洗碗人员必须在传送式洗碗机的装载区域和卸载区域之间进行更多次的替换。这增加了移动量。

[0023] 从这个问题出发,本发明的目的在于开发一种在引言部分中引用的那种传送式洗碗机,其效果在于,即使在只有一个洗碗人员操作的情况下也可以有效地利用机器。根据本发明所基于的另一个目的,传送式洗碗机还应当被设计成在由两名或更多名洗碗人员操作的情况下,能够尽可能高效和流畅地运行。

[0024] 此外,本发明旨在指定操作传送式洗碗机的相应方法,利用该方法可以解决上述问题。

[0025] 就传送式洗碗机而言,本发明所基于的问题通过独立专利权利要求1的主题来解决,就操作传送式洗碗机的方法而言,该问题通过并列专利权利要求17的主题来解决,在相应的从属权利要求中指出了本发明的有利改进方案。

[0026] 根据本发明,因此建议提供一种检测系统,该检测系统被设计成检测在传送式洗碗机的入口或进给区的预定区域内洗涤器皿的存在。本文中使用的术语“入口”一般意指传送式洗碗机的入口区域。该入口例如是传送式洗碗机的入口通路。

[0027] 另一方面,在本文中使用的术语“进给区”特别应理解为可以设置在传送式洗碗机的入口处的进给盘的区域。该进给区特别是指可以设置的进给盘和实际的传送式洗碗机之间的界面处的区域。

[0028] 这种进给盘通常用来将洗涤器皿装载到洗涤器皿载体上,和/或为了执行预清理,特别是手动预清理。这种预清理是有意义的,特别是当供应到洗碗机的洗涤器皿受到残留物、餐巾、牙签等的或多或少的污染时。这些污染物不应该引入洗涤剂再循环槽中,否则洗涤剂溶液(洗涤液体)会被严重污染。

[0029] 根据本发明,还提供了一种控制装置,该控制装置被设计成以这样的方式致动传送装置,即当借助检测系统检测到在传送式洗碗机的入口或进给区处的区域内存在洗涤器皿时,传送装置被启动。此外,控制器被设计成在传送式洗碗机的入口或进给区处的区域内未检测到洗涤器皿时,传送装置被停用。

[0030] 这种控制装置的设置,其根据借助检测系统检测到的洗涤器皿的存在启动或停用传送装置,具有以下有利结果:只有在待洗涤的洗涤器皿在传送式洗碗机的入口处,即在传送式洗碗机的入口或进给区处实际存在时,待处理的洗涤器皿才通过传送式洗碗机的各个处理区域进行传送。

[0031] 在根据本发明的解决方案的一个优选改进方案中,检测系统被进一步设计成检测传送式洗碗机的出口处的预定区域内洗涤器皿的存在。在该实施例中,控制装置进一步被设计成根据传送式洗碗机的出口处的区域内洗涤器皿是否存在来致动传送式洗碗机的传送装置。在这种情况下,特别优选的是,传送式洗碗机的出口跟随传送装置,如洗涤器皿的传送方向所示,其中检测系统被设计成检测传送式洗碗机的出口处的预定区域内洗涤器皿是否存在。

[0032] 在本文中使用的术语“传送式洗碗机的出口”意在理解为指的是位于传送式洗碗机下游的区域,如洗涤器皿的传送方向所示,并且先前在传送式洗碗机的各个处理区域内处理的洗涤器皿,在所述洗涤器皿通过各个处理区域之后,借助传送装置被推入该区域。该

传送式洗碗机的所述出口特别是指出口台,在传送式洗碗机的处理区域中处理所述洗涤器皿之后,该洗涤器皿借助该传送装置被推到该出口台上。

[0033] 在这种情况下,传送式洗碗机的传送装置在出口区域内不再起作用是很重要的。换句话说,尽管传送装置被启动,已经被推入洗碗机的出口的洗涤器皿在传送式洗碗机的出口处停止。

[0034] 在传送式洗碗机的出口的区域中,也就是说在传送式洗碗机的传送装置不再直接起作用的出口的区域中,借助于检测系统有利地检测到洗涤器皿的存在。

[0035] 传送式洗碗机的出口特别是设计成容纳大量洗涤器皿单元的出口台。出口台的尺寸通常如此设计,使得至少两个标准的洗涤器皿载体可被出口台容纳,如传送装置的传送方向所示。

[0036] 关于用于检测洗涤器皿存在的检测系统的定位,有利地将该检测系统设计成检测位于出口的起点的下游0-500mm,优选100-300mm的出口区域内洗涤器皿的存在。

[0037] 在根据本发明的传送式洗碗机的一个特别优选的实施方式中,控制装置被设计成在传送式洗碗机的第一运行状态或操作模式中启动传送装置,具体地不管洗涤器皿是否存在于传送式洗碗机的入口或进给区处的区域内。此外,控制装置被设计成在传送式洗碗机的第二运行状态或操作模式中以这样的方式致动传送装置,即在传送式洗碗机的入口或进给区处的区域内和传送式洗碗机的出口处或内的区域内检测到洗涤器皿时,启动传送装置。此外,控制装置被设计成在传送式洗碗机的入口或进给区处的区域内没有检测到洗涤器皿,并且在传送式洗碗机的出口处或内的区域内检测到洗涤器皿时,停用传送装置。

[0038] 在这种实施方式的改进方案中,控制装置被设计成当借助检测系统检测到之前存在于传送式洗碗机的出口处或内的洗涤器皿被移除时,自动地,优选选择性自动地,将传送式洗碗机从第二运行状态切换至第一运行状态。作为替代方案或除此之外,控制装置被设计成在借助检测系统检测到传送式洗碗机的入口或进给区处存在洗涤器皿时,在该传送式洗碗机的第一和主要在第二运行状态中启动传送装置。

[0039] 在根据本发明的传送式洗碗机的最后提到的实施方式的优选改进方案中,检测装置被进一步设计成检测在出口的端部区域内预定义的区域内的洗涤器皿的存在。换句话说,检测系统被设计成检测是否已经有太多的洗涤器皿被推入传送式洗碗机的出口中,使得出口充满了洗涤器皿,特别是当被推入出口的洗涤器皿到达出口的端部区域时会出现这种情况。

[0040] 在这种优选的改进方案中,控制装置进一步被设计为以如下方式致动传送装置:在传送式洗碗机的第二运行状态下,当在传送式洗碗机的入口或进给区处的区域或在传送式洗碗机的出口处或内的区域内分别检测到洗涤器皿,而在洗碗机的出口的端部区域内的区域内没有检测到洗涤器皿时,启动传送装置。此外,控制装置被设计成当在传送式洗碗机的入口或进给区处的区域内没有检测到洗涤器皿,而在传送式洗碗机的出口处或内的区域内检测到洗涤器皿时,停用传送装置。

[0041] 在最后提到的实施例的改进方案中规定,控制装置进一步被设计成以这样的方式致动传送装置,即当在出口的端部区域内的区域内检测到洗涤器,或者当在传送式洗碗机的出口处或内的区域内和在出口的端部区域内的区域内分别检测到洗涤器皿时,停用传送装置。

[0042] 下面将参照附图更详细地描述根据本发明的传送式洗碗机的一个纯示例性实施例,其中:

[0043] 图1示出了根据本发明的传送式洗碗机的示例性实施例在洗碗机操作的第一时间的示意图;以及

[0044] 图2示出了根据本发明的如图1的传送式洗碗机的示例性实施例在洗碗机操作的稍后的第二时间的示意图。

[0045] 图1示出作为根据本发明的解决方案的示例的传送式洗碗机1的示意性纵向截面图。图1所示传送式洗碗机1的示例性实施例具有预洗涤区域11和主洗涤区域12,主洗涤区域12布置在预洗涤区域11的下游,如洗涤器皿的传送方向T所示。如传送方向T所示,对于图1所示的传送式洗碗机1,后洗涤区域或预漂洗区域13和最终漂洗区域14布置在主洗涤区域12的下游。

[0046] 如传送方向T所示,对于附图中示意性示出的示例性实施例,由洗涤器皿载体特别是碗碟架保持的洗涤器皿经过入口通路10、之后的预洗涤区域11、主洗涤区域12、后洗涤或预漂洗区域13、最终漂洗区域14以及干燥区域15,进入出口区段17。

[0047] 传送式洗碗机1的上述处理区域11、12、13和14各自具有相关的喷嘴,通过该喷嘴将液体喷洒到由传送带通过相应的处理区域11、12、13、14传送的洗涤器皿上。

[0048] 如附图中示意性所示,优选地,当例如与预洗涤区域11和主洗涤区域12相关的洗涤系统的喷嘴分别形成在上部和下部洗涤管内,在这些处理区域11、12中使用相应的洗涤臂。这里用于具有大量形成一组洗涤臂的洗涤管的洗涤系统是可行的,其中大量洗涤管通过优选的共同线路系统连接到相应的洗涤泵。

[0049] 尽管图中未示出,但是每个洗涤区域(预洗涤区域11、主洗涤区域12、后洗涤区域13)具有容纳喷射液体,和/或其中具有用于相关区域11、12、13的喷嘴的液体的相关的槽(洗涤槽)。

[0050] 本文中使用的术语“洗涤区域”应该理解为原则上是指具有相关的再循环槽(洗涤槽)的处理区域,并且其中收集在处理区域的再循环槽中的液体借助于与处理区域相关的洗涤泵而被再循环。术语“洗涤区域”因此包括洗涤区域11和主洗涤区域12,而且还包括后洗涤区域13,该后洗涤区域可以布置在主洗涤区域12的下游,如洗涤器皿的传送方向T所示。在商用洗碗机领域,后洗涤区域13有时也被称为“泵最终漂洗区域”或“预漂洗区域”。这是在用淡水进行最终漂洗前的再循环最终漂洗。

[0051] 对比而言,本文中使用的术语“最终漂洗区域”意在理解为这样的区域,其中用淡水进行最终漂洗,最终漂洗时,洗涤器皿用淡水喷洒,而且可能添加最终漂洗助剂,以除去洗涤器皿上的污物颗粒和不含残留物的洗涤剂溶液。

[0052] 在附图中示出的示例性实施例中,干燥区15中干燥之前的最后漂洗循环因此发生在最终漂洗区域14中。干燥区15具有相关的相应风扇(附图中未示出),以便在已经清洁的洗涤器皿周围提供暖空气流,并因此干燥所述洗涤器皿。

[0053] 此外,提供了在附图中仅示意性示出的控制装置50,该控制装置在附图中示出的本发明的实施例的情况下用于(尤其是)在洗涤过程中以合适的方式致动洗涤区域11、12、13的相应的洗涤泵,以通过相关的管线系统至少偶尔地将洗涤液体供应到相应的喷嘴。

[0054] 对于图1所示的传送式洗碗机1,已经添加了其它化学添加剂(例如最终漂洗助剂)

的淡水形式的最终漂洗液体通过喷嘴2被喷洒到洗涤器皿上(在图1中未示出),喷嘴2布置在最终漂洗区域14的传送带的上方和下方。尽管同样未示出,但是也可以在最终漂洗区域14中设置横向布置的喷嘴。

[0055] 在最终漂洗区域14中喷洒的一些最终漂洗液体通过级联系统在区域间以相反于洗涤器皿的传送方向T的方向被传送。其余部分通过阀门和旁路管线(未示出)直接引入预洗涤区域11的预洗槽中。

[0056] 在最终漂洗区域14中喷洒的最终漂洗液体被收集在后洗涤或预漂洗区域13的槽(后洗涤或预漂洗槽)中,再通过属于后洗涤或预漂洗区域13的洗涤系统的洗涤泵传送至后洗涤或预漂洗区域13的喷嘴3(后洗涤或预漂洗喷嘴)。洗涤液体在后洗涤或预漂洗区域13中从洗涤器皿上漂洗掉。

[0057] 在该过程中产生的液体流入主洗涤区域12的洗涤槽中,通常设置有洗涤剂,并借助于属于主洗涤区域12的洗涤系统的洗涤泵,通过属于主洗涤区域12的洗涤系统的喷嘴(洗涤喷嘴4)喷洒到洗涤器皿上。

[0058] 随后,洗涤液体从主洗涤区域12的洗涤槽流入预洗涤区域11的预洗槽。在预洗涤区域11中,借助于属于预洗涤区域11的洗涤系统的洗涤泵通过喷嘴(预洗涤喷嘴5)将预洗槽中收集的洗涤液体喷洒到洗涤器皿上,以去除洗涤器皿上的粗颗粒污物。

[0059] 在这种情况下,喷洒在主洗涤区域12中的一些洗涤液体可以通过溢流系统进入预洗涤区域11的洗涤槽(预洗槽)中。与主洗涤区域12一样,预洗涤区域11可以配备有平面筛形式的槽覆盖筛。该槽覆盖筛优选地布置在预洗涤区域11的洗涤槽(预洗槽)的上方,以将污物颗粒从预洗涤区域11中喷射并且在重力作用下流回预洗槽的洗涤液体分离。槽覆盖筛的网眼宽度优选在大约1mm和4mm之间。

[0060] 当在传送式洗碗机1的洗涤区域和最终漂洗区域11、12、13、14内喷射洗涤液体和最终漂洗液体时,加热的洗涤液体和最终漂洗液体会产生一团团的蒸气。为了防止这些蒸气从传送式洗碗机1中流出,在图1中示意性示出的实施例中,各个处理区域,特别是洗涤区域和最终漂洗区域11、12、13、14被帘6隔开是很有利的。

[0061] 为了排出传送式洗碗机1运行期间产生的蒸气云(蒸气)以及来自传送式洗碗机1内部的湿热空气,可以使传送式洗碗机1配备有机器侧废气系统,其被设计成将传送式洗碗机1运行期间在处理区域11、12、13、14中产生的至少大部分湿热空气作为废气从机器的相应处理区域11、12、13、14中排出。

[0062] 对于附图中示出的根据本发明的传送式洗碗机1的示例性实施例,使用检测系统30,该检测系统具有通道入口开关/通道入口传感器31,其被布置在传送式洗碗机1的入口10或进给区16处的预定区域A中,并被设计为检测洗涤器皿或洗涤器皿载体7在其中是否存在。该通道入口开关/通道入口传感器31可以是例如光学、电容或电感系统、光扫描器或磁簧传感器或机械开关。当然,也可以使用另一种传感器系统等。

[0063] 在附图中示意性示出的传送式洗碗机1是一种通道传送式洗碗机,其中放置在餐具载体7或碗碟架中的洗涤器皿(未明确示出)被从进给区16(进给盘)推入入口10(入口通道),并且分别进入传送式洗碗机1,并且在其中借助传送装置20通过各个处理区域11、12、13、14、15进行传送。当然,本发明不限于这种类型的通道传送式洗碗机,而是通常也可以使用其他类型的机器,特别是长龙式洗碗机。

[0064] 设置在传送式洗碗机1的入口10或进给区16处的区域A中的通道入口开关/通道入口传感器31在将可能承载洗涤器皿的洗涤器皿载体7(碗碟架)放入传送式洗碗机1的入口10或进给区16中时启动。

[0065] 根据本发明,检测系统30连接到在附图中仅示意性示出的控制装置50,使得控制装置50根据在传送式洗碗机1的入口10或进给区16处的区域A中是否存在洗涤器皿或者洗涤器皿载体7来致动传送式洗碗机1的传送装置20。在这种情况下,尤其规定,当借助通道入口开关/通道入口传感器31在传送式洗碗机1的入口10或进给区16处的区域A中检测到洗涤器皿或洗涤器皿载体7时,借助控制装置50启动传送装置20。换句话说,当传送式洗碗机1的入口10或进给区16处设置的通道入口开关/通道入口传感器31由洗涤器皿载体7(碗碟架)启动或触发时,传送式洗碗机1的传送装置20借助控制装置50被启动。

[0066] 其次,传送式洗碗机1的入口10或进给区16处设置的检测系统30通道入口开关/通道入口传感器31被设计成,当检测到传送式洗碗机1的入口10或进给区16处的区域A中没有(不再有)洗涤器皿或洗涤器皿载体7时,向检测系统30或控制装置50输出相应的信号。在传送式洗碗机的缓冲操作期间,控制装置50然后致动传送装置20,使得传送装置20被停用。

[0067] 对于附图中示意性示出的根据本发明的传送式洗碗机1的实施例,检测系统30还具有缓冲开关/缓冲传感器32,缓冲开关/缓冲传感器32设置在传送式洗碗机的出口17处的预定区域B中。该缓冲开关/缓冲传感器32可以像设置在传送式洗碗机1的入口10或进给区16处的通道入口开关/通道入口传感器31那样被设计为光学、电容或电感系统。此外,也可以使用例如机械操作开关、磁簧开关或其他类型的开关。

[0068] 一般来说,设置在传送式洗碗机1的出口17处的预定区域B中的缓冲开关/缓冲传感器32用于检测洗涤器皿或洗涤器皿载体7是否存在于该区域B中。如果是这样,则缓冲开关/缓冲传感器32向检测系统30输出相应的信号,由此控制装置50以相应的方式致动传送装置20。

[0069] 此外,在附图中所示的根据本发明的传送式洗碗机1的示例性实施例中使用至少一个另外的开关/传感器,该另外的开关/传感器同样与检测系统30相关,并且特别设计为端部开关/端部传感器33。如附图所示,该端部开关/端部传感器33被布置在传送式洗碗机1的出口17的端部区域C内的预定区域中,以检测那里的洗涤器皿或洗涤器皿载体7是否存在。端部开关/端部传感器33优选为光学、电容或电感操作系统,或者开关,特别是机械操作开关,当洗涤器皿或洗涤器皿载体7被推入传送式洗碗机1的出口17时触发,直到洗涤器皿或洗涤器皿载体7到达端部开关/端部传感器33的作用区域。

[0070] 如附图所示,传送式洗碗机1的出口17的尺寸设计成使得其可以容纳至少两个前后放置的洗涤器皿载体7,如传送装置20的传送方向T所示。传送式洗碗机1的出口17的通常尺寸在700mm和2000mm之间。

[0071] 传送式洗碗机1的进给区16的尺寸确定通常与出口17的尺寸确定方式类似,能够容纳至少两个标准的洗涤器皿载体7,预清除也可能在该进给区域进行,所述进给区一般用于将洗涤器皿装载到洗涤器皿载体7(例如碗碟架)上。例如设计为进给盘形式的进给区16的通常尺寸在700mm和2000mm之间。

[0072] 附图中的示意图进一步示出检测系统30的通道入口开关/通道入口传感器31优选地布置在传送式洗碗机1的入口10处的区域A中,传送装置20已经在该区域中起作用。这尤

其应该理解为,当洗涤器皿或洗涤器皿载体7位于通道入口开关/通道入口传感器31的作用区域时,该洗涤器皿或洗涤器皿载体7在传送装置20起作用时被沿着传送方向T传送。

[0073] 对比指下,检测系统30的缓冲开关/缓冲传感器32布置在传送式洗碗机1的出口17处的区域B中,并且优选地,如附图所示,布置在传送式洗碗机1的出口17的这样一个区域中,该区域不再位于传送式洗碗机1的传送装置20的作用区域中。该缓冲开关/缓冲传感器32通常布置在出口起点的下游0-500mm,优选100-300mm处。

[0074] 同样属于检测系统30的端部开关/端部传感器33被布置在端部区域C中,优选地紧接在出口17的端部处。

[0075] 根据本发明的传送式洗碗机1的检测系统30与控制装置50和传送装置20的相互作用将在下面参考附图中的图示更详细地描述。

[0076] 具体而言,对于附图中示意性示出的传送式洗碗机1的示例性实施例,该传送式洗碗机能够以至少两种运行模式运行。在这种情况下,本文中也称为“第一运行状态”的第一运行模式表示洗涤器皿载体7在传送装置20不停工作的情况下,通过传送式洗碗机1的各个处理区域11、12、13、14、15被传送的标准情况。

[0077] 然而,一旦在传送式洗碗机1的出口17处启动了缓冲开关/缓冲传感器32,也就是说,例如当洗涤器皿载体7在传送式洗碗机1和例如设计为出口台的出口17之间的界面处启动缓冲开关/缓冲传感器32时,传送式洗碗机1的传送装置20通过控制装置50被停用,并且因此通过传送式洗碗机1的处理区域11、12、13、14、15传送洗涤器皿载体7的过程被中断。传送式洗碗机1通过触发/操作缓冲开关/缓冲传感器32切换到第二运行模式(“缓冲运行”)。

[0078] 在本文中也称为“第二运行状态”或“缓冲运行”的第二运行模式中,仅当位于传送式洗碗机1的入口10或进给区16处的通道入口开关/通道入口传感器31被洗涤器皿载体7或洗涤器皿覆盖时,才通过控制装置50启动传送装置20。换句话说,仅当例如新的洗涤器皿载体7的新的洗涤器皿被放入洗碗机中时,传送装置20才在第二运行模式(缓冲运行)中被启动。结果,洗涤器皿被沿传送方向T传送,直到洗涤器皿不再位于通道入口开关/通道入口传感器31的作用区域中。

[0079] 在第二运行模式(缓冲运行)中,如已经讨论的那样,传送装置20仅在通道入口开关/通道入口传感器31被覆盖时才被启动。一旦洗涤器皿或洗涤器皿载体7已经被运送出通道入口开关/通道入口传感器31的作用区域,则传送装置20被停用。

[0080] 由此,在通道入口开关/通道入口传感器31的下游区域(如洗涤器皿的传送方向T所示),在洗涤器皿或洗涤器皿载体7之间不会产生新的空间,其结果是洗碗机的长度可以更有效地起到通道缓冲器的作用。这尤其在图2中示意性地示出。

[0081] 上述第二运行模式(缓冲运行)再次通过在传送式洗碗机1的出口17处卸载洗涤器皿或洗涤器皿载体7而停止。这可以例如通过触发端部开关/端部传感器33或者通过清除缓冲开关/缓冲传感器32来执行。然后借助控制装置50再次不间断地启动传送装置20,具体地,至少直到所有的洗涤器皿或所有的洗涤器皿载体7已经通过传送式洗碗机1的处理区域11、12、13、14、15被传送。

[0082] 优选地,只有当洗涤器皿或洗涤器皿载体7被推入空洗碗机并且该洗涤器皿或洗涤器皿载体然后到达缓冲开关/缓冲传感器32时,再次进行缓冲运行(也就是说转换到第二运行模式)。

[0083] 因此,应当注意的是,传送式洗碗机1的卸载行为可以由检测系统30或检测系统30的缓冲开关/缓冲传感器32来监测。有关加载行为的附加信息可以结合通道入口开关/通道入口传感器31获得。传送装置20的智能控制通过组合这两项信息而成为可能。

[0084] 因此,仅由单一洗碗人员进行操作的情况下可以最佳地利用,特别是,机器长度,也就是说,当装载传送式洗碗机1时,洗涤器皿载体7的数量或洗涤器皿单元的数量达到最大化。由于无间隙装载,在洗碗人员必须卸载传送式洗碗机1之前,可以将更多数量的洗涤器皿载体7或更多的洗涤器皿单元装载到传送式洗碗机1中。此外,只有一名洗碗人员操作的情况下,卸载比较方便,特别是由于在卸载过程中无中断传送。

[0085] 此外,由于在这种情况下传送式洗碗机1的各个处理区域11、12、13、14、15的传送也不中断,所以在由两个或更多人操作的情况下不会出现任何弊端。

[0086] 因此,由于加载行为信息,连续传送(第一运行模式)的优点和缓冲运行(第二运行模式)的优点都得以实现,而这两种运行模式的缺点都得以避免。

[0087] 尽管在附图中没有示出,但是在根据本发明的传送式洗碗机1的优选的改进方案中,当控制装置50被设计成在传送式洗碗机1的入口10或进给区16处的区域内检测到洗涤器皿或者洗涤器皿载体7时,以一定的时间延迟启动传送装置20是有利的。

[0088] 因此,传送式洗碗机1可以被设计成在传送装置20被停用的状态下,也就是说,当没有洗涤器皿通过传送式洗碗机1的各个处理区域11、12、13、14、15传送时,停用相应的洗涤和最终漂洗系统(关闭相应的洗涤和最终漂洗泵),这样做可以在传送装置20停用状态下节省资源(能量、淡水、化学助剂)。传送装置20的延迟激活导致传送式洗碗机1的洗涤和最终漂洗系统的某个“准备时间”被清除,以便能够形成有效处理洗涤器皿所需的喷嘴压力。

[0089] 传送装置20的启动时延优选是可手动调节的,其位于0s和10s之间。

[0090] 此外,有利的是,控制装置50被设计成仅在一段时间内,在传送式洗碗机1的入口10或进给区16处的区域中没有检测到洗涤器皿时,停用传送装置20。这个时间优选地也可以手动调节,其在0s和10s之间。

[0091] 本发明不仅涉及传送式洗碗机1,而且涉及操作传送式洗碗机1的相应方法。特别地,该方法特征在于包括以下步骤:

[0092] i) 使用检测系统30检测传送式洗碗机1的入口10或进给区16的区域A内是否存在洗涤器皿或洗涤器皿载体7;以及

[0093] ii) 当在传送式洗碗机1的入口10或进给区16处的区域A内检测到洗涤器皿或洗涤器皿载体7时,使用控制装置50激活传送式洗碗机1的传送装置20,当在传送式洗碗机1的入口10或进给区16处的区域A内没有检测到洗涤器皿或洗涤器皿载体7时,使用控制装置50停用所述传送装置。

[0094] 该方法优选还包括以下步骤:

[0095] 使用检测系统30检测传送式洗碗机1的出口17处的区域B内是否存在洗涤器皿或洗涤器皿载体7;以及

[0096] 使用控制装置50在传送式洗碗机1的入口10或进给区16处的区域A内和在传送式洗碗机1的出口17处或内的区域B内分别检测到洗涤器皿或洗涤器皿载体7时,启动传送装置20;在传送式洗碗机1的入口10或进给区16处的区域A内没有检测到洗涤器皿或洗涤器皿载体7,而在传送式洗碗机1的出口17处或内的区域B内检测到洗涤器皿或洗涤器皿载体时,

停用所述传送装置。

[0097] 该方法优选还包括以下步骤：

[0098] 使用检测系统30检测洗碗机的出口17的端部区域C内是否存在洗涤器皿或洗涤器皿载体7；以及

[0099] 使用控制装置50在传送式洗碗机1的入口10或进给区16处的区域A和在传送式洗碗机1的出口17处或内的区域B内分别检测到洗涤器皿或洗涤器皿载体7，而在传送式洗碗机1的出口17的端部区域C内的区域内没有检测到洗涤器皿或洗涤器皿载体7时，启动传送装置20；在传送式洗碗机1的入口10或进给区16处的区域A内没有检测到洗涤器皿或洗涤器皿载体7，而在传送式洗碗机1的出口17处或内的区域B内检测到洗涤器皿或洗涤器皿载体7时，停用所述传送装置。

[0100] 本发明不限于结合附图描述的实施例，而是可以通过查看本文中公开的所有特征而获得。

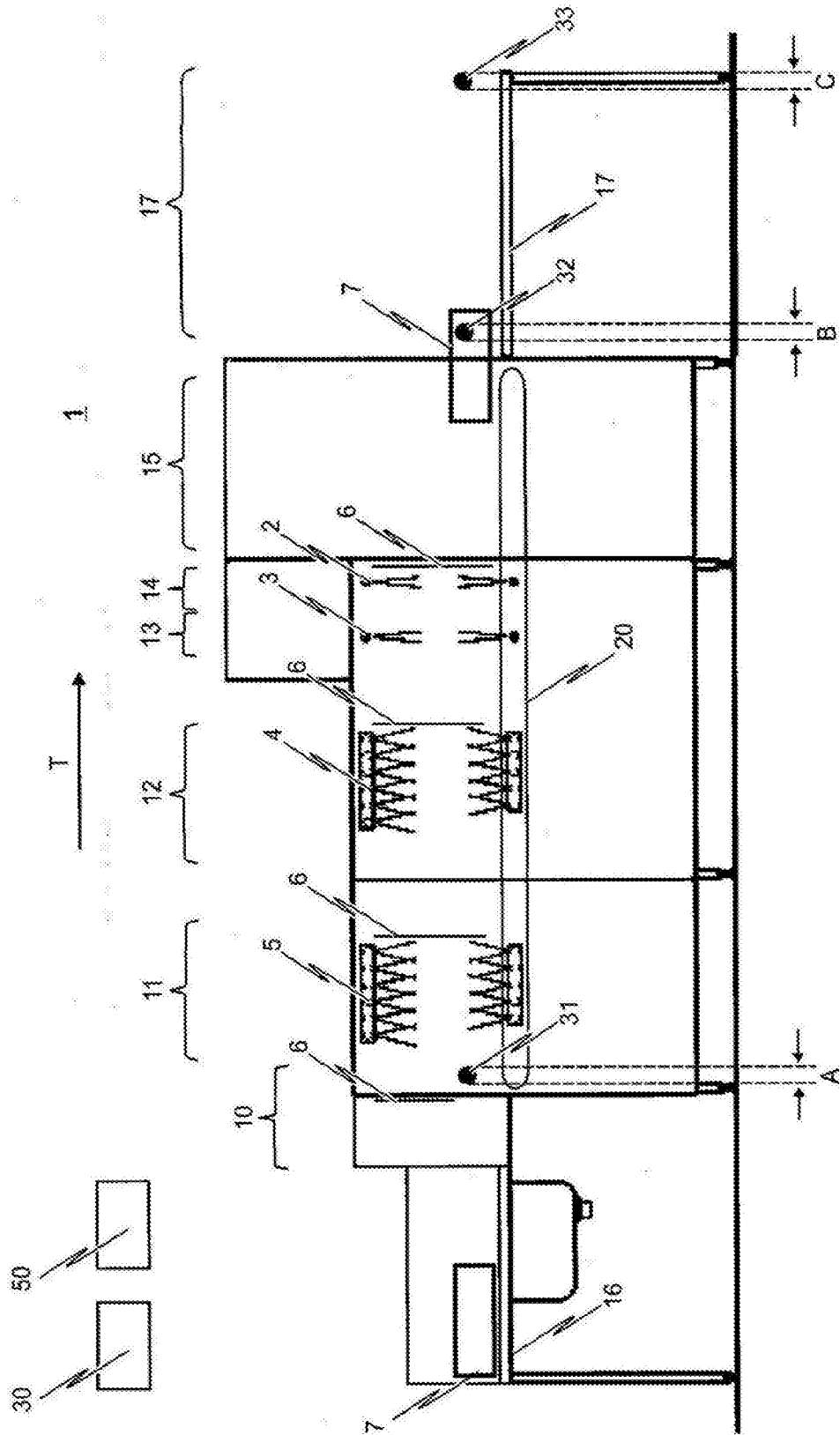


图1

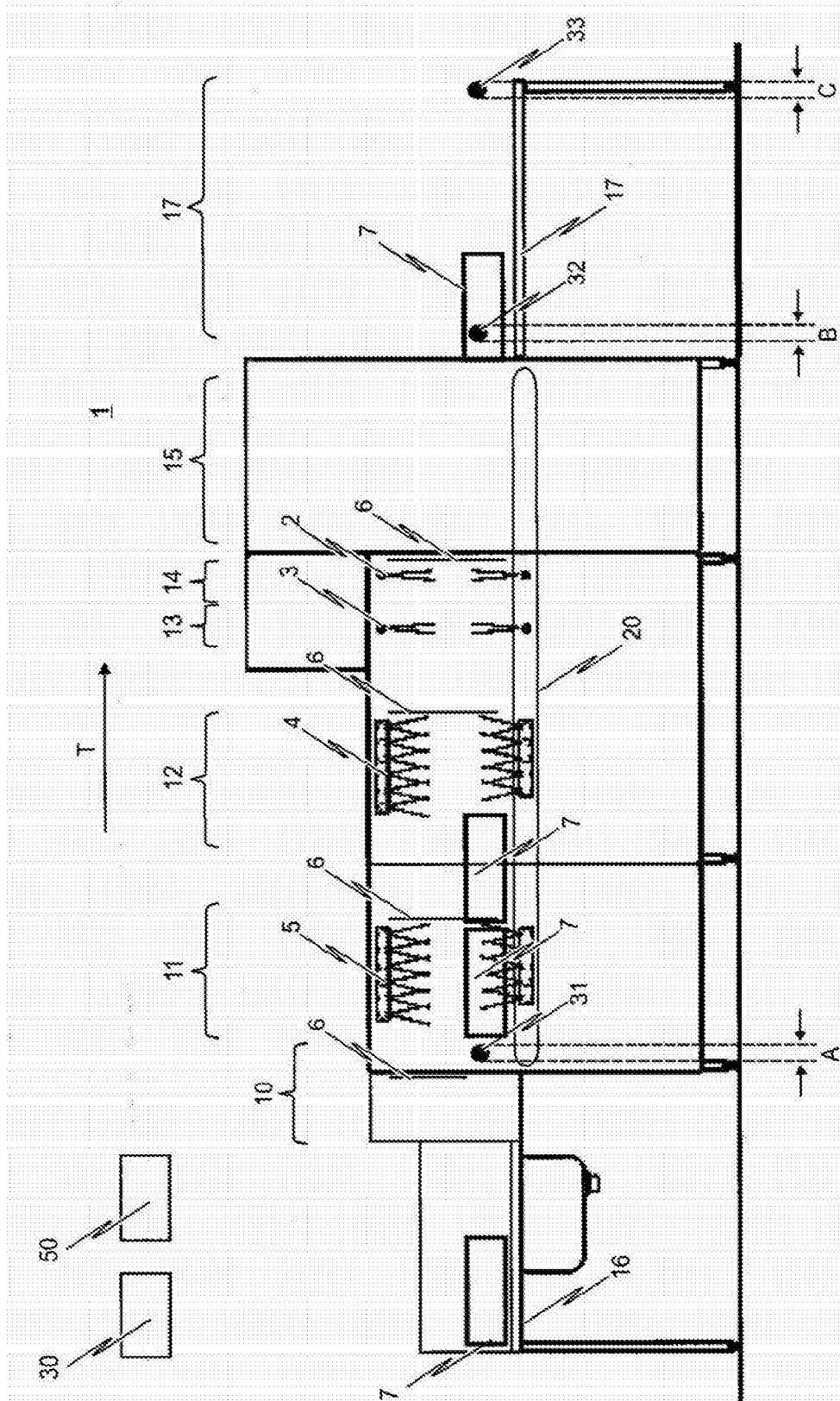
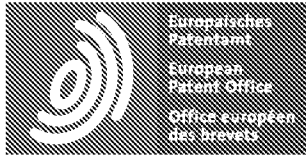


图2



Espacenet

CN109259690A Tableware rack and dishwasher

Applicants: GREE ELECTRIC APPLIANCES INC ZHUHAI

Inventors: LI SHUGUANG,WANG CHUNJIE,ZHANG JIDONG

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Tableware rack and dishwasher

Abstract

The invention discloses a tableware rack and a dishwasher. The tableware rack comprises a first tableware rack body and a second tableware rack body, the first cutlery rack body is provided with a first receiving groove for receiving the cutlery, one end of the second cutlery rack body is rotatably connected with one end of the first cutlery rack body for opening or closing the first receiving groove, the side wall of the first receiving groove is provided with a first through hole, and the other end of the first cutlery rack body is used for connecting with a container basket. The tableware rack is convenient for holding other long-shaped tableware such as chopsticks and the like, and is convenient to use; as the dishwasher comprises the tableware rack, the dishwasher has the advantage of convenience in holding other long-shaped tableware such as chopsticks and the like and convenience in use.



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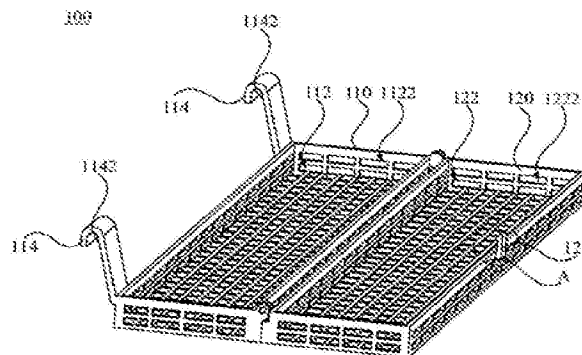
权利要求书1页 说明书5页 附图6页

(54)发明名称

餐具架及洗碗机

(57)摘要

本发明公开了一种餐具架及洗碗机;该餐具架包括第一餐具架本体和第二餐具架本体,所述第一餐具架本体设有用于容纳餐具的第一容纳槽,第二餐具架本体的一端与所述第一餐具架本体的一端转动连接,用于打开或关闭所述第一容纳槽,所述第一容纳槽的侧壁设有第一通孔,所述第一餐具架本体的另一端用于与盛物篮连接。该餐具架便于盛装筷类等其他长条形餐具,且使用便捷;该洗碗机包括上述餐具架,因此,该洗碗机具备便于盛装筷类等其他长条形餐具和使用便捷的优点。



1. 一种餐具架, 其特征在于, 包括第一餐具架本体和第二餐具架本体, 所述第一餐具架本体设有用于容纳餐具的第一容纳槽, 第二餐具架本体的一端与所述第一餐具架本体的一端转动连接, 用于打开或关闭所述第一容纳槽, 所述第一容纳槽的侧壁设有第一通孔, 所述第一餐具架本体的另一端用于与盛物篮连接。

2. 根据权利要求1所述的餐具架, 其特征在于, 所述第一餐具架本体的另一端设有用于与所述盛物篮转动连接的第一连接部, 所述第二餐具架本体包括第一侧壁和第二侧壁, 所述第一侧壁用于盖合所述第一容纳槽, 所述第二侧壁设有用于与所述盛物篮连接的第二连接部, 当所述第一餐具架本体相对所述盛物篮转动至第一预设位置时, 所述第二连接部与所述盛物篮连接。

3. 根据权利要求2所述的餐具架, 其特征在于, 所述第二连接部与所述盛物篮的连接杆卡接, 所述第二连接部的一端设有用于与所述盛物篮的连接杆导向配合的导向结构。

4. 根据权利要求3所述的餐具架, 其特征在于, 所述第二连接部包括第一连接体和第二连接体, 所述第一连接体的一端与所述第二侧壁连接, 另一端设有第一卡凸, 所述第二连接体的一端与所述第二侧壁连接, 另一端设有第二卡凸, 所述第二卡凸和所述第一卡凸间隔设置形成用于与所述盛物篮的连接杆卡接的卡接结构, 所述第一卡凸设有第一导向斜面, 所述第二卡凸设有第二导向斜面, 所述第一导向斜面和所述第二导向斜面间隔形成所述导向结构。

5. 根据权利要求2所述的餐具架, 其特征在于, 所述第一连接部为挂钩, 所述挂钩的内壁设有限位凸起。

6. 根据权利要求1所述的餐具架, 其特征在于, 所述第二餐具架本体的另一端设有用于与所述第一餐具架本体的另一端连接的第三连接部, 当所述第二餐具架本体转动至第二预设位置时, 所述第二餐具架本体关闭所述第一容纳槽, 所述第三连接部与所述第一餐具架本体的另一端连接, 当所述第二餐具架本体转动至第三预设位置时, 所述第三连接部与所述第一餐具架本体分离, 所述第二餐具架本体打开所述第一容纳槽。

7. 根据权利要求6所述的餐具架, 其特征在于, 所述第三连接部设有用于与所述第一餐具架本体的另一端卡接的卡槽。

8. 根据权利要求1至7任一项所述的餐具架, 其特征在于, 所述第二餐具架本体设有第二容纳槽, 当所述第二餐具架本体转动至关闭所述第一容纳槽时, 所述第二容纳槽和所述第一容纳槽配合形成容纳结构。

9. 根据权利要求8所述的餐具架, 其特征在于, 所述第二容纳槽的内壁开设有第二通孔。

10. 根据权利要求8所述的餐具架, 其特征在于, 所述第一餐具架本体和/或所述第二餐具架本体为镂空结构。

11. 一种洗碗机, 其特征在于, 包括权利要求1至10任一项所述的餐具架, 还包括盛物篮, 所述第一餐具架本体的另一端与所述盛物篮连接。

12. 根据权利要求11所述的洗碗机, 其特征在于, 所述盛物篮包括盛物篮本体, 所述盛物篮本体包括至少两个支撑件, 所述盛物篮本体设有容纳腔, 所述支撑件可转动地设置于所述容纳腔的底壁, 当所述支撑件转动至第四预设位置时, 相邻两个所述支撑件间隔设置形成用于支撑餐具的支撑结构。

餐具架及洗碗机

技术领域

[0001] 本发明涉及洗碗设备技术领域,特别是涉及一种餐具架及洗碗机。

背景技术

[0002] 洗碗机是自动清洗碗、筷、盘、碟、刀、叉等餐具的设备,给人们的生活带来了极大的便利。

[0003] 目前市面上的洗碗机,在使用时需将碗盘类餐具摆放于盛物篮内进行清洗,同时,将筷类等长条状的餐具设置于洗碗机所配置的筷篮内,然而,这类筷篮在使用时,用户需将餐具一一插入相应的格子里面,使用不方便。

发明内容

[0004] 基于此,针对传统的洗碗机所配置的筷篮在使用时,用户需将餐具一一插入相应的格子里面,使用不方便的问题,提出了一种餐具架及洗碗机;该餐具架便于盛装筷类等其他长条形餐具,且使用便捷;该洗碗机包括上述餐具架,因此,该洗碗机具备便于盛装筷类等其他长条形餐具和使用便捷的优点。

[0005] 具体技术方案如下:

[0006] 一方面,本申请涉及一种餐具架,包括第一餐具架本体和第二餐具架本体,所述第一餐具架本体设有用于容纳餐具的第一容纳槽,第二餐具架本体的一端与所述第一餐具架本体的一端转动连接,用于打开或关闭所述第一容纳槽,所述第一容纳槽的侧壁设有第一通孔,所述第一餐具架本体的另一端用于与盛物篮连接。

[0007] 上述餐具架在使用时,将第一餐具架本体与盛物篮连接,将筷类等其他长条形餐具平铺于所述第一容纳槽内,然后转动所述第二餐具架本体直至盖合所述第一容纳槽,随后进行清洗;如此,既可以方便筷类等其他长条形餐具的放置,还可以避免筷类等其他长条形餐具在清洗时被水冲走及避免筷类等其他长条形餐具在清洗时四处游动影响清洗效果的问题。

[0008] 下面进一步对技术方案进行说明:

[0009] 在其中一个实施例中,所述第一餐具架本体的另一端设有用于与所述盛物篮转动连接的第一连接部,所述第二餐具架本体包括第一侧壁和第二侧壁,所述第一侧壁用于盖合所述第一容纳槽,所述第二侧壁设有用于与所述盛物篮连接的第二连接部,当所述第一餐具架本体相对所述盛物篮转动至第一预设位置时,所述第二连接部与所述盛物篮连接。

[0010] 在其中一个实施例中,所述第二连接部与所述盛物篮的连接杆卡接,所述第二连接部的一端设有用于与所述盛物篮的连接杆导向配合的导向结构。

[0011] 在其中一个实施例中,所述第二连接部包括第一连接体和第二连接体,所述第一连接体的一端与所述第二侧壁连接,另一端设有第一卡凸,所述第二连接体的一端与所述第二侧壁连接,另一端设有第二卡凸,所述第二卡凸和所述第一卡凸间隔设置形成用于与所述盛物篮的连接杆卡接的卡接结构,所述第一卡凸设有第一导向斜面,所述第二卡凸设

有第二导向斜面,所述第一导向斜面和所述第二导向斜面间隔形成所述导向结构。

[0012] 在其中一个实施例中,所述第一连接部为挂钩,所述挂钩的内壁设有限位凸起。

[0013] 在其中一个实施例中,所述第二餐具架本体的另一端设有用于与所述第一餐具架本体的另一端连接的第三连接部,当所述第二餐具架本体转动至第二预设位置时,所述第二餐具架本体关闭所述第一容纳槽,所述第三连接部与所述第一餐具架本体的另一端连接,当所述第二餐具架本体转动至第三预设位置时,所述第三连接部与所述第一餐具架本体分离,所述第二餐具架本体打开所述第一容纳槽。

[0014] 在其中一个实施例中,所述第三连接部设有用于与所述第一餐具架本体的另一端卡接的卡槽。

[0015] 在其中一个实施例中,所述第二餐具架本体设有第二容纳槽,当所述第二餐具架本体转动至关闭所述第一容纳槽时,所述第二容纳槽和所述第一容纳槽配合形成容纳结构。

[0016] 在其中一个实施例中,所述第二容纳槽的内壁开设有第二通孔。

[0017] 在其中一个实施例中,所述第一餐具架本体和/或所述第二餐具架本体为镂空结构。

[0018] 另一方面,本申请还涉及一种洗碗机,包括餐具架,还包括盛物篮,所述第一餐具架本体的另一端与所述盛物篮连接。

[0019] 上述洗碗机在使用时,将第一餐具架本体与盛物篮连接,将筷类等其他长条形餐具平铺于所述第一容纳槽内,然后转动所述第二餐具架本体直至盖合所述第一容纳槽,随后进行清洗;如此,既可以方便筷类等其他长条形餐具的放置,还可以避免筷类等其他长条形餐具在清洗时被水冲走及避免筷类等其他长条形餐具在清洗时四处游动影响清洗效果的问题。

[0020] 下面进一步对技术方案进行说明:

[0021] 在其中一个实施例中,所述盛物篮包括盛物篮本体,所述盛物篮本体包括至少两个支撑件,所述盛物篮本体设有容纳腔,所述支撑件可转动地设置于所述容纳腔的底壁,当所述支撑件转动至第四预设位置时,相邻两个所述支撑件间隔设置形成用于支撑餐具的支撑结构。

附图说明

[0022] 图1为餐具架处于展开状态的结构示意图;

[0023] 图2为餐具架处于闭合状态的结构示意图;

[0024] 图3为图1中A的局部放大示意图;

[0025] 图4为图2中B的局部放大示意图;

[0026] 图5为餐具架处于关闭状态时与盛物篮的装配示意图;

[0027] 图6为餐具架处于展开状态时与盛物篮的装配示意图;

[0028] 图7为一实施例中第一餐具架本体转动至第一预设位置时与盛物篮的装配示意图;

[0029] 图8为图7中C的局部放大示意图;

[0030] 图9为另一实施例中第一餐具架本体转动至第一预设位置时与盛物篮的装配示意图;

图。

[0031] 附图标记说明：

[0032] 100、餐具架,110、第一餐具架本体,112、第一容纳槽,1122、第一通孔,114、第一连接部,1142、限位凸起,120、第二餐具架本体,122、第二容纳槽,1222、第二通孔,124、第二侧壁,126、第二连接部,1260、第一连接体,1262、第一卡凸,1264、第二连接体,1266、第二卡凸,1268、导向结构,128、第三连接部,1282、卡槽,200、盛物篮,210、支撑结构,212、支撑件,220、容纳腔,230、盛物篮的连接杆。

具体实施方式

[0033] 为使本发明的目的、技术方案及优点更加清楚明白,以下结合附图及具体实施方式,对本发明进行进一步的详细说明。应当理解的是,此处所描述的具体实施方式仅用以解释本发明,并不限定本发明的保护范围。

[0034] 需要说明的是,当元件被称为“设置于”另一个元件,它可以直接在另一个元件上或者也可以存在居中的元件。当元件被称为“固设于”另一个元件,它可以直接在另一个元件上或者也可以存在居中的元件。当一个元件被认为是“连接”另一个元件,它可以是直接连接到另一个元件或者可能同时存在居中元件。本文所使用的术语“垂直的”、“水平的”、“左”、“右”以及类似的表述只是为了说明的目的,并不表示是唯一的实施方式。

[0035] 有必要指出的是,当元件被称为“固设于”另一元件时,两个元件可以是一体的,也可以是两个元件之间可拆卸连接。

[0036] 除非另有定义,本文所使用的所有的技术和科学术语与属于本发明的技术领域的技术人员通常理解的含义相同。本文中在本发明的说明书中所使用的术语只是为了描述具体地实施方式的目的,不是旨在于限制本发明。本文所使用的术语“及/或”包括一个或多个相关的所列项目的任意的和所有的组合。

[0037] 此外,还需要理解的是,在本实施例中,术语“下”、“上”、“前”、“后”、“左”、“右”、“内”、“外”、“顶”、“底”、“一侧”、“另一侧”、“一端”、“另一端”、等所指示的位置关系为基于附图所示的位置关系;“第一”、“第二”等术语,是为了区分不同的结构部件。这些术语仅为了便于描述本发明和简化描述,不能理解为对本发明的限制。

[0038] 如图1至图4所示,一实施例中的一种餐具架100,包括第一餐具架本体110和第二餐具架本体120,第一餐具架本体110设有用于容纳餐具的第一容纳槽112,第二餐具架本体120的一端与第一餐具架本体110的一端转动连接,用于打开或关闭第一容纳槽112,第一容纳槽112的侧壁设有第一通孔1122,第一餐具架本体110的另一端用于与盛物篮200连接。

[0039] 上述餐具架100在使用时,将第一餐具架本体110与盛物篮200连接,将筷类等其他长条形餐具平铺于第一容纳槽112内,然后转动第二餐具架本体120直至盖合第一容纳槽112,随后进行清洗;如此,既可以方便筷类等其他长条形餐具的放置,还可以避免筷类等其他长条形餐具在清洗时被水冲走及避免筷类等其他长条形餐具在清洗时四处游动影响清洗效果的问题。在本次实施例中,第一餐具架本体110和第二餐具架本体120通过连接旋转轴的方式实现转动连接;当然了,在其他实施例中,还可以通过铰接的方式实现第二餐具架本体120和第一餐具架本体110的转动连接。具体地,第一通孔1122可以开设于第一餐具架本体110的侧壁和/或底壁,优选地,第一餐具架本体的110侧壁和底壁均开设有第一通孔

1122,如此,可以提升餐具清洗的洁净度。

[0040] 如图2、图7及图8所示,在上述实施例的基础上,第一餐具架本体110的另一端设有用于与盛物篮200转动连接的第一连接部114,第二餐具架本体120包括第一侧壁和第二侧壁124,第一侧壁用于盖合第一容纳槽112,第二侧壁124设有用于与盛物篮200连接的第二连接部126,当第一餐具架本体110相对盛物篮200转动至第一预设位置时,第二连接部126与盛物篮200连接。如此,在不使用时,将第一餐具架本体110相对盛物篮200转动至第一预设位置,此时通过第二连接部126与盛物篮200连接,起到收纳餐具架100的目的,节约盛物篮200的容纳空间。如图8所示,在该实施例的基础上,第二连接部126与盛物篮的连接杆230卡接,第二连接部126的一端设有用于与盛物篮的连接杆230导向配合的导向结构1268。如此,通过第二连接部126与盛物篮的连接杆230卡接的方式实现将餐具架100固定在盛物篮200上;在安装时,盛物篮的连接杆230与导向结构1268导向配合,便于盛物篮的连接杆230与第二连接部126的定位连接。

[0041] 如图8所示,进一步,在上述任一实施例的基础上,第二连接部126包括第一连接体1260和第二连接体1264,第一连接体1260的一端与第二侧壁124连接,另一端设有第一卡凸1262,第二连接体1264的一端与第二侧壁124连接,另一端设有第二卡凸1266,第二卡凸1266和第一卡凸1262间隔设置形成卡接结构,第一卡凸1262设有第一导向斜面,第二卡凸1266设有第二导向斜面,第一导向斜面和第二导向斜面间隔形成导向结构1268。如此,通过第一卡凸和第二卡凸形成的卡结结构与盛物篮的连接杆230卡接实现将餐具架100固定在盛物篮200上;在安装时,盛物篮的连接杆230与导向结构1268导向配合,便于盛物篮的连接杆230与第二连接部126的连接。

[0042] 如图1和图2所示,在上述任一实施例的基础上,第一连接部114为挂钩,挂钩的内壁设有限位凸起1142。如此,通过挂钩与盛物篮的连接杆230转动连接,此时,限位凸起1142设置于挂钩的内壁,起到限位和提升安装稳固性的作用。

[0043] 如图2和图3所示,在上述任一实施例的基础上,第二餐具架本体120的另一端设有用于与第一餐具架本体110的另一端连接的第二连接部128,当第二餐具架本体120转动至第二预设位置时,第二餐具架本体120关闭第一容纳槽112,第三连接部128与第一餐具架本体110的另一端连接,当第二餐具架本体120转动至第三预设位置时,第三连接部128与第一餐具架本体110分离,第二餐具架本体120打开第一容纳槽112。如此,当第二餐具架本体120盖合第一容纳槽112时,通过第三连接部128与第一餐具架本体110的另一端连接,提升第二餐具架本体120盖合第一容纳槽112的稳固性。进一步,在该实施例的基础上,第三连接部128设有用于与第一餐具架本体110的另一端卡接的卡槽1282。如此,通过卡槽1282与第一餐具架本体110的另一端卡接的方式实现将第二餐具架本体120固定在第一餐具架本体110上。当然了,在别的实施例中,还可以采用螺纹连接或者其他可拆卸方式实现第二餐具架本体120与第一餐具架本体110连接。

[0044] 如图1所示,在上述任一实施例的基础上,第二餐具架本体120设有第二容纳槽122,当第二餐具架本体120转动至关闭第一容纳槽112时,第二容纳槽122和第一容纳槽112配合形成容纳结构。如此,在第二餐具架本体120上开设第二容纳槽122,通过第二容纳槽122与第一容纳槽112配合形成容纳结构,以提升容纳空间,使该餐具架100能够容纳更多的筷类等长条型餐具。如图1所示,进一步,在该实施例的基础上,第二容纳槽122的内壁开设

有第二通孔1222。如此,通过第二通孔1222进水清洗筷类等长条形餐具,提升清洗效率。具体地,第二通孔1222可以开设于第二餐具架本体120的侧壁和/或底壁,优选地,第二餐具架本体的120侧壁和底壁均开设有第二通孔1222,如此,可以提升餐具清洗的洁净度。

[0045] 在上述任一实施例的基础上,第一餐具架本体110和/或第二餐具架本体120为镂空结构。如此,可以提升清洗餐具的清洁度。

[0046] 如图5至图9所示,一实施例中的一种洗碗机,包括餐具架100,还包括盛物篮200,第一餐具架本体110的另一端与盛物篮200连接。

[0047] 上述洗碗机在使用时,将第一餐具架本体110与盛物篮200连接,将筷类等其他长条形餐具平铺于第一容纳槽112内,然后转动第二餐具架本体120直至盖合第一容纳槽112,随后进行清洗;如此,既可以方便筷类等其他长条形餐具的放置,还可以避免筷类等其他长条形餐具在清洗时被水冲走及避免筷类等其他长条形餐具在清洗时四处游动影响清洗效果的问题。

[0048] 如图5所示,在该实施例的基础上,盛物篮200包括盛物篮200本体,盛物篮200本体包括至少两个支撑件212,盛物篮200本体设有容纳腔220,支撑件212可转动地设置于容纳腔220的底壁,当支撑件212转动至第四预设位置时,相邻两个支撑件212间隔设置形成用于支撑餐具的支撑结构210。如此,在使用时,可以将支撑件212转动至第四预设位置,将碗盘类餐具设置于支撑结构210内,便于清洗;当不需要清洗时,将支撑件212转动至平铺于容纳腔220的底壁,便于收纳支撑件212。在本次实施例中,餐具架100设置于所述容纳腔220的内壁上,如此,便于与盛装在盛物篮内的碗盘类餐具一起清洗。

[0049] 以上实施例的各技术特征可以进行任意的组合,为使描述简洁,未对上述实施例中的各个技术特征所有可能的组合都进行描述,然而,只要这些技术特征的组合不存在矛盾,都应当认为是本说明书记载的范围。

[0050] 以上实施例仅表达了本发明的几种实施方式,其描述较为具体和详细,但并不能因此而理解为对发明专利范围的限制。应当指出的是,对于本领域的普通技术人员来说,在不脱离本发明构思的前提下,还可以做出若干变形和改进,这些都属于本发明的保护范围。因此,本发明的保护范围应以所附权利要求为准。

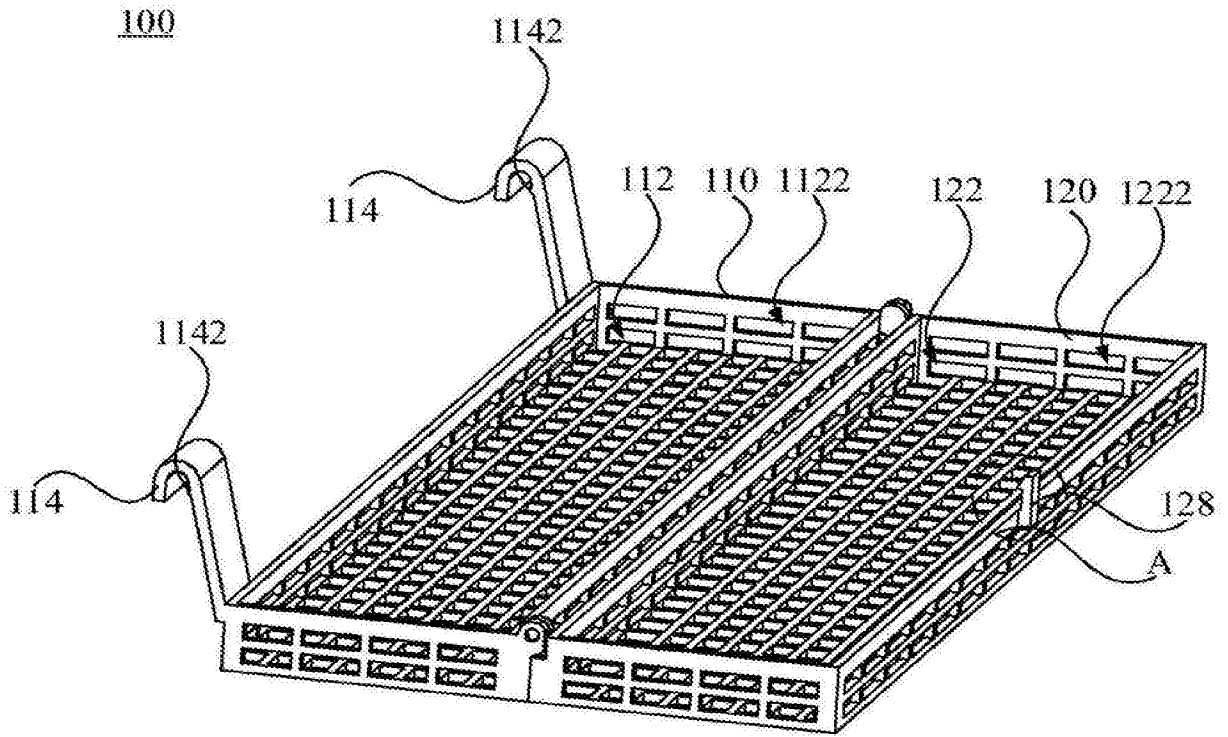


图1

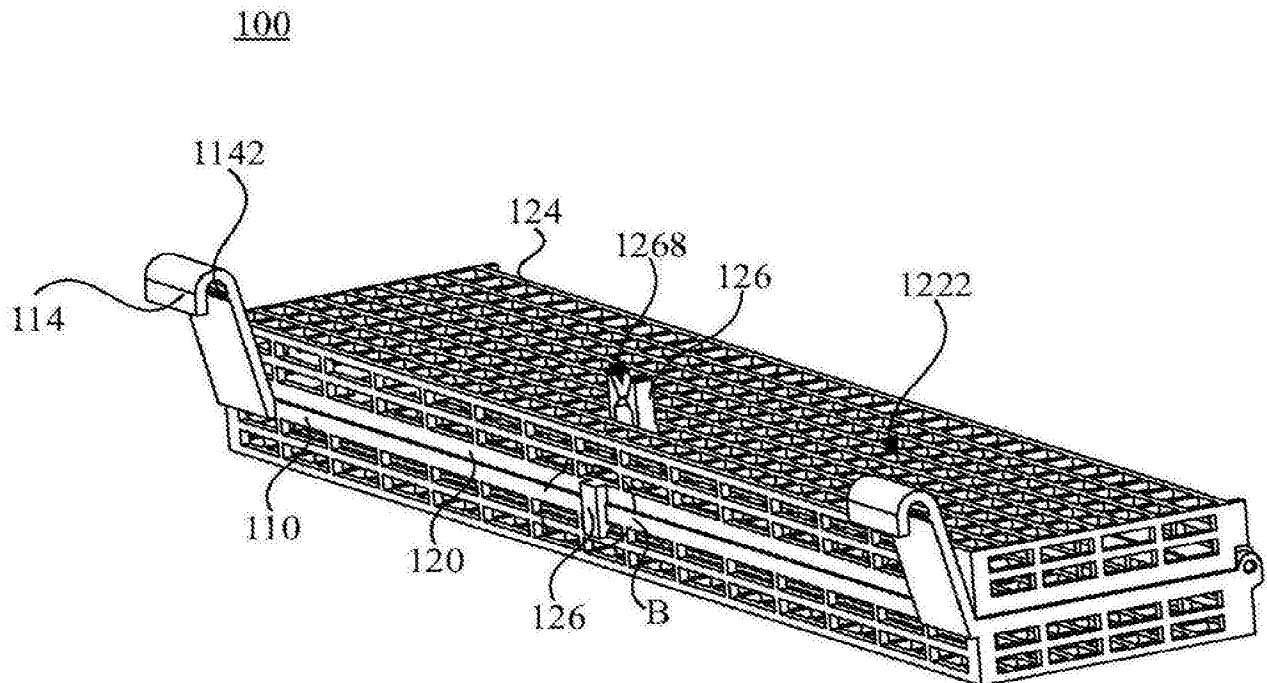


图2

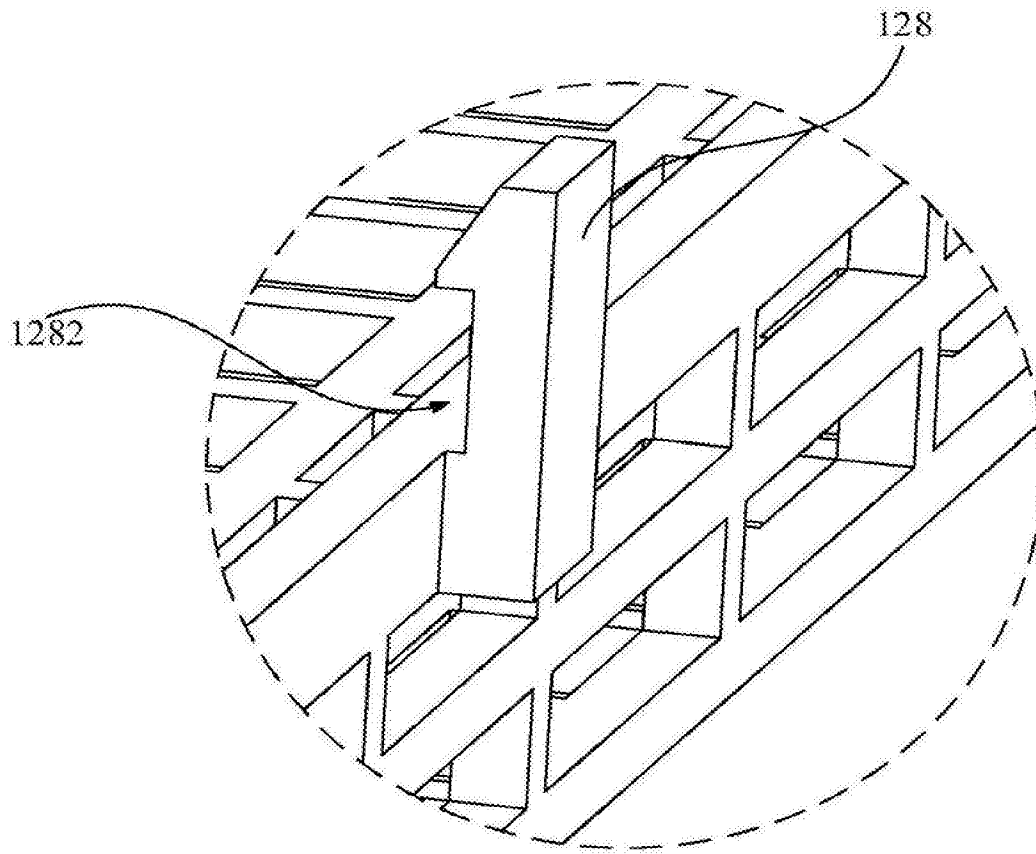


图3

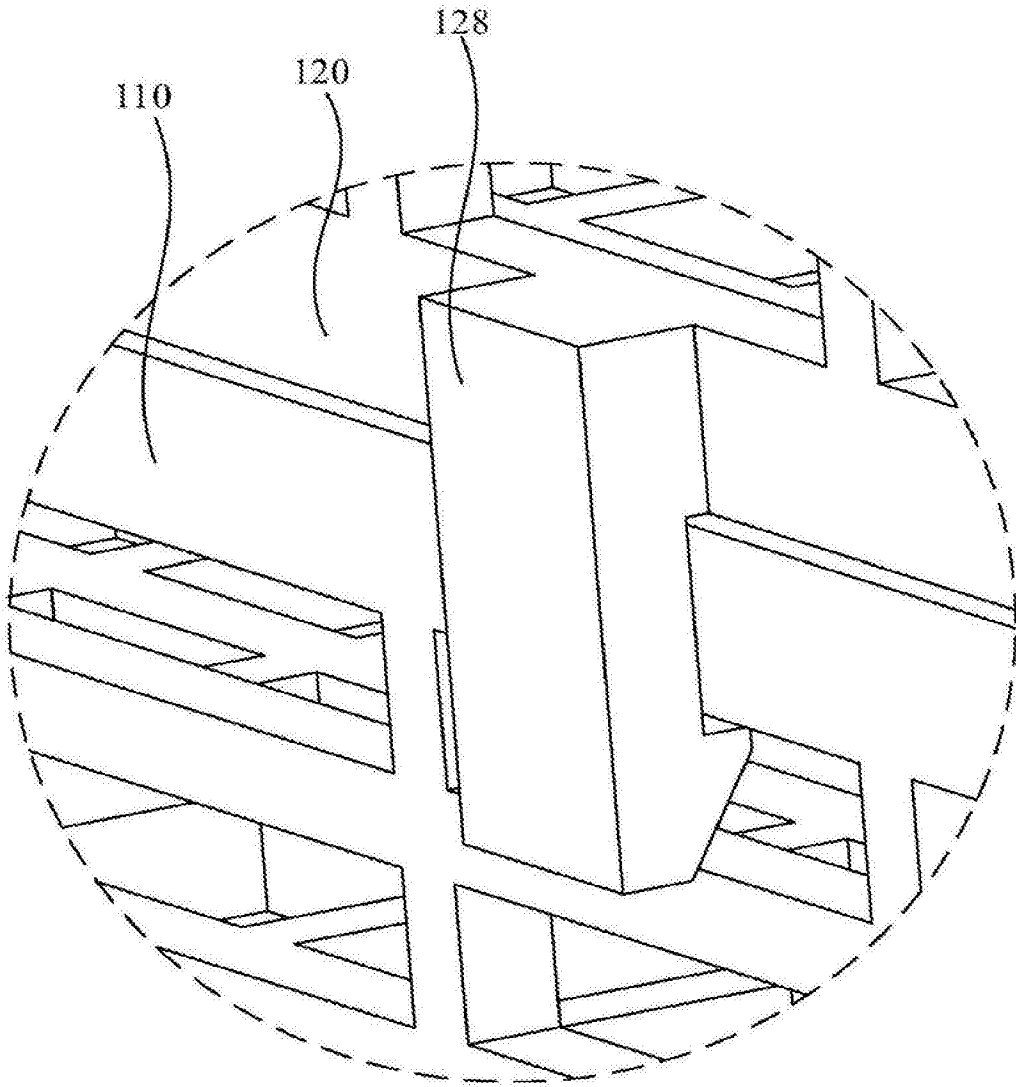


图4

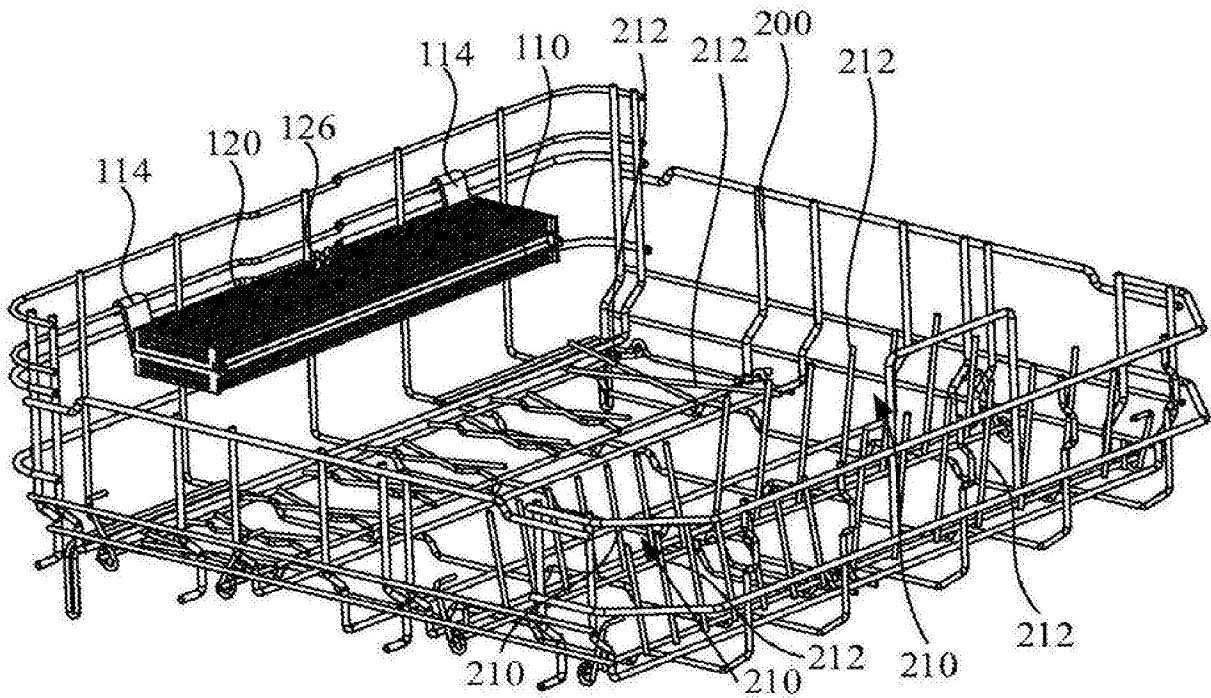


图5

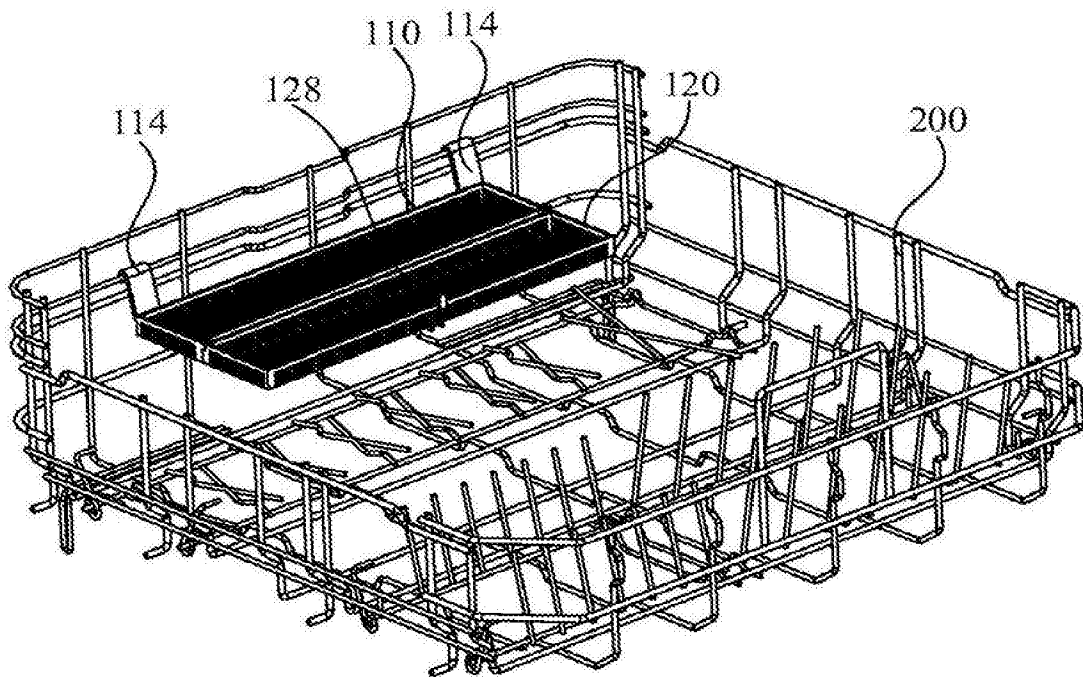


图6

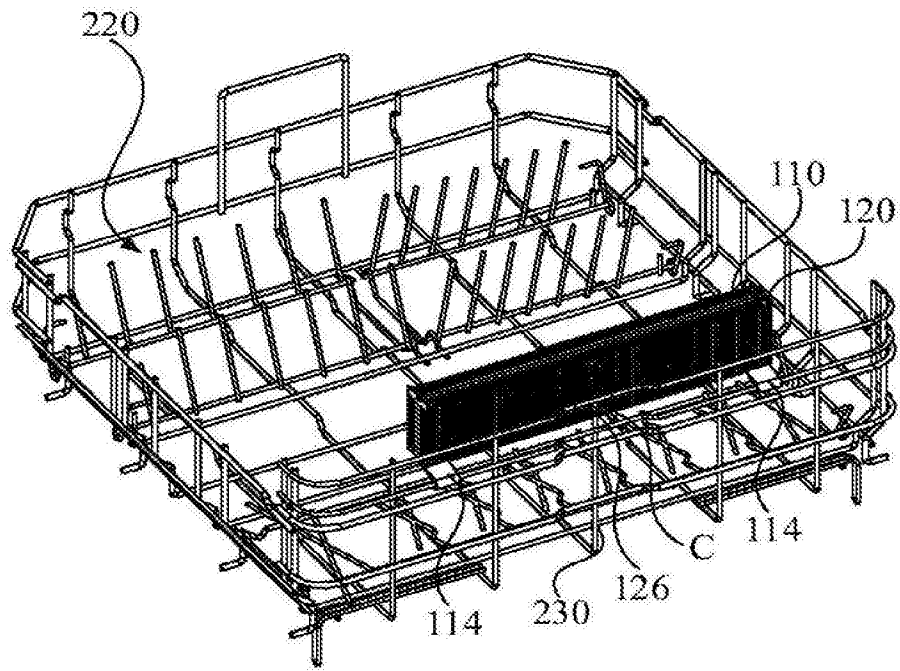


图7

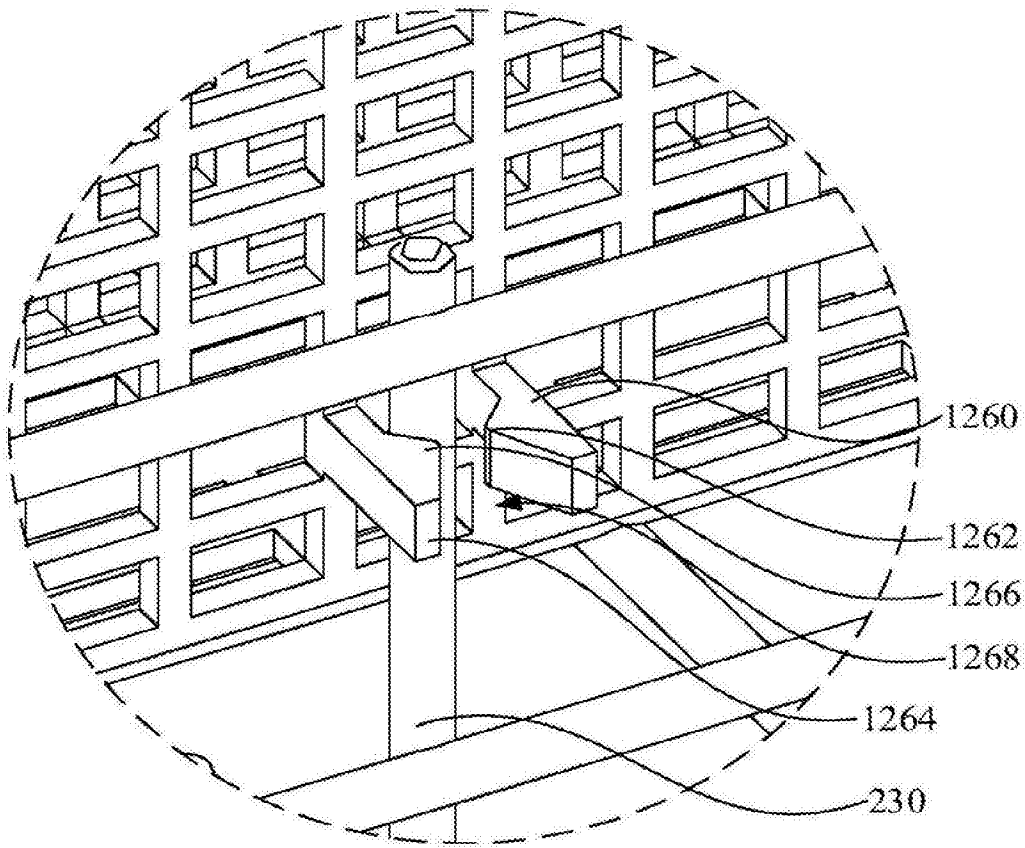


图8

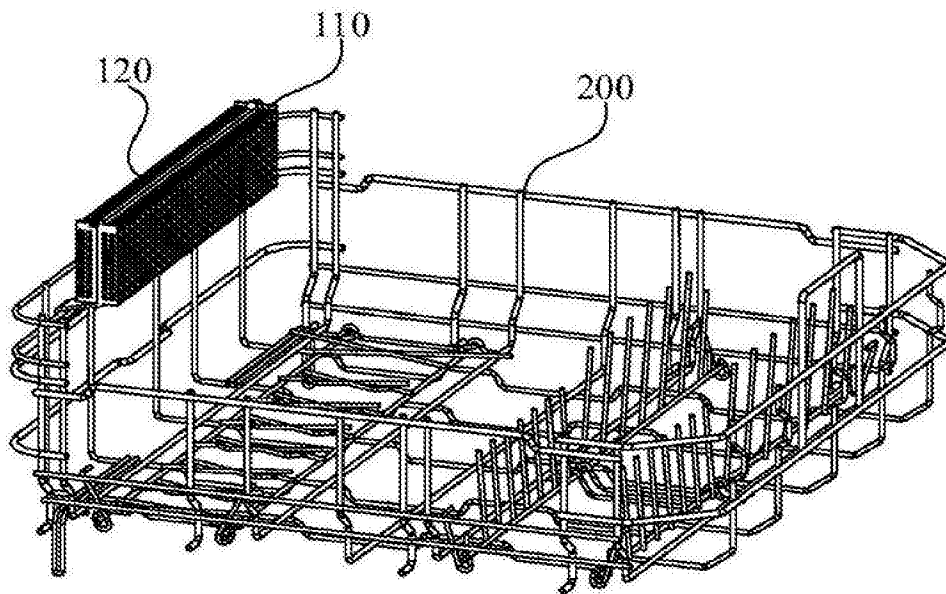


图9



Espacenet

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Besteckaufnahme für eine Geschirrspülmaschine und Geschirrspülmaschine

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Abstract of DE102013213612 (A1)

Die Erfindung betrifft eine Besteckaufnahme (1) für eine Geschirrspülmaschine (2), mit einem Aufnahmekorb (3), einer relativ zu dem Aufnahmekorb (3) verschwenkbaren Aufnahmekorbabdeckung (13), und einer Arretiereinrichtung (23, 24), die dazu eingerichtet ist, die Aufnahmekorbabdeckung (13) derart zu arretieren, dass diese in zumindest einem Verschwenkwinkel (α_2 , α_3) relativ zu einer Vorderwand (7) des Aufnahmekorbes (3) schräg positionierbar ist.



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ABSTRACT DE102013213612A1

The invention relates to a cutlery holder (1) for a dishwasher (2), comprising a receiving basket (3), a receiving basket cover (13) which can be pivoted relative to the receiving basket (3), and a locking device (23, 24) which is designed to lock the receiving basket cover (13) in such a way that it can be positioned obliquely at at least one pivoting angle (α_2 , α_3) relative to a front wall (7) of the receiving basket (3).

(19)



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(56) Ermittelter Stand der Technik:

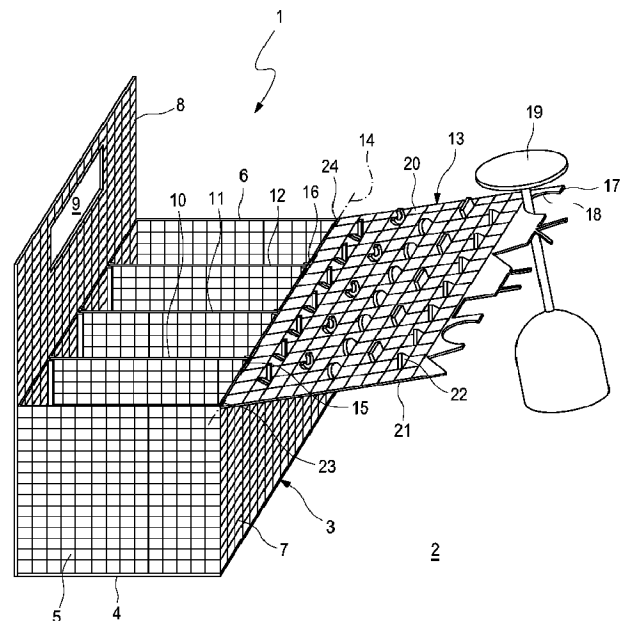
DE	10 2009 000 748	A1
US	7 861 883	B2
US	2005 / 0 109 378	A1
US	5 287 984	A
EP	1 256 309	B1
EP	1 929 928	A1

Prüfungsantrag gemäß § 44 PatG ist gestellt.

Die folgenden Angaben sind den vom Anmelder eingereichten Unterlagen entnommen

(54) Bezeichnung: **Besteckaufnahme für eine Geschirrspülmaschine und Geschirrspülmaschine**

(57) Zusammenfassung: Die Erfindung betrifft eine Besteckaufnahme (1) für eine Geschirrspülmaschine (2), mit einem Aufnahmekorb (3), einer relativ zu dem Aufnahmekorb (3) verschwenkbaren Aufnahmekorbabdeckung (13), und einer Arretiereinrichtung (23, 24), die dazu eingerichtet ist, die Aufnahmekorbabdeckung (13) derart zu arretieren, dass diese in zumindest einem Verschwenkwinkel (α_2 , α_3) relativ zu einer Vorderwand (7) des Aufnahmekorbes (3) schräg positionierbar ist.



Beschreibung

[0001] Die vorliegende Erfindung betrifft eine Besteckaufnahme für eine Geschirrspülmaschine und eine Geschirrspülmaschine.

[0002] In einer Geschirrspülmaschine wird Spülgut, wie beispielsweise Besteck zum Reinigen in einen Besteckkorb eingebracht. Der Besteckkorb kann in einer Spülgutaufnahme der Geschirrspülmaschine aufgenommen sein. Die Spülgutaufnahme ist beispielsweise ein Geschirrkorb der Geschirrspülmaschine. Zum Vereinzeln des Spülguts, das heißt zum beabstandeten Anordnen des Spülguts in dem Besteckkorb kann ein gitterförmiger Zwischenboden oder eine Geschirrkorbabdeckung vorgesehen sein. Mittels des Vereinzeln des Spülguts wird die Bildung von Wasserflecken auf dem Spülgut beim Trocknen der Spülflotte verhindert oder reduziert.

[0003] Die US 7,861,883 B2 beschreibt einen Besteckkorb für eine Geschirrspülmaschine. Der Besteckkorb weist einen Zwischenboden zum Vereinzeln von in den Besteckkorb eingebrachtem Spülgut auf. Der Zwischenboden ist horizontal angeordnet und kann schubladenartig aus dem Besteckkorb herausgezogen und wieder in diesen eingeschoben werden.

[0004] Die EP 1 256 309 B1 beschreibt einen Besteckkorb für eine Geschirrspülmaschine mit einer relativ zu dem Besteckkorb verschwenkbaren Besteckkorbabdeckung. Die Besteckkorbabdeckung ist aus einer vertikalen Position, in der sie als Zwischenwand des Besteckkorbes fungiert, in eine horizontale Position, in der sie den Besteckkorb zumindest abschnittsweise abdeckt, verlagerbar. In der horizontalen Position ist die Besteckkorbabdeckung dazu geeignet, in den Besteckkorb eingebrachtes Spülgut zu vereinzeln.

[0005] Vor diesem Hintergrund besteht eine Aufgabe der vorliegenden Erfindung darin, eine verbesserte Besteckaufnahme für eine Geschirrspülmaschine zur Verfügung zu stellen.

[0006] Demgemäß wird eine Besteckaufnahme für eine Geschirrspülmaschine mit einem Aufnahmekorb, einer relativ zu dem Aufnahmekorb verschwenkbaren Aufnahmekorbabdeckung, und einer Arretiereinrichtung vorgeschlagen. Die Arretiereinrichtung ist dazu eingerichtet, die Aufnahmekorbabdeckung derart zu arretieren, dass diese in zumindest einem Verschwenkwinkel relativ zu einer Vorderwand des Aufnahmekorbes schräg positionierbar ist.

[0007] Der Verschwenkwinkel kann beliebig gewählt sein. Die Aufnahmekorbabdeckung ist insbesondere von einer Ausgangsposition, in der die Aufnah-

mekorbabdeckung oben auf dem Aufnahmekorb aufliegt und diesen nach oben hin abschließt, bis in eine Endposition, in der die Aufnahmekorbabdeckung seitlich an dem Aufnahmekorb, insbesondere an der Vorderwand desselben, anliegt, verschwenkbar. Der Verschwenkwinkel kann insbesondere einen beliebig gewählten Wert zwischen 270° , bei dem sich die Aufnahmekorbabdeckung in ihrer Ausgangsposition befindet, und 0° , bei dem sich die Aufnahmekorbabdeckung in ihrer Endposition befindet, annehmen. Unter einem Winkel von 0° ist ein Winkel von $0^\circ \pm 10^\circ$, bevorzugt von $0^\circ \pm 5^\circ$, weiter bevorzugt von genau 0° zu verstehen. Unter einem Winkel von 270° ist ein Winkel von $270^\circ \pm 10^\circ$, bevorzugt von $270^\circ \pm 5^\circ$, weiter bevorzugt von genau 270° zu verstehen. Unter einer „schrägen“ Positionierung der Aufnahmekorbabdeckung relativ zu der Vorderwand des Aufnahmekorbes ist vorliegend zu verstehen, dass der Verschwenkwinkel zwischen der Aufnahmekorbabdeckung und der Vorderwand größer als 0° und kleiner als 270° ist. Unter „schräg“ kann ferner zu verstehen sein, dass die Aufnahmekorbabdeckung nicht parallel zu der Vorderwand oder einem Boden des Aufnahmekorbes angeordnet ist. Insbesondere beträgt der Verschwenkwinkel in der Ausgangsposition der Aufnahmekorbabdeckung genau 270° , in der Endposition der Aufnahmekorbabdeckung beträgt der Verschwenkwinkel insbesondere genau 0° .

[0008] Mittels der Arretiereinrichtung ist die Aufnahmekorbabdeckung vorzugsweise in der gewünschten Position arretierbar. Das heißt, sowohl in einer gewünschten schrägen Position als auch in der Ausgangsposition und der Endposition. In der Ausgangsposition dient die Aufnahmekorbabdeckung dem Vereinzeln von Spülgut. In der Endposition ist die Aufnahmekorbabdeckung ohne Funktion. Ein Entfernen der Aufnahmekorbabdeckung, wenn diese nicht zum Vereinzeln des Spülgutes benötigt wird, ist nicht erforderlich. Hierdurch ist die Aufnahmekorbabdeckung unverlierbar. In beliebigen Zwischenpositionen der Aufnahmekorbabdeckung kann Spülgut auf dieser abgelegt werden oder sie kann als Stabilisator für in einer Spülgutaufnahme der Geschirrspülmaschine aufgenommenes Spülgut fungieren. Hierdurch ergibt sich ein weiterer Einsatzbereich der Besteckaufnahme. Die Spülgutaufnahme kann beispielsweise ein unterer Geschirrkorb der Geschirrspülmaschine sein.

[0009] Der Aufnahmekorb ist vorzugsweise quaderförmig. Der Aufnahmekorb weist insbesondere den Boden, zwei einander gegenüberliegend angeordnete Seitenwände, eine Rückwand und die der Rückwand gegenüberliegend angeordnete Vorderwand auf. Der Boden, die Vorderwand, die Rückwand, die Seitenwände und die Aufnahmekorbabdeckung sind vorzugsweise gitterförmig ausgebildet, so dass Spülflotte durch diese hindurch strömen kann. Der Aufnahmekorb und/oder die Aufnahmekorbabdeckung weisen vorzugsweise ein Kunststoffmaterial

auf. Das heißt, sie sind vollständig oder teilweise mit einem Kunststoffmaterial gebildet. Alternativ können der Aufnahmekorb und/oder die Aufnahmekorbabdeckung einen Metallwerkstoff aufweisen.

[0010] Gemäß einer Ausführungsform weist die Arretiereinrichtung zum Einstellen des Verschwenkwinkels eine Rasteinrichtung auf.

[0011] Die Rasteinrichtung ist insbesondere dazu eingerichtet, die Aufnahmekorbabdeckung in vorbestimmten Positionen zu verrasten. Durch die Rasteinrichtung wird die Aufnahmekorbabdeckung sicher in der gewünschten Position gehalten. Dies verhindert ein Verstellen des Verschwenkwinkels durch auf die Aufnahmekorbabdeckung aufgelegtes Spülgut oder auf die Aufnahmekorbabdeckung auftreffende Spülflotte.

[0012] Gemäß einer weiteren Ausführungsform weist die Rasteinrichtung ein Eingriffselement und ein in das Eingriffselement formschlüssig eingreifendes Gegeneingriffselement auf.

[0013] Das Eingriffselement ist vorzugsweise an der Aufnahmekorbabdeckung angebracht. Das Gegeneingriffselement ist vorzugsweise an dem Aufnahmekorb vorgesehen. Dadurch, dass das Gegeneingriffselement formschlüssig in das Eingriffselement eingreift, ist die Aufnahmekorbabdeckung sicher in der gewünschten Position arretierbar.

[0014] Gemäß einer weiteren Ausführungsform ist das Gegeneingriffselement eine an dem Aufnahmekorb angeordnete Scheibe.

[0015] Die Scheibe kann kreisrund sein. Die Scheibe kann materialeinstückig mit dem Aufnahmekorb, insbesondere mit einer der Seitenwände des Aufnahmekorbes, ausgebildet sein. Insbesondere kann beidseitig an dem Aufnahmekorb jeweils eine Scheibe vorgesehen sein. Vorzugsweise weist die Scheibe ein Kunststoffmaterial auf. Die Scheibe weist vorzugsweise eine Vielzahl Ausnehmungen wie beispielsweise Nuten, Einkerbungen oder Vertiefungen auf, die bevorzugt über einen Umfang der Scheibe verteilt, insbesondere gleichmäßig verteilt, angeordnet sind. Die Ausnehmungen weisen vorzugsweise zu einem Mittelpunkt der Scheibe hin. Insbesondere können die Ausnehmungen einen halbrunden oder dreieckförmigen Querschnitt aufweisen. Die Anzahl der Ausnehmungen bestimmt die Anzahl der möglichen Positionen der Aufnahmekorbabdeckung relativ zu dem Aufnahmekorb.

[0016] Gemäß einer weiteren Ausführungsform ist das Eingriffselement eine an der Aufnahmekorbabdeckung angeordnete Vorwölbung.

[0017] Vorzugsweise ist die Vorwölbung materialeinstückig mit der Aufnahmekorbabdeckung ausgebildet. Die Vorwölbung ist bevorzugt an einer Schmalseite der Aufnahmekorbabdeckung angeordnet. Die Vorwölbung ist korrespondierend zu den Ausnehmungen der Scheibe ausgebildet. Insbesondere kann an zwei gegenüberliegenden Schmalseiten der Aufnahmekorbabdeckung jeweils eine Scheibe vorgesehen sein.

[0018] Gemäß einer weiteren Ausführungsform ist das Gegeneingriffselement ein an dem Aufnahmekorb angeordneter Schapphaken und das Eingriffselement ist eine an der Aufnahmekorbabdeckung angeordnete Zahnstange, in die der Schnapphaken formschlüssig eingreift.

[0019] Der Schnapphaken ist vorzugsweise verschwenkbar an dem Aufnahmekorb angeordnet. Der Schnapphaken kann ein Kunststoffmaterial aufweisen. Der Schnapphaken greift insbesondere formschlüssig und lösbar in das Eingriffselement ein. Dies ermöglicht eine schnelle Verstellbarkeit des Verschwenkwinkels. Die Zahnstange ist vorzugsweise relativ zu der Aufnahmekorbabdeckung verschwenkbar. Insbesondere weist die Zahnstange ein Kunststoffmaterial auf. Der Schnapphaken greift vorzugsweise zwischen zwei Zähne der Zahnstange ein.

[0020] Gemäß einer weiteren Ausführungsform ist zum Stabilisieren von sich in einer Spülgutaufnahme der Geschirrspülmaschine befindlichem Spülgut an einer Seitenkante der Aufnahmekorbabdeckung zumindest eine, insbesondere rechteckförmige, halbkreisförmige, zylinderförmige, stiftförmige, stachelförmige oder dreieckförmige, Anlagekontur vorgesehen.

[0021] Die Spülgutaufnahme kann ein unterer Geschirrkorb der Geschirrspülmaschine sein. Die zumindest eine Anlagekontur ist insbesondere materialeinstückig mit der Aufnahmekorbabdeckung ausgebildet. Mittels der Anlagekontur kann sich in der Spülgutaufnahme der Geschirrspülmaschine befindliches Spülgut, wie beispielsweise Teller oder Stielgläser stabilisiert werden. Vorzugsweise kann die Aufnahmekorbabdeckung eine Vielzahl nebeneinander, insbesondere benachbart zueinander, angeordneter Anlagekonturen aufweisen.

[0022] Gemäß einer weiteren Ausführungsform weist die Arretiereinrichtung zum Einstellen des Verschwenkwinkels eine Reibungseinrichtung auf.

[0023] Mittels der Reibungseinrichtung ist der Verschwenkwinkel beliebig einstellbar. Hierdurch ist die Besteckaufnahme für unterschiedlichste Arten von Spülgut verwendbar. Dies erweitert das Einsatzgebiet der Besteckaufnahme.

[0024] Gemäß einer weiteren Ausführungsform weist die Reibungseinrichtung eine Reibfläche und einen auf der Reibfläche reibungsbehaftet verlagerbaren Reibkörper auf.

[0025] Der Reibkörper kann ein Kunststoffblock sein. Vorzugsweise ist der Reibkörper an der Aufnahmekorbabdeckung, insbesondere an einer Schmalseite derselben, angebracht. Der Reibkörper kann materialeinstückig mit der Aufnahmekorbabdeckung ausgebildet sein. Die Reibfläche ist vorzugsweise an dem Aufnahmekorb, insbesondere an einer der Seitenwände des Aufnahmekorbes, angeordnet. Insbesondere kann an den Seitenwänden jeweils eine Reibfläche vorgesehen sein. Die Reibfläche kann materialeinstückig mit dem Aufnahmekorb ausgebildet sein. Vorzugsweise ist die Reibfläche eine Scheibe, insbesondere eine Kunststoffscheibe. Die Scheibe ist insbesondere kreisrund.

[0026] Gemäß einer weiteren Ausführungsform ist die Reibung zwischen der Reibfläche und dem Reibkörper einstellbar.

[0027] Hierzu kann die Reibungseinrichtung ein Einstellelement aufweisen. Mittels des Einstellelementes ist die Reibfläche vorzugsweise gegen den Reibkörper pressbar. Insbesondere ist mittels der Reibungseinrichtung eine Anpresskraft zwischen der Reibfläche und dem Reibkörper beliebig einstellbar. Mittels des Einstellelementes ist die Aufnahmekorbabdeckung ferner in ihrer gewünschten Position arretierbar. Das Einstellelement kann beispielsweise eine Schraube sein.

[0028] Gemäß einer weiteren Ausführungsform ist die Aufnahmekorbabdeckung mittels einer Scharniereinrichtung relativ zu dem Aufnahmekorb verschwenkbar.

[0029] Vorzugsweise sind zwei Scharniereinrichtungen vorgesehen. Die Scharniereinrichtungen verbinden die Aufnahmekorbabdeckung verschwenkbar mit dem Aufnahmekorb.

[0030] Gemäß einer weiteren Ausführungsform ist die Arretiereinrichtung in die Scharniereinrichtung integriert.

[0031] Hierdurch ergibt sich ein besonders kompakter Aufbau der Arretiereinrichtung.

[0032] Gemäß einer weiteren Ausführungsform sind auf einer Rückseite der Aufnahmekorbabdeckung Halteelemente zum Halten von Spülgut vorgesehen.

[0033] Die Halteelemente sind vorzugsweise dazu eingerichtet, dass diese auf der Rückseite der Aufnahmekorbabdeckung abgelegtes Spülgut aufnehmen und/oder in dieses formschlüssig eingreifen,

um ein Abrutschen des Spülgutes von der Aufnahmekorbabdeckung zu verhindern. Die Halteelemente können beispielsweise als prismenförmige, pyramidenförmige, halbkugelförmige, zylinderförmige oder quaderförmige Vorwölbungen der Aufnahmekorbabdeckung ausgebildet sein. Insbesondere können die Halteelemente als sich aus der Rückseite der Aufnahmekorbabdeckung heraus erstreckende Dorne, Stacheln oder dergleichen ausgebildet sein. Auf der Rückseite können eine Vielzahl Halteelemente mit unterschiedlichen Geometrien vorgesehen sein. Die Halteelemente können regelmäßig, insbesondere rasterförmig, angeordnet sein. Mittels der Halteelemente ist die Rückseite der Aufnahmekorbabdeckung zum Ablegen von Spülgut nutzbar. Hierdurch kann die Besteckaufnahme mehr Spülgut aufnehmen.

[0034] Gemäß einer weiteren Ausführungsform ist der Verschwenkwinkel derart einstellbar, dass die Halteelemente von dem Aufnahmekorb weg nach oben weisen.

[0035] Der Verschwenkwinkel ist ferner derart einstellbar, dass die Halteelemente in den Aufnahmekorb hineinragen.

[0036] Weiterhin wird eine Geschirrspülmaschine mit einer derartigen Besteckaufnahme vorgeschlagen.

[0037] Die Geschirrspülmaschine ist insbesondere ein Haushaltsgerät.

[0038] Weitere mögliche Implementierungen der Erfindung umfassen auch nicht explizit genannte Kombinationen von zuvor oder im Folgenden bezüglich der Ausführungsbeispiele beschriebenen Merkmale oder Ausführungsformen. Dabei wird der Fachmann auch Einzelaspekte als Verbesserungen oder Ergänzungen zu der jeweiligen Grundform der Erfindung hinzufügen.

[0039] Weitere vorteilhafte Ausgestaltungen und Aspekte der Erfindung sind Gegenstand der Unteransprüche sowie der im Folgenden beschriebenen Ausführungsbeispiele der Erfindung. Im Weiteren wird die Erfindung anhand von bevorzugten Ausführungsformen unter Bezugnahme auf die beigelegten Figuren näher erläutert.

[0040] Fig. 1 zeigt eine schematische perspektivische Ansicht einer Ausführungsform einer Besteckaufnahme für eine Geschirrspülmaschine;

[0041] Fig. 2 zeigt eine schematische Aufsicht einer Aufnahmekorbabdeckung der Besteckaufnahme gemäß der Fig. 1;

[0042] Fig. 3 zeigt eine schematische Seitenansicht der Besteckaufnahme gemäß der Fig. 1;

[0043] Fig. 4 zeigt eine schematische Seitenansicht einer Ausführungsform einer Rasteinrichtung der Besteckaufnahme gemäß der Fig. 1;

[0044] Fig. 5 zeigt eine schematische Seitenansicht einer weiteren Ausführungsform einer Rasteinrichtung der Besteckaufnahme gemäß der Fig. 1;

[0045] Fig. 6 zeigt eine schematische Seitenansicht einer weiteren Ausführungsform einer Rasteinrichtung der Besteckaufnahme gemäß der Fig. 1;

[0046] Fig. 7 zeigt eine schematische Vorderansicht der Rasteinrichtung gemäß der Fig. 6;

[0047] Fig. 8 zeigt eine schematische Seitenansicht einer weiteren Ausführungsform einer Rasteinrichtung der Besteckaufnahme gemäß der Fig. 1;

[0048] Fig. 9 zeigt eine schematische Vorderansicht der Rasteinrichtung gemäß der Fig. 8;

[0049] Fig. 10 zeigt eine schematische perspektivische Ansicht einer Ausführungsform einer Arretiereinrichtung der Besteckaufnahme gemäß der Fig. 1;

[0050] Fig. 11 zeigt eine weitere schematische perspektivische Ansicht der Arretiereinrichtung der Besteckaufnahme gemäß der Fig. 10;

[0051] Fig. 12 zeigt eine schematische perspektivische Ansicht einer weiteren Ausführungsform einer Arretiereinrichtung der Besteckaufnahme gemäß der Fig. 1;

[0052] Fig. 13 zeigt eine weitere schematische perspektivische Ansicht der Arretiereinrichtung der Besteckaufnahme gemäß der Fig. 12; und

[0053] Fig. 14 zeigt eine schematische perspektivische Ansicht einer weiteren Ausführungsform einer Besteckaufnahme für eine Geschirrspülmaschine.

[0054] In den Figuren sind gleiche oder funktionsgleiche Elemente mit denselben Bezugszeichen versehen worden, sofern nichts anderes angegeben ist.

[0055] Die Fig. 1 zeigt eine Besteckaufnahme 1 für eine Geschirrspülmaschine 2. Die Geschirrspülmaschine 2 ist vorzugsweise ein Haushaltsgerät. Die Besteckaufnahme 1 weist einen Aufnahmekorb 3 auf. Der Aufnahmekorb 3 weist vorzugsweise ein Kunststoffmaterial auf. Das heißt, der Aufnahmekorb 3 ist vollständig oder teilweise mit einem Kunststoffmaterial gebildet. Der Aufnahmekorb 3 kann ferner einen Metallwerkstoff aufweisen. Der Aufnahmekorb 3 weist eine Quaderform mit einem Boden 4, zwei ein-

ander gegenüberliegenden Seitenwänden 5, 6, einer Vorderwand 7 und einer der Vorderwand 7 gegenüberliegenden Rückwand 8 auf. Die Rückwand 8 ragt vorzugsweise über die Seitenwände 5, 6 und die Vorderwand 7 hinaus und weist einen Handgriff 9 auf. Der Handgriff 9 ist vorzugsweise als ein Durchbruch der Rückwand 8 ausgebildet. Der Boden 4, die Seitenwände 5, 6, die Vorderwand 7 und die Rückwand 8 sind vorzugsweise gitterförmig ausgebildet. Das heißt, Spülflotte kann durch den Boden 4, die Seitenwände 5, 6, die Vorderwand 7 und die Rückwand 8 strömen. Der Aufnahmekorb 3 kann material-einstückig ausgebildet sein.

[0056] Ferner kann der Aufnahmekorb 3 eine beliebige Anzahl Zwischenwände 10–12 aufweisen. Vorzugsweise weist der Aufnahmekorb 3 drei Zwischenwände 10–12 auf. Die Zwischenwände 10–12 sind vorzugsweise parallel zu den Seitenwänden 5, 6 und beabstandet von diesen angeordnet. Die Zwischenwände 10–12 sind beabstandet voneinander angeordnet. Die Zwischenwände 10–12 können materialeinstückig mit dem Aufnahmekorb 3 ausgebildet sein. Alternativ können die Zwischenwände 10–12 aus dem Aufnahmekorb 3 entnehmbar und in beliebiger Position wieder in diesen einsteckbar sein. Die Zwischenwände 10–12 sind vorzugsweise gitterförmig ausgebildet. Die Zwischenwände können ein Kunststoffmaterial und/oder einen Metallwerkstoff aufweisen.

[0057] Die Besteckaufnahme 1 weist ferner eine relativ zu dem Aufnahmekorb 3 verschwenkbare Aufnahmekorbabdeckung 13 auf. Die Aufnahmekorbabdeckung 13 weist vorzugsweise eine Rechteckform auf und ist insbesondere an einer Langseite verschwenkbar an dem Aufnahmekorb 3, insbesondere an der Vorderwand 7 des Aufnahmekorbes 3, angebracht. Vorzugsweise ist die Aufnahmekorbabdeckung 13 an einer Oberkante der Vorderwand 7 verschwenkbar angebracht. Die Aufnahmekorbabdeckung 13 ist insbesondere um eine Schwenkachse 14 relativ zu dem Aufnahmekorb 3 verschwenkbar. Die Aufnahmekorbabdeckung 13 kann mit zumindest einer Scharniereinrichtung 15, 16, insbesondere mit zwei Scharniereinrichtungen 15, 16, an dem Aufnahmekorb 3 verschwenkbar angebracht sein. Die Aufnahmekorbabdeckung 13 kann ein Kunststoffmaterial und/oder einen Metallwerkstoff aufweisen. Die Aufnahmekorbabdeckung 13 ist vorzugsweise gitterförmig ausgebildet, so dass Spülflotte durch die Aufnahmekorbabdeckung 13 hindurchströmen kann.

[0058] Die Aufnahmekorbabdeckung 13 kann an einer der Schwenkachse 14 abgewandten Seitenkante 17 zumindest eine Anlagekontur 18 aufweisen. Vorzugsweise kann die Aufnahmekorbabdeckung 13 eine Vielzahl nebeneinander, insbesondere benachbart zueinander, angeordneter Anlagekonturen 18 aufweisen. Die zumindest eine Anlagekontur 18 ist

dazu eingerichtet, Spülgut **19** wie beispielsweise Stielgläser, Teller, Besteck, Küchenmesser oder dergleichen zumindest abschnittsweise aufzunehmen und/oder zu umgreifen.

[0059] Die **Fig. 2** zeigt schematisch unterschiedliche Ausführungsformen der zumindest einen Anlagekontur **18**. Die zumindest eine Anlagekontur **18** kann beispielsweise als eine rechteckige, halbkreisförmige, abgerundete oder dreieckige Ausnehmung oder Nut in der Seitenkante **17** der Aufnahmekorbabdeckung **13** ausgebildet sein. Alternativ kann die Anlagekontur **18** eine beliebige Geometrie aufweisen. Die zumindest eine Anlagekontur **18** kann ferner als eine rechteckige, halbkreisförmige, abgerundete oder dreieckige Vorwölbung der Seitenkante **17** ausgebildet sein. Die Geometrie der Vorwölbung ist beliebig. Die zumindest eine Anlagekontur **18** kann ferner als sich aus der Seitenkante **17** der Aufnahmekorbabdeckung **13** erstreckender Dorn, Zylinder, Stachel, Stift oder dergleichen ausgebildet sein. An der Seitenkante **17** der Aufnahmekorbabdeckung **13** können unterschiedliche Anlagekonturen **18** nebeneinander angeordnet sein.

[0060] Die Aufnahmekorbabdeckung **13** weist, wie die **Fig. 1** zeigt, eine Rückseite **20** und eine Vorderseite **21** auf. An der Rückseite **20** ist vorzugsweise zumindest ein sich aus der Rückseite **20** heraus erstreckendes Halteelement **22** vorsehen. Das zumindest eine Halteelement **22** ist vorzugsweise material-einstückig mit der Aufnahmekorbabdeckung **13** ausgebildet. Insbesondere kann die Aufnahmekorbabdeckung **13** eine Vielzahl nebeneinander, insbesondere benachbart zueinander, angeordneter Halteelemente **22** aufweisen. Das zumindest eine Halteelement **22** ist dazu eingerichtet, dass es auf der Rückseite **20** der Aufnahmekorbabdeckung **13** abgelegtes Spülgut **19** aufnimmt und/oder in dieses formschlüssig eingreift, um ein Abrutschen des Spülgutes **19** von der Aufnahmekorbabdeckung **13** zu verhindern. Das zumindest eine Halteelement **22** kann beispielsweise als eine prismenförmige, pyramidenförmige, halbkugelförmige, zylinderförmige oder quaderförmige Vorwölbung der Aufnahmekorbabdeckung **13** ausgebildet sein. Die Geometrie des zumindest einen Halteelementes **22** ist beliebig. Insbesondere kann das zumindest eine Halteelement **22** als ein sich aus der Rückseite **20** der Aufnahmekorbabdeckung **13** heraus erstreckender Dorn, Stachel oder dergleichen ausgebildet sein. Auf der Rückseite **20** können eine Vielzahl Halteelemente **22** mit insbesondere unterschiedlichen oder gleichen Geometrien vorgesehen sein. Die Halteelemente **22** können regelmäßig, insbesondere rasterförmig, angeordnet sein.

[0061] Die Besteckaufnahme **1** kann ferner eine Arretiereinrichtung **23, 24** aufweisen. Beispielsweise kann die Besteckaufnahme **1** zwei jeweils an einem Randbereich der Aufnahmekorbabdeckung **13** ange-

ordnete Arretiereinrichtungen **23, 24** aufweisen. Vorzugsweise weist die Besteckaufnahme **1** genau eine Arretiereinrichtung **23, 24** auf. Die genau eine Arretiereinrichtung **23, 24** ist vorzugsweise seitlich an dem Aufnahmekorb **3** und/oder seitlich an der Aufnahmekorbabdeckung **13** angeordnet.

[0062] Wie die **Fig. 3** zeigt, ist die Arretiereinrichtung **23, 24** dazu eingerichtet, die Aufnahmekorbabdeckung **13** so zu arretieren, dass diese in zumindest einem Verschwenkwinkel α_2, α_3 relativ zu dem Aufnahmekorb **3** schräg positionierbar ist. Der Verschwenkwinkel α_2, α_3 ist jeweils definiert als ein Winkel zwischen der Vorderwand **7** des Aufnahmekorbes **3** und der Aufnahmekorbabdeckung **13**. Der Verschwenkwinkel α_2, α_3 kann vorzugsweise wahlweise einen beliebigen Wert zwischen 0° , bei dem die Aufnahmekorbabdeckung **13** vollständig von dem Aufnahmekorb **3** weggeklappt ist und auf der Vorderwand **7** aufliegt, und 270° annehmen, bei dem die Aufnahmekorbabdeckung **13** vollständig auf den Aufnahmekorb **3** geklappt ist und auf diesem aufliegt und diesen nach oben hin abschließt. Unter „schräg“ ist vorliegend insbesondere zu verstehen, dass der Verschwenkwinkel α_2, α_3 einen beliebigen Wert von größer 0° und kleiner 270° annimmt.

[0063] Die **Fig. 3** zeigt die Aufnahmekorbabdeckung **13** in einer ersten oder Ausgangsposition P_1 , in der ein Verschwenkwinkel α_1 270° beträgt und die Aufnahmekorbabdeckung **13** auf dem Aufnahmekorb **3** aufliegt und diesen nach oben hin abschließt. In dieser Position P_1 ist die Aufnahmekorbabdeckung **13** dazu geeignet, in den Aufnahmekorb **3** von oben eingestecktes Spülgut **19**, wie beispielsweise Besteck derart zu vereinzeln, dass dieses trocknet, ohne dass Wasserflecken auf diesem zurückbleiben. In der Position P_1 weisen die Halteelemente **22** der Aufnahmekorbabdeckung **13** nach unten zu dem Aufnahmekorb **3** hin. In einer Endposition der Aufnahmekorbabdeckung **13** liegt diese an dem Aufnahmekorb **3**, insbesondere an der Vorderwand **7**, an. In der Endposition beträgt der Verschwenkwinkel α_1 vorzugsweise 0° . Die **Fig. 3** zeigt mit gestrichelten Linien zwei weitere beispielhafte schräge Positionen P_2 mit dem Verschwenkwinkel α_2 und P_3 mit dem Verschwenkwinkel α_3 der Aufnahmekorbabdeckung **13**. Die Aufnahmekorbabdeckung **13** ist wahlweise in beliebig viele Positionen P_1, P_2, P_3 relativ zu dem Aufnahmekorb **3** verschwenkbar. Der Verschwenkwinkel α_2, α_3 ist insbesondere derart einstellbar, dass die Halteelemente **22** der Aufnahmekorbabdeckung von dem Aufnahmekorb weg nach oben weisen. Die Arretiereinrichtung **23, 24** kann in eine oder in beide der Scharniereinrichtungen **15, 16** integriert sein.

[0064] Die Arretiereinrichtung **23, 24** kann eine Rasteinrichtung **25** aufweisen. Die Rasteinrichtung **25** ist dazu eingerichtet, die Aufnahmekorbabdeckung **13** in

vorbestimmten Verschwenkwinkeln α_1 , α_2 , α_3 zu ver-rasten.

[0065] Die **Fig. 4** zeigt eine erste Ausführungsform der Rasteinrichtung **25**. Die Rasteinrichtung **25** kann ein Eingriffselement **26** und ein dazu korrespondierendes Gegeneingriffselement **27** aufweisen. Das Gegeneingriffselement **27** kann eine an dem Auf-nahmekorb **3**, insbesondere an der Vorderwand **7** des Aufnahmekorbes **3**, angebrachte Rastschiene mit mehreren nebeneinander angeordneten Ausnehmungen oder Kerben sein. Die Rastschiene kann integral mit dem Aufnahmekorb **3** ausgebildet sein. In die Rastschiene, insbesondere in eine der Ausnehmungen der Rastschiene, greift das Eingriffselement **26** formschlüssig ein. Das Eingriffselement **26** kann beispielsweise als eine verschwenkbar an der Auf-nahmekorbaddeckung **13** angebrachte Stange ausgebildet sein. Je nachdem, in welche der Ausnehmungen die Stange eingreift ist die Aufnahmekorbad-deckung **13** in unterschiedlichen Verschwenkwinkeln α_1 , α_2 , α_3 relativ zu dem Aufnahmekorb **3** angeordnet.

[0066] Die **Fig. 5** zeigt eine weitere Ausführungsform der Rasteinrichtung **25**. Das Eingriffselement **26** kann als an der Aufnahmekorbaddeckung **13** verschwenkbar angebrachte Zahnstange ausgebildet sein. In die Zahnstange greift formschlüssig das als ein Schnapphaken ausgebildete Gegeneingriffselement **27** ein. Der Schnapphaken ist an dem Auf-nahmekorb **3**, insbesondere an einer der Seitenwände **5**, **6**, verschwenkbar angebracht.

[0067] Die **Fig. 6** und **Fig. 7** zeigen eine weitere Ausführungsform der Rasteinrichtung **25**. Das Eingriffselement **26** kann als eine an der Aufnahmekorbad-deckung **13** angeordnete Vorwölbung ausgebildet sein. Die Vorwölbung ist insbesondere materialeinstückig mit der Aufnahmekorbaddeckung **13** ausgeführt. Die Vorwölbung ist insbesondere an einer Schmalseite der Aufnahmekorbaddeckung **13** angeordnet und kann einen dreieckförmigen Querschnitt aufweisen. Das Gegeneingriffselement **27** ist vorzugsweise als eine an dem Aufnahmekorb **3**, insbesondere an einer der Seitenwände **5**, **6** des Aufnahmekorbes **3**, angeordnete Scheibe ausgebildet. An beiden Seitenwänden **5**, **6** kann jeweils eine Scheibe vorgesehen sein. Die Scheibe ist vorzugsweise materialeinstückig mit dem Aufnahmekorb **3** ausgeführt. Die Scheibe weist vorzugsweise eine Vielzahl zu der Vorwölbung der Aufnahmekorbaddeckung korrespondierend ausgebildete Nuten oder Kerben auf. Hierdurch können vorbestimmte Verschwenkwinkel α_1 , α_2 , α_3 eingestellt werden.

[0068] Die **Fig. 8** und **Fig. 9** zeigen eine weitere Ausführungsform der Rasteinrichtung **25**. Die Ausführungsform der Rasteinrichtung **25** gemäß der **Fig. 8** und **Fig. 9** unterscheidet sich von der Ausführungsform der Rasteinrichtung **25** gemäß der **Fig. 6**

und **Fig. 7** lediglich dadurch, dass das Eingriffselement **26** als halbkugelförmige Vorwölbung ausgebildet ist. Das Gegeneingriffselement **27** ist bevorzugt als Scheibe mit korrespondierenden halbkugelförmigen Vertiefungen oder Kerben ausgebildet. Die Vorwölbung und die korrespondierenden Vertiefungen des Gegeneingriffselementes **27** können beliebige Geometrien aufweisen.

[0069] Die **Fig. 10** und **Fig. 11** zeigen eine bevorzugte Ausführungsform der Arretiereinrichtung **23**, **24**. Vorzugsweise ist an gegenüberliegenden Schmalseiten der Aufnahmekorbaddeckung **13** jeweils eine Arretiereinrichtung **23**, **24** vorgesehen. Die Arretiereinrichtungen **23**, **24** sind vorzugsweise als außenliegende Scharniere ausgebildet, die dazu eingerichtet sind, die Aufnahmekorbaddeckung **13** zu stützen. Wenn die Aufnahmekorbaddeckung **13** von dem Auf-nahmekorb **3** weggeschwenkt ist, sind die Arretiereinrichtungen **23**, **24** mit einer Druckkraft belastet. Die Arretiereinrichtungen **23**, **24** können jeweils eine Rasteinrichtung **25** aufweisen.

[0070] Die **Fig. 12** und **Fig. 13** zeigen eine weitere bevorzugte Ausführungsform der Arretiereinrichtung **23**, **24**. Vorzugsweise ist an gegenüberliegenden Schmalseiten der Aufnahmekorbaddeckung **13** jeweils eine Arretiereinrichtung **23**, **24** vorgesehen. Die Arretiereinrichtungen **23**, **24** sind vorzugsweise als innenliegende Scharniere ausgebildet, die dazu eingerichtet sind, die Aufnahmekorbaddeckung **13** zu stützen. Wenn die Aufnahmekorbaddeckung **13** von dem Aufnahmekorb **3** weggeschwenkt ist, sind die Arretiereinrichtungen **23**, **24** mit einer Zugkraft belastet. Die Arretiereinrichtungen **23**, **24** können jeweils eine Rasteinrichtung **25** aufweisen.

[0071] Die **Fig. 14** zeigt eine weitere Ausführungsform der Besteckaufnahme **1**. Die Arretiereinrichtung **23**, **24** weist zum Einstellen beliebiger Verschwenkwinkel α_1 , α_2 , α_3 vorzugsweise eine Reibungseinrichtung **28** auf. Die Reibungseinrichtung **28** kann eine Reibfläche **29** aufweisen. Die Reibfläche **29** ist vorzugsweise an dem Aufnahmekorb **3**, insbesondere an einer der Seitenwände **5**, **6** des Aufnahmekorbes **3** angebracht. Die Reibfläche **29** kann integral mit dem Aufnahmekorb **3** ausgebildet sein. Alternativ kann die Reibfläche **29** lösbar mit dem Aufnahmekorb **3** verbunden, beispielsweise verschraubt sein. Die Reibfläche **29** kann beispielsweise als Kunststoffscheibe ausgebildet sein.

[0072] Die Reibungseinrichtung **28** weist ferner einen auf der Reibfläche **29** reibungsbehaftet verlagerbaren Reibkörper **30** auf. Der Reibkörper **30** kann beispielsweise ein Kunststoffblock sein. Vorzugsweise ist der Reibkörper **30** integral mit der Aufnahmekorbaddeckung **13** ausgebildet. Die Reibung zwischen der Reibfläche **29** und dem Reibkörper **30** ist vorzugsweise einstellbar. Hierzu kann die Reibungsein-

richtung **28** beispielsweise ein Einstellelement **31** aufweisen. Das Einstellelement **31** kann eine Schraube sein, mit der die Reibfläche **29** gegen den Reibkörper **30** pressbar ist. Mittels des Einstellelementes **31** kann die Aufnahmekorbabdeckung **13** in der gewünschten Position P_1 , P_2 , P_3 relativ zu dem Aufnahmekorb **3** fixiert werden.

[0073] Obwohl die vorliegende Erfindung anhand von Ausführungsbeispielen beschrieben wurde, ist sie vielfältig modifizierbar.

Bezugszeichenliste

1	Besteckaufnahme
2	Geschirrspülmaschine
3	Aufnahmekorb
4	Boden
5	Seitenwand
6	Seitenwand
7	Vorderwand
8	Rückwand
9	Handgriff
10	Zwischenwand
11	Zwischenwand
12	Zwischenwand
13	Aufnahmekorbabdeckung
14	Schwenkachse
15	Scharniereinrichtung
16	Scharniereinrichtung
17	Seitenkante
18	Anlagekontur
19	Spülgut
20	Rückseite
21	Vorderseite
22	Halteelement
23	Arretiereinrichtung
24	Arretiereinrichtung
25	Rasteinrichtung
26	Eingriffselement
27	Gegeneingriffselement
28	Reibungseinrichtung
29	Reibfläche
30	Reibkörper
31	Einstellelement
P_1	Position
P_2	Position
P_3	Position
α_1	Verschwenkwinkel
α_2	Verschwenkwinkel
α_3	Verschwenkwinkel

ZITATE ENTHALTEN IN DER BESCHREIBUNG

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Zitierte Patentliteratur

- US 7861883 B2 [0003]
- EP 1256309 B1 [0004]

Patentansprüche

1. Besteckaufnahme (1) für eine Geschirrspülmaschine (2), mit einem Aufnahmekorb (3), einer relativ zu dem Aufnahmekorb (3) verschwenkbaren Aufnahmekorbabdeckung (13), und einer Arretiereinrichtung (23, 24), die dazu eingerichtet ist, die Aufnahmekorbabdeckung (13) derart zu arretieren, dass diese in zumindest einem Verschwenkwinkel (α_2 , α_3) relativ zu einer Vorderwand (7) des Aufnahmekorbes (3) schräg positionierbar ist.

2. Besteckaufnahme nach Anspruch 1, **dadurch gekennzeichnet**, dass die Arretiereinrichtung (23, 24) zum Einstellen des Verschwenkwinkels (α_2 , α_3) eine Rasteinrichtung (25) aufweist.

3. Besteckaufnahme nach Anspruch 2, **dadurch gekennzeichnet**, dass die Rasteinrichtung (25) ein Eingriffselement (26) und ein in das Eingriffselement (26) formschlüssig eingreifendes Gegeneingriffselement (27) aufweist.

4. Besteckaufnahme nach Anspruch 3, **dadurch gekennzeichnet**, dass das Gegeneingriffselement (27) eine an dem Aufnahmekorb (3) angeordnete Scheibe ist.

5. Besteckaufnahme nach Anspruch 3 oder 4, **dadurch gekennzeichnet**, dass das Eingriffselement (26) eine an der Aufnahmekorbabdeckung (13) angeordnete Vorwölbung ist.

6. Besteckaufnahme nach Anspruch 3, **dadurch gekennzeichnet**, dass das Gegeneingriffselement (27) ein an dem Aufnahmekorb (3) angeordneter Schnapphaken ist, und dass das Eingriffselement (26) eine an der Aufnahmekorbabdeckung (13) angeordnete Zahnstange ist, in die der Schnapphaken formschlüssig eingreift.

7. Besteckaufnahme nach einem der Ansprüche 1–6, **dadurch gekennzeichnet**, dass zum Stabilisieren von sich in einer Spülgutaufnahme der Geschirrspülmaschine (2) befindlichem Spülgut (19) an einer Seitenkante (17) der Aufnahmekorbabdeckung (13) zumindest eine, insbesondere rechteckförmige, halbkreisförmige, zylinderförmige, stiftförmige, stachelförmige oder dreieckförmige, Anlagekontur (18) vorgesehen ist.

8. Besteckaufnahme nach Anspruch 1, **dadurch gekennzeichnet**, dass die Arretiereinrichtung (23, 24) zum Einstellen des Verschwenkwinkels (α_2 , α_3) eine Reibungseinrichtung (28) aufweist.

9. Besteckaufnahme nach Anspruch 8, **dadurch gekennzeichnet**, dass die Reibungseinrichtung (28) eine Reibfläche (29) und einen auf der Reibfläche

(29) reibungsbehaftet verlagerbaren Reibkörper (30) aufweist.

10. Besteckaufnahme nach Anspruch 9, **dadurch gekennzeichnet**, dass die Reibung zwischen der Reibfläche (29) und dem Reibkörper (30) einstellbar ist.

11. Besteckaufnahme nach einem der Ansprüche 1–10, **dadurch gekennzeichnet**, dass die Aufnahmekorbabdeckung (13) mittels einer Scharniereinrichtung (15, 16) relativ zu dem Aufnahmekorb (3) verschwenkbar ist.

12. Besteckaufnahme nach Anspruch 11, **dadurch gekennzeichnet**, dass die Arretiereinrichtung (23, 24) in die Scharniereinrichtung (15, 16) integriert ist.

13. Besteckaufnahme nach einem der Ansprüche 1–12, **dadurch gekennzeichnet**, dass auf einer Rückseite (20) der Aufnahmekorbabdeckung (13) Halteelemente (22) zum Halten von Spülgut (19) vorgesehen sind.

14. Besteckaufnahme nach Anspruch 13, **dadurch gekennzeichnet**, dass der Verschwenkwinkel (α_2 , α_3) derart einstellbar ist, dass die Halteelemente (22) von dem Aufnahmekorb (13) weg nach oben weisen.

15. Geschirrspülmaschine (2), mit einer Besteckaufnahme (1) nach einem der Ansprüche 1–14.

Es folgen 8 Seiten Zeichnungen

Anhängende Zeichnungen

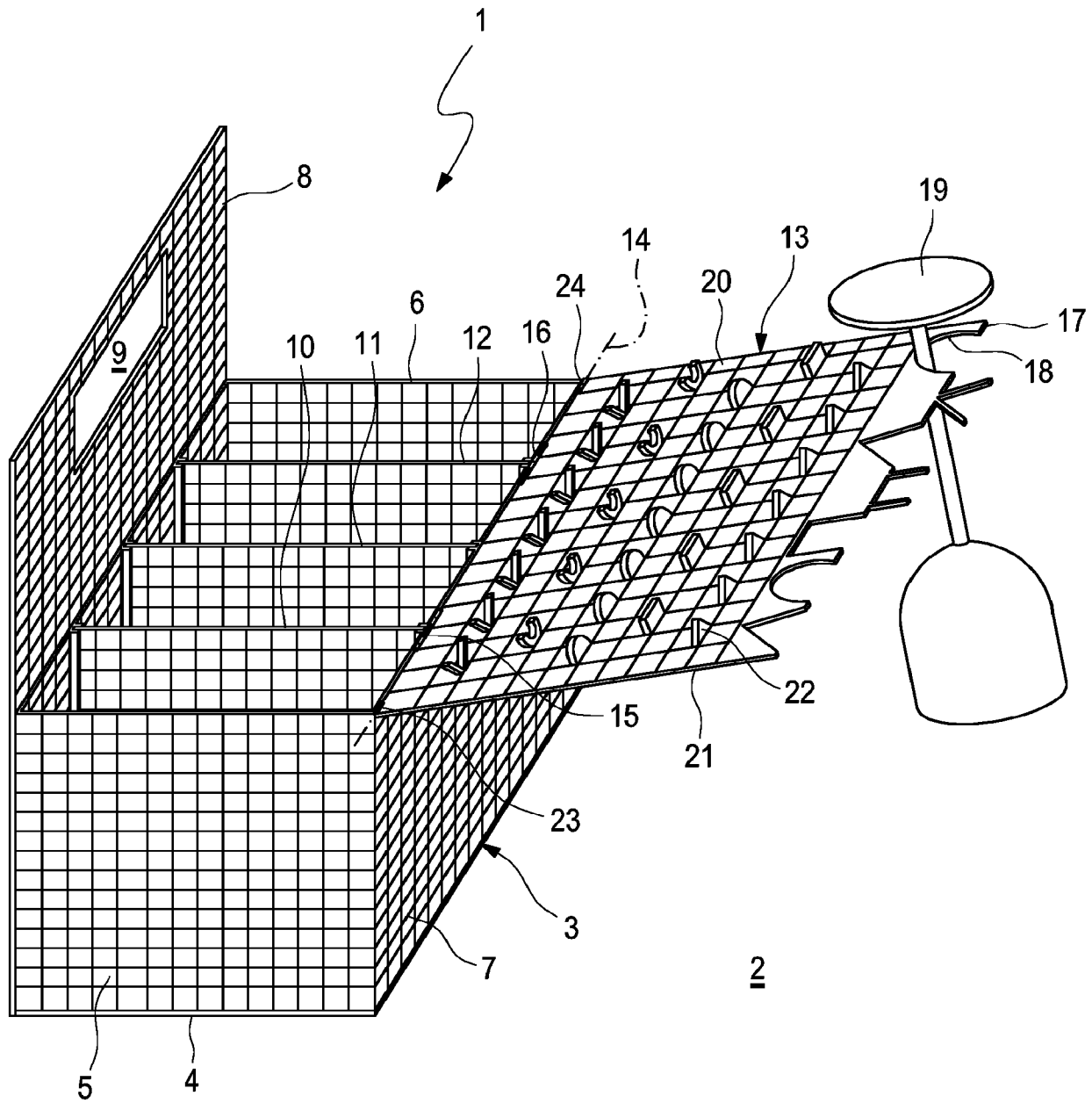


Fig. 1

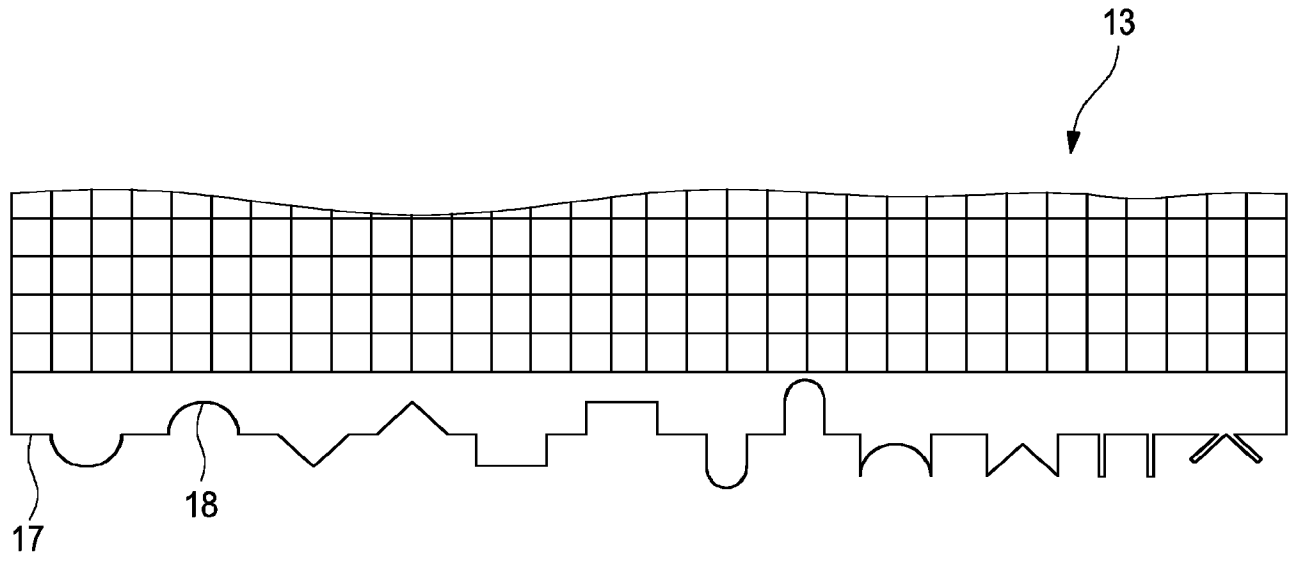


Fig. 2

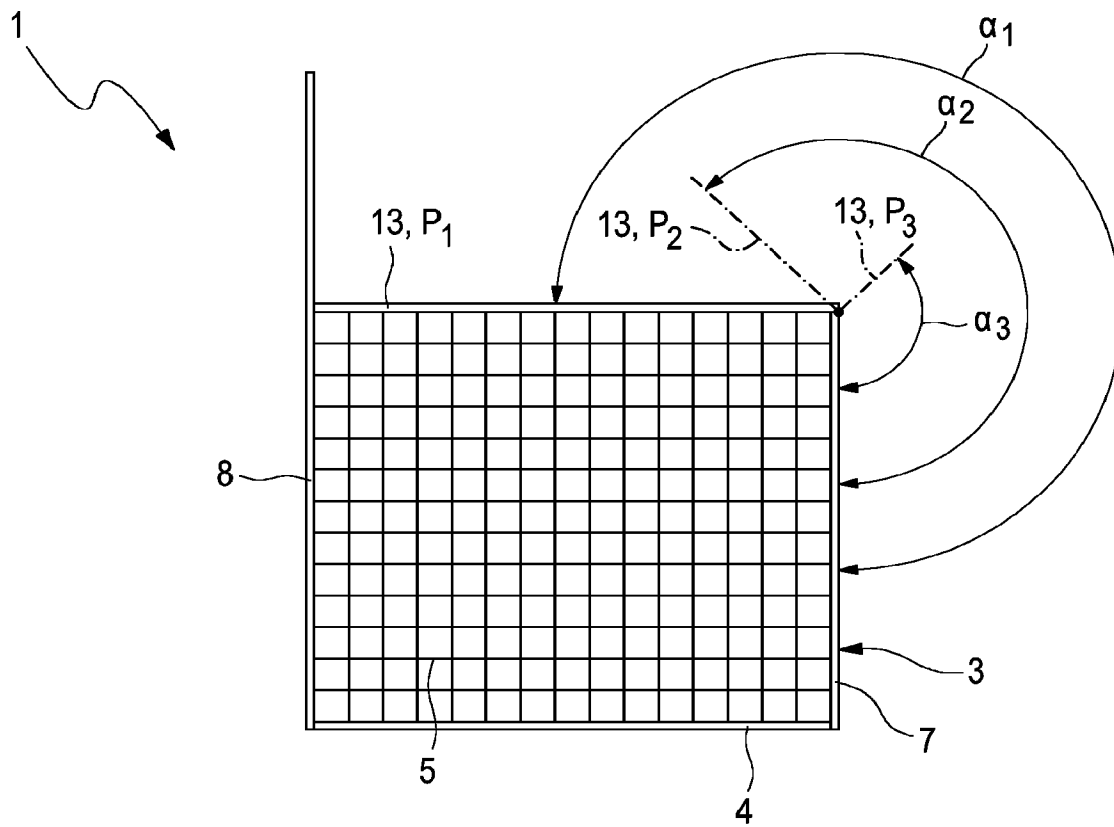


Fig. 3

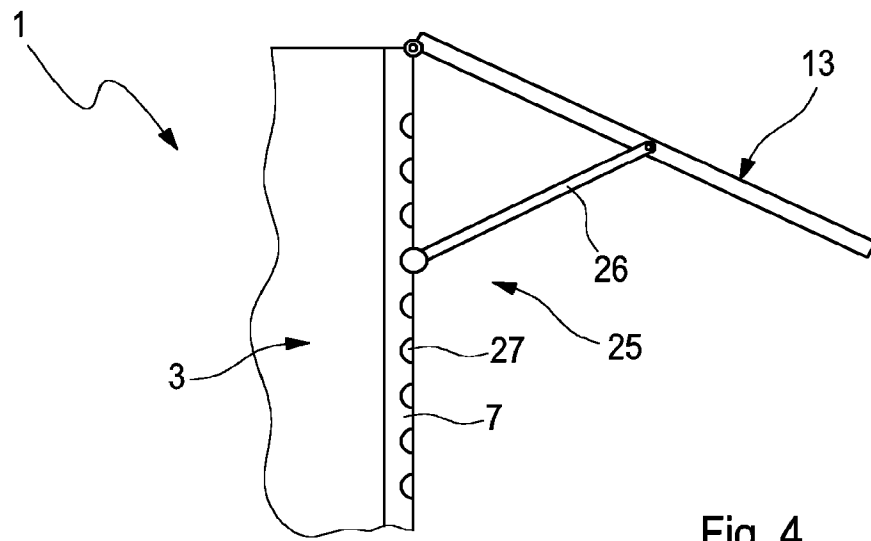


Fig. 4

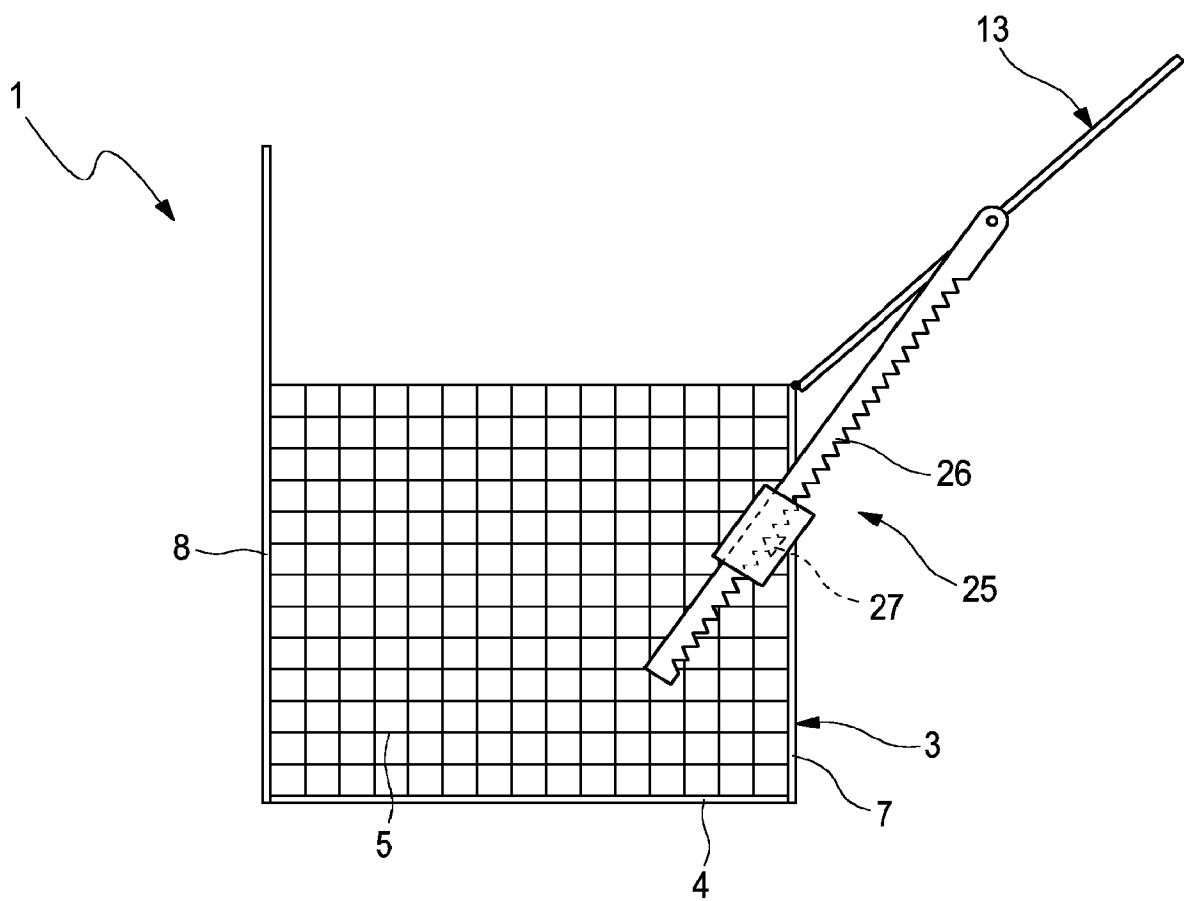
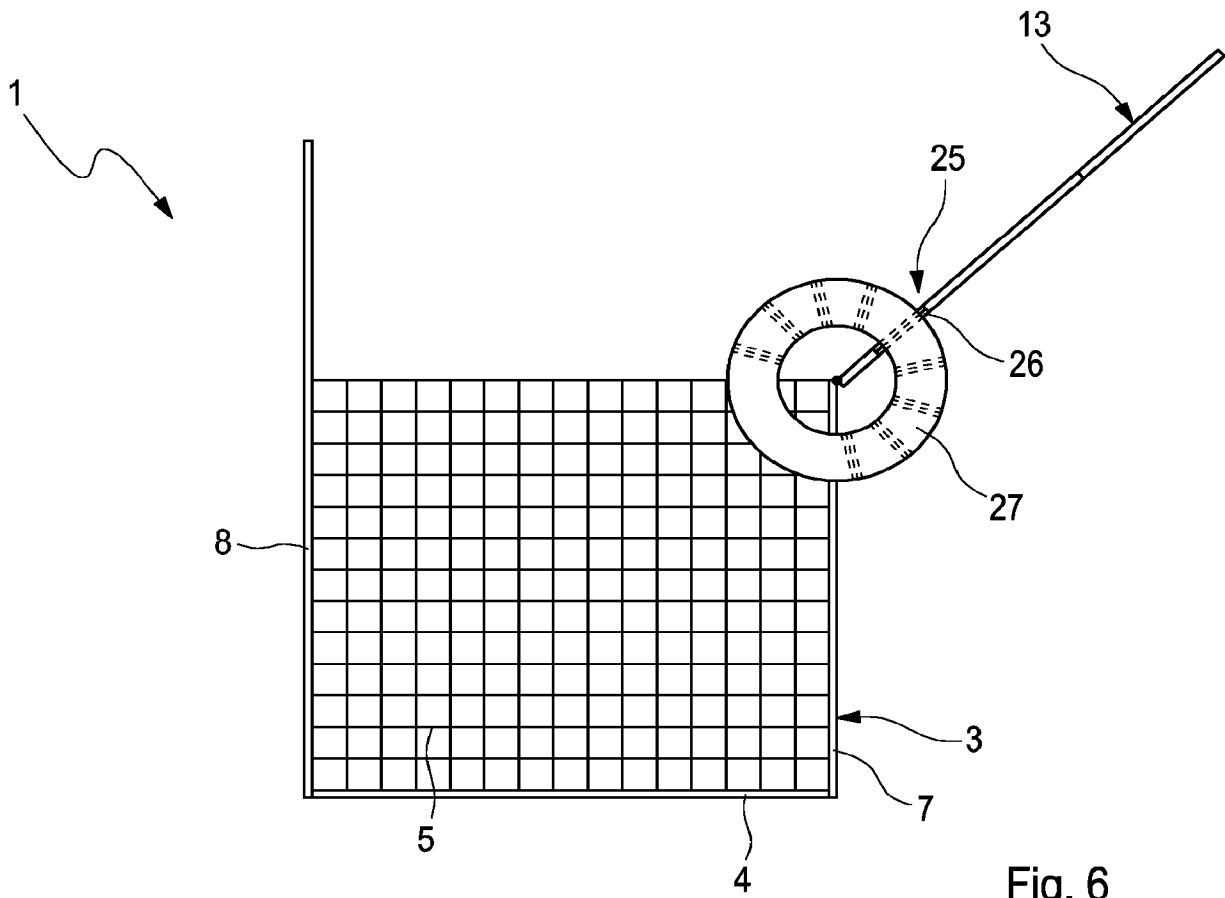
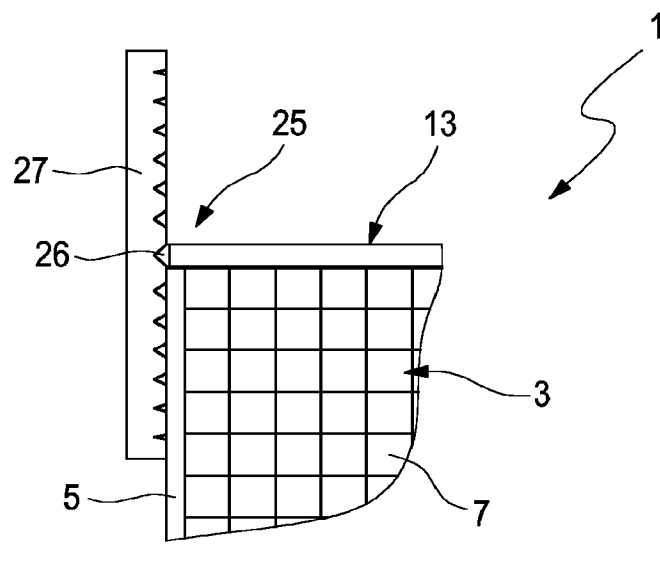
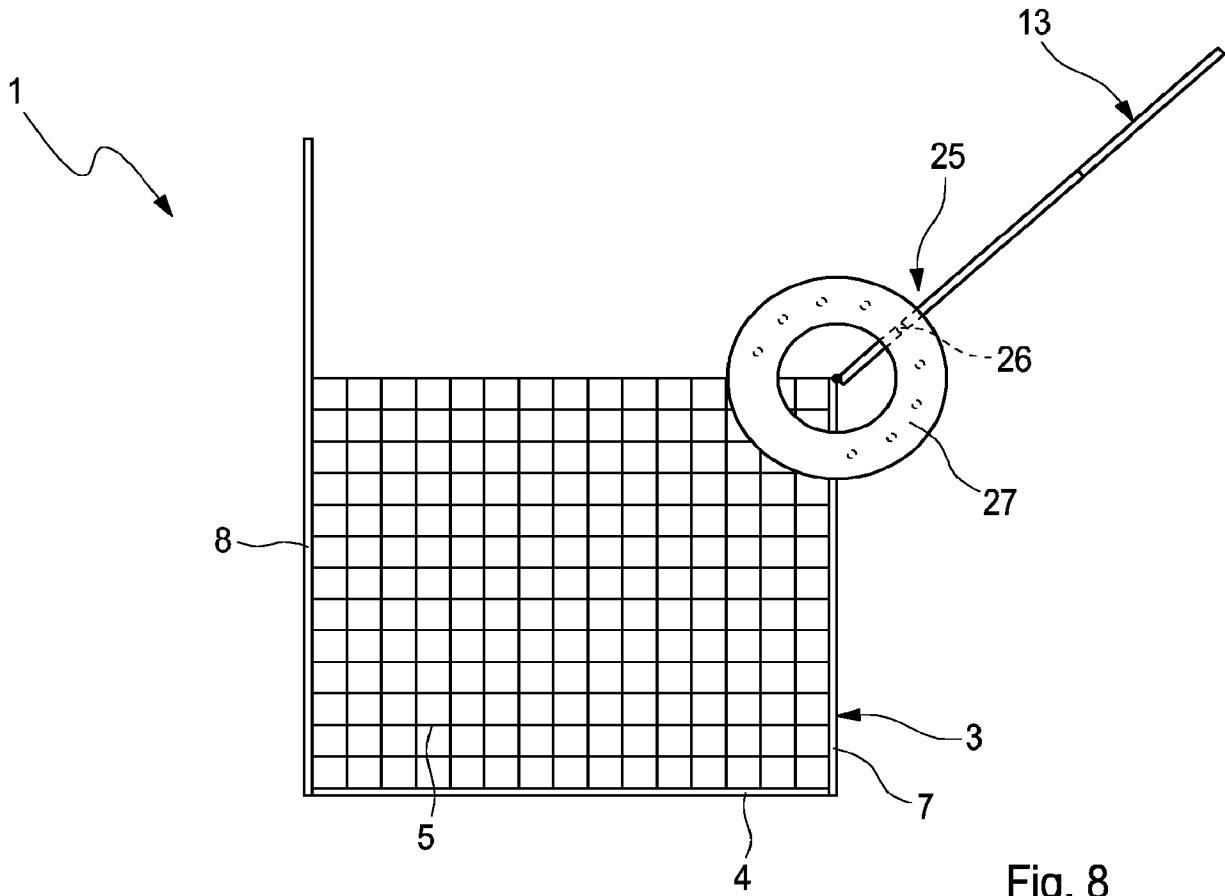
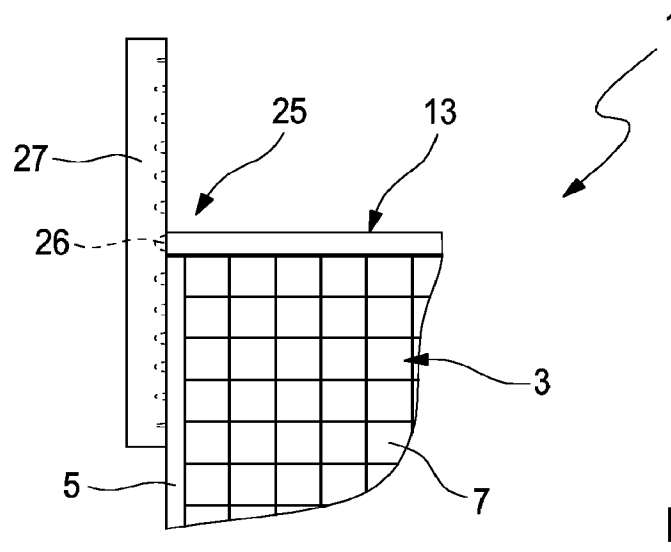
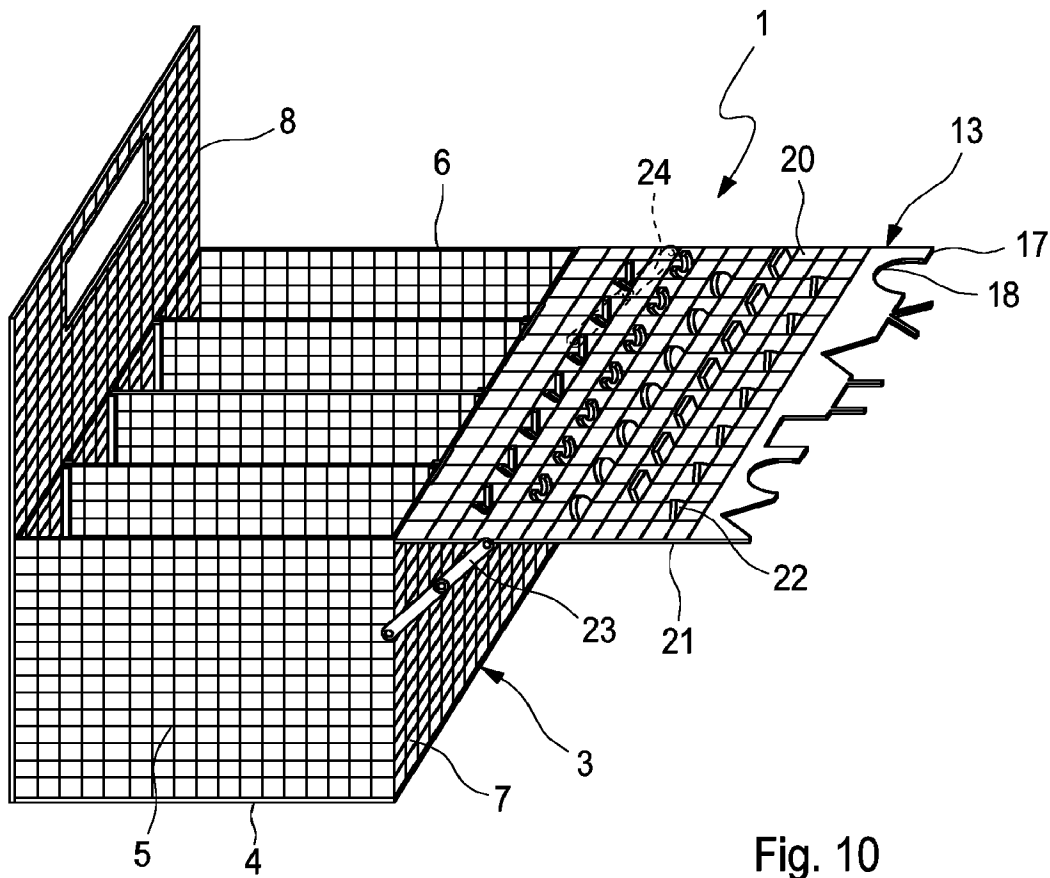
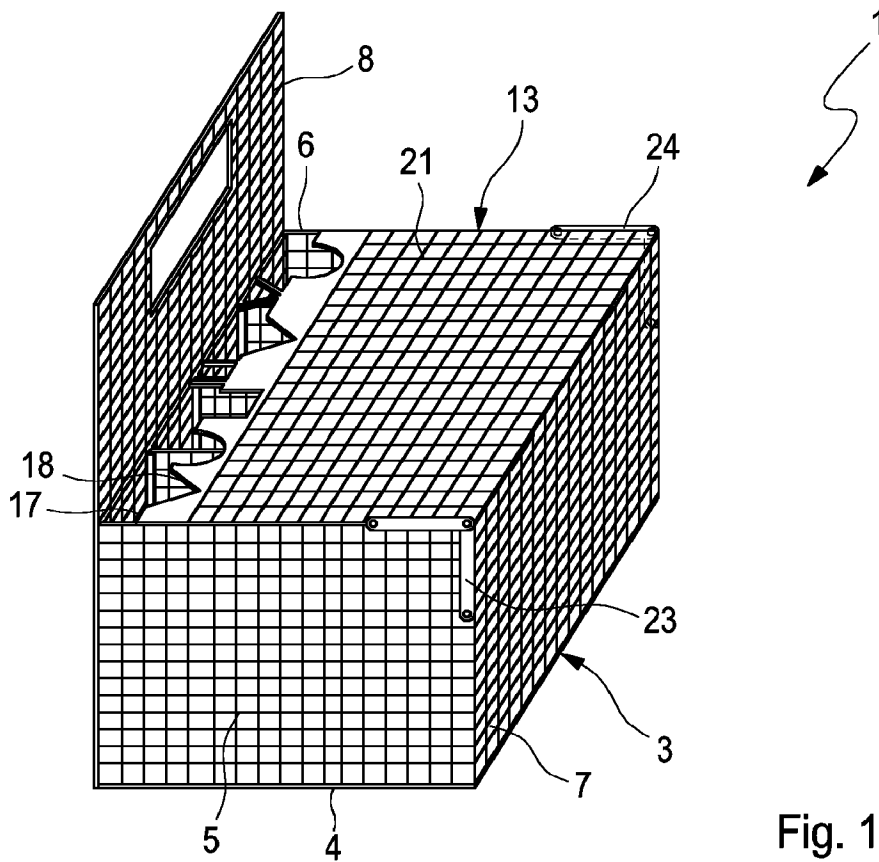


Fig. 5







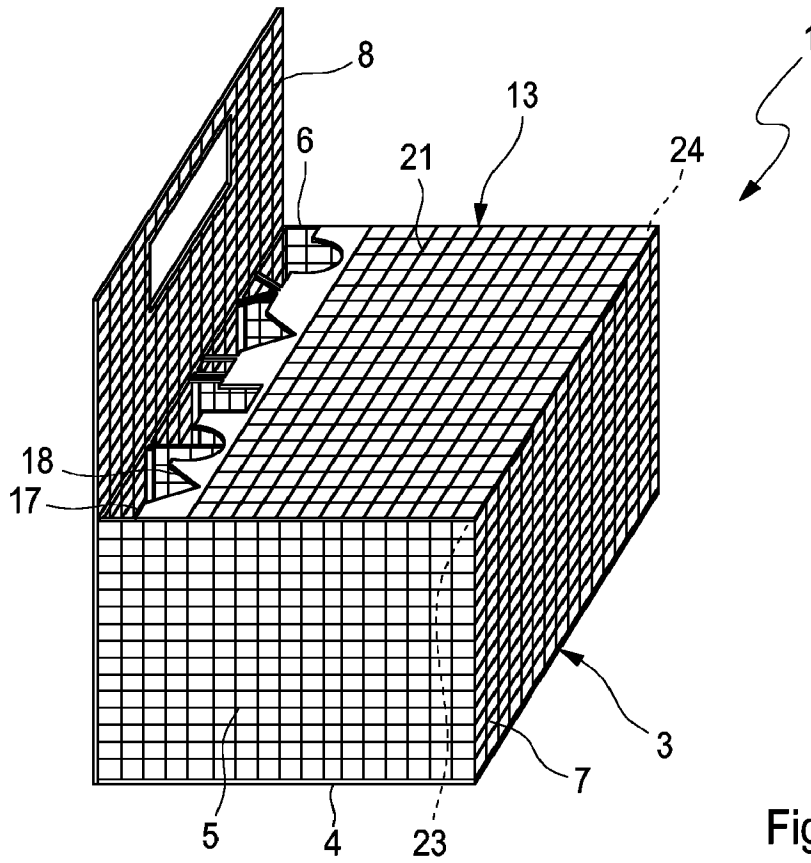


Fig. 12

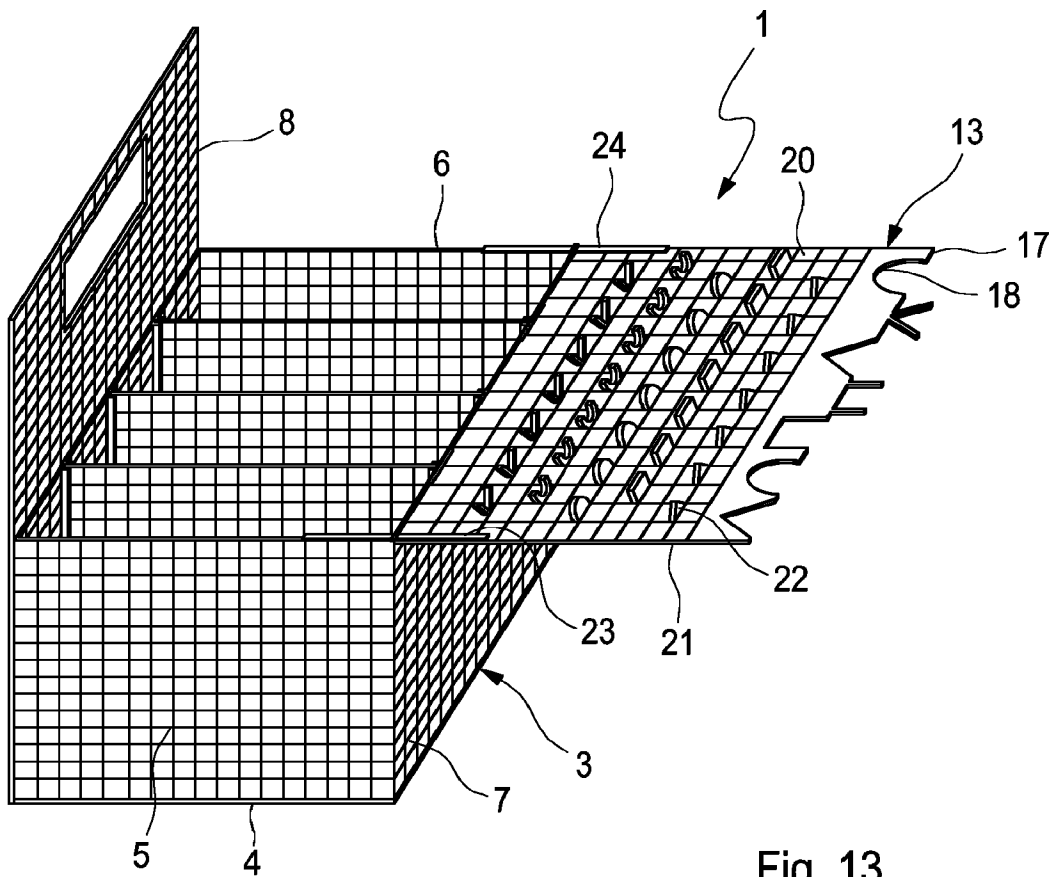


Fig. 13

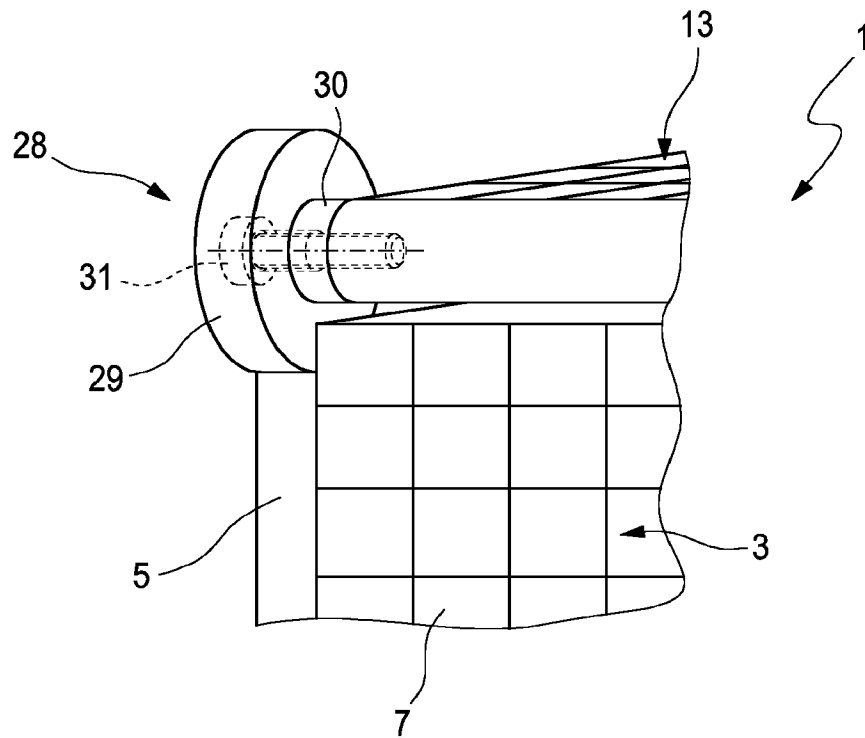


Fig. 14

Notice

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ABSTRACT DE102017200272A1

¹⁰ The invention relates to a dishwasher (1), in particular a domestic dishwasher, with at least one component (50) made of at least one plastic which, when the dishwasher (1) is in operation, is at least temporarily exposed to a washing or cleaning liquid, the component (50) made of at least one plastic, at least partially, preferably predominantly, in particular completely, is provided with a surface grain (100) in its surface area directly exposed to the rinsing or cleaning liquid in order to thereby reduce the surface energy which is provided in the surface area provided with the surface grain (100) Area is present, and thus to achieve a preferably noticeably improved drying behavior on the component (50) made of at least one plastic that is directly acted upon by the rinsing or cleaning liquid.



(10) **DE 10 2017 200 272 A1** 2018.07.12

(12)

Offenlegungsschrift

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(56) Ermittelter Stand der Technik:

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US	6 660 363	B1

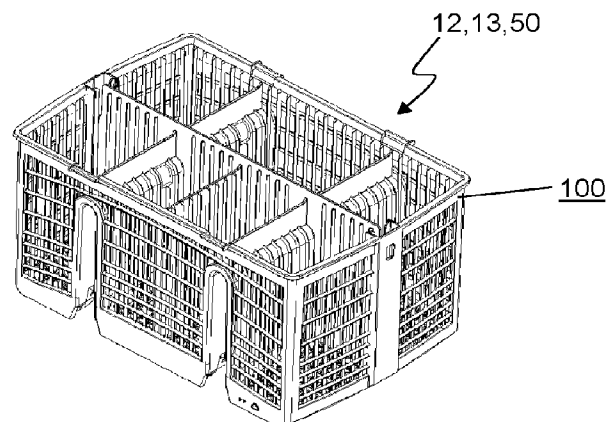
**Popov: Kontaktmechanik und Reibung.
Springer, Berlin, 2009. S. 42f – ISBN 978-3-540-
88836-9**

Prüfungsantrag gemäß § 44 PatG ist gestellt.

Die folgenden Angaben sind den vom Anmelder eingereichten Unterlagen entnommen.

(54) Bezeichnung: **Geschirrspülmaschine, insbesondere Haushaltsgeschirrspülmaschine**

(57) Zusammenfassung: Die Erfindung betrifft eine Geschirrspülmaschine (1), insbesondere Haushaltsgeschirrspülmaschine, mit wenigstens einem Bauteil (50) aus mindestens einem Kunststoff, welcher im Betrieb der Geschirrspülmaschine (1) zumindest zeitweise von einer Spül- oder Reinigungsflüssigkeit unmittelbar beaufschlagt wird, wobei das Bauteil (50) aus mindestens einem Kunststoff wenigstens teilweise, vorzugsweise überwiegend, insbesondere vollständig, in seinem von der Spül- oder Reinigungsflüssigkeit direkt beaufschlagten Oberflächenbereich mit einer Oberflächennarbung (100) versehen ist, um dadurch ein Absinken der Oberflächenenergie, welche in dem mit der Oberflächennarbung (100) versehenen Bereich vorliegt, und somit ein vorzugsweise merklich verbessertes Trocknungsverhalten an dem von der Spül- oder Reinigungsflüssigkeit direkt beaufschlagten Bauteil (50) aus mindestens einem Kunststoff zu erreichen.



Beschreibung

[0001] Die Erfindung betrifft eine Geschirrspülmaschine, insbesondere eine Haushaltsgeschirrspülmaschine, mit wenigstens einem Bauteil aus mindestens einem Kunststoff, welcher im Betrieb der Geschirrspülmaschine zumindest zeitweise von einer Spül- oder Reinigungsflüssigkeit unmittelbar beaufschlagt wird.

[0002] Bei wasserführenden Haushaltsgeräten, wie Haushaltsgeschirrspülmaschinen oder Haushaltswaschmaschinen, ist es allgemein bekannt, die mit der Spül- oder Reinigungsflüssigkeit in Berührung kommenden Formteile und Baugruppen, wie beispielsweise Spülbehälter, Spülboden, Spülbehältertür oder Spülgutträger, aus einem hochwertigen polymeren Kunststoff, wie beispielsweise Polypropylen, zu fertigen oder wenigstens die Oberflächen der Teile mit einem entsprechenden Werkstoff, wie beispielsweise Polyamid, zu überziehen. Diese Maßnahmen dienen einerseits dem Korrosionsschutz der mit der Spül- oder Reinigungsflüssigkeit in Berührung kommenden Formteile und Baugruppen und schonen andererseits das in einem Spülgutträger, insbesondere in einem Korb, abgelegte Geschirr oder Besteck.

[0003] Das bekannte Überziehen eines Spülgutträgers, insbesondere eines Geschirr- oder Besteckkorbs, mit einem hochwertigen polymeren Kunststoff kann jedoch aufgrund der nicht optimalen Abtropfeigenschaften des verwendeten Kunststoffs nicht verhindern, dass sich dennoch Wassertropfen an den Berührungsstellen zwischen Kunststoff und Geschirr oder Besteck an dem Korbgestell anhängen, welche auch im Programmabschnitt „Trocknen“ oftmals nicht ganz beseitigt werden können. Eine mangelhafte Wassertropfenableitung wirkt sich ungünstig auf die zum optimalen Spülen und Reinigen notwendige Wassermenge im Hinblick auf einen geringen Wasser- und Heizenergieverbrauch aus und begünstigt eine negative Wasserfleckenbildung an den Geschirr- und Besteckteilen. Ein optimales Reinigungs- und Spülergebnis ist somit nicht immer zu erreichen. Ferner erfordert die völlige Beseitigung hängengebliebener Wassertropfen eine erhöhte Trocknungsleistung und/oder eine verlängerte Programmlaufzeit.

[0004] Zur Verbesserung dieser negativen Eigenschaften der Beladungsmittel ist es auch bekannt geworden, die Spülgutträger oder die Besteckschubladen mit zusätzlichen Tropfenableitern zu versehen. So können beispielsweise die Maschen und die Gitter der Korbgestelle in ihrer örtlichen Profilgebung schneidenförmig und/oder sägezahnförmig ausgebildet sein. Diese Maßnahmen komplizieren und verteuern jedoch die Herstellung der Spülgutträger oder der Besteckschubladen aus einem hochwertigen polymeren Kunststoff und verringern die Problematik nur teilweise.

[0005] Darüber hinaus besteht das Problem, dass sich aus einem hochwertigen polymeren Kunststoff bestehende beziehungsweise mit einem hochwertigen polymeren Kunststoff überzogene Bauteile im Spülprozess mit der Zeit verfärben, wobei in der Regel eine Gelbfärbung beziehungsweise eine gelb-rötliche Verfärbung zu erkennen ist. Die Verfärbung tritt praktisch an allen der Spülflüssigkeit ausgesetzten Kunststoffteilen auf, die in dem Spülbehälter sowie außerhalb des Spülbehälters in dem Leitungsweg des Spülwassers angeordnet sind. Besonders fallen die Gelbverfärbungen bei mit Kunststoff überzogenen Geschirrkörben sowie Besteckkörben und Besteckschubladen aus Kunststoff auf; im Wesentlichen jedoch an Polypropylen-Kunststoffteilen. Wie festgestellt werden konnte, resultiert die Verfärbung zum einen daraus, dass sich die Reinigungs- und Spülmittel für das Geschirr wesentlich geändert haben. Frühere Reinigungsmittel mit Chlor als Inhaltsstoff hatten Bleichwirkung, die eine Verfärbung des Kunststoffs weitestgehend verhinderte. Derzeit eingesetzte Reiniger ersetzen Chlor durch Sauerstoff, wobei die Sauerstoffbleiche eine Verfärbung jedoch behindern kann. Hervorgerufen aber werden Kunststoffverfärbungen durch Carotin (Betacarotin), welches als fettlöslicher Naturfarbstoff in den von dem Geschirr abzuspülenden Lebensmittelresten anfällt.

[0006] Aus der Druckschrift DE 198 42 095 A1 ist beispielsweise bekannt, Bauteile aus Kunststoff durch nachträgliche Aktivierung ihrer Oberflächen mittels Fluorierung oder Plasmatisierung, insbesondere Niederdruck-Plasmatisierung, in ihren Benetzungseigenschaften zu verbessern. Dabei wird die Kunststoffoberfläche des Bauteils in einer Unterdruckkammer mittels Fluorierung oder Plasmatisierung, insbesondere Niederdruck-Plasmatisierung, aktiviert, um die Oberflächenspannung der ursprünglich stark hydrophoben Kunststoffoberfläche abzusenken. Bei den nachträglich aktivierten Kunststoffoberflächen handelt es sich vorzugsweise um Oberflächen von Kunststoffbauteilen, welche in Geschirrspülmaschinen oder in Waschmaschinen mit Spül- oder Reinigungsflüssigkeit direkt beaufschlagt sind. Insbesondere können vollständig aus einem polymeren Werkstoff, wie Polypropylen, Polyethylen, deren Copolymerisate, Polyamid oder aus einem Regenerat dieser Kunststoffe gefertigte oder mit diesem Kunststoff überzogene und in den Spülwasserkreislauf einbezogene Formteile und/oder Baugruppen behandelt werden. Weiterhin können Spülbehälter oder Spülgutträger in Form von Besteckkörben, Besteckschubladen oder Geschirrkörben zur Verbesserung des Wasser-Abtropfverhaltens und/oder zur Vermeidung einer Materialverfärbung behandelt werden.

[0007] Ein Nachteil dieses nachträglichen Aktivierungsverfahrens besteht unter anderem darin, dass mit steigender Waschzykluszahl die Aktivierung der Kunststoffoberfläche des Bauteils aus mindestens ei-

nem Kunststoff wieder egalisiert wird und somit die ehemals verbesserten Benetzungseigenschaften mit der Wirkung einer ehemals verbesserten Abtrocknung wieder merklich verschlechtert werden.

[0008] Vor diesem Hintergrund besteht eine Aufgabe der vorliegenden Erfindung darin, eine Geschirrspülmaschine, insbesondere eine Haushaltsgeschirrspülmaschine, welche wenigstens ein Bauteil aus mindestens einem Kunststoff, welches im Betrieb der Geschirrspülmaschine, insbesondere der Haushaltsgeschirrspülmaschine, zumindest zeitweise von einer Spül- oder Reinigungsflüssigkeit unmittelbar beaufschlagt wird, mit einem merklich verbesserten Trocknungsprozess, insbesondere Trocknungsverhalten, bereitzustellen und die Wirksamkeit der Trocknungsverbesserung auch fortwährend auf einem gewünschten Niveau zu erhalten.

[0009] Zur Lösung der erfindungsgemäßen Aufgabe wird eine Geschirrspülmaschine, insbesondere eine Haushaltsgeschirrspülmaschine, welche wenigstens ein Bauteil aus mindestens einem Kunststoff, welcher im Betrieb der Geschirrspülmaschine zumindest zeitweise von einer Spül- oder Reinigungsflüssigkeit unmittelbar beaufschlagt wird, vorgeschlagen, wobei das Bauteil aus mindestens einem Kunststoff wenigstens teilweise, vorzugsweise überwiegend, insbesondere vollständig, in seinem von der Spül- oder Reinigungsflüssigkeit direkt beaufschlagten Oberflächenbereich mit einer Oberflächennarbung versehen ist, um dadurch ein Absinken der Oberflächenenergie, welche in dem mit der Oberflächennarbung versehenen Bereich vorliegt, und somit ein vorzugsweise merklich verbessertes Trocknungsverhalten an dem von der Spül- oder Reinigungsflüssigkeit direkt beaufschlagten Bauteil aus mindestens einem Kunststoff zu erreichen. Das Bauteil aus mindestens einem Kunststoff kann ein Formteil und/oder ein Teil einer Baugruppe sein.

[0010] Unter Oberflächennarbung versteht man allgemein die Strukturierung einer Oberfläche, die wesentlich für die haptischen und visuellen Eigenschaften verantwortlich ist. Der Begriff wurde ursprünglich für die Oberflächenstruktur von Leder verwendet, wurde dann aber auch auf industriell hergestellte Oberflächennarben übertragen. Diese sind allgegenwärtig auf Kunststoff-Spritzgussteilen oder Kunstleder. Oberflächennarben können die Griffigkeit oder das Griffgefühl einer Oberfläche beeinflussen sowie ein charakteristisches optisches Streuverhalten und visuelles Erscheinungsbild einer Oberfläche erzeugen.

[0011] Das Versehen des von der Spül- oder Reinigungsflüssigkeit direkt beaufschlagten Oberflächenbereichs des Bauteils aus mindestens einem Kunststoff mit einer Oberflächennarbung bewirkt eine Erhöhung der Gesamt-Oberflächenenergie auf etwa 20

mN/m aufgrund einer Erhöhung sowohl der polaren Oberflächenenergie, das heißt der permanenten Dipol-Anziehungskräfte durch funktionelle chemische Molekülen und Wasserstoffbrückenbindungen, als auch der dispersen Oberflächenenergie, das heißt der temporären, also nicht permanenten Schwankungen der Elektronendichte im Molekül in Folge temporärer Dipole und wirkender Van der Waals-Kräfte.

[0012] Auch ist die erfindungsgemäße Oberflächenanordnung des von der Spül- oder Reinigungsflüssigkeit direkt beaufschlagten Oberflächenbereichs eines Bauteils aus mindestens einem Kunststoff im Gegensatz zu der bekannten und vorbeschriebenen Oberflächenaktivierung eines Bauteils aus Kunststoff von dauerhafter Wirkung.

[0013] So haben durchgeführte Versuche gezeigt, dass die polaren Anteile der Gesamt-Oberflächenenergie, also der Summe aus polarer Oberflächenenergie und disperser Oberflächenenergie, bereits durch eine Aufrauung der Oberfläche des Bauteils aus mindestens einem Kunststoff herstellenden Werkzeugs um etwa 50 % gegenüber der polaren Oberflächenenergie eines unbehandelten Serienteils angestiegen ist.

[0014] Ein weiterer Effekt auf die Benetzbarkeit einer Oberfläche durch Wasser entsteht durch die Wirkung der Gravitation. Eine Flüssigkeit muss den energetisch günstigsten Zustand finden zwischen ihrer eigenen Oberflächenspannung, welche die energetisch günstigste Oberfläche erreichen will, und der Gravitation, welche möglichst viel Wasser an möglichst tiefer Stelle sammeln will. Bei großen Wassermengen in einer Geschirrspülmaschine, insbesondere einer Haushaltsgeschirrspülmaschine, gewinnt die Gravitation die Oberhand und das Wasser versucht, sich so nahe wie möglich an dem tiefsten Punkt in der der Geschirrspülmaschine, insbesondere in der Haushaltsgeschirrspülmaschine, zu sammeln.

[0015] Das Versehen des Bauteils aus mindestens einem Kunststoff mit einer Oberflächennarbung erfolgt insbesondere schon bei seiner Herstellung in einem Spritzgusswerkzeug einer Spritzgussmaschine. Hierbei können vorzugsweise normierte Oberflächennarben in einem unkomplizierten Ätzprozess in die relevanten Oberflächen der Spritzgusskavitäten des Spritzgusswerkzeugs eingebracht werden. Derartige Oberflächennarben können auch als Mittel zur Verbesserung der Haptik und zur Kaschierung von „Oberflächenfehlern“, wie beispielsweise Werkzeuggrennrate, verwendet werden. Die Werkstoffauswahl für das Spritzgusswerkzeug und die Wärmebehandlung des Spritzgusswerkzeugs spielen im Hinblick auf das spätere Oberflächennarbungsergebnis eine zentrale Rolle. Schon bei der Werkstoffbeschaffung muss sichergestellt werden,

dass ausschließlich für eine Oberflächennarbung geeignete Stähle zum Einsatz kommen. Alle relevanten Werkzeugkomponenten, wie beispielsweise Schieber, Einsätze und dergleichen, sollten aus dem gleichen Material gefertigt sein, um mögliche Risiken für den Oberflächennarbungsausfall und den Glanzgrad zu vermeiden. Geeignete Werkstoffe für das Spritzgusswerkzeug sind beispielsweise 40 CrMnNiMo 8-6-4, 40 CrMnMo 7 oder X37 CrMoV 5-1, gegebenenfalls allesamt auch in Ausführung einer Sonderlegierung.

[0016] In einer ersten Ausführungsform ist das Bauteil aus mindestens einem Kunststoff ein Spülbehälter, ein Spülboden, eine Spülbehältertür, ein Sprüharm, eine Wärmetauscher-Befestigungsschraube, ein Zugabedeckel oder ein Spülgutträger, wie ein Geschirrkorb, ein Besteckkorb, eine Besteckschublade, eine Ablage oder dergleichen. Bei diesen beispielhaft angeführten Bauteilen kommen die erfindungsgemäßen Vorteile, wie vorstehend beschrieben, vollumfänglich zum Tragen.

[0017] In einer weiteren Ausführungsform ist das Bauteil aus mindestens einem Kunststoff vollständig aus einem polymeren Werkstoff, wie Polypropylen, Polyethylen, deren Copolymerisate, Polyamid oder aus einem Regenerat dieser Kunststoffe gefertigt oder mit diesem Kunststoff überzogen. Bei diesen angeführten Materialien handelt es sich um sogenannte „Massenprodukte“, welche üblicherweise zu günstigen Konditionen zu beziehen sind und welche die an sie gestellten Anforderungen überdurchschnittlich erfüllen.

[0018] In einer weiteren Ausführungsform weist das Bauteil aus mindestens einem Kunststoff im Bereich seiner Oberflächennarbung eine Oberflächennarbungstiefe im Bereich von 0,03 bis 0,1 mm, vorzugsweise von 0,04 bis 0,07 mm, insbesondere von etwa 0,05 mm, und/oder eine Entformungskonizität im Bereich von 1,5 bis 3°, vorzugsweise von 2 bis 3°, insbesondere von etwa 2,5°, auf. Die optimale Tiefe der dauerhaft vorhandenen Oberflächennarbung, als das Niveau der abgesenkten Oberflächenenergie, wird von der Größe der Entformungskonizität und ihrer optischen Erscheinung geprägt.

[0019] In einer weiteren Ausführungsform weist das Bauteil aus mindestens einem Kunststoff im Bereich seiner Oberflächennarbung ein Verhältnis von geschlossener Fläche zu offener Oberflächennarbenfläche von 1,5 bis 0,8, vorzugsweise von 1,2 bis 0,9, insbesondere von etwa 1, auf. Bei diesen beispielhaft angeführten Verhältnissen kommen die erfindungsgemäßen Vorteile, wie vorstehend beschrieben, vollumfänglich zum Tragen.

[0020] In einer weiteren Ausführungsform umfasst die Oberflächennarbung des Bauteils aus mindes-

tens einem Kunststoff eine Vielzahl von Oberflächennarbenkonturen, welche kalottenförmige, rechteckige oder annähernd rechteckige, dreieckige oder annähernd dreieckige und/oder polygone Querschnittskonturen aufweisen. Die angeführten Querschnittskonturen sind kostengünstig und prozesssicher herstellbar.

[0021] In einer weiteren Ausführungsform weist die Oberflächennarbung des Bauteils eine kräftige Struktur mit Korn 240 (Ätztiefe im Spritzgusswerkzeug > 0,10 mm), eine feine Struktur mit Korn 320 (Ätztiefe im Spritzgusswerkzeug von 0,04 bis 0,10 mm) oder eine sehr feine Struktur mit Korn 400 (Ätztiefe im Spritzgusswerkzeug von 0,01 bis 0,04 mm) auf. Die beispielhaft angeführten Strukturen erfüllen vollumfänglich die in sie gesetzten Anforderungen.

[0022] In einer weiteren Ausführungsform ist die Oberflächennarbung des Bauteils aus mindestens einem Kunststoff derart ausgebildet, dass sie eine Gesamtoberflächenenergie im Bereich von 15 bis 25 mN/m, vorzugsweise von 18 bis 23 mN/m, insbesondere von etwa 20 mN/m, aufweist. So ist beispielsweise die Benetzungsfähigkeit von Wasser an eine (Polypropylen)- Oberfläche dann am besten, wenn der Abstand der Oberflächenenergien ($H_2O = 72,8 \text{ mN/m}$; PP = 32,0 mN/m) Null ist.

[0023] Die erfindungsgemäße Oberflächennarbung kann im Grunde an jedem Oberflächenbereich eines Bauteils aus mindestens einem Kunststoff, welcher im Betrieb der Maschine zumindest zeitweise von einer Flüssigkeit unmittelbar beaufschlagt wird, vorgehen sein. Bei der Maschine kann sich beispielsweise um eine Geschirrspülmaschine, insbesondere eine Haushaltsgeschirrspülmaschine, eine Waschmaschine, insbesondere eine Haushaltswaschmaschine, einen Trockner, insbesondere einen Haushaltstrockner, oder dergleichen handeln.

[0024] Weitere vorteilhafte Ausgestaltungen und Aspekte der Geschirrspülmaschine, insbesondere der Haushaltsgeschirrspülmaschine, sind Gegenstand der Unteransprüche sowie der im Folgenden beschriebenen Ausführungsbeispiele der Geschirrspülmaschine, insbesondere der Haushaltsgeschirrspülmaschine. Im Weiteren wird die Geschirrspülmaschine, insbesondere die Haushaltsgeschirrspülmaschine, anhand von bevorzugten Ausführungsformen unter Bezugnahme auf die beigelegten Figuren näher erläutert.

[0025] Es zeigen

Fig. 1 eine schematische Perspektivansicht einer Ausführungsform einer Geschirrspülmaschine;

Fig. 2 eine schematische Perspektivansicht einer Ausführungsform eines Besteckkorbs für eine Geschirrspülmaschine;

Fig. 3 eine schematische Perspektivansicht einer Ausführungsform einer Besteckschublade für eine Geschirrspülmaschine;

Fig. 4 eine schematische Perspektivansicht einer Ausführungsform einer Ablage für eine Geschirrspülmaschine;

Fig. 5 eine Schnittdarstellung einer bevorzugten Ausführungsform einer Oberflächennarbung eines Bauteils für eine Geschirrspülmaschine; und

Fig. 6 eine Detailansicht der in der **Fig. 5** dargestellten Schnittdarstellung einer Oberflächennarbung eines Bauteils für eine Geschirrspülmaschine.

[0026] In den Figuren sind gleiche oder funktionsgleiche Elemente mit denselben Bezugszeichen versehen worden, sofern nichts anderes angegeben ist.

[0027] Die **Fig. 1** zeigt eine schematische Perspektivansicht eines insbesondere wasserführenden Haushaltsgeräts **1**. Das Haushaltsgerät **1** kann beispielsweise eine Geschirrspülmaschine, eine Waschmaschine, ein Trockner oder dergleichen sein. In der **Fig. 1** ist eine Geschirrspülmaschine, insbesondere eine Haushaltsgeschirrspülmaschine, gezeigt.

[0028] Die Geschirrspülmaschine **1** weist einen Aufnahmebereich **2** auf, der durch eine Spülbehältertür **3**, insbesondere wasserdicht verschließbar ist. Hierzu kann zwischen der Spülbehältertür **3** und dem Aufnahmebereich **2** eine Dichteinrichtung vorgesehen sein. Der Aufnahmebereich **2** kann ein Spülbehälter der in der **Fig. 1** gezeigten Geschirrspülmaschine **1** sein. Der Aufnahmebereich **2** ist vorzugsweise quaderförmig. Insbesondere kann der Aufnahmebereich **2** aus einem Stahlblech gefertigt sein. Alternativ kann der Aufnahmebereich **2** zumindest abschnittsweise aus einem Kunststoffmaterial gefertigt sein. Der Aufnahmebereich **2** und die Spülbehältertür **3** können eine Spülkammer **4** zum Spülen von Spülgut bilden. Der Aufnahmebereich **2** kann in dem Inneren eines Gehäuses der Geschirrspülmaschine **1** angeordnet sein.

[0029] Die Spülbehältertür **3** ist in der **Fig. 1** in ihrer geöffneten Stellung dargestellt. Durch ein Schwenken um eine an einem unteren Ende der Tür **3** vorgesehene Schwenkachse **5** kann die Spülbehältertür **3** geschlossen oder geöffnet werden. Der Aufnahmebereich **2** weist eine Wandung **6** mit einem Spülboden **7**, einer dem Spülboden **7** gegenüberliegend angeordneten Decke **8**, einer der Spülbehältertür **3** gegen-

überliegend angeordneten Rückwand **9** und zwei einander gegenüberliegend angeordneten Seitenwänden **10**, **11** auf. Der Spülboden **7**, die Decke **8**, die Rückwand **9** und die Seitenwände **10**, **11** können beispielsweise aus einem Edelstahlblech gefertigt sein. Alternativ kann beispielsweise der Spülboden **7** aus einem Kunststoffmaterial gefertigt sein.

[0030] Die Geschirrspülmaschine **1** weist weiterhin zumindest eine Spülgutaufnahme **12** auf. Insbesondere können mehrere Spülgutaufnahmen **12** vorgesehen sein, wobei jeweils eine der mehreren Spülgutaufnahmen **12** ein Unterkorb, ein Oberkorb oder eine Besteckschublade der Geschirrspülmaschine **1** ist. Die mehreren Spülgutaufnahmen **12** sind vorzugsweise übereinander in dem Aufnahmebereich **2** angeordnet. Jede Spülgutaufnahme **12** ist wahlweise in den Aufnahmebereich **2** hinein oder aus diesem heraus verlagerbar. Insbesondere ist jede Spülgutaufnahme **12** in einer Einschubrichtung **E** (Pfeil) in den Aufnahmebereich **2** hineinschiebbar und entgegen der Einschubrichtung **E** (Pfeil) in einer Auszugsrichtung **A** (Pfeil) aus dem Aufnahmebereich **2** herausziehbar.

[0031] Es ist nun vorgesehen, dass mindestens eine der Spülgutaufnahmen **12**, also der Unterkorb, der Oberkorb oder die Besteckschublade, und/oder ein nicht dargestellter Besteckkorb der Geschirrspülmaschine **1** wenigstens ein Bauteil **50** aus mindestens einem Kunststoff, welcher im Betrieb der Geschirrspülmaschine **1** zumindest zeitweise von einer Spül- oder Reinigungsflüssigkeit unmittelbar beaufschlagt wird, besteht. Das Bauteil **50** aus mindestens einem Kunststoff ist wenigstens teilweise, vorzugsweise überwiegend, insbesondere vollständig, in seinem von der Spül- oder Reinigungsflüssigkeit direkt beaufschlagten Oberflächenbereich mit einer Oberflächennarbung **100** versehen, um dadurch ein Absinken der Oberflächenenergie, welche in dem mit der Oberflächennarbung **100** versehenen Bereich vorliegt, und somit ein vorzugsweise merklich verbessertes Trocknungsverhalten an dem von der Spül- oder Reinigungsflüssigkeit direkt beaufschlagten Bauteil **50** aus mindestens einem Kunststoff zu erreichen.

[0032] Besteht nun zusätzlich der Spülbehälter, umfassend die Decke **8**, die Rückwand **9** und die zwei Seitenwänden **10**, **11**, der Spülboden **7** und/oder die Spülbehältertür **3**, ein nicht dargestellter, dem Fachmann jedoch bekannter Sprüharm, eine nicht dargestellte, dem Fachmann jedoch bekannte Wärmetauscher-Befestigungsschraube und/oder ein nicht dargestellter, dem Fachmann jedoch bekannter Zugabedeckel auch aus einem hochwertigen polymeren Kunststoff, dann kann auch dieses mindestens eine Bauteil **50** aus Kunststoff zumindest in seinem der Spül- oder Reinigungsflüssigkeit direkt beaufschlagten Oberflächenbereich mit einer Oberflächennarbung **100** versehen sein.

[0033] Das Bauteil **50** aus mindestens einem Kunststoff kann vollständig aus einem polymeren Werkstoff, wie Polypropylen, Polyethylen, deren Copolymerisate, Polyamid oder aus einem Regenerat dieser Kunststoffe gefertigt oder mit diesem Kunststoff überzogen sein.

[0034] Die **Fig. 2** zeigt eine schematische Perspektivansicht einer Ausführungsform einer Spülgutnahme **12** in Ausgestaltung eines Besteckkorbs **13** für eine Geschirrspülmaschine (vergleiche **Fig. 1**). Ein derartiger Besteckkorb **13** ist beispielsweise in der Druckschrift DE 10 2007 057 510 A1 offenbart und dargestellt. Der diesbezügliche Offenbarungsgehalt dieser Druckschrift wird hiermit zum Gegenstand der vorliegenden Offenbarung gemacht.

[0035] Der Besteckkorb **13** aus mindestens einem Kunststoff ist wenigstens teilweise, vorzugsweise überwiegend, insbesondere vollständig, in seinem von der Spül- oder Reinigungsflüssigkeit direkt beaufschlagten Oberflächenbereich mit einer Oberflächennarbung **100** versehen, um dadurch ein Absinken der Oberflächenenergie, welche in dem mit der Oberflächennarbung **100** versehenen Bereich vorliegt, und somit ein vorzugsweise merklich verbessertes Trocknungsverhalten an dem von der Spül- oder Reinigungsflüssigkeit direkt beaufschlagten Besteckkorb **13** aus mindestens einem Kunststoff zu erreichen.

[0036] Der in der **Fig. 2** in schematischer Perspektivansicht gezeigte Besteckkorb **13** kann ein Teil der in der **Fig. 1** gezeigten erfindungsgemäßen Geschirrspülmaschine **1** sein.

[0037] Die **Fig. 3** zeigt eine schematische Perspektivansicht einer Ausführungsform einer Spülgutnahme **12** in Ausgestaltung einer Besteckschublade **14** für eine Geschirrspülmaschine (vergleiche **Fig. 1**). Eine derartige Besteckschublade **14** ist beispielsweise in den Druckschriften DE 10 2011 080 842 A1 und DE 10 2011 081 774 A1 offenbart und dargestellt. Der diesbezügliche Offenbarungsgehalt dieser Druckschriften wird hiermit zum Gegenstand der vorliegenden Offenbarung gemacht.

[0038] Die Besteckschublade **14** aus mindestens einem Kunststoff ist wenigstens teilweise, vorzugsweise überwiegend, insbesondere vollständig, in ihrem von der Spül- oder Reinigungsflüssigkeit direkt beaufschlagten Oberflächenbereich mit einer Oberflächennarbung **100** versehen, um dadurch ein Absinken der Oberflächenenergie, welche in dem mit der Oberflächennarbung **100** versehenen Bereich vorliegt, und somit ein vorzugsweise merklich verbessertes Trocknungsverhalten an der von der Spül- oder Reinigungsflüssigkeit direkt beaufschlagten Besteckschublade **14** aus mindestens einem Kunststoff zu erreichen.

[0039] Die in der **Fig. 3** in schematischer Perspektivansicht gezeigte Besteckschublade **14** kann ein Teil der in der **Fig. 1** gezeigten erfindungsgemäßen Geschirrspülmaschine **1** sein.

[0040] Die **Fig. 4** zeigt eine schematische Perspektivansicht einer Ausführungsform einer Spülgutnahme **12** in Ausgestaltung einer Ablage **15**, insbesondere einer Besteckablage oder einer Messerablage, für eine Geschirrspülmaschine (vergleiche **Fig. 1**). Eine derartige Ablage **15** ist beispielsweise in der Druckschrift DE 10 2009 027 616 A1 offenbart und dargestellt. Der diesbezügliche Offenbarungsgehalt dieser Druckschrift wird hiermit zum Gegenstand der vorliegenden Offenbarung gemacht.

[0041] Die Ablage **15** aus mindestens einem Kunststoff ist wenigstens teilweise, vorzugsweise überwiegend, insbesondere vollständig, in ihrem von der Spül- oder Reinigungsflüssigkeit direkt beaufschlagten Oberflächenbereich mit einer Oberflächennarbung **100** versehen, um dadurch ein Absinken der Oberflächenenergie, welche in dem mit der Oberflächennarbung **100** versehenen Bereich vorliegt, und somit ein vorzugsweise merklich verbessertes Trocknungsverhalten an der von der Spül- oder Reinigungsflüssigkeit direkt beaufschlagten Ablage **15** aus mindestens einem Kunststoff zu erreichen.

[0042] Die in der **Fig. 4** in schematischer Perspektivansicht gezeigte Ablage **15** kann ein Teil der in der **Fig. 1** gezeigten erfindungsgemäßen Geschirrspülmaschine **1** sein.

[0043] Die **Fig. 5** zeigt eine Schnittdarstellung einer bevorzugten Ausführungsform einer Oberflächennarbung **100** eines Bauteils **50** für eine Geschirrspülmaschine **1** (vergleiche **Fig. 1**).

[0044] Bei dem Bauteil **50** aus mindestens einem Kunststoff kann es sich um eines der vorgenannten Bauteile **50** für eine Geschirrspülmaschine **1** (vergleiche **Fig. 1**), wie beispielsweise eine Spülgutnahme **12** in Ausgestaltung eines Besteckkorbs **13** (vergleiche **Fig. 2**), einer Besteckschublade **14** (vergleiche **Fig. 3**) oder einer Ablage **15** (vergleiche **Fig. 4**), einer Wandung **6** (vergleiche **Fig. 1**) in Ausgestaltung eines Spülbodens **7**, einer Decke **8**, einer Rückwand **9** oder einer Seitenwand **10**, **11**, eine Spülbehältertür **3**, einen dem Fachmann bekannten Sprüharm, eine dem Fachmann bekannte Wärmetauscher-Befestigungsschraube oder einen dem Fachmann bekannten Zugabedeckel handeln.

[0045] Das Bauteil **50** aus mindestens einem Kunststoff weist im Bereich seiner Oberflächennarbung **100** eine Oberflächennarbungstiefe **100.T** im Bereich von 0,03 bis 0,1 mm, vorzugsweise von 0,04 bis 0,07 mm, insbesondere von etwa 0,05 mm, auf.

[0046] Weiterhin weist das Bauteil **50** aus mindestens einem Kunststoff im Bereich seiner Oberflächennarbung **100** ein Verhältnis von geschlossener Fläche **100.FG** zu offener Oberflächennarbungsfläche **100.FO** von 1,5 bis 0,8, vorzugsweise von 1,2 bis 0,9, insbesondere von etwa 1 zu 1, auf.

[0047] Ferner weist die Oberflächennarbung **100** des Bauteils **50** eine kräftige Struktur **100.S** mit Korn 240, eine feine Struktur mit Korn 320 oder eine sehr feine Struktur mit Korn 400 auf.

[0048] Auch ist die Oberflächennarbung **100** des Bauteils **50** aus mindestens einem Kunststoff derart ausgebildet, dass sie eine Gesamtoberflächenenergie **100.E** im Bereich von 15 bis 25 mN/m, vorzugsweise von 18 bis 23 mN/m, insbesondere von etwa 20 mN/m, aufweist.

[0049] Die Fig. 6 zeigt eine Detailansicht der in der Fig. 5 dargestellten Schnittdarstellung einer Oberflächennarbung **100** eines Bauteils **50** für eine Geschirrspülmaschine **1** (vergleiche Fig. 1).

[0050] Das Bauteil **50** aus mindestens einem Kunststoff weist im Bereich seiner Oberflächennarbung **100** eine Entformungskonizität **100.EK** im Bereich von 1,5 bis 3°, vorzugsweise von 2 bis 3°, insbesondere von etwa 2,5°, auf.

[0051] Die Oberflächennarbung **100** des Bauteils **50** aus mindestens einem Kunststoff umfasst weiterhin eine Vielzahl von Oberflächennarbungskonturen **100.K**, welche kalottenförmige, rechteckige oder annähernd rechteckige, dreieckige oder annähernd dreieckige und/oder polygone Querschnittskonturen aufweisen.

[0052] Obwohl die vorliegende Erfindung anhand von Ausführungsbeispielen beschrieben wurde, ist sie vielfältig modifizierbar.

11	Seitenwand
12	Spülgutaufnahme
13	Besteckkorb
14	Besteckschublade
15	Ablage
50	Bauteil
100	Oberflächennarbung
100.E	Gesamtoberflächenenergie
100.EK	Entformungskonizität
100.FG	Geschlossene Fläche
100.FO	Offene Oberflächennarbungsfläche
100.K	Oberflächennarbungskontur
100.S	Struktur
100.T	Oberflächennarbungstiefe
A	Auszugsrichtung (Pfeil)
E	Einschubrichtung (Pfeil)

Bezugszeichenliste

1	Haushaltsgerät; Geschirrspülmaschine; Haushaltsgeschirrspülmaschine
2	Aufnahmebereich; Spülbehälter
3	Spülbehältertür
4	Spülkammer
5	Schwenkachse
6	Wandung
7	Spülboden
8	Decke
9	Rückwand
10	Seitenwand

ZITATE ENTHALTEN IN DER BESCHREIBUNG

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Patentansprüche

1. Geschirrspülmaschine (1), insbesondere Haushaltsgeschirrspülmaschine, mit wenigstens einem Bauteil (50) aus mindestens einem Kunststoff, welcher im Betrieb der Geschirrspülmaschine (1) zumindest zeitweise von einer Spül- oder Reinigungsflüssigkeit unmittelbar beaufschlagt wird, wobei das Bauteil (50) aus mindestens einem Kunststoff wenigstens teilweise, vorzugsweise überwiegend, insbesondere vollständig, in seinem von der Spül- oder Reinigungsflüssigkeit direkt beaufschlagten Oberflächenbereich mit einer Oberflächennarbung (100) versehen ist, um dadurch ein Absinken der Oberflächenenergie, welche in dem mit der Oberflächennarbung (100) versehenen Bereich vorliegt, und somit ein vorzugsweise merklich verbessertes Trocknungsverhalten an dem von der Spül- oder Reinigungsflüssigkeit direkt beaufschlagten Bauteil (50) aus mindestens einem Kunststoff zu erreichen.

2. Geschirrspülmaschine (1) nach Anspruch 1, **dadurch gekennzeichnet**, dass das Bauteil (50) aus mindestens einem Kunststoff ein Spülbehälter (2), ein Spülboden (7), eine Spülbehältertür (3), ein Sprüharm, eine Wärmetauscher-Befestigungsschraube, ein Zugabedeckel oder ein Spülgutträger (12), wie ein Geschirrkorb, ein Besteckkorb (13), eine Besteckschublade (14), eine Ablage (15) oder dergleichen, ist.

3. Geschirrspülmaschine (1) nach Anspruch 1 oder 2, **dadurch gekennzeichnet**, dass das Bauteil (50) aus mindestens einem Kunststoff vollständig aus einem polymeren Werkstoff, wie Polypropylen, Polyethylen, deren Copolymerisate, Polyamid oder aus einem Regenerat dieser Kunststoffe gefertigt oder mit diesem Kunststoff überzogen ist.

4. Geschirrspülmaschine (1) nach Anspruch 1, 2 oder 3, **dadurch gekennzeichnet**, dass das Bauteil (50) aus mindestens einem Kunststoff im Bereich seiner Oberflächennarbung (100) eine Oberflächennarbungstiefe (100.T) im Bereich von 0,03 bis 0,1 mm, vorzugsweise von 0,04 bis 0,07 mm, insbesondere von etwa 0,05 mm, aufweist.

5. Geschirrspülmaschine (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet**, dass das Bauteil (50) aus mindestens einem Kunststoff im Bereich seiner Oberflächennarbung (100) eine Entformungskonizität (100.EK) im Bereich von 1,5 bis 3°, vorzugsweise von 2 bis 3°, insbesondere von etwa 2,5°, aufweist.

6. Geschirrspülmaschine (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet**, dass das Bauteil (50) aus mindestens einem Kunststoff im Bereich seiner Oberflächennarbung (100) ein Verhältnis von geschlossener Fläche

che (100.FG) zu offener Oberflächennarbungsfläche (100.FO) von 1,5 bis 0,8, vorzugsweise von 1,2 bis 0,9, insbesondere von etwa 1, aufweist.

7. Geschirrspülmaschine (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet**, dass die Oberflächennarbung (100) des Bauteils (50) aus mindestens einem Kunststoff eine Vielzahl von Oberflächennarbungskonturen (100.K) umfasst, welche kalottenförmige, rechteckige oder annähernd rechteckige, dreieckige oder annähernd dreieckige und/oder polygone Querschnittskonturen aufweisen.

8. Geschirrspülmaschine (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet**, dass die Oberflächennarbung (100) des Bauteils (50) eine kräftige Struktur (100.S) mit Korn 240, eine feine Struktur (100.S) mit Korn 320 oder eine sehr feine Struktur (100.S) mit Korn 400 aufweist.

9. Geschirrspülmaschine (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet**, dass die Oberflächennarbung (100) des Bauteils (50) aus mindestens einem Kunststoff derart ausgebildet ist, dass sie eine Gesamtoberflächenenergie (100.E) im Bereich von 15 bis 25 mN/m, vorzugsweise von 18 bis 23 mN/m, insbesondere von etwa 20 mN/m, aufweist.

Es folgen 3 Seiten Zeichnungen

Anhängende Zeichnungen

Fig. 1

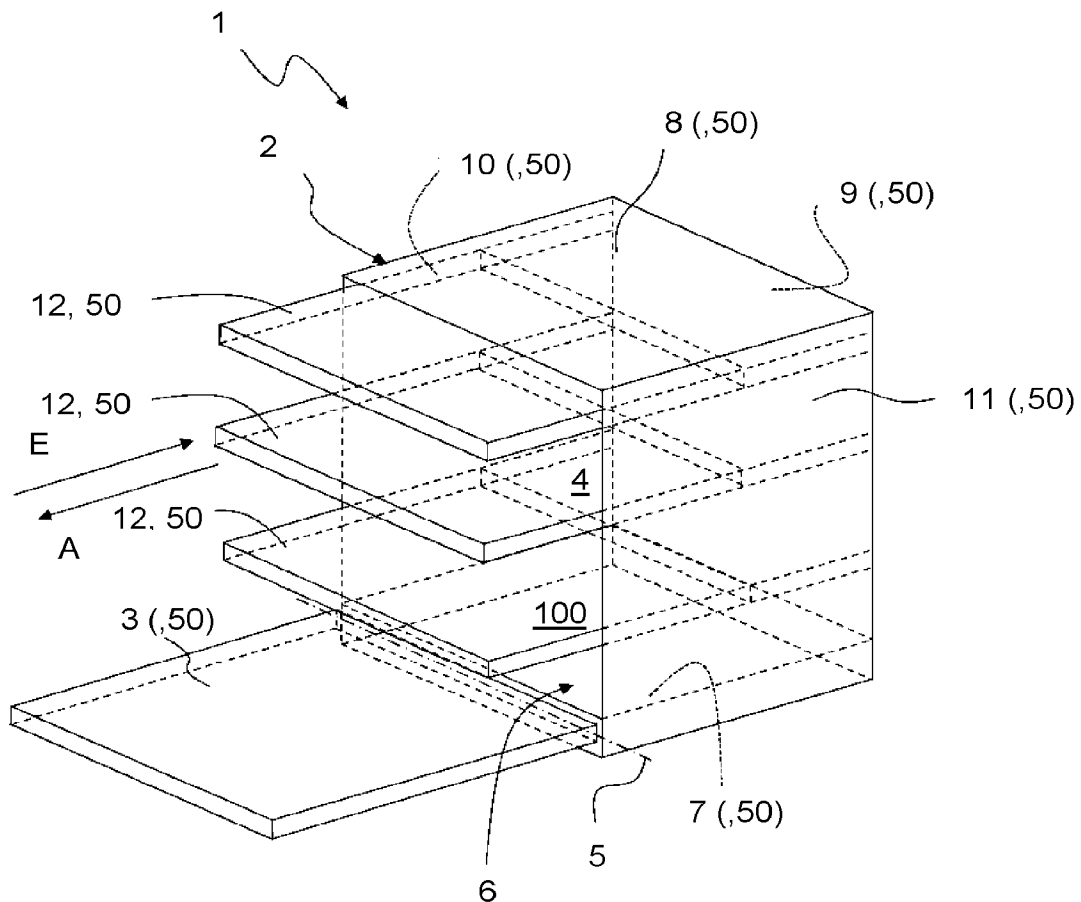


Fig. 2

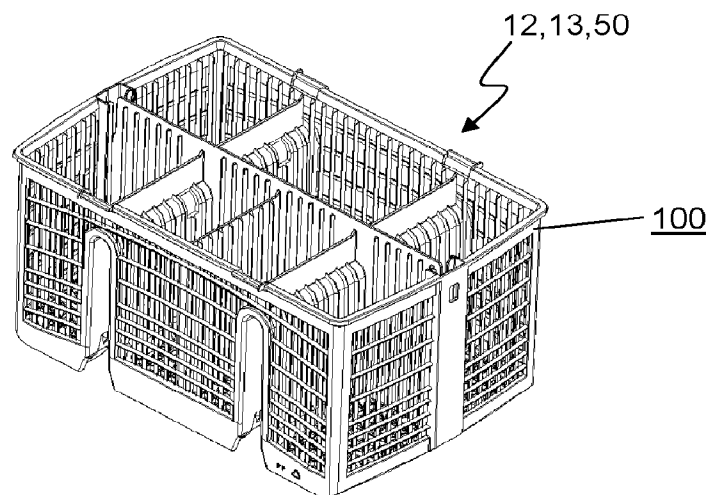


Fig. 3

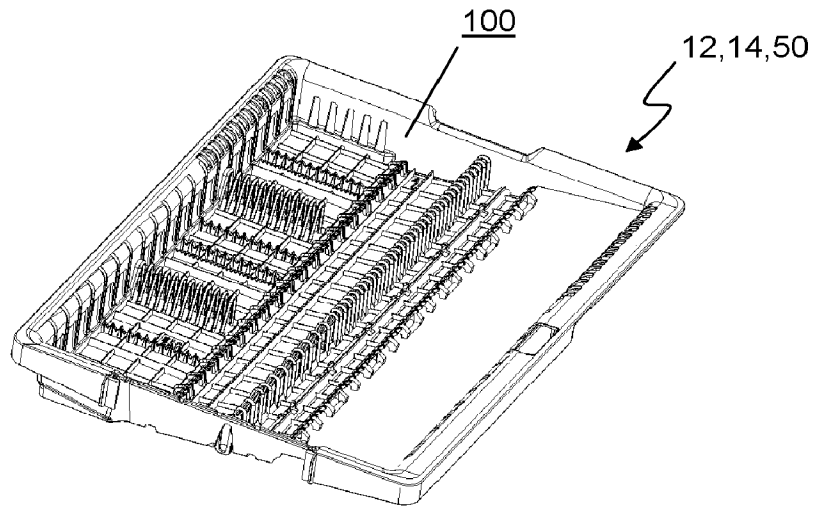


Fig. 4

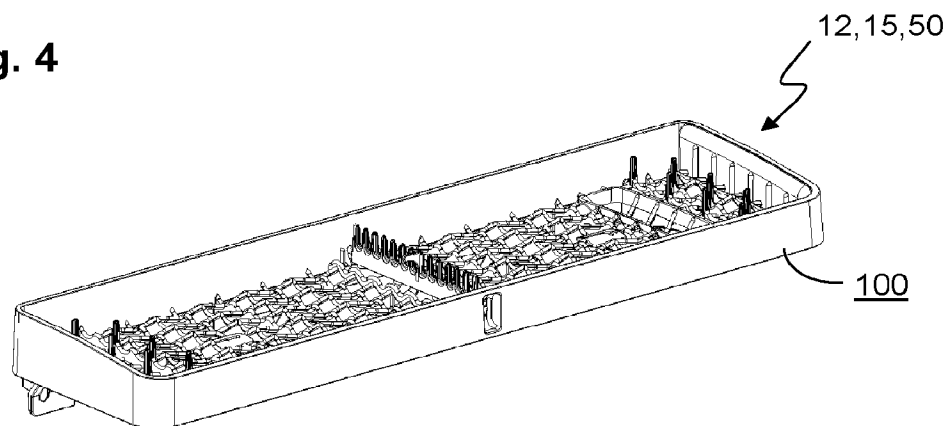


Fig. 5

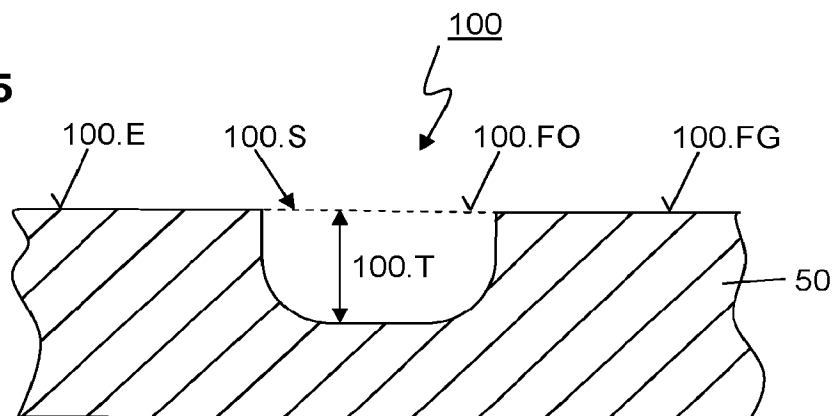
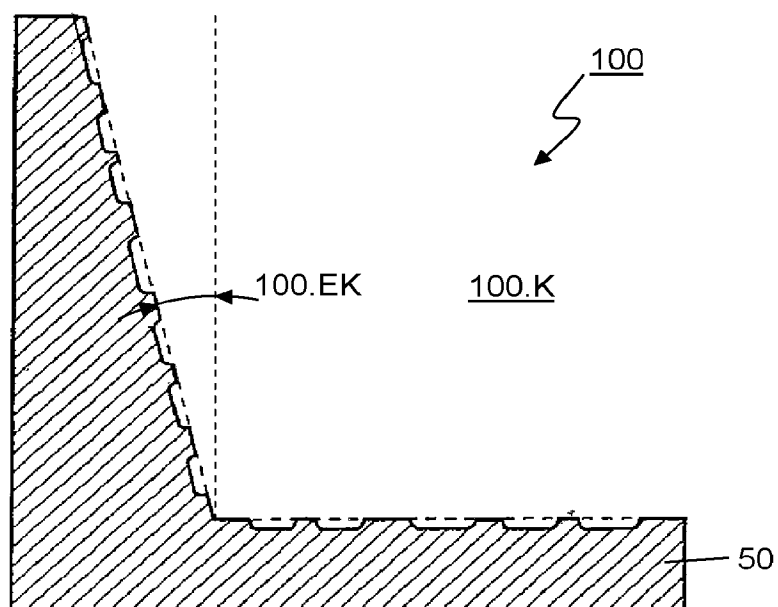


Fig. 6



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NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	To Be Determined (TBD) - filed herewith
Filing Date	Filed herewith
First Named Inventor	Mark S. Feddema
Title	DISHWASHER WITH A DISH RACK
Art Unit	TBD
Examiner Name	TBD
Attorney Docket Number	SUB-13230-US-CON3

SIGNATURE of Applicant or Patent Practitioner

Signature	/brianrcheslek/	Date (Optional)	2025-08-12
Name	Brian R. Cheslek	Registration Number	58,329
Title (if Applicant is a juristic entity)	Attorney for Applicant		
Applicant Name (if Applicant is a juristic entity)	Whirlpool Corporation		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.



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This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

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130333

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☒ The address associated with the above-mentioned Customer Number

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City

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Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Whirlpool Corporation

- ☐ Inventor or Joint Inventor (title not required below)
- ☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
- ☒ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
- ☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Nathan J. Davis

Date (Optional)

3/12/2023 | 6:20 AM PDT

Name

Nathan J. Davis

Title

Legal Director, Patents & Intellectual Property Litigation

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☒ Total of one forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Petitioner Samsung Ex-1004, 0191

DISHWASHER WITH A DISH RACK

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. Patent Application No. 19/039,228, filed on January 28, 2025, which is a continuation of U.S. Patent Application No. 18/535,327, filed on December 11, 2023, now U.S. Patent No. 12,232,681, issued February 25, 2025, which is a continuation of U.S. Patent Application No. 17/830,947, filed on June 2, 2022, now U.S. Patent No. 11,864,712, issued January 9, 2024, which is a continuation of U.S. Patent Application No. 16/833,984, filed March 30, 2020, now U.S. Patent No. 11,375,874, issued July 5, 2022, all of which are incorporated herein by reference in their entirety.

TECHNICAL FIELD

[0002] This disclosure generally relates to a dishwasher, and more specifically to dishwasher including a dish rack.

BACKGROUND

[0003] Household dishwashers typically include one or more dish racks for holding various types of dishes in the dishwasher tub. Traditionally, a dishwasher includes an upper dish rack that holds glassware and small dishes, and a lower dish rack that holds larger dishes, such as plates. The upper and lower dish racks usually consume most of the space inside the dishwasher tub. Some dishwashers can also include a third dish rack, often referred to as a third level rack, of a much shorter height the upper and lower dish racks, with the height being such as to only accommodate silverware or other low profile utensils.

[0004] A utensil caddy is often used to specifically hold silverware. Utensil caddies are normally removably carried by the lower dish rack or on the inner surface of the door closing the dishwasher. These utensil caddies are oriented such that they hold the utensils in an upright or vertical orientation during washing.

[0005] Some dishwashes can have both a utensil caddy and a third level rack. The third level rack can normally accommodate long handle items, such as spatulas, severing

spoons, stirring spoons, which, if put into the utensil caddy, would extend far enough vertically to interfere with the rotation of the sprayer below the upper rack.

SUMMARY

[0006] According to one aspect of the present disclosure, a dishwasher includes a tub that defines a dish treating chamber. A first lower dish rack and a second lower dish rack are located in the dish treating chamber. An upper dish rack is located above the first lower dish rack and the second lower dish rack in the dish treating chamber. The upper dish rack defines a planar portion and a depression. The depression extends below the planar portion and includes a first angled wall and a second angled wall that each extend at an acute angle relative to the planar portion. The first angled wall defines a first set of cup seats and the second angled wall defines a second set of cup seats. A plurality of utensil holders is disposed in the planar portion and is configured to horizontally support utensils.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] In the drawings:

[0008] FIG. 1 is a schematic, cross-sectional view of a dishwasher with a dish rack according to an aspect of the present disclosure.

[0009] FIG. 2 is a schematic diagram of a control system for the dishwasher of FIG. 1.

[0010] FIG. 3 is a side view of a dish rack assembly including the dish rack of FIG. 1 with a utensil caddy according aspects of the disclosure.

[0011] FIG. 4 is a perspective view of the utensil caddy of FIG. 3 in a first position according to aspects of the disclosure.

[0012] FIG. 5A is a perspective view of the utensil caddy of FIG. 3 in a second position according to aspects of the disclosure.

[0013] FIG. 5B is a perspective view of the utensil caddy in the second position of FIG. 5a according to aspects of the disclosure.

[0014] FIG. 6 is a perspective view of the utensil caddy in the second position of FIG. 5 including utensils according to aspects of the disclosure

[0015] FIG. 7 is a perspective view of the dish rack including an exemplary utensil caddy of FIG. 3 which extends across a quarter of the dish rack assembly according to aspects of the disclosure.

[0016] FIG. 8 is a perspective view of the dish rack including an exemplary utensil caddy of FIG. 3 which extends across half of the dish rack assembly according to aspects of the disclosure.

DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0017] Aspects of the present disclosure relate to a utensil caddy including on a dish rack of dishwasher, specifically an automatic dishwasher. The utensil caddy can be configured to include, at least, a first side wall including a first set of utensil holders and a second side wall including a second set of utensil holders. The second side wall can be further configured to be moveable relative to the utensil caddy between a first position and a second position.

[0018] FIG. 1 illustrates a schematic, cross-sectional view of an exemplary dishwasher 10, specifically an automatic dishwasher, according to an embodiment of the present disclosure. The dishwasher 10 shares many features of a conventional automatic dishwasher, which will not be described in detail herein except as necessary for a complete understanding of the disclosure. While the present disclosure is described in terms of a conventional dishwashing unit, it can also be implemented in other types of dishwashing units, such, but not limited to, as in-sink dishwashers, multi-tub dishwashers, or drawer-type dishwashers. A chassis 12 can define an interior of the dishwasher 10 and can include a frame, with or without panels mounted to the frame. For built-in dishwashers, outer panels are typically not needed. For dishwashers that are not built into existing cabinetry, the chassis 12 can include the panels mounted to the frame to form a cabinet for the dishwasher 10. An open-faced tub 14 can be provided within the interior of and mounted to the chassis 12 and can at least partially define a treating chamber 16 or a dish treating chamber for washing or otherwise treating dishes. The open face of the tub 14 defines an access opening for the treating chamber 16.

[0019] A closure element, such as a door assembly 18, can be movably mounted to the dishwasher 10 for movement between opened and closed positions. The door assembly 18 can be configured selectively open and close the treating chamber access opening defined by the open face of the tub 14. Thus, the door assembly 18 provides accessibility to the treating chamber 16 for the loading and unloading of dishes or other washable items. It should be appreciated that the door assembly 18 can be secured to the lower front edge of the chassis 12 or to the lower front edge of the tub 14 via a hinge assembly (not shown) configured to pivot the door assembly 18. When the door assembly 18 is closed, user access to the treating chamber 16 can be prevented, whereas user access to the treating chamber 16 can be permitted when the door assembly 18 is open. Alternatively, the closure element can be slidable relative to the chassis 12, such as in a drawer-type dishwasher, wherein the access opening for the treating chamber 16 is formed by an open-top tub. Other configurations of the closure element relative to the chassis 12 and the tub 14 are also within the scope of the disclosure.

[0020] Dish holders, illustrated in the form of an upper dish rack 22, a lower dish rack 24, and a third level rack 20, can be located within the treating chamber 16 and receive dishes for treatment, such as washing. The third level, upper, and lower dish racks 20, 22, 24 can be vertically oriented with respect to one another. That is, third level, upper, and lower dish racks 20, 22, 24 can be spaced from one another in a vertical direction denoted by a Z-axis. The third level, upper, and lower dish racks 20, 22, 24 are typically mounted for slidable movement in and out of the treating chamber 16 for ease of loading and unloading. Other dish holders can be provided, such as a silverware basket, separate from or combined with third level, upper, and lower dish racks 20, 22, 24. As used in this description, the term “dish(es)” is intended to be generic to any item, single or plural, that may be treated in the dishwasher 10, including, without limitation, dishes, plates, pots, bowls, pans, glassware, and silverware. While the dishwasher 10 is illustrated herein as having three dish racks 20, 22, 24, it will be understood that any suitable number and configuration of dish racks is also within the scope of the disclosure.

[0021] A utensil caddy 70 can be included with the third level rack 20. Specifically, the utensil caddy 70 can be provided on a lateral side of third level dish rack 20. As used herein, the term lateral can denote any direction corresponding to the X-axis. The utensil caddy 70 can be configured to hold a set of utensils so they can be treated within the treating chamber 16. As used herein, the term utensil can refer to any implement, article or container suitable for treatment within the treating chamber 16. For example, the set of utensils can include, but is not limited to, a spoon, a fork, a spork, a knife, a spatula, a baby-bottle nipple, a measuring spoon, a ladle, a tong, or the like. It will be appreciated that there can be any number of one or more utensil caddy's 70 within the treating chamber 16 and included with any of the third level, upper, and lower dish racks 20, 22, 24.

[0022] A spray system can be provided for spraying liquid in the treating chamber 16 and may be provided in the form of, for example, an upper spray assembly 26, a middle spray assembly 28, and a lower spray assembly 30. The upper spray assembly 26, the middle spray assembly 28, and the lower spray assembly 30 are located, respectively, above the third level dish rack 20, beneath the upper dish rack 22, and beneath the lower dish rack 24 and are illustrated as rotating spray arms by example but are not limited to such positions and sprayer type. The spray system can further include a rack spray assembly 32 coupled to the third level dish rack 20; the rack spray assembly 32 will be discussed in further detail below. Furthermore, the spray system can include additional and/or alternative spray assemblies. For example, a distribution header or spray manifold can be located at the rear of the tub 14 at any vertical position. An exemplary spray manifold is set forth in detail in U.S. Patent No. 7,594,513, issued September 29, 2009, and titled "Multiple Wash Zone Dishwasher," which is incorporated herein by reference in its entirety.

[0023] A recirculation system can be provided for recirculating liquid from the treating chamber 16 to the spray system. The recirculation system can include a sump 34 and a pump assembly 36. The sump 34 collects the liquid sprayed in the treating chamber 16 and can be formed by a sloped or recess portion of a bottom wall of the tub 14. The pump

assembly 36 can include both a drain pump 38 and a recirculation pump 40. The drain pump 38 can draw liquid from the sump 34 and pump the liquid out of the dishwasher 10 to a household drain line (not shown). The recirculation pump 40 can draw liquid from the sump 34, and the liquid can be simultaneously or selectively pumped through a supply conduit or tube 42 to each of the upper, middle, lower, and rack spray assemblies 26, 28, 30, 32 for selective spraying. The liquid supply tube 42 extends along a wall of the tub 14 and fluidly connect the pump assembly 36 to the upper, middle, lower, and rack spray assemblies 26, 28, 30, 32. While not shown, a liquid supply system can include a water supply conduit coupled with a household water supply for supplying water to the treating chamber 16.

[0024] While the pump assembly 36 is illustrated herein as having separate drain and recirculation pumps 38, 40, in an alternative embodiment, the pump assembly 36 can include a single pump configured to selectively supply wash liquid to either the spray system or the drain line, such as by configuring the pump to rotate in opposite directions, or by providing a suitable valve system.

[0025] A heating system including a heater 44 can be located, for example, within the sump 34 for heating the liquid contained in the sump 34. The heater 44 can also heat air contained in the treating chamber 16. Alternatively, a separate heating element (not shown) can be provided for heating the air circulated through the treating chamber 16. A filtering system (not shown) can be fluidly coupled with the recirculation flow path for filtering the recirculated liquid.

[0026] A control system including a controller 46 can also be included in the dishwasher 10, which can be operably coupled with various components of the dishwasher 10 to implement a cycle of operation. The controller 46 can be located within the door assembly 18 as illustrated, or it can alternatively be located somewhere within the chassis 12. The controller 46 can also be operably coupled with a control panel or user interface 48 for receiving user-selected inputs and communicating information to the user. The user interface 48 can include operational controls such as dials, lights, switches, and displays

enabling a user to input commands, such as a cycle of operation, to the controller 46 and receive information.

[0027] FIG. 2 is a schematic illustration of the controller 46 of FIG. 1. The controller 46 can be coupled with the heater 44 for heating the wash liquid during a cycle of operation, the drain pump 38 for draining liquid from the treating chamber 16, and the recirculation pump 40 for recirculating the wash liquid during the cycle of operation. The controller 46 can be provided with a memory 50 and a central processing unit (CPU) 52. The memory 50 can be used for storing control software that can be executed by the CPU 52 in completing an automatic cycle of operation using the dishwasher 10 and any additional software. For example, the memory 50 can store one or more pre-programmed cycles of operation that can be selected by a user and completed by the dishwasher 10. A cycle of operation for the dishwasher 10 can include one or more of the following steps: a wash step, a rinse step, and a drying step. The wash step can further include a pre-wash step and a main wash step. The rinse step can also include multiple steps such as one or more additional rinsing steps performed in addition to a first rinsing. The amounts of water and/or rinse aid used during each of the multiple rinse steps can be varied. The drying step can have a non-heated drying step (so called “air only”), a heated drying step or a combination thereof. These multiple steps can also be performed by the dishwasher 10 in any desired combination.

[0028] The controller 46 can also receive input from one or more sensors 54. Non-limiting examples of sensors that can be communicably coupled with the controller 46 include a temperature sensor and turbidity sensor to determine the soil load associated with a selected grouping of dishes, such as the dishes associated with a particular area of the treating chamber 16.

[0029] The dishwasher 10 can include all of the above exemplary systems, a selection of the above exemplary systems, and/or other systems not listed above as desired. Further, some of the systems can be combined with other systems and/or can share components with other systems. Examples of other systems that the dishwasher can further include are a dispensing system that supplies one or more treating agents or chemistries to the

treating chamber 16 and an air supply system that can provide air, which can be heated or not heated, to the treating chamber 16, such as for drying and/or cooling the dishes. An exemplary air supply system is set forth in U.S. Patent Application No. 12/959,673, filed December 3, 2010 and published as U.S. Patent Application Publication No. 2012/0138106 on June 7, 2012, both of which are incorporated herein by reference in their entireties.

[0030] FIG. 3 illustrates a side view of a dish rack assembly 100 including the utensil caddy 70 of FIG. 1 and a dish rack 102. It will be appreciated that the dish rack assembly 100 can include any dish rack 102 as described herein. For example, the dish rack 102 can be any of the upper or lower dish racks 22, 24, or the third level rack 20.

[0031] The dish rack 102 has a wire frame construction forming a bottom wall 104 from which extends a peripheral wall 108 defining the sides of the dishrack. The bottom wall 104 and peripheral wall 108 define an interior where utensils and the like can be placed for washing.

[0032] While the bottom wall 104 can have any shape, including planar, the bottom wall 104 is illustrated as having a planar portion 106 and a depression defined by a first and second angled wall 110, 112. The depression, as illustrated, forms a first set of cup seats 114 and a second set of cup seats 115, which hold cups as illustrated.

[0033] The bottom wall 104 can define multiple planes. For example, the planar portion 106 can define a first plane transverse to the X-axis, while the first angled wall 110 can define a second plane and the second angled wall 112 can define a third plane. The second and the third planes can both be angled with respect to the X-axis such that they intersect with the first plane. Specifically, the second plane can intersect the first plan at the point where the planar portion 106 and the first angled wall 110 meet.

[0034] A spray assembly is carried by the dish rack 102 and includes first and second sprayers 116, 117, with the first sprayer 116 located between the first and second set of cup seats 114, 115 to emit a spray into the open top of the cups, and the second sprayer 117 located to emit a spray into the planar portion 106.

[0035] The utensil caddy 70 can be received within a region of the dish rack 102 adjacent to a portion of the bottom wall 104, specifically the planar portion 106. It is contemplated that the utensil caddy 70 can be removably mounted to a portion of the dish rack 102, specifically the planar portion 106. As such, the utensil caddy 70 can be moved to other portions of the dish rack 102 or to another dish rack 102 altogether. Alternatively, at least a portion of the utensil caddy 70 can be integrally formed with the planar portion 106 and hence the dish rack 102. It is further contemplated that the utensil caddy 70 can be laid on its side or otherwise be defined as a horizontal utensil caddy such that utensils can be received within the utensil caddy 70 in a horizontal fashion transverse to the X-axis. Traditional utensil caddies, on the other hand, are vertically mounted such that they can be defined as a vertical utensil caddy. As such, utensils can be received within the vertical utensil caddy in a vertical fashion transverse to the Z-axis.

[0036] FIG. 4 is a perspective view of the dish rack assembly 100 of FIG. 3 including the utensil caddy 70 in a first position. As used herein, the first position can be defined as a closed configuration of the utensil caddy 70 where at least a portion of the utensil caddy 70 abuts a portion of the bottom wall 104 and does not abut the first angled wall 110. As illustrated, the first and second set of cup seats 114, 115, the first and second sprayers 116, 117, and the utensil caddy 70 can extend along the entirety of the dish rack 102 along the Z-axis.

[0037] The utensil caddy 70 can include a periphery defining an interior with an open top 132. The open top 132 can be defined as a portion of the utensil caddy 70 in which utensils can be passed through. The open top 132 can lie at a junction point between the first plane of the planar portion 106 and the second plane of the first angled wall 110.

[0038] FIG. 5A is a perspective view of the dish rack assembly 100 of FIG. 3 including the utensil caddy 70 in a second position. The second position can be defined as an open configuration of the utensil caddy 70 where at least a portion of the utensil caddy 70 is carried by, received on, or abuts a portion of the bottom wall 104, specifically the first angled portion 112 as illustrated. It will be appreciated that the utensil caddy 70 can be advantageously shaped so that a portion of the utensil caddy 70 can transition from the

closed or first position to the opened or second position and conform with the first angled wall 110.

[0039] FIG. 5B is a perspective view of the utensil caddy 70 in the second position of FIG. 5A without the dish rack 102. The utensil caddy 70 can include a first side wall 120, a second side wall 122, and a set of hinges 124.

[0040] The first side wall 120 can rest on, be directly coupled to, or form a portion of the bottom wall 104 of the dish rack 102, specifically, the planar portion 106. The first side wall 120 can include a first set of utensil holders illustrated as a set of utensil seats 126 or loops 128. The utensil holders can be configured to retain or hold a set of utensils such as, but not limited to, spoons, forks, sporks, knives, ladles, spatulas, or the like. Specifically, the set of utensil seats 126 can be configured to hold smaller utensils (e.g., spoons, forks, sporks, etc.) while the loops 128 can be configured to hold larger utensils (e.g., spatulas, ladles, whisks, etc.). Although illustrated as four separate loops 128 and four sets of utensil seats 126, it will be appreciated that there can be any number of loops 128 or utensil seats 126 provided on the first side wall 120. It will be further appreciated, that one or more of the sets of utensils seats 126 can be provided between adjacent loops 128 as illustrated.

[0041] The second side wall 122 can be configured to rotate along the Y-axis about the set of hinges 124 and with respect to the first side wall 120. As such, the second side wall 122 can be moveable between the first position where at least a portion of the second side wall 122 abuts the first side wall 120, and the second position where at least a portion of the second side wall 122 rests against or abuts the bottom wall 104, specifically against the first angled portion 112. As illustrated, the second side wall 122 can overlie the entire first set of cup seats 114 and not overlie the second set of cup seats 115 when in the second position.

[0042] The second side wall 122 can further include a second set of utensil holders illustrated as a pin 130 and a seat 131. The pin 130 can be formed as a triangular projection extending from a surface while the seat 131 can be formed as a curved projection of the second side wall 122. A space or slot can be included between adjacent

pins 130. As such, the slot can be configured to accept the blade of a knife while the seat 131 accept the handle of the knife, as illustrated. Additionally, or alternatively, the utensil holders of the second side wall 122 can be configured to hold the any suitable utensils such as, but not limited to, a spatula, a ladle, or the like.

[0043] The first side wall 120 and the second side wall 122 can be coupled together through the set of hinges 124, specifically two hinges 124 provided on either distal end of the utensil caddy 70 along the Y-Axis. The set of hinges 124 can act as a method of coupling or a point of connection between first side wall 120 and the second side wall 122 and also provide for rotational movement about the Y-Axis for the second side wall 122 with respect to the first side wall 120. As such, the second side wall 122 can pivot from the first position to the second position.

[0044] FIG. 6 is a perspective view of the dish rack assembly 100 of FIG. 3 in the first position and including various sets of utensils received within the utensil caddy 70 in the first position. As illustrated, a set of cups is received within the first set of cup seats 114, and a set of mugs is received within the second set of cup seats 115. Further, a set of utensils are received within the utensil caddy 70, specifically, a set of knives, forks, and spoons are received within the set of utensil seats 126 and a set of larger knives are received within the second utensil holders, specifically the pins 130 and the seats 131. It will be appreciated, however, that other such as sporks, measuring cups, or the like can be received within the utensil seats 126 and larger utensils such as spatulas, ladles, or the like can be received within the loops 128. It will be further appreciated that although illustrated as cups and mugs either the first or the second set of cup seats 114, 115 can receive other objects to be treated within the treating chamber 16 such as, but not limited to, baby bottles, plates, bowls, pans, or the like.

[0045] A diffuser section can be included within a portion of the utensil caddy 70, specifically a portion of the second side wall 122. The diffuser section can be defined as a portion of the utensil caddy 70 which directly contacts a stream of water from one or more of the first and second sprayers 116, 117. The stream of water emitted from the first and second sprayers 116, 117 can, in some instances, be defined as a straight-line

stream of water. This straight-line stream of water can be used to effectively clean targeted portions of various utensils, cups, mugs, or plates within the treating chamber 16. It is contemplated, however, that placing a portion of the utensil caddy 70, specifically the diffuser section on the second side wall 122, in the path of the stream of water can diffuse the stream of water outward to form a fan pattern covering a larger area than the straight-line stream can be more effective at cleaning various utensils. For example, if it is desired to clean a spatula or other utensils with a large surface area, at least a portion of the stream of water from the first and second sprayers 116, 117 that is directed toward the spatula can impact the diffuser region of the utensil caddy 70. Once the stream of water hits the diffuser section, the stream of water can fan-out or form a cone-shaped spray area which can cover a larger surface area than the straight-line stream of water. This, in turn, can be more effective in cleaning utensils on the utensil caddy 70 which have a large surface area than through the use of non-diffused, straight-line stream of water.

[0046] In operation, the first and second sprayers 116, 117 or any other sprayer within the treating chamber 16 (e.g., upper, lower, or middle spray assemblies 26, 28, 30) can be configured to treat a set of utensils within a spray zone created by the sprayers. As used herein, the term spray zone can be defined as a region or section within the treating chamber which receives a direct or indirect flow of treating fluid. As such, utensils, cups, plates, or the like, placed within the spray zone will be washed or treated. The utensil caddy 70 can be placed in either the first or second position depending on the utensils which need to be treated. For example, if it is desired to clean a set of mugs and a set of cups, the utensil caddy 70 can be positioned in the first position such that cups and mugs can be placed within the first and second sets of cup seats 114, 115 as illustrated in FIG. 6. On the other hand, if it is desired to clean a set of utensils, the utensil caddy 70 can be positioned in the second position and a set of utensils can be placed within the respective utensil holders or seats, as illustrated in FIG. 6. It is further contemplated that when the utensil caddy 70 is positioned in the second position that only the first set of cup seats 114 are covered by the second side wall 122. As such, cups or mugs can still be received within the second set of cup seats 115.

[0047] FIG. 7 is a perspective view of a dish rack assembly 200. The dish rack assembly 200 is similar to the dish rack assembly 100; therefore, like parts will be identified by like numerals in the 200 series, with it being understood that the description of the like parts of the dish rack assembly 100 applies to the dish rack assembly 200 unless otherwise noted.

[0048] The dish rack assembly 200 includes a utensil caddy 270 which includes a second side wall 222 similar to the second side wall 122 except the overall length along the Y-axis of the second side wall 222 is smaller than the overall length of a first side wall 220 along the Y-axis. Specifically, the second side wall 222 is configured to have an overall length that is a quarter of the overall length of the first side wall 220. As such, when the utensil caddy 270 is in the second position as illustrated, an uncovered portion or an opening is formed within the first set of cup seats 114. This, in turn, ensures that at least a portion of the first set of cup seats 114 are free or open regardless of whether the utensil caddy 270 is in the first position or the second position.

[0049] The second side wall 222 can be configured to hold smaller, more delicate utensils than the second side wall 122. For example, the second side wall 222 can be configured to hold baby bottle nipples, caps, burrs, or the like. Additionally, or alternatively, the second side wall 222 can include a utensil holder similar to a utensil loop 228 or a utensil seat 226 to hold a set of utensils.

[0050] FIG. 9 is a perspective view of a dish rack assembly 300. The dish rack assembly 300 is similar to the dish rack assembly 100, 200; therefore, like parts will be identified by like numerals in the 300 series, with it being understood that the description of the like parts of the dish rack assembly 100, 200 applies to the dish rack assembly 300 unless otherwise noted.

[0051] The dish rack assembly 300 includes a utensil caddy 370 which includes a second side wall 322 similar to the second side wall 122, 222 except that the second side wall 322 includes an overall length along the Y-axis that is half the overall length of a first side wall 320 along the Y-axis. This is similar to the second side wall 222 in that a portion of the first set of cup seats 114 are free or open regardless of whether the utensil caddy 370 is

in the first position or the second position. However, the second side wall 322 includes the overall length of half the overall length of the first side wall 320. This, in turn, allows for larger utensils, such as large knives, to be mounted on the second side wall 322 when the utensil caddy 370 is in the second position while still allowing for at least a portion of the first set of cup seats 114 to be open regardless of the position of the utensil caddy 370.

[0052] A set of loops 328 can be provided on the first side wall 320 such that a set of larger utensils, illustrated as three spatulas, can be secured within the utensil caddy 370. It is contemplated, that a set of larger utensils can be secured by the set of loops 328 regardless of whether the utensil caddy 370 is in the first position or the second position. As illustrated, the utensil caddy 370 is in the first position such that a portion of the larger utensils extend beyond the utensil caddy along the X-axis.

[0053] Benefits of the present disclosure include a dish rack assembly which is more versatile when compared to traditional dish rack assemblies. For example, traditional dish rack assemblies can include a vertical utensil caddy in a fixed position on the dish rack and a set of cup seats. Utensils can be secured within the utensil caddy while cups and mugs can be provided within the cup seats. The set of cup seats, however, are not configured to receive a set of utensils, so in cases where it is desired to treat a large amount of utensils there may not be adequate space to secure the utensils. The utensil caddy as disclosed herein, however, can be further as a horizontal utensil caddy in that utensils can be horizontally placed within the utensil caddy through the open top when the utensil caddy is in the first position and be laid horizontally across either the first or second side walls when the utensil caddy is in the second position. This allows for a more versatile dish rack assembly as the utensil caddy can be in either the first position or the second position depending on the utensils which are desired to be treated. For example, if a large amount of cups or mugs are desired to be treated, the utensil caddy can be positioned in the first position such that all the cup seats are opened. If, on the other hand, it is desired to treat a large amount of utensils, the utensil caddy can be positioned in the second

position and allow for a larger amount of utensils to be secured by the first and second side walls.

[0054] Further benefits of this disclosure include the dish rack assembly, specifically the utensil caddy, with an improved washing efficiency of utensils when compared to traditional vertical utensil caddies. For example, in traditional vertical utensil caddies receive or secure the utensils in a vertical fashion. This, in turn, can place portions of the utensils out of the spray zone such that they are not as effectively cleaned. The utensil caddy as described herein, however, ensures that all of the utensils are horizontally secured and that all portions of the utensils which need to be treated are within the spray zone. Further, the utensil caddy can include a diffuser section which can diffuse the streams of water from the sprayers and effectively cover a larger surface area for the treating fluid or water to reach. As such, the washing efficiency of the utensils placed or secured within the utensil caddy can be improved when compared to the traditional vertical utensil caddies.

[0055] It will also be understood that various changes and/or modifications can be made without departing from the spirit of the present disclosure. By way of non-limiting example, although the present disclosure is described for use with a wire dish rack, it will be recognized that the rack height adjustment assembly can be employed with various rack constructions, including molded racks, such as racks molded of plastic.

[0056] To the extent not already described, the different features and structures of the various embodiments may be used in combination with each other as desired. That one feature may not be illustrated in all of the embodiments is not meant to be construed that it cannot be, but is done for brevity of description. Thus, the various features of the different embodiments may be mixed and matched as desired to form new embodiments, whether or not the new embodiments are expressly described. All combinations or permutations of features described herein are covered by this disclosure.

[0057] While the invention has been specifically described in connection with certain specific embodiments thereof, it is to be understood that this is by way of illustration and not of limitation. Reasonable variation and modification are possible within the scope of

the forgoing disclosure and drawings without departing from the spirit of the invention which is defined in the appended claims.

[0058] It is intended that the following concepts can define at least a portion of the scope of the disclosure and that the apparatus and/or method(s) within the scope of these concepts and their equivalents be covered thereby. This disclosure should be understood to include all novel and non-obvious combinations of elements described herein, and the concepts may be presented in this or a later application to any novel and non-obvious combination of these elements. Any aspect of any embodiment can be combined with any aspect of any other embodiments. Moreover, the foregoing embodiments are illustrative, and no single feature or element is essential to all possible combinations that may be included in this or a later application. Further aspects of the invention are provided by the subject matter of the following clauses:

[0059] An automatic dishwasher configured to implement an automatic treating cycle of operation, comprising a tub defining a dish treating chamber, a dish rack located within the dish treating chamber and comprising a bottom wall defining a first cup seat and a second cup seat, a first sprayer, carried by the dish rack, and emitting a spray into the first cup seat and a second sprayer, carried by the dish rack, and emitting a spray into the second cup seat.

[0060] The automatic dishwasher of the preceding clause wherein at least one of the first and second cup seats is defined by a depression.

[0061] The automatic dishwasher of any of the preceding clauses wherein the bottom wall further comprises a substantially planar portion extending across a first portion of the bottom wall and the depression extends across a second portion of the bottom wall.

[0062] The automatic dishwasher of any of the preceding clauses wherein the first substantially planar portion defines a utensil seat.

[0063] The automatic dishwasher of any of the preceding clauses wherein the dish rack is an upper dishrack and located within a top portion of the dish treating chamber.

- [0064]** The automatic dishwasher of any of the preceding clauses wherein the depression is defined by a second and a third planar portion angled with respect to the first planar portion.
- [0065]** The automatic dishwasher of any of the preceding clauses wherein the second planar portion defines the first cup seat and the third planar portion defines the second cup seat.
- [0066]** The automatic dishwasher of any of the preceding clauses further comprising a utensil caddy, removably mounted to the dish rack, and comprising a periphery defining an interior with an open top, the periphery having at least first and second opposing side walls, the first side wall abutting and laying parallel to the bottom wall, and the second side wall movable relative to the utensil caddy between a first position, in opposition to the first side wall, and a second position, abutting the bottom wall.
- [0067]** The automatic dishwasher of any of the preceding clauses further comprising a first set of utensil holders provided on the first side wall comprising loops extending from the first side wall and a second set of utensil holders provided on the second side wall comprising pairs of spaced pins defining a slot to receive at least one of a blade or handle of a utensil.
- [0068]** The automatic dishwasher of any of the preceding clauses wherein the first set of utensil holders is different from the second set of utensil holders.
- [0069]** The automatic dishwasher of any of the preceding clauses wherein the second set of utensil holders is only operationally functional when the second side wall is in the second position.
- [0070]** The automatic dishwasher of any of the preceding clauses wherein the first set of utensil holders is nested within the second set of utensil holders when the second side wall is in the first position.
- [0071]** The automatic dishwasher of any of the preceding clauses wherein the first sprayer is a dedicated sprayer emitting spray into the first cup seat.
- [0072]** A dishrack for a dishwasher comprising a bottom wall defining a first cup seat and a second cup seat, a first sprayer, carried by the dish rack, and emitting a spray into the

first cup seat and a second sprayer, carried by the dish rack, and emitting a spray into the second cup seat.

[0073] The dishrack of the preceding clause wherein at least one of the first and second cup seats is defined by a depression.

[0074] The dishrack of any of the preceding clauses wherein the bottom wall further comprises a substantially planar portion extending across a first portion of the bottom wall and the depression extends across a second portion of the bottom wall.

[0075] The dishrack of any of the preceding clauses wherein the first substantially planar portion defines a utensil seat.

[0076] The dishrack of any of the preceding clauses wherein the dish rack is an upper dishrack and located within a top portion of the dish treating chamber.

[0077] The automatic dishwasher of any of the preceding clauses wherein the depression is defined by a second and a third planar portion angled with respect to the first planar portion.

[0078] The automatic dishwasher of any of the preceding clauses wherein the second planar portion defines the first cup seat and the third planar portion defines the second cup seat.

What is claimed is:

1. A dishwasher, comprising:
 - a tub defining a dish treating chamber;
 - a first lower dish rack and a second lower dish rack located in the dish treating chamber;
 - an upper dish rack located above the first lower dish rack and the second lower dish rack in the dish treating chamber, the upper dish rack defining a planar portion and a depression, the depression extending below the planar portion, wherein the depression includes a first angled wall and a second angled wall that each extend at an acute angle relative to the planar portion, and wherein the first angled wall defines a first set of cup seats, and wherein the second angled wall defines a second set of cup seats; and
 - a plurality of utensil holders disposed in the planar portion, the plurality of utensil holders configured to horizontally support utensils.
2. The dishwasher of claim 1, wherein the plurality of utensil holders is disposed in a utensil caddy operably coupled to the planar portion.
3. The dishwasher of claim 2, wherein the utensil caddy includes a basket that is removably coupled with a bottom wall of the planar portion.
4. The dishwasher of claim 2, wherein the utensil caddy defines a periphery defining an interior with an open top.
5. The dishwasher of claim 2, wherein the utensil caddy includes a first side wall, a second side wall, and a set of hinges.

6. The dishwasher of claim 5, wherein the first side wall and the second side wall are coupled together through the set of hinges.
7. The dishwasher of claim 2, further comprising:
at least one sprayer adjacent to the first set of cup seats and configured to emit a spray of water into a cup held by the first set of cup seats.
8. The dishwasher of claim 7, wherein the at least one sprayer is located between the first set of cup seats and the second set of cup seats.
9. The dishwasher of claim 7, wherein the at least one sprayer extends from a front of the upper dish rack to a back of the upper dish rack.
10. The dishwasher of claim 7, wherein the at least one sprayer is also configured to emit the spray of water into a cup held by the second set of cup seats.
11. The dishwasher of claim 7, wherein the at least one sprayer is configured to provide a straight-line stream of water.
12. The dishwasher of claim 7, wherein the at least one sprayer includes a plurality of spray nozzles, and wherein each of the spray nozzles is configured to rotate as the at least one sprayer emits the spray of water into the cup held by the first set of cup seats.
13. The dishwasher of claim 7, wherein the utensil caddy includes a diffuser that diffuses the spray of water emitted by the at least one sprayer.
14. The dishwasher of claim 7, wherein the at least one sprayer is configured to emit a straight-line steam of water to the planar portion of the upper dish rack.

15. The dishwasher of claim 7, wherein the at least one sprayer is configured to emit a fan pattern of water.
16. The dishwasher of claim 1, wherein the first set of cup seats is configured to support a set of cups and the second set of cup seats is configured to support a set of mugs.
17. The dishwasher of claim 7, wherein the at least one sprayer is located between the first set of cup seats and the second set of cup seats, the at least one sprayer configured to emit the spray of water into drinking vessels held by the first and second sets of cup seats.
18. The dishwasher of claim 7, wherein a portion of the spray of water emitted by the at least one sprayer is directed toward the plurality of utensil holders.
19. The dishwasher of claim 7, wherein the upper dish rack includes a wire frame construction that forms the first angled wall and the second angled wall.
20. The dishwasher of claim 19, wherein the wire frame construction also forms the planar portion and side walls of the upper dish rack.
21. The dishwasher of claim 19, wherein a plurality of spray nozzles of the at least one sprayer are located beneath the wire frame construction.
22. The dishwasher of claim 21, wherein the plurality of spray nozzles are configured to rotate during said dishwasher operation.
23. The dishwasher of claim 21, wherein the wire frame construction includes a raised section disposed between the first set of cup seats and the second set of cup seats.

24. The dishwasher of claim 23, wherein the plurality of spray nozzles are disposed below a portion of the raised section.

25. The dishwasher of claim 7, wherein a lowermost portion of the first set of cup seats and a lowermost portion of the second set of cup seats is disposed below the at least one sprayer.

26. The dishwasher of claim 7, wherein the at least one sprayer is disposed below the planar portion.

ABSTRACT OF THE DISCLOSURE

A dishwasher includes a tub that defines a dish treating chamber. A first lower dish rack and a second lower dish rack are located in the dish treating chamber. An upper dish rack is located above the first lower dish rack and the second lower dish rack in the dish treating chamber. The upper dish rack defines a planar portion and a depression. The depression extends below the planar portion and includes a first angled wall and a second angled wall that each extend at an acute angle relative to the planar portion. The first angled wall defines a first set of cup seats and the second angled wall defines a second set of cup seats. A plurality of utensil holders is disposed in the planar portion and is configured to horizontally support utensils.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	SUB-13230-US-CON3
		Application Number	
Title of Invention	DISHWASHER WITH A DISH RACK		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2:

☐	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
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Inventor Information:

Inventor 1					Remove	
Legal Name						
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Petitioner Samsung Ex-1004, 0215

Application Data Sheet 37 CFR 1.76		Attorney Docket Number		SUB-13230-US-CON3	
		Application Number			
Title of Invention		DISHWASHER WITH A DISH RACK			
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All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button. Add					

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence Information of this application.			
Customer Number	130333		
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Application Information:

Title of the Invention	DISHWASHER WITH A DISH RACK		
Attorney Docket Number	SUB-13230-US-CON3	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	9	Suggested Figure for Publication (if any)	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐ Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Petitioner Samsung Ex-1004, 0216

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	SUB-13230-US-CON3
		Application Number	
Title of Invention	DISHWASHER WITH A DISH RACK		

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	130333		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending	Remove			
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
	Continuation of	19039228	2025-01-28		
Prior Application Status	Patented	Remove			
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
19039228	Continuation of	18535327	2023-12-11	12232681	2025-02-25
Prior Application Status	Patented	Remove			
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
18535327	Continuation of	17830947	2022-06-02	11864712	2024-01-09
Prior Application Status	Patented	Remove			
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
17830947	Continuation of	16833984	2020-03-30	11375874	2022-07-05
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.					Add

Foreign Priority Information:

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	SUB-13230-US-CON3
		Application Number	
Title of Invention	DISHWASHER WITH A DISH RACK		

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ⁱ (if applicable)

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Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

<p>This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.</p> <p>☐ NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.</p>
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	SUB-13230-US-CON3
		Application Number	
Title of Invention	DISHWASHER WITH A DISH RACK		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	SUB-13230-US-CON3
		Application Number	
Title of Invention	DISHWASHER WITH A DISH RACK		

Applicant Information:

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		Application Number	
Title of Invention	DISHWASHER WITH A DISH RACK		

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor : Mark S. Feddema
For : DISHWASHER WITH A DISH RACK

Dear Commissioner:

**INFORMATION DISCLOSURE STATEMENT
UNDER 37 C.F.R. § 1.97(b)**

Pursuant to 37 C.F.R. §§ 1.56 and 1.97(b), Applicant brings to the attention of the Examiner each document listed on the attached Form PTO/SB/08a. This Information Disclosure Statement is being filed concurrently with the filing of this patent application.

Copies of the listed foreign patent documents are attached. Applicant respectfully requests that the Examiner consider the listed documents and evidence that consideration by making appropriate notations on the attached form. At least an English language abstract of any foreign patent document is incorporated herein by reference in its entirety as Applicant's concise explanation of the relevancy of the document under MPEP 609.04 and 37 C.F.R. §1.98(a)(3)(i).

This submission does not represent that a search has been made or that no better art exists and does not constitute an admission that any listed document is material or constitutes "prior art." Applicant reserves the right to present to the Office the relevant facts and law regarding the appropriate status of each document. Applicant further reserves the right to take appropriate action to establish the patentability of the disclosed invention over each document listed, should one or more be applied against the claims of the present application.

If there is any fee due in connection with the filing of this Statement, please charge the fee to our Deposit Account No. 16-2463.

Respectfully submitted,

PRICE HENEVELD LLP

August 12, 2025

Date

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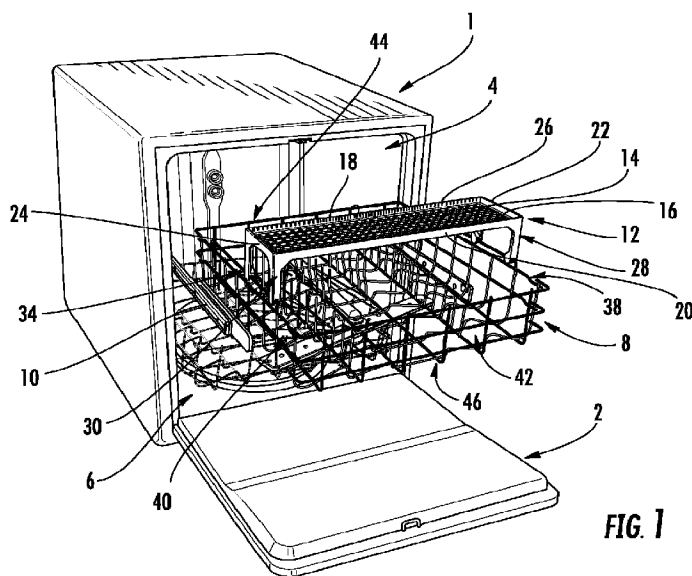


FIG. 1

(57) Abstract: Provided herein are cutlery racks, dishwashers, and associated methods for manufacturing and cleaning with the same. The dishwasher may include a cutlery rack having a first engaging portion, a second engaging portion, and a shelf. The first and second engaging portions may be respectively slidably attached to a first wall and a second wall of a dishwasher rack. The shelf may extend between the first engaging portion and the second engaging portion, may slide in a longitudinal direction with respect to the first wall and the second wall, and may pivot with respect to the dishwasher rack between a working position and a stowed position. In the working position, a receiving surface of the shelf may align with the longitudinal direction, and in the stowed position, the receiving surface shelf may be pivoted out of alignment with the longitudinal direction and positioned adjacent ends of the first and second walls.

FOLD AWAY CUTLERY RACK

FIELD OF THE INVENTION

Embodiments of the present invention relate generally to dishwashers and, more particularly, to cutlery racks for dishwashers and dishwashers comprising at least one cutlery rack.

5

BACKGROUND OF THE INVENTION

Dishwashers are often provided with a cutlery basket or a cutlery tray for stacking cutlery pieces. Traditionally, cutlery baskets may be detachably arranged within the lower rack of the dishwasher, and arranged for essentially vertical reception of cutlery.

10 However, these baskets occupy space in the bottom of the lower rack or must be removed and stored outside the dishwasher. Cutlery trays may be arranged for substantially horizontal reception of cutlery, and are adapted to be extractably arranged in the dishwasher, *e.g.* attached to the wall or top of the tub in the upper part of the dishwasher, above the upper rack. These cutlery trays also occupy substantial vertical
15 space in the tub, even when not in use.

Applicant has identified a number of deficiencies and problems associated with conventional dishwasher cutlery racks and other associated systems and methods.

Through applied effort, ingenuity, and innovation, many of these identified problems have been solved by developing solutions that are included in embodiments of the present

20 invention, many examples of which are described in detail herein.

BRIEF SUMMARY OF THE INVENTION

Generally, some embodiments provided herein include dishwashers, cutlery racks, and associated methods. The dishwasher may include a dishwasher rack
25 disposed in the dishwasher. The dishwasher rack may comprise at least a first wall and a second wall. The first wall may be parallel to the second wall, and each of the first wall and the second wall may define at least one end. The dishwasher may further include a cutlery rack comprising a first engaging portion. The first engaging portion of the cutlery rack may be slidably attached to the first wall of the dishwasher rack. The cutlery rack

may include a second engaging portion, and the second engaging portion of the cutlery rack may be slidably attached to the second wall of the dishwasher rack. The cutlery rack may further include a shelf extending between the first engaging portion and the second engaging portion. The shelf may define a receiving surface for receiving cutlery. The shelf may be configured to slide in a longitudinal direction with respect to the first wall and the second wall, and the shelf may be configured to pivot with respect to the dishwasher rack between a working position and a stowed position. In the working position, the receiving surface of the shelf may be aligned with the longitudinal direction. In the stowed position, the receiving surface shelf may be pivoted out of alignment with the longitudinal direction and may be positioned adjacent an end of the first wall and an end of the second wall.

In some embodiments, the first engaging portion and the second engaging portion may be disposed on a first side of the cutlery rack. The first engaging portion may define a first pivotal attachment member engaging a first rail on the first wall of the dishwasher rack, and the second engaging portion may define a second pivotal attachment member engaging a second rail on the second wall of the dishwasher rack. The cutlery rack may further comprise a second side comprising a third engaging portion configured to be removably and slidably disposed on the first rail in the working position and a fourth engaging portion configured to be removably and slidably disposed on the second rail in the working position. The cutlery rack may be configured to slide along the first rail on the first engaging portion and the third engaging portion and the cutlery rack may be configured to slide along the second rail on the second engaging portion and the fourth engaging portion. The cutlery rack may be configured to be pivoted to the stowed position by lifting the second side of the cutlery rack and rotating the cutlery rack about a first pivotal attachment member of the first engaging portion and a second pivotal attachment member of the second engaging portion.

In some embodiments, in the working position, the receiving surface of the shelf may be configured to be disposed generally parallel to the longitudinal direction. In the stowed position, the receiving surface of the shelf may be configured to be disposed generally perpendicular to the longitudinal direction.

The first wall may further comprise a first rail disposed on an upper edge of the first wall. The first rail may at least partially define a first receiving slot. The first receiving slot may extend parallel to the longitudinal direction, and the first engaging portion may be configured to engage the first receiving slot. In some embodiments, the first engaging portion may include a first leg attached generally perpendicular to the shelf, the first leg defining a length. The first receiving slot may terminate at a distance from the end of the

first wall of the dishwasher rack, and the distance may be equal to the length of the first leg.

5 In some embodiments, the second wall may further comprise a second rail disposed on an upper edge of the second wall. The second rail may at least partially define a second receiving slot. The second receiving slot may extend parallel to the longitudinal direction, and the second engaging portion may be configured to engage the second receiving slot.

10 The second engaging portion may comprise a second leg attached generally perpendicular to the shelf, the second leg defining the length. The second receiving slot may terminate at the distance from the end of the second wall of the dishwasher rack.

15 In some embodiments, the cutlery rack may further comprise a third engaging portion attached to the shelf and a fourth engaging portion attached to the shelf. The third engaging portion may be configured to engage the first wall in the working position, and the fourth engaging portion may be configured to engage the second wall in the working position.

The first engaging portion may define a first slot configured to receive at least a portion of the first wall therein. The first engaging portion may further comprise a first attachment member extending across the first slot, such that the first engaging portion may at least partially surround the portion of the first wall.

20 The second engaging portion may define a second slot configured to receive at least a portion of the second wall therein. The second engaging portion may further comprise a second attachment member extending across the second slot, such that the second engaging portion may at least partially surround the portion of the second wall. In some embodiments, the shelf may be configured to pivot about an axis spanning the first attachment member and the second attachment member.

25 In some embodiments, in the stowed position, a portion of the shelf is configured to rest on an upper edge of a third wall of the dishwasher rack, and the third wall may extend between the end of the first wall and the end of the second wall.

30 The shelf, the first engaging portion, and the second engaging portion may be fixedly connected to each other, and the shelf may be configured to pivot about an axis extending between the first engaging portion and the second engaging portion.

35 In another embodiment, a cutlery rack may be provided. The cutlery rack may include a first side and a second side. The first side may comprise a first engaging portion configured to pivotally and slidably attach to a first rail of a first wall of a dishwasher rack. The first engaging portion may define a first pivotal attachment member configured to engage the first rail. The first side may include a second engaging portion configured to pivotally and slidably attach to a second rail of a second wall of a

dishwasher rack. The second engaging portion may define a second pivotal attachment member configured to engage the second rail. The second side may comprise a third engaging portion configured to be removably and slidably disposed on the first rail and a fourth engaging portion configured to be removably and slidably disposed on the second rail. The cutlery rack may be configured to slide along the first rail on the first engaging portion and the third engaging portion and the cutlery rack may be configured to slide along the second rail on the second engaging portion and the fourth engaging portion. The cutlery rack may be configured to be pivoted to a stowed position by lifting the second side of the cutlery rack and rotating the cutlery rack about the first pivotal attachment member of the first engaging portion and the second pivotal attachment member of the second engaging portion.

In some embodiments, the cutlery rack may comprise a shelf extending between the first side and the second side, the shelf defining a receiving surface for receiving cutlery. The first engaging portion may comprise a first leg attached generally perpendicular to the shelf, the first leg defining a length. The length may be configured to be equal to a distance a termination point of a first receiving slot defined by the first rail and an end of the first wall.

In some embodiments, the second engaging portion may comprise a second leg attached generally perpendicular to the shelf, the second leg defining the length.

The first engaging portion may define a first slot configured to receive the first rail. In some embodiments, the first attachment member may extend across the first slot, such that the first engaging portion may be configured to at least partially surround the first rail. The second engaging portion may define a second slot configured to receive the second rail, and the second attachment member may extend across the second slot, such that the second engaging portion may be configured to at least partially surround the second rail.

In yet another embodiment, a method of manufacturing a dishwasher with a cutlery rack is provided. The dishwasher may include a dishwasher rack disposed in the dishwasher. The dishwasher rack may comprise at least a first wall and a second wall.

The first wall may be parallel to the second wall, and each of the first wall and the second wall may define at least one end. The dishwasher may further include a cutlery rack comprising a first engaging portion, a second engaging portion, and a shelf extending between the first engaging portion and the second engaging portion. The shelf may define a receiving surface for receiving cutlery. The method may include attaching the first engaging portion of the cutlery rack to the first wall of the dishwasher rack. After attachment, the first engaging portion may be configured to slide relative to the first wall of the dishwasher rack. The method may further include attaching the second engaging

portion of the cutlery rack to the second wall of the dishwasher rack. After attachment, the second engaging portion may be configured to slide relative to the second wall of the dishwasher rack. The shelf may be configured to slide in a longitudinal direction with respect to the first wall and the second wall. The shelf may be configured to pivot with respect to the dishwasher rack between a working position and a stowed position. In the working position, the receiving surface of the shelf may be aligned with the longitudinal direction. In the stowed position, the receiving surface shelf may be pivoted out of alignment with the longitudinal direction and positioned adjacent an end of the first wall and an end of the second wall.

BRIEF DESCRIPTION OF THE DRAWINGS

Having thus described the invention in general terms, reference will now be made to the accompanying drawings, which are not necessarily drawn to scale, and wherein:

FIG. 1 shows a dishwasher having a cutlery rack in a working position according to some embodiments discussed herein;

FIG. 2 shows the dishwasher of FIG. 1 having the cutlery rack in a stowed position according to some embodiments discussed herein;

FIG. 3 shows a cutlery rack in a working position according to some embodiments discussed herein; and

FIG. 4 shows a cutlery rack moving between a working position and a stowed position according to some embodiments discussed herein.

DETAILED DESCRIPTION

Exemplary embodiments of the present invention now will be described more fully hereinafter with reference to the accompanying drawings, in which some, but not all embodiments of the invention are shown. Indeed, the invention may be embodied in many different forms and should not be construed as limited to the exemplary embodiments set forth herein; rather, these embodiments are provided so that this disclosure will satisfy applicable legal requirements. Like reference numerals refer to like elements throughout.

Dishwashers often include dedicated receiving areas for washing cutlery. Cutlery, including knives, forks, spoons, and the like, often has smaller dimensions than traditional dishware and, thus, may fall through the relatively larger openings of a dishwasher rack. Moreover, cutlery includes many, smaller surfaces, which warrant specific positioning in the wash chamber and/or higher spray intensities to ensure that the cutlery is cleaned thoroughly.

Some embodiments discussed herein include an improved cutlery rack that offers space and organization for cutlery, while also obstructing as little of the wash chamber as possible without requiring disassembly or storage. As detailed herein, a cutlery rack may be provided that is slidably attached to a dishwasher rack (e.g., the middle rack of a three-rack dishwasher or the top rack of a two-rack dishwasher), wherein the cutlery tray includes a detachable front connection and is designed to pivot to a vertical stowed position that is aligned with and proximate the back wall of the dishwasher tub when in non-use.

With reference to FIG. 1, a dishwasher 1 is shown in accordance with some embodiments discussed herein. The depicted dishwasher 1 includes a door 2 and a wash chamber 4 in which various articles, including cutlery, may be positioned for cleaning. The depicted embodiment includes a lower dish rack 6 and a middle dish rack 8, each configured to hold crockery, including plates, dishes, cups, pans, and the like, for washing. The dish racks 6, 8 may be movable on rails 10 from a loading position, outside the wash chamber 4, to a working position in the wash chamber.

The embodiment shown in FIGS. 1-2 further includes a cutlery rack 12 disposed on the middle rack 8 of the dishwasher for holding cutlery to be cleaned. The cutlery rack includes a shelf 14 having a receiving surface 16 that may include a grid of support bars. In some embodiments, adjacent, parallel grid bars may be spaced one half inch from each other, defining half inch square holes in the grid. The shelf 14 may include raised side walls 18, 20, 22, 24 surrounding the receiving surface 16 for supporting and containing cutlery on the receiving surface of the shelf. For example, the walls 18, 20, 22, 24 may prevent items lying on the shelf from inadvertently falling into the spray arms or sump of the dishwasher during a wash cycle. In some embodiments, the cutlery rack 12 may be disposed on a lower dish rack 6.

In some embodiments, one or more of the raised side walls 18, 20, 22, 24 may include one or more holders 26 (e.g., grooves, slots, openings, or other holding features) for supporting and securing cutlery. For example, in the embodiment shown in FIGS. 1-2, the shelf 14 includes a plurality of holders 26 spaced along the rear wall 18. These holders 26 may be evenly spaced, or may include variable spacing. For example, in the depicted embodiment of FIG. 1, the holders 26 at outer ends of the rear wall 18 include wider spacing than near a center portion of the rear wall (e.g., outer thirds of the rear wall 18 may include wider spacing than a center third of the rear wall). In other embodiments, either half of any wall 18, 20, 22, 24 of the shelf 14 may include holders 26 at a wider spacing than the other half. One of ordinary skill in the art will appreciate, in view of the present disclosure, that any configuration of additional holders, such as clips, specialized

openings, raised prongs, and the like may be disposed on the shelf to organize and support cutlery.

In some embodiments, the shelf 14 may define a width corresponding to the width of the dishwasher rack. For example, in some embodiments, the width of the shelf 14 may be from 18 inches to 20 inches. For example, the width of the shelf 14 may be 18.41 inches (~467.54 mm). In some embodiments, the length of the shelf 14 in the longitudinal direction A may be from 4 inches to 5 inches. For example, the length of the shelf 14 may be 4.88 inches (~124 mm). In some embodiments, the walls 20, 22, 24, 26 of the shelf 14 may be between half an inch and 1.5 inches tall. For example, the height of the walls 20, 22, 24, 26 of the shelf 14 may be .71 inches (~18 mm).

With reference to FIGS. 1-4, the shelf 14 may include one or more engaging portions 28, 30, 32, 34 that connect the shelf to the dishwasher rack 8. In the depicted embodiment, the engaging portions 28, 30, 32, 34 include four legs extending perpendicularly downward from the shelf to engage the dishwasher rack 8. The engaging portions 28, 30, 32, 34 may engage two or more walls 38, 40, 42, 44 of the dishwasher rack 8. In some embodiments, as shown in FIGS. 1-4, the cutlery rack 12 may engage and slide along rails 48, on two parallel walls (e.g., first side wall 38 and second side wall 40). As used herein, the "walls" do not require a solid or continuous surface, but rather, encompass structures that generally align in different regions of the dishwasher rack 8 and/or cutlery rack 12. For example, the depicted "rear wall" 44 may include a plurality of horizontal and/or vertical grid bars along a rear of the dishwasher rack 8. Each wall 38, 40, 42, 44 may define two ends, an upper edge and a lower edge (e.g., two ends of the second wall 40 are shown at the left and right extremes of the wall in the longitudinal direction A of FIGS. 3-4, with the upper edge shown at the top side of the wall 40 and the lower edge shown at the bottom side of the wall 40 in FIGS. 3-4).

The depicted rails 48 are defined on a top edge of the first side wall 38 and the second side wall 40, such that slots 36 of the engaging portions 28, 30, 32, 34 may slide along the rails at an uppermost edge of the side walls. As detailed below, the rails 48 may define longitudinal receiving slots 52 between the rail and the remainder of the walls (e.g., first side wall 38 and second side wall 40). In some embodiments, the engaging portions may ride on rails disposed on an outside or inside surface of the dishwasher rack walls, and the rails may be disposed at an uppermost edge of the walls or at some intermediate position on the side walls. One of ordinary skill in the art will further appreciate, in light of the present disclosure, that the cutlery rack may ride along any parallel walls of the dishwasher rack (e.g., the first and second side walls 38, 40 or the front and rear walls 42, 44), or the cutlery rack may attach to the bottom 46 of the dishwasher rack.

The shelf 14 may be positioned above the dishwasher rack 8 by the engaging portions 28, 30, 32, 34 to allow sufficient space for crockery in the middle dishwasher rack 8. For example, the shelf 14 may be positioned higher than a wine glass, which may be positioned on the dishwasher rack 8 below. The engaging portions 28, 30, 32, 34 may each define a length L from the attachment members 50, which may engage the underside of the rails 48 in the receiving slot 52, to the top of the side walls 20, 22, 24, 26 of the shelf 14. The sum of the length L and the height of the respective wall 38, 40, 42, 44 from the bottom 46 of the dishwasher rack 8 to the attachment members 50 may define the maximum height of the crockery that may be positioned in the dishwasher rack.

In some embodiments, the length may be from 3 inches to 5 inches. For example, the length L may be approximately 3.78 inches (~96.05 mm) in some embodiments. In some embodiments, the length L may be zero, such that the shelf 14 is generally level with the rail 48. In some embodiments, the shelf 14 may rest on the rails 48, and the engaging portions 28, 30, 32, 34 may define slots, bumpers, abutment mechanisms, or other attachment devices for attaching the shelf directly to the rails. In some embodiments, the engaging portions may define a width, perpendicular to the longitudinal direction, of approximately 0.6 inches (~15 mm).

One or more of the engaging portions 28, 30, 32, 34 may attach to the walls of the dishwasher rack 8 to allow pivotal and sliding movement of the shelf 14 relative to the rack, while limiting or preventing removal of the cutlery rack 12 from the dishwasher rack. In the depicted embodiment, the rear engaging portions 32, 34 attach to the rack 8, while the front engaging portions 28, 30 removably engage the dishwasher rack, such as by resting on the rack or loosely gripping the dishwasher rack in a working position. The depicted engaging portions 28, 30, 32, 34 include the slots 36 at a distal end of the legs for receiving a portion of the side walls (*e.g.*, rails 48 of one or more of the walls 38, 40, 42, 44) therein. The depicted rear engaging portions 32, 34 further include attachment members 50 (*e.g.*, pins, clips, pegs, bolts, or the like) extending across the slots 36 to hold the cutlery rack 12 on the rails 48. In such embodiments, the engaging portions 32, 34 having the attachment members 50 may be on a first side of the cutlery rack 12 and the engaging portions 28, 30 removably and slidably resting on the rails 48 without an attachment member may be on a second side of the cutlery rack 12.

The rails 48 may define a continuous, longitudinal receiving slot 52 in which the attachment members 50 may slide. The receiving slots 52 may allow the rear engaging portions 32, 34 on the first side to remain attached to the dishwasher rack 8 while being pivotable and slidable relative to the dishwasher rack. In some embodiments, the rails may be from 12 to 14 inches long (*e.g.*, 12.62 inches or 320.55 mm), and the rails may be

from one half inch to 1.5 inches tall (*e.g.*, 0.65 inches or 16.53 mm) above the upper edge of the respective walls 38, 40, 42, 44.

In some embodiments, the slots 36 and attachment members 50 (shown in FIGS. 3-4) may combine to surround the rails 48 on a cross-sectional plane. In some other
5 embodiments, the engaging portions may hold the rails without completely surrounding them (*e.g.*, via an open-ended pin extending in the receiving slots 52). In some embodiments, the slots 36 and/or attachment members 50 may be removably attached to the rails 48 (*e.g.*, via removable pin, latch, open-ended pin, or the like), such that the cutlery rack 12 remains attached to the dishwasher rack 8 in normal operation, while also
10 being detachable for cleaning or replacement.

Turning to the embodiment shown in FIGS. 3-4, a dishwasher rack 8 is shown from a right-side view, depicting the second wall 40 of the rack as coplanar with the page. While FIGS. 3-4 depict the structure of the dishwasher and cutlery rack 12 as viewed from the right side, one of ordinary skill in the art will appreciate that the descriptions of
15 FIGS. 3-4 may be applied to the left-side structure in the same manner. In operation, with reference to FIG. 3, the cutlery rack 12 may slide along the dishwasher rack 8 in a longitudinal direction A of the walls to which the cutlery rack is engaged (*e.g.*, first side wall 38 and second side wall 40). For example, the depicted embodiment of the cutlery rack 12 slides left-to-right in the longitudinal direction A along the rails 48 of the upper
20 edge of the side walls 38, 40 of the dishwasher rack 8, generally parallel to the bottom 46 of the dishwasher rack. In this manner, the cutlery rack 12 may be positioned at any desired position along the rails 48 to allow the user to choose the relative positioning of the cutlery in the wash chamber 4 (shown in FIGS. 1-2) and the crockery in the dishwasher rack 8. Similarly, the slidable movement of the cutlery rack 12 may allow the
25 user to load the cutlery rack at a front of the dishwasher rack 8 (*e.g.*, proximate the front wall 42 of the dishwasher rack 8), and subsequently move the loaded cutlery rack to the rear (*e.g.*, proximate the rear wall 44 of the dishwasher rack 8) for loading the dishwasher basket and/or for washing operations.

Turning to FIG. 4, the cutlery rack 12 may further pivot between a working position
30 (shown in dashed line), in which the shelf 14 is positioned to accept cutlery, and a stowed position (showed in solid line), in which the shelf is positioned so as to avoid interfering with the operation of the dishwasher rack 8. In the depicted embodiment, the cutlery rack 12 pivots about an axis spanning the attachment members 50 of the rear engaging portions 32, 34. The front engaging portions 28, 30 on the second side may rest on a
35 portion of the side walls 38, 40 (*e.g.*, the rail 48) in the working position, and the front engaging portions may disconnect from the side walls 38, 40 in the stowed position. One of ordinary skill in the art will appreciate that the front engaging portions may instead be

attached to the walls and may pivot with respect to the dishwasher rack. In such embodiments, the shelf may pivot forward in the stowed position. In some embodiments, the cutlery rack 12 may be configured to slide on parallel front and rear walls 42, 44, and the cutlery rack may pivot to the stowed position at or proximate the first side wall 38 or the second side wall 40.

With continued reference to FIGS. 3-4, the working position may be defined as an in-use position in which the receiving surface 16 of the shelf 14 is at least partially horizontal within the wash chamber 4 (shown in FIGS. 1, 2, and 4). In such embodiments, the receiving surface 16 of the shelf 14 may align with the longitudinal direction A. For example, the receiving surface 16 of the shelf 14 may be generally parallel with a plane spanning the longitudinal direction A of the respective walls on which the cutlery rack slides. For example, in the embodiment shown in FIG. 4, the working position is shown parallel with the longitudinal direction A of the second wall 40 (*e.g.*, with the surface of the shelf oriented left-to-right). In some embodiments, the working position may encompass any position of the shelf in the longitudinal direction A (*e.g.*, any sliding position) in which the shelf is generally parallel to the longitudinal direction. As used herein, the term “generally” when used in combination with orientations or dimensions, such as “generally parallel,” does not require the receiving surface of the shelf to be parallel in a mathematically precise position and is meant to indicate that the shelf is within a moderate range of deviation from absolutely parallel that is commonly acceptable as a level of accuracy for these terms within dishwashing arts.

The stowed position may be defined farther from parallel to the longitudinal direction than the working position. In such embodiments, the receiving surface 16 of the shelf 14 may be pivoted out of alignment with the longitudinal direction when transitioning from the working position to the stowed position. With continued reference to FIG. 4, the shelf 14 is shown pivoting about the rear engagement portion 34 and attachment member 50 between the working and stowed positions. In such embodiments, the shelf 14 may be lifted from the second side and may pivot relative to the pivotal attachment members 50 on the engaging portions 32, 34 of the first side.

In the depicted embodiment, the receiving surface 16 of the shelf 14 is generally perpendicular to the longitudinal direction in the stowed position. In some embodiments, the shelf 14 may be slid to the rear wall 44 in the stowed position to avoid obstructing the dishwasher rack 8. Said differently, the shelf 14 may be slid until the receiving surface 16 is adjacent to an end of the first wall and an end of the second wall (*e.g.*, the left end relative to the page in FIG. 4). For example, in the stowed position, the receiving surface 16 of the shelf 14 may be pivoted generally perpendicular to the longitudinal direction and slid at least to the longitudinal position of the rear wall 44 (*e.g.*, to the end of the first wall

38 and the second wall 40). The rear wall 44 may extend between the end of the first wall 38 and the end of the second wall 40.

In some embodiments, the rear wall 44 and the receiving surface 16 of the shelf 14 may be generally parallel in the stowed position, and in some further embodiments, the rear wall 44 and the receiving surface 16 of the shelf 14 may be generally coplanar in the stowed position. In some other embodiments, the upper edges of the walls 18, 20, 22, 24 may be generally coplanar with the rear wall 44 in the stowed position. In each of the embodiments discussed above, the receiving surface 16 of the shelf 14 may be said to be adjacent the ends of the walls on which the cutlery rack slides. In some embodiments, the shelf may slide past the rear wall 44 (*e.g.*, farther into the wash chamber 4 behind the dishwasher rack 8 and past the ends of the walls). The shelf 14 may rest against the rear wall 44 and/or the side walls 38, 40 of the dishwasher rack 8 in the stowed position.

In some embodiments, the receiving channel 52 of the rail 48 may terminate at a distance equal to the length L from the rear wall 44. In such embodiments, the cutlery rack 12 may be limited from sliding closer than the length L from the rear wall 44 in the working position, and thus, the shelf 14 may be generally coplanar with the rear wall 44 in the stowed position because the engaging portions 28, 30, 32, 34 may also define a length L.

In some embodiments described herein, a method of manufacturing a dishwasher with a cutlery rack may be provided. The dishwasher may include a dishwasher rack removably disposed in the dishwasher. The dishwasher rack may include at least a first wall, a second wall, and a third wall (*e.g.*, first side wall 38, second side wall 40, and rear wall 44, respectively, in the embodiment depicted in FIGS. 1-4). The first wall may be parallel to the second wall, and the third wall may extend between the first wall and the second wall. A cutlery rack may be provided that includes a first engaging portion, a second engaging portion, and a shelf extending between the engaging portions. The method may include attaching the first engaging portion of the cutlery rack to the first wall of the dishwasher rack. After attachment, the first engaging portion may be configured to slide relative to the first wall of the dishwasher rack. The method may further include attaching the second engaging portion of the cutlery rack to the second wall of the dishwasher rack. After attachment, the second engaging portion may be configured to slide relative to the second wall of the dishwasher rack. The shelf may slide in a longitudinal direction with respect to the first wall and the second wall. The shelf may be configured to pivot with respect to the dishwasher rack between the working position and the stowed position. In the working position, the shelf may be disposed closer to parallel

with the longitudinal direction than in the stowed position, and in the stowed position, the shelf may slide at least to a longitudinal position of the third wall of the dishwasher rack.

With reference to FIG. 4, the cutlery rack 12 may be positioned sufficiently close to the top wall of the wash chamber 4 that the rack 12 impinges the top wall during folding
5 between the working position and the stowed position, while allowing the cutlery rack 12 to not impinge the top wall when in the final working and stowed positions. In such embodiments, the cutlery rack may be pivoted between the working position and folded position only when the cutlery rack and dishwasher rack are slid out from the wash chamber 4. For example, in some embodiments, the rails 48 of the dishwasher rack 8
10 may be positioned less than 6.18 inches and greater than 4.88 inches from the top of the wash chamber 4, such that for example in embodiments in which the length L is approximately 3.78 inches and the width of the shelf 14 is approximately 4.88 inches, the cutlery rack 12 may be approximately from 1.1 inches to 2.4 inches from the top of the wash chamber in the working position and approximately from zero inches to 1.3 inches
15 from the top wall of the wash chamber in the stowed position.

Many modifications and other embodiments of the inventions set forth herein will come to mind to one skilled in the art to which these embodiments of the invention pertain having the benefit of the teachings presented in the foregoing descriptions and the associated drawings. Therefore, it is to be understood that the embodiments of the
20 invention are not to be limited to the specific embodiments disclosed and that modifications and other embodiments are intended to be included within the scope of the appended claims. While some drawings and description may omit features described elsewhere for simplicity of explanation, it is understood that these features may nonetheless be present in any of the embodiments in any combination or configuration,
25 as detailed above. Although specific terms are employed herein, they are used in a generic and descriptive sense only and not for purposes of limitation.

CLAIMS

1. A dishwasher comprising:

a dishwasher rack disposed in the dishwasher, the dishwasher rack comprising at least a first wall and a second wall, wherein the first wall is parallel to the second wall,

5 and wherein each of the first wall and the second wall defines at least one end;

a cutlery rack comprising:

a first engaging portion, wherein the first engaging portion of the cutlery rack is slidably attached to the first wall of the dishwasher rack;

10 a second engaging portion, wherein the second engaging portion of the cutlery rack is slidably attached to the second wall of the dishwasher rack; and

a shelf extending between the first engaging portion and the second engaging portion, the shelf defining a receiving surface for receiving cutlery, wherein the shelf is configured to slide in a longitudinal direction with respect to the first wall and the second wall, and wherein the shelf is configured to pivot with respect to the dishwasher rack between a working position and a stowed position;

15 wherein in the working position, the receiving surface of the shelf is aligned with the longitudinal direction, wherein in the stowed position, the receiving surface shelf is pivoted out of alignment with the longitudinal direction and positioned adjacent an end of the first wall and an end of the second wall.

2. The dishwasher according to Claim 1, wherein the first engaging portion and the second engaging portion are disposed on a first side of the cutlery rack, wherein the first engaging portion defines a first pivotal attachment member engaging a first rail on the first wall of the dishwasher rack, wherein the second engaging portion defines a second pivotal attachment member engaging a second rail on the second wall of the dishwasher rack, and wherein the cutlery rack further comprises:

25 a second side comprising a third engaging portion configured to be removably and slidably disposed on the first rail in the working position and a fourth engaging portion configured to be removably and slidably disposed on the second rail in the working position;

30 wherein the cutlery rack is configured to slide along the first rail on the first engaging portion and the third engaging portion and the cutlery rack is configured to slide along the second rail on the second engaging portion and the fourth engaging portion;

35 and

wherein the cutlery rack is configured to be pivoted to the stowed position by lifting the second side of the cutlery rack and rotating the cutlery rack about a first pivotal attachment member of the first engaging portion and a second pivotal attachment member of the second engaging portion.

5

3. The dishwasher according to Claims 1 or 2, wherein in the working position, the receiving surface of the shelf is configured to be disposed generally parallel to the longitudinal direction.

10

4. The dishwasher according to any one of the preceding claims, wherein in the stowed position, the receiving surface of the shelf is configured to be disposed generally perpendicular to the longitudinal direction.

15

5. The dishwasher according to any one of Claims 1, 3, or 4, wherein the first wall further comprises a first rail disposed on an upper edge of the first wall, the first rail at least partially defining a first receiving slot, wherein the first receiving slot extends parallel to the longitudinal direction, and wherein the first engaging portion is configured to engage the first receiving slot.

20

6. The dishwasher according to Claim 5, wherein the first engaging portion comprises a first leg attached generally perpendicular to the shelf, the first leg defining a length, wherein the first receiving slot terminates at a distance from the end of the first wall of the dishwasher rack, and wherein the distance is equal to the length of the first leg.

25

7. The dishwasher according to Claim 5 or Claim 6, wherein the second wall further comprises a second rail disposed on an upper edge of the second wall, the second rail at least partially defining a second receiving slot, wherein the second receiving slot extends parallel to the longitudinal direction, and wherein the second engaging portion is configured to engage the second receiving slot.

30

8. The dishwasher according to Claim 7, wherein the second engaging portion comprises a second leg attached generally perpendicular to the shelf, the second leg defining the length, wherein the second receiving slot terminates at the distance from the end of the second wall of the dishwasher rack.

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9. The dishwasher according to any one of Claims 1 or 3 to 8, wherein the cutlery rack further comprises a third engaging portion attached to the shelf and a fourth engaging portion attached to the shelf, wherein the third engaging portion is configured to engage the first wall in the working position, and wherein the fourth engaging portion is
5 configured to engage the second wall in the working position.

10. The dishwasher according to any one of Claims 1 or 3 to 8, wherein the first engaging portion defines a first slot configured to receive at least a portion of the first wall therein, and wherein the first engaging portion further comprises a first attachment
10 member extending across the first slot, such that the first engaging portion at least partially surrounds the portion of the first wall.

11. The dishwasher according to Claim 10, wherein the second engaging portion defines a second slot configured to receive at least a portion of the second wall therein, and wherein the second engaging portion further comprises a second attachment
15 member extending across the second slot, such that the second engaging portion at least partially surrounds the portion of the second wall.

12. The dishwasher according to Claim 11, wherein the shelf is configured to pivot
20 about an axis spanning the first attachment member and the second attachment member.

13. The dishwasher according to any one of the preceding claims, wherein in the stowed position, a portion of the shelf is configured to rest on an upper edge of a third wall of the dishwasher rack, and wherein the third wall extends between the end of the
25 first wall and the end of the second wall.

14. The dishwasher according to any one of the preceding claims, wherein the shelf, the first engaging portion, and the second engaging portion are fixedly connected to each other, and wherein the shelf is configured to pivot about an axis extending between the
30 first engaging portion and the second engaging portion.

15. A cutlery rack comprising:
a first side comprising:
a first engaging portion configured to pivotally and slidably attach to a first
35 rail of a first wall of a dishwasher rack, wherein the first engaging portion defines a first pivotal attachment member configured to engage the first rail;

a second engaging portion configured to pivotally and slidably attach to a second rail of a second wall of a dishwasher rack, wherein the second engaging portion defines a second pivotal attachment member configured to engage the second rail;

5 a second side comprising:

a third engaging portion configured to be removably and slidably disposed on the first rail;

a fourth engaging portion configured to be removably and slidably disposed on the second rail;

10 wherein the cutlery rack is configured to slide along the first rail on the first engaging portion and the third engaging portion and the cutlery rack is configured to slide along the second rail on the second engaging portion and the fourth engaging portion; and

15 wherein the cutlery rack is configured to be pivoted to a stowed position by lifting the second side of the cutlery rack and rotating the cutlery rack about the first pivotal attachment member of the first engaging portion and the second pivotal attachment member of the second engaging portion.

16. The cutlery rack according to Claim 15, further comprising a shelf extending
20 between the first side and the second side, the shelf defining a receiving surface for receiving cutlery.

17. The cutlery rack according to Claim 16, wherein the first engaging portion
25 comprises a first leg attached generally perpendicular to the shelf, the first leg defining a length, wherein the length is configured to be equal to a distance a termination point of a first receiving slot defined by the first rail and an end of the first wall.

18. The dishwasher according to Claim 17, wherein the second engaging portion
30 comprises a second leg attached generally perpendicular to the shelf, the second leg defining the length.

19. The dishwasher according to any one of Claims 15 to 18, wherein the first
35 engaging portion defines a first slot configured to receive the first rail, wherein the first attachment member extends across the first slot, such that the first engaging portion is configured to at least partially surround the first rail,

wherein the second engaging portion defines a second slot configured to receive the second rail, and wherein the second attachment member extends across the second

slot, such that the second engaging portion is configured to at least partially surround the second rail.

20. A method of manufacturing a dishwasher with a cutlery rack, the dishwasher comprising a dishwasher rack disposed in the dishwasher, the dishwasher rack comprising at least a first wall and a second wall, wherein the first wall is parallel to the second wall, and wherein each of the first wall and the second wall defines at least one end; a cutlery rack comprising a first engaging portion, a second engaging portion, and a shelf extending between the first engaging portion and the second engaging portion, the shelf defining a receiving surface for receiving cutlery; the method comprising:

attaching the first engaging portion of the cutlery rack to the first wall of the dishwasher rack, wherein after attachment, the first engaging portion is configured to slide relative to the first wall of the dishwasher rack;

attaching the second engaging portion of the cutlery rack to the second wall of the dishwasher rack, wherein after attachment, the second engaging portion is configured to slide relative to the second wall of the dishwasher rack;

wherein the shelf is configured to slide in a longitudinal direction with respect to the first wall and the second wall, and wherein the shelf is configured to pivot with respect to the dishwasher rack between a working position and a stowed position,

wherein in the working position, the receiving surface of the shelf is aligned with the longitudinal direction, wherein in the stowed position, the receiving surface shelf is pivoted out of alignment with the longitudinal direction and positioned adjacent an end of the first wall and an end of the second wall.

1/2

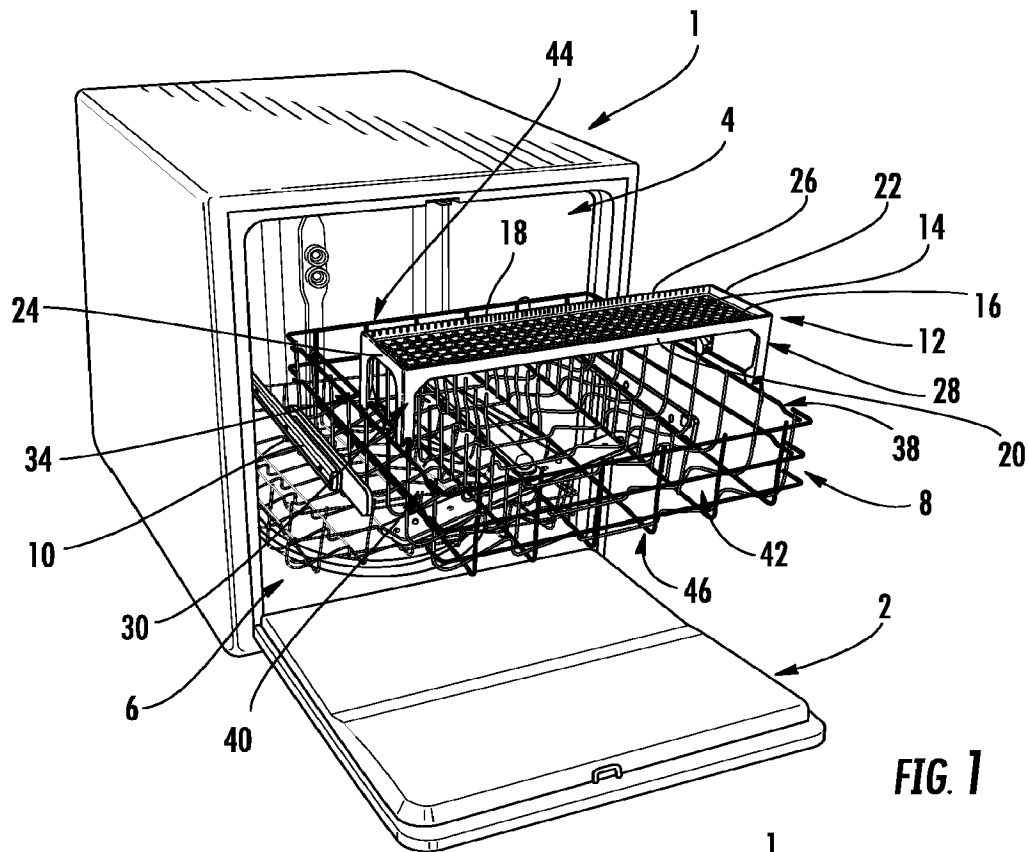


FIG. 1

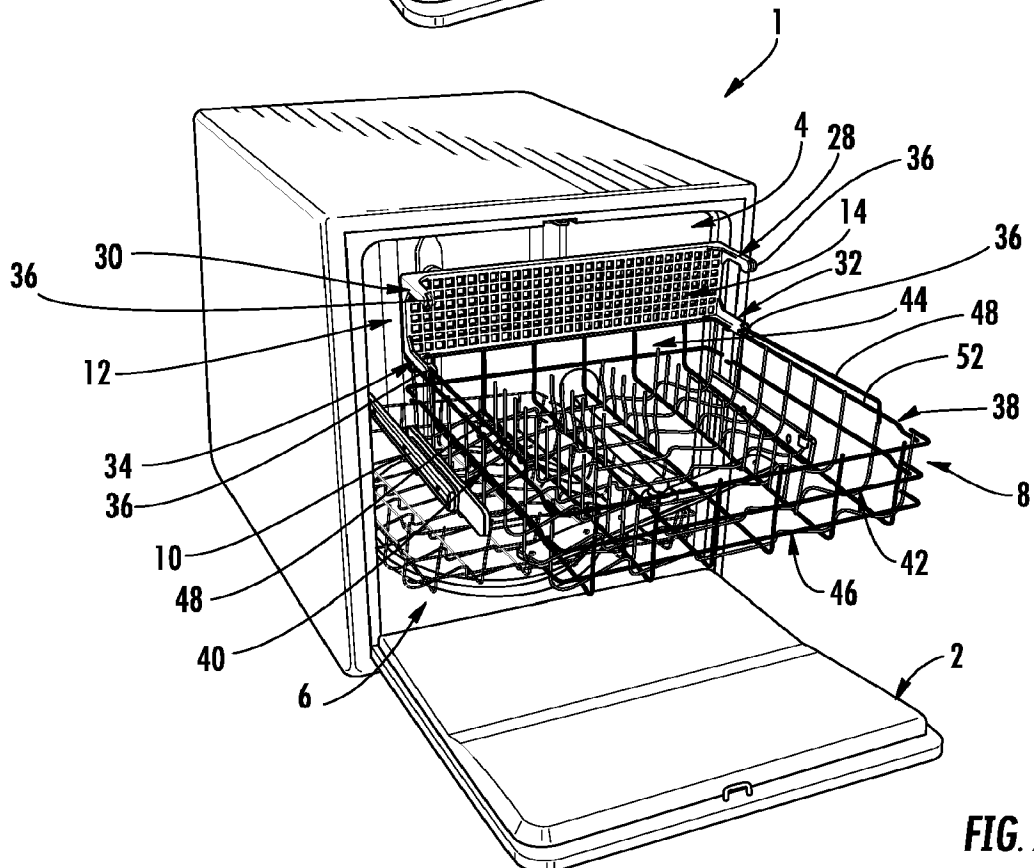


FIG. 2

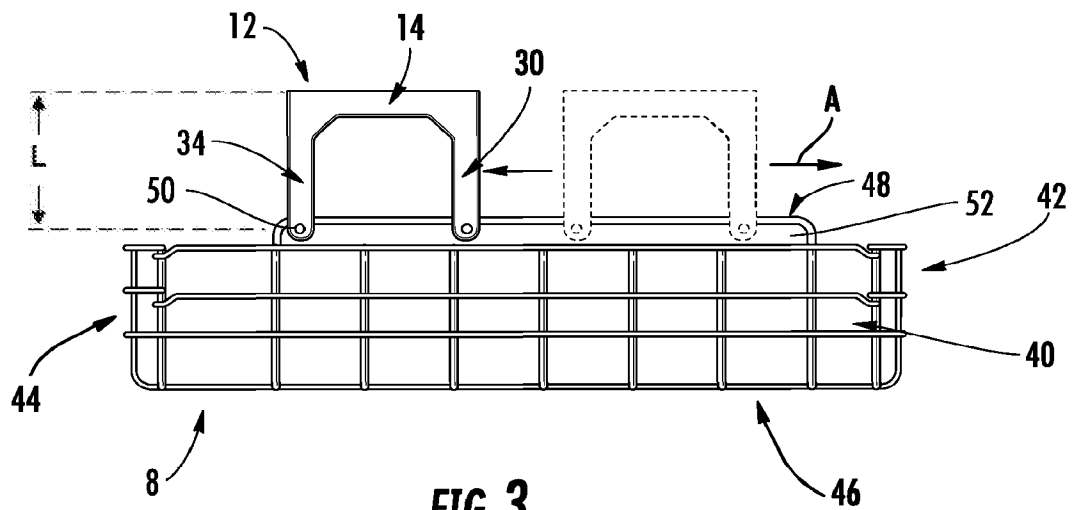


FIG. 3

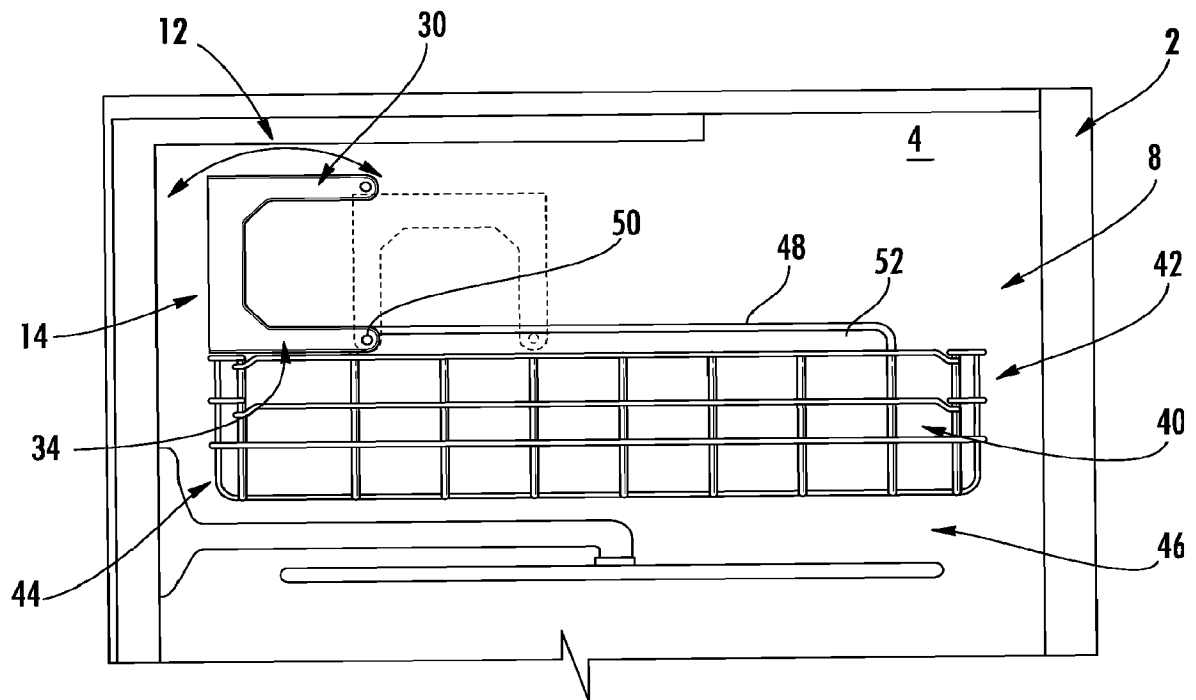


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2016/026704

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A47L 15/50; A47B 77/14; A47L 15/24; A47L 15/26; A47L 15/33; A47L 15/48 (2016.01)
 CPC - A47L 15/507; A47L 15/501; A47L 15/502; A47L 15/503; A47L 15/504; A47L 15/505 (2016.05)
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC(8) - A47B 77/14; A47L 15/24; A47L 15/26; A47L 15/33; A47L 15/48; A47L 15/50; B65D 6/16 (2016.01)
 CPC - A47L 15/501; A47L 15/502; A47L 15/503; A47L 15/504; A47L 15/505; A47L 15/506; A47L 15/507 (2016.05)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
 USPC - 134/183; 211/41.8; 211/70.7; 312/228.1 (keyword delimited)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Patbase, Google Patents, Google, YouTube.

Search terms used: dishwasher, cutlery, utensil, pivot, hinge, rotate, slide, stow.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,462,348 A (ELLINGSON et al) 31 October 1995 (31.10.1995) entire document	1-3, 15, 16, 20
Y	EP 2 322 074 B1 (CANDY S.P.A) 13 March 2013 (13.03.2013) entire document	1-3, 15, 16, 20
A	DE 43 09 915 A1 (LICENTIA PATENT-VERWALTUNGS-GMBH) 29 September 1994 (29.09.1994) machine translation	1-3, 15-20
A	EP 1 475 030 A2 (CANDY S.P.A.) 10 November 2004 (10.11.2004) entire document	1-3, 15-20
A	US 2013/0247944 A1 (FISCHER et al) 26 September 2013 (26.09.2013) entire document	1-3, 15-20

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

25 May 2016

Date of mailing of the international search report

30 JUN 2016

Name and mailing address of the ISA/

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
 P.O. Box 1450, Alexandria, VA 22313-1450
 Facsimile No. 571-273-8300

Authorized officer

Blaine R. Copenheaver

PCT Helpdesk: 571-272-4300
 PCT OSP: 571-272-7774

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2016/026704

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☒ Claims Nos.: 4-14
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.



Espacenet

Bibliographic data: DE102014208843 (A1) — 2015-11-12

Vorrichtung für eine Geschirrspülmaschine, Anordnung und Geschirrspülmaschine

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Classification: - **international:** A47L15/50
- **cooperative:** A47L15/502 (EP)

Application number: DE201410208843 20140512

Priority number(s): DE201410208843 20140512

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Die Erfindung betrifft eine Vorrichtung (12, 12', 12'') für eine Geschirrspülmaschine (1), welche dazu eingerichtet ist, in einem ersten Zustand als Besteckkorb und in einem zweiten Zustand als Besteckschublade verwendet zu werden.



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ABSTRACT DE102014208843A1

The invention relates to a device (12, 12', 12'') for a dishwasher (1), which is designed to be used as a cutlery basket in a first state and as a cutlery drawer in a second state.

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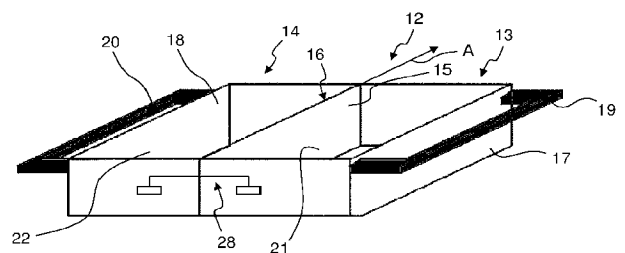
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Prüfungsantrag gemäß § 44 PatG ist gestellt.

Die folgenden Angaben sind den vom Anmelder eingereichten Unterlagen entnommen

(54) Bezeichnung: **Vorrichtung für eine Geschirrspülmaschine, Anordnung und Geschirrspülmaschine**

(57) Zusammenfassung: Die Erfindung betrifft eine Vorrichtung (12, 12', 12'') für eine Geschirrspülmaschine (1), welche dazu eingerichtet ist, in einem ersten Zustand als Besteckkorb und in einem zweiten Zustand als Besteckschublade verwendet zu werden.



Beschreibung

[0001] Die vorliegende Erfindung betrifft eine Vorrichtung für eine Geschirrspülmaschine. Ferner betrifft die Erfindung eine Anordnung mit einer Spülgutaufnahme und zumindest einer Vorrichtung. Des Weiteren betrifft die Erfindung eine Geschirrspülmaschine.

[0002] Typischerweise weisen Haushaltsgeschirrspülmaschinen zum Aufnehmen von Besteck einen Besteckkorb oder eine Besteckschublade auf. Je nach zu spülendem Spülgut kann jedoch ein Besteckkorb oder eine Besteckschublade vorteilhafter sein.

[0003] Vor diesem Hintergrund besteht eine Aufgabe der vorliegenden Erfindung darin, eine verbesserte Vorrichtung für eine Geschirrspülmaschine, eine verbesserte Anordnung mit einer Spülgutaufnahme und zumindest einer Vorrichtung sowie eine verbesserte eine Geschirrspülmaschine bereitzustellen.

[0004] Demgemäß wird eine Vorrichtung für eine Geschirrspülmaschine vorgeschlagen, welche dazu eingerichtet ist, in einem ersten Zustand als Besteckkorb und in einem zweiten Zustand als Besteckschublade verwendet zu werden.

[0005] Vorteilhaft kann die Vorrichtung somit je nach den Bedürfnissen eines Benutzers der Geschirrspülmaschine als Besteckkorb oder als Besteckschublade verwendet werden. Wird die Vorrichtung als Besteckkorb verwendet, kann beispielsweise auch relativ hohes Spülgut, beispielsweise Stielgläser, in einen Oberkorb der Geschirrspülmaschine eingelegt werden. Bei einer Verwendung als Besteckschublade können hingegen relativ sperrige Spülgüter wie Töpfe in einen Unterkorb der Geschirrspülmaschine eingelegt werden. Somit kann die Anordnung des Bestecks flexibel an die jeweilige Beladungssituation der Geschirrspülmaschine angepasst werden, sodass der vorhandene Platz stets gut genutzt wird.

[0006] Die Verwendung als Besteckkorb setzt nach vorliegender Definition voraus, dass dieser von oben mit Besteck beladen werden kann, wobei das Besteck eine stehende, also sich in Hochrichtung erstreckende Lage, einnimmt. Des Weiteren umfasst der Besteckkorb bevorzugt einen Handgriff.

[0007] Die Verwendung als Besteckschublade setzt nach vorliegender Definition voraus, dass Mittel vorgesehen sind, die ein Einschieben und Herausziehen der Vorrichtung aus einem Spülbehälter der Geschirrspülmaschine vorgesehen sind. Das Einschieben und Herausziehen erfolgt dabei in einer horizontalen Ebene. Bevorzugt ist die Ebene eine dritte Beladungsebene – zusätzlich zu einem Unter- und einem Oberkorb – der Geschirrspülmaschine.

[0008] Um eine ausreichende Beaufschlagung des Spülguts mit einer Spülflotte und eine genügende Trocknung des Spülguts zu gewährleisten, kann die Vorrichtung aus einem Gittermaterial hergestellt sein. Bevorzugt ist das Gittermaterial ein Kunststoff oder Metall.

[0009] Gemäß einer Ausführungsform ist die Vorrichtung durch einen ersten und einen zweiten Aufnahmeabschnitt gekennzeichnet, welche schwenkbar miteinander verbunden sind, wobei die Vorrichtung durch Schwenken des ersten und zweiten Aufnahmeabschnitts zueinander zwischen dem ersten Zustand und einen zweiten Zustand überführbar ist.

[0010] Dies hat den Vorteil, dass die Vorrichtung schnell und einfach mittels Schwenkens von dem ersten Zustand in den zweiten Zustand und wieder zurückgeführt werden kann.

[0011] Gemäß einer weiteren Ausführungsform weist der erste und/oder zweite Aufnahmeabschnitt eine quaderförmige Gestalt auf.

[0012] Insbesondere können der erste und zweite Aufnahmeabschnitt eine gleiche quaderförmige Gestalt aufweisen. Die quaderförmige Gestalt kann eine rechteckige Grundfläche aufweisen. Der Aufnahmeabschnitt hat insbesondere sich gegenüberliegende erste und zweite Schmalseiten, sich gegenüberliegende dritte und vierte Schmalseiten sowie sich gegenüberliegende erste und zweite Deckflächen. Die erste und zweite Deckfläche können insbesondere eine größere Fläche als die erste und zweite Schmalseite und als die dritte und vierte Schmalseite haben. Insbesondere ist die erste Deckfläche geschlossen und die zweite Deckfläche offen ausgebildet, sodass der erste und zweite Aufnahmeabschnitt jeweils die Gestalt einer oben und seitlich offenen Kiste aufweisen.

[0013] Gemäß einer weiteren Ausführungsform sind der erste und zweite Aufnahmeabschnitt in einem Bereich einer ersten Schmalseite des ersten und zweiten Aufnahmeabschnitts aneinander angelenkt.

[0014] Insbesondere kann die erste Schmalseite des ersten und zweiten Aufnahmeabschnitts eine Standfläche der Vorrichtung bei einer Verwendung in dem ersten Zustand bilden.

[0015] Gemäß einer weiteren Ausführungsform erfolgt eine Beladung der Vorrichtung in dem ersten Zustand über eine zweite Schmalseite des ersten und/oder zweiten Aufnahmeabschnitts und in dem zweiten Zustand über eine Deckfläche des ersten und/oder zweiten Aufnahmeabschnitts.

[0016] Insbesondere kann die Beladung in einem ersten Zustand über die, der ersten Schmalseite

gegenüberliegende zweite Schmalseite erfolgen. In dem ersten Zustand können die Deckflächen des ersten und zweiten Aufnahmeabschnitts die Seitenflächen der Vorrichtung bilden. Insbesondere kann eine Beladung in dem ersten Zustand über die zweite Schmalseite den Vorteil haben, dass die Vorrichtung eine kleinere Standfläche bei einer Verwendung als Besteckkorb in einer Spülgutaufnahme aufweist. Des Weiteren kann eine Beladung in dem zweiten Zustand über die (zweite) Deckfläche den Vorteil haben, dass die Vorrichtung in dem zweiten Zustand eine in Hochrichtung schmale Gestalt aufweist.

[0017] Gemäß einer weiteren Ausführungsform ist der erste und/oder zweite Aufnahmeabschnitt jeweils zumindest teilweise auffaltbar.

[0018] Insbesondere kann der erste und/oder zweite Aufnahmeabschnitt, um von dem ersten Zustand zu dem zweiten Zustand zu gelangen, zumindest teilweise aufgeklappt werden. Beispielsweise kann dadurch eine beladbare Fläche vergrößert werden. Insbesondere können in einem aufgeklappten Zustand die Deckfläche und die erste Schmalseite eine ebene Gesamtfläche bilden.

[0019] Gemäß einer weiteren Ausführungsform ist die Vorrichtung durch ein Halteelement gekennzeichnet, das dazu eingerichtet ist, die Vorrichtung in dem zweiten Zustand in einer an einem Spülbehälter der Geschirrspülmaschine angebrachten Haltevorrichtung zu befestigen.

[0020] Das Halteelement kann ferner außen – bezogen auf ein von dem ersten und/oder zweiten Aufnahmeabschnitt umschlossenes Volumen – an dem ersten und/oder zweiten Aufnahmeabschnitt angebracht sein.

[0021] Die Haltevorrichtung kann beispielsweise als Führungsschiene oder -stange ausgebildet sein. Hierzu kann sie als Profilteil mit einem beispielsweise kreisförmigen, quadratischen, U- oder L-förmigen Querschnitt ausgebildet sein.

[0022] Gemäß einer weiteren Ausführungsform ist das Halteelement in zumindest einem der beiden Zustände als Handgriff verwendbar.

[0023] Dies hat den Vorteil, dass die Vorrichtung in dem ersten Zustand von einem Benutzer aus einer Spülgutaufnahme herausgehoben werden kann. Des Weiteren kann das Halteelement dazu verwendet werden, die Vorrichtung in dem zweiten Zustand aus der Geschirrspülmaschine herauszuziehen.

[0024] Gemäß einer weiteren Ausführungsform ist das Halteelement als Gleitelement ausgebildet, welches dazu eingerichtet ist, entlang eines Abschnitts der Haltevorrichtung zu gleiten, und/oder als Aufste-

ckelement ausgebildet, welches dazu eingerichtet ist, auf einen Abschnitt der Haltevorrichtung aufgesteckt zu werden und/oder als Rahmenelement ausgebildet, welches dazu eingerichtet ist, auf einen Abschnitt der Haltevorrichtung gelegt zu werden.

[0025] Gemäß einer weiteren Ausführungsform ist der erste und zweite Aufnahmeabschnitt in dem zweiten Zustand zwischen zwei gegenüberliegenden Abschnitten der Haltevorrichtung gespannt gehalten.

[0026] Insbesondere kann die Vorrichtung somit zwischen zwei gegenüberliegenden Abschnitten der Haltevorrichtung derart gespannt gehalten werden, dass sie bei einer Verwendung als Besteckschublade in der Geschirrspülmaschine einer Belastung durch Spülgut von oben (auf Grund der Wirkung der Schwerkraft) standhält.

[0027] Gemäß einer weiteren Ausführungsform sind der erste und zweite Aufnahmeabschnitt in dem ersten und/oder dem zweiten Zustand miteinander lösbar verrastbar.

[0028] Beispielsweise kann der erste und zweite Aufnahmeabschnitt mittels eines Arretierelements in dem ersten und/oder zweiten Zustand arretiert, beispielsweise verriegelt, sein. Das Arretierelement kann so ausgebildet sein, dass es den ersten und zweiten Aufnahmeabschnitt sowohl in dem ersten Zustand als auch in dem zweiten Zustand verrasten kann. Es können aber auch zwei Arretierelemente vorgesehen sein, die die beiden Aufnahmeabschnitte jeweils in einem Zustand verriegeln. Insbesondere kann die Arretiervorrichtung ein unerwünschtes Überführen (beispielsweise auf Grund der Schwerkraft) der Vorrichtung von dem ersten Zustand in den zweiten Zustand und umgekehrt verhindern.

[0029] Ferner wird eine Anordnung mit einer Spülgutaufnahme, die einen Rahmen hat, und zumindest einer Vorrichtung, wie vorstehend beschrieben, vorgeschlagen, wobei die zumindest eine Vorrichtung in einem ersten Zustand als Besteckkorb in die Spülgutaufnahme hineinstellbar ist und in einem zweiten Zustand auf dem Rahmen der Spülgutaufnahme ablegbar ist.

[0030] Des Weiteren wird eine Geschirrspülmaschine mit einer Spülgutaufnahme und zumindest einer Vorrichtung, wie vorstehend beschrieben, vorgeschlagen, wobei die Vorrichtung in dem ersten Zustand in der Spülgutaufnahme als Besteckkorb und in dem zweiten Zustand in der Geschirrspülmaschine als Besteckschublade verwendbar ist.

[0031] Die Geschirrspülmaschine ist insbesondere eine Haushaltsgeschirrspülmaschine.

[0032] Gemäß einer weiteren Ausführungsform ist die Haltevorrichtung unterhalb einer Decke eines Spülbehälters der Geschirrspülmaschine angeordnet und/oder an zwei sich gegenüberliegenden Seiten eines Spülbehälters der Geschirrspülmaschine angeordnet.

[0033] Insbesondere kann die Haltevorrichtung zwischen einem Oberkorb und einem Unterkorb an zwei sich gegenüberliegenden Seiten des Spülbehälters der Geschirrspülmaschine angeordnet sein.

[0034] Weitere mögliche Implementierungen der Erfindung umfassen auch nicht explizit genannte Kombinationen von zuvor oder im Folgenden bezüglich der Ausführungsbeispiele beschriebenen Merkmale oder Ausführungsformen. Dabei wird der Fachmann auch Einzelaspekte als Verbesserungen oder Ergänzungen zu der jeweiligen Grundform der Erfindung hinzufügen.

[0035] Weitere vorteilhafte Ausgestaltungen und Aspekte der Erfindung sind Gegenstand der Unteransprüche sowie der im Folgenden beschriebenen Ausführungsbeispiele der Erfindung. Im Weiteren wird die Erfindung anhand von bevorzugten Ausführungsformen unter Bezugnahme auf die beigelegten Figuren näher erläutert.

[0036] **Fig. 1** zeigt schematische perspektivische Ansicht einer Haushaltsgeschirrspülmaschine; und

[0037] **Fig. 2 bis Fig. 9** zeigen verschiedene Ausführungsformen der Vorrichtung sowie deren Verwendung in einem ersten Zustand und einem zweiten Zustand.

[0038] In den Figuren sind gleiche oder funktionsgleiche Elemente mit denselben Bezugszeichen versehen worden, sofern nichts anderes angegeben ist.

[0039] Die **Fig. 1** zeigt eine schematische perspektivische Ansicht einer Haushaltsgeschirrspülmaschine **1**. Die Haushaltsgeschirrspülmaschine **1** weist einen Spülbehälter **2** auf, der durch eine Tür **3** wasserdicht verschließbar ist.

[0040] Der Spülbehälter **2** ist vorzugsweise quaderförmig. Insbesondere ist der Spülbehälter **2** aus einem Stahlblech gefertigt. Alternativ kann der Spülbehälter **2** zumindest abschnittsweise aus einem Kunststoffmaterial gefertigt sein. Der Spülbehälter **2** und die Tür **3** können eine Spülkammer **4** zum Spülen von Spülgut bilden. Der Spülbehälter **2** kann im Inneren eines Gehäuses der Haushaltsgeschirrspülmaschine **1** angeordnet sein. Die Tür **3** ist in **Fig. 1** in ihrer geöffneten Stellung dargestellt. Durch ein Schwenken um eine an einem unteren Ende der Tür **3** vorgesehene Schwenkachse **S** kann die Tür **3** geschlossen oder geöffnet werden.

[0041] Der Spülbehälter **2** weist einen Boden **5**, eine dem Boden **5** gegenüberliegend angeordnete Decke **6**, eine der Tür **3** gegenüberliegend angeordnete Rückwand **7** und zwei einander gegenüberliegend angeordnete Seitenwände **8, 9** auf. Der Boden **5**, die Decke **6**, die Rückwand **7** und die Seitenwände **8, 9** können beispielsweise aus einem Edelstahlblech gefertigt sein.

[0042] Die Haushaltsgeschirrspülmaschine **1** weist weiterhin zumindest eine Spülgutaufnahme **10** auf. Insbesondere können mehrere Spülgutaufnahmen **10** vorgesehen sein, wobei jeweils eine der mehreren Spülgutaufnahmen **10** ein Unterkorb oder ein Oberkorb der Haushaltsgeschirrspülmaschine **1** ist. Die mehreren Spülgutaufnahmen **10** sind vorzugsweise übereinander in dem Spülbehälter **2** angeordnet. Insbesondere ist jeder Spülgutaufnahme **10** eine Führungseinrichtung **11** zugeordnet. Mit Hilfe der Führungseinrichtung **11** ist die jeweilige Spülgutaufnahme **10** in den Spülbehälter **2** hinein (Einschubrichtung **E**) oder aus diesem heraus verlagerbar.

[0043] Die **Fig. 2 bis Fig. 9** zeigen schematische Ansichten von verschiedenen Ausführungsformen einer Vorrichtung **12, 12', 12''** sowie deren Verwendung in einem ersten Zustand und einem zweiten Zustand in der Haushaltsgeschirrspülmaschine **1** aus **Fig. 1**. Dabei zeigen die mit **A** gekennzeichneten Figuren jeweils die Vorrichtung in einem ersten Zustand, die mit **B** gekennzeichneten Figuren jeweils die Vorrichtung in einem zweiten Zustand, die mit **C** gekennzeichneten Figuren jeweils eine Verwendung der Vorrichtung in dem ersten Zustand beziehungsweise den diese aufnehmenden Spülbehälter **2** und die mit **D** gekennzeichneten Figuren jeweils eine Verwendung der Vorrichtung in dem zweiten Zustand.

[0044] **Fig. 2A** zeigt eine Vorrichtung **12** in einem ersten Zustand. Die Vorrichtung **12** weist zwei Aufnahmeabschnitte **13, 14** auf, die beispielsweise jeweils eine quaderförmige Gestalt mit einer rechteckigen Grundfläche besitzen. Die Aufnahmeabschnitte **13, 14** hat insgesamt sechs paarweise einander gegenüberliegende Flächen. Der erste und zweite Aufnahmeabschnitt **13, 14** sind in einem Bereich einer ersten Schmalseite **15** des ersten Aufnahmeabschnitts **13** und einer ersten Schmalseite **16** des zweiten Aufnahmeabschnitts **14** aneinander um eine Schwenkachse **X** angelenkt. Auf den gegenüberliegenden zweiten Schmalseiten **17, 18** ist jeweils ein Halteelement **19, 20** an der Vorrichtung **12** angeordnet.

[0045] In dem in der **Fig. 2A** dargestellten ersten Zustand kann die Vorrichtung **12** als ein Besteckkorb in eine Spülgutaufnahme **10** hineingestellt werden. Die Halteelemente **19, 20** sind insbesondere dazu eingerichtet, als Handgriffe für die Vorrichtung **12** in dem ersten Zustand zu dienen.

[0046] Eine Beladung der Vorrichtung **12** in dem ersten Zustand erfolgt über die zweiten Schmalseiten **17, 18**. Die Vorrichtung **12** kann insbesondere aus einem gitterartigen Kunststoffmaterial hergestellt sein. In der **Fig. 2C** ist die Verwendung der Vorrichtung **12** in dem ersten Zustand als Besteckkorb in einer Spülgutaufnahme **10**, beispielsweise einem Unterkorb, dargestellt.

[0047] Um die Vorrichtung **12** von dem ersten Zustand, dargestellt in der **Fig. 2A**, in einen zweiten Zustand (**Fig. 2B**) zu überführen, werden der erste und zweite Aufnahmeabschnitt **13, 14** gegeneinander verschwenkt. In dem zweiten Zustand erfolgt eine Beladung der Vorrichtung **12** über die insbesondere offenen Deckflächen **21** und **22**, die in dem ersten Zustand nebeneinanderliegend eine Mittenebene **M** gebildet haben. Geschlossene Deck- beziehungsweise Seitenflächen **23, 24** der Vorrichtung **12** in dem ersten Zustand (**Fig. 2A**) bilden in dem zweiten Zustand Bodenflächen, auf die ein zu spülendes Spülgut gelegt wird.

[0048] In dem zweiten Zustand kann die Vorrichtung **12** als eine Besteckschublade in der Haushaltsgeschirrspülmaschine **1** verwendet werden. Hierzu weist die Haushaltsgeschirrspülmaschine **1** eine Haltevorrichtung **25** auf, welche an der Decke **6** des Spülbehälters **2** insbesondere oberhalb des Oberkorbs **10** befestigt ist. Die Haltevorrichtung **25** weist zwei Abschnitte **26** und **27** auf, auf denen die Halteelemente **19** und **20** der Vorrichtung **12** gleiten können. Die Abschnitte **26, 27** sind beispielsweise als Profile, insbesondere U-Profile, ausgebildet.

[0049] Um ein unerwünschtes Überführen der Vorrichtung **12** von dem ersten Zustand in den zweiten Zustand zu verhindern, ist eine Arretiervorrichtung **28** an dem ersten und zweiten Aufnahmeabschnitt **13** und **14** beispielsweise an zumindest einer dritten Schmalseite **29, 30** des Aufnahmeabschnitt **13** beziehungsweise **14** angeordnet. Die Arretiervorrichtung **28** ist dazu eingerichtet, die Vorrichtung **12** sowohl in dem ersten Zustand als auch in dem zweiten Zustand lösbar zu verrasten.

[0050] **Fig. 3** zeigt eine weitere Ausführungsform der Vorrichtung **12'**. Im Unterschied zu der Vorrichtung **12** ist bei der Vorrichtung **12'** lediglich das Halteelement **19** als Handgriff in ausgebildet. Ferner weist das Halteelement **19** außen auf der dritten und vierten Schmalseite **29** und **31** des ersten Aufnahmeabschnitts **13** verlaufende Gleitabschnitte **19'** auf. Das an dem zweiten Aufnahmeabschnitt **14** angeordnete Halteelement **20** umfasst lediglich zwei Gleitabschnitte **20'**, welche nicht miteinander verbunden sind. Die Gleitabschnitte **20'** sind an der dritten und vierten Schmalseite **30, 32** des zweiten Aufnahmeabschnitts **14** angeordnet.

[0051] In dem zweiten Zustand der Vorrichtung **12** (**Fig. 3B**) bilden die Gleitabschnitte **19'** und **20'** der Halteelemente **19** und **20** eine Gleitschiene, welche sich entlang der Seitenfläche der Vorrichtung **12** erstreckt, die durch die Schmalseiten **29** und **30** gebildet wird. Die Abschnitte **26, 27** der Haltevorrichtung **25** sind derart eingerichtet, dass die Gleitabschnitte **19', 20'** der Halteelemente **19, 20** auf ihnen gleiten können.

[0052] Das Halteelement **19** dient des Weiteren auch als Handgriff in dem zweiten Zustand der Vorrichtung **12'**, so dass die Vorrichtung **12'** beispielsweise an dem Halteelement **19** aus der Haltevorrichtung **25** herausziehbar ist. Dies kann beispielsweise in der **Fig. 3D** gesehen werden.

[0053] **Fig. 4** zeigt eine weitere Ausführungsform der Vorrichtung **12'**. Im Unterschied zu der Ausführungsform nach **Fig. 3** ist die Haltevorrichtung **25** als ein in der Draufsicht rechteckiger Rahmen **33** ausgebildet, in den die Vorrichtung **12'** in dem zweiten Zustand einlegbar ist (**Fig. 4D**). Die Vorrichtung **12'** liegt dann mittels der Abschnitte **19', 20'** der Halteelemente **19, 20** auf dem Rahmen **33** auf.

[0054] **Fig. 5** zeigt eine weitere Ausführungsform der Vorrichtung **12'**. Im Gegensatz zu der in **Fig. 4** gezeigten Vorrichtung **12'** wird die in der **Fig. 5** gezeigte Vorrichtung **12'** in einen Rahmen **33** einer Haltevorrichtung **25** eingelegt, die an den Seiten **8, 9** des Spülbehälters **2** insbesondere oberhalb des Oberkorbs **10** befestigt ist.

[0055] **Fig. 6** zeigt eine weitere Ausführungsform der Vorrichtung **12**. Im Gegensatz zu der Vorrichtung **12** aus der **Fig. 2** weist die Vorrichtung **12** aus **Fig. 6** Halteelemente **19''** und **20''** auf, die als Hohlkörperprofile ausgebildet sind. Die Halteelemente **19''** und **20''** sind auf als korrespondierende Zapfen oder Führungsstangen gebildete Schenkel **36, 37** der Haltevorrichtung **25** aufsteckbar. Die Führungsstangen **36, 37** der Haltevorrichtung **25** sind beispielsweise an der Decke **6** des Spülbehälters **2** angeordnet. Jeweils zwei Schenkel **36, 37** können zu einer U-förmig gebogene Gestalt **34, 35** verbunden sein. Die Schenkel **36, 37** können gleich lang oder verschieden lang sein.

[0056] Durch das Aufstecken der Halteelemente **19''** und **20''** auf die Führungsstangen **36, 37** der Haltevorrichtung **25** kann die Vorrichtung **12** in dem zweiten Zustand gespannt, insbesondere in horizontaler Ebene formschlüssig, gehalten werden. Dadurch kann auf eine Arretiervorrichtung **28** verzichtet werden.

[0057] Bei der Ausführungsform nach **Fig. 7** sind die Halteelemente **19''** und **20''** als C-Profile ausgebildet, wobei der geschlossene Abschnitt in dem ersten Zustand der Vorrichtung **12** nach unten weist, sodass

ein gutes manuelles Greifen gewährleistet ist. Über den offenen Abschnitt des C-Profils kann eine Reinigung im Spülbetrieb erfolgen. Die Führungsstangen **36, 37** sind als korrespondierende Rundprofile ausgebildet.

[0058] Fig. 8 zeigt eine weitere Ausführungsform der Vorrichtung **12''**. Im Unterschied zu der Vorrichtung **12** aus der Fig. 6 weist die Vorrichtung **12''** in der Fig. 8 einen ersten und einen zweiten Aufnahmeabschnitt **13'** und **14'** auf, welche jeweils auseinander geklappt beziehungsweise auseinander gefaltet werden, um von dem ersten Zustand (Fig. 8A) in den zweiten Zustand (Fig. 8B) überführt zu werden. In dem zweiten Zustand weist die Vorrichtung **12''** zumindest teilweise die Form des Netzes der quaderförmigen Aufnahmeabschnitte **13'**, **14'** auf. Das heißt, eine Beladungsfläche der Vorrichtung **12''** in dem zweiten Zustand wird neben den Seitenflächen **23, 24** noch aus den mittleren Trennflächen **38, 39** sowie den ersten Schmalseiten **15, 16** der Aufnahmeabschnitte **13'**, **14'** gebildet.

[0059] Um eine Belastbarkeit der Vorrichtung **12''** in dem zweiten Zustand, insbesondere bei einer Belastung gegen die Schwerkraft, zu erhöhen, wird die Vorrichtung **12''** mit ihren Halteelementen **19'', 20''** auf die Führungsstangen **36, 37** der Haltevorrichtung **25** aufgesteckt. Die Haltevorrichtung **25** ist an den Seiten **8, 9** des Spülbehälters **2** der Haushaltsgeschirrspülmaschine **1** angeordnet. Auf diese Art und Weise kann die Vorrichtung **12** in dem zweiten Zustand zwischen den Führungsstangen **36, 37** gespannt werden.

[0060] Fig. 9 zeigt eine weitere Ausführungsform der Vorrichtung **12''** mit C-förmigen Halteelemente **19''** und **20''**, wie bereits im Zusammenhang mit Fig. 7 beschrieben.

[0061] Ferner weist zumindest eine Spülgutaufnahme **10** einen umlaufenden Rahmen **40** (Fig. 1) auf. Auf diesem ist die Vorrichtung **12, 12', 12''** in ihrem zweiten Zustand insbesondere mittels ihrer Halteelemente **19, 19', 19'', 20, 20', 20''** ablegbar. Somit wird zusätzlich zu der Verwendung als Besteckschublade eine Verwendung als Ablagemöglichkeit auf beziehungsweise oberhalb einer Spülgutaufnahme **10**, beispielsweise einem Unter- oder Oberkorb, geschaffen.

[0062] Obwohl die vorliegende Erfindung anhand von Ausführungsbeispielen beschrieben wurde, ist sie vielfältig modifizierbar.

Bezugszeichenliste

1	Haushaltsgeschirrspülmaschine
2	Spülbehälter
3	Tür
4	Spülkammer
5	Boden
6	Decke
7	Rückwand
8	Seite
9	Seite
10	Spülgutaufnahme
11	Führungseinrichtung
12	Vorrichtung
12'	Vorrichtung
12''	Vorrichtung
13	Aufnahmeabschnitt
13'	Aufnahmeabschnitt
14	Aufnahmeabschnitt
14'	Aufnahmeabschnitt
15	Erste Schmalseite
16	Erste Schmalseite
17	Zweite Schmalseite
18	Zweite Schmalseite
19	Halteelement
19'	Halteelement
19''	Halteelement
20	Halteelement
20'	Halteelement
20''	Halteelement
21	Deckfläche
22	Deckfläche
23	Seitenfläche
24	Seitenfläche
25	Haltevorrichtung
26	Abschnitt
27	Abschnitt
28	Arretiervorrichtung
29	Dritte Schmalseite
30	Dritte Schmalseite
31	Vierte Schmalseite
32	Vierte Schmalseite
33	Rahmen
34	Gestalt
36	Gestalt
36	Führungsstange
37	Führungsstange
38	Trennfläche
39	Trennfläche
40	Rahmen
E	Einschubrichtung
M	Mittenebene
S	Schwenkachse
X	Schwenkachse

Patentansprüche

1. Vorrichtung (**12, 12', 12''**) für eine Geschirrspülmaschine (**1**), welche dazu eingerichtet ist, in einem

ersten Zustand als Besteckkorb und in einem zweiten Zustand als Besteckschublade verwendet zu werden.

2. Vorrichtung (12, 12', 12'') nach Anspruch 1, gekennzeichnet durch einen ersten und einen zweiten Aufnahmeabschnitt (13, 13', 14, 14'), welche schwenkbar miteinander verbunden sind, wobei die Vorrichtung (12, 12', 12'') durch Schwenken des ersten und zweiten Aufnahmeabschnitts (13, 13', 14, 14') zueinander zwischen dem ersten und zweiten Zustand überführbar ist.

3. Vorrichtung (12, 12', 12'') nach Anspruch 2, **dadurch gekennzeichnet**, dass der erste und/oder zweite Aufnahmeabschnitt (13, 13', 14, 14') eine quaderförmige Gestalt aufweisen.

4. Vorrichtung (12, 12', 12'') nach Anspruch 3, **dadurch gekennzeichnet**, dass der erste und zweite Aufnahmeabschnitt (13, 13', 14, 14') in einem Bereich einer ersten Schmalseite (15, 16) des ersten und zweiten Aufnahmeabschnitts (13, 13', 14, 14') aneinander angelenkt sind.

5. Vorrichtung (12, 12', 12'') nach Anspruch 4, **dadurch gekennzeichnet**, dass eine Beladung der Vorrichtung (12, 12', 12'') in dem ersten Zustand über eine zweite Schmalseite (17, 18) des ersten und/oder zweiten Aufnahmeabschnitts (13, 13', 14, 14') und in dem zweiten Zustand über eine Deckfläche (21, 22) des ersten und/oder zweiten Aufnahmeabschnitts (13, 13', 14, 14') erfolgt.

6. Vorrichtung (12, 12', 12'') nach einem der Ansprüche 2 bis 5, **dadurch gekennzeichnet**, dass der erste und/oder zweite Aufnahmeabschnitt (13, 13', 14, 14') jeweils zumindest teilweise auffaltbar ist.

7. Vorrichtung (12, 12', 12'') nach einem der Ansprüche 1 bis 6, gekennzeichnet durch ein Halteelement (19; 19', 19'', 20, 20', 20''), das dazu eingerichtet ist, die Vorrichtung (12, 12', 12'') in dem zweiten Zustand in einer an einem Spülbehälter (2) der Geschirrspülmaschine (1) angebrachten Haltevorrichtung (25) zu befestigen.

8. Vorrichtung (12, 12', 12'') nach Anspruch 7, **dadurch gekennzeichnet**, dass das Halteelement (19; 19', 19'', 20, 20', 20'') in zumindest einem der beiden Zustände als Handgriff verwendbar ist.

9. Vorrichtung (12, 12', 12'') nach Anspruch 7 oder 8, **dadurch gekennzeichnet**, dass das Halteelement (19; 19', 19'', 20, 20', 20'') als Gleitelement (19, 19', 20, 20') ausgebildet ist, welches dazu eingerichtet ist, entlang eines Abschnitts (26, 27) der Haltevorrichtung (25) zu gleiten, und/oder als Aufsteckelement (19'', 20'') ausgebildet ist, welches dazu eingerichtet ist, auf einen Abschnitt (36, 37) der Haltevorrichtung (25) aufgesteckt zu werden und/oder als Rahmenele-

ment (19', 20') ausgebildet ist, welches dazu eingerichtet ist, auf einen Abschnitt (33) der Haltevorrichtung (25) gelegt zu werden.

10. Vorrichtung (12, 12', 12'') nach einem der Ansprüche 7 bis 9, **dadurch gekennzeichnet**, dass der erste und zweite Aufnahmeabschnitt (13, 13', 14, 14') in dem zweiten Zustand zwischen zwei gegenüberliegenden Abschnitten (36, 37) der Haltevorrichtung (25) gespannt gehalten ist.

11. Vorrichtung (12, 12', 12'') nach einem der Ansprüche 1 bis 10, **dadurch gekennzeichnet**, dass der erste und zweite Aufnahmeabschnitt (13, 13', 14, 14') in dem ersten und/oder zweiten dem Zustand miteinander lösbar verrastbar sind.

12. Anordnung mit einer Spülgutaufnahme (10), die einen Rahmen (40) hat, und zumindest einer Vorrichtung (12, 12', 12'') nach einem der Ansprüche 1 bis 11, wobei die zumindest eine Vorrichtung (12, 12', 12'') in einem ersten Zustand als Besteckkorb in die Spülgutaufnahme (10) hineinstellbar ist und in einem zweiten Zustand auf dem Rahmen (40) der Spülgutaufnahme (10) ablegbar ist.

13. Geschirrspülmaschine (1) mit einer Spülgutaufnahme (10) und zumindest einer Vorrichtung (12, 12', 12'') nach einem der Ansprüche 1 bis 11, wobei die Vorrichtung (12, 12', 12'') in dem ersten Zustand in der Spülgutaufnahme (10) als Besteckkorb verwendbar ist und in dem zweiten Zustand in der Geschirrspülmaschine (1) als Besteckschublade verwendbar ist.

14. Geschirrspülmaschine nach Anspruch 13, **dadurch gekennzeichnet**, dass die Haltevorrichtung (19; 19', 19'', 20, 20', 20'') unterhalb einer Decke (6) eines Spülbehälters (2) der Geschirrspülmaschine (1) angeordnet ist und/oder an zwei sich gegenüberliegenden Seiten (8, 9) eines Spülbehälters (2) der Geschirrspülmaschine (1) angeordnet ist.

Es folgen 17 Seiten Zeichnungen

Anhängende Zeichnungen

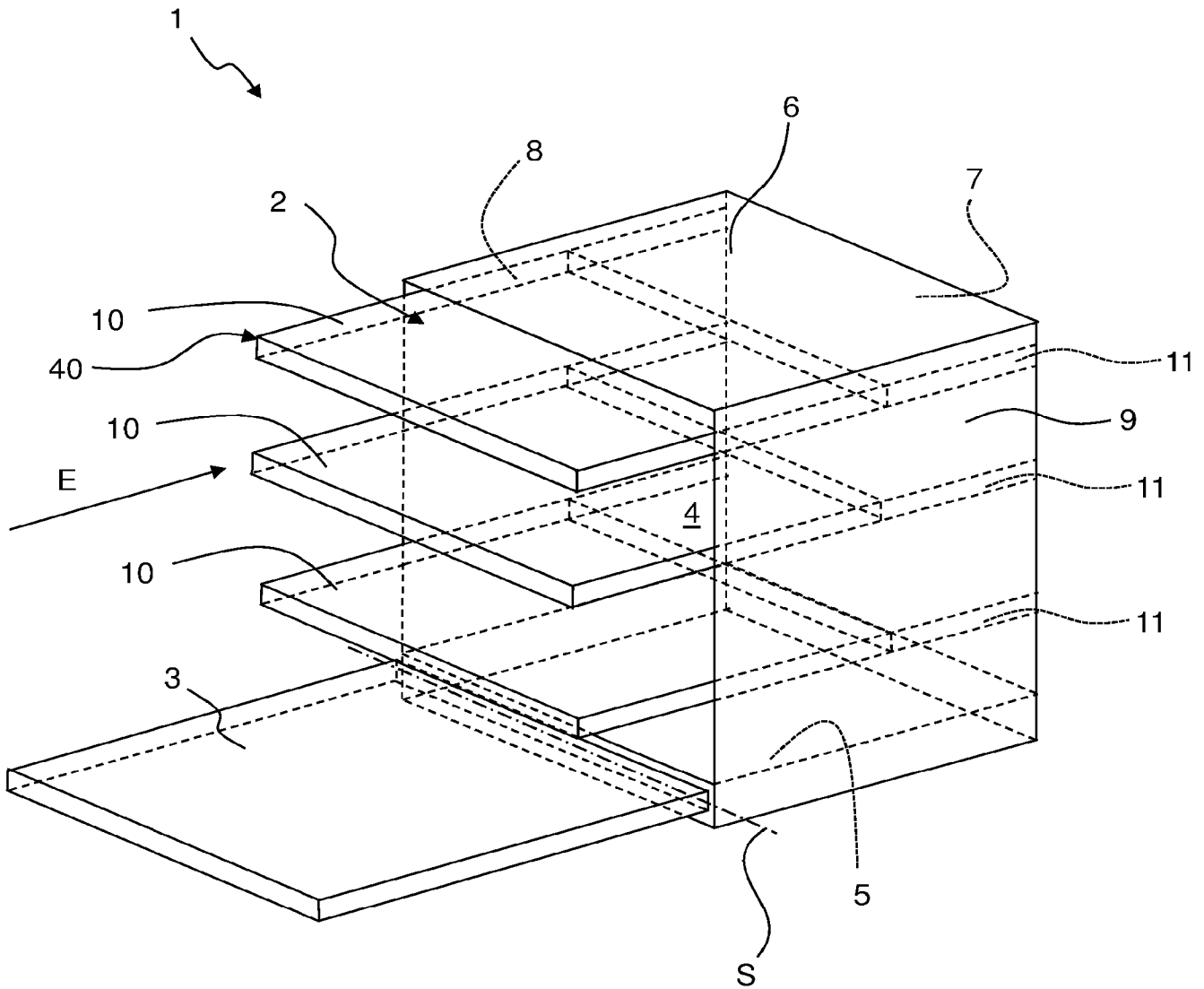


Fig. 1

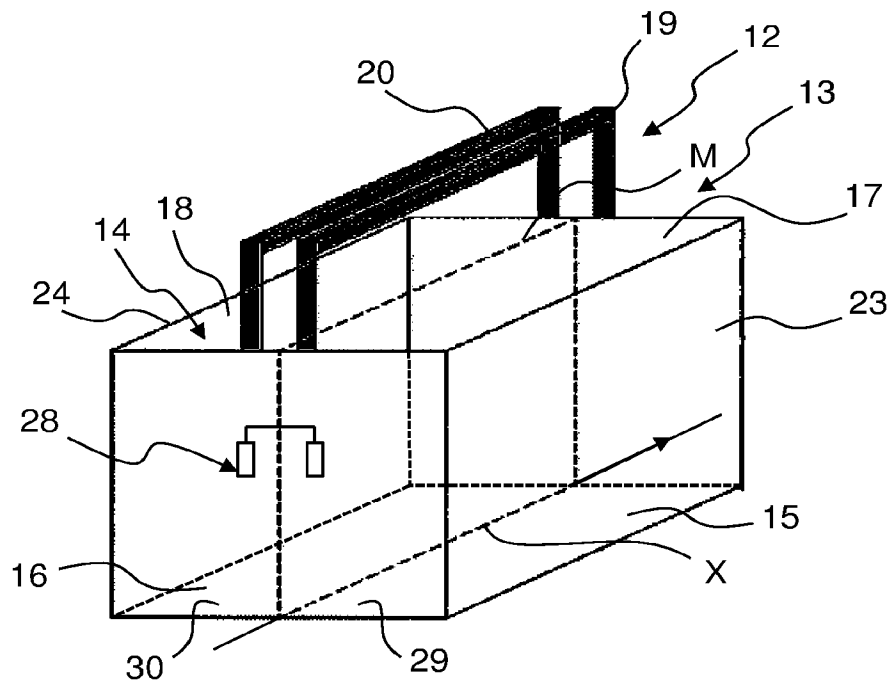


Fig. 2A

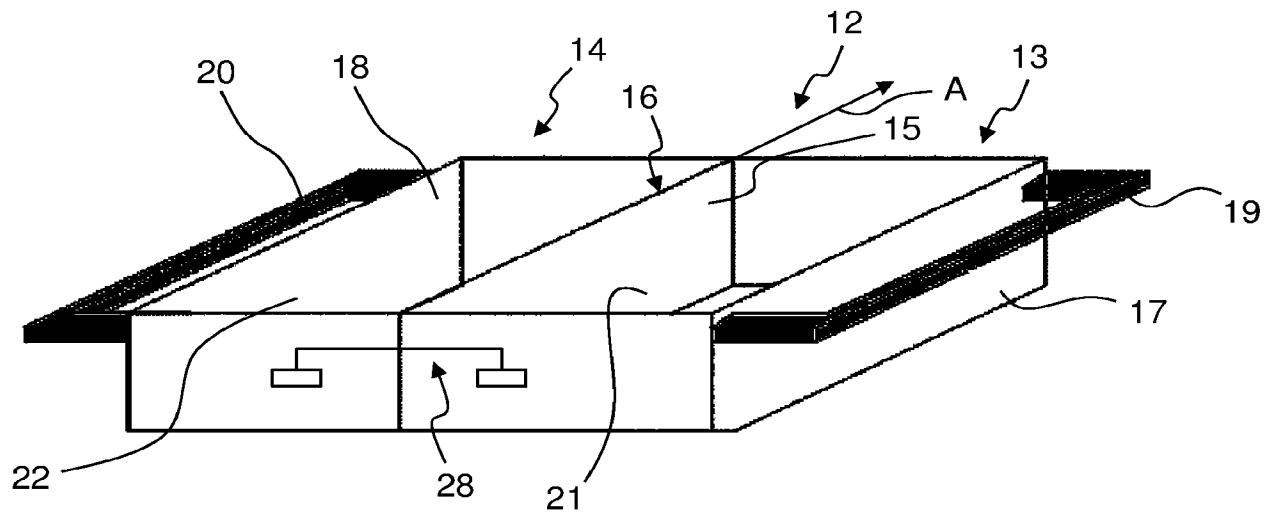


Fig. 2B

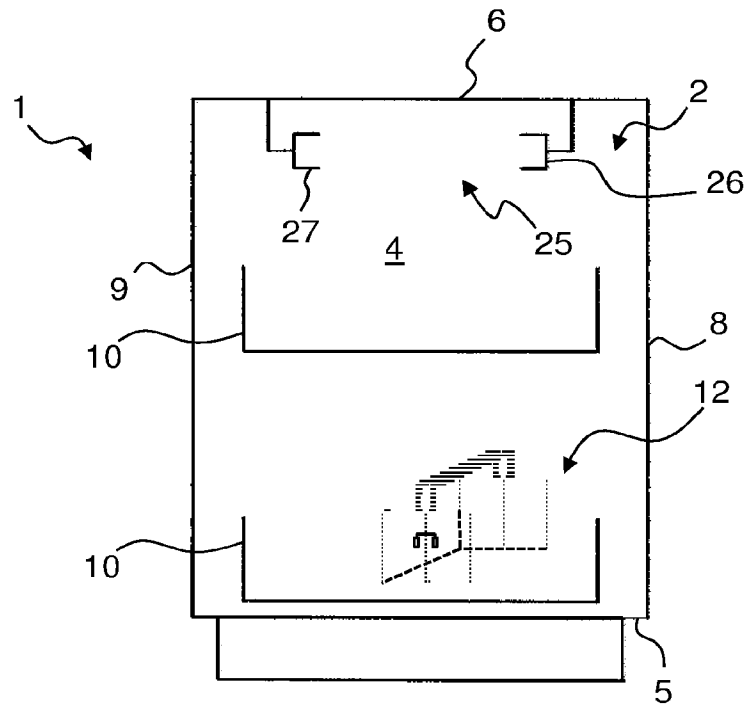


Fig. 2C

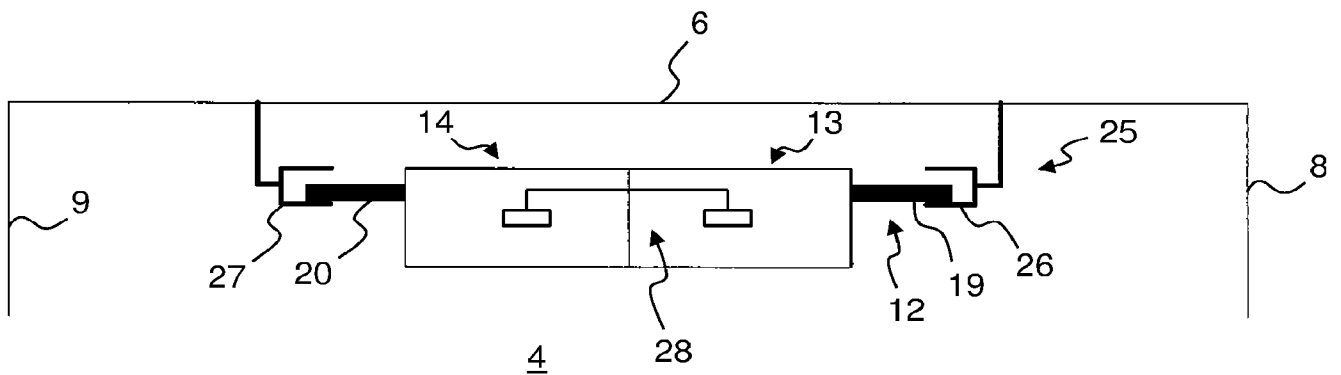


Fig. 2D

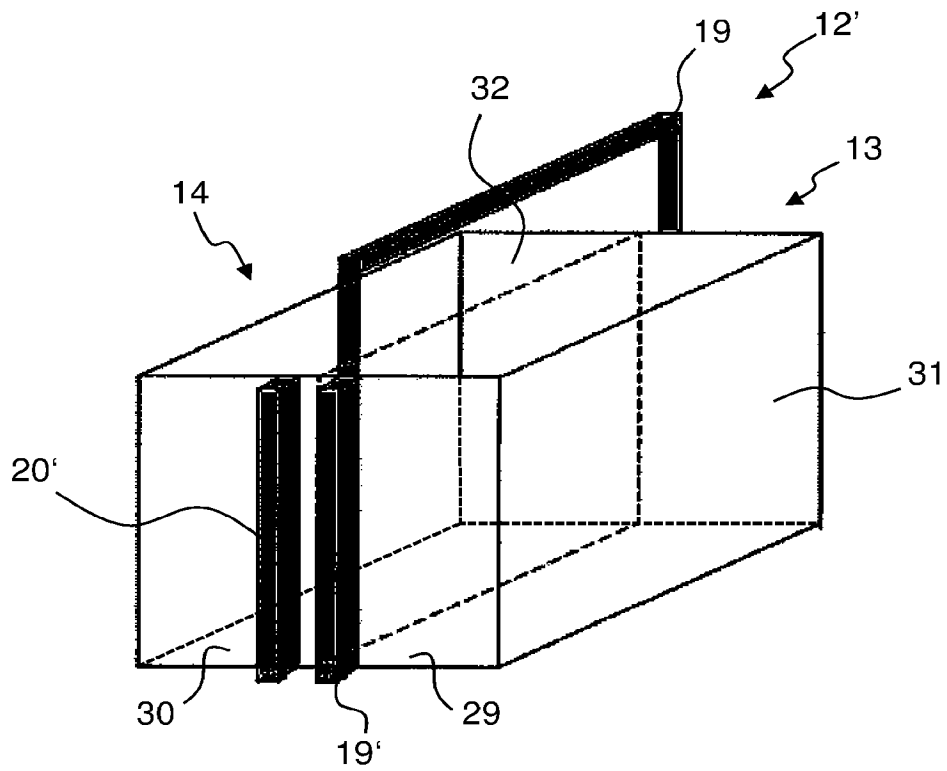


Fig. 3A

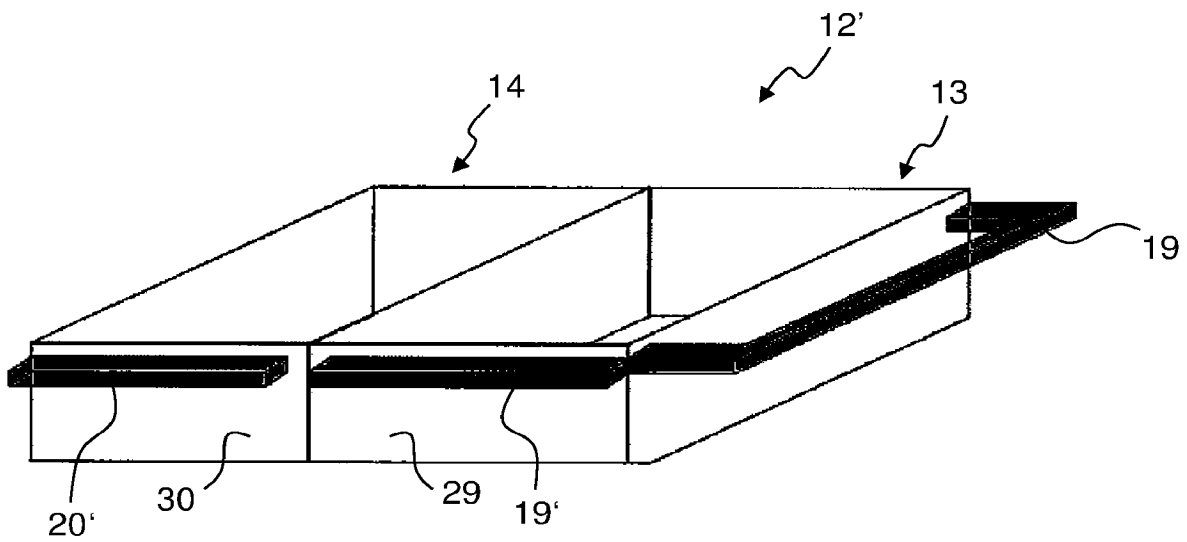


Fig. 3B

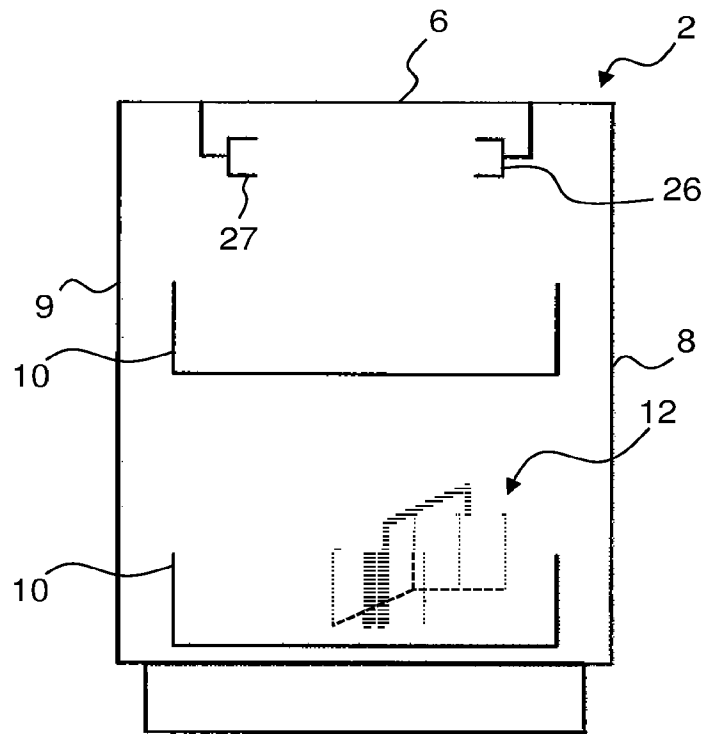


Fig. 3C

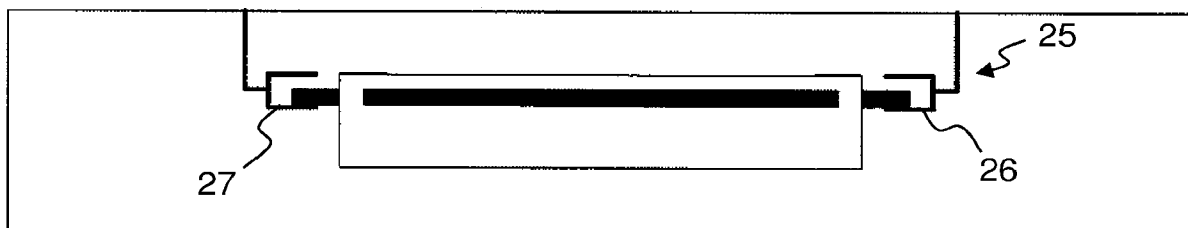


Fig. 3D

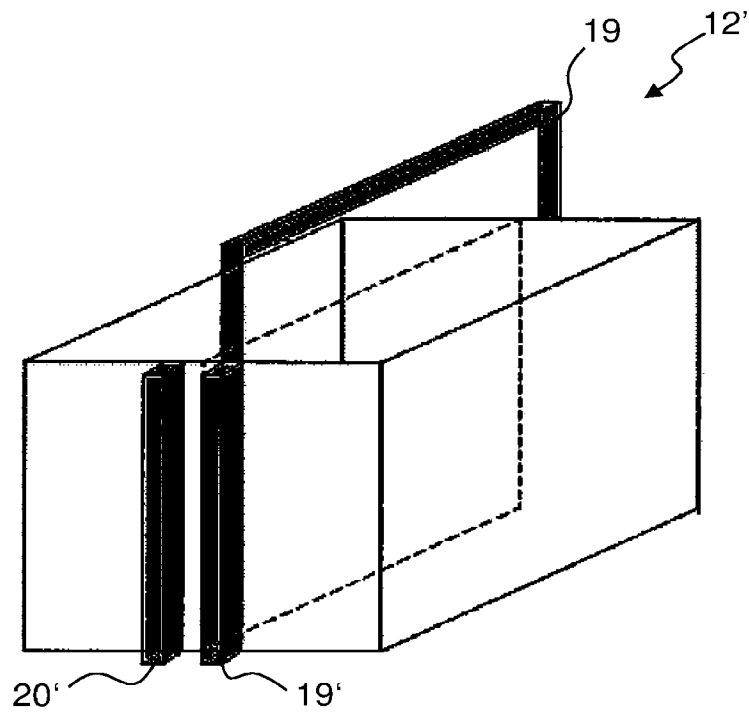


Fig. 4A

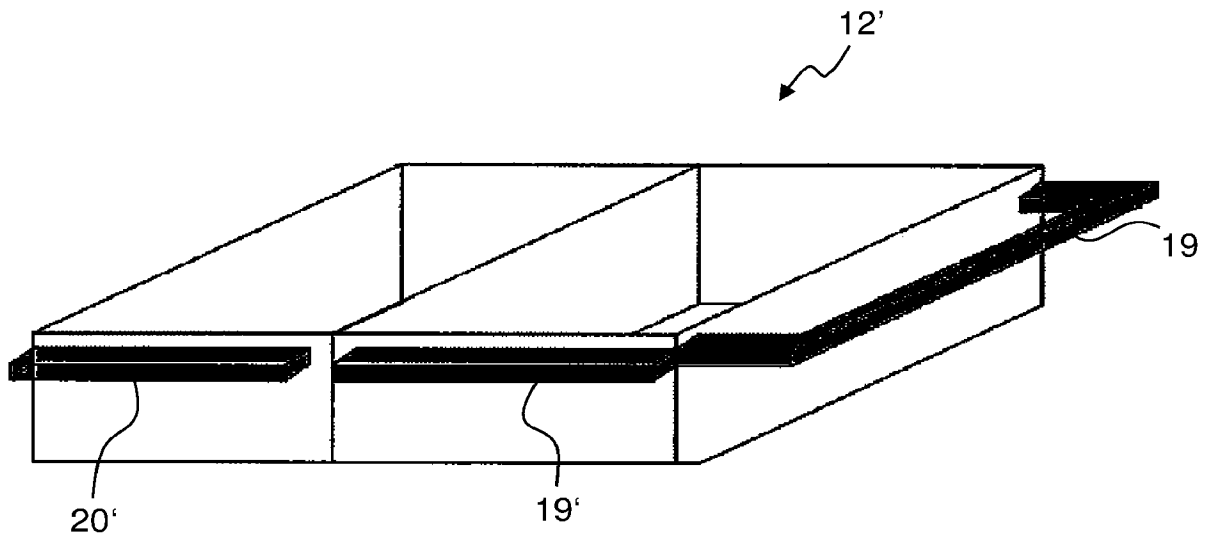


Fig. 4B

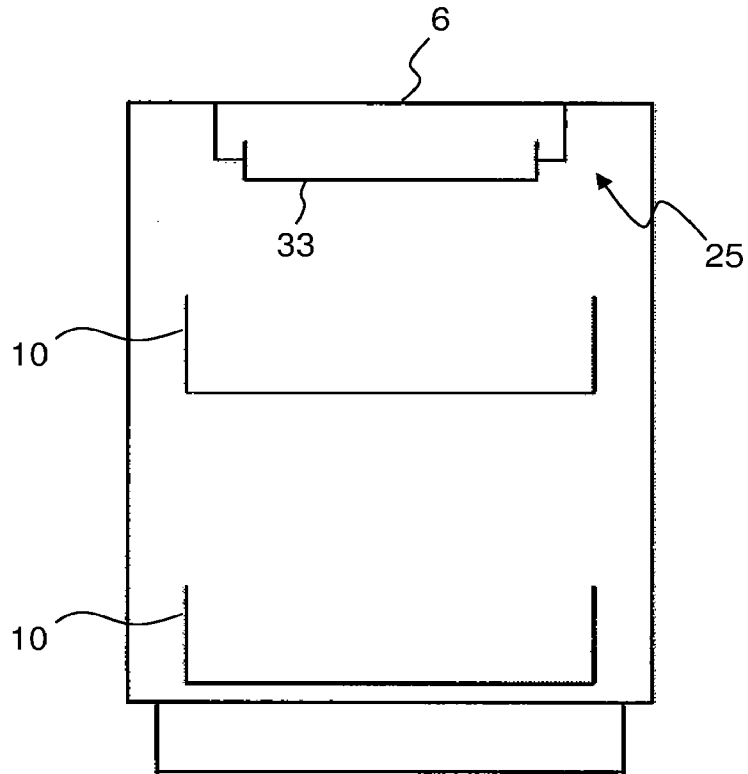


Fig. 4C

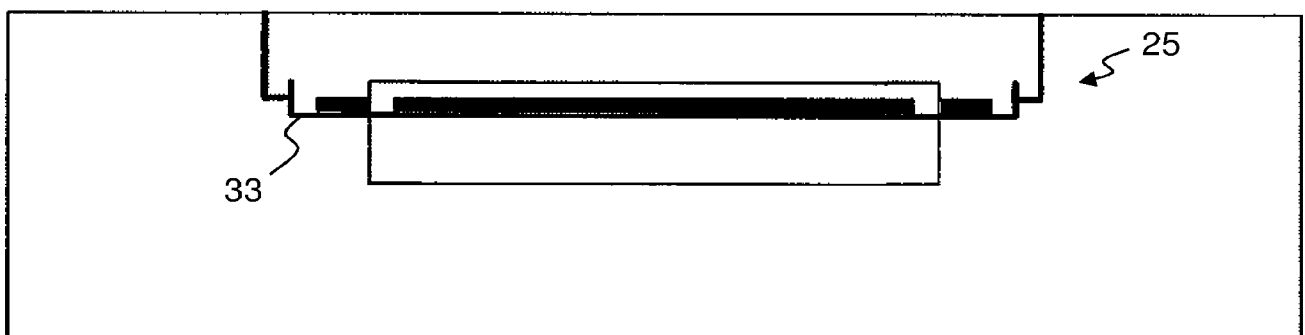


Fig. 4D

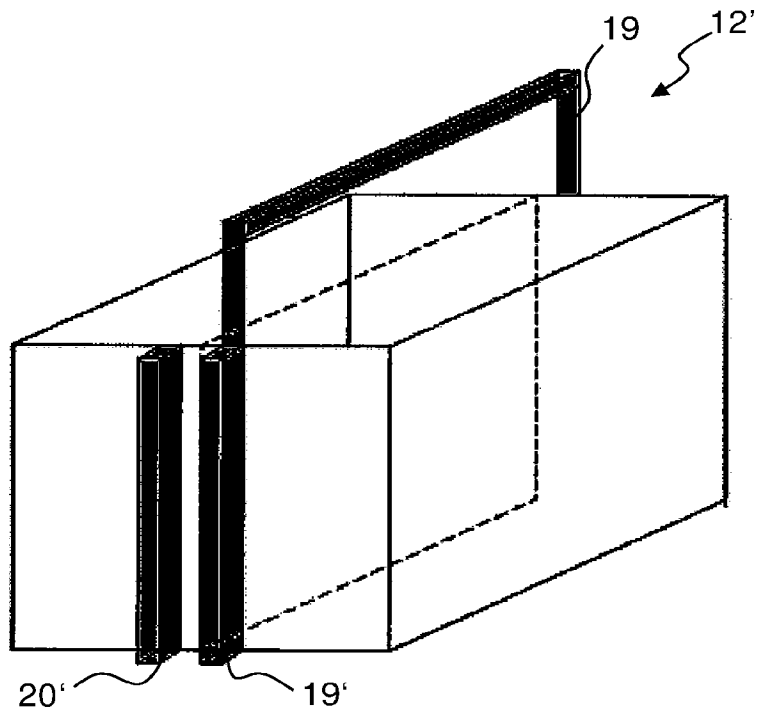


Fig. 5A

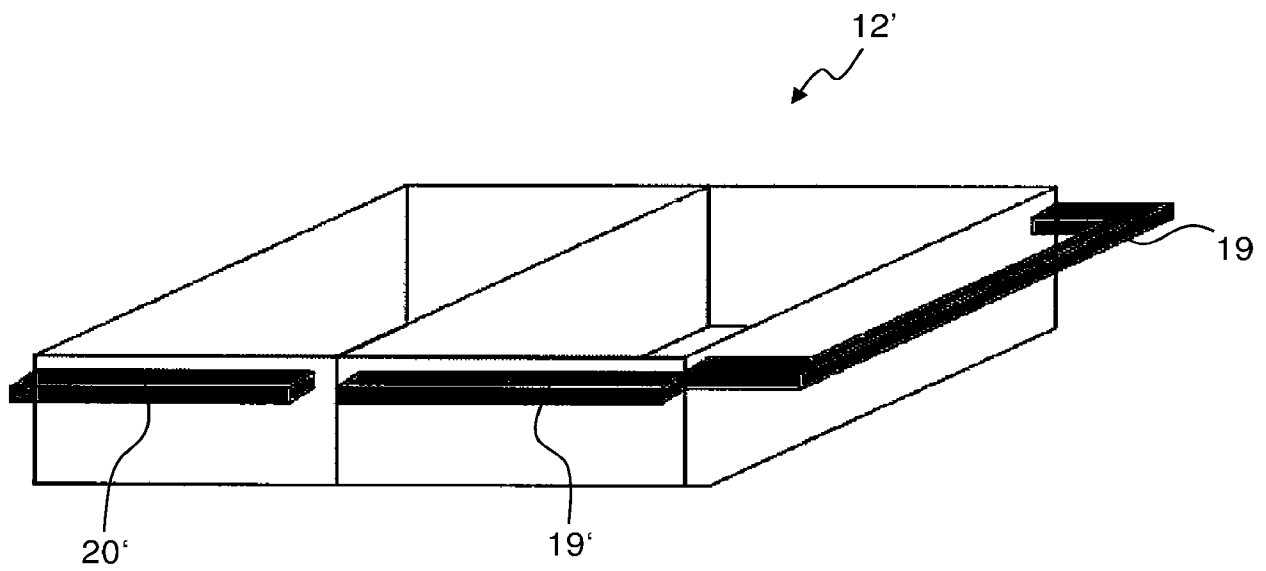


Fig. 5B

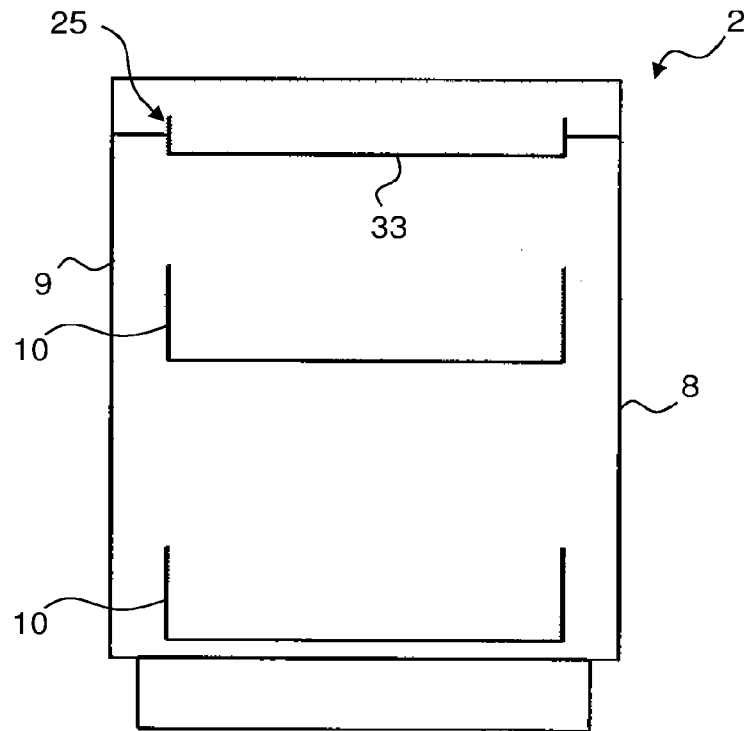


Fig. 5C

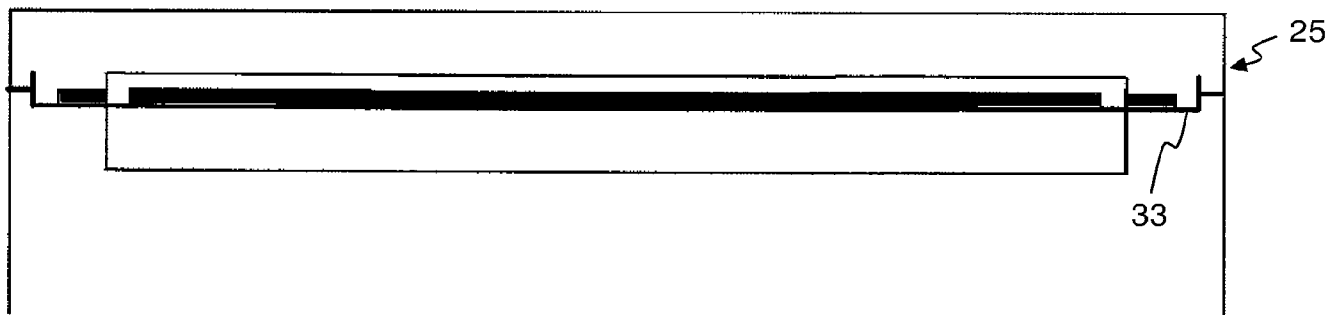


Fig. 5D

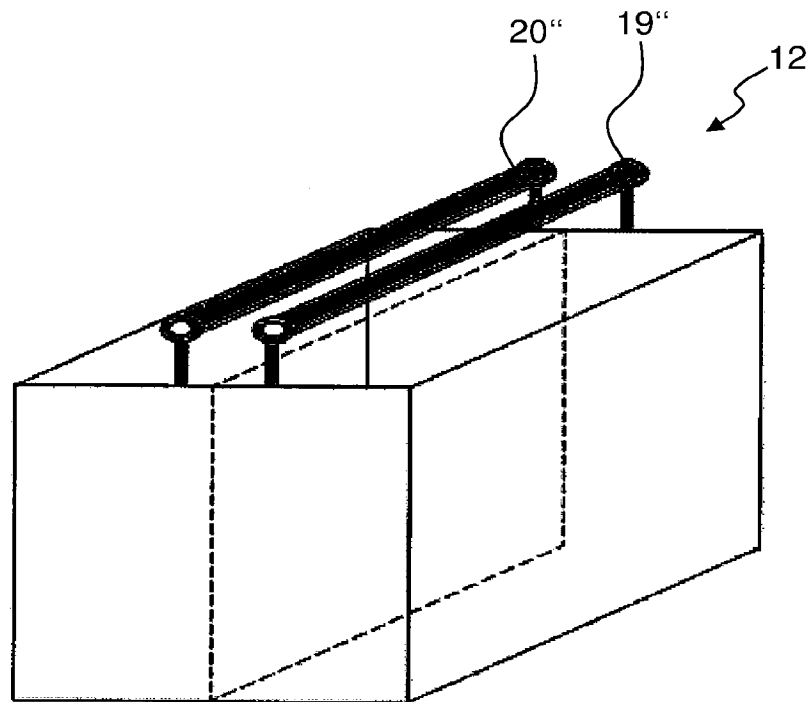


Fig. 6A

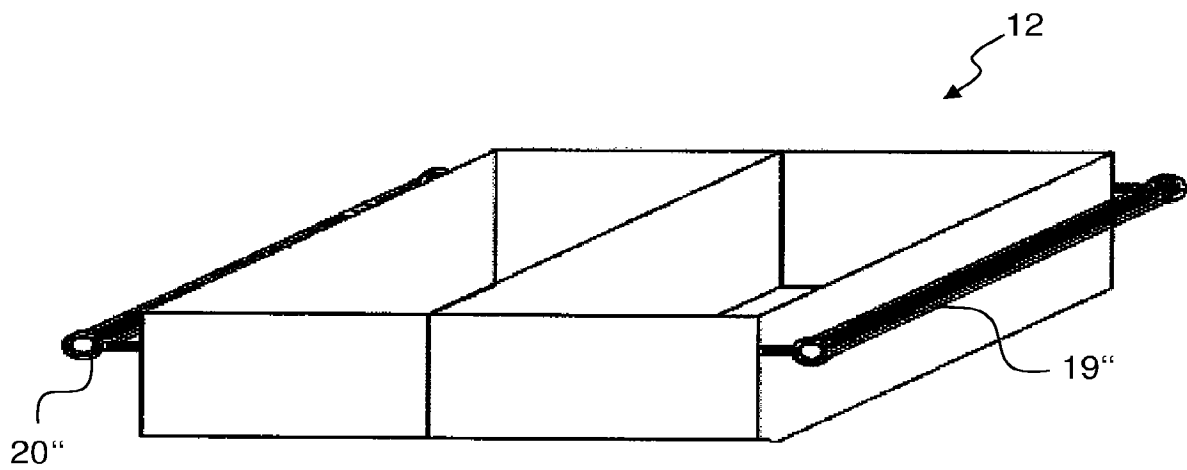


Fig. 6B

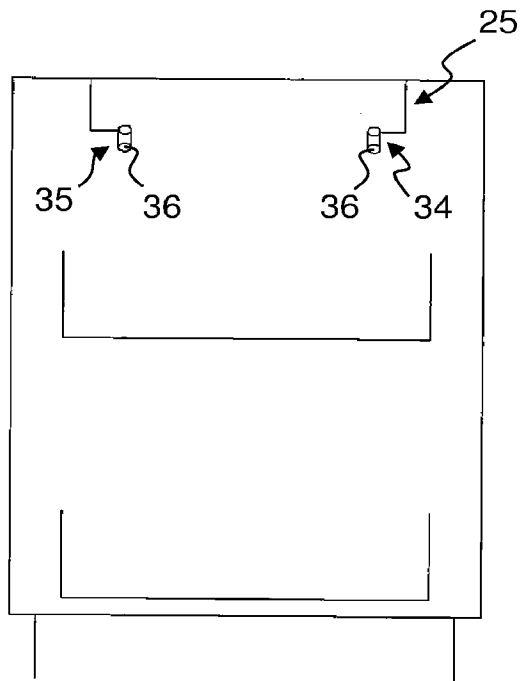


Fig. 6C

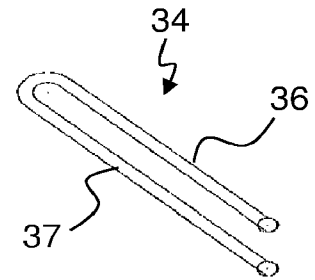


Fig. 6E

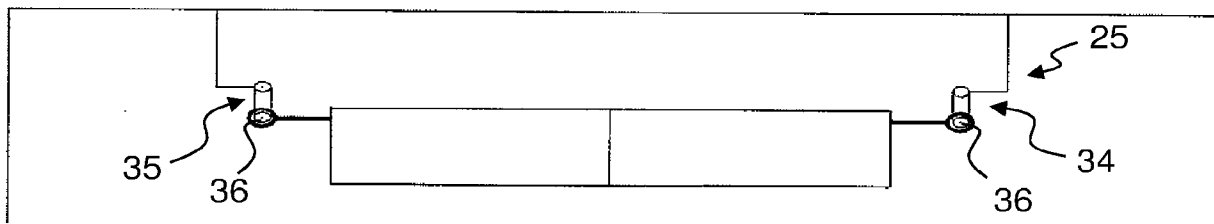


Fig. 6D

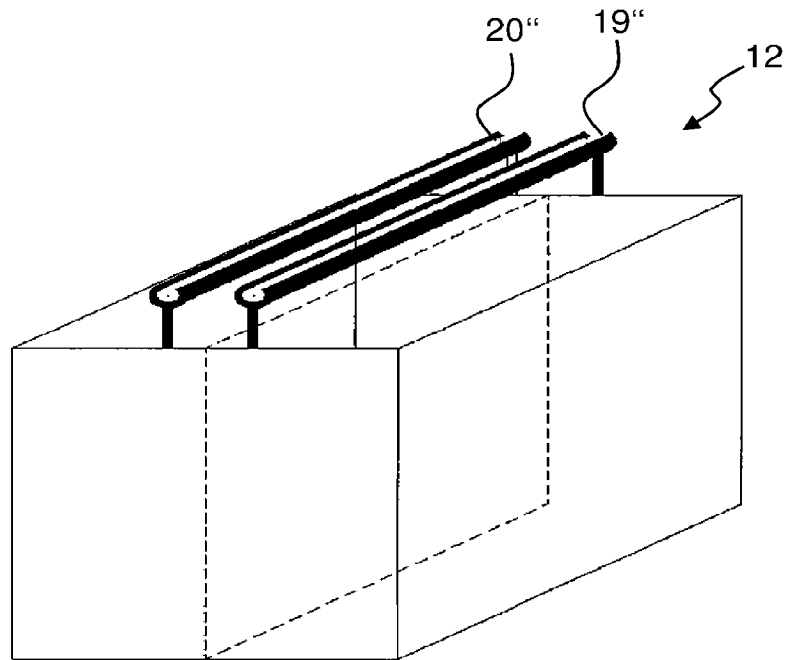


Fig. 7A

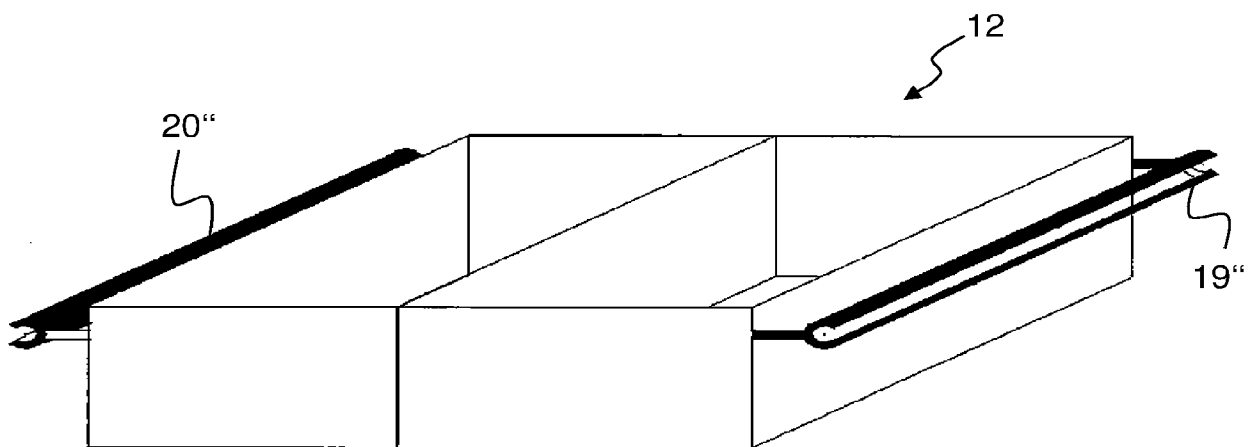


Fig. 7B

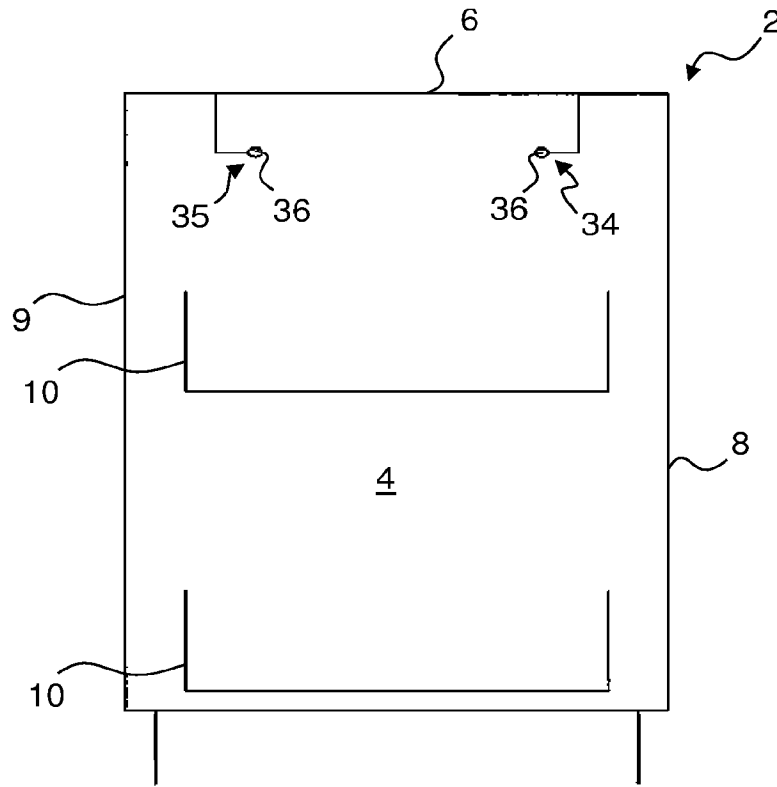


Fig. 7C

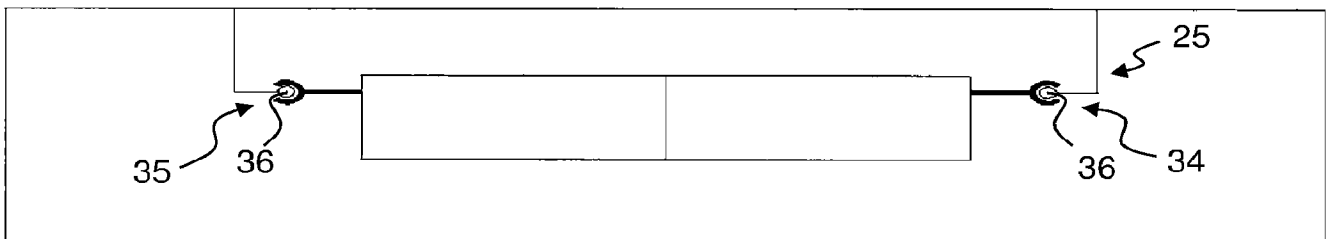


Fig. 7D

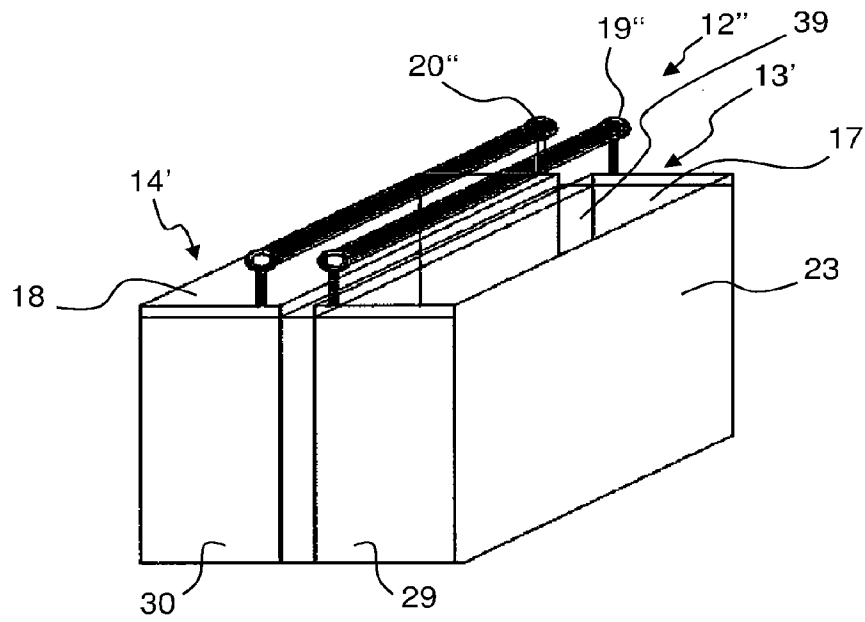


Fig. 8A

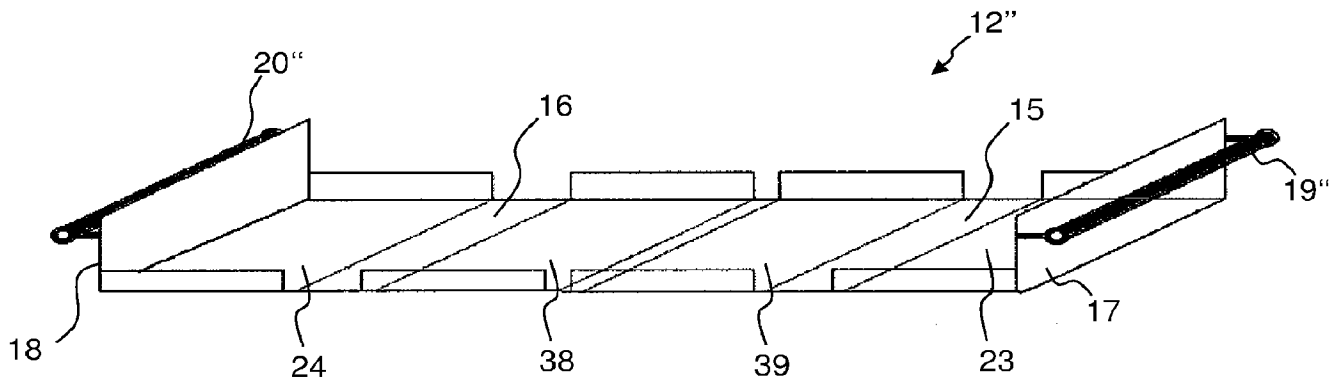


Fig. 8B

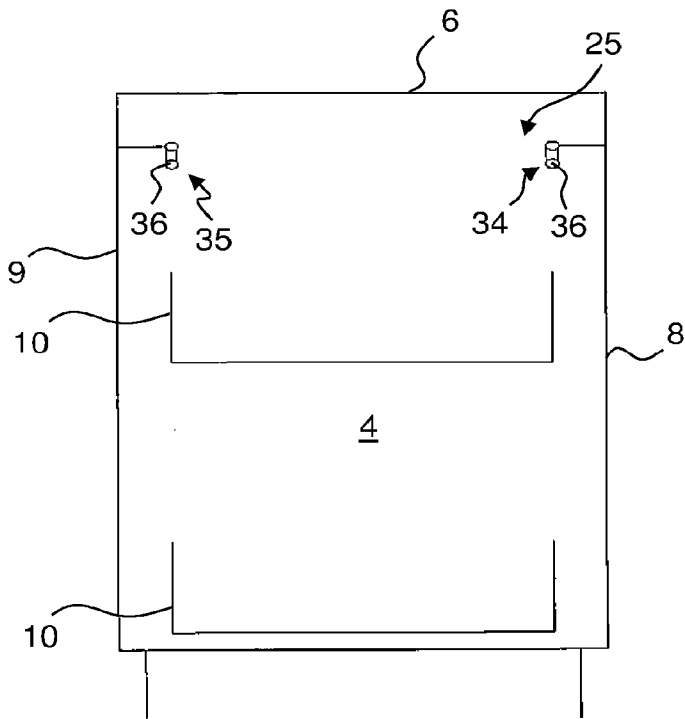


Fig. 8C

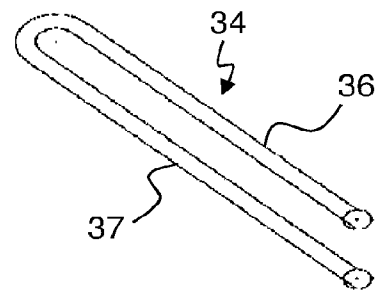


Fig. 8E

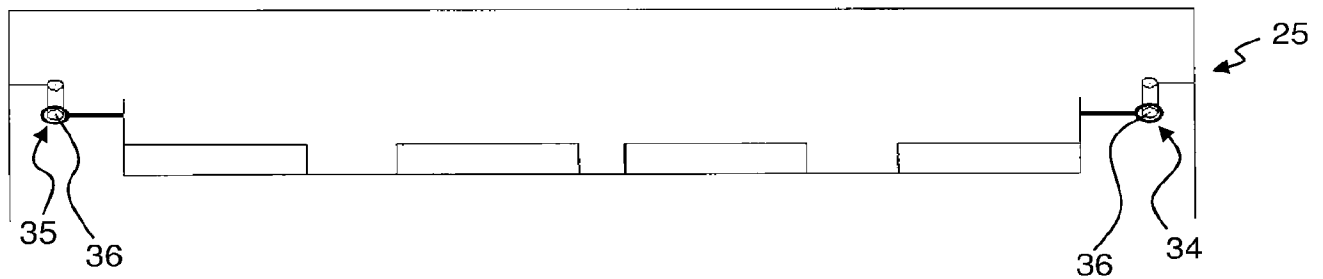


Fig. 8D

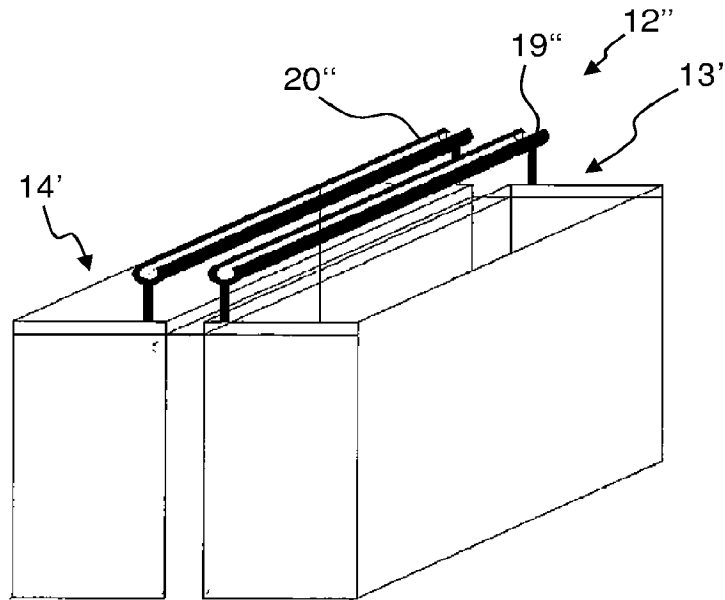


Fig. 9A

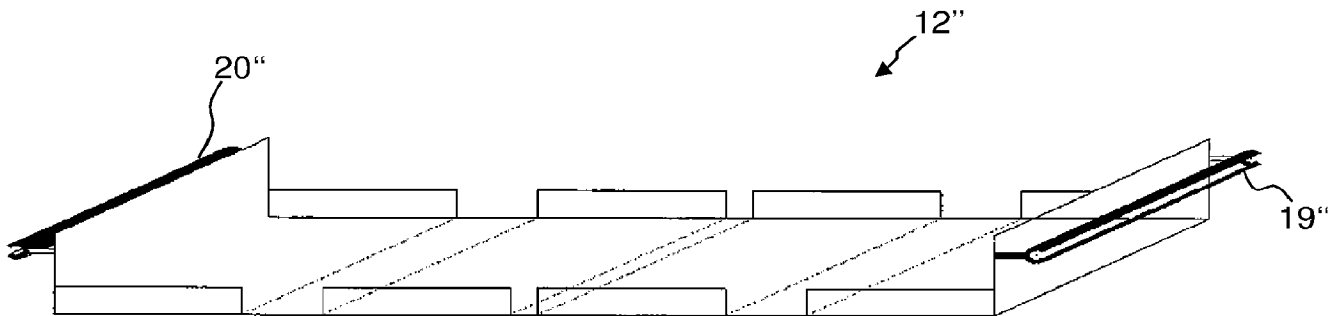


Fig. 9B

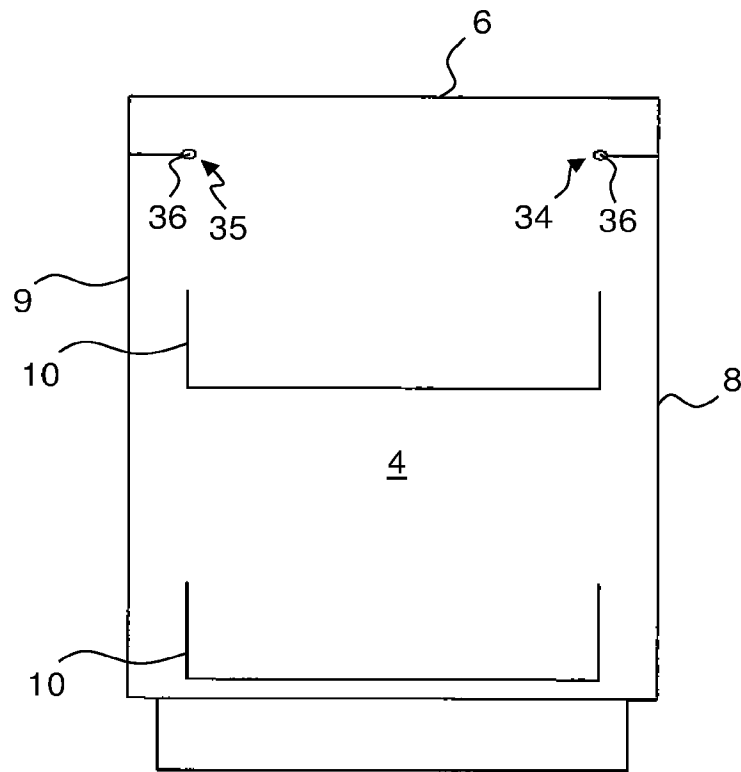


Fig. 9C

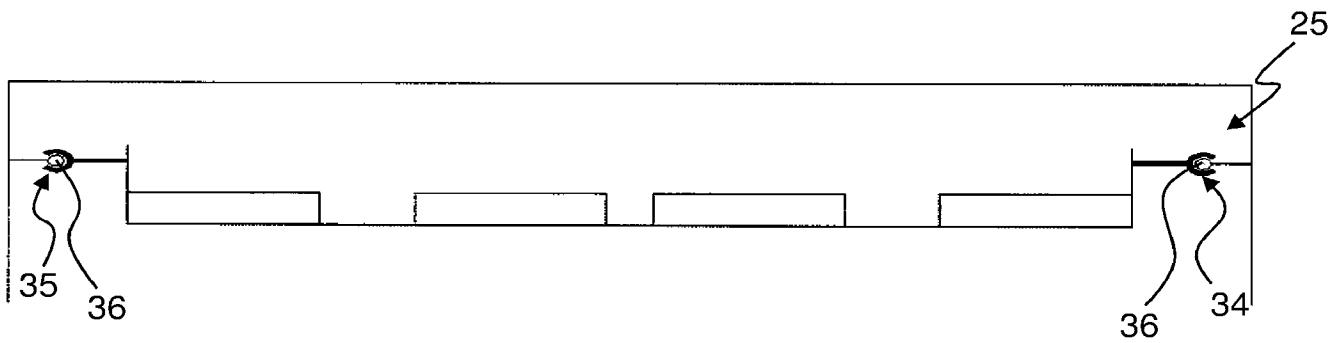
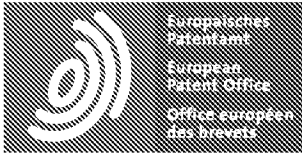


Fig. 9D



Espacenet

CN101966069A Household dishwasher

Applicants: BSH BOSCH SIEMENS HAUSGERAETE

Inventors: JOHANN JOBST

Classifications:

IPC **A47L15/42; A47L15/50;**

CPC **A47L15/502 (EP); A47L15/506 (EP); A47L15/505 (EP);**

Priorities: DE102009028035A 2009-07-27

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Published as: CN101966069A; **DE102009028035A1; EP2283765A2; EP2283765A3**

Household dishwasher

Abstract

The invention relates to a household dishwasher (1), which comprises a pullout type dish basket rack (4), wherein, shelves (8, 14) of articles to be washed which are arranged in the household dishwasher (1) are configured for the pullout type dish basket rack, the shelves can be taken to an operation position in order to wash the articles to be washed and are taken to a loading position in order to load and/or unload the shelves (8, 14), a control device for connecting the pullout type dish basket rack (4) with the shelves (8, 14) is arranged, characterized in that, the control device can be used for keeping storage cabins (9) of the shelves (8, 14) in the basically constant orientation in the course of the shelves (8, 14) from the operation position to the loading position and are moved from the loading position to the operation position.



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72002

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(51) Int. Cl.

A47L 15/50 (2006.01)

A47L 15/42 (2006.01)

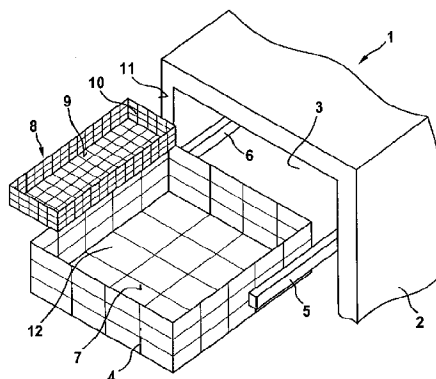
权利要求书 1 页 说明书 5 页 附图 2 页

(54) 发明名称

家用洗碗机

(57) 摘要

本发明涉及一种家用洗碗机(1),包括拉出式碗碟篮架(4),其中用于将在所述家用洗碗机(1)内布置的待清洗的物品的搁架(8、14)配置给所述拉出式碗碟篮架,所述搁架可以被带到一操作位置,以便清洁所述待清洗的物品,并且被带到一装载位置,以便装载和/或卸载所述搁架(8、14),设置将所述拉出式碗碟篮架(4)和所述搁架(8、14)相连的控制装置,其特征在于,所述控制装置在所述搁架(8、14)从所述操作位置移动到所述装载位置以及从所述装载位置移动到所述操作位置的过程中保持所述搁架(8、14)的存储舱室(9)处于基本上恒定的方位。



1. 一种家用洗碗机 (1), 包括拉出式碗碟篮架 (4), 其中用于将在所述家用洗碗机 (1) 内布置的待清洗的物品的搁架 (8、14) 配置给所述拉出式碗碟篮架, 所述搁架可以被带到一操作位置, 以便清洁所述待清洗的物品, 并且被带到一装载位置, 以便装载和 / 或卸载所述搁架 (8、14), 设置将所述拉出式碗碟篮架 (4) 和所述搁架 (8、14) 相连的控制装置, 其特征在于, 所述控制装置在所述搁架 (8、14) 从所述操作位置移动到所述装载位置以及从所述装载位置移动到所述操作位置的过程中保持所述搁架 (8、14) 的存储舱室 (9) 处于基本上恒定的方位。

2. 根据权利要求 1 所述的家用洗碗机, 其特征在于, 所述控制装置包括轴 (17), 其中所述轴在所述家用洗碗机的使用位置中垂直地延伸。

3. 根据权利要求 1 所述的家用洗碗机, 其特征在于, 所述引导装置设置为双连杆或剪刀型接头。

4. 根据权利要求 1 所述的家用洗碗机, 其特征在于, 所述引导装置设置为导轨或滑轨。

5. 根据权利要求 1 至 4 任一所述的家用洗碗机, 其特征在于, 在所述装载位置, 所述存储舱室 (9) 的在所述存储区段 (7) 上的投影面至少部分地位于所述存储区段 (7) 之外。

6. 根据权利要求 1 至 5 任一所述的家用洗碗机, 其特征在于, 在所述搁架 (8、14) 处于装载位置的情况中, 通过所述搁架 (8、14) 防止所述拉出式碗碟篮架 (4) 进入所述洗碗机内部 (3) 中的插入运动。

7. 根据权利要求 1 至 6 任一所述的家用洗碗机, 其特征在于, 所述搁架 (8、14) 从所述操作位置到所述装载位置的和 / 或相反方式的运动可以手动地致动, 和 / 或在致动所述拉出式碗碟篮架 (4) 时实现自动运动。

8. 根据前述权利要求任一所述的家用洗碗机, 其特征在于, 设置锁定装置, 如果所述搁架 (8、14) 并不处于所述操作位置, 则所述锁定装置用于防止所述拉出式碗碟篮架 (4) 的致动。

9. 根据权利要求 8 所述的家用洗碗机, 其特征在于, 所述锁定装置在所述拉出式碗碟篮架 (4) 的导轨 (5、6) 上设置和 / 或与所述导轨相互作用。

10. 根据前述权利要求任一所述的家用洗碗机, 其特征在于, 所述存储舱室 (9) 设置成支承烹饪器皿、刀具和 / 或容器。

11. 根据前述权利要求任一所述的家用洗碗机, 其特征在于, 在所述搁架 (8、14) 的操作位置, 所述拉出式碗碟篮架 (4) 的存储区段 (7) 至少在低于所述搁架 (8、14) 的存储舱室 (9) 的区域内与处于所述操作位置的所述搁架 (8、14) 的存储舱室 (9) 基本上平行, 在所述搁架 (8、14) 从所述操作位置移动到所述装载位置以及从所述装载位置移动到所述操作位置的过程中, 所述控制装置基本上保持所述搁架 (8、14) 的存储舱室 (9) 与所述拉出式碗碟篮架 (4) 的存储区段 (7) 的该区域平行。

家用洗碗机

技术领域

[0001] 本发明涉及具有拉出式碗碟篮架的家用洗碗机,用于家用洗碗机内的待清洗的搁架配置给所述碗碟篮架,可以使得所述搁架进入一操作位置以便清洁待清洗的物品并进入到一装载位置以便装载和 / 或卸载搁架,设置将所述拉出式碗碟篮架和搁架相连的控制装置。

背景技术

[0002] 家用洗碗机可以包括拉出式碗碟篮架,其中所述拉出式碗碟篮架在家用洗碗机的洗碗机内部中布置。待清洗的物品可以在拉出式碗碟篮架内或上布置。拉出式碗碟篮架可以被安装成从洗碗机内部取出,以便进行装载。为此目的,导轨系统可以例如被设置用于拉出式碗碟篮架。为了扩大拉出式碗碟篮架的可用于待清洗物品的空间,可以设置附加的搁架,其中所述附加的搁架配置给拉出式碗碟篮架。该搁架布置成高于拉出式碗碟篮架的存储区段。在这种情况下,待清洗的物品可以在搁架上布置也可以在存储区段与搁架之间布置。为了对存储区段的低于搁架的区域进行装载,有利的是释放该区域,从而可以以尽可能简单的方式在存储区段上布置待清洗的物品。搁架因此例如可以借助于可脱离连接的铰接机构从拉出式碗碟篮架被拆卸。为此目的,搁架的铰接区域通常由弹性材料制成,并且因而可以按压到拉出式碗碟篮架的对立元件上并还可以再次从那里脱离。同样已知的是,搁架可以借助于铰接机构被抬高。这两种可能性使得拉出式碗碟篮架存储区段的在搁架下方布置的区域可以容易地被装载。在使得存储区段装载之后,搁架必须被重新紧固至拉出式碗碟篮架或者向回卡持到其装载位置。然后,仅仅搁架可以装载有将在家用电器内布置的待清洗的物品。此外,在卸载的过程中,待清洗的物品必须首先从搁架被取出,从而触及在存储区段上布置的待清洗的物品。因此,总是无法直接实现这种触及。

发明内容

[0003] 本发明的目的在于提供一种家用洗碗机,其中所述家用洗碗机并不具有所述的这些缺点,而是实现了拉出式碗碟篮架以及搁架的简单的装载和卸载。

[0004] 根据本发明,控制装置设置成在搁架从操作位置移动到装载位置与从装载位置移动到操作位置的过程中以基本上恒定的方位保持搁架的存储舱室。搁架的恒定的方位在此理解为搁架的存储舱室并不被枢转成以实现搁架的成角度的位置的方式支承待清洗的物品,否则的话这导致了在搁架的支承区域上安装的待清洗的物品非故意地掉落。此外,传统的制造误差范围内的偏差基本上被理解为意味着例如最大 5° 。因此,移动是可行的,而不会造成搁架的存储舱室倾斜也不会导致待清洗的物品掉落。这使得搁架也被带到一其装载有待清洗物品的状态,例如从操作位置移动到装载位置,从而随后向低于搁架的空间装载待清洗的物品。

[0005] 在一个实施例中,优选设置成搁架被紧固至拉出式碗碟篮架,从而搁架可以绕一垂直轴枢转。因此,搁架被设置成其可以释放拉出式碗碟篮架的存储区段的位于搁架区域

内的区域,从而简化装载和卸载。为此目的,搁架优选在靠近拉出式碗碟篮架的区域内移动。这种移动在水平平面内实现。另外,这种移动也可以相对于垂直平面实现,从而这种移动包括在水平平面以及垂直平面内的移动。然而,可选地,移动也可以仅仅在垂直平面内实现,搁架被抬高,从而拉出式碗碟篮架的存储区段可以容易地被装载。因此,这种移动可以实现成,搁架的成角度的对正 (angular alignment) 仍是恒定的。尤其不应该存在绕水平轴线的倾斜。在移动的过程中,在其中存在搁架或搁架的存储舱室的平面因此应该总是与这样的平面平行,在所述平面内,搁架和 / 或存储舱室是在移动之前。在这种实施例,搁架以及拉出式碗碟篮架不必连续地被装载和 / 或卸载,而实际上待清洗的物品可以以任何次序被可选地布置在拉出式碗碟篮架的存储区段和 / 或搁架上。拉出式碗碟篮架绕垂直轴的枢转和 / 或在水平和 / 或垂直平面内的移动被设置成,这种运动也可以与在拉出式碗碟篮架上布置的待清洗的物品一起完成。

[0006] 在另一实施例中,优选设置成控制装置设置为双连杆或剪刀型接头。该双连杆可以包括相同长度的两个连杆臂,它们的水平或垂直延伸的旋转轴彼此相对偏离地设置,这两个连杆的一个端部可旋转地紧固至搁架而另一端部可旋转地紧固至用于待清洗的物品的托盘。

[0007] 在另一实施例中,优选设置成控制装置设置为导轨或导杆。搁架的枢转和 / 或移动可以手动地完成,换句话说通过家用电器的使用者通过力作用完成;或者搁架的枢转和 / 或移动可以自动地完成,例如通过弹性力实现。

[0008] 本发明的改型设置成,搁架的存储舱室在拉出式碗碟篮架的存储区段上投影区域至少部分地位于存储区段之外,也就是说,在该位置,搁架沿延伸方向伸出超过拉出式碗碟篮架。

[0009] 还可以设置成,在搁架位于装载位置的情况中,借助于搁架防止拉出式碗碟篮架插入到洗碗机内部中。这种情况就是,如果搁架相对于拉出式碗碟篮架沿与插入方向成直角的方向被移动的话,则存储区段与存储舱室之间的高度距离不会发生改变。在操作位置中,搁架被设置成拉出式碗碟篮架可以被引入到家用洗碗机的洗碗机内部中,并且洗碗机的清洗循环可以执行。相反地,装载位置至少在特定区域横向地邻近拉出式碗碟篮架。在装载位置,拉出式碗碟篮架和 / 或拉出式碗碟篮架的存储区段基本上被释放,从而拉出式碗碟篮架可以容易地被装载。然而,装载位置不必被设置成释放拉出式碗碟篮架的整个存储区段。为了使得搁架从操作位置进入装载位置并且为了相反地使得搁架从装载位置进入操作位置,提供搁架的枢转和 / 或移动。

[0010] 本发明的改型设置成,搁架的枢转和 / 或移动可以手动地完成和 / 或在致动拉出式碗碟篮架时提供自动的枢转和 / 或移动。因此,拉出式碗碟篮架的释放可以由家用洗碗机的使用者通过力作用实现。然后,使用者必须将力施加至搁架,从而该搁架枢转和 / 或移动到装载位置。可选地,还可以提供自动枢转和 / 或移动。例如,在将拉出式碗碟篮架从家用洗碗机的洗碗机内部拉出时,搁架可以借助于弹性力从操作位置枢转和 / 或移动到装载位置。在将拉出式碗碟篮架插入到洗碗机内部时,搁架可以与家用洗碗机的一区域相互作用,从而使得搁架移动和 / 或枢转回到操作位置。手动与自动枢转和 / 或移动的组合也是可行的。例如,在将拉出式碗碟篮架从洗碗机内部拉出时,自动的枢转 / 移动也可以提供;并且在拉出式碗碟篮架可以重新插入到洗碗机内部之前,也需要搁架的手动枢转 / 移动。

[0011] 本发明的改型提供了锁定装置,如果搁架并未处于操作位置,则所述锁定装置用于防止拉出式碗碟篮架的致动。在搁架并不处于操作位置、而实际上处于装载位置时,拉出式碗碟篮架因此在该位置被阻挡和/或保持。这尤其可以设置成在用于待清洗的物品的篮架并未处于操作位置时防止拉出式碗碟篮架插入到家用洗碗机的洗碗机内部中,由此,拉出式碗碟篮架插入到洗碗机内部可能导致至少针对在搁架上布置的待清洗的物品或者甚至搁架的损害。例如,搁架可以设置成只要拉出式碗碟篮架将移动到洗碗机内部中则搁架在其装载位置与家用洗碗机的一区域接触。在这种情况下,拉出式碗碟篮架的致动、换句话说进入洗碗机内部的移动通过搁架本身被防止。因此,锁定装置是搁架的一体部分和/或因此被设置。

[0012] 本发明的改型设置成,锁定装置在拉出式碗碟篮架的导轨上设置和/或与所述导轨相互作用。与所述的措施相反,拉出式碗碟篮架的致动也可以借助于导轨被防止。为此目的,锁定装置在导轨上设置并且与其相互作用。只要搁架移出和/或枢转出操作位置,则锁定装置就被启动。在此,拉出式碗碟篮架可以固定至导轨,或者可选地,导轨的运动可以被防止。

[0013] 本发明的改型设置成,搁架具有存储舱室,其尤其用于烹饪器皿、刀具和/或容器。存储舱室因此在搁架上设置,在所述存储舱室上可以布置待清洗的物品。存储装置可以包括专用装置,其例如对于烹饪器皿、刀具和/或容器等优化并且具有针对其调整的保持装置。

[0014] 在另一实施例中,在搁架的操作位置,拉出式碗碟篮架的存储区段至少在低于搁架的存储舱室的部分内与处于操作位置的搁架的存储舱室可以基本上彼此相互平行地布置,而 $\pm 15^\circ$ 的偏差基本上理解成,在搁架从操作位置到装载位置的运动过程中并且在搁架从装载位置到操作位置的运动过程中,保持装置保持搁架的存储舱室基本上与存储区段的那部分平行。因此,拉出式碗碟篮架的存储区段的该部分可以设置成例如相对于水平面最大倾斜 20° ,从而产生用于玻璃杯或茶杯的倾斜安坐表面,其中所述玻璃杯或茶杯通常头向下地在拉出式碗碟篮架内布置。

附图说明

[0015] 参照附图中示出的示意性实施例以下更加详细地说明本发明,其中这种说明并不涉及对本发明的限制,其中:

[0016] 图1示出了具有拉出式碗碟篮架的家用洗碗机的示意图,其中,搁架配置给所述拉出式碗碟篮架;

[0017] 图2a示出了拉出式碗碟篮架的前视图,所述搁架处于操作位置;

[0018] 图2b示出了具有搁架的拉出式碗碟篮架,其中所述搁架可以在水平平面内移动到装载位置;并且

[0019] 图3示出了拉出式碗碟篮架的俯视图,示出了搁架的两个不同的实施例,其中一个搁架可以绕一垂直轴线枢转,另一个搁架可以在水平平面内移动。

具体实施方式

[0020] 图1示出了家用洗碗机1的区域,其具有壳体2,所述壳体2具有在所述区域内如

图所示由此被封闭的洗碗机内部 3。拉出式碗碟篮架 4 借助于两个导轨 5 和 6 在洗碗机内部 3 中被紧固,从而所述拉出式碗碟篮架可以从洗碗机内部 3 移出并且移动到如图 1 所示的位置。为了运行家用洗碗机 1 的清洗循环,拉出式碗碟篮架 4 完全地在洗碗机内部 3 中布置,而为了向拉出式碗碟篮架 4 装载待清洗的物品,该拉出式碗碟篮架 4 被移动到如图所示的位置。在装载拉出式碗碟篮架 4 时,待清洗的物品在存储区段 7 和 / 或存储舱室上布置。拉出式碗碟篮架 4 然后与待清洗的物品一起被引入到洗碗机内部 3 中,从而运行清洗循环。搁架 8 被设置,以便增加拉出式碗碟篮架的可用于布置待清洗的物品的表面。该搁架配置给拉出式碗碟篮架 4 并具有存储舱室 9,其中所述存储舱室也可以被用于布置待清洗的物品。该搁架 8 在图 1 所示的视图中处于装载位置,在该位置,该搁架至少在特定区域内横向靠近拉出式碗碟篮架 4 布置。如果该搁架 8 被移动成拉出式碗碟篮架 4 可以插入到家用洗碗机 1 的洗碗机内部 3 中,则出现了操作位置(未示出)。这在所示的视图中不可能出现,这是因为在将拉出式碗碟篮架 4 插入到洗碗机内部 3 中时,搁架 8 的区域 10 将与壳体 2 的存储区域 11 相互作用,并且将防止拉出式碗碟篮架 4 插入到洗碗机内部 3 中。为了使得容易装载拉出式碗碟篮架 4 的存储区段 7 的区域 12,搁架 8 可以在操作位置与装载位置之间枢转和 / 或移动 / 平移,也就是说可以沿轴线移动 / 平移。

[0021] 可选地,还可以设置锁定装置(未示出),其中如果搁架 8 并不处于操作位置的话,则所述锁定装置防止拉出式碗碟篮架 4 插入到洗碗机内部 3 中。锁定装置可以在导轨 5 和 6 中的一个或两个上设置和 / 或可以与其相互作用。在此,可以设置门锁机构,其中如果所述锁定装置由于所述搁架 8 处于装载位置而激活的话,则所述门锁机构相对于导轨 5 和 6 紧固拉出式碗碟篮架 4。

[0022] 在如图 1 所示的家用洗碗机 1 的示意性实施例中,仅仅一个搁架 8 在拉出式碗碟篮架 4 上设置。然而,这是纯粹示例性的理解。多个搁架 8 也可以紧固至拉出式碗碟篮架 4。

[0023] 在图 2a 和 2b 中示出了搁架 8 的实施例,其中所述搁架可以在一水平平面 13 内移动。这意味着搁架 8 可以相对于拉出式碗碟篮架 4 在平面 13 内移动或者至少与其平行地移动。为此目的设置移动 / 平移设备(未示出),其中所述移动 / 平移设备例如具有铰接机构。可选地,还可以将水平平面内的移动与垂直平面内的移动组合。在对应平面内的水平和垂直移动可以按照任一次序实现。在水平和 / 或垂直平面内的同时移动也是可行的。在此,仅仅重要的是,搁架 8 和 / 或存储舱室 9 在移动的过程中恒定地被布置,从而待清洗的物品不会掉落,搁架 8 和 / 或其存储舱室 9 因此总是与平面 13 平行地布置。

[0024] 图 3 示出了具有拉出式碗碟篮架 4 的家用洗碗机 1,搁架 8 以及附加的搁架 14 被设置,它们体现了不同的实施例。搁架 8 和 / 或附加的搁架 14 的不同实施例的出现纯粹示例性地理解。拉出式碗碟篮架 4 可以包括两个搁架 8 或者可选地两个搁架 14。搁架 8 如上所述可以在水平平面 13 内移动。搁架 8 的操作位置由点划线 15 表示,而该搁架所示处于装载位置,其横向邻近拉出式碗碟篮架 4。在于水平平面 13 内从操作位置移动到装载位置的移动过程中,搁架 8 因此沿箭头 16 的方向移动。可选地,可以提供搁架 14 的另一实施例。该搁架可以绕一垂直轴 / 轴线 17 可枢转地安装。轴承在此在拉出式碗碟篮架 4 的后区域内设置。搁架 14 的操作位置由线 18 示出,由箭头 19 表示从操作位置枢转到装载位置。

[0025] 针对这两个搁架 8 和 14 所共同的是,在它们处于操作位置、至少在某些区域内处

于装载位置时,它们释放操作区段 7 的低于搁架 8 和 14 的区域 12。这使得实现了该区域 12 以及还有搁架 8 和 14 的简单的装载,而不必将它们从拉出式碗碟篮架 4 稍微脱离。搁架 8 和 14 的枢转和 / 或移动可以手动地实现或自动地设置。在此,枢转和 / 或移动到装载位置尤其是例如借助于弹性力自动进行的。在搁架 14 的情况中,从装载位置自动枢转到操作位置也是可行的,因为在将拉出式碗碟篮架 4 插入到家用洗碗机 1 的洗碗机内部 3 中时,搁架 14 的滑动表面 20 与壳体 2 接触并且在这种情况下产生绕轴线 17 的扭矩,这种扭矩使得搁架 14 枢转到装载位置。该扭矩然后例如抵抗着弹簧的弹性力作用,从而下次拉出式碗碟篮架 4 从洗碗机内部被拉出时该弹簧被预压。

[0026] 针对搁架 8 和 14 的由现有技术之前可知的技术方案仅仅表明了搁架 8 和 / 或 14 的向上枢转。为此目的,足够的空间必须可用。在家用洗碗机的正常的安装位置中,拉出式碗碟篮架 4 的侧部的空间通常是自由的,从而在这种情况下之前所述的在水平平面内的枢转和 / 或移动是可行的。在待清洗的物品在搁架 8 和 / 或 14 上布置时,枢转和 / 或移动也可以实现。如上所述,搁架 8 和 14 的枢转和 / 或移动可以手动地或自动地完成。自动的枢转和 / 或移动还可以仅仅在已经由家用洗碗机 1 的使用者手动触发之后完成。

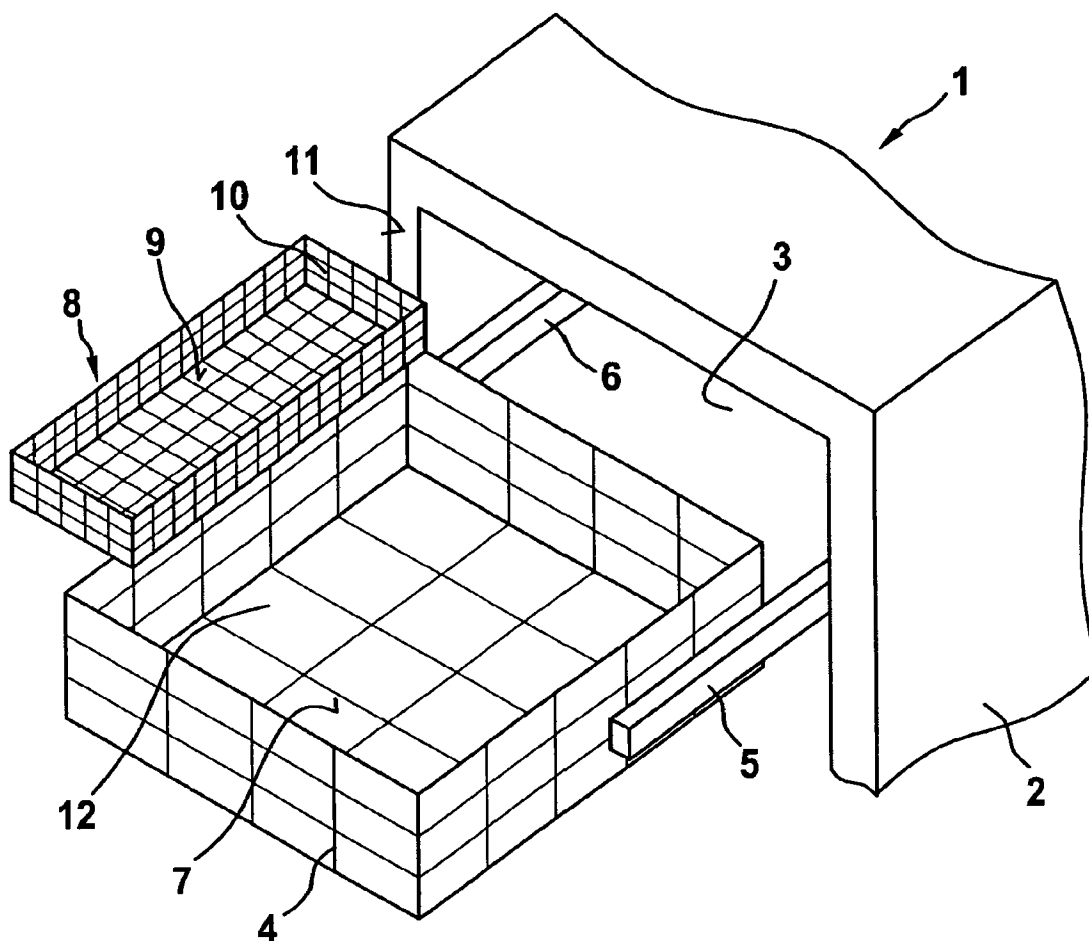


图 1

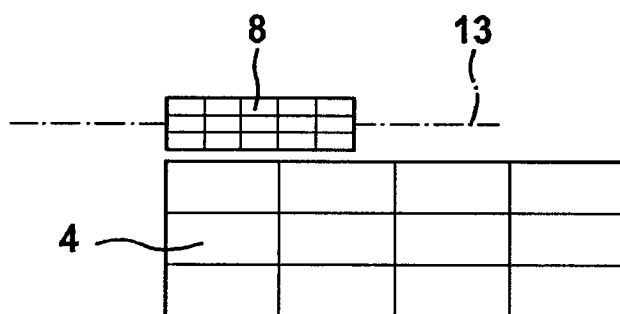


图 2a

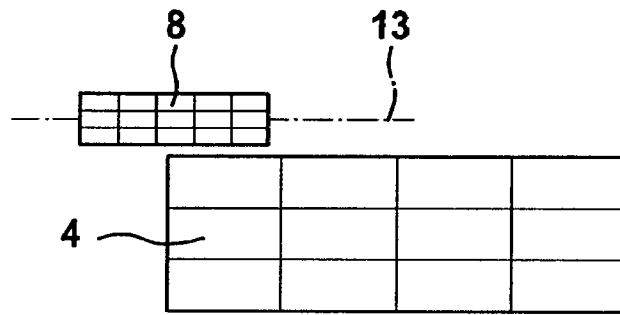


图 2b

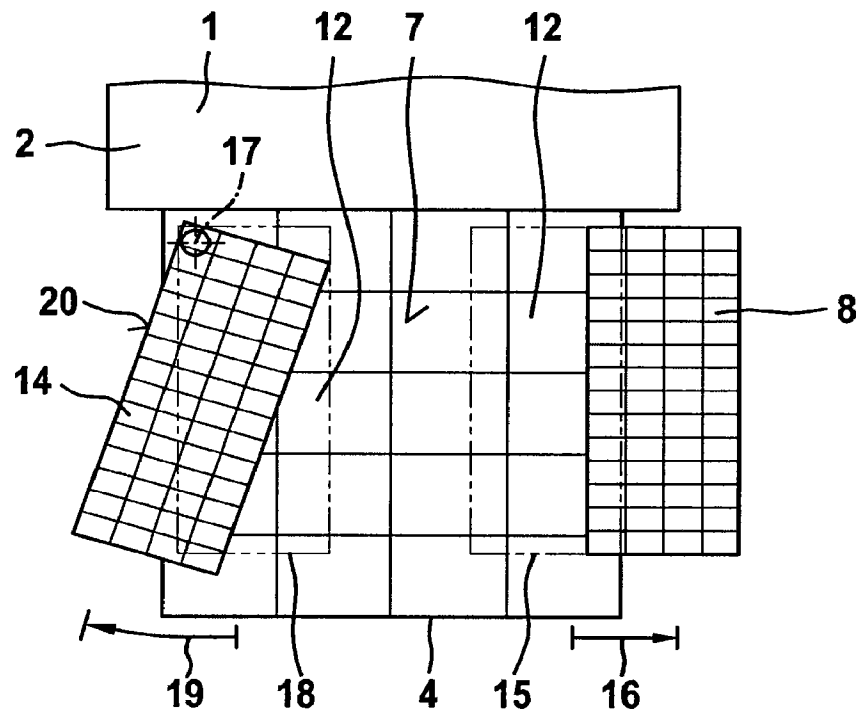


图 3



Espacenet

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System for washing washware and method for operating a system of this type

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Abstract of CN102215985 (A)

The invention relates to a dishwashing system (100) comprising at least one conveyor system (101) for feeding washware to one conveyor dishwasher (2, 2') and a conveyor system (101) for feeding dishware to the at least one conveyor dishwasher (2, 2') In order to further reduce the consumption of fresh water, chemicals and energy during operation, the invention provides a washware detector apparatus (51) which is designed to detect the number of units of washware, which are fed to the at least one conveyor dishwasher (2, 2') with the aid of the conveyor system (101) per unit time, in a prespecified or prespecifiable region of the conveyor system (101). Furthermore, a control device (50) is provided which is designed to select a predefined or predefinable treatment program.



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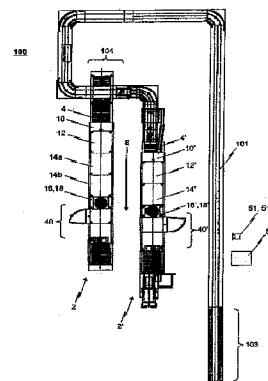
权利要求书 3 页 说明书 9 页 附图 2 页

(54) 发明名称

用于清洗洗涤器皿的系统及其操作方法

(57) 摘要

本发明涉及洗碗系统(100),其包括至少一个传送式洗碗机(2,2')和用于将洗涤器皿供应到所述至少一个传送式洗碗机(2,2')的传送系统(101)。为了进一步减少操作过程中清水、化学品的消耗量,本发明具有洗涤器皿检测装置(51),其设计为在传送系统(101)的预定的或可预定的区域检测每单位时间内借助于传送系统(101)供应到所述至少一个传送式洗碗机(2,2')的洗涤器皿个体的数量。此外,还具有控制装置(50),其设计为自动选择预设或可预设的处理程序。



1. 用于清洗洗涤器皿的系统 (100), 该系统 (100) 包括:

- 至少一个传送式洗碗机 (2, 2'), 其具有至少一个洗涤区域 (12, 14a, 14b; 12', 14')、至少一个最终漂洗区域 (18; 18'), 以及用于将洗涤器皿传送经过传送式洗碗机 (2, 2') 的独立的处理区域 (12, 14a, 14b, 16, 18; 12', 14', 16', 18') 的运输装置 (4; 4'); 以及

- 传送系统 (101), 其用于将洗涤器皿供应到所述至少一个传送式洗碗机 (2, 2'),

其特征在于: 具有洗涤器皿检测设备 (51), 其设计为在传送系统 (101) 的预定的或可预定的区域中检测每单位时间内借助于传送系统 (101) 供应到所述至少一个传送式洗碗机 (2, 2') 的洗涤器皿个体的数量, 以及

具有控制装置 (50), 其设计为根据所检测的每单位时间内供应到所述至少一个传送式洗碗机 (2, 2') 的洗涤器皿个体的数量, 为所述至少一个传送式洗碗机 (2, 2') 自动选择预设的或可预设的处理程序, 并设定与所选择的处理程序相关的程序参数。

2. 根据权利要求 1 所述的系统, 其中, 所述洗涤器皿检测设备 (51) 具有优选为光学、电容或电感运作的至少一个检测装置 (51'), 该检测装置 (51') 设计为检测传送系统 (101) 的所述预定的或可预定的区域中洗涤器皿的存在, 并且其中, 所述传送系统 (101) 设计为以预设的或可预设的供给速度将洗涤器皿供应到所述至少一个传送式洗碗机 (2, 2')。

3. 根据权利要求 2 所述的系统, 其中, 所述至少一个检测装置 (51') 被设计为检测单独的托盘、单独的盘碟、单独的炊事用具、单独的玻璃杯、单独的刀叉餐具物品和 / 或单独的容器的存在。

4. 根据权利要求 2 或者 3 所述的系统, 其中, 所述控制装置 (50) 被设计为将与所选择的处理程序相关的程序参数设定为在所述至少一个传送式洗碗机 (2, 2') 中具有时间迟延, 其中, 该时间迟延取决于由所述检测装置 (51') 检测的传送系统 (101) 的所述区域离开所述至少一个传送式洗碗机 (2, 2') 的距离以及洗涤器皿被供应到所述至少一个传送式洗碗机 (2, 2') 的供给速率。

5. 根据前述权利要求任一项所述的系统, 其中, 在传送系统 (101) 和所述至少一个传送式洗碗机 (2, 2') 之间还具有预清洗和 / 或预分类站 (104), 以用来手动预清洗和 / 或预分类由传送系统 (101) 供应的洗涤器皿。

6. 根据前述权利要求任一项所述的系统, 其中, 所述控制装置 (50) 被设计为根据所检测的每单位时间内供应到所述至少一个传送式洗碗机 (2, 2') 的洗涤器皿个体的数量, 将洗涤器皿被运送经过所述至少一个传送式洗碗机 (2, 2') 的独立的处理区域 (12, 14a, 14b, 16, 18; 12', 14', 16', 18') 的运输速度自动设定为预设的或者可预设的数值, 和 / 或

所述控制装置 (50) 被设计为根据所检测的每单位时间内供应到所述至少一个传送式洗碗机 (2, 2') 的洗涤器皿个体的数量, 将每单位时间内在所述至少一个洗涤区域 (12, 14a, 14b; 12', 14') 中喷洒的洗涤液体的量自动设定为预设的或可预设的数值; 和 / 或

所述控制装置 (50) 被设计为根据所检测的每单位时间内供应到所述至少一个传送式洗碗机 (2, 2') 的洗涤器皿个体的数量, 将每单位时间内在所述至少一个传送式洗碗机 (2, 2') 的最终漂洗区域 (18, 18') 中喷洒的最终漂洗液体的量自动设定为预设的或可预设的数值。

7. 根据前述权利要求任一项所述的系统, 其中, 所述至少一个传送式洗碗机 (2, 2') 具

有设有预洗涤喷嘴 (30) 的预洗涤区域 (12 ;12'),和连接至所述预洗涤区域 (12 ;12') 的下游并设有主洗涤喷嘴 (28) 的至少一个主洗涤区域 (14a,14b ;14') ;

其中,所述控制装置 (50) 被设计为根据所检测的每单位时间内供应到所述至少一个传送式洗碗机 (2,2') 的洗涤器皿个体的数量自动打开或者关闭对所述预洗涤区域 (12 ;12') 的预洗涤喷嘴 (30) 的洗涤液供应 ;和 / 或

其中,所述控制装置 (50) 被设计为根据所检测的每单位时间内供应到所述至少一个传送式洗碗机 (2,2') 的洗涤器皿个体的数量自动打开或者关闭对所述至少一个主洗涤区域 (14a,14b ;14') 的主洗涤喷嘴 (28) 的洗涤液供应。

8. 根据前述权利要求任一项所述的系统,其中,所述至少一个传送式洗碗机 (2,2') 具有干燥区域 (40,40'),以及

其中,所述控制装置 (50) 被设计为根据所检测到的每单位时间内供应到所述传送式洗碗机 (2,2') 的洗涤器皿个体的数量,自动选择用于在所述干燥区域 (40,40') 中干燥洗涤器皿的空气流的预设的或可预设的温度值,并且将用于干燥目的的空气流的温度设定为所选择的数值 ;和 / 或

其中,所述控制装置 (50) 被设计为根据所检测到的每单位时间内供应到所述传送式洗碗机 2,2' 的洗涤器皿个体的数量,自动选择每单位时间内在所述干燥区域 (40,40') 中流动用于干燥洗涤器皿的干燥空气流的体积量的预设或者可预设的数值,并且将每单位时间内流动的体积量设定为所选择的数值。

9. 根据前述权利要求任一项所述的系统,其中,所述至少一个传送式洗碗机 (2) 具有设有主洗涤喷嘴 (28) 的第一主洗涤区域 (14a),以及同样设有主洗涤喷嘴 (28) 的第二主洗涤区域 (14b),所述第二主洗涤区域 (14b) 连接至所述第一主洗涤区域 (14a) 的下游 ;并且其中,所述控制装置 (50) 被设计为根据所检测的每单位时间内供应到所述至少一个传送式洗碗机 (2) 的洗涤器皿个体的数量,自动打开和关闭对第一主洗涤区域 (14a) 的主洗涤喷嘴 (28) 的洗涤液体供应或对第二主洗涤区域 (14b) 的主洗涤喷嘴 (28) 的洗涤液体供应。

10. 根据前述权利要求任一项所述的系统,其中,第一传送式洗碗机 (2) 被提供用于洗涤盘碟、炊事用具、玻璃杯和容器,并且第二传送式洗碗机 (2') 被提供用于洗涤托盘和刀叉餐具物品。

11. 根据权利要求 10 所述的系统,其中,所述控制装置 (50) 被设计为根据所检测的每单位时间内供应到所述至少一个传送式洗碗机 (2,2') 的洗涤器皿个体的数量,自动选择所述至少一个传送式洗碗机 (2,2') 中的预设的或可预设的处理程序,并且设定与所选处理程序相关的程序参数。

12. 根据前述权利要求任一项所述的系统,其中,所述控制装置 (50) 被设计为根据所检测的每单位时间内供应的洗涤器皿个体的数量,可选择地为至少一个传送式洗碗机 (2,2') 自动选择预设的或者可预设的处理程序,并在所述至少一个传送式洗碗机 (2,2') 中设定与所选择的处理程序相关的处理参数。

13. 清洗洗涤器皿的方法,在该方法中,洗涤器皿借助于传送系统 (101) 被传送到传送式洗碗机 (2,2'),所述传送式洗碗机 (2,2') 特别设计为架传送式洗碗机或长龙式洗碗机 (2,2'),所述传送式洗碗机 (2,2') 具有至少一个洗涤区域 (12,14a,14b ;12' ,14') 、至

少一个最终漂洗区域 (18 ;18') 和用于将洗涤器皿运送经过所述传送式洗碗机 (2,2') 的独立的处理区域 (12,14a,14b,16,18 ;12' ,14' ,16' ,18') 的运输装置 (4 ;4') ,其特征在于,所述方法具有以下方法步骤:

a) 在传送系统 (101) 的预定的或可预定的区域中借助于洗涤器皿检测装置 (51) 检测每单位时间内借助于传送系统 (101) 供应到传送式洗碗机 (2,2') 的洗涤器皿个体的数量;以及

b) 根据所检测的每单位时间内供应到传送式洗碗机 (2,2') 的洗涤器皿个体的数量,在传送式洗碗机 (2,2') 中自动选择预设的或者可预设的处理程序并且设定与所选处理程序相关的程序参数。

14. 根据权利要求 13 所述的方法,其中,根据每单位时间内借助于传送系统 (101) 供应到传送式洗碗机 (2,2') 的洗涤器皿个体的预设的或者可预设的数量,将洗涤器皿被运送经过传送式洗碗机 (2,2') 的独立处理区域 (12,14a,14b,16,18 ;12' ,14' ,16' ,18') 的运输速度自动设定为预设的或可预设的数值 ;和 / 或

其中,根据每单位时间内借助于传送系统 (101) 供应到传送式洗碗机 (2,2') 的洗涤器皿个体的预设或者可预设的数量,将每单位时间内在所述至少一个洗涤区域 (12,14a,14b ;12' ,14') 中喷洒的洗涤液体的量自动设定为预设或可预设的数值 ;和 / 或

其中,根据每单位时间内借助于传送系统 (101) 供应到传送式洗碗机 (2,2') 的洗涤器皿个体的预设的或者可预设的数量,将每单位时间在所述至少一个传送式洗碗机 (2,2') 的最终漂洗区域 (18 ;18') 中喷洒的最终漂洗液体的量自动设定为预设的或者可预设的数值。

15. 根据权利要求 13 或 14 所述的方法,其中,将第一处理程序的程序参数自动设定等于 (up to) 在传送式洗碗机 (2,2') 中每单位时间内借助传送系统 (101) 供应的洗涤器皿个体的预设的或者可预设的数量 ;并且,其中,当超过在传送式洗碗机 (2,2') 中每单位时间内借助传送系统 (101) 供应的洗涤器皿个体的所述预设的或者可预设的数量时,第二处理程序的程序参数被自动设定。

16. 根据权利要求 15 所述的方法,其中,所述可设定的程序参数包括下列参数中的至少一个 :洗涤器皿被运送经过传送式洗碗机 (2,2') 的独立处理区域 (12,14a,14b,16,18 ;12' ,14' ,16' ,18') 的运输速度 ;每单位时间内在所述至少一个洗涤区域 (12,14a,14b ;12' ,14') 中喷洒的洗涤液体的量 ;每单位时间内在所述至少一个最终漂洗区域 (18 ;18') 中喷洒的最终漂洗液体的量 ;在所述至少一个传送式洗碗机 (2,2') 的干燥区域 (40,40') 中用于干燥洗涤器皿的空气流的温度值 ;以及每单位时间内在所述至少一个传送式洗碗机 (2,2') 的干燥区域 (40,40') 中流动用于干燥洗涤器皿的干燥空气流的体积量。

17. 根据权利要求 13 至 16 中任一项所述的方法,其中,当超过在传送式洗碗机 (2,2') 中每单位时间内借助于传送系统 (101) 供应的洗涤器皿个体的预设或可预设的数量时,洗涤器皿被运送经过传送式洗碗机 (2,2') 的独立处理区域 (12,14a,14b,16,18 ;12' ,14' ,16' ,18') 的所述运输速度、每单位时间内在所述至少一个洗涤区域 (12,14a,14b or 12' ,14') 中喷洒的洗涤液体的所述量、以及每单位时间内在所述至少一个最终漂洗区域 (18,18') 喷洒的最终漂洗液体的所述量都自动增加。

用于清洗洗涤器皿的系统及其操作方法

[0001] 本发明涉及用于清洗洗涤器皿的系统,其包括至少一个传送式洗碗机,所述传送式洗碗机具有至少一个洗涤区域、至少一个最终漂洗区域和用于将洗涤器皿运输经过传送式洗碗机的所述独立的处理区域的运输装置,所述系统还包括用于将洗涤器皿供应到所述至少一个传送式洗碗机的传送系统。本发明还涉及用于操作这种类型的洗碗系统的方法。

[0002] 因此,本发明尤其涉及具有长龙式洗碗机(长龙式器皿洗涤机)或架传送式洗碗机(架传送式器皿洗涤机)的洗碗系统,其中待处理的洗涤器皿,例如待清洗的盘碟、炊事用具、玻璃杯、刀叉餐具、托盘和其他厨房用具,借助于传送系统被供给至传送式洗碗机。

[0003] 半自动式洗碗系统逐渐被用于特别是相对大型的公共餐饮公司,在该洗碗系统中,盘碟通过传送系统循环,该传送系统具有例如用于将洗涤器皿供应给传送式洗碗机的供给传送带等等。该传送系统可以是例如托盘循环式传送带的形式,具有盘碟的托盘或盘碟可在盘碟接收位置被直接放置在该传送带上,并且从此位置直接或经过手工预清洗站或预分类站被供应到传送式洗碗机。无需置疑的是,其他方案用于传送系统也是可行的。

[0004] 传送式洗碗机(传送式器皿洗涤机)被用于商业领域。与家用洗碗机相反,在家用洗碗机中,待清洗的洗涤器皿在清洗过程中在机器中保持静止,而在传送式洗碗机中,洗涤器皿被传送经过不同的处理区域。在传送式洗碗机的情况下,洗涤器皿被传送经过多个的处理区域,例如一个或多个预洗涤区或、一个或多个主洗涤区、一个或多个后洗涤区或预漂洗区、一个或多个最终漂洗区以及一个或多个干燥区。通常具有用于容纳洗涤器皿的隔间的运输装置用于在运输方向上将洗涤器皿运输经过传送式洗碗机。在长龙式洗碗机的情况下,隔间可以由运输装置的运输带上的支撑指状物形成。在架传送式洗碗机中,能够形成容纳待处理的洗涤器皿的隔间的盘碟架用作传送装置。通过传送装置将盘碟架传送经过架传送式洗碗机在此处是可行的。

[0005] DE 196 08 030 C1 描述了用于清洗洗涤器皿的系统,其具有传送式洗碗机,在该传送式洗碗机中,在操作过程中,各个处理区域(预洗涤区、主洗涤区和可能存在的最终漂洗区)的处理参数能与相应的洗涤器皿相匹配,从而洗涤器皿能以有效和经济的方式被清洗。在这种传统的传送式洗碗机的情形下,总共考虑两种不同的类型的洗涤器皿,具体来讲,一种是“饮用玻璃杯、盘子、托盘”,另一种是“炊事用具、容器、桶”。另外,当选择程序参数时,待处理的洗涤器皿脏污的程度起到要作用。

[0006] DE 10 2005 021 101 A1 公开了具有传送式洗碗机的用于清洗洗涤器皿的系统,在该传送式洗碗机中,最终漂洗区具有两个相互分开的喷洒臂。根据需要,两个喷洒臂中的至少一个被开启或者关闭。最终漂洗区中的另一个喷洒臂根据运输速度或根据洗涤器皿的类型、洗涤器皿的数量和洗涤器皿脏污的程度被开启或者关闭。

[0007] US 6,530,996 B2 涉及具有传送式洗碗机的用于清洗洗涤器皿的系统,在该传送式洗碗机中,洗涤和/或最终漂洗程序根据洗涤器皿的类型被自动选择。特别是,运输速度和喷洒时间根据洗涤器皿的类型而变化。

[0008] 本发明的目的在于实现得到如介绍中所述类型的用于清洗洗涤器皿的系统的目标,从而与现有技术已知的洗碗系统相比,在操作过程中能进一步减少清水、化学品和能量

的消耗量。另一个目的是详细说明用于操作这种类型的洗碗系统的方法。

[0009] 每单位时间内借助传送系统供应到至少一个传送式洗碗机的洗涤器皿个体的数量能够通过提供洗涤器皿检测装置来确定,该洗涤器皿检测装置在传送系统的预定的或者可预定的区域检测洗涤器皿的存在。这样,洗碗系统上的操作负载能够被检测到,且能够预测对一个或多个传送式洗碗机的利用的预期程度。这允许所述一个或多个传送式洗碗机的操作参数及时地与洗涤器皿的数量相匹配,因为已经提前知道了有多少洗涤器皿个体不久将在至少一个传送式洗碗机中被处理。

[0010] 因此,根据本发明的洗碗系统还具有控制装置,该控制装置根据所检测到的每单位时间内借助传送系统被供应到至少一个传送式洗碗机的洗涤器皿个体的数量,为至少一个传送式洗碗机自动选择预设的或可预设的(例如,在机器制造过程中通过预置而设置或存储在控制装置的内存中,和/或根据机器安装的具体需要遵从服务人员或设备操作员的现场调整)处理程序,并设定与所选择的处理程序相关的程序参数。由于每单位时间内供应到传送式洗碗机的洗涤器皿个体的数量已通过可在传送系统的预定的或者可预定的区域中检测洗涤器皿的存在的洗涤器皿检测装置确定,对传送式洗碗机的预期的利用程度能提前知道。因此,提供了与在传送式洗碗机中设置程序参数相关的确定的前置时间,该前置时间可能对改变或者修改某个处理参数是必须的。

[0011] 例如,当每单位时间内在传送式洗碗机的至少一个洗涤区域中喷洒的洗涤液体的量和/或每单位时间内在至少一个最终漂洗区域中喷洒的最终漂洗液体的量要与传送式洗碗机的利用程度相匹配时,尤其如此。在某些情况下,这些处理参数可仅在具有时间延迟的情况下改变,因为需要特定的前置时间使得在至少一个洗涤区域或者在至少一个最终漂洗区域中的喷嘴适当地分散开,从而能够保证在洗涤区域中或者在最终漂洗区域中对洗涤器皿的有效处理。

[0012] 由于根据本发明的技术方案,可以根据传送式洗碗机的预期的利用程度为传送式洗碗机自动选择预设的或者可预设的程序顺序并设定与所选程序顺序相关的程序参数,从而确保了控制装置总能够为处理洗涤器皿选择并设定最适宜的程序参数。所述“最适宜的程序参数”应当理解为,通过该程序参数,洗涤器皿在传送式洗碗机的独立处理区域中不仅以有效方式并且还以特别经济的方式被处理。

[0013] 在根据本发明的技术方案的优选实施例中,根据检测到的每单位时间内供应到传送式洗碗机的洗涤器皿个体的数量,自动设定或者改变下列处理参数中的至少一个:

[0014] - 洗涤器皿被运送经过传送式洗碗机的独立处理区域的运输速度;

[0015] - 每单位时间内在传送式洗碗机的至少一个洗涤区域中喷洒的洗涤液体的量;

[0016] - 每单位时间内在传送式洗碗机的至少一个最终漂洗区域中喷洒的最终漂洗液体的量;

[0017] - 用于在传送式洗碗机的干燥区域中干燥洗涤器皿的空气流的温度值;和/或

[0018] - 每单位时间内在传送式洗碗机的干燥区域中流动用于干燥洗涤器皿的干燥空气流的体积量。

[0019] 除此之外或可选择的是,进一步优选的是,根据本发明的洗碗系统的这个实施例中,具有至少一个传送式洗碗机,该传送式洗碗机具有设有主洗涤喷嘴的第一主洗涤区域,和同样设有主洗涤喷嘴并连接至第一主洗涤区域的下流的第二主洗涤区域,其中,控制装

置被设计为根据检测到的每单位时间内供应到至少一个传送式洗碗机的洗涤器皿个体的数量,自动打开或者关闭对第一主洗涤区域的主洗涤喷嘴的洗涤液体供应或是对第二主洗涤区域的主洗涤喷嘴的洗涤液体供应(洗涤区域的打开或者关闭)。

[0020] 由于不仅是每单位时间内喷洒的洗涤液体的量或每单位时间内喷洒的最终漂洗液体的量被改变,而且此外运输速度也改变,这样的效果是洗涤器皿在传送式洗碗机的各个处理区域中的接触时间不再比充分处理实际所需的时间长。由此避免了洗涤器皿的过度处理。

[0021] 在根据本发明的洗碗系统,原则上在传送式洗碗机的各个处理区域中只消耗能确保充分处理(洗涤、最终漂洗、干燥)所实际需要的量的水、能量和化学品。特别是,在传送式洗碗机的最终漂洗区域中喷洒到洗涤器皿上所消耗的纯水形式的或者具有其他添加剂形式的清水能够在洗碗系统的操作过程中明显减少。

[0022] 在根据本发明的洗碗系统的一个可能的实施例中,可行的是,第一处理程序的程序参数,例如用于部分载荷操作的程序参数,能够被自动设定为等于在传送式洗碗机中每单位时间内借助传送系统供应的洗涤器皿个体的预设或者可预设的数量,而当超过在传送式洗碗机中每单位时间内借助传送系统供应的洗涤器皿个体的预设或者可预设的数量时,第二处理程序的程序参数,例如用于满载操作的程序参数,被自动设定。在这个优选实施例中,可设定的程序参数也优选地包括下列参数中的至少一个:洗涤器皿被运送经过传送式洗碗机的独立处理区域的运输速度;每单位时间内在至少一个洗涤区域中喷洒的洗涤液体的量;和/或每单位时间内在至少一个最终漂洗区域中喷洒的最终漂洗液体的量。

[0023] 因此可行的是,尤其是,部分负载操作过程中的运输速度,也就是说当第一处理程序的程序参数被设定时,与满载操作时相比是减小的,且同时,每单位时间内在传送式洗碗机的至少一个洗涤区域中喷洒的洗涤液体的量和每单位时间内在传送式洗碗机的至少一个洗涤区域中喷洒的最终漂洗液体的量与满载操作时相比同样是减少的。

[0024] 根据本发明的方法是操作用于清洗洗涤器皿的系统的方案,该系统具有至少一个传送式洗碗机和用于将洗涤器皿供应到所述至少一个传送式洗碗机的传送系统。根据本发明的方法可以减少这种洗碗系统的操作过程中尤其是清水的消耗量,该方法特别容易执行而又有效。

[0025] 本发明将基于作为例子的优选实施例并参考附图在下面描述,其中:

[0026] 图1示意性地示出了根据本发明的用于清洗洗涤器皿的系统的俯视图;以及

[0027] 图2示意性地示出了穿过根据图1的系统中使用的传送式洗碗机的纵剖视图。

[0028] 图1示意性地示出了根据本发明的洗碗系统100的实施例的俯视图。因此,这是半自动式洗碗系统,其具有用于清洗盘碟、玻璃杯和炊事用具的第一传送式洗碗机2,还具有用于清洗托盘和刀叉餐具物品的第二传送式洗碗机2'。还具有传送系统101。传送系统101从洗涤器皿接收区域103延伸到第二传送式洗碗机2'并且用作将洗涤器皿从洗涤器皿接收区域103传送到第二传送式洗碗机2'的入口区域11'。

[0029] 洗涤器皿优选为以恒定的前进速率被供应到传送式洗碗机2'。此外,上面提到的第一传送式洗碗机2设置在传送系统101的出口区域。在示出的实施例中,此第一传送式洗碗机2用来清洗盘碟,例如盘子、杯子、碟子、碗以及容器和器皿。用在根据图1的洗碗系统100中的第二传送式洗碗机2'的操作方式和设计将参考图2所示在下面描述。用来清洗

盘碟、玻璃杯和炊事用具的第一传送式洗碗机 2 大体上与第二传送式洗碗机 2' 是相同的设计,但此处提供的第一传送式洗碗机 2 不是仅具有一个主洗涤区 14',而是具有一前一后设置的两个主洗涤区 14a,14b。单个主洗涤区 14' 在第二传送式洗碗机 2' 中已足够,因为将在第二传送式洗碗机 2' 中处理的洗涤器皿的类型通常不是严重脏污的,从而不需要多个主洗涤区。

[0030] 相同作用的部件在第一传送式洗碗机 2 和第二传送式洗碗机 2' 中由相同的参考数字表示,为了显示区别,与第二传送式洗碗机 2' 的处理区域相关的参考数字具有撇号。第二传送式洗碗机 2' 的操作方式将参考根据图 2 的图示在下面描述。这些解释等同地适用于第一传送式洗碗机 2 的操作方式。

[0031] 借助传送系统 101 被传送到两个传送式洗碗机 2,2' 的洗涤器皿在预分类区域 104 中根据洗涤器皿的类型被预分类。具体地说,将在第一传送式洗碗机 2 中处理的洗涤器皿(玻璃杯和盘碟)此处被设置为在预分类区域 104 手动地从传送系统 101 移动第一传送式洗碗机 2 的运输装置 4 上。这确保了只有托盘和刀叉餐具借助传送系统 101 被供应到第二传送式洗碗机 2'。

[0032] 根据本发明的洗碗系统 100 的显著之处在于:其具有洗涤器皿检测设备 51,该洗涤器皿检测设备 51 设计为在传送系统 101 的预定的或可预定的区域中检测洗涤器皿的存在。根据图 1 的优选实施例中,传送系统 101 被设计为使得洗涤器皿以预设或可预设的供给速度被供应到两个传送式洗碗机 2,2'。这样,洗涤器皿检测设备 51 还适合于检测每单位时间内借助于传送系统 101 供应到传送式洗碗机 2,2' 的洗涤器皿个体的数量。

[0033] 所述洗涤器皿检测装置 51 优选为具有至少一个光学、电感或电容地操作的检测设备 51',其被设计为在传送系统 101 的预定的或者可预定的区域中检测洗涤器皿的存在。当检测设备 51' 被设计为检测单独的托盘、单独的盘碟、单独的炊事用具、单独的玻璃杯、单独的刀叉餐具物品和 / 或单独的容器的存在时是明显有利。

[0034] 图 1 中示出的洗碗系统 100 中还具有控制装置 50,其被设计为根据检测到的每单位时间内被供应到两个传送式洗碗机 2,2' 的洗涤器皿个体的数量,为两个传送式洗碗机 2,2' 中的至少一个传送式洗碗机自动选择预设的或可预设的处理程序,并且设定与所选处理程序相关的程序参数。

[0035] 此处优选的是控制装置 50 被设计为将与所选择的处理程序相关的处理参数设定为具有在所述至少一个传送式洗碗机 2,2' 中的时间迟延,该时间迟延取决于由检测装置 51' 检测的传送系统 101 的所述区域离开所述至少一个传送式洗碗机 2,2' 的距离以及洗涤器皿被供应到所述至少一个传送式洗碗机 2,2' 的供应速度。

[0036] 控制装置 50 操作的精确方式将结合传送式洗碗机 2' 被描述,传送式洗碗机 2' 在图 2 中示意性地示出。

[0037] 图 2 示意性地示出穿过第二传送式洗碗机 2' 的纵向剖视图,第二传送式洗碗机 2' 用于在根据图 1 的洗碗系统中清洗托盘和刀叉餐具。该传送式洗碗机 2' 配备有运输装置 4',其用于在运输方向 8 上将洗涤器皿(未示出)运送经过传送式洗碗机 2'。该传送式洗碗机 2' 具有至少一个洗涤区,例如在图 2 中所示出的预洗涤区 12' 和主洗涤区 14',所述主洗涤区 14' 在运输方向 8 上被设置在预洗涤区 12' 的下游。

[0038] 后洗涤区 16' 在运输方向 8 上被设置在所述至少一个洗涤区域 12',14' 的下游,

并且至少一个最终漂洗区,例如所示出的只有单个最终漂洗区 18',被设置在后洗涤区 16' 的下游。在图 2 中示出的传送式洗碗机 2' 中,干燥区域 40' 在洗涤器皿的运输方向 8 上跟在最终漂洗区域 18' 之后。传送式洗碗机 2' 的各个区域 12',14',16',18',40' 可通过分隔板 47 相互分隔开。图 2 中示出的实施例中,入口管道 10' 自身也通过分隔板 47 与入口 11' 分隔开。通过设置分隔板 47 防止洗涤液体和最终漂洗液体溅出来,并且防止蒸汽从传送式洗碗机 2' 中漏出。

[0039] 喷嘴 20,22,24,26,28,30 被结合进传送式洗碗机 2' 的所述处理区域 12',14',16',18'。当洗涤器皿通过运输装置 4' 被运送经过各个处理区域 12',14',16',18' 时,这些喷嘴 20,22,24,26,28,30 用作将液体喷洒到所述洗涤器皿上。处理区域 12',14',16',18' 的独立的喷洒系统确保了待处理的洗涤器皿从上方和下方都被喷洒到。

[0040] 然而,在图 2 示意性示出的传送式洗碗机 2' 中,最终漂洗区域 18' 不仅具有向下引导的上部喷嘴 20 和向上引导的下部喷嘴 22,还具有在运输装置 4' 的每一侧上横向引导的侧部喷嘴 24。侧部喷嘴 24 的使用允许在隐蔽的地方也能用最终漂洗液体以洗涤器皿区域作为目标喷洒。在最终漂洗区域 18' 中使用侧部喷嘴 24 在最终漂洗效果方面(在隐蔽的地方也能有效地将洗涤剂残余物从洗涤器皿表面漂洗掉)与那些在最终漂洗区域 18' 中只有上部和下部喷嘴 20,22 而没有提供横向引导的侧部喷嘴 24 的系统相比具有明显优势,尤其是当运输系统满载时,也就是说,例如当托盘运载机承载着一个接一个的托盘时。

[0041] 后洗涤区域 16'、主洗涤区域 14' 和预洗涤区域 12' 还具有相关的水箱(后洗涤水箱 32、主洗涤水箱 34、预洗涤水箱 36),以用于容纳喷洒的液体和/或用于将液体提供给相关处理区域 14',16',18' 的喷嘴 26,28,30。

[0042] 如已经提到的,在图 1 中示出的洗碗系统 100 中的第一传送式洗碗机 2 同样具有用于将洗涤器皿(未显示)在运输方向 8 上运送经过传送式洗碗机 2 的运输装置 4。第一传送式洗碗机 2 也具有后洗涤区域 12 和(第一)主洗涤区域 14a,该(第一)主洗涤区域 14a 在运输方向 8 上设置在预洗涤区域 12 的下游,并且在运输方向 8 上设置在入口管道 10 的下游。与根据图 2 的第二传送式洗碗机 2' 相比,在第一传送式洗碗机 2 中还具有在运输方向 8 上位于(第一)主洗涤区域 14a 的下游的另一个(第二)主洗涤区域 14b。后洗涤区域 16 在运输方向 8 上设置在第二主洗涤区域 14b 的下游,并且至少一个最终漂洗区域,例如示出的只有单个最终漂洗区域 18,被设置在后洗涤区域 16 的下游。在图 1 中示出俯视图的第一传送式洗碗机 2 中,干燥区域 40 在洗涤器皿的运输方向 8 上跟随在最终漂洗区域 18 之后。

[0043] 第一传送式洗碗机 2 的处理区域 10,12,14a,14b,16 和 18 在功能和结构上与相应的处理区域 10',12',14',16' 和 18' 相同,因此,第一传送式洗碗机 2 的处理区域 10,12,14a,14b,16 和 18 不再详细描述。

[0044] 如已经指出的,最终漂洗液体通过最终漂洗区域 18' 的喷嘴 20,22,24 被喷洒到洗涤器皿(未示出)上,所述最终漂洗液体包括清水以及以计量方式添加的漂洗辅助剂,所述最终漂洗区域 18' 的喷洒区设置在图 2 中示出的传送式洗碗机 2' 中的运输装置 4' 的上方和下方,以及侧部。一些喷洒的最终漂洗液体通过串级系统(cascade system)在与洗涤器皿的运输方向 8 相反的方向上从一个处理区域被传送到另一个处理区域。在最终漂洗区域 18' 中被喷洒的最终漂洗液体的剩余物被直接引导进入预洗涤水箱 36,该预洗涤水箱 36

通过阀 V1 和旁通管路 38 与预洗涤区域 12' 相联结。

[0045] 在串联系统中,由最终漂洗喷嘴 20,22,24 喷洒的最终漂洗液体由重力作用从最终漂洗区域 18' 流入后洗涤水箱 32,该后洗涤水箱 32 与后洗涤区域 16' 相关联。然后,在最终漂洗区域 18' 中喷洒并且由后洗涤水箱 32 收集的最终漂洗液体借助后洗涤泵 45 被输送到后洗涤区域 16' 的喷嘴(后洗涤喷嘴 26)。

[0046] 在后洗涤区域 16' 中洗涤液体从洗涤器皿上被漂洗下来。在此过程中产生的液体(后洗涤液体)由于重力作用流入主洗涤水箱 34,该主洗涤水箱 34 与主洗涤区域 14' 相关联。为了这个目的,优选为具有流出元件 39,例如引导后洗涤液体的流出底座或挡板,所述后洗涤液体由后洗涤喷嘴 26 喷洒,并进入主洗涤水箱 34。根据另一个实施例(未示出),当主洗涤水箱 34 延伸到后洗涤区域 16' 的后洗涤喷嘴 26 的下方时,流出元件 39 可以省略。

[0047] 主洗涤区域 14' 的主洗涤水箱 34 容纳的液体通常配备有洗涤剂,并借助于主洗涤泵 35 通过主洗涤区域 14' 的喷嘴(主洗涤喷嘴 28)被喷洒到洗涤器皿上。由主洗涤喷嘴 28 喷洒的洗涤液体由于重力作用流回到主洗涤水箱 34。

[0048] 主洗涤水箱 34 通过溢流管路 37 与预洗涤水箱 36 形成流体连通,预洗涤水箱 36 与预洗涤区域 12' 相关联。当主洗涤水箱 34 容纳有充足量的洗涤液体时,在主洗涤区域 14' 喷洒的洗涤液体通过这个溢流管路 37 进入预洗涤水箱 36。

[0049] 之后,容纳在预洗涤区域 12' 的预洗涤水箱 36 中的液体借助于预洗涤泵 33 通过预洗涤区域 12' 的喷嘴(预洗涤喷嘴 30)被喷洒到洗涤器皿上,以从洗涤器皿上除去粗糙颗粒的污垢。由预洗涤喷嘴 30 喷洒的洗涤液体由于重力的作用流回预洗涤水箱 36。

[0050] 预洗涤水箱 36 具有溢流管路 31,当预洗涤水箱 36 中的液体水平面超出界限时,该溢流管路 31 用作将超量的液体供应到废水系统。

[0051] 如已经指出的,在主洗涤区域 14' 和预洗涤区域 12' 中喷洒的液体优选为包括以计量方式添加的洗涤剂,例如,借助于洗涤剂测量装置(在图中未示出)将该洗涤剂添加到容纳在主洗涤区域 14' 的主洗涤水箱 34 中的液体中。

[0052] 如已经提到的,干燥区域 40' 在传送方向 8 上跟在最终漂洗区域 18' 之后。为了吹去或干燥洗涤器皿上的水气,洗涤器皿在干燥区域 40' 中通过干燥的且加热的空气干燥。为了将空气的湿度保持在对干燥有利的程度,例如,通过开口例如通过用于洗涤器皿的出口开口将环境空气从外部供应到干燥区域 40' 是可行的。

[0053] 然后,干燥区域 40' 中的暖和潮湿的空气例如借助于风扇 41 通过其他开口从干燥区域 40' 排出。在这种情况下,如果从干燥区域 40' 出来的排放空气流经可能具有例如冷凝器的热回收装置 42 则是有利的。热回收装置 42 用作回收排放空气中包含的至少一部分热能。

[0054] 第一传送式洗碗机 2 具有与干燥区域 40' 相对应的干燥区域 40。

[0055] 如果与洗涤区域 12', 14' 和 16' 相关联的水箱(预洗涤水箱 36、主洗涤水箱 34、后洗涤水箱 32)在首次启动传送式洗碗机 2' 之前是空的或者未充足,所述的水箱首先必须通过清水管路 90 和 / 或通过将最终漂洗液体喷洒进入最终漂洗区域 18' 中而被填充。清水管路 90 可以通过可控制的阀 V3 与清水供应系统连接。在主洗涤区域 14' 和预洗涤区域 12' 中可获得的洗涤液体的量都能够分别借助位于主洗涤水箱 34 中的水位传感器和位于预洗涤水箱 36 中的水位传感器被监测,并且被报告至控制装置 50。

[0056] 如图 2 中所示,最终漂洗区域 18' 可具有相关联的清水容器 30,以用于缓冲存储提供用作最终漂洗的清水的至少一部分。该清水容器 30 在一端配备有清水接头,该接头可以通过可控制的清水供给阀 V2 与清水供应系统连接,所述清水容器在其另一端连接到最终漂洗泵 43 的进口侧。然而不用说,省略用于缓冲存储提供用作最终漂洗的清水的至少一部分的清水容器 30,而将清水供给阀 V2 直接连接到最终漂清洗泵 43 的进口侧也是可行的。

[0057] 最终漂洗泵 43 的压力侧通过管道系统被连接到水加热器 9(锅炉)。在这种情况下,所述管路系统以这种方式设计:通过最终漂洗泵 43 传输到最终漂洗区域 18' 的喷嘴 20,22,24 的液体在到达水加热器 9 之前经过热回收装置 12。这样,利用被排出的排放气体的至少一部分热能来加热供应到最终漂洗区域 18' 的喷嘴 20,22,24 的液体成为可能。

[0058] 漂洗辅助剂以计量的方式被添加到清水中,该清水借助于漂洗辅助剂计量装置(图 2 中未明确示出)直接通过清水供给阀 V2 或通过清水容器 30 供应到最终漂洗泵 43。

[0059] 已经结合图 1 中示出的洗碗系统 100 描述过的控制装置 50 在图 2 所示的第二传送式洗碗机 2' 中示意性地示出。该控制装置 50 被设计为根据每单位时间内借助传送系统 101 供应到传送式洗碗机 2,2' 的洗涤器皿个体的数量来自动设定特定的处理参数,所述洗涤器皿个体的数量借助于洗涤器皿检测设备 51 来检测。控制装置 50 优选地设置为根据预设的或者可预设的程序顺序来控制传送式洗碗机 2,2' 的不同的可控制部件,例如相应的泵和阀,因而能够设定传送式洗碗机 2 或者 2' 的独立的处理区域 12,14a,14b,16,18 或 12',14',16',18' 中的处理参数,并且能够设定运输装置 4 或 4' 的运输速度。

[0060] 所述控制装置 50 优选地设计为:根据检测到的每单位时间内供应到传送式洗碗机 2,2' 的洗涤器皿个体的数量,将洗涤器皿被运送经过传送式洗碗机 2 或 2' 的独立处理区域 12,14a,14b,16,18 或 12',14',16',18' 的运输速度自动设定为预设的或可预设的数值;和/或根据检测到的每单位时间内供应到传送式洗碗机 2,2' 的洗涤器皿个体的数量,将每单位时间内在至少一个洗涤区域 12,14a,14b 或 12',14' 中喷洒的洗涤液体的量自动设定为预设的或者可预设的值;和/或根据检测到的每单位时间供应到传送式洗碗机 2,2' 的洗涤器皿个体的数量,将每单位时间内在传送式洗碗机 2 或 2' 的最终漂洗区域 18 或 18' 中喷洒的最终漂洗液体的量自动设定为预设的或者可预设的值。

[0061] 作为一种可选方案或者除此之外,优选地,控制装置 50 被设计为根据所检测到的每单位时间内被供应到传送式洗碗机 2,2' 的洗涤器皿个体的数量,自动选择在至少一个传送式洗碗机 2,2' 的干燥区域 40,40' 中的预设的或可预设的程序顺序,并且设定与所选的程序顺序相关的处理参数。此处可行的是,特别地,控制装置 50 被设计为根据检测到的每单位时间内供应到传送式洗碗机 2,2' 的洗涤器皿个体的数量,自动选择用于在至少一个传送式洗碗机 2,2' 的干燥区域 40,40' 中干燥洗涤器皿的空气流的预设的或可预设的温度值,并且将用于干燥目的的空气流的温度设定为所选择的数值。

[0062] 作为一种可选方案或者除此之外,控制装置 50 被设计为根据检测到的每单位时间内供应到传送式洗碗机 2,2' 的洗涤器皿个体的数量,自动选择每单位时间内在至少一个传送式洗碗机 2,2' 的干燥区域 40,40' 中流动用于干燥洗涤器皿的干燥空气流的体积量的预设的或者可预设的数值,并且将每单位时间内流动的体积量设置为所选择的数值,这也是可行的。

[0063] 在图 2 中示出的传送式洗碗机(第二传送式洗碗机 2')中,可行的是,尤其是,控

制装置 50 被设计为：根据所检测到每单位时间内供应到传送式洗碗机 2, 2' 的洗涤器皿个体的数量，自动打开或者关闭对预洗涤区域 12 或 12' 的预洗涤喷嘴 30 的洗涤液体的供应；和 / 或根据所检测到的每单位时间内供应到传送式洗碗机 2, 2' 的洗涤器皿个体的数量，自动打开或者关闭对主洗涤区域 14a, 14b 或 14' 的主洗涤喷嘴 28 的洗涤液体的供应。

[0064] 控制装置 50 通过适当的通讯连接器与洗涤器皿检测设备 51 相连接，以检测供应到传送式洗碗机 2 的洗涤器皿的类型，并且由洗涤器皿检测设备 51 连续地或者以预定次数或项目进行检测。

[0065] 因此，根据本发明的洗碗系统 100 还适于实施用于洗涤器皿的方法，其具有下述被执行的方法步骤：

[0066] a) 在传送系统 101 的预定的或可预定的区域中借助于洗涤器皿检测设备 51 检测每单位时间内借助于传送系统 101 供应到传送式洗碗机 2, 2' 的洗涤器皿个体的数量；以及

[0067] b) 根据所检测的每单位时间内供应到传送式洗碗机 2, 2' 的洗涤器皿个体的数量，在传送式洗碗机 2, 2' 中自动选择预设的或者可预设的处理程序，并且设定与所选处理程序相关的程序参数。

[0068] 第一处理程序的程序参数在此处优选地被自动设定等于 (up to) 在传送式洗碗机 2, 2' 中每单位时间内借助于传送系统 101 供应的洗涤器皿个体的预设的或可预设的数量，而当超过在传送式洗碗机 2, 2' 中每单位时间内借助于传送系统 101 供应的洗涤器皿个体的预设的或可预设的数量时，第二处理程序的程序理参数被自动设置。可设定的程序参数包括下述参数中的至少一个：洗涤器皿被运送经过传送式洗碗机 2 或 2' 的独立处理区域 12, 14a, 14b, 16, 18 或 12', 14', 16', 18' 的运输速度；每单位时间内在至少一个洗涤区域 12, 14a, 14b 或 12', 14' 中喷洒的洗涤液体的量；每单位时间内在至少一个最终漂洗区域 18 或 18' 中喷洒的最终漂洗液体的量；在干燥区域 40 或 40' 中用于干燥洗涤器皿的空气流的温度值；和 / 或每单位时间内在干燥区域 40, 40' 中流动的用于干燥洗涤器皿的干燥空气流的体积量。

[0069] 根据本发明方法的优选的进一步改进中，当超过传送式洗碗机 2 或 2' 中每单位时间内借助于传送系统 101 供应的洗涤器皿个体的预设的或可预设的数量时，洗涤器皿被运送经过传送式洗碗机 2 或 2' 的独立处理区域 12, 14a, 14b, 16, 18 或 12', 14', 16', 18' 的运输速度、每单位时间内在至少一个洗涤区域 12, 14a, 14b 或 12', 14' 中喷洒的洗涤液体的量、以及每单位时间内在至少一个最终漂洗区域 18 或 18' 中喷洒的最终漂洗液体的量都自动增加。

[0070] 特别地，可行的是，将干燥空气流的温度设定为平均值，例如在至少一个传送式洗碗机 2, 2' 的干燥区域 40, 40' 中的平均运输速度时的 55 至 65℃，和 / 或将每单位时间内流动的干燥空气的体积量设定为平均值，例如 1500 至 2500m³/h。

[0071] 本发明不受限于附图中以例举方式示出的图 1 和图 2 的实施例。相反，本发明可以从对专利权利要求和例举实施例的描述的全面的专业考虑集合而成。

[0072] 因此，可行的是，例如，两个传送式洗碗机 2, 2' 中只有一个传送式洗碗机根据每单位时间内由传送系统 101 供应的洗涤器皿个体的数量借助于控制装置 50 被控制。

[0073] 还可行的是，控制装置 50 被设计为根据所检测的每单位时间内供应的洗涤器皿个体的数量，可选择地自动选择用于至少一个传送式洗碗机 2, 2' 的预设的或者可预设的处

理程序,并且设定与所述至少一个传送式洗碗机 2,2' 中所选择的处理程序相关的程序参数。

[0074] 关于第一传送式洗碗机 2,其具有设有主洗涤喷嘴 28 的第一主洗涤区域 14a,以及同样具有主洗涤喷嘴 28 并连接至第一主洗涤区域 14a 的下游的第二主洗涤区域 14b,同样可行的是,控制装置 50 被设计为根据所检测的每单位时间内供应到至少一个传送式洗碗机 2 的洗涤器皿个体的数量自动打开或者关闭对第一主洗涤区域 14a 的主洗涤喷嘴 28 的洗涤液体的供应或是对第二主洗涤区域 14b 的主洗涤喷嘴 28 的洗涤液体的供应(例如,控制装置可以被设置使得仅供应到主洗涤区域 14a 和 14b 中的一个洗涤区域的洗涤液体的供应被打开或关闭,而另一个则不打开或关闭)。

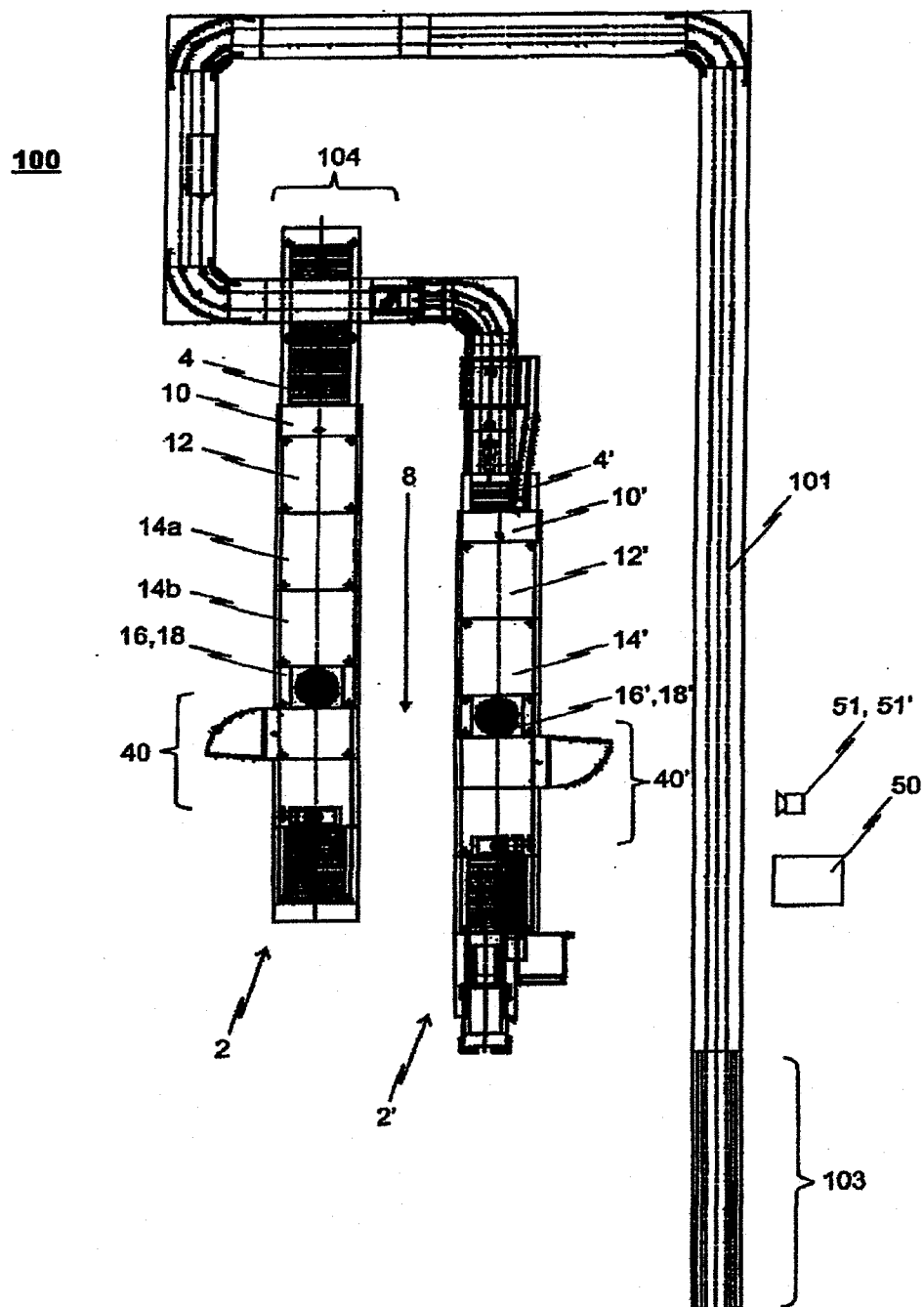


图 1

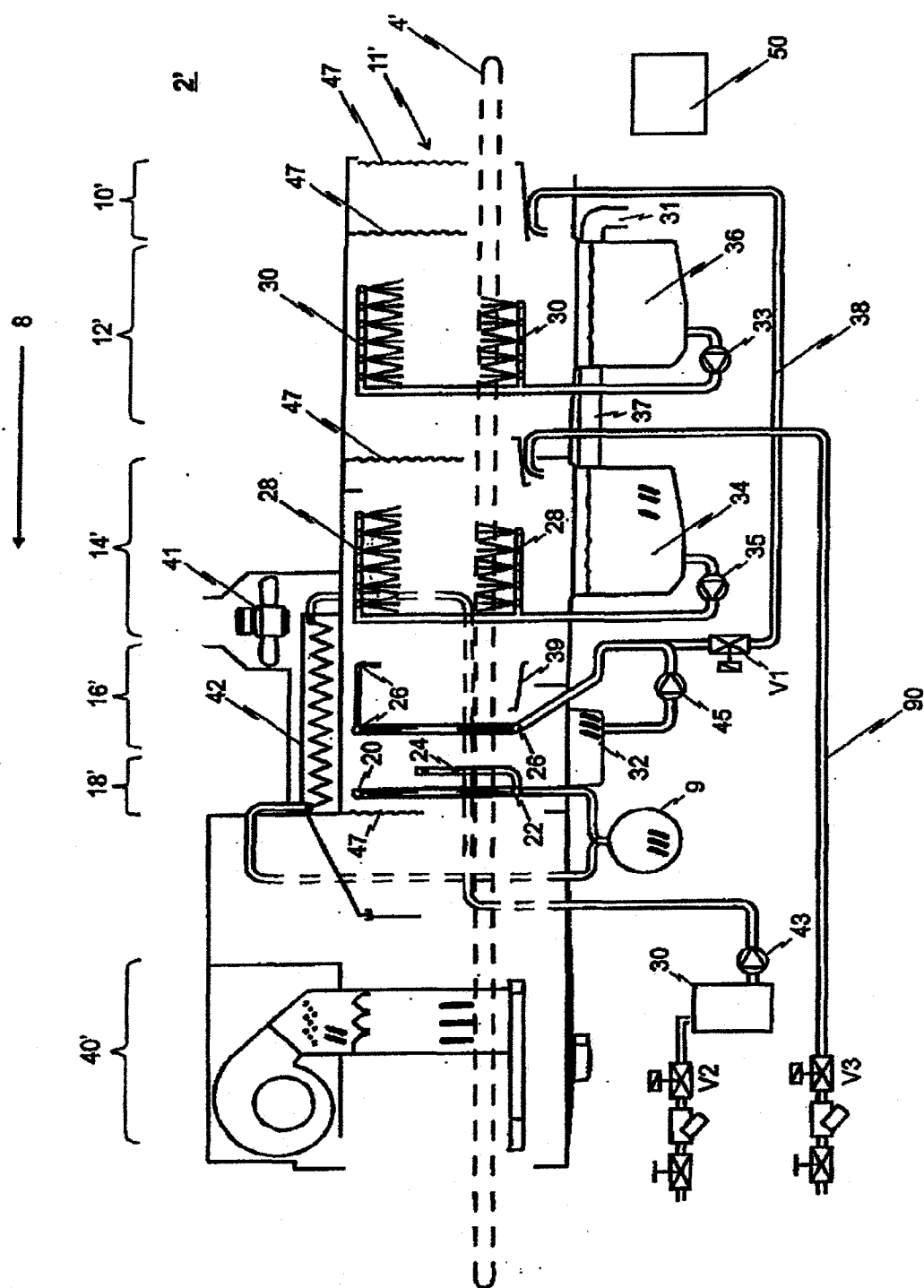


图 2



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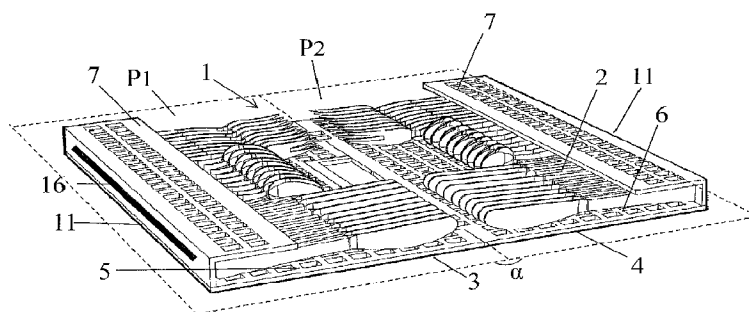


Figure 1

(57) Abstract: The present invention relates to a cutlery stacking device (1), for stacking cutlery items in a dishwasher. The cutlery stacking device (1) comprises a first stacking portion (3) and a second stacking portion (4), said first stacking portion (3) and said second stacking portion (4) being foldably interconnected with each other essentially at an upper edge (13) of said first stacking portion (3) and said second stacking portion (4). Each one of said first stacking portion (3) and said second stacking portion (4) comprising an outer surface, at least one of said outer surfaces being adapted to hold said cutlery items. The outer surface of said first stacking portion (3) extending in a plane P₁ and said outer surface of said second stacking portion (4) extending in a plane P₂, wherein, in said planes P₁, P₂, said first stacking portion (3) and said second stacking portion (4) are arranged in an angle α with respect to each other. The cutlery stacking device (1) has at least an unfolded state and a folded state, and wherein said cutlery stacking device (1) is foldable between at least said unfolded and said folded state such that α differs from 0°-180°. The present invention further relates to a dishwasher comprising such cutlery stacking device (1).

TITLE

Cutlery stacking device

FIELD OF THE INVENTION

- 5 The present invention relates to a cutlery stacking device for a dishwasher, and a dishwasher comprising such cutlery stacking device, according to the preambles of the independent claims.

BACKGROUND OF THE INVENTION

- 10 Dishwashers, and in particular dishwashers designed for domestic use, are often provided with a cutlery basket for stacking cutlery pieces. The cutlery basket is most commonly arranged in the lower rack of the dishwasher. In most cases, the cutlery basket is detachably arranged within the rack and provided with a handle, which facilitates loading and unloading of the cutlery.
- 15 However, instead of having a cutlery basket, dishwashers are sometimes provided with a cutlery tray arranged for substantially horizontal reception of cutlery. Commonly, such cutlery tray is slidingly arranged in the upper part of the dishwasher, above the upper rack.
- 20 In US2008302397 A a washing-up basket for a dishwasher with a device for stacking cutlery pieces, is disclosed. A pivoting stacking device is arranged on an external side of the washing-up basket. The device comprises a holder, in which at least one separate cutlery basket may be introduced. The cutlery basket is characterized by particular aids for individual stacking of the cutlery
- 25 pieces. At least one side wall of the crockery basket can be folded out. When the cutlery basket, removed from the holder of the pivoting stacking device, is placed on its side, and the hinged side wall of the cutlery basket is opened, the cutlery pieces collect on the lower side of the cutlery basket and may easily be removed without the cutlery pieces needing to be taken individually
- 30 from the cutlery basket grid.

A further example of a cutlery basket is disclosed in US2005000554 A, which discloses a dishwasher rack basket assembly that includes a water impervious basket of open mesh construction. The basket is selectively positionable between a first size and a second size, the first size securing
5 small items while permitting flow of liquid therethrough, the second size smaller than the first size and not securing small items while permitting flow of liquid therethrough.

EP0186157A discloses a domestic dishwasher with a removable crockery
10 basket and a separate cutlery basket in which items of cutlery can be placed for the purpose of washing.

DE9216495U1 discloses a cutlery basket comprising two object receiving parts, the cutlery basket may be opened up to facilitate removal of the cutlery
15 items. In DE19726553 A1 a further example of a cutlery basket comprising two portions, is disclosed. The basket may be opened in order to facilitate unloading of the cutlery items.

Thus, a great variety of different cutlery baskets and cutlery trays have been
20 suggested for stacking cutlery in the dishwasher. However, the inventors of the present invention have identified a need for an improved cutlery basket which allows more flexibility than previous known cutlery baskets, which facilitates loading and unloading of the cutlery, and which provides reduced costs.

25

Thus, an object of the present invention is to provide a cutlery basket which facilitates loading and unloading of the cutlery.

A further object of the present invention is to provide a cutlery basket which
30 provides improved space and cost efficiency.

Another object of the present invention is to provide more flexibility and improved freedom of choice for the user when loading or unloading the cutlery items in the dishwasher.

5 SUMMARY OF THE INVENTION

The above-mentioned objects are achieved by the present invention according to the independent claims.

Preferred embodiments are set forth in the dependent claims.

10

The cutlery stacking device, for stacking cutlery items in a dishwasher, in accordance with the present invention, comprises a first stacking portion and a second stacking portion, said first stacking portion and said second stacking portion being foldably interconnected with each other essentially at an upper edge of said first stacking portion and said second stacking portion. Each one of said first stacking portion and said second stacking portion comprising an outer surface, at least one of said outer surfaces being adapted to hold said cutlery items, said outer surface of said first stacking portion extending in a plane P_1 and said outer surface of said second stacking portion extending in a plane P_2 , wherein, in said planes P_1 , P_2 , said first stacking portion and said second stacking portion are arranged in an angle α with respect to each other, and wherein said cutlery stacking device has at least an unfolded state and a folded state, and wherein said cutlery stacking device is foldable between at least said unfolded and said folded state such that α differs from 0°-180°

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In another aspect, the present invention relates to a dishwasher comprising a cutlery stacking device.

30 SHORT DESCRIPTION OF THE APPENDED DRAWINGS

Figure 1 shows the cutlery stacking device, when in the unfolded state acting as a cutlery tray, according to one embodiment of the present invention.

Figure 2 shows the cutlery stacking device, when in the semi-folded state acting as a cutlery basket, according to one embodiment of the present invention.

- 5 Figure 3 shows the cutlery stacking device, when in the folded state acting as a cutlery basket, according to one embodiment of the present invention.

Figure 4 shows the cutlery stacking device, arranged in a dishwasher, when the cutlery stacking device is in the folded state acting as a cutlery basket,
10 according to one embodiment of the present invention.

Figure 5 shows the cutlery stacking device, when in the unfolded state, and when being arranged in a rack support in a dishwasher, according to one embodiment of the present invention.

15

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS OF THE INVENTION

Throughout the application the term upper edge refers to the edge located furthest away from a supporting surface, against which the cutlery stacking
20 device is supported when the cutlery stacking device is in a folded state and in upright position. The supporting surface may be, e.g. a table or a dishwasher rack, against which the cutlery stacking device is supported. The term outer edge refers to the edge which is located closest to a supporting surface, when the cutlery stacking device is in a folded state and in upright
25 position. The outer edge abuts against the supporting surface in case of the cutlery stacking device being self-supporting in the upright position.

Throughout the application the term outer surface 5 of the first stacking portion 3 refers to the surface facing away from the second stacking portion 4,
30 when cutlery stacking device is in the folded state and the angle α is essentially 0° . In a similar way, the term outer surface 6 of the second stacking portion 4 refers to the surface facing away from the first stacking portion 3, when in the folded state and the angle α is essentially 0° .

Figure 1 shows a cutlery stacking device 1, for stacking cutlery items 2 in a dishwasher (not shown), according to one embodiment of the present invention. The cutlery stacking device 1 comprises a first stacking portion 3 and a second stacking portion 4, the first stacking portion 3 and the second stacking portion 4 are foldably interconnected with each other essentially at an upper edge 13 of the first stacking portion 3 and the second stacking portion 4. Each one of the first stacking portion 3 and the second stacking portion 4 comprising an outer surface 5, 6, at least one of the outer surfaces 5, 6 being adapted to hold the cutlery items. The outer surface 5 of the first stacking portion 3 extends in a plane P_1 and the outer surface 6 of the second stacking portion 4 extends in a plane P_2 , wherein, in the planes P_1 , P_2 , the first stacking portion 3 and the second stacking portion 4 are arranged in an angle α with respect to each other. Furthermore, the cutlery stacking device 1 has at least an unfolded state and a folded state, and wherein the cutlery stacking device 1 is foldable between at least the unfolded and the folded state such that α differs from 0° - 180° . In the Figures, the planes P_1 , P_2 are indicated with dashed lines, the angle α between the first stacking portion 3 and the second stacking portion 4 is located between said planes P_1 , P_2 closest to the upper edge 13.

In one embodiment, when in the unfolded state, the angle α is 180° , and when in the folded state, the angle α is $0^\circ \leq \alpha < 180^\circ$. The angle α being 180° in the unfolded state is advantageous in that the cutlery stacking device 1 then extends essentially horizontally, which facilitates using the cutlery stacking device 1 as a cutlery tray in the dishwasher.

Thus, in use, when in the unfolded state, the cutlery stacking device 1 acts as a cutlery tray, as illustrated in Figures 1 and 5, and is adapted to be slidably arranged within a dishwasher, e.g. above the upper rack. In the folded state, as illustrated in Figures 2-4, the cutlery stacking device 1 is adapted to act as a cutlery basket. The cutlery stacking device being foldable between at least two states is advantageous in that it provides improved freedom of choice for

the user, since the user may choose between using the cutlery stacking device 1 as a cutlery tray or a cutlery basket.

As illustrated in Figures 1 and 5, the cutlery stacking device 1 is adapted to
5 be mounted as a sliding tray in a dishwasher or extractably in a rack support 15 in the dishwasher 17, when in the unfolded state. The rack support may be a wire support, or any other similar support, e.g. a rack support made of plastic.

10 According to one embodiment, shown in Figure 1, an outer edge 11 of the first stacking portion 3 and an outer edge 11 of the second stacking portion 4 are provided with sliding means 16, adapted to fit slidingly in the dishwasher 17, when the cutlery stacking device 1 is in the unfolded state. The sliding means 16 may be sliding grooves, or sliding tongues.

15 In another embodiment, as shown in Figure 5, when the cutlery stacking device 1 is in the unfolded state, the cutlery stacking device 1 may be arranged essentially horizontally in a rack support 15 which is extractably arranged in the dishwasher 17. Arranging the cutlery stacking device 1 in a
20 rack support 15 is advantageous in that it facilitates lifting out and removing the cutlery stacking device 1 from the dishwasher 17, which facilitates loading and unloading of the cutlery items.

According to one embodiment, as illustrated in Figure 2, the cutlery stacking
25 device 1 has a semi-folded state, in which the angle α is approximately 10°-60°. As can be seen in Figure 2, in the semi-folded state, the first stacking portion 3 and the second stacking portion 4 are adapted to act as a support, such that the cutlery stacking device 1 is self-supporting in an upright position. The semi-folded state is advantageous in that the cutlery stacking
30 device 1 may be detached from the dishwasher 17, lifted out, and placed on, e.g. a table or any other surface, which facilitates unloading of the cutlery items. The cutlery stacking device 1 being self-supporting also facilitates unloading of the cutlery items.

In one embodiment, at least one of the outer surfaces 5, 6 are provided with at least one holding element 7, adapted to hold said cutlery items. In Figures 1-2, each one of the outer surfaces 5, 6 are provided with a holding element
5 7. Preferably, the at least one holding element 7 is arranged essentially at an outer edge 11 of at least one of the first stacking portion 3 and the second stacking portion 4.

In the embodiment shown in Figure 2, the holding element 7 comprises an
10 elongated pocket 12, adapted to receive at least a portion of one or more of the cutlery items 2. The pocket 12 may be arranged essentially at the outer edge 11 of the first stacking portion 3 and/or the second stacking portion 4. In Figure 2 each one of the first stacking portion 3 and the second stacking portion 4 comprises an elongated pocket 12 arranged essentially at the outer
15 edge 11. Preferably, the pocket 12 extends essentially the complete length L of the first stacking portion 3 and/or the second stacking portion 4. However, the pocket 12 may extend only along parts of the length L of the first stacking portion 3 and/or the second stacking portion 4.

20 In one embodiment, as illustrated in Figures 2-3, the pocket 12 is provided with an opening 14, said opening 14 being adapted to receive the portion of the one or more cutlery items, wherein the opening 14 is directed in a direction D towards the upper edge 13 of the first stacking portion 3 and/or the second stacking portion 4.

25

According to one embodiment, the holding element 7 comprises an elongated supporting device 18 arranged close to an upper edge 13 of the first stacking portion 3 or the second stacking portion 4, the elongated supporting device being adapted to maintain an upper portion of the cutlery items 2 in position.

30 The elongated supporting device 18 may be adjustably arranged, such that the position of the elongated supporting device 18 along the first stacking portion 3 and/or the second stacking portion 4 may be adjusted. Thus, the

position between the upper edge 13 and the outer edge 11 may be adjusted. This facilitates loading and unloading the cutlery items.

In one embodiment, the interconnection between the first stacking portion 3 and the second stacking portion 4 comprises a pivot connection 9, which is adapted to interconnect the first stacking portion 3 and the second stacking portion 4. The first stacking portion 3 and the second stacking portion 4 are then advantageously foldable between the folded state, wherein the first stacking portion 3 and the second stacking portion 4 may be essentially parallel to each other and vertically arranged, and the unfolded state, wherein the first stacking portion 3 and the second stacking portion 4 are arranged aligned with each other and in the same plane.

In one embodiment, a handle 8 is arranged adjacent to the pivot connection 9 of the cutlery stacking device 1. The handle 8 may be arranged between the first stacking portion 3 and the second stacking portion 4. In one embodiment, the handle 8 is attached essentially at an upper edge 13 of the first stacking portion 3. In another embodiment, the handle 8 is attached essentially at an upper edge 13 of the second stacking portion 4, as shown in the embodiment illustrated in Figure 4.

In one embodiment, as shown in Figure 3, the angle α is essentially 0° in the folded state. The first stacking portion 3 and the second stacking portion 4 are then completely folded such that the outer surfaces 5, 6 are parallel with respect to each other and vertically arranged.

In the folded state, when the angle α is essentially 0° the cutlery stacking device 1 is preferably arranged in a dishwasher rack 10, as illustrated in Figure 4. The surfaces 5, 6 being vertically arranged provides improved space efficiency.

In another aspect, the present invention relates to a dishwasher comprising at least one cutlery stacking device 1 as mentioned above.

In one embodiment, as illustrated in Figure 5, when in the unfolded state, the at least one cutlery stacking device 1 is arranged essentially horizontally in a rack support 15 extractably arranged in the dishwasher 17. In another
5 embodiment, the cutlery stacking device 1 is arranged essentially horizontally as a sliding tray in the dishwasher 17. In that case, as also mentioned above, the cutlery stacking device 1 is provided with sliding means 16 (see Figure 1) adapted to fit in corresponding sliding means in the dishwasher, such that the cutlery stacking device 1 is extractably arranged in the dishwasher in a
10 manner similar to what is shown in fig. 5. Preferably, the angle α is 180° when the cutlery stacking device 1 is arranged in a rack support or mounted as a sliding tray. Furthermore, when in the folded state, the at least one cutlery stacking device 1 is arranged essentially vertically in a dishwasher rack 10 in the dishwasher, as shown in Figure 4. In Figure 4, the cutlery stacking device
15 1 is folded and the angle α is 0° .

The present invention is not limited to the above-described preferred embodiments. Various alternatives, modifications and equivalents may be used. Therefore, the above embodiments should not be taken as limiting the
20 scope of the invention, which is defined by the appending claims.

CLAIMS

1. Cutlery stacking device (1), for stacking cutlery items in a dishwasher, said cutlery stacking device (1) comprising a first stacking portion (3) and a second stacking portion (4), said first stacking portion (3) and said second stacking portion (4) being foldably interconnected with each other essentially at an upper edge (13) of said first stacking portion (3) and said second stacking portion (4), each one of said first stacking portion (3) and said second stacking portion (4) comprising an outer surface, at least one of said outer surfaces (5, 6) being adapted to hold said cutlery items, said outer surface (5) of said first stacking portion (3) extending in a plane P_1 and said outer surface (6) of said second stacking portion (4) extending in a plane P_2 , wherein, in said planes (P_1 , P_2), said first stacking portion (3) and said second stacking portion (4) are arranged in an angle α with respect to each other, and wherein said cutlery stacking device (1) has at least an unfolded state and a folded state, and wherein said cutlery stacking device (1) is foldable between at least said unfolded and said folded state such that α differs from 0° - 180° .
2. Cutlery stacking device according to claim 1, wherein, in said unfolded state, said angle α is 180° , and in said folded state, said angle α is $0^\circ \leq \alpha < 180^\circ$.
3. Cutlery stacking device according to claim 1, wherein said cutlery stacking device (1) has a semi-folded state, in which said angle α is approximately 10° - 60° .
4. Cutlery stacking device according to claim 3, wherein, when in said semi-folded state, said first stacking portion (3) and said second stacking portion (4) are adapted to act as a support, such that said cutlery stacking device (1) is self-supporting in an upright position.
5. Cutlery stacking device according to claim 1, wherein in said folded state, said angle α is essentially 0° .

6. Cutlery stacking device according to any of claims 1-5, wherein at least one of said outer surfaces (5, 6) are provided with at least one holding element (7), adapted to hold said cutlery items.
- 5 7. Cutlery stacking device according to claim 6, wherein said at least one holding element (7) is arranged essentially at an outer edge (11) of at least one of said first stacking portion (3) and said second stacking portion (4).
8. Cutlery stacking device according to any of claims 1-7, wherein the
10 cutlery stacking device (1) is adapted to be mounted as a sliding tray or in a rack support (15) in a dishwasher (17), when in said unfolded state.
9. Cutlery stacking device according to any of claims 6-7, wherein said
15 holding element (7) comprises an elongated pocket (12), adapted to receive at least a portion of one or more of said cutlery items.
10. Cutlery stacking device according to claim 9, wherein the pocket (12) is provided with an opening (14), adapted to receive said portion of said one or more cutlery items, wherein said opening (14) is directed in a direction D
20 towards said upper edge (13) of said first stacking portion (3) and/or said second stacking portion (4).
11. Cutlery stacking device according to any of claims 1-10, wherein said foldable interconnection comprises a pivot connection (9), which is adapted to
25 interconnect said first stacking portion (3) and said second stacking portion (4).
12. Cutlery stacking device according to claim 11, wherein a handle (8) is arranged adjacent to said pivot connection (9) of said cutlery stacking device
30 (1).

13. Cutlery stacking device according to claim 12, wherein said handle (8) is attached essentially at an upper edge (13) of said first stacking portion (3) and/or of said second stacking portion (4).

5 14. Dishwasher (17) comprising at least one cutlery stacking device (1) according to any of claims 1-13.

15. Dishwasher according to claim 14, wherein, when in said unfolded state, said at least one cutlery stacking device (1) is arranged essentially

10 horizontally

- in a rack support (15) extractably arranged in said dishwasher (17), or
- as a sliding tray in said dishwasher (17),

and wherein, when in said folded state, said at least one cutlery stacking device (1) is arranged essentially vertically in a dishwasher rack (10) in said

15 dishwasher (17).

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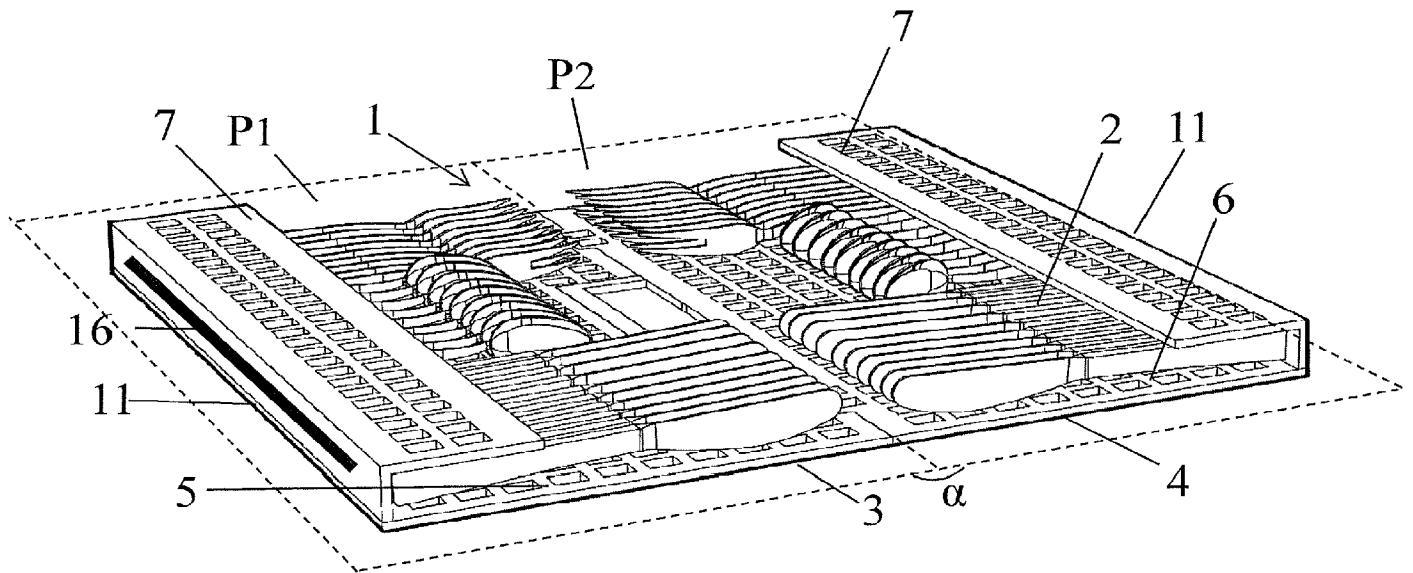


Figure 1

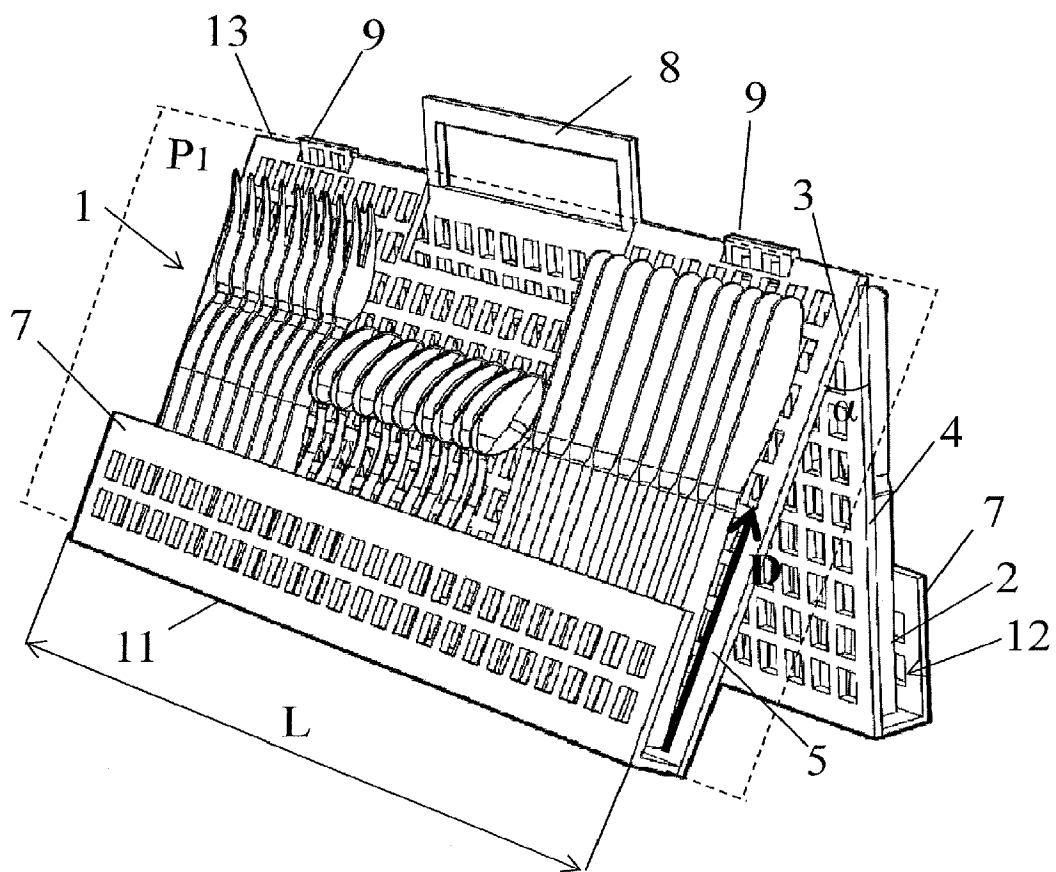


Figure 2

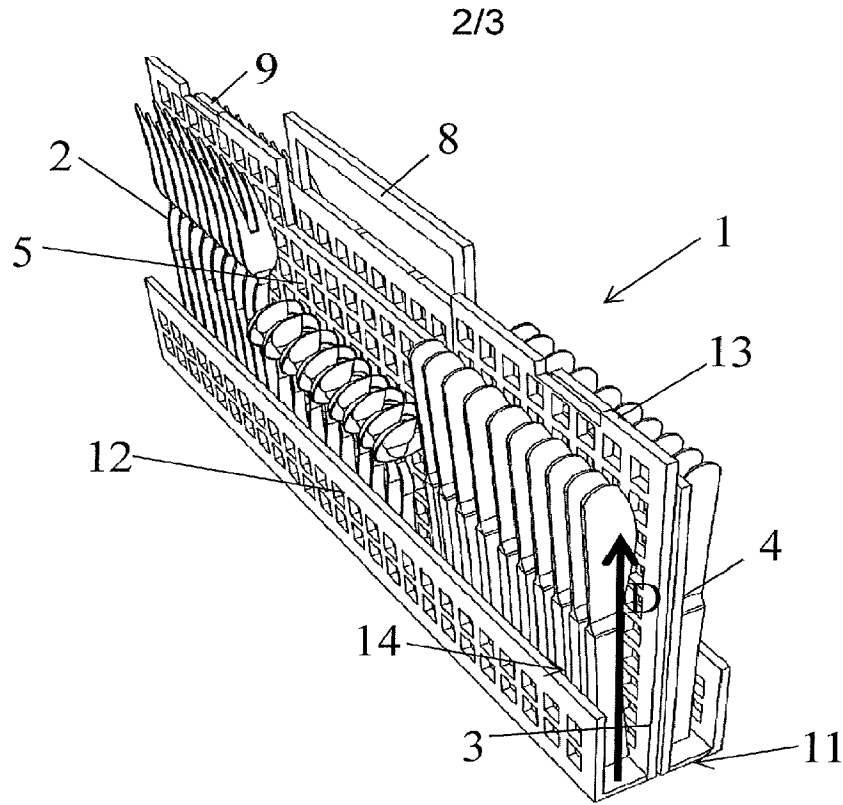


Figure 3

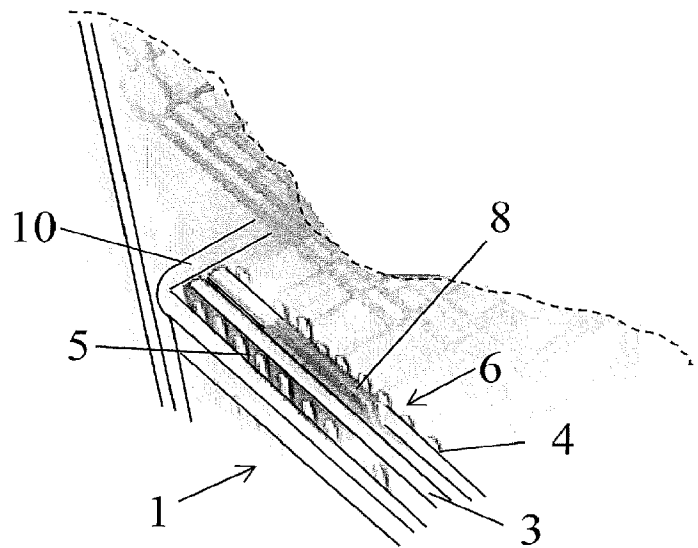


Figure 4

3/3

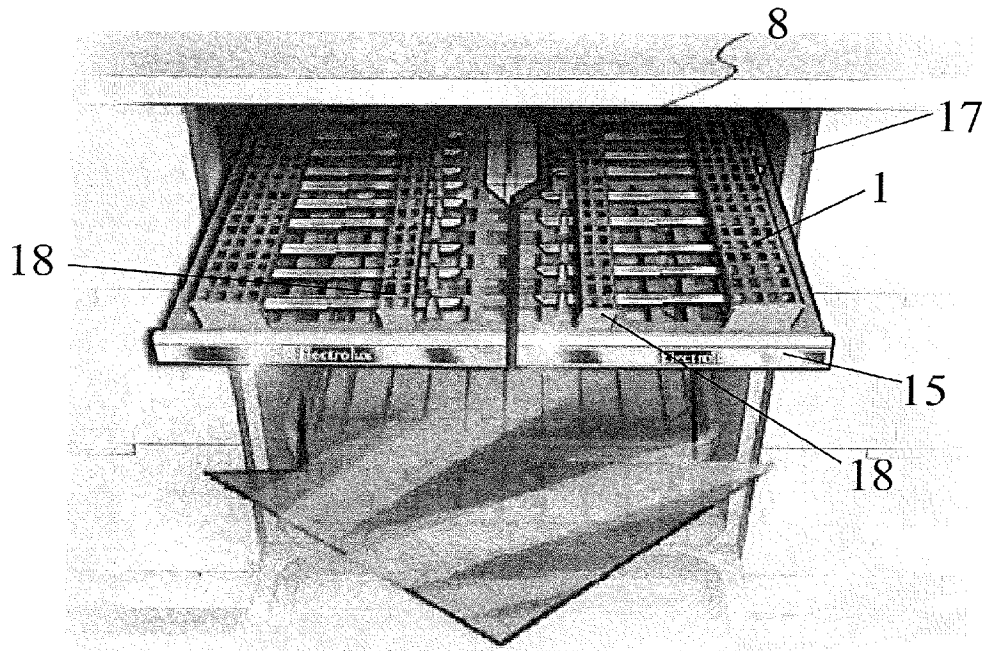


Figure 5

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2012/076767

A. CLASSIFICATION OF SUBJECT MATTER

INV. A47L15/50

ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 643 809 A1 (ESSWEIN SA [FR]) 7 September 1990 (1990-09-07) page 1, line 29 - page 2, line 3 page 2, line 30 - page 3, line 34 page 4, line 28 - page 6, line 11 figures 1-5	1-15
A	----- DE 296 00 642 U1 (AEG HAUSGERAETE GMBH [DE]) 15 May 1997 (1997-05-15) page 5, line 1 - page 6, line 5 figures 1-5	1-15
A	----- DE 197 26 553 A1 (SCHWANDEN KUNSTSTOFF [CH]) 2 January 1998 (1998-01-02) cited in the application column 1, line 47 - page 2, line 39 figures 1-5 ----- -/-	1-15



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

5 September 2013

Date of mailing of the international search report

13/09/2013

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
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Authorized officer

Weinberg, Ekkehard

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2012/076767

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2006/010711 A2 (BSH BOSCH SIEMENS HAUSGERAETE [DE]; BUEHLMAYER ALEXANDER [DE]; EGGER G) 2 February 2006 (2006-02-02) page 2, line 14 - page 2, line 37 page 9, line 12 - page 11, line 36 figures 1-3 -----	1-15
A	FR 2 821 735 A1 (ESSWEIN SA [FR]) 13 September 2002 (2002-09-13) page 4, line 6 - page 6, line 17 claims 1-12; figures 1-6 -----	1-15

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2012/076767

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2643809	A1	07-09-1990	NONE	
DE 29600642	U1	15-05-1997	DE 19624888 A1 DE 29600642 U1	17-07-1997 15-05-1997
DE 19726553	A1	02-01-1998	NONE	
WO 2006010711	A2	02-02-2006	EP 1773175 A2 EP 2090214 A1 KR 20070039522 A US 2008302397 A1 WO 2006010711 A2	18-04-2007 19-08-2009 12-04-2007 11-12-2008 02-02-2006
FR 2821735	A1	13-09-2002	NONE	

**CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION
UNDER 37 CFR 1.102(e) (Page 1 of 1)**

First Named Inventor:	Mark S. Feddema	Nonprovisional Application Number (if known):	
Title of Invention:	DISHWASHER WITH A DISH RACK		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently \$0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.
2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.
3. The applicable box is checked below:

I. ☒ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)

i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via USPTO patent electronic filing system.

---OR---

(b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.

ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, or the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.

II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)

- i. A request for continued examination has been filed with, or prior to, this form.
- ii. If the application is a utility application, this certification and request is being filed via USPTO patent electronic filing system.
- iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
- iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
- v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature <u>/brianrcheslek/</u>	Date <u>2025-08-12</u>
Name (Print/Typed) <u>Brian R. Cheslek</u>	Practitioner Registration Number <u>58,329</u>

Note: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.*

☒ *Total of one forms are submitted.

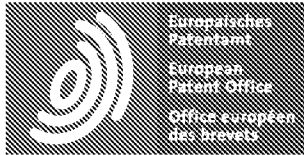
Privacy Act Statement

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- 6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;
- 7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;
- 8) another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c));
- 9) the Office of Personnel Management (OPM) for personnel research purposes; and
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**Espacenet**

CN105559725A Knife and fork basket

Applicants: FOSHAN SHUNDE MIDEA WASHING APPLIANCES MFG CO LTD,MIDEA GROUP CO LTD

Inventors: CAO HONGKUI

Classifications:

IPC **A47L15/50;**CPC **A47L15/502 (CN); A47L15/503 (CN);**

Priorities: CN201610109560A 2016-02-26

Application: CN105559725A 2016-02-26

Publication: CN105559725A 2016-05-11

Published as: CN105559725A

Knife and fork basket

Abstract

The invention discloses a knife and fork basket. The knife and fork basket comprises a rear knife and fork basket body and a front knife and fork basket body, wherein the rear knife and fork basket body extends in the vertical direction, and a first buckle position is arranged on the rear knife and fork basket body; a second buckle position corresponding to the first buckle position is arranged on the front knife and fork basket body, the front knife and fork basket body is connected with the rear knife and fork basket body in a turnover mode in the vertical direction, and the front knife and fork basket body and the rear knife and fork basket body can be switched in a folded state and an unfolded state; in the folded state, the front knife and fork basket body can slide between a first position and a second position relative to the rear knife and fork basket body; when the front knife and fork basket body is located at the first position, the first buckle position and the second buckle position are buckled; when the front knife and fork basket body is located at the second position, the first buckle position and the second buckle position are separated. According to the knife and fork basket, a user can utilize different functions of the knife and fork basket in the folded state and the unfolded state, and therefore the demand of the user can be better met.



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(51) Int. Cl.

A47L 15/50(2006. 01)

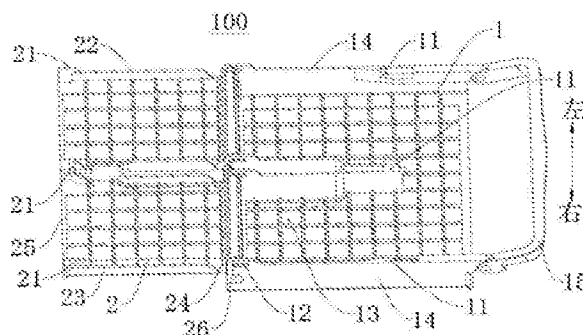
权利要求书1页 说明书5页 附图2页

(54) 发明名称

刀叉篮

(57) 摘要

本发明公开了一种刀叉篮,刀叉篮包括:刀叉后篮和刀叉前篮,刀叉后篮沿上下方向延伸,且刀叉后篮上设有第一扣位;刀叉前篮上设有与第一扣位对应的第二扣位,刀叉前篮沿上下可翻转地与刀叉后篮相连,刀叉前篮与刀叉后篮可在合拢状态和展开状态之间转换,在合拢状态刀叉前篮相对于刀叉后篮在第一位置和第二位置之间可滑动,刀叉前篮位于第一位置时第一扣位与第二扣位扣合,且刀叉前篮位于第二位置时第一扣位与第二扣位分离。根据本发明的刀叉篮,用户可以利用刀叉篮处于合拢状态和展开状态时的不同功能,从而可以更好地满足用户的需求。



1. 一种刀叉篮, 其特征在于, 包括:

刀叉后篮, 所述刀叉后篮沿上下方向延伸, 且所述刀叉后篮上设有第一扣位;

刀叉前篮, 所述刀叉前篮上设有与所述第一扣位对应的第二扣位, 所述刀叉前篮沿上下可翻转地与所述刀叉后篮相连,

所述刀叉前篮与所述刀叉后篮可在合拢状态和展开状态之间转换, 在所述合拢状态所述刀叉前篮相对于所述刀叉后篮在第一位置和第二位置之间可滑动, 所述刀叉前篮位于所述第一位置时所述第一扣位与所述第二扣位扣合, 且所述刀叉前篮位于所述第二位置时所述第一扣位与所述第二扣位分离。

2. 根据权利要求1所述的刀叉篮, 其特征在于, 所述第一扣位呈开口朝上的钩状, 所述第二扣位呈开口向下并与所述第一扣位对应的钩状。

3. 根据权利要求1所述的刀叉篮, 其特征在于, 所述第一扣位呈开口朝上的钩状, 所述第二扣位呈开口朝向所述刀叉前篮的U形, 且所述第二扣位的两个开口端中的至少一个与所述刀叉前篮相连。

4. 根据权利要求1-3中任一项所述的刀叉篮, 其特征在于, 所述第一扣位包括多个, 且所述第二扣位包括与所述第一扣位对应的多个, 且所述刀叉前篮位于所述第一位置时每个所述第二扣位均与至少一个所述第一扣位扣合。

5. 根据权利要求4所述的刀叉篮, 其特征在于, 所述第一扣位包括沿左右方向间隔布置的三个, 其中两个所述第一扣位分别位于所述刀叉后篮的左侧沿和右侧沿, 且另一个所述第一扣位位于所述刀叉后篮沿前后方向的中间位置, 所述第二扣位与所述第一扣位一一对应。

6. 根据权利要求1-3中任一项所述的刀叉篮, 其特征在于, 所述刀叉前篮的一端与所述刀叉后篮可转动并可移动地相连, 且所述第二扣位位于所述刀叉前篮的另一端。

7. 根据权利要求1-3中任一项所述的刀叉篮, 其特征在于, 所述刀叉后篮上形成有沿上下方向延伸的滑槽, 所述刀叉前篮上设有与所述滑槽对应的转轴, 所述转轴可转动并可滑动地配合在所述滑槽内。

8. 根据权利要求7所述的刀叉篮, 其特征在于, 所述刀叉后篮包括沿上下方向延伸的板体部, 所述板体部的左侧和右侧均形成侧板, 所述侧板上均形成有所述滑槽, 且所述板体部左侧和右侧的侧板上的滑槽左右相对, 所述刀叉前篮的左右两侧均设有与所述滑槽对应的转轴, 所述转轴可转动并可滑动地配合在对应的所述滑槽内。

9. 根据权利要求7所述的刀叉篮, 其特征在于, 所述刀叉前篮在所述第一位置时所述转轴抵在所述滑槽内的下沿, 所述刀叉前篮位于所述第二位置时所述转轴抵在所述滑槽的上沿。

10. 根据权利要求1-3中任一项所述的刀叉篮, 其特征在于, 所述刀叉后篮上设有提手, 所述提手呈两个开口端均与所述刀叉后篮相连的U形。

刀叉篮

技术领域

[0001] 本发明涉及家用电器技术领域,特别是涉及一种刀叉篮。

背景技术

[0002] 相关技术中,洗碗机内部设有刀叉篮或刀叉托盘来放置各种取食类餐具,如刀子、叉子和勺子等。刀叉篮本身具有转移餐具的便捷性,一般竖直放置在洗碗机的下碗篮内,然而,当餐盘等餐具较多时,碗篮上就没有多余空间来放置刀叉篮,只好将刀叉篮平躺放置在刀叉托盘上,接受顶喷臂喷淋。然而,直接将传统的刀叉篮放置在刀叉托盘上,刀叉篮上方往往有栅格阻碍,既影响喷淋效果,又占用空间。

发明内容

[0003] 本发明旨在至少在一定程度上解决相关技术中的技术问题之一。为此,本发明在于提出一种刀叉篮,所述刀叉篮可以在合拢状态和展开状态之间转换,方便用户快捷操作。

[0004] 根据本发明实施例的刀叉篮,包括:刀叉后篮和刀叉前篮,所述刀叉后篮沿上下方向延伸,且所述刀叉后篮上设有第一扣位;所述刀叉前篮上设有与所述第一扣位对应的第二扣位,所述刀叉前篮沿上下可翻转地与所述刀叉后篮相连,所述刀叉前篮与所述刀叉后篮可在合拢状态和展开状态之间转换,在所述合拢状态所述刀叉前篮相对于所述刀叉后篮在第一位置和第二位置之间可滑动,所述刀叉前篮位于所述第一位置时所述第一扣位与所述第二扣位扣合,且所述刀叉前篮位于所述第二位置时所述第一扣位与所述第二扣位分离。

[0005] 根据本发明实施例的刀叉篮,刀叉前篮与刀叉后篮可以通过第二扣位与第一扣位的扣合或分离实现刀叉篮在合拢状态和展开状态之间的转换,由此,用户可以利用刀叉篮处于合拢状态和展开状态时的不同功能,从而可以更好地满足用户的需求。

[0006] 另外,根据本发明上述实施例的刀叉篮还可以具有如下附加的技术特征:

[0007] 根据发明的一个实施例,所述第一扣位呈开口朝上的钩状,所述第二扣位呈开口向下并与所述第一扣位对应的钩状。

[0008] 根据发明的一个实施例,所述第一扣位呈开口朝上的钩状,所述第二扣位呈开口朝向所述刀叉前篮的U形,且所述第二扣位的两个开口端中的至少一个与所述刀叉前篮相连。

[0009] 根据发明的一些实施例,所述第一扣位包括多个,且所述第二扣位包括与所述第一扣位对应的多个,且所述刀叉前篮位于所述第一位置时每个所述第二扣位均与至少一个所述第一扣位扣合。

[0010] 进一步地,所述第一扣位包括沿左右方向间隔布置的三个,其中两个所述第一扣位分别位于所述刀叉后篮的左侧沿和右侧沿,且另一个所述第一扣位位于所述刀叉后篮沿前后方向的中间位置,所述第二扣位与所述第一扣位一一对应。

[0011] 根据发明的一些实施例,所述刀叉前篮的一端与所述刀叉后篮可转动并可移动地

相连,且所述第二扣位位于所述刀叉前篮的另一端。

[0012] 根据发明的一些实施例,所述刀叉后篮上形成有沿上下方向延伸的滑槽,所述刀叉前篮上设有与所述滑槽对应的转轴,所述转轴可转动并可滑动地配合在所述滑槽内。

[0013] 进一步地,所述刀叉后篮包括沿上下方向延伸的板体部,所述板体部的左侧和右侧均形成侧板,所述侧板上均形成有所述滑槽,且所述板体部左侧和右侧的侧板上的滑槽左右相对,所述刀叉前篮的左右两侧均设有与所述滑槽对应的转轴,所述转轴可转动并可滑动地配合在对应的所述滑槽内。

[0014] 可选地,所述刀叉前篮在所述第一位置时所述转轴抵在所述滑槽内的下沿,所述刀叉前篮位于所述第二位置时所述转轴抵在所述滑槽的上沿。

[0015] 根据发明的一些实施例,所述刀叉后篮上设有提手,所述提手呈两个开口端均与所述刀叉后篮相连的U形。

附图说明

[0016] 图1是本发明实施例的刀叉篮处于展开状态的示意图。

[0017] 图2是本发明实施例的刀叉篮中刀叉前篮和刀叉后篮向合拢状态转变的中间过程示意图。

[0018] 图3是本发明实施例的刀叉前篮处于第二位置时的示意图。

[0019] 图4是本发明实施例的刀叉前篮处于第一位置(即合拢状态)时的示意图。

[0020] 附图标记:

[0021] 刀叉篮100,刀叉后篮1,刀叉前篮2,第一扣位11,滑槽12,板体部13,侧板14,提手15,第二扣位21,刀叉前篮的左侧沿22,刀叉前篮的右侧沿23,刀叉前篮的一端24,刀叉前篮的另一端25,转轴26。

具体实施方式

[0022] 下面详细描述本发明的实施例,所述实施例的示例在附图中示出,其中自始至终相同或类似的标号表示相同或类似的元件或具有相同或类似功能的元件。下面通过参考附图描述的实施例是示例性的,旨在用于解释本发明,而不能理解为对本发明的限制。

[0023] 下面结合图1至图4详细描述根据本发明实施例的刀叉篮100。

[0024] 参照图1,根据本发明实施例的刀叉篮100,包括:刀叉后篮1和刀叉前篮2。

[0025] 具体而言,参照图1和图2,刀叉后篮1可以沿上下方向(例如,图2中所示的上下方向)延伸,且刀叉后篮1上可以设有第一扣位11。刀叉前篮2上可以设有第二扣位21,其中,第二扣位21可以与第一扣位11对应,刀叉前篮2沿上下可翻转地与刀叉后篮1相连,刀叉前篮2与刀叉后篮1可在合拢状态和展开状态之间转换,在合拢状态刀叉前篮2相对于刀叉后篮1在第一位置和第二位置之间可滑动。图3和图4示出了刀叉篮100处于合拢状态时的情形,其中,参照图4,刀叉前篮2位于第一位置时第一扣位11与第二扣位21扣合,此时,刀叉前篮2与刀叉后篮1无法相对转动展开;参照图3,刀叉前篮2位于第二位置时第一扣位11与第二扣位21分离,此时,刀叉前篮2与刀叉后篮1可以相对转动展开(参照图2→图1)。

[0026] 其中,如图1和图4所示,在展开状态刀叉前篮2和刀叉后篮1放平可以用于搁置餐具;如图3和图4所示,在合拢状态刀叉前篮2和刀叉后篮1合拢可以形成上端(例如,图2中刀

叉篮100的上端)敞开且下端(例如,图2中刀叉篮100的下端)封闭的容纳腔。刀叉前篮2与刀叉后篮1处于展开状态时,刀叉篮100可以与刀叉托盘结合用于摆放刀叉;刀叉前篮2与刀叉后篮1处于合拢状态时,可以单独用作刀叉篮100使用,便于餐具的转移。

[0027] 根据本发明实施例的刀叉篮100,刀叉前篮2与刀叉后篮1可以通过第二扣位21与第一扣位11的扣合或分离实现刀叉篮100在合拢状态和展开状态之间的转换,由此,用户可以利用刀叉篮100处于合拢状态和展开状态时的不同功能,从而可以更好地满足用户的需求。

[0028] 参照图2并结合图1,第一扣位11可以呈开口朝上的钩状,第二扣位21可以呈开口向下并与第一扣位11对应的钩状。由此,可以通过第一扣位11和第二扣位21的扣合将刀叉前篮2与刀叉后篮1合拢,从而可以充分利用刀叉前篮2与刀叉后篮1处于合拢状态时的功能。

[0029] 当然,也可以是第一扣位11可以呈开口朝下的钩状,第二扣位21可以呈开口向上并与第一扣位11对应的钩状。本发明对第一扣位11和第二扣位21的开口方向不作具体限定,实际应用中可以根据需要适应性设置。

[0030] 如图1和图2所示,第一扣位11可以呈开口朝上的钩状,第二扣位21可以呈开口朝向刀叉前篮2的U形,且第二扣位21的两个开口端中的至少一个可以与刀叉前篮2相连。由此,可以使得刀叉前篮2与刀叉后篮1的连接更加可靠,从而可以方便用户操作,实现餐具的快速转移。

[0031] 参照图1至图4,第一扣位11可以包括多个,且第二扣位21可以包括与第一扣位11对应的多个,且刀叉前篮2位于第一位置时每个第二扣位21均可以与至少一个第一扣位11扣合。由此,可以有效改善刀叉前篮2与刀叉后篮1连接的稳定性。

[0032] 进一步地,参照图4并结合图1,第一扣位11可以包括沿左右方向(例如,图1中所示的左右方向)间隔布置的三个,其中两个第一扣位11可以分别位于刀叉后篮1的左侧沿22和右侧沿23,且另一个第一扣位11可以位于刀叉后篮1沿前后方向的中间位置,第二扣位21与第一扣位11一一对应。由此,可以平衡受力,使得刀叉前篮2与刀叉后篮1能够更加牢固的连接。

[0033] 另外,当第一扣位11和第二扣位21为多个时,多个第一扣位11的结构可以相同或不相同,而多个第二扣位21与多个第一扣位21对应,多个第二扣位21也可以具有相同或不同的形状。

[0034] 如图1所示,刀叉前篮2的一端24与刀叉后篮1可转动并可移动地相连,且第二扣位21可以位于刀叉前篮2的另一端25。刀叉篮100可以滑动旋转地展开或合拢。

[0035] 其中,刀叉前篮2的一端24与刀叉后篮1可转动指的是,刀叉前篮2与刀叉后篮1能够转动地合拢或展开;刀叉前篮2的一端24与刀叉后篮1可移动指的是,刀叉前篮2与刀叉后篮1在合拢或展开时可以进行一定距离的移动。

[0036] 参照图1至图4,刀叉后篮1上可以形成有沿上下方向(例如,图2中所示的上下方向)延伸的滑槽12,刀叉前篮2上可以设有与滑槽12对应的转轴26,转轴26可转动并可滑动地配合在滑槽12内。由此,可以使得刀叉前篮2与刀叉后篮1能够在第一位置和第二位置之间进行转换,从而便于用户利用刀叉篮100处于合拢状态和展开状态时的不同功能。

[0037] 进一步地,如图1和图2所示,刀叉后篮1可以包括沿上下方向(例如,图2中所示的

上下方向)延伸的板体部13,板体部13的左侧和右侧(例如,图1中板体部13的左侧和右侧)均可以形成侧板14,侧板14上均可以形成有滑槽12,且板体部左侧和右侧的侧板14上的滑槽12可以左右相对,刀叉前篮2的左右两侧均可以设有与滑槽12对应的转轴26,转轴26可转动并可滑动地配合在对应的滑槽12内。由此,可以使得刀叉篮100的受力更加均衡,从而可以保证刀叉前篮2与刀叉后篮1的正常开合。

[0038] 参照图2至图4,刀叉前篮2在第一位置时转轴26可以抵在滑槽12内的下沿(例如,图2中滑槽12内的下沿),刀叉前篮2位于第二位置时转轴26可以抵在滑槽12的上沿(例如,图2中滑槽12内的上沿)。由此,使得滑槽12的上沿和下沿可以给转轴26一定的支撑力,从而可以确保刀叉前篮2与刀叉后篮1可以正常的合拢或展开,进而可以利用刀叉前篮2与刀叉后篮1处于合拢和展开状态时的不同功能,更好地满足用户的需求。

[0039] 另外,滑槽12可以起到限位的作用,方便刀叉篮100的开合以及锁扣。

[0040] 如图1所示,刀叉后篮1上可以设有提手15,提手15可以呈两个开口端均与刀叉后篮1相连的U形。由此,便于用户操作,易于餐具的转移。

[0041] 当然,在本发明的其他实施例中,也可以在刀叉前篮2上设有提手15;还可以是在刀叉后篮1和刀叉前篮2上均设有提手15,本发明对提手15的具体设置位置不作限定,实际应用中可以根据需要适应性设置。

[0042] 另外,参照图1和图2,刀叉篮100上可以设有凹槽,在合拢状态凹槽可以从刀叉篮100的下表面向上延伸并沿前后方向贯通刀叉篮100。

[0043] 其中,凹槽可以设在刀叉篮100沿前后方向(例如,图1中所示的前后方向)的中部。凹槽可以包括沿前后对齐的第一槽部和第二槽部,第一槽部可以设在刀叉前篮2上,且在合拢状态第一槽部可以从刀叉前篮2的下表面向上延伸并沿前后贯通刀叉前篮2,第二槽部可以设在刀叉后篮1上,且在合拢状态第二槽部可以从刀叉后篮1的下表面向上延伸并沿前后贯通刀叉后篮1。

[0044] 刀叉篮100可以放置在刀叉托盘上用于餐具的洗涤和转移,刀叉托盘上可以设有多个摆放齿,多个摆放齿可以用于定位餐具。由此,便于用户操作,易于餐具的清洗和转移。

[0045] 下面结合图1至图4详细描述根据本发明实施例的刀叉篮100的工作过程。

[0046] 展开刀叉篮100:图4示出了刀叉篮100处于合拢状态时的情形,此时,第一扣位11与第二扣位21扣合,当需要展开刀叉篮100时,向上(参照图2)拖拽刀叉前篮2,刀叉前篮2的转轴26沿着刀叉后篮底部的滑槽12向上滑动一段距离,使转轴26沿着滑槽12从A位置滑动到B位置(参照图3),此时第二扣位21与第一扣位11脱离,然后将刀叉前篮2相对于刀叉后篮1绕图3中的逆时针旋转预定角度(例如180°、120°等),此时,刀叉篮100经过图2的状态转换至图1示出的展开状态。

[0047] 合拢刀叉篮100:合拢刀叉篮100的过程是前述展开刀叉篮100的逆过程,具体而言,图1示出了刀叉篮100处于展开状态的情形,此时,刀叉前篮2与刀叉后篮1相互展开呈托盘状,当需要合拢刀叉篮100时,将刀叉前篮2相对于刀叉后篮1绕图1中的顺时针方向旋转预定角度,并使刀叉前篮2相对于刀叉后篮1滑动,使得刀叉前篮2与刀叉后篮1合拢后刀叉前篮2处于第二位置(如图3),此时第一扣位11与第二扣位21分离,向下滑动刀叉前篮2,刀叉前篮2的转轴26沿着刀叉后篮底部的滑槽12向下滑动一段距离,使转轴26沿着滑槽12从B位置滑动到A位置(参照图3、图4),此时第二扣位21与第一扣位11扣合,此时,刀叉篮100转

换至图4示出的合拢状态。

[0048] 刀叉篮100呈合拢状态时,刀叉篮100可以从刀叉托盘中提出来使用。至此完成根据本发明实施例的刀叉篮100的工作过程。

[0049] 在本发明的描述中,需要理解的是,术语“中心”、“纵向”、“横向”、“长度”、“宽度”、“厚度”、“上”、“下”、“前”、“后”、“左”、“右”、“竖直”、“水平”、“顶”、“底”、“内”、“外”、“顺时针”、“逆时针”、“轴向”、“径向”、“周向”等指示的方位或位置关系为基于附图所示的方位或位置关系,仅是为了便于描述本发明和简化描述,而不是指示或暗示所指的装置或元件必须具有特定的方位、以特定的方位构造和操作,因此不能理解为对本发明的限制。

[0050] 此外,术语“第一”、“第二”仅用于描述目的,而不能理解为指示或暗示相对重要性或者隐含指明所指示的技术特征的数量。由此,限定有“第一”、“第二”的特征可以明示或者隐含地包括至少一个该特征。在本发明的描述中,“多个”的含义是至少两个,例如两个,三个等,除非另有明确具体的限定。

[0051] 在本发明中,除非另有明确的规定和限定,术语“安装”、“相连”、“连接”、“固定”等术语应做广义理解,例如,可以是固定连接,也可以是可拆卸连接,或成一体;可以是机械连接,也可以是电连接;可以是直接相连,也可以通过中间媒介间接相连,可以是两个元件内部的连通或两个元件的相互作用关系,除非另有明确的限定。对于本领域的普通技术人员而言,可以根据具体情况理解上述术语在本发明中的具体含义。

[0052] 在本发明中,除非另有明确的规定和限定,第一特征在第二特征“上”或“下”可以是第一和第二特征直接接触,或第一和第二特征通过中间媒介间接接触。而且,第一特征在第二特征“之上”、“上方”和“上面”可是第一特征在第二特征正上方或斜上方,或仅仅表示第一特征水平高度高于第二特征。第一特征在第二特征“之下”、“下方”和“下面”可以是第一特征在第二特征正下方或斜下方,或仅仅表示第一特征水平高度小于第二特征。

[0053] 在本说明书的描述中,参考术语“一个实施例”、“一些实施例”、“示例”、“具体示例”、或“一些示例”等的描述意指结合该实施例或示例描述的具体特征、结构、材料或者特点包含于本发明的至少一个实施例或示例中。在本说明书中,对上述术语的示意性表述不必针对的是相同的实施例或示例。而且,描述的具体特征、结构、材料或者特点可以在任一个或多个实施例或示例中以合适的方式结合。此外,在不相互矛盾的情况下,本领域的技术人员可以将本说明书中描述的不同实施例或示例以及不同实施例或示例的特征进行结合和组合。

[0054] 尽管上面已经示出和描述了本发明的实施例,可以理解的是,上述实施例是示例性的,不能理解为对本发明的限制,本领域的普通技术人员在本发明的范围内可以对上述实施例进行变化、修改、替换和变型。

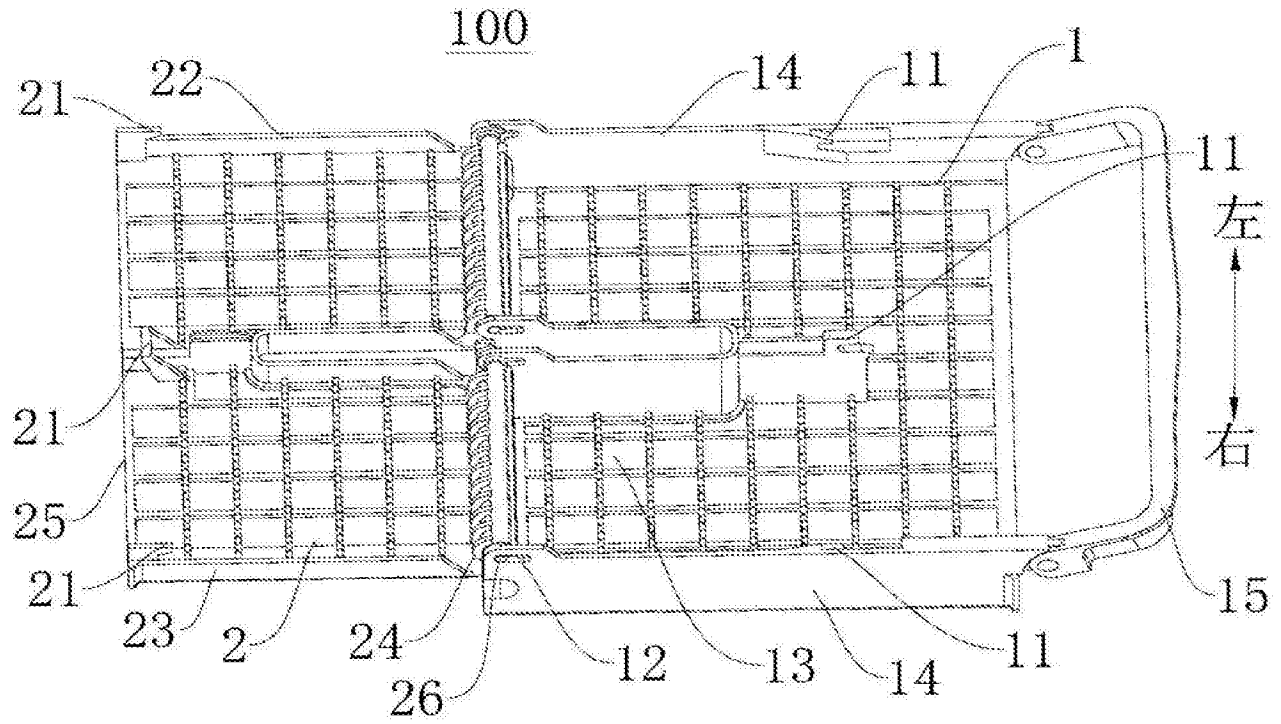


图1

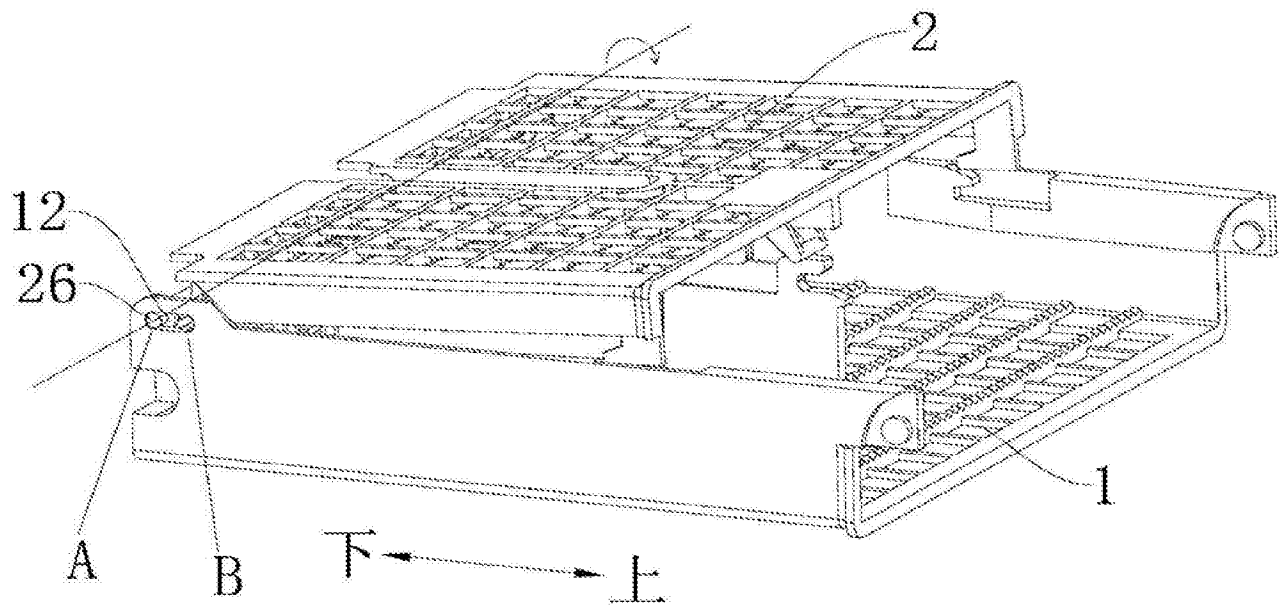


图2

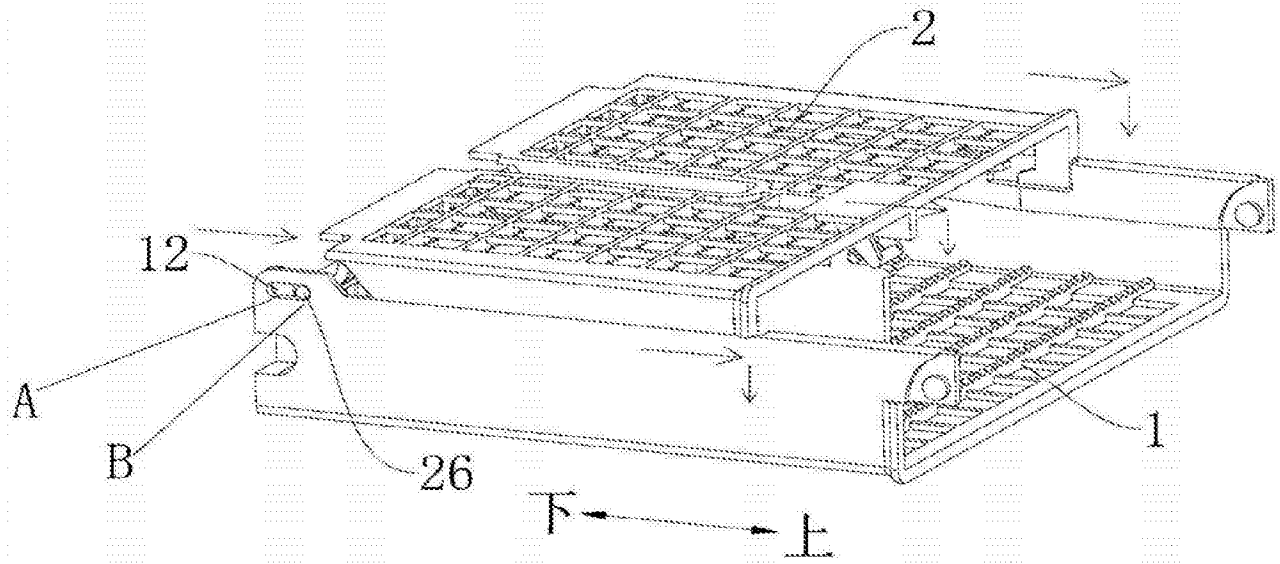


图3

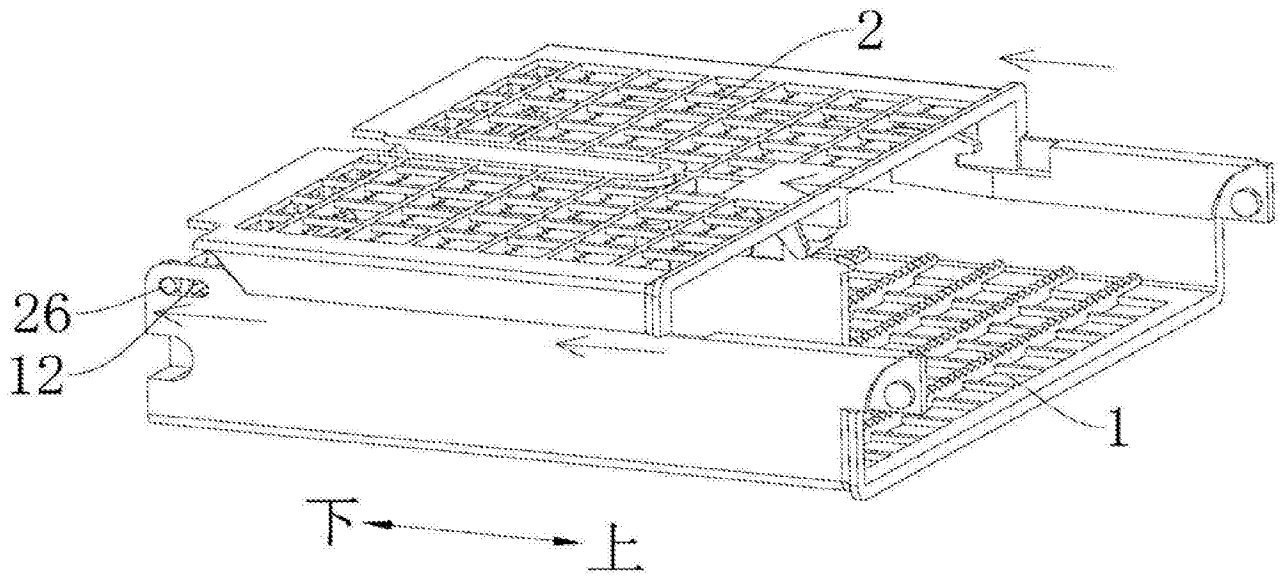


图4



UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
19/297,954

RECEIPT DATE / TIME
08/12/2025 06:24:23 PM Z ET

ATTORNEY DOCKET #
SUB-13230-US-CON3

Title of Invention

DISHWASHER WITH A DISH RACK

Application Information

APPLICATION TYPE Utility - Nonprovisional Application
under 35 USC 111(a)

PATENT # -

CONFIRMATION # 2948

FILED BY Megan Boot

PATENT CENTER # 71822414

FILING DATE -

CUSTOMER # 130333

FIRST NAMED INVENTOR Mark S. Feddema

CORRESPONDENCE ADDRESS -

AUTHORIZED BY BRIAN CHESLEK

Documents

TOTAL DOCUMENTS: 29

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
2025-08-12 SUB-13230-US-CON3 WHI025 P328A ADS.pdf	9	Application Data Sheet	2174 KB
2025-08-12 SUB-13230-US-CON3 WHI025 P328A Track 1 Request.pdf	2	Track One Request	178 KB
2025-08-12 SUB-13230-US-CON3 WHI025 P328A POA.pdf	2	Power of Attorney	223 KB
2025-08-12 SUB-13230-US-CON3 WHI025 P328A Formals.pdf	3	Oath or Declaration filed	1000 KB
2025-08-12 SUB-13230-US-CON3 WHI025 P328A	1	Miscellaneous Incoming Letter	41 KB

Petitioner Samsung Ex-1004, 0330

Deposit Account.pdf

2025-08-12 SUB-13230-US- CON3 WHI025 P328A Application-APP.TEXT.docx	23	Application body structured text document	35 KB
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Warning: Text decorations have been removed.

2025-08-12 SUB-13230-US- CON3 WHI025 P328A Drawings with Headers.pdf	9	Drawings-other than black and white line drawings	1552 KB
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2025-08-12 SUB-13230-US- CON3 WHI025 P328A IDS Transmittal.pdf	1	Transmittal Letter	64 KB
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2025-08-12 SUB-13230-US- CON3 WHI025 P328A IDS SB08.pdf	7	Information Disclosure Statement (IDS) Form (SB08)	1274 KB
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2025-08-12 SUB-13230-US- CON3 WHI025 P328A IDS SB08C Size Fee Form.pdf	4	Assertion regarding Information Disclosure Statement (IDS) Size Fee (SB/08C)	261 KB
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FR1_BR112018070373A2.pdf	23	Foreign Reference	1258 KB
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FR2_CN101612027A.pdf	22	Foreign Reference	1775 KB
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FR3_CN101966069A.pdf	10	Foreign Reference	992 KB
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FR4_CN102215985A.pdf	16	Foreign Reference	2012 KB
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FR5_CN109475265A.pdf	15	Foreign Reference	1221 KB
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FR6_CN105496336A.pdf	25	Foreign Reference	1870 KB
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FR7_CN105559725A.pdf	10	Foreign Reference	766 KB
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FR8_CN205697665U.pdf	19	Foreign Reference	1481 KB
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FR9_CN108135432A.pdf	18	Foreign Reference	2207 KB
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FR10_CN109259690A.pdf	14	Foreign Reference	1110 KB
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FR11_DE102013213612A1.pdf	20	Foreign Reference	994 KB
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FR12_DE102014208843A1.pdf	26	Foreign Reference	823 KB
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FR13_DE102017200272A1.pdf	13	Foreign Reference	829 KB
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FR14_EP0963733A1.pdf	9	Foreign Reference	351 KB
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FR15_EP3439527A1.pdf	23	Foreign Reference	1171 KB
FR16_FR2643809A1.pdf	12	Foreign Reference	409 KB
FR17_WO2014094897A1.pdf	19	Foreign Reference	1044 KB
FR18_WO2017176286A1.pdf	22	Foreign Reference	1157 KB
2025-08-12 SUB-13230-US-CON3 WHI025 P328A Application.pdf	23	Auxiliary PDF of Application	129 KB

Digest

DOCUMENT

MESSAGE DIGEST(SHA-512)

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



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FOLD AWAY CUTLERY RACK

Inventor(s): MICHAL JUSTIN D ± (贾斯廷·D·米夏尔)

Applicant(s): ELECTROLUX HOME PROD INC ± (伊莱克斯家用产品公司)

Classification: - international: A47B77/14; A47L15/24; A47L15/26; A47L15/33; A47L15/48; A47L15/50
- cooperative: A47L15/502 (EP); A47L15/503 (EP); A47L15/505 (EP)

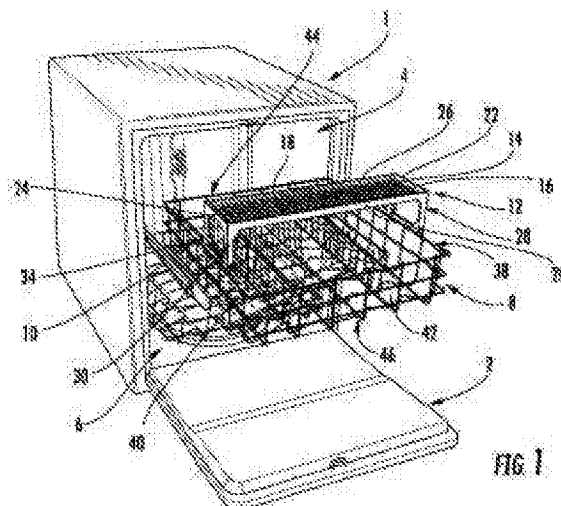
Application number: CN20168085516 20160408 Global Dossier

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Abstract of CN109475265 (A)

Provided herein are cutlery racks, dishwashers, and associated methods for manufacturing and cleaning with the same. The dishwasher may include a cutlery rack having a first engaging portion, a second engaging portion, and a shelf. The first and second engaging portions may be respectively slidably attached to a first wall and a second wall of a dishwasher rack. The shelf may extend between the first engaging portion and the second engaging portion, may slide in a longitudinal direction with respect to the first wall and the second wall, and may pivot with respect to the dishwasher rack between a working position and a stowed position. In the working position, a receiving surface of the shelf may align with the longitudinal direction, and in the stowed position, the receiving surface shelf may be pivoted out of alignment with the longitudinal direction and positioned adjacent ends of the first and second walls.





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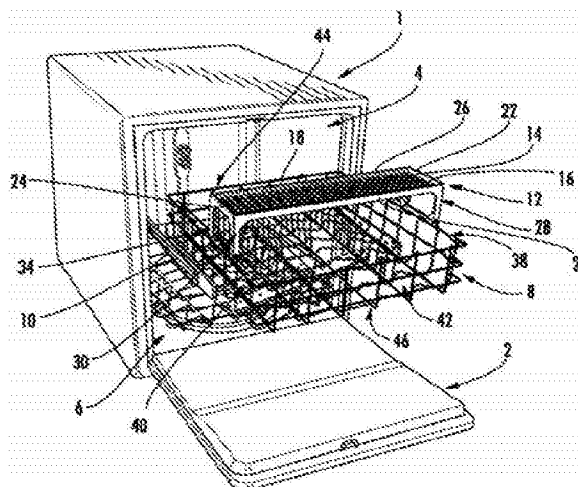
权利要求书3页 说明书8页 附图2页

(54)发明名称

折叠式餐具搁架

(57)摘要

本文中提供了餐具搁架、洗碗机以及相关联的用于制造洗碗机的方法和利用该洗碗机进行清洗的方法。洗碗机可以包括具有第一接合部分、第二接合部分和搁板的餐具搁架。第一接合部分和第二接合部分可以分别可滑动地附接至洗碗机搁架的第一壁和第二壁。搁板可以在第一接合部分与第二接合部分之间延伸,可以相对于第一壁和第二壁沿纵向方向滑动,并且可以相对于洗碗机搁架在工作位置与收起位置之间枢转。在工作位置,搁板的接纳表面可以与纵向方向对齐,并且在收起位置,搁板的接纳表面可以枢转成不与纵向方向对齐并且定位成与第一壁和第二壁的端部相邻。



1. 一种洗碗机,包括:

洗碗机搁架,所述洗碗机搁架设置在所述洗碗机中,所述洗碗机搁架包括至少第一壁和第二壁,其中,所述第一壁平行于所述第二壁,并且其中,所述第一壁和所述第二壁中的每一者限定至少一个端部;

餐具搁架,所述餐具搁架包括:

第一接合部分,其中,所述餐具搁架的所述第一接合部分可滑动地附接至所述洗碗机搁架的所述第一壁;

第二接合部分,其中,所述餐具搁架的所述第二接合部分可滑动地附接至所述洗碗机搁架的所述第二壁;以及

搁板,所述搁板在所述第一接合部分与所述第二接合部分之间延伸,所述搁板限定用于接纳餐具的接纳表面,其中,所述搁板构造成相对于所述第一壁和所述第二壁沿纵向方向滑动,并且其中,所述搁板构造成相对于所述洗碗机搁架在工作位置与收起位置之间枢转;

其中,在所述工作位置,所述搁板的所述接纳表面与所述纵向方向对齐,其中,在所述收起位置,所述搁板的所述接纳表面枢转成不与所述纵向方向对齐并且定位成与所述第一壁的端部和所述第二壁的端部相邻。

2. 根据权利要求1所述的洗碗机,其中,所述第一接合部分和所述第二接合部分设置在所述餐具搁架的第一侧部上,其中,所述第一接合部分限定与所述洗碗机搁架的所述第一壁上的第一轨道接合的第一枢转附接构件,其中,所述第二接合部分限定与所述洗碗机搁架的所述第二壁上的第二轨道接合的第二枢转附接构件,并且其中,所述餐具搁架还包括:

第二侧部,所述第二侧部包括第三接合部分和第四接合部分,所述第三接合部分构造成在所述工作位置可移除且可滑动地设置在所述第一轨道上,所述第四接合部分构造成在所述工作位置可移除且可滑动地设置在所述第二轨道上;

其中,所述餐具搁架构造成在所述第一接合部分和所述第三接合部分上沿着所述第一轨道滑动,并且所述餐具搁架构造成在所述第三接合部分与所述第四接合部分上沿着所述第二轨道滑动;并且

其中,所述餐具搁架构造成通过提升所述餐具搁架的所述第二侧部并使所述餐具搁架绕着所述第一接合部分的第一枢转附接构件和所述第二接合部分的第二枢转附接构件旋转而枢转至所述收起位置。

3. 根据权利要求1或2所述的洗碗机,其中,在所述工作位置,所述搁板的所述接纳表面构造成大致平行于所述纵向方向设置。

4. 根据前述权利要求中的任一项所述的洗碗机,其中,在所述收起位置,所述搁板的所述接纳表面构造成大致垂直于所述纵向方向设置。

5. 根据权利要求1、3或4中的任一项所述的洗碗机,其中,所述第一壁还包括设置在所述第一壁的上边缘上的第一轨道,所述第一轨道至少部分地限定第一接纳狭槽,其中,所述第一接纳狭槽平行于所述纵向方向延伸,并且其中,所述第一接合部分构造成接合所述第一接纳狭槽。

6. 根据权利要求5所述的洗碗机,其中,所述第一接合部分包括大致垂直于所述搁板地附接的第一腿部,所述第一腿部限定一段长度,其中,所述第一接纳狭槽在与所述洗碗机搁

架的所述第一壁的所述端部相距一段距离处终止,并且其中,所述距离与所述第一腿部的长度相等。

7. 根据权利要求5或权利要求6所述的洗碗机,其中,所述第二壁还包括设置在所述第二壁的上边缘上的第二轨道,所述第二轨道至少部分地限定第二接纳狭槽,其中,所述第二接纳狭槽平行于所述纵向方向延伸,并且其中,所述第二接合部分构造成接合所述第二接纳狭槽。

8. 根据权利要求7所述的洗碗机,其中,所述第二接合部分包括大致垂直于所述搁板地附接的第二腿部,所述第二腿部限定所述长度,其中,所述第二接纳狭槽在与所述洗碗机搁架的所述第二壁的所述端部相距所述距离处终止。

9. 根据权利要求1或3至8中的任一项所述的洗碗机,其中,所述餐具搁架还包括附接至所述搁板的第三接合部分和附接至所述搁板的第四接合部分,其中,所述第三接合部分构造成在所述工作位置接合所述第一壁,并且其中,所述第四接合部分构造成在所述工作位置接合所述第二壁。

10. 根据权利要求1或3至8中的任一项所述的洗碗机,其中,所述第一接合部分限定第一狭槽,所述第一狭槽构造成将所述第一壁的至少一部分接纳在所述第一狭槽中,并且其中,所述第一接合部分还包括延伸穿过所述第一狭槽的第一附接构件,使得所述第一接合部分至少部分地围绕所述第一壁的所述部分。

11. 根据权利要求10所述的洗碗机,其中,所述第二接合部分限定第二狭槽,所述第二狭槽构造成将所述第二壁的至少一部分接纳在所述第二狭槽中,并且其中,所述第二接合部分还包括延伸穿过所述第二狭槽的第二附接构件,使得所述第二接合部分至少部分地围绕所述第二壁的所述部分。

12. 根据权利要求11所述的洗碗机,其中,所述搁板构造成绕横跨所述第一附接构件和所述第二附接构件的轴线枢转。

13. 根据前述权利要求中的任一项所述的洗碗机,其中,在所述收起位置,所述搁板的一部分构造成搁置在所述洗碗机搁架的第三壁的上边缘上,并且其中,所述第三壁在所述第一壁的所述端部与所述第二壁的所述端部之间延伸。

14. 根据前述权利要求中的任一项所述的洗碗机,其中,所述搁板、所述第一接合部分和所述第二接合部分彼此固定地连接,并且其中,所述搁板构造成绕在所述第一接合部分与所述第二接合部分之间延伸的轴线枢转。

15. 一种餐具搁架,包括:

第一侧部,所述第一侧部包括:

第一接合部分,所述第一接合部分构造成可枢转且可滑动地附接至洗碗机搁架的第一壁的第一轨道,其中,所述第一接合部分限定构造成接合所述第一轨道的第一枢转附接构件;

第二接合部分,所述第二接合部分构造成可枢转且可滑动地附接至洗碗机搁架的第二壁的第二轨道,其中,所述第二接合部分限定构造成接合所述第二轨道的第二枢转附接构件;

第二侧部,所述第二侧部包括:

第三接合部分,所述第三接合部分构造成可移除且可滑动地设置在所述第一轨道上;

第四接合部分,所述第四接合部分构造成可移除且可滑动地设置在所述第二轨道上;

其中,所述餐具搁架构造成在所述第一接合部分和所述第三接合部分上沿着所述第一轨道滑动,并且所述餐具搁架构造成在所述第二接合部分和所述第四接合部分上沿着所述第二轨道滑动;并且

其中,所述餐具搁架构造成通过提升所述餐具搁架的所述第二侧部并使所述餐具搁架绕着所述第一接合部分的所述第一枢转附接构件和所述第二接合部分的所述第二枢转附接构件旋转而枢转至收起位置。

16. 根据权利要求15所述的餐具搁架,还包括在所述第一侧部与所述第二侧部之间延伸的搁板,所述搁板限定用于接纳餐具的接纳表面。

17. 根据权利要求16所述的餐具搁架,其中,所述第一接合部分包括大致垂直于所述搁板地附接的第一腿部,所述第一腿部限定一段长度,其中,所述长度构造成和由所述第一轨道限定的第一接纳狭槽的终点与所述第一壁的端部之间的距离相等。

18. 根据权利要求17所述的洗碗机,其中,所述第二接合部分包括大致垂直于所述搁板地附接的第二腿部,所述第二腿部限定所述长度。

19. 根据权利要求15至18中的任一项所述的洗碗机,其中,所述第一接合部分限定构造成接纳所述第一轨道的第一狭槽,其中,所述第一附接构件延伸穿过所述第一狭槽,使得所述第一接合部分构造成至少部分地围绕所述第一轨道,

其中,所述第二接合部分限定构造成接纳所述第二轨道的第二狭槽,并且其中,所述第二附接构件延伸穿过所述第二狭槽,使得所述第二接合部分构造成至少部分地围绕所述第二轨道。

20. 一种制造具有餐具搁架的洗碗机的方法,所述洗碗机包括:洗碗机搁架,所述洗碗机搁架设置在所述洗碗机中,所述洗碗机搁架包括至少第一壁和第二壁,其中,所述第一壁平行于所述第二壁,并且其中,所述第一壁和所述第二壁中的每一者限定至少一个端部;餐具搁架,所述餐具搁架包括第一接合部分、第二接合部分以及在所述第一接合部分与所述第二接合部分之间延伸的搁板,所述搁板限定用于接纳餐具的接纳表面;所述方法包括:

将所述餐具搁架的所述第一接合部分附接至所述洗碗机搁架的所述第一壁,其中,在附接之后,所述第一接合部分构造成相对于所述洗碗机搁架的所述第一壁滑动;

将所述餐具搁架的所述第二接合部分附接至所述洗碗机搁架的所述第二壁,其中,在附接之后,所述第二接合部分构造成相对于所述洗碗机搁架的所述第二壁滑动;

其中,所述搁板构造成相对于所述第一壁和所述第二壁沿纵向方向滑动,并且其中,所述搁板构造成相对于所述洗碗机搁架在工作位置与收起位置之间枢转,

其中,在所述工作位置,所述搁板的所述接纳表面与所述纵向方向对齐,其中,在所述收起位置,所述搁板的所述接纳表面枢转成不与所述纵向方向对齐并且定位成与所述第一壁的端部和所述第二壁的端部相邻。

折叠式餐具搁架

技术领域

[0001] 本发明的实施方式总体上涉及洗碗机,并且更特别地涉及用于洗碗机的餐具搁架以及包括至少一个餐具搁架的洗碗机。

背景技术

[0002] 洗碗机通常设置有用用于堆叠餐具件的餐具篮或餐具盘。按惯例,餐具篮可以以可拆卸的方式布置在洗碗机的下搁架内,并且布置成用于基本上竖向地接纳餐具。然而,这些篮子占用下搁架的底部中的空间或者必须被移除并存放在洗碗机的外部。餐具盘可以布置成用于基本上水平地接纳餐具,并且适于以可抽出的方式布置在洗碗机中,例如附接至洗碗机的位于上搁架的上方的上部中的壁或槽的顶部。这些餐具盘即使在不使用时也占用槽中的大量竖向的空间。

[0003] 申请人已经发现与常规的洗碗机餐具搁架以及其他相关联的系统和方法相关联的许多缺陷和问题。通过应用的努力、独创性和创新,这些已发现的问题中的许多问题已经通过开发本发明的实施方式中包括的解决方案解决,本发明的许多示例将在本文中进行详细的描述。

发明内容

[0004] 通常,本文中提供的一些实施方式包括洗碗机、餐具搁架和相关联的方法。洗碗机可以包括设置在洗碗机中的洗碗机搁架。洗碗机搁架可以包括至少第一壁和第二壁。第一壁可以平行于第二壁,并且第一壁和第二壁中的每一者可以限定至少一个端部。洗碗机还可以包括餐具搁架,该餐具搁架包括第一接合部分。餐具搁架的第一接合部分可以可滑动地附接至洗碗机搁架的第一壁。餐具搁架可以包括第二接合部分,并且餐具搁架的第二接合部分可以可滑动地附接至洗碗机搁架的第二壁。餐具搁架还可以包括在第一接合部分与第二接合部分之间延伸的搁板。搁板可以限定用于接纳餐具的接纳表面。搁板可以构造成相对于第一壁和第二壁沿纵向方向滑动,并且搁板可以构造成相对于洗碗机搁架在工作位置与收起位置之间枢转。在工作位置,搁板的接纳表面可以与纵向方向对齐。在收起位置,搁板的接纳表面可以枢转成不与纵向方向对齐并且可以定位成与第一壁的端部和第二壁的端部相邻。

[0005] 在一些实施方式中,第一接合部分和第二接合部分可以设置在餐具搁架的第一侧部上。第一接合部分可以限定与位于洗碗机搁架的第一壁上的第一轨道接合的第一枢转附接构件,并且第二接合部分可以限定与位于洗碗机搁架的第二壁上的第二轨道接合的第二枢转附接构件。餐具搁架还可以包括第二侧部,第二侧部包括构造成在工作位置可移除且可滑动地设置在第一轨道上的第三接合部分和构造成在工作位置可移除且可滑动地设置在第二轨道上的第四接合部分。餐具搁架可以构造成在第一接合部分和第三接合部分上沿着第一轨道滑动,并且餐具搁架可以构造成在第二接合部分和第四接合部分上沿着第二轨道滑动。餐具搁架可以构造成通过提升餐具搁架的第二侧部并且使餐具搁架绕着第一接合

部分的第一枢转附接构件和第二接合部分的第二枢转附接构件旋转而枢转至收起位置。

[0006] 在一些实施方式中,在工作位置,搁板的接纳表面可以构造成大致平行于纵向方向设置。在收起位置,搁板的接纳表面可以构造成大致垂直于纵向方向设置。

[0007] 第一壁还可以包括设置在第一壁的上边缘上的第一轨道。第一轨道可以至少部分地限定第一接纳狭槽。第一接纳狭槽可以平行于纵向方向延伸,并且第一接合部分可以构造成接合第一接纳狭槽。在一些实施方式中,第一接合部分可以包括大致垂直于搁板地附接的第一腿部,第一腿部限定一段长度。第一接纳狭槽可以在与洗碗机搁架的第一壁的端部相距一段距离处终止,并且该距离可以与第一腿部的长度相等。

[0008] 在一些实施方式中,第二壁还可以包括设置在第二壁的上边缘上的第二轨道。第二轨道可以至少部分地限定第二接纳狭槽。第二接纳狭槽可以平行于纵向方向延伸,并且第二接合部分可以构造成接合第二接纳狭槽。

[0009] 第二接合部分可以包括大致垂直于搁板地附接的第二腿部,第二腿部限定所述长度。第二接纳狭槽可以在与洗碗机搁架的第二壁的端部相距一段距离处终止。

[0010] 在一些实施方式中,餐具搁架还可以包括附接至搁板的第三接合部分和附接至搁板的第四接合部分。第三接合部分可以构造成在工作位置接合第一壁,并且第四接合部分可以构造成在工作位置接合第二壁。

[0011] 第一接合部分可以限定第一狭槽,该第一狭槽构造成在其中接纳第一壁的至少一部分。第一接合部分还可以包括延伸穿过第一狭槽的第一附接构件,使得第一接合部分可以至少部分地围绕第一壁的部分。

[0012] 第二接合部分可以限定第二狭槽,该第二狭槽构造成在其中接纳第二壁的至少一部分。第二接合部分还可以包括延伸穿过第二狭槽的第二附接构件,使得第二接合部分可以至少部分地围绕第二壁的部分。在一些实施方式中,搁板可以构造成绕横跨第一附接构件和第二附接构件的轴线枢转。

[0013] 在一些实施方式中,在收起位置,搁板的一部分构造成搁置在洗碗机搁架的第三壁的上边缘上,并且第三壁可以在第一壁的端部与第二壁的端部之间延伸。

[0014] 搁板、第一接合部分和第二接合部分可以彼此固定地连接,并且搁板可以构造成绕着在第一接合部分与第二接合部分之间延伸的轴线枢转。

[0015] 在另一实施方式中,可以提供餐具搁架。餐具搁架可以包括第一侧部和第二侧部。第一侧部可以包括第一接合部分,该第一接合部分构造成可枢转且可滑动地附接至洗碗机搁架的第一壁的第一轨道。第一接合部分可以限定构造成接合第一轨道的第一枢转附接构件。第一侧部可以包括第二接合部分,该第二接合部分构造成可枢转且可滑动地附接至洗碗机搁架的第二壁的第二轨道。第二接合部分可以限定构造成接合第二轨道的第二枢转附接构件。第二侧部可以包括第三接合部分和第四接合部分,第三接合部分构造成可移除且可滑动地设置在第一轨道上,第四接合部分构造成可移除且可滑动地设置在第二轨道上。餐具搁架可以构造成在第一接合部分和第三接合部分上沿着第一轨道滑动,并且餐具搁架可以构造成在第二接合部分和第四接合部分上沿着第二轨道滑动。餐具搁架可以构造成通过提升餐具搁架的第二侧部并且使餐具搁架绕着第一接合部分的第一枢转附接构件和第二接合部分的第二枢转附接构件旋转而枢转至收起位置。

[0016] 在一些实施方式中,餐具搁架可以包括在第一侧部与第二侧部之间延伸的搁板,

搁板限定用于接纳餐具的接纳表面。第一接合部分可以包括大致垂直于搁板地附接的第一腿部,第一腿部限定一段长度。该长度可以构造成和由第一轨道限定的第一接纳狭槽的终点与第一壁的端部之间的距离相等。

[0017] 在一些实施方式中,第二接合部分可以包括大致垂直于搁板地附接的第二腿部,第二腿部限定所述长度。

[0018] 第一接合部分可以限定构造成接纳第一轨道的第一狭槽。在一些实施方式中,第一附接构件可以延伸穿过第一狭槽,使得第一接合部分可以构造成至少部分地围绕第一轨道。第二接合部分可以限定构造成接纳第二轨道的第二狭槽,并且第二附接构件可以延伸穿过第二狭槽,使得第二接合部分可以构造成至少部分地围绕第二轨道。

[0019] 在又一另外的实施方式中,提供了制造具有餐具搁架的洗碗机的方法。洗碗机可以包括设置在洗碗机中的洗碗机搁架。洗碗机搁架可以包括至少第一壁和第二壁。第一壁可以平行于第二壁,并且第一壁和第二壁中的每一者可以限定至少一个端部。洗碗机还可以包括餐具搁架,餐具搁架包括第一接合部分、第二接合部分和在第一接合部分与第二接合部分之间延伸的搁板。搁板可以限定用于接纳餐具的接纳表面。该方法可以包括将餐具搁架的第一接合部分附接至洗碗机搁架的第一壁。在附接之后,第一接合部分可以构造成相对于洗碗机搁架的第一壁滑动。该方法还可以包括将餐具搁架的第二接合部分附接至洗碗机搁架的第二壁。在附接之后,第二接合部分可以构造成相对于洗碗机搁架的第二壁滑动。搁板可以构造成相对于第一壁和第二壁沿纵向方向滑动。搁板可以构造成相对于洗碗机搁架在工作位置与收起位置之间枢转。在工作位置,搁板的接纳表面可以与纵向方向对齐。在收起位置,搁板的接纳表面可以枢转成不与纵向方向对齐并且定位成与第一壁的端部和第二壁的端部相邻。

附图说明

[0020] 已概括地描述了本发明,现在将参照附图,附图不一定按比例绘制,并且在附图中:

[0021] 图1示出了根据本文中论述的一些实施方式的具有处于工作位置的餐具搁架的洗碗机;

[0022] 图2示出了根据本文中论述的一些实施方式的具有处于收起位置的餐具搁架的图1中的洗碗机;

[0023] 图3示出了根据本文中论述的一些实施方式的处于工作位置的餐具搁架;以及

[0024] 图4示出了根据本文中论述的一些实施方式的在工作位置与收起位置之间移动的餐具搁架。

具体实施方式

[0025] 现在将参照附图在下文中更充分地描述了本发明的示例性实施方式,在附图中示出了本发明的一些实施方式而非所有实施方式。实际上,本发明可以以许多不同的形式实施,并且不应当被理解为限于本文中所陈述的示例性实施方式;相反,提供这些实施方式使得本公开将满足适用的法律要求。相同的附图标记始终指的是相同的元件。

[0026] 洗碗机通常包括用于清洗餐具的专用的接纳区域。包括刀、叉、匙等的餐具通常比

常规的餐饮器具具有较小的尺寸,并且因此可以掉落通过洗碗机搁架的相对较大的开口。此外,餐具包括许多较小的表面,这保证了在清洗腔中的特殊定位和/或较高的喷洒密度,从而确保餐具被完全清洗干净。

[0027] 本文中论述的一些实施方式包括为餐具提供空间和组织的改进的餐具搁架,同时还在无需拆卸或存放的情况下尽可能少地妨碍清洗腔。如本文中所详述地,餐具搁架可以设置成以可滑动的方式附接至洗碗机搁架(例如,三搁架式洗碗机的中间搁架或两搁架式洗碗机的顶部搁架),其中,餐具盘包括可拆卸的前连接部并且被设计成在不使用时枢转至与洗碗机槽的后壁对齐且邻近洗碗机槽的后壁的竖向收起位置。

[0028] 参照图1,根据本文中论述的一些实施方式示出洗碗机1。描绘的洗碗机1包括门2和清洗腔4,包括餐具的各种物品可以被定位在清洗腔4中以被清洗。描绘的实施方式包括下部餐盘搁架6和中间餐盘搁架8,每个餐盘搁架构造保持陶瓷餐具,包括盘、碟、杯、平底锅等以用于清洗。餐盘搁架6、8可以在轨道10上被从清洗腔4外部的负载位置移动至清洗腔中的工作位置。

[0029] 在图1至图2中示出的实施方式还包括设置在洗碗机的中间搁架8上的用于保持要清洗的餐具的餐具搁架12。餐具搁架包括搁板14,搁板14具有可以包括支撑条网格的接纳表面16。在一些实施方式中,相邻的、平行的网格条可以彼此间隔开半英寸,从而在网格中限定半英寸的方形孔。搁板14可以包括凸起的侧壁18、20、22、24,凸起的侧壁18、20、22、24环绕接纳表面16以用于支撑和容纳位于搁板的接纳表面上的餐具。例如,壁18、20、22、24可以防止放在搁板上的物品在清洗循环期间无意地掉落到洗碗机的喷洒臂或水槽中。在一些实施方式中,餐具搁架12可以设置在下部餐盘搁架6上。

[0030] 在一些实施方式中,凸起的侧壁18、20、22、24中的一个或更多个凸起的侧壁可以包括用于支承和固定餐具的一个或更多个保持部26(例如凹槽、狭槽、开口或其他的保持特征)。例如,在图1至图2中示出的实施方式中,搁板14包括沿着后壁18间隔开的多个保持部26。这些保持部26可以被均匀地间隔开,或者可以包括可变的间距。例如,在图1所描绘的实施方式中,后壁18的外端部处的保持部26包括比后壁的中央部分附近的保持部26更宽的间距(例如,后壁18的外部三分之一可以包括比后壁的中央三分之一更宽的间距)。在其他的实施方式中,搁板14的任何壁18、20、22、24的任意一半与另一半相比可以包括更宽间距的保持部26。本领域的普通技术人员将理解的是,鉴于本公开,附加的保持部的任何构型,比如夹、专用的开口、凸起的尖部等可以设置在搁板上以组织并支撑餐具。

[0031] 在一些实施方式中,搁板14可以限定与洗碗机搁架的宽度对应的宽度。例如,在一些实施方式中,搁板14的宽度可以是18英寸至20英寸。例如,搁板14的宽度可以是18.41英寸(~467.54mm)。在一些实施方式中,搁板14的在纵向方向A的长度可以是4英寸至5英寸。例如,搁板14的长度可以是4.88英寸(~124mm)。在一些实施方式中,搁板14的壁20、22、24、26可以在半英寸高与1.5英寸高之间。例如,搁板14的壁20、22、24、26的高度可以是.71英寸(~18mm)。

[0032] 参照图1至图4,搁板14可以包括将搁板连接至洗碗机搁架8的一个或更多个接合部分28、30、32、34。在描绘的实施方式中,接合部分28、30、32、34包括从搁板垂直向下延伸的四个腿部以接合洗碗机搁架8。接合部分28、30、32、34可以接合洗碗机搁架8的两个或更多个壁38、40、42、44。在一些实施方式中,如图1至图4所示,餐具搁架12可以在两个平行的

壁(例如,第一侧壁38和第二侧壁40)上接合轨道48并沿轨道48滑动。如在本文中所使用的,“壁”不需要坚实的或连续的表面,而是相反地,“壁”包括在洗碗机搁架8和/或餐具搁架12的不同区域中大致对齐的结构。例如,描绘的“后壁”44可以包括沿着洗碗机搁架8的后部的多个水平的和/或竖向的网格条。每个壁38、40、42、44可以限定两个端部、上边缘和下边缘(例如,第二壁40的两个端部被示出为位于壁的在图3至图4中的纵向方向A上的左末端和右末端处,其中,在图3至图4中,上边缘被示出为位于壁40的顶侧处并且下边缘被示出为位于壁40的底侧处)。

[0033] 描绘的轨道48被限定在第一侧壁38和第二侧壁40的顶部边缘上,使得接合部分28、30、32、34的狭槽36可以沿着轨道在侧壁的最上边缘处滑动。如以下所详述地,轨道48可以限定位于轨道与壁(例如,第一侧壁38和第二侧壁40)的剩余部分之间的纵向接纳狭槽52。在一些实施方式中,接合部分可以跨置在设置于洗碗机搁架壁的外侧表面或内侧表面上的轨道上,并且轨道可以设置在壁的最上边缘处或侧壁上的一些中间位置处。本领域的普通技术人员还将理解的是,根据本公开,餐具搁架可以沿着洗碗机搁架的任何平行的壁(例如,第一侧壁38和第二侧壁40或前壁42和后壁44)跨置,或者餐具搁架可以附接至洗碗机搁架的底部46。

[0034] 搁板14可以通过接合部分28、30、32、34定位在洗碗机搁架8的上方以在中间的洗碗机搁架8中留出用于餐具的足够的空间。例如,搁板14可以定位成高于酒杯,酒杯可以定位在下面的洗碗机搁架8上。接合部分28、30、32、34可以各自限定从附接构件50至搁板14的侧壁20、22、24、26的顶部的长度L,附接构件50可以在接纳狭槽52中接合轨道48的下侧。长度L和从洗碗机搁架8的底部46至附接构件50的各个壁38、40、42、44的高度的总和可以限定可以定位在洗碗机搁架中的餐具的最大高度。在一些实施方式中,长度可以是3英寸至5英寸。例如,在一些实施方式中,长度L可以是大约3.78英寸(~96.05mm)。在一些实施方式中,长度L可以是零,使得搁板14与轨道48大致齐平。在一些实施方式中,搁板14可以搁置在轨道48上,并且接合部分28、30、32、34可以限定狭槽、缓冲器、接合机构或用于将搁板直接附接至轨道的其他附接装置。在一些实施方式中,接合部分可以限定垂直于纵向方向的大约0.6英寸(~15mm)的宽度。

[0035] 接合部分28、30、32、34中的一个或更多个接合部分可以附接至洗碗机搁架8的壁以允许搁板14相对于搁架的枢转和滑动移动,同时限制或防止餐具搁架12被从洗碗机搁架移除。在描绘的实施方式中,后接合部分32、34附接至搁架8,同时前接合部分28、30可移除地接合洗碗机搁架,比如通过搁置在搁架上或将洗碗机搁架松动地夹在工作位置。描绘的接合部分28、30、32、34包括位于腿部的远端部处的狭槽36以用于在其中接纳侧壁中的一部分(例如,壁38、40、42、44中的一个或更多个壁的轨道48)。描绘的后接合部分32、34还包括延伸穿过狭槽36的附接构件50(例如,销、夹、钉、螺栓等)以将餐具搁架12保持在轨道48上。在这种实施方式中,具有附接构件50的接合部分32、34可以位于餐具搁架12的第一侧部上并且接合部分28、30可移除且可滑动地搁置在轨道48上,而没有附接构件可以位于餐具搁架12的第二侧部上。

[0036] 轨道48可以限定连续的纵向接纳狭槽52,附接构件50在接纳狭槽52中滑动。接纳狭槽52可以允许位于第一侧部上的后接合部分32、34保持附接至洗碗机搁架8,同时能够相对于洗碗机搁架枢转和滑动。在一些实施方式中,轨道可以是12英寸至14英寸长(例如,

12.62英寸或320.55mm),并且轨道可以在各个壁38、40、42、44的上边缘的上方高出半英寸至1.5英寸(例如,0.65英寸或16.53mm)。

[0037] 在一些实施方式中,狭槽36和附接构件50(在图3至图4中示出)可以组合以在横截面上围绕轨道48。在一些其他的实施方式中,接合部分可以在不完全围绕轨道的情况下保持轨道(例如,通过在接纳狭槽52中延伸的端部开口的销)。在一些实施方式中,狭槽36和/或附接构件50可以可移除地附接至轨道48(例如,通过可移除的销、闩、端部开口的销等),使得在正常操作下餐具搁架12保持附接至洗碗机搁架8,同时还是可拆卸的以用于清洗或替换。

[0038] 转到如图3至图4中所示的实施方式,洗碗机搁架8通过右侧的视图示出,与页面共面地描绘了搁架的第二壁40。当图3至图4描绘了如从右侧观察的洗碗机和餐具搁架12的结构时,本领域的普通技术人员将理解的是,图3至图4的描述可以以相同的方式应用至左侧结构。在操作中,参照图3,餐具搁架12可以沿着洗碗机搁架8在餐具搁架所接合至的壁(例如,第一侧壁38和第二侧壁40)的纵向方向A上滑动。例如,餐具搁架12的描绘的实施方式沿着洗碗机搁架8的侧壁38、40的上边缘的轨道48在纵向方向A上大致平行于洗碗机搁架的底部46左右滑动。以这种方式,餐具搁架12可以定位在沿着轨道48的任何期望的位置处以允许使用者选择清洗腔4(在图1至图2示出)中的餐具和洗碗机搁架8中的陶制餐具的相对定位。类似地,餐具搁架12的可滑动的移动可以允许使用者将餐具搁架装载在洗碗机搁架8的前面(例如,接近洗碗机搁架8的前壁42),并且随后将装载的餐具搁架移动至后面(例如,接近洗碗机搁架8的后壁44)以用于装载洗碗机篮和/或用于清洗操作。

[0039] 转到图4,餐具搁架12还可以在工作位置——在工作位置,搁板14定位成接纳餐具(以虚线示出)——与收起位置——在收起位置,搁板定位成避免干预洗碗机搁架8的操作(以实线示出)——之间枢转。在描绘的实施方式中,餐具搁架12绕着横跨后接合部分32、34的附接构件50的轴线枢转。在工作位置,位于第二侧部上的前接合部分28、30可以搁置在侧壁38、40的一部分(例如,轨道48)上,并且在收起位置,前接合部分可以与侧壁38、40不连接。本领域的普通技术人员将理解的是前接合部分可以替代地附接至壁并且可以相对于洗碗机搁架枢转。在这种实施方式中,在收起位置,搁板可以向前枢转。在一些实施方式中,餐具搁架12可以构造成在平行的前壁42和后壁44上滑动,并且餐具搁架可以枢转至第一侧壁38或第二侧壁40处或附近的收起位置。

[0040] 继续参照图3至图4,工作位置可以被定义为使用位置,在该使用位置,搁板14的接纳表面16在清洗腔4(在图1、图2和图4中示出)内至少部分地是水平的。在这种实施方式中,搁板14的接纳表面16可以与纵向方向A对齐。例如,搁板14的接纳表面16可以与横跨餐具搁架在其上滑动的各个壁的纵向方向A的平面大致平行。例如,在图4中所示的实施方式中,工作位置被示出为平行于第二壁40的纵向方向A(例如,搁板的表面从左到右地取向)。在一些实施方式中,工作位置可以包括搁板在纵向方向A上的任何位置(例如,任何滑动位置),在这些位置,搁板大致平行于纵向方向。如本文中所使用的,在与取向或维度组合使用时的术语“大致”,比如“大致平行”,不要求搁板的接纳表面在数学上精确的位置平行并且旨在表明搁板在与绝对平行有适度偏差的范围内,对于洗碗领域内的这些术语,该适度范围的精确度水平通常是可接受的。

[0041] 收起位置可以被限定为与工作位置相比更加远离与纵向方向平行的方向。在这种

实施方式中,搁板14的接纳表面16在从工作位置转变至收起位置时可以枢转成不与纵向方向对齐。继续参照图4,搁板14被示出为在工作位置与收起位置之间绕后接合部分34和附接构件50枢转。在这种实施方式中,搁板14可以被从第二侧部提升并且可以相对于在第一侧部的接合部分32、34上的枢转附接构件50枢转。

[0042] 在描绘的实施方式中,在收起位置,搁板14的接纳表面16大致垂直于纵向方向。在一些实施方式中,搁板14可以在收起位置滑动至后壁44以避免妨碍洗碗机搁架8。换句话说,搁板14可以滑动直到接纳表面16与第一壁的端部和第二壁的端部(例如,图4中相对于页面的左端部)相邻。例如,在收起位置,搁板14的接纳表面16可以大致垂直于纵向方向枢转并且至少滑动至后壁44的纵向位置(例如,至第一壁38和第二壁40的端部)。后壁44可以在第一壁38的端部与第二壁40的端部之间延伸。

[0043] 在一些实施方式中,在收起位置,后壁44与搁板14的接纳表面16可以大致平行,并且在一些另外的实施方式中,在收起位置,后壁44与搁板14的接纳表面16可以大致共面。在一些其他的实施方式中,在收起位置,壁18、20、22、24的上边缘可以与后壁44大致共面。在以上所论述的实施方式中的每个实施方式中,可以说搁板14的接纳表面16与餐具搁架在其上滑动的壁的端部相邻。在一些实施方式中,搁板可以滑过后壁44(例如,进一步进入洗碗机搁架8后面的清洗腔4中并且越过壁的端部)。搁板14可以在收起位置搁置地抵靠洗碗机搁架8的后壁44和/或侧壁38、40。

[0044] 在一些实施方式中,轨道48的接纳通道52可以在与到后壁44的距离长度L相等的距离处终止。在这种实施方式中,餐具搁架12可以在工作位置被限制得不会滑动成与后壁44相距的距离比长度L更少,并且因此,在收起位置,搁板14可以与后壁44大致共面,这是因为接合部分28、30、32、34也可以限定长度L。

[0045] 在本文中描述的一些实施方式中,提供了制造具有餐具搁架的洗碗机的方法。洗碗机可以包括可移除地设置在洗碗机中的洗碗机搁架。洗碗机搁架可以至少包括第一壁、第二壁和第三壁(例如,在图1至图4中描绘的实施方法中,分别为第一侧壁38、第二侧壁40和后壁44)。第一壁可以平行于第二壁,并且第三壁可以在第一壁与第二壁之间延伸。餐具搁架可以被设置成包括第一接合部分、第二接合部分和在接合部分之间延伸的搁板。该方法可以包括将餐具搁架的第一接合部分附接至洗碗机搁架的第一壁。在附接之后,第一接合部分可以构造成相对于洗碗机搁架的第一壁滑动。该方法还可以包括将餐具搁架的第二接合部分附接至洗碗机搁架的第二壁。在附接之后,第二接合部分可以构造成相对于洗碗机搁架的第二壁滑动。搁板可以相对于第一壁和第二壁沿纵向方向滑动。搁板可以构造成相对于洗碗机搁架在工作位置与收起位置之间枢转。在工作位置,搁板可以设置成比在收起位置更接近平行于纵向方向,并且在收起位置,搁板可以至少滑动至洗碗机搁架的第三壁的纵向位置。

[0046] 参照图4,餐具搁架12可以定位成足够靠近清洗腔4的顶壁使得搁架12在工作位置与收起位置之间的折叠期间撞击顶壁,同时允许餐具搁架12在位于最终工作位置和收起位置时不撞击顶壁。在这种实施方式中,餐具搁架可以仅当餐具搁架和洗碗机搁架从清洗腔4滑出时在工作位置与折叠位置之间枢转。例如,在一些实施方式中,洗碗机搁架8的轨道48可以定位成距清洗腔4的顶部小于6.18英寸且大于4.88英寸,使得例如在长度L为大约3.78英寸并且搁板14的宽度为大约4.88英寸的实施方式中,餐具搁架12可以在工作位置距清洗

腔的顶部大约1.1英寸至2.4英寸并且在收起位置距清洗腔的顶壁大约零英寸至1.3英寸。

[0047] 受益于前面的描述和相关联的附图的教导,本发明的实施方式所属领域的技术人员将想到文中陈述的本发明的许多改型和其他实施方式。因此,应该理解的是,本发明的实施方式不限于所公开的特定的实施方式,并且改型和其他的实施方式旨在包括在所附权利要求的范围内。尽管为了简单说明,一些附图和描述可以省略其他地方描述的特征,但是应该理解的是,这些特征可以出现在如前所详述的呈任何组合或构型的实施方式中的任一实施方式中。尽管本文中使用了特定的术语,但是它们仅出于通用的且描述性的意义使用,而非出于限制的目的。

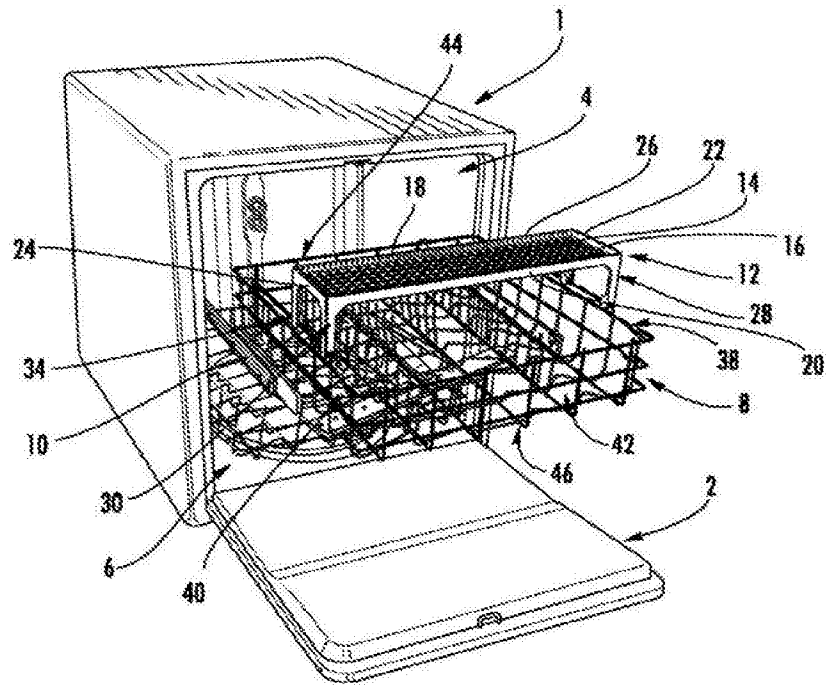


图1

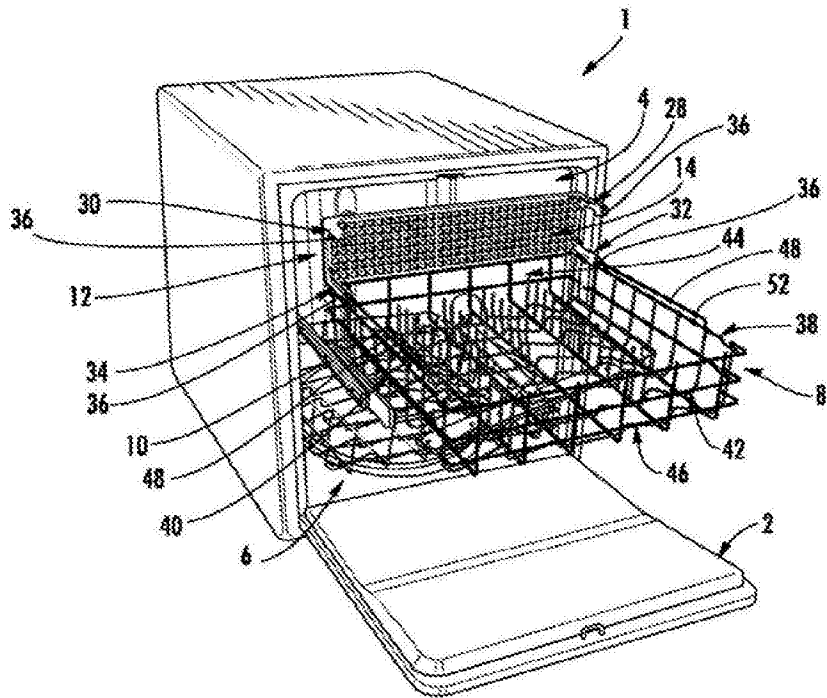


图2

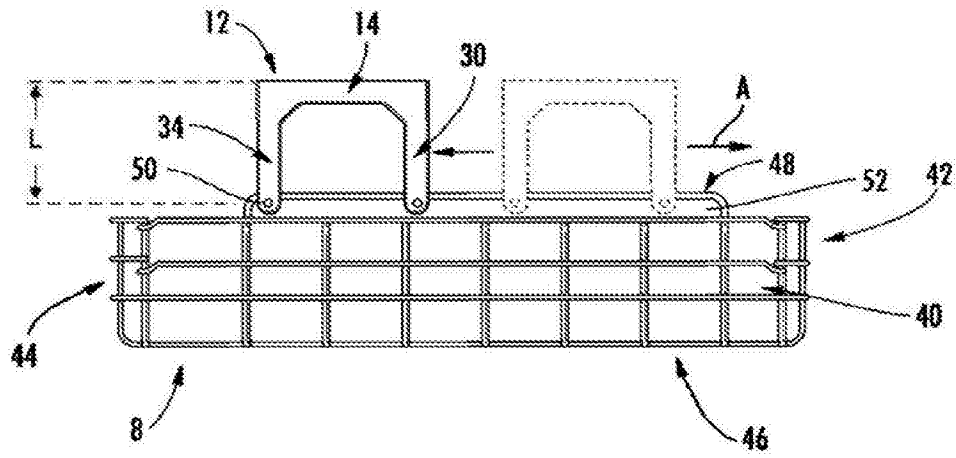


图3

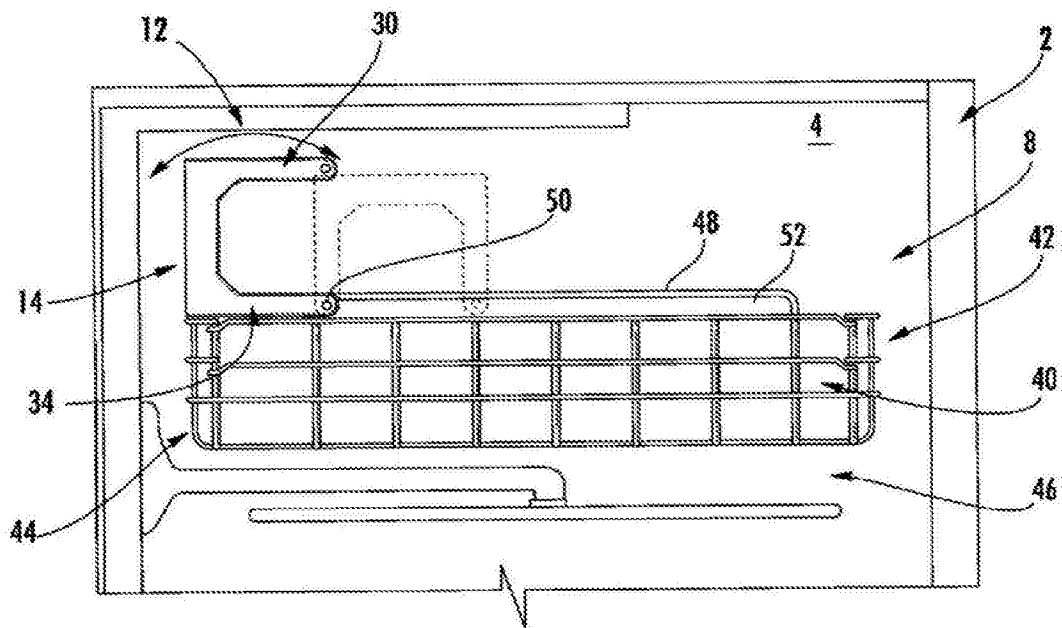
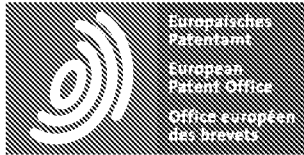


图4



Espacenet

CN205697665U Knife and fork basket and have its dish washer

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Inventors: CAO HONGKUI,LI MINGFENG

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Knife and fork basket and have its dish washer

Abstract

The utility model discloses a knife and fork basket and have its dish washer, knife and fork basket includes: the basket subassembly is connected between fold condition and development condition in knife and fork basket body in front convertibly before the basket subassembly before knife and fork basket body and the knife and fork, knife and fork, and the basket subassembly includes before the knife and fork: go up the rib, go up the rib and do not link to each other with the knife and fork basket body along upper and lower slidable ground, a plurality of down ribs, a plurality of rib from the top down down arrange in proper order, and the rib links to each other with last rib and along with the linkage of last rib down, wherein, rib and the folding lower part to the knife and fork basket body of rib down on fold condition, the rib expands with rib down and forms with the cooperation of knife and fork basket body that the upper end is opened and the lower extreme confined basket body on development condition. According to the utility model discloses a knife and fork basket, a plurality of ribs down link to each other with last rib and link along with last rib to the different functions of user when utilizing knife and fork basket to be in fold condition and development condition respectively of being convenient for, convenience of customers takes out the cutlery and makes things convenient for spray arm to wash.



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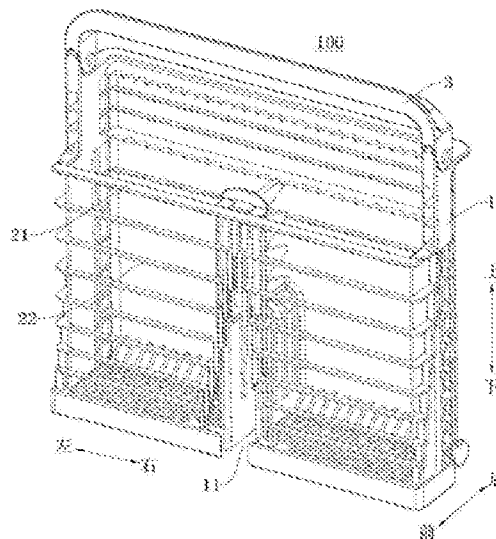
权利要求书2页 说明书7页 附图8页

(54)实用新型名称

刀叉篮及具有其的洗碗机

(57)摘要

本实用新型公开了一种刀叉篮及具有其的洗碗机,刀叉篮包括:刀叉篮本体和刀叉前篮组件,刀叉前篮组件在折叠状态和展开状态之间可转换地连接在刀叉篮本体的前面,刀叉前篮组件包括:上筋条,上筋条沿上下可滑动地与刀叉篮本体相连;多个下筋条,多个下筋条从上到下依次布置,且下筋条与上筋条相连并随上筋条联动,其中,在折叠状态上筋条和下筋条折叠至刀叉篮本体的下部,在展开状态上筋条和下筋条展开并与刀叉篮本体配合形成上端敞开且下端封闭的篮体。根据本实用新型的刀叉篮,多个下筋条与上筋条相连并随上筋条联动,从而便于用户分别利用刀叉篮处于折叠状态和展开状态时的不同功能,方便用户取出刀叉餐具且方便喷臂清洗。



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1. 一种刀叉篮, 其特征在于, 所述刀叉篮包括刀叉篮本体和刀叉前篮组件, 所述刀叉前篮组件在折叠状态和展开状态之间可转换地连接在所述刀叉篮本体的前面, 所述刀叉前篮组件包括:

上筋条, 所述上筋条沿上下可滑动地与所述刀叉篮本体相连;

多个下筋条, 多个所述下筋条从上到下依次布置, 且所述下筋条与所述上筋条相连并随所述上筋条联动,

其中, 在所述折叠状态所述上筋条和所述下筋条折叠至所述刀叉篮本体的下部, 在所述展开状态所述上筋条和所述下筋条展开并与所述刀叉篮本体配合形成上端敞开且下端封闭的篮体。

2. 根据权利要求1所述的刀叉篮, 其特征在于, 每个所述下筋条均包括第一本体部和第一导向部, 所述第一导向部沿上下方向延伸且上端与所述第一本体部相连, 多个所述下筋条的所述第一导向部依次相连并可沿上下相对滑动, 位于最上面的下筋条中的所述第一导向部与所述上筋条相连, 位于最下面的下筋条中的所述第一导向部与所述刀叉篮本体相连。

3. 根据权利要求2所述的刀叉篮, 其特征在于, 在相邻的两个所述下筋条中, 位于上面的下筋条中的所述第一导向部的下端设有第一限位凸块, 且位于下面的下筋条的第一导向部上设有与所述第一限位凸块相对的第一导向槽, 所述第一导向槽上端封闭, 且在所述展开状态所述第一限位凸块勾住所述第一导向槽的上端。

4. 根据权利要求2所述的刀叉篮, 其特征在于, 所述上筋条包括第二本体部和第二导向部, 所述第二本体部呈条状, 所述第二导向部沿上下方向延伸且上端与所述第二本体部相连,

多个所述下筋条中位于最上面的下筋条中的所述第一导向部上设有上端封闭的第二导向槽, 所述第二导向部的下端设有与所述第二导向槽相对的第二限位凸块, 在所述展开状态所述第二限位凸块勾住所述第二导向槽的上端。

5. 根据权利要求2所述的刀叉篮, 其特征在于, 最下面的下筋条中的所述第一导向部的下端穿过所述刀叉篮本体的底壁并设有第三限位凸块, 在所述展开状态所述刀叉篮本体的底壁对所述第三限位凸块限位。

6. 根据权利要求2所述的刀叉篮, 其特征在于, 所述第一本体部的两端均设有所述第一导向部, 且两个所述第一导向部上的第一导向槽的开口方向相互垂直。

7. 根据权利要求6所述的刀叉篮, 其特征在于, 所述第一本体部呈水平延伸并从所述刀叉篮主体的中部延伸到所述刀叉篮主体的侧沿的长条状, 所述第一本体部上邻近所述刀叉篮本体中部的所述第一导向部上的第一导向槽的开口背离所述第一本体部, 且所述第一本体部上邻近所述刀叉篮本体侧沿的第一导向部上的第一导向槽的开口向后。

8. 根据权利要求1-7中任一项所述的刀叉篮, 其特征在于, 所述下筋条包括分别布置在所述刀叉篮本体的左侧和右侧的两组。

9. 根据权利要求8所述的刀叉篮, 其特征在于, 所述刀叉篮本体的底部设有定位槽, 所述定位槽贯通所述刀叉篮本体的底面并沿前后方向贯通所述刀叉篮本体, 在所述展开状态两组所述下筋条之间限定出与所述定位槽适配的形状。

10. 根据权利要求1-7中任一项所述的刀叉篮, 其特征在于, 所述刀叉篮本体的左右两侧以及中部均设有沿上下方向延伸的滑柱, 所述上筋条上设有与所述滑柱对应的卡扣, 所

述卡扣卡持在对应的所述滑柱上并沿上下方向可滑动。

11. 根据权利要求10所述的刀叉篮, 其特征在于, 多个所述下筋条中的至少一部分沿上下方向可滑动的卡持在所述滑柱上。

12. 根据权利要求1-7中任一项所述的刀叉篮, 其特征在于, 所述上筋条呈水平延伸且开口向后的U形。

13. 根据权利要求1-7中任一项所述的刀叉篮, 其特征在于, 所述刀叉篮本体上设有锁扣, 在所述展开状态所述上筋条由所述锁扣锁紧。

14. 根据权利要求13所述的刀叉篮, 其特征在于, 所述上筋条上设有沿左右方向延伸的卡柱, 在所述展开状态所述卡柱与所述锁扣卡合。

15. 根据权利要求13所述的刀叉篮, 其特征在于, 所述锁扣在适于锁紧所述上筋条的锁扣位置和适于释放所述上筋条的释放位置之间可移动地与所述刀叉篮本体相连, 所述锁扣常处于所述锁扣位置, 且所述锁扣上连接有用于驱动所述锁扣朝释放位置移动的锁扣拨片。

16. 一种洗碗机, 其特征在于, 包括:

刀叉托盘;

刀叉篮, 所述刀叉篮可取出地搁置在所述刀叉托盘上, 所述刀叉篮为根据权利要求1-15中任一项所述的刀叉篮, 所述刀叉篮的刀叉前篮组件位于所述刀叉篮本体的外侧。

刀叉篮及具有其的洗碗机

技术领域

[0001] 本实用新型涉及家用电器技术领域,特别是涉及一种刀叉篮及具有其的洗碗机。

背景技术

[0002] 相关技术中,洗碗机内部设置刀叉篮或刀叉托盘用来放置各种取食类餐具,例如刀子、叉子和勺子等。刀叉篮本身具有转移餐具的便捷性,通常竖直放置在洗碗机的下碗篮内。然而,当餐盘等餐具较多时,碗篮上就没有多余空间来放置刀叉篮,只好将刀叉篮平躺放置在刀叉托盘上,接受顶喷臂喷淋。然而,直接将传统的刀叉篮放置在刀叉托盘上,刀叉篮的上方往往有栅格阻碍,既影响喷淋效果,也不方便取出刀叉进行摆放。

实用新型内容

[0003] 本实用新型旨在至少在一定程度上解决相关技术中的技术问题之一。为此,本实用新型的一个目的在于提出一种刀叉篮,所述刀叉篮的刀叉前篮组件可以在折叠状态和展开状态之间转换,便于用户取出刀叉餐具且方便喷臂清洗。

[0004] 本实用新型的另一个目的在于提出一种洗碗机,所述洗碗机上设有上述刀叉篮。

[0005] 根据本实用新型第一方面实施例的刀叉篮,所述刀叉篮包括刀叉篮本体和刀叉前篮组件,所述刀叉前篮组件在折叠状态和展开状态之间可转换地连接在所述刀叉篮本体的前面,所述刀叉前篮组件包括:上筋条,所述上筋条沿上下可滑动地与所述刀叉篮本体相连;多个下筋条,多个所述下筋条从上到下依次布置,且所述下筋条与所述上筋条相连并随所述上筋条联动,其中,在所述折叠状态所述上筋条和所述下筋条折叠至所述刀叉篮本体的下部,在所述展开状态所述上筋条和所述下筋条展开并与所述刀叉篮本体配合形成上端敞开且下端封闭的篮体。

[0006] 根据本实用新型实施例的刀叉篮,多个下筋条与上筋条相连并随上筋条联动,使得刀叉前篮组件可以在折叠状态和展开状态之间转换,这样不仅方便刀叉餐具的清洗,还便于用户取出刀叉餐具,使得用户可以分别利用刀叉篮处于折叠状态和展开状态时的不同功能,更好地满足用户的需求。

[0007] 另外,根据本实用新型上述实施例的刀叉篮还具有如下附加的技术特征:

[0008] 根据本实用新型的一些实施例,每个所述下筋条均包括第一本体部和第一导向部,所述第一导向部沿上下方向延伸且上端与所述第一本体部相连,多个所述下筋条的所述第一导向部依次相连并可沿上下相对滑动,位于最上面的下筋条中的第一导向部与所述上筋条相连,位于最下面的下筋条中的第一导向部与所述刀叉篮本体相连。

[0009] 进一步地,在相邻的两个所述下筋条中,位于上面的下筋条中的第一导向部的下端设有第一限位凸块,且位于下面的下筋条的第一导向部上设有与所述第一限位凸块相对的第一导向槽,所述第一导向槽上端封闭,且在所述展开状态所述第一限位凸块勾住所述第一导向槽的上端。

[0010] 在本实用新型的一些实施例中,所述上筋条包括第二本体部和第二导向部,所述

第二本体部呈条状,所述第二导向部沿上下方向延伸且上端与所述第二本体部相连,多个所述下筋条中位于最上面的下筋条中的第一导向部上设有上端封闭的第二导向槽,所述第二导向部的下端设有与所述第二导向槽相对的第二限位凸块,在所述展开状态所述第二限位凸块勾住所述第二导向槽的上端。

[0011] 在本实用新型的一些实施例中,最下面的下筋条中的第一导向部的下端穿过所述刀叉篮本体的底壁并设有第三限位凸块,在所述展开状态所述刀叉篮本体的底壁对所述第三限位凸块限位。

[0012] 在本实用新型的一些实施例中,所述第一本体部的两端均设有所述第一导向部,且两个所述第一导向部上的第一导向槽的开口方向相互垂直。

[0013] 进一步地,所述第一本体部呈水平延伸并从所述刀叉篮主体的中部延伸到所述刀叉篮主体的侧沿的长条状,所述第一本体部上邻近所述刀叉篮本体中部的第一导向部上的第一导向槽的开口背离所述第一本体部,且所述第一本体部上邻近所述刀叉篮本体侧沿的第一导向部上的第一导向槽的开口向后。

[0014] 根据本实用新型的一些实施例,所述下筋条包括分别布置在所述刀叉篮本体的左侧和右侧的两组。

[0015] 进一步地,所述刀叉篮本体的底部设有定位槽,所述定位槽贯通所述刀叉篮本体的底面并沿前后方向贯通所述刀叉篮本体,在所述展开状态两组所述下筋条之间限定出与所述定位槽适配的形状。

[0016] 根据本实用新型的一些实施例,所述刀叉篮本体的左右两侧以及中部均设有沿上下方向延伸的滑柱,所述上筋条上设有与所述滑柱对应的卡扣,所述卡扣卡持在对应的所述滑柱上并沿上下方向可滑动。

[0017] 进一步地,多个所述下筋条中的至少一部分沿上下方向可滑动的卡持在所述滑柱上。

[0018] 根据本实用新型的一些实施例,所述上筋条呈水平延伸且开口向后的U形。

[0019] 根据本实用新型的一些实施例,所述刀叉篮本体上设有锁扣,在所述展开状态所述上筋条由所述锁扣锁紧。

[0020] 进一步地,所述上筋条上设有沿左右方向延伸的卡柱,在所述展开状态所述卡柱与所述锁扣卡合。

[0021] 在本实用新型的一些实施例中,所述锁扣在适于锁紧所述上筋条的锁扣位置和适于释放所述上筋条的释放位置之间可移动地与所述刀叉篮本体相连,所述锁扣常处于所述锁扣位置,且所述锁扣上连接有用于驱动所述锁扣朝释放位置移动的锁扣拨片。

[0022] 根据本实用新型第二方面实施例的洗碗机,包括:刀叉托盘;刀叉篮,所述刀叉篮可取出地搁置在所述刀叉托盘上,所述刀叉篮为上述所述的刀叉篮,所述刀叉篮的刀叉前篮组件位于所述刀叉篮本体的外侧。

[0023] 本实用新型的附加方面和优点将在下面的描述中部分给出,部分将从下面的描述中变得明显,或通过本实用新型的实践了解到。

附图说明

[0024] 本实用新型的上述和/或附加的方面和优点从结合下面附图对实施例的描述中将

变得明显和容易理解,其中:

[0025] 图1是根据本实用新型实施例的刀叉篮的示意图(其中,刀叉前篮组件处于展开状态);

[0026] 图2是根据本实用新型实施例的刀叉篮的另一个示意图(其中,刀叉前篮组件处于折叠状态);

[0027] 图3是图2中圈A处的局部放大图;

[0028] 图4是根据本实用新型实施例的刀叉篮的刀叉前篮组件处于展开状态时的示意图(包括滑柱);

[0029] 图5是根据本实用新型实施例的刀叉篮的刀叉前篮组件处于折叠状态时的示意图;

[0030] 图6是根据本实用新型实施例的刀叉篮的刀叉前篮组件处于展开状态时的示意图(不包括滑柱);

[0031] 图7和图8是根据本实用新型实施例的刀叉篮的刀叉前篮组件中多个下筋条中位于中间位置的一个下筋条的示意图;

[0032] 图9是根据本实用新型一个实施例的洗碗机的示意图;

[0033] 图10是根据本实用新型另一个实施例的洗碗机的示意图。

[0034] 附图标记:

[0035] 刀叉篮100,

[0036] 刀叉篮本体1,定位槽11,滑柱12,锁扣13,锁扣拨片131,

[0037] 刀叉前篮组件2,上筋条21,第二本体部211,第二导向部212,下筋条22,第一本体部221,第一导向部222,第一限位凸块2221,第一导向槽2222,第二导向槽2223,第三限位凸块2224,导向套223,

[0038] 把手3,

[0039] 洗碗机200,刀叉托盘201。

具体实施方式

[0040] 下面详细描述本实用新型的实施例,所述实施例的示例在附图中示出,其中自始至终相同或类似的标号表示相同或类似的元件或具有相同或类似功能的元件。下面通过参考附图描述的实施例是示例性的,旨在用于解释本实用新型,而不能理解为对本实用新型的限制。

[0041] 本实用新型在于提出一种刀叉篮100,所述刀叉篮100的结构简单,使得用户取放刀叉更加地方便快捷。刀叉篮100可以直接躺在刀叉托盘201中,刀叉前篮组件2在折叠状态时接受清洗,也可以取出刀叉规整地放置在刀叉托盘201的一侧接受清洗,也可以在刀叉前篮组件2在展开状态时单独用来作为刀叉篮100放置在下碗篮中接受清洗,亦可以独立作为刀叉篮100用来转移收取餐具等。

[0042] 下面结合图1至图10详细描述根据本实用新型实施例的刀叉篮100。

[0043] 参照图1和图2,根据本实用新型第一方面实施例的刀叉篮100,刀叉篮100包括刀叉篮本体1和刀叉前篮组件2,刀叉前篮组件2在折叠状态和展开状态之间可转换地连接在刀叉篮本体1的前面(例如,图1中刀叉篮本体1的前面)。

[0044] 具体而言,参照图4至图6并结合图1和图2,刀叉前篮组件2包括:上筋条21和多个下筋条22。上筋条21沿上下(例如,图1或图2中的上下)可滑动地与刀叉篮本体1相连;多个下筋条22从上到下依次布置,且下筋条22与上筋条21相连并随上筋条21联动。其中,在折叠状态(参照图2)上筋条21和下筋条22折叠至刀叉篮本体1的下部,在展开状态(参照图1)上筋条21和下筋条22展开并与刀叉篮本体1配合形成上端(例如,图1或图2中所示的上端)敞开且下端(例如,图1或图2中所示的下端)封闭的篮体。由此,易于实现刀叉前篮组件2在折叠状态和展开状态之间的转换,便于用户取出刀叉餐具且方便喷臂清洗。

[0045] 这里,需要说明的是,多个下筋条22从上到下依次布置且下筋条22与上筋条21相连并随上筋条21联动指的是,当刀叉篮100从折叠状态向展开状态转换时,多个下筋条22随上筋条21一起向上移动;当刀叉篮100从展开状态向折叠状态转换时,多个下筋条22随上筋条21一起向下移动。

[0046] 根据本实用新型实施例的刀叉篮100,多个下筋条22与上筋条21相连并随上筋条21联动,使得刀叉前篮组件2可以在折叠状态和展开状态之间转换,这样不仅方便刀叉餐具的清洗,还便于用户取出刀叉餐具,使得用户可以分别利用刀叉篮100处于折叠状态和展开状态时的不同功能,更好地满足用户的需求。

[0047] 根据本实用新型的一些实施例,参照图7和图6并结合图1,每个下筋条22均包括第一本体部221和第一导向部222,第一导向部222沿上下方向(例如,图6中所示的上下方向)延伸且第一导向部222的上端(例如,图7中第一导向部222的上端)与第一本体部221相连,多个下筋条22的第一导向部222依次相连并可沿上下相对滑动,位于最上面的下筋条22中的第一导向部222与上筋条21相连,位于最下面的下筋条22中的第一导向部222与刀叉篮本体1相连。由此,使得多个下筋条22能够上下相对滑动,使得刀叉前篮组件2在折叠状态和展开状态之间的转换能够顺利实现。

[0048] 当然,在本实用新型的其他实施例中,多个下筋条22也可以通过例如铰链等方式实现上下相对滑动。本实用新型对多个下筋条22实现上下相对滑动的方式不作具体限定,实际应用中可以根据需要适应性选择。

[0049] 进一步地,如图6至图8所示,在相邻的两个下筋条22中,位于上面的下筋条22中的第一导向部222的下端(例如,图7中第一导向部222的下端)设有第一限位凸块2221,且位于下面的下筋条22的第一导向部222上设有与第一限位凸块2221相对的第一导向槽2222,第一导向槽2222上端封闭,且在展开状态第一限位凸块2221勾住第一导向槽2222的上端(例如,图6中第一导向槽2222的上端)。这样能够确保多个下筋条22之间连接以及相对滑动的可靠性,从而可以在一定程度上提高刀叉篮100的使用性能。

[0050] 其中,在图7示出的下筋条22中,由于该下筋条22位于多个所述下筋条22的中间位置,相对于与其相邻的下筋条22,图7示出的下筋条22可能位于上面也可能位于下面,因此,图7示出的下筋条22中既有第一导向槽2222、也有第一限位凸块2221。

[0051] 在本实用新型的一些实施例中,参照图6,上筋条21包括第二本体部211和第二导向部212,第二本体部211呈条状,第二导向部212沿上下方向(例如,图6中所示的上下方向)延伸且第二导向部212的上端(例如,图6中第二导向部212的上端)与第二本体部211相连,多个下筋条22中位于最上面的下筋条22中的第一导向部222上设有上端封闭的第二导向槽2223,第二导向部212的下端(例如,图6中第二导向部212的下端)设有与第二导向槽2223相

对的第二限位凸块(未示出),在所述展开状态,所述第二限位凸块勾住第二导向槽2223的上端(例如,图6中第二导向槽2223的上端)。由此,可以进一步确保上筋条21与多个下筋条22之间上下相对滑动的可靠连接。

[0052] 在本实用新型的一些实施例中,参照图6至图8并结合图1,最下面的下筋条22中的第一导向部222的下端穿过刀叉篮本体1的底壁,最下面的下筋条22中的第一导向部222的下端设有第三限位凸块2224(参照图6),在所述展开状态刀叉篮本体1的底壁对第三限位凸块2224限位(参照图1)。由此,可以实现最下面的下筋条22在刀叉篮本体1的底壁上的固定连接,从而能够确保多个下筋条22与上筋条21联动的可靠性,进而实现刀叉前篮组件2在折叠状态与展开状态之间的转换。

[0053] 在本实用新型的一些实施例中,参照图4和图6并结合图7和图8,第一本体部221的两端(例如,图7或图8中第一本体部221的左端和右端)均设有第一导向部222,且两个第一导向部222上的第一导向槽2222的开口方向相互垂直。由此,可以确保多个下筋条22之间连接以及相对滑动的可靠性。

[0054] 例如,在图7的示例中,第一本体部221右端的第一导向部222上的第一导向槽2222的开口方向即图7中标号B处的方向;第一本体部221左端的第一导向部222上的第一导向槽2222的开口方向即图7中标号C处的方向。其中,标号B处的方向与标号C处的方向相互垂直。

[0055] 进一步地,参照图6和图7并结合图1,第一本体部221呈水平延伸并从刀叉篮主体1的中部延伸到刀叉篮主体1的侧沿的长条状,第一本体部221上邻近刀叉篮本体中部的第一导向部222上的第一导向槽2222的开口(例如,图7中标号C处的开口方向)背离第一本体部221,且第一本体部221上邻近刀叉篮本体侧沿的第一导向部222上的第一导向槽2222的开口向后(例如,图7中标号B处的开口方向)。由此,可以实现多个下筋条22之间地可靠滑动连接,从而在一定程度上提高刀叉篮100的使用性能。

[0056] 根据本实用新型的一些实施例,参照图4并结合图1,下筋条22包括分别布置在刀叉篮本体1的左侧和右侧(例如,图1中刀叉篮本体1的左侧和右侧)的两组。其中,两组下筋条22对称布置,由此,可以平衡受力,使得刀叉前篮组件2在折叠状态和展开状态转换时动作更加平稳,从而可以进一步提高刀叉前篮组件2的使用性能。

[0057] 进一步地,参照图1,刀叉篮本体1的底部设有定位槽11,定位槽11贯通刀叉篮本体1的底面并沿前后方向(例如,图1中所示的前后方向)贯通刀叉篮本体1,在所述展开状态,两组下筋条22之间限定出与定位槽11适配的形状。由此,当刀叉篮100放置在例如刀叉托盘上时,定位槽11可以用于支撑和自由滑动,这样可扩大刀叉篮100的适用范围。

[0058] 根据本实用新型的一些实施例,如图4和图5所示,刀叉篮本体1的左右两侧以及中部均设有沿上下方向(例如,图4或图5中所示的上下方向)延伸的滑柱12,上筋条21上设有与滑柱12对应的卡扣213,卡扣213卡持在对应的滑柱12上并沿上下方向可滑动。由此,可以有效地实现上筋条21与多个下筋条22之间的联动,从而实现刀叉前篮组件2在折叠状态和展开状态之间的转换。

[0059] 进一步地,结合图4和图5,多个下筋条22中的至少一部分沿上下方向(例如,图4或图5中所示的上下方向)可滑动的卡持在滑柱12上。例如,在图4和图5的示例中,多个下筋条22中的至少一个的一端可以设有导向套223,导向套223可以套设在滑柱12上,且导向套223与滑柱12之间可相对滑动。由此,可以进一步确保刀叉前篮组件2在折叠状态和展开状态之

间转换时的平稳性。

[0060] 另外,下筋条22可以为3个至11个。例如,在本实用新型的一些具体实施例中,下筋条22可以为7个。当然,在本实用新型的其他实施例中,下筋条22也可以为3个、5个、9个或11等,本实用新型对下筋条22的具体个数不作限定,实际应用中可以根据需要适应性设置。

[0061] 根据本实用新型的一些实施例,参照图1和图2,上筋条21呈水平延伸且开口向后的U形。由此,可以使得上筋条21易于加工成型,便于装配,还可简化刀叉篮100的结构。

[0062] 当然,在本实用新型的其他实施例中,上筋条21也可以包括本体部和两个折弯部,其中,本体部可以呈矩形长条状,两个折弯部分别设在本体部的两端并与本体部相连。本体部和两个折弯部也可以通过焊接或一体成型的方式制成。

[0063] 根据本实用新型的一些实施例,参照图1和图3,刀叉篮本体1上设有锁扣13,在所述展开状态,上筋条21由锁扣13锁紧。其中,锁扣13可以呈开口宽度逐渐缩小的勾状,由此,使得上筋条21与刀叉篮本体1之间连接更加可靠,从而能够提高刀叉前篮组件2的使用安全性。

[0064] 进一步地,参照图5和图6并结合图1,上筋条21上设有沿左右方向(例如,图5或图6中所示的左右方向)延伸的卡柱214,在所述展开状态,卡柱214与锁扣13卡合。这样可以实现上筋条21在刀叉篮本体1上的可靠定位,从而进一步提高刀叉前篮组件2的使用性能。

[0065] 在本实用新型的一些实施例中,参照图1至图3,锁扣13在适于锁紧上筋条21的锁扣位置和适于释放上筋条21的释放位置之间可移动地与刀叉篮本体1相连,锁扣13常处于锁扣位置,且锁扣13上连接有锁扣拨片131,锁扣拨片131可以用于驱动锁扣13朝释放位置移动。由此,易于控制锁扣13在锁扣位置与释放位置之间的转换,从而实现刀叉前篮组件2在展开状态与折叠状态之间的转换,便于利用刀叉前篮组件2的不同功能,更好地满足用户的需求。

[0066] 参照图1和图2,根据本实用新型实施例的刀叉篮100还包括把手3,把手3可以设在刀叉篮本体1上,把手3与刀叉篮本体1铰接。其中,在所述展开状态,刀叉篮本体1的上沿高于刀叉前篮组件2的上沿,把手3的上沿高于刀叉篮本体1的上沿。由此,当刀叉前篮组件2处于所述展开状态时,易于实现刀叉篮100和刀叉篮100内餐具等的转移。

[0067] 根据本实用新型第二方面实施例的洗碗机200,结合图9和图10,包括:刀叉托盘201和刀叉篮。刀叉篮可取出地搁置在刀叉托盘201上,刀叉篮为上述的刀叉篮100,刀叉篮100的刀叉前篮组件2位于刀叉篮本体1的外侧(例如,图9或图10中面向用户的一侧)。由此,易于实现刀叉类餐具的清洗和转移。

[0068] 下面结合图1至图10详细描述根据本实用新型刀叉篮100的一个具体实施例。

[0069] 具体而言,如图1和图2所示,根据本实用新型实施例的刀叉篮100包括:刀叉篮本体1、刀叉前篮组件2以及把手3。

[0070] 其中,刀叉前篮组件2由多个筋条(包括上筋条21和多个下筋条22)装配而成,本实用新型以八层筋条(即上筋条21和七个下筋条22)为例讲述折叠原理:最上面一层筋条即上筋条21为一根整体式筋条,左右两侧和中间分别设置有第二导向部212,用以在刀叉篮本体1上的四根滑柱12上上下下滑动,下方每层筋条即七个下筋条22皆为两段式,且左右对称,每段筋条左右两段也设置有第一导向槽2222,以下筋条22为例,第一导向槽2222的开口朝向互相垂直,第一导向槽2222的背面底部分别设置有第一限位凸块2221,第一限位凸块2221

分别与相邻下层下筋条21的第二导向槽2223配合,以实现滑动,进而可实现八层筋条上下滑动可折叠的目的。

[0071] 如图1至8所示,最上方一层筋条即上筋条21的中间设有卡柱214,卡柱214与刀叉篮本体1中间的锁扣13配合,当上筋条21向上滑至最上方时,卡柱214卡入锁扣13中,此时刀叉前篮组件2呈展开状态。

[0072] 同理,拨动刀叉篮本体1中间的卡槽拨片131,则卡柱214从锁扣13中脱离,然后向下拉动上筋条21,八层筋条逐次滑动,折叠在一起,此时刀叉前篮组件2呈折叠状态。

[0073] 参照图9和图10,具体使用时,将刀叉前篮组件2平躺放入刀叉托盘201中,然后将刀叉前篮组件2滑动折叠,使刀叉餐具曝露,或直接接受清洗,或将刀叉取出在刀叉托盘201另外一侧规整摆放接受清洗。同理逆向地,需要取用刀叉时,将刀叉托盘201另外一侧规整摆放的刀叉餐具拾入刀叉前篮组件2中,然后滑动上筋条21,直至刀叉前篮组件2呈展开状态,然后拎起把手3,从刀叉托盘201中取出,进而可将刀叉餐具拿去餐桌取用,整个过程易取易放,方便快捷。

[0074] 根据本实用新型实施例的刀叉篮100,多个下筋条22与上筋条21相连并随上筋条21联动,使得刀叉前篮组件2可以在折叠状态和展开状态之间转换,这样不仅方便刀叉餐具的清洗,还便于用户取用刀叉餐具,使得用户可以分别利用刀叉篮100处于折叠状态和展开状态时的不同功能,更好地满足用户的需求。

[0075] 在本说明书的描述中,参考术语“一个实施例”、“一些实施例”、“示例”、“具体示例”或“一些示例”等的描述意指结合该实施例或示例描述的具体特征、结构、材料或者特点包含于本实用新型的至少一个实施例或示例中。在本说明书中,对上述术语的示意性表述不必须针对的是相同的实施例或示例。而且,描述的具体特征、结构、材料或者特点可以在任一个或多个实施例或示例中以合适的方式结合。此外,在不相互矛盾的情况下,本领域的技术人员可以将本说明书中描述的不同实施例或示例以及不同实施例或示例的特征进行结合和组合。

[0076] 尽管上面已经示出和描述了本实用新型的实施例,可以理解的是,上述实施例是示例性的,不能理解为对本实用新型的限制,本领域的普通技术人员在本实用新型的范围内可以对上述实施例进行变化、修改、替换和变型。

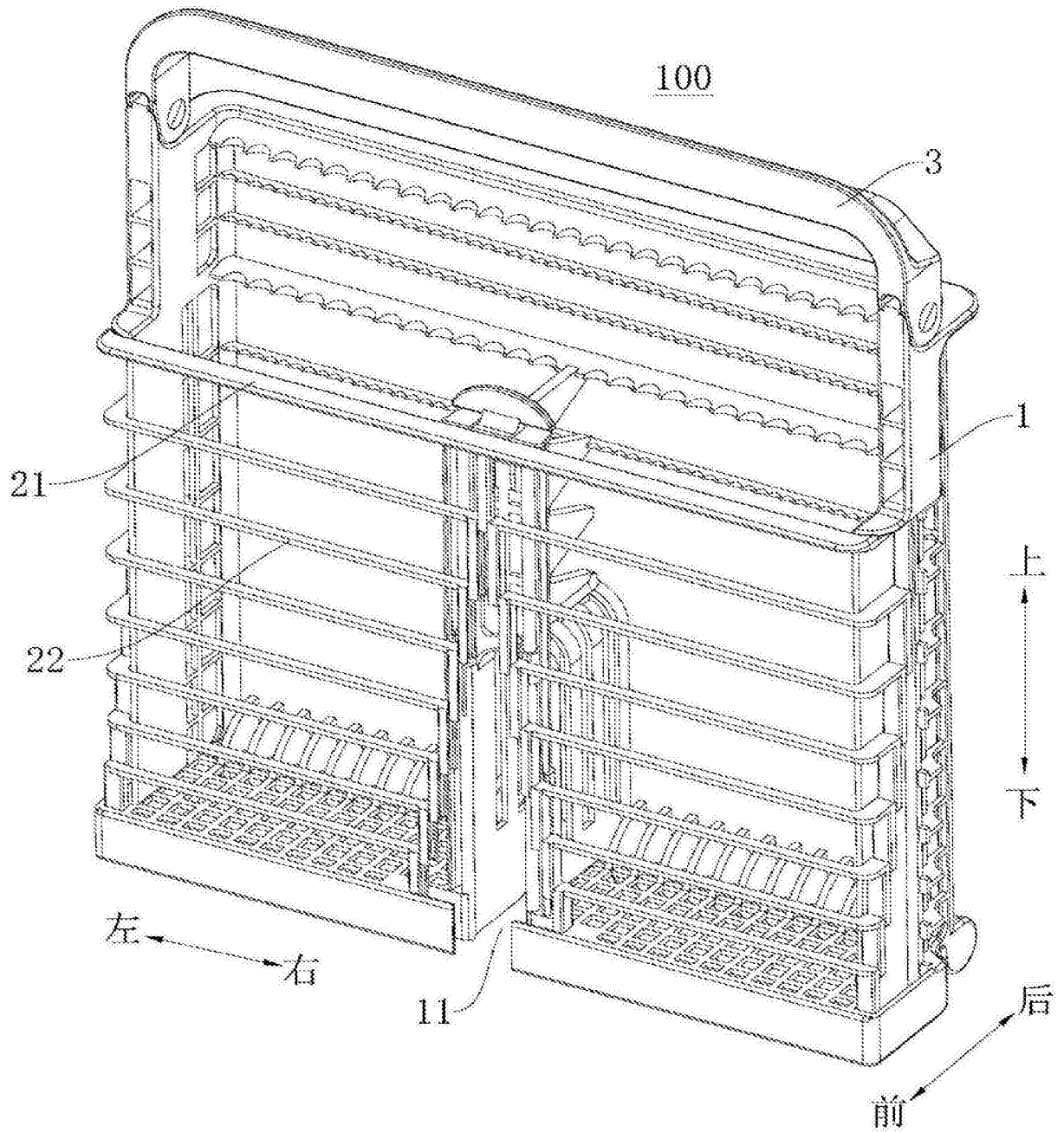


图1

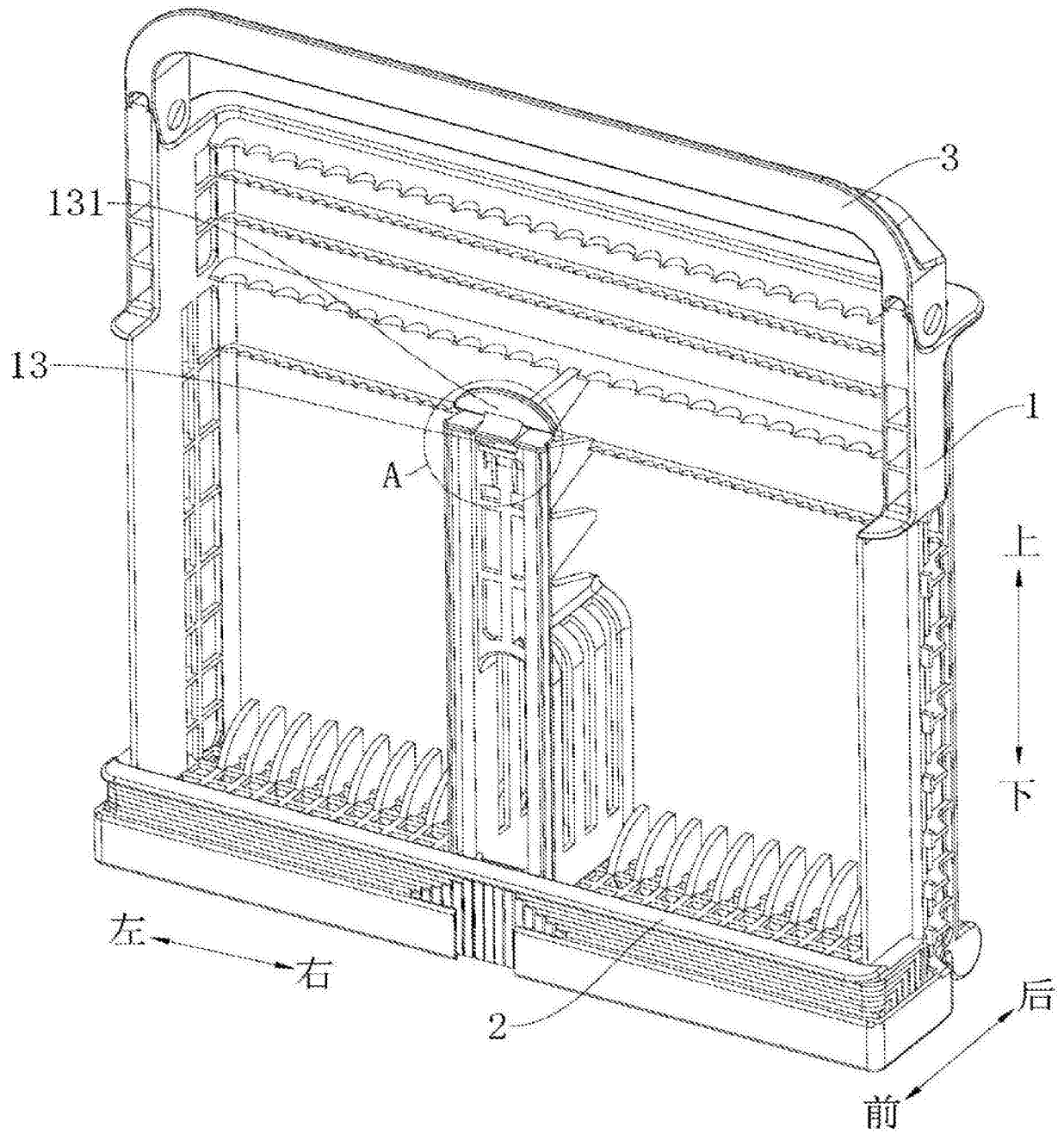


图2

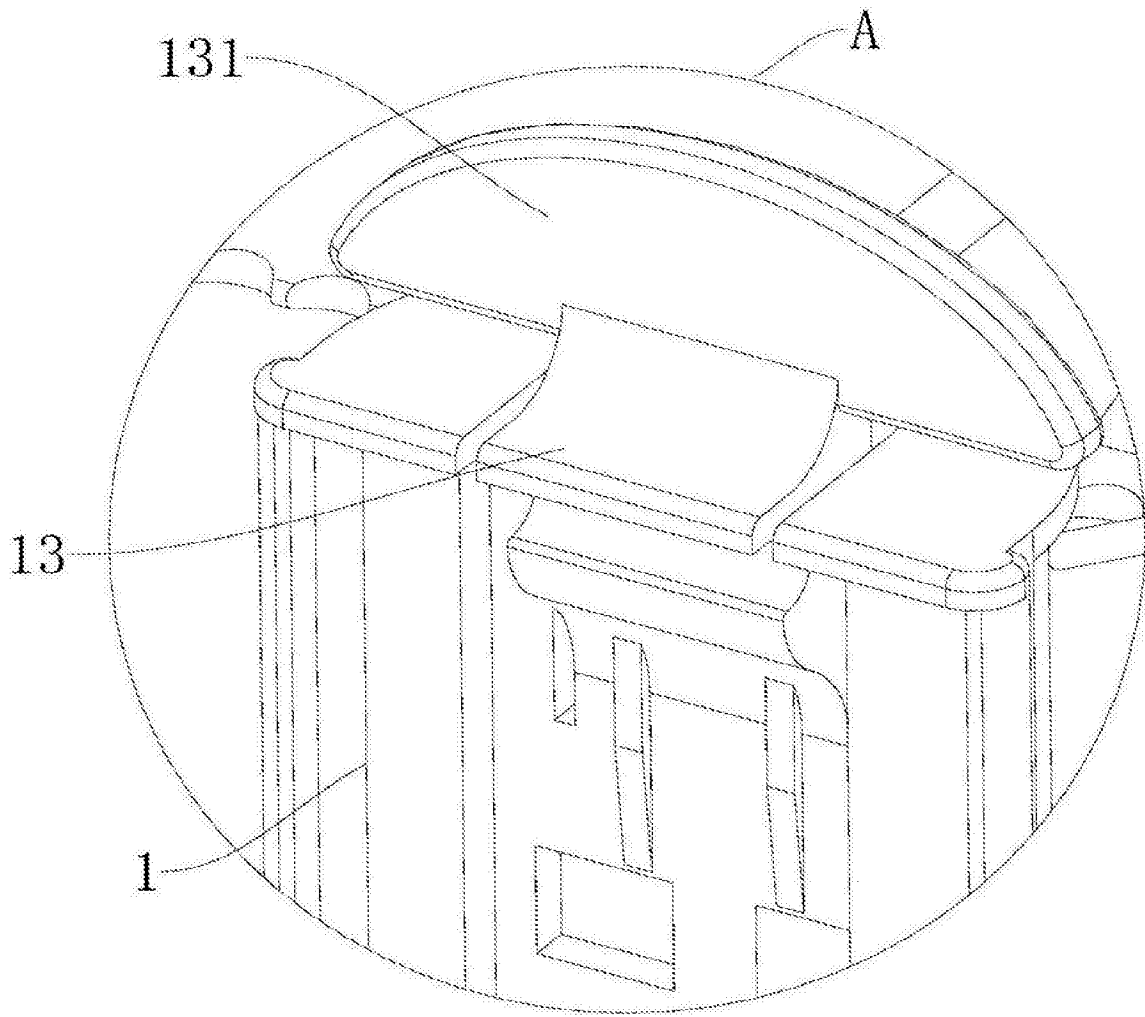


图3

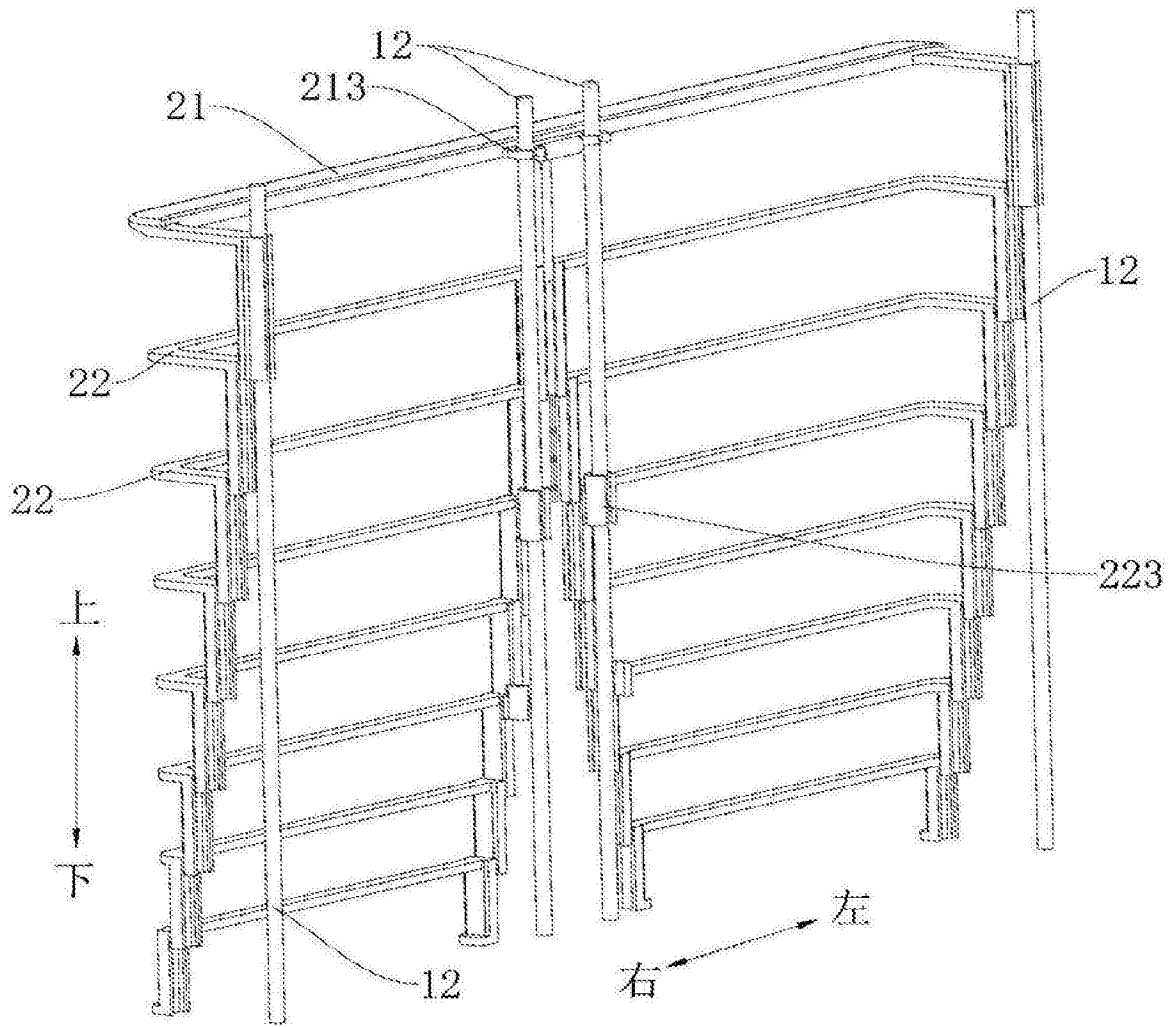


图4

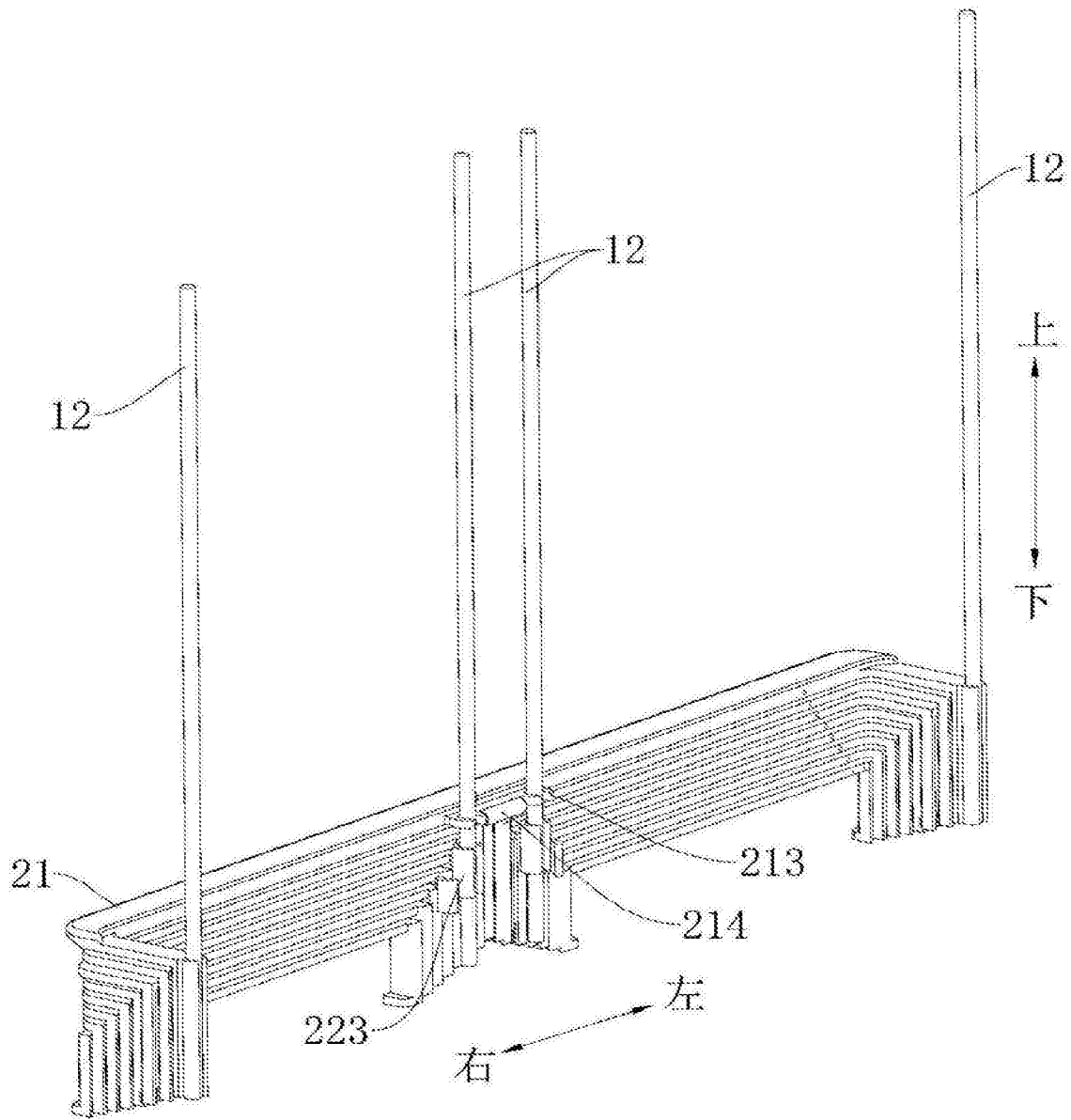


图5

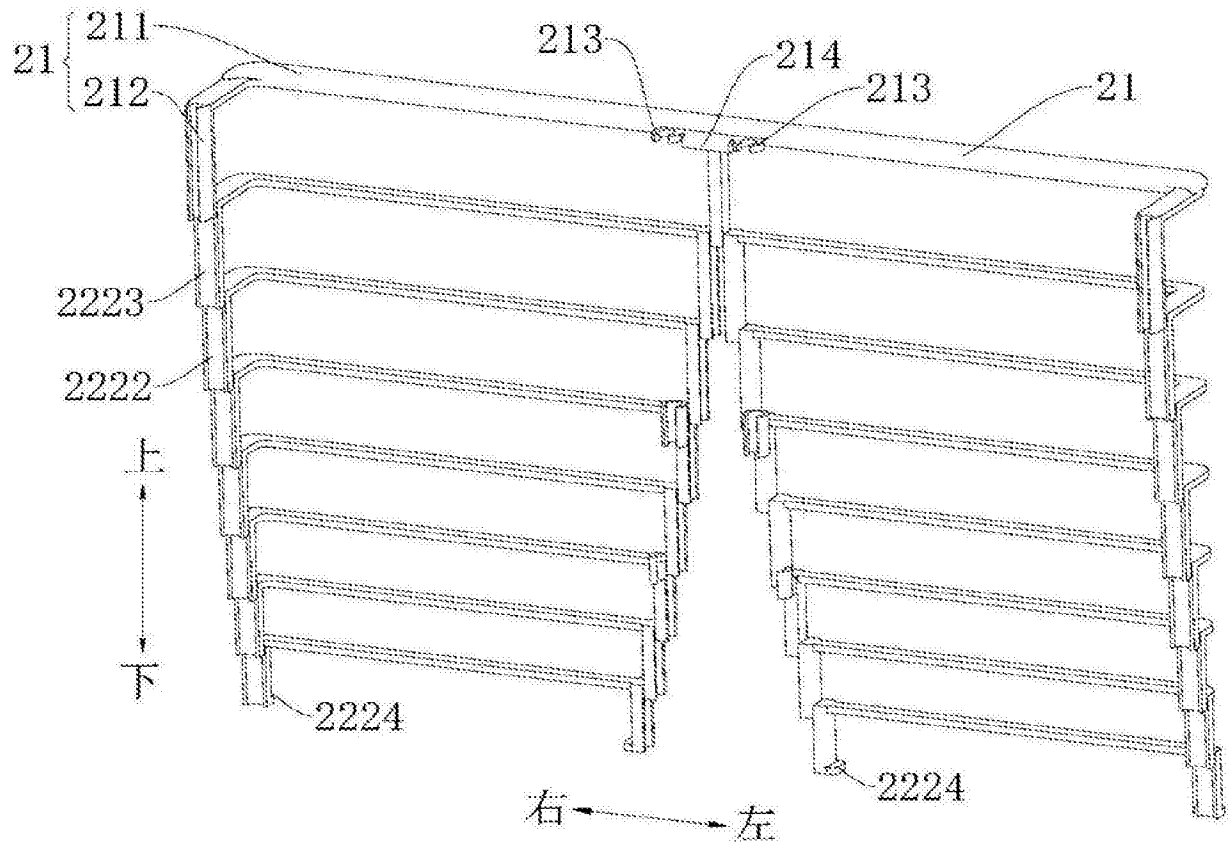


图6

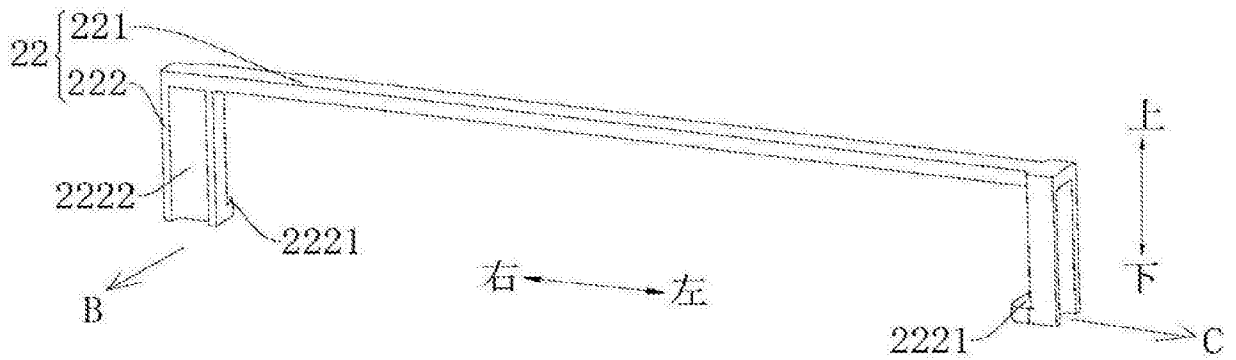


图7

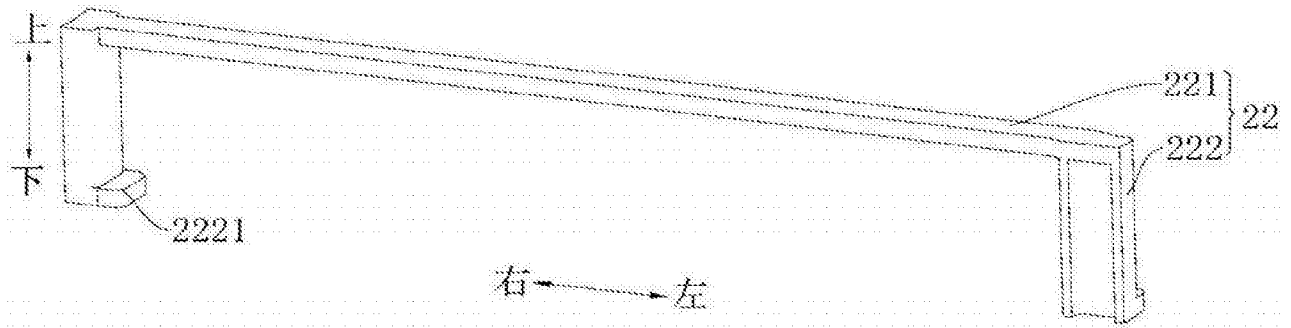


图8

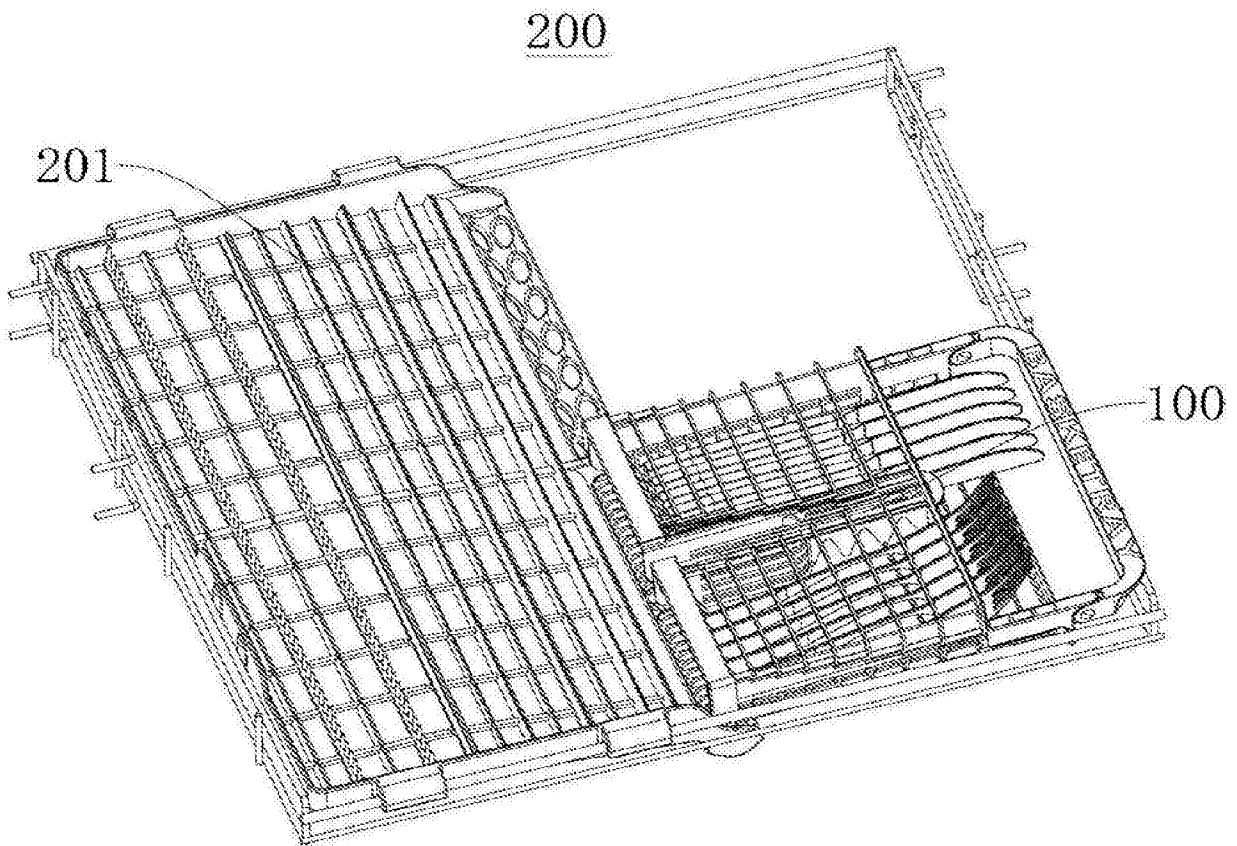


图9

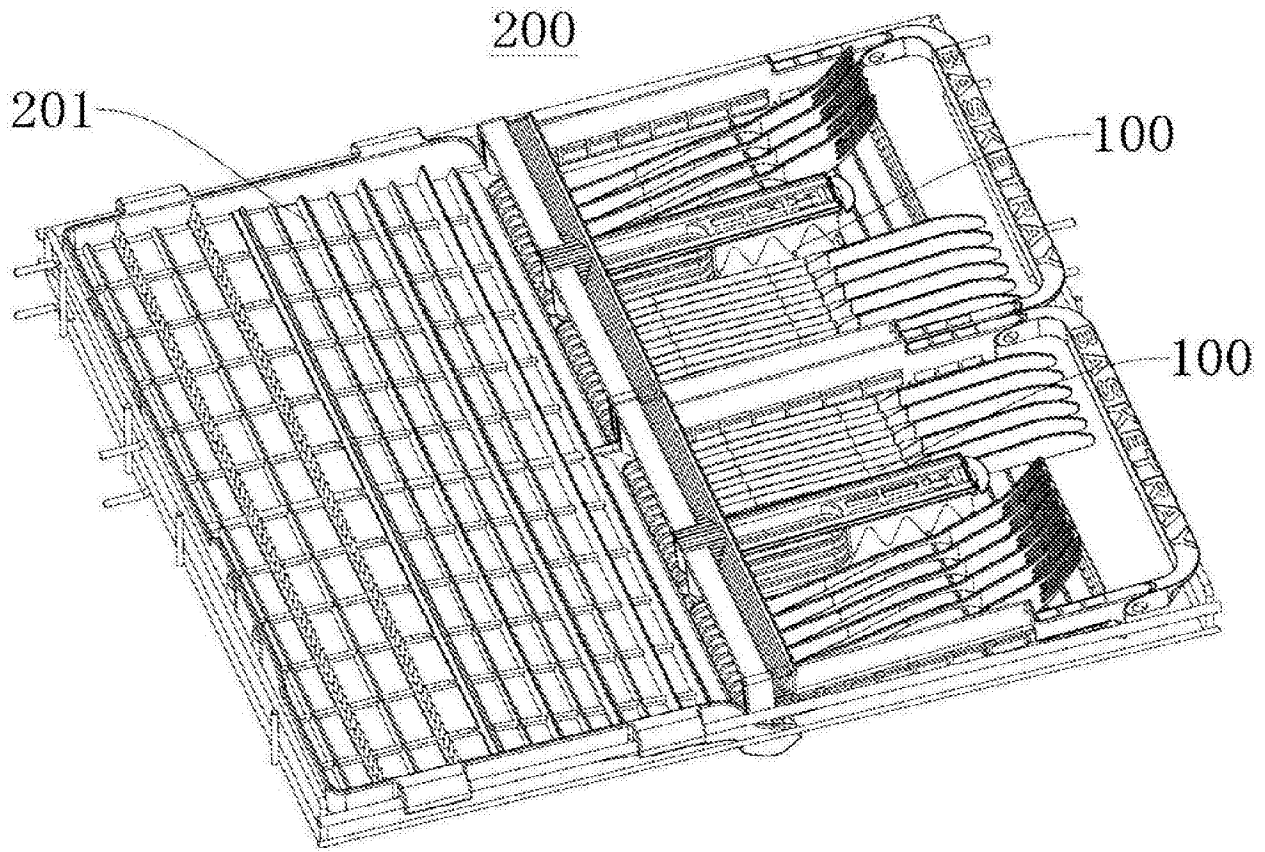
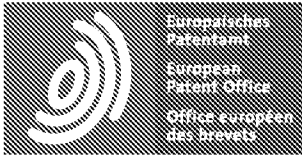


图10



Espacenet

FR2643809A1 Removable accessory for dishwasher

Applicants: ESSWEIN SA [FR]

Inventors: CLAVEL PAUL

Classifications:

IPC **A47L15/50**; (IPC1-7): A47L15/42; A47L15/50;

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Removable accessory for dishwasher

Abstract

Removable accessory for dishwasher, this accessory being designed to hold cutlery 3. It takes the form of a flat perforated case 1. Several pieces of cutlery 3 can be secured inside this case, which takes up about the same amount of space in the dishwasher as a large soup plate.

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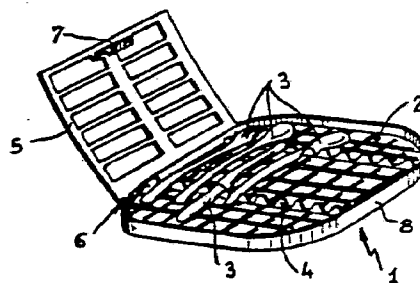
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(54) Accessoire amovible pour lave-vaisselle.

(57) Accessoire amovible pour lave-vaisselle, cet accessoire
étant destiné à recevoir des couverts de table 3.

Il se présente sous la forme d'une pochette plane 1 à claire-
voie. Cette pochette est apte à emprisonner plusieurs couverts
3, et son encombrement dans le lave-vaisselle est du même
ordre que celui d'une grande assiette creuse.



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ACCESSOIRE AMOVIBLE POUR LAVE-VAISSELLE

La présente invention se rapporte à un accessoire amovible pour lave-vaisselle, cet accessoire étant destiné à contenir des couverts de table.

5 Dans les lave-vaisselle couramment répandus, les couverts de table se placent dans un panier amovible prévu à cet effet. Ce genre de panier amovible présente généralement plusieurs compartiments qui sont tous ouverts vers le haut afin de permettre l'introduction et le retrait des couverts.

10 Dans ce panier, les couverts, qu'il s'agisse de couteaux, de fourchettes, ou de cuillers, sont placés avec leur manche orienté vers le bas, et leur autre partie, c'est-à-dire en fait la partie sale, orientée vers le haut et dépassant généralement de la face supérieure du panier.
15 Ceci a pour inconvénient que l'utilisateur risque de se blesser, en se piquant ou en se coupant, lorsqu'il place les couverts dans ce panier ou lorsqu'il les en extrait. En outre, il est désagréable pour cet utilisateur de devoir pratiquement toujours saisir les couverts par leur moitié
20 sale pour les mettre en place dans ce panier avant le lavage.

Enfin, ce genre de panier à couverts, qui est assez volumineux, prend une place non négligeable dans le lave-vaisselle, cette place assez importante ayant en outre
25 pour inconvénient d'être généralement localisée en un emplacement bien déterminé du lave-vaisselle. Il en résulte un manque de souplesse en ce qui concerne les possibilités de remplissage de ce lave-vaisselle.

L'invention vise à remédier à ces inconvénients.
30 Elle se rapporte à cet effet à un accessoire amovible pour lave-vaisselle, cet accessoire étant destiné à contenir des couverts de table, et se présentant sous la forme d'une pochette plane à claire-voie. Cette pochette est apte à emprisonner plusieurs couverts de table et son encombrement

dans le lave-vaisselle est du même ordre que celui d'une grande assiette creuse. Elle est préférentiellement constituée en matière plastique de qualité alimentaire.

De toute façon, l'invention sera bien comprise, et ses avantages et autres caractéristiques ressortiront, lors de la description suivante de quelques exemples non-limitatifs de réalisation, en référence au dessin schématique annexé dans lequel :

- 10 - Figure 1 est une vue en perspective d'une forme de réalisation de cet accessoire, représenté ouvert et partiellement rempli de couverts de table ;
- Figure 2 montre un accessoire semblable à celui de la figure 1, mais de forme légèrement différente, en place dans le panier supérieur, ou inférieur, d'un lave-
15 vaisselle ;
- Figure 3 montre une possibilité de positionnement de cet accessoire contre le plafond de la cuve d'un lave-vaisselle ;
- Figure 4 montre une variante de réalisation de cet accessoire, représenté sur cette figure en position ouverte ;
20 - Figure 5 montre l'accessoire de la figure 4, en position fermée ;
- Figure 6 montre quelques possibilités de positionnement d'un tel accessoire en différents autres endroits d'un
25 panier, supérieur ou inférieur, de lave-vaisselle ;
- Figure 7 montre une autre variante de réalisation de cet accessoire, en position de chargement avant lavage ; et
- Figure 8 montre l'accessoire selon la figure 7, en position de déchargement après lavage.

30 En se reportant tout d'abord à la figure 1, cet accessoire se présente sous la forme d'une pochette plane 1 à claire-voie, en matière plastique de qualité alimentaire, et comprenant :

- . Une partie principale rigide, ou réceptacle 2, qui affecte une forme de plat présentant un rebord périphérique de

protection 8. Cette partie principale 2 est apte à recevoir les couverts 3, posés à plat l'un à côté de l'autre, et des cannelures 4 sont prévues en conséquence sur le fond plat du réceptacle 2, afin de maintenir ces couverts 3 en place dans ce réceptacle. Le réceptacle 2 est d'un encombrement transversal légèrement supérieur (d'environ 10 à 20 %) à celui d'une grande assiette creuse.

Un couvercle semi-rigide 5, qui est articulé autour d'un côté 6 du réceptacle 1, et qui est apte à se refermer sur ce dernier, par encliquetage par dessus le rebord 2 au moyen d'un crochet semi-rigide 7.

L'épaisseur de cette pochette 1 est suffisamment faible (par exemple sensiblement égale à celle d'une assiette creuse) pour qu'une fois remplie de couverts 3, puis refermée à l'aide du couvercle 5, elle puisse prendre, comme le montre la figure 2, la place qu'occupe les autres assiettes 13 dans le panier, supérieur ou inférieur 9, prévu à cet effet dans un lave-vaisselle.

A titre illustratif, cette pochette à couverts 1 est représentée légèrement différente sur cette figure 2, où elle affecte alors une forme circulaire. Bien entendu, d'autres formes sont possibles (par exemple une forme ovale).

Cette pochette s'utilise de façon très propre, et sans aucun danger de pique ou de coupure par les couverts 3. L'utilisateur saisit chaque couvert à laver 3 (couteau, fourchette, cuiller) par son manche, et le place dans le réceptacle 1, en position de blocage imposée par les cannelures 4 (figure 1). Ce réceptacle 1 reçoit ainsi environ une dizaine de couverts 3.

Le réceptacle ainsi rempli, l'utilisateur referme le couvercle 5 sur celui-ci, par encliquetage au moyen du crochet semi-rigide 7 : les couverts 3 ne peuvent alors plus bouger.

Il est alors aisé de placer la pochette dans le lave-vaisselle, par exemple comme schématisé figure 2 à la place prévue pour une assiette, ou en un autre endroit : à ce propos, la figure 3 montre une intéressante possibilité
5 de placer cette pochette sous le plafond 10 de la cuve 11 du lave-vaisselle, au moyen de cornières 12, alors prévues à cet effet.

Le fait que la pochette 1 soit à claire-voie autorise un lavage optimal des couverts 3. Le lavage terminé,
10 l'utilisateur n'a plus qu'à extraire cette pochette 1 du lave-vaisselle, à l'ouvrir à l'aide du couvercle articulé 5 et de son crochet d'encliquetage 7, puis à sortir les couverts propres 3 un à un pour les ranger.

La pochette 1 est alors prête pour une nouvelle
15 utilisation, car à l'instar des couverts 3 qu'elle contenait, elle est ressortie du lave-vaisselle parfaitement propre. Bien entendu, il conviendra d'utiliser en général plusieurs de ces pochettes 1 à chaque lavage, selon le nombre de couverts 3 à nettoyer.

Il va de soi que bien d'autres formes de réalisation sont possibles pour cette pochette. Il est par exemple possible de lui donner une véritable forme de pochette, trouvant sa place soit à l'emplacement normalement réservé à une assiette, soit ailleurs entre différents objets de
25 vaisselle à laver : à titre illustratif, il sera maintenant décrit, en référence aux figures 5 à 8, deux réalisations de ce type.

La pochette représentée aux figures 4 et 5 est composée de deux parties planes rigides et sensiblement
30 identiques 14 et 15, toujours en matière plastique et à claire-voie, qui sont articulées l'une par rapport à l'autre autour d'une axe transversal de rotation X qui est confondu avec un bord transversal commun 16. Des créneaux 17 sont prévus sur au moins une des deux moitiés 14, 15, afin de maintenir en place les couverts 3.

La longueur L de cette pochette est préférentiellement inférieure à celle d'un couvert 3 (couteau, cuiller à soupe, ou fourchette standards) de sorte que, comme représenté aux figures 4 et 5, le manche 18 de chaque couvert 3 se place à l'intérieur de la pochette 14, 15, tandis que sa tête 19 en dépasse : ceci entraîne un bon lavage des couverts, dont seule la tête 19 est vraiment sale. Bien entendu, les pochettes selon les figures 1 et 2 pourraient être conformées pour procurer ce même effet.

La fermeture de la pochette pleine s'effectue en faisant tourner les parties 14, 15 autour de leur axe commun X, des boutons d'extrémité 20 favorisant et guidant cette rotation. Le maintien en position fermée, selon la figure 5, s'effectue là encore par encliquetage classique, au moyen de crochets semi-rigides 21 prévus de moulage sur le bord libre transversal 22 de la moitié 15, et d'évidements complémentaires (non apparents) prévus à cet effet sur la tranche du bord libre transversal 23 de l'autre moitié 14. La pochette selon les figures 4 et 5 peut bien entendu remplacer une assiette dans la le lave-vaisselle. En plus, comme le montre la figure 6, elle peut se loger facilement, en 24, 25, 26 ou 27, par exemple, dans le panier supérieur 28 d'un lave-vaisselle ou dans on panier inférieur, en fonction de la place disponible dans ce panier.

Enfin, les figures 7 et 8 montrent un autre exemple de réalisation possible pour une pochette à couverts conforme à l'invention.

Il s'agit dans ce cas d'une pochette à claire-voie, réalisée en matière plastique semi-rigide d'un seul bloc. Ses deux moitiés 29, 30 ne sont pas articulées l'une sur l'autre, mais elles peuvent s'écarter légèrement sur un côté commun 31, en raison du caractère semi-rigide du matériau utilisé : ce côté commun 31 forme une fente par laquelle les couverts à laver 3 sont introduits comme indiqué

par la flèche F, là encore avec leur manche 18 à l'intérieur de la pochette 29, 30, et leur tête en dépassant. Cette pochette ne comporte pas de créneaux semblables aux créneaux 17 précités (figure 4), pour ne pas gêner l'introduction et le retrait des couverts 3.

Comme le montrent ces figures 7 et 8, l'introduction des couverts 3 à laver s'effectue du haut en bas, avec la fente 31 tournée vers le haut. A contrario, leur extraction, après lavage au lave-vaisselle, s'effectue bien également du haut en bas, mais avec la fente 31 tournée vers le bas.

Comme il va de soi, l'invention n'est pas limitée aux quelques exemples de réalisation qui viennent d'être décrits, et bien d'autres formes de réalisation de cette pochette à claire-voie sont imaginables sans qu'elles sortent du cadre de la présente invention.

REVENDEICATIONS

1 - Accessoire amovible pour lave-vaisselle, cet accessoire étant destiné à recevoir des couverts de table (3), caractérisé en ce qu'il se présente sous la forme d'une pochette plane (1, 14 - 15, 29 - 30) à claire-voie, qui est apte à emprisonner plusieurs couverts de table (3) et dont l'encombrement dans le lave-vaisselle est du même ordre que celui d'une grande assiette creuse.

2 - Accessoire selon la revendication 1, caractérisé en ce que cette pochette (1, 14 - 15, 29 - 30) est réalisée en matière plastique de qualité alimentaire.

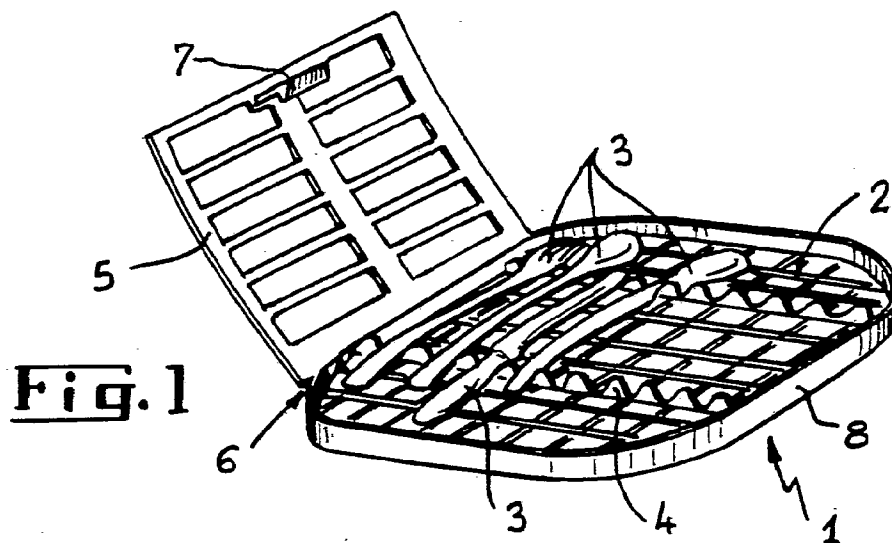
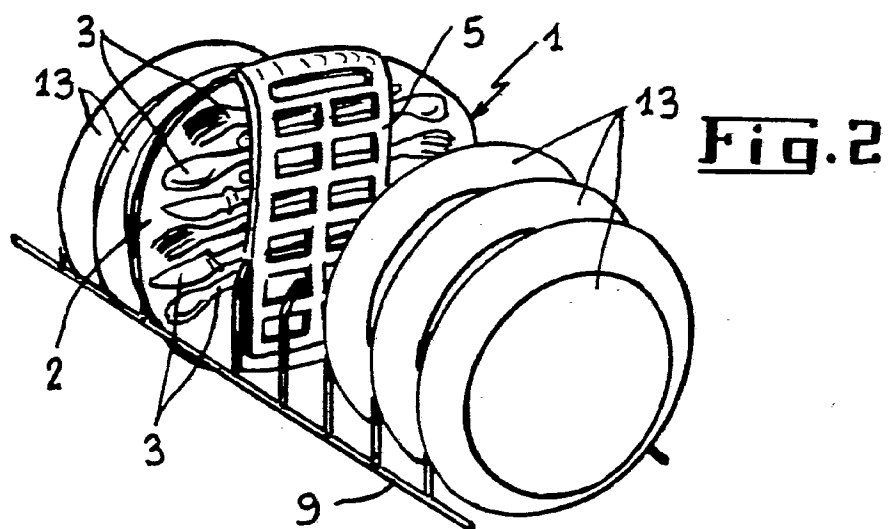
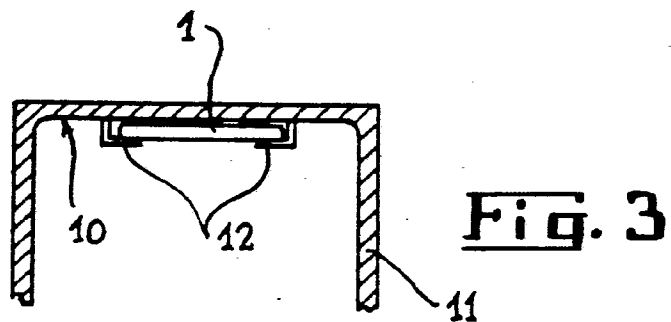
3 - Accessoire selon la revendication 1 ou la revendication 2, caractérisé en ce que cette pochette est composée d'un réceptacle rigide (2), affectant une forme de plat et pourvu de cannelures (4) de maintien des couverts (3), et d'un couvercle (5) articulé sur ce réceptacle (2).

4 - Accessoire selon la revendication 1 ou la revendication 2, caractérisé en ce que la pochette est constituée de deux moitiés sensiblement identiques (14, 15), qui sont articulées l'une par rapport à l'autre autour d'un axe de rotation (X) confondu avec un bord transversal commun, des moyens (17) de maintien des couverts (3) étant prévus sur au moins une de ces deux moitiés (14, 15).

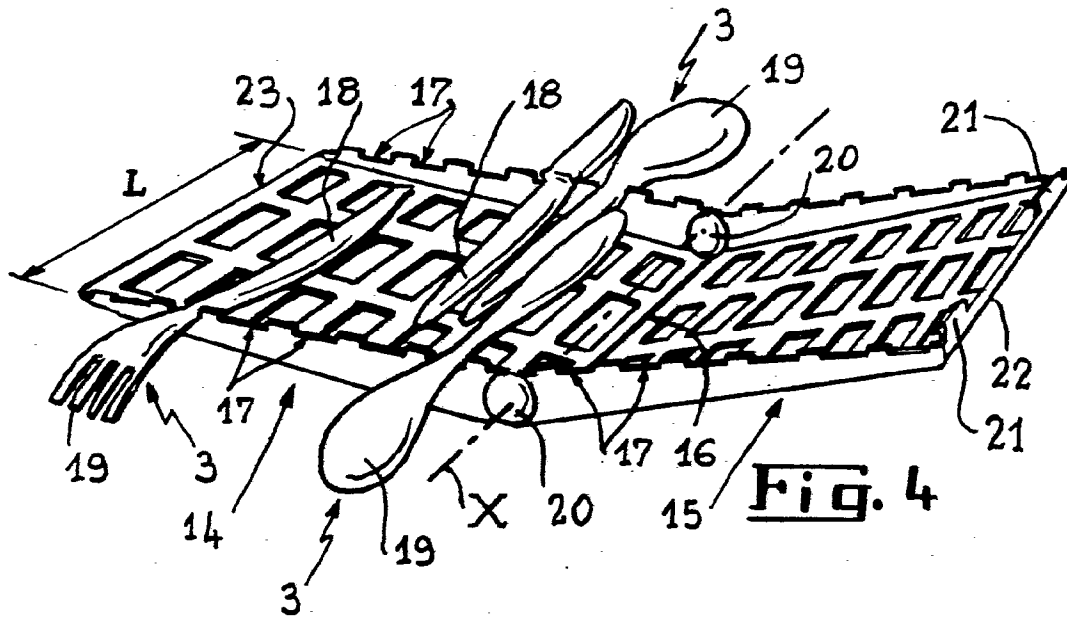
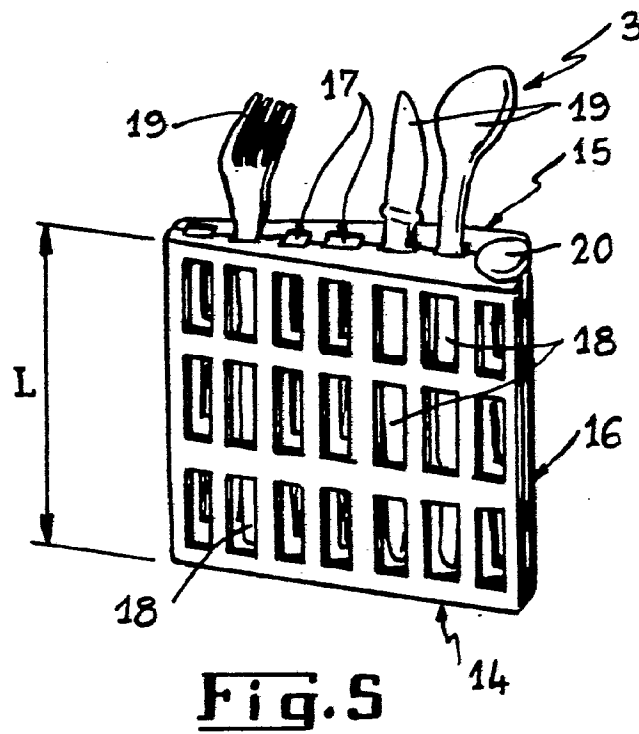
5 - Accessoire selon la revendication 1 ou la revendication 2, caractérisé en ce qu'elle comporte deux moitiés semi-rigides (29, 30) qui sont agencées pour définir entre elles une fente (31) d'introduction et de retrait des couverts.

6 - Accessoire selon l'une des revendications 1 à 5, caractérisé en ce qu'il est dimensionné de telle sorte que le manche (18) de chaque couvert (3) se place à l'intérieur de la pochette, tandis que sa tête (19) en dépasse.

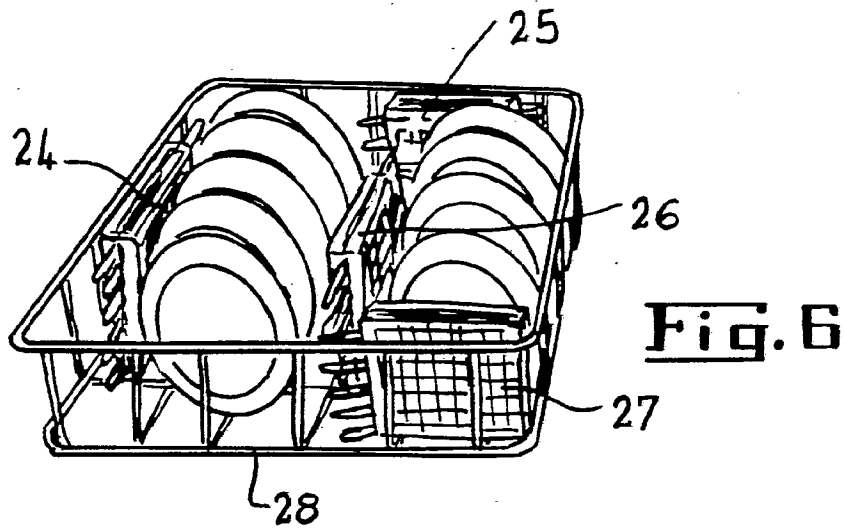
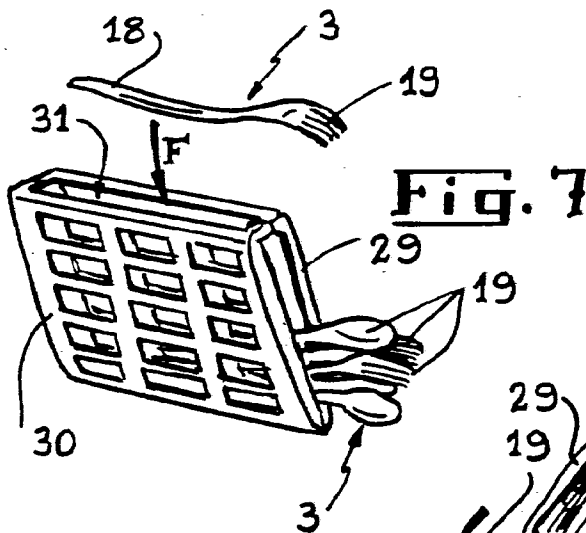
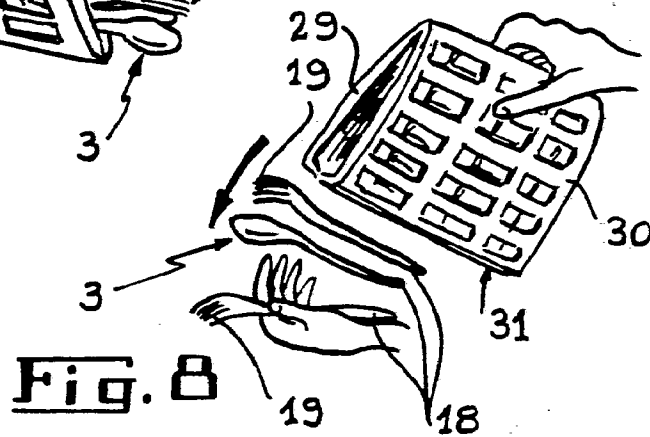
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2/3



3/3

**Fig. 6****Fig. 7****Fig. 8**

(19)



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(54) Dishwasher with a door provided with a cutlery rack

(57) A dishwasher with increased loading capacity for items to be washed, particularly with regard to cutlery.

The dishwasher to which the present invention relates is of the type comprising a parallelepipedal washing chamber (4) accessible from the front through a door (2) pivotable about a horizontal articulation axis (3) disposed in the vicinity of the bottom of the chamber, the dishwasher comprising a plurality of crockery compartments (5, 6) slidable horizontally like drawers in the chamber (4) on respective sliding guides (7, 8) carried by the internal vertical side walls (9, 10) of the chamber. The machine also has a container (14) with grid-like walls for housing cutlery in general, the container (14) being carried by the face (11) of the door (2) which faces the interior of the washing chamber (4) when the door is closed.

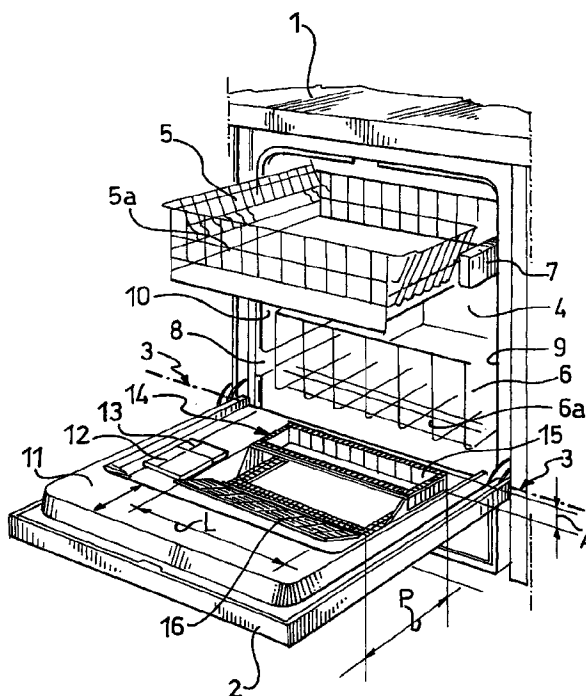


FIG.1

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Description

[0001] The present invention relates to a dishwasher with increased loading capacity for the items to be washed, particularly with regard to cutlery.

[0002] The dishwasher to which the present invention relates is of the type comprising a parallelepipedal washing chamber accessible from the front through a door pivotable about a horizontal articulation axis disposed in the vicinity of the bottom of the chamber, the dishwasher also comprising a plurality of crockery compartments slidable horizontally like drawers in the chamber on respective sliding guides carried by the internal vertical side walls of the chamber.

[0003] In dishwashers of the type indicated above, the cutlery is generally housed for washing in a vertical position in baskets with walls and bases which are perforated to allow the water to pass through them. These baskets are placed in one of the crockery compartments of the machine, usually in the lower one, and can be removed manually.

[0004] The number of baskets varies according to the amount of cutlery to be washed.

[0005] Although, on the one hand, these baskets are convenient to use since they can easily be removed from the machine manually, on the other hand, they cause a series of problems.

[0006] First of all, when they are placed in the crockery compartment, they reduce the crockery space which is reduced to a greater extent the more cutlery there is to be washed and hence the greater the number of baskets used.

[0007] Moreover, when the baskets are not used during a washing operation, they take up space whether they are kept outside the dishwasher or are left inside where they occupy space which could more appropriately be used for crockery.

[0008] The object of the present invention is to provide a dishwasher having a cutlery container which does not interfere with the space intended for the loading of the crockery but which nevertheless permits the use of conventional cutlery baskets if it is considered necessary.

[0009] The object is achieved by the dishwasher the characteristics of which are given in appended Claim 1.

[0010] The invention will now be described in greater detail with reference to some preferred embodiments thereof, illustrated in the appended drawings provided purely by way of non-limiting example, in which:

Figure 1 is a schematic, perspective view of a dishwasher with the door in the open position and with a cutlery container formed in accordance with a first embodiment of the invention,

Figure 2 shows, in partial vertical section, a dishwasher with the door in the closed position and with a cutlery container formed in accordance with a second embodiment,

Figure 3 is a schematic side view of the dishwasher

of Figure 1, with the door partially open,

Figure 4 is a schematic view of a dishwasher with the door in the open position, and with a cutlery container formed in accordance with the embodiment of Figure 2, with the lid open.

[0011] With reference to the above-mentioned drawings and, in particular, to Figure 1, the dishwasher 1 has a front door 2 pivotable about a horizontal axis 3 by means of conventional hinges, not shown in detail.

[0012] The machine 1 has a washing chamber 4 inside which there are crockery compartments 5 and 6 slidable like drawers on conventional guides 7 and 8 carried by the vertical side walls 9 and 10 of the chamber 4.

[0013] In addition to the conventional compartments 12 and 13 for detergent and rinse aid, the internal face 11 of the door 2 has a container, generally indicated 14, for holding cutlery.

[0014] In the embodiment shown in Figure 1, the container 14 is formed as a basket anchored firmly to the face 11 of the door 2 and comprises a perforated end 15, the depth A of which is no greater than the distance X between the face 11 of the door 2, when it is closed, and the front walls 5a and 6a of the compartments 5 and 6 when they are fully inserted in the chamber 4.

[0015] The width L of the container 14 may take up the entire free width of the face 11 up to the region of the detergent and rinse-aid compartments 12 and 13.

[0016] The width L, like the length P, is in any case no less than the length of an item of table cutlery.

[0017] At the opposite end to the end 15, the container 14 has a pivotable lid 16 for preventing the cutlery from coming out of the container after the cutlery has been inserted manually and the door 2 has been closed for washing cycles to be performed.

[0018] The formation of the container 14 as a perforated basket allows the washing water to penetrate between the items of cutlery.

[0019] The cutlery can also be loaded into the container 14 through the end opposite the end wall 15 with the door 2 in an inclined or semi-open position, as shown in Figure 3.

[0020] With reference to Figure 2, the cutlery container is indicated 140 and is connected to the internal face 11 of the door 2 by mechanical snap couplings constituted by recesses 141 formed in the face 11 of the door 2 and by pins 142 fixed to the container 140.

[0021] In this embodiment, the depth A of the end wall 150 is also no greater than the distance X between the front walls 5a and 6a of the drawer-like compartments 5 and 6 and the face 11 of the door 2 although, in the intermediate portion of the container 140 corresponding to the vertical space between the compartments 5 and 6, the depth of the container 140 may exceed this distance, extending up to a distance Y such as to enable it to house the rounded portions of spoons, even those larger than conventional spoons, for example, so-called

serving spoons.

[0022] The cutlery is loaded into the container 140, after the lid 240 has been raised, with the door 2 in an inclined position, as shown in Figure 3, or fully open, as shown in Figure 1.

[0023] Alternatively, the container 140 may be completely removed from the door 2 to enable the cutlery also to be loaded at a distance from the dishwasher.

[0024] With reference to Figure 4, it can be seen that the cutlery container 140 with perforated or grid-like walls has a lid 240 hinged on an axis 241 extending along the edge 242 of a base 243 which in turn is anchored to the face 11 of the door 2.

[0025] In this embodiment, the lid 240 of the container 140 can adopt a position for the loading of the cutlery, shown in Figure 4, in which it is arranged perpendicular to the face 11 of the door 2 and a washing position in which, after pivoting about the axis 241, it lies on the container parallel to the face 11 of the door 2.

[0026] The lid 240 has a convex central portion 244 for receiving and housing the rounded portions even of large serving spoons.

[0027] It is clear from the foregoing that the dishwasher according to the invention can house and hence wash a large amount of cutlery, for example, a complete service, without affecting the space in the chamber conventionally intended for crockery, although the possibility of the additional use of conventional baskets to be placed in the crockery compartments is not excluded.

[0028] Naturally, the grid-like configurations of the cutlery containers may vary according to requirements, for example, to facilitate the positioning of items of cutlery individually or in groups or to permit adequate and efficient circulation of the washing water, without thereby departing from the scope of the invention.

Claims

1. A dishwasher of the type comprising a parallelepipedal washing chamber (4) accessible from the front through a door (2) pivotable about a horizontal articulation axis (3) disposed in the vicinity of the bottom of the chamber, the dishwasher also comprising a plurality of crockery compartments (5, 6) slidable horizontally like drawers in the chamber (4) on respective sliding guides (7, 8) carried by the internal vertical side walls (9, 10) of the chamber, characterized in that the face (11) of the door (2) facing the interior of the chamber (4) is provided with a container (14, 140) for housing cutlery.
2. A dishwasher according to Claim 1, characterized in that the cutlery container (14, 140) carried by the door (2) is in the form of a basket with perforated walls.
3. A dishwasher according to Claims 1 and 2, characterized in that the end wall (15) of the cutlery container (14, 140) carried by the door (2) extends in a direction perpendicular to the face (11) of the door 20 for a distance (A) no greater than the distance (X) between the front walls (5a, 6a) of the crockery compartments (5, 6) when they are in the inserted position in the chamber (4) and the internal face (11) of the door (2).
4. A dishwasher according to Claims 1 to 3, characterized in that the central region of the cutlery container (14, 140) carried by the door (2) extends in a direction perpendicular to the face (11) of the door (2) for a distance (Y) greater than the distance (X) between the front walls (5a, 6a) of the crockery compartments (5, 6) when they are in the inserted position in the chamber (4) and the internal face (11) of the door (2), so as to be able to house the rounded portions of spoons.
5. A dishwasher according to Claims 1 to 4, characterized in that the cutlery container (14, 140) carried by the door (2) extends in directions parallel to the face (11) of the door, at least for distances (P, L) no shorter than the length of an item of table cutlery.
6. A dishwasher according to Claims 1 to 5, characterized in that the cutlery container (14) has a folding lid (16) on its open end opposite the end (15).
7. A dishwasher according to Claims 1 to 6, characterized in that the cutlery container (14) is fixed firmly to the internal face (11) of the door (2) for closing the chamber (4).
8. A dishwasher according to Claims 1 to 6, characterized in that the cutlery container (140) is fixed removably to the internal face (11) of the door (2).
9. A dishwasher according to Claims 1 to 6, characterized in that the cutlery container (140) has a lid (240) articulated by one of its edges (242) to the internal face (11) of the door (2) by means of a hinge the axis of rotation (241) of which extends parallel to the face (11) of the door so that the lid adopts an open position for the loading of the cutlery, in which it is perpendicular to the face (11) of the door, and a closed position for washing, in which it is parallel to the face (11).
10. A dishwasher according to Claim 9, characterized in that the lid (240) has a central convex portion (244) for housing the rounded portions of large serving spoons.

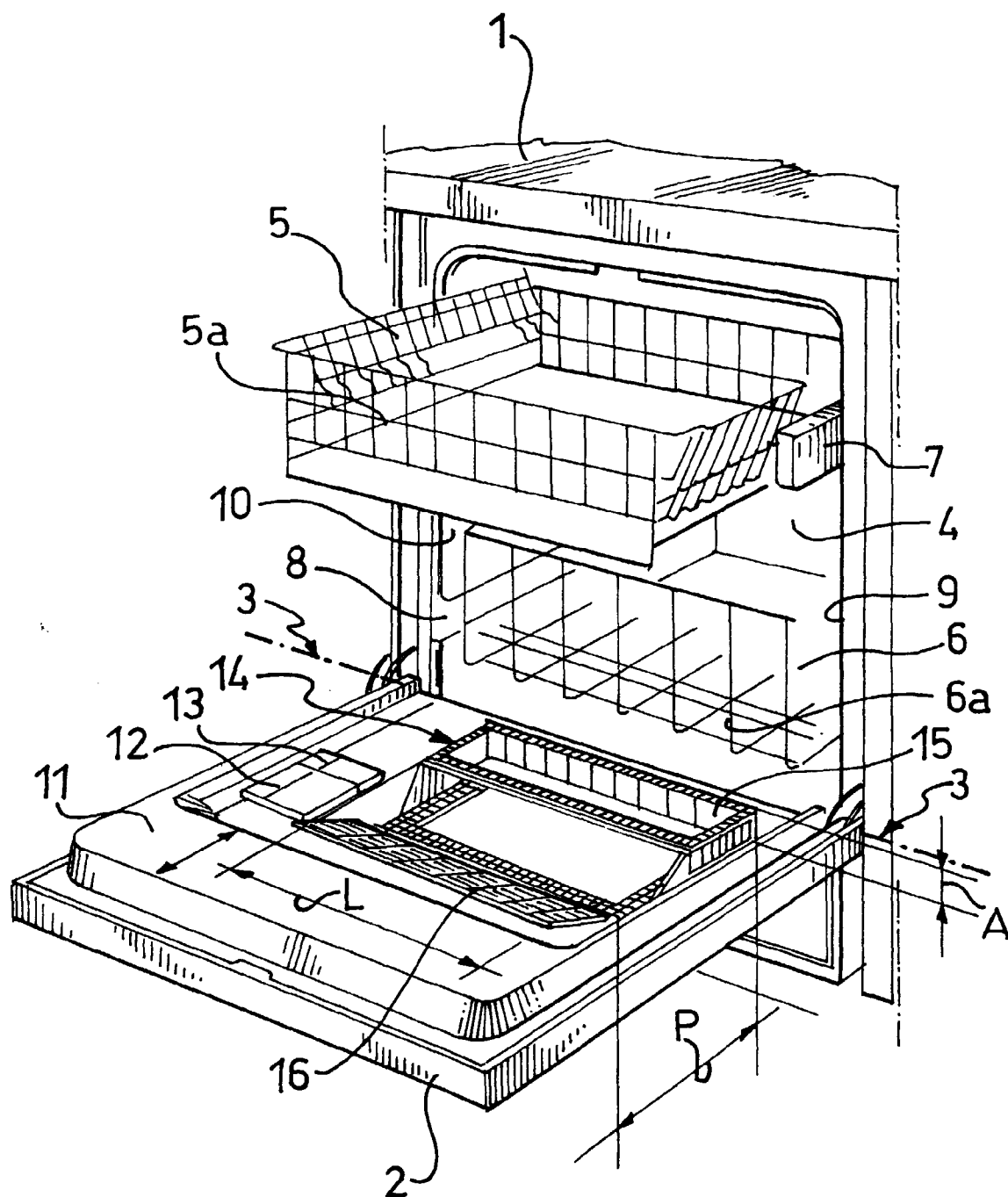
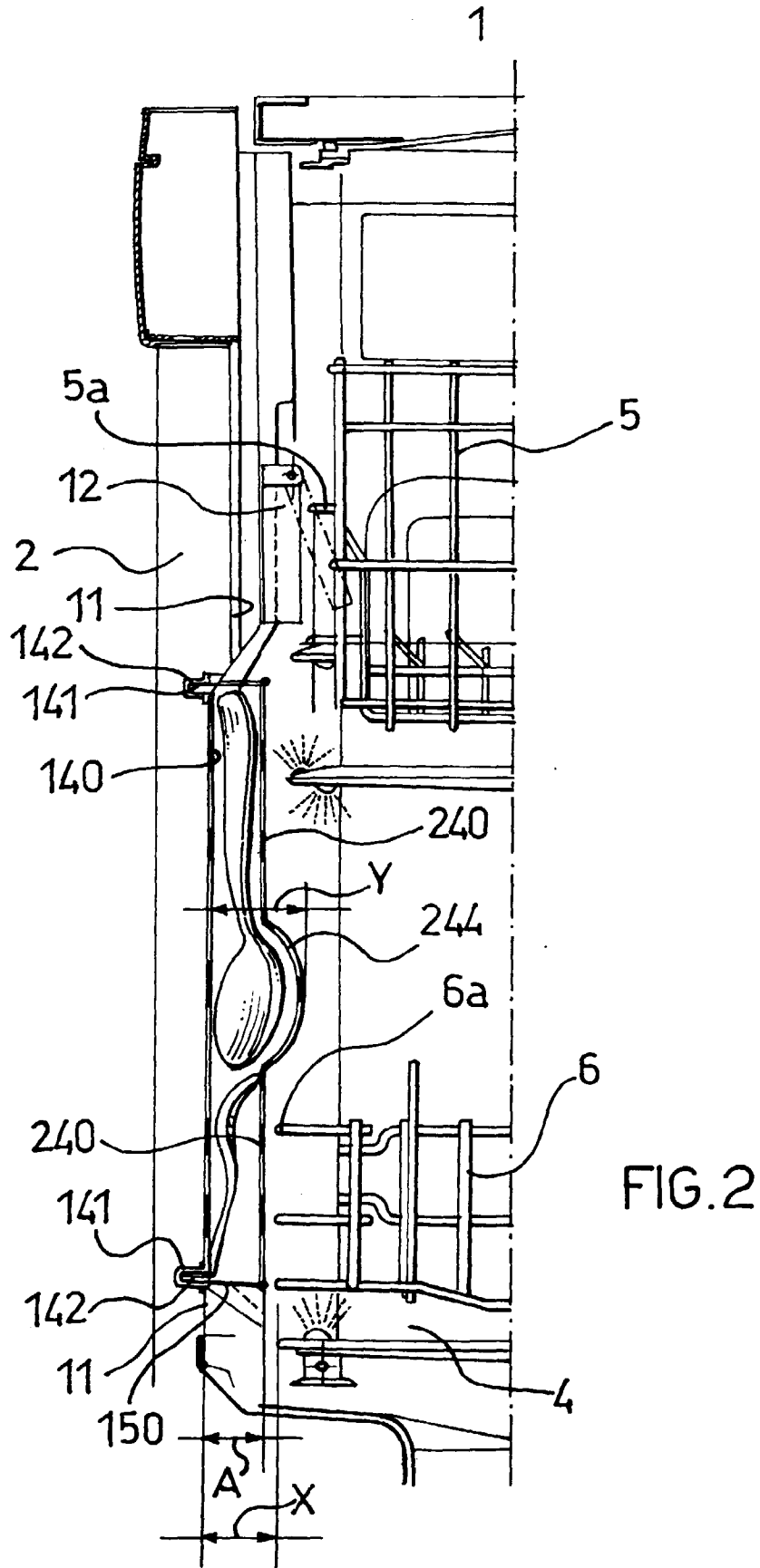


FIG.1



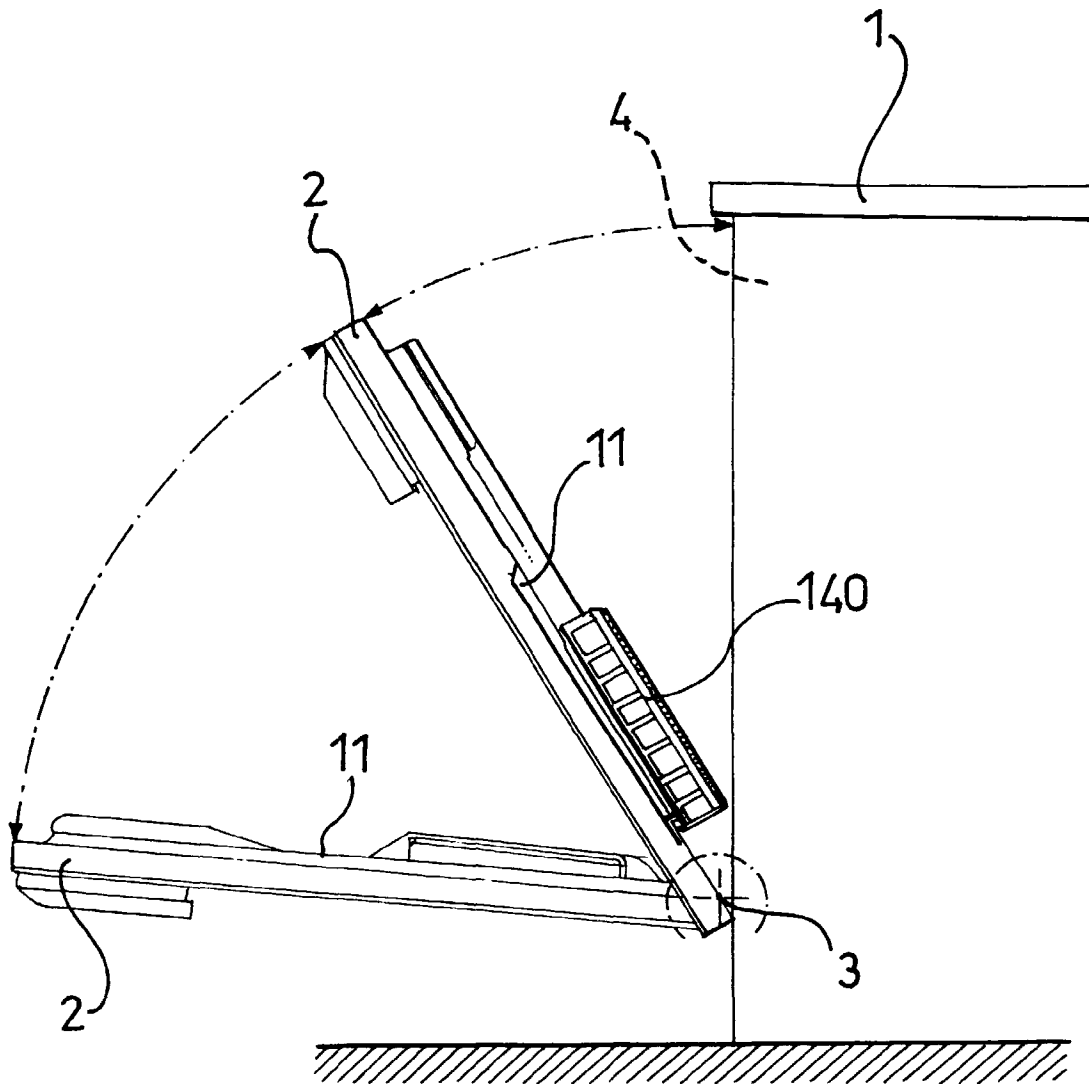


FIG.3

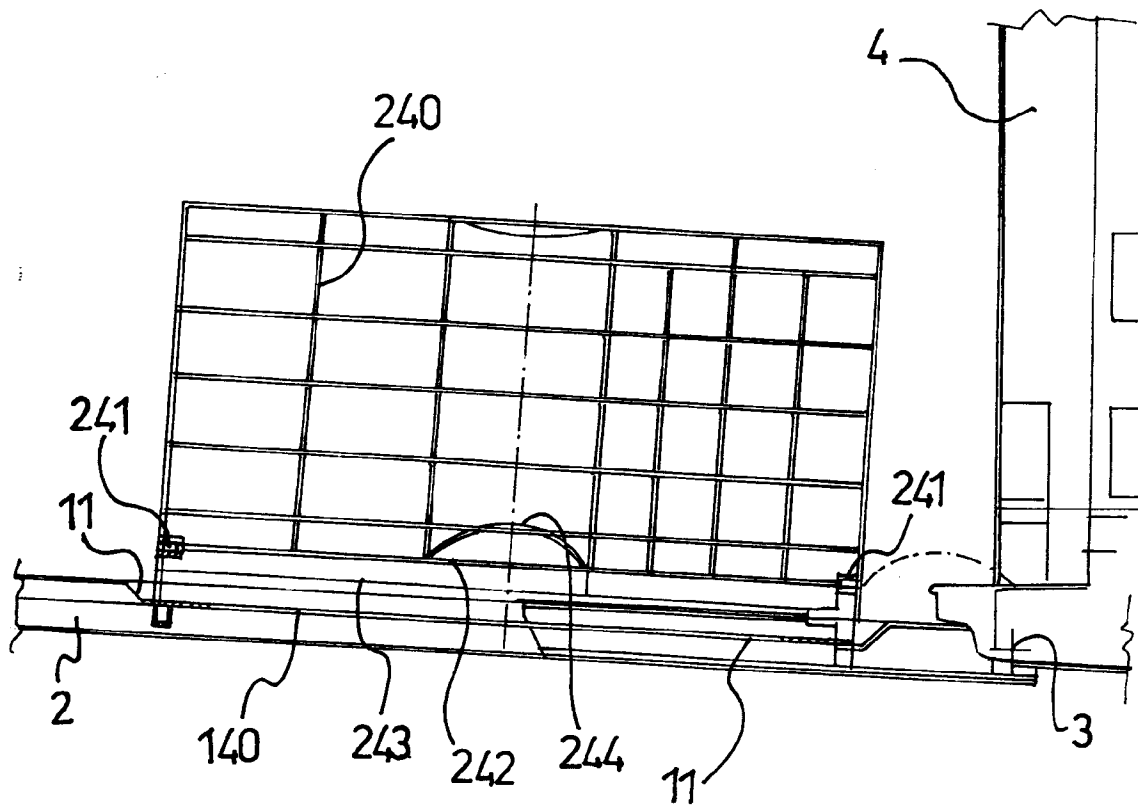


FIG. 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 83 0272

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US 3 665 943 A (LAMPMAN WILLIAM T ET AL) 30 May 1972	1-3,8	A47L15/50
A	* column 1, line 32 - column 3, line 16; figures 1-3 *	4-6,9-11	
X	US 3 732 876 A (BRAGA A ET AL) 15 May 1973	1,2,8	
A	* column 1, line 43 - column 4, line 33; figures 1-3 *	3-5	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A47L
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 18 September 1998	Examiner Laue, F
CATEGORY OF CITED DOCUMENTS		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	
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			

EPO FORM 1503 03.92 (P44201)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 98 83 0272

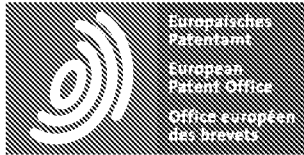
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The members are as contained in the European Patent Office EDP file on
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18-09-1998

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EPO FORM P469

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82



Espacenet

CN105496336A Knife and fork basket assembly for dish-washing machine

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IPC **A47L15/50;**

CPC **A47L15/502 (CN); A47L15/503 (CN);**

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Knife and fork basket assembly for dish-washing machine

Abstract

The invention discloses a knife and fork basket assembly for a dish-washing machine. The knife and fork basket assembly for the dish-washing machine comprises a first tray and two second trays, the second trays are rotatably connected with the left edge and the right edge of the first tray respectively, the knife and fork basket assembly can shift between a folding state and an unfolding state, in the folding state, the two second trays are folded to form a cavity of which the lower end is closed by the first tray and the upper end is opened, and in the unfolding state, the two second trays are separated from each other and located on the left side and the right side of the first tray. According to the knife and fork basket assembly for the dish-washing machine, a user can utilize different functions of the knife and fork basket assembly in the folding state and the unfolding state; therefore, tableware such as knives and forks can be transferred conveniently, and the user can fetch the knives and the forks more conveniently and rapidly.



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A47L 15/50(2006.01)

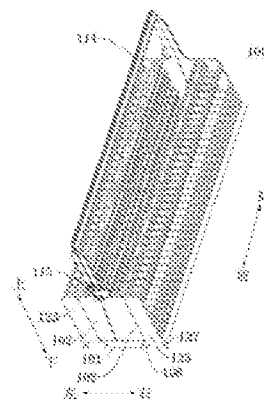
权利要求书3页 说明书10页 附图10页

(54) 发明名称

用于洗碗机的刀叉篮组件

(57) 摘要

本发明公开了一种用于洗碗机的刀叉篮组件,所述用于洗碗机的刀叉篮组件包括:第一托盘和第二托盘,所述第二托盘为分别与所述第一托盘的左边沿和右边沿可转动地相连,所述刀叉篮组件在折叠状态和展开状态之间可转换,在所述折叠状态两个所述第二托盘合拢成下端由所述第一托盘封闭且上端敞开的空腔,在所述展开状态两个所述第二托盘相互分离并位于所述第一托盘的左右两侧。根据本发明的用于洗碗机的刀叉篮组件,用户可以分别利用刀叉篮组件处于折叠状态和展开状态时的不同功能,由此,可方便转移刀叉类餐具,使得用户取放刀叉更加地方便快捷。



1. 一种用于洗碗机的刀叉托盘组件, 其特征在于, 包括: 第一托盘和第二托盘, 所述第二托盘为分别与所述第一托盘的左边沿和右边沿可转动地相连的两个,

所述刀叉篮组件在折叠状态和展开状态之间可转换, 在所述折叠状态两个所述第二托盘合拢成下端由所述第一托盘封闭且上端敞开的空腔, 在所述展开状态两个所述第二托盘相互分离并位于所述第一托盘的左右两侧。

2. 根据权利要求1所述的刀叉托盘组件, 其特征在于, 所述第一托盘包括第一主体板, 且所述第一主体板左侧和右侧中任一侧的上沿均连接有沿前后方向延伸的第一圆轴, 且所述第一主体板的左侧和右侧中任一侧的上沿均形成有环绕所述第一圆轴的第一缺口, 所述第二托盘的第一端形成有第一圆弧沟槽和第一卡勾, 所述第一圆弧沟槽沿前后方向延伸并与所述第一圆轴适配, 所述第一圆弧沟槽套在所述第一圆轴上, 且所述第一卡勾插入所述第一缺口并可转动地套接在所述第一圆轴上。

3. 根据权利要求2所述的刀叉托盘组件, 其特征在于, 在所述展开状态所述第一卡勾的一端连接在所述第一圆弧沟槽的上侧并呈沿环绕所述第一圆弧沟槽的轴线的方向延伸的圆弧形板状。

4. 根据权利要求2所述的刀叉托盘组件, 其特征在于, 所述第一缺口包括沿所述第一圆轴的轴向间隔布置的多个, 且所述第一卡勾包括沿前后方向间隔布置并与所述第一缺口一一对应的多个。

5. 根据权利要求1所述的刀叉篮组件, 其特征在于, 所述第二托盘在所述折叠状态与所述第一托盘垂直, 且从所述折叠状态向所述展开状态转换时所述第二托盘相对于所述第一托盘的转动角度不大于 90° 。

6. 根据权利要求1-5中任一项所述的刀叉托盘组件, 其特征在于, 所述第一托盘的底面上形成有沿前后方向延伸的定位槽, 所述定位槽为一个或沿左右间隔布置的多个。

7. 根据权利要求1-6中任一项所述的刀叉托盘组件, 其特征在于, 所述第一托盘呈格栅型的水平板状并形成沿上下方向贯通所述第一托盘的网孔。

8. 根据权利要求1-7中任一项所述的刀叉托盘组件, 其特征在于, 所述第二托盘包括第二主体板和设在所述第二主体板前沿和后沿的侧板, 所述侧板与所述第二主体板垂直, 在所述折叠状态两个所述第二托盘的第二主体板左右间隔且两个所述第二托盘的侧板对应地对接。

9. 根据权利要求8所述的刀叉托盘组件, 其特征在于, 一个所述第二托盘上的侧板的前表面或后表面上形成有与侧板的自由端的边沿间隔开的凸起部, 在所述折叠状态另一个所述第二托盘的侧板抵在所述凸起部上。

10. 根据权利要求8所述的刀叉托盘组件, 其特征在于, 所述第二主体板呈格栅型板状。

11. 根据权利要求8所述的刀叉托盘组件, 其特征在于, 所述第二主体板上形成有前后布置的摆放齿, 所述摆放齿为多个, 在折叠状态所述第二主体板上的多个所述摆放齿沿上下方向间隔布置。

12. 根据权利要求1-11中任一项所述的刀叉托盘组件, 其特征在于, 所述第二托盘的第二端设有把手, 所述把手在所述折叠状态位于所述第二托盘的上端并呈开口向下的U形。

13. 根据权利要求1-12中任一项所述的刀叉托盘组件, 其特征在于, 所述刀叉篮组件还包括锁扣装置, 所述锁扣装置包括卡扣和适于与所述卡扣卡合的拨片, 所述卡扣固设在两

个所述第二托盘中一个的侧沿,且所述拨片的第一端与两个所述第二托盘中的另一个铰接并与所述卡扣对应,

其中,在所述折叠状态所述拨片的旋转中心轴沿上下方向延伸。

14.根据权利要求13所述的刀叉托盘组件,其特征在于,所述锁扣装置还包括轴套,在所述折叠状态所述轴套沿上下方向延伸且所述拨片的第一端设有沿上下方向延伸并套设在所述轴套内的转轴。

15.根据权利要求14所述的刀叉托盘组件,其特征在于,所述轴套包括在折叠状态下沿上下间隔布置的两个,且所述转轴包括在折叠状态分别从所述拨片的第一端向上和向下延伸的两个,两个所述转轴一一对应的与两个所述轴套套接。

16.根据权利要求13所述的刀叉托盘组件,其特征在于,所述拨片的第二端设有勾部,所述卡扣包括在折叠状态沿上下相对布置的两个子卡扣部,且两个子卡扣部之间形成有在远离所述第二托盘的方向上宽度逐渐减小的卡槽,所述拨片卡持在所述卡槽内且勾部勾住两个子卡扣部。

17.根据权利要求13所述的刀叉托盘组件,其特征在于,两个所述第二托盘中的一个的前沿和后沿分别设有所述拨片和所述卡扣,且两个所述第二托盘中另一个的前沿和后沿分别设有所述卡扣和所述拨片。

18.根据权利要求1-17中任一项所述的刀叉托盘组件,其特征在于,每个所述第二托盘上均连接有可转动的第三托盘,所述第三托盘的第一端与所述第二托盘相连,且在所述折叠状态所述第三托盘的上端与所述第二托盘的上端相连,在所述展开状态所述第三托盘向外展开。

19.根据权利要求18所述的刀叉托盘组件,其特征在于,所述第二托盘上远离所述第一托盘的端部设有沿前后方向延伸的第二圆轴,且所述第二托盘上形成有环绕所述第二圆轴的第二缺口,所述第三托盘的第一端形成第二卡勾,所述第二卡勾插入所述第二缺口并可转动地套接在所述第二圆轴上。

20.根据权利要求19所述的刀叉托盘组件,其特征在于,在所述折叠状态所述第二卡勾位于所述第三托盘的上端朝向所述第二托盘的一侧,且所述第二卡勾呈开口向下的圆弧形板状。

21.根据权利要求19所述的刀叉托盘组件,其特征在于,所述第二缺口包括沿所述第二圆轴的轴线间隔布置的多个,且所述第二卡勾包括沿前后方向间隔布置并与所述第二缺口一一对应的多个。

22.根据权利要求18所述的刀叉托盘组件,其特征在于,所述第三托盘的第二端设有沿前后方向延伸的支撑筋,所述支撑筋呈在所述展开状态时开口向下的弧形板体。

23.根据权利要求18所述的刀叉托盘组件,其特征在于,所述第三托盘上形成搁置槽,且在所述折叠状态,所述搁置槽上端敞开下端封闭并沿前后间隔布置。

24.根据权利要求23所述的刀叉托盘组件,其特征在于,所述第三托盘包括:

第三主体板,所述第三主体板的第一端与所述第二托盘铰接,所述第三主体板的第二端设有第一边板,所述第三主体板的前沿设有第二边板,所述第三主体板的后沿设有第三边板,所述第二边板、所述第一边板和所述第三边板沿所述第三主体板的周向依次相连;

定位筋,所述定位筋为多个,多个所述定位筋沿前后方向间隔布置在所述第二边板和

所述第三边板之间并限定出所述搁置槽；

定位板，所述定位板沿前后方向延伸且分别与所述定位筋的自由端、所述第二边板以及所述第三边板相连。

25. 根据权利要求24所述的刀叉托盘组件，其特征在于，所述定位筋包括在折叠状态沿上下间隔布置的多组，且每组所述定位筋均对应连接有定位板。

26. 根据权利要求24所述的刀叉托盘组件，其特征在于，所述第三主体板、所述定位板呈格栅型板状。

27. 根据权利要求18所述的刀叉篮组件，其特征在于，所述第三托盘在所述折叠状态与所述第二托盘平行，且从所述折叠状态向所述展开状态转换时所述第三托盘相对于所述第二托盘的旋转角度在180°到210°的范围内。

用于洗碗机的刀叉篮组件

技术领域

[0001] 本发明涉及家用电器技术领域,特别是涉及一种用于洗碗机的刀叉篮组件。

背景技术

[0002] 相关技术中,刀叉托盘设置在洗碗机内的顶部,用于摆放餐刀、叉子、勺子等取食类餐具。然而,刀叉托盘在使用时,清洗前需要用户先将餐具收集并转移到刀叉托盘上,摆放好餐具后再开启洗碗机进行清洗,清洗结束后又需要用户将餐具取出并收集,然后分发使用或进行存放。这样,用户需要花费很多时间进行餐具的收取和转移,用户满意度较低。再者,刀叉托盘仅用作摆放餐具的载体,功能比较单一,不利于含刀叉托盘的洗碗机在市场上的推广应用。

发明内容

[0003] 本发明旨在至少在一定程度上解决相关技术中的技术问题之一。为此,本发明在于提出一种刀叉篮组件,所述刀叉篮组件可方便刀叉餐具的转移,使得用户取放刀叉更加地方便快捷。

[0004] 根据本发明实施例的刀叉篮组件,包括:第一托盘和第二托盘,所述第二托盘为分别与所述第一托盘的左边沿和右边沿可转动地相连的两个,所述刀叉篮组件在折叠状态和展开状态之间可转换,在所述折叠状态两个所述第二托盘合拢成下端由所述第一托盘封闭且上端敞开的空腔,在所述展开状态两个所述第二托盘相互分离并位于所述第一托盘的左右两侧。

[0005] 根据本发明实施例的刀叉篮组件,用户可以分别利用刀叉篮组件处于折叠状态和展开状态时的不同功能,由此,可方便转移刀叉类餐具,使得用户取放刀叉更加地方便快捷。

[0006] 另外,根据本发明上述实施例的刀叉篮组件还可以具有如下附加的技术特征:

[0007] 根据本发明的一个实施例,所述第一托盘包括第一主体板,且所述第一主体板左侧和右侧中任一侧的上沿均连接有沿前后方向延伸的第一圆轴,且所述第一主体板的左侧和右侧中任一侧的上沿均形成有环绕所述第一圆轴的第一缺口,所述第二托盘的第一端形成有第一圆弧沟槽和第一卡勾,所述第一圆弧沟槽沿前后方向延伸并与所述第一圆轴适配,所述第一圆弧沟槽套在所述第一圆轴上,且所述第一卡勾插入所述第一缺口并可转动地套接在所述第一圆轴上。

[0008] 进一步地,在所述展开状态所述第一卡勾的一端连接在所述第一圆弧沟槽的上侧并呈沿环绕所述第一圆弧沟槽的轴线的方向延伸的圆弧形板状。

[0009] 可选地,所述第一缺口包括沿所述第一圆轴的轴向间隔布置的多个,且所述第一卡勾包括沿前后方向间隔布置并与所述第一缺口一一对应的多个。

[0010] 根据本发明的一个实施例,所述第二托盘在所述折叠状态与所述第一托盘垂直,且从所述折叠状态向所述展开状态转换时所述第二托盘相对于所述第一托盘的转动角度

不大于90°。

[0011] 根据本发明的一些实施例,所述第一托盘的底面上形成有沿前后方向延伸的定位槽,所述定位槽为一个或沿左右间隔布置的多个。

[0012] 根据本发明的一些实施例,所述第一托盘呈格栅型的水平板状并形成沿上下方向贯通所述第一托盘的网孔。

[0013] 根据本发明的一些实施例,所述第二托盘包括第二主体板和设在所述第二主体板前沿和后沿的侧板,所述侧板与所述第二主体板垂直,在所述折叠状态两个所述第二托盘的所述第二主体板左右间隔且两个所述第二托盘的侧板对应地对接。

[0014] 进一步地,一个所述第二托盘上的侧板的前表面或后表面上形成有与侧板的自由端的边沿间隔开的凸起部,在所述折叠状态另一个所述第二托盘的侧板抵在所述凸起部上。

[0015] 可选地,所述第二主体板呈格栅型板状。

[0016] 可选地,所述第二主体板上形成有前后布置的摆放齿,所述摆放齿为多个,在折叠状态所述第二主体板上的多个所述摆放齿沿上下方向间隔布置。

[0017] 根据本发明的一些实施例,所述第二托盘的第二端设有把手,所述把手在所述折叠状态位于所述第二托盘的上端并呈开口向下的U形。

[0018] 根据本发明的一些实施例,所述刀叉篮组件还包括锁扣装置,所述锁扣装置包括卡扣和适于与所述卡扣卡合的拨片,所述卡扣固设在两个所述第二托盘中一个的侧沿,且所述拨片的第一端与两个所述第二托盘中的另一个铰接并与所述卡扣对应,其中,在所述折叠状态所述拨片的旋转中心轴沿上下方向延伸。

[0019] 进一步地,所述锁扣装置还包括轴套,在所述折叠状态所述轴套沿上下方向延伸且所述拨片的第一端设有沿上下方向延伸并套设在所述轴套内的转轴。

[0020] 进一步地,所述轴套包括在折叠状态下沿上下间隔布置的两个,且所述转轴包括在折叠状态分别从所述拨片的第一端向上和向下延伸的两个,两个所述转轴一一对应的与两个所述轴套套接。

[0021] 可选地,所述拨片的第二端设有勾部,所述卡扣包括在折叠状态沿上下相对布置的两个子卡扣部,且两个子卡扣部之间形成有在远离所述第二托盘的方向上宽度逐渐减小的卡槽,所述拨片卡持在所述卡槽内且勾部勾住两个子卡扣部。

[0022] 可选地,两个所述第二托盘中的一个的前沿和后沿分别设有所述拨片和所述卡扣,且两个所述第二托盘中另一个的前沿和后沿分别设有所述卡扣和所述拨片。

[0023] 根据本发明的一些实施例,每个所述第二托盘上均连接有可转动的第三托盘,所述第三托盘的第一端与所述第二托盘相连,且在所述折叠状态所述第三托盘的上端与所述第一托盘的上端相连,在所述展开状态所述第三托盘向外展开。

[0024] 进一步地,所述第二托盘上远离所述第一托盘的端部设有沿前后方向延伸的第二圆轴,且所述第二托盘上形成有环绕所述第二圆轴的第二缺口,所述第三托盘的第一端形成第二卡勾,所述第二卡勾插入所述第二缺口并可转动地套接在所述第二圆轴上。

[0025] 进一步地,在所述折叠状态所述第二卡勾位于所述第三托盘的上端朝向所述第二托盘的一侧,且所述第二卡勾呈开口向下的圆弧形板状。

[0026] 可选地,所述第二缺口包括沿所述第二圆轴的轴线间隔布置的多个,且所述第二

卡勾包括沿前后方向间隔布置并与所述第二缺口一一对应的多个。

[0027] 可选地,所述第三托盘的第二端设有沿前后方向延伸的支撑筋,所述支撑筋呈在所述展开状态时开口向下的弧形板体。

[0028] 可选地,所述第三托盘上形成搁置槽,且在所述折叠状态,所述搁置槽上端敞开下端封闭并沿前后间隔布置。

[0029] 进一步地,所述第三托盘包括:第三主体板,所述第三主体板的第一端与所述第二托盘铰接,所述第三主体板的第二端设有第一边板,所述第三主体板的前沿设有第二边板,所述第三主体板的后沿设有第三边板,所述第二边板、所述第一边板和所述第三边板沿所述第三主体板的周向依次相连;定位筋,所述定位筋为多个,多个所述定位筋沿前后方向间隔布置在所述第二边板和所述第三边板之间并限定出所述搁置槽;定位板,所述定位板沿前后方向延伸且分别与所述定位筋的自由端、所述第二边板以及所述第三边板相连。

[0030] 进一步地,所述定位筋包括在折叠状态沿上下间隔布置的多组,且每组所述定位筋均对应连接有定位板。

[0031] 可选地,所述第三主体板、所述定位板呈格栅型板状。

[0032] 可选地,所述第三托盘在所述折叠状态与所述第二托盘平行,且从所述折叠状态向所述展开状态转换时所述第三托盘相对于所述第二托盘的旋转角度在 180° 到 210° 的范围内。

附图说明

[0033] 图1是本发明实施例的刀叉篮组件在展开状态的示意图。

[0034] 图2是图1中刀叉篮组件在折叠状态的示意图。

[0035] 图3是图1的爆炸图。

[0036] 图3a是图3中圈A所示区域的局部放大示意图。

[0037] 图3b是图3中圈B所示区域的局部放大示意图。

[0038] 图4是图1第一托盘的剖视图。

[0039] 图5是图1中刀叉篮组件中第二托盘的示意图。

[0040] 图6是图2的爆炸示意图。

[0041] 图6c是图6中圈C所示区域的局部放大示意图。

[0042] 图6d是图6中圈D所示区域的局部放大示意图。

[0043] 图6e是图6中圈E所示区域的局部放大示意图。

[0044] 图7是图2中刀叉篮组件中第三托盘的示意图。

[0045] 图8是图7的截面示意图。

[0046] 图9是图1中刀叉盘组件的剖视图。

[0047] 附图标记:

[0048] 刀叉篮组件100,第一托盘101,第二托盘102,第一主体板103,第一圆轴104,第一缺口105,第一圆弧沟槽106,第一卡勾107,定位槽108,网孔109,第二主体板110,侧板111,凸起部112,摆放齿113,把手114,锁扣装置115,卡扣116,拨片117,轴套118,转轴119,勾部120,子卡扣部121,卡槽122,第三托盘123,第二圆轴124,第二缺口125,第二卡勾126,支撑筋127,搁置槽128,第三主体板129,第一边板130,第二边板131,第三边板132,定位筋133,

定位板134, 支架135, 支撑条136, 沟槽137, 刀叉138。

具体实施方式

[0049] 下面详细描述本发明的实施例, 所述实施例的示例在附图中示出, 其中自始至终相同或类似的标号表示相同或类似的元件或具有相同或类似功能的元件。下面通过参考附图描述的实施例是示例性的, 旨在用于解释本发明, 而不能理解为对本发明的限制。

[0050] 下面结合图1至图9详细描述根据本发明实施例的用于洗碗机的刀叉篮组件100。

[0051] 参照图1和图2, 根据本发明实施例的用于洗碗机的刀叉篮组件100可以包括第一托盘101和第二托盘102。

[0052] 具体而言, 如图1和图2所示, 第二托盘102为两个, 且两个第二托盘102分别与第一托盘101的左边沿和右边沿(例如, 图1或图2中第一托盘101的左边沿和右边沿)可转动地相连, 刀叉篮组件100在折叠状态和展开状态之间可转换。参照图2, 在折叠状态, 两个第二托盘102可以合拢成下端(例如, 图2中所示的下端)由第一托盘101封闭且上端(例如, 图2中所示的上端)敞开的空腔; 如图1所示, 在展开状态, 两个第二托盘102可以相互分离并位于第一托盘101的左右两侧(例如, 图1中第一托盘101的左右两侧)。当刀叉篮组件100处于折叠状态时可以用作盛放餐具的刀叉篮, 便于刀叉类餐具的转移; 当刀叉篮组件100处于展开状态时可以将刀叉类餐具放在刀叉篮组件100上, 并放入洗碗机内进行清洗。

[0053] 换言之, 刀叉篮组件100可以具有两种不同的状态: 一种为折叠状态, 此时刀叉篮组件100为一个可收集刀叉等餐具的篮子, 刀叉篮能够用作收集、存放和转移刀叉类餐具的载体, 便于刀叉类餐具的转移; 另一种为展开状态, 此时刀叉篮组件100为刀叉托盘, 适于搁置刀叉篮组件在折叠状态收集的餐具, 以方便对刀叉类餐具清洗。

[0054] 另外, 处于展开状态的刀叉篮组件在刀叉等餐具清洗完成后可以折叠, 以方便刀叉等餐具的转移。

[0055] 根据本发明实施例的用于洗碗机的刀叉篮组件100, 用户可以分别利用刀叉篮组件100处于折叠状态和展开状态时的不同功能, 由此, 可方便转移刀叉类餐具, 使得用户取放刀叉更加地方便快捷。

[0056] 本发明的第二托盘102可以通过轴孔配合等方式与第一托盘101可转动地相连, 例如, 可以设置铰接件(例如铰链)将第一托盘101和第二托盘102连接在一起。下面参照附图详细描述本发明的一个实施例中第一托盘101和第二托盘102的连接方式。

[0057] 参照图1至图4, 在本发明的一些实施例中, 第一托盘101可以包括第一主体板103, 参照图3和图4, 第一主体板103左侧和右侧(例如, 图4中第一主体板103的左侧和右侧)中任一侧的上沿均可以连接有第一圆轴104, 其中, 第一圆轴104沿前后方向(参照图4中垂直纸面的方向或图3中的前后方向)延伸的。另外, 第一主体板103的左侧和右侧中任一侧的上沿均可以形成有环绕第一圆轴104的第一缺口105。

[0058] 参照图3, 第二托盘102的第一端(即第二托盘102上朝向第一托盘101的一端)可以形成有第一圆弧沟槽106和第一卡勾107, 第一圆弧沟槽106可以沿前后方向延伸并可以与第一圆轴104适配, 第一圆弧沟槽106可以套在第一圆轴104上, 且第一卡勾107可以插入第一缺口105并可转动地套接在第一圆轴104上。

[0059] 由此, 通过第一圆弧沟槽106与第一圆轴104的配合, 第二托盘102可以相对第一托

盘101稳定的转动,而且通过第一卡勾107伸入第一缺口105并勾在第一圆轴104上,第一托盘102稳定地与第一托盘101可旋转的相连,另外,第一卡勾107与第一缺口105的配合还可以方便第二托盘102的装拆,方便托盘组件的装配、维护以及清洗。

[0060] 进一步地,如图3所示,在展开状态第一卡勾107的一端(参照图3中第一卡勾107的上端)可以连接在第一圆弧沟槽106的上侧(例如,图3中第一圆弧沟槽106的上侧)并可以呈沿环绕第一圆弧沟槽106的轴线的方向延伸的圆弧形板状。由此,方便第二托盘102与第一托盘101稳定连接,而且易于第二托盘102的旋转,使得第一托盘101和第二托盘102能够展开或折叠。

[0061] 参照图3,第一缺口105可以包括沿第一圆轴104的轴向(参照图3中的前后方向)间隔布置的多个,且第一卡勾107可以包括沿前后方向间隔布置并与第一缺口105一一对应的多个,也就是说,通过多个第一卡勾107可转动地与多个第一缺口105一一对应地卡合将第一托盘101和第二托盘102连接在一起。由此,可以通过多个第一卡勾107与多个第一缺口105的配合实现第二托盘102与第一托盘101的连接,从而使得第二托盘102稳定地与第一托盘101连接,并使得第二托盘102相对于第一托盘101稳定转动。

[0062] 参照图2并结合图1,第二托盘102在折叠状态可以与第一托盘101垂直,且从折叠状态向展开状态转换时第二托盘102相对于第一托盘101的转动角度可以不大于 90° 。由此,可以保证刀叉篮组件100在展开状态和折叠状态时的工作可靠性,从而可以充分利用刀叉篮组件100处于折叠状态和展开状态时的不同功能。

[0063] 当然,上述对第二托盘102旋转角度的限制仅是本发明的一些具体示例,不能理解为对本发明保护范围的限制,例如,在展开状态和折叠状态,可以将第二托盘102相对于第一托盘的旋转角度设置成 80° 、 100° 或 110° 等。

[0064] 参照图4,第一托盘101的底面上可以形成有沿前后方向延伸的定位槽108,定位槽108可以为一个或沿左右(例如,图2或图4中所示的左右方向)间隔布置的多个。由此,在将刀叉篮组件100放置于碗篮上时,可以通过第一托盘101上的定位槽108限定托盘组件的位置,从而可以提高刀叉篮组件100的稳定性。

[0065] 例如,参照图1和图3,刀叉篮组件100可以放置在支架135上,支架135可以为由若干段不同形状的钢丝组合形成四方框架结构,支架135可以包括支撑条136,第一托盘101可以通过定位槽108与支撑条136的配合实现第一托盘101在支架135上的支撑定位。

[0066] 参照图3并结合图2,第一托盘101可以呈格栅型的水平板状,且第一托盘101上形成有沿上下方向(例如,图3中所示的上下方向)贯通第一托盘101的网孔109。由此,在餐具洗涤的过程中,洗涤水可以通过网孔109,这样可以加快水流的循环,从而可以在一定程度上保证餐具的清洗效果。

[0067] 具体而言,第一托盘101可以包括沿纵向间隔布置并沿横向延伸的多个横向连接条和沿横向间隔布置并沿纵向延伸的多个纵向连接条,多个横向连接条与多个纵向连接条交错连接形成格栅形成的水平板,因此,相邻的两个横向连接条和相邻的两个纵向连接条构成供洗涤水通过的碗孔109。

[0068] 如图5并结合图2,第二托盘102可以包括第二主体板110和侧板111,侧板111设在第二主体板110的前沿和后沿(参照图5中第二主体板110的前沿和后沿),侧板111可以与第二主体板110垂直。在折叠状态,两个第二托盘102的第二主体板110可以左右(例如,图2中

所示的左右方向)间隔且两个第二托盘102的侧板111可以对应地对接。由此,第一托盘101和两个第二托盘102可以组合形成刀叉类餐具的容纳腔,便于餐具的存放和转移。

[0069] 进一步地,如图5所示,一个第二托盘102上的侧板111的前表面或后表面上可以形成有凸起部112,凸起部112与侧板111的自由端的边沿间隔开,在折叠状态另一个第二托盘102的侧板111可以抵在凸起部112上。由此,便于刀叉篮组件100稳定地维持在折叠状态,从而提高刀叉篮组件100的稳定性。可以使得第二主体板110及其前沿和后沿的侧板111能够与第一托盘101形成一个下端封闭且上端敞开的容纳腔。

[0070] 其中,第一托盘101所在平面和第二托盘102所在平面可以构成第一角度,第一角度的变化范围可以为 90° 至 180° 。

[0071] 在本发明的实施例中,参照图1,当刀叉篮组件100用作刀叉托盘时,第一托盘101和两个第二托盘102为展开状态。此时,第一角度221可以设计为 150° 至 180° 之间的某一角度。优选地,展开状态下第一角度221可以为 175° ,此时第一托盘101可以为水平放置,两个第二托盘102可以呈由内向外向上倾斜状,使得刀叉托盘成为一个竖直截面为倒梯形的结构体。

[0072] 在本发明的实施例中,当刀叉篮组件100用作刀叉篮时,第一角度可以为 90° ,即第二托盘102可以折叠至垂直于第一托盘101。此时,第一托盘101和两个第二托盘102可以构成刀叉篮的中间室,其中第一托盘101可以作为中间室的底面,两个第二托盘102的第二主体板110可以构成中间室的左右壁面,两个第二托盘102的前后侧板111可以拼合构成中间室的前后壁面。

[0073] 可选地,参照图5,第二主体板110可以呈格栅型板状。由此,可以在保证第二主体板110的强度的同时减轻刀叉篮组件100的重量,在展开状态,格栅板状的第二主体板120可以方便洗涤水冲洗刀叉等餐具。

[0074] 其中,第二托盘102可以为平板状结构体,第二主体板110上可以设有网孔结构,使得洗涤水可以通过网孔。在第二托盘102的前后边缘处可以设有侧板111,两侧侧板111的形状可以互补。

[0075] 可选地,如图5并结合图2和图6,第二主体板110上可以形成有前后(例如,图2中所示的前后方向)布置的摆放齿113,摆放齿113可以为多个,在折叠状态第二主体板110上的多个摆放齿113可以沿上下方向(参照图6中的上下方向)间隔布置。这样刀叉类餐具可以稳定地放置在摆放齿113上,由此,不仅可以保证刀叉类餐具的定位可靠性,还可以增加容纳刀叉类餐具的数量和稳定性。

[0076] 参照图5并结合图6,第二托盘102的第二端可以设有把手114,把手114在折叠状态可以位于第二托盘102的上端(例如,图6中第二托盘102的上端)并可以呈开口向下的U形。由此,在刀叉篮组件100上可以留有扣手位,便于用户进行刀叉类餐具的转移。

[0077] 参照图6并结合图2,刀叉篮组件100还可以包括锁扣装置115,锁扣装置115可以包括卡扣116和适于与卡扣116卡合的拨片117,卡扣116可以固设在两个第二托盘102中一个的侧沿,且拨片117的第一端可以与两个第二托盘102中的另一个铰接并可以与卡扣116对应,其中,在折叠状态拨片117的旋转中心轴可以沿上下方向(例如,图6中所示的上下方向)延伸。由此,在折叠状态,可以通过拨片117与卡扣116的卡合实现两个第二托盘102的稳定连接,从而可以保证两个第二托盘102之间连接的可靠性。

[0078] 进一步地,如图6和图2所示,锁扣装置115还可以包括轴套118,在折叠状态轴套118可以沿上下方向(例如,图6中所示的上下方向)延伸且拨片117的第一端可以设有沿上下方向延伸并套设在轴套118内的转轴119。由此,可以使得拨片117能够在轴套118内稳定地旋转,使得刀叉篮组件100可以在展开状态和折叠状态之间转换。

[0079] 进一步地,参照图6并结合图2,轴套118可以包括在折叠状态下沿上下(例如,图6中所示的上下)间隔布置的两个,且转轴119可以包括在折叠状态分别从拨片117的第一端(即固定端)向上和向下延伸的两个,两个转轴119可以一一对应的与两个轴套118套接。由此,使得拨片117可以在转轴119的带动下在轴套118内可靠地旋转,另外,上下设置的两个轴套118可以对拨片117进行定位,从而提高拨片117的稳定性。

[0080] 可选地,结合图6,拨片117的第二端(即自由端)可以设有勾部120,卡扣116可以包括在折叠状态沿上下相对布置的两个子卡扣部121,且两个子卡扣部121之间可以形成有在远离第二托盘102的方向上宽度逐渐减小的卡槽122,拨片117可以卡持在卡槽122内且勾部120可以勾住两个子卡扣部121。由此,提高了锁扣装置115的稳定性,当刀叉篮组件100处于折叠状态时,可以比较稳定地放置和转移餐具。

[0081] 可选地,两个第二托盘102中的一个的前沿和后沿可以分别设有拨片117和卡扣116,且两个第二托盘102中另一个的前沿和后沿可以分别设有卡扣116和拨片117,换言之,第二托盘102的前侧和右侧均形成有锁扣装置115,位于第二托盘102前沿的拨片117和卡扣116构成一个锁扣装置115,且位于第二托盘102后沿的拨片117和卡扣116可以组成另一个锁扣装置115,从而进一步地提高折叠状态的稳定性。由此,第二托盘102的前沿和后沿可以通过卡扣116和拨片117的配合进行连接且可保证连接的可靠性。

[0082] 其中,当刀叉篮组件100作为刀叉篮使用时,两个第二托盘102拼合可以构成刀叉篮的中间室,此时拨动拨片117,使勾部120卡入卡槽122内,将两个第二托盘102固定为拼合状态。需要分离即刀叉篮组件100作为刀叉托盘使用时,将拨片117往外拨动,使勾部120从卡槽122内拨出,即可将两个第二托盘102分离至展开。

[0083] 如图1至图9所示,在本发明的一些实施例中,每个第二托盘102可以连接有可转动的第三托盘123,第三托盘123的第一端(例如,图2中第三托盘123的上端)可以与第二托盘102相连,且在折叠状态第三托盘123的上端(例如,图2中第三托盘123的上端)可以与第二托盘102的上端相连,在展开状态第三托盘123可以向外展开。由此,用户可以根据需要利用刀叉篮组件100处于折叠状态和展开状态时的不同功能。

[0084] 另外,在折叠状态,第三托盘123可以存放刀叉等餐具,在展开状态,第三托盘123的转动使得存放于第三托盘123上的刀叉等餐具搁置于托盘组件上,从而方便对刀叉等餐具的清洗。而且在清洗完成后,将托盘转换成折叠状态即可对刀叉等餐具进行转移。

[0085] 进一步地,参照图6和图7,第二托盘102上远离第一托盘101的端部可以设有沿前后方向(例如,图6中所示的前后方向)延伸的第二圆轴124,且第二托盘102上可以形成有环绕第二圆轴124的第二缺口125,第三托盘123的第一端可以形成第二卡勾126,第二卡勾126可以插入第二缺口125并可转动地套接在第二圆轴124上。由此,可以实现第二托盘102与第三托盘123的可靠连接。

[0086] 另外,通过第二卡勾126伸入第二缺口125并勾在第二圆轴124上,第三托盘123稳定地与第二托盘102可旋转的相连,另外,第二卡勾126与第二缺口125的配合还可以方便第

三托盘123的装拆,方便托盘组件的装配、维护以及清洗。

[0087] 另外,还可以在第三托盘123的上端设置第二圆弧沟槽139(参照图6e),并将第二圆轴124可转动地与第二圆弧沟槽配合。

[0088] 进一步地,参照图6并结合图2,在折叠状态第二卡勾126可以位于第三托盘123的上端(例如,图6中第三托盘123的上端)朝向第二托盘102的一侧,且第二卡勾126可以呈开口向下的圆弧形板状。由此,通过第二卡勾126与第二圆轴124的配合可以进一步保证第二托盘102与第三托盘123连接的可靠性。

[0089] 可选地,如图6和图7所示,第二缺口125可以包括沿第二圆轴124的轴线间隔布置的多个,且第二卡勾126可以包括沿前后方向间隔布置并与第二缺口125一一对应的多个,也就是说,通过多个第二卡勾126可转动地与多个第二缺口125一一对应地卡合连接第二托盘102和第三托盘123。由此,使得第二托盘102与第三托盘123能够可靠地连接,从而使得第三托盘123稳定地与第二托盘102连接,并使得第三托盘123相对于第二托盘102稳定转动。

[0090] 可选地,结合图1至图8,第三托盘123的第二端(例如,图7中第三托盘123的下端)可以设有沿前后方向(例如,图7中所示的前后方向)延伸的支撑筋127,支撑筋127可以呈在展开状态时开口向下的弧形板体。由此,第三托盘123可以通过支撑筋127定位在支架135上且可保证定位的稳定性。

[0091] 其中,第三托盘123底部可以设置多个支撑筋127(参照图7),多个支撑筋127可以支撑在支架135的边框形状上。优选地,参照图8,支撑筋127上设有沟槽137。

[0092] 可选地,参照图2和图8,第三托盘123上可以形成搁置槽128,且在折叠状态,搁置槽128的上端(例如,图7中搁置槽128的上端)可以敞开下端(例如,图7中搁置槽128的下端)可以封闭并可以沿前后(例如,图7中所示的前后)间隔布置。由此,可以将刀叉138放置在搁置槽128内,利用搁置槽128的预摆放功能,可以减轻在刀叉托盘上摆放刀叉类餐具的工作量,还可以加强刀叉类餐具的放置稳妥性,便于刀叉类餐具的进一步转移。

[0093] 进一步地,参照图7和图8,第三托盘123可以包括第三主体板129、定位筋133以及定位板134。

[0094] 具体而言,结合1和图9所示,第三主体板129的第一端(例如,图7中第三主体板129的上端)可以与第二托盘102铰接,第三主体板129的第二端(例如,图8中第三主体板129的下端)可以设有第一边板130,第三主体板129的前沿可以设有第二边板131,第三主体板129的后沿可以设有第三边板132,第二边板131、第一边板130和第三边板132可以沿第三主体板129的周向依次相连。定位筋133可以为多个,多个定位筋133可以沿前后方向(例如,图7中所示的前后方向)间隔布置在第二边板131和第三边板132之间并限定出搁置槽128。定位板134可以沿前后方向(例如,图7中所示的前后方向)延伸且可以分别与定位筋133的自由端、第二边板131以及第三边板132相连。由此,可以使得刀叉138能够可靠地放置在刀叉篮组件100内,从而可以进一步将刀叉类餐具进行转移,方便快捷。

[0095] 进一步地,参照图2并结合图7,定位筋133可以包括在折叠状态沿上下(例如,图7中所示的上下)间隔布置的多组,且每组定位筋133均可以对应连接有定位板134。由此,可以提高第三托盘123的强度且可有效改善第三托盘123的稳定性。

[0096] 可选地,第三主体板129、定位板134均可以呈格栅型板状。由此,可以节省材料、保证刀叉类餐具的清洗效果。

[0097] 可选地,参照图1、图2并结合图9,第三托盘123在折叠状态可以与第二托盘102平行,且从折叠状态向展开状态转换时第三托盘123相对于第二托盘102的旋转角度可以在 180° 到 210° 的范围内。由此,便于用户利用刀叉篮组件100处于折叠状态和展开状态时的不同功能,从而可以方便刀叉餐具的收集和转移。

[0098] 当然,上述第三托盘123相对第二托盘102的旋转角度的限制仅是本发明的一些具体示例,不能理解为对本发明保护范围的限制,例如,在展开状态和折叠状态,可以将第三托盘123相对于第二托盘102的旋转角度设置成 170° 、 190° 、 200° 、 210° 或 220° 等。

[0099] 具体地,第二托盘102所在平面和第三托盘123所在平面可以构成第二角度,第二角度的变化范围可以为 0° 至 210° 。

[0100] 在本发明的实施例中,当刀叉篮组件100用作刀叉托盘时,同侧的第二托盘102和第三托盘123为展开状态。可选地,第二角度可以设计为 180° 至 210° 之间的某一角度。展开状态下的第二角度为 180° ,同侧的第二托盘102和第三托盘123平行,两者构成一个平面。

[0101] 在本发明的实施例中,当刀叉篮组件100用作刀叉篮时,第二角度可以为 0° ,即同侧的第三托盘123可以折叠至贴合第二托盘102。此时,左右两个第三托盘123可以分别挂在刀叉篮中间室的两侧,构成刀叉篮的左外室和右外室。

[0102] 在本发明的实施例中,构成刀叉篮组件100的托盘组件具有至少两种组合形状,其中至少有一种为托盘形状,第一角度和第二角度都可以张开到自身最大角度,此时第一角度221为 175° ,第二角度222为 180° ,则刀叉篮组件100可以呈中间低、两侧向中间倾斜的形状。

[0103] 在本发明的实施例中,构成刀叉篮组件100的托盘组件具有至少两种组合形状,其中至少有一种为篮子形状。此时,第一角度和第二角度都可以折叠成自身最小角度。第一角度可以为 90° ,第二角度可以为 0° ,托盘组件(包括第一托盘101,第二托盘102以及第三托盘123)可以构成刀叉篮的三个室。

[0104] 当刀叉篮组件100作为刀叉篮使用时,中间室可以为一个较大的存放空间,可以供刀叉类餐具比较自由地摆放。左外室和右外室是利用搁置槽128去插放刀叉类餐具,刀叉类餐具可以整齐有序地插放,达到预摆放的效果,从而减轻摆放餐具的工作量。

[0105] 根据本发明实施例的用于洗碗机的刀叉篮组件100能够作为刀叉托盘或者刀叉篮进行使用,具有收集、转移、存放以及在洗碗机内摆放刀叉类餐具进行清洗的多种实用功能。

[0106] 另外,根据本发明实施例的用于洗碗机的刀叉篮组件100可以应用到带有刀叉托盘的不同的洗碗机上,包括刀叉篮组件100作为刀叉托盘或者刀叉篮使用的情况。

[0107] 在本发明的描述中,需要理解的是,术语“中心”、“纵向”、“横向”、“长度”、“宽度”、“厚度”、“上”、“下”、“前”、“后”、“左”、“右”、“竖直”、“水平”、“顶”、“底”、“内”、“外”、“顺时针”、“逆时针”、“轴向”、“径向”、“周向”等指示的方位或位置关系为基于附图所示的方位或位置关系,仅是为了便于描述本发明和简化描述,而不是指示或暗示所指的装置或元件必须具有特定的方位、以特定的方位构造和操作,因此不能理解为对本发明的限制。

[0108] 此外,术语“第一”、“第二”仅用于描述目的,而不能理解为指示或暗示相对重要性或者隐含指明所指示的技术特征的数量。由此,限定有“第一”、“第二”的特征可以明示或者隐含地包括至少一个该特征。在本发明的描述中,“多个”的含义是至少两个,例如两个,三

个等,除非另有明确具体的限定。

[0109] 在本发明中,除非另有明确的规定和限定,术语“安装”、“相连”、“连接”、“固定”等术语应做广义理解,例如,可以是固定连接,也可以是可拆卸连接,或成一体;可以是机械连接,也可以是电连接;可以是直接相连,也可以通过中间媒介间接相连,可以是两个元件内部的连通或两个元件的相互作用关系,除非另有明确的限定。对于本领域的普通技术人员而言,可以根据具体情况理解上述术语在本发明中的具体含义。

[0110] 在本发明中,除非另有明确的规定和限定,第一特征在第二特征“上”或“下”可以是第一和第二特征直接接触,或第一和第二特征通过中间媒介间接接触。而且,第一特征在第二特征“之上”、“上方”和“上面”可是第一特征在第二特征正上方或斜上方,或仅仅表示第一特征水平高度高于第二特征。第一特征在第二特征“之下”、“下方”和“下面”可以是第一特征在第二特征正下方或斜下方,或仅仅表示第一特征水平高度小于第二特征。

[0111] 在本说明书的描述中,参考术语“一个实施例”、“一些实施例”、“示例”、“具体示例”、或“一些示例”等的描述意指结合该实施例或示例描述的具体特征、结构、材料或者特点包含于本发明的至少一个实施例或示例中。在本说明书中,对上述术语的示意性表述不必针对的是相同的实施例或示例。而且,描述的具体特征、结构、材料或者特点可以在任一个或多个实施例或示例中以合适的方式结合。此外,在不相互矛盾的情况下,本领域的技术人员可以将本说明书中描述的不同实施例或示例以及不同实施例或示例的特征进行结合和组合。

[0112] 尽管上面已经示出和描述了本发明的实施例,可以理解的是,上述实施例是示例性的,不能理解为对本发明的限制,本领域的普通技术人员在本发明的范围内可以对上述实施例进行变化、修改、替换和变型。

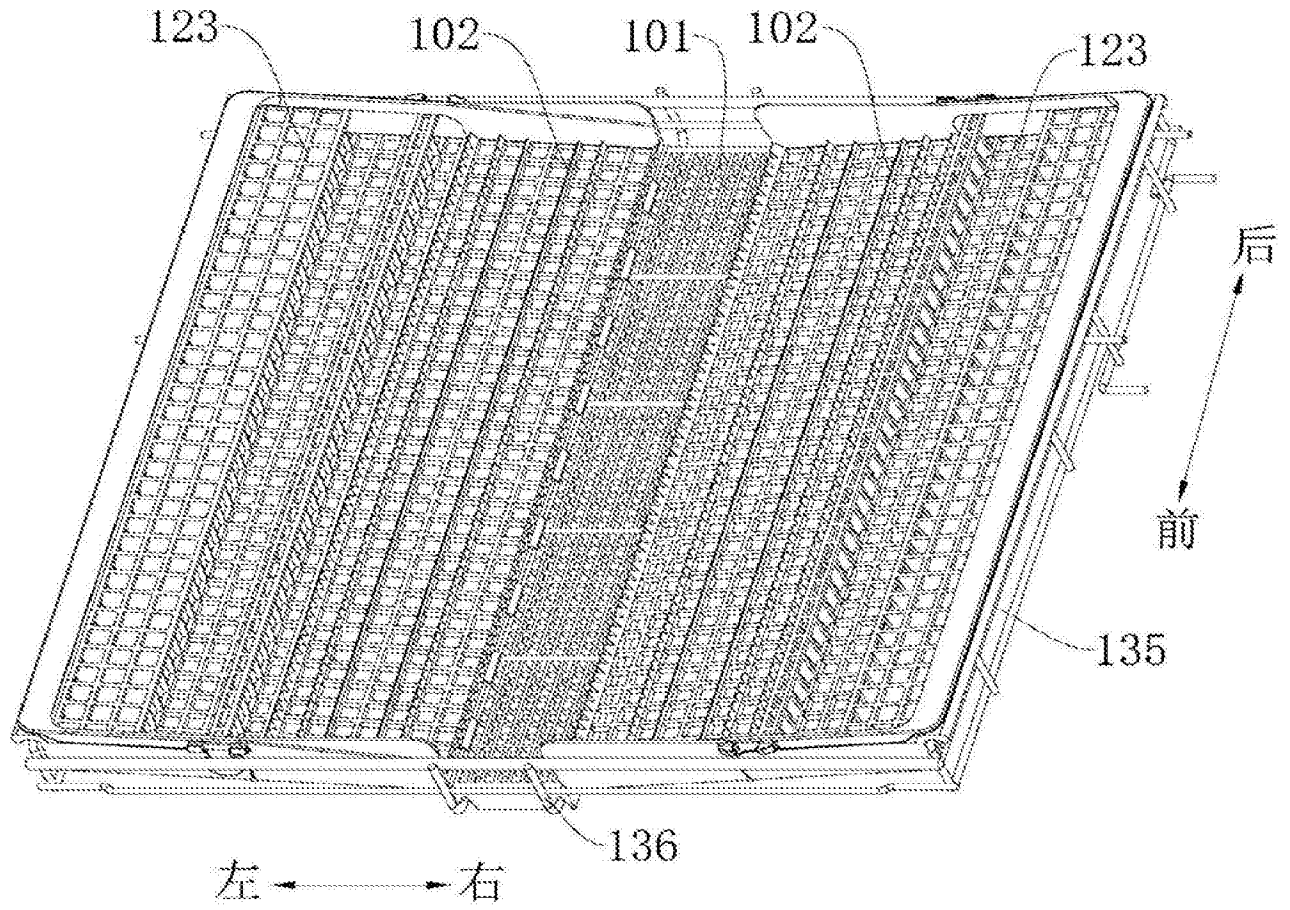


图1

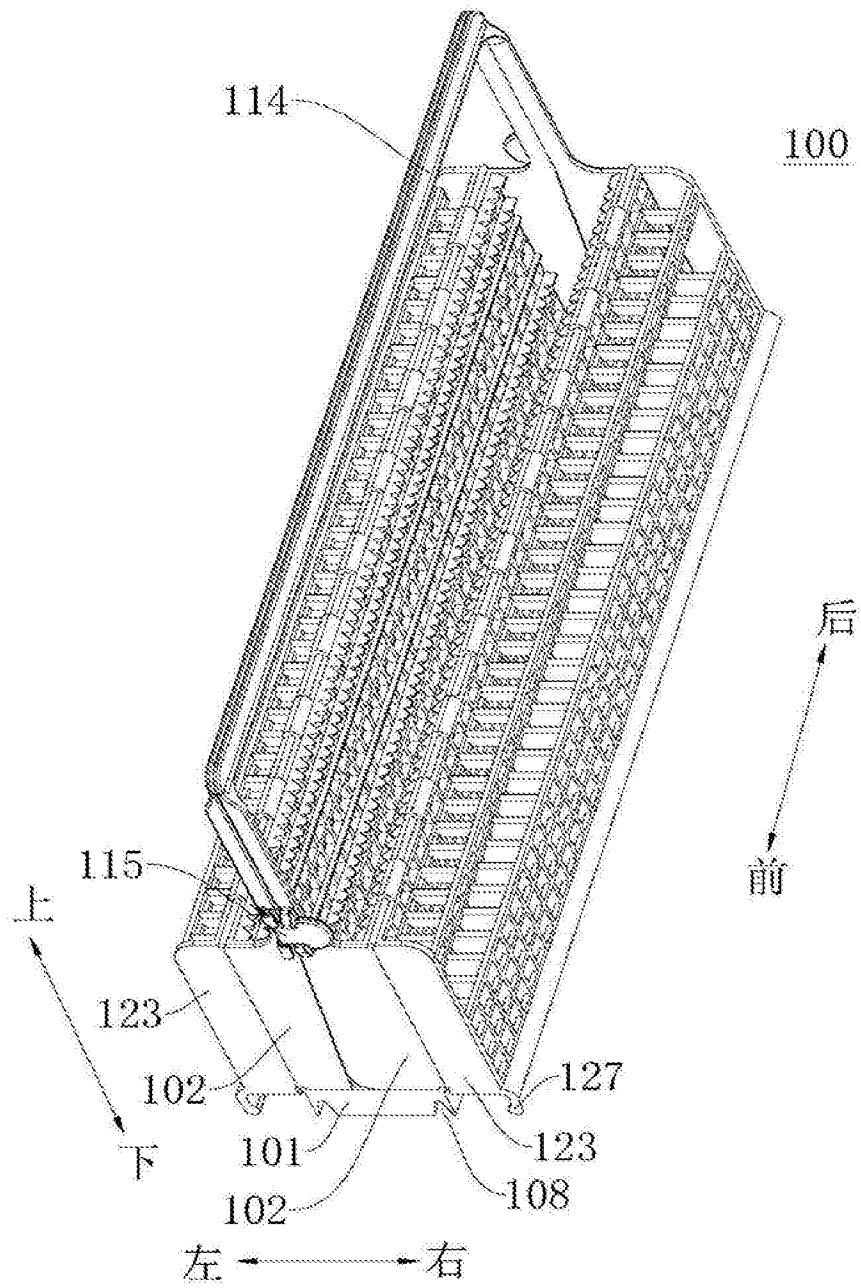


图2

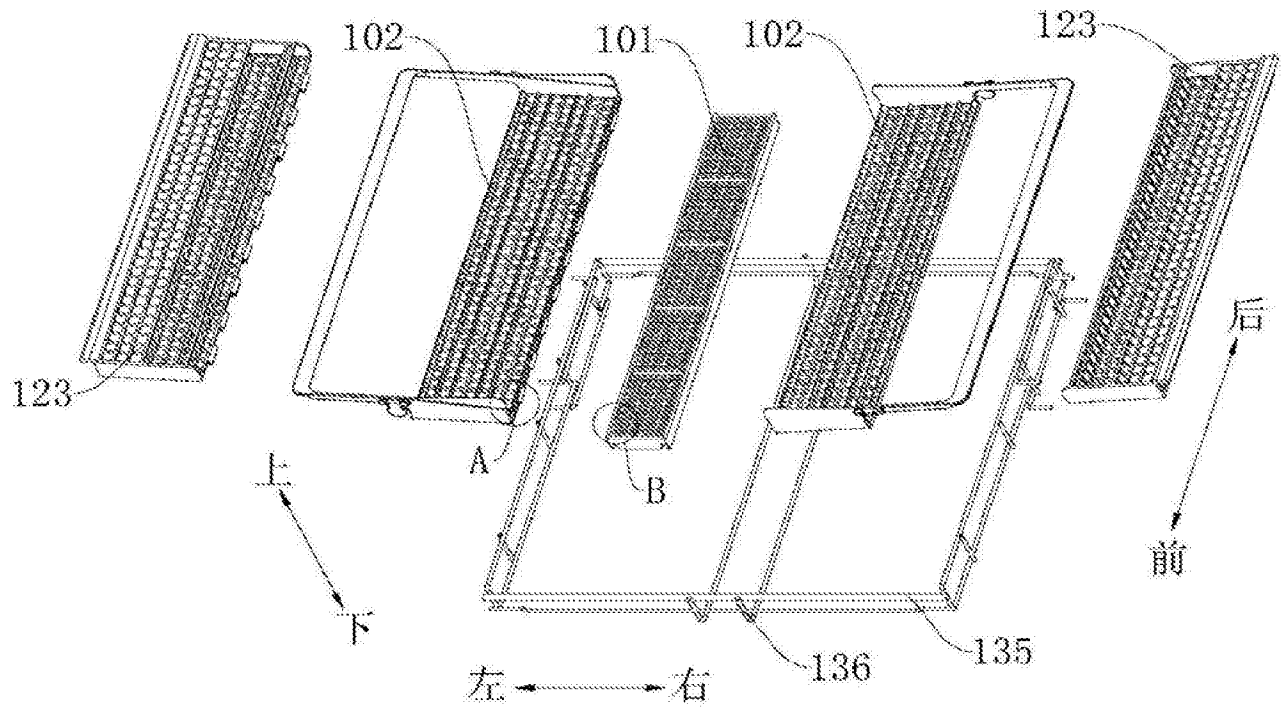


图3

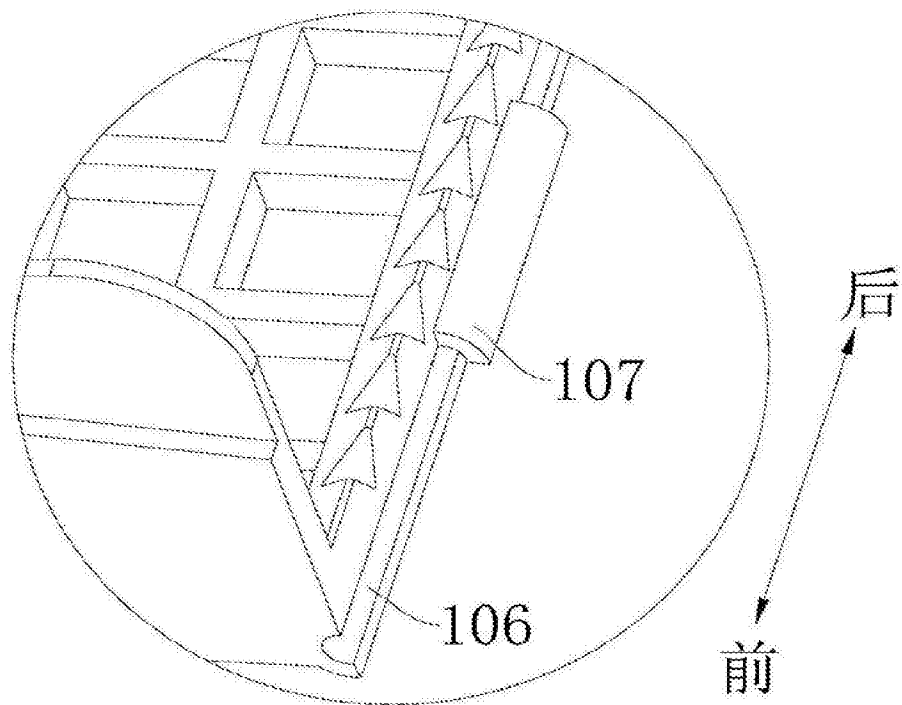


图3a

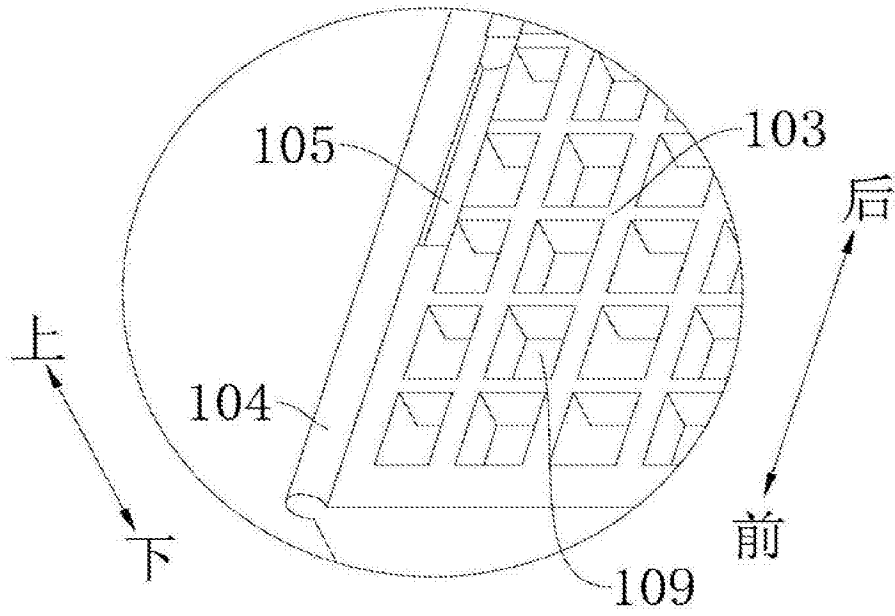


图3b

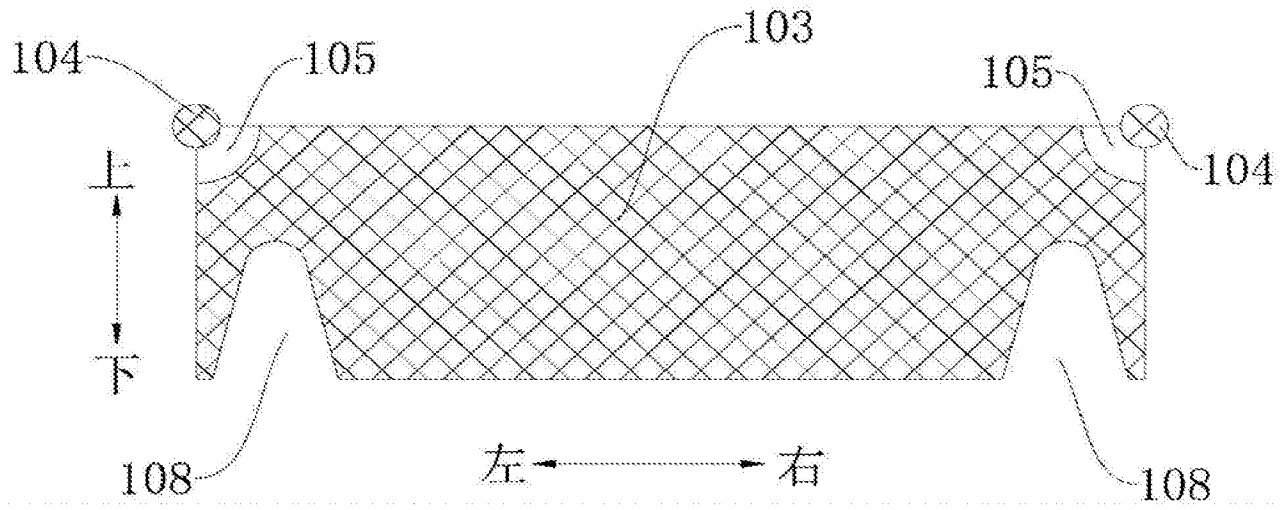


图4

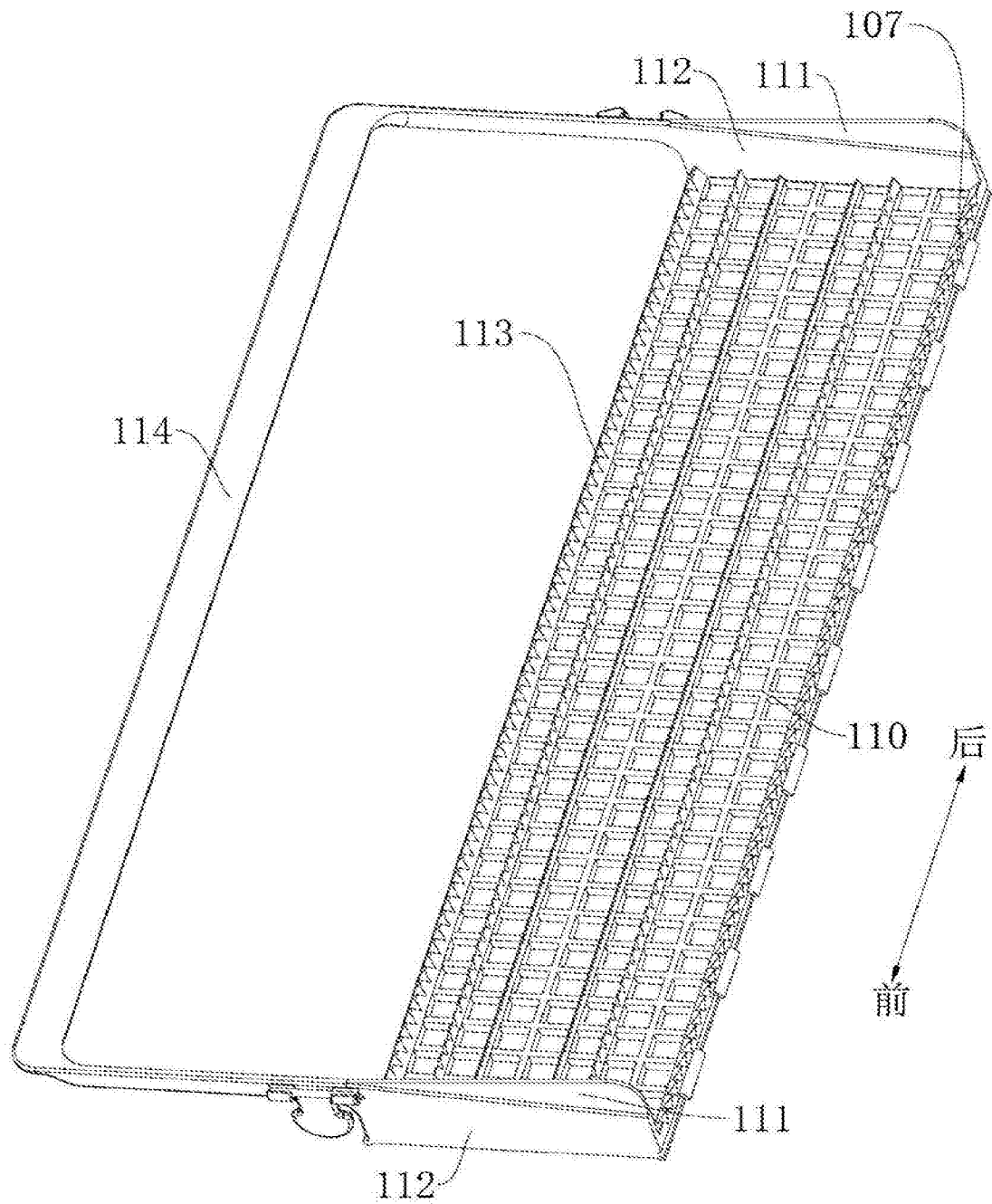


图5

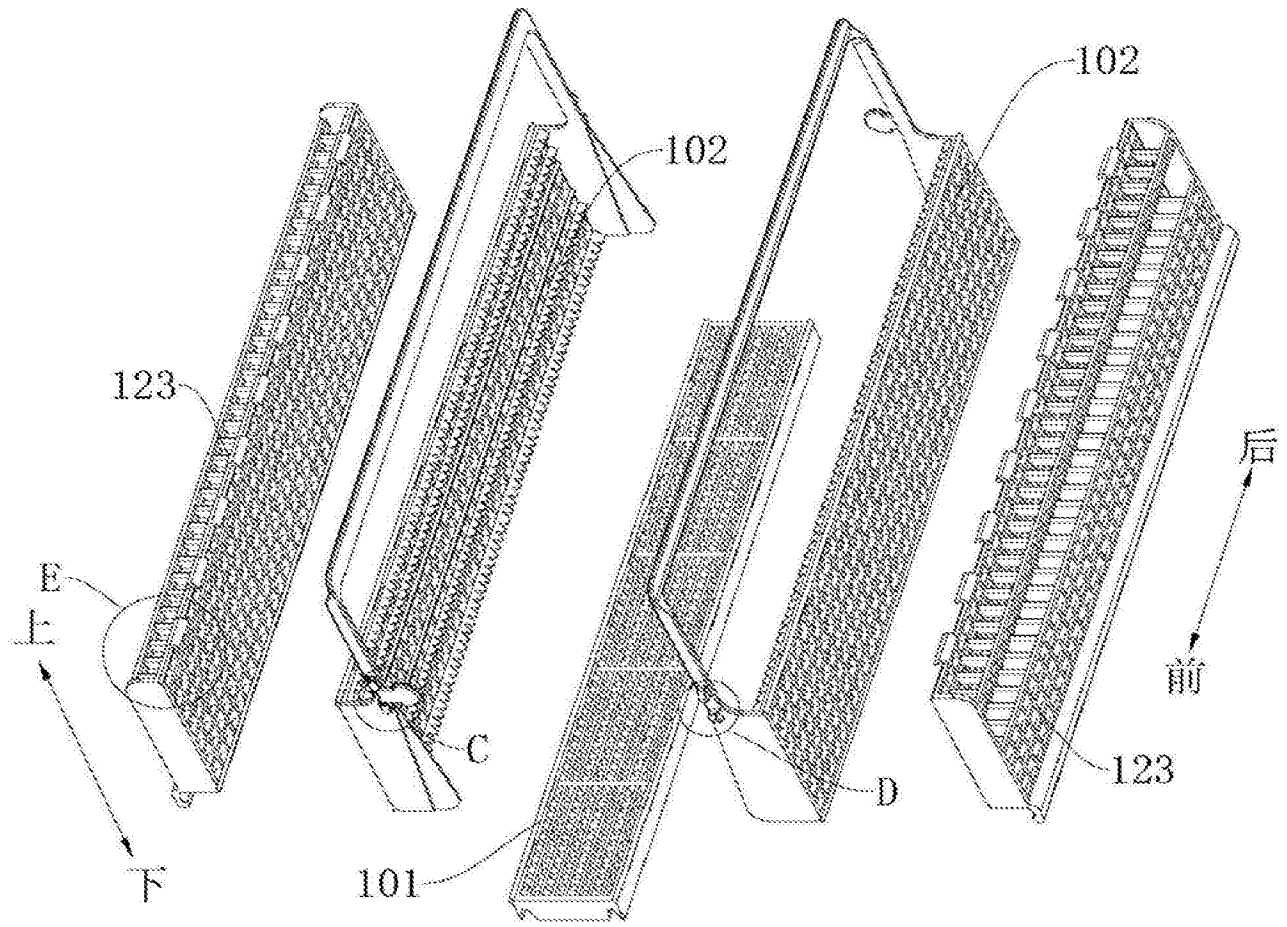


图6

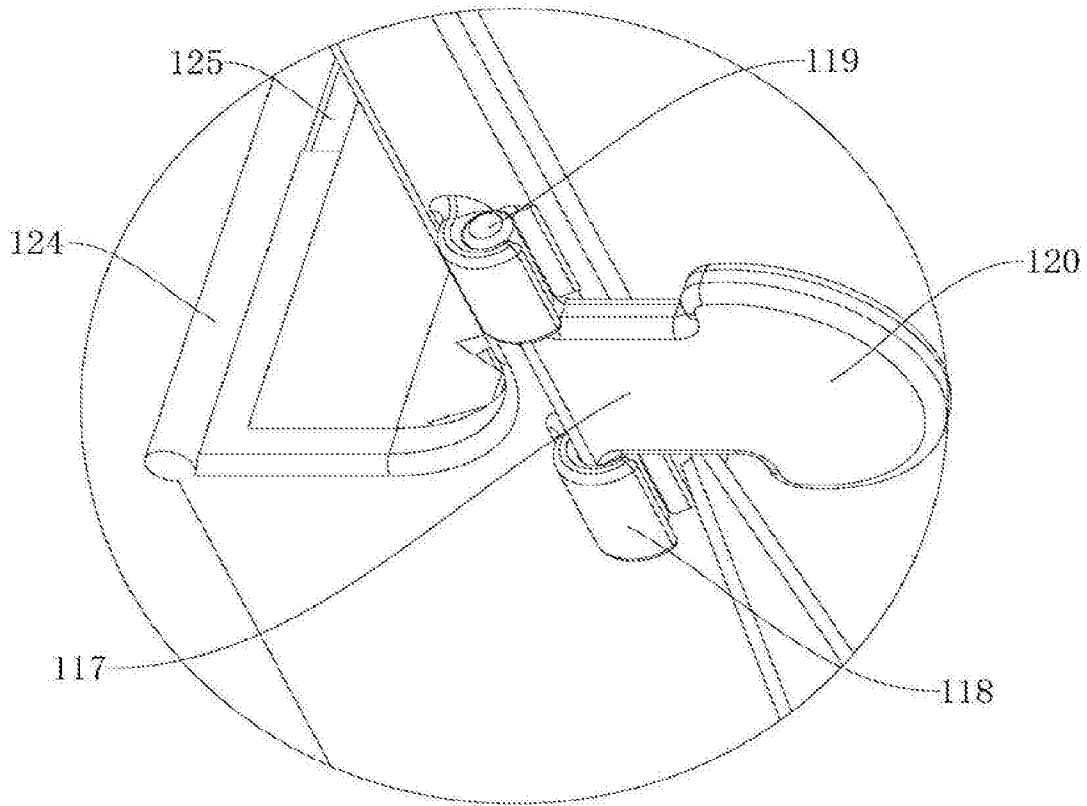


图6c

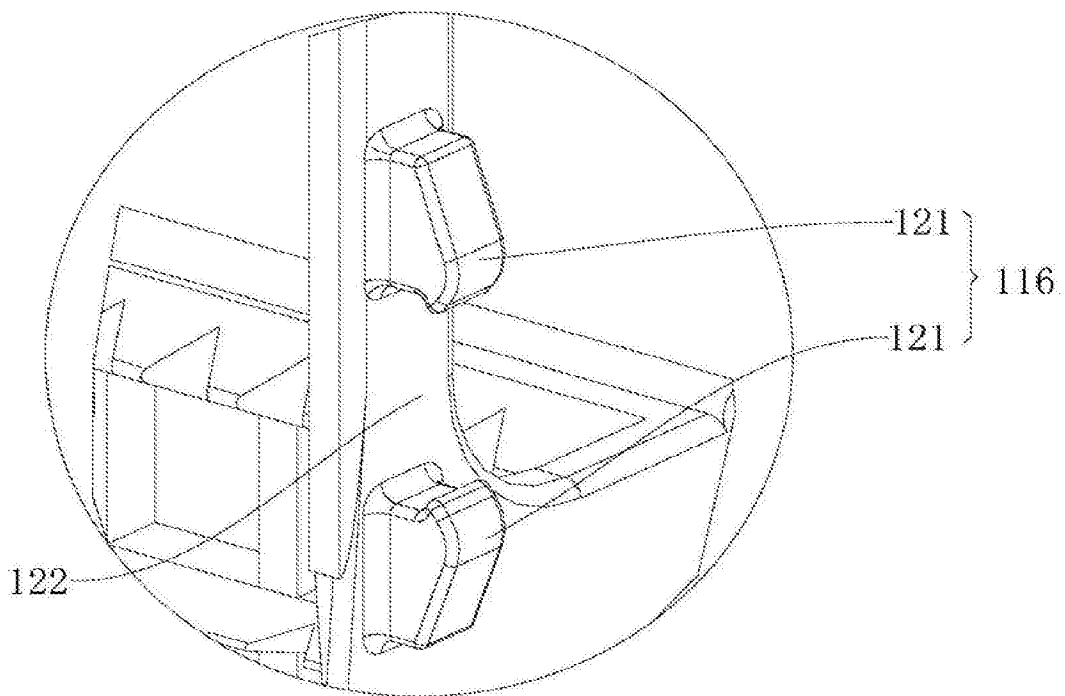


图6d

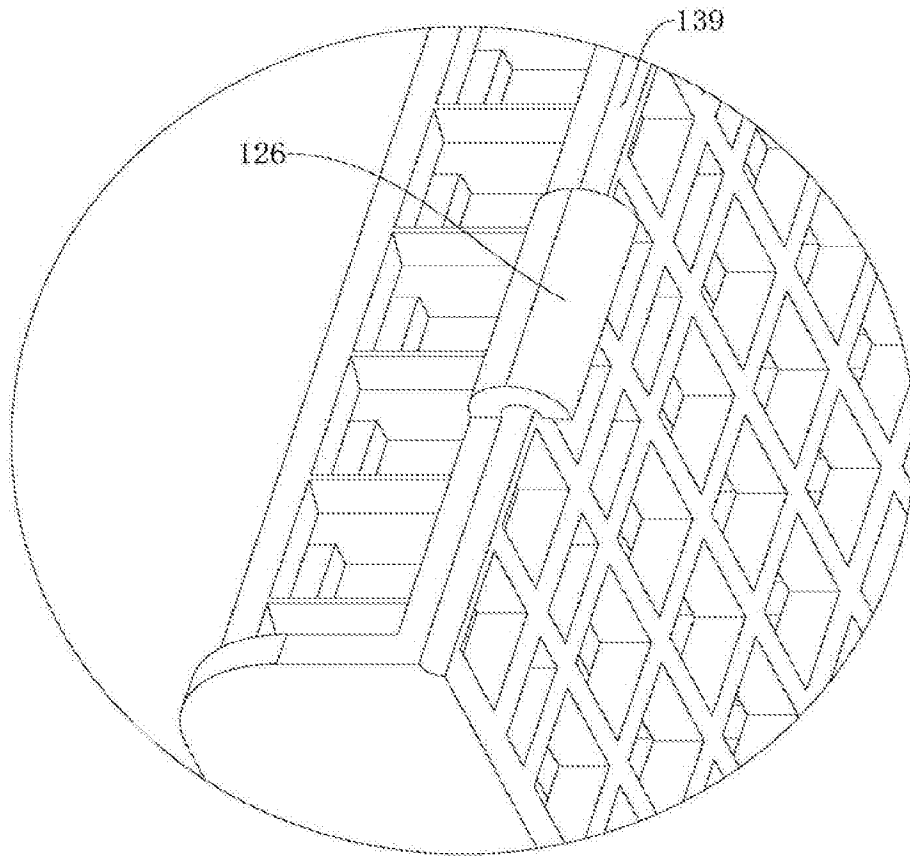


图6e

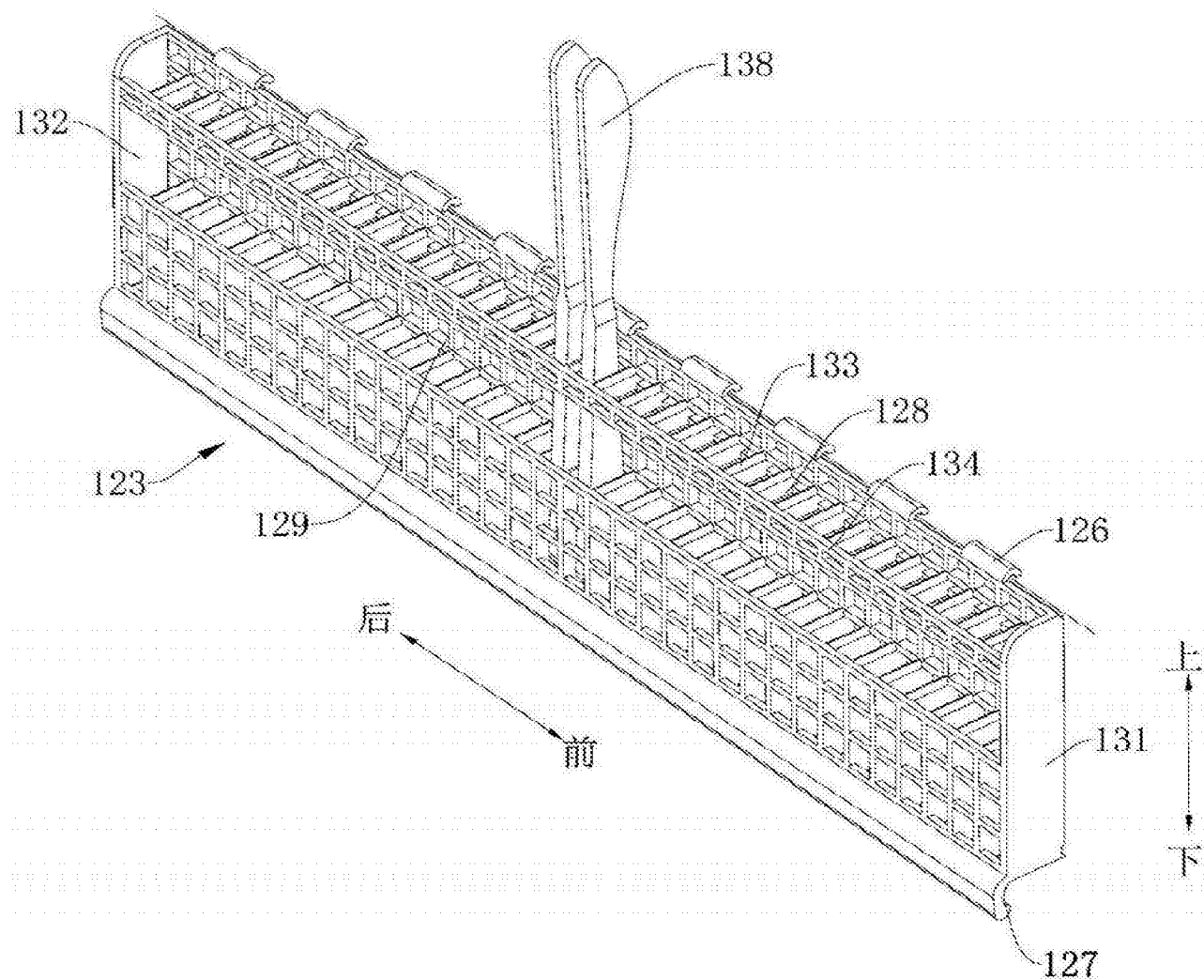


图7

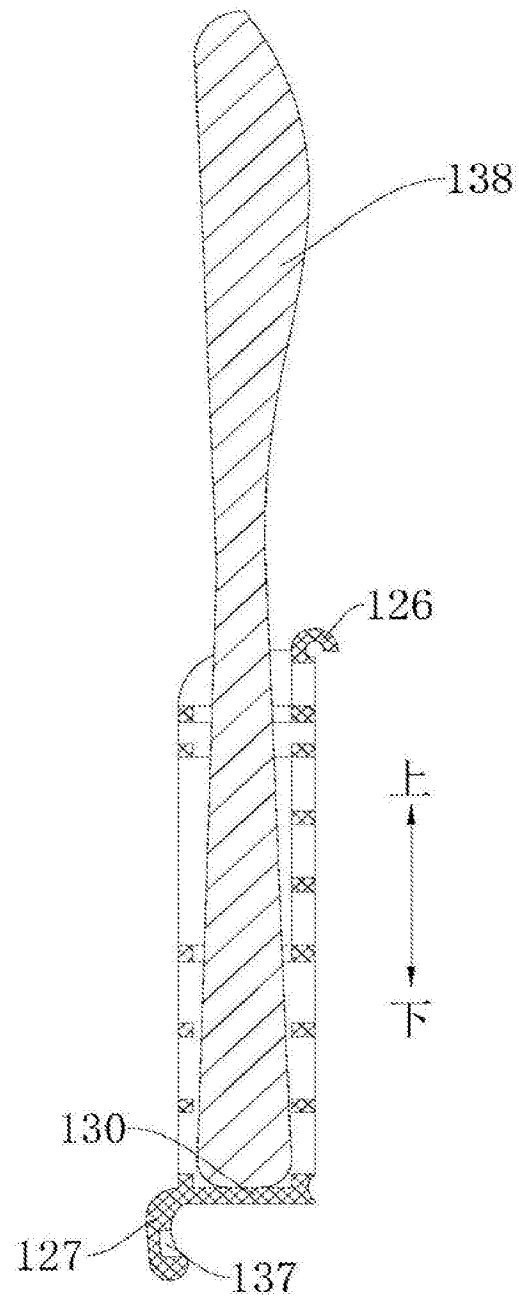


图8

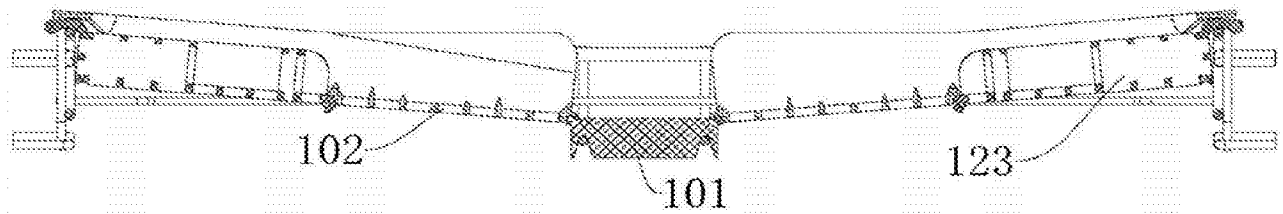


图9



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ELECTRONIC PAYMENT RECEIPT

APPLICATION # 19/297,954	RECEIPT DATE / TIME 08/12/2025 06:24:23 PM Z ET	ATTORNEY DOCKET # SUB-13230-US-CON3
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Title of Invention

DISHWASHER WITH A DISH RACK

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	2948	FILED BY	Megan Boot
PATENT CENTER #	71822414	AUTHORIZED BY	BRIAN CHESLEK
CUSTOMER #	130333	FILING DATE	-
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Mark S. Feddema

Payment Information

PAYMENT METHOD CARD / 9595	PAYMENT TRANSACTION ID E20258BI25205210	PAYMENT AUTHORIZED BY Megan Boot
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PRE-AUTHORIZED ACCOUNT 162463	PRE-AUTHORIZED CATEGORY 37 CFR 1.16 (National application filing, search, and examination fees); 37 CFR 1.17 (Patent application and reexamination processing fees); 37 CFR 1.20 (Post Issuance fees); 37 CFR 1.21 (Miscellaneous fees and charges)
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FEE CODE	DESCRIPTION	ITEM PRICE(\$)	QUANTITY	ITEM TOTAL(\$)
1011	BASIC FILING FEE - UTILITY (PAPER FILING ALSO REQUIRES NON-ELECTRONIC FILING FEE UNDER 1.16(T))	350.00	1	350.00
1111	UTILITY PATENT APPL. SEARCH FEE	770.00	1	770.00
1311	PATENT APPL. EXAMINATION FEE	880.00	1	880.00
1817	REQUEST FOR PRIORITIZED EXAMINATION	4515.00	1	4515.00

Petitioner Samsung Ex-1004, 0415

1830	PROCESSING FEE, EXCEPT IN PROVISIONAL APPLICATIONS	150.00	1	150.00
1202	EACH CLAIM IN EXCESS OF 20	200.00	6	1200.00
TOTAL AMOUNT:				\$7,865.00

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If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

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Placeholder Sheet for Supplemental Content

Application Number: 19297954

Document Date: 08/12/2025

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number
19/297,954

APPLICATION AS FILED - PART I

(Column 1)		(Column 2)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	350
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	770
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	880
TOTAL CLAIMS (37 CFR 1.16(i))	26 minus 20 =	6			OR	x 200 =	1200
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =					x =	0
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	3200

APPLICATION AS AMENDED - PART II

(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
Total (37 CFR 1.16(i))	*	Minus **	=	x	=	OR	x	=
Independent (37 CFR 1.16(h))	*	Minus ***	=	x	=	OR	x	=
Application Size Fee (37 CFR 1.16(s))						OR		
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						OR		
				TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
Total (37 CFR 1.16(i))	*	Minus **	=	x	=	OR	x	=
Independent (37 CFR 1.16(h))	*	Minus ***	=	x	=	OR	x	=
Application Size Fee (37 CFR 1.16(s))						OR		
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						OR		
				TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
19/297,954	08/12/2025		3200	SUB-13230-US-CON3	26	1

CONFIRMATION NO. 2948

130333
PRICE HENEVELD LLP
WHIRLPOOL CORPORATION - MD 3601
2000 NORTH M63
BENTON HARBOR, MI 49022

FILING RECEIPT



0000000093378225

Date Mailed: 08/26/2025

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Mark S. Feddema, Kalamazoo, MI;
William J. Snell, Elkhart, IN;
Sachie Kakehi, St. Joseph, MI;

Applicant(s)

WHIRLPOOL CORPORATION, BENTON HARBOR, MI;

Assignment For Published Patent Application

WHIRLPOOL CORPORATION, BENTON HARBOR, MI

Power of Attorney: The patent practitioners associated with Customer Number 130333

Domestic Applications for which benefit is claimed

This application is a CON of 19/039,228 01/28/2025
which is a CON of 18/535,327 12/11/2023 PAT 12,232,681
which is a CON of 17/830,947 06/02/2022 PAT 11,864,712
which is a CON of 16/833,984 03/30/2020 PAT 11,375,874

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - **None.**
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 08/21/2025

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 19/297,954**

Projected Publication Date: 11/27/2025

Non-Publication Request: No

Early Publication Request: No

Title

DISHWASHER WITH A DISH RACK

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

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For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

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Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

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Petitioner Samsung Ex-1004, 0423

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INFORMATION DISCLOSURE STATEMENT SIZE FEE – WRITTEN ASSERTION UNDER 37 CFR 1.98

Complete if Known

Application or Patent No.: 19/297,954	First Named Inventor: Mark S. Feddema	Art Unit:
Filing Date: 2025-08-12	Attorney Docket Number: SUB-13230-US-CON3	Examiner:

Please see 37 CFR 1.17(v) and attached Instructions for completing this form to make the appropriate selection of an assertion under 37 CFR 1.98. For the information disclosure statement (IDS) submitted herewith, the applicant or patent owner certifies the following with respect to the cumulative number of applicant-provided or patent-owner provided items of information submitted to date including those in the accompanying IDS (select only one):

- ☒ No IDS size fee is required under 37 CFR 1.17(v) at this time.
- ☐ The IDS is accompanied by the IDS size fee under 37 CFR 1.17(v)(1).
- ☐ The IDS is accompanied by the IDS size fee under 37 CFR 1.17(v)(2).
- ☐ The IDS is accompanied by the IDS size fee under 37 CFR 1.17(v)(3).

NOTE: This form must be accompanied by PTO/SB/08a and/or PTO/SB/08b or equivalent.

DEPOSIT ACCOUNT

The Director is authorized to charge the fee indicated above in the amount of \$ _____ for the IDS submitted herewith to deposit account _____.

SIGNATURE

This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications.

If applicant or patent owner is a juristic entity (e.g., an LLC or corporation), this form must be signed by a registered practitioner. See 37 CFR 1.31.

If applicant or patent owner is a person or persons, this form may be signed by either a registered practitioner, or the applicant or patentee. Note that if multiple people together are the applicant or patentee (e.g., there are joint inventors who together are the applicant), then a signature is required from each person who is an applicant or patentee. *Submit multiple forms if more than one signature is required, see below*.*

Signature /brianrcheslek/	Date 2025-08-26
Name (Print/Typed) Brian R. Cheslek	Practitioner Registration Number (if applicable) 58,329

☐ * Total of one forms are submitted.

A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995, unless the information collection has a currently valid OMB Control Number. The OMB Control Number for this information collection is 0651-0070. Public burden for this form is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the Office of the Chief Administrative Officer, United States Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 or email InformationCollection@uspto.gov. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

**Instructions for Filling out the
“Information Disclosure Statement Size Fee – Written Assertion Under 37 CFR 1.98” Form
(Not to be Submitted to the USPTO)**

Note: This form is to be used when applicant or patent owner files an Information Disclosure Statement (IDS) for consideration by the examiner. This form must be accompanied by PTO/SB/08a and/or PTO/SB/08b or equivalent.

Determining the cumulative number of applicant-provided or patent owner-provided items of information

The IDS size fee is based on the cumulative number of items of information provided by an applicant or patent owner during the pendency of the application or reexamination proceeding. It is the applicant’s and patent owner’s responsibility to track the cumulative number of items of information provided in the application or proceeding and provide a written assertion of any applicable IDS size fee due.

In determining the applicable written assertion for the cumulative number of applicant-provided or patent owner-provided items of information, “provided” refers to the items cited on an IDS under 37 CFR 1.98(a)(1) by an applicant or patent owner, whether or not an actual copy of the cited item is submitted by the applicant or patent owner to the USPTO. If a particular item provided by an applicant or patent owner on an IDS was not considered because the item was non-compliant and that particular item is provided on an IDS a second time in the same application or patent, it will not be counted again.

An item of information that an applicant cited in a parent application will not be counted in a child application (e.g., a continuation, continuation-in-part, or divisional application) for the purpose of the IDS size fees unless it is resubmitted, i.e., provided by the applicant on an IDS in the child application. Applicants who wish to avoid paying the IDS size fees in a child application for items of information considered in a parent application may do so by not resubmitting the items. An item of information must be resubmitted in the continuing application if the applicant desires the item of information to be printed on the patent. See MPEP 609.02, subsection II.A.2.

The cumulative count is determined for each application or patent separately. Continuing, CPA, and reissue applications and post-issuance proceedings will start with a count of zero. A request for continued examination (RCE) is not the filing of a new application, and thus the count will not reset when an RCE is filed.

Written Assertion

Check “[] No IDS size fee is required under 37 CFR 1.17(v) at this time” on the above PTO/SB/08c form when the IDS does not cause the cumulative number of applicant-provided or patent owner-provided items in this application or proceeding to:

- exceed 50, 100, or 200 items of information.

Check “[] The IDS is accompanied by the IDS size fee under 1.17(v)(1)” on the above PTO/SB/08c form when the IDS causes the cumulative number of applicant-provided or patent owner-provided items in this application or proceeding to:

- exceed 50 items of information but not exceed 100 items of information.

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- exceed 100 items of information but not exceed 200 items of information.

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- exceed 200 items of information.

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Select only one assertion on the PTO/SB/08c form above.

Note: the cumulative count of items of information includes all items of information already of record in a pending application or proceeding that were submitted via IDS(s) including those submitted prior to January 19, 2025.

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