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Lim(10) **Pub. No.: US 2006/0254992 A1**(43) **Pub. Date: Nov. 16, 2006**(54) **DISHWASHER WITH SLIP-PREVENTING
DEVICE FOR BOWL****Publication Classification**(75) Inventor: **Sung Bae Lim**, Changwon-si (KR)Correspondence Address:
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(57) **ABSTRACT**

There is provided a dishwasher. The dishwasher includes: a dish rack including an outer frame forming an exterior of the dish rack and an accommodation frame coupled to the outer frame for forming a bottom surface of the dish rack; and a slip-preventing device formed with an inserting groove for coupling with the dish rack to prevent a kitchen utensil from slipping.

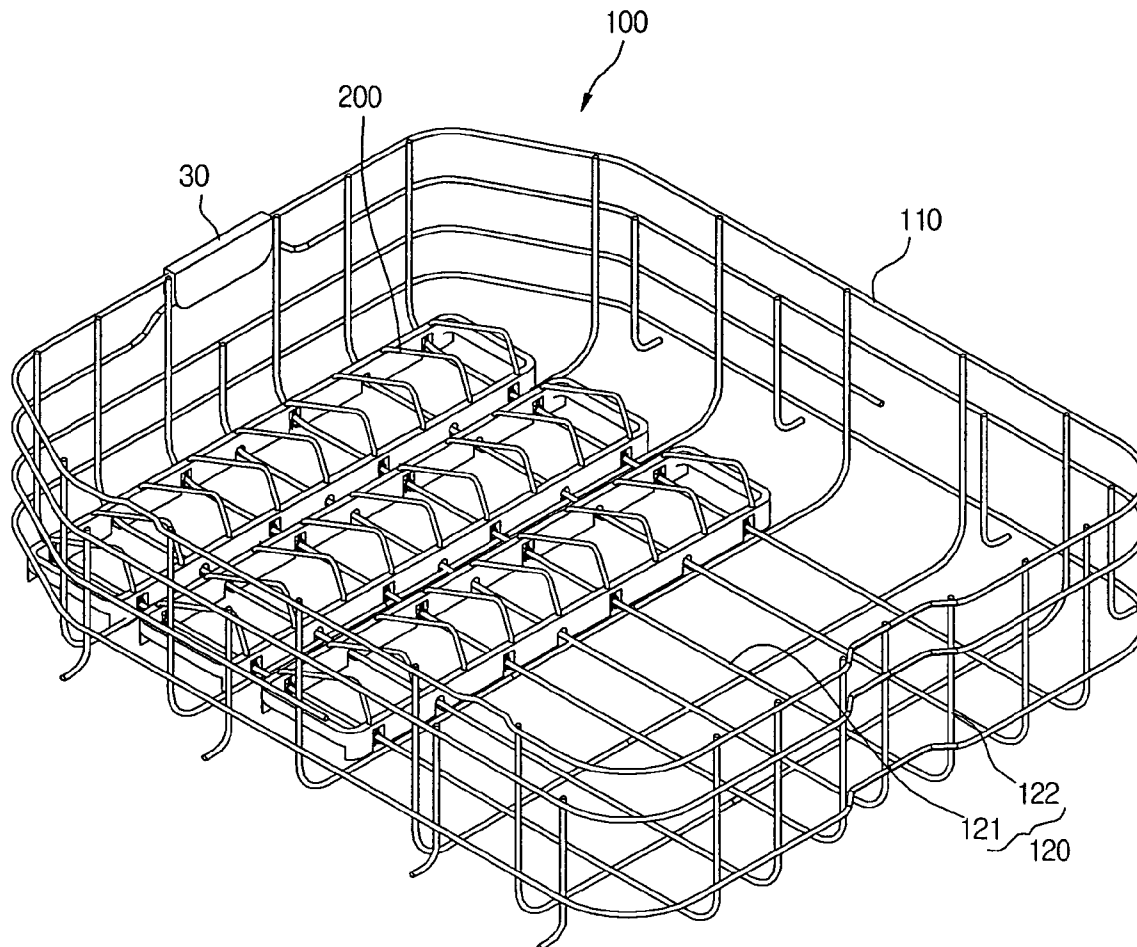


FIG. 1

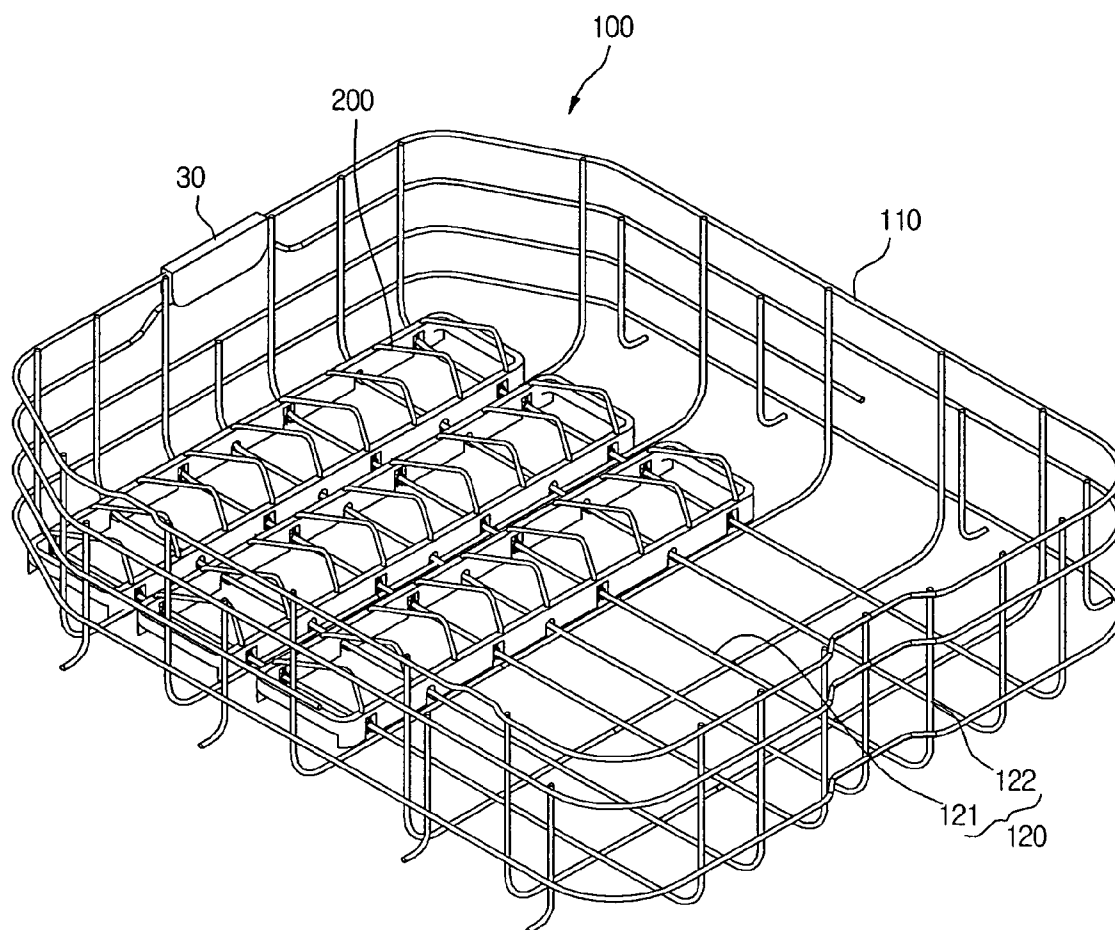


FIG.2

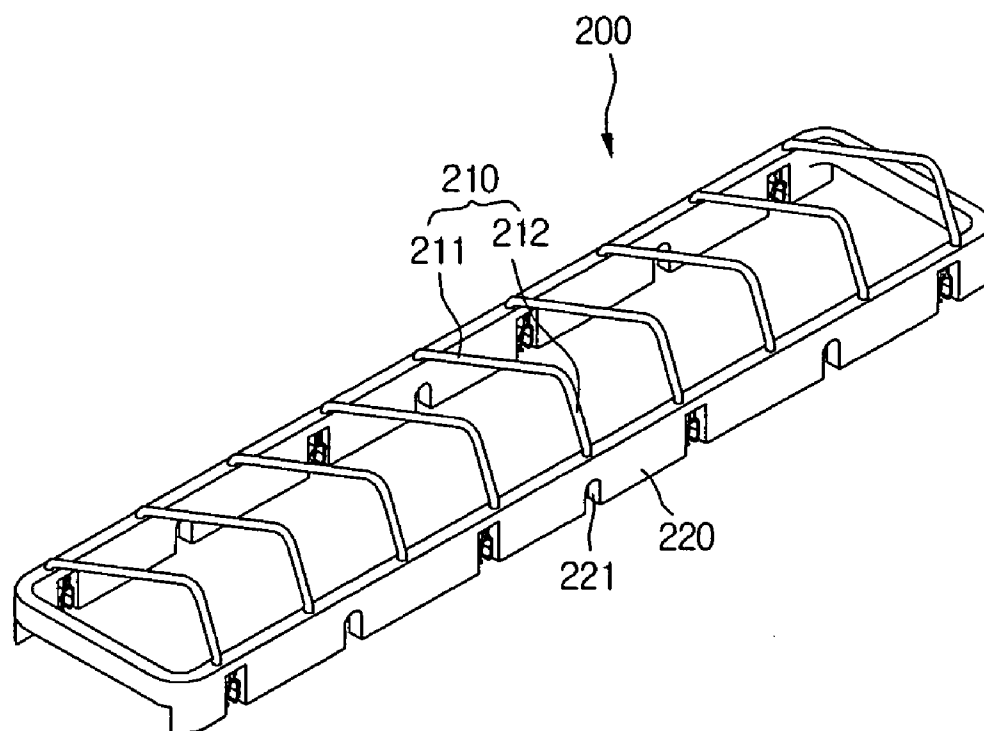


FIG.3

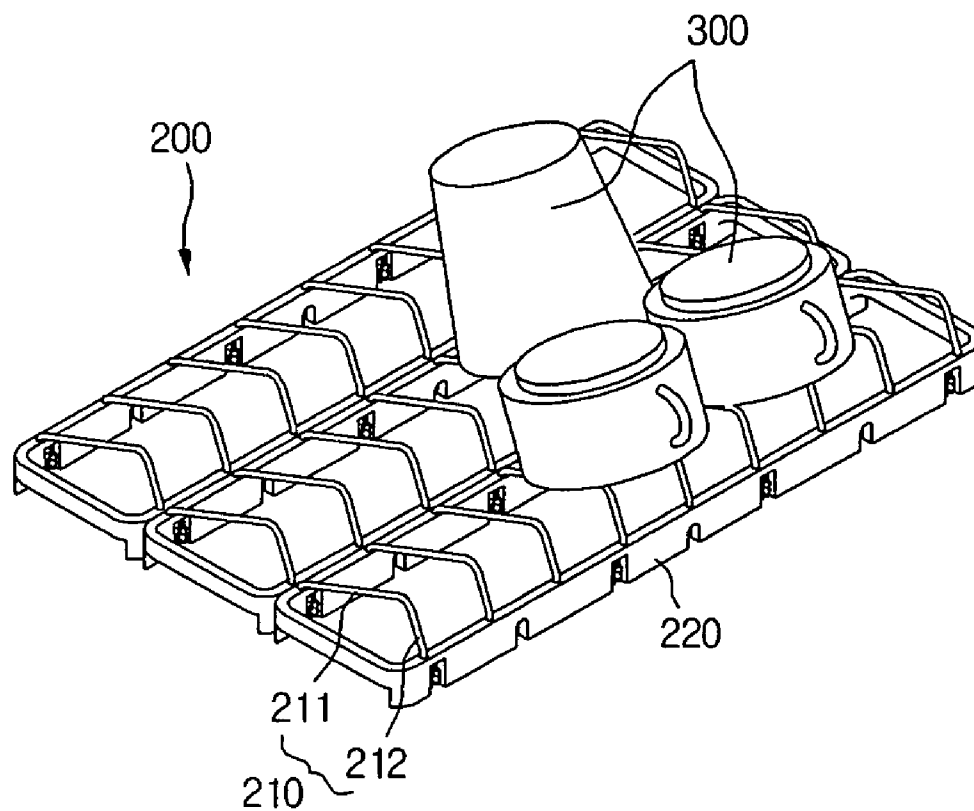


FIG.4

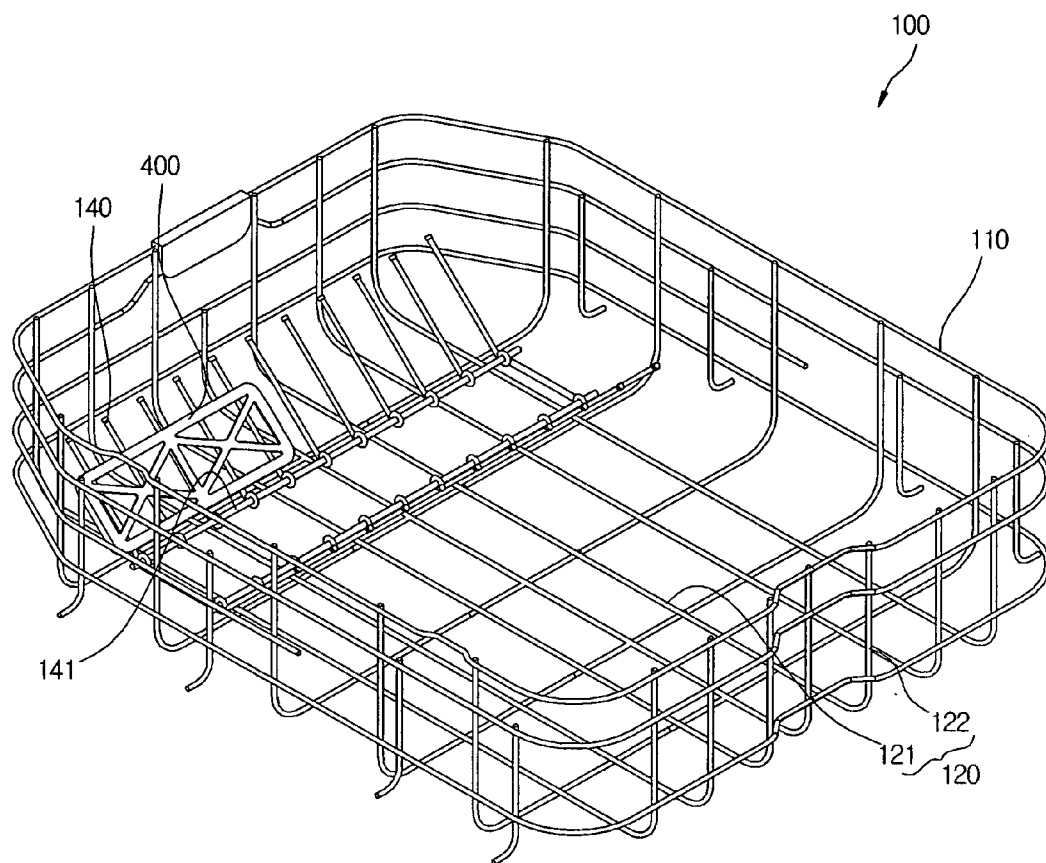


FIG.5

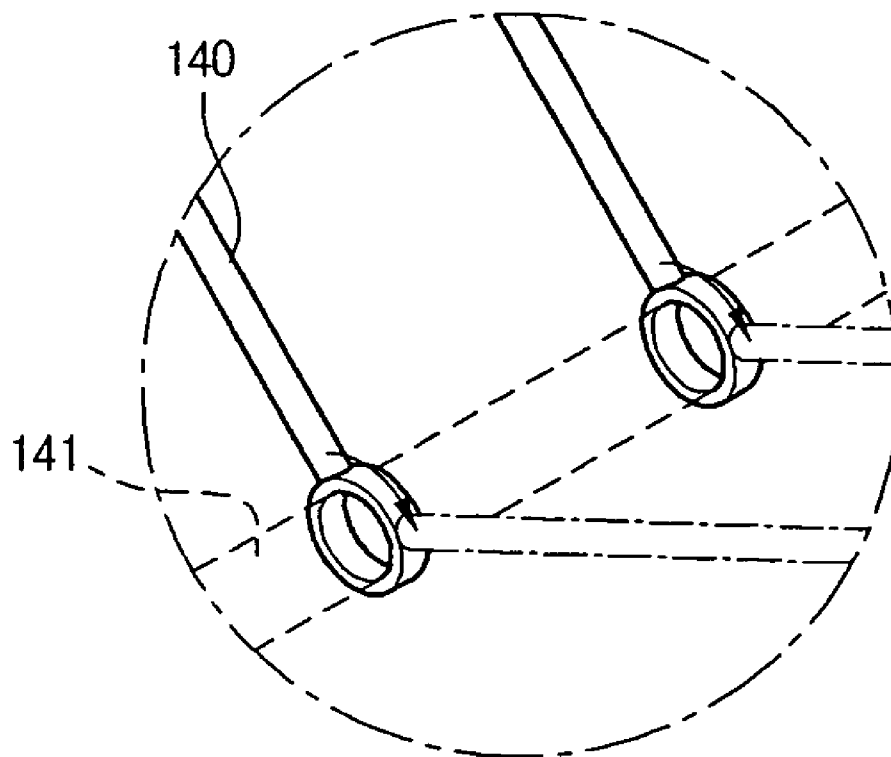


FIG.6

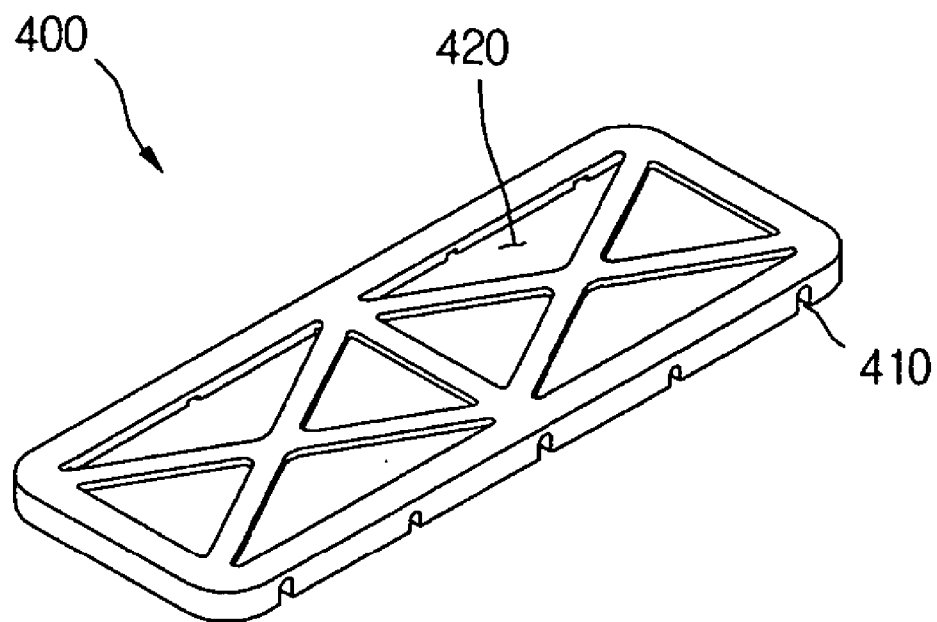
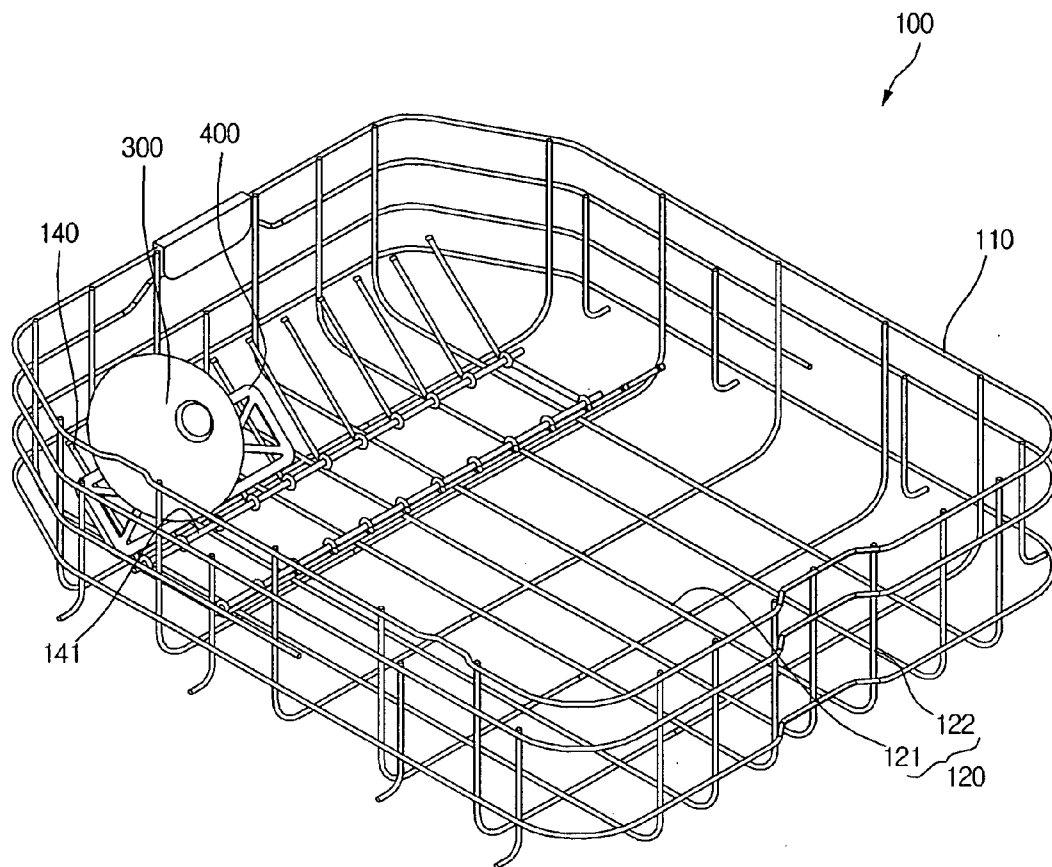


FIG. 7



DISHWASHER WITH SLIP-PREVENTING DEVICE FOR BOWL

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a dishwasher, and more particularly, to a dishwasher having a slip-preventing device detachably mounted on a dish rack for preventing slipping of kitchen utensils.

[0003] 2. Description of the Related Art

[0004] A dishwasher is a device that removes foreign substances such as remaining food and dirt from kitchen utensils by injecting washing liquid at a high pressure through an injection nozzle.

[0005] In detail, a dishwasher includes a tub forming a washing chamber and a sump installed under the tub for storing washing liquid. The washing liquid is pushed to an injection nozzle by a washing pump installed in the sump, and then injected at a high pressure through an injection hole formed in an end of the injection nozzle.

[0006] The injected washing liquid removes dirt such as remaining food from dishes by colliding with the dishes. The removed dirt drops to a bottom of the tub.

[0007] The dishwasher further includes at least one dish rack extendable from the tub for receiving kitchen utensils. Generally, two dish racks are detachably installed in the tub at upper and lower positions.

[0008] Various kitchen utensils such as bowls, cups, spoons, and forks are placed on the dish rack. Since various kitchen utensils having different shapes and size are put on the dish rack, the kitchen utensils are uniformly arranged on the dish rack. Further, kitchen utensils such as bowls are placed upside-down on the dish rack and inclined slightly in order to rapidly remove water from the kitchen utensils.

[0009] The dish rack is provided with bar-shaped tines. The tines are mounted on a bottom surface of the dish rack at a predetermined angle. Kitchen utensils such as bowls are placed on the inclined tines.

[0010] Flat kitchen utensils such as dishes are inserted between the tines.

[0011] However, in washing mode, the kitchen utensils placed on the tines easily slip to the bottom surface of the dish rack since the tines are inclined.

[0012] Further, if the kitchen utensils slip to the bottom surface of the dish rack from the tines, the kitchen utensils are not cleanly washed since they are placed upside-down on the flat bottom surface of the dish rack.

SUMMARY OF THE INVENTION

[0013] Accordingly, the present invention is directed to a dishwasher with a slip-preventing device for a bowl that substantially obviates one or more problems due to limitations and disadvantages of the related art.

[0014] An object of the present invention is to provide a dishwasher having a slip-preventing device detachably mounted on a dish rack for preventing slipping of kitchen utensils.

[0015] It is to be understood that both the foregoing general description and the following detailed description of the present invention are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this application, illustrate embodiment(s) of the invention and together with the description serve to explain the principle of the invention. In the drawings:

[0017] **FIG. 1** is a perspective view of a dish rack with a slip-preventing device according to a first embodiment of the present invention;

[0018] **FIG. 2** is a perspective view of the slip-preventing device depicted in **FIG. 1**;

[0019] **FIG. 3** is a perspective view of the slip-preventing device depicted in **FIG. 1** when kitchen utensils are placed on the slip-preventing device;

[0020] **FIG. 4** is a perspective view of a dish rack with a slip-preventing device according to a second embodiment of the present invention;

[0021] **FIG. 5** is an enlarged perspective view of tines mounted on an accommodation frame according to the second embodiment of the present invention;

[0022] **FIG. 6** is a perspective view of the slip-preventing device depicted in **FIG. 4**; and

[0023] **FIG. 7** is a perspective view of the dish rack depicted in **FIG. 4** when a kitchen utensil is placed on the slip preventing device.

DETAILED DESCRIPTION OF THE INVENTION

[0024] A slip-preventing device may be mounted on an accommodation frame forming a bottom portion of a dish rack or on a tine structure rotatably coupled to the dish rack according to embodiments of the present invention. The slip-preventing device is mounted on the dish rack to prevent slipping of kitchen utensils by supporting the kitchen utensils.

[0025] A dishwasher with a slip-preventing device will now be described in detail with reference to the accompanying drawings, in which exemplary embodiments of the present invention are shown.

[0026] **FIG. 1** is a perspective view of a dish rack with a slip-preventing device according to a first embodiment of the present invention.

[0027] Referring to **FIG. 1**, a dish rack **100** includes an outer frame **110** forming the exterior of the dish rack **100**, and an accommodation frame **120** coupled to the outer frame **110** for forming a bottom portion of the dish rack **100**.

[0028] The accommodation frame **120** is bent into a U-shape and supports kitchen utensils placed on the dish rack **100**.

[0029] In detail, the accommodation frame 120 includes bent portions 122 bent at a predetermined angle and coupled to the outer frame 110, and bottom portions 121 forming a lower portion of the dish rack 100.

[0030] A rack grip 130 is formed on one side of the outer frame 110. A user can easily pull and push the dish rack 100 using the rack grip 130.

[0031] A slip-preventing device 200 (three are shown) may be mounted on the accommodation frame 120. That is, the slip-preventing device 200 may be mounted on the bottom portions 121 of the accommodation frame 120.

[0032] A user can place kitchen utensils on the dish rack 100 or on the slip-preventing device 200.

[0033] In detail, when kitchen utensils are put on the slip-preventing device 200, the kitchen utensils does not slip when the dish rack 100 is pushed into or pulled from a tub of a dishwasher owing to the structure of the slip-preventing device 200.

[0034] Two or more slip-preventing devices 200 can be mounted on the dish rack 100 in a row for preventing slipping of kitchen utensils.

[0035] FIG. 2 is a perspective view of the slip-preventing device 200 depicted in FIG. 1.

[0036] Referring to FIG. 2, the slip-preventing device 200 includes a body 220 and a supporting frame 210 mounted on a top surface of the body 220 for supporting kitchen utensils.

[0037] The body 220 includes frame inserting grooves 221 for coupling with the accommodation frame 120.

[0038] In detail, the body 220 may be formed of plastic by injection molding. The frame inserting grooves 221 are uniformly formed in a bottom portion of the body 220 for receiving the accommodation frame 120. That is, the frame inserting grooves 221 may be spaced at the same interval as the bottom portions 121 of the accommodation frame 120 of the dish rack 100.

[0039] The body 220 further includes inserting holes formed in a top portion for coupling with bars of the supporting frame 210. In this case, the supporting frame 210 can be detachably mounted on the top portion of the body 220. Alternatively, the supporting frame 210 can be formed integrally with the body 220.

[0040] The supporting frame 210 includes utensil receiving portions 211 sloped at a predetermined angle from a horizontal plane, and utensil supporting portions 212 bent from the utensil receiving portions 211.

[0041] In detail, when two or more slip-preventing devices 200 are closely arranged, the utensil supporting portions 212 prevent slipping of kitchen utensils placed on the next slip-preventing device 200. In other words, when kitchen utensils such as bowls and cups are put on the utensil receiving portions 211 of the supporting frame 210, slipping of the kitchen utensils can be prevented by a supporting frame 210 of a neighboring slip-preventing device 200.

[0042] Preferably, the utensil receiving portions 211 are sloped from a horizontal plane less than the utensil supporting portions 212. Therefore, kitchen utensils hardly slip on the slip-preventing device 200.

[0043] FIG. 3 is a perspective view of the slip-preventing device 200 depicted in FIG. 1 when kitchen utensils are placed on the slip-preventing device.

[0044] Referring to FIG. 3, as described above, it is preferable that two or more slip-preventing devices 200 be closely arranged. In this case, the supporting frames 210 of the slip-preventing devices 200 are arranged in the form of waves, such that kitchen utensils such as cups 300 placed on the utensil receiving portions 211 can be supported by the neighboring utensil supporting portions 212.

[0045] The arranged slip-preventing devices 200 may be coupled to each other using additional coupling parts or structure (not shown).

[0046] For example, the slip-preventing device 200 may include a hook (not shown) on one side of the body 220 and a corresponding coupling structure such as a groove in the other side of the body 220. In this case, the plurality of slip-preventing devices 200 can be coupled together.

[0047] The utensil receiving portions 211 may be relatively long and gently sloping for receiving kitchen utensils such as the cups 300, and on the contrary, the utensil supporting portions 212 may be relatively short and steep when compared with the utensil receiving portions 211.

[0048] In this case, kitchen utensils can be stably put on the utensil receiving portions 211 without slipping.

[0049] FIG. 4 is a perspective view of a dish rack with a slip-preventing device according to a second embodiment of the present invention, and FIG. 5 is an enlarged perspective view of tines mounted on an accommodation frame according to the second embodiment of the present invention.

[0050] Referring to FIGS. 4 and 5, a dish rack 100 is provided with a slip-preventing device 400. The dish rack 100 includes an outer frame 110 and an accommodation frame 120.

[0051] The accommodation frame 120 is bent into a U-shape. The accommodation frame 120 supports kitchen utensils put on the dish rack 100.

[0052] In detail, the accommodation frame 120 is bent at a predetermined angle. The accommodation frame 120 includes bent portions 122 coupled to the outer frame 110 and bottom portions 121 forming a lower portion of the dish rack 100.

[0053] Tines 140 are formed on the bottom portions 121 of the accommodation frame 120 at a predetermined distance from each other in order to receive kitchen utensils at a predetermined angle.

[0054] The tines 140 are rotatably coupled to a supporting shaft 141 (two are shown), and the supporting shaft 141 is fixed to the bottom portions 121 of the accommodation frame 120 of the dish rack 100.

[0055] The tines 140 have a rod-like shape, and one ends of the tines 140 are bent around the supporting shaft 141. The supporting shaft 141 may be formed separately from the bottom portions 121 of the accommodation frame 120 and then fixed to the bottom portions 121. Alternatively, the tines 140 may be directly coupled to the bottom portions 121 without the supporting shaft 141.

[0056] The tines **140** can be rotated on the supporting shaft **141** to a predetermined position and kept at the position by friction between the tines **140** and the supporting shaft **141**.

[0057] At least slip-preventing device **400** is mounted on the tines **140** for preventing kitchen utensils from slipping.

[0058] Kitchen utensils such as dishes can be put on the dish rack **100** by inserting the dishes between the tines **140** or leaning the dishes against the tines **140**.

[0059] When the tines **140** are rotated, the slip-preventing device **400** mounted on the tines **140** is also rotated with the tines **140**.

[0060] FIG. 6 is a perspective view of the slip-preventing device **400** depicted in FIG. 4, and FIG. 7 is a perspective view of the dish rack **100** depicted in FIG. 4 when a kitchen utensil is placed on the slip preventing device **400**.

[0061] Referring to FIGS. 6 and 7, the slip-preventing device **400** of the second embodiment is formed of a rubber material, such that kitchen utensils can be prevented from slipping.

[0062] In detail, the slip-preventing device **400** is formed into a rectangular shape and includes one or more tine inserting grooves **410** for coupling with the tines **140**. The slip-preventing device **400** can be detachably coupled to the tines **140** by the tine inserting grooves **410**.

[0063] The slip-preventing device **400** further includes drain holes **420**. Therefore, washing liquid falling from kitchen utensils can be easily drained through the drain holes **420**.

[0064] In detail, the slip-preventing device **400** may be formed into a pad-shape using rubber or plastic by injection molding. Further, the slip-preventing device **400** may include an inner frame such as a rigid body. In this case, the slip-preventing device **400** may be formed by injecting a rubber material around the inner frame by insert molding.

[0065] The slip-preventing device **400** may include an upper portion formed of a rubber material for apply a frictional force to a kitchen utensil such as a dish **300**, and a tine inserting groove portion formed of plastic.

[0066] According to the above-mentioned structure, the slip-preventing device **400** is mounted on the tines **140** in a direction perpendicular to the tines **140** by inserting the tines **140** into the tine inserting grooves **410**.

[0067] Then, a kitchen utensil such as the dish **300** can be placed upside-down on a top surface of the slip-preventing device **400**. In washing mode, washing liquid injected from an injection nozzle (not shown) runs against an inner surface of the dish **300** through the drain holes **420**.

[0068] The washing liquid removes remaining food and dirt from the inner surface of the dish **300**.

[0069] Even when the dish rack **100** is pulled or pushed, the dish **300** placed on the dish rack **100** does not slip owing to the slip-preventing device **400**.

[0070] It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention. Thus, it is intended that the present invention covers the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

What is claimed is:

1. A dishwasher comprising:

a dish rack including an outer frame forming an exterior of the dish rack and an accommodation frame coupled to the outer frame for forming a bottom surface of the dish rack; and

a slip-preventing device formed with an inserting groove for coupling with the dish rack to prevent a kitchen utensil from slipping.

2. The dishwasher according to claim 1, wherein the slip-preventing device comprises:

a body detachably fixed to the accommodation frame; and

a supporting frame mounted on a top portion of the body for supporting the kitchen utensil.

3. The dishwasher according to claim 2, further comprising one or more slip-preventing devices, wherein all the slip-preventing devices are mounted on the dish rack side by side.

4. The dishwasher according to claim 3, wherein each of the slip-preventing device further comprises a hook on one side and a corresponding coupling structure on the other side, such that all the slip-preventing devices are coupled to each other.

5. The dishwasher according to claim 2, wherein the body comprises at least one frame inserting groove in a lower portion for receiving the accommodation frame.

6. The dishwasher according to claim 2, wherein both ends of the supporting frame are detachably mounted on the top portion of the body, and the supporting frame is bent predetermined times.

7. The dishwasher according to claim 2, wherein the supporting frame comprises:

a utensil receiving portion inclined at a predetermined angle for receiving the kitchen utensil; and

a utensil supporting portion bent from the utensil receiving portion and coupled to the top portion of the body.

8. The dishwasher according to claim 7, wherein the utensil receiving portion is longer and less steep than the utensil supporting portion.

9. The dishwasher according to claim 1, wherein the dish rack further includes tines rotatably mounted on a bottom surface of the accommodation frame at a predetermined distance from each other, and

the slip-preventing device includes tine inserting grooves formed in a lower portion for coupling with the tines.

10. The dishwasher according to claim 9, wherein the slip-preventing device is partially or entirely formed of a rubber material.

11. The dishwasher according to claim 9, wherein the slip-preventing device further includes a drain hole formed in a top portion to a predetermined size.

12. The dishwasher according to claim 9, wherein the slip-preventing device includes:

an upper portion formed of a rubber material for applying a frictional force to the kitchen utensil; and

a tine inserting groove portion formed of plastic.

13. A dishwasher comprising:

a dish rack including an outer frame forming an exterior of the dish rack and an accommodation frame coupled to the outer frame for forming a bottom surface of the dish rack; and

a slip-preventing device detachably mounted on the bottom surface of the dish rack, the slip-preventing device including a body detachably fixed to a bottom surface of the accommodation frame and a supporting frame coupled to a top surface of the body.

14. The dishwasher according to claim 13, wherein the body comprises at least one frame inserting groove in a lower portion for receiving the accommodation frame.

15. The dishwasher according to claim 13, further comprising one or more slip-preventing devices detachably mounted on the dish rack, wherein a kitchen utensil placed on the slip-preventing device is supported by the supporting frame of a neighboring slip-preventing device.

16. The dishwasher according to claim 13, wherein the supporting frame comprises:

a utensil receiving portion inclined at a predetermined angle for receiving a kitchen utensil; and

a utensil supporting portion bent from an end of the utensil receiving portion for supporting a kitchen utensil.

17. A dishwasher comprising:

a dish rack including an outer frame forming an exterior of the dish rack and an accommodation frame coupled to the outer frame for forming a bottom surface of the dish rack;

one or more tines inclined at a predetermined angle from a bottom surface of the accommodation frame; and

a slip-preventing device detachably mounted on the tines.

18. The dishwasher according to claim 17, wherein the tines are formed at a predetermined interval from each other, and the slip-preventing device comprises one or more tine inserting grooves formed in a lower portion at the same interval as the tines for coupling with the tines.

19. The dishwasher according to claim 17, wherein the slip-preventing device comprises an upper surface formed of a rubber material for preventing slipping of a kitchen utensil.

20. The dishwasher according to claim 17, wherein the slip-preventing device is mounted on at least two tines and formed with a drain hole for draining water from a kitchen utensil.

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