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(54) **Knob and cooking appliance**

(57) A knob and a cooking appliance provided with the knob are presented. The knob includes a shell and a shaft lever accommodating portion. The shaft lever accommodating portion is provided with a shaft hole adapting to an end portion of a shaft lever, and the shell and

the shaft lever accommodating portion are separately manufactured. Therefore, it is possible that the shell and the shaft lever accommodating portion are manufactured by adopting different materials, and both the appearance and the strength of the knob can be taken into account.

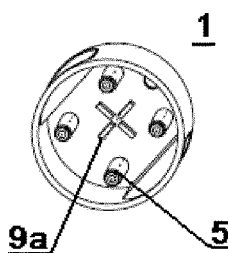


FIG. 1

Description

BACKGROUND OF THE INVENTION

Field of Invention

[0001] The present invention relates to the field of cooking appliances, and in particular, to a knob used in a cooking appliance.

Related Art

[0002] An existing knob is generally manufactured integrally. Therefore, the whole knob is manufactured by adopting the same material. In this way, a problem is caused. If a material suitable for electroplating is adopted to obtain a better appearance effect, the knob is easily fractured. However, if a high-strength material is adopted to avoid fracturing, a new disadvantage is caused that the electroplating cannot be performed to obtain the better appearance effect. It is thus clear that how to take into account both the appearance and the strength of the material is always a technical problem urgently to be solved in this field.

[0003] Unless supported by sufficient evidences, the prior art described herein does not mean that it is known to those of ordinary skill in the art before the filing date of this application.

SUMMARY OF THE INVENTION

[0004] To solve the above technical problem, the present invention puts forward a knob and a cooking appliance provided with the knob.

[0005] The knob put forward by the present invention includes a shell and a shaft lever accommodating portion. The shaft lever accommodating portion is provided with a shaft hole adapting to an end portion of a shaft lever, and the shell and the shaft lever accommodating portion are separately manufactured. In this way, it is possible that the shell and the shaft lever accommodating portion are manufactured by adopting different materials, and thereby, both the appearance and the strength of the knob may be taken into account.

[0006] Optionally, a main body of the shaft lever accommodating portion is provided in the shell.

[0007] Optionally, the shell is manufactured by adopting a material suitable for electroplating. In this way, the beauty of the appearance of the knob may be guaranteed.

[0008] Optionally, the shell is manufactured by adopting an ABS plastic material or a mixed material of ABS and PC.

[0009] Optionally, the shaft lever accommodating portion is manufactured by adopting a nylon material or a metal material or a PBT material. In this way, the strength of the knob may be guaranteed, thereby reducing the occurrence of fracturing in use and increasing the service

life of the knob.

[0010] Optionally, the shell and the shaft lever accommodating portion are fixed together in a hot riveting manner. In this way, the efficiency of fixing the shell and the shaft lever accommodating portion may be improved, and the cost may also be saved.

[0011] Optionally, the shell is provided with at least one hollow cylindrical plastic protrusion; the shaft lever accommodating portion is provided with a through hole for the cylindrical plastic protrusion to pass through; and the cylindrical plastic protrusion is used to be hot riveted after passing through the corresponding through hole, so as to fix the shell and the shaft lever accommodating portion together. In this way, the efficiency of fixing the shell and the shaft lever accommodating portion may be improved, and the cost may also be saved.

[0012] Optionally, the number of the cylindrical plastic protrusion is 2 or 3 or 4 or 5.

[0013] Optionally, the shaft lever accommodating portion includes a supporting portion, and an outer edge of the supporting portion fits an inner wall of the shell. In this way, it helps to improve the fixed effect between the shell and the shaft lever accommodating portion.

[0014] Optionally, the supporting portion is provided with at least one gap; the inner wall of the shell is provided with a protruding portion corresponding to the gap; and when the shell and the shaft lever accommodating portion are fixed together, the protruding portion is retained in the gap. In this way, it not only helps to improve the fixed effect between the shell and the shaft lever accommodating portion, but also functions to limit a position, that is, it is convenient to determine the specific position where the shaft lever accommodating portion is retained in the shell, thereby improving the assembly efficiency.

[0015] Optionally, the shell is provided with at least one hollow cylindrical plastic protrusion; the supporting portion is provided with a through hole for the cylindrical plastic protrusion to pass through; and the cylindrical plastic protrusion is used to be hot riveted after passing through the corresponding through hole, so as to fix the shell and the shaft lever accommodating portion together. In this way, the efficiency of fixing the shell and the shaft lever accommodating portion may be improved, and the cost may also be saved.

[0016] Optionally, the shaft lever accommodating portion is provided with a protruding portion or a gap; the shell is provided with a gap corresponding to the protruding portion on the shaft lever accommodating portion, or a protruding portion corresponding to the gap on the shaft lever accommodating portion; and when the shell and the shaft lever accommodating portion are fixed together, the protruding portion is retained in the corresponding gap. In this way, it not only helps to improve the fixed effect between the shell and the shaft lever accommodating portion, but also functions to limit a position, that is, it is convenient to determine the specific position where the shaft lever accommodating portion is retained in the shell, thereby improving the assembly efficiency.

[0017] The present invention also puts forward a cooking appliance, which includes a valve body and a knob as described above. The valve body includes a shaft lever, and the knob is retained on the shaft lever.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The following accompanying drawings are merely provided for schematically illustrating and explaining the present invention, but not intended to limit the scope of the present invention, where:

FIG. 1 is a schematic structural diagram of a shell of a knob embodiment according to the present invention;

FIG. 2 is another schematic structural diagram of a shell of a knob embodiment according to the present invention;

FIG. 3 is a sectional view along Line A-A in FIG. 2;

FIG. 4 is a sectional view along Line B-B in FIG. 2;

FIG. 5 is another schematic structural diagram of a shell of a knob embodiment according to the present invention;

FIG. 6 is a schematic structural diagram of a shaft lever accommodating portion of a knob embodiment according to the present invention;

FIG. 7 is another schematic structural diagram of a shaft lever accommodating portion of a knob embodiment according to the present invention;

FIG. 8 is another schematic structural diagram of a shaft lever accommodating portion of a knob embodiment according to the present invention;

FIG. 9 is a schematic structural diagram of a knob embodiment according to the present invention;

FIG. 10 is a sectional view along Line A-A in FIG. 9;

FIG. 11 is another schematic structural diagram of a knob embodiment according to the present invention; and

FIG. 12 is a schematic diagram of a joining relation between a shaft lever and a knob embodiment according to the present invention.

List of Reference Numerals:

[0019] 1-Shell; 2-Shaft lever accommodating portion; 3-Shaft lever; 4-Shaft hole; 5-Cylindrical plastic protrusion; 6-Through hole; 7-Supporting portion; 8a, 8b, 8c-

Gap; 9a, 9b-Protruding portion.

DETAILED DESCRIPTION OF THE INVENTION

[0020] To make the objective, solutions and beneficial effects of the present invention more clearly, the present invention is further illustrated with reference to the accompanying drawings and exemplary embodiments.

[0021] The present invention puts forward a knob embodiment, as shown in FIGs. 1 to 12. The knob embodiment includes a shell 1 and a shaft lever accommodating portion 2. The shaft accommodating portion 2 is provided with a shaft hole 4 adapting to an end portion of a shaft lever 3. The shell 1 and the shaft lever accommodating portion 2 are separately manufactured, and are then assembled together. The shell 1 is integrally formed. The shaft lever accommodating portion 2 is also integrally formed. A main body of the shaft lever accommodating portion 2 is provided in the shell 1. The "main body" is used for limitation because the part of the shaft hole 4 of the shaft lever accommodating portion 2 extends out of the cavity enclosed by the shell 1. The shell 1 is manufactured by adopting a material suitable for electroplating, such as a mixed material of ABS and PC. The ABS is an abbreviation for acrylonitrile butadiene styrene plastic. The PC is an abbreviation for polycarbonate, which is a colorless and transparent amorphous thermoplastic material. The shaft lever accommodating portion 2 is manufactured by adopting a nylon material or a metal material or a PBT material. The PBT is an abbreviation for polybutylene terephthalate.

[0022] The shell 1 and the shaft lever accommodating portion 2 are fixed together in a hot riveting manner. As shown in FIGs. 1 to 4, the shell 1 is provided with four hollow cylindrical plastic protrusions 5. As shown in FIGs. 6 to 8, the shaft lever accommodating portion 2 includes a supporting portion 7, and the supporting portion 7 is provided with four through holes 6 for the four cylindrical plastic protrusions 5 to pass through. Each of the cylindrical plastic protrusions 5 is used to be hot riveted after passing through the corresponding through hole 6, so as to fix the shell 1 and the shaft lever accommodating portion 2 together. Each of the cylindrical plastic protrusions 5 adopts a hollow structure to facilitate performing a fusion welding operation on the cylindrical plastic protrusion 5, thereby accomplishing the hot riveting. The fixed effect of the shell 1 and the shaft lever accommodating portion 2 is shown in FIGs. 9 to 11, where an outer edge of the supporting portion 7 fits an inner wall of the shell 1. The whole supporting portion 7 is in a round structure. The shell 1 includes an opening, a bottom wall and a circle of sidewall provided along the edge of the bottom wall, and the shaft lever accommodating portion 2 enters the shell 1 through the opening.

[0023] As shown in FIGs. 1 and 2, the inner wall of the shell 1 facing the opening is provided with four protruding portions 9a, and the four protruding portions 9a are arranged in a "cross" shape. As shown in FIGs. 7 and 8,

the shaft lever accommodating portion 2 is provided with four gaps 8a one-to-one corresponding to the four protruding portions 9a. When the shell 1 and the shaft lever accommodating portion 2 are fixed together, the protruding portions 9a are retained in the corresponding gaps 8a. The setting of the protruding portions 9a and the gaps 8a helps to improve the fixed effect between the shell 1 and the shaft lever accommodating portion 2.

[0024] As shown in FIGs. 2 and 5, the bottom wall of the shell 1 is provided with a gap 8b. The gap 8b is essentially a round through hole 6. As shown in FIGs. 8 and 9, the shaft lever accommodating portion 2 is provided with a protruding portion 9b corresponding to the gap 8b. When the shell 1 and the shaft lever accommodating portion 2 are fixed together, the protruding portion 9b is retained in the corresponding gap 8b. The setting of the protruding portion 9b and the gap 8b not only helps to improve the fixed effect between the shell 1 and the shaft lever accommodating portion 2, but also functions to limit a position, and may also mark the knob, so as to conveniently determine a rotation position in use.

[0025] As shown in FIGs. 6 to 8, the supporting portion 7 is provided with four gaps 8c. The inner wall of the shell 1 is provided with four protruding portions (not shown) respectively corresponding to the four gaps 8c. When the shell 1 and the shaft lever accommodating portion 2 are fixed together, the four protruding portions are respectively retained in the corresponding gaps 8c. The setting of the protruding portions and the gaps 8c helps to improve the fixed effect between the shell 1 and the shaft lever accommodating portion 2.

[0026] The above are merely the exemplary embodiments of the present invention, and other embodiments may be obtained by modifying and replacing some technical features. For example, the number of the cylindrical plastic protrusion may also be 1 or 2 or 3 or 5 or 6 or more. For another example, the cylindrical plastic protrusions may also be arranged asymmetrically. For another example, a reinforcing rib may also be provided on the shell.

[0027] The present invention also puts forward a cooking appliance, which is provided with a valve body and the above knob embodiment. The valve body includes a shaft lever and the knob is retained on the shaft lever. The cooking appliance may be a gas stove, an induction cooker, or a stove combining a gas stove and an induction cooker. It should be noted that, the understanding of the gas stove in the present invention should be broadened to include any stove provided with a burner, the type of gas source of which is not limited and may be natural gas, artificial coal gas, liquefied petroleum gas, biogas and any other gas source that may be similarly applied.

[0028] It should be noted that, the present invention is not limited to the above embodiments, but covers all the possible implementations determined according to the claims and the disclosure of the specification. Therefore, any simple modification, equivalent replacement, or improvement made without departing from the spirit and

principle of the present invention shall fall within the protection scope of the present invention.

5 Claims

1. A knob, **characterized by:**

comprising a shell and a shaft lever accommodating portion, wherein the shaft lever accommodating portion is provided with a shaft hole adapting to an end portion of a shaft lever, and the shell and the shaft lever accommodating portion are separately manufactured.

2. The knob according to claim 1, **characterized in that:**

a main body of the shaft lever accommodating portion is provided in the shell.

3. The knob according to claim 1, **characterized in that:**

the shell is manufactured by adopting a material suitable for electroplating.

4. The knob according to claim 3, **characterized in that:**

the shell is manufactured by adopting an ABS material or a mixed material of ABS and PC.

5. The knob according to claim 1, **characterized in that:**

the shaft lever accommodating portion is manufactured by adopting a nylon material or a metal material or a PBT material.

6. The knob according to claim 1, **characterized in that:**

the shell and the shaft lever accommodating portion are fixed together in a hot riveting manner.

7. The knob according to any one of claims 1 to 6, **characterized in that:**

the shell is provided with at least one hollow cylindrical plastic protrusion;
the shaft lever accommodating portion is provided with a through hole for the cylindrical plastic protrusion to pass through; and
the cylindrical plastic protrusion is used to be hot riveted after passing through the corresponding through hole, so as to fix the shell and the shaft lever accommodating portion together.

8. The knob according to claim 7, **characterized in that:**

the number of the cylindrical plastic protrusion is 2 or 3 or 4 or 5. 5

9. The knob according to any one of claims 1 to 6, **characterized in that:**

the shaft lever accommodating portion comprises a supporting portion, and an outer edge of the supporting portion fits an inner wall of the shell. 10

10. The knob according to claim 9, **characterized in that:** 15

the supporting portion is provided with at least one gap;
the inner wall of the shell is provided with a protruding portion corresponding to the gap; and
when the shell and the shaft lever accommodating portion are fixed together, the protruding portion is retained in the gap. 20
25

11. The knob according to claim 9, **characterized in that:**

the shell is provided with at least one hollow cylindrical plastic protrusion; 30
the supporting portion is provided with a through hole for the cylindrical plastic protrusion to pass through; and
the cylindrical plastic protrusion is used to be hot riveted after passing through the corresponding through hole, so as to fix the shell and the shaft lever accommodating portion together. 35

12. The knob according to any one of claims 1 to 6, **characterized in that:** 40

the shaft lever accommodating portion is provided with a protruding portion or a gap;
the shell is provided with a gap corresponding to the protruding portion on the shaft lever accommodating portion, or a protruding portion corresponding to the gap on the shaft lever accommodating portion; and
when the shell and the shaft lever accommodating portion are fixed together, the protruding portion is retained in the corresponding gap. 45
50

13. A cooking appliance, comprising a valve body and a knob according to any one of the above claims, wherein the valve body comprises a shaft lever, and the knob is retained on the shaft lever. 55

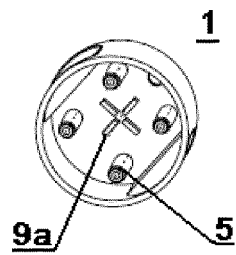


FIG. 1

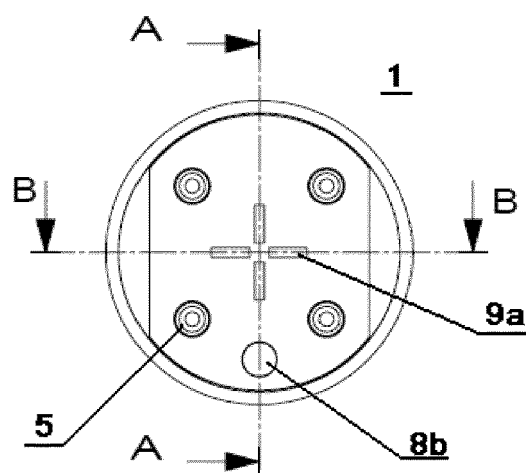


FIG. 2

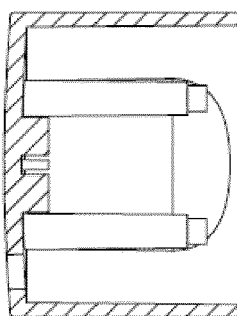


FIG. 3

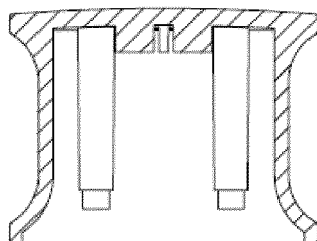


FIG. 4

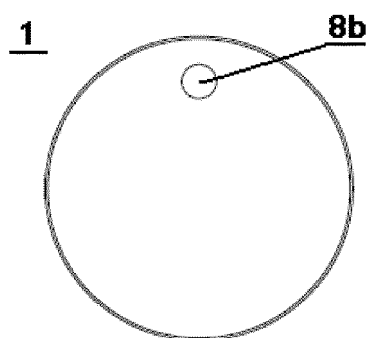


FIG. 5

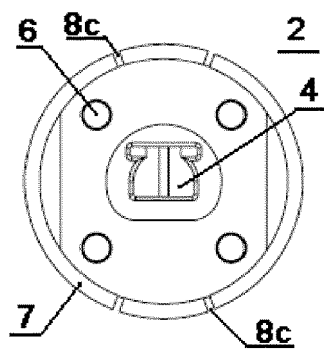


FIG. 6

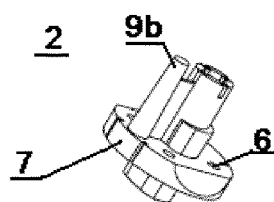


FIG. 7

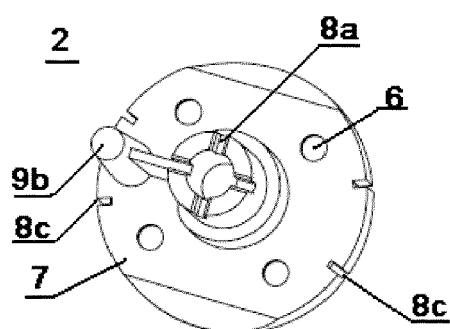


FIG. 8

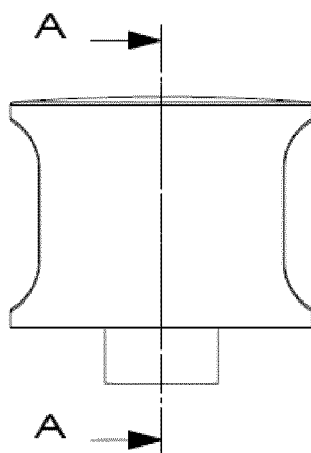


FIG. 9

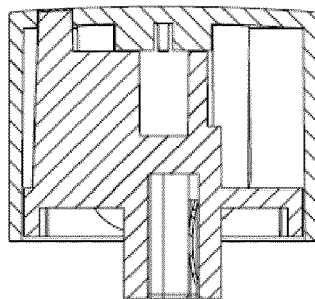


FIG. 10

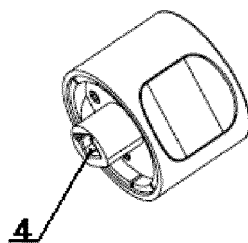


FIG. 11

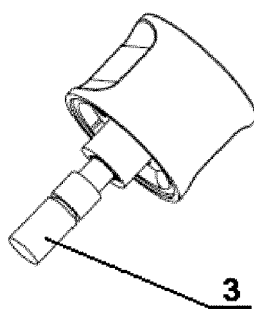


FIG. 12