

KNOB AND MASSAGER

BACKGROUND OF THE INVENTION

1. Technical Field

5 The present invention relates to the field of switches, and more particularly, to improvement of a knob. The present invention further relates to the field of electric appliances, and more particularly, to improvement of a massager.

2. Description of Related Art

10 Whether in small appliances or large machine equipment, knobs are used to switch on and off power supplies, control working strength, or adjust working modes. A handle of a knob in the prior art is generally fixedly and convexly arranged on a surface of the knob. Since the handle of the knob in the prior art protrudes outward, the best working states of some appliances or machines may be affected. Therefore, the knob is not suitable for appliances or machines with the
15 requirements for surface smoothness, such as a massager. Since the massager closely contacts a human body, even an unobvious projection of the massager will be sensed by the human body, which affects massaging comfort and damages the best massaging effect. Some knobs have grooves configured for enabling screwdrivers to insert and rotate, however, rotating the knobs needs other tools, and
20 the operations are inconvenient.

BRIEF SUMMARY OF THE INVENTION

25 A technical problem to be solved by the present invention is to overcome the shortcomings of the prior art and provide a knob that is convenient for being rotated and suitable for an appliance or a machine with requirements for surface smoothness.

 The embodiments of the present invention are implemented as follows: a knob, wherein the knob includes a base, an upper cover covering on and fixedly

connected to the base, and a buckle hinged on the upper cover and configured for rotating the base and the upper cover.

Further, a securing assembly configured for preventing the buckle from swaying is arranged in the upper cover.

5 Furthermore, a containing groove is defined in the upper cover, the securing assembly comprises a spring received in the containing groove and two sets of abutting assemblies, each set of the abutting assemblies comprises a first rotating shaft and a second rotating shaft, one end of the first rotating shaft has a first concave-convex surface, one end of the second rotating shaft has a second
10 concave-convex surface, the first concave-convex surface engages with the second concave-convex surface, the other end of the first rotating shaft is fixedly connected to the buckle, and the other end of the second rotating shaft is inserted into an end of the spring.

Preferably, the first and second concave-convex surfaces are smooth curved
15 surfaces.

In particular, the first and second concave-convex surfaces are serrated surfaces.

Further, the buckle comprises a C-shaped body and two plug shafts protruding from two ends of the body respectively, the plug shaft is provided with a stopping
20 surface, the other end of the first rotating shaft defines an insertion hole matching with the plug shaft, two ends of the containing groove are provided with through-holes configured to be passed by the plug shaft respectively, and each of the plug shafts passes through the through-hole and inserts in the insertion hole.

Furthermore, a shaft body of the second rotating shaft is provided with an
25 anti-rotation edge configured for preventing the second rotating shaft from rotation in the containing groove, and the anti-rotation edge closely contacts the containing groove.

In particular, the other end of the second rotating shaft is provided with a convex shaft inserted into the spring.

The present invention has the following benefits:

When the knob does not need to be rotated, the buckle is rotate to be at the same level with the upper cover. Thus surface smoothness of an appliance or machine adopting the knob will not be affected, and the best working state of the appliance or machine will not be affected by a convex knob. When the knob needs to be rotated, the buckle is rotated to be perpendicular to the upper cover, and then the buckle is rotated to drive the knob to rotate.

As improvement of the present invention, a securing assembly configured for preventing the buckle from swaying can be arranged in the upper cover, the securing assembly includes a spring and an abutting assembly, the abutting assembly includes a first rotating shaft and a second rotating shaft, a first concave-convex surface of the first rotating shaft engages with a second concave-convex surface of the second rotating shaft. Thus, the buckle will not sway at random when the buckle is vibrated.

The present invention also provides a massager adopting the knob.

The massager adopting the knob provided by the present invention does not affect comfort of use, and the knob is almost imperceptible for users. When a user needs to adjust the knob, the user just needs to manually hitch and rotate the buckle so that the buckle is perpendicular to the upper cover, and then the knob can be adjusted by rotating the buckle.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

Fig. 1 is an exploded view of a knob according to an embodiment of the present invention;

Fig. 2 is a bottom view of a buckle and an upper cover of the knob according to the embodiment of the present invention, wherein the buckle and the upper cover

are at the same level;

Fig. 3 is a bottom view of the buckle of the knob according to the embodiment of the present invention, wherein the buckle is rotated by 45°;

Fig. 4 is a bottom view of the buckle of the knob according to the embodiment
5 of the present invention, wherein the buckle is rotated by 90°; and

Fig. 5 is a schematic perspective view of a massager according to an embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

In order to make clearer the objects, technical solutions and advantages of the
10 invention, the present invention will be explained below in detail with reference to the accompanying drawings and embodiments. It is to be understood that the following description of the embodiments is merely to explain the present invention and is no way intended to limit the invention.

Referring to Fig. 1, the embodiment of the present invention provides a knob
15 which includes a base 1, an upper cover 2 covering on and fixedly connected to the base 1, and a buckle 3 hinged on the upper cover 2 and configured for rotating the base 1 and the upper cover 2. When the knob does not need to be rotated, the buckle 3 is rotated to be at the same level with the upper cover 2. Thus, surface smoothness of an appliance or machine adopting the knob will not be affected, and
20 the best working state of the appliance or machine will not be affected by a convex knob. When the knob needs to be rotated, the buckle 3 is rotated to be perpendicular to the upper cover 2, and then the buckle 3 can be rotated to drive the knob to rotate.

In particular, a securing assembly configured for preventing the buckle 3 from
25 swaying is arranged in the upper cover 2. Thus, the buckle 3 will not sway at random when the knob is vibrated by accident, and movement or vibration of an appliance or machine using the knob will not cause the buckle 3 to rotate outwards.

Therefore, an appearance of the appliance or machine will not be affected, and the buckle 3 can be prevented from rotating outwards and then being broken under an unexpected force.

As a preferred implement of the embodiment of the present invention, a
5 containing groove 21 is defined in the upper cover 2, the securing assembly includes a spring 4 received in the containing groove 21 and two sets of abutting assemblies 5, each set of the abutting assemblies 5 includes a first rotating shaft 51 and a second rotating shaft 52, one end of the first rotating shaft 51 has a first concave-convex surface 511, one end of the second rotating shaft 52 has a second
10 concave-convex surface 521, the first concave-convex surface 511 engages with the second concave-convex surface 521, the other end of the first rotating shaft 51 is fixedly connected to the buckle 3, and the other end of the second rotating shaft 52 is inserted into an end of the spring 4. Referring to Figs. 2 to 4, since the first concave-convex surface 511 and the second concave-convex surface 521 are
15 uneven, projections and depressions of the concave-convex surfaces are respectively engaged with each other, and the engagement between the concave-convex surfaces can prevent a relative rotation between the two rotating shafts. Only when a certain outward force is applied on the buckle 3 to rotate the buckle 3, the first rotating shaft 51 can be driven to overcome a resistance between
20 the concave-convex surfaces and rotate together with the rotation of the buckle 3. When the first rotating shaft 51 is rotated to a position where projections of the concave-convex surface of the first rotating shaft 51 are opposite to projections of the concave-convex surface of the second rotating shaft 52 respectively, the position is defined as a critical point. It can be understood that, only when the first
25 rotating shaft 51 is rotated to exceed the critical point, the buckle 3 can be rotated to be perpendicular to the upper cover 2. After the first rotating shaft 51 is rotated to exceed the critical point, the buckle 3 will automatically rotate to be

perpendicular to the upper cover 2 (i.e. the buckle is rotate by 90° , as shown in Fig. 4). If the first rotating shaft 51 is not rotated to exceed the critical point, after the external force is removed, the buckle 3 will automatically return to be at the same level with the upper cover 2, as shown in Fig. 2. The concave-convex structures have the following advantages: even if the knob is slightly vibrated by accident, the buckle 3 will not be caused to automatically rotate outwards; at the same time, normal rotations of the buckle 3 are not affected, and the buckle 3 can be rotated by an appropriate force. Each of the above concave-convex surfaces have four projections and four depressions, when the buckle is rotated by 45° , the first rotating shaft 51 is rotated to a position where the projections of the concave-convex surface of the rotating shaft 51 are opposite to the projections of the concave-convex surface of the second rotating shaft 52 respectively, as shown in Fig. 3, that is, to the critical state. It should be noted that, the number of the projections and the depressions can be set as required, thus there are a plurality of the critical points, only the first rotating shaft 51 is rotated to pass over all the critical points, can the buckle 3 be rotated to be perpendicular to the upper cover 2 or be at the same level with the upper cover 2.

In particular, the first concave-convex surface 511 and the second concave-convex surface 521 are smooth curved surfaces or serrated surfaces. It should be understood that, the object of designing the shapes of the concave-convex surfaces is just to prevent relative rotation between the rotating shafts.

Furthermore, the buckle 3 includes a C-shaped body and two plug shafts 31 protruding from two ends of the body respectively, the plug shaft 31 is provided with a stopping surface 311, the other end of the first rotating shaft 51 defines an insertion hole 512 matching with the plug shaft 31, two ends of the containing groove 21 are provided with through-holes 211 configured to be passed by the plug

shaft 31, and each of the plug shafts 31 passes through the through-hole 211 and inserts in the insertion hole 512. Thus, it is convenient for assembling and disassembling the securing assembly and the buckle 3.

In particular, a shaft body of the second rotating shaft 52 is provided with an anti-rotation edge 522 configured for preventing the second rotating shaft 52 from rotating in the containing groove 21, and the anti-rotation edge 522 closely contacts the containing groove 21. Since a reacting force generated by hindrance between the concave-convex surfaces will be applied on the second rotating shaft 52 when the first rotating shaft 51 is rotated, the second rotating shaft 52 will tend to rotate, and the configuration of the anti-rotation edge 522 can prevent the second rotating shaft 52 from rotating.

In particular, the other end of the second rotating shaft 52 is provided with a convex shaft 523 inserted into the spring 4. Thus, not only can the second rotating shaft 52 and the spring 4 be easily assembled, but also misplacement between the second rotating shaft 52 and the spring 4 can be prevented.

The knob according to the embodiment of the present invention further includes a filling strip 6. Since the plug shaft 31 of the buckle 3 is inserted into the upper cover 2 through a side wall of the upper cover 2, it can be learned that a side surface of the upper cover 2 is surrounded by the buckle 3, thus a channel will be formed around the other side surface of the upper cover 2. If the channel is not filled, debris may fall into the channel. The filling strip 6 is configured to fill the channel. The upper cover 2 and filling strip 6 can be fixed on the base 1 by bolts, which is convenient for the assembly of the whole knob.

Referring to Fig. 5, an embodiment of the present invention further provides a massager 7 adopting the aforementioned knob. The massager adopting the knob provided by the embodiment of the present invention does not affect comfort of use, and the knob is almost imperceptible for users. When a user needs to adjust the

knob, the user only needs to manually hitch and rotate the buckle 3 so that the buckle 3 is perpendicular to the upper cover 2, and then the knob can be adjusted by rotating the buckle 3.

5 The above-mentioned is only the preferred embodiments of the present invention, but places no limit to the invention. Therefore, any modification, equivalent replacement and improvement etc on the basis of the spirit and principle of invention shall be within the protective scope of the present invention.

CLAIMS

1. A knob, wherein the knob comprises a base, an upper cover covering on and fixedly connected to the base, and a buckle hinged on the upper cover and configured for rotating the base and the upper cover.

5 2. The knob according to claim 1, wherein a securing assembly configured for preventing the buckle from swaying is arranged in the upper cover.

3. The knob according to claim 2, wherein a containing groove is defined in the upper cover, the securing assembly comprises a spring received in the containing groove and two sets of abutting assemblies, each set of the abutting
10 assemblies comprises a first rotating shaft and a second rotating shaft, one end of the first rotating shaft has a first concave-convex surface, one end of the second rotating shaft has a second concave-convex surface, the first concave-convex surface engages with the second concave-convex surface, the other end of the first rotating shaft is fixedly connected to the buckle, and the other end of the second
15 rotating shaft is inserted into an end of the spring.

4. The knob according to claim 3, wherein the first and second concave-convex surfaces are smooth curved surfaces.

5. The knob according to claim 3, wherein the first and second concave-convex surfaces are serrated surfaces.

20 6. The knob according to claim 3, wherein the buckle comprises a C-shaped body and two plug shafts protruding from two ends of the body respectively, the plug shaft is provided with a stopping surface, the other end of the first rotating shaft defines an insertion hole matching with the plug shaft, two ends of the containing groove are provided with through-holes configured to be passed by the
25 plug shaft respectively, and each of the plug shafts passes through the through-hole and inserts in the insertion hole.

7. The knob according to claim 3, wherein a shaft body of the second rotating

shaft is provided with an anti-rotation edge configured for preventing the second rotating shaft from rotating in the containing groove, and the anti-rotation edge closely contacts the containing groove.

8. The knob according to claim 3, wherein the other end of the second
5 rotating shaft is provided with a convex shaft inserted into the spring.

9. A massager, wherein the massager adopts the knob of any of claims 1 to 8.