CLAIMS

WHAT IS CLAIMED IS:

1. A knob mechanism with an easily replaceable cap, comprising an inner knob and a cap, the cap being detachably mounted on an outer side of the inner knob, wherein the cap is provided with at least one locking block, the inner knob is provided with at least one separating and coupling mechanism, the locking block and the separating and coupling mechanism cooperate to achieve coupling and separation between the inner knob and the cap;

wherein each separating and coupling mechanism comprises a locking portion and a separating groove, the locking block and the locking portion are securely engaged, thereby forming mechanical coupling between the cap and the inner knob; and the cap is rotatable relative to the inner knob to rotate the locking block to the separating groove, thereby separating the cap from the inner knob through the separating groove.

2. The knob mechanism with an easily replaceable cap of claim 1, wherein each separating and coupling mechanism is disposed on an outer peripheral surface of the inner knob, and the separating groove is circumferentially offset from the locking portion along the outer peripheral surface of the inner knob.

3. The knob mechanism with an easily replaceable cap of claim 2, wherein each separating and coupling mechanism further comprises a rotation transition portion, the rotation transition portion is disposed between the locking portion and the separating groove and is configured for guiding the locking block to rotate and transition to the position of the separating groove.

4. The knob mechanism with an easily replaceable cap of claim 1, wherein each separating and coupling mechanism further comprises an assembly guide portion;

wherein the locking block is directly securely engaged with the locking portion at a position aligned with the locking portion; or under guidance of the assembly guide portion, the locking block is configured to move from a non-aligned position at least partially offset from the locking portion to a position aligned with the locking portion, thereby enabling the locking block and the locking portion to be securely engaged.

5. The knob mechanism with an easily replaceable cap of claim 1, wherein each separating and coupling mechanism further comprises an assembly guide portion, the assembly guide portion is configured as a helical surface, an inclined surface, or an irregular surface inclined relative to a rotation axis direction of the inner knob, the assembly guide portion has a proximal end adjacent to a bottom of the inner knob and an opposite distal end; wherein a position aligned with the locking portion is adjacent to the distal end of the assembly guide portion and the locking block is movable to the position aligned with the locking portion under guidance of the assembly guide portion, thereby enabling the locking block and the locking portion to be securely engaged.

6. The knob mechanism with an easily replaceable cap of claim 4 or 5, wherein each locking portion corresponds to an assembly guide pair, the assembly guide pair comprises two assembly guide units; and wherein each of the locking block is movable to the position aligned with the locking portion under guidance of any one of the two assembly guide units; wherein each assembly guide unit has a proximal end adjacent the bottom of the inner knob and an opposite distal end; the position aligned with the locking portion is adjacent to the distal end of each assembly guide unit in the assembly guide pair.

7. The knob mechanism with an easily replaceable cap of claim 4 or 5, wherein the cap comprises a guided portion configured to mate with each assembly guide portion; wherein the locking block is movable to the position aligned with the locking portion guided by the interaction between the assembly guide portion and the guided portion, thereby enabling the locking block and the locking portion to be engaged.

8. The knob mechanism with an easily replaceable cap of claim 4 or 5, wherein an assembly unit is formed by one assembly guide portion and one locking portion; a plurality of separating and coupling mechanisms are provided, each separating and coupling mechanism comprises one assembly unit and one separating groove; wherein a plurality of the assembly units are disposed around the outer peripheral surface of the inner knob, and are arranged circumferentially in a continuous and adjacent manner.

9. The knob mechanism with an easily replaceable cap of claim 1, wherein each separating groove comprises a first side wall adjacent to the locking portion and an opposite second side wall; both the first side wall and the second side wall have a proximal end adjacent to an opening end of the inner knob and an opposite distal end; wherein the distal end of the second side wall is configured to incline circumferentially away from the locking portion relative to its proximal end, and/or the distal end of the first side wall is configured to incline circumferentially close to the locking portion relative to its proximal end, thereby guiding the locking block to slide out smoothly.

10. A knob mechanism with an easily replaceable cap, comprising an inner knob and a cap, the cap being detachably mounted on the outer side of the inner knob, wherein the inner knob is provided with at least one locking block, the cap is provided with at least one separating and coupling mechanism, the locking block and the separating and coupling mechanism cooperate to achieve coupling and separation between the inner knob and the cap;

wherein each separating and coupling mechanism comprises a locking portion and a separating groove, the locking block and the locking portion are securely engaged, thereby forming mechanical coupling between the cap and the inner knob; the cap is rotatable relative to the inner knob to rotate the separating and coupling mechanism relative to the locking block to a position where the separating groove is aligned with the locking block, thereby separating the cap from the

inner knob through the separating groove.

11. A lacing device, comprising a housing and the knob mechanism with an easily replaceable cap according to any one of claims 1-9, wherein the knob mechanism with an easily replaceable cap is rotatably arranged on the housing.

12. The lacing device of claim 11, wherein the lacing device has a lace-winding mode and a lace-releasing mode; in the lace-winding mode, the inner knob of the knob mechanism is configured to be rotatable relative to the housing in a tensioning direction and non-rotatable relative to the housing in a loosening direction, while the cap is rotatable relative to the inner knob in the loosening direction.

13. The lacing device of claim 12, wherein the separating groove is circumferentially offset from the locking portion along the inner knob and located on a side of the locking portion corresponding to the loosening direction.

14. The lacing device of claim 12, wherein the lacing device further comprises an anti-reverse mechanism which allows the inner knob to rotate relative to the housing only in the tensioning direction during the lace-winding mode tensioning direction; wherein the anti-reverse mechanism comprises a first anti-reverse member and a second anti-reverse member that cooperate with each other, and the first anti-reverse member is a ratchet teeth or a recess; and the lacing device further comprises a limiting portion configured to restrict axial displacement of the second anti-reverse member.

15. The lacing device of claim 14, wherein the limiting portion and the second anti-reverse member are arranged on the same component of the lacing device, and the limiting portion and the second anti-reverse member form a force lock or a shape lock to restrict axial displacement of the second anti-reverse member.