Claims

1. A CT detection device, comprising:

a CT imaging system, comprising a radiation source, a detector, and a rotating frame, wherein the radiation source and the detector are mounted on the rotating frame, and a periphery of the rotating frame is provided with at least one first hole;

a support stand, wherein the rotating frame is fixed on the support stand through a slip ring bearing, and a periphery of the support stand is provided with at least one second hole aligned with the at least one first hole; and

a first sleeve detachably engaged in the aligned first hole and second hole, wherein the first sleeve comprises a first cooperating portion, and the first cooperating portion cooperates with a first locking portion to lock the rotating frame during a replacement of the slip ring bearing,

wherein the first sleeve comprises a first cylindrical portion engaged with the first hole and a second cylindrical portion engaged with the second hole,

wherein an outer surface of the first cylindrical portion and an inner surface of the first hole are provided with threads; and/or an outer surface of the second cylindrical portion and an inner surface of the second hole are provided with threads; and

wherein the first cooperating portion is formed as a thread on an inner surface of the first cylindrical portion or as threads on inner surfaces of the first cylindrical portion and the second cylindrical portion.

2. The CT detection device according to claim 1, wherein a diameter of the first cylindrical portion is smaller than a diameter of the second cylindrical portion, and the first cylindrical portion is connected with the second cylindrical portion by a step; and

wherein a diameter of the first hole is smaller than a diameter of the second hole.

3. The CT detection apparatus according to claim 1, wherein the first locking portion is formed as a screw.

4. The CT detection device according to claim 1, wherein,

the at least one first hole comprises a plurality of first holes evenly distributed on the periphery of the rotating frame; and

the at least one second hole comprises a plurality of second holes evenly distributed on a periphery of an accommodating cavity of the support stand, and the rotating frame is mounted in the accommodating cavity.

5. The CT detection device according to claim 1, wherein an end surface of an end of the first sleeve is a positioning surface.

6. The CT detection device according to any one of claims 1-5, further comprising a second sleeve configured to be detachably engaged in the second hole in a case that the first sleeve is removed from the first hole and the second hole, the second sleeve further comprising a second cooperating portion, wherein the second cooperating portion and the first hole cooperate with a second locking portion to lock the rotating frame during a maintenance of the CT detection device.

7. The CT detection device according to claim 6, wherein an outer surface of the second sleeve and an inner surface of the second hole comprise threads.

8. The CT detection device according to claim 7, wherein the second cooperating portion is formed as a pin hole inside the second sleeve, the second locking portion is formed as a pin, and the pin is inserted into the first hole and the pin hole inside the second sleeve.

9. The CT detection device according to claim 8, wherein inner diameters of the pin hole and the first hole are substantially equal to an outer diameter of the pin.

10. The CT detection device according to claim 1, wherein the first cooperating portion is formed as a thread on the inner surface of the first cylindrical portion or as threads on inner surfaces of the first cylindrical portion and the second cylindrical portion, the first locking portion is formed as a pin, and the pin is inserted

into the first hole and the first cooperating portion to lock the rotating frame during a maintenance of the CT detection device.

11. A locking assembly for a CT detection device, the CT detection device comprising a support stand and a rotating frame of a CT imaging system fixed together by a slip ring bearing, wherein the locking assembly comprises:

at least one first hole provided on the rotating frame;

at least one second hole provided on the support stand, wherein the at least one second hole is configured to be aligned with the at least one first hole;

a first sleeve detachably engaged in the aligned first hole and second hole, wherein the first sleeve comprises a first cooperating portion; and

a first locking portion cooperating with the first cooperating portion to lock the rotating frame during a replacement of the slip ring bearing,

wherein the first sleeve further comprises a first cylindrical portion engaged with the first hole and a second cylindrical portion engaged with the second hole,

wherein an outer surface of the first cylindrical portion and an inner surface of the first hole are provided with threads; and/or an outer surface of the second cylindrical portion and an inner surface of the second hole are provided with threads; and

wherein the first cooperating portion is formed as a thread on an inner surface of the first cylindrical portion or as threads on inner surfaces of the first cylindrical portion and the second cylindrical portion.

12. The locking assembly according to claim 11, wherein a diameter of the first cylindrical portion is smaller than a diameter of the second cylindrical portion, and the first cylindrical portion is connected with the second cylindrical portion by a step; and

wherein a diameter of the first hole is smaller than a diameter of the second hole.

13. The locking assembly according to claim 11, wherein the first locking portion is formed as a screw, and an end surface of an end portion of the first sleeve is

a positioning surface.

14. The locking assembly according to claim 11, wherein,

the at least one first hole comprises a plurality of first holes evenly distributed on a periphery of the rotating frame; and

the at least one second hole comprises a plurality of second holes evenly distributed on a periphery of an accommodating cavity of the support stand, and the rotating frame is mounted in the accommodating cavity.

15. The locking assembly according to any one of claims 11-14, further comprising a second sleeve configured to be detachably engaged in the second hole in a case that the first sleeve is removed from the first hole and the second hole, the second sleeve comprises a second cooperating portion, wherein the second cooperating portion and the first hole cooperate with a second locking portion to lock the rotating frame during a maintenance of the CT detection device.

16. The locking assembly according to claim 15, wherein an outer surface of the second sleeve and the inner surface of the second hole comprise threads.

17. The locking assembly according to claim 15, wherein the second cooperating portion is formed as a pin hole inside the second sleeve, the second locking portion is formed as a pin, the pin is inserted into the first hole and the pin hole inside the second sleeve, and inner diameters of the pin hole and the first hole are substantially equal to an outer diameter of the pin.

18. The locking assembly according to claim 11, wherein the first cooperating portion is formed as a thread on the inner surface of the first cylindrical portion or as threads on inner surfaces of the first cylindrical portion and the second cylindrical portion, the first locking portion is formed as a pin, and the pin is inserted into the first hole and the first cooperating portion to lock the rotating frame during a maintenance of the CT detection device.