WHAT IS CLAIMED IS:

1. A length-adjustable lower limb structure applied to a lower limb of a robot, comprising:

a hip joint assembly comprising a hip joint support, a hip joint driver fixed to the hip joint support, and a hip joint transmission handle driven by the hip joint driver;

a thigh rod connected to the hip joint transmission handle, so as to be driven by the hip joint driver;

a knee joint assembly comprising a knee joint fixing base, a knee joint driver fixed on the knee joint fixing base, and a knee joint transmission handle driven by the knee joint driver, wherein the knee joint fixing base comprises a sleeve and a connector connected to the knee joint driver, the sleeve is slidably fixed on the thigh rod along an extension direction of the thigh rod; and

a lower leg rod connected to the knee joint transmission handle and driven by the knee joint driver,

wherein the thigh rod does not coincide with a line connecting centers of the hip joint driver and the knee joint driver.

2. The lower limb structure according to claim 1, wherein,

the thigh rod further comprises a thigh rod limit assembly comprising a first limit post, wherein,

the thigh rod is provided with a plurality of first limit holes along the extension direction of the thigh rod, and the sleeve is formed with a first limit opening having a position aligned with one of the plurality of first limit holes; and

the first limit post passes through the first limit opening to be clamped in one of the plurality of first limit holes.

3. The lower limb structure according to claim 2, wherein the thigh rod limit assembly further comprises an adjusting sleeve and a locking nut, wherein,

the thigh rod passes through the adjusting sleeve to be in thread engagement with the adjusting sleeve, such that a position of the adjusting sleeve along the extension direction of the thigh rod is variable, and the adjusting sleeve is located below the sleeve, such that an upper end surface of the adjusting sleeve is in contact with a lower end surface of the sleeve;

the locking nut surrounds the upper end surface of the adjusting sleeve and the lower end surface of the sleeve, to maintain the contact between the upper end surface of the adjusting sleeve and the lower end surface of the sleeve or maintain a constant axial distance between the upper end surface of the adjusting sleeve and the lower end surface of the sleeve.

4. The lower limb structure according to claim 3, wherein the thigh rod limit assembly further comprises a plurality of roll balls between the upper end surface of the adjusting sleeve and the lower end surface of the sleeve, such that the upper end surface of the adjusting sleeve and the lower end surface of the sleeve are in rolling contact via the plurality of roll balls.

5. The lower limb structure according to claim 4, wherein the thigh rod limit assembly further comprises a roll ball holding frame for holding the plurality of roll balls.

6. The lower limb structure according to claim 2, wherein,

the thigh rod is formed with a groove along the extension direction of the thigh rod, the plurality of first limit holes are provided in the groove;

a boss is formed on an inner surface of the sleeve, and the boss is clamped in the groove when the thigh rod passes through the sleeve.

7. The lower limb structure according to claim 1, further comprising a sole assembly connected to a lower end of the lower leg rod.

8. The lower limb structure according to claim 1, wherein the lower leg rod comprises:

a hollow lower leg fixing rod having an upper end connected to the knee joint transmission handle; and

a lower leg adjusting rod slidably fitted into the lower leg fixing rod.

9. The lower limb structure according to claim 8, wherein,

the lower leg rod further comprises a lower leg rod limit assembly comprising a second limit post, wherein,

the lower leg adjusting rod is provided with a plurality of second limit holes along an extension direction of the lower leg adjusting rod, and the lower leg fixing rod is formed with a second limit opening aligned with one of the plurality of second limit holes; and

the second limit post passes through the second limit opening to be clamped in one of the plurality of second limit holes.

10. The lower limb structure according to claim 9, wherein the lower leg rod limit assembly further comprises a limit sleeve and an adjusting nut fixed to an inner surface of the limit sleeve, wherein,

the adjusting sleeve surrounds a lower end of the lower leg fixing rod, such that the lower end of the lower leg fixing rod abuts against the adjusting nut, and the adjusting sleeve is rotatable relative to the lower leg fixing rod;

the adjusting nut surrounds an outer surface of the lower leg adjusting rod and in thread engagement with the lower leg adjusting rod, such that the lower leg adjusting rod retracts into or extends out of the lower leg fixing rod.

11. The lower limb structure according to claim 10, wherein a lower end of the lower leg rod is formed with a flange, the inner surface of the limit sleeve is formed with a retracted step, and the flange is positioned between the retracted step and the adjusting nut.

12. The lower limb structure according to claim 11, wherein the lower leg rod limit assembly further comprises:

a plurality of roll balls disposed between the flange and the retracted step; and

a roll ball holding frame for holding the plurality of roll balls.

13. An exoskeleton robot, comprising:

lower limbs having the lower limb structure according to any of claims 1 to 12;

a waist support device mounted with the lower limbs; and

a suspension device on which the waist support device is mounted.

14. The exoskeleton robot according to claim 13, wherein the suspension device comprises:

a suspension frame;

a suspension mechanism mounted on the suspension frame, and the waist support device mounted on the suspension mechanism; and

an auxiliary mechanism mounted on the suspension frame, and connected to the suspension mechanism, the auxiliary mechanism outputs an auxiliary force to assist the suspension mechanism to suspend the waist support device and the lower limbs.

15. The exoskeleton robot according to claim 14, wherein, after the waist support device is suspended to a predetermined position, the suspension mechanism is locked, and when the user moves through the lower limbs, and drives the waist support device to move up and down relative to the predetermined position, the auxiliary mechanism further outputs the auxiliary force to assist movement of the lower limbs.

16. The exoskeleton robot according to claim 15, wherein the suspension frame comprises a suspension bearing rod and two longitudinal sliding rods arranged in parallel on both sides of the suspension bearing rod, and the suspension mechanism and the auxiliary mechanism are mounted on the suspension bearing rod.

17. The exoskeleton robot according to claim 16, wherein the suspension mechanism comprises:

at least one pulley mounted on the suspension bearing rod; and

a rope mounted on the at least one pulley, and connected to the auxiliary mechanism at one end, a member to be suspended is mounted on the rope, and the member is suspended by pulling the other end of the rope.

18. The exoskeleton robot according to claim 17, wherein the suspension bearing rod is provided with a through hole through which a part of the rope passes, and the member to be suspended is mounted on a part of the rope passing through the through hole.

19. The exoskeleton robot according to claim 17, wherein the auxiliary mechanism comprises:

a fixing base fixedly connected to an end part of the suspension bearing rod; and

a spring having one end connected to the fixing base, and the other end connected to one end of the rope.

20. The exoskeleton robot according to claim 17, wherein the suspension device further comprises a winch connected to the other end of the rope, the winch is rotated to drive the rope to slide between the at least one pulley to suspend the member to be suspended, and when the member is suspended to the predetermined position, the winch is locked.