WHAT IS CLAIMED IS:

1. A training robot comprising:

a base;

a serving mechanism provided above the base, and comprising a ball cage, a clamping device, and a throwing device, the clamping device being configured to get a ball from the ball cage and place the ball on the throwing device, and the throwing device being configured to throw the ball out;

a hitting mechanism provided above the base, and comprising a racket, a connecting arm, and a racket support rod, the racket being connected to the racket support rod through the connecting arm; wherein the connecting arm is a flexible arm, the racket is connected to the flexible arm through a racket connecting portion, and the racket is detachably connected to the racket connecting portion; wherein the flexible arm is fixed to a racket support seat sequentially through a flexible arm connecting portion and the racket support rod, and the racket support seat is located on an upper surface of the base;

a controller assembly configured to control the serving mechanism and the hitting mechanism.

2. The training robot according to claim 1, wherein the serving mechanism further comprises a cage bracket and a cage support seat, the ball cage is detachably fixed to the cage support seat through the cage bracket, and the cage support seat is located on an upper surface of the base.

3. The training robot according to claim 1, wherein the ball cage comprises a plurality of ball cartridges, which are installed on a cage bracket and being rotatable relative to the cage bracket to align a ball outlet of one ball cartridge with the clamping device.

4. The training robot according to claim 3, wherein the serving mechanism further comprises a cage support seat and a first sensor provided on the cage support seat, the cage brackets are installed on the cage support seat, and the first sensor is configured to detect whether there is a ball in the ball cartridge aligned with the clamping device;

the controller assembly is configured to obtain detection data of the first sensor and control the ball cage to rotate when there is no ball in the ball cartridge aligned with the clamping device.

5. The training robot according to claim 1, wherein the throwing device comprises a carrying platform and a platform support rod, and the controller assembly is configured to control the platform support rod to throw the ball in the carrying platform upwards, and control the racket of the hitting mechanism to hit the thrown ball.

6. The training robot according to claim 1, wherein the serving mechanism further comprises a cage support seat, the clamping device comprises two clamping arms and a movable seat, and the clamping arms are rotatably fixed to the cage support seat through the movable seat.

7. The training robot according to claim 1, wherein the serving mechanism is located in front of the hitting mechanism, the clamping device is located in front of the ball cage, the throwing device is arranged in front of the clamping device, a lower end of the ball cage tilts forward relative to an upper end of the ball cage, and a ball outlet on the lower end of the ball cage is aligned with the clamping device.

8. The training robot according to claim 1, wherein at least two first drive ropes extending in a length direction of the flexible arm are provided in the flexible arm, and the flexible arm connecting portion is provided with pulleys in one-to-one correspondence to the first drive ropes;

the first drive ropes are wound around the pulleys, and one end of the first drive rope is connected to an upper portion of the flexible arm, the other end of the first drive rope passes through the racket support rod and is connected to the racket support seat, the racket support seat is provided with a rope drive motor, and the controller assembly is configured to control the rope drive motor to move the first drive ropes, thereby adjusting a posture of the flexible arm;

the flexible arm is provided with a universal joint device, the universal joint device comprises at least one connecting rod and two universal joint bases, the two universal joint bases are arranged at two ends of the flexible arm, respectively, two ends of the connecting rod are rotatably connected with the two universal joint bases, respectively, the first drive ropes are connected with the two universal joint bases, and when driving the first drive ropes to move, a relative position relationship between the two universal joint bases is adjusted to make the flexible arm tilt to one side of and/or rotate relative to the flexible arm connecting portion;

the universal joint device further comprises a second drive rope, two universal bearings and a transmission shaft, two ends of the transmission shaft are connected to the two universal joint bases through the universal bearings, respectively, and one end of the transmission shaft is connected with the racket connecting portion, the second drive rope is configured to drive the transmission shaft to rotate, so that the racket connecting portion drives the racket to rotate relative to the flexible arm.

9. The training robot according to claim 1, wherein a camera is further provided above the base, and the camera is configured to communicate with the controller assembly to transmit collected images to the controller assembly; and/or

a second sensor is further provided on a side of or above the base, and the second sensor is configured to detect a position of a ball and communicate with the controller assembly to transmit detection data to the controller assembly.

10. The training robot according to claim 1, wherein a bottom of the base is provided with a moving mechanism, and the controller assembly is further configured to control movement of the moving mechanism to move the training robot to a designated position.

11. A control method of the training robot according to any one of claims 1 to 10, wherein the method comprises the following steps:

determining whether a current mode is a hitting mode or a serving mode;

if the current mode is the hitting mode, obtaining user's motion data and trajectory of a ball, analyzing to obtain a hitting strategy of the hitting mechanism, and controlling the hitting mechanism to hit the ball based on the hitting strategy, the hitting strategy comprising racket hitting posture, racket hitting speed, and landing point range of the ball;

if the current mode is the serving mode, controlling the clamping device of the serving mechanism to get a ball from the ball cage and place the ball on the throwing device, controlling the throwing device to throw the ball upwards, and controlling the hitting mechanism to hit the thrown ball.

12. The control method of the training robot according to claim 11, wherein the step of controlling the clamping device of the serving mechanism to get a ball from the ball cage and

place the ball on the throwing device, controlling the throwing device to throw the ball upwards, and controlling the hitting mechanism to hit the thrown ball comprises the following steps:

obtaining user's motion data;

obtaining a training level of the user and determining a serving strategy based on the user's motion data and the training level, the serving strategy comprising serving frequency, serving position range, landing point range, and serving speed;

controlling the clamping device of the serving mechanism according to the serving frequency to take out the ball from the ball cage and place the ball on the throwing device, and controlling the throwing device to throw the ball upwards;

controlling the hitting mechanism to hit the thrown ball based on the serving position range and the serving speed.

13. A control system applied to the control method of the training robot according to claims 11 or 12, wherein the system comprises:

a central controller, wherein when the current mode is the hitting mode, the central controller is configured to obtain the user's motion data and the trajectory of the ball, analyze to obtain the hitting strategy of the hitting mechanism, and send a hitting command comprising the hitting strategy to the hitting mechanism, when the current mode is the serving mode, the central controller is configured to send a serving command to the serving mechanism in the serving mode, and send a hitting command to the hitting mechanism;

a hitting controller configured to control the hitting mechanism to hit the ball based on an obtained hitting command;

a serving controller configured to control the clamping device of the serving mechanism to get the ball from the ball cage and place the ball on the throwing device based on an obtained serving command, and control the throwing device to throw the ball upwards.