CLAIMS

1. A cooling system suitable for a data center system, wherein the cooling system is disposed inside a machine room of the data center system, and the machine room has, on a side thereof close to the cooling system, a hot air returning layer (301) arranged above a cold pool layer (302) and in communication therewith;

the cooling system comprises: an air mixing cavity (2), an air supply cavity (3) in communication with a first air vent (32) of the air mixing cavity (2), and a refrigerating apparatus disposed in the air mixing cavity (2);

the air mixing cavity (2) comprises an air returning vent (21) and an air supply vent (31), the air mixing cavity (2) and the hot air returning layer (301) are in communication with each other through the air returning vent (21) and are disposed at the same level; the air supply cavity (3) and the cold pool layer (302) are in communication with each other through the air supply vent (31) and are disposed at the same level; and

the air mixing cavity (2) comprises a diffusion type air supply end, disposed on the air supply vent (31),

wherein the refrigerating apparatus comprises:

a spraying apparatus (4) disposed within the air mixing cavity (2) and located at an intersection between an air inlet path and an air returning path;

a water tank (5) disposed below the spraying apparatus (4) and having a water level control system; and

a circulating apparatus disposed between the spraying apparatus (4) and the water tank (5) and adapted to circularly pumping water in the water tank (5) into the spraying apparatus (4),

wherein the water level control system comprises:

a water level controller (7) disposed in the water tank (5); and

a temperature sensor electrically connected with the water level controller (7) and adapted to monitoring outdoor temperature in real time,

wherein the water level controller (7) controls opening or closing of a water inlet valve in the water tank (5) or opening or closing of a water outlet valve in the water tank (5) according to a temperature signal of the temperature sensor, and

wherein when temperature of heat exchange is high, the water level controller (7) controls water to be fed into the water tank (5) to maintain a high water level, and when temperature of heat exchange is low, the water level controller (7) controls the water tank (5) to discharge water to be reduced to a low water level.

2. The cooling system of claim 1 for the data center system, wherein the water level controller (7) is a dry reed tube water level controller.

3. The cooling system of claim 2 for the data center system, wherein the refrigerating apparatus further comprises:

a heat exchanger (8) disposed at an intersection between a spraying path from the spraying apparatus (4) towards the water tank (5) and the air returning path; and/or

a condenser (91) located above the spraying apparatus (4).

4. The cooling system of claim 2 for the data center system, wherein the refrigerating apparatus further comprises:

a cold coil (10) disposed in the air mixing cavity (2) and being close to the air supply cavity (3).

5. The cooling system of any one of claims 1-4 for the data center system, wherein the cooling system further comprises:

an air inlet cavity separated from and disposed at the same level with the air supply cavity (3),

wherein the air mixing cavity (2) is disposed above the air inlet cavity (1) and the air supply cavity (3) and is in communication with the air inlet cavity (1) and the air supply cavity (3), respectively.

6. The cooling system of claim 7 for the data center system, wherein circulating fans are disposed between the hot air returning layer (301) and the air mixing cavity (2), between the air mixing cavity (2) and the air supply cavity (3), and between the air supply cavity (3) and the cold pool layer (302).

7. A data center system, comprising:

a machine room and a plurality of machine cabinets (304); and

the cooling system of any one of claims 1 to 6 for the data center system,

wherein the machine cabinets (304) are disposed side by side in the cold pool layer (302).

8. The data center system of claim 7, wherein the data center system further comprises:

a mezzanine ceiling (303) disposed between the hot air returning layer (301) and the cold pool layer (302), wherein channels are uniformly distributed in the mezzanine ceiling (303) to enable communication between the hot air returning layer (301) and the cold pool layer (302), and

the machine cabinets (304) and the mezzanine ceiling (303) are spaced by a required distance;

a thermal insulation layer (305) disposed on the top of the hot air returning layer (301), wherein the height of the top of the hot air returning layer (301) gradually increases from a side of the machine room close to the cooling system toward the middle of the machine room or a side of the machine room facing away from the cooling system.