

**Claims**

1. A soil sampling device for environmental monitoring, comprising a top plate (1) and a bottom plate (6) arranged horizontally from top to bottom, wherein the bottom plate (6) is connected to the top plate (1) through a supporting component, and a through hole (7) is opened on the bottom plate (6), characterized in that it further comprises:

the outer cylinder (4) is vertically arranged between the bottom plate (6) and the top plate (1), and its lower end is close to the through hole (7), at least one first sampling port (11) is opened on the side of the outer cylinder (4), and two sliding grooves (16) are symmetrically opened vertically above the first sampling port (11) on the side of the outer cylinder (4);

an inner cylinder (5) is set inside the outer cylinder (4) and is slidably connected to the inner wall of the outer cylinder (4), a second sampling port (12) is opened on the side of the inner cylinder (5) near the position below the first sampling port (11);

a movable ring (15) is fitted onto the outer cylinder (4) and positioned near two sliding grooves (16), the outer diameter of the movable ring (15) is larger than the diameter of the through hole (7);

the connecting component is set inside the outer cylinder (4) and located close to the movable ring (15), the lower part of the connecting component is connected to the inner cylinder (5), and the two sides of the connecting component are connected to the movable ring (15) through two sliding grooves (16);

the lifting components are respectively connected to the top plate (1) and the outer cylinder (4), used to drive the outer cylinder (4) to move up and down, so that the movable ring (15) comes into contact with the bottom plate (6), and drives the inner cylinder (5) to move up and down on the outer cylinder (4), so that the first sampling port (11) and the second sampling port (12) coincide and separate.

2. The soil sampling device for environmental monitoring according to claim 1, characterized in that the connecting component comprises: a movable block (14) set inside the outer cylinder (4) and located near two sliding grooves (16); the transmission rod (18) is vertically arranged between the movable block (14) and the inner cylinder (5), and its two ends are respectively connected to the movable block (14) and the inner cylinder (5); two connecting rods (17) are horizontally arranged in two sliding grooves (16), and the two ends of each connecting rod (17) are respectively connected to the inner surface of the movable block (14) and the movable ring (15).

3. The soil sampling device for environmental monitoring according to claim 2,

characterized in that the lifting component comprises: an electric telescopic rod (8) vertically arranged between the top plate (1) and the outer cylinder (4), the upper end of the electric telescopic rod (8) is connected to the top plate (1), and the lower end of the electric telescopic rod (8) is connected to the outer cylinder (4) through a box (3); the first elastic component (20) is vertically arranged inside the outer cylinder (4) and located at the upper part of the movable block (14), the two ends of the first elastic component (20) are respectively connected to the top of the outer cylinder (4) and the movable block (14).

4. The soil sampling device for environmental monitoring according to claim 3, characterized in that a baffle (13) is obliquely arranged inside the first sampling port (11), the lower end of the baffle (13) is close to the inner cylinder (5) and is rotatably connected to the first sampling port (11), the upper end of the baffle (13) is close to the outside of the first sampling port (11), and the lower part of the baffle (13) is connected to the inside of the first sampling port (11) through a second elastic component (21) obliquely arranged, the first sampling port (11) is provided with an opening and closing component, which is respectively connected to the baffle (13) and the movable block (14), the opening and closing component is used to drive the baffle (13) through the up and down movement of the movable block (14), swing up and down to open and close the first sampling port (11).

5. The soil sampling device for environmental monitoring according to claim 4, characterized in that the opening and closing component comprises: a first plunger hydraulic cylinder (23) vertically arranged at the upper part of the movable block (14) and located inside the first elastic component (20), and the two ends of the first plunger hydraulic cylinder (23) are respectively connected to the movable block (14) and the top of the outer cylinder (4); the liquid storage chamber (25) is located inside the top of the outer cylinder (4) and is connected to the first plunger hydraulic cylinder (23); two installation chambers (27) are symmetrically opened inside the outer cylinder (4) and located below the storage chamber (25), the first sampling port (11) is located between the two installation chambers (27), and each installation chamber (27) is vertically equipped with a second plunger hydraulic cylinder (24), the upper end of each second plunger hydraulic cylinder (24) is connected to the top of the installation chamber (27), and the second plunger hydraulic cylinder (24) is connected to the storage chamber (25); the pressing component is connected to two second plunger hydraulic cylinders (24) and a baffle (13) respectively, and is used to drive the baffle (13) to swing up and down through the expansion and contraction of the two second plunger hydraulic cylinders (24).

6. The soil sampling device for environmental monitoring according to claim 5, characterized in that the pressing component comprises: a sliding chamber (28) opened inside the side of the outer cylinder (4) and located between two installation chambers (27) and the first sampling port (11), and the sliding chamber (28) is connected to each installation chamber (27) through a vertically arranged guide hole (29); two guide rods (30) are respectively set in two guide holes (29), and the upper end of each guide rod (30) is connected to the lower end of the corresponding second plunger hydraulic cylinder (24); an arc-shaped plate (31) is set inside the sliding chamber (28) and is slidably connected to the inner wall of the sliding chamber (28), the lower end of each guide rod (30) is connected to the arc-shaped plate (31); the pressure rod (33) is vertically arranged at the lower part of the arc-shaped plate (31) and located near the first sampling port (11), the upper end of the pressure rod (33) is connected to the arc-shaped plate (31), and the lower end of the pressure rod (33) passes through the bottom of the sliding chamber (28) and is located inside the first sampling port (11) and in contact with the upper surface of the baffle (13).
7. The soil sampling device for environmental monitoring according to claim 6, characterized in that a third elastic component (22) is sleeved on the pressure rod (33) at a position inside the sliding chamber (28), and the two ends of the third elastic component (22) are respectively slidably connected to the arc-shaped plate (31) and the bottom of the sliding chamber (28).
8. The soil sampling device for environmental monitoring according to claim 6, characterized in that the lower end of the pressure rod (33) is provided with a first roller (26), and the first roller (26) is in contact with the upper part of the baffle (13).