CLAIMS

1. An automatic drilling machine, comprising:

a delivering rail (2) mounted on a working table (20), for receiving a metal part (10) and allowing the metal part (10) to move back and forth thereon;

a first drilling device (11) mounted above the delivering rail (2), for drilling an upper surface of the metal part (10);

a second drilling device (12) mounted under the delivering rail (2), for drilling a lower surface of the metal part (10);

a pushing assembly (3) for pushing the metal part (10) to move forward along the delivering rail (2);

a first moving assembly for driving the pushing assembly (3) to move back and forth along the delivering rail (2);

a second moving assembly for driving the first drilling device (11) to move back and forth;

a third moving assembly for driving the first drilling device (11) to move up and down;

a fourth moving assembly for driving the second drilling device (12) to move back and forth;

a fifth moving assembly for driving the second drilling device (12) to move up and down;

a limiting assembly (5) for blocking a forward movement of the metal part (10) located at a drilling station;

a locking assembly for fixing the metal part (10) located at the drilling station;

at least one sensor arranged at one side of the delivering rail (2), for detecting whether the metal part (10) is on the delivering rail (2); and

an electric control box with a PLC arranged therein,

wherein the first drilling device (11), the second drilling device (12), the pushing assembly (3), the first moving assembly, the second moving assembly, the third moving assembly, the fourth moving assembly, the fifth moving assembly, the limiting assembly (5), the locking assembly and the sensor are connected to the electric control box respectively, and controlled by the PLC.

2. The automatic drilling machine according to claim 1, characterized in that the

pushing assembly (3) comprises a first cylinder (31), a supporting member (32), a pushing block (33), and a spring (34), wherein the supporting member (32) is driven up and down by the first cylinder (31), and the pushing block (33) is slidably arranged in front of the supporting member (32), the spring (34) being arranged between the supporting member (32) and the pushing block (33).

3. The automatic drilling machine according to claim 2, characterized in that two pushing assemblies (3) are provided, one located behind the other, and

a connecting plate (35), to which a connecting element (36) is fixedly connected, is fixedly connected between said two pushing assemblies (3), the connecting element (36) being connected with the first moving assembly.

4. The automatic drilling machine according to claim 3, characterized in that the first moving assembly comprises a first guide rail (411), a first ball screw (412), a first motor (413), and a first synchronizing wheel assembly (414),

wherein the first guide rail (411) is arranged at one side of the delivering rail (2) and parallel to a length direction of the delivering rail (2);

the first ball screw (412) is parallel to the first guide rail (411), and the connecting element (36) is mounted on the first guide rail (411), and fixedly connected to a nut seat provided on the first ball screw (412);

the first synchronous wheel assembly (414) consists of a synchronous wheel fixed on an output shaft of the first motor (413), a synchronous wheel fixed on the first ball screw (412), and a synchronous belt; and

the first motor (413) drives the first ball screw (412) in rotation through the first synchronizing wheel assembly (414), thereby driving the connecting element (36) to move forward or backward.

5. The automatic drilling machine according to any one of claims 1 to 4, characterized in that the second moving assembly includes a second guide rail (421), a second ball screw (422), a second motor (423), and a second synchronous wheel assembly (424),

wherein the second guide rail (421) is arranged at one side above the delivering rail (2) and is parallel to the length direction of the delivering rail (2);

the second ball screw (422) is parallel to the second guide rail (421), and the first

drilling device (11) is mounted on a first drilling device mounting assembly (81), which is mounted on the second guide rail (421) and fixedly connected to a nut seat provided on the second ball screw (422);

the second synchronous wheel assembly (424) consists of a synchronous wheel fixed on an output shaft of the second motor (423), a synchronous wheel fixed to the second ball screw (422), and a synchronous belt; and

the second motor (423) drives the second ball screw (422) in rotation through the second synchronous wheel assembly (424), thus driving the first drilling device mounting assembly (81) to move forward or backward.

6. The automatic drilling machine according to claim 5, characterized in that the third moving assembly is mounted on the first drilling device mounting assembly (81), and includes a third guide rail (431), a third ball screw (432), a third motor (433), and a third synchronous wheel assembly (434),

wherein the third guide rail (431) and the third ball screw (432) are both vertically arranged, and the first drilling device mounting assembly (81) includes a first fixing plate (811) fixedly connected to the first drilling device (11), the first fixing plate (811) being mounted on the third guide rail (431) and fixedly connected to a nut seat provided on the third ball screw (432);

the third synchronous wheel assembly (434) consists of a synchronous wheel fixed on an output shaft of the third motor (433), a synchronous wheel fixed to the third ball screw (432), and a synchronous belt; and

the third motor (433) drives the third ball screw (432) in rotation through the third synchronous wheel assembly (434), thus driving the first fixing plate (811) to move up or down.

7. The automatic drilling machine according to any one of claims 1 to 4, characterized in that the fourth moving assembly includes a fourth guide rail (441), a fourth ball screw (442), a fourth motor (443), and a fourth synchronous wheel assembly (444),

wherein the fourth guide rail (441) is mounted at one side below the delivering rail (2), and parallel to the length direction of the delivering rail (2);

the fourth ball screw (442) is parallel to the fourth guide rail (441) , and the second drilling device (12) is mounted on a second drilling device mounting assembly

(82), which is mounted on the fourth guide rail (441) and fixedly connected to a nut seat provided on the fourth ball screw (442);

the fourth synchronous wheel assembly (444) consists of a synchronous wheel fixed on an output shaft of the fourth motor (443), a synchronous wheel fixed to the fourth ball screw (442), and a synchronous belt; and

the fourth motor (443) drives the fourth ball screw (442) in rotation through the fourth synchronous wheel assembly (444), thus driving the second drilling device mounting assembly (82) to move forward or backward.

8. The automatic drilling machine according to claim 7, characterized in that the fifth moving assembly is mounted on the second drilling device mounting assembly (82), and includes a fifth guide rail (451), a fifth ball screw (452), a fifth motor (453), and a fifth synchronous wheel assembly (454),

wherein the fifth guide rail (451) and the fifth ball screw (452) are both vertically arranged, and the second drilling device mounting assembly (82) includes a second fixing plate (821) fixedly connected to the second drilling device (12), the second fixing plate (821) being mounted on the fifth guide rail (451) and fixedly connected to a nut seat provided on the fifth ball screw (452);

the fifth synchronous wheel assembly (454) consists of a synchronous wheel fixed on an output shaft of the fifth motor (453), a synchronous wheel fixed to the fifth ball screw (452), and a synchronous belt; and

the fifth motor (453) drives the fifth ball screw (452) in rotation through the fifth synchronous wheel assembly (454), thus driving the second fixing plate (821) to move up or down.

9. The automatic drilling machine according to any one of claims 1 to 4, characterized in that two limiting assemblies (5) are provided, one of which is arranged at a front end of the delivering rail (2) while the other is arranged at a middle portion thereof,

wherein each of the limiting assemblies (5) includes a limiting block (51), a second cylinder (52) and a limiting bracket (53), wherein the limiting bracket (53), on which the second cylinder (52) is mounted, is mounted on one side of the delivering rail (2), and the limiting block (51) is driven by the second cylinder (52) to extend toward or retract away from the delivering rail (2).

10. The automatic drilling machine according to any one of claims 1 to 4, characterized in that the locking assembly includes a locking cylinder assembly (61), a rotary clamping cylinder assembly (62) and an ejector cylinder assembly (63),

wherein multiple locking cylinder assemblies (61) are provided at a middle section of the delivering rail (2), each of the locking cylinder assemblies (61) including a clamping block (611), a third cylinder (612) and a clamping installation block (613), wherein:

the clamping installation block (613) is fixedly mounted on the working table (20), the third cylinder (612) is mounted on the clamping installation block (613), and the clamping block (611) is formed as an L-shaped structure by a horizontal plate and a vertical plate, wherein the horizontal plate is fixed to the third cylinder (612), and driven thereby to move left and right, and

when the third cylinder (612) is retracted, the vertical plate of the clamping block (611) clamps a side surface of the metal part (10) located at the clamping block (611);

multiple rotary clamping cylinder assemblies (62) are provided at front and middle sections of the delivering rail (2), each of the rotary clamping cylinder assemblies (62) including a rotary clamping cylinder (621), and a pressing element (622), which is mounted on an output shaft of the rotary clamping cylinder (621), and driven by the rotary clamping cylinder (621) in rotation to press down on a top of the metal part (10) located there; and

multiple ejector cylinder assemblies (63) are provided at the front section of the delivering rail (2), each of the ejector cylinder assemblies (63) including a fourth cylinder (631), and an ejector rod (632), which is fixed to an output shaft of the fourth cylinder (631), and driven by the fourth cylinder (631) to push forward a side surface of the metal part (10) located there or retract backward.