Amended Claims

1. An automatic workpiece punching system, comprising:

a punching die (1);

a die filling device (2), which is used to hold and feed a workpiece into the punching die (1) and withdraw after the workpiece is punched, wherein the die filling device (2) includes a clamping portion (21) for clamping the workpiece, and a first cylinder (22) for driving the clamping portion (21) to move;

a sensing device (3) used for sensing a position of the workpiece; and

a control device, which is connected to above devices and to the punching die (1), and controls operations thereof,

wherein the die filling device (2) further comprises a workpiece removing rod (23) in form of a lever, and a second cylinder (24), and

wherein the second cylinder (24) acts on one end of the workpiece removing rod (23), another end of which is located above the workpiece clamped at the clamping portion (21).

2. The automatic workpiece punching system according to claim 1, wherein a workpiece guiding plate (25) is provided below the workpiece clamped on the clamping portion (21) when it is at an initial position, for receiving and guiding out the workpiece.

3. The automatic workpiece punching system according to claim 1, wherein the clamping portion (21) of the die filling device (2) comprises a workpiece fixing member (211), an upper clamping plate (212), a lower clamping plate (213), and a clamping fine-adjustment member (214), and

wherein the lower clamping plate (213) is fixed to a lower part of the workpiece fixing member (211), and the upper clamping plate (212) is movably connected to an upper part of the workpiece fixing member (211) and adjusted by the clamping fine-adjustment member (214) in its vertical position.

4. The automatic workpiece punching system according to claim 3, wherein a clearance groove (215) is provided in a side wall of the workpiece fixing member (211), and a guiding slope or arc surface (216) is provided on a rear end of the side

wall of the workpiece fixing member (211).

5. The automatic workpiece punching system according to any one of claims 1-4, further comprising a workpiece loading and removing device (5) connected to the control device, the workpiece loading and removing device (5) including a workpiece seat (51) for carrying the workpiece, a third cylinder (52) acting on the workpiece seat (51) from a rear portion thereof, a workpiece upper limiting bracket (53), and a workpiece lower limiting bracket (54),

wherein the workpiece upper limiting bracket (53) and the workpiece lower limiting bracket (54) are disposed opposite to each other behind the clamping portion (21) at the initial position thereof, and

wherein the third cylinder (52) drives the workpiece seat (51) to move forward between the workpiece upper limiting bracket (53) and the workpiece lower limiting bracket (54), to feed the workpiece into the clamping portion (21), and meanwhile to remove the workpiece that has been punched from the clamping portion (21) or to withdraw backward.

6. The automatic workpiece punching system according to claim 5, wherein the workpiece loading and removing device (5) further comprises a workpiece removing plate (55), which is connected synchronously to a front part of the workpiece seat (51).

7. The automatic workpiece punching system according to claim 5, further comprising a workpiece conveying device (6) and a workpiece displacing device (7) for transferring the workpiece conveyed thereto to the workpiece seat (51), wherein the workpiece conveying device (6) and the workpiece displacing device (7) are both connected to the control device.

8. The automatic workpiece punching system according to claim 7, wherein the workpiece displacing device (7) comprises a workpiece holder (71) used to receive the workpiece conveyed thereto, a suction cup (72), a fourth cylinder (73) for controlling vertical displacement of the suction cup (72), and a fifth cylinder (74) for controlling horizontal displacement of the suction cup (72), and

wherein the suction cup (72), controlled by the fourth cylinder (73) and the fifth

cylinder (74), moves to the workpiece holder (71) to draw the workpiece and moves to the workpiece seat (51) to put down the workpiece.

9. The automatic workpiece punching system according to claim 7, wherein the workpiece conveying device (6) comprises a motor (61), a drive shaft (62), a conveyor belt (63), and a vibration plate (64),

wherein the motor (61) drives, through the drive shaft (62), the conveyor belt (63) to move, a front end of the conveyor belt (63) being adjacent to a rear end of the workpiece holder (71),

wherein the vibration plate (64) is provided with an output portion (65) to be connected to a rear end of the conveyor belt (63), and

wherein the workpiece is conveyed, from the vibration plate (64) and through the output portion (65), to the rear end of the conveyor belt (63), and after being conveyed forward in place by the conveyor belt (63), enters the workpiece holder (71).