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Pneumatic clamp for welding spindles

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Abstract

A pneumatic clamp for welding spindles comprises a base, a holder, two clamping assemblies, and a profiled positioning assembly matched with a spindle, wherein the two clamping assemblies are a left clamping assembly and a right clamping assembly respectively, the holder is mounted on the base, the left clamping assembly is mounted on the left side of the base, the right clamping assembly is mounted on the right side of the base, the profiled positioning assembly is mounted on the holder, and the spindle sleeves the profiled positioning assembly; and each clamping assembly comprises a cylinder and a clamping block, and the cylinder is connected to the clamping block and drives the clamping block to move towards the middle to clamp and position the spindle. The pneumatic clamp is simple in structure and can automatically clamp the spindle through the left and right clamping assemblies to realize positioning to ensure that the spindle always clings to the positioning assembly in the welding process, so that a stop piece will not get deformed under a high welding temperature, surface flatness of the stop piece is guaranteed, and the welding quality and machining speed of the spindle are improved.

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Pneumatic Clamp for Welding Spindles

Technical Field

The utility model belongs to the technical field of welding jigs, and particularly relates to a pneumatic clamp for welding spindles.

Description of Related Art

Laptop spindles typically include a spindle cavity and a stop piece disposed on the inner wall of a spindle shell. In the trial production phase, the spindles of a required size and shape are machined from solid aluminum alloy by means of CNC machining; however, this approach has a long machining time, is low efficiency, and causes material waste, thus being only suitable for production of a small batch of samples in the proofing phase.

In view of this, those skilled in the arts can attempt to machine the laptop spindles by welding aluminum-extruded spindles with stop pieces. To fulfill this purpose, a special clamping jig needs to be invented to position the spindle shell and the stop piece in the welding process.

Brief Summary of the Utility Model

The technical issue primarily to be settled by the utility model is to provide a pneumatic clamp for welding spindles. The pneumatic clamp is simple in structure and can automatically clamp a spindle through left and right clamping assemblies to realize positioning to ensure that the spindle always clings to a positioning assembly in the welding process, so that a stop piece will not deform under a high welding temperature, the surface flatness of the stop piece is guaranteed, and the welding quality and machining speed of the spindle are improved.

One technical solution adopted by the utility model to settle the aforesaid technical issue is as follows:

The utility model provides a pneumatic clamp for welding spindles, wherein each spindle comprises a hollow spindle cavity and a stop piece welded to the

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spindle cavity; and the pneumatic clamp comprises a base, a holder, two clamping assemblies, and a profiled positioning assembly matched with the spindle, wherein the two clamping assemblies are a left clamping assembly and a right clamping assembly respectively, the holder is mounted on the base, the left clamping assembly is mounted on the left side of the base, the right clamping assembly is mounted on the right side of the base, the profiled positioning assembly is mounted on the holder, and the spindle sleeves the profiled positioning assembly; and

Each clamping assembly comprises a cylinder and a clamping block, wherein the cylinder is connected to the clamping block and drives the clamping block to move towards the middle to clamp and position the spindle.

A further technical solution adopted by the utility model to settle the aforesaid technical issue is as follows: each cylinder comprises a housing, a piston rod, and a reset spring, wherein an end where the piston rod stretches out is defined as front, the housing has an air inlet, a convex part is formed in the middle of the piston rod and has a groove sleeved with a seal ring, a seal cavity is formed between the seal ring and a rear part of the housing, and the reset spring is arranged on a front part of the piston rod.

Furthermore, limiting columns are arranged at the bottom of the base and are matched with positioning holes formed in a welding bench of a welding facility to position the pneumatic clamp on the welding bench of the welding facility.

Furthermore, the profiled positioning assembly comprises a positioning column and a positioning sleeve disposed around the positioning column; after being disposed around the positioning column, the positioning sleeve is inserted into a positioning hole formed in the holder; and an upper end of the positioning column stretches out of an upper surface of the positioning sleeve.

Furthermore, the positioning hole is a through hole which extends from an upper surface to a lower surface of the holder, and after being inserted into the positioning hole, the positioning assembly is limited by the base from below.

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Furthermore, the clamping blocks are fiberglass blocks.

Furthermore, the clamping block of the left clamping assembly is defined as a left clamping block, and a clamping surface of the left clamping block extends outwards to form a clamping protrusion for improving a clamping force.

Furthermore, the base is detachably connected to the holder.

Furthermore, the pneumatic clamp comprises two profiled positioning assemblies, and after the spindles are disposed in the positioning assemblies, openings of the two spindle cavities face each other.

The utility model has the following beneficial effects:

The pneumatic clamp of the utility model comprises a base, a holder, clamping assemblies, and a profiled positioning assembly matched with a spindle, wherein the two clamping assemblies are a left clamping assembly and a right clamping assembly respectively, the holder is mounted on the base, the left clamping assembly is mounted on the left side of the base, the right clamping assembly is mounted on the right side of the base, the profiled positioning assembly is mounted on the holder, and the spindle sleeves the profiled positioning assembly; and each clamping assembly comprises a cylinder and a clamping block, and the cylinder is connected to the clamping block and drives the clamping block to move towards the middle to clamp and position the spindle. The left and right clamping assemblies can automatically clamp the spindle to realize positioning, so that the spindle always clings to the positioning assembly in the welding process, a stop piece will not deform under a high welding temperature, the surface flatness of the stop piece is guaranteed, and the welding quality and machining speed of the spindle are improved;

Moreover, the clamping blocks of the utility model can be fiberglass blocks and can fulfill a clamping and positioning effect without scratching the surface of the spindle; and

In addition, the pneumatic clamp of the utility model comprises two profiled

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positioning assemblies, and after the spindles are disposed in the positioning assemblies, openings of the two spindle cavities face each other. By adopting such structure, after the spindle cavities are welded to one sides of the stop pieces, the two spindles can be transposed to be welded to other sides of the stop pieces, so that welding is convenient and fast, and the welding efficiency is improved.

The technical solutions of the utility model are summarized above, can be implemented in accordance with the contents in the specification to be better understood, and will be detailed hereinafter with reference to preferred embodiments of the utility model.

Brief Description of the Several Views of the Drawings

FIG. 1 is an external view of the utility model (in the state of clamping a spindle);

FIG. 2 is a structural view of a cylinder of the utility model;

FIG. 3 is a sectional view of the cylinder of the utility model;

FIG. 4 is a structural view of a holder of the utility model;

FIG. 5 is one exploded view of the holder of the utility mode;

FIG. 6 is another exploded view of the holder of the utility model;

10, spindle; 101, spindle cavity; 102, stop piece; 20, base; 201, limiting column; 30, holder; 301, positioning hole; 40, profiled positioning assembly; 401, positioning column; 402, positioning sleeve; 50, left clamping assembly; 501, cylinder; 5011, housing; 5012, piston rod; 50121, groove; 5013, air inlet; 502, clamping block; 5021, clamping protrusion; 60, right clamping assembly.

Detailed Description of the Utility Model

The specific implementations of the utility model are explained below in conjunction with specific embodiments, and those skilled in the arts can easily appreciate the advantages and effects of the utility model by referring to the contents in the specification. The utility model can also be implemented in other

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different ways, that is, various modifications and transformations can be made without departing from the scope of the utility model.

Embodiment: this embodiment provides a pneumatic clamp for welding spindles, wherein as shown in FIG. 1 to FIG. 6, each spindle 10 comprises a hollow spindle cavity 101 and a stop piece 102 welded to the spindle cavity; and the pneumatic clamp comprises a base 20, a holder 30, two clamping assemblies and a profiled positioning assembly 40 matched with the spindle, wherein the two clamping assemblies are a left clamping assembly 50 and a right clamping assembly 60 respectively, the holder is mounted on the base, the left clamping assembly is mounted on the left side of the base, the right clamping assembly is mounted on the right side of the base, the profiled positioning assembly is mounted on the holder, and the spindle sleeves the profiled positioning assembly;

Each clamping assembly comprises a cylinder 501 and a clamping block 502, wherein the cylinder is connected to the clamping block and drives the clamping block to move towards the middle to clamp and position the spindle.

Each cylinder 501 comprises a housing 5011, a piston rod 5012 and a reset spring (not shown), wherein an end where the piston rod stretches out is defined as front, the housing has an air inlet 5013, a convex part is formed in the middle of the piston rod and has a groove 50121 which is sleeved with a seal ring (not shown), a seal cavity is formed between the seal ring and a rear part of the housing, and the reset spring is arranged on a front part of the piston rod. The cylinder has a small size and occupies a small space, thus being suitable for spindle welding jigs.

Limiting columns 201 are arranged at the bottom of the base and are matched with positioning holes formed in a welding bench of a welding facility to position the pneumatic clamp on the welding bench of the welding facility. In this way, the pneumatic clamp can be easily positioned and fixed on the welding bench.

In this embodiment, the profiled positioning assembly comprises a positioning column 401 and a positioning sleeve 402 disposed around the positioning column;

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after being disposed around the positioning column, the positioning sleeve is inserted into a positioning hole 301 formed in the holder; and an upper end of the positioning column stretches out of an upper surface of the positioning sleeve.

The positioning hole is a through hole which extends from an upper surface to a lower surface of the holder, and after being inserted into the positioning hole, the positioning assembly is limited by the base from below.

The clamping blocks are fiberglass blocks and can fulfill a clamping and positioning effect without scratching the surface of the spindle.

The clamping block of the left clamping assembly is defined as a left clamping block, and a clamping surface of the left clamping block extends outwards to form a clamping protrusion 5021 for improving the clamping force.

The base is detachably connected to the holder, and the holder can be changed to position different models of spindles, so that the universality is high.

The pneumatic clamp comprises two profiled positioning assemblies, and after the spindles are disposed in the positioning assemblies, openings of the two spindle cavities face each other. By adopting such design, after the spindles are welded to one sides of the stop pieces, the two spindles can be transposed to be welded to the other sides of the stop pieces.

The working principle and process of the utility model are as follows:

In use, before the cylinders are started, the clamping blocks are away from the positioning assembly, the stop piece is disposed on the positioning sleeve, the spindle is disposed around the positioning sleeve, and then the cylinders are started to drive the clamping blocks to move towards the middle to position the spindle, so that the spindle cavity and the stop piece are welded; the spindle always clings to the positioning assembly in the welding process through the left and right clamping assemblies, so that the stop piece will not deform under a high welding temperature, the surface flatness of the stop piece is guaranteed, and the welding quality and machining speed of the spindle are improved; and after welding is

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finished, the piston rods are pushed by the reset springs to retreat to drive the clamping blocks to move backwards to release the spindle.

The clamping blocks are fiberglass blocks and can fulfill a clamping and positioning effect without scratching the surface of the spindle;

The pneumatic clamp comprises two profiled positioning assemblies, and after the spindles are disposed in the positioning assemblies, openings of the two spindle cavities face each other. By adopting such structure, after the spindle cavities are welded to one sides of the stop pieces, the two spindles can be transposed to be welded to the other sides of the stop pieces, so that welding is convenient and fast, and the welding efficiency is improved.

The above description is only used to explain the embodiments of the utility model, and is not intended to limit the patent scope of the utility model. All equivalent structures obtained with reference to the specification of the utility model, or direct or indirect applications to other relating technical fields should also fall within the patent protection scope of the utility model.

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1. A pneumatic clamp for welding spindles, characterized in that each spindle (10) comprises a hollow spindle cavity (101) and a stop piece (102) welded to the spindle cavity; and the pneumatic clamp comprises a base (20), a holder (30), two clamping assemblies and a profiled positioning assembly (40) matched with the spindle, wherein the two clamping assemblies are a left clamping assembly (50) and a right clamping assembly (60) respectively, the holder is mounted on the base, the left clamping assembly is mounted on a left side of the base, the right clamping assembly is mounted on a right side of the base, the profiled positioning assembly is mounted on the holder, and the spindle sleeves the profiled positioning assembly; and

each said clamping assembly comprises a cylinder (501) and a clamping block (502), wherein the cylinder is connected to the clamping block and drives the clamping block to move towards a middle to clamp and position the spindle.

2. The pneumatic clamp for welding spindles according to Claim 1, wherein each said cylinder (501) comprises a housing (5011), a piston rod (5012) and a reset spring, wherein an end where the piston rod stretches out is defined as front, the housing has an air inlet (5013), a convex part is formed in a middle of the piston rod and has a groove (50121) sleeved with a seal ring, a seal cavity is formed between the seal ring and a rear part of the housing, and the reset spring is arranged on a front part of the piston rod.

3. The pneumatic clamp for welding spindles according to Claim 1, wherein limiting columns (201) are arranged at a bottom of the base and are matched with positioning holes formed in a welding bench of a welding facility to position the pneumatic clamp on the welding bench of the welding facility.

4. The pneumatic clamp for welding spindles according to Claim 1, wherein the profiled positioning assembly comprises a positioning column (401) and a positioning sleeve (402) disposed around the positioning column; after being disposed around the positioning column, the positioning sleeve is inserted into a

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positioning hole (301) formed in the holder; and an upper end of the positioning column stretches out of an upper surface of the positioning sleeve

5. The pneumatic clamp for welding spindles according to Claim 4, wherein the positioning hole is a through hole which extends from an upper surface to a lower surface of the holder, and after being inserted into the positioning hole, the positioning assembly is limited by the base from below.

6. The pneumatic clamp for welding spindles according to Claim 1, wherein the clamping blocks are fiberglass blocks.

7. The pneumatic clamp for welding spindles according to Claim 1, wherein the clamping block of the left clamping assembly is defined as a left clamping block, and a clamping surface of the left clamping block extends outwards to form a clamping protrusion (5021) for improving clamping force.

8. The pneumatic clamp for welding spindles according to Claim 1, wherein the base is detachably connected to the holder.

9. The pneumatic clamp for welding spindles according to Claim 1, wherein the pneumatic clamp comprises two said profiled positioning assemblies, and after the spindles are disposed in the positioning assemblies, openings of the two spindle cavities face each other.

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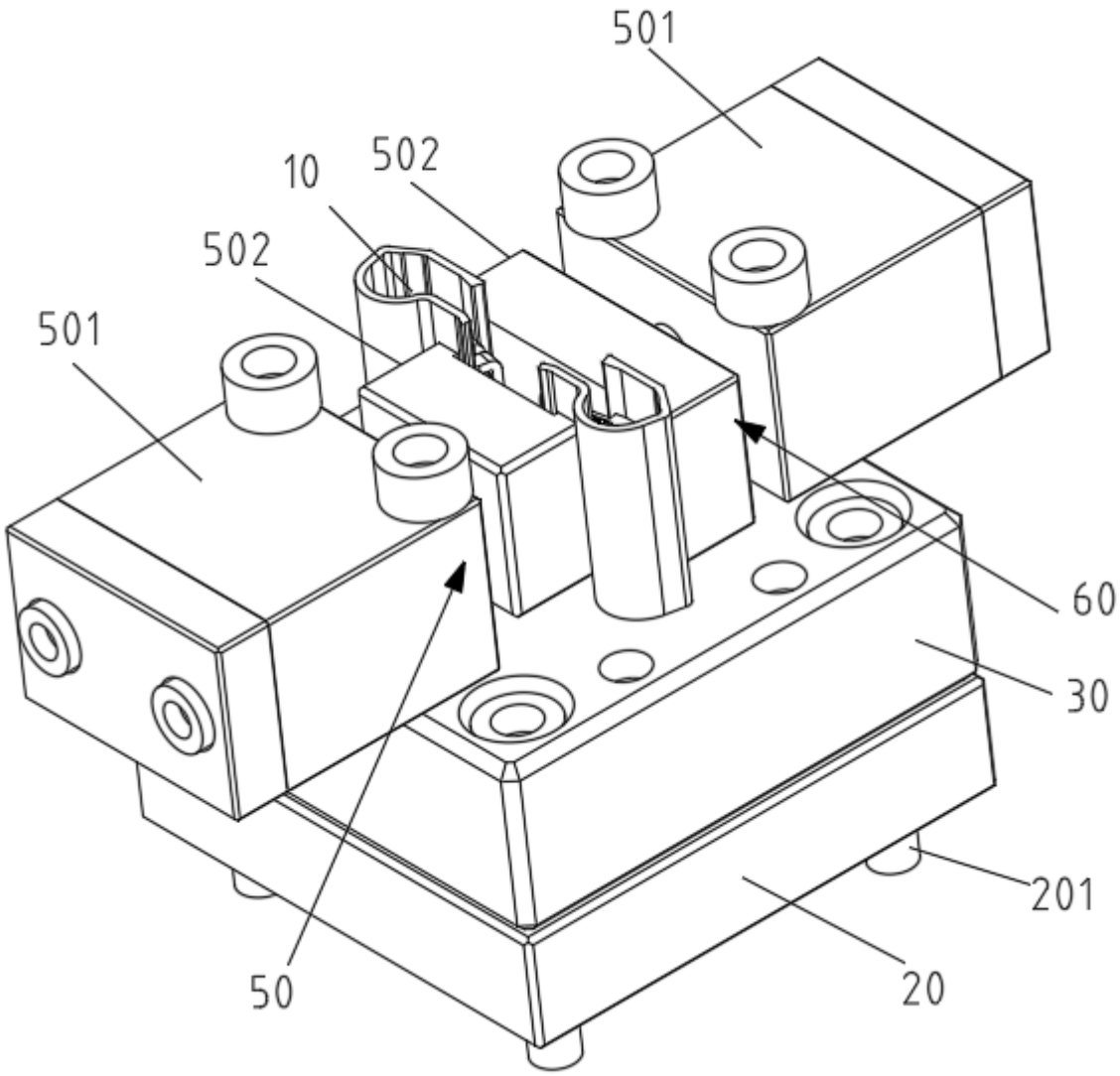


FIG. 1

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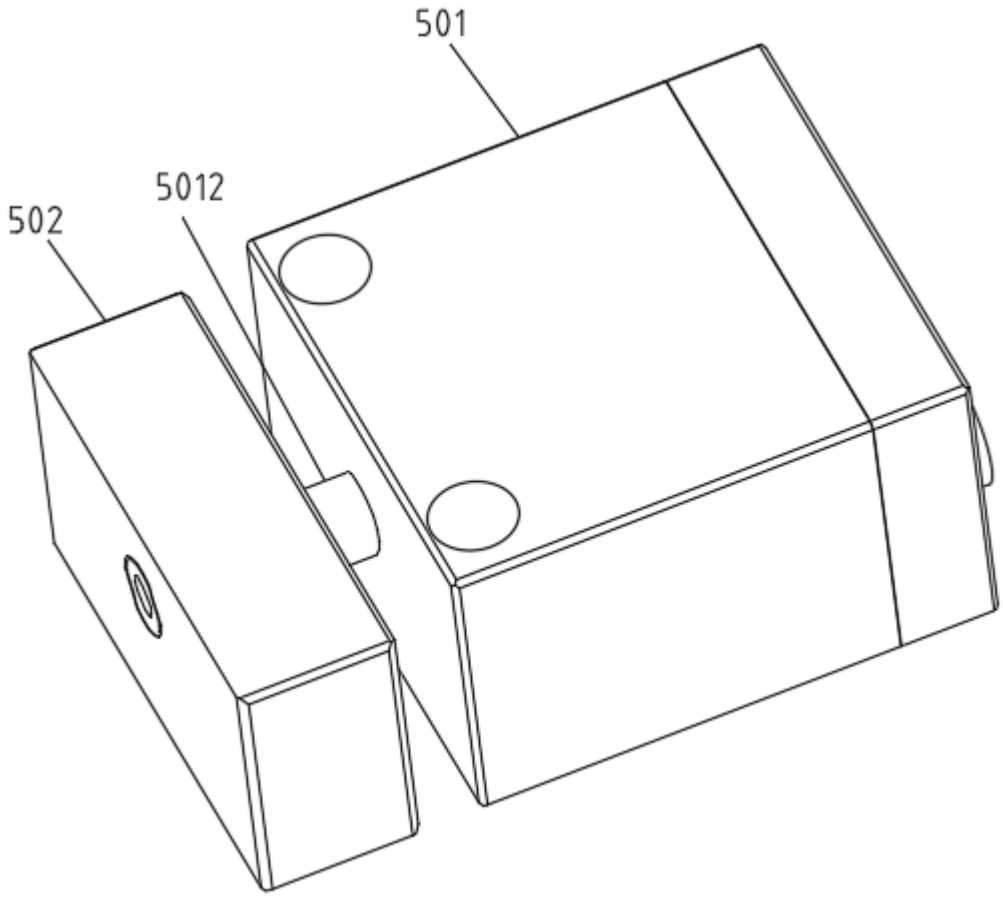


FIG. 2

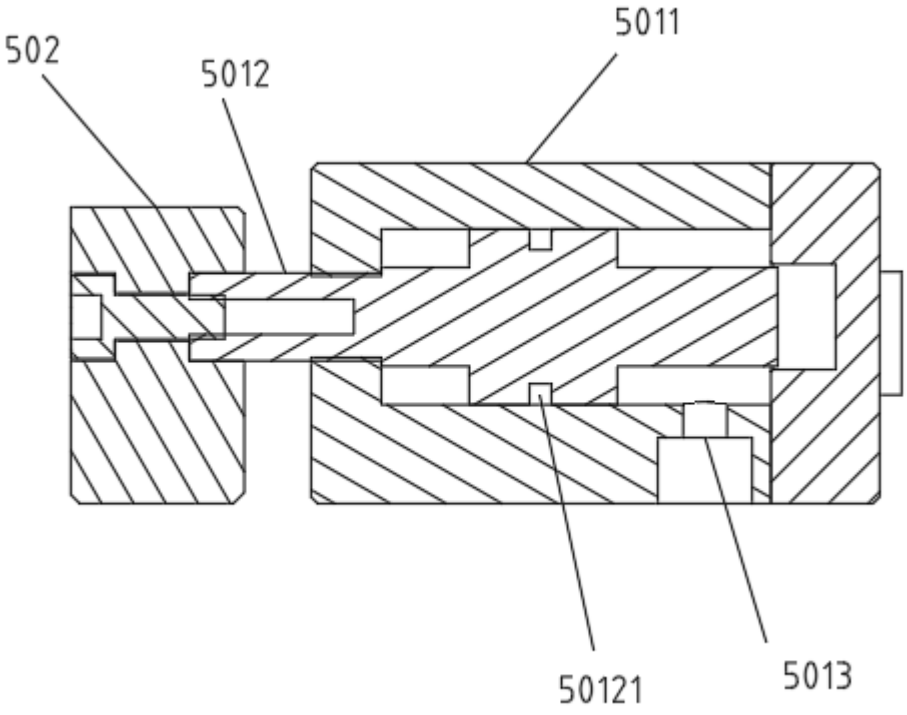


FIG. 3

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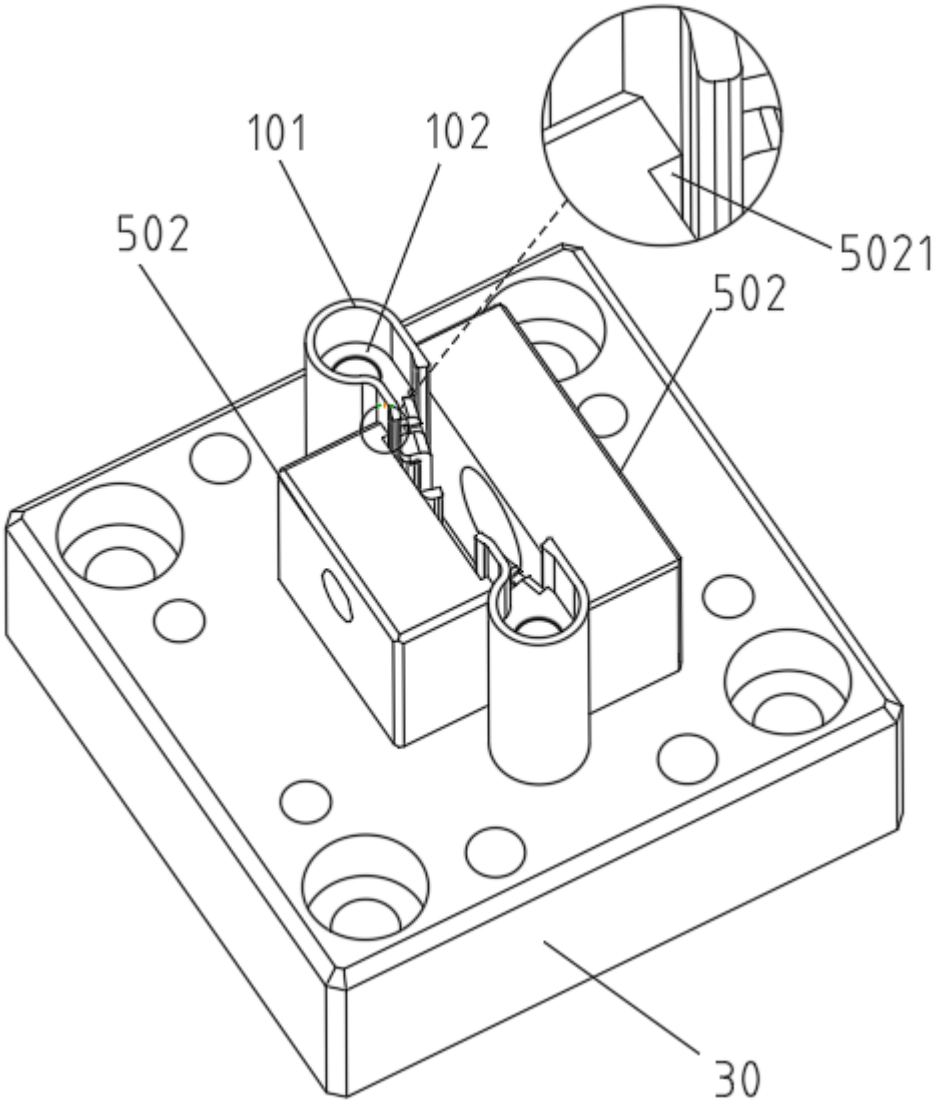


FIG. 4

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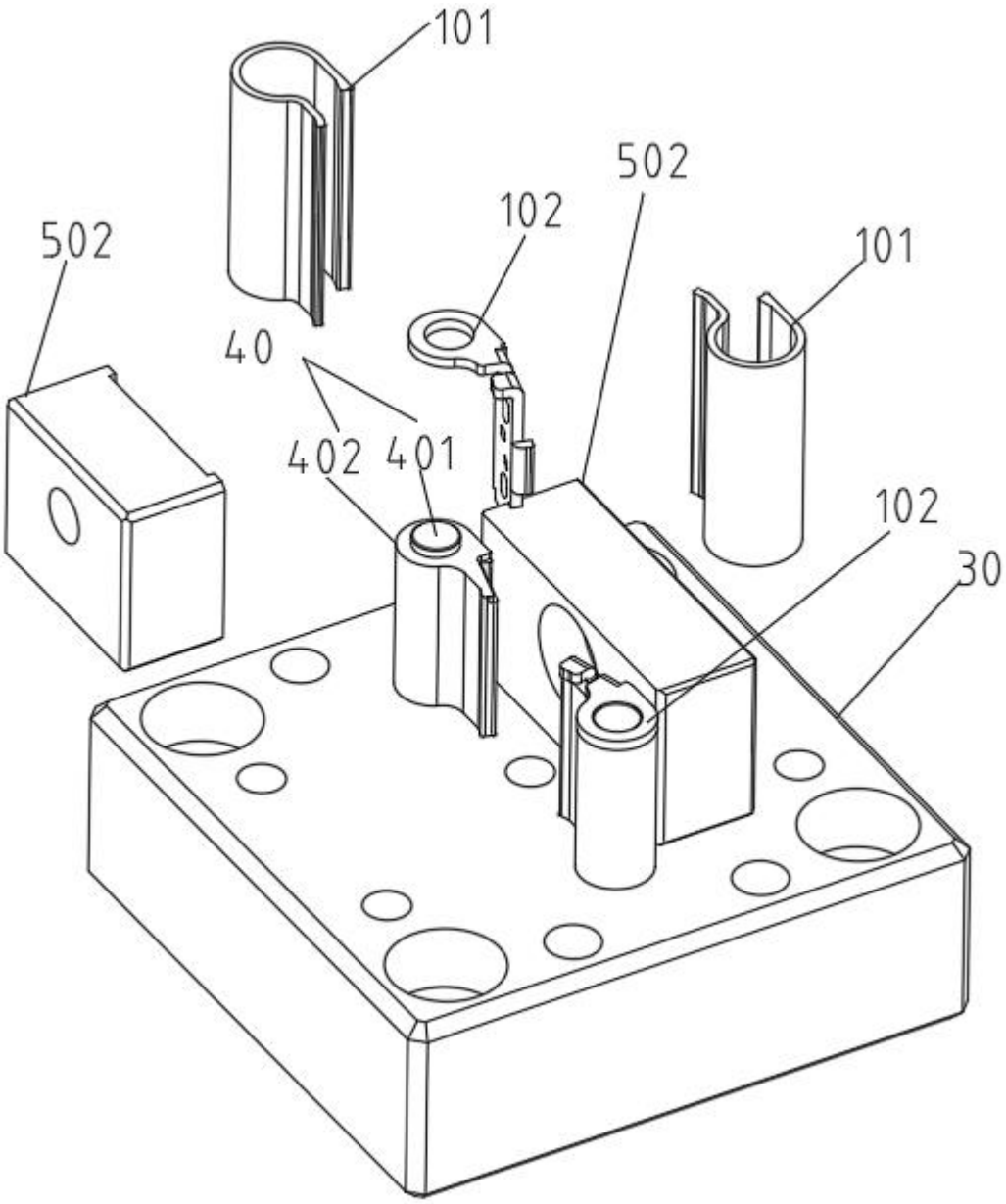


FIG. 5

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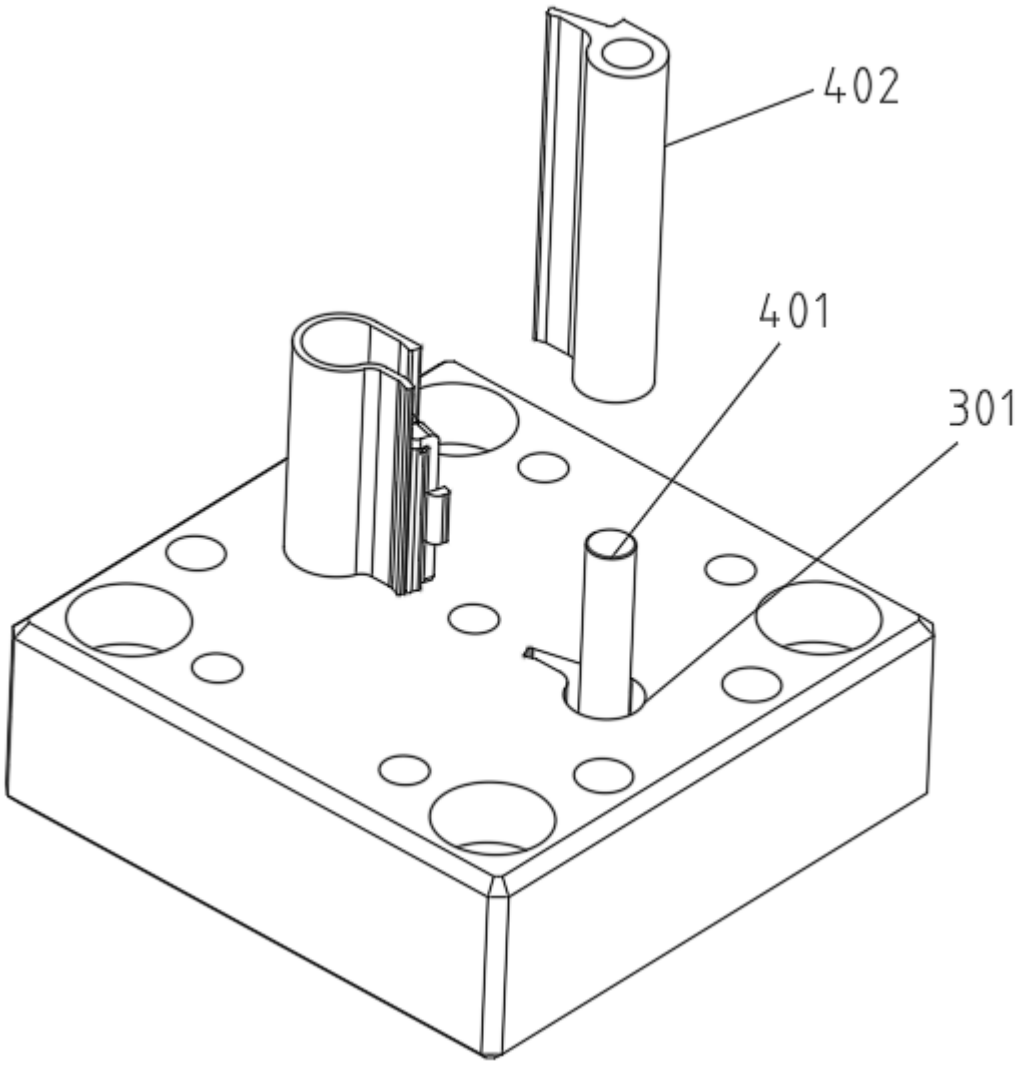


FIG. 6