

DIE FRAME

TECHNICAL FIELD

The present application relates to the field of die cutting, and in particular, to a die frame.

5 BACKGROUND

In the related technology, flatbed die-cutting molds are commonly used for die cutting of multi-layer materials, or for cutting a certain depth into single-layer thicker materials. When the adjustment of a depth of die cutting is required, it is achieved by adjusting a height of a bottom plate of a lower die holder. However, the over cutting is easily caused due to the instability of a machine in the operation process, thereby affecting the die cutting effect. Moreover, it takes a large amount of time to adjust the height of the bottom plate, which delays production and processing.

SUMMARY

The present application aims to at least solve one of the technical problems in the conventional technology. Therefore, the present application proposes a die frame that can ensure that materials will not be over-cut and thus can prolong the service life of an etching die.

A die frame according to an embodiment in a first aspect of the present application comprises: an upper die holder, an upper pressure plate and a lower die holder, wherein the upper pressure plate is connected to a bottom of the upper die holder, and a lower end face of the upper pressure plate is configured to mount an etching die; the lower die holder is correspondingly arranged below the upper die holder and configured to bear materials; the lower end face of the upper pressure plate or an upper end face of the lower die holder is provided with a boss, and a thickness of the boss is greater than that of the etching die, so that an uncut height is reserved between the etching die and the lower die holder during die closing, and the uncut height is equal to a thickness difference between the boss and the etching die.

The die frame according to an embodiment of the present application at least has the following beneficial effects. The above die frame comprises an upper die holder, an upper pressure plate and a lower die holder, wherein the upper pressure plate is connected to a bottom of the upper die holder, the lower die holder is correspondingly arranged below the upper pressure plate, and the bottom of the upper pressure plate is configured to mount an etching die, so that materials on the lower die holder can be cut into corresponding shapes by the etching die at the bottom of the upper die holder;

a lower end of the upper pressure plate or an upper end face of the lower die holder is provided with a boss, and a thickness of the boss is greater than that of the etching die, so that the boss is positioned between the upper pressure plate and the lower die holder in the closing process of the upper die holder and the lower die holder; as a result, the thickness of the etching die only allows for die-cutting with a certain height, but the remaining height which is the thickness difference between the boss and the etching die cannot be die-cut. Specifically, in this embodiment, the boss is arranged at the bottom of the upper pressure plate, and when the upper pressure plate moves downward along with the upper die holder, since the boss is thicker than the etching die, the boss abuts against the lower die holder first, making the etching die a certain height from the upper end face of the lower die holder and unable to abut against the lower die holder. This forms an uncut height between the etching die and the lower die holder, where the uncut height is equal to the thickness difference between the boss and the etching die. If the uncut height is d , then the die-cut depth of the etching die is the difference between a material thickness and d . Thus, the arrangement of the boss can ensure that the material is not over-cut and thus can protect the etching die, thereby preventing the etching die from being damaged due to long-term abutment against the lower die holder, so as to prolong the service life of the etching die. In addition, the time for adjusting the height of the lower die holder can be shortened.

According to some embodiments of the present application, the lower die holder is provided with limiting plates at two sides along a width direction of material feeding, a feeding position is formed between a bottom of each of the limiting plates and the upper end face of the lower die holder to limit the materials at the feeding position, a bottom of the upper pressure plate is provided with first avoidance grooves each corresponding to a respective one of the limiting plates.

According to some embodiments of the present application, the bottom of each of the limiting plates at two sides is provided with a limiting step to limit a width direction of the materials.

According to some embodiments of the present application, the die frame further comprises a first fastener, the lower die holder is provided with a threaded hole, the limiting plate is provided with a through hole corresponding to the threaded hole, and the first fastener is threadedly connected to the lower die holder through the through hole and the threaded hole and configured to limit a width direction of the materials.

According to some embodiments of the present application, a top of the first fastener protrudes out of an upper end face of the limiting plate, a bottom of the first avoidance groove is provided with a second avoidance groove, and the second avoidance groove is correspondingly matched with the first fastener.

According to some embodiments of the present application, the bottom of the upper pressure plate is provided with a plurality of punches, the punches are positioned at two sides of the width

direction of material feeding and configured to punch positioning holes at two sides of the materials, and the lower die holder is provided with a plurality of first avoidance holes corresponding to the punches.

According to some embodiments of the present application, the bottom of the upper pressure plate is provided with a plurality of positioning pins, the positioning pins are positioned at two sides of the width direction of material feeding and configured to position the materials, the lower die holder is provided with a plurality of second avoidance holes corresponding to the positioning pins, and the punches and the positioning pins are sequentially arranged along a feeding direction of the materials.

According to some embodiments of the present application, the limiting plate is provided with a plurality of third avoidance holes, and the plurality of third avoidance holes separately correspond to the first avoidance holes and the second avoidance holes.

According to some embodiments of the present application, an elastic member is connected between the upper die holder and the upper pressure plate, so that the upper pressure plate is elastically connected to the upper die holder.

According to some embodiments of the present application, a guide structure is arranged at the bottom of the upper die holder and on the lower die holder, and the upper pressure plate is provided with a via hole, so that the upper die holder, the upper pressure plate and the lower die holder vertically correspond to each other during die closing.

Additional aspects and advantages of the present application will be set forth in part in the following description, some of which will be apparent from the following description, or will be learned by practice of the present application.

BRIEF DESCRIPTION OF DRAWINGS

The present application is further described below with reference to the accompanying drawings and embodiments.

FIG. 1 is a schematic structural diagram according to an embodiment of the present application from one perspective;

FIG. 2 is a schematic structural diagram according to an embodiment of the present application from another perspective; and

FIG. 3 is a schematic structural diagram according to an embodiment of the present application from a third perspective.

Reference numerals:

100: upper die holder; 200: upper pressure plate; 210: boss; 220: first avoidance groove; 230: second avoidance groove; 240: punch; 250: positioning pin; 300: lower die holder; 310: limiting plate; 311: third avoidance hole; 320: first fastener; 330: first avoidance hole; 340: second avoidance hole; 400: etching die; 500: elastic member; 600: guide structure; 610: guide post; 620: guide hole.

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DETAILED DESCRIPTION

Embodiments of the present application will be described in detail below, and examples of the embodiments are shown in the accompanying drawings, wherein the same or similar reference numerals indicate the same or similar elements or elements having the same or similar functions throughout. The embodiments described below with reference to the accompanying drawings are illustrative only for the purpose of explaining the present application, and are not to be construed as limiting the present application.

In the description of the present application, it should be understood that the directional descriptions, for example, directions or positional relationships indicated by terms such as "upper", "lower", "front", "rear", "left", "right" and the like are those shown based on the accompanying drawings, and are merely intended to facilitate and simplify the description of the present application rather than indicate or imply that the indicated apparatus or element must have a specific direction and must be configured and operated according to the specific direction. Therefore, these directions or positional relationships should not be construed as limiting the present application.

In the description of the present application, "several" means one or more, "a plurality of" means two or more, "greater than", "less than", "more than" and the like are understood as excluding the following number, and "above", "below", "within" and the like are understood as including the following number. The description of "first" and "second" is merely for the purpose of distinguishing technical features, but shall not be understood as an indication or implication of relative importance, or an implicit indication of a quantity of indicated technical features, or an implicit indication of the sequence of the indicated technical features.

In the description of the present application, unless otherwise explicitly defined, terms such as "arrange", "mount", "connect" and the like should be understood in a broad sense, and those skilled in the art can reasonably determine the specific meanings of the above terms in the present application in conjunction with the specific contents of the technical solutions.

In the description of the present application, the description with reference to the terms "an embodiment", "some embodiments", "schematic embodiment", "example", "specific example", "some examples" or the like means the particular features, structures, materials or characteristics described in combination with the embodiment or example are included in at least one embodiment

or example of the present application. In this specification, the schematic expression of the above terms does not necessarily refer to the same embodiments or examples. Furthermore, the specific features, structures, materials, or characteristics described can be combined in any suitable manner in any one or more embodiments or examples.

5 The die frame according to an embodiment of the present application is described below with reference to FIGs. 1 to 3.

As shown in FIG. 1, the die frame according to an embodiment of the present application comprises: an upper die holder 100, an upper pressure plate 200 and a lower die holder 300, wherein the upper pressure plate 200 is connected to a bottom of the upper die holder 100, and a lower end
10 face of the upper pressure plate 200 is configured to mount an etching die 400; the lower die holder 300 is correspondingly arranged below the upper die holder 100 and configured to bear materials; the lower end face of the upper pressure plate 200 or an upper end face of the lower die holder 300 is provided with a boss 210, and a thickness of the boss 210 is greater than that of the etching die 400, so that an uncut height is reserved between the etching die 400 and the lower die holder 300 during
15 die closing, and the uncut height is equal to a thickness difference between the boss 210 and the etching die.

It may be understood that the above die frame comprises an upper die holder 100, an upper pressure plate 200 and a lower die holder 300, wherein the upper pressure plate 200 is connected to a bottom of the upper die holder 100, the lower die holder 300 corresponds to the upper pressure plate
20 200 and is arranged below the upper pressure plate 200, and the bottom of the upper pressure plate 200 is configured to mount an etching die 400, so that materials on the lower die holder 300 can be cut into corresponding shapes by the etching die 400 at the bottom of the upper die holder 100; a lower end of the upper pressure plate 200 or an upper end face of the lower die holder 300 is provided with a boss 210, and a thickness of the boss 210 is greater than that of the etching die 400, so that the
25 boss 210 is positioned between the upper pressure plate 200 and the lower die holder 300 in the closing process of the upper die holder 100 and the lower die holder 300; as a result, the thickness of the etching die 400 only allows for die-cutting with a certain height, but the remaining height which is the thickness difference between the boss 210 and the etching die 400 cannot be die-cut. Specifically, in this embodiment, the boss 210 is arranged at the bottom of the upper pressure plate
30 200, and when the upper pressure plate 200 moves downward along with the upper die holder 100, since the boss 210 is thicker than the etching die 400, the boss 210 abuts against the lower die holder 300 first, making the etching die 400 a certain height from the upper end face of the lower die holder 300 and unable to abut against the lower die holder 300. This forms an uncut height between the etching die 400 and the lower die holder 300, where the uncut height is equal to the thickness

difference between the boss 210 and the etching die 400. If the uncut height is d , then the die-cut depth of the etching die 400 is the difference between a material thickness and d . Thus, the arrangement of the boss 210 can ensure that the material is not over-cut and thus can protect the etching die 400, thereby preventing the etching die 400 from being damaged due to long-term
5 abutment against the lower die holder 300, so as to prolong the service life of the etching die 400. In addition, the time for adjusting the height of the lower die holder 300 can be shortened.

It should be understood that, in other embodiments, the boss 210 may also be arranged on the upper end face of the lower die holder 300, so that after the upper die holder 100 descends with the upper pressure plate 200, the boss 210 abuts against the upper pressure plate 200 first during die
10 closing. Since the thickness of the etching die 400 is less than that of the boss 210, the etching die 400 is at a certain distance from the upper end face of the lower die holder 300, so that the material cannot be cut through to the lower die holder 300.

It may be understood that the lower die holder 300 is provided with limiting plates 310 at two sides along a width direction of material feeding, a feeding position is formed between a bottom of
15 the limiting plate 310 and the upper end face of the lower die holder 300 to limit the materials at the feeding position, the bottom of the upper pressure plate 200 is provided with a first avoidance groove 220, and the first avoidance groove 220 is correspondingly adapted to the limiting plate 310. For example, as shown in FIGs. 1 to 2, in this embodiment, the upper end face of the lower die holder 300 is provided with limiting plates 310 at two sides along the width direction of material feeding, a
20 feeding position is formed between a bottom of the limiting plate 310 and the upper end face of the lower die holder 300, therefore, when the material is fed along the feeding position as the die cutting is performed, the material is prevented from being moved by the etching die 400 or other punching components to be separated from the lower die holder 300, so as to limit the material in a height direction. In addition, the bottom of the upper pressure plate 200 is provided with a first avoidance
25 groove 220, and the first avoidance groove 220 is correspondingly matched with the limiting plate 310, so that the limiting plate 310 can be accommodated in the first avoidance groove 220 during die closing, thereby not affecting the die cutting of the etching die 400.

It may be understood that a bottom of each of the limiting plates 310 at two sides is provided with a limiting step to limit a width direction of the materials. For example, in this embodiment, the
30 lower die holder 300 is provided with a limiting step at the bottom of each of the limiting plates 310 positioned at two sides along the width direction of material feeding, and the limiting steps are arranged at the bottoms of the limiting plates 310, so that the limiting steps at the bottoms of the limiting plates 310 positioned at the two sides serve to limit the materials in the width direction of material feeding, thereby preventing the die cutting position deviation caused by material deviation.

It may be understood that the die frame further comprises a first fastener 320, the lower die holder 300 is provided with a threaded hole, the limiting plate 310 is provided with a through hole corresponding to the threaded hole, and the first fastener 320 is threadedly connected to the lower die holder 300 through the through hole and the threaded hole and configured to limit a width direction of the materials. For example, as shown in FIGs. 1 to 2, in this embodiment, the lower die holder 300 is provided with a threaded hole, the limiting plate 310 is provided with a through hole, the through hole corresponds to the threaded hole, and the first fastener 320 passes through the through hole and the threaded hole in sequence to lock the limiting plate 310 to the lower die holder 300. Meanwhile, the first fasteners 320 at the two sides along the width direction of material feeding can limit the width direction of the materials, so that die cutting deviation caused by material deviation is prevented.

It may be understood that a top of the first fastener 320 protrudes out of an upper end face of the limiting plate 310, a bottom of the first avoidance groove 220 is provided with a second avoidance groove 230, and the second avoidance groove 230 is correspondingly matched with the first fastener 320. For example, as shown in FIGs. 1 to 2, in this embodiment, since the top of the first fastener 320 protrudes out of the upper end face of the limiting plate 310, in order to avoid interference, the second avoidance groove 230 adapted to the first fastener 320 is also arranged at the bottom of the first avoidance groove 220, so that the top of the first fastener 320 can be accommodated in the second avoidance groove 230 during the die closing process, thereby avoiding interference between the first fastener 320 and the upper pressure plate 200.

It may be understood that the bottom of the upper pressure plate 200 is provided with a plurality of punches 240, the punches 240 are positioned at two sides of the width direction of material feeding and configured to punch positioning holes at two sides of the materials, and the lower die holder 300 is provided with a plurality of first avoidance holes 330 corresponding to the punches 240. For example, as shown in FIGs. 1 to 2, in this embodiment, a plurality of punches 240 are arranged at the bottom of the upper pressure plate 200, the punches 240 are positioned at two sides of the width direction of material feeding to punch positioning holes at two sides of the materials, and the upper end face of the lower die holder 300 is provided with first avoidance holes 330 corresponding to the punches 240, so that after the punches 240 punch the positioning holes for the materials, the bottom ends of the punches 240 are prevented from interfering with the lower die holder 300, and the lower die holder 300 can avoid the punches 240 through the first avoidance holes 330.

It may be understood that the bottom of the upper pressure plate 200 is provided with a plurality of positioning pins 250, the positioning pins 250 are positioned at two sides of the width direction of material feeding and configured to position the materials, the lower die holder 300 is provided with a plurality of second avoidance holes 340 corresponding to the positioning pins 250, and the punches

240 and the positioning pins 250 are sequentially arranged along a feeding direction of the materials. For example, as shown in FIGs. 1 to 2, in this embodiment, the bottom of the upper pressure plate is provided with a plurality of positioning pins 250, the positioning pins 250 are positioned at two sides of the upper pressure plate 200, and the lower die holder 300 is provided with second avoidance holes 340 corresponding to the positioning pins 250, so that the positioning pins 250 pass through the positioning holes for the materials to position the materials, thereby improving the accuracy of die cutting. In addition, the second avoidance holes 340 avoids interference between the positioning pins 250 and the lower die holder 300, and the punches 240 and the positioning pins 250 are sequentially arranged along the feeding direction of the materials, so that after the punches 240 punch the positioning holes for the materials, the positioning pins 250 pass through the positioning holes to position the materials.

Specifically, an outer diameter of each of the positioning pins 250 gradually increases from bottom to top, so that the positioning pin 250 can correct the position of the materials in the process of passing downward through the positioning hole for the materials, ensuring the linearity of the material feeding, and improving the accuracy of the die cutting position.

It may be understood that the limiting plate 310 is provided with a plurality of third avoidance holes 311, and the plurality of third avoidance holes 311 separately correspond to the first avoidance hole 330 and the second avoidance holes 340. For example, as shown in FIGs. 1 to 2, in this embodiment, the limiting plate 310 is provided with a plurality of third avoidance holes 311, and the third avoidance holes 311 are divided into two types that respectively correspond to the first avoidance holes 330 and the second avoidance holes 340, so that after the punches 240 sequentially pass through the third avoidance holes 311 and the first avoidance holes 330 to punch the materials, the limiting plate 310 can limit the materials on the lower die holder 300, and the materials are prevented from being moved by the punches 240; and after the positioning pins 250 sequentially pass through the third avoidance holes 311 and the second avoidance holes 340, the limiting plate 310 can limit the materials on the lower die holder 300, and the materials are prevented from being moved by the positioning pins 250.

It may be understood that an elastic member 500 is connected between the upper die holder 100 and the upper pressure plate 200, so that the upper pressure plate 200 is elastically connected to the upper die holder 100. For example, as shown in FIG. 3, in this embodiment, the elastic member 500 is connected between the upper pressure plate 200 and the upper die holder 100, so that the upper pressure plate 200 is elastically connected to the bottom of the upper die holder 100, and the impact of the lower pressure plate on the materials can be reduced through the buffering action of the elastic member 500 during the process of pressing by the upper die holder 100.

It may be understood that a guide structure 600 is arranged at the bottom of the upper die holder 100 and on the lower die holder 300, and the upper pressure plate 200 is provided with a via hole, so that the upper die holder 100, the upper pressure plate 200 and the lower die holder 300 vertically correspond to each other when the die is closed. For example, as shown in FIG. 3, in this embodiment, the bottom of the upper die holder 100 and the upper end face of the lower die holder 300 are provided with the guide structure 600, and the upper pressure plate 200 is provided with the via hole, so that the upper die holder 100, the upper pressure plate 200 and the lower die holder 300 can vertically correspond to each other in the process that the upper die holder 100 drives the upper pressure plate 200 to perform downward die cutting.

Specifically, in this embodiment, the bottom of the upper die holder 100 is provided with a guide post 610, the lower die holder 300 is provided with a guide hole 620 corresponding to the guide post 610, the via hole corresponds to the guide post 610. In the process that the upper die holder 100 drives the upper pressure plate 200 to perform downward die closing, the guide post 610 passes through the via hole and is accommodated in the guide hole 620, so that the upper die holder 100, the lower die holder 300 and the upper pressure plate 200 can vertically correspond to each other, and the upper die holder 100 is prevented from deviating from the lower die holder 300 in the downward process.

It should be understood that, in other embodiments, the upper end face of the lower die holder 300 is provided with a guide post 610, the upper die holder 100 is provided with a guide hole 620 corresponding to the guide post 610, and the via hole corresponds to the guide post 610. Therefore, in the process that the upper die holder 100 drives the upper pressure plate 200 to move downward, the guide post 610 sequentially passes through the through hole and the guide hole 620, so that the linearity of the lower die holder 300, the upper pressure plate 200 and the upper die holder 100 in the vertical direction can be ensured.

The embodiments of the present application have been described in detail with reference to the accompanying drawings, however, the present application is not limited to the foregoing embodiments. Various changes can be made within the knowledge of those of ordinary skill in the art without departing from the gist of the present application. In addition, the embodiments and features in the embodiments of the present application can be combined with each other without conflict.

CLAIMS

1. A die frame, comprising:

an upper die holder;

an upper pressure plate connected to a bottom of the upper die holder, wherein a lower end face
5 of the upper pressure plate is configured to mount an etching die; and

a lower die holder correspondingly arranged below the upper pressure plate and configured to
bear materials;

wherein the lower end face of the upper pressure plate or an upper end face of the lower die
holder is provided with a boss, and a thickness of the boss is greater than a thickness of the etching
10 die, so that an uncut height is reserved between the etching die and the lower die holder during die
closing, and the uncut height is equal to a thickness difference between the boss and the etching die.

2. The die frame according to claim 1, wherein the lower die holder is provided with limiting
plates at two sides along a width direction of material feeding, a feeding position is formed between
a bottom of each of the limiting plates and the upper end face of the lower die holder to limit the
15 materials at the feeding position, a bottom of the upper pressure plate is provided with first avoidance
grooves each corresponding to a respective one of the limiting plates.

3. The die frame according to claim 2, wherein a bottom of each of the limiting plates at two
sides is provided with a limiting step to limit a width direction of the materials.

4. The die frame according to claim 2, further comprising a first fastener, wherein the lower die
20 holder is provided with a threaded hole, the limiting plate is provided with a through hole
corresponding to the threaded hole, and the first fastener is threadedly connected to the lower die
holder through the through hole and the threaded hole and configured to limit a width direction of the
materials.

5. The die frame according to claim 4, wherein a top of the first fastener protrudes out of an
25 upper end face of the limiting plate, a bottom of the first avoidance groove is provided with a second
avoidance groove, and the second avoidance groove is correspondingly matched with the first fastener.

6. The die frame according to claim 2, wherein the bottom of the upper pressure plate is
provided with a plurality of punches, the punches are positioned at two sides of the width direction
of material feeding and configured to punch positioning holes at two sides of the materials, and the
30 lower die holder is provided with a plurality of first avoidance holes corresponding to the punches.

7. The die frame according to claim 6, wherein the bottom of the upper pressure plate is
provided with a plurality of positioning pins, the positioning pins are positioned at two sides of the
width direction of material feeding and configured to position the materials, the lower die holder is

provided with a plurality of second avoidance holes corresponding to the positioning pins, and the punches and the positioning pins are sequentially arranged along a feeding direction of the materials.

8. The die frame according to claim 7, wherein the limiting plate is provided with a plurality of third avoidance holes, and the plurality of third avoidance holes separately correspond to the first
5 avoidance holes and the second avoidance holes.

9. The die frame according to claim 1, wherein an elastic member is connected between the upper die holder and the upper pressure plate, so that the upper pressure plate is elastically connected to the upper die holder.

10. The die frame according to claim 9, wherein a guide structure is arranged at the bottom of
10 the upper die holder and on the lower die holder, and the upper pressure plate is provided with a via hole, so that the upper die holder, the upper pressure plate and the lower die holder vertically correspond to each other during die closing.