(19) Europäisches Patentamt
European Patent Office
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(11) **EP 3 702 503 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
02.09.2020 Bulletin 2020/36

(51) Int Cl.:
D04B 15/90 *(2006.01)*

(21) Application number: **19159742.6**

(22) Date of filing: **27.02.2019**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

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(54) **FLAT KNITTING MACHINE STITCH PRESSING DEVICE WITH POSITION VARYING WITH GAP SIZE**

(57) A flat knitting machine mangling device (40) with position varying with gap (10) size is provided. The flat knitting machine mangling device (40) includes a driving element (41), a fixing base (42) disposed on a cam supporting base (137), a sliding base (43) disposed to correspond to the fixing base (42), a limiting block (44) combined with the fixing base (42) and limiting the sliding base (43) to only slide relative to the cam supporting base (137), a mangling sheet supporting arm (45) and a mangling sheet (46) disposed on the mangling sheet supporting arm (45). The driving element (41) is started when a knock-over bit cam (132) makes a displacement stroke (133). The sliding base (43) is provided with a guide block (432) and makes a regulation stroke (431) relative to the cam supporting base (137) when the driving element (41) is started. The guide block (432) drives the mangling sheet (46) to move to change a mangling position when the sliding base (43) makes the regulation stroke (431).

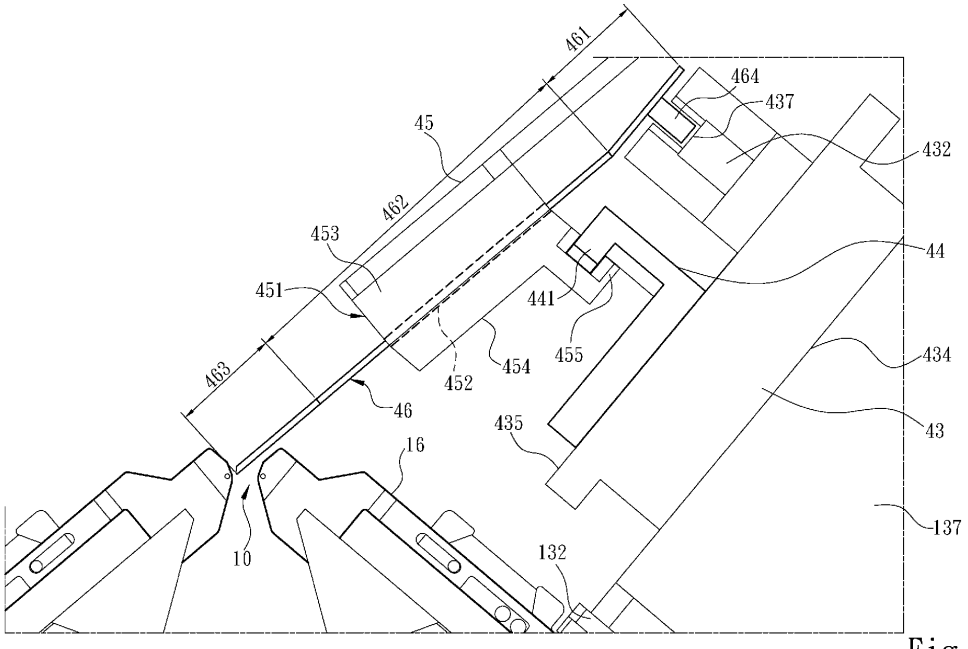

Fig. 4

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a flat knitting machine mangling device, and particularly relates to a flat knitting machine mangling device with position varying with gap size.

BACKGROUND OF THE INVENTION

[0002] The mangling position cannot be changed after a mangling device of the current flat knitting machine is set. Thus, the mangling device has the problem of not being able to press the cloth if the gap size is changed in the knitting process of the flat knitting machine.

SUMMARY OF THE INVENTION

[0003] The main purpose of the present invention is to solve the problem derived from gap size change of the flat knitting machine in the mangling device.

[0004] It is an object of the present invention to provide a flat knitting machine mangling device this is suited to overcome the afore-mentioned drawbacks.

[0005] This problem is solved by a flat knitting machine mangling device as claimed by claim 1. Further advantageous embodiments are the subject-matter of the dependent claims.

[0006] The flat knitting machine mangling device of the present invention is configured to change the mangling position when a gap size of the flat knitting machine structure is changed.

[0007] According to the present invention there is provided a flat knitting machine mangling device with position varying with gap size. The flat knitting machine mangling device includes a driving element, a fixing (fixed) base disposed on a cam supporting base, a sliding base disposed correspondingly to the fixing base, a limiting block combined with the fixing base and limiting the sliding base to only slide relative to the cam supporting base, a mangling sheet supporting arm and a mangling sheet. The driving element is started when a knock-over bit cam makes a displacement stroke. The sliding base is disposed to correspond to the fixing base, is provided with a guide block and makes a regulation stroke relative to the cam supporting base when the driving element moves. One end of the mangling sheet supporting arm is fixed to a yarn feeder guide rod and the other end is provided with an installing base. A passage is formed in the installing base. The mangling sheet includes a control section connected with the guide block, a connection section extending from the control section and penetrating through the passage, and a mangling section extending from the connection section and facing a needle bed, wherein the control section leads the mangling section to move when the sliding base makes the regulation stroke, so as to change a mangling position.

[0008] In an embodiment, the driving element comprises a combining part connected with the knock-over bit cam and a pushing part connected with the combining part; the driving element makes a driving stroke for allowing the pushing part to move when the knock-over bit cam makes the displacement stroke; one side of the sliding base is provided with an inclined guide path in which the pushing part is disposed; and the sliding base makes the regulation stroke relative to the cam supporting base when the driving element makes the driving stroke.

[0009] In an embodiment, the driving element is composed of a motor and a gear connected with the motor; and one side of the sliding base is provided with a rack that comes into contact with the gear.

[0010] In an embodiment, the limiting block comprises a first hook part that protrudes towards the mangling sheet supporting arm; and the mangling sheet supporting arm comprises a second hook part disposed on the installing base, protruding towards the limiting block and combined with the first hook part.

[0011] In an embodiment, the sliding base comprises a first long hole in which the fixing base is disposed.

[0012] In an embodiment, the mangling sheet comprises a second long hole disposed on the connection section; and the installing base comprises at least one installing hole communicated with the passage and providing an installing element corresponding to the second long hole to limit the mangling sheet.

[0013] In an embodiment, the mangling sheet comprises a guide rod disposed on the control section; and the guide block is provided with a groove in which the guide rod is disposed.

[0014] In an embodiment, the sliding base comprises a first surface that faces the cam supporting base, and a second surface that faces the limiting block; and the inclined guide path extends from the first surface to the second surface toward the knock-over bit cam.

[0015] As previously disclosed in the present invention, compared with the prior art, the present invention comprises the following characteristics: the flat knitting machine mangling device of the present invention can change the mangling position when a gap size of the flat knitting machine structure is changed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

Fig. 1 is a structural schematic diagram of a flat knitting machine in an embodiment of the present invention;

Fig. 2 is a structural schematic diagram (I) of a flat knitting machine mangling device with a small gap size in an embodiment of the present invention;

Fig. 3 is a structural schematic diagram (I) of a flat knitting machine mangling device with a large gap size in an embodiment of the present invention;

Fig. 4 is a structural schematic diagram (II) of a flat

knitting machine mangling device with a small gap size in an embodiment of the present invention;
Fig. 5 is a structural schematic diagram (II) of a flat knitting machine mangling device with a large gap size in an embodiment of the present invention;
Fig. 6 is a structural schematic diagram of a flat knitting machine mangling device with a small gap size in another embodiment of the present invention; and
Fig. 7 is a structural schematic diagram of a flat knitting machine mangling device with a large gap size in another embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0017] The details and technical contents of the present invention will be described below with reference to drawings.

[0018] By referring to Figs. 1, 2, 3, 4, and 5, the present invention provides a flat knitting machine mangling device 40 with position varying with gap size. A gap 10 of the present invention is defined by a plurality of knock-over bits 16 that face each other in two needle beds 11 and 12 disposed in a flat knitting machine 100. The plurality of knock-over bits 16 are respectively driven by a knock-over bit cam 132 to move, so as to change the size of the gap 10.

[0019] Based on this, a plurality of flat knitting machine mangling devices 40 are configured on the flat knitting machine 100 structure. Each of the plurality of flat knitting machine mangling devices 40 is respectively disposed on a cam supporting base 137 included in one cam system 13. Each of the plurality of flat knitting machine mangling devices 40 includes a driving element 41, a fixing base 42 disposed on the cam supporting base 137, a sliding base 43 disposed correspondingly to the fixing base42, a limiting block 44 combined with the fixing base 42 and limiting the sliding base 43 to only slide relative to the cam supporting base 137, a mangling sheet supporting arm 45 and a mangling sheet 46 disposed on the mangling sheet supporting arm 45 and driven by the sliding base 43.

[0020] The driving element 41 is started when the knock-over bit cam 132 makes a displacement stroke 133. Namely, the driving element 41 is started based on whether the knock-over bit cam 132 makes the displacement stroke 133. Therefore, if the knock-over bit cam 132 moves, the driving element 41 also moves.

[0021] Moreover, the sliding base 43 is disposed to correspond to the fixing base 42, and also makes a regulation stroke 431 relative to the cam supporting base 137 when the driving element 41 moves. Meanwhile, the sliding base 43 is provided with a guide block 432.

[0022] Based on this, when the driving element 41 is started, the sliding base 43 needs to move simultaneously. The displacement made by the sliding base 43 is the regulation stroke 431 herein. Furthermore, the sliding base 43 may be a U-shaped structure, and is disposed on the cam supporting base 137 in an inverted U manner. The fixing base 42 can be disposed at a recess of the U-shaped structure. Moreover, the sliding base 43 may have a first long hole 436 in which the fixing base 42 is disposed. The first long hole 436 is not the recess of the U-shaped structure, but is a hole disposed to corresponding to the recess. The size of the first long hole 436 is set to at least provide an extent to which the sliding base 43 makes the regulation stroke 431.

[0023] Accordingly, the height of the fixing base 42 is the same as the height of the sliding base 43, so that the limiting block 44 is able to limit the sliding base 43 more specifically. Moreover, one end of the mangling sheet supporting arm 45 is fixed to the yarn feeder guide rod 30 and the other end is provided with an installing base 451; and a passage 452 is formed in the installing base 451. Specifically, the installing base 451 may be composed of a first component 453 and a second component 454 combined with the first component 453 and jointly defining the passage 452. Furthermore, the mangling sheet 46 includes a control section 461 connected with the guide block 432, a connection section 462 extending from the control section 461 and penetrating through the passage 452, and a mangling section 463 extending from the connection section 462 and facing one of the needle bed 11 (or 12). The control section 461 and the guide block 432 form a linkage relationship. The control section 461 leads the mangling section 463 to move when the sliding base 43 makes the regulation stroke 431, so as to change a mangling position. In an embodiment, the mangling sheet 46 comprises a guide rod 464 disposed on the control section 461. The guide block 432 is provided with a groove 437 in which the guide rod 464 is disposed. The form of the groove 437 conforms to the guide rod 464. The groove 437 can be implemented in a form of a rail. Moreover, the width of the connection section 462 corresponds to the width of the passage 452, so that the connection section 462 can slide in the passage 452. The mangling section 463 generates a working surface for mangling the cloth through obvious size change related to the connection section 462.

[0024] Referring to Figs. 2, 3, 4, and. 5, based on the above description, the flat knitting machine mangling device 40 and the knock-over bit cam 132 move simultaneously since the time point when the flat knitting machine mangling device 40 changes the mangling position is the time when the gap 10 is changed. Therefore, when the driving element 41 is started when the knock-over bit cam 132 is controlled to move, the driving element 41 leads the sliding base 43 to make the regulation stroke 431. Next, the guide block 432 moves because the sliding base 43 moves. The control section 461 is driven by the guide block 432 to make the connection section 462 slides in the passage 452, so as to change the position of the mangling section 463 in the gap 10.

[0025] Referring to Figs. 2, 3, 4, and 5, in an embodiment, the driving element 41 comprises a combining part 411 connected with the knock-over bit cam 132 and a

pushing part 412 connected with the combining part 411, wherein the pushing part 412 only makes one-dimensional motion. The driving element 41 makes a driving stroke 413 for allowing the pushing part 412 to move when the knock-over bit cam 132 makes the displacement stroke 133. Moreover, the driving element 41 in the present embodiment may be formed in one-piece or formed by assembling a plurality of members. If the driving element 41 is formed by assembling the plurality of members, the combining part 411 and the pushing part 412 may be respectively different members. Moreover, the driving element 41 may have a push rod 414 disposed on the pushing part 412. In another aspect, the sliding base 43 comprises an inclined guide path 433 which is positioned at one side of the sliding base 43 and in which the pushing part 412 is disposed. Furthermore, the sliding base 43 comprises a first surface 434 that faces the cam supporting base 137, and a second surface 435 that faces the limiting block 44. The inclined guide path 433 is disposed at one side of the sliding base 43 adjacent to the driving element 41. Moreover, the inclined guide path 433 extends from the first surface 434 to the second surface 435 toward the knock-over bit cam 132. The inclined guide path 433 has the push rod 414 disposed therein, and the width of the inclined guide path 433 can correspond to the width of the push rod 414, so that the pushing part 412 can push the sliding base 43 specifically.

[0026] Referring to Fig. 6 and Fig. 7, in another embodiment, the driving element 41 is composed of a motor 415 and a gear 416 connected with the motor 415. One side of the sliding base 43 is provided with a rack 438 that comes into contact with the gear 416. The motor 415 is connected with a control device (not shown in the figure). The control device controls the motor 415, and also controls a displacement mechanism used to drive the knock-over bit cam 132. When the control unit sends a working signal to the displacement mechanism, the control unit also sends a starting signal to the motor 415 to start the motor 415 and rotate the gear 416. The gear 416 pushes the rack 438 while rotating, so that the sliding base 43 makes the regulation stroke 431.

[0027] Referring to Figs. 2, 3, 4, and 5, in an embodiment, the limiting block 44 comprises a first hook part 441 that protrudes towards the mangling sheet supporting arm 45 in order to enhance structural stability of the flat knitting machine mangling device 40. The mangling sheet supporting arm 45 comprises a second hook part 455 disposed on the installing base 451, protruding towards the limiting block 44 and combined with the first hook part 441. Further, open directions of the first hook part 441 and the second hook part 455 are opposite.

[0028] Referring to Fig. 2 and Fig. 3, in an embodiment, the mangling sheet 46 comprises a second long hole 465 disposed on the connection section 462; and the installing base 451 comprises at least one installing hole 456 communicated with the passage 452 and providing an installing element 47 corresponding to the second long hole 465 to limit the mangling sheet 46. In this way, the mangling sheet 46 is prevented from separating from the passage 452 abnormally.

Claims

1. A flat knitting machine mangling device (40) with position varying with gap (10) size, comprising:

   a driving element (41) started when a knock-over bit cam (132) makes a displacement stroke (133);
   a fixing base (42) disposed on a cam supporting base (137);
   a sliding base (43) disposed correspondingly to the fixing base (42) and provided with a guide block (432), the sliding base (43) making a regulation stroke (431) relative to the cam supporting base (137) when the driving element (41) is started;
   a limiting block (44) combined with the fixing base (42) and limiting the sliding base (43) to only slide relative to the cam supporting base (137);
   a mangling sheet supporting arm (45) fixed to a yarn feeder guide rod (30) with one end of the mangling sheet supporting arm (45) and provided with an installing base (451) on the other end of the mangling sheet supporting arm (45), wherein a passage (452) is formed in the installing base (451); and
   a mangling sheet (46) comprising a control section (461) connected with the guide block (432), a connection section (462) extending from the control section (461) and penetrating through the passage (452), and a mangling section (463) extending from the connection section (462) and facing a needle bed, wherein the control section (461) leads the mangling section (463) to move when the sliding base (43) makes the regulation stroke (431), so as to change a mangling position.

2. The flat knitting machine mangling device (40) of claim 1, wherein
   the driving element (41) comprises a combining part (411) connected with the knock-over bit cam (132) and a pushing part (412) connected with the combining part (411);
   the driving element (41) makes a driving stroke (413) for allowing the pushing part (412) to move when the knock-over bit cam (132) makes the displacement stroke (133);
   one side of the sliding base (43) is provided with an inclined guide path (433) in which the pushing part (412) is disposed; and
   the sliding base (43) makes the regulation stroke (431) relative to the cam supporting base (137) when

the driving element (41) makes the driving stroke (413).

3. The flat knitting machine mangling device (40) of claim 1, wherein
the driving element (41) is composed of a motor (415) and a gear (416) connected with the motor (415); and one side of the sliding base (43) is provided with a rack (438) that comes into contact with the gear.

4. The flat knitting machine mangling device (40) of any of the preceding claims, wherein
the limiting block (44) comprises a first hook part (441) that protrudes towards the mangling sheet supporting arm (45); and
the mangling sheet supporting arm (45) comprises a second hook part (455) disposed on the installing base (451), protruding towards the limiting block (44) and combined with the first hook part (441).

5. The flat knitting machine mangling device (40) of claims 1 to 3, wherein the sliding base (43) comprises a first long hole (436) in which the fixing base (42) is disposed.

6. The flat knitting machine mangling device (40) of claim 5, wherein the mangling sheet (46) comprises a second long hole (465) disposed on the connection section (462); and the installing base (451) comprises at least one installing hole (456) communicated with the passage (452) and providing an installing element (47) corresponding to the second long hole (465) to limit the mangling sheet (46).

7. The flat knitting machine mangling device (40) of claim 6, wherein the mangling sheet (46) comprises a guide rod (464) disposed on the control section (461); and the guide block (432) is provided with a groove (437) in which the guide rod (464) is disposed.

8. The flat knitting machine mangling device (40) of any of claims 1 to 3, wherein the mangling sheet (46) comprises a second long hole (465) disposed on the connection section (462); and the installing base (451) comprises at least one installing hole (456) communicated with the passage (452) and providing an installing element (47) corresponding to the second long hole (465) to limit the mangling sheet (46).

9. The flat knitting machine mangling device (40) of any of claims 1 to 3, wherein the mangling sheet (46) comprises a guide rod (464) disposed on the control section (461); and the guide block (432) is provided with a groove (437) in which the guide rod (464) is disposed.

10. The flat knitting machine mangling device (40) of claim 2, wherein the sliding base (43) comprises a first surface (434) that faces the cam supporting base (137), and a second surface (435) that faces the limiting block (44); and the inclined guide path (433) extends from the first surface (434) to the second surface (435) toward the knock-over bit cam (132).

11. The flat knitting machine mangling device (40) of claim 10, wherein the mangling sheet (46) comprises a guide rod (464) disposed on the control section (461); and the guide block (432) is provided with a groove (437) in which the guide rod (464) is disposed.

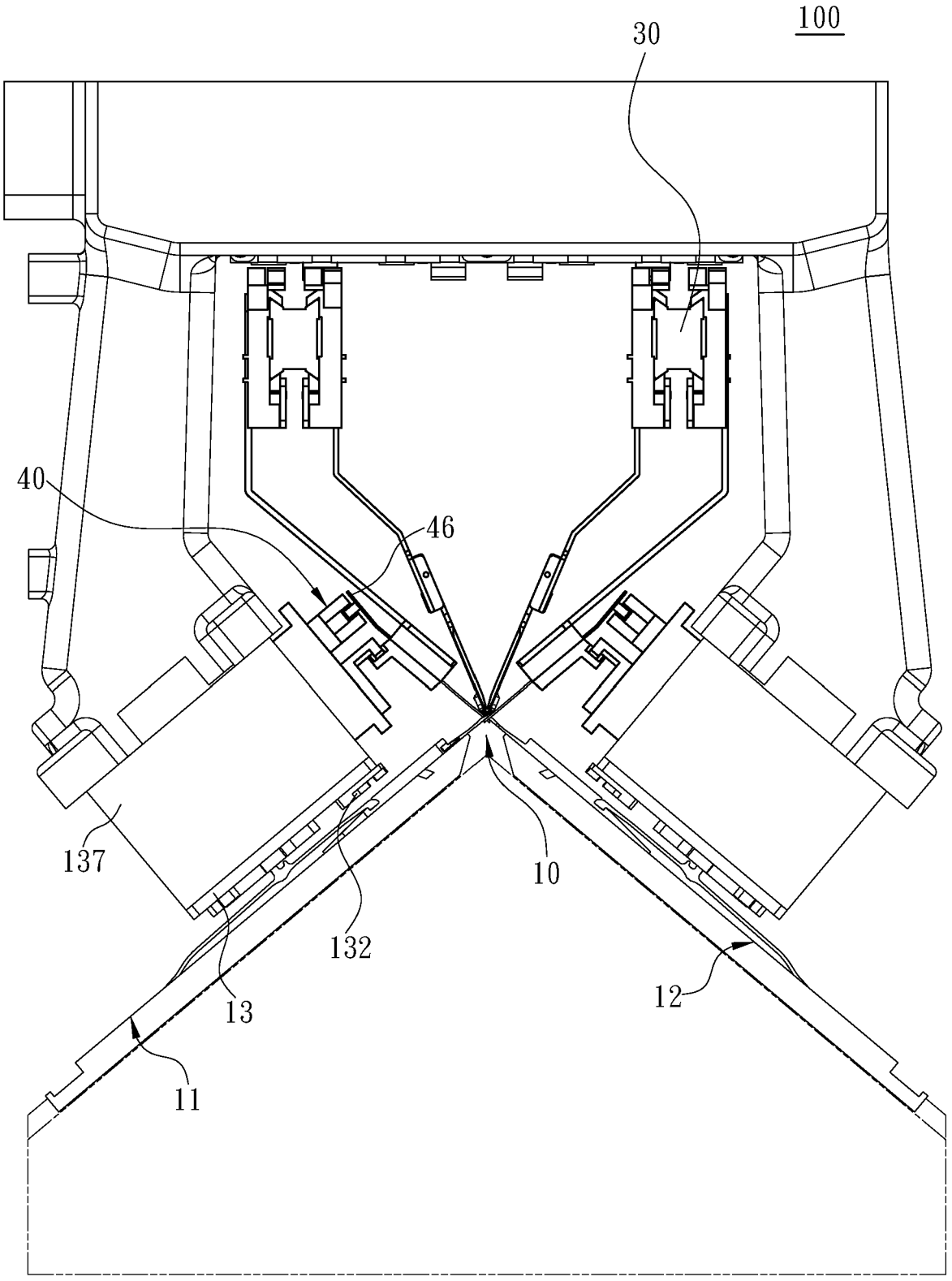

Fig. 1

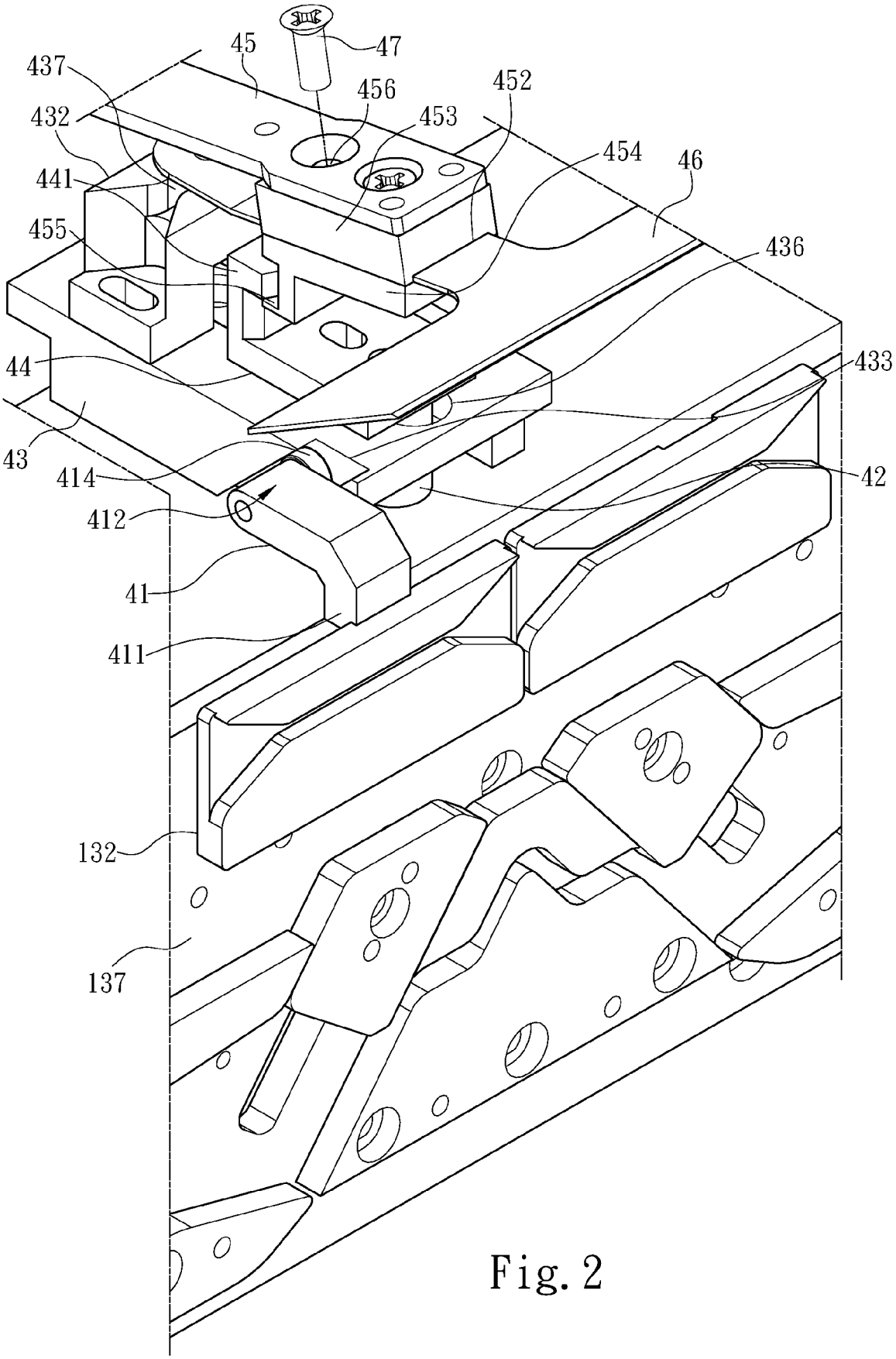
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Fig. 2

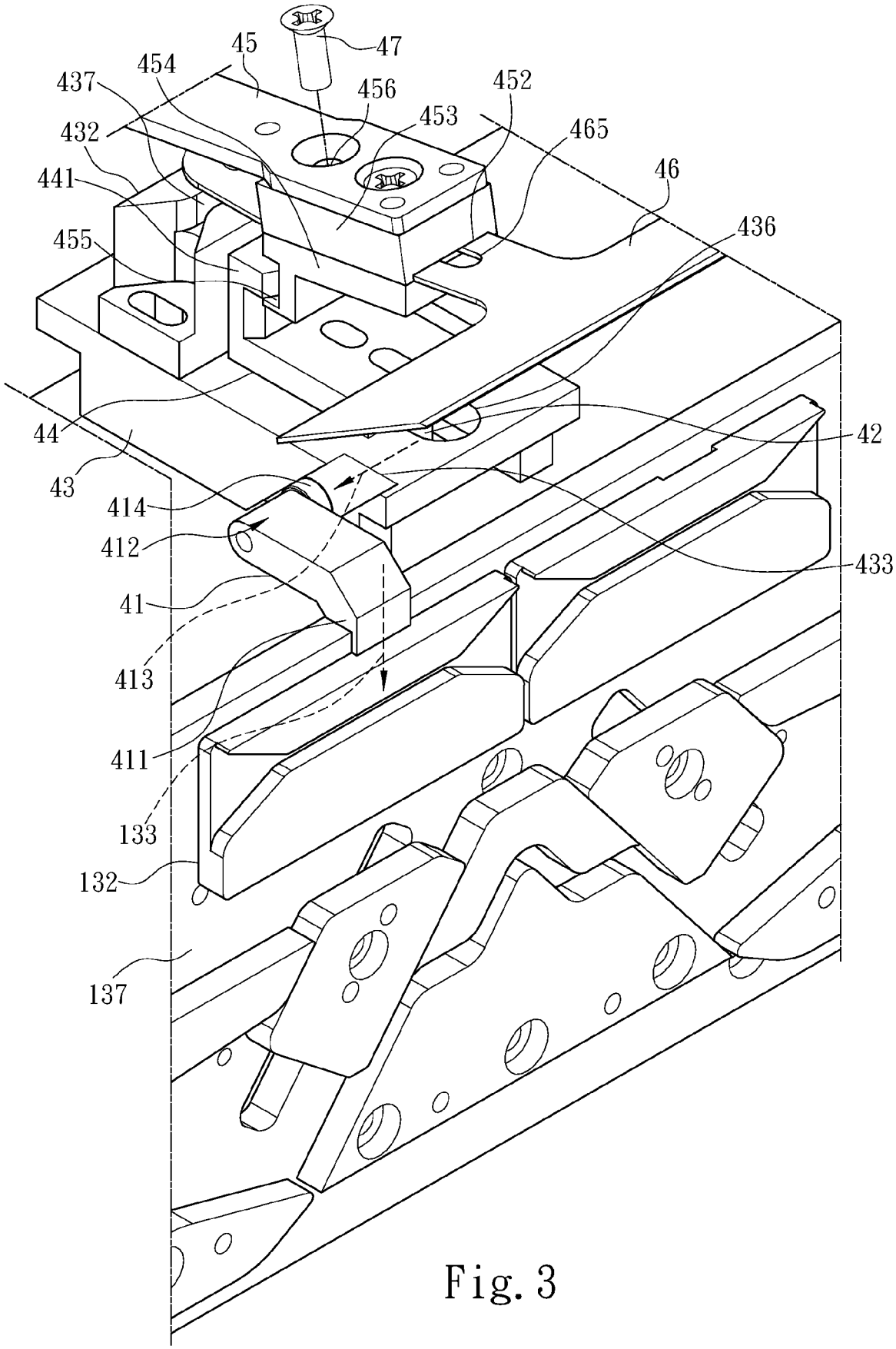
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Fig. 3

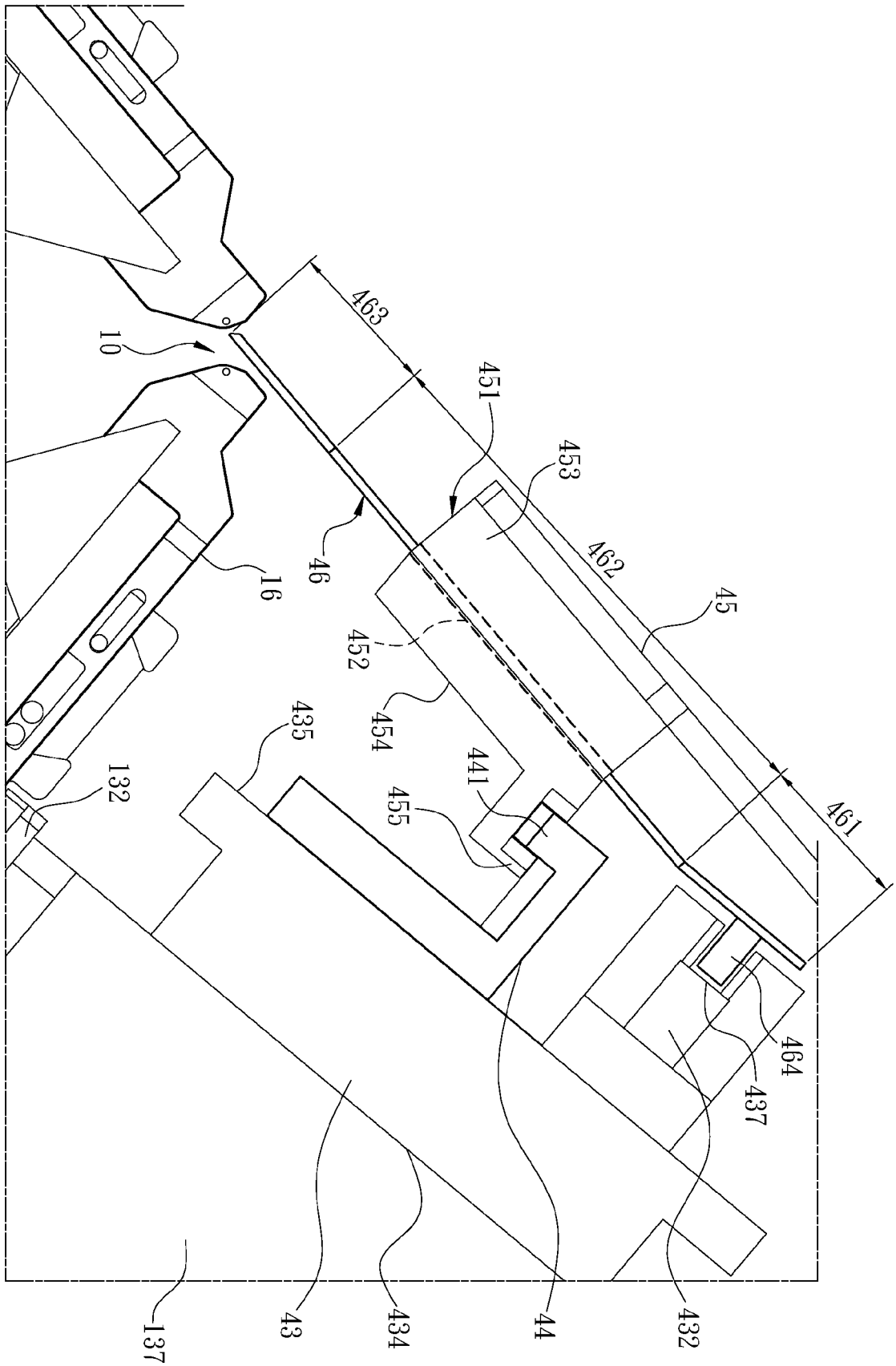
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Fig. 4

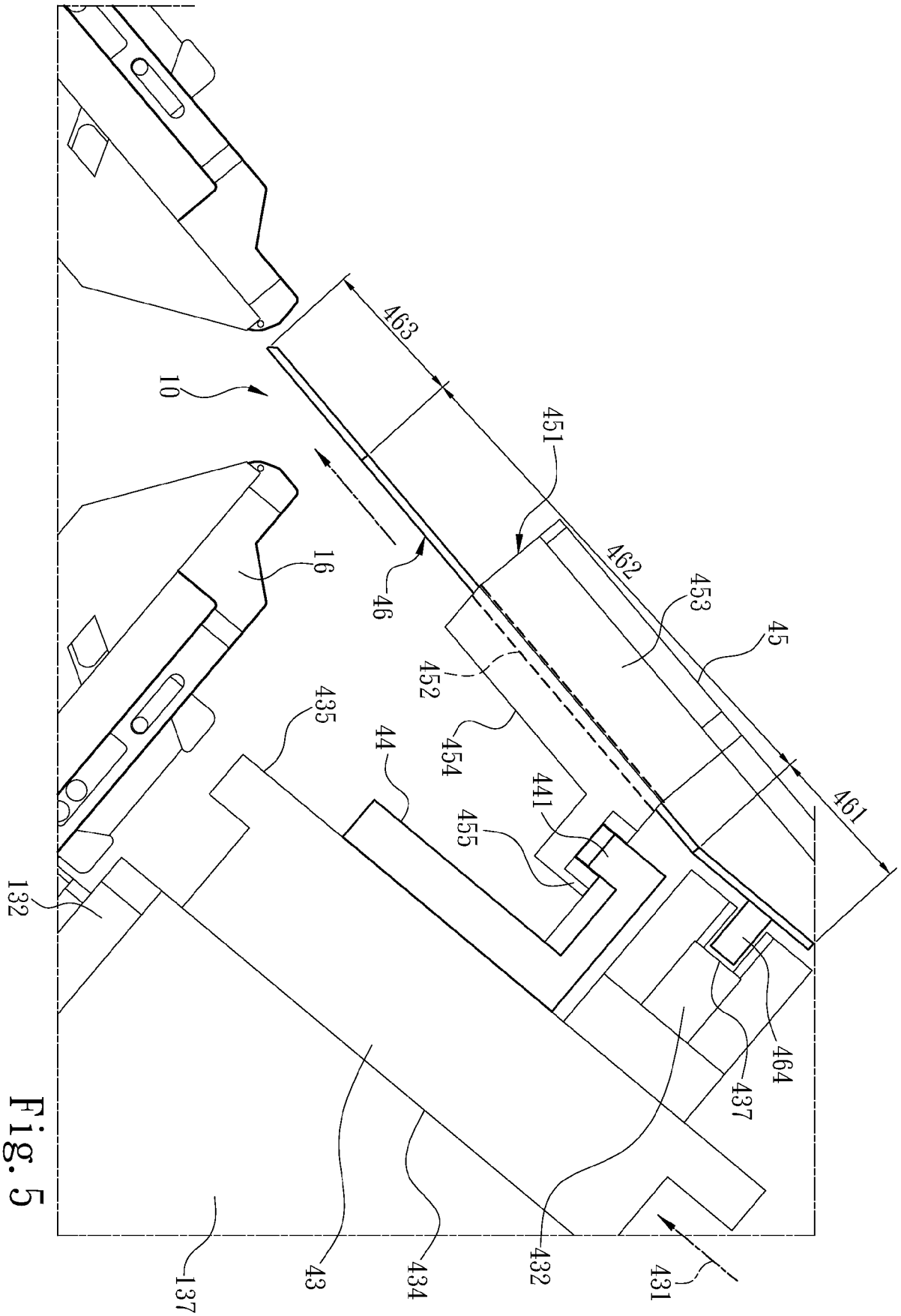
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Fig. 5

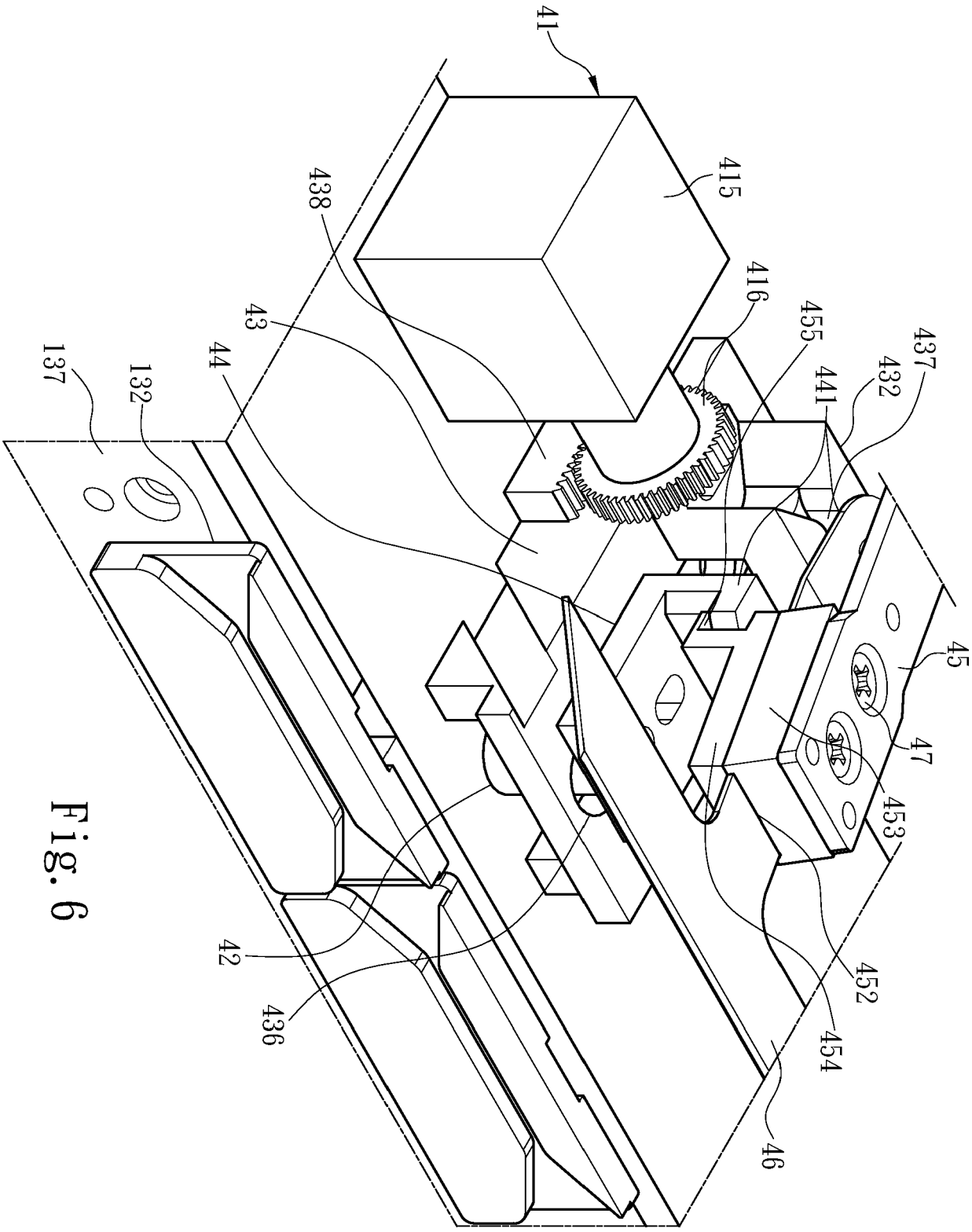
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Fig. 6

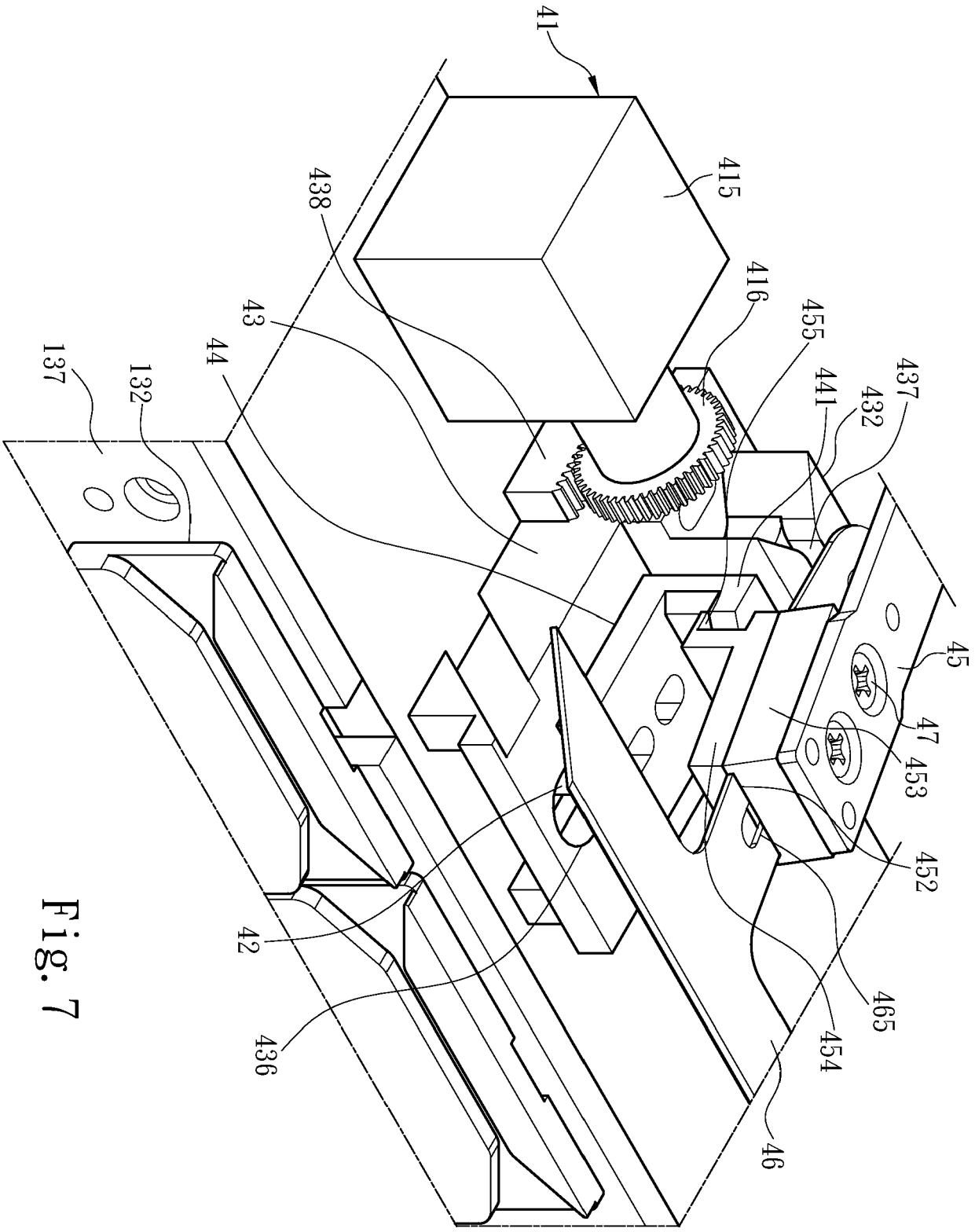
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Fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 19 15 9742

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
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CATEGORY OF CITED DOCUMENTS

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