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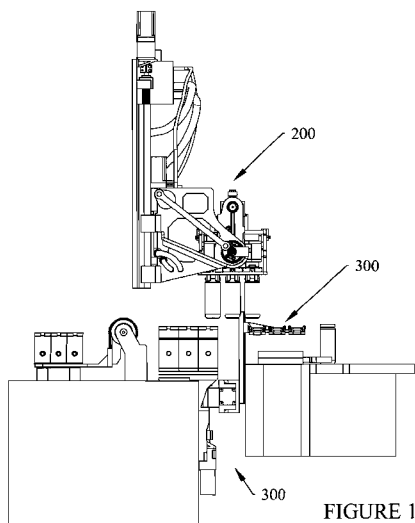


FIGURE 10

(57) Abstract: At I.S. (Individual Section) machines which are used to manufacture glass containers the combined blow-take out mechanism (200) converts the parison (2) to the final product (3). During that process, the parison (2) is blown and the finish part (4) is cooled. Then, the final product (3) is transferred from the blow side (12) over the dead plate (16). The final product (3) which is transferred over the dead plate (16) is kept over the dead plate (16) with a certain time by the new take out mechanism (300) until it gets cool enough. Then, it is left onto the dead plate (16). Also, the up-down movement mechanism (320) which is optionally added to the new take out mechanism, leaves the final product (3) onto the dead plate (16) from a shorter distance.



## DESCRIPTION

**COMBINING BLOW HEAD MECHANISM AND TAKE OUT MECHANISM AND ADDING A NEW  
TAKE OUT MECHANISM FOR I.S. MACHINES**5 **Field of the invention**

At the typical I.S. (Individual Section) machines which are manufacture glass containers, the blow head mechanism (14) converts the parison (2) to the final product (3) with blowing and the take out mechanism (15) transfers the final product (3) from the blow side (12) over to the dead  
10 plate (16).

With this invention, the blow head mechanism (14) and the take out mechanism (15) are combined and called as combined blow take out mechanism (200). In addition to that, a new take out mechanism is integrated to the I.S. machines called as new take out mechanism (300) that keeps the final product (3) over the dead plate (16) for a while and leaves onto the dead  
15 plate (16).

**Background of the invention**

The molten glass in the glass melting furnace passing through the forehearth channel comes  
20 into the feeder mechanism. Conditioned glass is cut with a desired weight and turned into a gob form. Gobs (1) are delivered to blank moulds (8) with a certain height by the help of scope, through and deflector. (Nowadays, in which the forming section of I.S. machines generally consist of 6-8-10 or 12 sections side by side) In the blank side (11), the gob (1) to be formed into a parison (2) via the plunger mechanism (13), the baffle mechanism and the funnel mechanism.  
25 The parison (2) at blank side (11) is transferred by the neck-ring mechanism (6) from the blank side to the blow side (12). At the blow side (12), the parison (2) is blown into the blow mould (7) by the blow head mechanism (14). Meanwhile, the finish part (4) of the final product (3) is cooled by the blow head mechanism (14). The final product (3) is taken from the blow side (12) and transferred over the dead plate (16) by the take out mechanism (15). The final product (3) is  
30 kept over the dead plate (16) with a certain time and at a certain height by the take out mechanism (15) to cool down and leave onto the dead plate (16). The final product (3) is transferred from the dead plate (16) with a 90 degree movement to the conveyor (18) by the pusher mechanism (17). The final product (3) is sent to the annealing lehr by the conveyor (18).

There are six companies on the world are manufacturing I.S. machines, two in Germany, two in  
35 Italy, one in Switzerland and one in Czech Republic. In addition to these countries, there are

companies producing I.S. machines in India, China and Mexico. But, these companies manufacture their machines with the main suppliers' licenses.

**Technological problems that the invention aims to solve**

5

At the typical I.S. machines, the parison (2) blown and the finish part (4) of parison (2) is cooled by the blow head mechanism (14). The final product (3) is transferred from the blow side (12) over to the dead plate (16) then left onto the dead plate (16) by the take-out mechanism (15).

10 With this invention, the blow head mechanism (14) and the take out mechanism (15) are combined called as combined blow-take out mechanism (200). Also, a new mechanism is added to the section box called as new take out mechanism (300).

In the typical application, the blow head mechanism (14) and the take out mechanism (15) are mounted on the front part of the section box (10) independently. With this invention, the combined blow-take out mechanism (200) will be mounted over the section box (10) and the  
15 new take out mechanism (300) is mounted on front side of the section box (10) instead of typical blow head mechanism (14) and take out mechanism (15).

Improvements achieved by the combination of the blow head mechanism and the take out mechanism are as followed,

20 **1. More compact structure will be provided.** Thanks to the empty volume in that compact structure;

**1.1.** The machine operator will be able to change blow moulds (7) easily.

**1.2.** In case of any failure or emergency, in front of the section box and blow side (12) will be able to reached easily.

25 **1.3.** Opening distance of the blow mould (7) will be able to increased. Opening distance of the blow mould (7) for the typical I.S. machines are limited by the installation parts of the blow head mechanism (14) and the take out mechanism (15).

**2. Better bearing of the mechanisms will be provided.** The mechanisms will be able to beared as both sided. For these;

30 **2.1.** It will be able to provided more sensitive and in a more centered running. In the typical machines the blow head mechanism (14) and the take out mechanism (15) are beared as single sided. According to the both sided bearing construction, the defects such as, cracks and verticality will be able to reduced.

35 **2.2.** It will be able to reach to a higher cycle speed. Thanks to the mechanism with both sided bearing, the system will run more stably and more rigidly when it runs with a higher running speed.

2.3. It will be able to provide a lower maintenance cost and a lower downtime. Thanks to the both sided bearing, the vibrations and wearing problems will be able to decreased. So, the machine parts' life time will be extended. Also, the impact defect between the blow head and the take out mechanism will be prevented. According to failure, the  
5 downtime will be decreased.

3. **Combined blow and take out head (240) will be able to driven with both sided.** When the cycle speed increase, the system will adapt more easily.
4. **Combined blow-take out head (240), side arms (230) and up-down movable body (220) will be able to positioned to the park position (500) all together.** This function will be  
10 provided by the help of a servo motor (213), a ball screw (214), a nut of ball screw (215) and rails (212). In this way, the system will be able to positioned to the park position (500) all together in case of any emergancy or failure time. Thanks to the empty volume on the section box (10), it can be interfere to the machine more easily.
5. **The height adjustment as known as "invert setting" will be able to applied easily.** Job  
15 change time will be decreased by the height adjustment of the combined blow-take out mechanism (200).
6. **Centering of the combined blow-take out head (240) by the help of centered pins (226,227,228,229) will be able to positioned more sensitively.** In that case, the combined blow-take out head (240) wherein is positioned over the blow mould (7) will be centered by  
20 centered pins (226,227,228,229) with their inside movements sensitively. Also, during the blowing and take out process the combined blow-take out head (240) will not be effected from vibrations, etc.
7. **Process will be improved.** At the typical I.S. machines, the take out mechanism (15) has to wait to complete the function of the blow head mechanism (14). But, with the combined  
25 blow-take out mechanism (200), the working time that is spent to take the final product from the blow side (12) will be decreased. As a result of that time saving, the improvements will be provided as below;

- 7.1. The quality at glass container will be increased.
- Reheat process time will be able to increased,
  - 30 - Blowing process will be applied earlier or sooner,
  - Taking time of the final product (3) from the inside of the blow mould (7) will be able to extended. For that, waiting time of the product inside the blow mould (7) will be able to increased. So, such product defaults as ovality, linearity, abnormal shape will be able to decreased.

7.2. The cycle speed of the production will be able to increased. Also, with this improvement, the process will be run in a hotter way. The quality of the product will be able to improved indirectly.

7.3. The production process will be able to flexible. If the saving time is not used to increase the cycle speed. It can be used in those cases; the on time and off time of the final blow and finish cooling process. Also, the saving time will be used to take and to leave the final product in a flexible way by take out tongs (252).

Improvements achieved by the new take out mechanism (300) are as followed;

- 10 **1. The cycle speed will be increased.** As soon as the final product (3) is transferred over the dead plate (16) by the combined blow-take out mechanism (200), the new take out mechanism (300) will take the final product (3) immediately with gripper claws (363) from the combined blow take out mechanism (200). Then, the combined blow take out mechanism (200) returns to the blow side (12) to start a new cycle.
- 15 **2. According to the catalogues at typical I.S. machines, the minimum length of the producible product will be decreased.** With the design of the special gripper (362) and the up-down movement mechanism (320), the minimum lenght of the producible product will be shortened.
- 20 **3. When working with different products with different length on different sections, the running conditions will be more efficient.** At the typical machines, products with similar weight are working with the same time. Since some defaults may occur, this defaults are eliminated by the new take out mechanism (300). At typical machines, the machine conveyor is adjusted according to the highest product length, so the shortest product is fallen onto the dead plate (16) with a higher distance. As a result of that, cracks, balance  
25 problems etc. may occur. With this invention, the up-down movement mechanism (320) will solve that defaults optionally with its vertical movement.
- 4. The running conditions will run more efficiently with the products with complex shape and balance difficulties.** The complex shape products and sensitive products will be left onto the dead plate (16) softly by the up-down movement mechanism (320).
- 30 **5. To make the invert setting will be easier.** Thanks to the up-down movement mechanism (320), height setting called as invert setting will be applied quickly and simply. So, the job change time will be decreased.

**Description of the drawings**

- Figure 1: Transforming the forms of the molten glass from the gob form to the final product
- Figure 2: Front view of the section box for typical I.S. machines
- 5 Figure 3: Side view of the section box for typical I.S. machines
- Figure 4: Up view of the section box for typical I.S. machines
- Figure 5: 3-Dimensional view of the section box for typical I.S. machines at the time of final blow process with the blow head mechanism
- Figure 6: 3-Dimensional view of section box for typical I.S. machines at the time of taking the
- 10 final product from the blow side with the take out mechanism
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- Figure 8: 3-Dimensional view of the take out mechanism for typical I.S. machines
- Figure 9: 3-Dimensional view of the combined blow-take out mechanism and the new take out mechanism on the typical section box
- 15 Figure 10: Side view of the combined blow-take out mechanism and the new take out mechanism on the typical section box
- Figure 11: 3-Dimensional view of the combined blow-take out mechanism at the outside position of the combined blow-take out head
- Figure 12: 3-Dimensional view of the combined blow-take out mechanism at the inside position
- 20 of the combined blow-take out head
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- Figure 14: Side view of the combined blow-take out mechanism at the outside position of the combined blow-take out head
- 25 Figure 15: 3-Dimensional view of the combined blow-take out mechanism and the new take out mechanism at the park position
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- Figure 17: Side view of drive technic of the combined blow-take out head at the positioned with
- 30 the centering pins
- Figure 18: Side view of drive technic of the combined blow-take out head at the waiting position
- Figure 19: Side view of drive technic of the combined blow-take out head over the dead plate
- Figure 20: Front view of drive technic of the combined blow-take out head
- Figure 21: Bottom view of drive technic of the combined blow-take out head
- 35 Figure 22: 3-Dimensional view of drive technic of the combined blow-take out head

- Figure 23: 3-Dimensional view of the mounting plate
- Figure 24: 3-Dimensional view of the up-down movable body
- Figure 25: 3-Dimensional installation view of the up-down movable body and the mounting plate
- 5 Figure 26: 3-Dimensional view of the side arm
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- Figure 28: Side view of the combined blow-take out head
- Figure 29: Top view of the combined blow-take out head
- Figure 30: Front view of the combined blow-take out head
- 10 Figure 31: 3-Dimensional view of the combined blow-take out head with the final blow hole and the finish cooling hole
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- 15 Figure 34: Side view of the combined blow-take out head's take out mechanism
- Figure 35: Bottom view of the combined blow-take out head's take out mechanism
- Figure 36: Front view of the combined blow-take out head's take out mechanism
- Figure 37: 3-Dimensional view of the combined blow-take out head's take out mechanism
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- 25 Figure 43: Sectional installation view of the lock-ring and the blow head
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- Figure 45: Front view positions of the blow head and take out tongs during the process
- Figure 46: 3-Dimensional view of the new take out mechanism
- Figure 47: 3-Dimensional view of the new the take out mechanism
- 30 Figure 48: 3-Dimensional view of the up-down movement mechanism
- Figure 49: 3-Dimensional view of the right-left movement mechanism
- Figure 50: Front view of the new take out mechanism
- Figure 51: Side view of the new take out mechanism
- Figure 52: Top view of the new take out mechanism

**Description of the exemplary embodiment**

- 1: Gob
- 2: Parison
- 5 3: Final product
- 4: Finish
- 5: Bead
- 6: Neck-ring mechanism
- 7: Blow mould
- 10 8: Blank mould
- 10: Section box of I.S. machine
- 11: Blank mould side
- 12: Blow mould side
- 13: Plunger mechanism
- 15 14: Blow head mechanism
- 15: Take out mechanism
- 16: Dead plate
- 17: Pusher
- 18: Conveyor
- 20 200: Combined blow-take out mechanism
- 201: High pressure pneumatic air hose for closing movement of the take out
- 202: High pressure pneumatic air hose for down movement of the blow head
- 203: The application hose of the finish cooling process air
- 204: The application hose of the final blow process air
- 25 210: Mounting plate mechanism
- 211: Mounting plate of combined blow-take out mechanism
- 212: Rail of the the mounting plate mechanism
- 213: Servo motor of the mounting plate mechanism
- 214: Ball screw of the mounting plate mechanism
- 30 215: Nut of ball screw of the mounting plate mechanism
- 216: Carriager of the up-down movable body
- 220: Up-down movable body
- 221: Servo motor of the up-down movable body
- 222: Drive disc-1 of the combined blow-take out head
- 35 223: Drive rod of the combined blow-take out head

- 224: Drive disc-2 of the combined blow-take out head
- 225: Bearing of centering pins
- 226: Centering pin-1 for the final blow process air
- 227: Centering pin-2 for the final blow process air
- 5 228: Centering pin-3 for the finish cooling process air
- 229: Centering pin-4 for the final blow process air
- 230: Side arm
- 240: Combined blow-take out head
- 241: The adjustment nut for opening degree of take out tongs
- 10 242: The spring of the drive piston for take out tongs
- 243: Quick-change linkage
- 244: Springs that provide park position of the blow head
- 245: The socket-1, supplying finish cooling air and centering of combined blow-take out head
- 246: The socket-2, supplying final blow air and centering of combined blow-take out head
- 15 247: The socket-3, supplying final blow air and centering of combined blow-take out head
- 248: The socket-4, supplying final blow air and centering of combined blow-take out head
- 249: Upper fixed part
- 250: Bottom fixed part
- 251: Movable body
- 20 252: Take out tongs
- 253: Drive cylinder of take out tongs
- 254: Rod of take out tongs' drive cylinder
- 255: Rod 1
- 256: Rod 2
- 25 257: Rod 3
- 260: Blow head
- 261: Spline shaft
- 262: The application hole of the final blow air on the blow head
- 263: The application hole of the finish cooling air on the blow head
- 30 264: Lock-ring
- 265: Final blow air application pipe on the lock-ring
- 266: Finish cooling application hole on the lock-ring
- 267: Fixing holes of the lock-ring on the movable part
- 271: Blow head at blowing position, take out tongs at parking position
- 35 272: Blow head at parking position, take out tongs at parking position

- 273: Blow head at parking position, take out tongs at taking position
- 274: High pressure pneumatic air application hole to provide downward movement of the blow head
- 275: Final blow process air application hose-1
- 5 276: Final blow process air application hose-2
- 277: Finish cooling process air application hose
- 300: New take out mechanism
- 320: Up-down movement mechanism
- 321: Mounting plate of the up-down movement mechanism
- 10 322: Rail of the up-down movement mechanism
- 323: Carriager of the up-down movement mechanism
- 324: Ball screw of the up-down movement mechanism
- 325: Servo motor of the up-down movement mechanism
- 326: Nut of ball screw of the up-down movement mechanism
- 15 340: Right-left movement mechanism
- 341: Mounting plate of the right-left movement mechanism
- 342: Servo motor of the right-left movement mechanism
- 343: Rail of the right-left movement mechanism
- 344: Ball screw of the right-left movement mechanism
- 20 345: Sliding plate
- 346: Carriager of the right-left movement mechanism
- 347: Nut of ball screw of the right-left movement mechanism
- 360: Gripper mechanism
- 361: Gripper bracket
- 25 362: Gripper
- 363: Gripper claws
- 500: Park position

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**Explanation of the invention**

This invention basically consist of two mechanisms. These are;

1. Combined blow-take out mechanism (200),
  - 5 2. New take out mechanism (300).
1. **Combined blow-take out mechanism (200);** This mechanism consist of four parts.
    - 1.1. **Mounting plate mechanism (210):**
      - This mechanism allows the combined blow-take out mechanism(200) to install into the I.S. machine.
      - 10 - It consist of a servo motor (213), a ball screw (214) and rails (212). By the help of such parts as, an up-down movable body (220), side arms (230) and a combined blow-take out head (240) can be positioned to the park position (500) as a block.
      - With these up-down movement, the invert setting can be done easily to I.S. machine.
    - 1.2. **Up-down movable body (220):**
      - 15 - The up-down movable body (220) combines the combined blow-take out head (240) to the combined blow-take-out mechanism (200) with side arms (230).
      - It allows a both sided drive of combined blow-take out head (240) by the help of a servo motor (221), drive discs (222,224), drive rods (223) and side arms (230).
      - The both sided pins (226,227,228,229) which are located on the up-down movable body
      - 20 (220) are provided as both sided centering of the blow-take out head (240) rigidly. Finish cooling air is sent to the combined blow-take out head(240) with one of the centering pin's (228) inside hole. Final blow air is sent to the combined blow-take out head (240) with three of the centering pins' (226,227,229) inside holes.
      - High pressure pneumatic air hose (202) which provides to downward direction
      - 25 movement of the blow head (260) is mounted on the up-down movable body (220). High pressure pneumatic air hose (201) which provides closing the take out tongs, is mounted on the up-down movable body (220). Low pressure pneumatic air hose (204) which provides the final blow air to blow the parison (2) is mounted on the up-down movable body (220). Low pressure pneumatic air hose (203) which provides finish cooling air to
      - 30 cool the finish (4) is mounted on the up-down movable body (220).
      - The side arms (230) and the combined blow-take out head (240) are positioned to the park position (500) by the help of carriers (216).

**1.3. Side arms (230),**

- The combined blow-take out head (240) is mounted as both sided by the help of side arms (230).
- The side arms (230) contributes the transmission of the necessary action to rotate the combined blow-take out head (240).
- The side arms (230) including time belt, pulleys etc. keep the combined blow-take out head (240) parallel during the rotational movement.

**1.4. Combined blow-take out head(240):**

- The blow head (260) which blows the parison (2) to transform it to the final product (3) and cools the finish (4) is located on the combined blow-take out head (240). The working principles of this mechanism are as below;

The downward movement of the blow head (260); the high pressure pneumatic air which is supplied by the high pressure air hose (202) follows the hole (274) of the upper fixed part (249) and the movable part (251) is moved through the downward position by the help of spline shaft (261) which is mounted on the upper fixed part (249). After application of the final blown process air and finish cooling process air high pressure pneumatic air is closed. The upward movement of the blow head (260) is done by four springs (244) which are under pressure. Final process air is applied a hole (262) which is located through the centerline of the blow head (260). Finish cooling process air is applied through holes (263) which are located inner diameter of the blow head (260).

- Transferring of the final product (3) from the blow side (12) over the dead plate (16) and leaving the final product(3) to the new take out mechanism (300) are provided with take out tongs (252) which are located on the combined blow-take out head (240). Operations of this mechanism are as follow; when the high pressure pneumatic air enters from high pressure pneumatic air hose (201) to the take out cylinder (253) whose strok adjustment can be made. The cylinder rod (254) moves to the upward direction and take out tongs (252) close angularly by the help of rods linkage (255,256,257). The final product (3) is transferred from the blow side (12) over the dead plate (16) by the help of combined blow-take out head (240) with a 180 degree rotation. At this position of the final product (3) the high pressure pneumatic air is closed and the cylinder rod (254) moves to the downward direction by the help of spring of cylinder. The take out tongs (252) are opened by the help of rods linkage (255,256,257).
- The combined blow-take out head (240) can be changed easily with the adjusted one by the help of both sided quick change connectors (243).

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2. **New take out mechanism (300);** this mechanism mainly consist of three parts. These are;

**2.1.Up-down movement mechanism (320):**

- It consists of a servo motor (325), a ball screw (324), a nut of ball screw (326), rails (322), carriers (323) and a mounting plate (321).
- 5 - It is installed in front of the section box (10) by the help of mounting plate (321).
- It is an optional mechanism so it is not an obligation to use in each production. It can be used optionally while working with the extra short products, sensitive products, complex shape products, the different length and with the different weight products with the different section box. The reasons for using these products to decrease the distance
- 10 between the bottom surface of the final product (3) and the upper surface of the dead plate (16). Through this mechanism, the final product (3) is left slowly.
- It allows invert settings be made easily with a short time.

**2.2.Right-left movement mechanism(340):**

- It consists of a servo motor (342), a ball screw (344), a nut of ball screw (347), rails (343), carriers (346) and height adjustable sliding plate (345).
- 15 - It provides the movement horizontally to take the final product (3) from gripper claws (363).
- To intervent the front side of the section box and to create the necessary space, in case of any failure, mould changes and so on, the gripper mechanism (360) is drawn into the
- 20 parking position.

**2.3.Gripping mechanism(360):**

- It consists of a gripping bracket(361), grippers (362) and gripping claws (363).
- There are gripper claws (363) on the gripper (362) which can close and open linearly or angularly. These claws (363) will be designed specially according to the finish (4) type of
- 25 the final product (3).
- The final product (3) is transferred from the blow side (12) over the dead plate (16) by the help of combined blow-take out mechanism (200). The final product (3) is kept over the dead plate (16) by the help of take out tongs (252) which are located on the combined blow-take out head (240). Meanwhile, gripper claws (363) centers the final
- 30 product's (3) finish (4) by the help of right-left movement mechanism (340). The gripper claws(363) take the final product (3) from take out tongs (252). The final product (3) is kept over the dead plate (16) with a certain time by take out tongs (252). Then, the gripper claws (363) are opened and the final product (3) is dropped onto the dead plate (16).

Mechanisms, part of the mechanisms and the duties of them are described above. Generally the operation of the system is like that;

- The parison (2) is transferred to the blow side (12) with a 180 degree rotational movement by the neck ring mechanism (6).
- 5 - Blow mould (7) is closed.
- Parison (2) is hung on the blow mould (7) by the help of bead (5). The neck ring mechanism (6) rerotates to the blank side (11) with a 180 degree rotational movement
- The combined blow-take out head (240) is positioned over the blow mould(7) at a certain height by the drive of a servo motor (221). The servo motor (221) drives drive  
10 discs (222,224), drive rods (223) and side arms (230).
- Combined blow-take out head (240) is centered by the both sided pins (226,227,228,229) which are installed on the up-down movable body (220).
- The movable part (251) wherein the blow head's (260) lock ring (264) is installed is moved to the downward direction by the application of high pressure pneumatic air  
15 which is applied from the hole (274) of upper fixed part. During this movement, the spline shaft (261) centers the movable part (251). This movement continuous until the blow head (260) touches to the blow mould (7) with the centering of the spline shaft (261).
- After the blow head (260) is positioned onto the blow mould (7), the final blow air is  
20 applied from the three of centering pins' inside holes (226,227,229) and the finish cooling air is applied from a centering pin's inside hole (228). The final blow air is applied from the centerline of the blow head (260). The finish cooling air is applied from the inside diameter of blow head (260). (271)
- When the final blow process and the finish cooling process completed, the pneumatic air  
25 is cut off. The movable part (251), the lock ring (264) and the blow head (260) are returned to the park position(500) by four springs (244) which are under the stress. (272)
- Blow mould (7) is opened.
- Take out tongs (252) are closed with the pneumatic air which is applied to the cylinder (255). (273)
- 30 - The pins (226,227,228,229) which are centered to the combined blow-take out head (240) are moved to the outward direction and return to the park position (500).
- The combined blow-take out head (240) is transferred from the blow side (12) over to the dead plate(16) by a servo motor (221) which drives drive discs (222,224), drive rods (223) and side arms (230).

- The gripper claws (363) are positioned to the center of the final product's finish (4) by the right-left movement mechanism's (340) horizontal movement.
- The final product (3) is gripped from finish (4) by gripper claws' (363) inside direction movement.
- 5 - The high pressure pneumatic air which is applied to the take out cylinder (253) of the combined blow-take out head (240) is interrupted. Then the cylinder rod (254) is moved to the downward direction by the help of spring (242) which is under stress. As a result of this movement take out tongs (252) are opened and return to the park position.
- The combined blow-take out head (240) returns to the park position by the drive of  
10 servo motor (221). For that, the servo motor(221) drives drive discs (222,224), drive rods (223) and side arms (230).
- The final product (3) is kept on the gripper claws (363) for a certain time. Then, the gripper claws (363) are opened and the final product (3) is left onto the dead plate (16) from a certain height. Also, optionally, the final product (3) is moved to the dead plate  
15 (16) with a defined velocity by the up-down movement mechanism (320) to left sensitivly.
- When the final product (3) is left to the dead plate (16), the gripper mechanism (360) is moved to the park position by right-left movement mechanism (340). The right-left movement mechanism's (340) right side and left side movement distance can be  
20 adjusted according to the final product's (3) shape. Thus, it can be easily adopted to the increased speed of the system. It consumes less power and extends the life span of machine parts.
- Note:** When it is worked with a low speed on the I.S. machine, just the combined blow-take out mechanism (200) will be sufficient. In this case, we can cancel the new take out  
25 mechanism (300).

#### **The method of the invention applied to industry**

The combined blow-take out mechanism (200) and the new take out mechanism (300) can be  
30 easily installed to the typical I.S. machines and further I.S. machines via the mounting plates.

With this conversion, the typical I.S. machines and further I.S. machines can be more efficient, faster, longer life time, easily adjustable, easily maintenance and a higher quality. Thanks to this application, the economic life of the typical I.S. machines will be extended as well.

35

## CLAIMS

- 1) The invention, about a combined blow-take out mechanism (200) for I.S. machines, comprising; it has a mounting plate mechanism (210) which installs the combined blow-take out mechanism (200) for typical and further I.S. machines, it has an up-down movable body (220) which rotates the combined blow-take out head (240) with a 180 degree, it has side arms(230) which keep the combined blow-take out head (240) parallel during a 180 degree rotation and it has a combined blow-take out head (240) which transforms the parison (2) to the final product (3) and transfers the final product (3) from the blow side (12) over the dead plate (16).
- 2) The mounting plate mechanism (210) as defined in claim 1, wherein has a servo motor (213), a ball screw (214), a nut of ball screw (215) and rails (212) which provides being positioned the up-down movable body (220), side arms (230) and combined blow-take out head (240) to the park position (500) as a block and provides height setting called as invert setting.
- 3) The up-down movable body (220) as defined in claim 1, wherein has a servo motor (221), drive discs (222,224) and drive rods (223) which drive the combined blow-take out head (240) with both sides.
- 4) The up-down movable body (220) as defined in claim 1 and 3, wherein has pins (226,227,228,229) which center the combined blow-take out head (240) with both sides.
- 5) The combined blow-take out head (240) as defined in claim 1, wherein has a blow head (260), a movable body (251), a bottom fixed part (250), an upper fixed part (249) and spline shafts (261) which blow the parison (2) and cool the finish (4) of parison (2).
- 6) The combined blow-take out head (240) as defined in claim 1 and 5, wherein has take out tongs (252) which transfer the final product (3) from the blow side (12) over to the dead plate (16).
- 7) The combined blow-take out head (240) as defined in claim 1,5 and 6, wherein has a both sided quick change linkage (243) which changes with a new one in case of a job change time or a failure time.
- 8) The invention, about the new take out mechanism (300) for I.S. machines, comprising; it has an up-down movement mechanism (320) which installs the new take out mechanism (300) for typical and further I.S. machines, it has a right-left movement mechanism (340) which provides a horizontal movement to take the final product (3) from take out tongs (252), it has a gripper mechanism (360) which takes the final product (3) from take out tongs (252) and leaves onto the dead plate (16).

- 9) The up-down movement mechanism (320) as defined in claim 8, wherein has a servo motor (325), a ball screw (324), a nut of ball screw (326), rails (322) and carriers (323) which decrease the distance between the final product's (3) bottom surface and the dead plate's (16) upper surface for a soft falling.
- 5 10) The right-left movement mechanism (340) as defined in claim 8, wherein has a servo motor (342), a ball screw (344), a nut of ball screw (347), rails (343), carriers (346) and a height adjustment sliding plate (345) which provide a horizontal movement to take the final product (3) from take out tongs (252) which are located on the combined blow-take out head (240).
- 10 11) The invention, about blowing the parison (2) which is transferred to the blow side (12), cooling the finish part (4) of parison (2) and transferring the final product (3) from the blow side (12) over the dead plate (16) in I.S. machine, comprising;
- Positioning of the combined blow-take out head (240) over the blow mould (7) with a certain distance by drive parts of the up-down movable body (220),
  - 15 - Centering of the combined blow-take out head (240) with centering pins (226,227,228,229) which are located on the up-down movable body (220),
  - To move down the blow head (260) until it touches to the blow mould (7) (271) by the help of pneumatic air and centering with the spline shaft (261),
  - Application of the final blow air from inside holes of centering pins (226,227,229) and  
20 application of the finish cooling air from inside hole of centering pin (228),
  - Whenever the pneumatic air is stopped the blow head (260) is returned to the park position (272) with springs (244) under pressure,
  - Opening of the blow mould (7),
  - Take out tongs (252) are closed via the application of pneumatic air to the cylinder (253)  
25 and the final product (3) is taken from inside of the blow mould (7) with take out tongs (252) (273),
  - The pins (226,227,228,229) center the combined blow-take out head (240), return to the park position with the outward direction movement,
  - Transferring of the final product (3) from the blow side (12) over the dead plate (16) with  
30 the combined blow-take out head (240),
  - With the pneumatic air is stop, the cylinder rod (254) is pushed to the downward direction by the force of spring (242) under pressure and take out tongs (252) are opened and take out out tongs (252) leave the final product (3) on the newly added gripper claws (363).

12) The invention, about taking the final product (3) from the blow side (12) and transferring to the dead plate (16) and thanks to the new take out mechanism (300) taking the final product (3) from the combined blow-take out mechanism (200) and leaving the final product (3) onto the dead plate (16), comprising;

- 5
- With the horizontal movement of the new take out mechanism (300), gripper claws (363) take the final product (3) from take out tongs (252), on the combined blow-take out mechanism (200),
  - Keeping of the final product (3) over the dead plate (16) with a certain time and height by the help of gripper claws (363) then leaving of the final product (3) onto the dead
- 10
- plate (16),
  - Returning to the park position of the right-left movement mechanism (340) with a reverse side movement,
  - Thanks to the up-down movement mechanism (320) leaving the final product (3) onto
- 15
- the dead plate (16) from a shorter distance, in case of having a very short final product (3), working with different sections and height and producing sensitive product.

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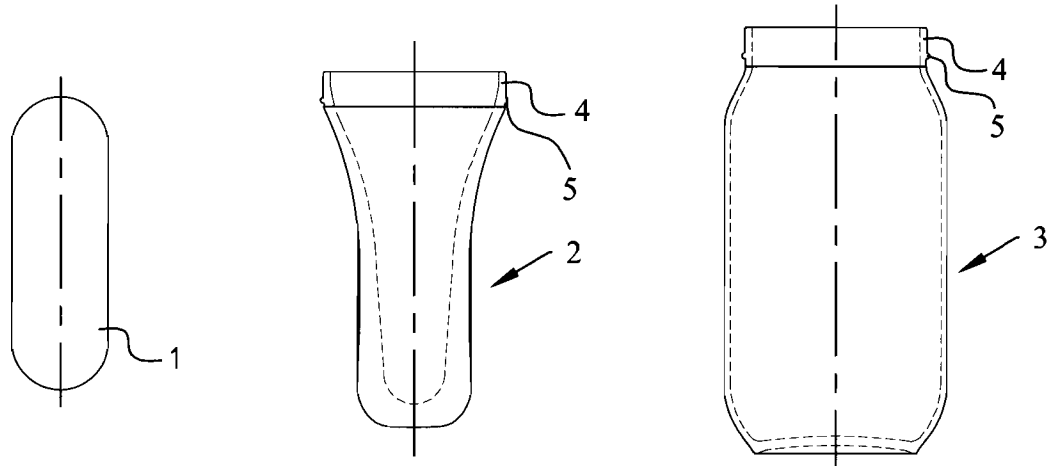


FIGURE 1

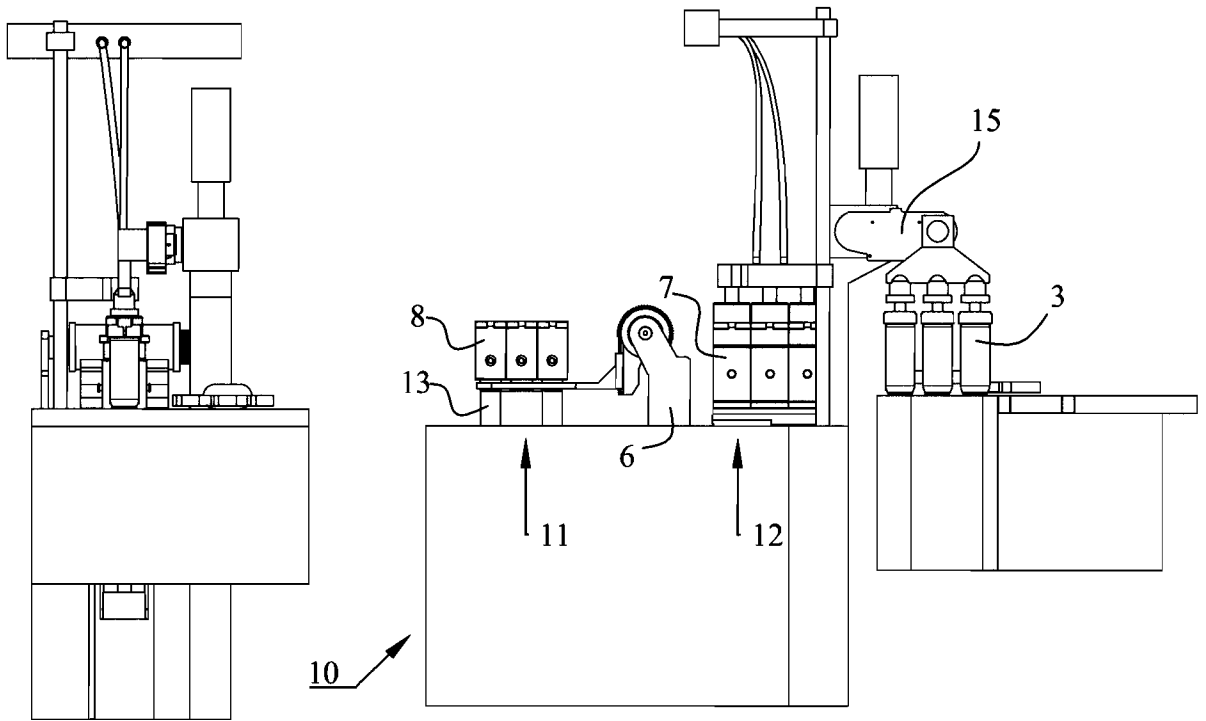


FIGURE 2

FIGURE 3

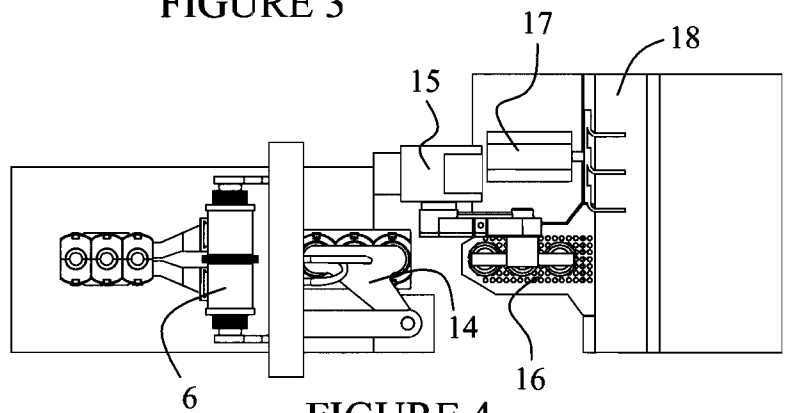


FIGURE 4

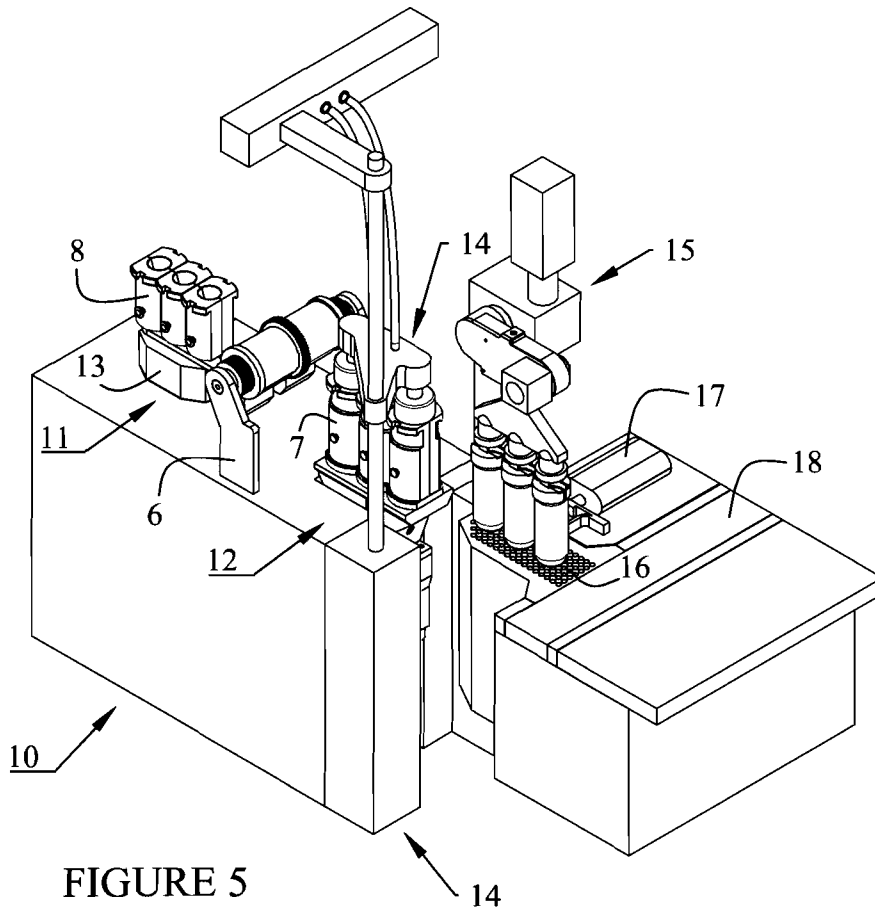


FIGURE 5

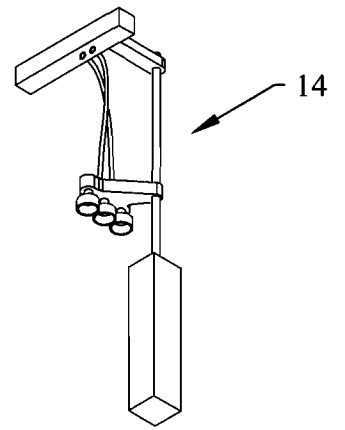


FIGURE 7

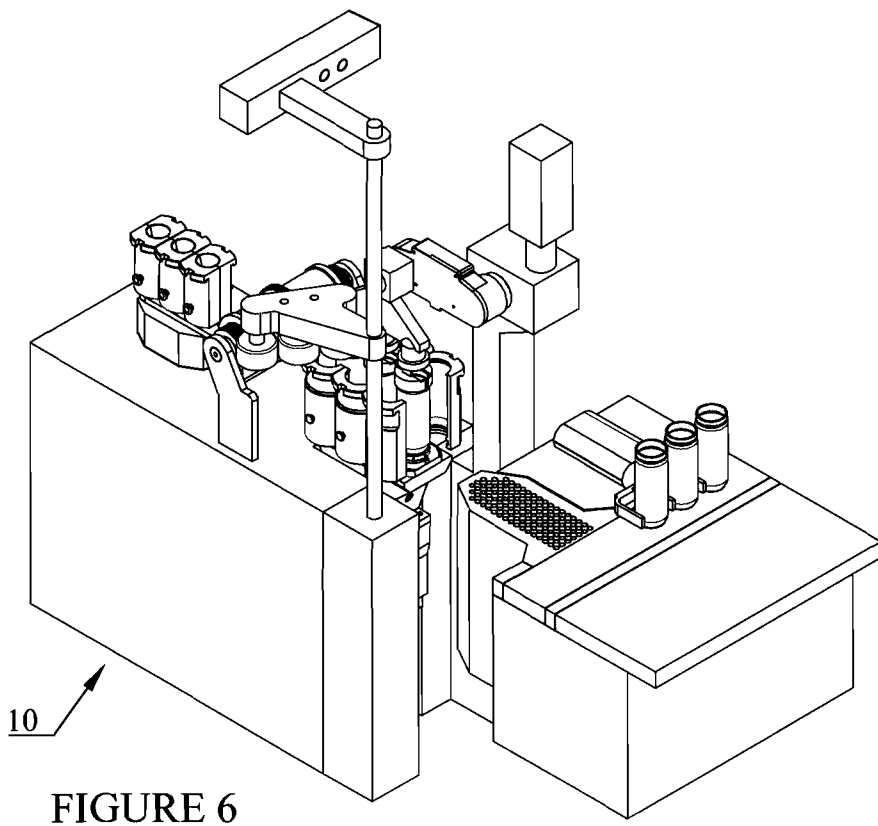


FIGURE 6

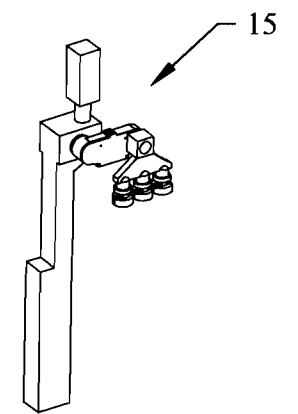


FIGURE 8

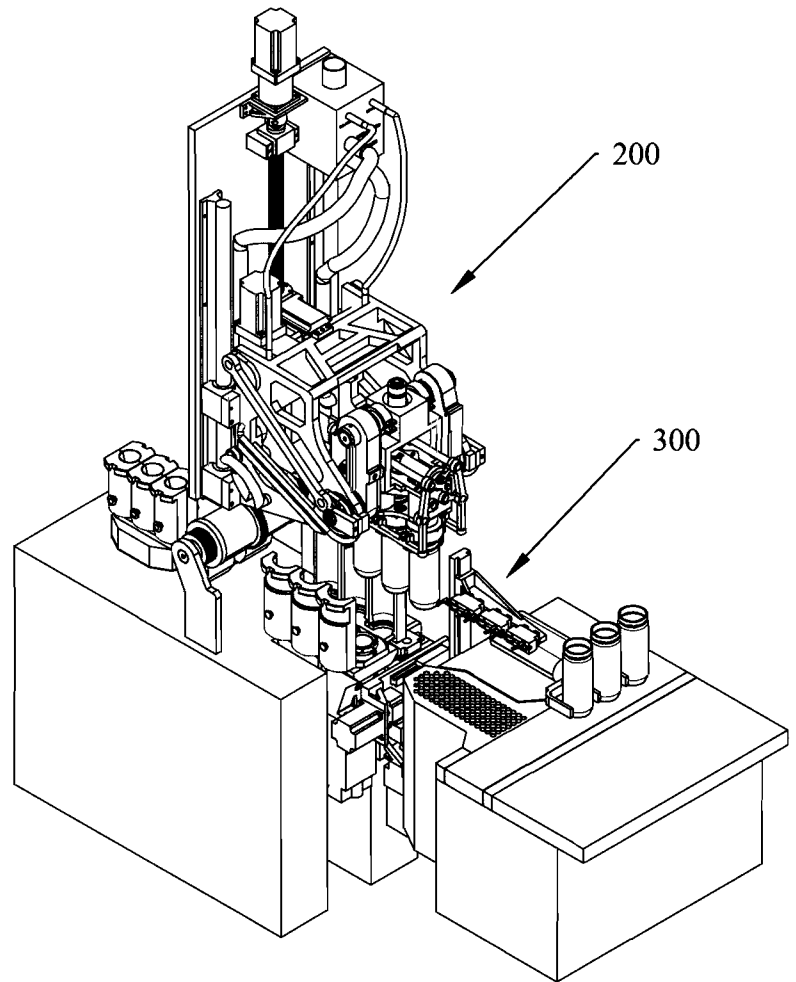


FIGURE 9

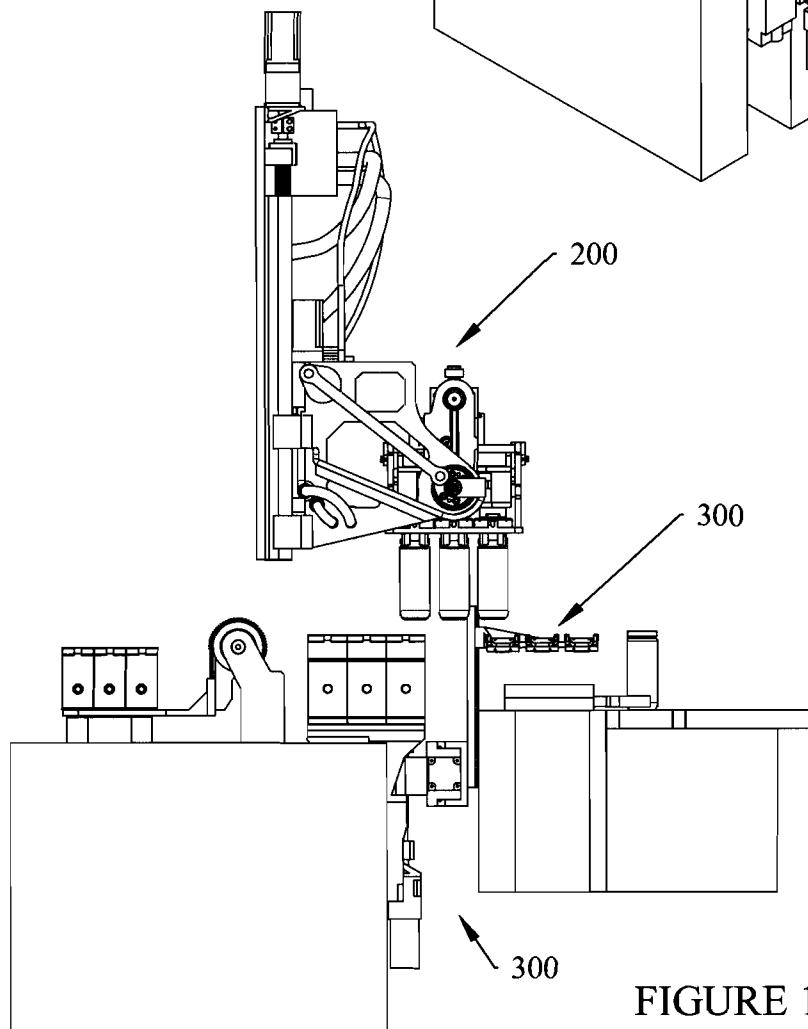


FIGURE 10

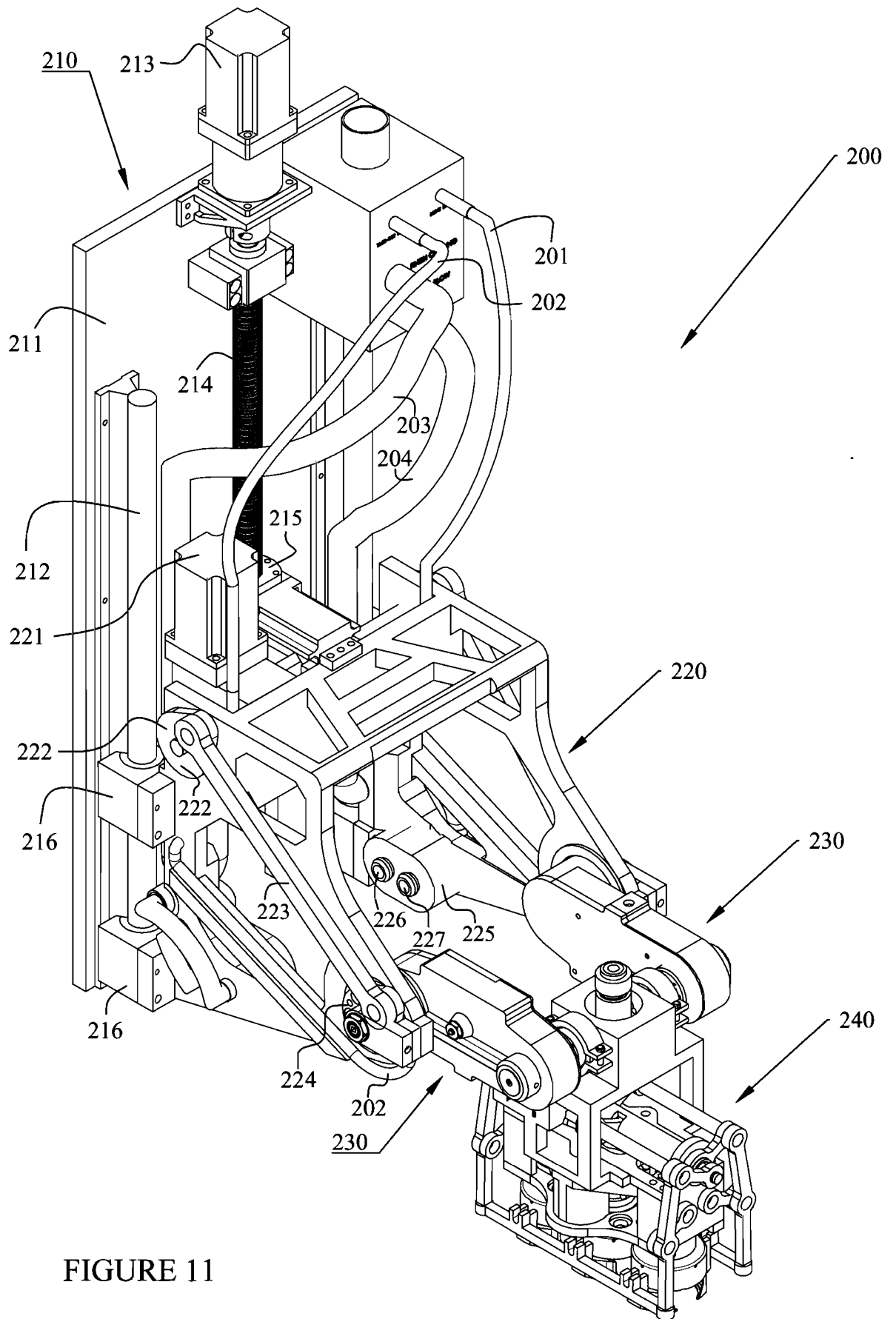


FIGURE 11

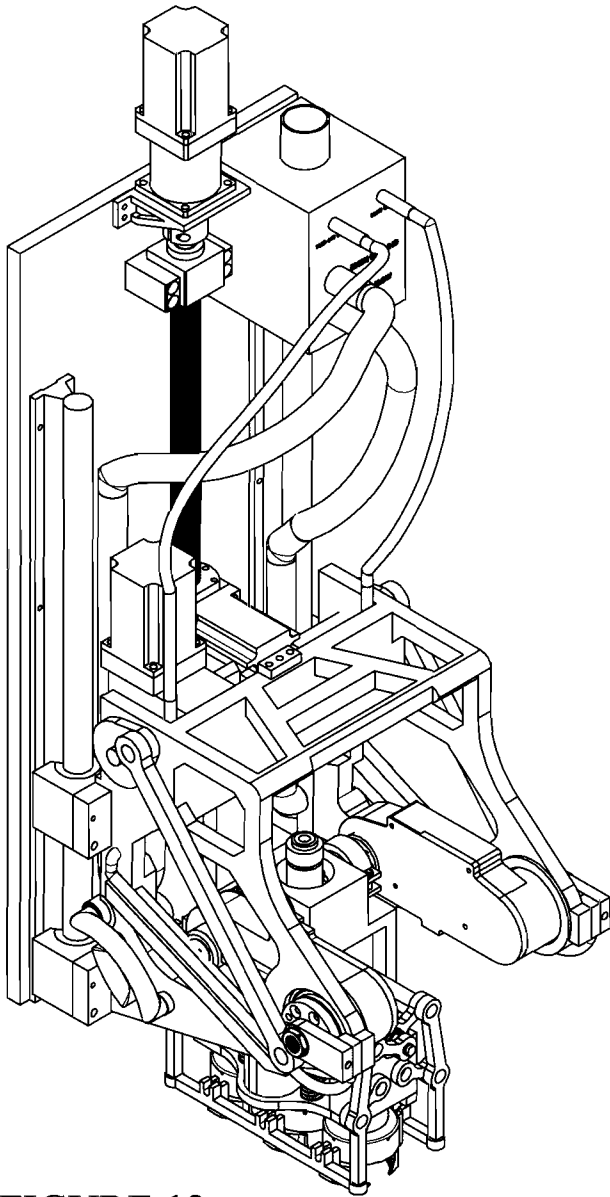


FIGURE 12

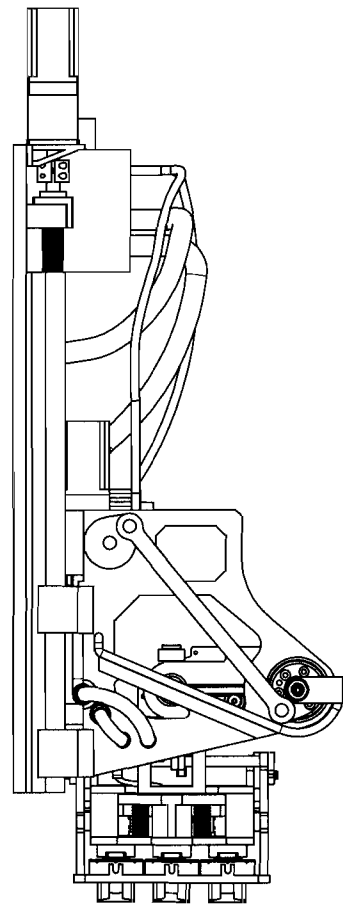


FIGURE 13

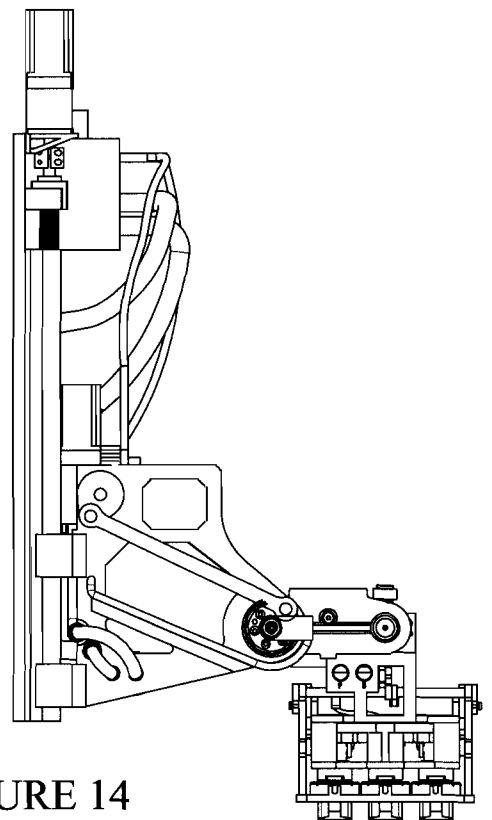


FIGURE 14

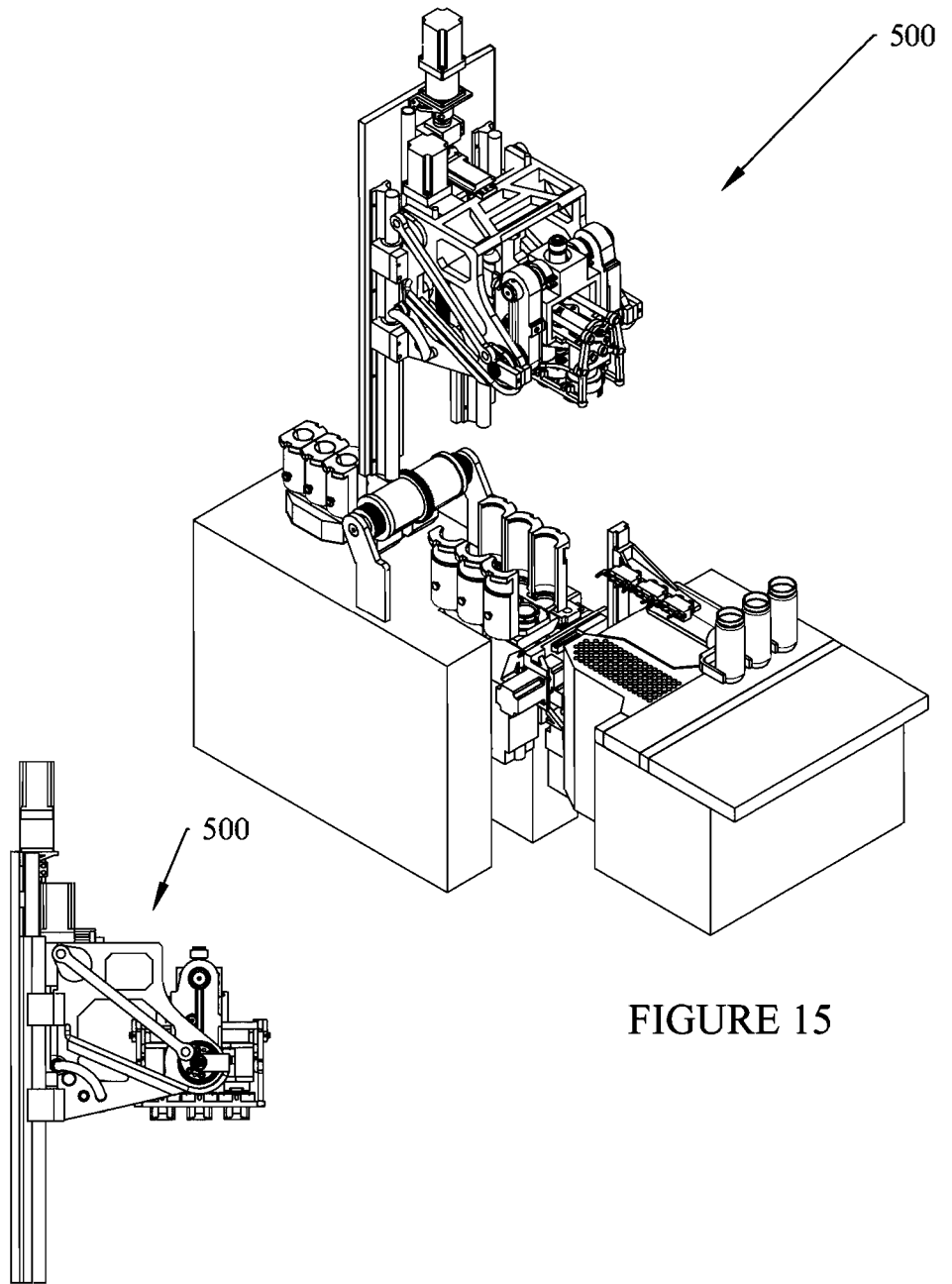


FIGURE 15

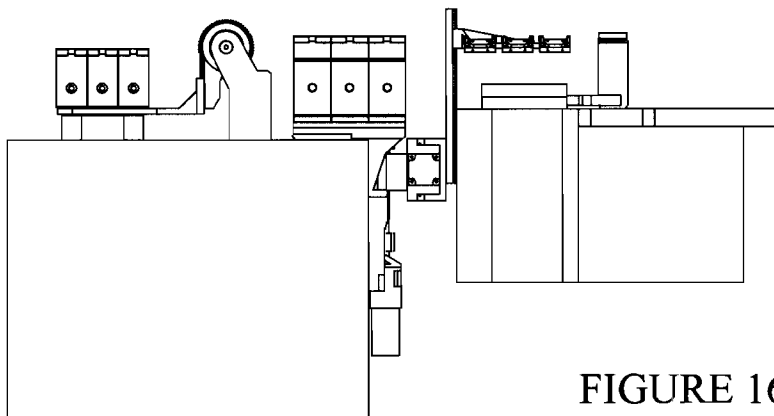


FIGURE 16

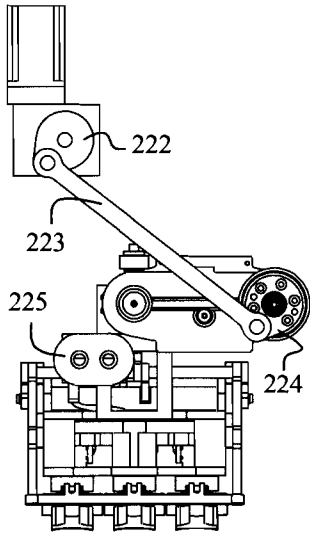


FIGURE 17

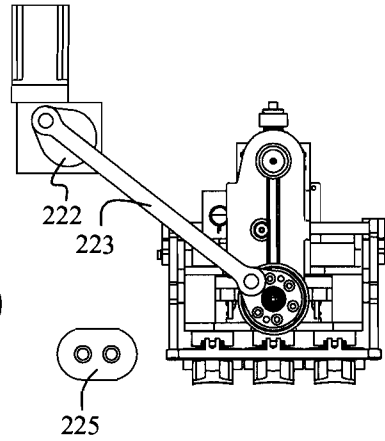


FIGURE 18

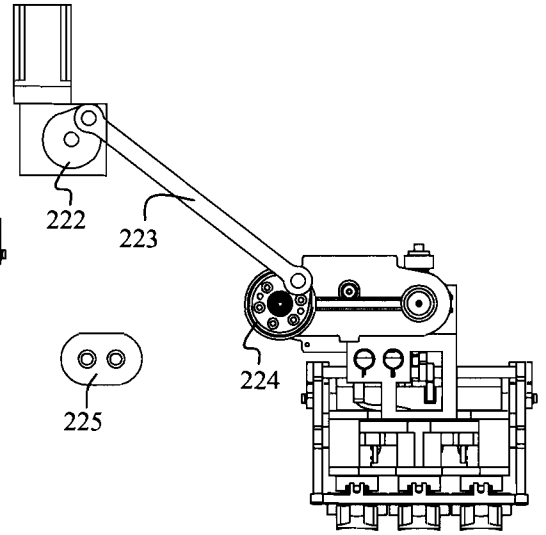


FIGURE 19

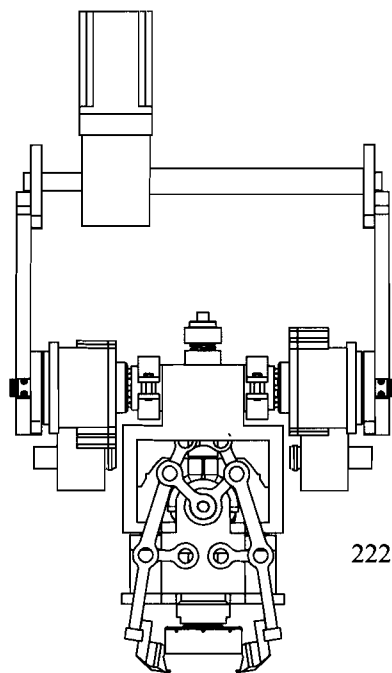


FIGURE 20

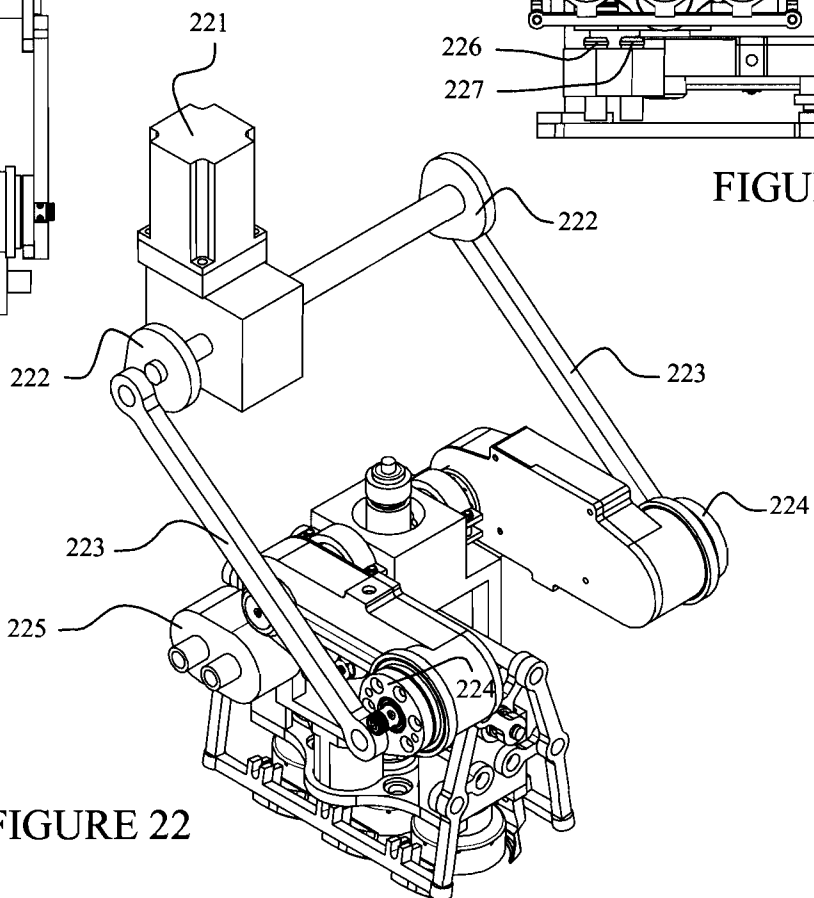


FIGURE 22

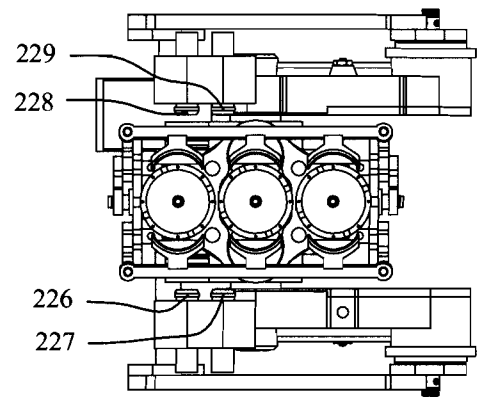


FIGURE 21

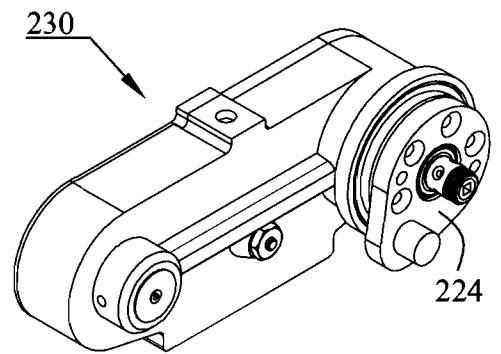
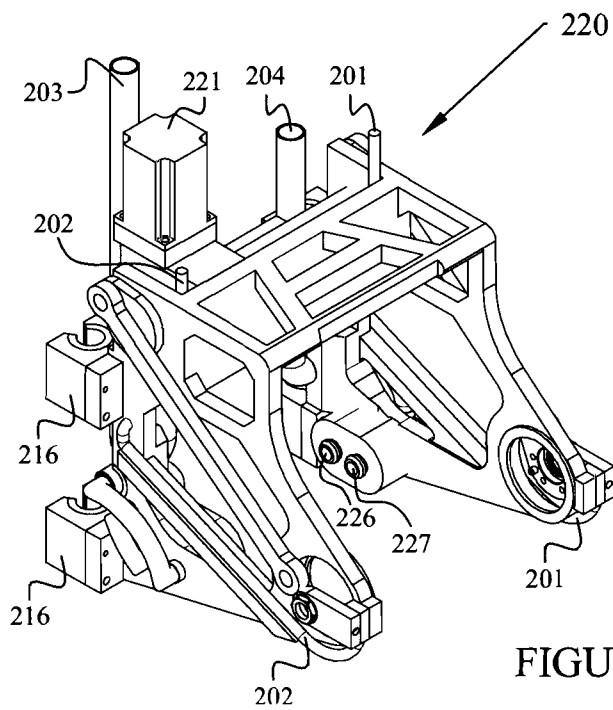
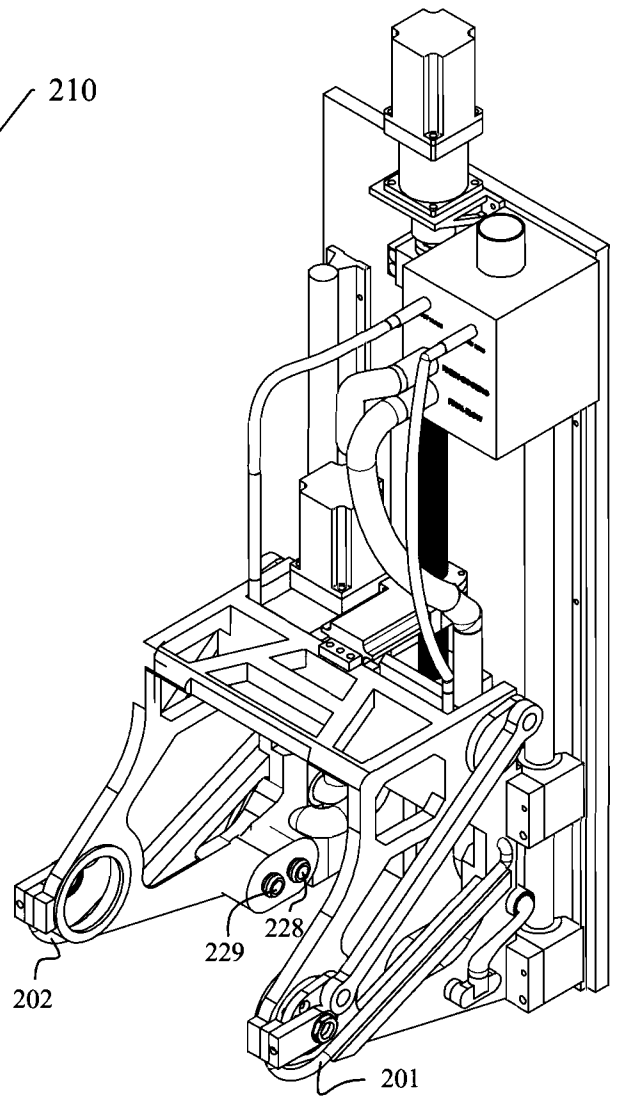
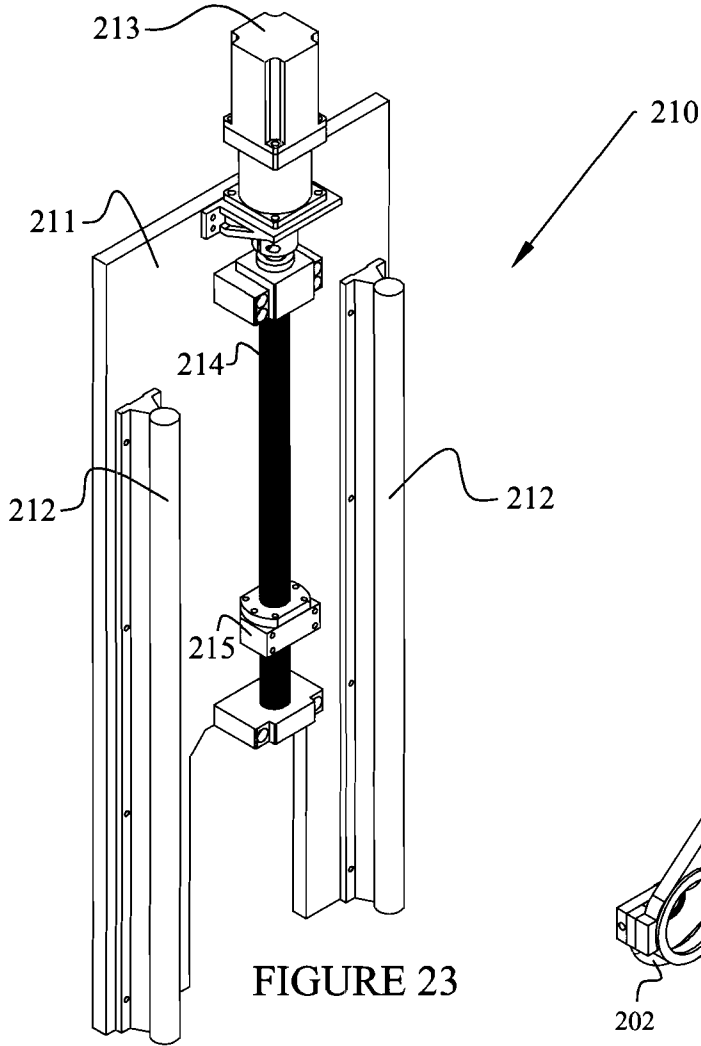


FIGURE 24

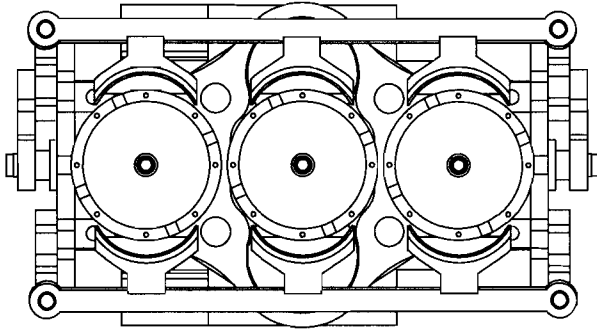


FIGURE 27

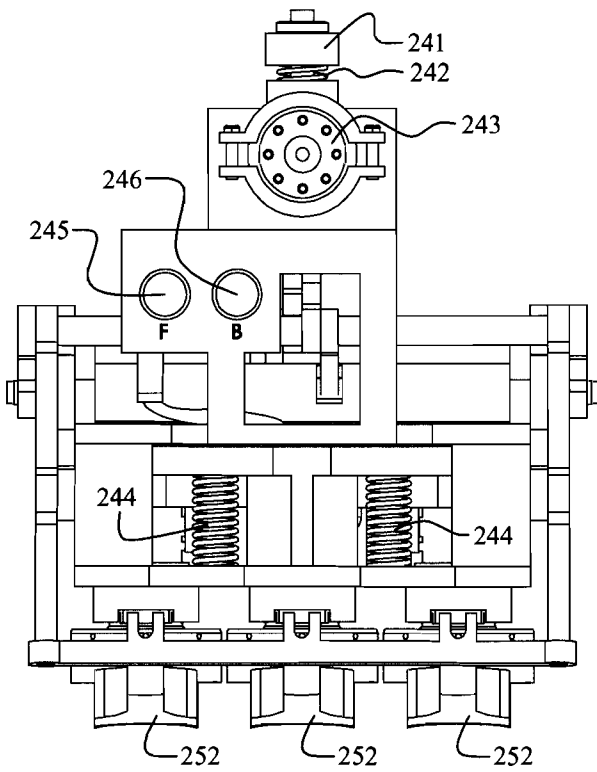


FIGURE 28

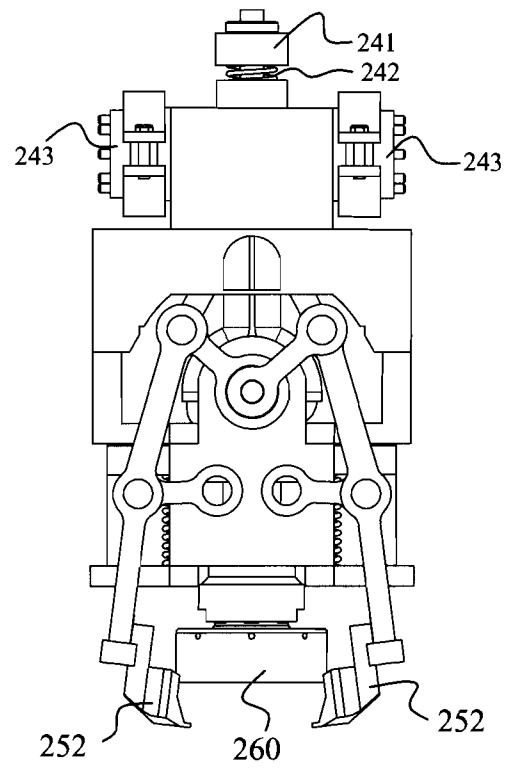


FIGURE 30

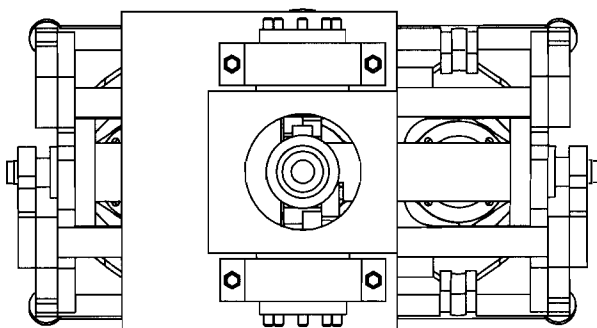


FIGURE 29

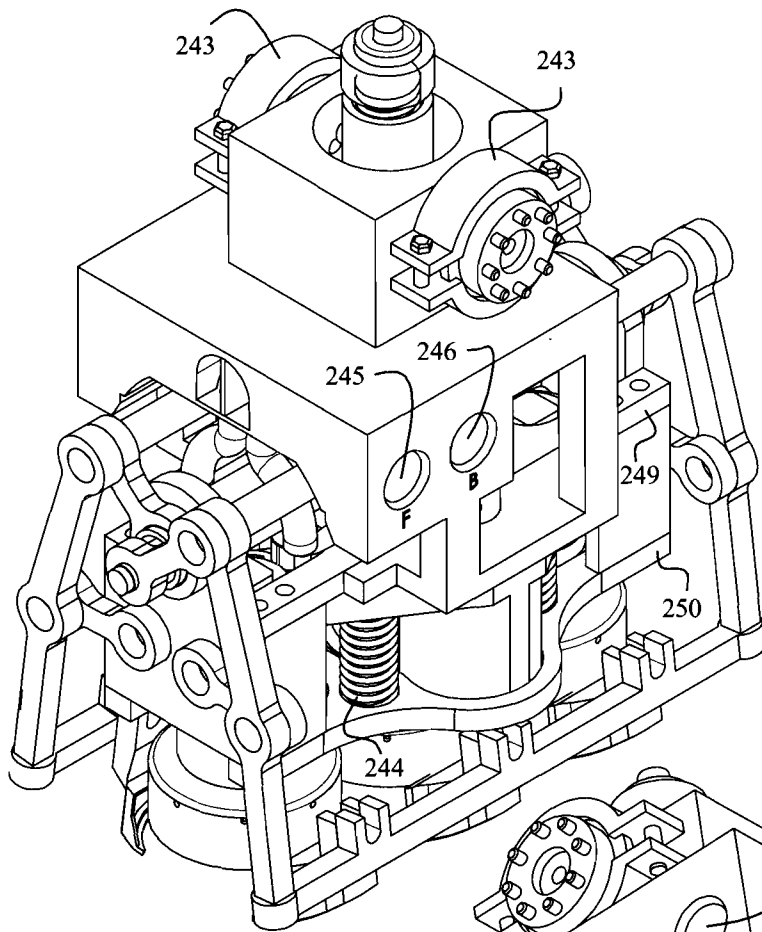


FIGURE 31

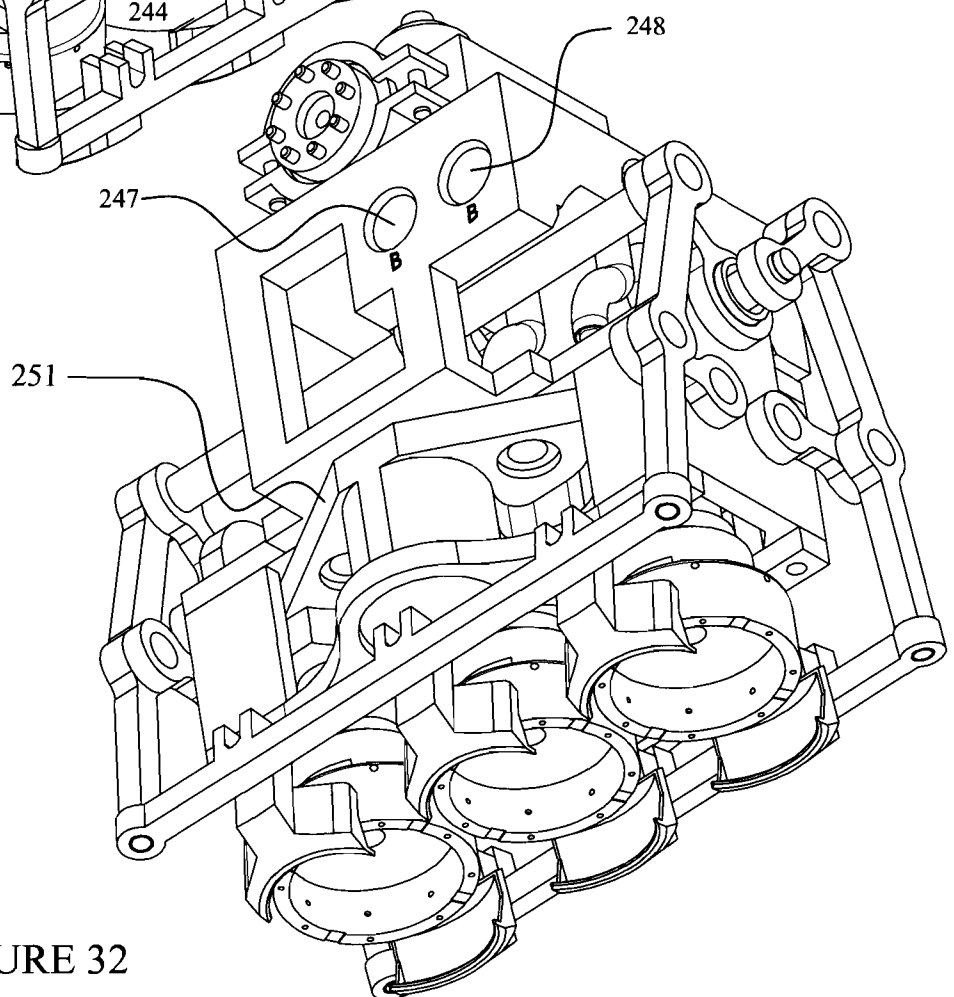


FIGURE 32

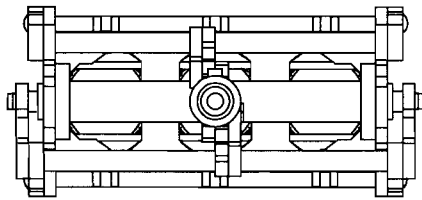


FIGURE 33

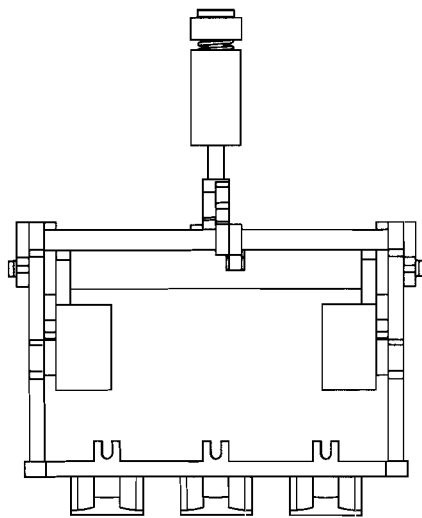


FIGURE 34

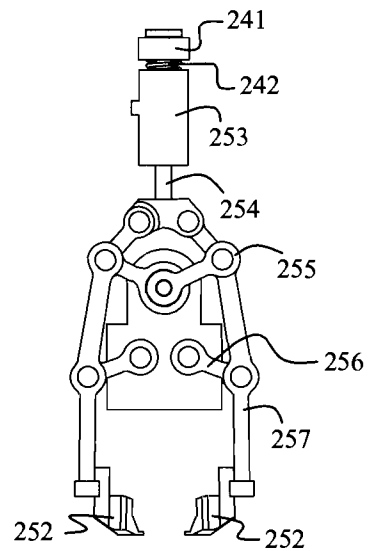


FIGURE 36

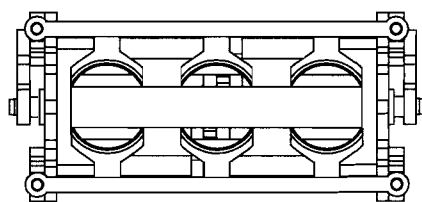


FIGURE 35

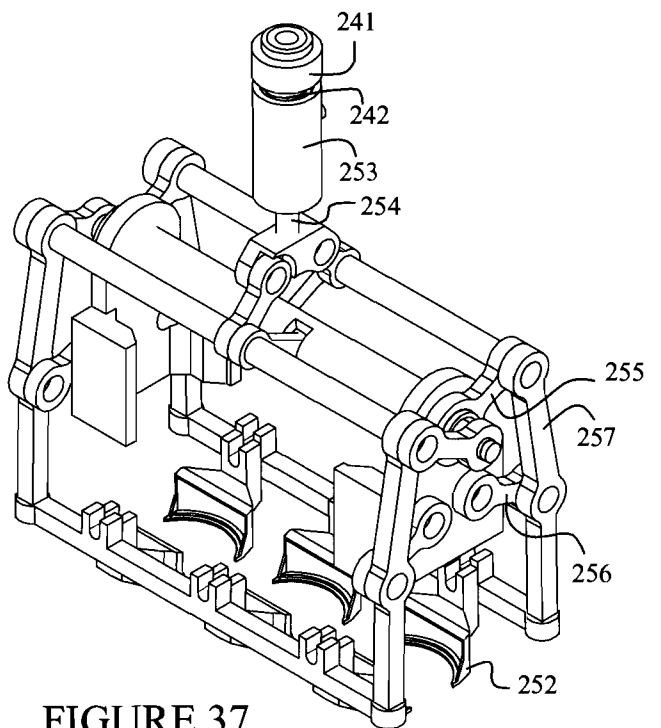


FIGURE 37

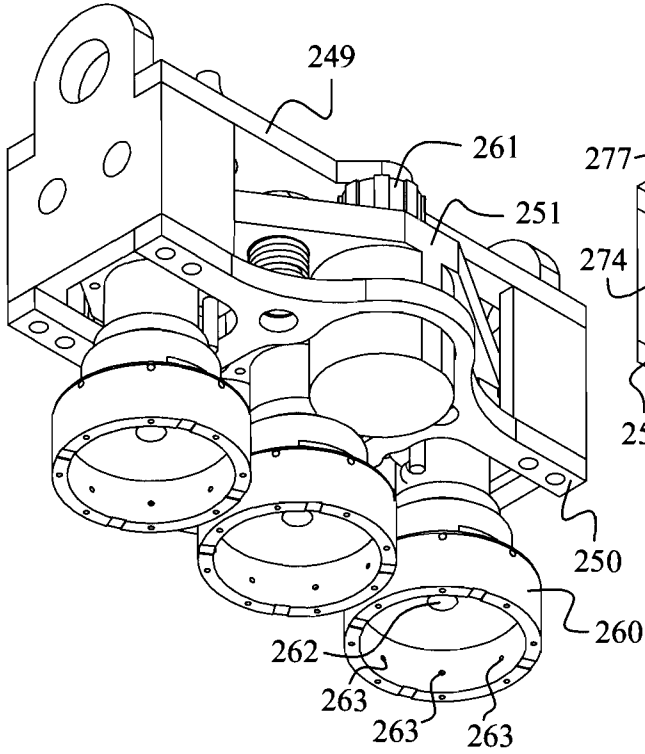


FIGURE 38

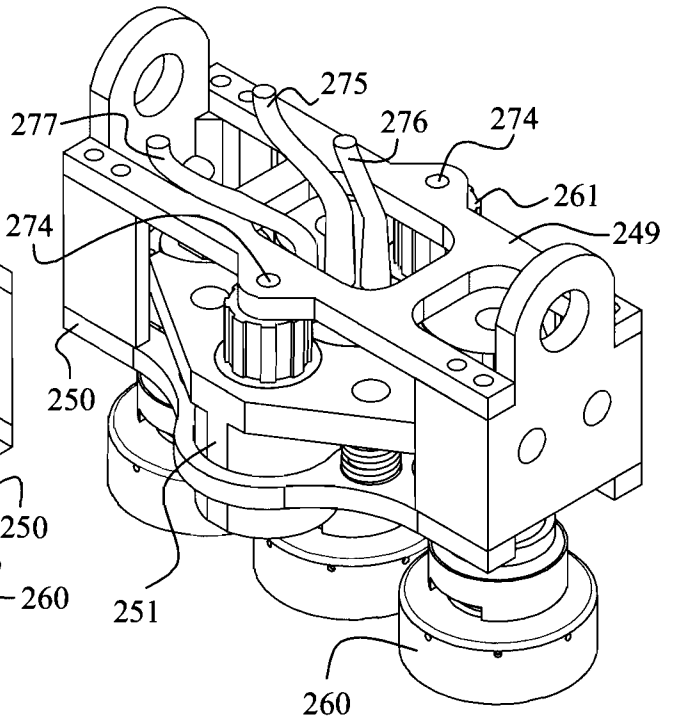


FIGURE 39

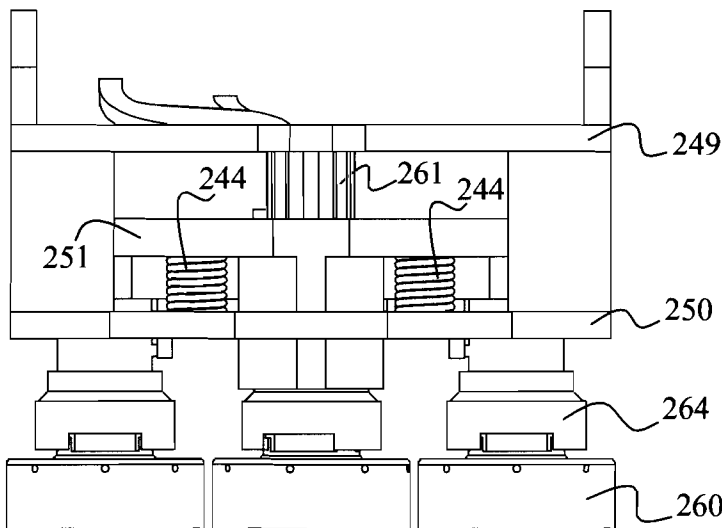


FIGURE 40

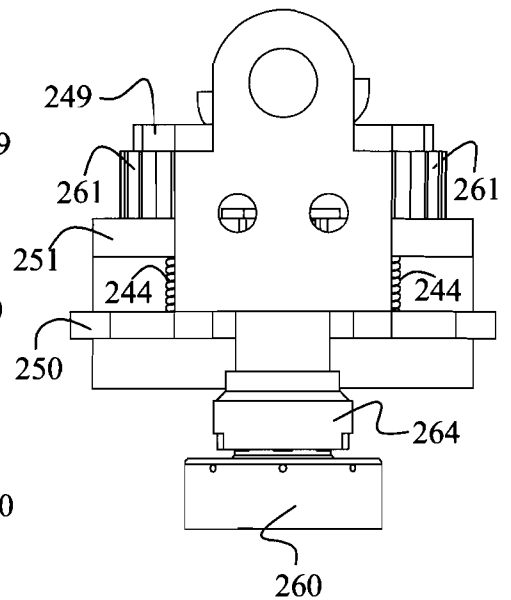


FIGURE 41

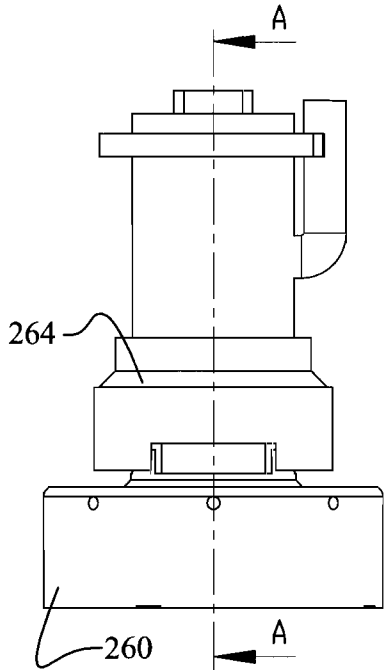


FIGURE 42

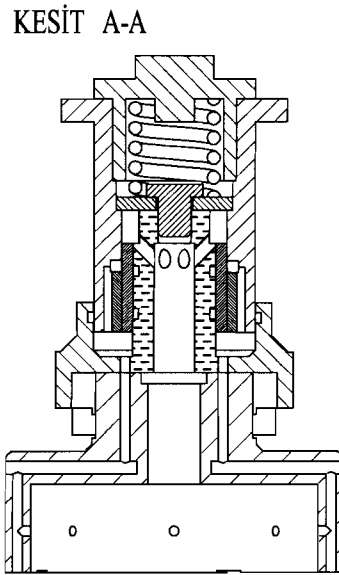


FIGURE 43

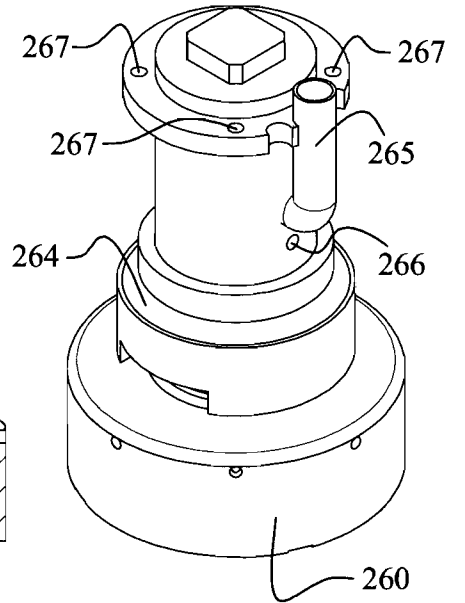


FIGURE 44

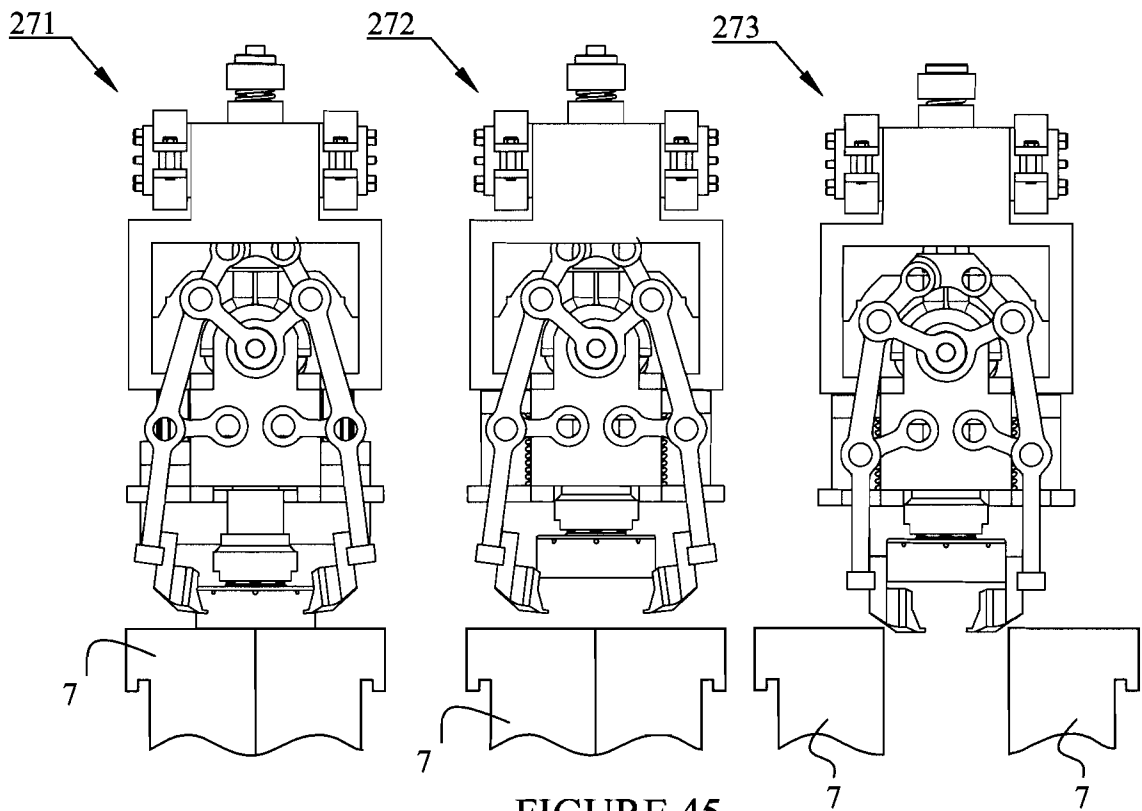


FIGURE 45

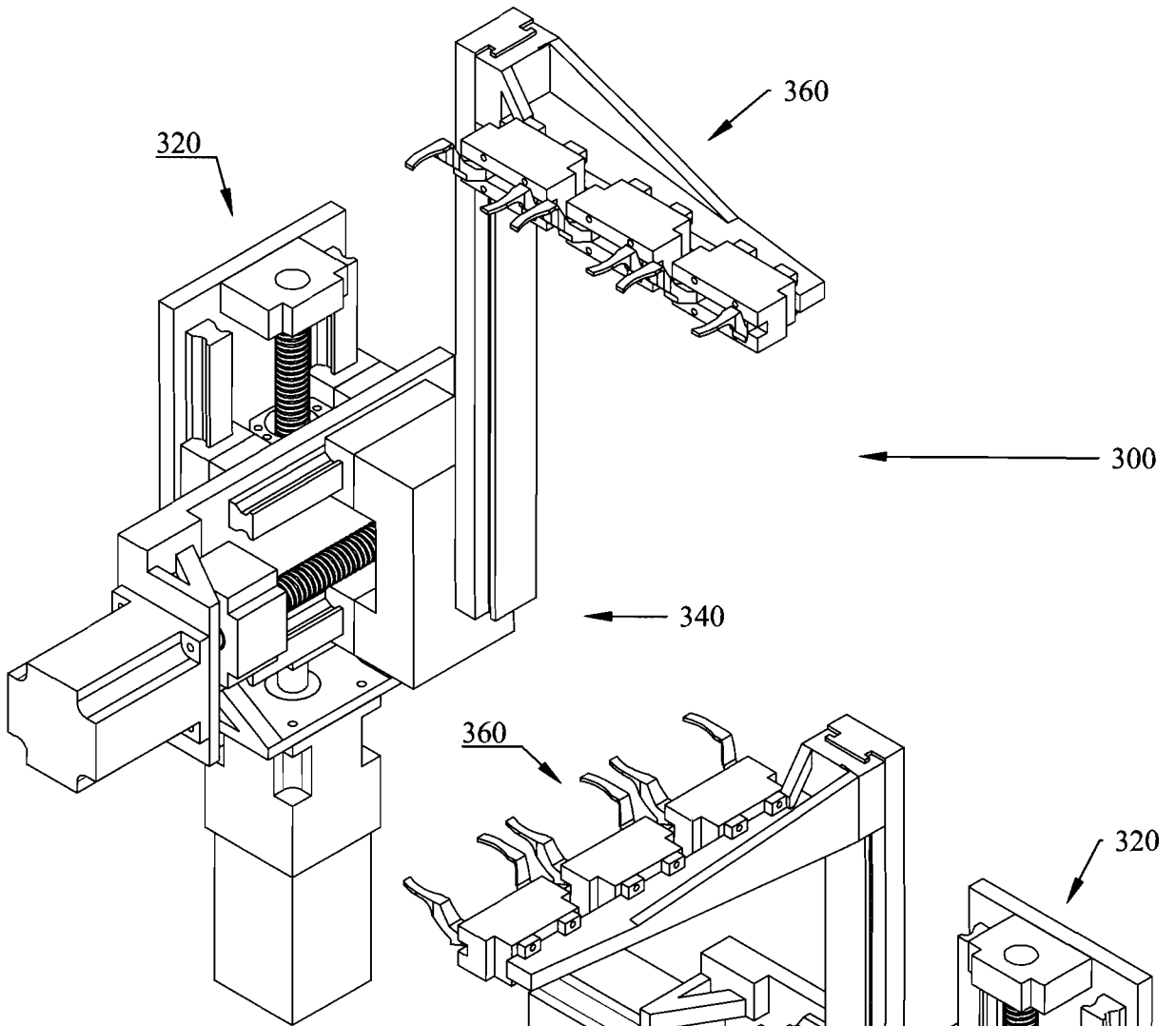


FIGURE 46

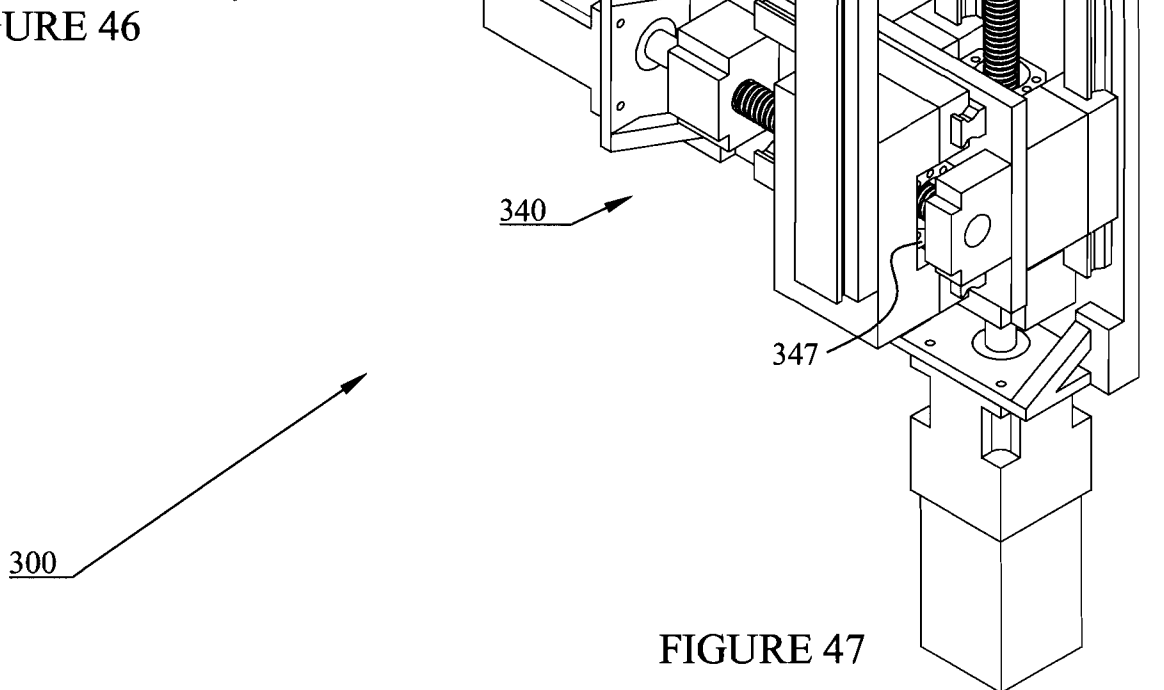


FIGURE 47

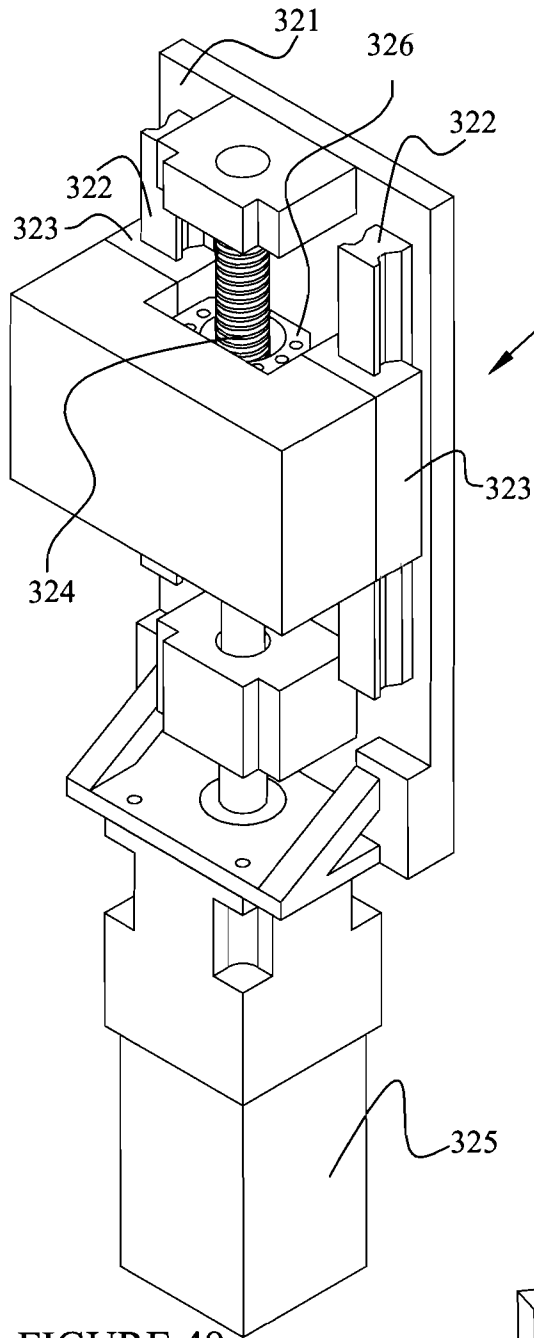


FIGURE 48

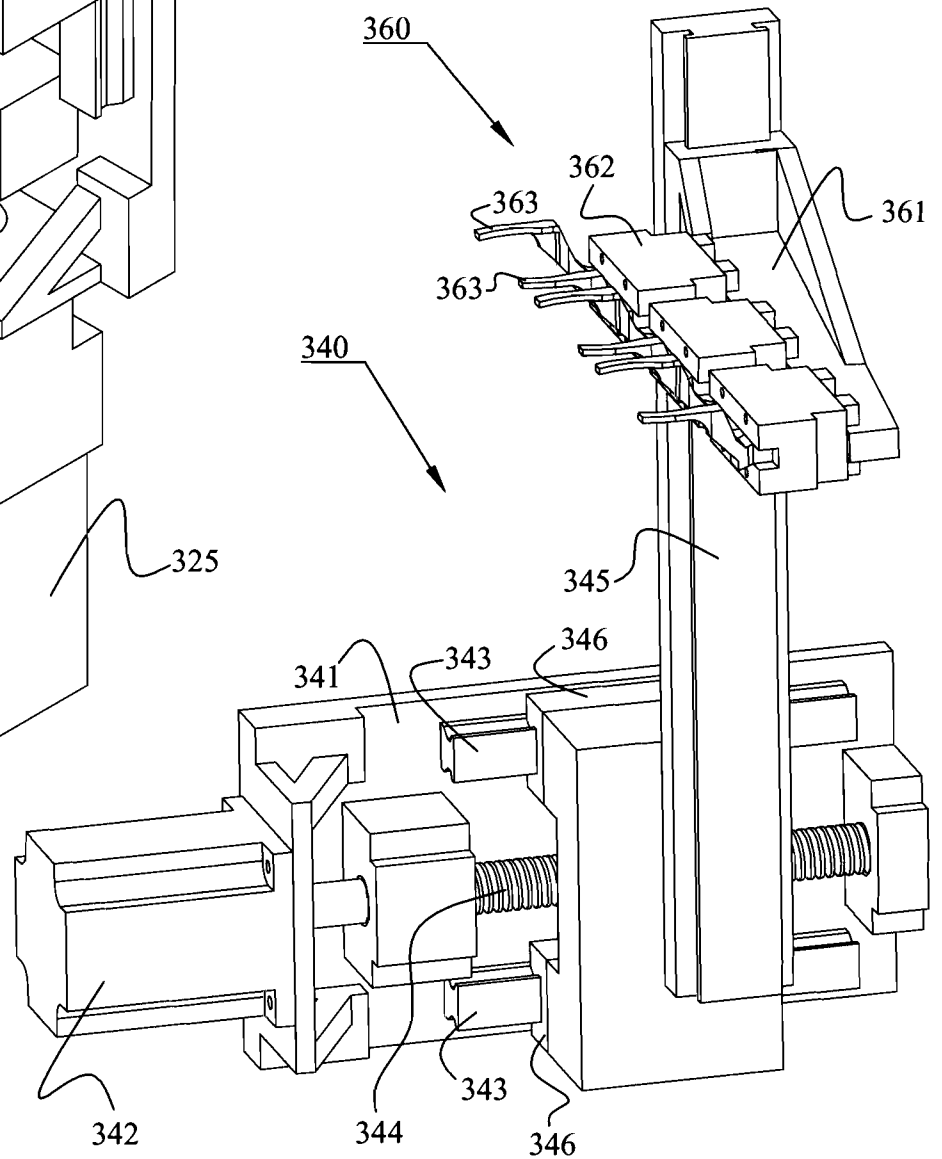


FIGURE 49

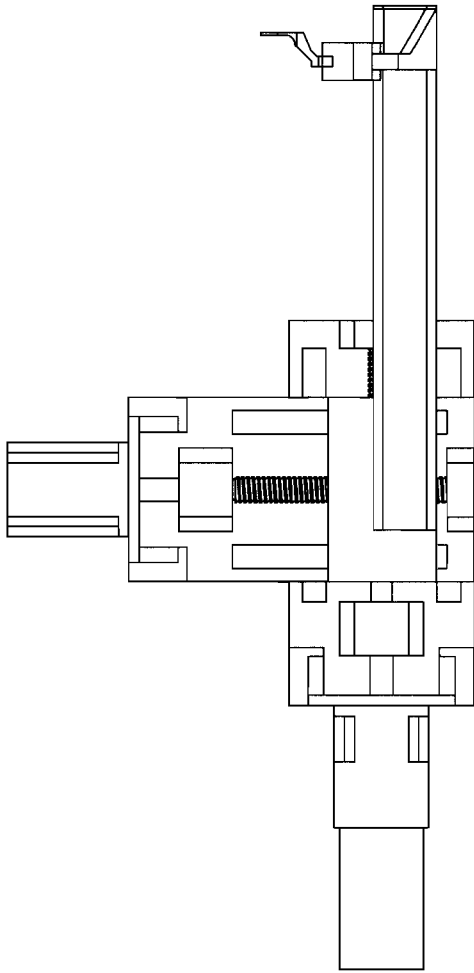


FIGURE 50

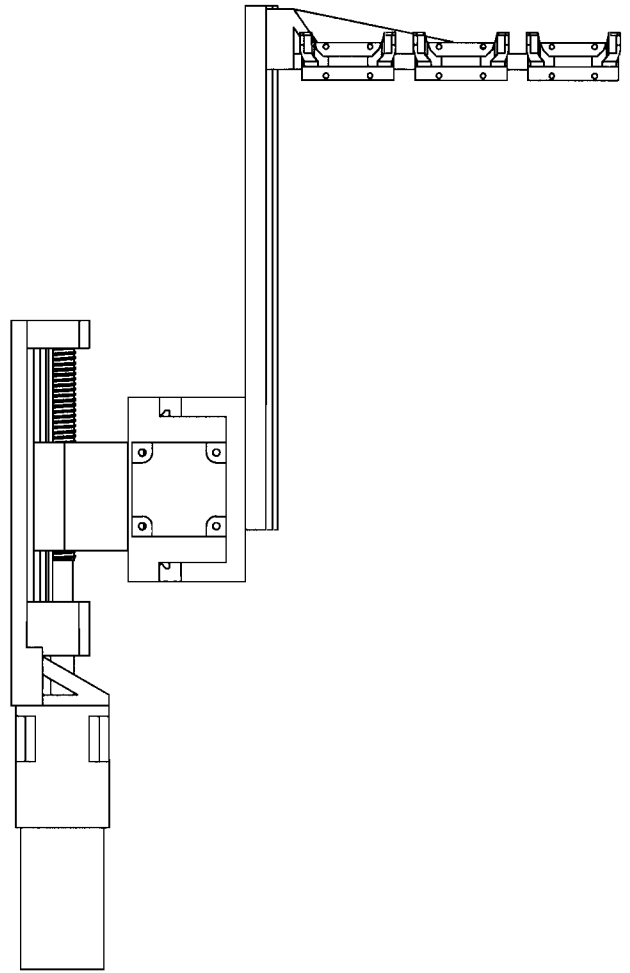


FIGURE 51

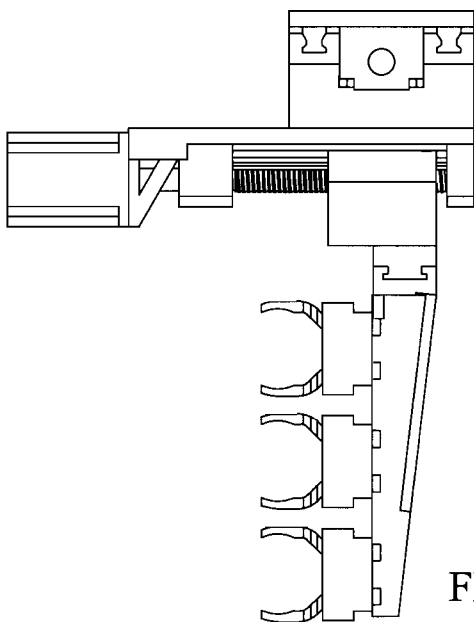


FIGURE 52

**INTERNATIONAL SEARCH REPORT**

International application No PCT/TR2016/000087
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**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. C03B9/36      C03B9/38      C03B9/447  
 ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**  
 Minimum documentation searched (classification system followed by classification symbols)  
 C03B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
 EPO-Internal, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 807 419 A (RODRIGUEZ-WONG GASPAR [MX] ET AL) 15 September 1998 (1998-09-15) claim all; figures 3,4	1-12
X	US 2003/221456 A1 (LEIDY D WAYNE [US] ET AL) 4 December 2003 (2003-12-04) claim all; figures 2-6	1-12

Further documents are listed in the continuation of Box C.       See patent family annex.

\* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search  14 November 2016	Date of mailing of the international search report  21/11/2016
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  Marrec, Patrick
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/TR2016/000087

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5807419	A	15-09-1998	NONE
US 2003221456	A1	04-12-2003	AR 040103 A1 16-03-2005
			AU 2003204447 A1 18-12-2003
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