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(54) Titre : DISPOSITIF DE CONVERSION D'ENERGIE A MOUVEMENT ALTERNATIF DE DISQUE  
(54) Title: RING DISK RECIPROCATING POWER CONVERSION DEVICE

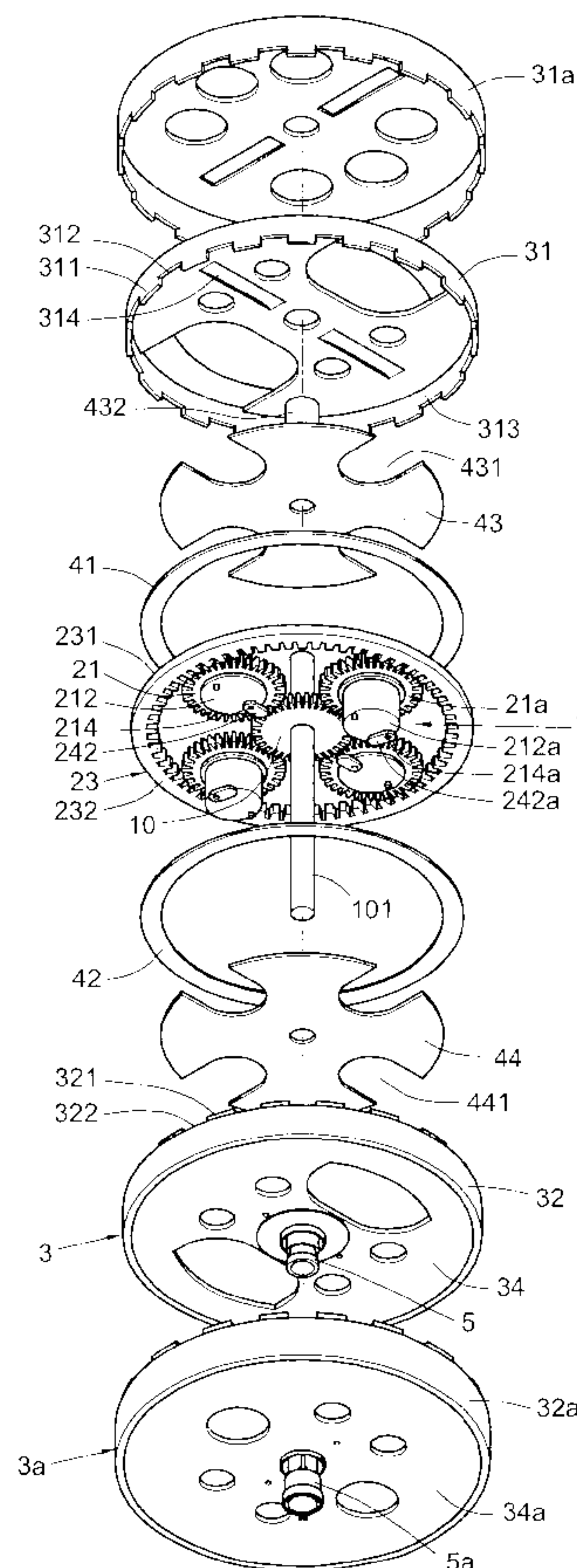


图 1 / Fig. 1

(57) Abrégé/Abstract:

A disk reciprocating power conversion device comprises a planetary gear set and more than one eccentric control disk group. The eccentric control disk group comprises a rotating disk pivotally disposed at an opposite end of the planetary gear set, and the

(57) **Abrégé(suite)/Abstract(continued):**

rotating disk is capable of being guided by rotation of most planetary gears of the planetary gear set, so that the rotating disk reciprocates and rotates in certain amplitude. An annular chamber is formed around the disk at an interval, and the annular chamber accommodates a medium capable of forming a pressure. At least one volume variable chamber is formed in the annular chamber at intervals. Spacers are disposed at the periphery of the disk, and the number of spacers is the same as the number of volume variable chambers, so as to press or suck the medium, thereby adjusting and braking the rotation of the planetary gears.

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(54) Title: DISK RECIPROCATING POWER CONVERSION DEVICE

(54) 发明名称: 环盘往复动力转换装置

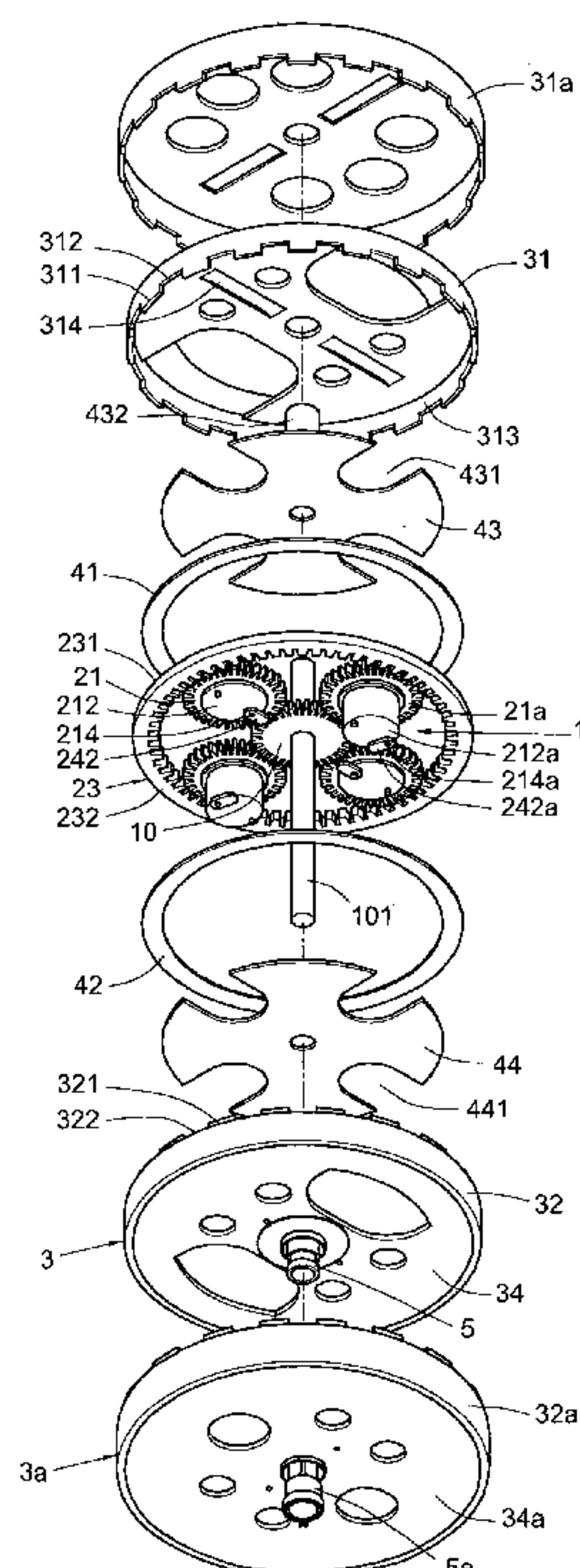


图 1 / Fig. 1

(57) Abstract: A disk reciprocating power conversion device comprises a planetary gear set and more than one eccentric control disk group. The eccentric control disk group comprises a rotating disk pivotally disposed at an opposite end of the planetary gear set, and the rotating disk is capable of being guided by rotation of most planetary gears of the planetary gear set, so that the rotating disk reciprocates and rotates in certain amplitude. An annular chamber is formed around the disk at an interval, and the annular chamber accommodates a medium capable of forming a pressure. At least one volume variable chamber is formed in the annular chamber at intervals. Spacers are disposed at the periphery of the disk, and the number of spacers is the same as the number of volume variable chambers, so as to press or suck the medium, thereby adjusting and braking the rotation of the planetary gears.

(57) 摘要: 一种环盘往复动力转换装置, 包括一行星齿轮组及一以上的偏心控制盘组, 该偏心控制盘组包含一枢置于行星齿轮组的相对端的转盘, 能接受行星齿轮组的多行星轮自转所导引, 而使转盘进行一定振幅的往复转动, 且转盘周围间隔形成一环形腔室, 该环形腔室容置有一能够形成压力的介质, 且环形腔室间隔形成至少一个的可变容积室, 该转盘周边设有等数于可变容积室的间隔件, 能压、吸该介质, 并调节及制动所述行星轮自转。

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## RING DISK RECIPROCATING POWER CONVERSION DEVICE

## BACKGROUND OF THE INVENTION

## 1. Field of the Invention

5 Present invention provides a ring disk reciprocating power conversion device, especially a planetary gear set and an off-center control panel set used to convert power, and more especially a rotary disk of the off-center control panel set used to guide the planet wheel, and a variable volume chamber and spacer used to control the self rotation of the planet wheel. Present invention also relates to an oil resilient torque convertor, a rotation damping decelerator, a  
10 compressor, and a switch chamber type internal combustion engine, which are all built by the ring disk reciprocating power conversion device.

## 2. Description of the Related Art

The traditional power conversion technique is mainly used in the torque conversion on the transportation vehicle. The technique includes a soft oil pressure flowing type torque converting  
15 device, which has two corresponding propeller blades, and one of the propeller blades drives the oil to generate oil eddy to propel another propeller blade in order to reach the purpose of power conversion. However, the propelling force of the propelling blades cannot be fully reflected on the power output of another propelling blade, which results the problem of power lost in the power conversion.

20 Besides, the traditional rotation deceleration technique mainly uses a brake lining to clamp or make a friction against the axle or the wheel frame to decelerate. However, after long time clamping and friction, the brake is very easy to break down due to overheat.

Moreover, the traditional compressor includes piston type and scroll type. The compressing and drawing efficiency of scroll type compressor is better than the other one, but the power of  
25 compressing and drawing is not strong enough, which is also hard to improve. Thus, the scroll

type compressor cannot be used when the strong power is needed. The piston type compressor has relatively good power, but only one compressing can be made in one compression cycle, resulting bad efficiency.

5 In addition, traditional combustion engine has a fixed type cylinder, and by way of the explosion power of the fuel, the piston in the cylinder can be driven to push the crank to output the power. However, half of the explosion power pushes against the surface of the piston, and the other half of the explosion power pushes against the cylinder head, which cause 10% power lost. After the power lost, the explosion power will push the piston surface again, which causes time differences for the twice pushing. Thus, the explosion power cannot be fully transformed to the  
10 piston propelling power.

Presently, combining the foresaid techniques of rotation deceleration, compressor, and combustion engine has not been disclosed in the traditional power conversion technique, which means lots of improvement can be made in the future.

## 15 SUMMARY OF THE INVENTION

Present invention aims to overcome the problems of the prior arts as follows:

1. Using two propelling blades via oil to output power, which causes high power lost.
2. Using brake lining to clamp or make a friction against the rotation elements, and the  
overheat due to over-friction, which makes the brake to break down.
- 20 3. The compressing and drawing power and efficiency of the traditional piston type and scroll type compressor cannot be improved.
4. The explosion power of the fuel is partially lost in the cylinder, and the explosion time point differences cause the power of the explosion unable to be fully transformed to the piston propelling power.

25 In order to solve the problems mentioned above, present invention provides a ring disk

reciprocating power conversion device, comprising:

a planetary gear set provided with a solar wheel and a plurality of planet wheels engaged in the periphery of the solar wheel;

at least one off-center control panel set, comprising:

5 a rotary disk pivoted on a center axle of the solar wheel and arranged opposite to the planetary gear set, being able to receive the guiding from self rotation of the planet wheel, forcing the rotary disk to do a reciprocating movement in limited amplitude;

an annular chamber, formed at interval in the periphery of the rotary disk, the annular chamber accommodating a press forming medium, wherein the medium is oil;

10 more than one separation parts, separating the annular chamber to form more than one variable volume chambers; and

equal amount of spacer as the variable volume chambers, movably arranged in the periphery of the rotary disk, being able to enter the variable volume chambers to compress or draw the medium to regulate and stop self rotation of the planet wheel, and being able to  
15 exit the variable volume chambers to release the planet wheel for self rotation.

When the outer power inputs to the solar wheel, the self rotation of the planet wheel can be driven via the solar wheel, and the outer power can be engine powered. The self rotation of the planet wheel guides the rotary disk to do a reciprocating movement, making the planet wheel to do the revolution and without fully reflecting the power of solar wheel. When the spacer enters  
20 the variable volume chamber to regulate and stop the self rotation of the planet wheel, the solar wheel can drive the planet wheel to enhance the revolution force. By increasing the revolution force of the planet wheel, the output of the solar wheel can be increased as well. As such, by way of oil flowing cut-off technique, such as dampening or locking the rotation of the planet wheel, the power output can be controlled, and the power conversion efficiency can be improved.

In fact, the center axle of the solar wheel is provided with a first axial rod, and an end surface of the planet wheel movably hitches a frame piece, and the center axle of the frame piece is provided with a second axial rod. The first axial rod is used as a power input terminal, and the first axial rod can drive the planet wheel to self rotate via the solar wheel, and the second axial rod is used as a power output terminal to transfer the power of revolution of the planet wheel.

In present invention, the outer power can be input to the planet wheel to directly drive the planet wheel. The outer power can be the power of the wheel axle. The rotary disk is guided by the self rotation of the planet wheel to do the reciprocating movement, and the planet wheel does the revolution along the solar wheel. When the spacer enters the variable volume chamber to regulate and stop the self rotation of the planet wheel, the revolution along the solar wheel of the planet wheel can be lowered or stopped, further reducing or stopping the power of the outer wheel axle. By utilizing the damping effect of the oil cut-off, the deceleration of the outer wheel axle can be achieved, and the brake failing duo to overheat will no longer exist.

In fact, the first axial rod can be used as the fixed end to brake the planet wheel, and the second axial rod can be used as the movable end to drive the planet wheel, or vice versa. The movable end can drive the planet wheel to self rotate or do the revolution along the solar wheel.

In another embodiment of the present invention, equal amount of troughs as the spacers are formed in the periphery of the rotary disk. The troughs are able to accommodate the spacer, and the spacer can enter the variable volume chamber via the trough, or enter the trough to exit the variable volume chamber. The center axle of the rotary disk is provided with a casing tube. The casing tube connects the spacer, and the casing tube can drive the spacer to enter or exit the variable volume chamber.

Besides, present invention provides another ring disk reciprocating power conversion device, comprising:

a planetary gear set provided with a solar wheel and a plurality of planet wheels engaged in the periphery of the solar wheel;

at least one off-center control panel set, comprising:

a rotary disk pivoted on a center axle of the solar wheel and arranged opposite to the planetary gear set, being able to receive the guiding from self rotation of the planet wheel, forcing the rotary disk to do a reciprocating movement in limited amplitude;

an annular chamber, formed in interval in the periphery of the rotary disk, and the annular chamber accommodating a press forming medium, wherein the medium is air or coolant;

more than one separation parts, separating the annular chamber to form more than one variable volume chambers; and

equal amount of spacers as the variable volume chambers, fixed to the periphery of the rotary disk, the spacers separating the variable volume chamber and being able to compress or draw the medium.

The spacer and separation part are used to separate the variable volume chamber to form four compressing and drawing chambers. The outer power inputs to the solar wheel, and the planet wheel is driven by the solar wheel. The outer power can be motor powered. The rotary disk is guided by the self rotation of the planet wheel, making the spacer with the rotary to do the reciprocating movement in limited amplitude, and thus compressing or drawing the air or the coolant in the chamber. By the volume changing in every chamber of the variable volume chamber, the compressing and drawing operation can be continuously alternating to compress or draw the air or coolant. Thus, the compressing and drawing power can be improved, and so do the efficiency.

Practically, the center axle of the solar wheel is provided with a fist axial rod which is used

as the power input terminal. Or, the medium of present invention can be fuel oil, and the fuel oil can be ignited in one of the variable volume chambers to generate the explosion power. The explosion power drives the spacer to further drive the rotary disk to do the reciprocating movement in limited amplitude, which results in the self rotation of the planet wheel. The self rotation of the planet wheel drives the solar wheel to output the power. Meanwhile, the spacer compresses the fuel oil in another chamber of the variable volume chamber. By those described above, the chamber can be used as drawing chamber, compressing chamber, explosion chamber, and emission chamber, and the planet wheel can be driven and continuously drives the solar wheel to output the power, improving the power output efficiency from converting the explosion power of the fuel oil. The center axle of the planet wheel is pivoted in a fixed position around the periphery of the solar wheel, or the center axle of the planet wheel uses the rotary disk as a fixed end to pivot the planet wheel around the periphery of the solar wheel. Or, the center axle of the planet wheel uses the gear rim as a fixed end to pivot the planet wheel around the solar wheel.

In one embodiment of the present invention, the off-center control panel set is provided with a shell, an interior wall of the shell is provided with a corresponding first engagement part and a second engagement part, the planetary gear set is pivoted on the first engagement part, the rotary disk is pivoted on the second engagement part, and the annular chamber is formed between the outer periphery of the rotary disk and the interior wall of the shell, and one side of the rotary disk is corresponding to the planetary gear set.

In another embodiment, present invention further comprises:

a plurality of first guiding grooves, using the solar wheel as a center and formed in the first engagement part in a radical shape, respectively;

two end surfaces of the planet wheel being provided with an eccentric axis respectively, the eccentric axis being arranged on both sides of the center axle of the planet wheel respectively;

and

a plurality of second guiding grooves, using the center axle of the rotary disk as a center and formed in the plate surface in a radical shape, the planet wheel via the eccentric axis being guided by the first guiding groove and the second guiding groove respectively to rotate, the rotary disk  
5 being guided by the eccentric axis to do the reciprocating movement via the second guiding groove.

The eccentric axis is pivoted with a sliding member, and the sliding member is slidably arranged in the guiding groove. The separation part is formed in the interior of the shell.

In still another embodiment, the ring disk reciprocating power conversion device has four  
10 planet wheels, which are arranged on the periphery of the solar wheel, respectively, the ring disk reciprocating power conversion device having two off-center control panel sets, each of the off-center control panel sets leading two planet wheels to self rotate respectively, the ring disk reciprocating power conversion device having two separation parts, the two separation parts separating the annular chamber to form two variable volume chambers. The outer periphery of  
15 the planet wheel engages a self-rotatable gear rim, the two end surfaces of the gear rim are provided with a ring, respectively, the planet wheel is situated between the rings, the two end surfaces of the planet wheel movably hitching a frame piece, respectively, and the frame piece situated in the ring.

In order to facilitate the movement for the separation part in the medium, the sectional view  
20 of the separation part is H shape.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The invention is illustrated by way of example, and not by way of limitation, in the figures of the accompanying drawings in which like reference numerals refer to similar elements and in

which:

FIG. 1 is an exploded view of the first embodiment of present invention;

FIG. 2 is a front view of the present invention;

FIG. 3 is a side view of FIG. 2;

5 FIG. 4 is an A-A sectional view of FIG. 3;

FIG. 5 is a B-B sectional view of FIG. 2;

FIG. 6 is a C-C sectional view of FIG. 2;

FIG. 7 is a partially enlarged view of the planetary gear set in FIG. 1;

FIG. 8 is an exploded view of one of the off-center control panel set in FIG. 1;

10 FIG. 9 is an exploded view of another off-center control panel set in FIG. 1;

FIG. 10 is a D-D sectional view of FIG. 3;

FIG. 11 is a schematic view in operating the apparatus of FIG. 4;

FIG. 12 is a schematic view in operating the apparatus of FIG. 4;

FIG. 13 is a schematic view in operating the apparatus of FIG. 4;

15 FIG. 14 is one of a schematic view in operating the apparatus of FIG. 10;

FIG. 15 is one of a schematic view in operating the apparatus of FIG. 10;

FIG. 16 is a schematic view in operating the apparatus of FIG. 5;

FIG. 17 is another schematic view in operating the apparatus of FIG. 10;

FIG. 18 is an exploded view of the second embodiment of the present invention;

20 FIG. 19 is an exploded view of the third embodiment of the present invention; and

FIG. 20 is an exploded view of the fourth embodiment of the present invention.

#### DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 discloses the exploded view of the first embodiment of present

invention. FIGS. 1, 2, and 7 disclose the ring disk reciprocating power conversion device of present invention, which includes a planetary gear set 1 and at least one off-center control panel set 3. The planetary gear set 1 is provided with a solar wheel 10 and a plurality of planet wheels 21, 21a engaged in the periphery of the solar wheel 10. In the present embodiment, the quantity of the planet wheels 21, 21a can be four, which are provided in the periphery of the solar wheel 10 with equal interval, and thus making a 180 degrees angle between the planet wheels 21, 21a which arranged in both sides of the solar wheel 10. The angle between planet wheels 21a is also 180 degrees. Planet wheels 21 are defined as a first group, and planet wheels 21a are defined as second group. The periphery of the first group planet wheel 21 and the second group planet wheel 21a engage to a self-rotatable gear rim 23, making the planet wheels 21, 21a movably arranged in the periphery of the solar wheel 10. Two end surfaces 231, 232 of gear rim 23 are provided with rings 41, 42, respectively. The planet wheels 21, 21a are situated between the rings 41, 42, and the rings 41, 42 can clamp the position where the planet wheels 21, 21a engage to the gear rim 23. First axial parts 211, 211a and second axial parts 212, 212a are provided on the two end surfaces of the planet wheels 21, 21a, respectively, as shown in FIG. 8 and FIG. 9. The first axial parts 211, 211a and the second axial parts 212, 212a of the planet wheels 21, 21a movably hitch a first frame piece 43 and a second frame piece 44, respectively.

The first frame part 43 is formed as a round plate shape, and first frame slots 431 which has equal amount as the planet wheels 21, 21a are formed in the edge of the first frame part 43. The first axial parts 211, 211a are pivoted in the first frame slots 431, and the first frame part 43 is pivoted in the ring 41. The second frame part 44 is also formed as a round plate shape, and second frame slots 441 which is equal amount as the planet wheel 21, 21a is formed in the edge

of the frame part 44. The first axial parts 212, 212a are pivoted in the second frame slot 441, and the second frame piece 44 is pivoted in the ring 42. A first axial rod 101 is provided on a center axle of the solar wheel 10. The center axle of the solar wheel 10 means the axle of the rotation center of the solar wheel 10. A second axial rod 432 is provided on the center axle of the first frame piece 43, and the center axle means the axle of the rotation center of the first frame piece 43. The solar wheel 10 and the first frame piece 43 are arranged in the same axis line. A through hole 433 is formed in the second axial rod 432, and one end of the first axial rod 101 is pivoted in the through hole 433. The top surface of the first axial parts 211, 211a of the planet wheels 21, 21a are provided with first eccentric axes 213, 213a. The top surface of the second axial parts 212, 212a of the planet wheels 21, 21a are provided with second eccentric axes 214, 214a. The first eccentric axes 213, 213a and the second eccentric axes 214, 214a are arranged in both sides of the center axle of the planet wheels 21, 21a, respectively. The center axles of the planet wheels 21, 21a mean the axles of the rotation center of the planet wheels 21, 21a. A 180 degrees included angle is formed between the first eccentric axes 213, 213a and the second eccentric axes 214, 214a. The first eccentric axes 213, 213a are pivoted with rectangle shaped first sliding members 241, 241a, and the second eccentric axes 214, 214a are pivoted with rectangle shaped second sliding members 242, 242a.

The off-center control panel set 3 includes a shell 30, a rotary disk 35, an annular chamber 36, more than one separation parts 37, more than one variable volume chambers 38, and equal amount of spacers 39 as the variable volume chambers 38. The shell 30 is formed as a cylindrical shape, and further provided with a containing room 300. The interior wall of the containing room 300 is provided with a corresponding first engagement part 301 and a second engagement part 302. The planetary gear set 1 is arranged in the containing room 300, and further pivoted in the first engagement part 301 via the first axial rod 101 and second axial rod 432. The second axial rod 432 extends to outside the shell 30 via the first engagement part 301. The shell 30 can be

composed of a ring housing 31, a ring cover 32, and a round shape lower cover plate 34. A cover opening 313 is formed on one end of the ring housing 31. A first opening 323 and a second opening 324 are formed on both ends of the ring cover 32. The cover opening 313 of the ring housing 31 and the first opening 323 of the ring cover 32 embed each other via a plurality of  
 5 teeth 311, 321 and groove parts 312, 322, making the interior of the ring housing 31 and the interior of the ring cover 32 connected to form the containing room 300. The lower cover plate 34 is pivoted in the second opening 324 of the ring cover 32 to close the containing room 300. The first engagement part 301 is provided in the interior wall of the ring housing 31, and the planetary gear set 1 is accommodated in the ring housing 31. The second engagement part 302 is arranged  
 10 in the second opening 324.

The rotary disk 35 is arranged in the containing room 300 and provided with a first plate surface 351 and a second plate surface 352, as shown in FIG. 8. The second plate surface 352 is fixed on the lower cover plate 34. The rotary disk 35 is pivoted in the second engagement part 302 via the lower cover plate 34, and further pivoted on the center axle of the solar wheel 10.  
 15 Thus, the rotary disk 35 is arranged opposite to the planetary gear set 1, and the first plate surface 351 of the rotary disk 35 corresponds to the planetary gear set 1. An upper cover plate 33 is fixed on the first plate surface 351. Besides, the first axial rod 101 extends outside the shell 30 via the second engagement part 302, and the upper cover plate 33, rotary disk 35, and the lower cover plate 34 are coaxial pivoted on the first axial rod 101. The rotary disk 35 can be guided by the  
 20 self rotation of the planet wheel 21, as shown in FIG. 12 and 13, and the rotary disk 35 can do reciprocating movement with limited amplitude, as shown in FIGS. 14 and 15. In fact, the present invention further includes a plurality of first guiding grooves 314 and second guiding grooves 331. Using the solar wheel 10 as the center, the first guiding groove 314 is formed in the first engagement part 301 in a radical shape. The first eccentric axis 213 of the first planet wheel 21 is  
 25 slidably arranged in the first guiding groove 314 via the first sliding member 214. Using the

center axle of the rotary disk 35 as the center, the second guiding groove 331 is formed in the upper cover plate 33 of the first plate surface 351 in a radial shape. The second eccentric axis 214 of the first planet wheel 21 is slidably arranged in the second guiding groove 331 via the second sliding member 242. Thus, the first planet wheel 21 can be guided by the first guiding groove 314 and the second guiding groove 331 to self rotate via the first eccentric axis 213 and the second eccentric axis 214, and the rotary disk 35 can be guided by the second eccentric axis 214 to do the reciprocating movement via the second guiding groove 331.

The annular chamber 36 is formed at intervals in the periphery of the rotary disk 35. In fact, the annular chamber 36 is separated to between the outer peripheral wall of the rotary disk 35 and the interior wall of the containing room 300 of the shell 30 by the upper cover plate 33 and the lower cover plate 34, as shown in FIG. 10. The interior of the annular chamber 36 can accommodate a pressure forming medium, which can be oil in the present embodiment. The separation part 37 is formed in the interior wall of the ring cover 32 of the shell 30, as shown in FIG. 8. Thus, the separation part 37 is arranged in the containing room 300. The separation part 37 separates the annular chamber 36 to form the variable volume chamber 38. In the present embodiment, the number of the separation part 37 can be two, and the separated annular chamber 36 forms two variable volume chambers 38.

The spacer 39 is movably arranged in the periphery of the rotary disk 35. Actually, equal amount of containing troughs 353 as the spacers 39 are formed in the periphery of the rotary disk 35. The containing trough 353 connects the variable volume chamber 38 and accommodates the spacer 39. Thus, the spacer 39 can enter the variable volume chamber 38 via the containing trough 353, as shown in FIG. 17, and do the reciprocating movement in limited amplitude with the rotary disk 35 to push or draw the medium to regulate and stop the self rotation of the first planet wheel 21. The spacer 39 can also return to the containing trough 353 to depart from the variable volume chamber 38, as shown in FIG. 16, and further releases the first planet wheel 21

to self rotate. Besides, the center axle of the rotary disk 35 is provided with a casing tube 5. The center axle of the rotary disk 35 means the rotation center of the rotary disk 35. The casing tube 5 and the spacer 39 can connect to each other by a rope. The casing tube 5 can move in accordance with the rotation direction of the rotary disk 35, and further drives the spacer 39 to enter or exit the variable volume chamber 38. In the present embodiment, the number of the spacer can be two. The cross section of the spacer 39 can be “H” shape, which benefits the movement of the spacer 39 in the medium. The variable volume chamber 38 is the operating section of the high positive pressure oil and the high negative pressure oil. Thus, the oil leaking between the variable volume chamber 38 and operating elements is hard to avoid. In order to replenish the oil into the variable volume chamber 38, equal amount of via holes 342 as the containing troughs 353 are formed on the lower cover plate 34, and the via hole 342 connects the containing trough 353 to outside. Thus, the oil can be supplied to the containing trough 353 via the via hole 342, and the oil can also be guided into the variable volume chamber 38 by the spacer 39 which has H shape cross section.

Besides, present embodiment adopts two off-center control panel set 3, 3a, as shown in FIG. 9. The off-center control panel 3 is defined as the first set, and the off-center control panel 3a is defined as the second set. According to the operating method mentioned above, the second off-center control panel 3a is arranged on the outer periphery of the first off-center control panel 3 to guide the second planet wheel 21a to self rotate. The difference is that the upper cover plate 33, the rotary disk 35, and the lower cover plate 34 of the first off-center control panel 3 form equal amount of ports 332, 354, and 341 as the second planet wheel 21a, and the second axial part 212a of the second planet wheel 21a extends to the outside of the lower cover plate 34 of the first off-center control panel 3 in order to be guided by the rotary disk 35a of the second off-center control panel 3a. Except the differences mentioned above, the assembly of the ring housing 31a, the upper cover plate 33a, ring cover 32a, lower cover plate 34a, spacer 39a and

casing tube 5a are the same as the first off-center control panel 3.

The method describe above can be used in the torque conversion of the transportation vehicle. The first axial rod 101 can be used as the exterior engine power input terminal, and the second axial rod 432 can be used as the engine power output terminal. When the spacer 39 not yet enters the variable volume chamber 38 to cut off the oil, as shown in FIG. 10, and the exterior engine power input via the first axial rod 101 and solar wheel 10, as shown in FIGS. 11 and 12, the revolution and self rotation of the first planet wheel 21 and the second planet wheel 21a can be driven by the solar wheel 10. At the same time, the first planet wheel 21 self rotates and guides the rotary disk 35 of the first off-center control panel set 3 to do the reciprocating movement. Meanwhile, the first guiding groove 314 arranged in the shell 30 restricts the first sliding member 241 of the first eccentric axis 213 to move in the first guiding groove 314, as shown in FIG. 13. The second guiding groove 331 which swings with the rotary disk 35 can restrict the second sliding member 242 of the second eccentric axis 214 to move in the second guiding groove 331, and further makes the first planet wheel 21 to self rotate. At this time, the revolution and the self rotation of the planet wheel 21 are in a balance condition, and the power output from the solar wheel 10 cannot be fully released. The first eccentric axis 213 moves with the rotation of the planet wheel 21, and via the first guiding groove 314 to guide the shell 30 to do the reciprocating movement in limited amplitude, as shown in FIGS. 14 and 15. The second eccentric axis moves with the rotation of the planet wheel 21, and via the second guiding groove 331 to guide the rotary disk 35 to do the reciprocating movement in limited amplitude, which makes a pendulum like reciprocating movement between the shell 30 and the rotary disk 35.

When the spacer 39 partially enters the variable volume chamber 38 to cut off the oil, as shown in FIG. 16, the spacer 39 can do the reciprocating movement with the rotary disk 35 to push or draw the medium, making the medium to form oil pressure, which dampens the relative reciprocating movement between the shell 30 and the rotary disk 35, forcing the planet wheel 21

not being able to freely self rotate. Thus, the rotation force of the planet wheel 21 will increase with the revolution of the solar wheel 10, and the torque used to output the power from the planet wheel 21 via the second axial rod 432 will be increased. As such, the self rotation of the first planet wheel 21 and the revolution with the solar wheel 10 can be regulated, and the torque  
5 output can also be controlled by regulating the dampening force.

When the spacer 39 fully enters the variable volume chamber 38 to cut off the oil, as shown in FIG. 17, the variable volume chamber 38 is separated into 4 oil pressure chambers 381, 382, 383, 384, forcing the planet wheel 21 to be fully locked and not being able to self rotate. The planet wheel 21 does the revolution with the solar wheel 10 and fully responses the power of the solar wheel 10, and further outputs the power of the solar wheel 10 via the planet wheel 21 and the second axial rod 432. At this time, the revolution power of the planet wheel 21 is the same as the power of the solar wheel 10, and the power can be output via the torque generated by the revolution of the planet wheel 21. When the exterior engine power drives the second planet wheel 21a via the solar wheel 10, the second planet wheel 21a is also guided by the rotary disk 35a of  
10 the second off-center control panel set 3a, and the operation principle is the same as previous disclosure. When the first eccentric axis 213 and the second eccentric axis 214 of the first planet wheel 21 rotate without dampening force generating, the first eccentric axis 213a and the second eccentric axis 214a of the second planet wheel 21a have the maximum dampening force. Therefore, the driving force of dampening generated by the first planet wheel 21 and the second  
15 planet wheel 21a is a composite function of sine function and cosine function, and which means the driving force always exist.

Present invention can control the output of the driving force by cutting off the oil or locking the planet wheels 21, 21a with damping. Present invention is a rigid hydraulic oil resistance torque converter, which is able to totally cut off the oil flowing, and  
20 the driving force can completely be reflected on the output power, lowering the power lost to

nearly zero after the power conversion. Present invention can be applied to light or heavy mechanical equipment to enhance the power conversion efficiency and save lots of energy.

Please refer to FIG. 18, the difference between the cross-section view of the second embodiment and the first embodiment of the present invention is that in the second embodiment, the first axial rod 101 can be arranged in a fixed base to be a fixed end, which restricts the rotation of the solar wheel 10. The second axial rod 432 can be a movable end which drives the planet wheels 21, 21a, as shown in FIGS. 5 and 6. The movable end can connect an exterior rotation mechanism and drive the planet wheels 21, 21a to do the revolution and self rotation along the solar wheel 10, and other elements or configuration are the same as the first embodiment. The operation principle as described above can be applied to the rotation deceleration of the transportation vehicle. An axle 6 is used as the rotation mechanism in the present embodiment. When the power of the axle 6 inputs via the second axial rod 432 and the planet wheels 21, 21a, the planet wheels 21, 21a can be directly driven, and the rotary disks 35, 35a will do the reciprocating movement by the guiding of the self rotation of the planet wheels 21, 21a, and the planet wheels 21, 21a will do the revolution along the solar wheel 10.

When the spacers 39, 39a partially enter the variable volume chamber 38 (see FIG. 16), the damping force of the oil will slow down the self rotation of the planet wheels 21, 21a, and so do the revolution of the planet wheels 21, 21a along the solar wheel 10, thus generating dampening force to slow down the axle 6. When the spacers 39, 39a fully enter the variable volume chamber 38 (see FIG. 17), the oil flowing in the chambers 381, 382, 383, 384 is completely cut off, which locks the planet wheels 21, 21a with the solar wheel 10 and further stops the axle 6. Thus, by regulating the dampening force, the power input from the axle 6 can be dampened and the power of the axle 6 can be diminished. Other operation principles are the same as the first embodiment of the present invention. In the present embodiment, the dampening force of the oil can be used for deceleration. When the dampening force completely applied, the power will translate to the

pressing force for compressing the oil, therefore only the friction heat of the flowing oil and the oil compressing heat will be generated. The heat will disperse in the whole annular chamber 36 to avoid the friction heat that concentrated on the friction surface of the traditional brake lining, and in addition to avoid the accidentally locked-up of rotation.

5 Please refer to FIG. 19, the difference between the cross-section view of the third embodiment and the first embodiment of the present invention is that the spacer 39b is integral as a whole or fixed to the periphery of the rotary disk 35b, and the spacer 39 separates the variable volume chamber 38 to compress or draw the medium. The first axial rod 101 of the solar wheel 10 is used as power input terminal, and other elements and configurations are the same as the first  
10 embodiment. The operation principle as described above can be applied to a compressor. The separation part 37 and the spacer 39b separate the variable volume chamber 38 into four compressing and drawing chambers 381, 382, 383, 384, and the medium in the present embodiment can be air or coolant. The chambers 381, 382, 383, 384 are connected to the inlet or outlet pipes, respectively. When the power of a motor drives the planet wheels 21, 21a to self  
15 rotate via the first axial rod 101 and the solar wheel 10, the rotary disk 35b is guided by the self rotation of the planet wheels 21, 21a, making the spacer 39b to do the reciprocating movement with the rotary disk 35b in limited amplitude, and further reciprocatingly compress and drawing the air or coolant in the chambers 381, 382, 383, 384 in sequence. Air and coolant are discharged via output pipes after being compressed.

20 Besides, the numbers of compressing and drawing in a rotation cycle can be set by the gear ratio of the solar wheel 10 and the planet wheels 21, 21a, and the numbers of the variable volume chambers 38. For example, the gear ratio is 1:1, and the variable chamber 38 is separated into four chambers 381, 382, 383, 384. One circle rotation of the solar wheel 10 also makes the planet wheels 21, 21a to rotate one circle as well. As such, four compressions and drawings can be made,  
25 and the other operation principles are the same as the first embodiment. By the volume changing

of the chambers 381, 382, 383, 384 of the variable volume chamber 38, the compressed and drew operation are continuously and alternately changing, to achieve the goal of push-out and draw-in the air or the coolant, and further improves the compress-draw power, as well as the compress-draw efficiency.

5 Please refer to FIG. 20, the difference between the cross-section view of the fourth embodiment and the third embodiment of the present invention is that the center axle of the planet wheels 21, 21a can be pivoted on the first engagement part 301, as shown in FIGS. 5 and 6, and thus situated on the periphery of the solar wheel 10. Or, the center axle of the planet wheels 21, 21a can use the rotary disk 35b as a fixed end, and the planet wheels 21, 21a are pivoted on  
10 the periphery of the solar wheel 10. Or, the center axle of the planet wheels 21, 21a can also use the gear ring 23 as a fixed end, and the planet wheels 21, 21a are pivoted on the periphery of the solar wheel 10. The first axial rod 101 of the solar wheel 10 is used as the power output terminal, and other elements or configurations are the same as the third embodiment of the present invention. Present embodiment can be applied to the switch chamber type internal combustion  
15 engine. The chambers 381, 382, 383, 384 can be used as the combustor of the cylinder. The medium can be fuel oil. The chambers 381, 382, 383, 384 are connected to the inlet or outlet pipes for the fuel oil, respectively. The spacer 39b in the present embodiment can be used as piston. Therefore, there will be two volume decreased chambers and two volume increased chambers among the chambers 381, 382, 383, 384 at the same time. The fuel can be ignited in the  
20 chamber 381 of the variable volume chamber 38 to generate the explosive force, as shown in FIG. 9. The explosive force drives the spacer 39b to extend the chamber 381, making the spacer 39b to drive the rotary disk 35b to do the reciprocating movement in limited amplitude, which further guides the planet wheels 21, 21a to self rotate. By the self rotation of the planet wheels 21, 21a, the solar wheel 10 and the first axial rod 101 can be driven to output the power. Meanwhile, the  
25 spacer 39b compresses the chamber 382 to force the chamber 382 to discharge the exhaust gas

generated by burning fuel oil. The spacer 39b extends another chamber 383, forcing the chamber 383 to draw in the fuel oil. The spacer 39b compresses another chamber 384 to force the chamber 384 to compress the fuel oil. By way of this, drawing, compressing, explosion, and emission of the internal combustion can continuously and orderly happen, which can continuously drive the planet wheels 21, 21a to force rotation of the solar wheel 10. Other elements and configurations are the same as the third embodiment.

Thus, the chambers 381, 382, 383, 384 can be used as an air-drawing chamber, a compressing chamber, an explosion chamber, and an emission chamber, respectively. By continuously driving the planet wheels 21, 21a, the solar wheel 10 and the first axial rod 101 can be driven to output the power. The enhancement of the explosion power of the fuel oil can be transformed to improve the power output efficiency. Besides, the spacer 39b is a movable element for doing the reciprocating movement in limited amplitude. The explosion power can simultaneously drive every spacer 39b, and so do the same planet wheels 21, 21a to generate the self rotation of the planet wheels 21, 21a. Thus, the explosion power can completely transformed to the self rotation propelling power of the planet wheels 21, 21a, and the power lost is zero, which can improve the fuel burning efficiency and save energy.

While the invention has been described in connection with a number of embodiments and implementations, the invention is not so limited but covers various obvious modifications and equivalent arrangements, which fall within the purview of the appended claims. Although features of the invention are expressed in certain combinations among the claims, it is contemplated that these features can be arranged in any combination and order.

## WHAT IS CLAIMED IS:

1. A ring disk reciprocating power conversion device, comprising:

a planetary gear set provided with a solar wheel and a plurality of planet wheels engaged in the periphery of the solar wheel; and

5 at least one off-center control panel set, comprising:

a rotary disk pivoted on a center axle of the solar wheel and arranged opposite to the planetary gear set, being able to receive guiding from self rotation of the planet wheel, forcing the rotary disk to do a reciprocating movement in limited amplitude;

10 an annular chamber, formed at interval in a periphery of the rotary disk, the annular chamber accommodating a press forming medium, wherein the medium is oil;

more than one separation part, separating the annular chamber to form more than one variable volume chamber; and

15 equal amount of spacer as the variable volume chamber, movably arranged in the periphery of the rotary disk, being able to enter the variable volume chamber to compress or draw the medium to regulate and stop the self rotation of the planet wheel, and being able to leave the variable volume chamber to release the planet wheel for the self rotation.

20 2. The ring disk reciprocating power conversion device according to claim 1, wherein the center axle of the solar wheel is provided with a first axial rod, an end surface of the planet wheel movably hitches a frame piece, and the center axle of the frame piece is provided with a second axial rod.

3. The ring disk reciprocating power conversion device according to claim 2, wherein the first axial rod is used as a power input terminal, the first axial rod can drive the planet wheel to self rotate via the solar wheel, and the second axial rod is used as a power output terminal to transfer the power of revolution of the planet wheel.

25 4. The ring disk reciprocating power conversion device according to claim 1, wherein equal

amount of containing trough as the spacer is formed in the periphery of the rotary disk to accommodate the spacer, and the spacer can enter the variable volume chamber via the trough or enter the trough to leave the variable volume chamber.

5 5. The ring disk reciprocating power conversion device according to claim 1, wherein the center axle of the rotary disk is provided with a casing tube, and the casing tube connects to the spacer to drive the spacer to enter or exit the variable volume chamber.

6. A ring disk reciprocating power conversion device, comprising:

a planetary gear set provided with a solar wheel and a plurality of planet wheels engaged in the periphery of the solar wheel;

10 at least one off-center control panel set, comprising:

a rotary disk pivoted on a center axle of the solar wheel and arranged opposite to the planetary gear set, being able to receive the guiding from self rotation of the planet wheel, forcing the rotary disk to do a reciprocating movement in limited amplitude;

15 an annular chamber, formed at interval in the periphery of the rotary disk, the annular chamber accommodating a press forming medium, wherein the medium is fuel oil;

more than one separation part, separating the annular chamber to form more than one variable volume chamber; and

20 equal amount of spacer as the variable volume chamber, fixed to the periphery of the rotary disk, the spacer separating the variable volume chamber and being able to compress or draw the medium.

7. The ring disk reciprocating power conversion device according to claim 6, wherein the center axle of the planet wheel is pivoted in a fixed position on the periphery of the solar wheel.

8. The ring disk reciprocating power conversion device according to claim 1 or 6, wherein the off-center control panel set is provided with a shell, an interior wall of the shell is provided with a corresponding first engagement part and a second engagement part, the planetary gear set  
25

is pivoted on the first engagement part, the rotary disk is pivoted on the second engagement part, the annular chamber is formed between the periphery of the rotary disk and the interior wall of the shell, and one side of the rotary disk is corresponding to the planetary gear set.

5 9. The ring disk reciprocating power conversion device according to claim 8, further comprising:

a plurality of first guiding grooves, using the solar wheel as a center and formed in the first engagement part in a radical shape, respectively;

two end surfaces of the planet wheel being provided with an eccentric axis respectively, the eccentric axes being arranged on both sides of the center axle of the planet wheel respectively;  
10 and

a plurality of second guiding grooves, using the center axle of the rotary disk as a center and formed in the plate surface in a radical shape, the planet wheel via the eccentric axes being guided by the first guiding grooves and the second guiding grooves respectively to rotate, the rotary disk being guided by the eccentric axes to do the reciprocating movement via the second  
15 guiding grooves.

10. The ring disk reciprocating power conversion device according to claim 9, wherein the eccentric axis is pivoted with a sliding member, and the sliding member is slidably arranged in the first or the second guiding groove.

11. The ring disk reciprocating power conversion device according to claim 1 or 6, further  
20 comprising four planet wheels arranged on a periphery of the solar wheel, two off-center control panel sets, each of the off-center control panel sets leading two planet wheels to self rotate respectively, and two separation parts separating the annular chamber to form two variable volume chambers.

12. The ring disk reciprocating power conversion device according to claim 1 or 6, wherein  
25 the outer periphery of the planet wheel engages a self-rotatable gear rim, the two end surfaces of

the gear rim are provided with a ring, respectively, the planet wheel is situated between the rings, the two end surfaces of the planet wheel movably hitching a frame piece, respectively, the frame piece situated in the ring.

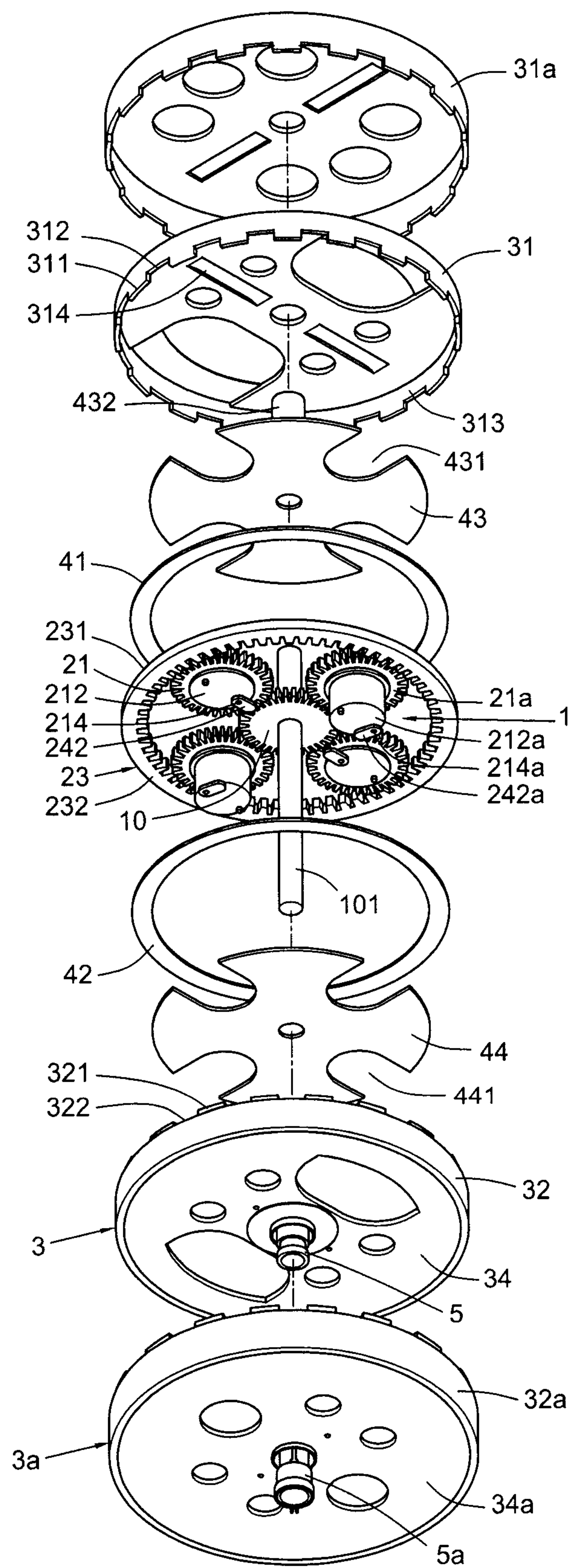


Fig. 1

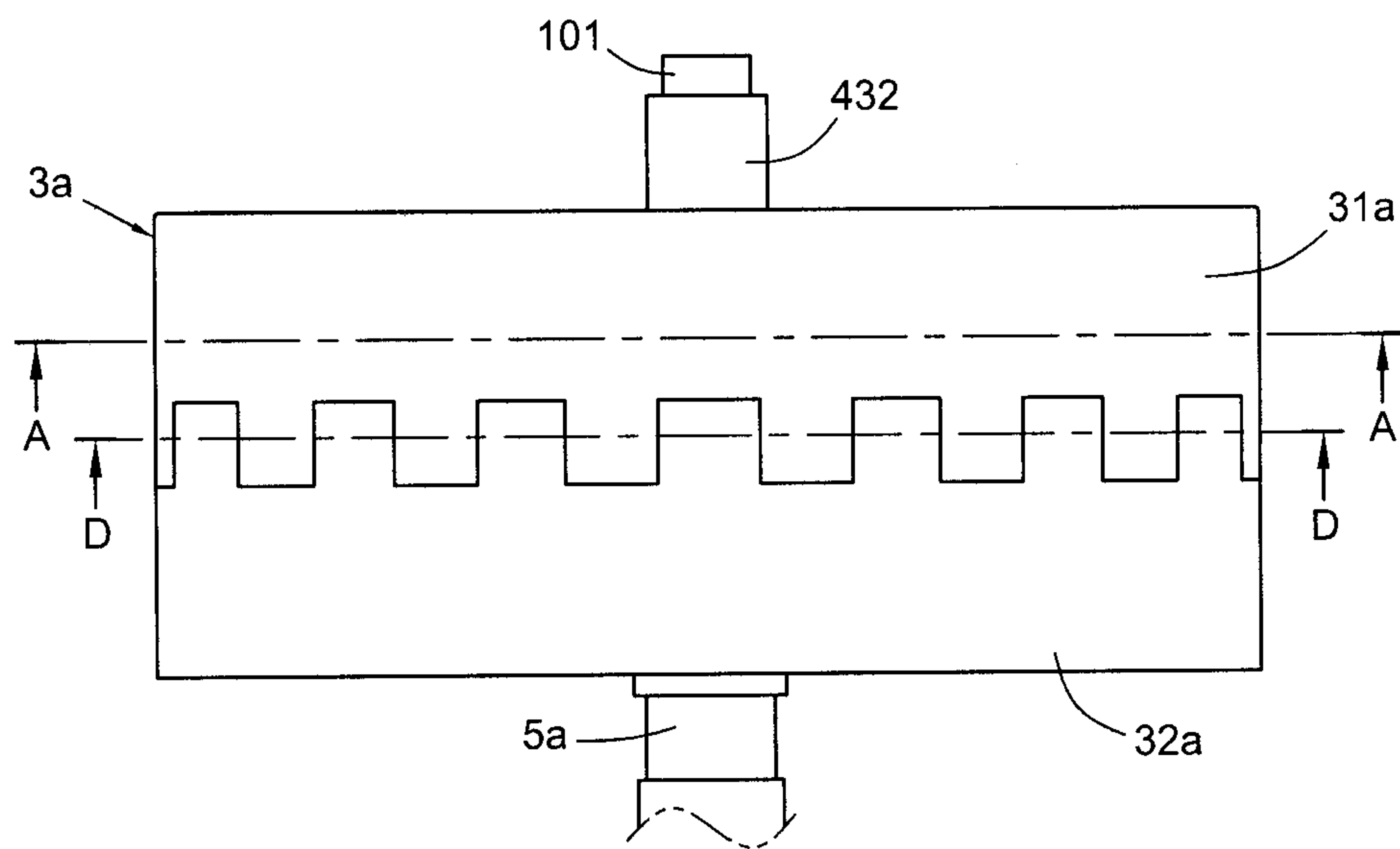
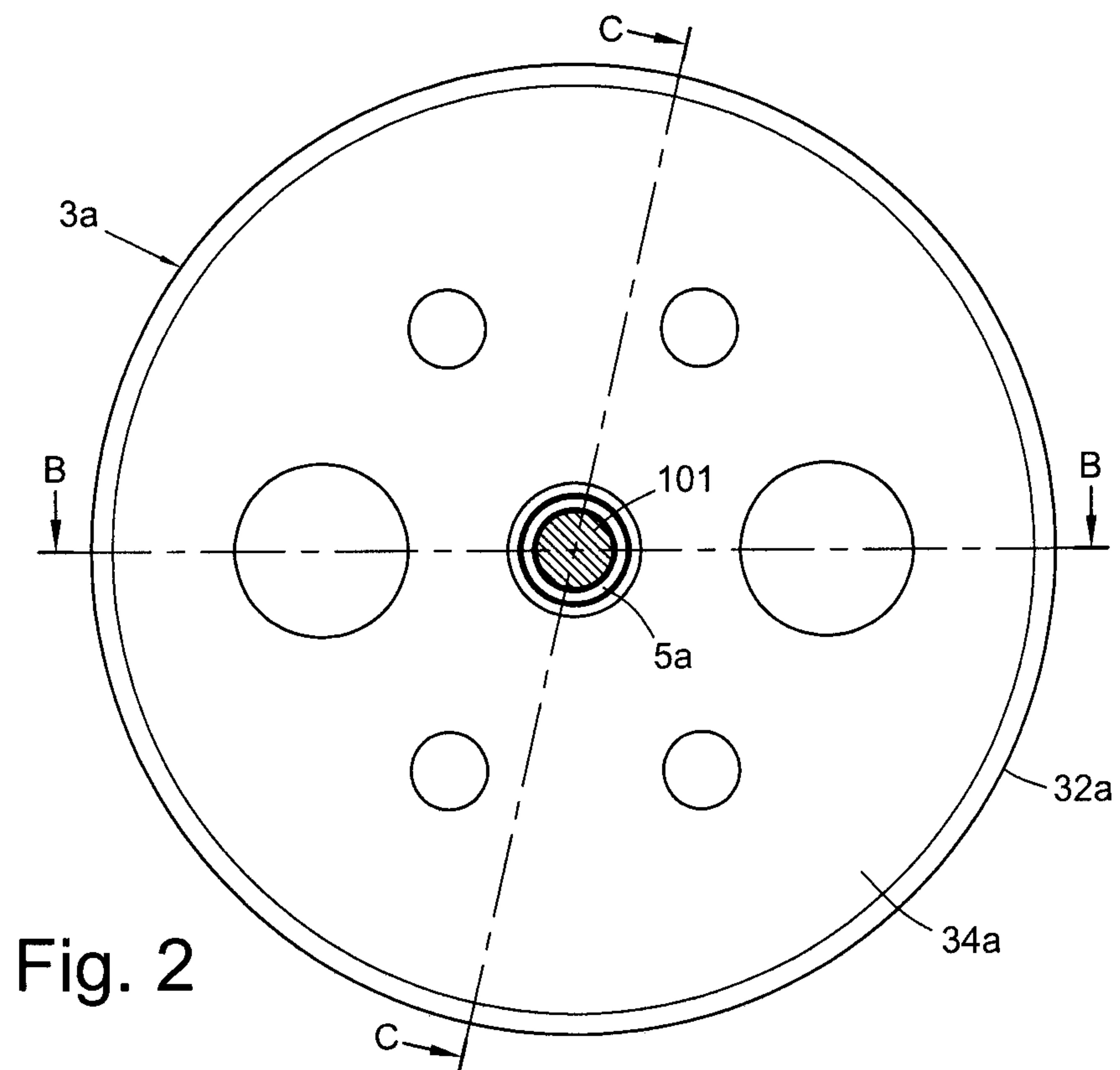
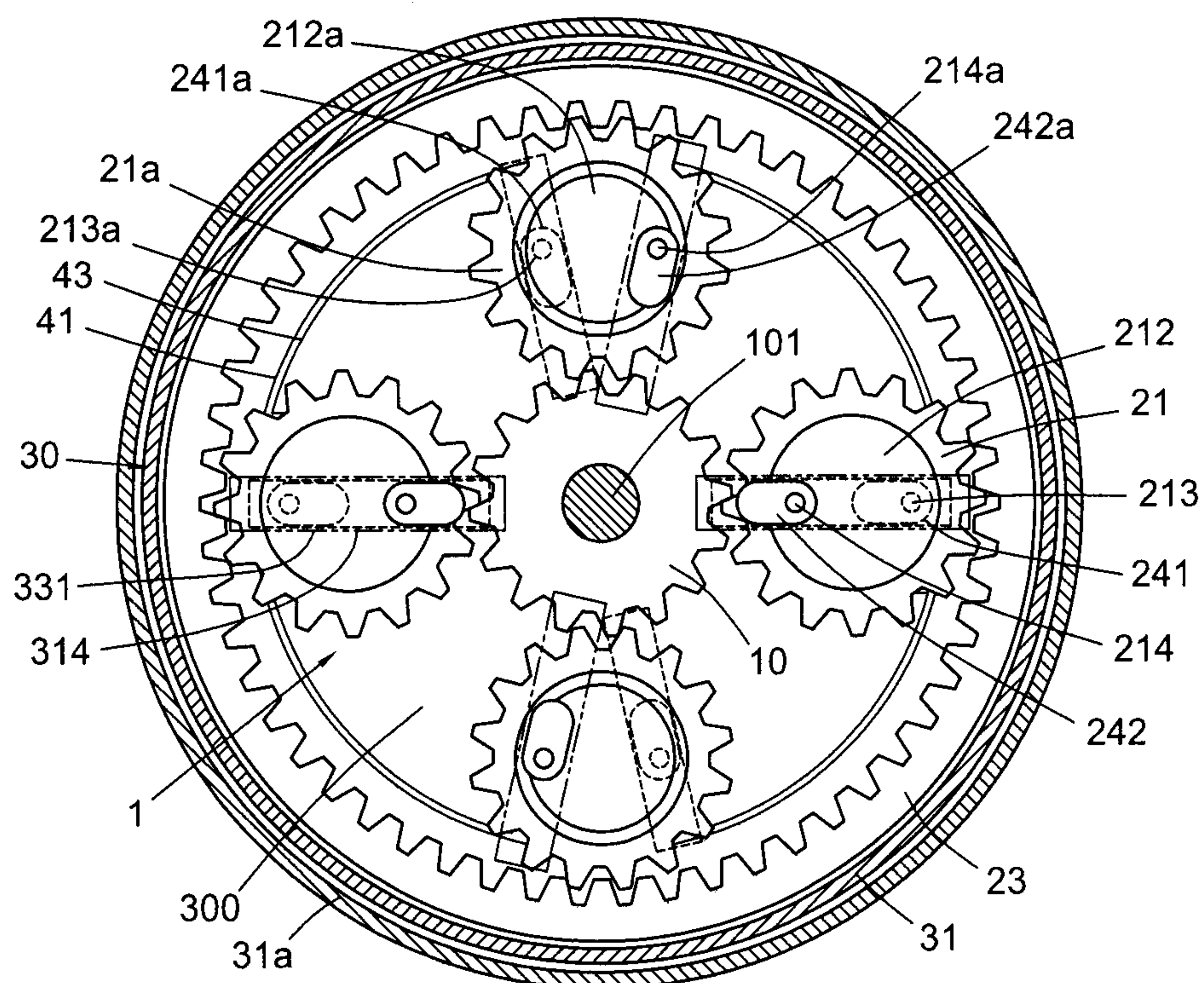
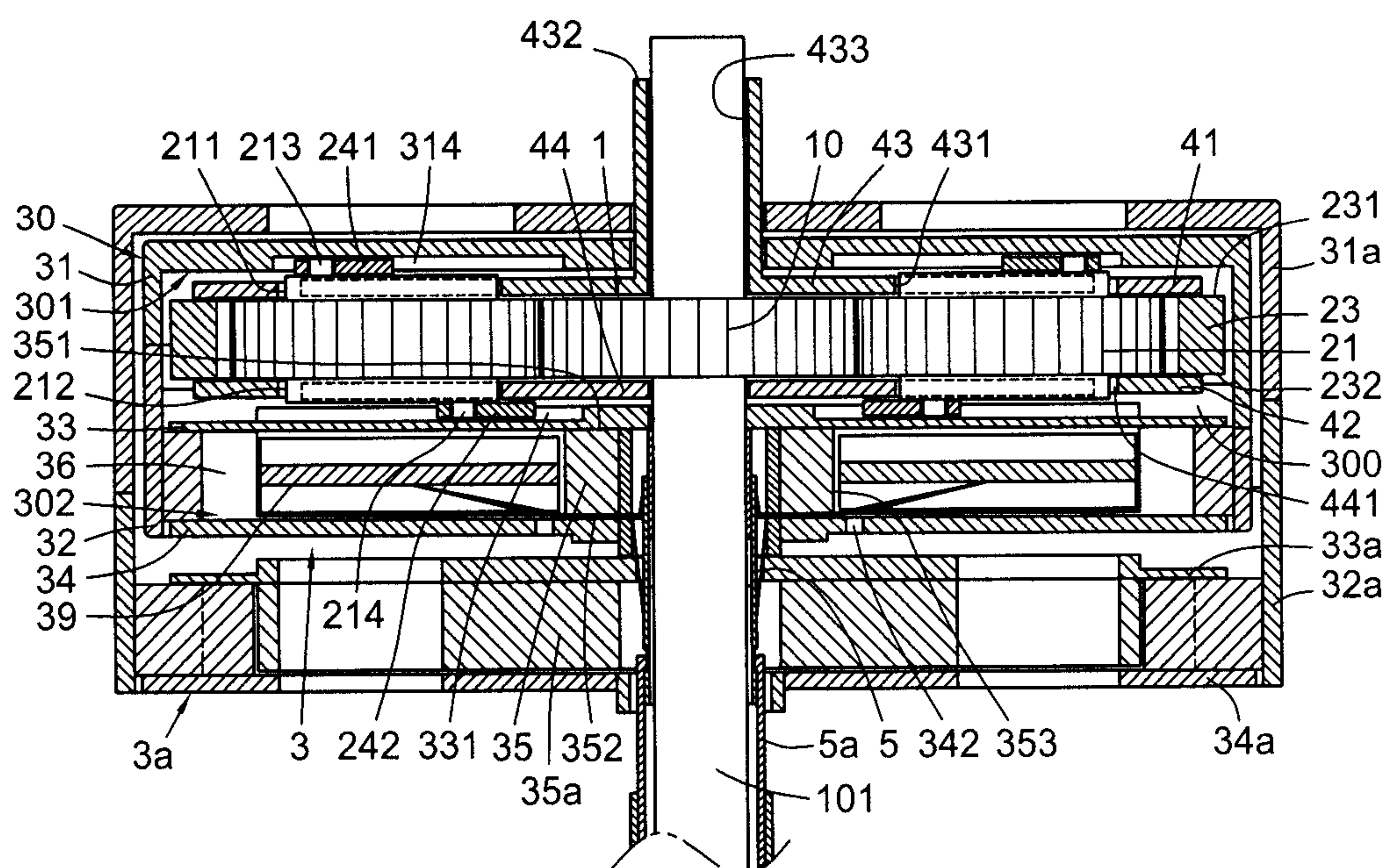


Fig. 3



(A-A)

Fig. 4



(B-B)

Fig. 5

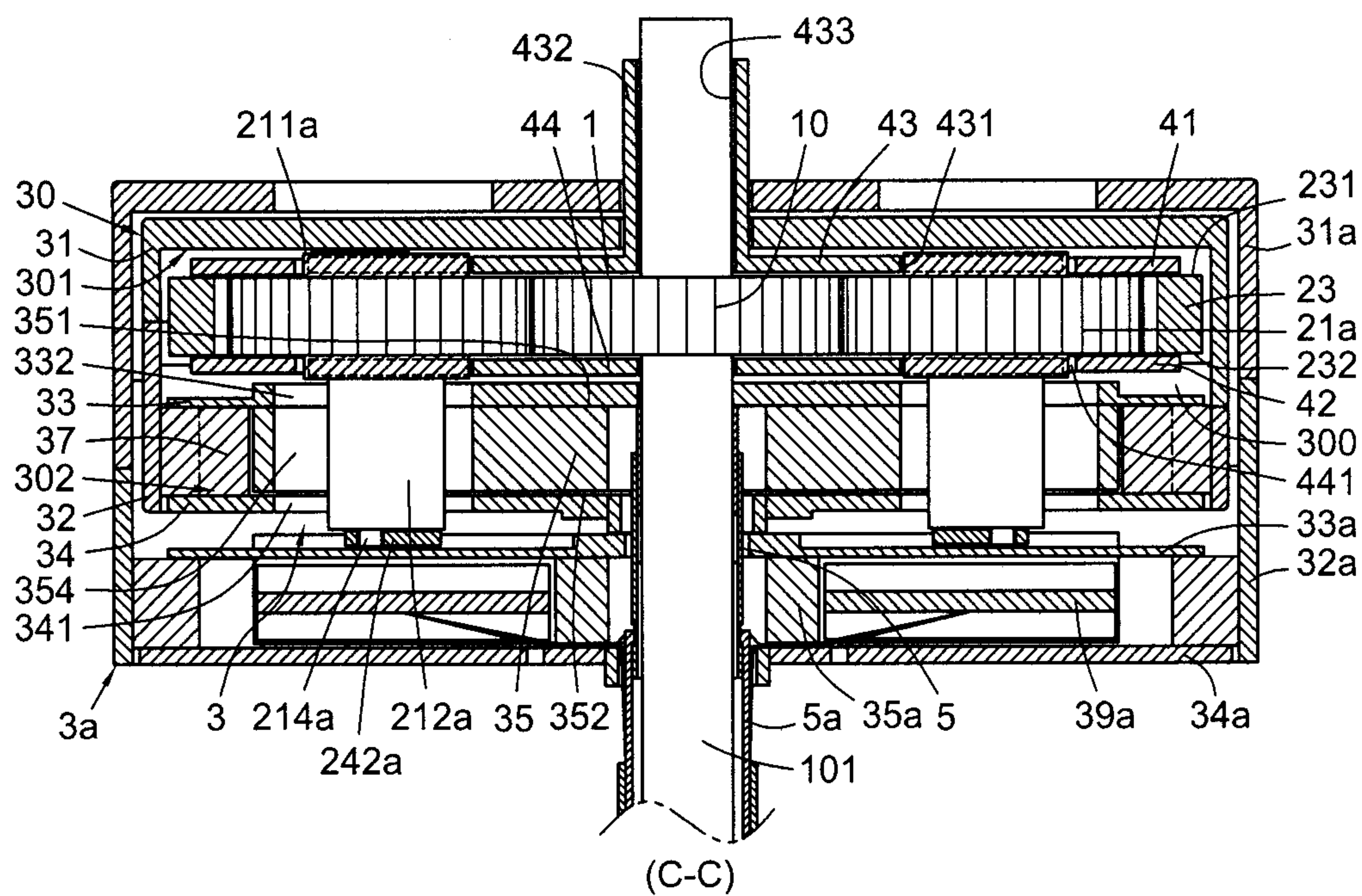


Fig. 6

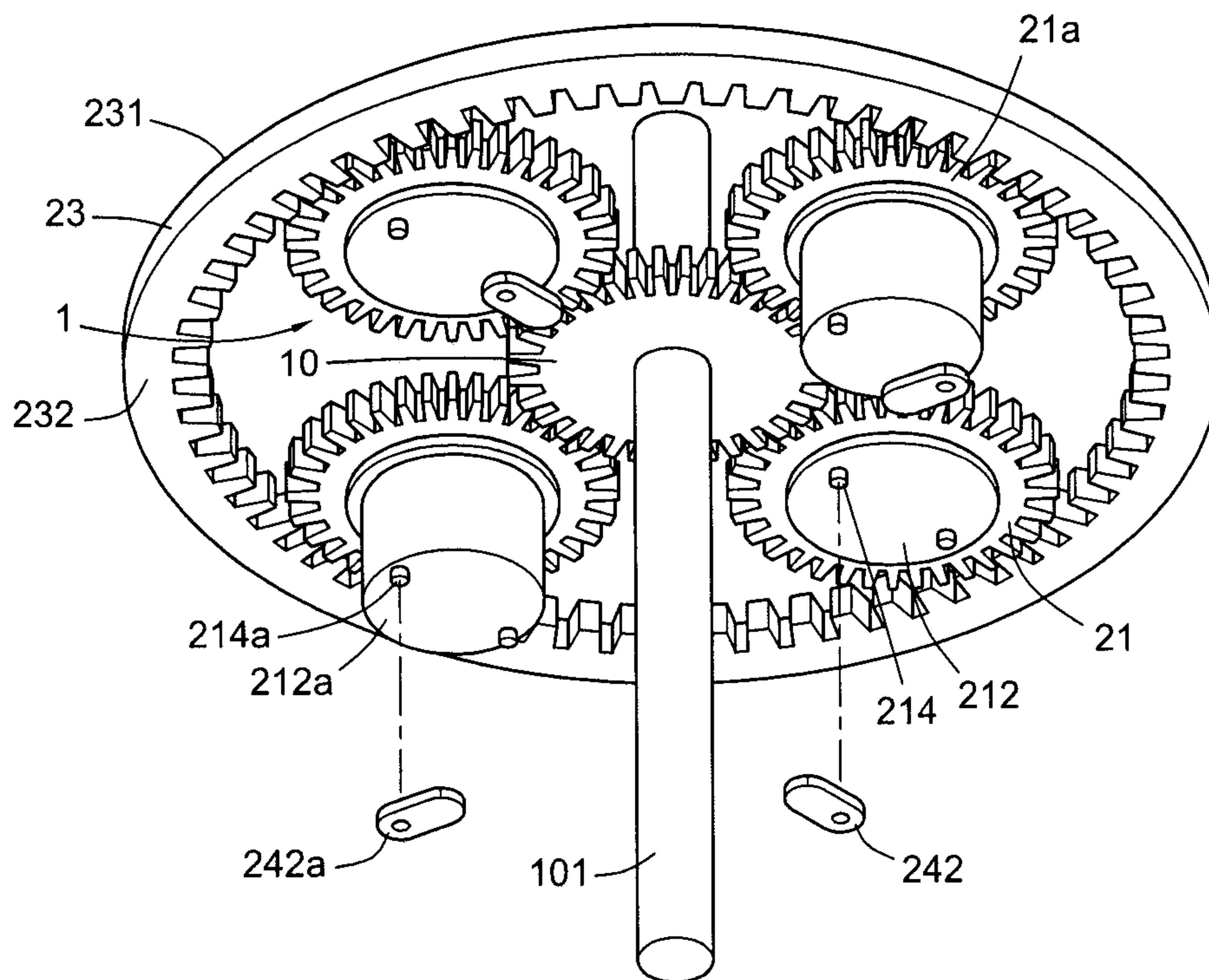


Fig. 7

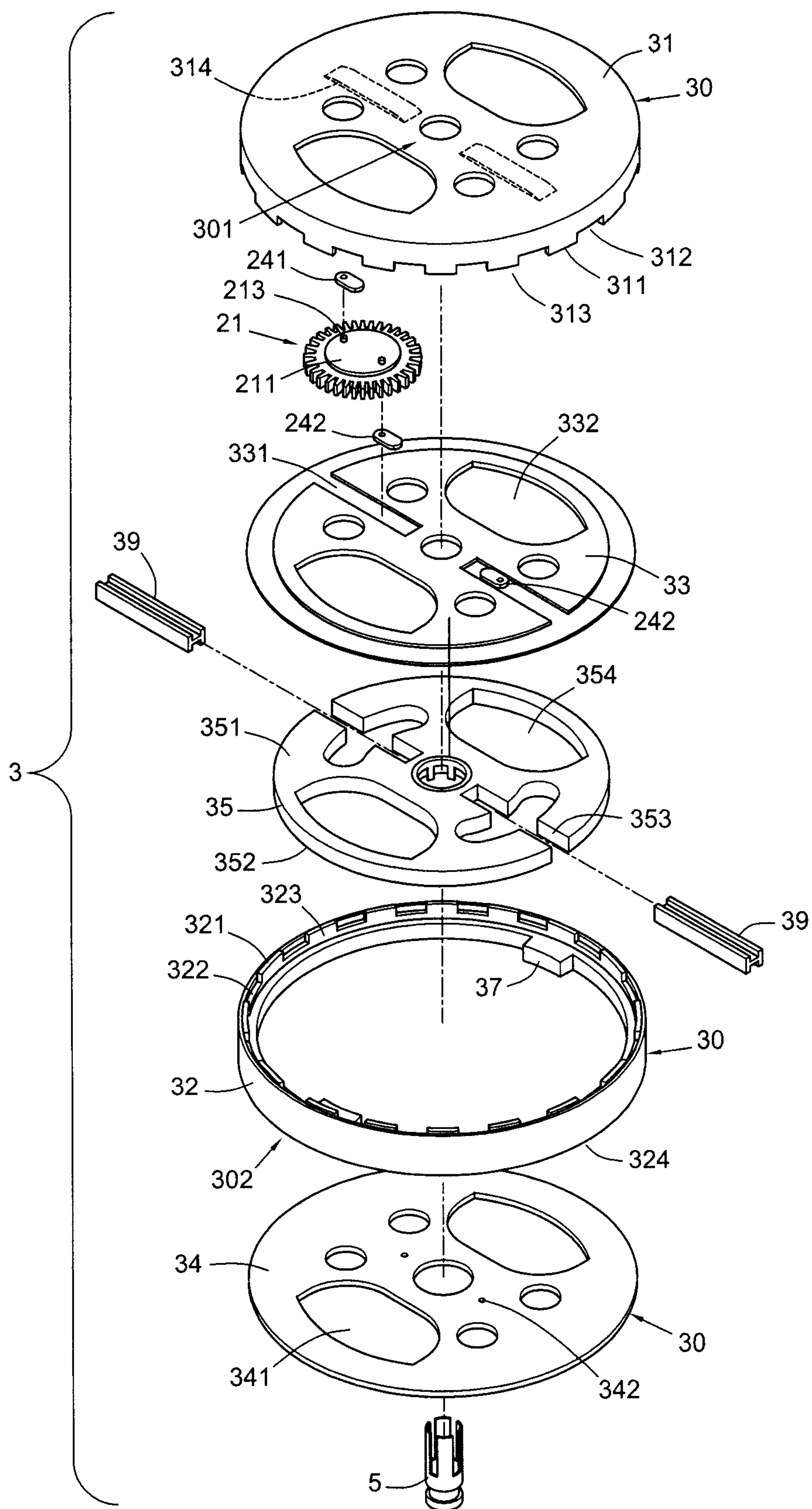


Fig. 8

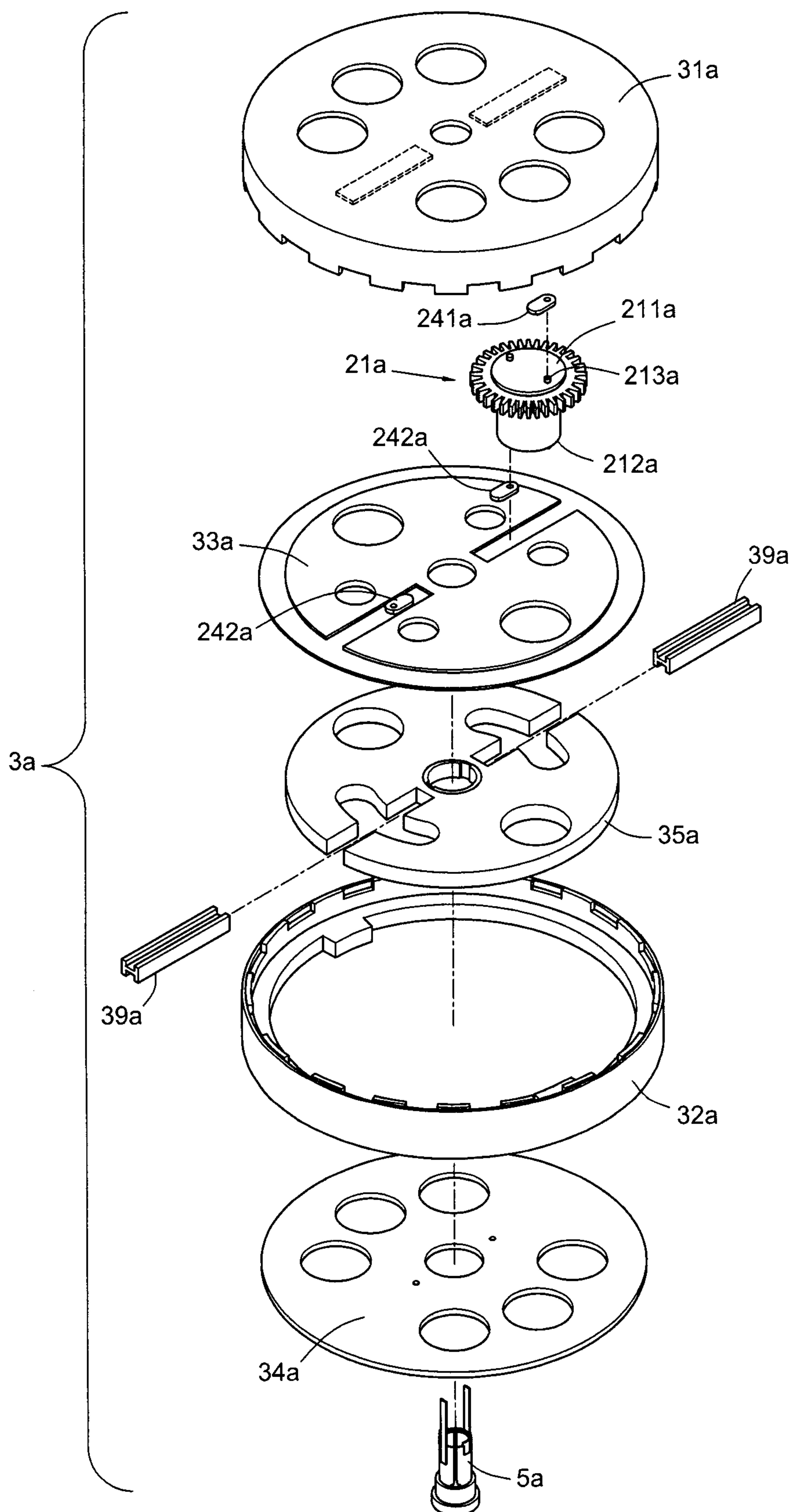
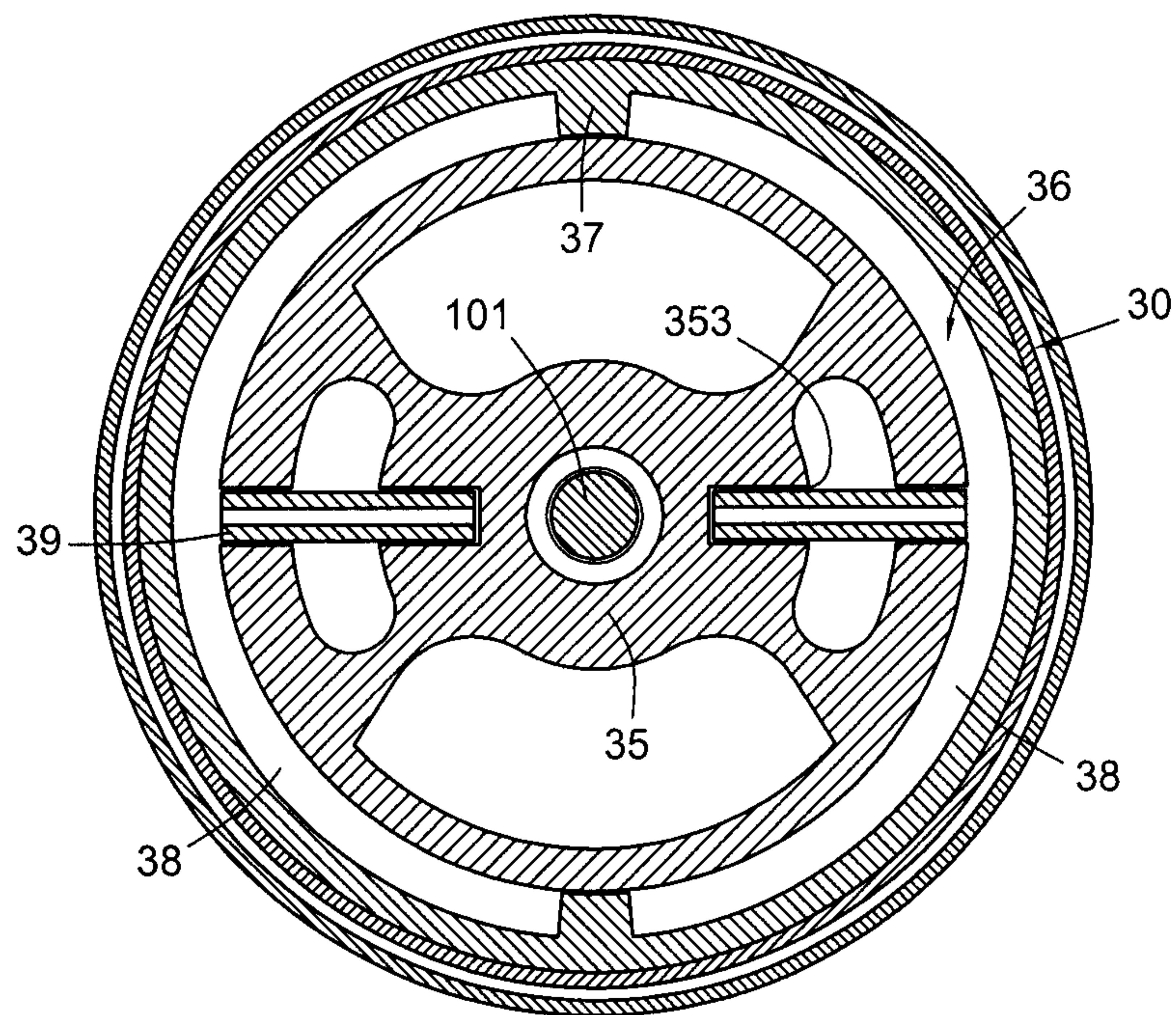


Fig. 9



(D-D)

Fig. 10

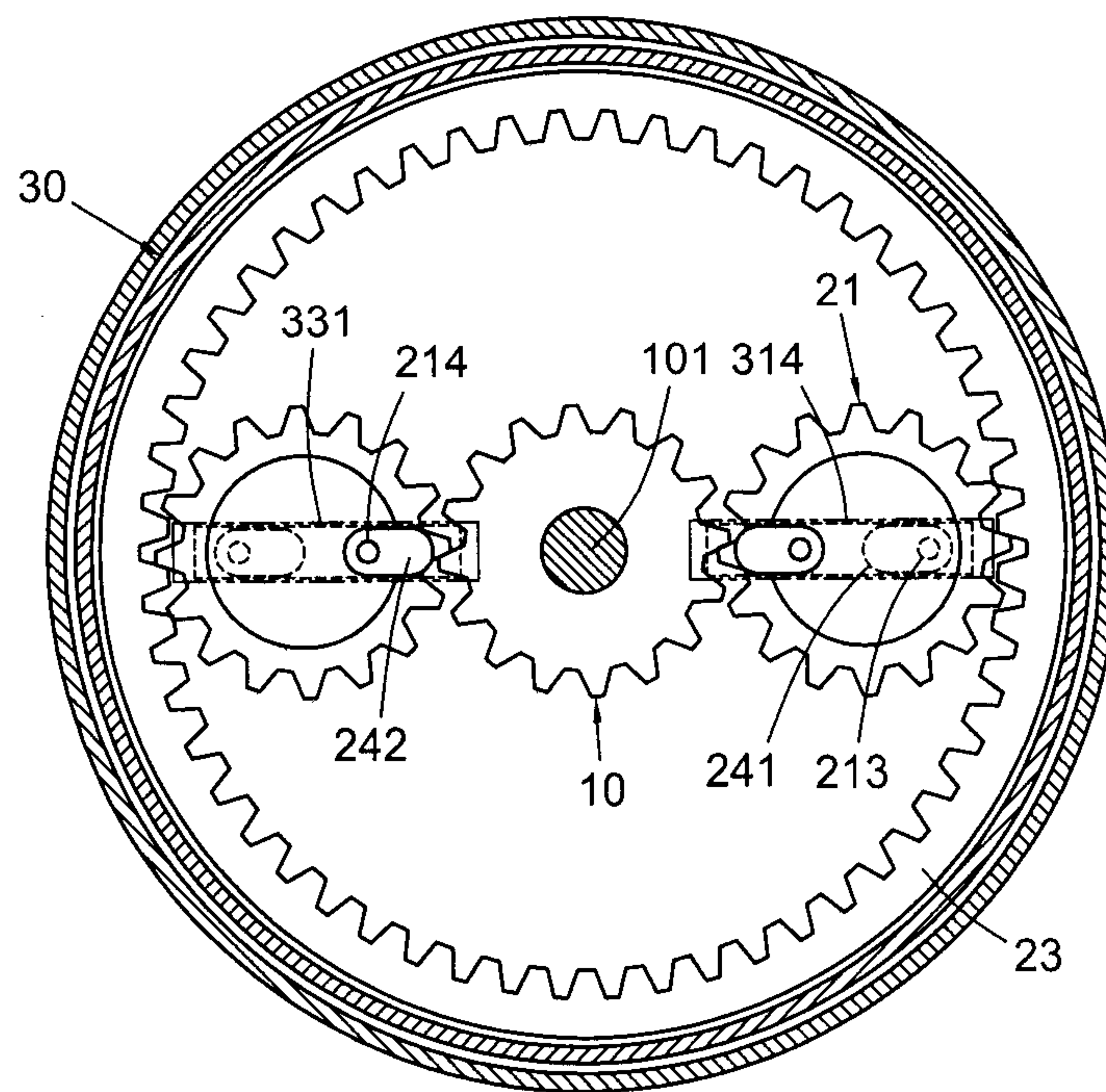


Fig. 11

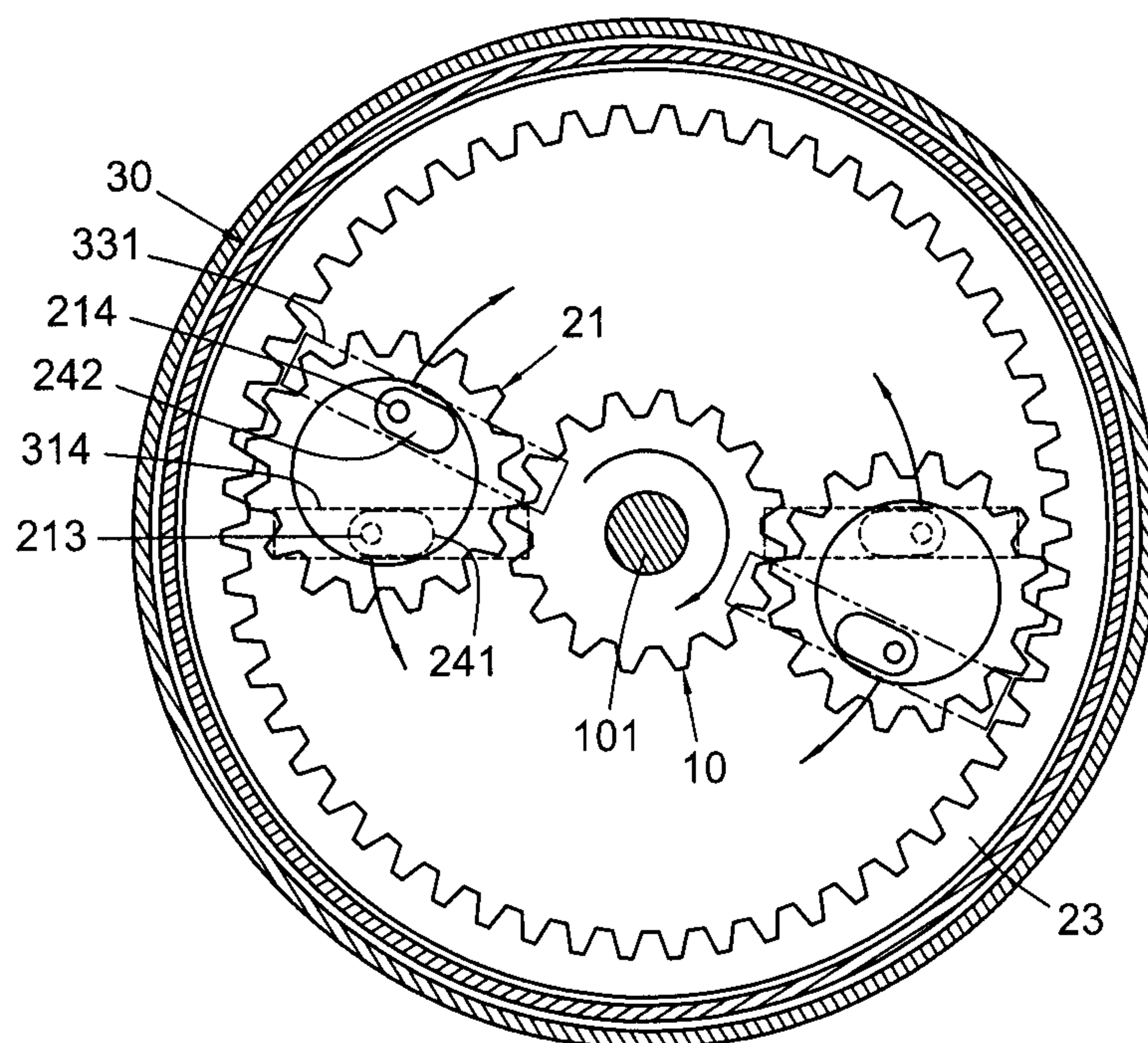


Fig. 12

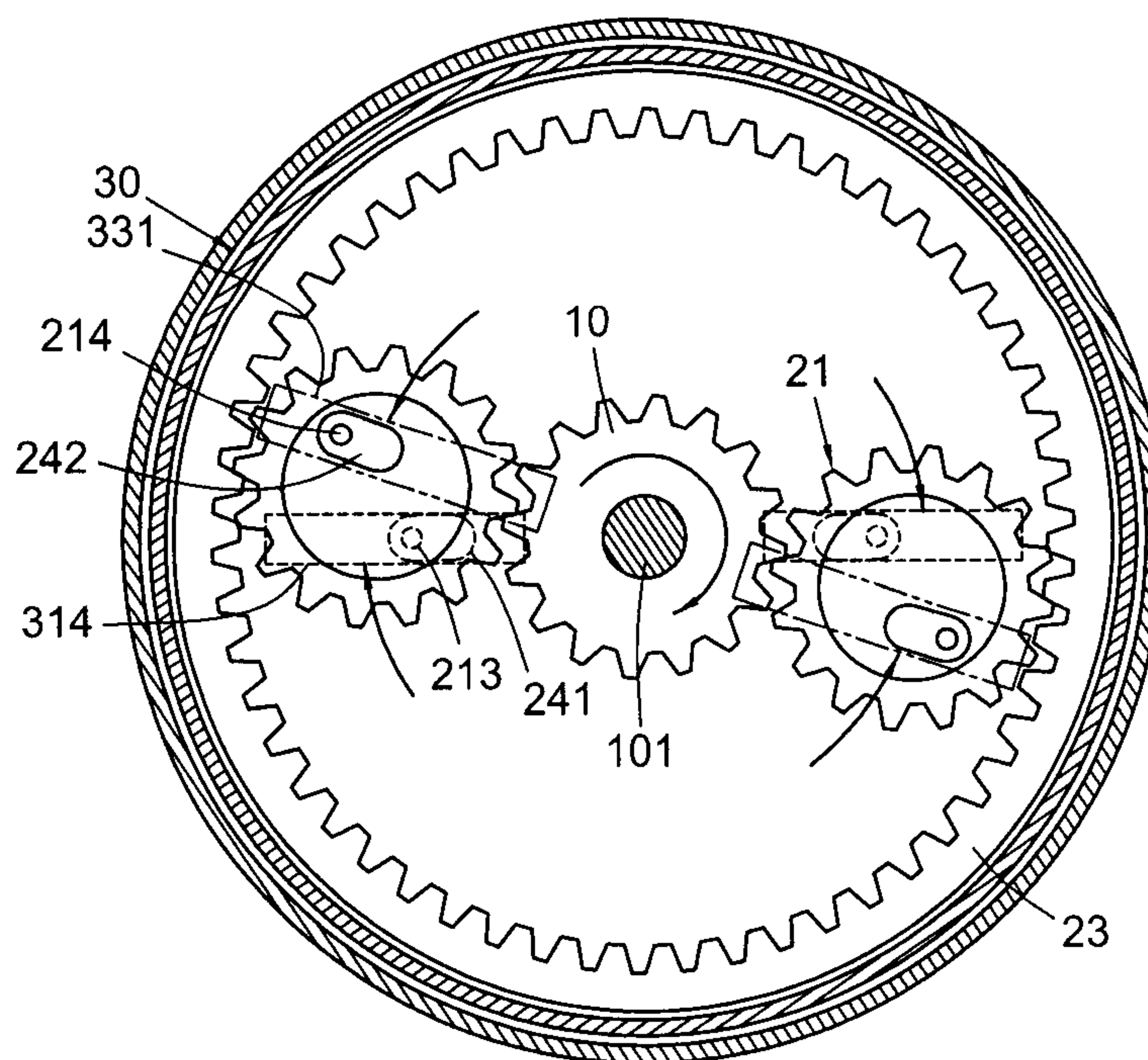


Fig. 13

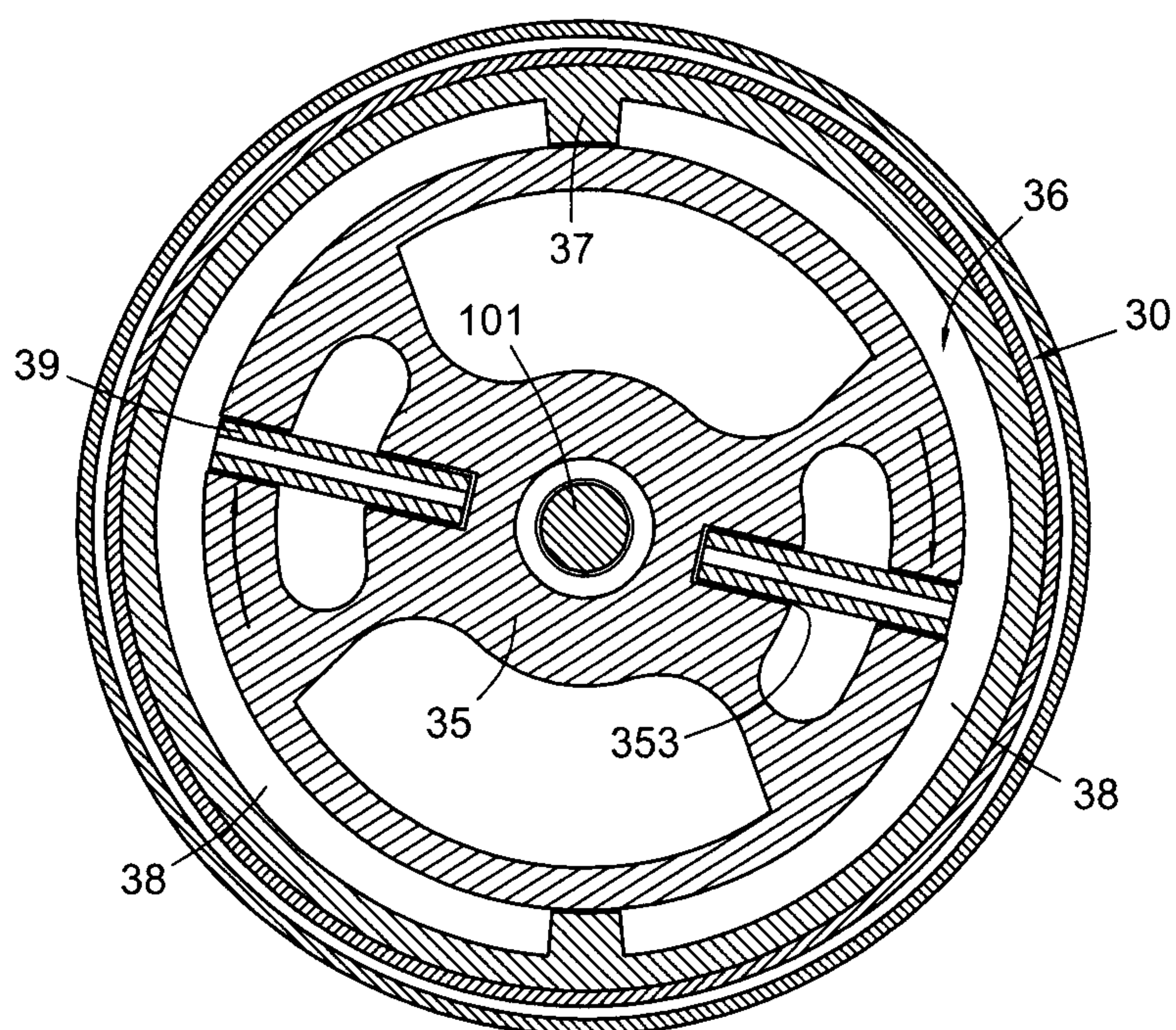


Fig. 14

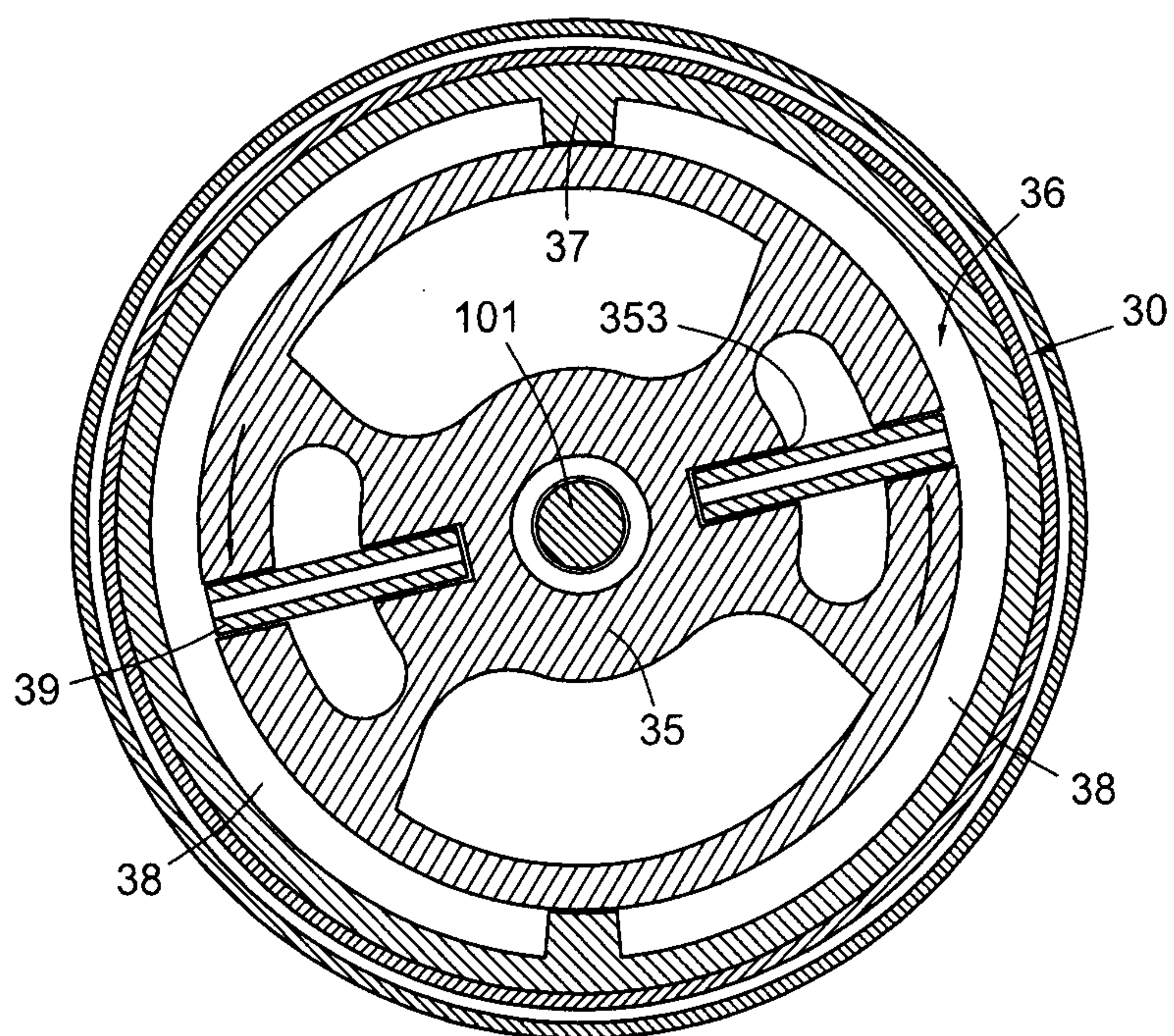


Fig. 15

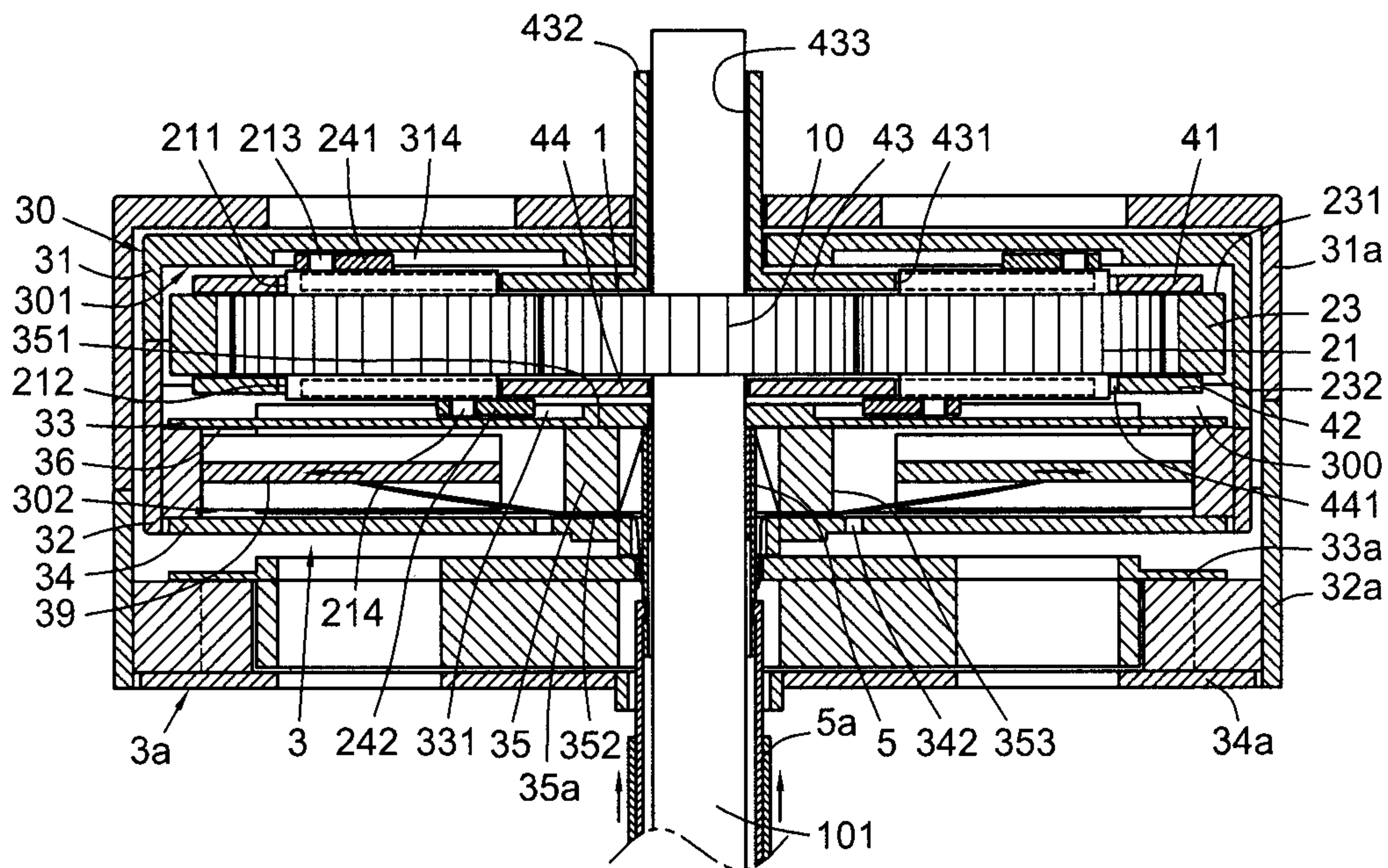


Fig. 16

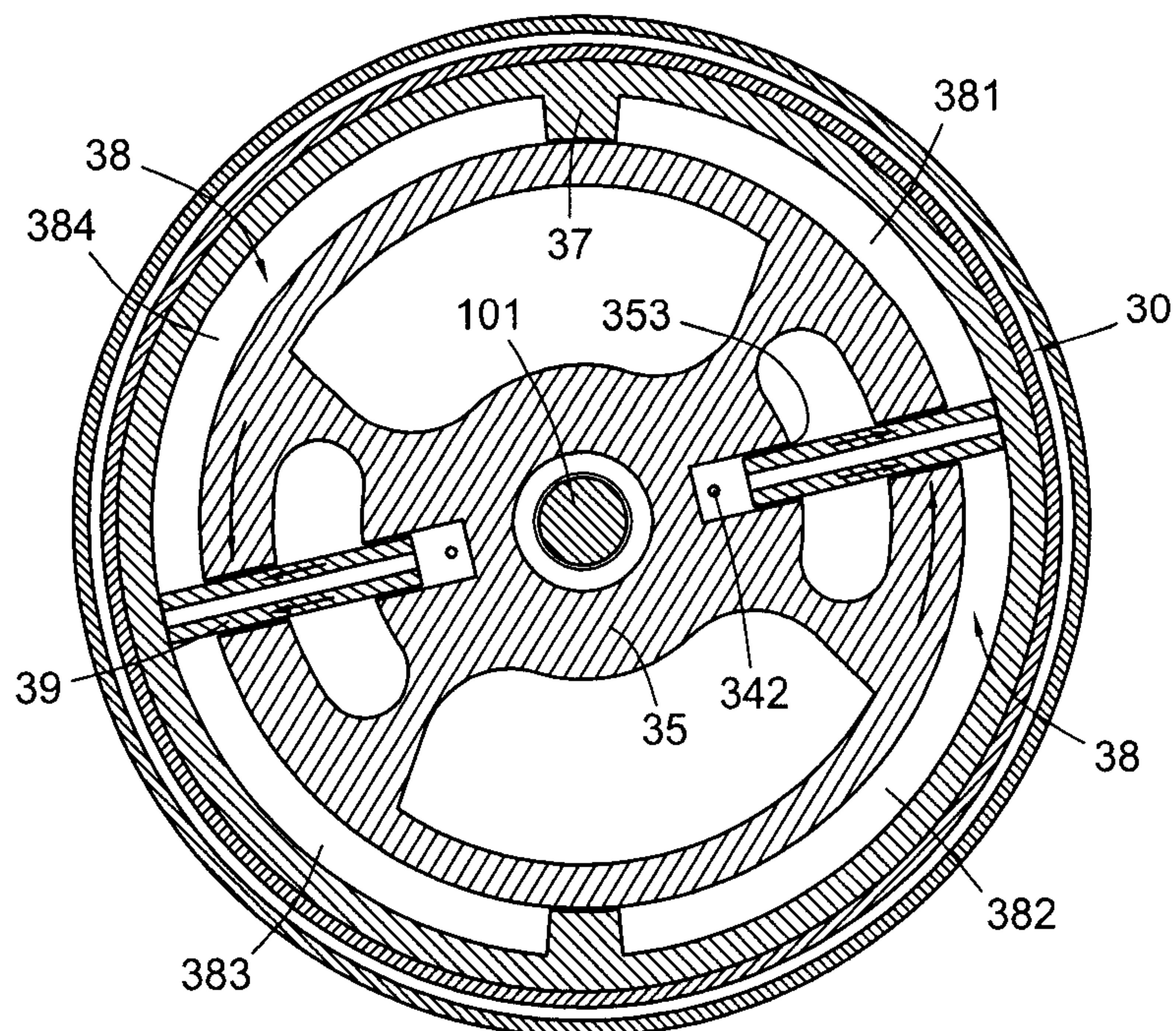
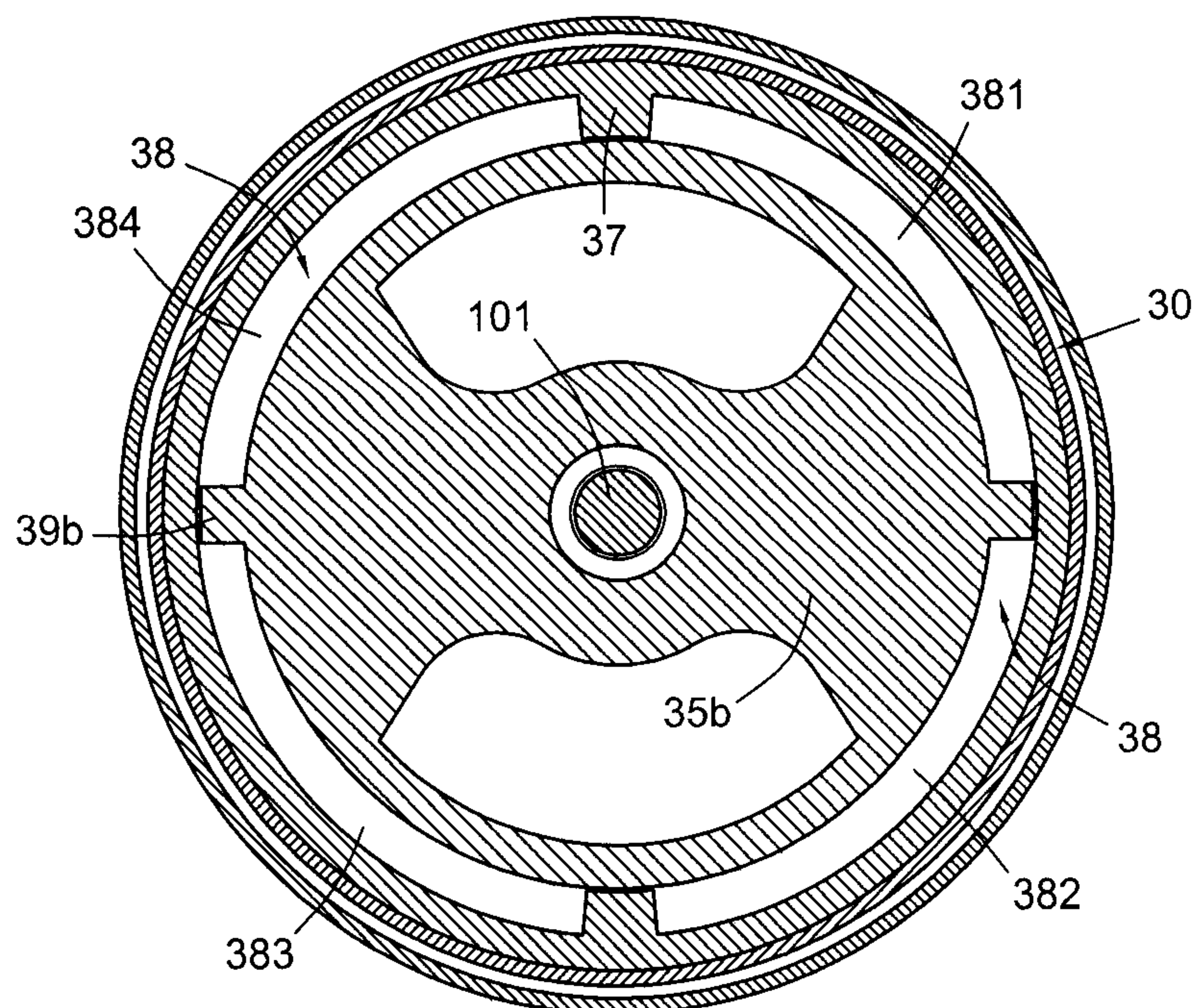
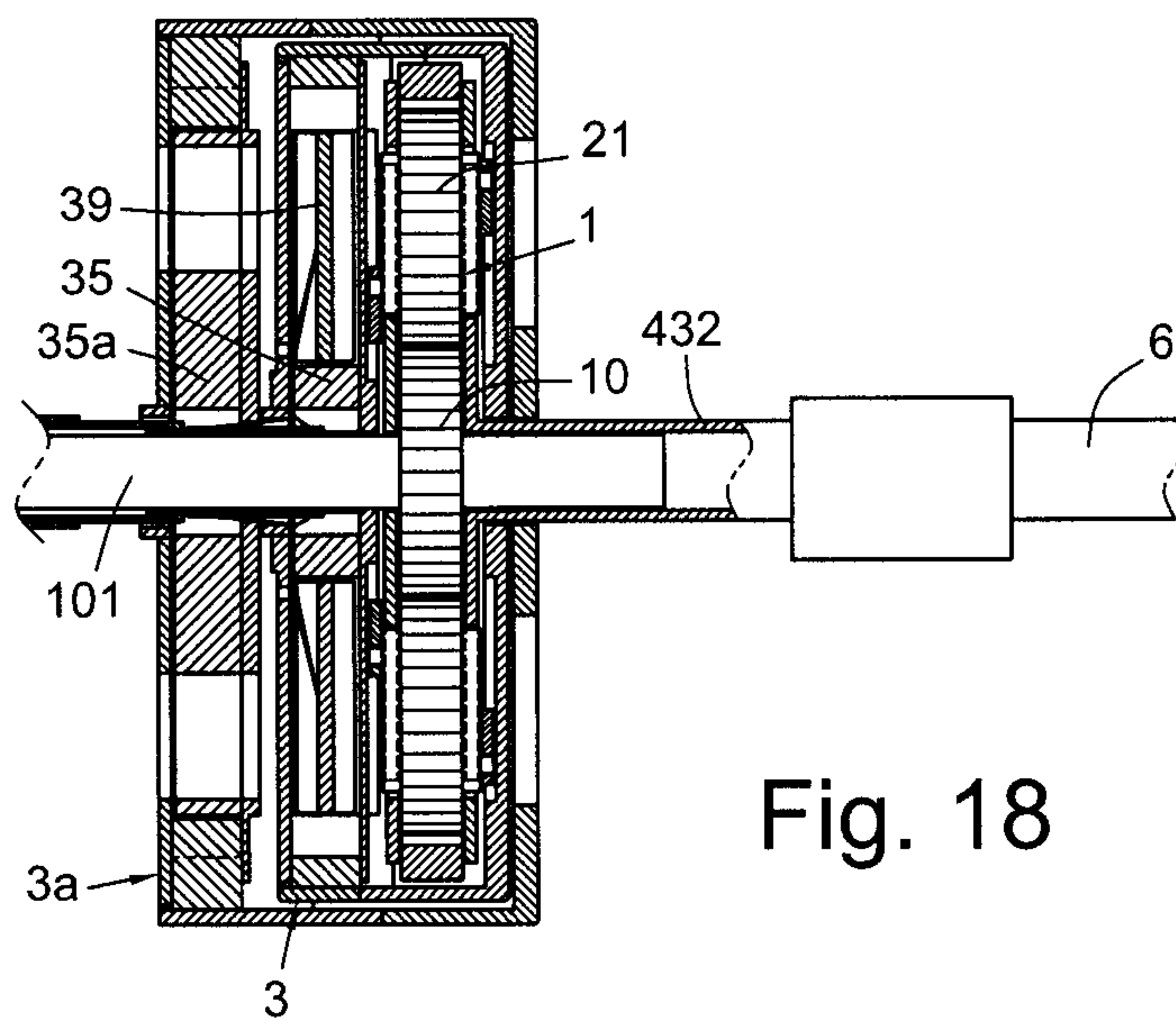


Fig. 17





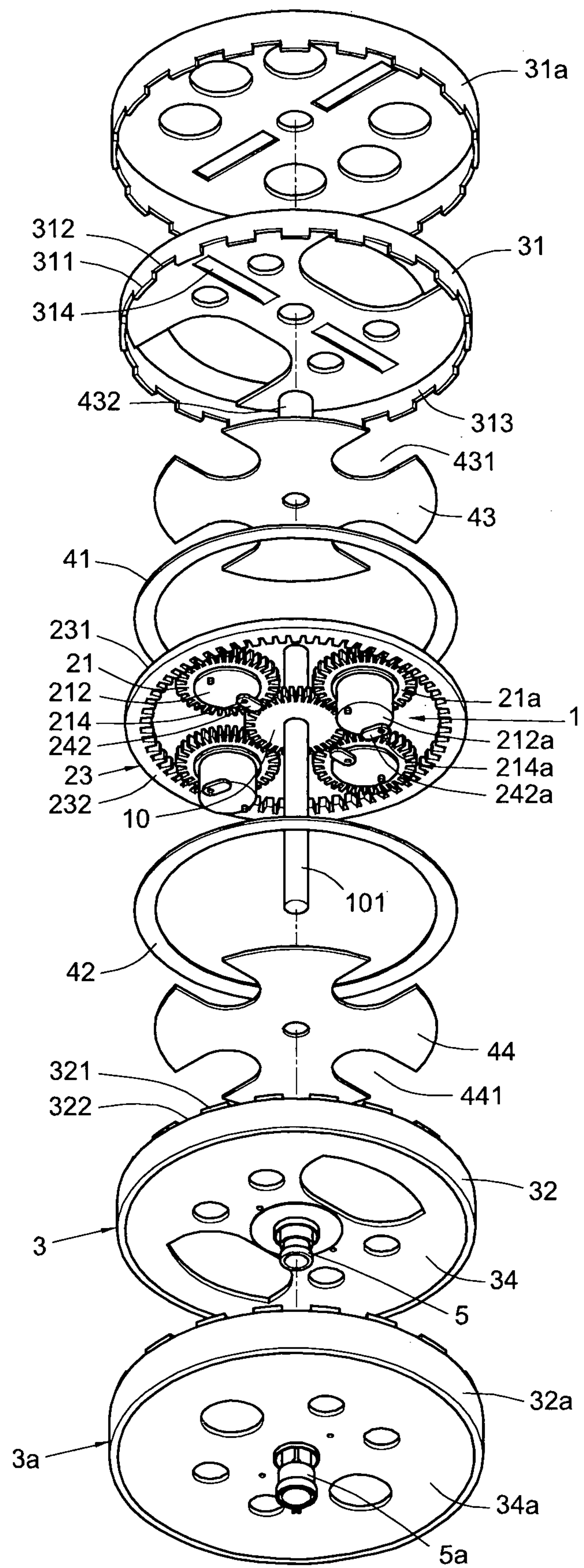


图 1 / Fig. 1