

(19)



(11)

EP 3 839 900 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
23.06.2021 Bulletin 2021/25

(51) Int Cl.:
G07D 1/00 (2006.01)

(21) Application number: **19216668.4**

(22) Date of filing: **16.12.2019**

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

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Remarks:

Amended claims in accordance with Rule 137(2)
EPC.

(54) COIN DISPENSER

(57) A coin dispenser is disclosed to use a dialing rod of a dialing device of a coin dispensing unit to push one side of the peripheral edge of one metal coin so that the other side of the peripheral edge of the metal coin will push two coin-stopping columns of one spring plate of the coin dispensing unit, causing the two coin-stopping columns to slide along the peripheral edge of the metal coin, and thus, when the metal coin crosses two coin-stopping columns, the metal coin is sent out of the coin outlet, achieving the effect of dispensing one metal coin at one time.

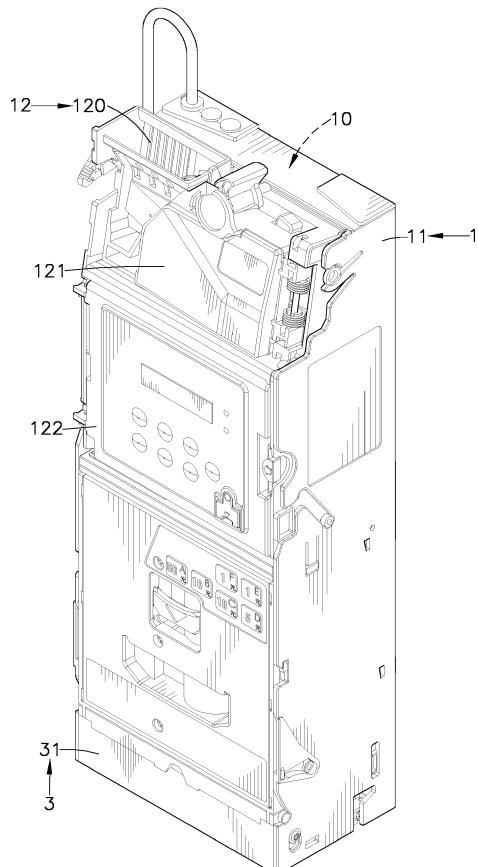


FIG. 1

Description**BACKGROUND OF THE INVENTION****1. Field of the Invention:**

[0001] The present invention relates to coin dispensers and more particularly, such a coin dispenser, which uses a dialing rod of a dialing device of the coin dispensing unit to push one side of the peripheral edge of one metal coin so that the other side of the peripheral edge of the metal coin will push two coin-stopping columns of one spring plate of the coin dispensing unit, causing the two coin-stopping columns to slide along the peripheral edge of the metal coin, and thus, when the metal coin crosses two coin-stopping columns, the metal coin is sent out of the coin outlet, achieving the effect of dispensing one metal coin at one time.

2. Description of the Related Art:

[0002] Today's fast development of social civilization and science and technology not only accelerates the pace of people's lives, but also makes the quality of life more convenient. Therefore, in order to consider the convenience and timeliness that the people pay attention to, many public places are equipped with automated vending machines, such as vending machines, ticket machines or coin exchange machines, to greatly saving personnel and employment costs. As more types of goods are sold, more additional functions are required.

[0003] Furthermore, in general, automated vending machines and game consoles on the market use coin acceptors to provide users with coins to operate, in order to achieve the purpose of unmanned operation and self-checkout. However, with the increase in the types of goods that can be traded and sold by automated vending machines, the unit prices are not the same, or according to the coin receiving function of the gaming machine, the coin acceptor inside the machine will be provided with an identification module to identify the authenticity and value of the inserted coins. Either country-made coins or playground-made tokens, they have different values and sizes. The coin acceptor must use a coin hopper to divert coins of different values to the corresponding coin collecting tubes for storage after coin value and authenticity identification, and use a coin dispensing unit for exchange, change, or refund with respect to the coins inserted by the user for transaction.

[0004] However, during the process that the coin dispensing unit pushes coins out for exchange, change or return, due to friction between two coins, two coins may be pushed out together, resulting in an exchanging error to cause loss of property.

[0005] Therefore, how to solve the above-mentioned shortcomings and inconveniences is the direction that related industry players are eager to study and improve.

SUMMARY OF THE INVENTION

[0006] The present invention has been accomplished under the circumstances in view. It is therefore the main object of the present invention to provide a coin dispenser, which comprises a body, at least one coin collecting tube and a coin dispensing unit. The body comprises a housing that defines therein an accommodation chamber. The at least one coin collecting tube is mounted in

5 the housing, each defining therein a duct for receiving at least one metal coin. The coin dispensing unit comprises a casing mounted in the bottom side of the accommodation chamber inside the body below the at least one coin collecting tube, a storage space defined in the casing, at least one through hole cut through the top wall of the casing and aimed at the bottom end of the duct of one respective coin collecting tube, a coin outlet located on an opposing bottom wall of the casing, a drive module mounted in the storage space inside the casing, at least

10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190 195 200 205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295 300 305 310 315 320 325 330 335 340 345 350 355 360 365 370 375 380 385 390 395 400 405 410 415 420 425 430 435 440 445 450 455 460 465 470 475 480 485 490 495 500 505 510 515 520 525 530 535 540 545 550 555 560 565 570 575 580 585 590 595 600 605 610 615 620 625 630 635 640 645 650 655 660 665 670 675 680 685 690 695 700 705 710 715 720 725 730 735 740 745 750 755 760 765 770 775 780 785 790 795 800 805 810 815 820 825 830 835 840 845 850 855 860 865 870 875 880 885 890 895 900 905 910 915 920 925 930 935 940 945 950 955 960 965 970 975 980 985 990 995 1000 1005 1010 1015 1020 1025 1030 1035 1040 1045 1050 1055 1060 1065 1070 1075 1080 1085 1090 1095 1100 1105 1110 1115 1120 1125 1130 1135 1140 1145 1150 1155 1160 1165 1170 1175 1180 1185 1190 1195 1200 1205 1210 1215 1220 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metal coin will be pushed out, and the second metal coin will be stopped by the stopper plate, thereby ensuring that the second metal coin will not be pushed out to achieve the reliability and stability of coin dispensing.

[0009] According to still another aspect of the present invention, the two coin-stopping columns of the dialing device are forced to slide along the peripheral edge of the metal coin to have the effect of limiting the position of the metal coin, so that the metal coin can be accurately pushed out. Therefore, the invention can be used with multiple metal coins of different sizes to achieve the purpose of improving the use stability and reducing the manufacturing cost.

[0010] Other advantages and features of the present invention will be fully understood by reference to the following specification in conjunction with the accompanying drawings, in which like reference signs denote like components of structure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011]

FIG. 1 is an oblique top elevational view of a coin dispenser in accordance with the present invention.

FIG. 2 is an elevational exploded view of a part of the present invention, showing the relationship between the coin collecting tubes and the coin dispensing unit.

FIG. 3 is an exploded view of the coin dispensing unit.

FIG. 4 is a top view of the coin dispensing unit.

FIG. 5 is a schematic applied view of the present invention, showing the status of the coin dispensing unit before pushing a metal coin.

FIG. 6 is a schematic applied view of the present invention, showing the status of the coin dispensing unit when pushing a metal coin.

FIG. 7 is a schematic applied view of the present invention, showing the status of the coin dispensing unit after pushed the metal coin.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0012] Referring to FIGS. 1-4, a coin dispenser in accordance with the present invention is shown. As illustrated, the coin dispenser comprises a body 1, at least one, for example, a plurality of coin collecting tubes 2, and a coin dispensing unit 3.

[0013] The body 1 comprises a housing 11 defining therein an accommodation chamber 10, a coin hopper 12 disposed above the accommodation chamber 10 with a coin-inlet 120 defined at a top side thereof for the insertion of metal coins 4, an identification module 121 mounted in the coin hopper 12 below the coin-inlet 120 for identifying the authenticity and value of each inserted metal coin 4, and a coin sorting module 122 mounted in the coin hopper 12 below the coin-inlet 120 for sorting

metal coins 4 identified by the identification module 121 into corresponding coin collecting tubes 2.

[0014] The coin collecting tubes 2 are in a cylindrical shape and assembled in the housing 11, and a duct 20 is formed in the hollow interior of each coin collecting tube 2 for receiving metal coins 4. The ducts 20 of the coin collecting tubes 2 are different so that each coin collecting tube 2 can receive metal coins 4 of one respective value.

[0015] The coin dispensing unit 3 comprises a casing 31 assembled to the body 1 and located in the accommodation chamber 10 below the coin collecting tubes 2, a storage space 310 defined in the casing 31, a plurality of through holes 312 cut through a top wall of the casing

31 and respectively aimed at the bottom ends of the ducts 20 of the coin collecting tube 2, a coin outlet 311 located on an opposing bottom wall of the casing 31, a slot 3121 cut through the top wall of the casing 31 and radially extended from each through hole 312, a stopper plate

313 mounted in each slot 3121 and extended into the inside of the associating through hole 312, a drive module 32 mounted in the storage space 310 inside the casing 31 and comprising a turntable 321 for axial rotation, the turntable 321 being internally provided with a hole 320

25 in communication with the coin outlet 311, a pusher 322 disposed on the surface of the turntable 321, at least one dialing device 33 disposed inside the storage space 310 and located around the drive module 32, and a spring plate 34 mounted in each through hole 312 of the casing

30. The dialing device 33 comprises a shaft 331 positioned on the bottom surface of the storage space 310, an elastomer 3311 mounted on the shaft 331, a paddle 332 pivotally disposed on the shaft 331 so as to be pressed against the elastomer 3311 and reciprocally rotated, a driving member 333 located on one end of the paddle 332 and drivable by the drive module 32 to cause the paddle 332 to rotate axially and provided with a dial block 3331 which can be pushed by the pusher 322 to cause the paddle 332 to rotate axially, and a dialing rod

40 334 upwardly extended from an opposite end of the paddle 332. The spring plate 34 comprises a positioning portion 341 positioned on the peripheral wall of the associating through hole 312, two spring arms 342 extended from one side of the positioning portion 341 toward the

45 inside of the associating through hole 312, a gap 3420 formed between the two spring arms 342 for the insertion of the dialing rod 334, a channel 3421 formed on one side of the gap 3420 for the dialing rod 334 to pass, and a coin-stopping column 343 upwardly extended from the

50 top surface of the distal end of each spring arm 342. The height of the dialing rod 334 exposed above the two spring arms 342 of the spring plate 34 is less than the thickness of one metal coin 4, and the vertical distance between the surface of the stopper plate 313 and the paddle 332 is larger than the thickness of one metal coin 4 but less than the combined thickness of two metal coins 4.

[0016] Furthermore, the turntable 321 of the above

drive module 32 is connected with a motor (not shown) so that the turntable 321 can be driven by the motor to generate axial rotation.

[0018] When the coin dispenser is assembled, the coin collecting tubes 2 are mounted in the accommodation chamber 10 of the body 1 below the coin hopper 12 for allowing the ducts 20 of the coin collecting tubes 2 to receive from metal coins 4 from the coin hopper 12, and then the coin dispensing unit 3 is mounted in the bottom side inside the accommodation chamber 10 of the body 1 to keep the through holes 312 of the casing 31 in alignment with the ducts 20 of the respective coin collecting tube 2 for receiving metal coins 4 from the ducts 20 of the respective coin collecting tube 2. Thus, the body 1, the coin collecting tubes 2 and the coin dispensing unit 3 are assembled to constitute the coin dispenser.

[0019] Referring to FIGS. 5-7, in actual application, metal coin(s) 4 can be inserted into the coin-inlet 120 of the coin hopper 12 of the body 1. When a metal coin 4 is inserted into the coin-inlet 120, it passes through the identification module 121 and coin sorting module 122 of the coin hopper 12 into the duct 20 of one respective coin collecting tube 2 and then falls through one respective through hole 312 of the casing 31 to the top side of the two spring arms 342 of one respective spring plate 34 inside of the coin dispensing unit 3 with the peripheral edge of the fallen metal coin 4 limited to the positioning portion 341 of the respective spring plate 34 and two coin-stopping column 343. At this time, turntable 321 of the drive module 32 is rotated axially, causing the pusher 322 at the turntable 321 to push the dial block 3331 of the driving member 333 of the dialing device 33, and thus, the paddle 332 of dialing device 33 uses shaft 331 as the axis to generate axial rotation. In this way, the dialing rod 334 on the paddle 332 is moved to enter the channel 3421 from the gap 3420 between the two spring arms 342 to push against one side of the peripheral edge of the metal coin 4, causing the other side of the peripheral edge of the metal coin 4 to push the two coin-stopping columns 343 to slide along the peripheral edge of the metal coin 4. This will make the two spring arms 342 relatively open. After the diameter of the metal coin 4 crosses two coin-stopping columns 343 from the two sides, the two spring arms 342 will elastically reset, so that the two coin-stopping columns 343 continue to slide along the peripheral edge of the metal coin 4. After the metal coin 4 completely passes between the two coin-stopping columns 343, the metal coin 4 will enter the hole 320 in the turntable 321, and then be sent from the coin outlet 311 of the casing 31 to the outside to complete the change or exchange function. After the metal coin 4 is dropped to the outside, the pusher 322 will not push against the dial block 3331 of driving member 333. At this time, the elastomer 3311 on the shaft 331 will elastically reset to return the dialing rod 334 to the original position within the gap 3420, thereby completing the use of the present invention to dispense one metal coin 4.

[0020] When plural metal coins 4 are dropped on the

top side of the two spring arms 342 of one spring plate 34, due to that the height of the dialing rod 334 exposed above the two spring arms 342 of the spring plate 34 is less than the thickness of one metal coin 4, only one first metal coin 4 will be pushed outward as the dialing rod 334 pushing the peripheral edge of the metal coin 4, and the second metal coin 4 will not be pushed outward. Because the stopper plate 313 is provided inside the through hole 312, and the vertical distance between the surface of the stopper plate 313 and the paddle 332 is larger than the thickness of one metal coin 4 and less than the combined thickness of two metal coins 4, only one metal coin 4 will be pushed outward as the dialing rod 334 pushing the peripheral edge of the coin 4, and the second metal coin 4 will be stopped by stopper plate 313. In this way, the aforementioned size design can be used to further ensure that the second metal coin 4 will not be launched to the outside, so as to improve the reliability and stability of coin dispensing.

[0021] Furthermore, the coin-stopping columns 343 of the dialing device 33 are sliding along the peripheral edge of the metal coin 4, so as to have the effect of limiting the position of the metal coin 4, enabling the metal coin 4 to be accurately pushed out. Because the two coin-stopping columns 343 slide along the peripheral edge of the metal coin 4 through the two spring arms 342, this design can be used with multiple metal coins 4 of different sizes, so there is no need to design multiple coin dispensers to match metal coins 4 of different sizes, thereby achieving the effect of improving the use stability and reducing the manufacturing cost.

[0022] It is to be understood that the above-described embodiment of the invention is merely a possible example of implementations, merely set forth for a clear understanding of the principles of the invention, many modifications and enhancements may be made without departing from the spirit and scope of the invention. Accordingly, the invention is not to be limited except as by the appended claims.

Claims

1. A coin dispenser, comprising:

a body 1 comprising a housing 11, said housing 11 defining therein an accommodation chamber 10;
 at least one coin collecting tube 2 mounted in said housing 11, each said coin collecting tube 2 defining therein a duct 20 for receiving at least one metal coin 4; and
 a coin dispensing unit 3 comprising a casing 31 mounted in a bottom side of said accommodation chamber 10 inside said body 1 below said at least one coin collecting tube 2, a storage space 310 defined in said casing 31, at least one through hole 312 cut through a top wall of said

casing 31 and aimed at a bottom end of the said duct 20 of one respective said coin collecting tube 2, a coin outlet 311 located on an opposing bottom wall of said casing, a drive module 32 mounted in said storage space 310 inside the casing 31, at least one dialing device 33 disposed inside said storage space 310 and located around said drive module 32 and a spring plate 34 mounted in each said through hole 312 of said casing 31, said dialing device 33 comprising a shaft 331 positioned on a bottom surface of said storage space 310, a paddle 332 pivotally disposed on said shaft 331, a driving member 333 located on one end of said paddle 332 and drivable by said drive module 32 to cause said paddle 332 to rotate axially and a dialing rod 334 upwardly extended from an opposite end of said paddle 332, said spring plate 34 comprising a positioning portion 341 positioned on the peripheral wall of the associating said through hole 312, two spring arms 342 extended from one side of said positioning portion 341 toward the inside of the associating said through hole 312, a gap 3420 formed between said two spring arms 342 for the insertion of said dialing rod 334, a channel 3421 formed on one side of said gap 3420 for said dialing rod 334 to pass and a coin-stopping column 343 upwardly extended from a top surface of a distal end of each said spring arm 342; wherein when said dialing rod 334 is pushed against one side of the peripheral edge of said metal coin 4, the other side of the peripheral edge of said metal coin 4 pushes against said coin-stopping columns 343 to slide along the peripheral edge of said metal coin 4 so that when said metal coin 4 crosses two said coin-stopping columns 343, said metal coin 4 is sent out of said coin outlet 311 of said casing 31.

2. The coin dispenser as claimed in claim 1, wherein said body 1 further comprises a coin hopper 12 disposed in said accommodation chamber 10 above said at least one coin collecting tube 2 for dispensing said metal coins 4 into said at least one coin collecting tube 2, said coin hopper 12 having a coin-inlet 120 defined at a top side thereof for the insertion of said metal coins 4.

3. The coin dispenser as claimed in claim 2, wherein said body 1 further comprises an identification module 121 mounted in said coin hopper 12 below said coin-inlet 120 for identifying the authenticity and value of each inserted metal coin 4, and a coin sorting module 122 mounted in said coin hopper 12 below said coin-inlet 120 for sorting metal coins 4 identified by said identification module 121 into said at least one coin collecting tube 2.

4. The coin dispenser as claimed in claim 1, wherein said coin dispensing unit 3 further comprises a slot 3121 cut through said top wall of said casing 31 and radially extended from each said through hole 312, and a stopper plate 313 mounted in each said slot 3121 and extended into the inside of the associating said through hole 312 for stopping against the peripheral edge of the second said metal coin 4.

5. The coin dispenser as claimed in claim 4, wherein the vertical distance between said stopper plate 313 and a paddle 332 is larger than the thickness of one said metal coin 4 but less than the combined thickness of two said metal coins 4.

10 6. The coin dispenser as claimed in claim 1, wherein said drive module 32 of said coin dispensing unit 3 comprises a turntable 321 for axial rotation, and a pusher 322 disposed on a top surface of said turntable 321; said driving member 333 is provided with a dial block 3331 being able pushed by said pusher 322 to cause said paddle 332 to rotate axially.

15 7. The coin dispenser as claimed in claim 6, wherein said turntable 321 is internally provided with a hole 320 in communication with said coin outlet 311.

20 8. The coin dispenser as claimed in claim 1, wherein said coin dispensing unit 3 further comprises an elastomer 3311 mounted on said shaft 331; said paddle 332 is pressed against said elastomer 3311 and reciprocally rotated.

25 9. The coin dispenser as claimed in claim 1, wherein the height of said dialing rod 334 exposed above said two spring arms 342 of one said spring plate 34 is less than the thickness of one said metal coin 4.

30 40 Amended claims in accordance with Rule 137(2) EPC.

35 1. A coin dispenser, comprising:

45 a body (1) comprising a housing (11), said housing (11) defining therein an accommodation chamber (10);

50 at least one coin collecting tube (2) mounted in said housing (11), each said coin collecting tube (2) defining therein a duct (20) for receiving at least one metal coin (4); and

55 a coin dispensing unit (3) comprising a casing (31) mounted in a bottom side of said accommodation chamber (10) inside said body (1) below said at least one coin collecting tube (2), a storage space (310) defined in said casing (31), at least one through hole (312) cut through a top wall of said casing (31) and aimed at a bottom end of the said duct (20) of one respective said coin collecting tube (2), a coin outlet (311) located

ed on an opposing bottom wall of said casing, a drive module (32) mounted in said storage space (310) inside the casing (31), at least one dialing device (33) disposed inside said storage space (310) and located around said drive module (32) and a spring plate (34) mounted in each said through hole (312) of said casing (31), said dialing device (33) comprising a shaft (331) positioned on a bottom surface of said storage space (310), a paddle (332) pivotally disposed on said shaft (331), a driving member (333) located on one end of said paddle (332) and drivable by said drive module (32) to cause said paddle (332) to rotate axially and a dialing rod (334) upwardly extended from an opposite end of said paddle (332), said spring plate (34) comprising a positioning portion (341) positioned on the peripheral wall of the associating said through hole (312), two spring arms (342) extended from one side of said positioning portion (341) toward the inside of the associating said through hole (312), a gap (3420) formed between said two spring arms (342) for the insertion of said dialing rod (334), a channel (3421) formed on one side of said gap (3420) for said dialing rod (334) to pass and a coin-stopping column (343) upwardly extended from a top surface of a distal end of each said spring arm (342); wherein when said dialing rod (334) is pushed against one side of the peripheral edge of said metal coin (4), the other side of the peripheral edge of said metal coin (4) pushes against said coin-stopping columns (343) to slide along the peripheral edge of said metal coin (4) so that when said metal coin (4) crosses two said coin-stopping columns (343), said metal coin (4) is sent out of said coin outlet (311) of said casing (31),

characterized in that said drive module (32) of said coin dispensing unit (3) comprises a turntable (321) for axial rotation, and a pusher (322) disposed on a top surface of said turntable (321); said driving member (333) is provided with a dial block (3331) being able pushed by said pusher (322) to cause said paddle (332) to rotate axially.

2. The coin dispenser as claimed in claim 1, wherein said body (1) further comprises a coin hopper (12) disposed in said accommodation chamber (10) above said at least one coin collecting tube (2) for dispensing said metal coins (4) into said at least one coin collecting tube (2), said coin hopper (12) having a coin-inlet (120) defined at a top side thereof for the insertion of said metal coins (4).
3. The coin dispenser as claimed in claim 2, wherein said body (1) further comprises an identification module (121) mounted in said coin hopper (12) be-

5 low said coin-inlet (120) for identifying the authenticity and value of each inserted metal coin (4), and a coin sorting module (122) mounted in said coin hopper (12) below said coin-inlet (120) for sorting metal coins (4) identified by said identification module (121) into said at least one coin collecting tube (2).

4. The coin dispenser as claimed in claim 1, wherein said coin dispensing unit (3) further comprises a slot (3121) cut through said top wall of said casing (31) and radially extended from each said through hole (312), and a stopper plate (313) mounted in each said slot (3121) and extended into the inside of the associating said through hole (312) for stopping against the peripheral edge of a second said metal coin (4).
5. The coin dispenser as claimed in claim (4), wherein the vertical distance between said stopper plate (313) and the paddle (332) is larger than the thickness of one said metal coin (4) but less than the combined thickness of two said metal coins (4).
6. The coin dispenser as claimed in claim 1, wherein said turntable (321) is internally provided with a hole (320) in communication with said coin outlet (311).
7. The coin dispenser as claimed in claim 1, wherein said coin dispensing unit (3) further comprises an elastomer (3311) mounted on said shaft (331); said paddle (332) is pressed against said elastomer (3311) and reciprocally rotated.
8. The coin dispenser as claimed in claim 1, wherein the height of said dialing rod (334) exposed above said two spring arms (342) of one said spring plate (34) is less than the thickness of one said metal coin (4).

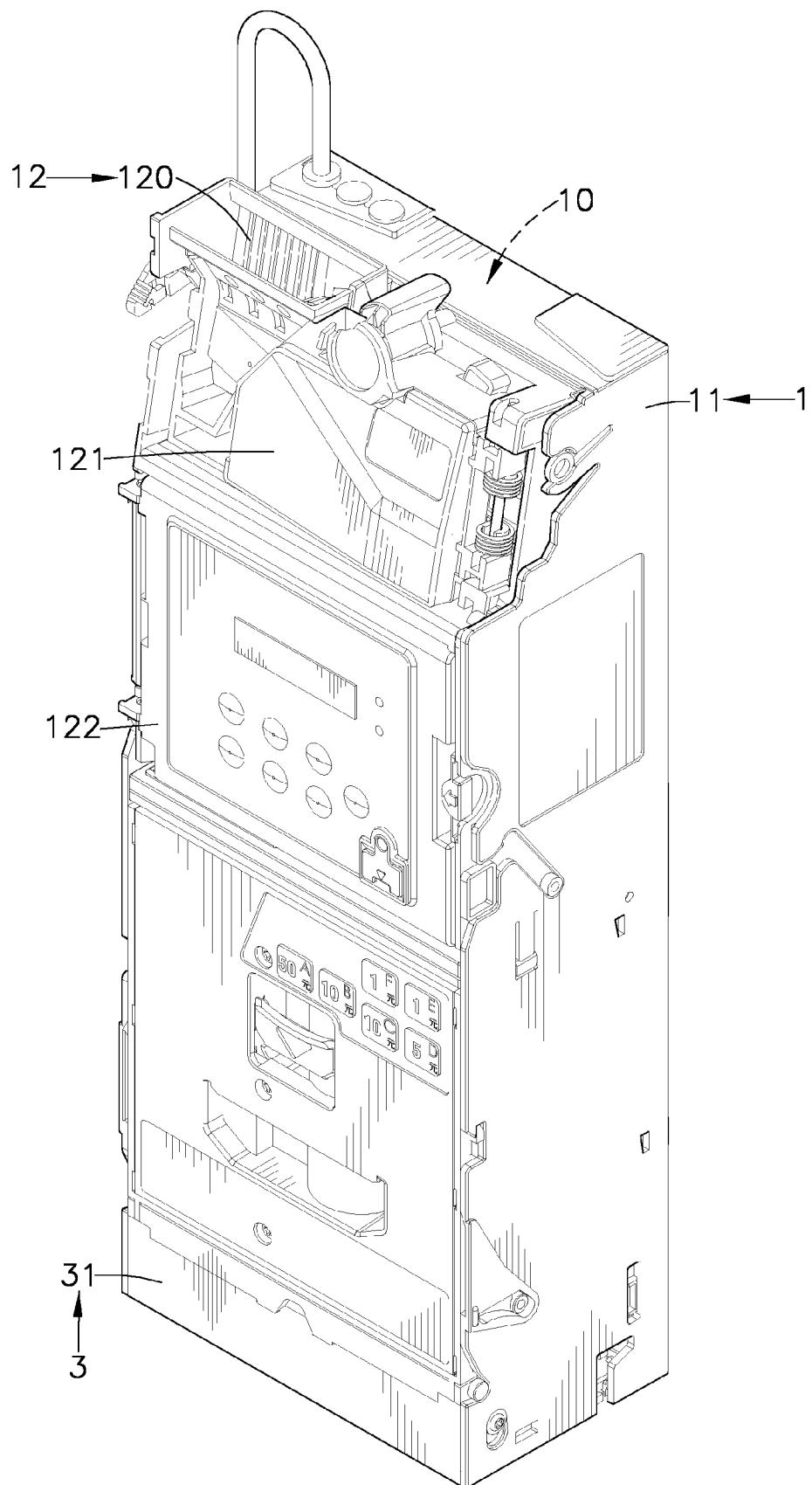
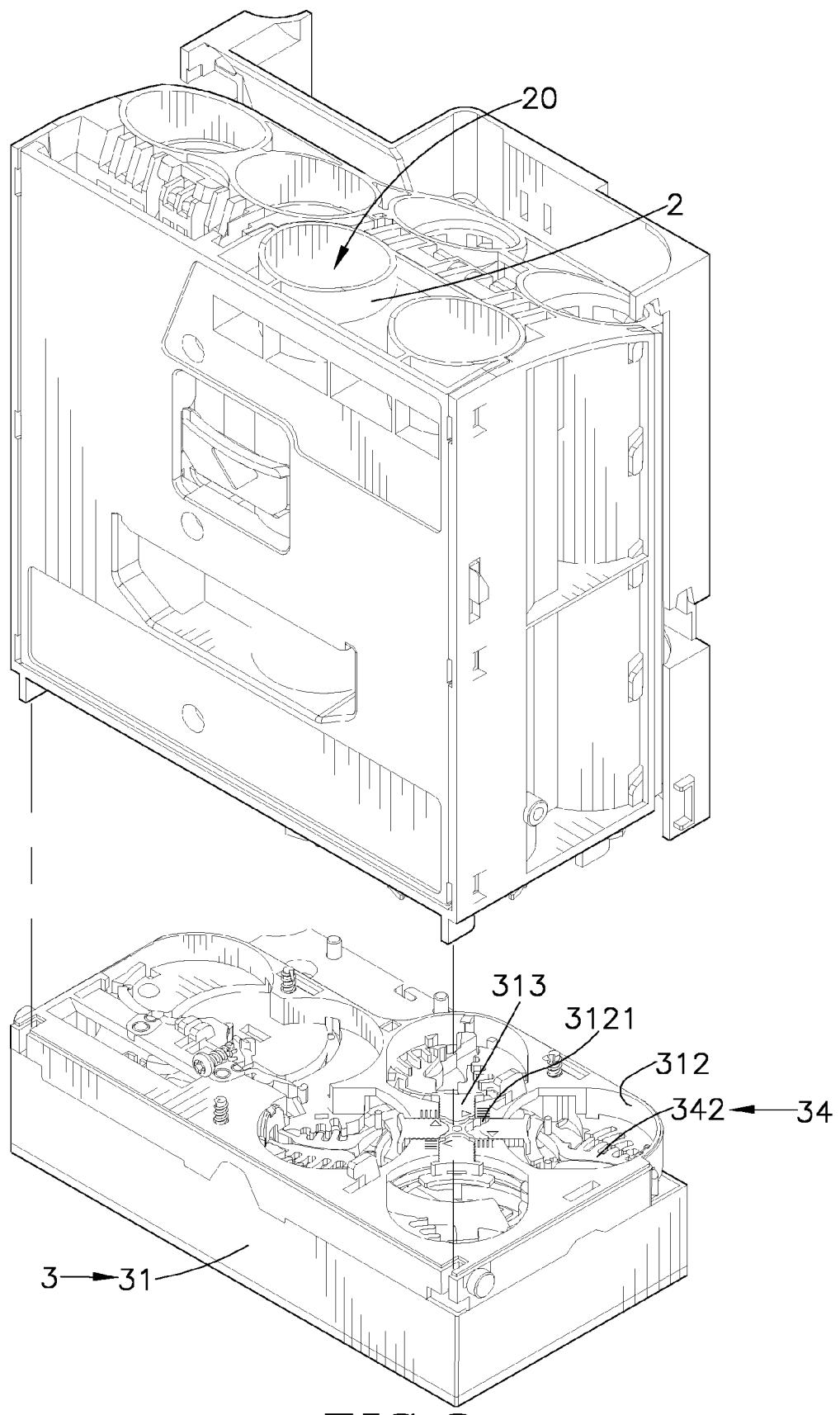


FIG. 1



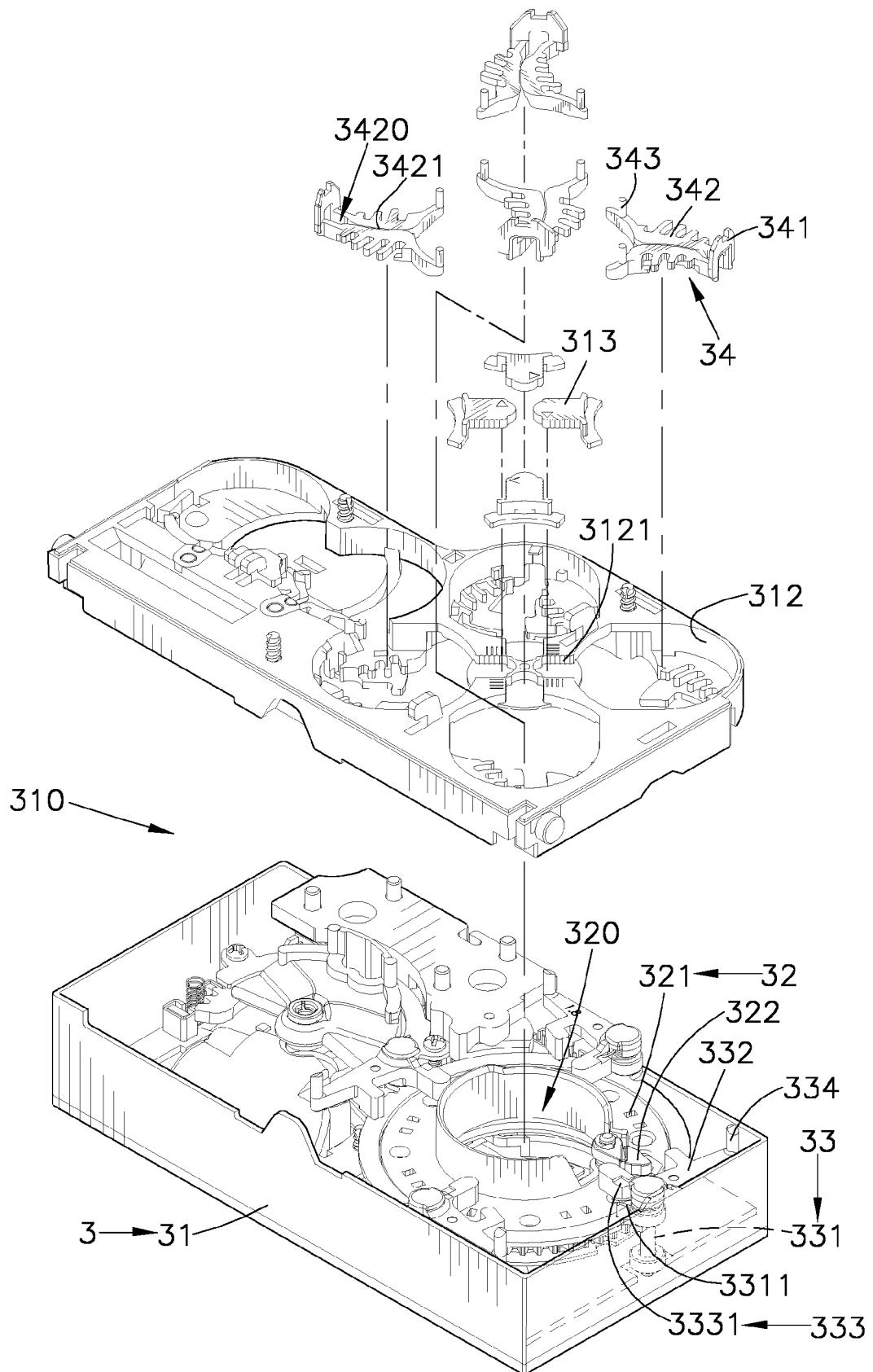


FIG. 3

FIG. 4

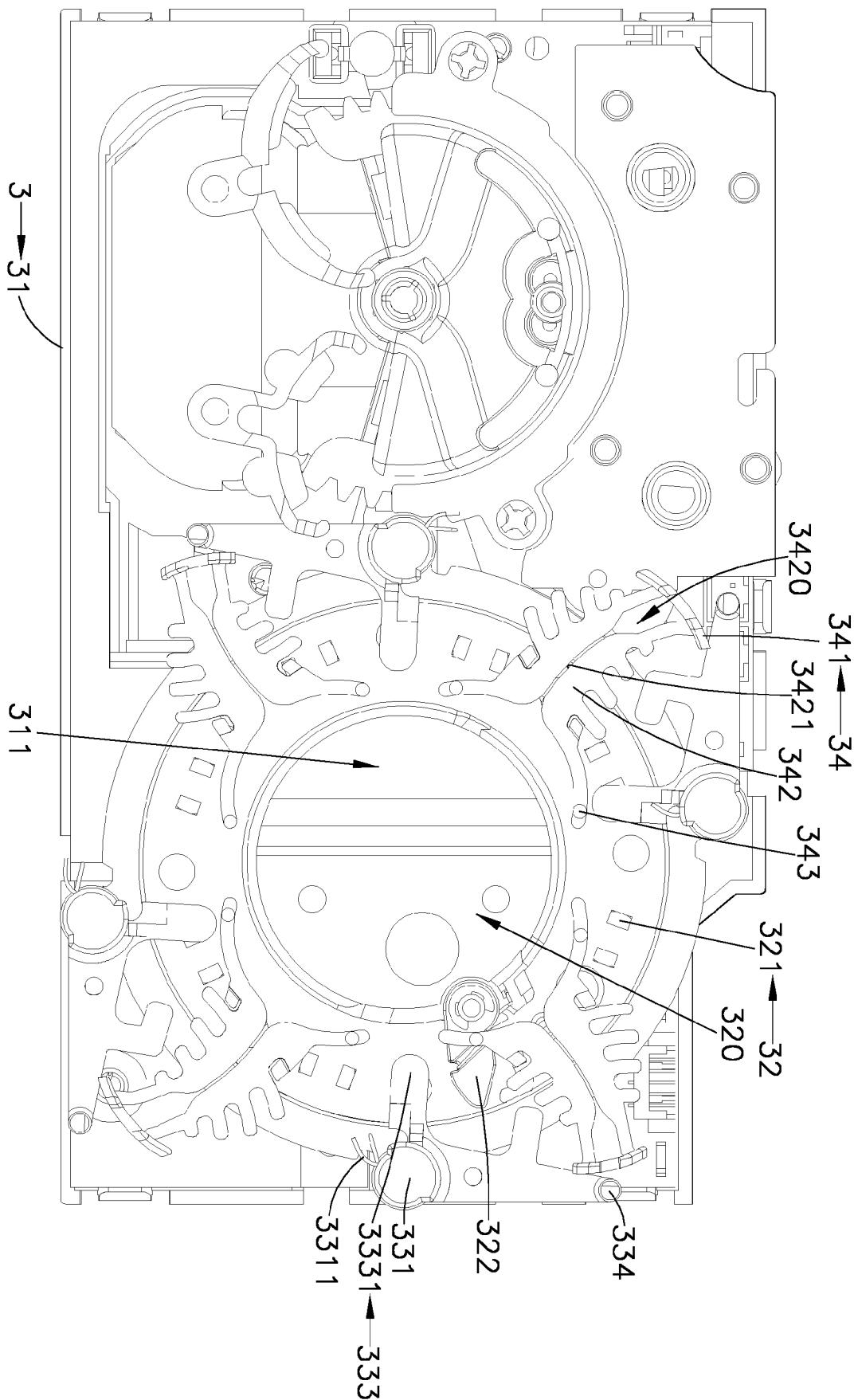
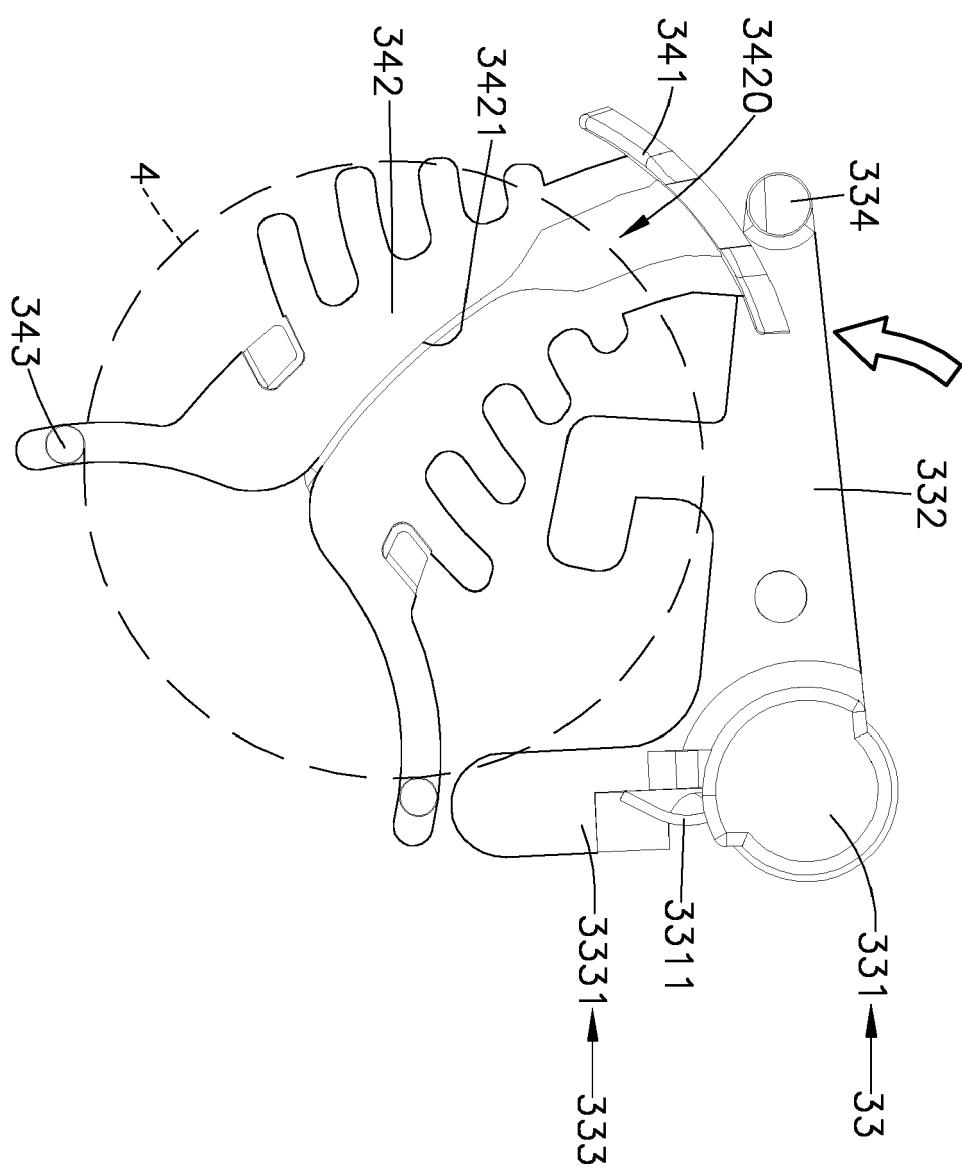
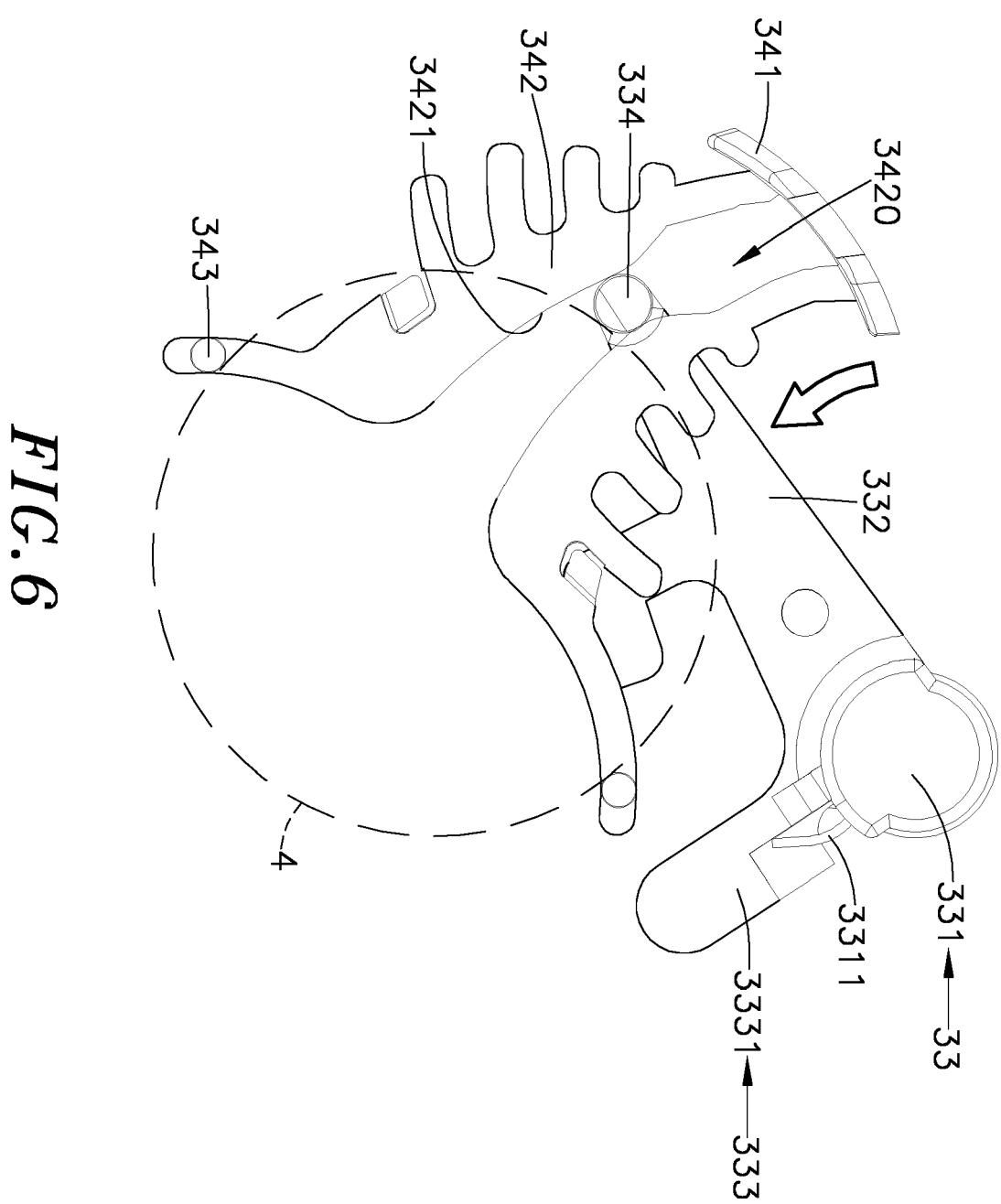


FIG.5





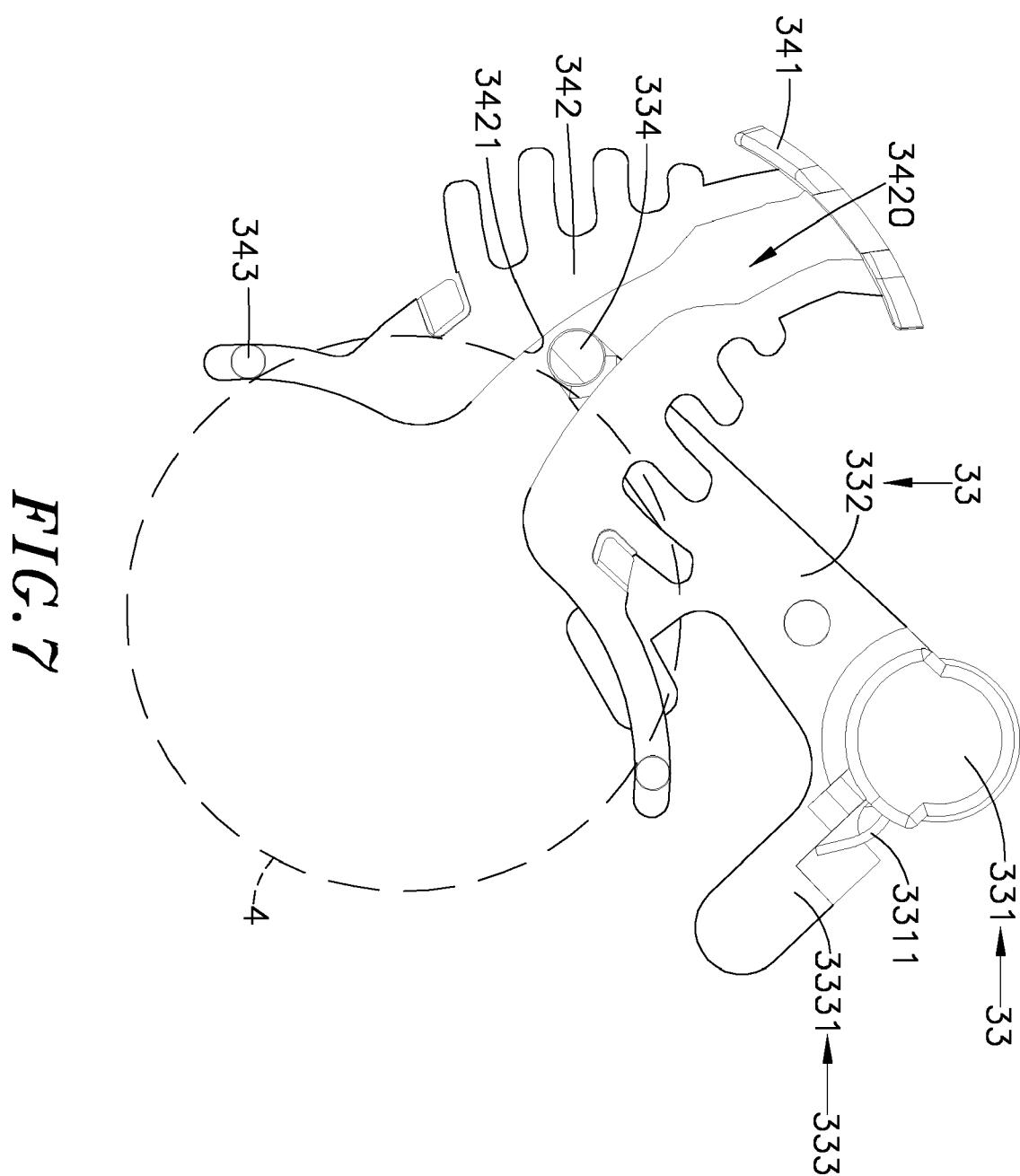


FIG. 7



EUROPEAN SEARCH REPORT

Application Number

EP 19 21 6668

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			TECHNICAL FIELDS SEARCHED (IPC)
			G07D
The present search report has been drawn up for all claims			
1	Place of search	Date of completion of the search	Examiner
50	The Hague	13 May 2020	Seifi, Mozhdeh
CATEGORY OF CITED DOCUMENTS			
55	X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document	T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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