



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
20.01.2010 Bulletin 2010/03

(51) Int Cl.:
G07D 9/00 (2006.01)

(21) Application number: **09490001.6**

(22) Date of filing: **13.06.2009**

(84) Designated Contracting States:
**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 SE SI SK TR**
Designated Extension States:
AL BA RS

(30) Priority: **14.07.2008 IT BO20080448**

(71) Applicant: **Alberici S.p.A.**
40024 Castel San Pietro Terme, (BO) (IT)

(72) Inventor: **Alberici, Fabrizio**
40024 Castel san Pietro Terme (BO) (IT)

(74) Representative: **Agazzani, Giampaolo**
RSM Patents & Trademarks S.R.L.
Via 28 Luglio, 187
47893 Borgo Maggiore (SM)

(54) **Distributing and measuring device for coins**

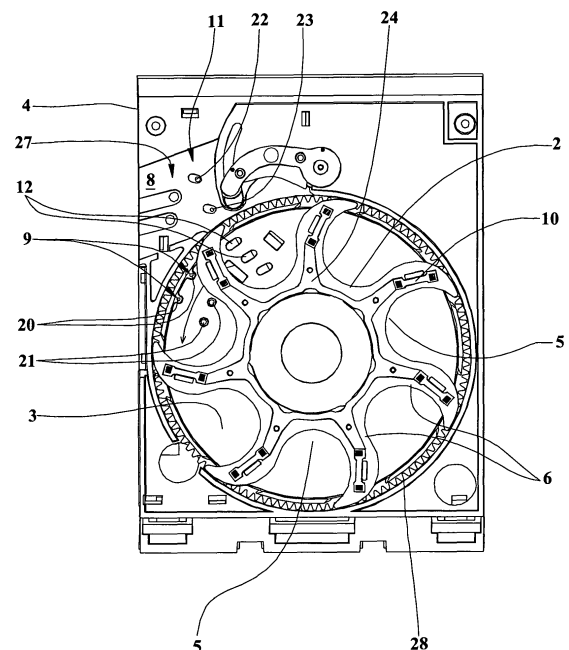
(57) A distributing and metering device for coins comprising at least a first rotating disc (2) axially rotated on a respective seat (3) carried out in a device body (4), said first rotating disc (2) is provided of a plurality of coin housings (5) separated by shaped arms (6) each fit for conveying a coin from a container (7) to an outlet (8) and, in cooperation with teeth means (12) of the seat (3), for expelling the coin through the outlet (8).

Said device comprises at least:

- two sensor means (9) placed on the seat (3) at a pre-determined mutual distance and data linked to a processor means of the device;
- a plurality of activation means (10) each fixed to a respective shaped arm (6) and fit to pass on the two sensor means (9), due to rotation, and to activate said sensors passing on them;
- a coin detector means (11), placed on the outlet (8), data linked to the processor means and activated by the exiting coin.

In an operating condition, the coin detector means (11) send a signal to the processor means when it detects a coin, each sensor means (9) sends a respective signal to the processor means when it detects an activation means (10) of the shaped arm (6) of said coin or of a predetermined adjacent shaped arm (6), the processor means counts the time between the signals provided by the coin detector means (11) and one of the sensor means (9) and the time between the signals provided by the two sensor means (9) to calculate the diameter of the respective coin.

FIG.3



Description

[0001] The present invention relates to coin and token machine and refers to a coin dispenser measurer at the exit of coins, tokens or the alike, from a container.

[0002] There are coin dispensers, known as hoppers, having a coin container and a disc element for withdrawing single coins from such container and for delivering such coins.

[0003] Some of these devices include also measuring means, of the diameter of the outgoing coins, including a motor for rotating the disc provided with encoder and a sector or windows disc associated to the disc rotational shaft for measuring the respectively speed and the angular position of the disc.

[0004] A disadvantage of these known devices consists in the fact that these devices are complex and expensive.

[0005] Another disadvantage of the known devices consists in the fact that they have casual and periodic errors of the speed evaluation and have uncertainty and errors in establishing the disc position with consequent excessive uncertainties in evaluating the coin diameter.

[0006] An object of the present invention is to propose a coin dispenser and a coin meter that is simple and inexpensive.

[0007] Another object is to propose a precise device and without excessive measuring uncertainties.

[0008] A further object is to propose a device with reliable function and easy and fast maintenance.

[0009] The characteristics of the invention are evidenced with particular reference to the enclosed drawings in which:

- figure 1 shows a front and axonometric view of the coin dispenser and coin meter object of the present invention;
- figure 2 shows an axonometric view of the dispenser of figure 1 in which some parts have been removed for better evidencing the others;
- figure 3 shows a front view of the device portion of figure 2;
- figure 4 shows a side view of one of the elements removed by figure 2;
- figure 5 shows a side view of a prism means of figure 2;
- figure 6 shows a side view of a rotating disc of figure 2;
- figure 7 shows an axonometric view of the rotating disc of figure 2;
- figures 8 and 9 show top and axonometric views of the prism means of figure 2 and figure 5.

[0010] With reference to figures 1-9, numeral 1 indicates the coin dispenser and coin meter object of the present invention. The device 1 first includes a rotating disc 2 associated and coaxial to a second rotating disc 26 and cooperating with this latter to transport the coins

from a container 7 to an outlet 8.

[0011] The first rotating disc 2 has a parametric toothed wheel 28 engaged by a motorized pinion for rotating axially said first rotating disc 2 jointly to the second rotating disc 26.

[0012] In an operative condition, the two rotating discs are rotated around their sloping main axis and their lower portions are inside the coin container 7 and the outlet 8 is placed closed to their tops. The discs rotate axially in a respective flat and circular seat 3 carried out in a device body 4 with the first rotating disc in contact, or almost, with the flat surface of the seat 3. The first star-shaped rotating disc 2, with curved arms and inscribed in a perimetrical circle, is equipped with a plurality of coin housings 5 separated by shaped arms 6 each arranged to carry a coin from the container 7 to the outlet 8 and, in cooperation with teeth means 12, for expelling the coin through the outlet 8.

[0013] The second disc 26 has holes with shaped edges in order to favour the entry of the coins into the same holes. Every hole is opposed to a respective housing 5 of the first rotating disc so that each coin fall from the hole into the corresponding seat.

[0014] Moreover, the device includes two sensor means 9 placed in the seat 3 at a mutual predetermined distance and in data connection with a processor means of the device.

[0015] The device 1 is also equipped with a plurality of activation means 10 each fixed to a respective shaped arm 6 and arranged to transit over both sensor means 9, due to rotation of the discs, and to activate each sensors passing thereon.

[0016] In addition the device 1 includes a coin detecting means 11, placed at the outlet 8. The detecting means 11 is in data connection with the processor means and is activated by the coin exiting from the disc.

[0017] The two sensor means 9 and the detector means 11 are optical and their activation occurs when their optical circuit is closed or open.

[0018] Each sensor means 9 includes a respective light emitter means 20, for example a LED (Light Emitter Diode), and a respective and spaced light sensitive means 21, for example a photoresistor or a phototransistor with control circuit.

[0019] The light emitter means 20 and the light sensitive means 21 emit and receive the light in respective operative directions and such means 20, 21 are fixed with respect to the plane of the seat 3 so that each operative direction are almost perpendicular to the said plane.

[0020] The light emitter means 20 and the light detector means 21 are placed under the active end of the activation means 10 when it transits on the sensor means 9 having each light emitter means 20 and light sensitive means 21.

[0021] The activation means 10 is made of transparent material for the light emitted by the light emitter means 20 and is shaped elongated with prisms at its active ends

for refracting the light of the emitter means 20 towards the light sensitive means 21 when this activation means 10 pass on the sensor means 9.

[0022] The light sensitive means 21 sends a signal to the processor means when it receives the light of the respective light emitter means 20 due to the transit of one of the activation means 10 or when the respective shaped arm 6 passes on such sensor means 9. In this way the two sensor means 9 send the respective signals at the transit instants of each shaped arm.

[0023] The detector means 11 includes a respective light source 22 and respective and spaced light receiver means 23 having the respective almost parallel operative directions and orthogonal to the outlet 8.

[0024] The light source means 22 and light receiver 23 are placed under, and spaced by, prismatic respective ends of a light transmitting means made of a material that is transparent to the light made by the light source means 22 to refract the light towards the known light receiver means 23 when none coin engages the outlet 8 and therefore when there is no obstructions to the light flow between one of the light source means 22 and light receiver 23 and the light transmitting means.

[0025] When a coin reaches the outlet 8 between the light source means 22 or the light receiver means 23 and one of the end of the light transmission means, this coin intercepts the light and said light receiver means 23 sends a signal to the processor means signalling the instant of the passage.

[0026] The device 1 includes a connecting means 24 reproducing the star shape of the first rotating disc 2. The end of each arm of the connecting means 24 has a respective activation means 10. The connecting means 24 is fixed and interposed between the rotating discs, first 2 and second 26, with each of the activation means 10 faced to a respective shaped arm 6.

[0027] The connection means 24 is fixed to the face of the first rotating disc 2 opposite to the seat 3 and each shaped arm 6 has two holes 25 for the passage of the light to the ends of the corresponding activation means 10.

[0028] In addition the device includes an optical coin detector 27 placed at the external end of the outlet 8 and fit to supply a reliable counting of the coins delivered by the device.

[0029] In operation condition, the coin detecting means 11 sends a signal to the process means when it detects a coin, each sensor means 9 sends a respective signal to the elaboration means when it detects an activation means 10 of the shaped arm 6 of this coin or an adjacent predetermined shaped arm 6, the process means counts the time elapsed between the signals supplied by the coin detecting means 11 and one of the sensor means 9 and the time elapsed between the signals supplied by the two sensor means 9 to calculate the diameter of the respective coin on the base of a special algorithm memorised in the same process means.

[0030] An advantage of the present invention is to sup-

ply a coin dispenser and coin meter that is either simple and cheap.

[0031] Other advantage is to supply a precise device without excessive measuring uncertainties.

[0032] A further advantage is to supply a device of reliable operation and of easy and fast maintenance.

Claims

1. Distributing and metering device for coins comprising at least a first rotating disc (2) axially rotated on a respective seat (3) carried out in a device body (4), said first rotating disc (2) is provided of a plurality of coin housings (5) separated by shaped arms (6) each fit for conveying a coin from a container (7) to an outlet (8) and, in cooperation with teeth means (12) of the seat (3), for expelling the coin through the outlet (8); said device being **characterized in that** it comprises at least:

- two sensor means (9) placed on the seat (3) at a predetermined mutual distance and data linked to a processor means of the device;
- a plurality of activation means (10) each fixed to a respective shaped arm (6) and fit to pass on the two sensor means (9), due to rotation, and to activate said sensors passing on them;
- a coin detector means (11), placed on the outlet (8), data linked to the processor means and activated by the exiting coin;

in an operating condition, the coin detector means (11) send a signal to the processor means when it detects a coin, each sensor means (9) sends a respective signal to the processor means when it detects an activation means (10) of the shaped arm (6) of said coin or of a predetermined adjacent shaped arm (6), the processor means counts the time between the signals provided by the coin detector means (11) and one of the sensor means (9) and the time between the signals provided by the two sensor means (9) to calculate the diameter of the respective coin.

2. Device according to claim 1 **characterized in that** the two sensor means (9) and the detector means (11) are of optical kind.

3. Device according to claim 2 **characterized in that** each sensor means (9) comprises a respective light emitter means (20) and a respective spaced apart light sensitive means (21) having almost parallel respective operative directions and laid below the active ends of the activation means (10) when it pass on the sensor means (9); said activation means (10) being made of material transparent to said light and being shaped in an elongated manner with prisms

at the active ends to deflect the light of the light emitter means (20) to the light sensitive means (21) when said activation means (10) passes on to the sensor means (9); the light sensitive means (21) sending a signal to the processor means when it receives the light of the respective light emitter means (20). 5

4. Device according to claim 2 **characterized in that** the detector means (11) comprises a respective light source means (22) and a respective spaced apart light receiving means (23) having almost parallel respective operative directions and laid below, and spaced apart to, respective prismatic ends of a light transmitting means made of a material transparent to said light to deflect the light of said light source means (22) to said light receiving means (23) when no coin runs the outlet (8); when a coin reach the outlet (8) between one of said light source means (22) or light receiving means (23) and one of the ends of the light transmitting means, said coin intercepts the light and said light receiving means (23) sends a signal to the processor means. 10 15 20
5. Device according to claim 1 **characterized in** comprising a connecting means (24) reproducing the shape of the first rotating disc (2) and having at each end a respective activation means (10); said connecting means (24) being fixed to the said first rotating disc (2) with each activation means (10) facing a respective shaped arm (6). 25 30
6. Device according to claim 5 **characterized in that** the connecting means (24) is fixed to the face of the first rotating disc (2) opposed to the seat (3) and each shaped arm (6) having two holes (25) for the passage of the light up to the ends of the activation means (10). 35
7. Device according to claim 5 **characterized in** comprising a second rotating disc (26) coaxial with the first one (2) and cooperating with the latter for conveying coins; the connecting means (24) being interposed between the first (2) and the second (26) rotating disc. 40 45
8. Device according to any of the preceding claims **characterized in** comprising an optical coin detector (27) placed at the external end of the outlet (8).
9. Device according to any of the preceding claims **characterized in that** the first rotating disc (2) has a perimetrical toothed wheel (28) engaged by a motorized pinion for rotating said first rotating disc (2). 50 55

FIG.1

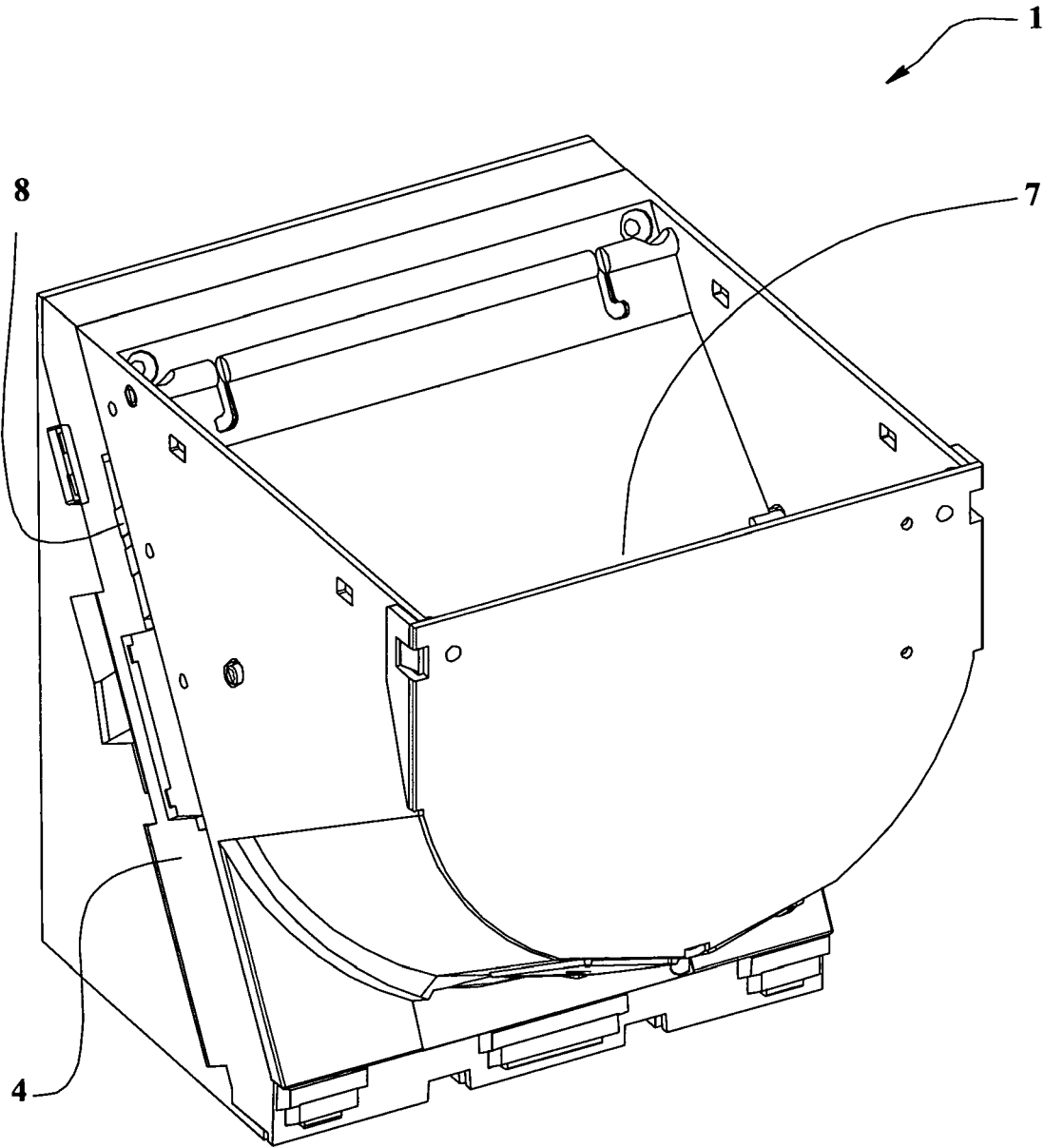


FIG.2

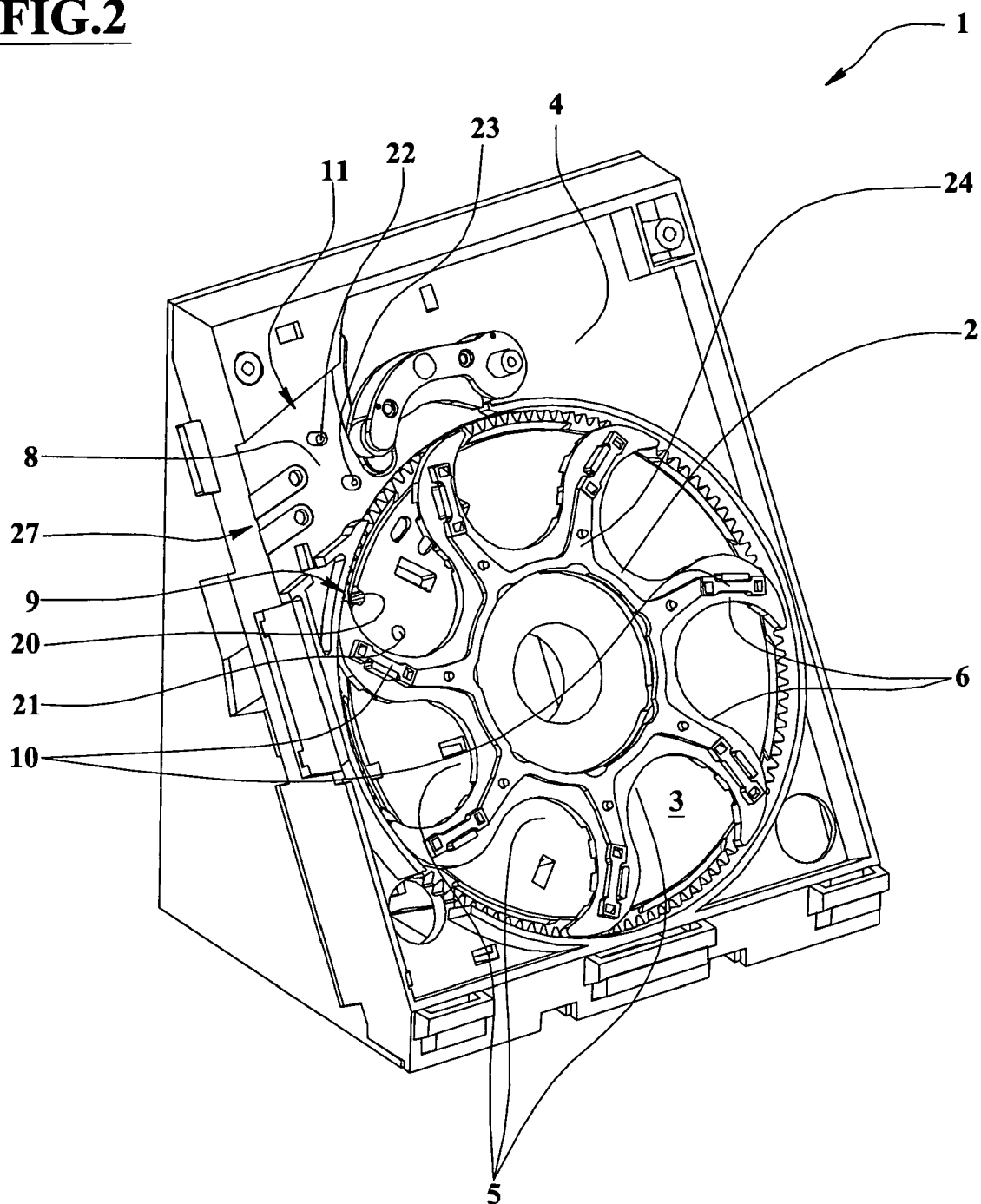


FIG.3

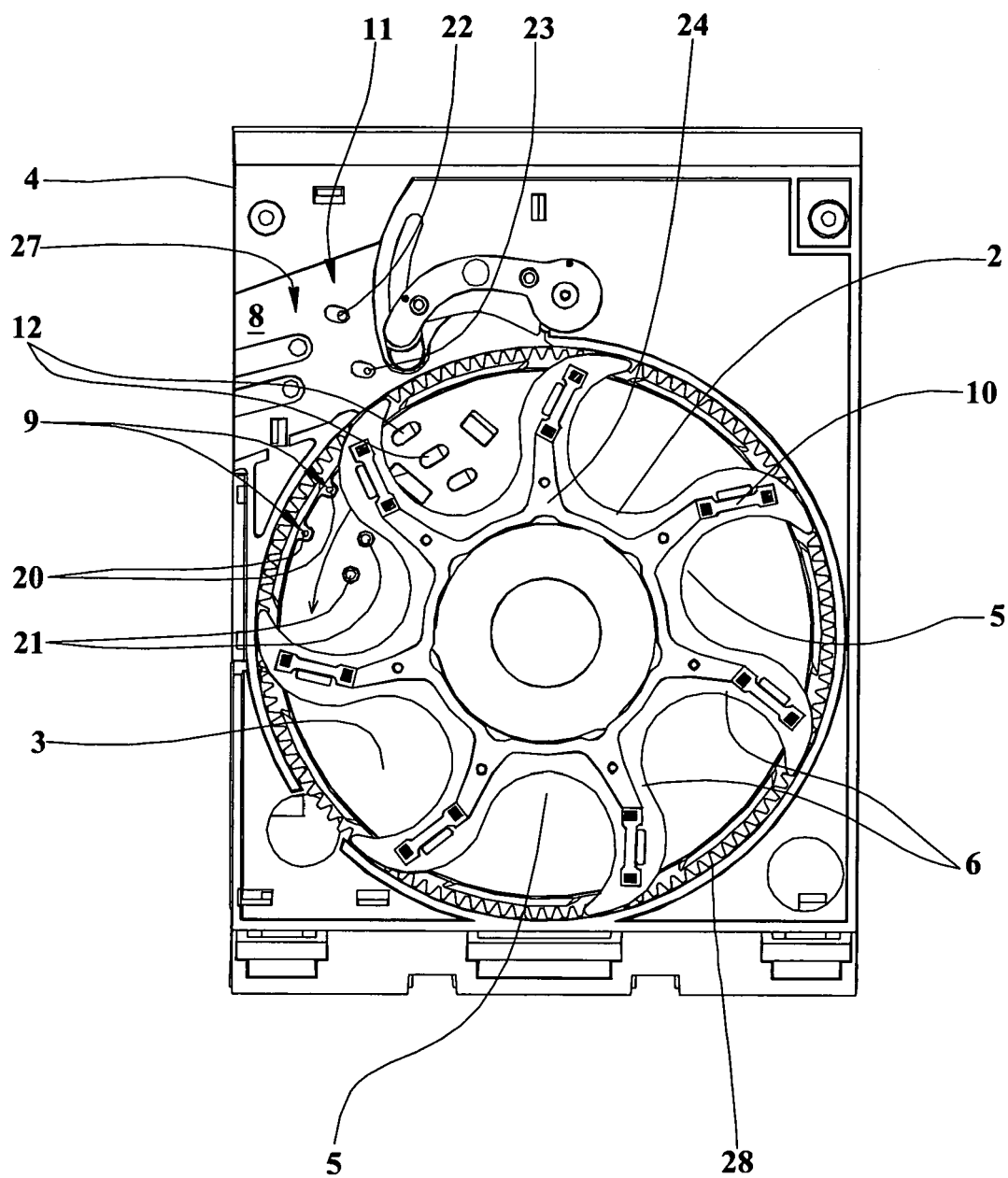


FIG.4

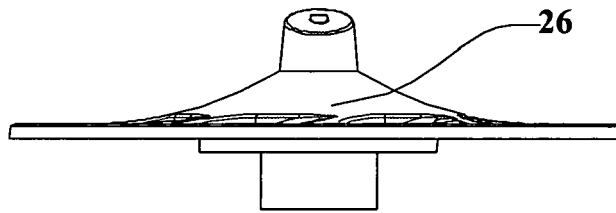


FIG.5

FIG.6

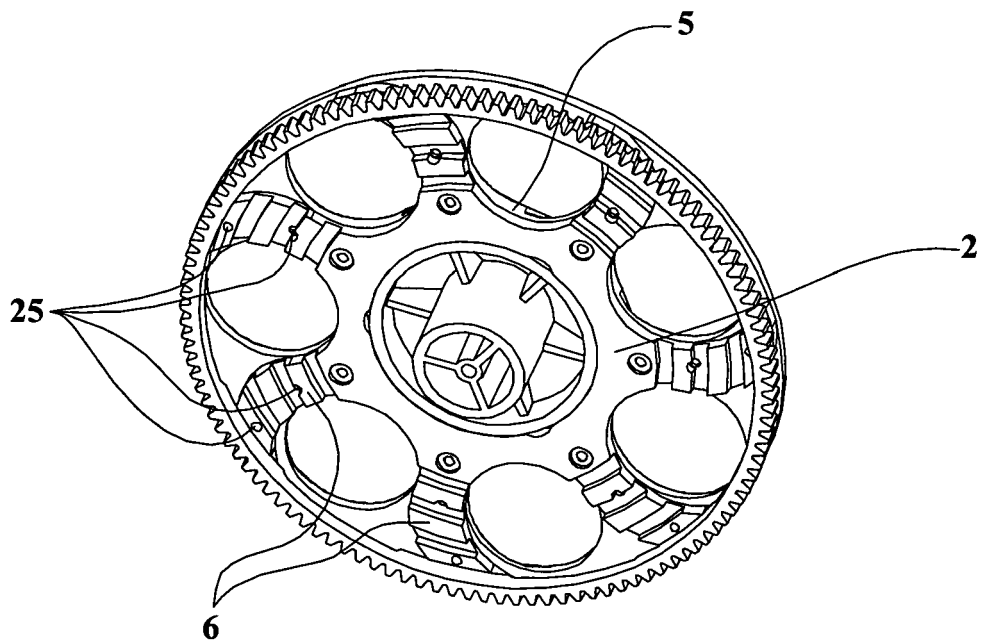


FIG.7

FIG.8

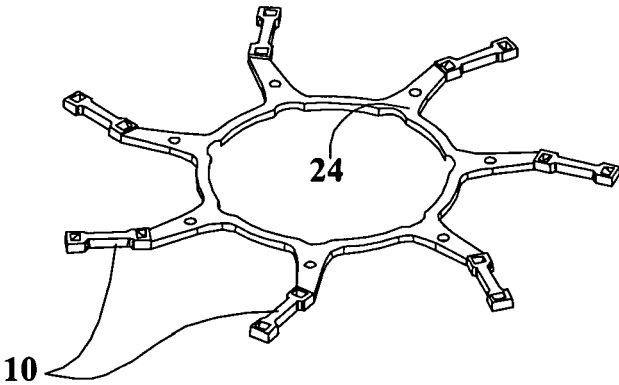
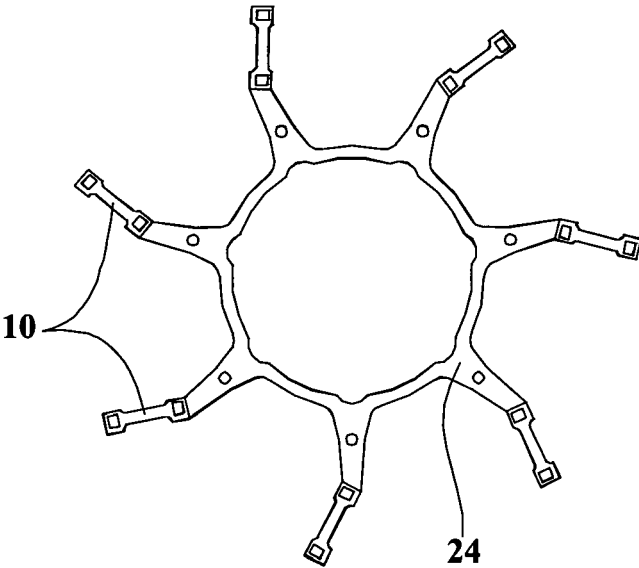


FIG.9