



Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11)

**EP 1 624 420 A1**

(12)

## EUROPEAN PATENT APPLICATION

(43) Date of publication:  
**08.02.2006 Bulletin 2006/06**

(51) Int Cl.:  
**G07F 5/02 (2006.01)**

(21) Application number: **04381027.4**

(22) Date of filing: **06.08.2004**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
HU IE IT LI LU MC NL PL PT RO SE SI SK TR**  
Designated Extension States:  
**AL HR LT LV MK**

(72) Inventor: **FERNANDEZ MUNOZ, Miguel**  
**4540 Chave (PT)**

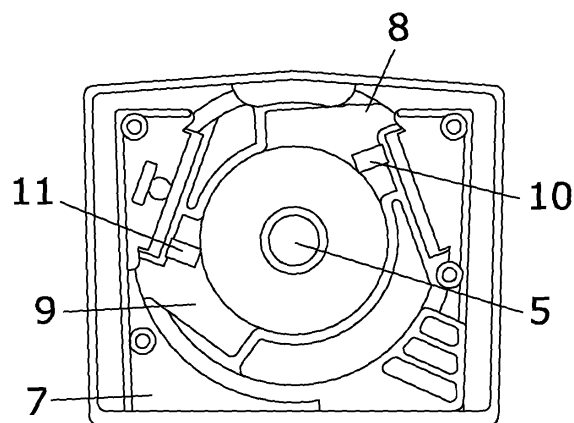
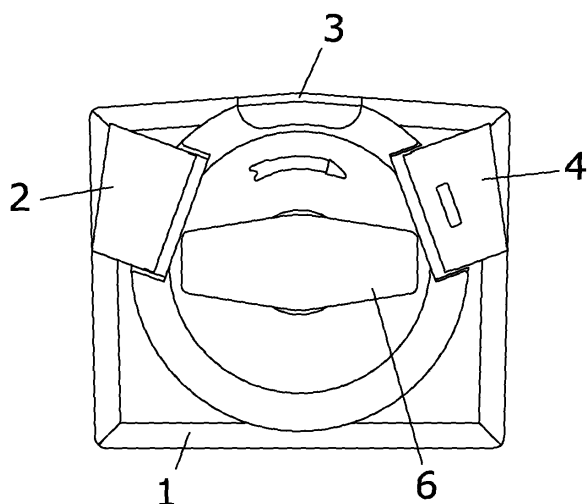
(74) Representative: **Esteban Perez-Serrano, Maria  
Isabel et al**  
**UDAPI & ASOCIADOS**  
**Explanada, 8**  
**28040 Madrid (ES)**

(71) Applicant: **FERNANDEZ MUNOZ, Miguel**  
**4540 Chave (PT)**

### (54) Three-coin coin system

(57) Three-coin coin system that has a front plate, with three slots through which the coins are inserted, also presenting on the first rotary disc in contact with the front plate housings that have recesses machined in their outer edge to facilitate the projection of the finger, while on the control unit there is a clutch that disengages the control unit when a certain torque is exceeded, for which purpose one end of the spindle is provided with opposing semi-circular recesses where metal rollers are located

which, when the spindle is installed on the control unit, match up with plastic rollers inside the control unit. Furthermore and in order to assist the three-coin coin system the angle-toothed crown wheel has some of these teeth removed so as to facilitate runback in the event of insertion of a wrong coin, something which often happens, while it also has means for fastening the coin system to the support structure of the machine, based on the use of a rocking pawl.



**FIG. 1**

## Description

### OBJECT OF THE INVENTION

**[0001]** The object of the present invention is a three-coin coin system from amongst the mechanisms that work with coins used in product dispensing which are operated subsequently to the insertion of three coins.

**[0002]** The present invention is characterised by the fact of being designed and configured so that it operates with three coins, so that the rest of the structure of the assembly is designed accordingly owing to the technical difficulties that might arise in its operation due to the fact that three coins are needed for its operation.

**[0003]** The object of the present invention comprises the improvements carried out on the operating system, which has a clutch that prevents the coin mechanisms from being broken.

**[0004]** The object of the invention also includes the improvement introduced into the fastening of the coin system as well as the improvements carried out that enable a coin to be removed when it has been inserted by mistake.

**[0005]** The present invention therefore lies within the bounds of coin-operated mechanisms, also known as coin systems and which are used in the distribution of products in vending machines.

### BACKGROUND OF THE INVENTION

**[0006]** Hitherto the systems on the market have needed the prior insertion of one or two coins for their correct working.

**[0007]** In some cases, in view of the price of the product the coin systems have to allow three coins to be inserted.

**[0008]** This circumstance has not been envisaged by any manufacturer to date, so far as the applicant knows, amongst other reasons, on technical grounds. The implementation of coin systems operating with three coins involves a series of difficulties.

**[0009]** On the one hand, it is necessary to design the machine so that if a wrong coin has been inserted in one of the slots for any reason, the control unit permits the runback of the mechanism so that the coin inserted wrongly may be removed.

**[0010]** On the other hand, the situation sometimes comes about on one-or two-coin systems that the coins have not been set in place properly, so that the rotation of the operating mechanism is obstructed and the coin parts may even break. This situation will be more likely to arise in the coin system covered by the present invention, so it is necessary to provide the control unit with clutch means that prevent excessive torque being exerted on said control unit that could result in the coin system parts being broken.

**[0011]** Furthermore, feeler fingers are responsible for determining the height of the coin. These fingers are housed in recesses on a rotary disc. One of the difficulties

existing is the protrusion of the feeler fingers from the recesses for housing the coins and means have to be provided that enable the feeler fingers to protrude from said recesses, especially when there is no coin in the recess.

**[0012]** Already known are the coin systems described in US patent 5657848, as well as the one described in Spanish utility model ES1 030441 U, where in both cases a coin system is shown that operates with two coins and that has means for receiving and checking the correct diameter and thickness of the coins, as well as means for preventing the removal of one of the coins in the advance of the control unit.

**[0013]** None of these coin systems, however, has means that limit the torque exerted on the control unit so that, when a given torque is exceeded, this is released without any of the coin system parts getting broken, besides means that facilitate the protrusion of feeler fingers disposed on the coin receiving recesses, nor are they designed to facilitate the removal of a coin inserted incorrectly.

**[0014]** Therefore, an objective of the present invention is to develop a three-coin coin system that will only permit the operation of the control unit after three coins have been inserted, all the structural parts making up the coin system having been adapted in order to facilitate rotation, permit the removal of a coin inserted wrongly, and prevent the breaking of the coin system parts in the event of excessive torque being exerted on the control unit.

### DESCRIPTION OF THE INVENTION

**[0015]** The three-coin coin system invention consists of a coin-operated mechanism from amongst those used in product dispensing machines characterised in that it is designed for three coins, a series of structural adaptations having been made in line with the technical or operating needs that might arise due to the fact of working with three coins.

**[0016]** The coin system basically consists of a front plate in which there are three slots for inserting the coins. In addition, the inner face of the plate is provided first with a rotary disc, then with a series of semi-circular openings, said plate being fitted with feeler fingers, and finally there is another rotary plate, through one of the faces of which there protrudes a toothed crown wheel against which a pawl is fixed that prevents the runback of the mechanism assembly, while the other face of this second rotary disc presents a circular shoulder which moves a lock plate in order that the smaller diameter coin may be removed while it is turning.

**[0017]** The front face of the coin system has three regularly arranged slots or openings in which the required coins are inserted.

**[0018]** Furthermore, matching up with the three coin system front face slots and on one of the faces of the rotary disc in contact with rear side of the coin system front face, there are three circular recesses machined

matching up with the openings in the front face which form housings for the coins.

**[0019]** On each of the recessed housings there are little recesses machined that permit the projection of feeler fingers when the disc turns and there is nothing in the space.

**[0020]** In addition, in view of the possible excess torque exerted on the control unit, even when the coins have been inserted in their respective slot correctly but are not properly in place, the parts could be broken, so there is a spindle release clutch in the control unit.

**[0021]** The control unit clutch consists of the disposition in the spindle of semi-circular profile slots, where metal rollers are provided in the slots. In addition, inside the control unit there is a housing structure made up of two diametrically opposed slots protruding sideways from the circular central cavity.

**[0022]** Said slots accommodate plastic rollers which are in contact with the metal rollers disposed in the spindle end slots, so that in the event of excessive torque being exerted on the control unit, the plastic rollers are deformed by metal rollers, releasing the spindle operating system and not transmitting the force exerted to the rest of the structure.

**[0023]** On the oblique toothed crown wheel on one of the faces of the second rotary disc, the number of teeth has been reduced in a substantial sector of the crown in order to facilitate runback for ejecting an incorrect coin.

**[0024]** On the other hand, the coin mechanism that is the object of the present invention has a system of fastening to the rest of the structure based on the use of a rocking pawl which is kept protruding under the action of a spring, so that the coin mechanism may be removed from its place of fastening by simply inserting your hand behind the structure and turning the locking pawl, so that the coin mechanism can be withdrawn from its fastening structure.

#### EXPLANATION OF THE DRAWINGS

**[0025]** To supplement the description being given and in order to assist a clearer understanding of the features of the invention, a set of drawings is attached as an integral part of the present report wherein the most significant details of the invention are represented for purely illustrative and never restrictive purposes.

**[0026]** Figure 1 shows the front and rear face of the coin system front plate.

**[0027]** Figure 2 represents both faces of the first rotary disc, which is in direct contact with the front plate of the coin system.

**[0028]** Figure 3 represents a front and side view of the spindle.

**[0029]** Figure 4 shows the inside of the operating system where one end of the spindle is housed.

**[0030]** Figure 5 shows the coin system assembly seen from the rear face highlighting the means for anchoring and fastening the coin system to the rest of the structure.

**[0031]** Figure 6 shows the front and rear face of the second rotary disc with which the coin system in question is provided.

#### 5 PREFERRED EMBODIMENT OF THE INVENTION

**[0032]** In the light of the above figures we now describe a preferred mode of embodiment of the proposed invention.

10 **[0033]** In figure 1 we observe the front plate (1) of the coin mechanism and in it there are three slots (2, 3 and 4) machined for inserting three coins, the whole assembly being traversed by a spindle (5) at one of the ends of which is attached an operating system (6) responsible for rotating and actuating the coin mechanism once the coins are inserted through its slots and set in place in their housings (13).

15 **[0034]** On the rear side (7) of the front plate (1) we observe areas (8) and (9) for accommodating feeler pawls which gauge that the coins inserted are the right diameter. Said pawls (8) and (9) act against the force of springs housed in the spaces marked (10) and (11).

20 **[0035]** In figure 2, we observe that on the face of the first rotary disc (12), which is not in contact with the back of the front plate, there are three housings (13) machined in keeping with the size of the coins to be inserted there are recesses (14) machined designed to facilitate the projection of the finger when the assembly turns.

25 **[0036]** In figure 3 we observe that the spindle (5) presents at one of its ends, the one that is housed and fixed inside the operating system (6), semi-circular profile recesses where metal cylinders (16) are disposed.

30 **[0037]** In figure 4, where the interior of the control unit (6) is shown, we observe a central circular housing which presents diametrically circular flarings (17) that each define housings where plastic rollers (18) are located.

35 **[0038]** When the spindle is installed together with the metal rollers (16), these are in contact with the plastic rollers (18), so that, if the force being exerted on the control unit exceeds the deformation strength of the plastic rollers (18), these are deformed by action of the metal rollers, thereby releasing the control unit and preventing the breaking of any other part of the assembly, so that we may consider that the control unit is provided with a clutch.

40 **[0039]** In figure 5 we observe the whole of the rear side of the coin system assembly where the most noteworthy feature is the means used for fixing the coin system to and releasing it from the structure housing it. For this purpose, attached to the coin system it has a pawl (19), which is pulled by a spring (20) causing it to rock in relation to a spindle (21), which means that this pawl is normally deployed preventing the removal of the coin mechanism from its place of installation.

45 **[0040]** To remove the coin mechanism, we simply have to insert our hand at the back of the support structure and rock the pawl in the opposite direction, so that it allows the coin mechanism to be withdrawn from the rest

of the structure.

**[0041]** The essential nature of this invention is not altered by variations in materials, shape, size and layout of the component parts, described in a non-restrictive way, but with sufficient information for it to be reproduced by an expert.

## Claims

1. Three-coin coin system, from amongst the coin systems that have a front plate, provided first of all with a rotary disc (12) housed on the rear face of the front plate (1), then with a plate with a series of semi-circular openings, said plate also being fitted with feeler fingers, and lastly there is another rotary plate, where there protrudes through one of it's a crown wheel with teeth against which a pawl is fixed that prevents the runback of the mechanism assembly, while the other face of this second rotary disc presents a circular recess that moves a lock plate in order that the smaller diameter coin may be removed while it turns, the whole assembly being operated by a control unit that connects up via a spindle with the other parts of the coin system, **characterised in that** the system is operated by three coins, so that:

- on the front plate (1) there are three slots (2, 3 and 4)
- on one of the faces of the first disc (12) there are housings (13) of the size of the coins to be accommodated
- on the edge of said housings (13) there are recesses (14) that assist the projection of a feeler finger provided on the housing (13), when the finger turns and there is no coin
- on the control unit there are clutch means that disengage the action of the control unit when a certain rotation torque threshold is exceeded
- on the second rotary disc and on the crown with angled teeth, part of them have been removed in order to facilitate runback for the ejection of a wrongly inserted coin, something that happens quite often since three coins have to be inserted
- the rear side of the assembly is provided with a disengagement pawl

2. Three-coin coin system, as defined in claim 1, **characterised in that** the clutch means disposed on the control unit (6) consist of providing one end of the spindle (5), the one which is housed inside the control unit (6), with semi-circular section recesses (15) where metal cylinders (16) are each housed, while the control unit (6) has a central circular housing which presents circular flarings (17) each defining housing where plastic rollers (18) are located, so that if for any reason the force that is being exerted on

the control unit exceeds the deformation strength of the plastic rollers (18), these are deformed by the action of the metal rollers, thereby disengaging the control unit so that there is no risk of any other part of the assembly being broken, so that we may consider that there is a clutch on the control unit.

3. Three-coin coin system, as defined in claim 1, **characterised in that** the means for anchoring the coin system to the rest of the assembly consist of a pawl (19) provided on the rear plate of the assembly; the pawl (19) is pulled by a spring (20) which causes the pawl to rock in relation to a spindle (21), said pawl normally being deployed to prevent the removal of the coin system from its place of installation.

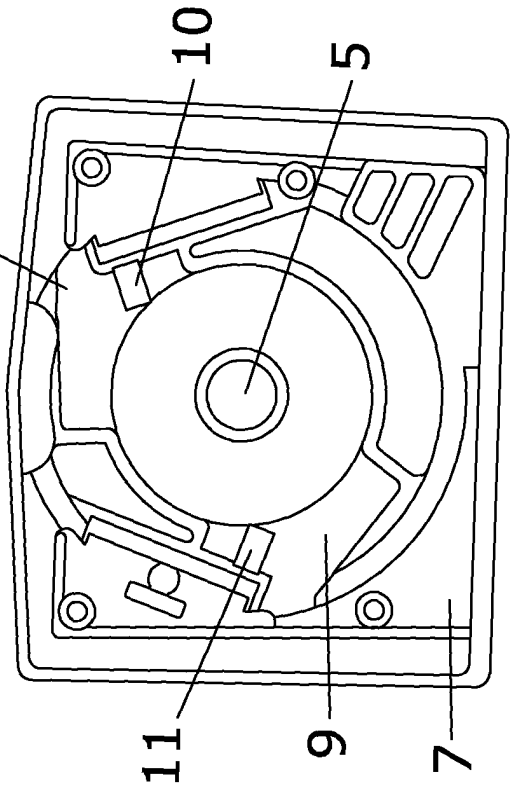
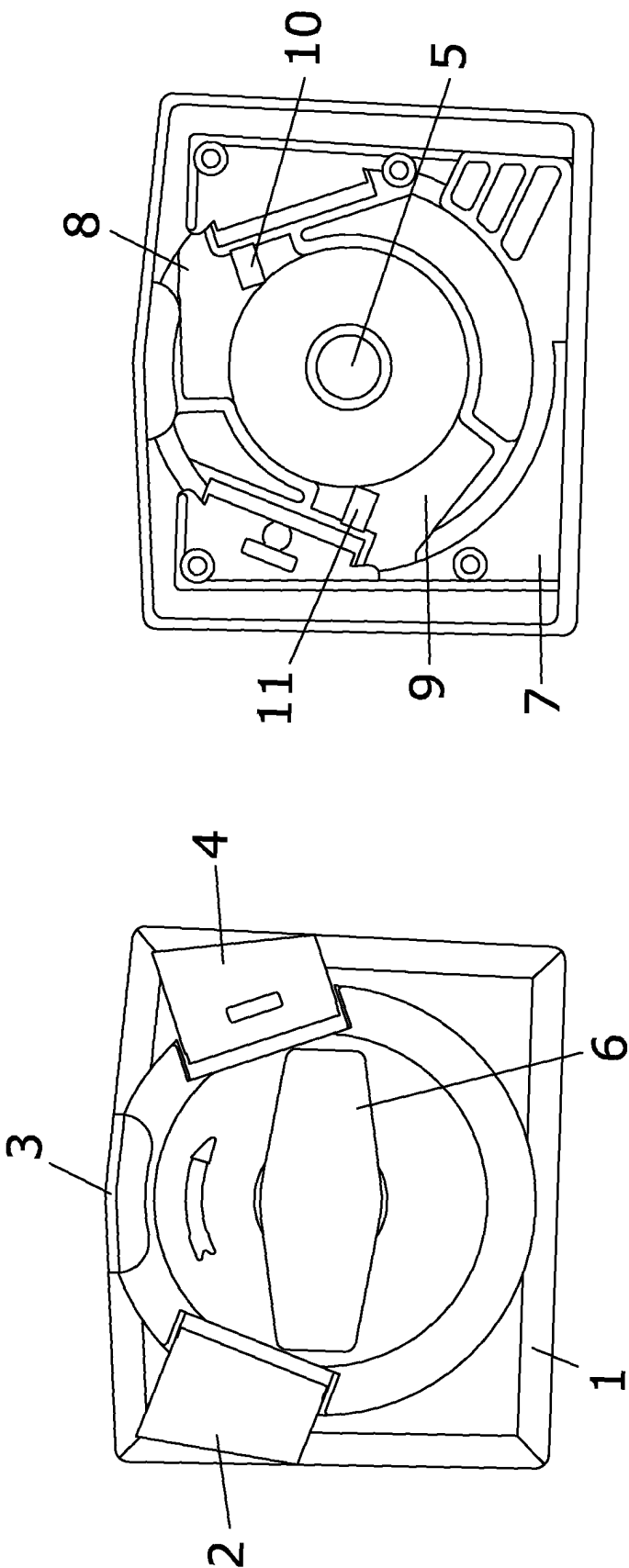
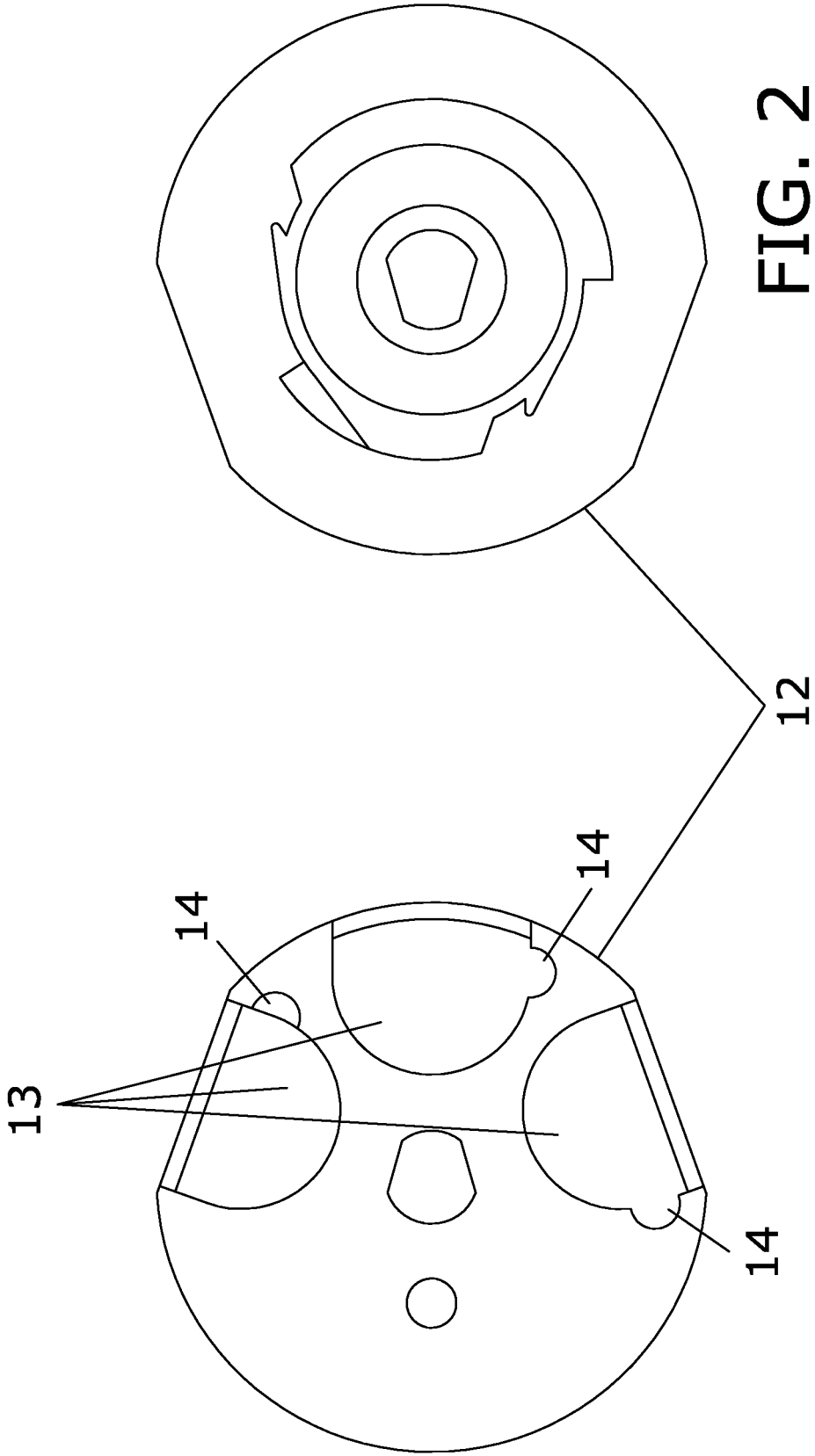
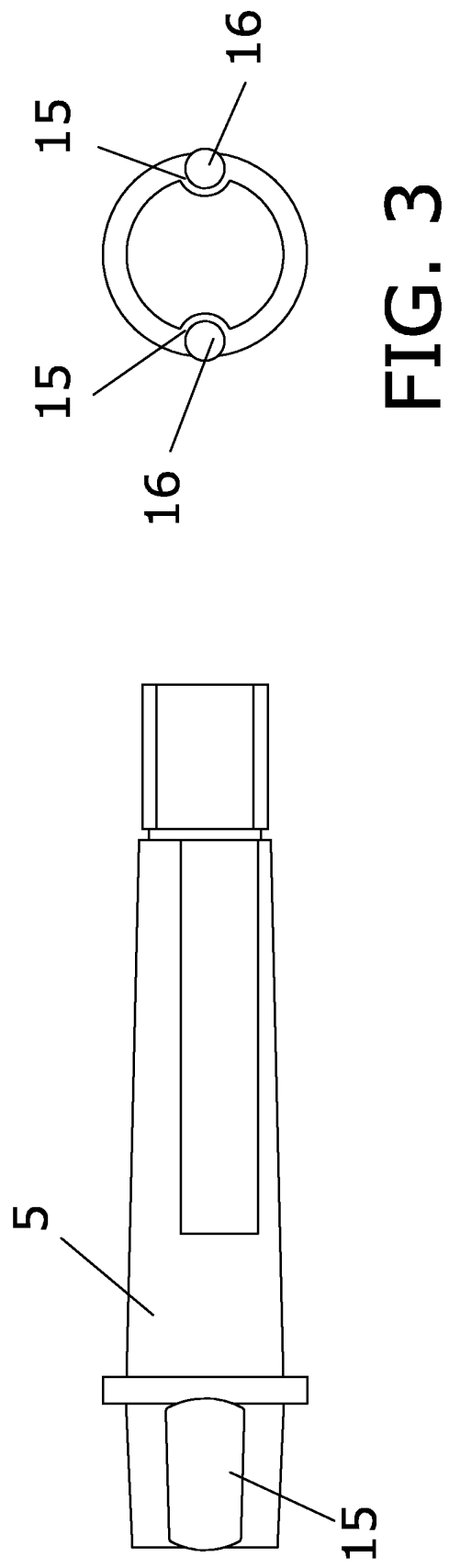
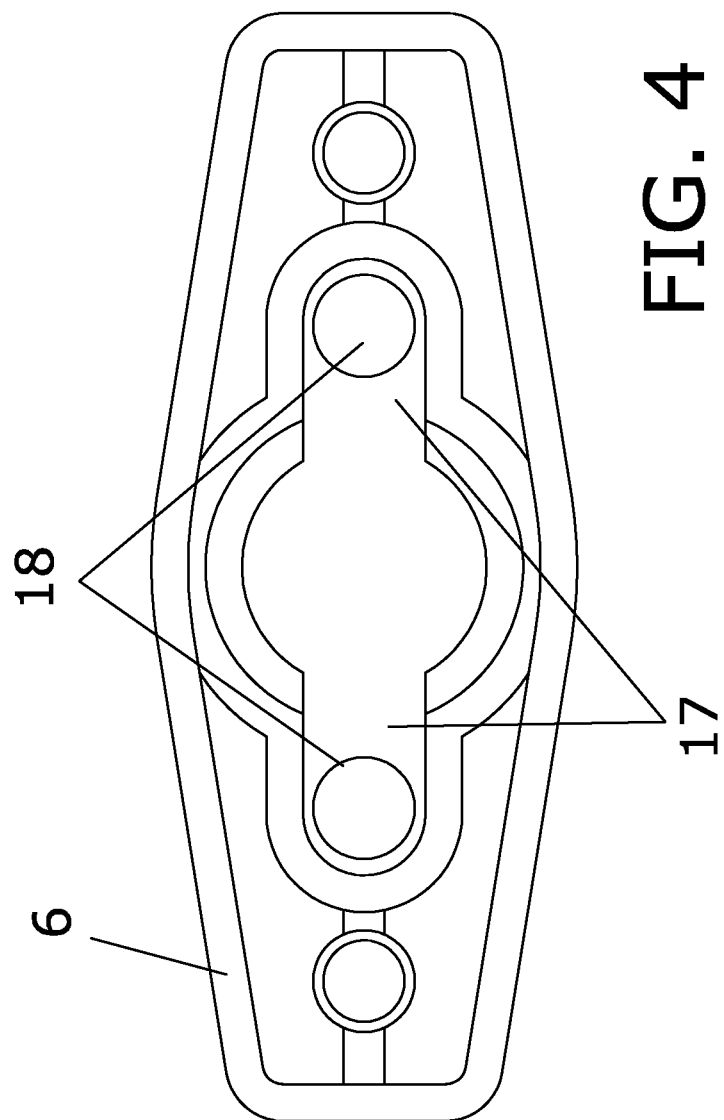


FIG. 1







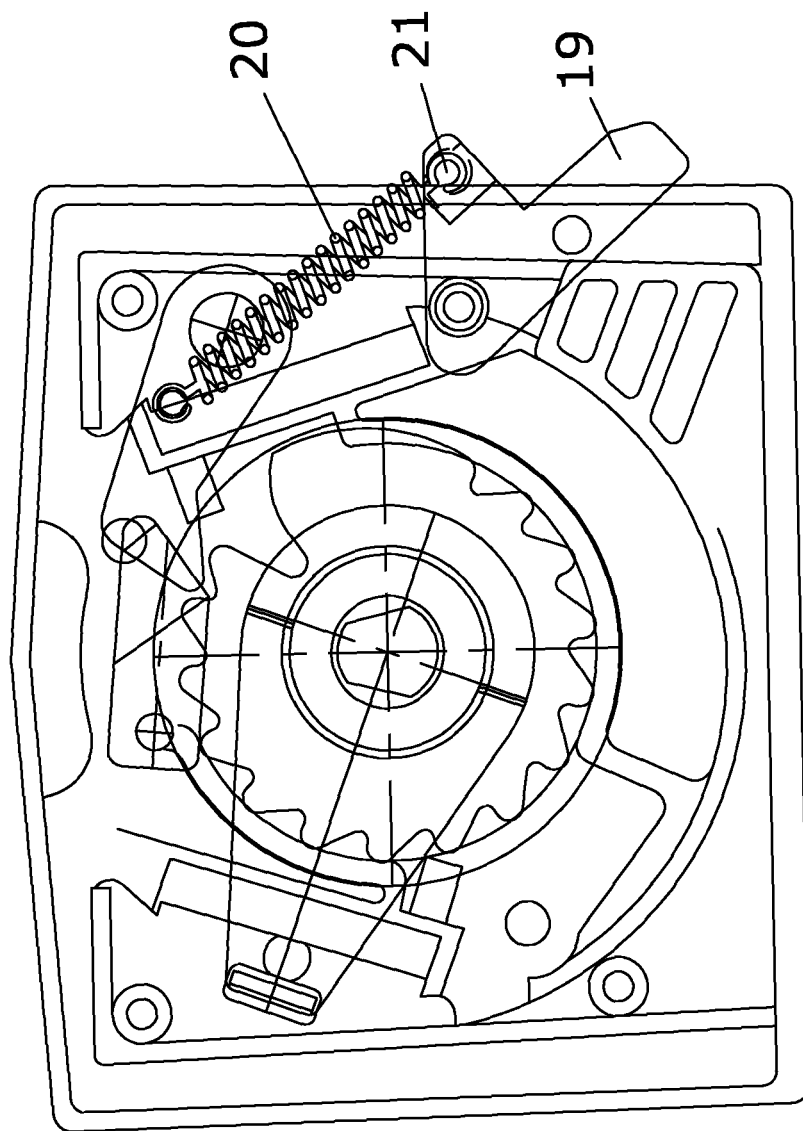


FIG. 5

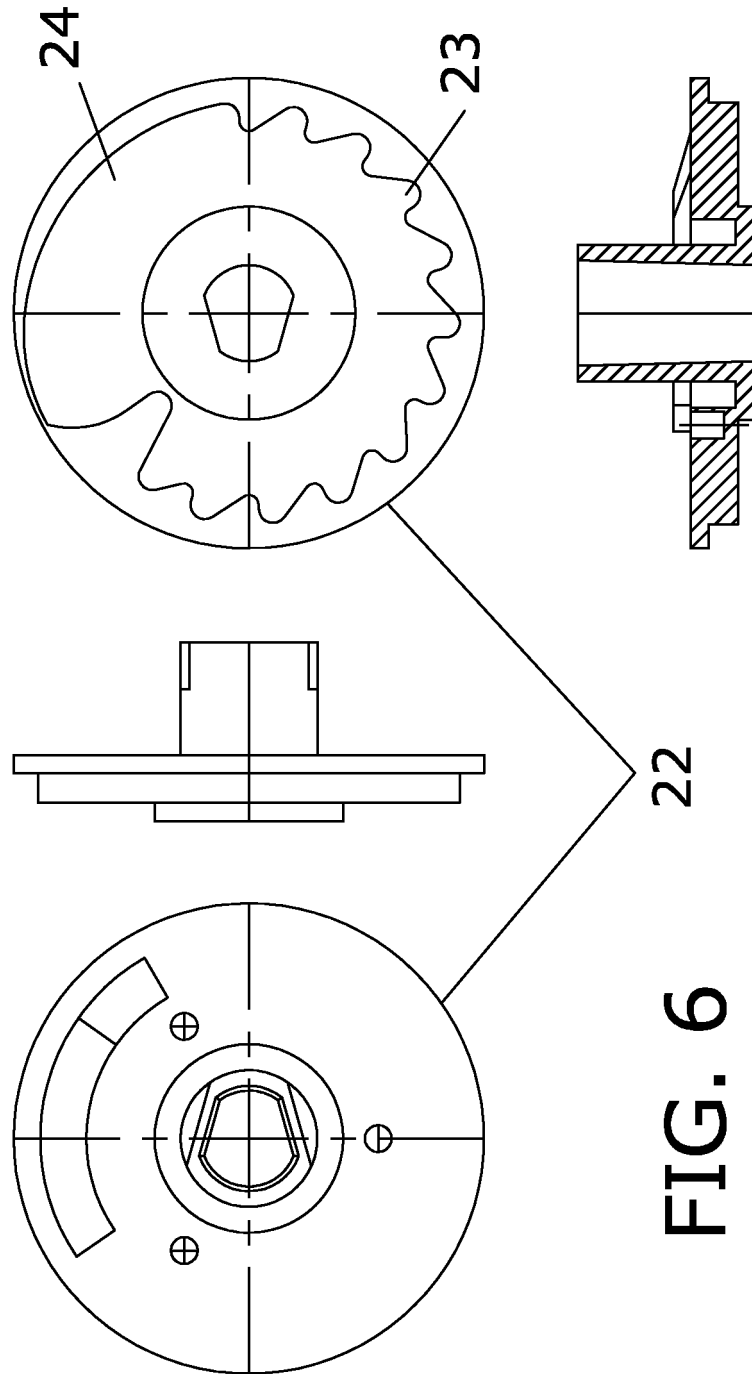


FIG. 6



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 04 38 1027

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                    |                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                       |                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Category                                                                                                                                                                                                                                               | Citation of document with indication, where appropriate, of relevant passages                                                                                                                     | Relevant to claim                                                                                                                                                                                                                                                                     | CLASSIFICATION OF THE APPLICATION (Int.Cl.7) |
| A,D                                                                                                                                                                                                                                                    | US 5 657 848 A (SCHWARZLI ET AL)<br>19 August 1997 (1997-08-19)<br>* abstract *<br>* column 2, line 28 - line 61 *<br>* column 3, line 53 - line 60 *<br>* figures 1-8 *                          | 1-3                                                                                                                                                                                                                                                                                   | G07F5/02                                     |
| A                                                                                                                                                                                                                                                      | US 3 010 557 A (WEITZMAN NORMAN G)<br>28 November 1961 (1961-11-28)<br>* the whole document *                                                                                                     | 1-3                                                                                                                                                                                                                                                                                   |                                              |
| A                                                                                                                                                                                                                                                      | US 4 363 393 A (MCDONALD ET AL)<br>14 December 1982 (1982-12-14)<br>* abstract *<br>* column 2, line 52 - line 58 *<br>* column 4, line 10 - line 14 *<br>* figures 7-10 *                        | 1-3                                                                                                                                                                                                                                                                                   |                                              |
| A                                                                                                                                                                                                                                                      | US 3 620 342 A (BERNARD CLARK PRESCOTT)<br>16 November 1971 (1971-11-16)<br>* abstract *<br>* column 1, line 33 - line 40 *<br>* column 6, line 46 - line 57 *<br>* column 8, line 11 - line 14 * | 1-3                                                                                                                                                                                                                                                                                   |                                              |
|                                                                                                                                                                                                                                                        |                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                       | TECHNICAL FIELDS SEARCHED (Int.Cl.7)         |
|                                                                                                                                                                                                                                                        |                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                       | G07D<br>G07F                                 |
| The present search report has been drawn up for all claims                                                                                                                                                                                             |                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                       |                                              |
| Place of search<br>Munich                                                                                                                                                                                                                              |                                                                                                                                                                                                   | Date of completion of the search<br>4 February 2005                                                                                                                                                                                                                                   | Examiner<br>Kling, J                         |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document |                                                                                                                                                                                                   | T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>.....<br>& : member of the same patent family, corresponding document |                                              |

3

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 38 1027

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.

04-02-2005

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s) | Publication<br>date      |
|-------------------------------------------|---------------------|----------------------------|--------------------------|
| US 5657848                                | A                   | 19-08-1997                 | CA 2120904 A1 09-10-1995 |
|                                           |                     | US 6076650 A               | 20-06-2000               |
|                                           |                     | US 5924542 A               | 20-07-1999               |
| -----                                     |                     |                            |                          |
| US 3010557                                | A                   | 28-11-1961                 | NONE                     |
| -----                                     |                     |                            |                          |
| US 4363393                                | A                   | 14-12-1982                 | NONE                     |
| -----                                     |                     |                            |                          |
| US 3620342                                | A                   | 16-11-1971                 | NONE                     |
| -----                                     |                     |                            |                          |

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82