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(54) DEVICE FOR THE RECEPTION AND CASHING OF COINS

(57) Device for the reception and cashing of coins, comprising a channel (1) capable of storing one or a plurality of coins (8) validated by a selector, such channel being intercepted by an admission door, an outlet in cashing door and at least one intermediary coin-retaining door. The bottom (4) of the channel is comprised of a rocking door which moves to the closing position with a transverse inclination downwards towards the free edge and includes a counterweight (13) for impulsing it towards such position. That gate has a finger (15) which remains blocked in the closing position of the gate by means of a trigger (16) which is actuatable by a low power electromagnet (18) through an intermediary rod (19) with counterweight and intertia maas (20) to impulse the trigger (16) towards the locking position.

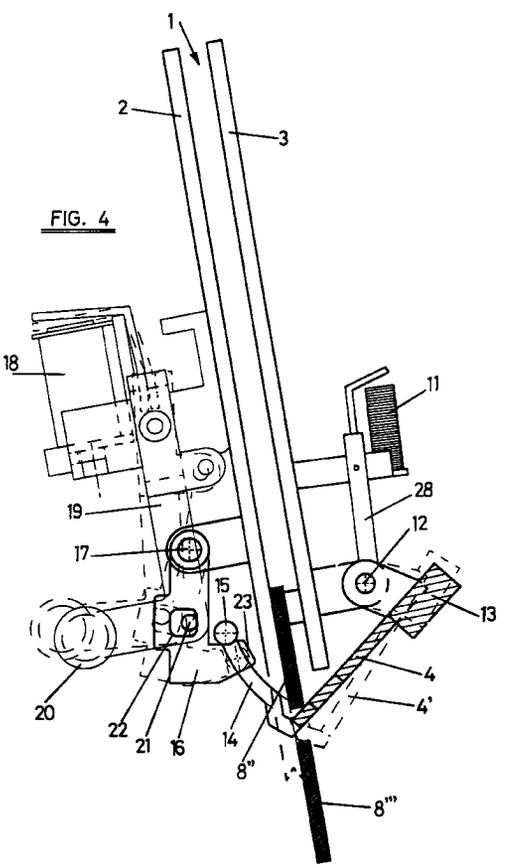

FIG. 4

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Description

[0001] The present invention relates to a device for admission and collection of coins, applicable to coin-operated machines, and which can store one or more valid coins in a waiting area or section for their eventual collection or recovery.

[0002] More specifically the object of the invention is a coin admission and collection device comprising a straight chute in the path followed by the coins, which can accept the coins validated by a sensor and store one or more of these coins for their collection, if required, or for their recovery, thus defining a linear coin holder or storage.

[0003] Devices of the type described are already known, for example Spanish patent no. 9000724, which describes a linear coin holder in which recovery is carried out by retracting the base of the chute, which defines the coin sliding track, with a retractable handle operated by the user when wishing to recover coins that have not been collected. Although it has the advantage of not using electrical energy for the recovery operation, this device has the disadvantage that the machine must collect the requested amount in advance, before providing the service, since otherwise the user may recover the coins, with the resulting fraud.

[0004] Spanish patent 8700583 describes a device consisting of a linear coin holder, in which coin recovery is achieved by the displacement of a sliding carriage, which acts as a coin holder, to an end position where coin recovery occurs. The recovery system used solves the above described problem, as the time of recovery is controlled by the machine, but as a disadvantage the power consumed by the electric motor required for the mechanism described is excessive for certain applications, in which it is not possible to use expensive or large energy storing components, such as high capacity batteries or capacitors.

[0005] Spanish utility model 9300839 can also be referenced, in which a rotating two-coin holder is described wherein the system employed for coin recovery coins consists of an electromagnet which activates a trapdoor, thus expelling the coin located opposite the recovery chute. In order to recover the next coin it is necessary to activate a motor which will cause a transporting disc to turn 120° until the next coin is located opposite the recovery chute, at which time the aforementioned electromagnet is again activated. This device also solves the problem of controlling the recovery, but also has an excessive power consumption due to the sequential recovery of the coins.

[0006] The object of the present invention is a device of the type initially described, in which collection is made at the time of providing the service, provided with low power consumption means of electromagnetic recovery and so that it may be applied advantageously in devices and installations in which it is desirable to keep a minimal electrical power consumption, as in public telephone systems.

[0007] The device of the invention consists of a chute which can accept coins validated by a coin selector and store one or more of these coins for their eventual collection or recovery.

[0008] This chute is composed of two parallel fixed walls and a base which can move between a closed position, in which a track is defined for the coins, and an open position in which all coins in the chute are allowed to fall under gravity towards a recovery path. This chute is crossed by an admission trapdoor which opens only to accept coins validated by the selector, by a exit trapdoor which limits a collection position and opens after receiving a collection signal, and by an intermediate trapdoor which opens to allow the accepted coin to pass to the collection position, all three trapdoors and the base of the chute being activated by respective electromagnets.

[0009] According to the invention, the base of the chute consists of a swiveling trapdoor with a rotation axis parallel to the track defined by said trapdoor in its closed position. In its closed position this trapdoor defines a track for the coins with a longitudinal inclination, descending in the direction of travel of the coins, and with a transversal inclination descending towards its free end. In order to minimise the effort required to activate the trapdoor, it is provided with a counterweight which propels it towards the closed position with a force lower than that applied on said trapdoor in the direction of opening by any coin admitted by the selector. In addition, the trapdoor is provided with a finger which is locked, in the closed trapdoor position, by a latch activated by an electromagnet of reduced consumption through an intermediate rod with a counterweight and inertial mass which propels the latch towards the locked position of the trapdoor.

[0010] The latch hangs from a freely revolving shaft and has an opening into which a pin connected to the rod can enter with a transversal clearance. In this way, the initial stroke of the rod takes place without touching the latch, allowing it to gain enough kinetic energy to free the latch from its locked position when there is contact between the latch and the rod.

[0011] In addition, the latch has an inclined edge upon which rests the trapdoor finger in its open position, and on which it slides while restoring it to its closed position.

[0012] With the structure described, the opening and closing movements of the trapdoor in the coin recovery operation are carried out with a minimal effort and therefore with minimal electrical power consumption. Opening the trapdoor requires only activating the electromagnet to unlock the trapdoor finger through the rod, since the weight of the coins contained in the chute will be enough to cause the trapdoor to open once its locking finger is freed. Closing the trapdoor is achieved by its counterweight, which propels it towards its closed position once the coins contained in the chute have fallen.

[0013] The admission, intermediate and collection trapdoors are related to the activating electromagnet by intermediate rods upon which act low-tension restoring springs.

[0014] The characteristics of the device of the invention can be better understood with the following description, made with reference to the accompanying drawings, in which an embodiment is given in a non-limiting example.

[0015] In the drawings:

Figure 1 is a front view of a device constructed according to the invention, which becomes part of a coin selector not shown.

Figures 2 to 5 are cross sections of the device taken respectively, along the lines A-A, B-B, C-C and D-D of figure 1.

[0016] The device shown in the drawings comprises a straight chute 1 with a slight transversal inclination and bounded by fixed walls 2 and 3 and a movable base 4, which consists of a swiveling trapdoor. Chute 1 is also crossed by an admission trapdoor 5, figures 1 and 2, an exit trapdoor 6, figures 1 and 5, and an intermediate trapdoor 7, figures 1 and 3.

[0017] Referring to figure 1, coins 8 arriving from a coin selector not shown, follow the path indicated by a dashed line, and reach admission trapdoor 5 which will be opened by electromagnet 9, figure 2, activated only when the coin has been validated by the selector. Otherwise electromagnet 9 is not activated and trapdoor 5 does not open, so that the coin passes directly into a rejected coin track not shown in the drawing. When electromagnet 9 is activated trapdoor 5 assumes position 5', indicated by dashed lines in figure 2, allowing the coin to enter chute 1, adopting the position labeled 8' in figure 1, where it is retained by intermediate trapdoor 7.

[0018] In order to admit a new coin into the holder, electromagnet 10 which controls trapdoor 7 is activated, figure 3. As this trapdoor is retracted a path is freed for the coin, which will adopt the position labeled 8" in figure 1, leaving position 8' free to accept the second coin. Collection of the coins is performed by activating electromagnet 11, figure 5, which controls swiveling trapdoor 6.

[0019] A coin store is thus constructed, consisting of chute 1 bound by walls 2 and 3. Due to the inclination of chute 1, as they move along the chute coins remain next to wall 2, as shown in figure 4. Their bottom rests on the inclined base defined by swiveling trapdoor 4, which hangs from shaft 12 and is provided with a counterweight 13 which pushes it at all times towards the closed position shown in figure 4, with a force lower than the weight on said trapdoor of any coin admitted by the coin selector. In addition, trapdoor 4 is provided with an arm 14 which is located behind chute wall 2 and carries a finger 15, which is locked when the trapdoor is closed by a latch 16 which hangs from shaft 17 so that it may freely rotate. Latch 16 is controlled by electromagnet 18, of low power consumption, through an intermediate rod 19 which is connected to latch 16 by a pin 21 joined to rod 19 which crosses opening 22 of the rod with a transverse clearance.

[0020] With the structure described, when electromagnet 18 is activated the rod stroke begins without there being contact between pin 21 and the edges of opening 22 of latch 16. In this way the rod moves freely and acquires, due to counterweight 20, sufficient kinetic energy to free the latch from the locked position shown in figure 4, thus freeing finger 15. At this moment, the weight of coin 8" causes trapdoor 4 to swivel, because of its transverse inclination, said coin dropping freely to recovery position 8'". Trapdoor 4 adopts the position shown by dotted lines and labeled 4'. During the opening of trapdoor 4 all coins contained in chute 1 will be recovered. As soon as the coins drop trapdoor 4 will regain its closed position because of counterweight 13.

[0021] This recovery of the closed position of trapdoor 4 is favoured by the fact that in open position 4', finger 15 rests on an inclined edge 23 of latch 16 and slides easily on it until passing said latch, when the latter is moved into its locked position, shown by a continuous line in figure 4, by the push of pin 21 due to counterweight 20 of rod 19.

[0022] Admission trapdoor 5 can swivel around shaft 24 and is jointed at the bottom, through an intermediate lever 25, to a rod 26 controlled by electromagnet 9.

[0023] Intermediate trapdoor 7 is related to activation electromagnet 10 by an intermediate rod 27, figure 3.

[0024] Likewise, exit trapdoor 6 is related through rod 28 to activation electromagnet 11.

[0025] With the structure described a coin storage chute is provided with an electromechanical recovery of low electrical power consumption and which allows recovering all coins contained in the chute simultaneously, all of this due to latch 16 with window 22, with a preset clearance to allow a free tun of pin 21, to activation rod 19 with a counterweight and inertial mass 20 and to the transversal inclination of swiveling trapdoor 4 in its closed position In addition, this trapdoor is closed without power consumption due to counterweight 13 of said trapdoor, to the support system of finger 15 and latch 16 and to counterweight 20.

Claims

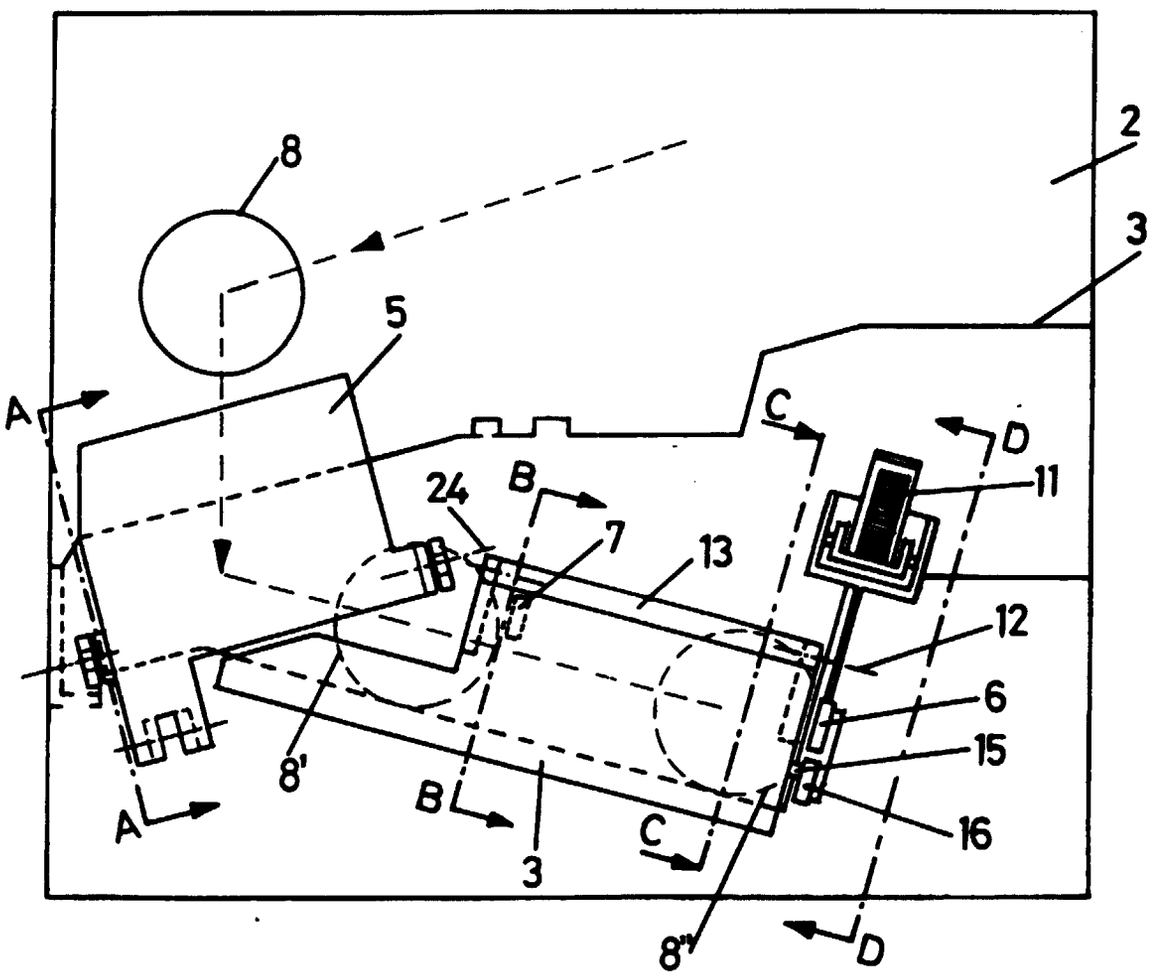
1. Coin admission and collection device applicable to coin-operated machines, comprising a chute capable of accepting coins validated by a coin selector and of storing one or more coins for their collection or recovery, said chute being bound by two parallel fixed walls and a base which can move between a closed position, in which it defines a track with a downwards longitudinal inclination for the coins, and an open one, in which all coins contained in the

chute are allowed to drop freely to a recovery path; said chute also being crossed by an admission trapdoor which opens only to admit coins validated by the selector, an exit trapdoor defining a collection position which opens only when a collection order is given, and at least one intermediate trapdoor which opens to allow the admitted coin to pass to the collection position, characterised in that the bottom of the chute consists of a swiveling trapdoor with a rotation axis parallel to the track defined by said trapdoor in its closed position; whose trapdoor has in its closed position a downwards transverse inclination towards its free end and is provided with a counterweight which propels it towards said closed position with a force lower than that applied to the trapdoor in the opening direction by any of the coins admitted by the selector, and having a finger which is locked in the trapdoor closed position by a latch controlled by an electromagnet of low power consumption, through an intermediate rod with a counterweight and inertial mass which propels the latch towards the locked trapdoor position.

2. Device a claimed in claim 1, characterised in that the latch hangs from a freely-revolving shaft and is provided with an opening in which can enter a pin connected to the rod, with transverse clearance, in a direction parallel to said revolving shaft, the initial stroke of the rod while in the opening stage of the trapdoor occurring without touching the latch, acquiring sufficient kinetic energy to free the latch from its locking position when said contact occurs.

3. Device as claimed in claims 1 and 2, characterised in that the latch is provided with an inclined edge upon which rests the trapdoor finger in its open position, and on which it slides while restoring the closed position of said trapdoor.

FIG. 1



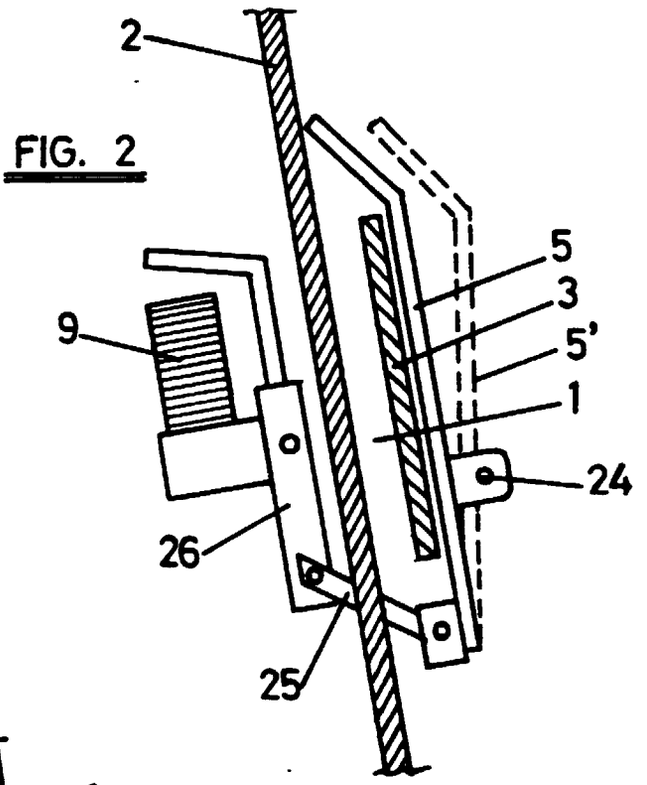


FIG. 2

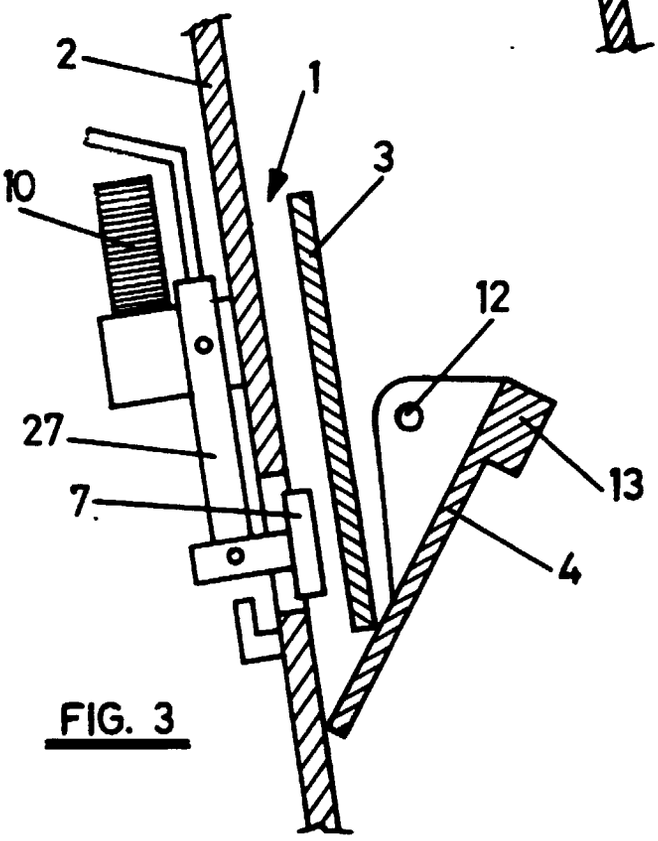


FIG. 3

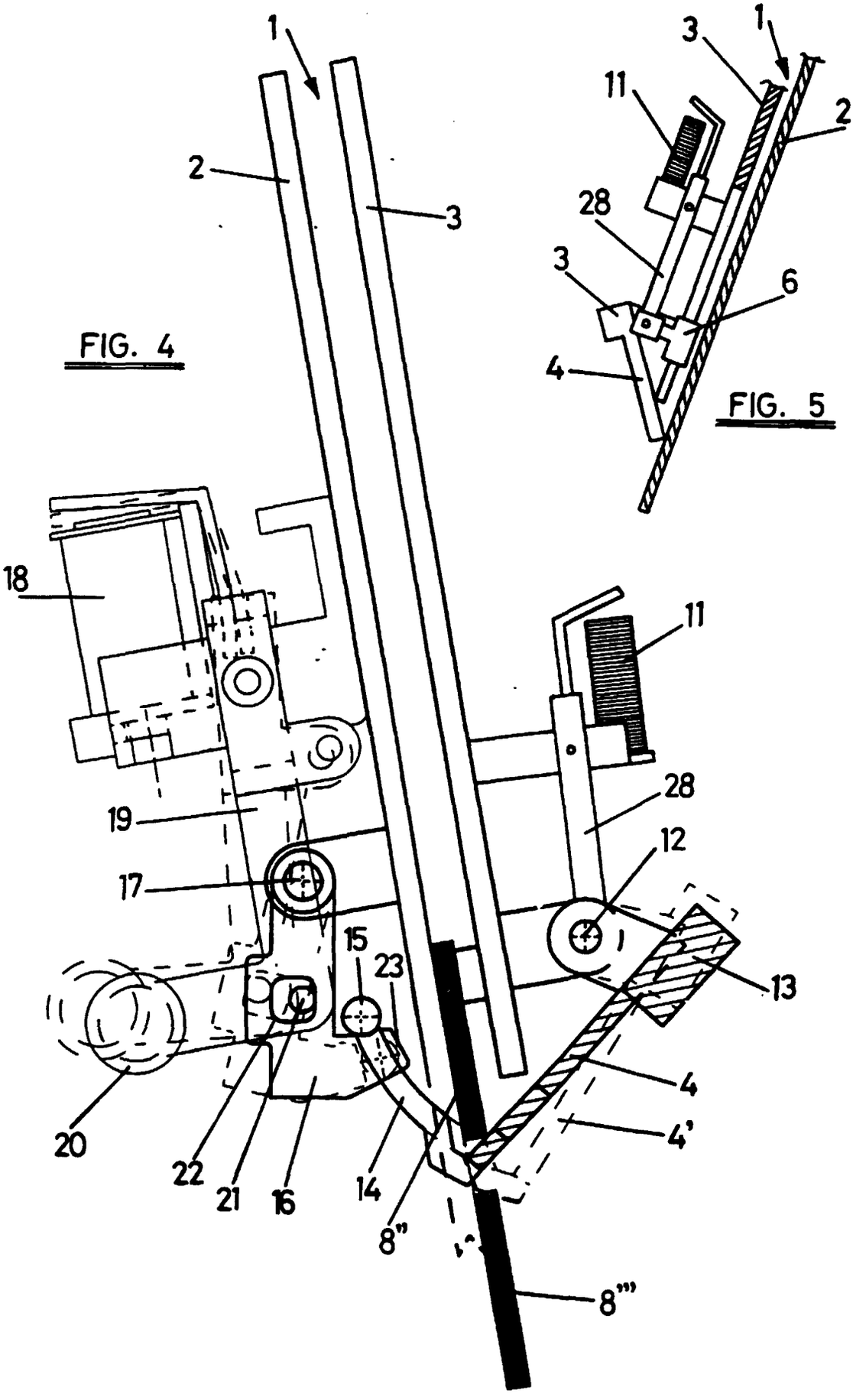


FIG. 4

FIG. 5

INTERNATIONAL SEARCH REPORT

Intern: al Application No
PCT/ES 98/00217

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 G07F1/04 G07F5/24

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 G07F G07D

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 1 511 265 A (EDDY MATCH COMPANY) 26 January 1968 see page 2, right-hand column, line 11 - page 7, left-hand column, line 32; figures 1-3 ---	1-3
A	US 2 670 830 A (HOYT) 2 March 1954 see column 3, line 21 - column 6, line 11; figures 4,5 ---	1
A	EP 0 447 890 A (ALCATEL CITESA, S.A.) 25 September 1991 cited in the application see column 3, line 45 - column 7, line 7; figures 1,2 --- -/--	1

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
6 October 1998	27.10.98

Name and mailing address of the ISA	Authorized officer
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INTERNATIONAL SEARCH REPORT

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PCT/ES 98/00217

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 092 733 A (GESI) 2 November 1983 see page 3, line 15 - page 7, line 10; figures 1-6	1
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INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern al Application No
PCT/ES 98/00217

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