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(54) **COIN-RECYCLING DEVICE THAT CAN BE FITTED TO AN AUTOMATIC AND SELF-SERVICE TELLER MACHINE**

(57) The invention proposed refers to Coin-recycling device that can be fitted to an automatic and self-service teller machine characterised by comprising a single, general deposit recipient, where all the coins to be recycled

are mixed and where the selection of the coins to be dispensed, from all those stored, identifying their denomination, takes place during preparation for dispensing.

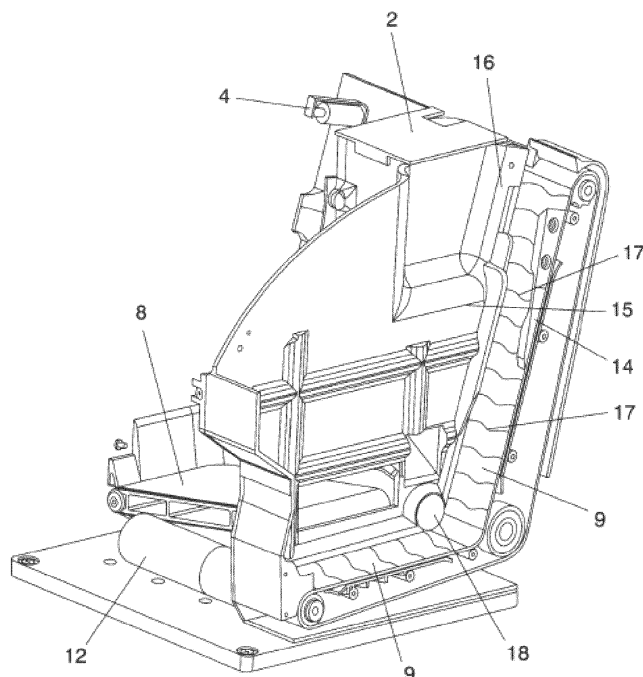


FIG. 1

Description

OBJECT OF THE INVENTION

[0001] Coin-recycling device that can be fitted to an automatic and self-service teller machine designed to facilitate deposit of coins and their return in processes taking place at self-service machines and at Banking Institution ATM posts.

FIELD OF THE INVENTION

[0002] The field of the invention refers to the industrial sector involved in the manufacture of numeric machines and devices aiding the coin handling industry.

BACKGROUND OF THE INVENTION

[0003] Until now, coin recycling in self-service machines handling 1000 or more coins has involved bulky solutions which meant that terminals had to be very large.

[0004] Such solutions cannot, because of their large size and high cost, apply to Bank and Savings Bank Cash facilities.

[0005] Similarly, devices known until now incorporated five or more internal denomination selectors (coin size), meaning that the apparatus were extremely large and their design complex.

[0006] The larger the number of denominations, the larger and more complex the machine had to be.

[0007] For both self-service machines and at the cash posts of any banking entity or service company, complex, large-scale solutions are unviable at this time.

[0008] Antecedents worthy of mention include US patent No. 6,128,402 promoting an automatic legal coin processing system, specifically comprising an ATM with a variety of modules including one to reclassify and count coins, and coin dispensing modules.

[0009] This is clearly far removed from what is advanced in this patent.

[0010] Another antecedent may be US patent No. 4,733,765 disclosing a machine for handling banknotes and coins where the configuration of the coin and banknote transporters and classifiers is linked to a single cash receiver for receipt of both coins and banknotes through an opening, and which is highly complex, with more than ten motors of a variety of characteristics.

[0011] Also highly different from the invention applied for.

[0012] The design advocated in this invention makes it possible to handle multiple denominations (8 or more) numbering more than 1000, of a volume which is more than 50% less than what is familiar, and whose ergonomics are adequate for both self-service machines and for the cash posts referred to.

[0013] Both make it possible to operate sequentially from two separate working points.

[0014] The inventor is unaware of anything previous

which incorporates the arrangements in this invention or of the benefits inherent to such arrangement.

DESCRIPTION OF THE INVENTION

[0015] The invention proposed refers to an Apparatus to recycle coins and which is adaptable to automatic cash and self-service machines characterised by comprising a single recipient, a general deposit, where all the coins for recycling are mixed and those to be dispensed are selected from all those stored, their denomination identified while they are being prepared to be dispensed.

[0016] This invention is configured as an approximately cuboid container housing the following elements:

[0017] A general coin container deposit where coins received are stored, the bottom of which is constituted by a conveyor belt driven by a suitable motor and whose mission is to feed the coins, in controlled form, to a lifting belt which is operated by a separate motor, assisted in its function by a circulating cylinder and by a return cylinder.

[0018] Said lifting belt has projections enabling the coins to move almost vertically, and assisted with a coin holder groove and a diverter for second coins.

[0019] The lifting belt moves coins deposited by a client to the circulating ramp where, now separated, they move in sequence through a sensor and then in front of a diverter solenoid which delivers the coins recognised to a temporary deposit.

[0020] Coins not recognised continue to move toward the rejects window from where they are returned to the equipment user, along the rejects channel, to the delivery tray.

[0021] The various sequences and command of the elements activating the various mechanisms are coordinated with the electronic control card.

[0022] The apparatus has two main functions, as coin deposit and coin dispenser.

[0023] The feature of the operation of the apparatus as coin deposit is that the coins it is wished to deposit are delivered directly to the feed tray from where the lifting belt takes them up to the circulating ramp and, on running through the distribution solenoid, they are selected by a sensor if genuine and deviated to a temporary deposit where they remain until the user approves their deposit, at which point they move to the general deposit where they are held until a new operation takes place.

[0024] Coins not selected are rejected through the rejects gate and the discharge outlet duct, into the delivery tray where the user client collects them.

[0025] Should a client not wish to accept the deposit operation, it is cancelled and the coins are moved from the temporary deposit to the collection tray.

[0026] If the apparatus is used for its coin dispensing function, the operation takes the following form:

[0027] On a request for coin delivery, the order is processed by the electronic control card (starting the coin supply belt which places them on the lifting belt which in

turn places them in sequence on the distribution ramp where the sensor sends the related signals to the electronic card which operates the diverter solenoid accordingly, selecting the coins corresponding to the amount, or to a selection preset by the operator from their work station by computer connection (the Ethernet Network, series bus, USB or other means of data transmission such as IR, Bluetooth...etc.), and the coins selected are placed in the temporary deposit where they remain until all the coins ordered have been selected.

[0028] Coins not selected are returned during the process to the general deposit. On completion of the selection of coins sought by the operator's computer system or, if applicable, from the self-service equipment control (for example to return change), they are dispensed to the delivery tray and the operation is completed.

[0029] For use in bank branches, the device can be connected to the computer terminals of two operators and used sequentially by both. In this case, there is an accessory which allows the delivery tray to be duplicated on both sides of the equipment using a conveyor belt which transports the coins to the delivery tray concerned.

[0030] Independently of the two main functions for depositing and dispensing coins, the coin sensor element may, optionally, not simply check the authenticity of the coins for selection, but also their state of use according to parameters established by the monetary authorities.

DESCRIPTION OF THE DRAWINGS.

[0031] For a better understanding of the invention, five pages of plans are attached where the following may be distinguished:

FIGURE 1.- A left side rear view of the apparatus.

FIGURE 2.- A right side rear view of the apparatus.

FIGURE 3.- A left rear view of the apparatus.

FIGURE 4.- A right rear view of the apparatus.

FIGURE 5.- A perspective detail of the coin lifting belt.

[0032] And in those figures, a single reference is used to denote identical elements, among which the following can be distinguished:

- (1).- the container
- (2).- the temporary coin deposit
- (3).- the coin sensor
- (4).- a solenoid activating the rejects gate
- (5).- the rejects gate
- (6).- the rejects channel
- (7).- the motor driving the coin feed belt
- (8).- the coin feed belt
- (9).- the coin-lifting belt with projections (17)

- (10). the coin distribution solenoid
- (11). the coin movement ramp
- (12). the motor driving the coin lifting belt
- (13). the temporary deposit enclosure
- (14). the second coin diverter
- (15). the return ramp
- (16). a groove to move coins to the control ramp
- (17). projections on the coin lifting belt (9)
- (18). the lifting belt circulating cylinder
- (19). a channel to return coins to the temporary deposit
- (20). the lifting belt return circulation cylinder (9).
- (21). the general deposit
- (22). the electronic control card
- (23). the delivery tray

A PREFERENTIAL EMBODIMENT OF THE INVENTION

[0033] This invention is configured as an approximately cuboid container (1) housing the following elements:

[0034] A general deposit containing coins (24) storing the coins received, the bottom of which comprises a conveyor belt (8) driven by a motor (7) and whose mission is to feed coins in a controlled way to a lifting belt (9) driven by a motor (12) and aided in its operation by a circulating cylinder (18) and by a return cylinder (20).

[0035] There are projections (17) on the lifting belt (9) to allow the coins to be moved almost vertically, assisted by a return ramp groove (15) and a diverter for second coins (14).

[0036] The lifting belt (9) moves the coins to the circulating ramp (11) where, now separated, they move sequentially through the sensor (21) and then in front of the diverter solenoid (4) which sends the coins recognised to the temporary deposit (2).

[0037] Coins not recognised move on toward the rejects window (5) from where they are returned, along the rejects channel (6) to the equipment user, on the delivery tray (23).

[0038] The various sequences and command of the components activating the various mechanisms are coordinated with the electronic control card (22).

[0039] The apparatus has two main functions, as coin deposit and coin dispenser.

[0040] The feature of the operation of the apparatus as coin deposit is that the coins it is wished to deposit are delivered directly to the feed tray (8) from where the lifting belt (9) takes them up to the circulating ramp (11) and, on running through the distribution solenoid (21), they are selected by the sensor (3) if genuine and diverted to the temporary deposit (2) where they remain until the user approves their deposit, at which point they move to the general deposit (24) where they are held until the next operation takes place.

[0041] Coins not selected are rejected through the rejects gate (5) and the discharge outlet duct, into the delivery tray (23) where the user client collects them.

[0042] Should a client not wish to accept the deposit operation, it is cancelled and the coins are moved from the temporary deposit (2) to the collection tray (23).

[0043] If the apparatus is used for its coin dispensing function, the operation takes the following form:

[0044] On a request for coin delivery, the order is processed by the electronic control card (22) starting the coin supply belt (8) which places them on the lifting belt (17) which in turn places them in sequence on the distribution ramp from where the sensor (3) sends the related signals to the electronic card (12) which operates the diverter solenoid (21) accordingly, selecting the coins corresponding to a selection preset by the operator from their work station by computer connection (the Ethernet Network, series bus, USB or other means of data transmission such as IR, Bluetooth...etc.), and the coins selected are placed in the temporary deposit (2) where they remain until all the coins ordered have been selected.

[0045] Coins not selected are returned to the general deposit (24). On completion of the selection of coins requested by the operator's computer system or, if applicable, from the self-service equipment control (for example to return change), they are sent to the delivery tray (23) and the operation is completed.

[0046] For use in bank branches, the device can be connected to the computer terminals of two operators and used sequentially by both. In this case, there is an accessory which allows the delivery tray to be duplicated on both sides of the equipment using a conveyor belt which transports the coins to the delivery tray concerned.

[0047] Independently of the two main functions for depositing and dispensing coins, the coin sensor element (3) may, optionally, not just check the authenticity of the coins for selection, but also their state of use according to parameters established by the monetary authorities

[0048] When it is wished to operate this option, an auxiliary coin deposit (25) is incorporated, outside the parameters of use.

[0049] Having sufficiently described the nature of the invention and its practical implementation, it must be recorded that the above provisions, also shown in the attached drawings, may be modified in detail as long as that does not alter their fundamental principles established in the previous paragraphs and summarised in the following claims.

Claims

1. Coin-recycling device that can be fitted to an automatic and self-service teller machine characterised essentially by comprising an approximately cuboid container (1) which houses at least the following elements:

A general deposit containing the coins (24), the bottom of which comprises a coin feed belt (8) driven by a small motor (7) which moves the

coins to a lifting belt (9) which has uneven projections (17) on its surface and which, driven by a motor (12) and aided in its lifting operation by a circulating cylinder (18) and by a return cylinder (20), and assisted by the return ramp (15) to the left of the belt (9) and by a diverter for second coins (14) to the right of the belt (9), moves the coins to the circulating ramp (11) where, now separated, they flow in sequence through the sensor (21) and then in front of a diverter solenoid (4) which delivers coins recognised to the temporary deposit (2); those not recognised continue moving toward a rejects gate (5) from where they are returned to the equipment user along the rejects channel (6) and into the delivery tray (23), the various sequences and command of the means for activating the various mechanisms coordinated by the electronic control card (22).

2. Coin-recycling device that can be fitted to an automatic and self-service teller machine according to claim 1 and characterised essentially because, in its function as coin deposit, the coins it is wished to deposit are delivered directly to the feed belt (8) from where they are raised by the lifting belt (9) to the circulating ramp (11) and, passing in front of the distribution solenoid (21), they are selected by the sensor (3) if genuine and diverted to the temporary deposit (2) where they are held until the user gives their approval for the deposit, at which point they move to the general deposit (24) where they remain until the next operation, and where coins not selected are rejected through the rejects gate (5) and the rejects discharge duct into the delivery tray (23), where coins from the temporary deposit (2) would also go if the operation were cancelled.
3. Coin-recycling device that can be fitted to an automatic and self-service teller machine according to above claims and characterised essentially if used as coin dispenser in that the order for the request for coin delivery is processed by the electronic control card (22) which starts the coin feed belt (8) which places them on the lifting belt (17) and which in turn places them sequentially on the distribution ramp (11) from where the sensor (3) sends the related signals to the electronic card (12) which activates the diverter solenoid (21) appropriately, selecting the coins which amount to the selection preset by the operator from their work station via a suitable computer connection, and where said selected coins are placed in the temporary deposit (2), remaining there until all the coins ordered have been selected and those not selected are returned to the general deposit (24) while those selected are dispatched to the delivery tray (23).

4. Coin-recycling device that can be fitted to an automatic and self-service teller machine according to the previous claims and characterised essentially because, when wished to be used sequentially by two operators, a conveyor belt is installed with two delivery trays. 5
5. Coin-recycling device that can be fitted to an automatic and self-service teller machine according to the previous claims and characterised essentially in that, independently of the two main functions as coin deposit and dispenser, the coin sensor element (3) checks the authenticity of the coins for selection according to parameters fixed by the monetary authorities, incorporating an auxiliary coin deposit outside the parameters of use. 10 15

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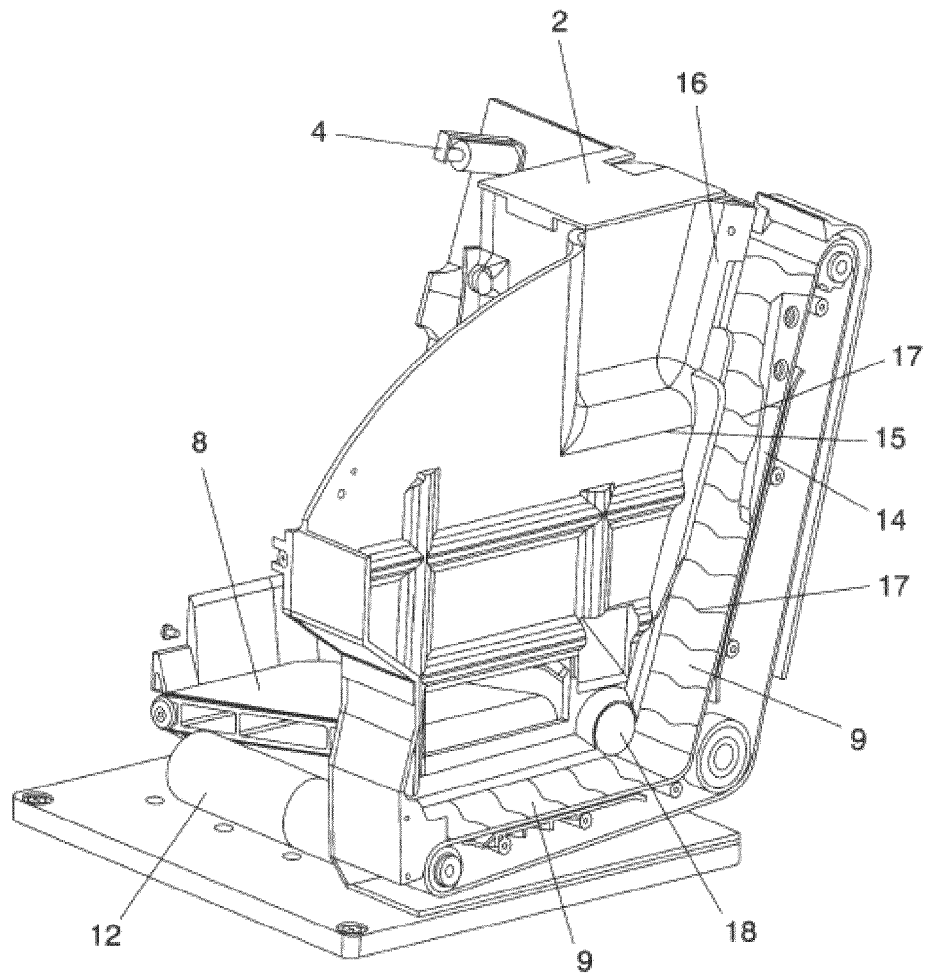
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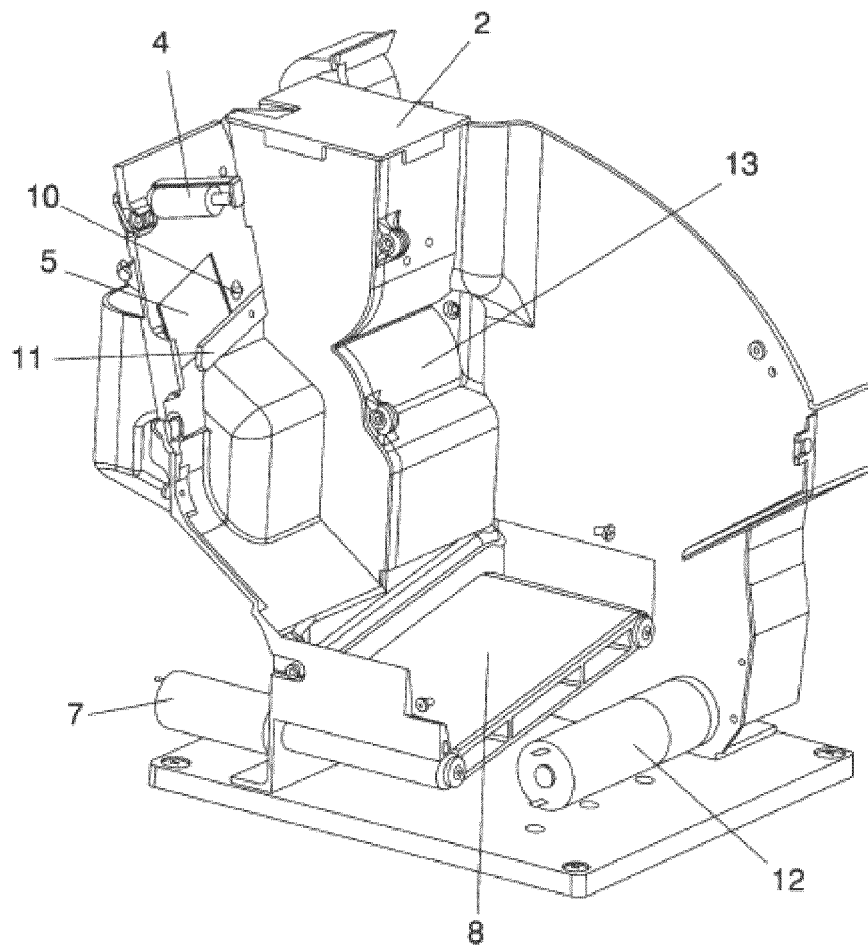
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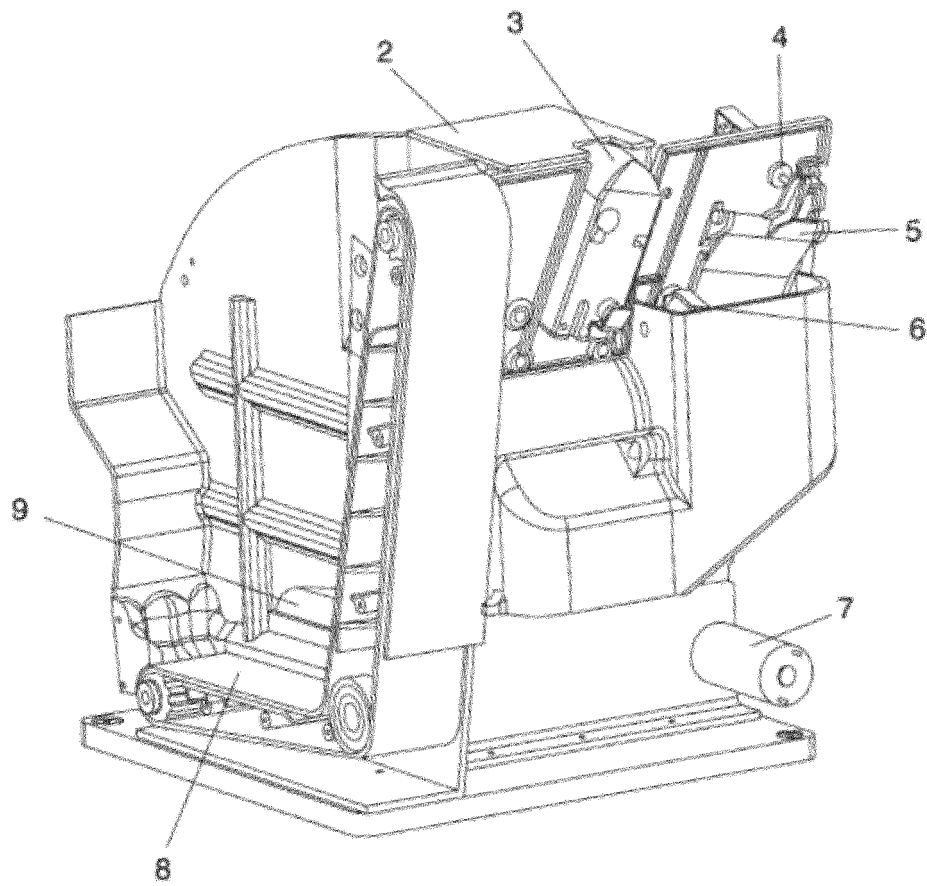


FIG. 3

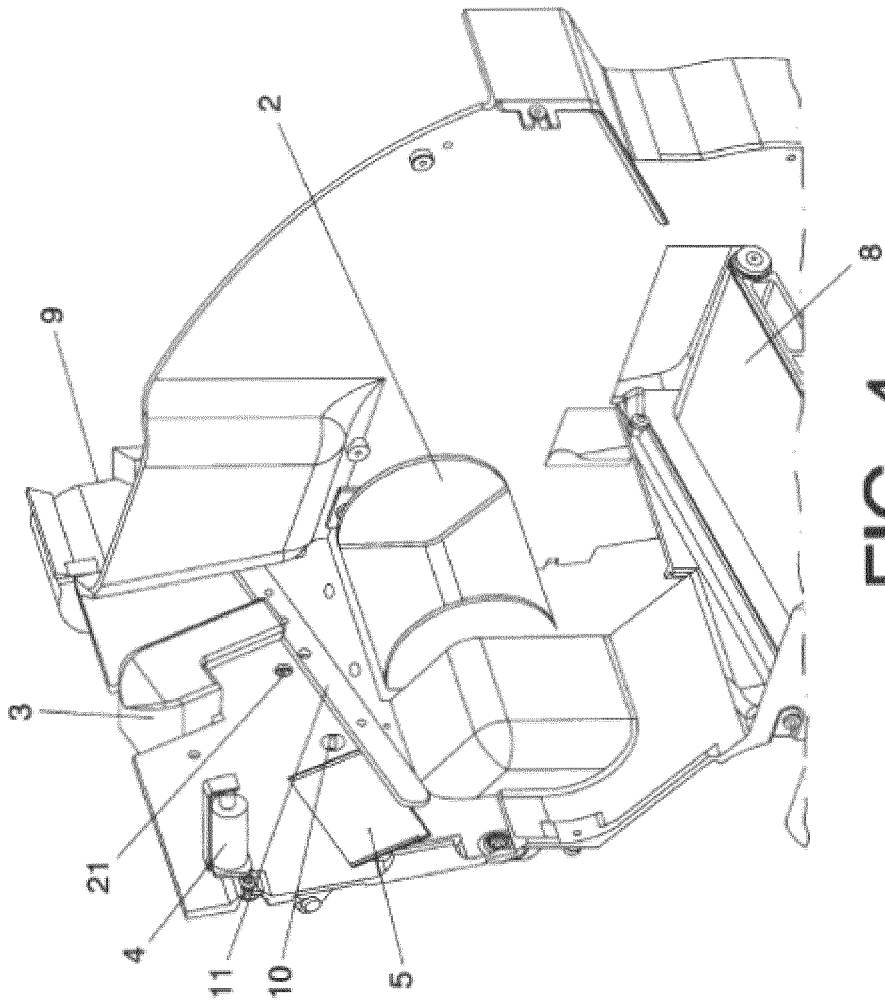


FIG. 4

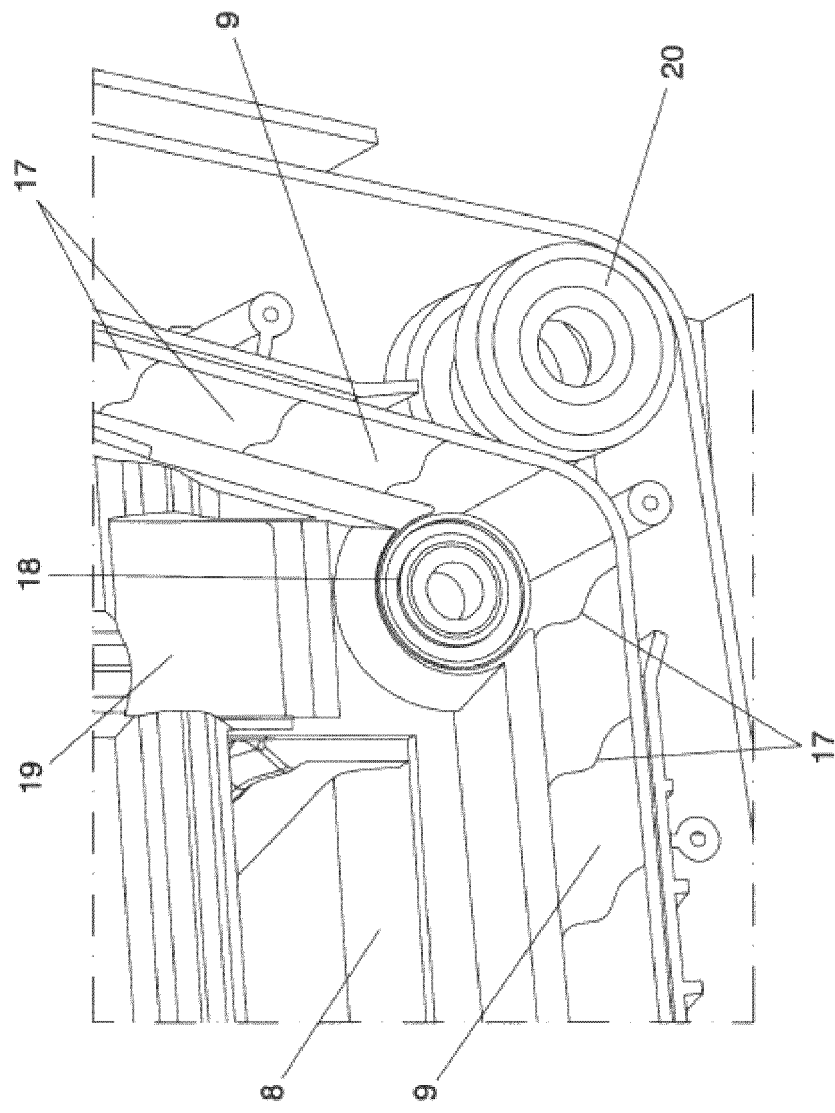


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2011/070577

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

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)

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 practicable, search terms used)

EPODOC, INVENES, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003221933 A1 (MORIKAWA JUN) 04/12/2003, figure 1, figure 3, figure 4, figure 6, figure 9, figure 11, figure 12, paragraph[0048]; paragraph[0054]; paragraphs[0071 - 0072]; paragraphs[0062 - 0063]; paragraph[0082].	1-5
A	US 5366407 A (SENTOKU HIDESHI) 22/11/1994, the whole document.	1-5
A	US 4558711 A (IKUTA YOSHIKI ET AL.) 17/12/1985, the whole document.	1-5

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance.

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"O" document referring to an oral disclosure use, exhibition, or other means.

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"&" document member of the same patent family

Date of the actual completion of the international search
09/01/2012Date of mailing of the international search report
(20/01/2012)

Name and mailing address of the ISA/

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Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.

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Form PCT/ISA/210 (patent family annex) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2011/070577

CLASSIFICATION OF SUBJECT MATTER

G07D1/00 (2006.01)

G07D3/00 (2006.01)

G07D5/00 (2006.01)

G07D9/00 (2006.01)

REFERENCES CITED IN THE DESCRIPTION

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- US 4733765 A [0010]