

[54] **DEVICE FOR CONTROLLING A SELF-SERVICE DISPENSER USING IDENTIFICATION DATA CARRIERS**

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[58] Field of Search..... **194/5, 13; 222/2, 222/23, 36-38, 153; 235/92 FL, 92 CT, 92 AC, 61.7 B; 340/149 A**

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[57] **ABSTRACT**

A device for controlling a self-service dispenser which includes a quantity and/or price recording mechanism connected to the dispenser includes a reader having a plug-in receiver. The plug-in receiver includes a lower receiving panel with a plurality of electrical contact elements arranged in a pattern and which are engageable with identification feelers carried by a plug-in identification device which is engageable in the plug-in receiver. The reader also carries a digital counter having a drive shaft which is connectable to the quantity or price recording mechanism upon interengagement of the plug-in identification device with the plug-in receiver. The article dispenser is provided with a start or a release signal operating means which energizes a solenoid causing interengagement and locking between the plug-in receiver and the plug-in identification device. During the delivery of the articles, the digital counter is driven by the recording mechanism which is actuated by the dispenser to indicate either the quantity of the devices dispensed or the price of these articles. When the delivery is completed, the solenoid releases the pawl to permit disengagement of the identification device.

6 Claims, 6 Drawing Figures

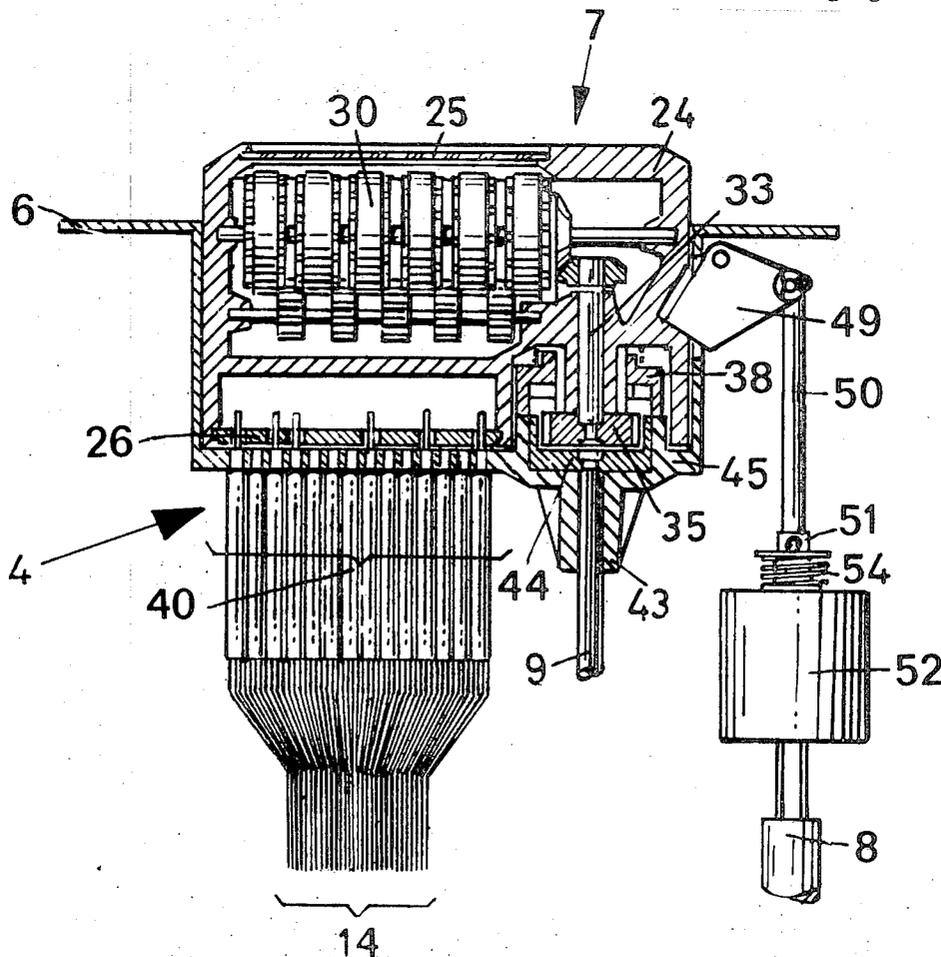
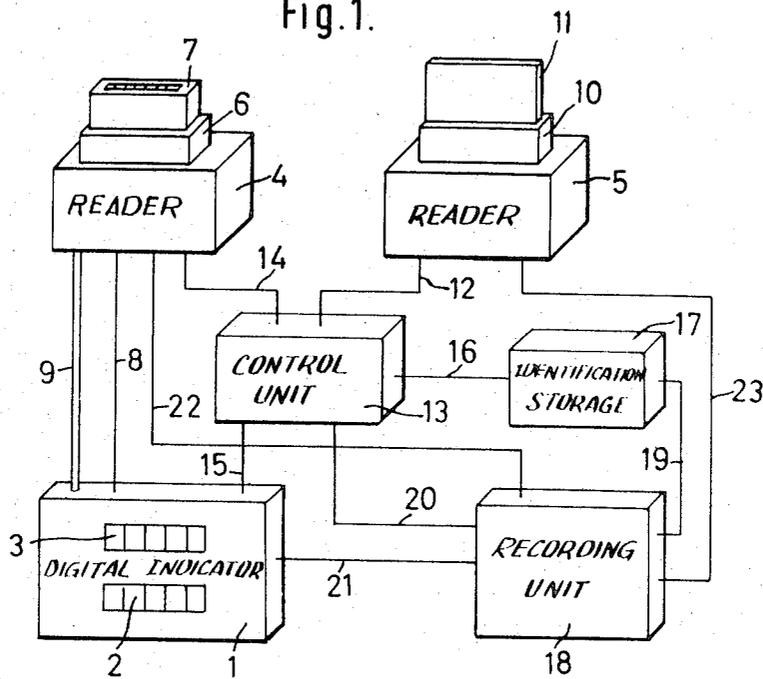
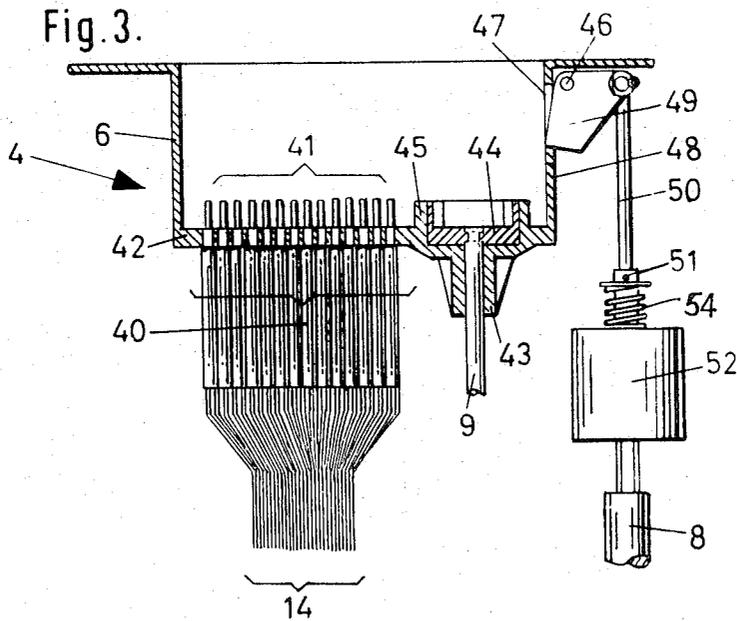
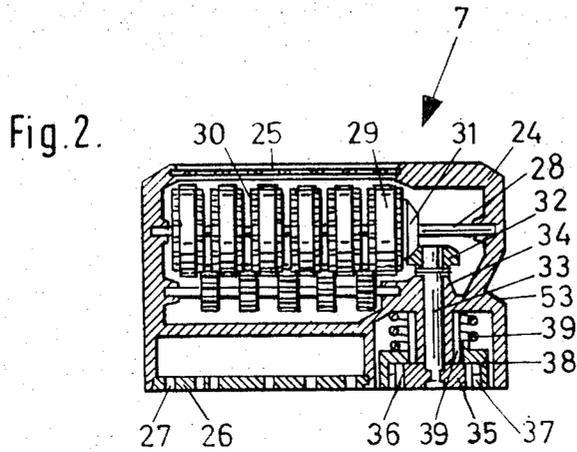


Fig. 1.



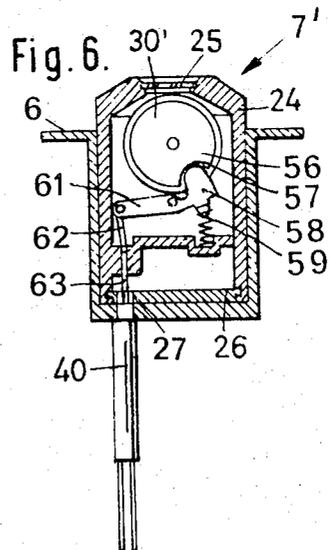
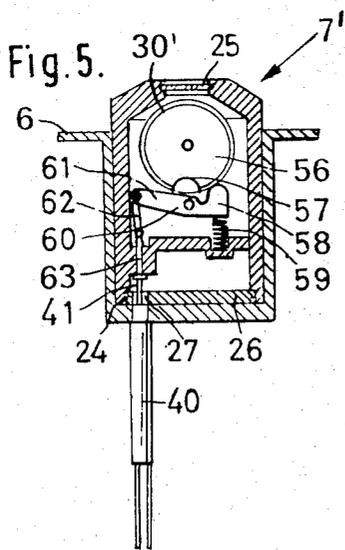
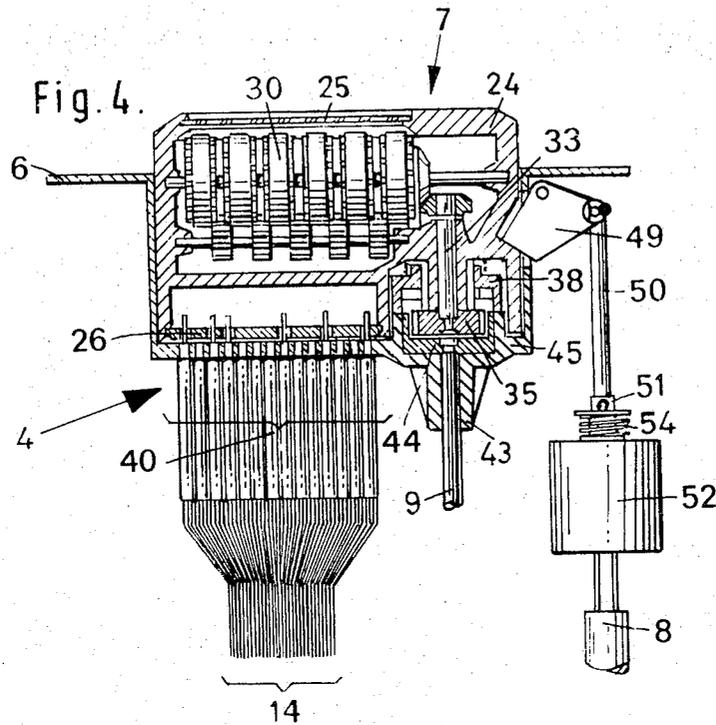
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DEVICE FOR CONTROLLING A SELF-SERVICE DISPENSER USING IDENTIFICATION DATA CARRIERS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates in general to devices for controlling the dispensing of articles and, in particular, to a new and useful device for controlling self-service dispensers which includes a quantity or price recording mechanism which are connected to a digital counter of an identification device which is engageable in a plug-in receiver of a reader which is connected to the dispenser for starting its operation.

2. Description of the Prior Art

Devices for dispensing articles under the control of an identifying device have been known for some time and they serve for the sale of goods without cash. Their use is provided for the cash-free delivery of fuel to regular customers of filling stations. The respective customer, if his credit is good, is handed a so-called credit card which serves as an identification data carrier since it is provided with specific identification marks assigned to the respective customer. The dispenser, in this case the fuel pump, is provided, in addition to the usual quantity and/or price recording mechanism, which is driven by a flowmeter, with a special control device which has a reading and identification unit that can read a so-called credit card and identify the identification data or markings contained therein and start the dispenser. The customer who is in possession of such a credit card can thus draw at any time any amount of fuel. The values taken are recorded not only by the quantity and/or price recording mechanism customary in filling stations, but fed to a data storage assigned to the respective customer by the control device corresponding to the identification data of the credit card. In certain intervals the owner of the filling station can charge the stored amounts.

A disadvantage of these known arrangements is that the customer himself has no receipt when he buys the fuel which would enable him to check the amounts charged by the station owner and to have some evidence in case of disputes. He can write down the amounts taken and add them up himself, which cannot be considered, however, conclusive evidence. Receipt printers, which print out any amount taken, cannot eliminate this disadvantage either, because such printed receipts can get lost or be willfully destroyed.

The object of the present invention is to eliminate this disadvantage and to provide the possibility of giving the customer in a simple manner and with very simple and inexpensive means a receipt, without making the operation more difficult, which will enable him, on the one hand, to check the sum of the quantities or price values taken in the course of a certain period and to be able, on the other hand, to prove wrong invoice amounts as such.

SUMMARY OF THE INVENTION

The invention provides an identification data carrier having a digital counter plug-in unit which can be introduced into the reader, the digital counter being coupled by a plug connection with a value transmitter connected to the quantity and/or price recording mechanism of the dispenser. This has the advantage that the customer can start the dispenser with his information

data carrier and at the same time effect the error-free and conclusive recording of the values taken without additional operations. At the same time, it prevents positively that the customer can take fuel without the corresponding values being recorded in his own digital counter performing the function of an additional storage, since the digital counter and the identification data carrier necessary for starting the dispenser form plug-in unit and can therefore only be present together.

In a further development of the invention, the plug-in unit is provided with a mechanical coupling piece connected operatively with the digital counter and a corresponding counter coupling piece is arranged in the plug box of the reader which is operatively connected with a digital quantity or price recording mechanism.

While it is principally also possible to drive the digital counter of the plug-in unit by electric impulses and to provide for the transmission of these impulses to the digital counter drive corresponding electric connecting elements in the plug-in unit and in the reader, the above-mentioned embodiment of the invention has the advantage that it ensures a greater reliability of the digital counter itself and of the value transmitter. In addition, it permits substantially higher counting velocities.

Another important feature of the invention is that the plug-in unit is provided either with a return lock or with a one-way coupling. This makes it impossible for the customer to falsify the values recorded by the digital counter of the plug-in unit by turning back the counter drive in his favor.

Another advantageous feature of the invention is that the digital counter of the plug-in unit is provided with a drive lock which can be released by a part arranged in the plug box of the reader. These measures prevent any manipulation to falsify the values to be recorded or already recorded in the digital counter so that the respective counter reading represents conclusive evidence of the values taken.

Another advantage is that the plug box of the reader is provided with a locking element which becomes operative when the dispenser is started and which retains the plug-in unit. This prevents that the plug-in unit can be removed from the reader while the goods are delivered, which could be the cause of recording errors under certain circumstances.

Another important feature of the invention is that the identification data carrier is detachably mounted in the plug-in unit. This offers the possibility of exchanging the identification data carrier, which is advisable, for example, when an identification data carrier which has been in use for a long time is worn out or has otherwise become unusable or if a plug-in unit is assigned to another customer.

In a further development of this invention, the identification data carrier has a surface provided with markings in the form of cams, depressions and/or holes, which faces in the reader a field with scanning elements actuating electric switching means. These features permit a simple and inexpensive production of the identification data carriers as well as an uncomplicated and reliable operation of the reader.

Another advantageous design, particularly with regard to the spatial arrangement and the simplicity of the assembly, consists in that the identification data carrier is a plate detachably mounted in the plug-in unit, on which the markings are arranged.

The fact that the digital counter of the plug-in unit can be reset by means of a key, etc., had the advantage that the digital counter can be set to zero again, for example, when it is handed over to a customer or shortly before it reaches its counting capacity or in certain time intervals after an accounting which facilitates the checking of the values recorded later.

Furthermore, the digital counter can be preset in a known manner to different counting values and the delivery is stopped when a preset value is attained. This permits determination of the amount of credit to be given to the respective customer and the customer himself is not only regularly reminded of the balance of his credit account, but he can also determine at any time the remaining amount of credit. Naturally, not only the delivery just in process is interrupted in such a digital counter with preset value, but also any delivery in the future. An advantage is that the identification data carrier is changed when a preset counting value is attained in such a digital counter. This solution saves complicated and expensive control and transmission mechanism and/or electric transmission means and switching devices, since the agreement between the existing identification data carrier and the identification data stored in the comparator is subsequently eliminated.

Accordingly, it is an object of the invention to provide a device for controlling a self-service dispenser which includes a quantity or price recording mechanism connected to the dispenser and which includes a plug-in identification device for actuating the dispenser having a digital counter which is driven by a connection to the recording mechanism to record either quantity or price on the identification unit during the dispensing operation.

A further object of the invention is to provide a dispensing device which includes a customer identification element which may be plugged into the dispensing operation control and recording system and which has a counter which is driven during the dispensing which cannot be removed from the device while the dispensing operation is progressing.

A further object of the invention is to provide a device for controlling a self-service dispenser which is simple in design, rugged in construction and economical to manufacture.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and specific objects attained by its uses, reference should be had to the accompanying drawings and descriptive matter in which there is illustrated preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a schematic representation of a control device of a self-service dispenser which is operated with an identification data carrier constructed in accordance with the invention;

FIG. 2 is a transverse sectional view of an identification data carrier constructed in accordance with the invention;

FIG. 3 is a partial sectional view of a plug-in receiver for the identification unit;

FIG. 4 is a section similar to FIG. 3 indicating the identification unit in position in the plug-in receiver;

FIG. 5 is a section taken transversely to that shown in FIG. 4 and of another embodiment of the invention; and

FIG. 6 is a section of the elements shown in FIG. 5 with the parts in an advance position.

GENERAL DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings in particular, the invention as embodied therein in FIGS. 1 through 4 comprises a device for controlling a self-service dispenser 1 which includes a digital quantity recording mechanism which may be indicated visually at 2 and a digital price recording mechanism which is indicated visually at 3. The apparatus has two readers 4 and 5. Reader 4 has a plug box 6 into which can be plugged an identification data carrier or plug-in unit 7. Reader 4 is connected to the dispenser 1 electrically by a cable 8 and mechanically by a shaft 9. Reader 5 has another plug box 10 which is provided for plugging in an identification data carrier in the form of a credit card 11. Reader 5 is connected by an electric connection 12 to a control unit 13 to which reader 4 is connected by means of a line 14. Control unit 13 identifies the identification data of credit card 11 and of plug-in unit 7 read by the readers 4 and 5 and compares them with the identification data stored in a storage 17, to which it is connected by a line 16. In case of agreement between the read and stored data, control unit 13 emits a signal over line 15 to dispenser 1 so that it can be started. A second recording mechanism 18, which can be, for example, a perforated tape unit, serves to store the values recorded by the quantity or price recording mechanism 2 or 3 and the identification data read by the readers 4 and 5. If necessary, this recording mechanism 18 can also record, over a line 19, fixed values assigned to certain identification data, that is, to a certain customer. These values are stored in storage 17 as fixed values which are controlled by control unit 13. Control unit 13 also has the function of controlling the second recording mechanism 18 and is therefore connected to the latter by a line 20. The transmission of the price or quantity values from dispenser 1 to recording mechanism 18 is effected through a line 21 and the transmission of the identification data from the readers 4 and 5 through cables 22 and 23. In addition, control unit 13 can also control the zeroing of the quantity and price recording mechanism 2 and 3. The values recorded by recording mechanism 18 can be called and erased in any desired time intervals for accounting.

As it can be seen from FIGS. 2, 3 and 4, the plug-in unit 7 consists of a housing 24 which is provided on the top side with a window 25 and on the underside with a plate 26 provided with holes 27. In housing 24 are arranged on a shaft 28 cipher rolls 29 of a digital counter 30 which are visible through window 25. The "Unit" roll of the digital counter 30 is equipped with a conical wheel 31 which meshes with a second conical wheel 32 secured on a coupling shaft 33. Coupling shaft 33 is rotatably mounted in a bore 34 of housing 24 extending perpendicularly to shaft 28 and is provided at the bottom end with a coupling piece 35 which has an external toothing 36. This external toothing 36 is engaged by an internal toothing 37 of a locking element moving axially under the action of a compression spring 39. Locking element 38 is guided non-rotatably on a hub 39'.

Reader 4, represented in a section in FIG. 3, includes a plug box 6 adapted to be contour of housing 24 of plug-in unit 7. A plurality of electric contact elements 40, indicated schematically in the drawing, are arranged side-by-side in rows in a defined pattern so that they may be actuated individually by feelers 41. The feelers 41 are arranged for axial movement in a panel of the bottom 42 of plug box 6, which is arranged opposite the outer surface of plate 26 of plug-in unit 7 when the plug-in unit is introduced into plug box 6. Shaft 9, already represented in FIG. 1, is rotatably mounted in a hub 43 of bottom 42 and provided at the upper end with a coupling counterpiece 44 which can be brought in engagement with coupling piece 35 of plug-in unit 7. Coupling counterpiece 44 is surrounded by an annular extension 45 opposite locking element 38 of plug-in unit 7.

A journal 46 carries a pawl 49 that can be put through a slot 47 in wall 48 of plug box 6, and which is connected by a bar 50 to the armature 51 of an electromagnet or solenoid 52. Electromagnet 52 is connected by cable 8 to a switch provided in dispenser 1 which is closed when dispenser 1 is started and which starts electromagnet 52.

Plate 26 represents the identification data carrier and the holes 27 provided therein the identification data, for example, in the form of a binary code. The holes 27 are so arranged in plate 26 that the associated feelers 41 of the contact elements 40 not to be actuated can dip into the holes 27, as it can be seen from FIG. 4, when the plug-in unit is plugged into plug box 6 of reader 4. When plug-in unit 7 is plugged into plug box 6, coupling piece 35 is also brought in engagement with coupling counterpiece 44 and at the same time locking element 38 is displaced axially on hub 39 against the pressure of spring 39 by annular extension 45, so that its internal toothing 37 is disengaged from the external toothing 36 of coupling piece 35 and the latter is released for rotation.

As soon as the identification data of plate 26 and of credit card 11 have been identified and the start or release signal arrives from control unit 13 in dispenser 1, electromagnet 52 is energized by the switch provided in dispenser 1, which turns pawl 49 so far clockwise that it engages a corresponding depression 53 of housing 24 of plug-in unit 7 and prevents plug-in unit 7 in plug box 6 from being pulled out as long as the dispenser is in operation. During the delivery, digital counter 30 is driven in an adding direction by shaft 9 over coupling 35/44, shaft 33 and conical wheels 31 and 32. Shaft 9 can be connected either by quantity recording mechanism 2 or to a price recording mechanism 3. Corresponding to this connection, digital counter 30 records either quantity values or price values.

As soon as the delivery is completed, the dispenser is shut off, electromagnet 52 releases pawl 49 so that it returns through a compression spring 54 into its rest position represented in FIG. 3 and releases plug-in unit 7. Plug-in unit 7 can therefore be removed again from plug box 6 of reader 4.

While the digital counter 30 described above cannot be reset to zero and adds continuously all values taken, it is naturally possible to use instead a resettable digital counter, but such a counter must only be resettable with a special key, which is in the possession of the owner of the dispenser, for example. This measure is

necessary so that the customer cannot change the values recorded in the digital counter himself.

For the same purpose, locking element 38 is also used, which engages again coupling piece 35 which plug-in unit 7' is removed from plug box 6 of reader 4 under the influence of spring 39 and secures shaft 33 against rotation.

In the embodiment according to FIGS. 5 and 6, plug-in unit 7 is provided with a presettable digital counter 30'. The cipher rolls of this digital counter 30' are provided in known manner with control disks 56 which have on the circumference a radial cut 57 and are scanned by fingers 58 of a scanning rake 60 which is under the action of a compression spring 59. A lever arm 61 of scanning rake 60 is connected over a connecting piece 62 to a plunger 63 which is guided axially in housing 24 and is arranged coaxially to a hole 27 of identification data carrier 26.

As soon as the preset value of digital counter 30' has been attained, all fingers 58 of scanning rake 60 can drop into the opposite cuts 57 of the control disks 56 and scanning rake 60 performs a pivotal movement in counterclockwise direction. Plunger 63 moves then down so that it presses the opposite feeler 41 of reader 4 down and effects corresponding actuation of its contact element 40. Due to this actuation of contact element 40, the agreement between the identification data carrier 26 and the identification data stored in control unit 13 is eliminated, which results in an interruption of the delivery and prevents dispenser 1 from being started again.

While specific embodiments of the invention have been shown and described in detail to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A device for controlling a self-service dispenser having an amount recording mechanism by means of an identification data carrier assigned to an authorized person and which is provided with coded markings which are checked in a reading and identification unit connected to the dispenser in order to start the dispenser, comprising an identification data carrier (26) having a digital counter (30) forming a plug-in unit (7), a reader (4) having a receiving portion for receiving said plug-in unit, an identification storage unit (17) connected to said reader for identifying an authorized person and connected to said reader for generating an identification control signal, an amount transmitter (9) provided in said reader (4) and connected to a dispenser having a reader (5) and an amount recording mechanism (2 or 3), coupling means for coupling said digital counter with said amount transmitter upon engagement of said plug-in unit with said reader and upon receiving an identification control signal from said identification storage unit, and a recording unit (18) connected to said amount recording mechanism (2,3), to said readers (4,5) and to said identification storage unit (17), said recording unit (18) comprising a plurality of counters, every counter of which is adapted to be assigned to a defined identification carrier, whereby each of said counters is only switched on when the identification carrier assigned to it is inserted into the reader for switching on the dispenser.

2. A device for controlling a self-service dispenser having an amount recording mechanism, comprising a

dispenser, a reader having a plug-in receiver with a plurality of electrical contact elements arranged in a pattern, amount-value transmitter means on said reader connected to said dispenser for indicating the amount of a fluid dispensed, a plug-in identification device engageable in the plug-in receiver and having a plurality of identification feelers arranged in a pattern and engageable with at least some of the contact elements to identify and authorize identification patterns, a digital counter carried on said identification device, and coupling means connected between said digital counter and said amount-value transmitter upon engagement of said identification device with the plug-in receiver of said reader and a recording unit connected to said amount recording mechanism and to said reader, said recording unit comprising a plurality of counters, every counter of which is adapted to be assigned to a defined identification carrier, whereby each of said counters is only switched on when the identification carrier assigned to it is inserted into the reader for switching on the dispenser.

3. A device for controlling a self-service dispenser, according to claim 2, including

- a. an identification storage unit connected to said reader for identifying an authorized person and for generating a control signal and connected to said reader for operating said reader in accordance with the generation of said control signal,
- b. key means for setting said digital counter to zero,
- c. means for locking said identification device with said plug-in receiver adapted to be connected to said dispenser for locking the identification device to the receiver during operation of the dispenser, and
- d. a recording unit connected to said reader and to said amount recording mechanism.

4. A device according to claim 2, wherein said coupling means comprises a return lock, a rotatable shaft connected to said digital counter and terminating in a first coupling member, a second counter coupling member arranged in said plug-in receiver in alignment with said first coupling member and engageable therewith upon engagement of said identification device into said receiver, said device including a driving lock member engageable over said first coupling part and preventing rotation thereof, said second coupling member being engageable with said driving lock member to displace it out of a locking position when said identification unit is engaged with said plug-in receiver.

5. A device according to claim 2, wherein said identification device has a removable plate portion defining an identification pattern for influencing said plug-in receiver and includes a lower pannel portion carrying said identification feelers with the identification data, said carrier has a surface provided with actuation portions engageable with identification feelers carried by said plug-in receiver.

6. A device according to claim 2, including means connected between said digital counter and said feelers for resetting said feelers when a preset counting value is attained and wherein said digital counter includes means for setting it at a preset counting value and for stopping said counter when the value is attained, and said digital counter includes a rotatable disk having a recess extending into the periphery thereof, a pivotal scanning member mounted in said identification device adjacent said disk and being biased to engage over the surface of said disk, and electrical circuit means engageable with said scanner being movable when said scanner enters the recess of said disk for resetting said counter.

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