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(56) Documents Cited:

GB 2261208 A	GB 2175280 A
GB 2169584 A	EP 0032831 A2

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UK CL (Edition X) **B8N**
INT CL **B67D, G01F**
Other: **EPODOC, WPI**

(54) Abstract Title: **Liquid dispenser with counting device**

(57) A liquid dispenser, such as a spirits dispenser, comprises a support structure 1 for a bottle being held upside down and containing the liquid to be dispensed and a pouring element 4. Pouring element 4 comprises a valve member (5, fig.2) which is displaced to open and close a conduit. The counter device includes an electronic circuit (6, fig.3), which comprises at least one detector (SW1, fig.4) adapted to detect a change in position of said moving valve member 5 and a microprocessor-based electronic unit (U1, fig.4) connected to the detector (SW1) to record, in a memory, the number of detections made. The detector may be a magnetic detector and the moving part 5 may be magnetic. A wireless communications system may be associated with the electronic unit (U1), to supply the data to an external reader device 7.

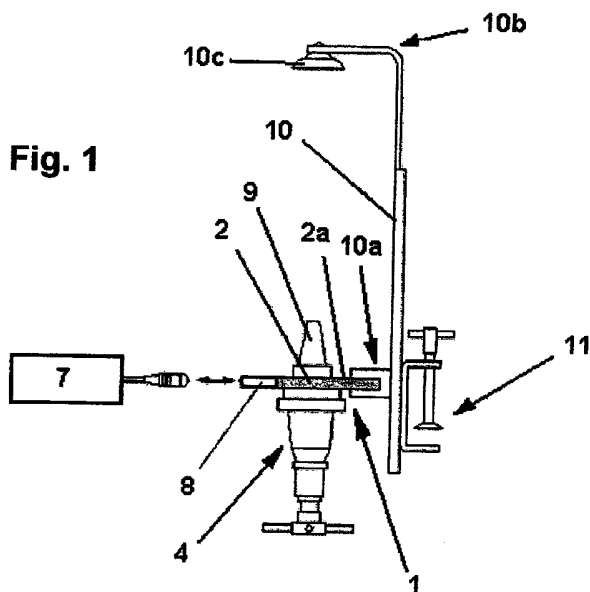


Fig. 1

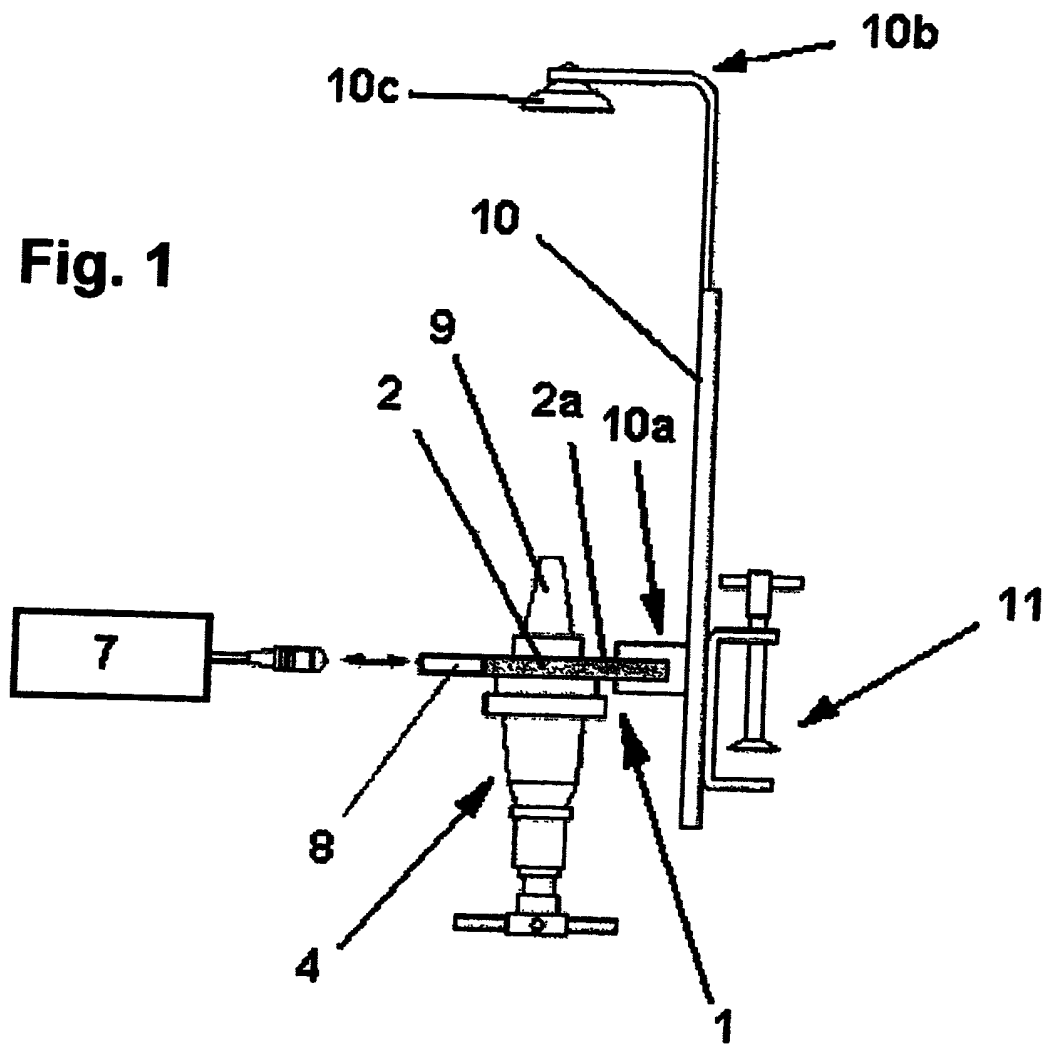
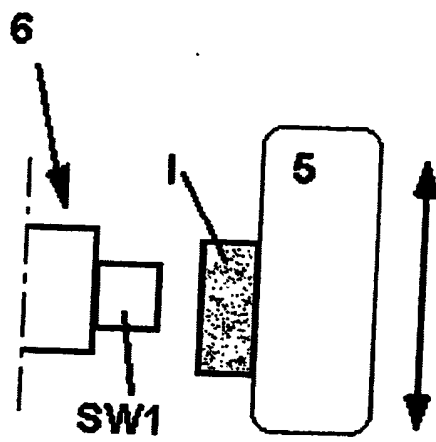


Fig. 2



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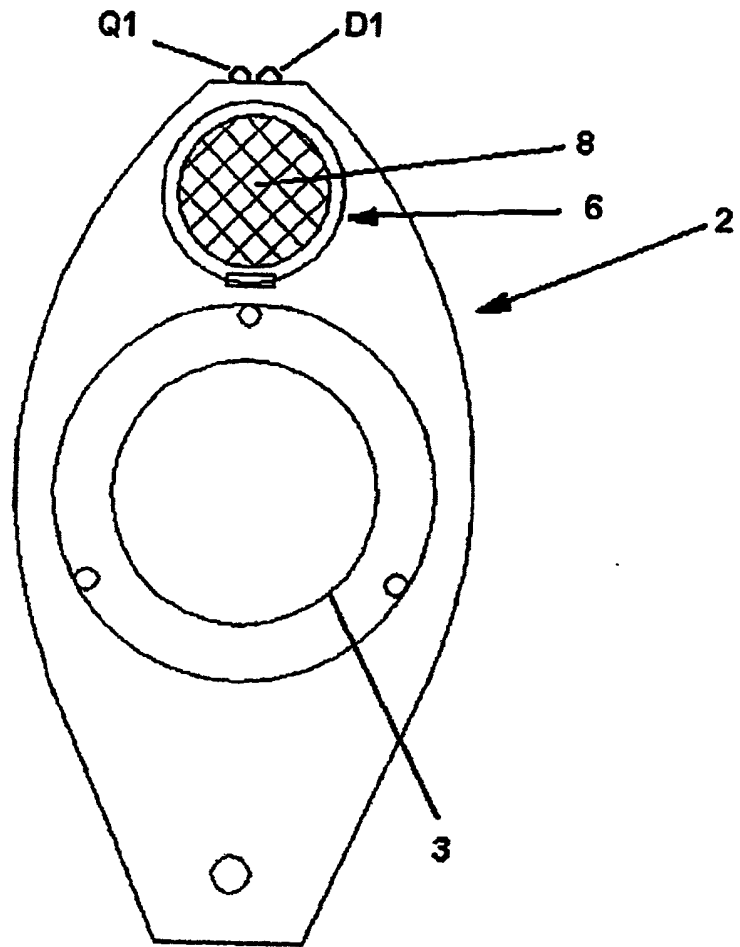


Fig. 3

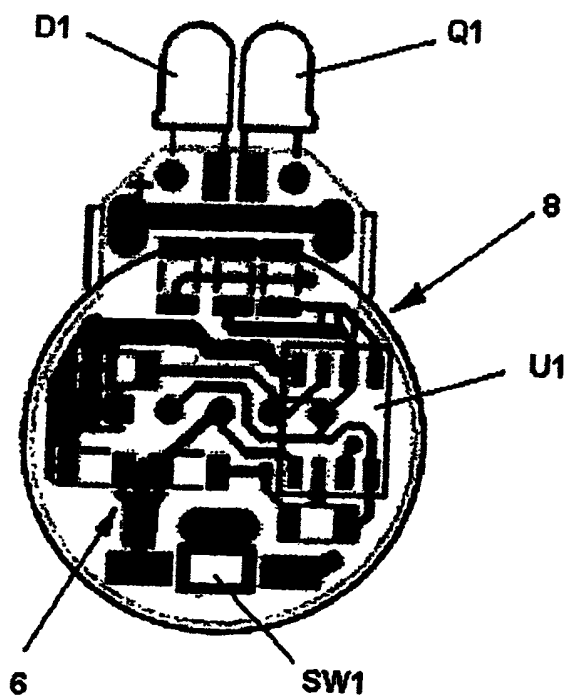


Fig. 4

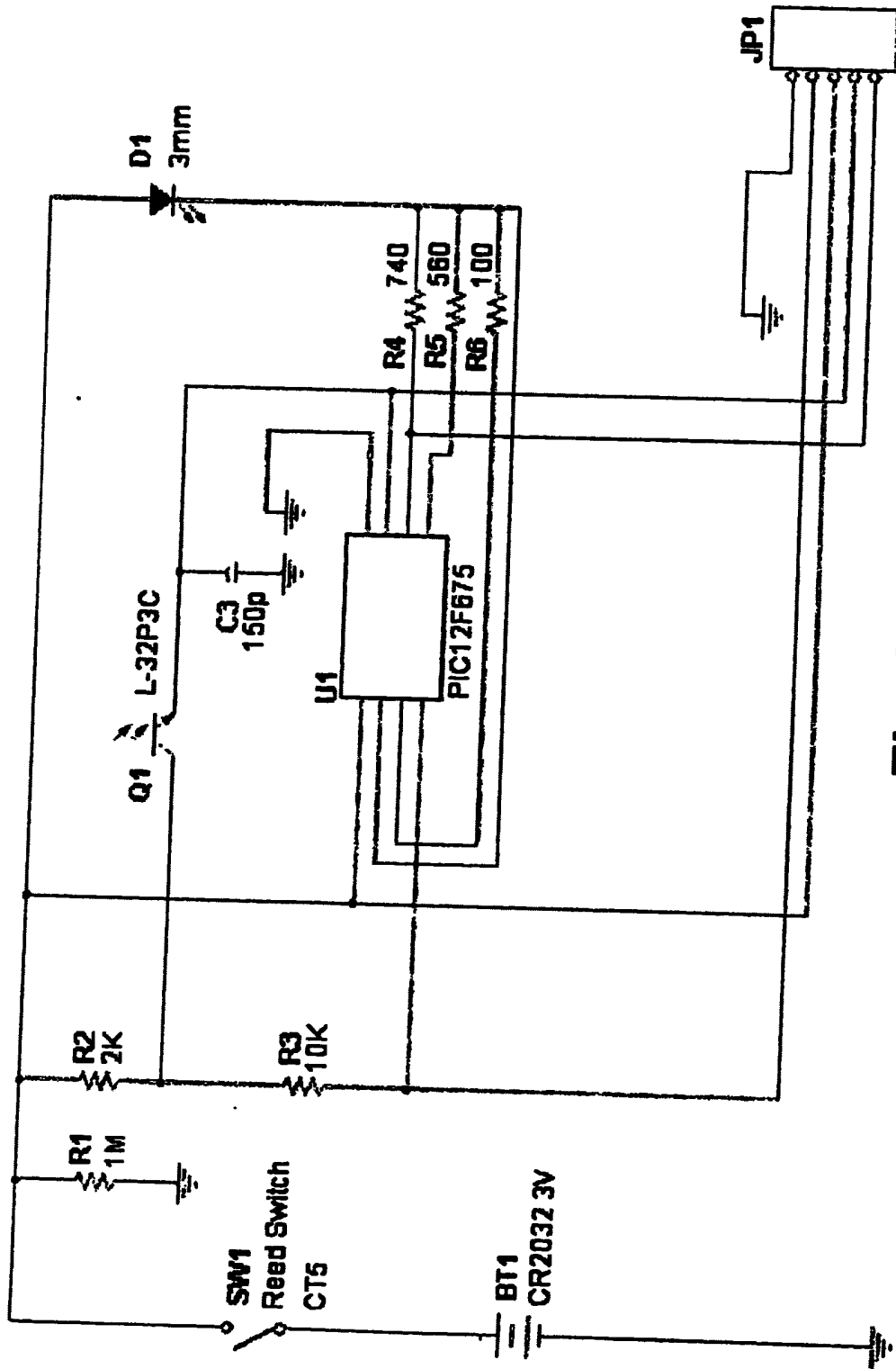


Fig. 5

TITLE

A counter device applicable to a liquid dispenser.

5 DESCRIPTION**Technical field**

10 In general, the present invention concerns a counter device applicable to a liquid dispenser and in particular, a self-contained electronic counter device.

Prior art

15 Various proposals are known for the purpose of counting the doses supplied by a liquid dispenser of the type generally manually operated by displacing a moving part of a valve, such as a piston or plunger, whether by applying pressure with the hand on, for example, a lever or with a cup or glass when it is positioned under the dispenser and pressed upwards against said moving part or another associated with same.

20 Document ES-A-2056064 concerns a dispenser measuring apparatus of the type described above, in other words, with a valve comprising a piston or operative column which, when moved upwards opens a conduit that allows liquid to flow from an upside-down bottle into which a dispenser head has
25 been inserted. In the apparatus proposed by said document, the operation of the moving part or operative column is manually produced by the operation of a corresponding lever. Although not claimed, the possibility is contemplated of the apparatus incorporating a mechanical counter, such as the one proposed by patent application GB-A-2036695, or electrically, together with a signalling
30 device that transmits a signal to a cash register or a computer each time a dose is dispensed.

Patent application GB-A-2036695, referred to by the previous background, proposes a counter for one of said liquid dispensers, which is fitted to the dispenser casing and operated when a piston of same is moved upwards. The possibility is contemplated of the counter being mechanical or electronic, but the final objective is to show the count made by display means, being those incorporated into the actual counter if it is mechanical or by means of an LCD screen or LEDs.

10 In the cited documents, it is proposed either to visually show the user the count, or to transmit a signal to a computer or cash register each time the count is incremented, in other words, in real-time, but it is not proposed to autonomously store the count in the actual dispenser in order to communicate it to a computer or any other class of electronic device, not in real-time, but
15 when the user desires, so also making it possible to read the bottles by predetermined groups (user-defined) and in different periods, for statistical purposes.

Disclosure of the invention

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It seems necessary to offer an alternative to the state of the art, which covers the gaps stated above, by contributing a counter device, as proposed by the present invention, applicable to a dispenser of liquids: in general, drinks from a bottle.

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The dispenser is of the conventional type, briefly described above, comprising:

30

- a support structure with a support piece providing an orifice, around which, on a first face of said support piece, is seated the edge of a bottle neck containing the liquid to be dispensed, when said bottle is arranged upside-down on said support structure, and

- a pouring element which is fixed to said support piece, crossed by a conduit or internal chamber for the circulation of liquid from said bottle with two ends that define inlet and outlet mouths for said chamber and which comprises a valve member to open and close said conduit or chamber through the movement of a moving part of said valve member.

In an exemplary embodiment, the edge of the bottle containing the liquid to be dispensed does not come into contact with said support piece, but instead is directly seated on a head of said pouring element, which includes said inlet mouth, which is adapted to fit inside the neck of said bottle going through said orifice in the support piece.

The present invention is characterised in that said counter device comprises an electronic circuit with:

- a detector adapted to detect a minimum of the change in position of said moving part when it is moved, and
- a microprocessor-based electronic unit, such as a microprocessor, connected to said detector to at least count the detections made by the detector and to store at least the number of detections in a memory.

In a preferred embodiment, said detector is a magnetic detector and said moving part is, in part, magnetic or is fitted with a magnet, arranged so that when the moving part is moved, said magnetic part or said magnet lies in the field of capture of said magnetic detector.

Said electronic circuit comprises a wireless communications system, which, in general, is bidirectional, associated with said electronic unit so that, for an embodiment example, it is adapted to supply the data stored in said memory to an external reader device.

The communications system operates via infrared and/or radio frequency and/or any other wireless technology that those skilled in the art consider recommended.

- 5 In a more elaborate embodiment, said detector is also adapted to detect the periods during which said moving part remains in an open position for each change of position, and said electronic unit is adapted to also store said periods in said or another memory, with each period corresponding to a respective dose of supplied liquid, thus finally, not only the number of
- 10 doses that have been supplied by the pouring element incorporated into the counter device proposed by the present invention, but also the amount of liquid supplied in each dose, which can be calculated from the cited periods by said electronic unit, and supply the result of said calculations to said external reader, or to supply to said reader only the
- 15 data referring to the number of doses supplied, together with the periods corresponding to each dose and that the actual external reader or other device, such as a computer to which the said data are downloaded, performs the commented calculations from the periods.

20 **Brief description of the drawings**

The previous and other advantages and characteristics will be more fully understood from the following detailed description of embodiments, with reference to the attached drawings, in which:

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Fig. 1 is a schematic elevation view showing a liquid dispenser that incorporates the device proposed by the present invention and an external reader device in a situation of communication with the counter device, as an embodiment example,

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Fig. 2 is a schematic diagram showing a detector included in the electronic circuit of the counter device proposed by the present invention, facing a

corresponding magnet mounted on the moving part of the pouring element of Fig. 1, as an embodiment example,

Fig. 3 is a lower plan view of the support piece of the dispenser of Fig. 1, where the printed circuit card, integrated into the same, can be appreciated incorporated into the electronic circuit for the counter device proposed by the present invention, for the embodiment example of Fig. 1,

Fig. 4 is an upper plan view of the printed circuit card with the respective electronic circuit for the counter device proposed by the present invention, as an embodiment example, and

Fig. 5 is an electrical drawing of the electronic circuit proposed by this invention as an embodiment example.

Detailed descriptions of some exemplary embodiments

The present invention concerns a counter device applicable to a liquid dispenser, with said dispenser being of the type illustrated in Fig. 1 and, as can be appreciated, comprises:

- a support structure 1 with a support piece 2 providing an orifice 3, around which, on a first face 2a of said support piece 2, is seated the edge of a bottle neck (not shown) containing the liquid to be dispensed, when said bottle is arranged upside-down on said support structure 1, and
- a pouring element 4, which is fixed to said support piece 2, crossed by a conduit or internal chamber for the circulation of liquid from said bottle with two ends that define inlet and outlet mouths for said chamber and which comprises a valve member to open and close said conduit or chamber through the movement of a moving part 5 (see Fig. 2) of said valve member.

The pouring element 4, illustrated in Fig. 1, comprises a head 9, which includes said inlet mouth, which is adapted to fit inside the neck of said bottle, passing through said orifice 3 of support piece 2.

- 5 As indicated above, for another embodiment example, not shown, the edge of the bottle containing the liquid to be dispensed, does not come into contact with said support piece 2, but instead is directly seated on said head 9 of said pouring element 4, which includes said inlet mouth, being, in both cases, applicable to the counter device proposed by the
- 10 present invention.

- The mentioned support structure 1 illustrated in Fig. 1 comprises an arm 10 fixed by a zone 10a close to one end of said support piece 2 and the other bent end 10b, which is coupled to a support portion 10c to secure
- 15 the base of said bottle so that same is fixed between said support piece 2 and said support portion 10c.

- As can be seen in Fig. 1, said arm 10 is adapted to be secured to a board, for which it comprises suitable means, such as the illustrated clamp 11.
- 20

- In order to adapt it to the securing of bottles of various heights, said support structure 1 preferably comprises distance adjustment and regulation means to adjust and regulate the distance between said support piece 2 and said portion 10c.
- 25

- The moving part 5 of said valve member is movable, by pressure, from a rest position in which said conduit or chamber is blocked, to a position in which said conduit or chamber is open, which allows the flow or dispensing of the liquid in said bottle, with, in general, said pressure
- 30 exerted on said moving part 5 by pushing directly or indirectly upwards with a glass or cup, although in another embodiment example, said

pressure may be exerted in a different manner, such as a lever that is pressed with the hand.

On the other hand, the mentioned moving part 5 cannot be appreciated in Fig. 1, since it moves internally with respect to the illustrated pouring device, for which reason it is only shown in a schematic fashion in Fig. 2.

The counter device proposed by the present invention comprises an electronic circuit 6, which is illustrated in more or less detail in Figs. 2, 3, 4 and 5. Said electronic circuit 6 comprises:

- a detector SW1 adapted to detect a minimum of the change in position of said moving part 5 when it is moved, and
- an electronic unit U1 based on a microprocessor connected to said detector SW1 in order to at least count the detections made by the detector SW1 and to record the number of detections in a memory, in other words, the number of services performed by said pouring element 4.

For a preferred embodiment, said detector SW1 is a magnetic detector SW1, such as the reed switch CT5 illustrated in the drawing of Fig. 5, and said moving part 5 is partly magnetic or includes a magnet I (or element capable of producing a magnetic field) (situation illustrated in Fig. 2), arranged so that when the moving part 5 is moved, said magnetic part or said magnet I lies in the capture field of said magnetic detector SW1.

Said magnetic part or said magnet I is arranged on said moving part 5 so that it lies within the capture field of said magnetic detector SW1, when moving part 5 is in a position of opening the said conduit or chamber (not visible). Such a situation is schematically shown in Fig. 2, with the magnet I facing the magnetic detector SW1.

In an embodiment example, said magnet 1 is of the neodymium cylindrical type and is located in the air inlet zone (not shown) of the pouring element 4, with, for the same or another embodiment example, the arrangement of magnetic detector SW1 vertical and displaced a few millimetres with respect to the printed circuit card 8, remaining in line with to the movement made by the magnet 1 in the air inlet orifice (not shown).

For other embodiments that are not shown, the detector SW1 can be another type, such as a proximity detector or infrared detector that detects the beam emitted by a corresponding transmitter, also belonging to the electronic circuit 6, with the transmitter and receiver arranged on either side of the moving part 5, so that the infrared beam is interrupted by the moving part 5 when displaced to one position, in general, the opening of the pouring element 4 conduit, thus producing the detection of the position change at this moment.

The mentioned electronic circuit 6 comprises a wireless communications system, preferably bidirectional, associated with said electronic unit U1, in order to supply at least the data recorded in said memory to an external reader device 7 (Fig. 1).

Depending on the exemplary embodiment, said communications system operates via infrared and/or radio frequency. In the example illustrated in Figs. 3, 4 and 5, the communications system is via infrared and comprises an infrared-emitting diode D1, together with phototransistor Q1 for bidirectional communications with said external reader device 7.

As can be seen, above all in Fig. 4, the electronic circuit 6 is arranged on a printed circuit card 8, which (depending on the exemplary embodiment) is fitted to and/or integrated into said support piece 2, preferably in a sealed manner. Fig. 3 illustrates an embodiment example in which the printed circuit card is integrated into support piece 2, so that only part of same can be appreciated, with parts of said diode D1 and phototransistor Q1 and their

respective connections to the rest of the electronic circuit 6 being hidden. Such an arrangement is also that illustrated by Fig. 1, a figure in which it can also be seen how an external reader device 7 is in bidirectional communication (as shown by the arrow with two heads represented in Fig. 1) with the electronic circuit 6 arranged on card 8.

For an embodiment example, the printed circuit card 8 is made of fibreglass with tinned tracks and a green mask.

10 For another embodiment example, already described in the previous section corresponding to the invention description, the detector SW1 is also adapted to detect the periods during which the moving part 5, for each change of position, remains in an open position and the electronic unit U1 is adapted to also record said periods in said memory (in a different sector to that for the position change data, for example) or another memory, with each period
15 corresponding to a respective dose of supplied liquid.

In general, the memory or memories where the electronic unit U1 records the mentioned data referring to at least the number of services performed by the pouring element 4, is an internal non-volatile memory in the electronic
20 unit U1, which, in general, comprises a microcontroller that is usually programmed prior to being fitted to the card 8 on the support piece 2.

The electronic circuit 6 is shown as an electronic circuit drawing in Fig. 5 for
25 an embodiment that must be taken merely as an example. In said drawing, the electronic unit U1 uses a Microchip PIC12F675 RISC microcontroller, a series of resistors R1-R6, the values of which in ohms are given in Fig. 5, an encapsulated, L-32P3C NPN phototransistor Q1, with two 3-mm pins, a 3-mm diameter transparent W11541D infrared-emitting diode D1, a 150 pF
30 ceramic capacitor C3, a 3.2V lithium battery, type CR2032 232 mAh, BT1, connected to a Reed Switch CT5-type detector SW1 and a connector JP1 that incorporates and represents the microcontroller U1 programming points.

In the embodiment example illustrated in Fig. 5, it can be seen how the layout of detector SW1 between the battery BT1 and the other components of the electronic circuit 6 means that these are only powered when the pouring element 4 provides a service, or when communications are initiated for reading the accounted value, which results in considerable savings in consumption.

10 The external reader device 7 is adapted, for an embodiment example, to read the data stored in the memories of a plurality of counter devices, such as that proposed by the present invention and is also adapted for communication with another electronic device or central unit (not shown), such as a computer, in order to download said data acquired in same, which can then be processed by said computer using suitable software.

15 Those skilled in the art would be able to introduce changes and modifications in the described exemplary embodiments without leaving the scope of the invention in accordance with that defined in the attached claims.

CLAIMS

1. A counter device applicable to a liquid dispenser, with said dispenser being of the type comprising:

5 a support structure (1), with at least one support piece (2) that provides an orifice (3) next to which may be seated the edge of a bottle neck by a first face (2a) of said support piece (2), the bottle being arranged upside down and containing the liquid to be dispensed;

10 a pouring element (4) secured to said support piece (2), with a conduit or chamber for the circulation of the liquid from said bottle, comprising a valve member to open and close said conduit or chamber by displacing a moving part (5) of said valve member,

said counter device being characterised in that it includes an electronic circuit (6) comprising:

15 at least one detector (SW1) adapted to detect a minimum of the change in position of said moving part (5) when it is moved, and

at least one microprocessor-based electronic unit (U1) connected to said detector (SW1) to at least count the detections made by detector (SW1) and to record, in a memory, the number of detections made.

20

2. A counter device in accordance with claim 1, characterised in that said detector (SW1) is a magnetic detector and said moving part (5) is, in part, magnetic or is fitted with a magnet (I), arranged so that when the moving part (5) is moved, said magnetic part or said magnet (I) lies in the field of capture
25 of said magnetic detector (SW1).

3. A counter device in accordance with claim 2, characterised in that said magnetic part or said magnet (I) is fitted to said moving part (5) so that it lies in the capture field of said magnetic detector (SW1) when the moving part (5)
30 is in a position for opening the said conduit or chamber.

4. A counter device in accordance with claim 1, 2 or 3, characterised in that said electronic circuit (6) comprises a wireless communications system associated with said electronic unit (U1) to at least supply the data recorded in said memory to an external reader device (7).

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5. A counter device in accordance with claim 4, characterised in that said communications system operates using infrared and/or radio frequency.

10

6. A counter device in accordance with claim 4 or 5, characterised in that said communications system is bidirectional.

15

7. A counter device in accordance with claim 6, characterised in that said communications system comprises at least one infrared emitter diode (D1) and a phototransistor (Q1) for bidirectional communications with said external reader device (7).

20

8. A counter device in accordance with any preceding claim, characterised in that said electronic circuit (6) is arranged on a printed circuit card (8) which is fitted to and/or integrated into said support piece (2).

25

9. A counter device in accordance with any preceding claim, characterised in that said detector (SW1) is also adapted to detect the periods during which the said moving part (5), for each position change, remains in an open position and in that said electronic unit (U1) is adapted to also record said periods in said memory or another memory, with each period corresponding to a respective supplied dose of liquid.



For Innovation

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Application No: GB0614532.0

Examiner: Mrs Emma Tonner

Claims searched: 1-9

Date of search: 28 November 2006

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1, 2, 3, 8	GB2169584 A (SIMMONS) see page 2, lines 29-45
X	1, 2, 3	EP0032831 A2 (SANDIACRE ELECTRICS) see page 2, lines 32-34
X	1, 2, 3	GB2175280 A (LILLEY) see page 2, lines 63-67
X	1	GB2261208 A (JOHNSON) see page 2, lines 7-9

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X:

B8N

Worldwide search of patent documents classified in the following areas of the IPC

B67D; G01F

The following online and other databases have been used in the preparation of this search report

EPODOC, WPI