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(71) Applicant: **Chen, Ching-Shih**
No. 20, Shuang Hsi Street
Sheh-Lin District, Taipei(TW)

(72) Inventor: **Chen, Ching-Shih**
No. 20, Shuang Hsi Street
Sheh-Lin District, Taipei(TW)

(74) Representative: **Barlow, Roy James et al**
J.A. KEMP & CO. 14, South Square, Gray's Inn
London WC1R 5LX(GB)

(54) Cleanser dispenser.

(57) In a cleanser dispenser, the motor-operated cleanser discharge unit is provided with a plurality of press rollers 344 which are mounted on a rotary support 341 operated by the motor 32 in such a manner that they are angularly spaced from one another and that their axes are parallel to and equally spaced from the axis of rotation of the rotary support 341. The press rollers 344 depress a flexible cleanser discharge conduit 33 against a curved guide wall 31c to stop the flow of the cleanser. The press rollers 344 minimize the friction produced on the flexible conduit 33. The flexible conduit is always compressed by at least one press roller 344 regardless of the accuracy of the control of the motor operation, thereby alleviating the problem of cleanser leakage.

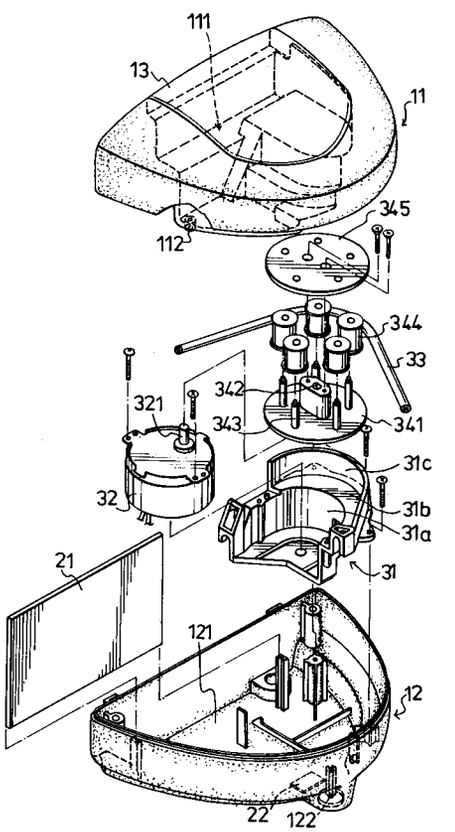


FIG. 3

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This invention relates to a cleanser dispenser, and particularly to a cleanser dispenser which has motor operated cleanser discharge unit to discharge the cleanser from a flexible cleanser conduit and a detector to signal and control the motor.

Cleanser dispensers are now commonly used in rest rooms of public centers such as hotels, railway stations, shopping centers, etc. Early cleanser dispensers have push buttons for manual operation. Later, cleanser dispensers were developed to those which automatically discharge a predetermined amount of cleanser when the user places his/her hands under the dispensers. The dispensers of the later type generally have a flexible cleanser discharging conduit and a motor-operated eccentric rotary valve to depress the flexible conduit so as to stop the flow of cleanser at an appropriate time. A control system associated with an infrared detector is provided in the dispenser to control the motor so as to cause the rotary valve to move a predetermined angular distance when the user' hands are moved to the dispenser. In such a cleanser dispenser, the displacement of the rotary valve must be precisely controlled in order to ensure that it stops at a predetermined position at the conclusion of a dispensing operation. Otherwise, the rotary valve would stop at a position in which it is ineffective in preventing the cleanser from flowing outward. It is inevitable that such dispenser suffer cleanser leakage when the control system deviates from its normal performance. This is the reason why conventional cleanser dispensers leak after a period of use. Another drawback existing in these dispensers are that the rotary valve is liable to produce much friction when sliding over the flexible conduit, which friction would cause difficulties in the operation of the rotary valve.

An object of the invention is to provide an improved automatic cleanser dispenser which overcomes the problems of the above conventional cleanser dispenser.

According to the present invention, a cleanser dispenser comprises a housing having an upper compartment to receive a liquid cleanser, a lower compartment and a discharge outlet at the bottom of the housing. A flexible conduit extends from the upper compartment to the discharge outlet passing through the lower compartment. A cleanser discharge unit is disposed in the lower compartment, and includes a motor, a rotary support driven by the motor, and a plurality of annularly spaced press rollers mounted on the rotary support with their axes parallel to and equally spaced from the axis of rotation of the rotary support. A conduit positioning member is provided adjacent to the rotary support and has a curve guide wall to curve and position the conduit adjacent to one side of the press rollers so that the press rollers roll over and depress the flexible conduit against the curve guide wall when the rotary support is rotated.

A detector is disposed at the discharge outlet to detect the presence of the user' hand. An electronic control unit is disposed in the lower compartment and electrically is connected to the motor and the detector. The control unit controls the motor so as to turn the rotary support through a predetermined angle upon receiving an appropriate signal from the detector.

The present exemplary preferred embodiment will be described in detail with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a cleanser dispenser embodying the present invention;

Figure 2 is a partially exploded view of the cleanser dispenser of Figure 1;

Figure 3 is an exploded view of the cleanser of Figure 1; and

Figure 4 is a fragmentary view showing the discharge unit of the dispenser.

Referring to the drawings, a cleanser dispenser embodying the present invention includes a housing 10 which includes an upper casing 11 having an accommodating space 111 to receive a cleanser and a bottom outlet 112. A lower casing 12 is screwed to the bottom side of the upper casing 11 and confines another accommodating space 121. A discharge outlet 122 is provided at the bottom of the lower housing 12. A top cover 13 is provided to cover a top opening of the upper housing 11.

An electronic control circuit unit is installed on a circuit board 21 which in turn is mounted in the accommodating space 121 of the lower housing 12, and an infrared detector 22 is provided adjacent the discharge outlet 122 of the lower housing 12.

A support 31 is disposed in the lower casing 12 and has a cavity 31a to hold a motor 32 which is electrically connected to the circuit board 21. A flexible conduit 33 extends from the outlet 112 of the upper casing 11 to the discharge outlet 122. The support 31 further has a positioning seat 31b at one side of and above the cavity 31a and a curved guide wall 31c adjacent to said positioning seat 31b. The flexible conduit 33 lies on the seat 31b and curved by the guide wall 31c. A rotary support 341 has a mounting post 342 which is mounted on the shaft 321 of the motor 32 adjacent to the conduit 33. Five press rollers 344 are mounted on vertical shafts 343 which in turn are mounted on the rotary support 341 in such a manner that they are annularly spaced from one another and are equally spaced from the shaft of the motor. A cover plate 345 is mounted on the mounting post 342 of the rotary support 341. The rollers 344 are close enough to the curved guide wall 31c to compress the conduit 33 against the guide wall 31c when the rollers 344 are turned to said guide wall

31c. The curvature of the guide wall 331c is substantially similar to that of the contour of the path along which the rollers 344 are moved so that the rollers 344 constantly compress and roll over the conduit 33 while moving from one end to the other end of the guide wall 31c, i.e. from point A to point C. The rollers 344 squeeze the cleanser out of the conduit 33 through the discharge outlet 122 when the rotary support 341 is turned.

The infrared detector 22 produces a signal to the control circuit unit of the circuit board 21 to actuate the motor 32 to rotate one turn when the hand of a user is moved to the discharge outlet 122. Accordingly, the rotary support 341 will make one revolution and then stop, discharging a predetermined amount of cleanser from the conduit 33.

The dispenser of the present invention does not have the leakage problem that exists in the conventional dispenser because more than one roller compresses the flexible conduit and the conduit is always compressed by at least one roller to stop the flow of the cleanser regardless of the accuracy of the control of the motor operation. Moreover, the present invention lacks the friction problem of the conventional dispenser because it employs press rollers which can easily roll over the flexible conduit.

With the invention thus explained, it is apparent that various modifications and variations can be made without departing from the scope of the invention. It is therefore intended that the invention be limited only as indicated in the appended claims.

Claims

1. A cleanser dispenser comprising:

a housing having an upper compartment 111 to receive a liquid cleanser, a lower compartment 121 below said upper compartment, and a discharge outlet 122 at the bottom of said housing;

a flexible conduit 33 extending from said upper compartment 111 to said discharge outlet 122 passing through said lower compartment 121;

a cleanser discharge unit disposed in said lower compartment 121, including a motor 32, a rotary support 341 driven by said motor, a plurality of annularly spaced press rollers 344 mounted on said rotary support 341, said press rollers 344 having respective axes parallel to and equally spaced from the axis of rotation of said rotary support;

a conduit positioning member provided adjacent to said rotary support 341 and having a curved guide wall 31c to curve and position said conduit adjacent to one side of said press rollers;

a detector 22 disposed at said discharge outlet 122; an electronic control unit 21 disposed in said lower compartment and electrically connected to said motor and said detector, said control unit 21 controlling said motor so as to turn said rotary support a predetermined angle upon receiving a signal from said detector;

said press rollers 344 rolling over and compressing said conduit 33 against said curved guide wall 31c when said rotary support is rotated; and

at least one of said press rollers 344 compressing said flexible conduit 33 against said curved guide wall 31c at all times.

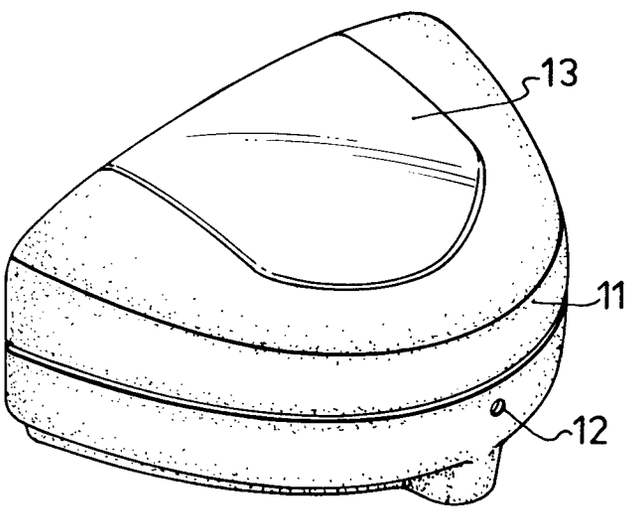


FIG. 1

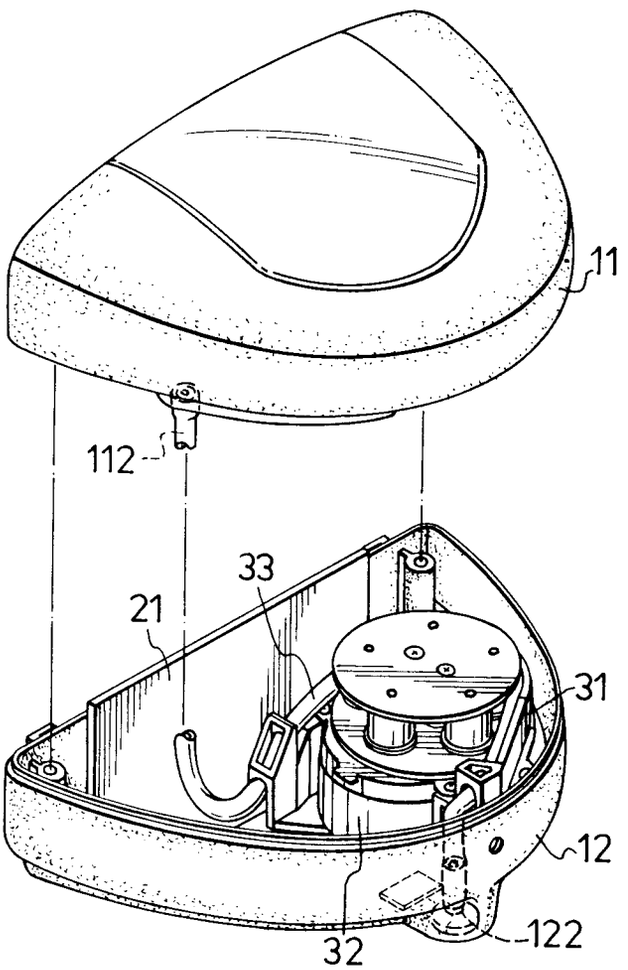


FIG. 2

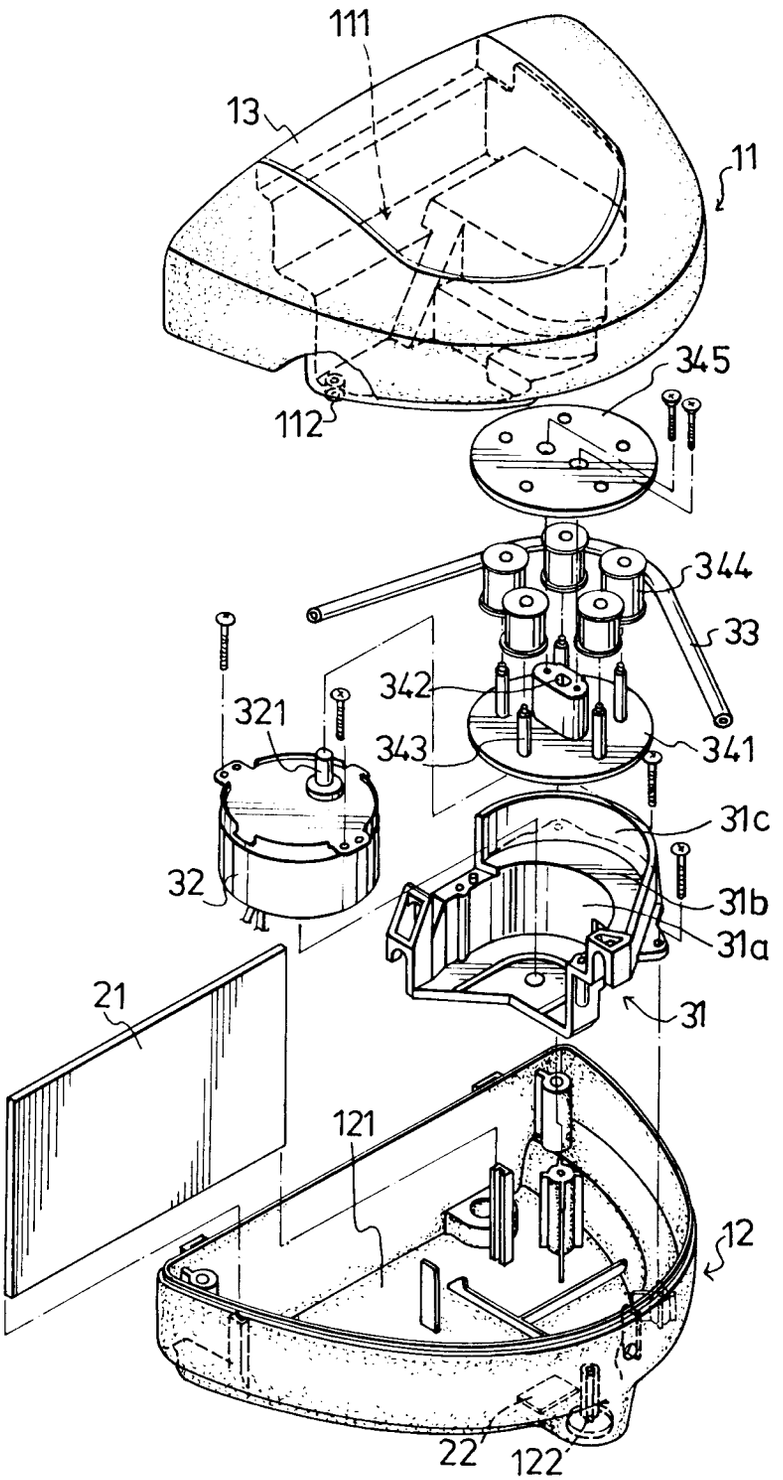

111
13
11
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112
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341
31c
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31b
31a
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12
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122

FIG. 3

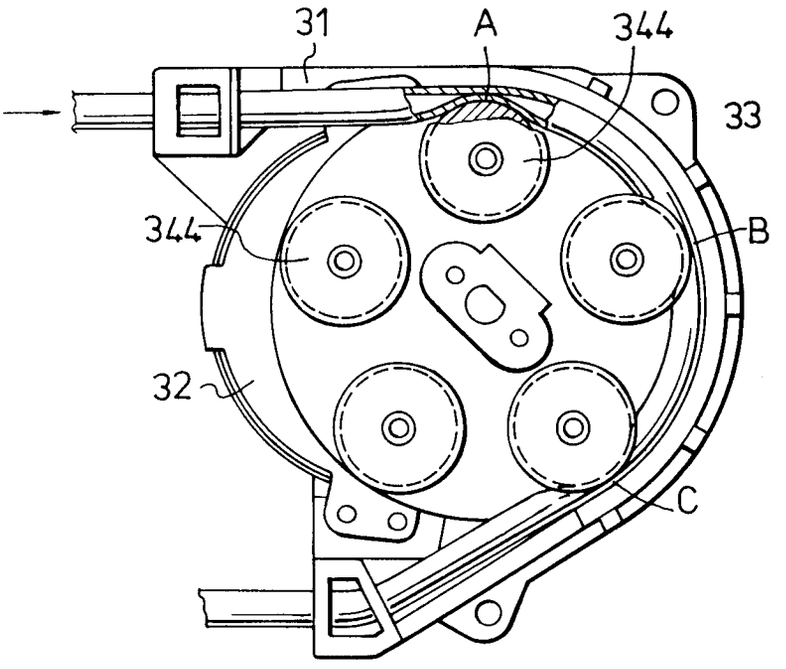


FIG. 4

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EUROPEAN SEARCH REPORT

Application Number

EP 91 30 0004

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.5)
X	US-A-4 921 150 (P. J. LAGERGREN ET AL.) * column 4, line 50 - line 65; figures 1-2A * * column 5, line 18 - line 46; figure 3 *	1	A47K5/12
X	US-A-3 531 021 (R. C. BASSET) * column 2, line 52 - line 67; figures 1-4 * * column 4, line 23 - line 54; figure 8 *	1	
A	WO-A-9 012 530 (FENDER & GIBSON) * page 6, paragraph 2 - page 7, paragraph 1; figures 1-3 *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

A47K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	13 AUGUST 1991	KAPPOS A.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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