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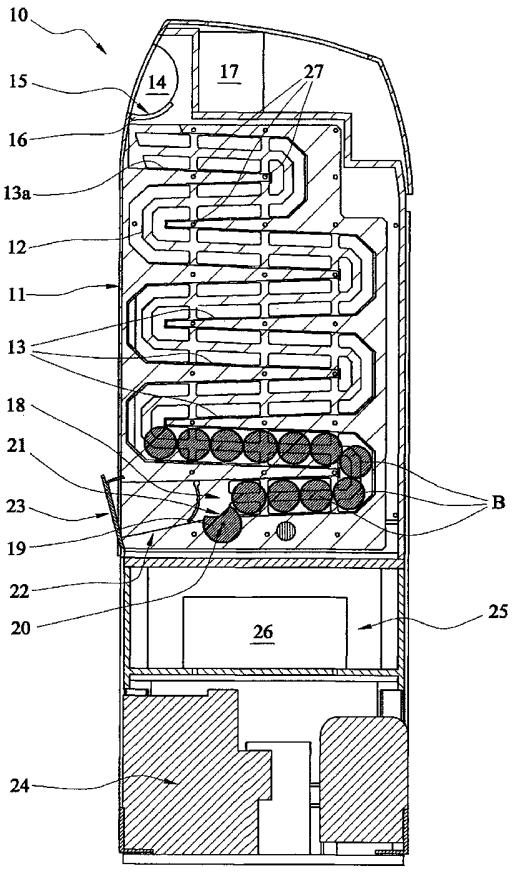

(57) Abstract: A dispenser (10) suitable for use in a public house or bar to dispense beverages, preferably in a chilled state. The dispenser includes a housing (11) with an input end (14), accessible by a user, within which to place a beverage bottle (B). Within the housing is a pathway (12) leading to a dispensing end (18) where bottles are released. Preferably the housing is refrigerated (by means of forced convection equipment to enable rapid chilling) such that bottles are cooled to a predetermined temperature before being dispensed. Also it is preferable that the dispensing end is activated by the placement of a beverage bottle (usually in a "warm" state) in the input end. Thereby the dispenser is always stocked with cool beverages ready for sale.

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A DISPENSER

TECHNICAL FIELD

The present invention relates to a dispenser, more particularly a beverage dispenser for dispensing bottles or cans.

BACKGROUND ART

Dispensing machines that dispense canned or bottled drink are commonplace. Such machines are normally of a "vending" variety that supply a single unit of beverage to a customer, operated by a coin-activated means. An internal refrigerator ensures that drink is cold for consumption, which is desirable for the customer. Dispensing machines of this variety are usually located outdoors or at least away from food service establishments (although may be found in close proximity to other automated food vending machines). Very rarely would a beverage vending machine be found in a bar, public house or restaurant establishment.

The reason for the reluctance to have a coin-operated vending machine in a drinking establishment is that a certain "human touch" is desirable when serving drink in a social environment. However, at the same time, it is now common for beverages to be sold directly in bottle form over-the-bar, particularly if the type of drink is not available "on-tap". These beverages should preferably be served at between 3° (but possibly down to as low as -5°) to 10°C depending on the specific drink.

The current method of cooling bottled or canned beverages, ready for sale, is to load individual bottles from a case (e.g. a cardboard carton of, say, 24 bottles) into a back-of-bar

conventional fridge. It can often take many hours for a conventional fridge to sufficiently cool a bottle and its contents to a desirable temperature yet, depending on demand, far less time is available for adequate refrigeration. Furthermore it is likely that the coldest bottles will be at the back of the fridge whereas the warmer bottles are turned over more rapidly (because of easy access) at the front of the fridge. Such is the case in a busy establishment. Insufficient chilling can lead to customer dissatisfaction at being supplied a "warm" drink. Another disadvantage is that, depending on how well organised bar staff are, the rate of consumption may be greater than the rate of restocking the fridge leading to product unavailability. This is simply due to the fact that product can be taken from a fridge until empty, with no prompt to restock.

DISCLOSURE OF INVENTION

It is therefore an object of the present invention to provide a dispenser for use in the environments described above that improves the reliable availability of product or at least goes some way to alleviate the problems presently being encountered. It is desirable, in the preferred application of the invention, that the dispenser supply ready-to-drink chilled beverages at a consistent temperature.

In one broad aspect of the invention there is provided a dispenser including a housing for storing a plurality of packaged products, a user accessible input means for putting a packaged product into the housing and a dispensing means for releasing a packaged product from the housing, there being a pathway for the movement of packaged product between the input means and dispensing means.

Preferably the housing has associated therewith a refrigeration means for cooling the packaged product.

Preferably the dispensing means can be set to a mode wherein it cannot activate to release a packaged product from the dispensing means unless another packaged product is placed by the user into the input means.

In one embodiment there is a control means wherein the desired temperature of a packaged product at the dispensing means can be set to a predetermined temperature such that said packaged product will not be released from the dispensing means unless it is at the predetermined temperature. In this connection the control means adjusts the refrigeration characteristics (e.g. rate of heat exchange) depending on the speed of throughput of packaged product in the pathway.

Preferably the refrigeration method is forced air convection within the housing.

BRIEF DESCRIPTION OF DRAWINGS

Figure 1 is a section view illustrating a preferred embodiment of a dispenser according to the present invention, and

Figure 2 is a general perspective view of an alternative embodiment according to the present invention.

MODE(S) OF CARRYING OUT THE INVENTION

In Figure 1 a dispenser according to the present invention is generally denoted 10. A primary housing 11 encloses a snaking pathway 12 along which a plurality of bottles B (shown end-on in the view illustrated) travels. In the illustrated

embodiment, pathway 12 is of a gravity feeding type, defined by inclined surfaces 13 directing bottles B, in single file, to roll toward an adjacent opposing inclined surface doubling back below. This type of pathway where the first object in one end is the first out the other end (i.e. "first-in-first-out") is well known. The general layout allows a compact design.

At an upper end of the housing is an input means 14 in the form of a scalloped recess, shaped to receive a bottle B. Preferably a bottle B (not shown within recess 14) could rest on a surface of the scallop awaiting entry into housing 11 if it was otherwise full of product. A gate 15 conforming with and forming part of scallop 14 revolves around an axis 16 to provide an entrance to pathway 12. Gate 15 can be controlled by a control means 17 hereinafter described.

At a lower end of housing 11, communicating with input means 14 via snaking pathway 12 is a dispensing means 18 where bottles B can be controllably released from housing 11. In the illustrated example the dispensing means 18 is comprised of a scalloped disc (or cylinder) 19 rotatable about an axis pin 20. Such an arrangement is well known wherein the disc 19 rotates (either counter clockwise or clockwise for a fraction of a turn and then back) to capture a bottle B within scallop 21 (the radius of which is substantially similar to that of the product, e.g. bottle B, within the dispenser 10) by virtue of the gravity feed and delivers it through a second gate 22.

A released bottle B can roll down a short ramp 22 to a door 23, openable by a user for removal.

Below housing 11 wherein bottles B are housed is a condenser 24 and evaporator 25 module. These components are generally known in the art of refrigeration and will not be described in any

detail. However, generally it is desirable for the modules 24/25 to be proportionally dimensioned as illustrated so as to provide a dispenser 10 of practical size. A centrifugal fan unit 26 is provided for forced air convection circulation of chilled air within housing 11. Air may be directed over bottles B through holes 27 (in which case inclined surfaces 13 would preferably be a framework track to allow access for air flow). It will be appreciated that other methods of air circulation can be employed other than the use of centrifugal fans.

In the illustrated embodiment the control means 17 is situated at the top of the device but it could be anywhere inside or outside housing 11 where there is room. Preferably the dispenser 10 is intelligently controlled by control means 17 in respect of its ability to ensure dispensed product at an optimum predetermined temperature. In order to achieve this, sensors (movement and/or temperature) may be placed at various stages of the pathway 12 to relay data back to control means 17 for monitoring. Control means 17 can then adjust refrigeration requirements depending on how quickly bottles B are being dispensed. The adjustment of refrigeration requirements may be via increasing/decreasing operating characteristics of the condenser module itself or with respect to the speed of fan 26 that controls forced air convection (and hence wind-chill on the product). By way of example, fan 26 could adjust chilled air velocity over the product, preferably in a direction parallel with the longitudinal axis of the bottle, from 1 m/s to 20 m/s.

To avoid bottles bursting and/or damage (e.g. loss of carbonation etc) to the liquid beverage within the bottle itself, the temperature of air within the housing can be controlled to ensure it is always above the freezing point of the liquid. Alternatively sensors can measure the temperature

of the bottle surface (or ideally its actual contents) to ensure this does not drop below freezing.

For rapid chilling, the effective temperature of air inside the housing may be below the freezing point of the liquid within bottles B but the risk of actual freezing is minimised by controlling the time that recirculated air is below the freezing point such that there is not enough time for the liquid to freeze.

Intelligent control relies on monitoring the air or bottle temperature within the system and analysis by comparison with experimental data.

A control panel (not illustrated) interface can be used by the user to pre-set the dispenser. One of the options may be to manually release a bottle or plurality of bottles from the dispensing means, however, in general operation the control means 17 should be automatic. The automatic function is to prevent dispensing means 18 from releasing a bottle B unless a replacement bottle has been sensed as being placed in the input end 14. A sensor further down the first inclined surface 13a could prevent a user from 'tricking' control means 17 into sensing a bottle by merely manually holding open gate 15 (where a first sensor would likely be positioned).

Overall the advantage of the dispenser according to the present invention is to ensure that the "fridge is always stocked" after initial loading, thereby meeting customer drinking requirements as to temperature. The first-in-first-out configuration inherently means that the bottle being dispensed has had the longest residency time in the device and is therefore the coldest. The control means 17 controls

refrigeration for the greatest efficiency such that a bottle is gradually cooled during its travel down pathway 12.

In addition to its functional advantages the dispenser can also include exterior advertising for the products housed within.

Alternative configurations according to the present invention can include provision for multiple products, each with a separate chute for loading and dispensing product (possibly for compactness the chute, equivalent to pathway 12 , could simply be a vertical channel). An advanced embodiment of the control means could be programmed with different optimum temperatures for different products and adjust an advanced refrigeration means accordingly.

Another mode of operation may include the loading of multiple bottles (e.g. a full carton of 12 or 24) into the pathway 12 at one time. Product can then be dispensed automatically (one-by-one) from the bottom again once reaching the required temperature, but the control means would notify when a further plurality (e.g. another 12 or 24) bottles needs to be loaded. In this sense the dispenser has a kind of 'batch' refrigeration mode, rather than continuous operation. Such a mode may be useful for bar staff as a full carton of bottles is loaded at one time (saving the time of loading only one bottle at a time), but always ensuring that another batch is at drinking temperature. In this aspect it is preferable that the pathway 12 be long enough to house at least two full cartons (e.g. 24 or 48 bottles).

It is noteworthy that the energy requirements of the dispenser may be high if the establishment has a heavy demand for the particular product, however, it will be apparent that sales are higher to the same degree. A lower turnover of product through

the dispenser will have correspondingly lower energy requirements as the control means can conservatively operate the refrigeration means.

Figure 2 illustrates a second embodiment of a dispenser according to the present invention, wherein the housing 28 includes a lever 29 extending therefrom to load/release a bottle B. A window 30 is also provided to view bottles within. Such a device could also be gravity reliant as with pathway 12 from Figure 1 or include a motorised means for conveying bottles B from an input end 14 to the dispensing means 18. Some embodiments could have a bottom-to-top feed of bottles by a suitable conveyance means. Other "active" conveyence means could be developed, such that it is not necessary to rely on gravity.

INDUSTRIAL APPLICABILITY

One advantage of the present invention is improving the reliable dispense of packaged products (e.g. alcoholic beverages in a drinking establishment) at a required temperature. The embodiment described herein could be modified for providing hot packages of like product based on the same principles, by simply substituting refrigeration equipment for heating/cooking equipment in a heat resistant housing.

A second advantage is the ability to remain "stocked" in the sense that a user (usually bar staff etc) is essentially prompted to replace a product into the dispenser well before it runs out.

Materials and components required to manufacture a dispenser according to the invention are well known in the art. Preferably the housing will include an insulated wall to

improve efficiency, particularly when the dispenser is in resident refrigeration mode, i.e. when the establishment is closed and the dispenser acts merely as a fridge.

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CLAIMS:

1. A dispenser including a housing for storing a plurality of packaged products, a user accessible input means for putting a packaged product into the housing and a dispensing means for releasing a packaged product from the housing, there being a pathway for the movement of packaged product between the input means and dispensing means.

2. The dispenser according to claim 1 wherein the packaged products are arranged in single file in the pathway.

3. The dispenser according to claim 1 or 2 wherein the housing has associated therewith a refrigeration means.

4. The dispenser according to claim 3 wherein the refrigeration means includes a means for forced convection of air over the package products.

5. The dispenser according to any one of the preceding claims wherein the pathway includes a series of opposing inclined surfaces, the input means being at an upper end of the housing and the dispensing means at a lower end, the dispensing means thereby being gravity fed.

6. The dispenser according to any one of the preceding claims further including a control means.

7. The dispenser of claim 6 wherein the control means is in communication with at least one sensor and will not activate the dispensing means to release a packaged product unless a replacement packaged product is sensed in the input means.

8. The dispenser of claim 6 or 7 wherein the control means is in communication with a temperature sensor means and thereby a packaged product will not be released from the dispensing means unless it is at a predetermined temperature.

9. The dispenser of claim 6 or 7 wherein the control means is in communication with a temperature sensor means and ensures that the temperature of contents in a packaged product does not fall below its freezing point.

10. The dispenser of claim 9 wherein the control means allows air temperature within the housing to be below the freezing point, but ensures that the time that air stays at this temperature is not so long as to cause contents in a packaged product to freeze.

11. The dispenser of any one of the preceding claims wherein multiple pathways are provided in the housing.

12. The dispenser of claim 11 wherein each pathway has a sensor or plurality of sensors associated with a control means for independently controlling release and/or temperature of packaged product in the pathway.

13. The dispenser of claim 6, wherein the control means is in communication with at least one sensor in the pathway and will not activate the dispensing means to release a packaged product unless a predetermined minimum number of packaged products are resident in the pathway.

14. The dispenser of claim 13 wherein the control means will display a visual or audio signal when the minimum number of packaged products is reached.

15. The dispenser of any one of the preceding claims wherein bottles are loaded into the pathway in amounts of twelve or twenty-four.

16. The dispenser of any one of the preceding claims wherein the packaged product is a beverage bottle or can.

17. The dispenser of any one of the preceding claims wherein any reference in the claims hereinbefore to refrigeration is substituted with heating or similar such that the dispenser dispenses heated or cooked packaged products.

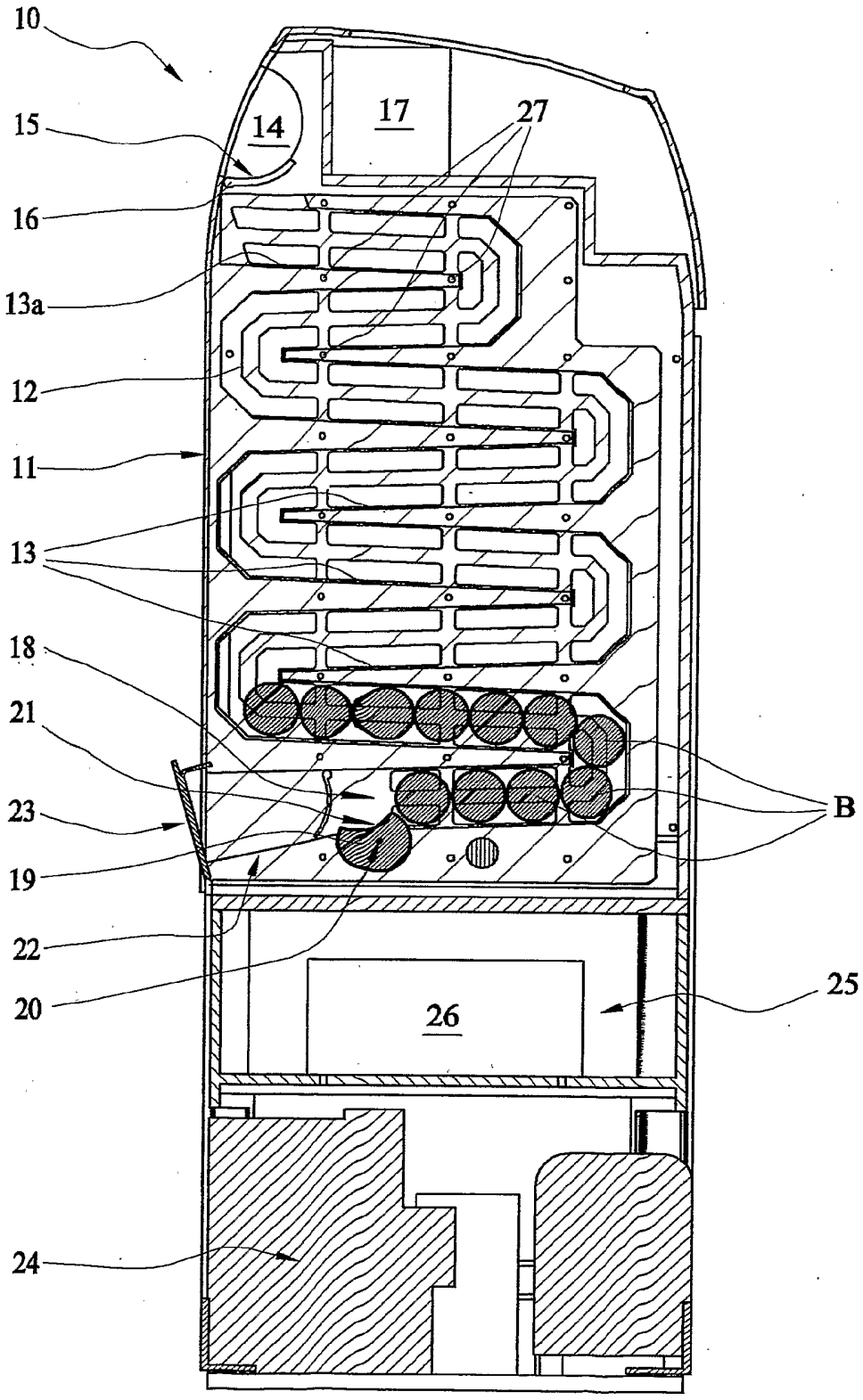

FIG. 1

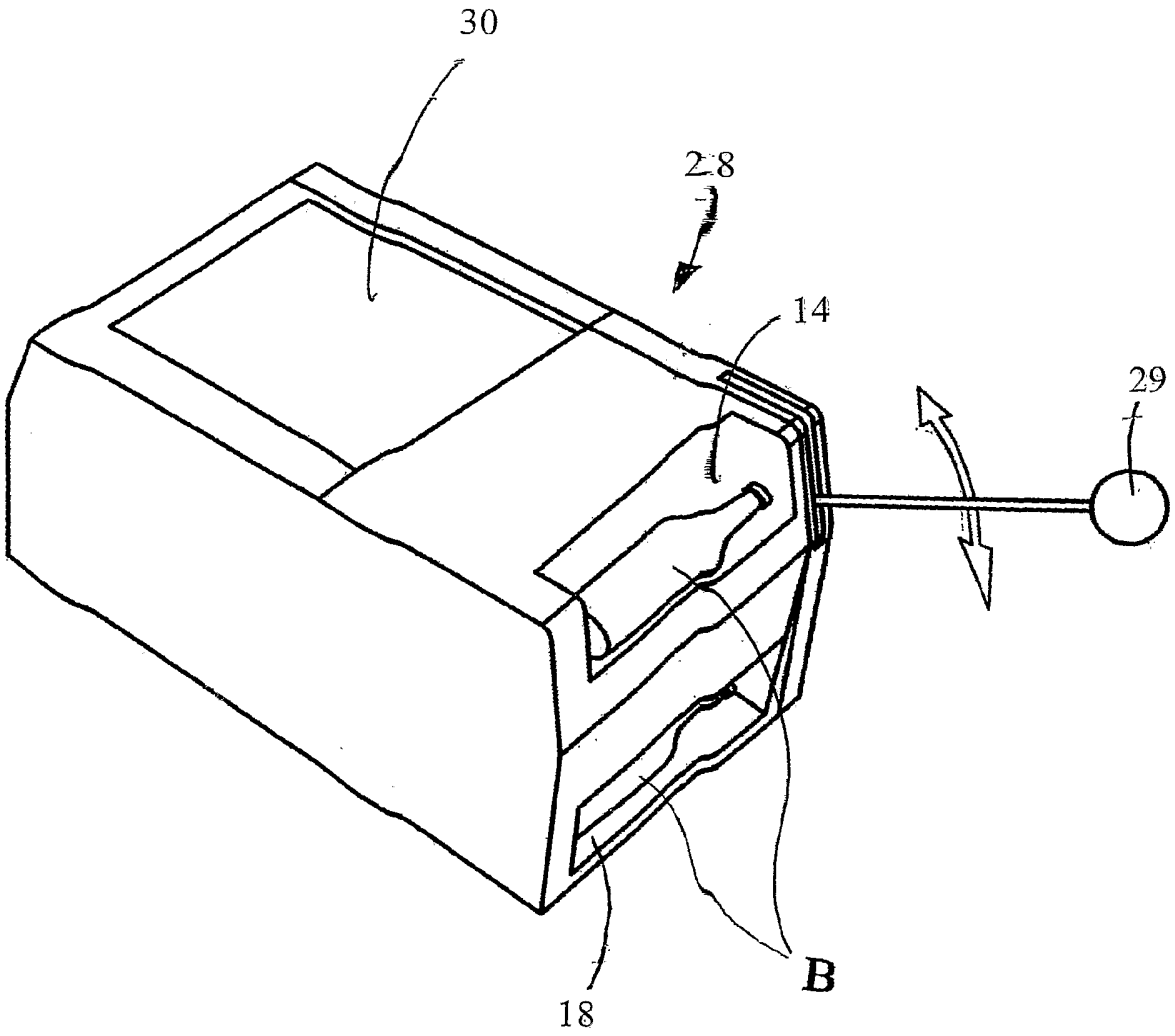

FIG. 2.