



US 20050252933A1

(19) **United States**

(12) **Patent Application Publication**
Manisco

(10) **Pub. No.: US 2005/0252933 A1**

(43) **Pub. Date: Nov. 17, 2005**

(54) **LIGHTING SYSTEM FOR BEVERAGE DISPENSER**

Publication Classification

(51) **Int. Cl.⁷ B65D 5/66**

(52) **U.S. Cl. 222/113; 222/129.1**

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(57) **ABSTRACT**

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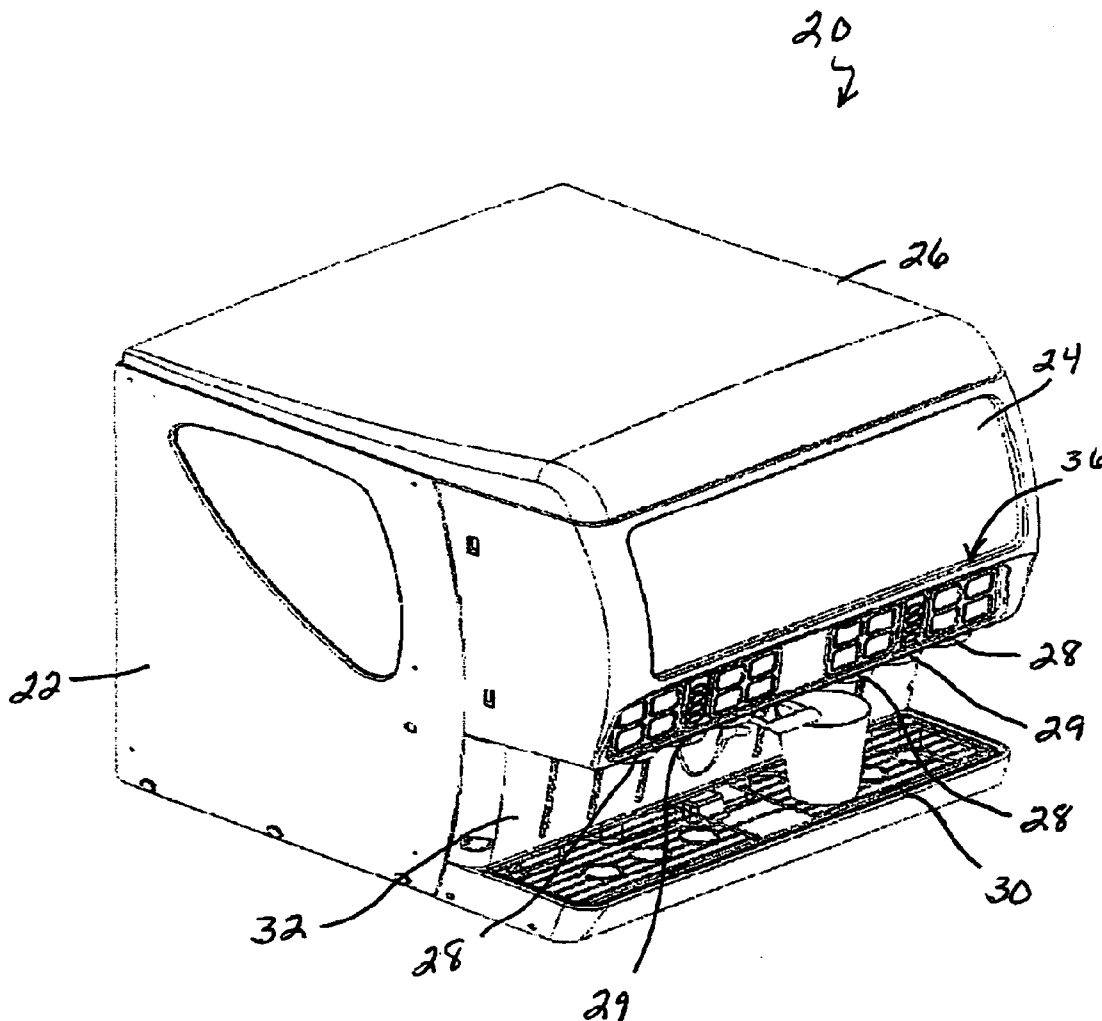
In accordance with the present invention, a lighting system for an ice/beverage dispenser visually identifies various states of operation of the dispenser. The dispenser is of a type that can be operated to selectively dispense any one of a variety of beverages as well as beverage flavoring bonus syrups. The dispenser has beverage and bonus syrup dispensing nozzles and a control panel on which are a first plurality of switches for actuation by a user to dispense selected beverages and a second plurality of switches for actuation by the user to dispense selected flavors of bonus syrups. Light sources illuminate the switches and the illumination, sequence of illumination and intensity of the light sources are controlled in a manner to visually identify to the user the various states of operation of the dispenser.

(21) **Appl. No.: 11/130,314**

(22) **Filed: May 16, 2005**

Related U.S. Application Data

(60) **Provisional application No. 60/571,697, filed on May 17, 2004.**



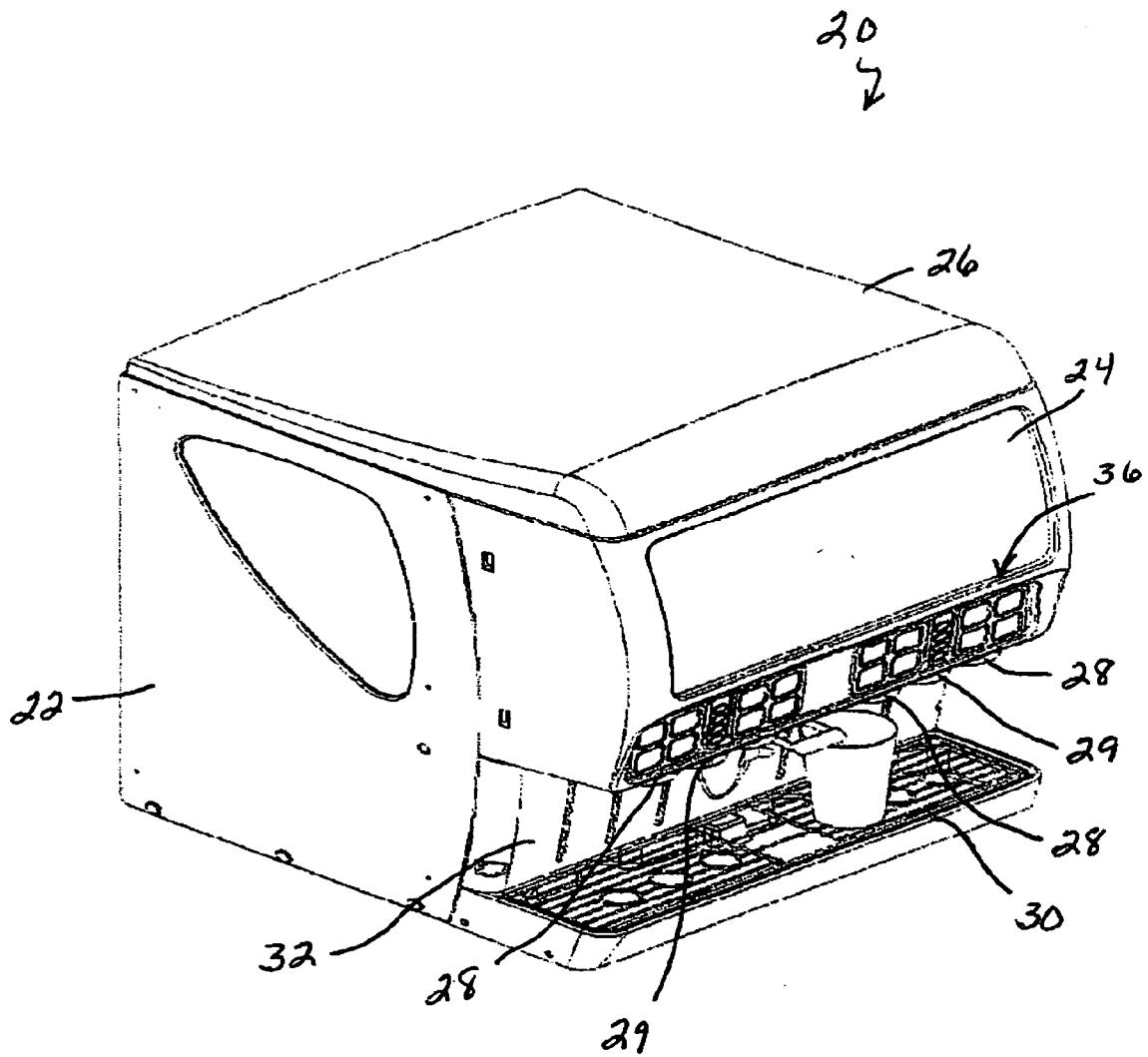


Fig. 1

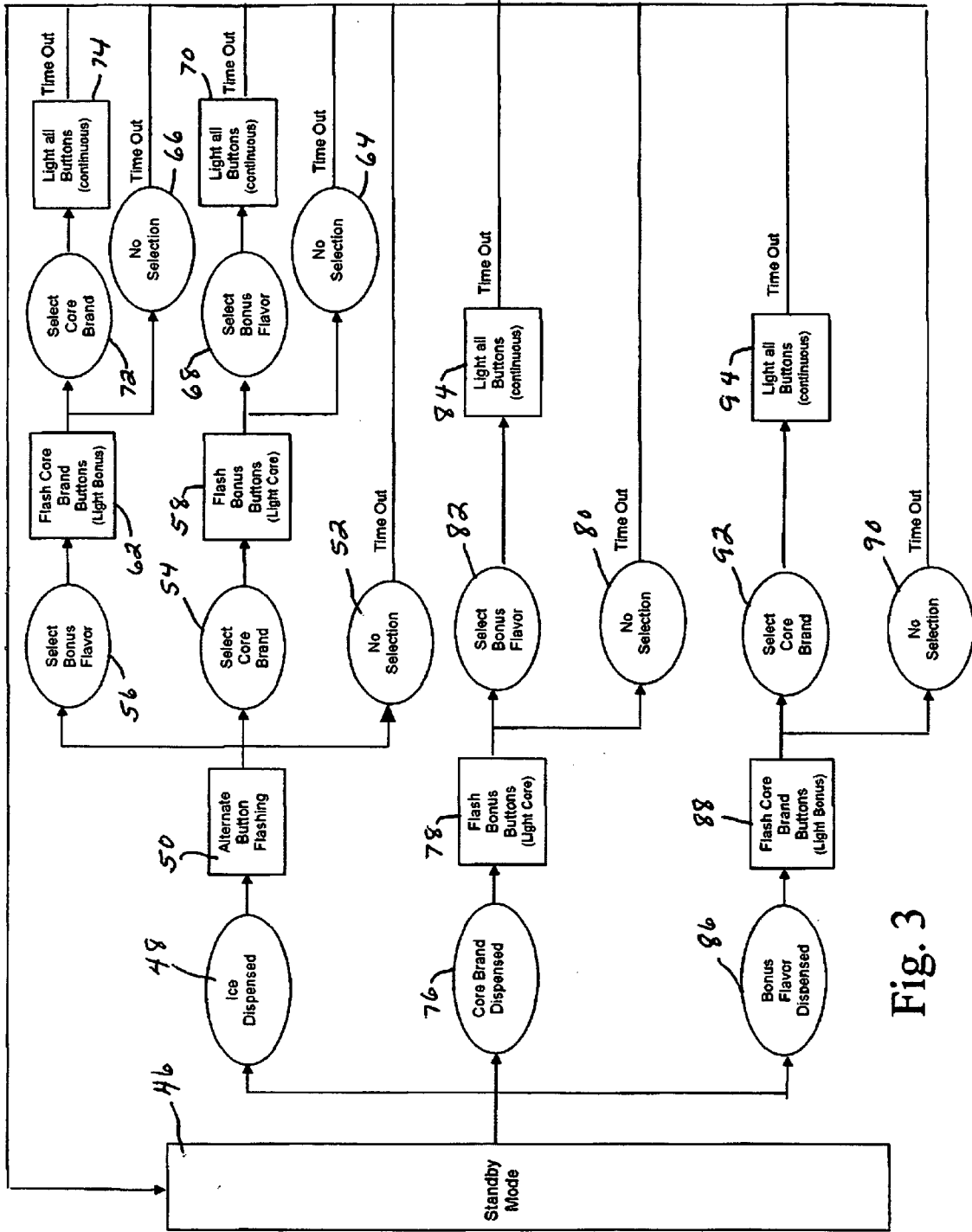


Fig. 3

LIGHTING SYSTEM FOR BEVERAGE DISPENSER

[0001] This application claims benefit of provisional application Ser. No. 06/571,697, filed May 17, 2004.

FIELD OF THE INVENTION

[0002] The present invention relates in general to beverage dispensers, and in particular to self-serve beverage dispensers.

BACKGROUND OF THE INVENTION

[0003] Beverage dispensers deliver chilled flavored concentrate syrup and chilled diluent for the syrup to post-mix beverage dispensing valves where the beverage components are mixed together in proper proportions and dispensed a into a cup. The diluent may be carbonated or non-carbonated water depending whether a carbonated or non-carbonated drink is to be serve, and the beverage dispenser is normally fluid coupled to a number of sources of concentrate syrup flavors, so that a variety of different beverages may be served. A control panel located on the front of the dispenser above the dispensing valves is normally used to provide an interface with which a user interacts to select and dispense a desired beverage. The control panel enables a user to conveniently operate the beverage dispenser and may include push-button switches for being actuated by the user to select a particular beverage to be dispensed.

[0004] A beverage dispenser typically has more than one and up to about twelve beverage dispensing valves. A dispensing valve may be dedicated to serving a single beverage flavor or adapted to dispense a variety of different flavors through a single nozzle. For the situation where a valve dispenses a single flavor, a lever may be provided below the valve nozzle for rearward displacement by a cup to actuate the valve to dispense a beverage until the cup is removed and the lever released. Where a valve dispenses multiple flavors from a single nozzle, push-buttons on the control panel, each associated with a different flavor, are typically used to operate the dispenser to serve a selected beverage. In this case, a cup is positioned beneath the nozzle and one or more buttons is pressed to dispense one or more flavors of concentrate beverage syrup and diluent into the cup. While in the past beverage dispensing machines were usually operated by restaurant employees to dispense and serve drinks to customers, it is becoming common practice to place beverage dispensers at locations where they can be accessed by restaurant patrons to permit self-service of beverages.

[0005] Restaurant employees are trained in the use of beverage dispensers, but operation of a beverage dispenser does not necessarily come intuitively to restaurant patrons. This is particularly true where the dispenser is of a type having a control panel with customer actuated push-buttons and multi-flavor dispensing nozzles, as compared to a dispenser having beverage dispensing valves that are each labeled with the name of and dedicated to dispensing a single beverage in response to rearward displacement of a lever located below the valve. In addition, with pushbutton actuated dispensers further customer confusion can arise where the dispenser is also adapted to dispense both core brand beverages and bonus flavored syrups, since the arrangement requires the presence of additional push-buttons on the control panel, adding to customer confusion and

sometimes discouraging an inexperienced user from even attempting to operate the dispenser.

[0006] For beverage dispensers intended for self-serve use, it would be desirable to provide means for visually guiding a user through a beverage dispensing process. It would also be desirable if the visual display were attractively configured to increase customer interest in the dispenser and fountain beverages served by the dispenser.

OBJECTS OF THE INVENTION

[0007] An object of the present invention is to provide a self-serve beverage dispenser with a lighting display that visually guides restaurant patrons through the process of dispensing selected beverages.

[0008] Another object is to provide such a beverage dispenser in which the visual display creates customer interest both in the dispenser and fountain beverages served by the dispenser.

SUMMARY OF THE INVENTION

[0009] In accordance with the present invention, an ice and beverage dispenser comprises a control panel on a housing of the dispenser, and means on the control panel for being controlled by a user to operate the dispenser in first and second states where beverages and flavored syrups are respectively dispensed by the dispenser. Also included are means for operating the dispenser in a third state where ice is dispensed by the dispenser, and means for visibly indicating to a user the state of the dispenser. In addition to visibly indicating the first, second and states of the dispenser, the visibly indicating means also indicates the dispenser being in a fourth state where the dispenser is in standby or idle.

[0010] In a preferred embodiment of the ice and beverage dispenser, the means on the control panel for being controlled by the user comprises a first plurality of switches for being actuated by the user to operate the dispenser in the first state in which a beverage associated with an actuated switch of the first plurality is dispensed, and a second plurality of switches for being actuated by the user to operate the dispenser in the second state in which a flavored syrup associated with an actuated switch of the second plurality is dispensed. Further, the means for visibly indicating comprises illuminator means, and means for controlling the illuminator means to visibly indicate to the user the state of the dispenser.

[0011] The illuminator means is visible on the control panel and may illuminate the switches of the first and second pluralities of switches, advantageously by providing illumination around the switches of the first and second pluralities. The controlling means controls the illuminator means to provide first, second, third and fourth visible indications when the dispenser is in the respective first, second, third and fourth states, and the first, second, third and fourth visible indications desirably are visibly distinct one from the other. The means for controlling is responsive to an absence of actuation of switches of the first and second pluralities and to the absence of a dispensing of ice to control the illuminator means to visibly indicate that the dispenser is in the fourth state.

[0012] The invention also contemplates a method of operating an ice and beverage dispenser, comprising the steps of

operating the dispenser in a first state in which beverage is dispensed, operating the dispenser in a second state in which flavored syrup is dispensed, operating the dispenser in a third state in which ice is dispensed, and visibly indicating to a user the state of the dispenser.

[0013] In a preferred practice of the method, the visibly indicating step comprises generating visual indications of the dispenser being in the first, second and third states as well as in a fourth state where the dispenser is in standby or idle. The visibly indicating step comprises the steps of providing illuminators on the dispenser, and controlling the illuminators to visibly indicate the state of the dispenser. The dispenser has a first plurality of switches for being actuated to operate the dispenser in the first state in which beverage is dispensed, a second plurality of switches for being actuated to operate the dispenser in the second state in which flavored syrup is dispensed, and a control panel for mounting the first and second pluralities of switches, and the providing step provides illuminators at the control panel. The illuminators at the control panel are in association with the switches of the first and second pluralities, and may be around individual ones of the switches of the first and second pluralities. The controlling step is responsive to actuation of switches of the first and second pluralities to control the providing step to visibly indicate the first and second states of the dispenser, and advantageously the controlling step controls the illuminators to provide first, second, third and fourth visible indications when the dispenser is in the respective first, second, third and fourth states. The first, second, third and fourth visible indications are visibly distinct one from the other, and the controlling step is responsive to an absence of actuation of switches of the first and second pluralities and to an absence of ice dispense to control the illuminators to visibly indicate the fourth state of the dispenser.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. 1 is a perspective view of an ice/beverage dispenser of a type with which a visual light display system according to the present invention may advantageously be used;

[0015] FIG. 2 is a front elevation view of a control panel and of dispensing nozzles of the dispenser of FIG. 1, and FIG. 3 is a flow diagram of the operation of the visual light display system of the invention.

DETAILED DESCRIPTION

[0016] The present invention may be embodied in an ice and beverage dispenser of a type shown in FIGS. 1 and 2 and indicated generally at 20. The dispenser 20 includes an outer housing 22, a merchandising cover 24 and a removable ice bin cover 26. A plurality of multi-beverage dispensing nozzles 28 and bonus flavor concentrate syrup dispensing nozzles 29 is secured to a front of the dispenser above a drip tray 30 and in front of and adjacent a splash panel 32. An ice dispensing chute 34 is secured to the front of the dispenser 20 centrally of the valves 28 and above the drip tray 30. Although not shown, the ice/beverage dispenser 20 has an ice retaining bin or hopper within an upper part of the housing 22. To chill beverage liquids for serving, the dispenser may use a mechanical chiller, although more advantageously it may employ a cold plate located within a lower

part of the housing 22 beneath the ice retaining bin, with the ice retaining bin then having an opening in a lower surface thereof through which ice gravitates from the bin onto and in heat exchange contact with the cold plate. To fill the hopper with ice, the cover 26 may be removed or, more conveniently, be provided with a removable lid over an ice drop hole, such that the lid may be removed for manual pouring of ice through the ice drop hole into the hopper. Alternatively, the dispenser 20 may be provided with an icemaker for making ice pieces for automatic introduction into the ice retaining bin. As is understood, the ice bin has a forward ice outlet opening controlled by a gate and through which ice to be dispensed exits the bin under the influence of an agitator in the bin for flow into, through and out of the ice dispensing chute 34 into a cup located below the chute.

[0017] The ice/beverage dispenser 20 includes a front control panel, indicated generally at 36, located above the multi-beverage dispensing nozzles 28 and bonus flavor syrup dispensing nozzles 29, and below the merchandising cover 24, with which customers interact to select particular core brand beverages and bonus flavor syrups for dispensing into a cup. The control panel 36 is provided with a number of push-button switches for operation by users to select one or more core brand beverages and/or one or more bonus flavor syrups for their drinks. The dispensing nozzles 28 and 29 are fluid coupled to valves in the dispenser 20, which in the case of the valves for delivering beverages to the nozzles 28 are post-mix valves, and the valves in turn are fluid coupled to supplies of concentrate core brand beverage syrup, diluents and concentrate bonus flavor syrups. The diluents are normally supplies of carbonated and non-carbonated or plain water, which are mixed with core brand concentrate beverage syrups by the post-mix valves to enable the dispensing of core brand beverages into cups, all in a manner well understood in the art.

[0018] Above each multi-flavor core brand beverage dispensing nozzle 28, the control panel 36 is provided with an associated group, indicated generally at 38, of core brand beverage dispensing push-button switches 40. In addition, above each multi-flavor bonus syrup dispensing nozzle 29, the control panel 36 is provided with an associated group, indicated generally at 42, of bonus flavor syrup dispensing push-button switches 44. As is understood, each group 38 push-button switch 40 is labeled with a particular brand of beverage to be dispensed from the below associated dispensing nozzle 28 upon actuation of a selected push-button switch 40, and each group 42 push button switch 44 is labeled with a particular bonus flavor syrup to be dispensed from the below associated dispensing nozzle 29 upon actuation of a selected push-button switch 44. Each button of the push-button switches 40 and 44 is generally translucent and illuminated from behind by any suitable illuminator. If the push-button switches 40 and 44 each carry a centrally located opaque label identifying the core brand beverage or bonus flavor to be dispensed, visible illumination provided by the illuminators will appear as halos surrounding the switches.

[0019] In accordance with the invention, the beverage dispenser 20 has a lighting system for controlling the illuminators to visibly illuminate the control panel push-button switches 40 and 44 in a manner to create increased customer interest in the dispenser and beverages served by the dispenser and also to help guide customers in the

dispensing of desired beverages. The lighting scheme is intended to create increased fountain beverage sales through the display of bright colors and lighting for improved merchandising and high core brand beverage density in a small counter footprint. The dispenser **20**, with its push-button control panel **38**, is highly flexible and user friendly in that users have the option of creating drinks to suit their tastes and also are guided through the beverage creation process. The dispenser provides customers with the option of dispensing core brand beverages and/or bonus flavor syrups into their cups, depending upon customer preferences. The dispenser also accommodates more than one core brand beverage and more than one bonus flavor syrup being dispensed for each individual drink.

[0020] To enhance merchandising of the dispenser **20** and to guide a customer through a drink creation process, the invention contemplates that the dispenser incorporate a suitable controller, such as a microprocessor, for controlling and driving operation of the illuminators or lights, which may be a plurality of multi-colored light emitting diodes (LEDs) that are located behind and illuminate each push-button switch **40** and **44**. The LEDs light into the back of a translucent push-button of each switch, with each push-button being provided with a generally centrally located opaque core brand beverage or bonus syrup flavor label on its front that identifies the particular beverage or bonus flavor syrup to be dispensed when the button is pushed. The light emitted through the buttons thus glows around a perimeter **45** of the button and appears as a halo around the labels.

[0021] The LEDs function in distinct modes. One mode occurs when the dispenser **20** has been idle for a selected period and is not being used, in which case the LEDs or illuminators are controlled to illuminate the control panel switches **40** and **44** in a visually identifiable standby mode. Other mode occur when ice is dispensed, when a pushbutton switch **40** is actuated to operate the dispenser to delivering a core brand beverage or when a pushbutton switch **44** is actuated to operate the dispenser to dispense a bonus flavor syrup. In other words, depending upon the state of the dispenser, the LEDs are controlled to illuminate the control panel switches **40** and **44** in visually unique and identifiable manners that represent the state of operation of the dispenser. The manner of illumination of the push-button switches **40** and **44** to represent the various different states of the dispenser is not critical to practice of the invention, it being understood that unique and different manners of illumination of the switches by the LEDs may be selected for use in identifying each different state of the dispenser.

[0022] With reference to FIG. 3, at a box **46** a controller for the LEDs drives or illuminates the LEDs in a standby mode when the dispenser **20** is not in use, for example when it has been idle for at least a selected time-out period. It is contemplated that for the standby mode the controller drive, e.g., illuminate and control the intensity of illumination and the color of, the LEDs in either random or preset patterns. This light event or visual lighting display may be characterized, for example, by causing selected ones or all of the LEDs to fade in and out and to morph between various colors, with the controller varying the power provided to each LED to create blends of different colors and brightness for each. Standby mode of the LEDs is intended to visually develop customer interest in the dispenser **20** and the beverages it serves.

[0023] Upon occurrence of any one of four states of the ice/beverage dispenser **20**, comprising dispensing ice, dispensing a core brand beverage, dispensing bonus flavor syrup and being idle, an associated and unique active mode of illumination of the LEDs is initiated by the controller. Beginning at the box **46**, with the dispenser **20** in an idle state and the LEDs being driven or illuminated by the controller in a manner representing standby mode of the dispenser **20**, a first active mode of the LEDs is commenced by the controller upon sensing at a box **48** the dispensing of ice from the dispenser. Upon sensing of ice dispense, at a box **50** the first active mode lighting event is initiated in which, for example, the LEDs may be driven to alternately illuminate and flash between the core brand beverage push-button switches **40** and the bonus flavor syrup push-button switches **44**. All bonus flavor syrup buttons could simultaneously light and then all core brand beverage buttons could simultaneously light alternately during the illumination cycle in the first active mode of the LEDs. The first active mode then continues until one of three events occur, comprising actuation by a user of any pushbutton switch **40**, actuation of any push-button switch **44** or timing out of a selected period without any push-button switch having been actuated. If a user does not make a selection of a core brand beverage or syrup flavor and the controller therefore does not sense actuation of a push-button switch **40** or **44** before the end of the time-out period, at a box **52** the controller discontinues driving the LEDs in the first active mode and at the box **46** returns to driving the LEDs in the standby mode. However, if before the end of the time-out period a push button switch **40** or **44** is actuated, at a box **54** the controller senses whether it is a switch **40** for a core brand beverage or at a box **56** if it is a switch **44** for bonus flavor syrup. If it is sensed that a core brand beverage switch **40** was pressed to dispense a selected core brand beverage into a customer's cup held below the associated dispensing nozzle **28**, at a box **58** the controller terminates the first active mode of the LEDs and changes the lighting event to a second active mode in which, for example, the buttons of all of the core brand beverage switches **40** are continuously lighted and the buttons of all of the bonus flavor syrup switches **44** are alternately illuminated or flashed. On the other hand, if at the box **56** the controller senses that a bonus flavor syrup switch **44** was pressed to dispense a selected bonus flavor syrup into a cup held below a dispensing nozzle **29**, at a box **62** the controller terminates the first active mode of the LEDs and changes the lighting event to a third active mode in which, for example, the buttons of all of the bonus flavor switches **44** are continuously lighted while the buttons of all of the core beverage switches **40** are alternately illuminated or flashed.

[0024] If after an initial actuation of a core brand switch **40** no further switches are actuated for the selected time-out period, then at a box **64** the controller discontinues driving the LEDs in the second active mode and at the box **46** returns to driving the LEDs in the standby mode. Similarly, if after an initial actuation of a bonus flavor switch **44** no further switches are actuated for the selected time-out period, then at a box **66** the controller discontinues driving the LEDs in the third active mode and at the box **46** returns to driving the LEDs in the standby mode. On the other hand, if a core brand switch **40** has initially been actuated and before the end of the time-out period, while the LEDs are still being driven in the second active mode, at a box **68** a bonus flavor

syrup switch **44** is actuated, then at a box **70** the controller interrupts driving the LEDs in the second active mode and commences driving the LEDs in the third active mode where the bonus flavor switches **44** are continuously illuminated and the core brand beverage switches **40** are alternately illuminated or flashed. Similarly, if a bonus flavor syrup switch **44** has initially been actuated and before the end of the time-out period, while the LEDs are still being driven in the third active mode, a core brand beverage switch **40** is actuated at a box **72**, then at a box **74** the controller interrupts driving the LEDs in the third active mode and commences driving the LEDs in the second active mode where the core brand beverage switches **40** are continuously illuminated and the bonus flavor switches **44** are alternately illuminated or flashed. After the core brand beverage switches **40** or the bonus flavor switches **44** have continuously been illuminated at respective box **74** or **70** for a time-out period, at the box **46** the controller returns to driving the LEDs in the standby mode.

[0025] If while the ice/beverage dispenser **20** is in an idle state at the box **46** and the LEDs are being driven in standby mode, at a box **76** a core brand beverage switch **40** is actuated, then at a box **78** the controller will drive the LEDs in the second active, mode in which the core brand beverage switches **40** are continuously illuminated and the bonus flavor syrup switches **44** are alternately illuminated or flashed. If no further switches **40** or **44** are actuated by the user before the end of the time-out period, at a box **80** the controller discontinues driving the LEDs in the second active mode and at the box **46** returns to driving the LEDs in the standby mode. If, however, before the end of the time-out period the user at a box **82** selects a bonus flavor by actuating a bonus flavor switch **44**, then at a box **84** the controller discontinues driving the LEDs in the second active mode and commences driving the LEDs in the third active mode where all of the bonus flavor syrup switches **44** are continuously illuminated and all of the core brand beverage switches **40** are alternately illuminated or flashed for the time-out period, following which the at the box **46** controller returns to driving the LEDs in the standby mode.

[0026] On the other hand, if at a box **86** a bonus flavor syrup switch **44** is actuated while the ice/beverage dispenser **20** is in an idle state, at a box **88** the controller discontinues driving the LEDs in the standby mode and commences driving the LEDs in the third active mode in which the bonus flavor switches **44** are continuously illuminated and the core brand beverage switches **40** are alternately illuminated or flashed. If no further switches **40** or **44** are actuated by the user before the end of the time-out period, at a box **90** the controller discontinues driving the LEDs in the third active mode and at the box **46** returns to driving the LEDs in the standby mode. However, if before the end of the time-out period the user at a box **92** selects a core brand beverage by actuating a core brand beverage switch **44**, then at a box **94** the controller discontinues driving the LEDs in the third active mode and commences driving the LEDs in the second active mode where all of the core brand beverage switches **40** are continuously illuminated and all of the bonus flavor syrup switches **44** are alternately illuminated or flashed for the time-out period, following which at the box **46**;the controller returns to driving the LEDs in the standby mode.

[0027] If there is no activity, i.e., no ice dispense or actuation of a switch **40** or **44**, during a period when there

is flashing of the switches **40** or **44**, it is contemplated that the controller will continue to drive the LEDs to flash for a preset time before beginning the time-out period, and that during the time-out period the switches will be continuously illuminated before the controller returns to driving the LEDs in standby mode.

[0028] When either the core brand beverage switches **40** or the bonus flavor syrup switches **44** are continuously on and respective dispensing of a core brand beverage or a bonus flavor syrup is occurring, additional actuation of any push-button switch is ignored by the LED controller and the LEDs continue to be driven in the then existing active mode of illumination until the end of the respective time-out period. Also, ice dispense operations that occur after initiation of an active mode of the LEDs are ignored by the controller and the then occurring light event continues as though ice dispense has not taken place. Further, in the event that two actuations of the switches **40** and **44** occur in a very short time frame, the light event initiated by the first actuation is continued to its conclusion and the subsequent actuation is ignored by the controller.

[0029] While embodiments of the invention have been described in detail, various modifications and other embodiments thereof may be devised by one skilled in the art without departing from the spirit and scope of the invention, as defined in the appended claims.

What is claimed is:

1. An ice and beverage dispenser, comprising:
 - a control panel on a housing of said dispenser;
 - means on said control panel for being controlled by a user to operate said dispenser in first and second states where beverages and flavored syrups are respectively dispensed by said dispenser;
 - means for operating said dispenser in a third state where ice is dispensed by said dispenser;
 - and means for visibly indicating to a user the state of said dispenser.
2. An ice and beverage dispenser as in claim 1, wherein said visibly indicating means generates visual indications of said dispenser being in said first, second and third states and of said dispenser being in a fourth state where said dispenser is in standby or idle.
3. An ice and beverage dispenser as in claim 2, wherein said means on said control panel for being controlled by the user comprises:
 - a first plurality of switches for being actuated by the user to operate said dispenser in said first state in which a beverage associated with an actuated switch of said first plurality is dispensed;
 - a second plurality of switches for being actuated by the user to operate said dispenser in said second state in which a flavored syrup associated with an actuated switch of said second plurality is dispensed,
 - and wherein said means for visibly indicating comprises: illuminator means; and
 - means for controlling said illuminator means to visibly indicate to the user the state of said dispenser.

4. An ice and beverage dispenser as in claim 3, wherein said illuminator means is visible on said control panel.

5. An ice and beverage dispenser as in claim 3, wherein said illuminator means illuminates said switches of said first and second pluralities of switches.

6. An ice and beverage dispenser as in claim 3, wherein said illuminator means provides illumination around said switches of said first and second pluralities of switches.

7. An ice and beverage dispenser as in claim 3, wherein said controlling means controls said illuminator means to provide first, second, third and fourth visible indications when said dispenser is in said respective first, second, third and fourth states.

8. An ice and beverage dispenser as in claim 7, wherein said first, second, third and fourth visible indications are visibly distinct one from the other.

9. An ice and beverage dispenser as in claim 3, wherein said means for controlling is responsive to an absence of actuation of switches of said first and second pluralities and to an absence of dispensing of ice to control said illuminator means to visibly indicate that said dispenser is in said fourth state.

10. A method of operating an ice and beverage dispenser, comprising the steps of:

operating the dispenser in a first state in which beverage is dispensed;

operating the dispenser in a second state in which flavored syrup is dispensed;

operating the dispenser in a third state in which ice is dispensed; and

visibly indicating to a user the state of the dispenser.

11. A method as in claim 10, wherein said visibly indicating step comprises generating visual indications of the dispenser being in the first, second and third states and in a fourth state where the dispenser is in standby or idle.

12. A method as in claim 11, wherein said visibly indicating step comprises the steps of:

providing illuminators on the dispenser; and

controlling the illuminators to visibly indicate the state of the dispenser.

13. A method as in claim 12, wherein the dispenser has a first plurality of switches for being actuated to operate the dispenser in the first state in which beverage is dispensed, a second plurality of switches for being actuated to operate the dispenser in the second state in which flavored syrup is dispensed, and a control panel for mounting the first and second pluralities of switches,

wherein said providing step provides illuminators at the control panel.

14. A method as in claim 13, wherein said providing step provides illuminators at the control panel in association with the switches of the first and second pluralities.

15. A method as in claim 14, wherein said providing step provides illuminators around individual ones of the switches of the first and second pluralities.

16. A method as in claim 13, wherein said controlling step is responsive to actuation of switches of the first and second pluralities to control said providing step to visibly indicate the first and second states of the dispenser.

17. A method as in claim 12, wherein said controlling step controls the illuminators to provide first, second, third and fourth visible indications when the dispenser is in the respective first, second, third and fourth states.

18. A method as in claim 17, wherein the first, second, third and fourth visible indications are visibly distinct one from the other.

19. A method as in claim 13, wherein said controlling step is responsive to an absence of actuation of switches of the first and second pluralities and to an absence of ice dispense to control the illuminators to visibly indicate the fourth state of the dispenser.

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