

DYNAMIC DEVICE AND METHOD FOR DISPENSING MACHINES

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FIELD OF THE INVENTION

The present invention relates, in general, to dispensing machines and, more particularly, to dispensing machines capable of dynamic-content presentation and methods of using dynamic-content presentation on
10 dispensing machines.

BACKGROUND OF THE INVENTION

15 Dispensing machines are used to display various messages typically consisting of a combination of text and graphics. Traditionally, the message has been provided by way of fixed sheets that are attached to a backing or molded into structural components. This traditional approach suffers from the inability to quickly change the displayed message,
20 because it requires the use of a crew to change the message, or replace an entire machine for upgrading.

Electronic billboards are known that include the dot matrix type utilizing many individual bulbs or Light Emitting Diodes (LED's). Within
25 stadiums, arenas and auditoriums there presently are electronic dot matrix

display devices used for instant replays, advertising and customer information.

Loban *et al.* disclose a video billboard including a remote computer control with radio communications to the billboard display in US Patent No. 5,612,741 ('741). The '741 patent discloses that display information is communicated from a master computer to a receiver in the billboard housing which, in turn, controls the light valve display of the '741 invention. Commands may also be communicated via shared or dedicated landlines. The '741 billboard is capable of providing complex video graphics with high contrast ratios. It can provide message changes on command through landline, cellular phone, satellite relay or other wireless communication links. Within the commercial advertising billboard industry it will allow the use of computer video control to change graphics easily and quickly, as desired. Information displays, public service announcements or traffic conditions can be displayed in near real time from remote locations since images can be downloaded via the communication links and displayed at pre-programmed time slots, if desired.

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Gofman *et al.* disclose a system and method for serving local and global media content in PCT publication WO 00/52935 ('52935). The '52935 publication discloses a system and method for combining broadcast media content with additional content at a local site according to at least one locally determined characteristic of the audience to which the

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combined content is served. The '52935 publication discloses a template containing information concerning the type of data objects to be displayed, their size and location on the display, as well as the timing of display and transitions to the display, such that the template describes how to process
5 and display the data.

New display materials are being developed that have the potential to expand advertising display technology, such as, for example, GYRICON a trade name of Xerox Corporation, Palo Alto Research Center, Palo Alto
10 California. These new materials have the potential to expand the capabilities of dispensing machines. Another new material for displays is E-INK, a trade name of E Ink Corporation 733 Concord Avenue, Cambridge, MA. GYRICON technology is disclosed, for example, in US Patent Number 4,126,854. E-INK technology is disclosed, for example, in
15 US Patent Number 6,120,588.

It would therefore be advantageous to provide an improved method of dispensing machine advertising that reduces the effort necessary to manage dynamic dispensing machine displays. It would further be
20 advantageous to provide methods of controlling dispensing machines that include content-display units. It would also be advantageous to provide easily manageable dynamic-content displays on dispensing machines. It would further be advantageous to provide a system capable of time shared display output for dispensing machines from a hierarchical control
25 structure.

SUMMARY OF THE INVENTION

A dynamic device and methods for dispensing machine displays are disclosed. A dispensing machine device in accordance with the present invention comprises a display controller adapted to receive and display dynamic-content. At least one content display unit is in communication with the display controller, wherein the content display unit visually displays the information from the dynamic-content. The dispensing machine display controller may also comprise a timing means, the display controller altering the visual display of the content display unit as a function of a signal from the timing means. The display controller may be adapted to receive, store, and display dynamic-content from a plurality of servers, wherein the display controller comprises a hierarchical control scheme, the hierarchical control scheme adapted to select dynamic-content from one server of the plurality of servers for display on the content display unit. The dispensing machine device may also comprise a plurality of display controllers in communication with a plurality of content display unit devices, each display controller from the plurality of display controllers having a type identifier, wherein each of the display controllers selects dynamic-content for display on its content display unit as a function of the type identifier.

A method for dispensing machine advertising in accordance with one embodiment of the present invention includes the following steps:

A) providing a dispensing machine, wherein the dispensing machine comprises:

a display controller, wherein the display controller is adapted to receive, store, and display dynamic-content; and

5 a content-display unit in communication with the display controller, wherein the content-display unit visually displays the information from the dynamic-content;

B) receiving information from a source; and

C) displaying the information on the content-display unit.

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A method in accordance with the present invention may also include one or more of the steps of:

D) In step C, the displaying step may be divided into a plurality of time
15 segments, allowing the step of: displaying a first information display during a first time segment and displaying a second information display during a second time segment.

E) segmenting a plurality of content-display units into a plurality of groups, each group from the plurality of groups identified with a
20 characteristic;

F) selecting a group from the plurality of groups to display dynamic-content on the plurality of content-display units having the group characteristic.

25 A method for dispensing machine advertising in accordance with an

alternate embodiment of the present invention may include some or all of the following steps:

- A) providing a dispensing machine, wherein the dispensing machine comprises:
 - 5 at least one server;
 - at least one display controller, wherein the display controller is adapted to receive, store, and display dynamic-content from the server; and
 - at least one content display unit in communication with the display
 - 10 controller, wherein the content display unit visually displays the information from the dynamic-content;
- B) receiving information from a source;
- C) communicating the information as dynamic-content from the server to the display controller;
- 15 D) displaying the information on the content display unit. In step D, the displaying step may be divided into a plurality of time segments, allowing the step of: displaying a first information display during a first time segment and displaying a second information display during a second time segment.
- 20 E) segmenting a plurality of content display units into a plurality of groups, each group from the plurality of groups identified with a - characteristic;
- F) selecting a group from the plurality of groups to display dynamic-content on the plurality of content display units having the group
- 25 characteristic.

In step A, a plurality of servers may be provided, and the method may further comprise:

- 5 G) selecting a hierarchy; the hierarchy defining a prioritization of the plurality of servers to at least one of the display controllers such that the display controller selects one server from the plurality of servers.

BRIEF DESCRIPTION OF THE DRAWINGS

10 The novel features of the invention are set forth with particularity in the appended claims. The invention itself, however, both as to organization and methods of operation, together with further objects and advantages thereof, may best be understood by reference to the following description, taken in conjunction with the accompanying drawings in which:

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Figure 1 is a block diagram of a dispensing machine system in accordance with the present invention;

Figure 2 is a block diagram of a dispensing machine system including a
20 plurality of content-display units in accordance with the present invention;

Figure 3 is a block diagram of a dispensing machine device in accordance with the present invention;

25 Figure 4 is a block diagram of a dispensing machine system with a

hierarchical control in accordance with the present invention;

Figure 5 is a flow chart illustrating a method of dispensing machine information display in accordance with the present invention;

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Figure 6 illustrates a method in accordance with the present invention where a client selects content-display units for their information via the Internet;

10 Figure 7 illustrates a plurality of dispensing machines in accordance with the present invention;

Figure 8 illustrates a plurality of dispensing machines in accordance with an alternate embodiment of the present invention; and

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Figure 9 illustrates a plurality of dispensing machines in accordance with another embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

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The present invention relates, in general, to dispensing machines and, more particularly, to dispensing machines capable of dynamic-content presentation and methods of using dynamic-content presentation on dispensing machines.

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~~Content display units~~ are herein defined to include any visual display or portion of display on a dispensing machine capable of displaying information from dynamic-content such as, for example, video billboards, GYRICON, E-Ink, computer monitors, and other forms of electronic paper.

- 5 Content display units are divided into two types, active content-display units and passive content-display units. Active content-display units are displays that only display dynamic-content when they are actively being addressed or written on, such as, for example, computer monitors, movie-theater screens, and L.E.D. displays. Passive content-display units are
- 10 displays that, when not being actively written to or addressed, retain a viewable image such as, for example, GYRICON and E-INK.

A suitable material for a passive content-display media would be, for example, SMARTPAPER (Trademark of Gyricon Inc. Palo Alto,

15 California) technology using an array of tiny (100 micron diameter or smaller) solid beads with one hemisphere of each bead one color (e.g. white) and the other a different color (e.g. black). These beads are embedded in a flexible plastic sheet in small cavities surrounded by a liquid. Each bead carries an electrical charge. When an external electric

20 field is applied the bead rotates or gyrates. Adhesive forces between each bead and cavity wall require an electrical threshold be exceeded before it will rotate. This makes an image electrically "printed" onto the material stable and unchanging until "erased" by another transmission. Electrical signals can be applied to the SMARTPAPER sheets through fixed surface

25 electrodes or a moving stylus. A networked programmable sign will run for

~~Up to 2 Years on 3 AAA Batteries~~, with the power almost completely used by the communications and processing systems. SMARTPAPER itself requires just a capacitance or voltage (about 100 volts), not a power current. Unlike other types of electronic displays, SMARTPAPER has a wide viewing angle identical to traditional printed signs. This allows SMARTPAPER to be viewed like paper, from all angles and without added backlighting. Images can currently be displayed on SMARTPAPER with resolution over 100 dpi. Applying electrical fields to the display surface changes the image on SMARTPAPER. For purposes herein, GYRICON and SMARTPAPER are synonymous.

Dynamic-content is herein defined as information or data to be visually displayed that is updateable or changeable by electronic control such as, for example, pixel data for an image, analog beam modulation information for a cathode ray tube (CRT), streaming video, and ASCII or other codes.

Display-time is herein defined as the actual display of dynamic-content on a content-display unit.

Figure 1 is a block diagram of a dispensing machine system 20 in accordance with the present invention. Dispensing machine system 20 comprises a server 40 and a display controller 30 adapted to receive, store, and display a dynamic-content 70 from the server 40. Display controller 30 includes at least one content-display unit 25, a receiver 36, storage means 33, and may include a timing means 31. Dynamic-content

70 is transmitted from server 40 on a transmission path 45, through transmission media 50, and on receiving path 55 to display controller 30. Transmission path 45, transmission media 50, and receiving path 55 may be any one or combination of data transfer such as, for example, telephone wire, internet link, radio communication, cellular telephony, microwave link, local area network, and satellite broadcast. Receiver 36 receives the dynamic-content 70 where it is either stored in storage means 33, or displayed on content-display unit 25. Storage means 33 may be, for example, dynamic RAM in a computer, videotape, display memory, and computer hard disk.

The content-display unit 25 visually displays the information from the dynamic-content 70. The timing means 31 may be, for example, a clock, a Global Positioning System (GPS), timing trigger, or other means of detecting a timing event. The display controller 30 alters the visual display of the content-display unit 25 as a function of the time or position from the timing means 31. For example, if content-display unit 25 is located near a restaurant visible to customers, it may be desirable to display a first message on content-display unit 25 during lunch hours, and to display a second different message on content-display unit 25 at other times.

Figure 2 is a block diagram of dispensing machine system 20 including a plurality of content-display units 25 in accordance with the present invention. The dispensing machine system 20 may also comprise a plurality of display controllers 26, 27, 28, 29 in communication with a

Plurality of content-display units 25, each one from the plurality of display controllers 26, 27, 28, 29 having a type identifier, wherein each of the display controllers 26, 27, 28, 29 selects dynamic-content 70 for display on its content-display unit 25 as a function of its type identifier. For example, display controller 26 may have a type identifier of highway rest-area dispensing machine, display controller 27 may have a type identifier of shopping mall dispensing machine, display controller 28 may have a type identifier of the first machine in a series of dispensing machines, and display controller 29 may have a type identifier of a dispensing machine in Butler County in the state of Ohio in the United States of America.

Figure 3 is a block diagram of a content-display unit 25 in accordance with the present invention. Content-display unit 25 may display dynamic-content 70 that changes over time such as, for example, video, image morphing, sequential messages, or discrete time periods of static image. Figure 3 illustrates an example of discrete time periods of static image. An image 81 may be displayed on content-display unit 25 during the overnight period of a day, an image 82 may be displayed on content-display unit 25 during the morning period of a day, an image 83 may be displayed on content-display unit 25 during the afternoon period of a day, and an image 84 may be displayed on content-display unit 25 during the evening period of a day,

Figure 4 is a block diagram of a dispensing machine system 20 with a hierarchical control in accordance with the present invention. The display

Controller 30 may be adapted to receive, store, and display dynamic-content 70 from a plurality of servers illustrated in Figure 4 as server 40, a second server 41, and a third server 42. Display controller 30 comprises a hierarchical control scheme, the hierarchical control scheme adapted to
5 select dynamic-content 70 from one server of the plurality of servers for display on the content-display unit 25. The hierarchical control scheme may be prioritized or heuristic. For example, server 40 may be a national host computer at a highest priority, second server 41 may be a regional host computer at a middle priority, and third server 42 may be a local host
10 computer at a low priority. Since any or all servers may be transmitting dynamic-content 70 at any time or simultaneously, the hierarchical control scheme will select which dynamic-content 70 is displayed on content-display unit 25 at any time.

15 Figure 5 is a flow chart illustrating a method 21 of dispensing machine advertising in accordance with the present invention. The method 21 for dispensing machine advertising illustrated in Figure 5 includes the following steps:

A) providing a dispensing machine, wherein the dispensing machine
20 comprises:

at least one display controller, wherein the display controller is adapted to receive, store, and display dynamic-content; and
at least one content-display unit in communication with the display controller, wherein the content-display unit visually displays the
25 information from the dynamic-content;(illustrated as step 61)

- B) ~~receiving information~~ receiving information from a source; (illustrated as step 62).
- C) displaying the information on the content-display unit. (illustrated as step 64)
- 5 In step C, the displaying step may be divided into a plurality of time segments, allowing the step of:
- D) displaying a first information display during a first time segment and displaying a second information display during a second time segment. (illustrated as step 65)
- 10 E) segmenting a plurality of content-display units into a plurality of groups, each group from the plurality of groups identified with a characteristic; (illustrated as step 66)
- F) selecting a group from the plurality of groups to display dynamic-content on the plurality of content-display units having the group
- 15 characteristic. (illustrated as step 67)

Further, one or more servers may be provided, each in communication with one or more content-display units. A plurality of servers may be provided, and the method may further comprise:

- 20 G) selecting a hierarchy, the hierarchy defining a prioritization of the plurality of servers to at least one of the display controllers such that the display controller selects one server from the plurality of servers. (illustrated as step 68)

25 Illustrations of method steps, such as, for example, the steps

illustrated in Figure 5 show steps sequentially and in a particular order.

There is no need to perform the steps in the order illustrated. Deviating from the illustrated order for some or all of the steps is contemplated by the inventor, and does not depart from the scope of the present invention.

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Figure 6 illustrates a method in accordance with the present invention where a client selects content-display units 25 for their information display via the Internet. An order 607 to display dynamic-content on one or more content-display units 25 is placed by a purchaser at a client system 601 and received by a server system 602. The server system 602 receives purchaser information including identification of the purchaser, payment information, and dynamic-content location information from the client system 601. The server system then assigns a client identifier 603 to the client system 601 and associates the assigned client identifier 603 with the received purchaser information. The server system 602 sends to the client system 601 the assigned client identifier 603 and an HTML document 604 identifying the content-display units 25 and including an order button 605. The client system 601 receives and stores the assigned client identifier 603 and receives and displays the HTML document 604. In response to the selection of the order button 605, the client system 601 sends to the server system 602 a request 606 to purchase display-time on the content-display units 25. The server system 602 receives the request 606 and combines the purchaser information associated with the client identifier 603 of the client system 601 to generate the order 607 to display the dynamic-content on the content-

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display units 25 in accordance with the billing information, whereby the purchaser orders the display-time by selection of the order button 605.

Server system 602 sends dynamic content 608 to content-display unit 25 for display-time according to order 607. Content-display units 25 such as, for example, a roadside dispensing machine, may have a camera 704 accessible via the Internet for viewing the dispensing machine and its surroundings, to verify display-time or for service and quality control purposes.

Figure 7 illustrates a plurality of dispensing machines 708 in accordance with the present invention. A storefront display 700 includes a first dispensing machine 701, a second dispensing machine 702, a third dispensing machine 703, a fourth dispensing machine 704, a fifth dispensing machine 705 and a sixth dispensing machine 706 positioned at a storefront 708 having a door 707. Each of dispensing machines 701 through 706 has a display 709 through 714 respectively.

First dispensing machine 701 may have a type indicator of first-machine-of-six, second dispensing machine may have a type indicator of second-machine-of-six, through sixth dispensing machine with a type indicator of sixth-machine-of-six. Dynamic content may be created to span all six displays, creating a larger-scale presentation for storefront 708. Alternately, dynamic content may span 2 or more dispensing machines, and may move across storefront 708 over time, traveling from display 709 to display 714 over time.

Figure 8 illustrates a plurality of dispensing machines in accordance with an alternate embodiment of the present invention. First dispensing machine 701 through sixth dispensing machine 706 have a first image portion 801 through a sixth image portion 806 respectively, illustrating that a plurality of dispensing machines may perform as a single display or an advertising billboard 800. It is contemplated by the inventor that the dynamic content on the advertising billboard 800 may be totally unrelated to the contents of the dispensing machines, and may be used for emergency messages or other public service applications as well as commercial uses.

Figure 9 illustrates a plurality of dispensing machines in accordance with another embodiment of the present invention. A geographical area 900 is segmented into a first segment 910 and a second segment 920. Dispensing machines 901 in the first segment 910 may have a type indicator of first segment 910, as well as one or more other type indicators. Likewise, dispensing machines 902 in second segment 920 may have a type indicator of second segment 920, as well as one or more other type indicators. Dispensing machines 901 may differ from dispensing machines 902 only by their geographical location type indicators, and have all other type indicators equal, and through a hierarchical control structure, alter their displays based on location.

Each feature disclosed in this specification (including any accompanying claims, abstract, and drawings), may be replaced by alternative features having the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each
5 feature disclosed is one example only of a generic series of equivalent or similar features. In addition, it should be understood that every structure described above has a function and such structure can be referred to as a means for performing that function.

10 While preferred embodiments of the present invention have been shown and described herein, it will be obvious to those skilled in the art that such embodiments are provided by way of example only. Numerous variations, changes, and substitutions will be apparent to those skilled in the art without departing from the invention. Accordingly, it is intended that
15 the invention be limited only by the spirit and scope of the appended claims.

CLAIMS

1. A dispensing machine device comprising:
a server in communication with a network, wherein the server stores dynamic-content; and
a plurality of dispensing machines in communication with the server, wherein each dispensing machine of the plurality of dispensing machines is in communication with the server via the network, wherein each dispensing machine of the plurality of dispensing machines comprises:
 - (i) a display controller, wherein said display controller is adapted to receive and display dynamic-content from said server via the network,
 - (ii) at least one content display unit in communication with said display controller, wherein said at least one content display unit visually displays the information from said dynamic-content, and
 - (iii) one or more products, wherein each of the dispensing machines is operable to dispense its respective one or more products, wherein the dynamic-content comprises a first content that is related to at least one of the one or more products and a second content that is unrelated to any of the one or more products, wherein the display controller is operable to selectively display each of the first content or the second content on the content display unit.
2. The dispensing machine device of claim 1, wherein said display controller comprises a timing means, said display controller altering the visual-display of said at least one content display unit as a function of the time from said timing means.
3. The dispensing machine device of claim 1, wherein said display controller is adapted to receive, store, and display dynamic-content from a plurality of servers, wherein said display controller comprises a hierarchical control scheme, said hierarchical control scheme adapted to select dynamic-content from one server of said plurality of servers for display on said content display unit.

4. The dispensing machine device of claim 2 comprising a plurality of display controllers in communication with a plurality of content display units, each display controller from said plurality of display controllers having a type identifier, wherein each said display controller selects dynamic-content for display on its content display unit as a function of said type identifier.

5. A dispensing machine system comprising:

a plurality of dispensing machines in communication with a network, wherein each dispensing machine of the plurality of dispensing machines comprises one or more products, wherein each dispensing machine of the plurality of dispensing machines is operable to dispense its respective one or more products;

a plurality of display controllers, wherein each display controller of said plurality of display controllers is adapted to receive and display dynamic-content from a source;

a plurality of content display units in communication with said plurality of display controllers, wherein each content display unit of the plurality of content display units is operable to visually display the information from said dynamic-content, wherein each dispensing machine of the plurality of dispensing machines comprises one or more content display units of the plurality of content display units; and

a plurality of type identifiers, wherein each dispensing machine of the plurality of dispensing machines is associated with one or more type identifiers of the plurality of type identifiers, wherein each content display unit is configured to display information from said dynamic-content based at least in part on the one or more type identifier associated with the corresponding dispensing machine.

6. The dispensing machine system of claim 5, wherein each display controller of the plurality of display controllers is adapted to receive, store, and display dynamic-content from a plurality of sources, wherein each display controller of the

plurality of display controllers comprises a hierarchical control scheme, said hierarchical control scheme adapted to select dynamic-content from one source of said plurality of sources for display on at least one content display unit of the plurality of content display units.

7. The dispensing machine system of claim 5, wherein said display controller comprises a timing means; said display controller altering the visual display of said at least one passive content display unit as a function of the time from said timing means.

8. The dispensing machine device of claim 5, wherein each display controller of the plurality of display controllers comprises a timing means, each display controller of the plurality of display controllers altering the visual display of said at least one passive content display unit as a function of the time from said timing means.

9. A method for dispensing machine advertising comprising the steps of:

A) providing a plurality of dispensing machines, wherein each dispensing machine of the plurality of dispensing machines is positioned at a particular location, wherein each dispensing machine of the plurality of dispensing machines comprises:

(i) one or more products, wherein each dispensing machine of the plurality of dispensing machines is operable to dispense its respective one or more products, and

(ii) a content-display unit;

B) providing a plurality of display controllers, wherein each display controller of the plurality of display controllers is adapted to receive, store, and provide dynamic-content for a corresponding content display unit of one or more of the plurality of dispensing machines;

C) selecting content for display on the content-display unit of one of the dispensing machines of the plurality of dispensing machines, wherein the selected content is selected at least in part based on the location of the one of the dispensing machines;

- D) receiving the selected content from a source; and
 - E) displaying the received content on said content-display unit of the one of the dispensing machines.
10. The method of claim 9 further comprising the steps of:
- F) providing a clock indicating a time; and
 - G) changing the dynamic-content-displayed on a content-display unit of a dispensing machine of the plurality of dispensing machines from a first dynamic-content to a second dynamic-content at a first time.
11. The method of claim 9 further comprising the steps of:
- F) providing a plurality of servers; and
 - G) providing a hierarchy to at least one said display controller, said hierarchy used to select one server from said plurality of servers for dynamic-content to display by said display controller.
12. The dispensing machine system of claim 5, wherein the content display units of the plurality of content display units are passive.
13. The dispensing machine system of claim 5, wherein the type identifier represents a geographical location.
14. The dispensing machine system of claim 5, wherein at least a portion of the plurality of dispensing machines are located adjacent to one another, wherein the plurality of display controllers, the dynamic-content, and the content display units of the adjacent dispensing machines are configured to provide a single collective display among the content display units of the adjacent dispensing machines.
15. The dispensing machine system of claim 6, wherein the hierarchical control scheme comprises a heuristic hierarchical control scheme.

16. The method of claim 9, wherein the selected content is received from the source via a network.

17. The method of claim 9, wherein each dispensing machine of the plurality of dispensing machines comprises one or more products, wherein each dispensing machine of the plurality of dispensing machines is operable to dispense its one or more products, wherein the selected content is unrelated to the one or more products of the one of the dispensing machines.

18. The method of claim 17, wherein the selected content comprises advertising content.

19. The method of claim 9, wherein the source is remote from the plurality of dispensing machines.

20. The method of claim 9, wherein the source comprises a server.

21. The dispensing machine system of claim 1, wherein at least a portion of the plurality of dispensing machines are located adjacent to one another, wherein the plurality of display controllers, the dynamic-content, and the content display units of the adjacent dispensing machines are configured to provide a single collective display among the content display units of the adjacent dispensing machines.

22. The dispensing machine system of claim 9, wherein at least a portion of the plurality of dispensing machines are located adjacent to one another, wherein the plurality of display controllers, the dynamic-content, and the content display units of the adjacent dispensing machines are configured to provide a single collective display among the content display units of the adjacent dispensing machines.