AUTOMATED ORDER HANDLING AND DELIVERY SYSTEM

TECHNICAL FIELD

[0001] The present subject matter relates, in general, to the field of automated delivery and, in particular, to a system for automated delivery of food items.

BACKGROUND

[0002] Catering and restauranteering are highly demanding fields of operation, where on-demand preparation of hygienic and fresh food items and their timely and reliable delivery are important factors to delight customers. In current times, customers are provided with a variety of cuisines to choose from, and dine-in facilities to treat themselves and their loved ones. As the demand for restaurants and catering facilities increase, high degrees of quality, efficiency, hygiene, and cost effectiveness should be maintained and possibly increased. Fast food or quick service restaurants strive to effectively meet variable customer demand, while at the same time provide hygienic, quality, consistent, and cost effective food and beverage items.

SUMMARY

[0003] This summary is provided to introduce concepts related to order handling and delivery, and the concepts are further described below in the detailed description. This summary is neither intended to identify essential features of the claimed subject matter nor is it intended for use in determining or limiting the scope of the claimed subject matter.

[0004] In one implementation, the present subject matter relates to a dispenser for storing, preserving, and delivering a plurality of food items. The dispenser may include a) a loading bay for placing the food items in the dispenser; b) a plurality of chambers for storing and dispensing each of the food items; c) an automated scanning unit for scanning the food items placed in the chambers to generate a scan map comprising locations and time of preparation of each of the plurality of food items, the time of preparation of a food item being depicted by a time tag, an earlier time tag representing an earlier time of preparation; d) an automated dispensing unit having a drive unit for dispensing at east one food item from among the plurality of food items, the dispensing of food items being done in a decreasing order of the time tags of the food items; e) a piercing apparatus; f) a climate control means; and g) a controller for controlling the climate control means to control climate conditions within the dispenser for preservation of the food items, for actuating the automated scanning unit based on at least one of

an order parameter of at least one selected food item and a completion of the placing the food items in the dispenser, where the order parameter includes at least one of: indicative of the at least one selected food item, and a temperature preference of the at least one selected food item. Further, the controller identifies the at least one selected from the plurality of food items based on the scan map and the order parameter. Furthermore, the controller operates the piercing apparatus to automatically pierce a lid of the identified food item prior to heating based on the order parameter, and operates automated dispensing unit to dispense the identified food items.

[0004a] In another implementation, the present subject matter relates a delivery control unit for controlling an automated order handling and delivery system. The delivery control unit comprising a processor, a delivery module coupled to the processor, and a temperature control module coupled to the processor. The processor controls a delivery apparatus for delivering at least one food item to a delivery station, where the at least one food item is obtained by the delivery apparatus based on a scan map comprising locations and time of preparation of each of a plurality of food items. The time of preparation of a food item being depicted by a time tag, an earlier time tag representing an earlier time of preparation. Further, the processor dispenses the at least one food item based on a decreasing order of the time tag of the at least one food item. The processor passes the at least one food item from a dispenser to a heating apparatus if an order parameter of a corresponding food item includes a temperature preference to heat the corresponding food item, where a container of the corresponding food item is pierced prior to heating. The processor bypasses the heating apparatus and deliver the at least one food item from the dispenser to the delivery station if the order parameter of the corresponding food item includes the temperature preference to not to heat the corresponding food item. Further, an alert notification on at least one display apparatus is triggered by the processor based on an arrival of the at least one food item at the delivery station, and a customer is notified by the alert notification to pick up the at least one food item. The temperature control module actuates the heating apparatus based on the order parameter, where the temperature control module maintains the heating apparatus in switch off mode, while the at least one food item passes through, if the order parameter includes the temperature preference to not to heat the at least one food item.

[0004b] In another implementation, the present subject matter relates to an order handling and delivery system for automated ordering and delivering of at least one food item. The system comprises an order handling unit, one or more dispensers, a delivery apparatus, a heating

apparatus, and a delivery station. The order handling unit receives at least one food item selection. The at least one food item selection includes information relating to the at least one food item and information relating to a temperature preference of the at least one food item. The order handling unit generates at least one order parameter based on the at least one food item selection. Further, each dispenser comprising an automated scanning unit, an automated dispensing unit, a piercing apparatus, a climate control means and a controller. The automated scanning unit scans the plurality of food items in plurality of chambers of the dispenser to generate a scan map comprising locations and time of preparation of each of the plurality of food items. The time of preparation of a food item being depicted by a time tag, and an earlier time tag representing an earlier time of preparation. The automated dispensing unit includes a drive unit to dispense the at least one food item based on a decreasing order of the time tag of the at least one food item. The controller controls a climate control means to control climate conditions within the dispenser for preservation of the plurality of food items and actuates the scanning unit based on at least one of: the at least one order parameter, and completion of the placing the plurality of food items in the dispenser. The at least one order parameter includes at least one of: indicative of the at least one food item, and a temperature preference of the at least one food item.

[0004c] Further, the controller identifies the at least one food item from the plurality of food items based on the scan map and the at least one order parameter, operates the piercing apparatus to automatically pierce a lid of a container of the identified food item prior to heating based on the at least one order parameter, and operates the dispensing unit to dispense the identified food item. The delivery apparatus automatically conveys the dispensed at least one food item to a delivery station and selectively moves the at least one food item through a heating apparatus. The heating apparatus heats the at least one food item based on the at least one order parameter. Further, the delivery receives the delivered food items.

Claims:

1. A dispenser (102, 202, 302) for storing, preserving, and delivering a plurality of food items, the dispenser (102, 202, 302) comprising:

a loading bay (104, 306) for placing the plurality of food items in the dispenser (102, 202, 302);

a plurality of chambers (304) for storing each of the plurality of food items;

an automated scanning unit (106, 308) for scanning the plurality of food items in the plurality of chambers (304) to generate a scan map comprising locations and time of preparation of each of the plurality of food items, the time of preparation of a food item being depicted by a time tag, an earlier time tag representing an earlier time of preparation;

an automated dispensing unit (108, 310) having a drive unit for dispensing at least one food item from among the plurality of food items, the dispensing of food items being done in a decreasing order of the time tags of the food items;

a piercing apparatus;

a climate control means; and

a controller (112) for:

controlling the climate control means to control climate conditions within the dispenser (102, 202, 302) for preservation of the plurality of food items;

actuating the automated scanning unit (106, 308) based on at least one of: an order parameter of at least one selected food item and completion of the placing the plurality of food items in the dispenser (102, 202, 302), wherein the order parameter includes at least one of: indicative of the at least one selected food item, and a temperature preference of the at least one selected food item;

identifying the at least one selected food item from the plurality of food items based on the scan map and the order parameter;

operating the piercing apparatus to automatically pierce a lid of a container of the identified food item prior to heating based on the order parameter; and

operating the automated dispensing unit (108, 310) to dispense the identified food item.

2. The dispenser (102, 202, 302) as claimed in claim 1, wherein the plurality of chambers (304) are formed as one of a shelf structure and a honeycomb structure with integrated climate control means.

3. The dispenser (102, 202, 302) as claimed in claim 1, wherein the climate control means is coupled to the controller (112), and the climate control means is one of a Variable Absorption Refrigeration (VAR) system and a hot air and steam system.

4. The dispenser (102, 202, 302) as claimed in claim 1, wherein each of the plurality of food items is tagged with a barcode including the time tag of preparation indicative of a time of preparation and storage of each of the plurality of food items for effective shelf life control of the plurality of food items.

5. The dispenser (102, 202, 302) as claimed in claim 1, wherein the automated scanning unit (106, 308) comprises a servo motor arm for scanning the plurality of food items stored in the dispenser (102, 202, 302), and wherein the servo motor arm is communicatively coupled with a barcode reader.

6. The dispenser (102, 202, 302) as claimed in claim 1, wherein the controller (112) actuates the automated scanning unit (106, 308) for identifying an earliest tagged food item for dispensing based on the scan map.

7. The dispenser (102, 202, 302) as claimed in claim 1, wherein the automated dispensing unit (108, 310) comprises an electromechanical arm having the piercing apparatus and the drive unit.

8. The dispenser (102, 202, 302) as claimed in claim 1, wherein the drive unit includes one of a servo motor, a pneumatic actuator, and an electric actuator.

9. The dispenser (102, 202, 302) as claimed in claim 1, wherein the drive unit is functionally coupled to at least one splined shaft and a ball screw.

10. The dispenser (102, 202, 302) as claimed in claim 1, wherein the controller (112) provides for tallying stocks in the dispenser (102, 202, 302) by keeping track of the plurality of food items stored in the dispenser (102, 202, 302) and the dispensed food items.

11. The dispenser (102, 202, 302) as claimed in claim 1 or 10, wherein the controller (112) further provides for issuing a replenishment order to at least one kitchen for supplying out of stock food items.

12. The dispenser (102, 202, 302) as claimed in claim 1, wherein the controller (112) provides an interface for receiving digital signals, and wherein the digital signals includes information related to customer order parameters.

13. A delivery control unit (128) for controlling an automated order handling and delivery system (100, 200), the delivery control unit (128) comprising:

a processor (130); and

a delivery module (142), coupled to the processor (130), to:

control a delivery apparatus (110, 206) for delivering at least one food item to a delivery station (116, 208), wherein the at least one food item is obtained by the delivery apparatus (110, 206) based on a scan map comprising locations and time of preparation of each of a plurality of food items, the time of preparation of a food item being depicted by a time tag, an earlier time tag representing an earlier time of preparation, and to allow to dispense the at least one food item based on a decreasing order of the time tag of the at least one food item;

perform one of:

pass the at least one food item from a dispenser to a heating apparatus (114, 210) if an order parameter of a corresponding food item includes a temperature preference to heat the corresponding food item, wherein a container of the corresponding food item is pierced prior to heating; and

bypass the heating apparatus (114, 210) and deliver the at least one food item from the dispenser to the delivery station (116, 208) if the order parameter of the corresponding food item includes the temperature preference to not to heat the corresponding food item; and

trigger an alert notification on at least one display apparatus (118) based on an arrival of the at least one food item at the delivery station (116, 208),

wherein a customer is notified by the alert notification to pick up the at least one food item; and

a temperature control module (144) coupled to the processor (130) to actuate the heating apparatus (114, 210) based on the order parameter, wherein the temperature control module maintains the heating apparatus in switch off mode, while the at least one food item passes through, if the order parameter includes the temperature preference to not to heat the at least one food item.

14. The delivery control unit (128) as claimed in claim 13 further comprising a retrieval module (140) coupled to the processor (130) to receive at least one order parameter from an order handling unit (124), wherein the at least one order parameter is indicative of the at least one food item and a corresponding temperature preference of each of the at least one food items.

15. The delivery control unit (128) as claimed in claim 13, wherein the alert notification includes a token number provided on an order receipt.

16. The delivery control unit (128) as claimed in claim 13, wherein the delivery module (142) further alerts a member of staff if the delivered at least one food item is not picked up within a predetermined time period.

17. An order handling and delivery system (100, 200) for automated ordering and delivering of at least one food item comprising:

an order handling unit (124) for receiving at least one food item selection, wherein the at least one food item selection includes information relating to the at least one food item and information relating to a temperature preference of the at least one food item, and wherein the order handling unit (124) generates at least one order parameter based on the at least one food item selection;

one or more dispensers (102, 202, 302), for storing, preserving, and dispensing the at least one food item, wherein each dispenser (102, 202, 302) comprising:

an automated scanning unit (106, 308) to scan the plurality of food items in plurality of chambers (304) of each dispenser (102, 202, 302) to generate a scan map comprising locations and time of preparation of each of the plurality of food items, the time of preparation of a food item being depicted by a time tag, an earlier time tag representing an earlier time of preparation;

an automated dispensing unit (108, 310) having a drive unit to dispense the at least one food item based on a decreasing order of the time tag of the at least one food item;

a piercing apparatus;

a climate control means; and

a controller to:

control a climate control means to control climate conditions within the dispenser (102, 202, 302) for preservation of the plurality of food items;

actuate the automated scanning unit (106, 308) based on at least one of: the at least one order parameter, and completion of the placing the plurality of food items in the dispenser (102, 202, 302), wherein the at least one order parameter includes at least one of: indicative of the at least one food item, and a temperature preference of the at least one food item;

identify the at least one food item from the plurality of food items based on the scan map and the at least one order parameter;

operate the piercing apparatus to automatically pierce a lid of a container of the identified food item prior to heating based on the at least one order parameter; and

operate the automated dispensing unit (108, 310) to dispense the identified food item;

a delivery apparatus (110, 206) for:

automatically conveying the dispensed at least one food item to a delivery station (110, 206); and

selectively moving the at least one food item through a heating apparatus;

the heating apparatus (114, 210) for heating the at least one food item based on the at least one order parameter; and

the delivery station (116, 208) for receiving delivered food items.

18. The order handling and delivery system (100, 200) as claimed in claim 17, wherein the order handling unit (124) receives the at least one food item selection from one of

an ordering kiosk (120, 204) and at least one user device (122), wherein the at least one user device (122) is one of a smart phone (122-1), a laptop (122-2), a netbook, a tablet, and a personal computer.

19. The order handling and delivery system (100, 200) as claimed in claim 17, wherein the order handling unit (124) is disposed at one of an on-site location and a remote location.

20. The order handling and delivery system (100, 200) as claimed in claim 18 or 19, wherein the ordering kiosk (120, 204) comprises a computing system coupled with a display interface, and wherein the ordering kiosk (120, 204):

provides a customer with a plurality of ordering options by which the customer makes the selection of the at least one food item; and

transmits the selection to the order handling unit (124).

21. The order handling and delivery system (100, 200) as claimed in claim 17, or 18, or 20, wherein the ordering kiosk (120, 204) generates an order token, containing an order number, upon payment by the customer for the at least one food item.

22. The order handling and delivery system (100, 200) as claimed in claim 17, wherein the delivery apparatus (110, 206) comprises at least one of a conveyor belt and a robotic arm.

23. The order handling and delivery system (100, 200) as claimed in claim 22, wherein the delivery apparatus (110, 206) is driven by a drive means.

24. The order handling and delivery system (100, 200) as claimed in claim 23, wherein the drive means includes one of a servo motor, a pneumatic actuator, and an electric actuator.

25. The order handling and delivery system (100, 200) as claimed in claim 23, wherein the drive unit is functionally coupled to at least one splined shaft, a ball screw, and a gear mechanism.

26. The order handling and delivery system (100, 200) as claimed in claim 17, wherein the delivery apparatus (110, 206) moves the at least one food item to the heating apparatus (114, 210) for heating the at least one food item based on the temperature preference.

27. The order handling and delivery system (100, 200) as claimed in claim 17, wherein the order handling and delivery system (100, 200) is implemented at one of a quick service restaurant, a takeout restaurant, a home delivery restaurant, and a self service restaurant.

28. The order handling and delivery system (100, 200) as claimed in claim 27, wherein one or more kitchens, including kitchens of popular restaurants, are located away from the quick service restaurant, the takeout restaurant, the home delivery restaurant, and the self service restaurant.

29. The order handling and delivery system (100, 200) as claimed in claim 28, wherein the one or more kitchens supply the at least one food item to the one or more dispensers (102, 202, 302) located in the quick service restaurant, the takeout restaurant, the home delivery restaurant, and the self service restaurant,

30. The order handling and delivery system (100, 200) as claimed in claim 27, wherein a kitchen is co-located with the quick service restaurant, the takeout restaurant, home delivery restaurant, or the self service restaurant.

31. The order handling and delivery system (100, 200) as claimed in claim 17, wherein the delivery apparatus (110, 206) moves the at least one food item to a delivery personnel who subsequently delivers the at least one food item to a delivery address.