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(54) **ADVANCED FOOD AND/OR DRINK ORGANIZATION AND/OR HANDLING SYSTEM**

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See application file for complete search history.

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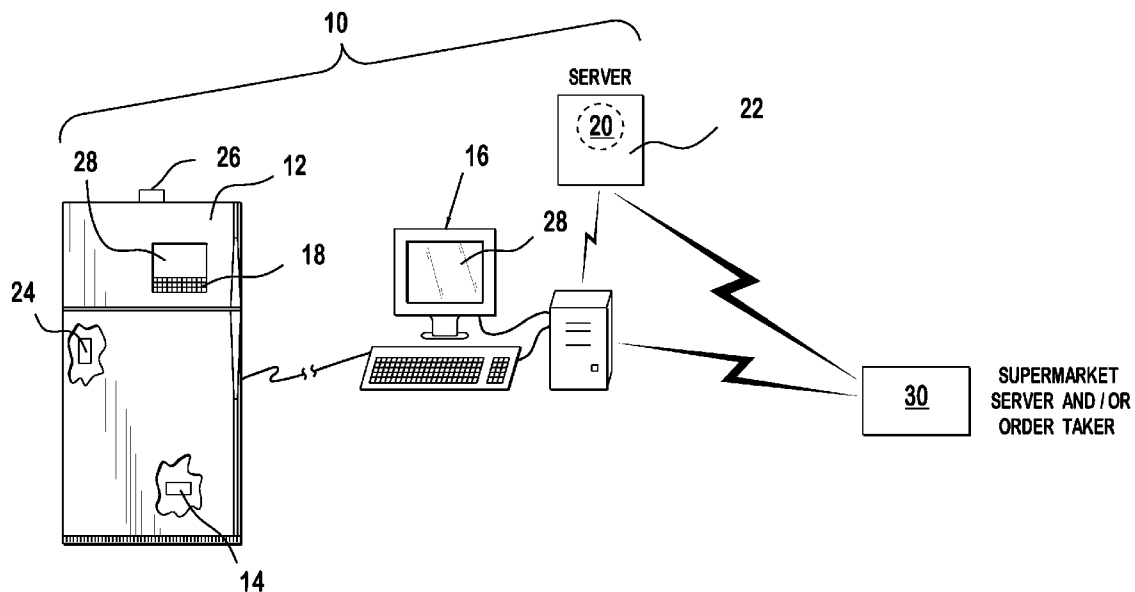
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(57) **ABSTRACT**

An advanced food and/or drink organization and/or handling system that greatly facilitates food management and handling to help streamline household operations as relate to foods and related functions and events.

29 Claims, 1 Drawing Sheet



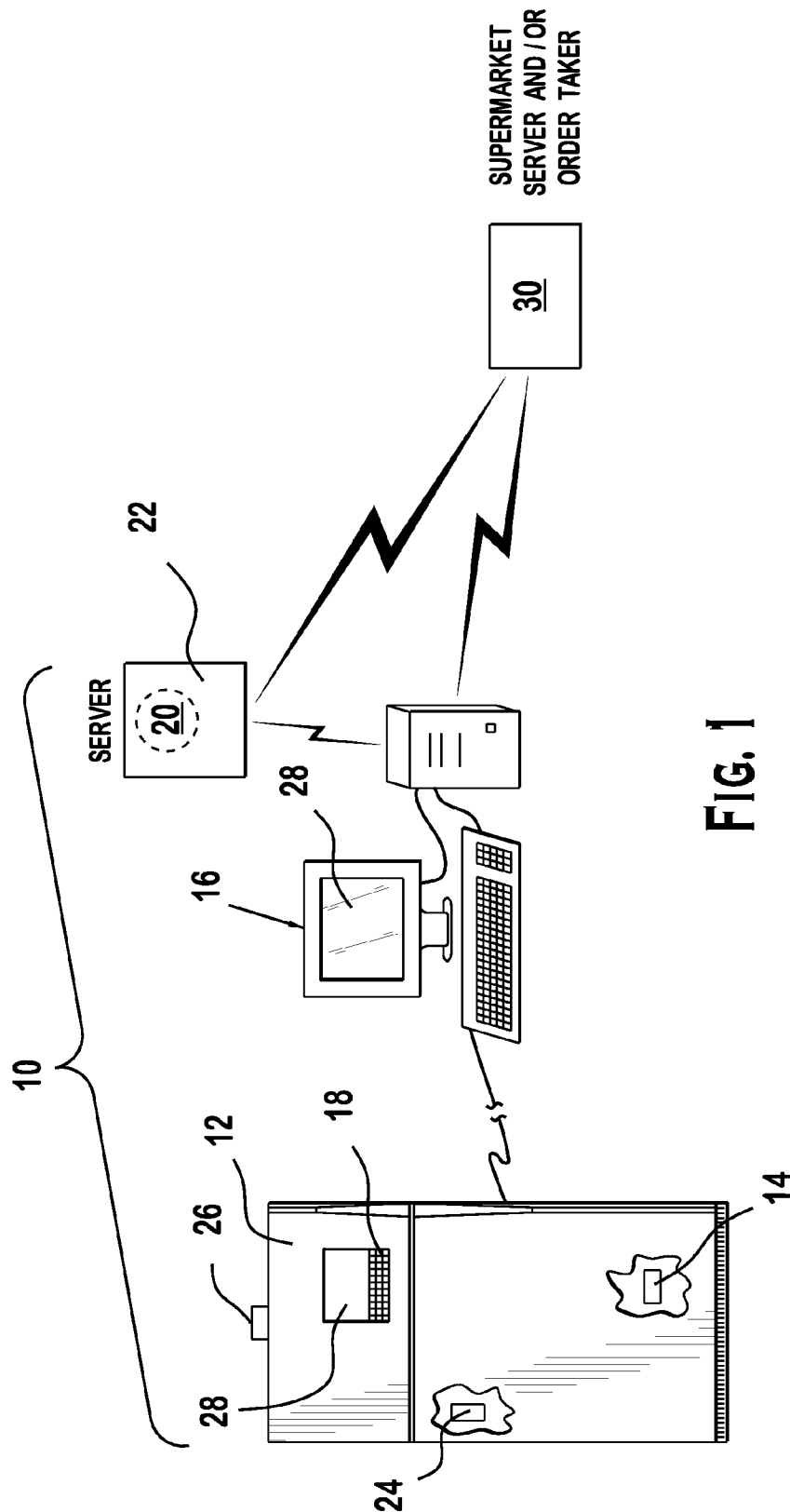


FIG. 1

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ADVANCED FOOD AND/OR DRINK ORGANIZATION AND/OR HANDLING SYSTEM

CROSS REFERENCE TO RELATED APPLICATION

This application claims priority to and benefit of U.S. Provisional Patent Application 60/515,054, filed Oct. 27, 2003, invented by Thu H. Nguyen, and entitled "Advanced Food and/or Drink Organization and/or Handling System", which is hereby incorporated by reference herein as if fully set forth in its entirety.

BACKGROUND

The present invention relates generally to food handling and, more specifically, to an advanced food management system and method. Conventional refrigerators are used to store food and drink items which often spoil and remain unnoticed and/or unused due to the number of items packed in the refrigerator. Ensuring that items in a refrigerator are used in a timely and creative fashion requires manually going through a refrigerator and examining each item for freshness.

It would be advantageous to provide an advanced food management system and method that overcomes many of the difficulties encountered in conventional food storage.

SUMMARY

Briefly speaking, one embodiment of the present invention is directed to a method of handling and/or organizing food and/or drink. The method includes the steps of: providing a refrigerator and an associated processor in communication with a data entry device; placing an item of food and/or drink in the refrigerator; communicating data corresponding to the item via a bar code reader in communication with the associated processor; automatically monitoring an expected period of usefulness for the item by the associated processor; entering data into the associated processor regarding an upcoming food shopping trip and an expected date of a subsequent trip; and the processor identifies those items that may reach the end of their expected period of usefulness between the two shopping trips.

In another aspect, the present invention is directed to a method of handling and/or organizing food and/or drink. The method includes the steps of: providing a refrigerator and an associated processor in communication with a data entry device; placing an item of food and/or drink in the refrigerator; entering data corresponding to the item via the data entry device; entering date data corresponding to the item via the data entry device; and monitoring an expected period of usefulness for the item of food and/or drink by the associated processor.

In another aspect, the present invention is directed to a method of handling and/or organizing food and/or drink. The method includes the steps of: providing a refrigerator and an associated processor in communication with a data entry device; placing an item of food and/or drink in the refrigerator; entering data corresponding to the item via the data entry device; and monitoring an expected period of usefulness for the item of food and/or drink by the associated processor; sending at least one notification email when the item is near the expected period of usefulness.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing Summary, as well as the following detailed description of preferred embodiments of the present inven-

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tion, will be better understood when read in conjunction with the appended drawings. For the purpose of illustrating the invention, there is shown in the drawings an embodiment which is presently preferred. It is understood, however, that the invention is not limited to the precise arrangement and instrumentality shown. In the drawings:

FIG. 1 is a schematic diagram of a system according to a preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

The words "a" and "one" are defined to include one or more of the referenced item unless specifically stated otherwise. The term "data entry device" as used in the claims and in the corresponding portions of the specification, means "any one of a keyboard, a numeric pad, a separate computer or processor, a bar code reader, a touch pad, a touch sensitive screen, a voice recognition system, or any other known method of entering data into a processible format, such as that used by computer processors and personal computers". While many embodiments of the present invention will be described below, those of ordinary skill in the art will appreciate from this disclosure that any of the steps or system components described in one embodiment can be combined with any of the other described embodiments.

Referring to FIG. 1, wherein like numerals indicate like elements throughout, the system **10** of the present invention preferably provides a "smart" refrigerator **12** that facilitates the monitoring of the freshness of foods and/or drinks contained therein. The refrigerator **12** preferably includes onboard circuitry **14**, such as a PC processor, and/or is in communication, via a wireless connection or a hard wired connection, to a separate computer **16**. Alternatively, the computer **16** can be located next to the refrigerator **12** to monitor food and/or drink while not being actually connected or in communication with the refrigerator **12**. One method and apparatus for partially connecting and/or integrating a computer or processor with a refrigerator for specific functions is shown in U.S. patent application Ser. No. 10/344,937 which is hereby incorporated by reference herein as if fully set forth in its entirety.

In one preferred embodiment, at least one of the interior portions of the refrigerator, such as a crisper or other interior surface, includes a small data entry device **18**. When food and/or drink is placed in the refrigerator, the data entry device **18** is used to enter the type of food and/or drink that is being positioned in the refrigerator **12** as well as some date data that will allow the relative freshness of the food and/or drink to be estimated by the processor **14** or the computer **16**. For example, a user can enter the sell by date for food and/or drink that is placed in the refrigerator so that the processor and/or computer **14, 16** can monitor when the food and/or drink should be used by or discarded.

Alternatively, the user can enter the purchase date as well as the type of food and/or drink and the processor and/or computer **14, 16** can estimate the remaining useful period for the food and/or drink. When unusual food is placed in the refrigerator, the processor or computer can go online to check multiple databases **20** or servers **22** to determine how long the food and/or drink can be expected to last. Additionally, the term "processor **14**" is hereinafter defined as meaning "any known processor and/or computer **14, 16**" can include algorithms and formulas to allow the expected period of usefulness (i.e., for how long the food and/or drink

can be safely consumed) to be adjusted depending on the temperature of the refrigerator **12**. Methods and apparatuses for entering data into a computer or processor are shown in U.S. patent application Ser. Nos. 10/614,091 and 09/901,595; each of which are hereby incorporated by reference herein as if fully set forth in their entirety.

A bar code reader **24** can be positioned in or by the refrigerator **12** to allow the food and/or drink data to be automatically collected by the refrigerator **12** and stored in the processor **14** when a user properly moves the food and/or drink past the bar code reader **24**. The bar code reader **24** can be combined with any other data entry device **18** to allow multiple ways of entering food and/or drink data in the processor **14**. One method and apparatus for scanning bar codes is shown in U.S. patent application Ser. No. 09/973,303 which is hereby incorporated by reference herein as if fully set forth in its entirety. Alternatively RFID tags placed on food and/or drink items can be used to provide data to the processor **14**. This results in the "smart" refrigerator keeping a running inventory of all items in the refrigerator that is automatically updated when new items having RFID tags are inserted into or removed from the refrigerator **12**.

In another preferred embodiment, an audible or visual indicator **26** can alert a user when food and/or drink in the refrigerator is nearing the end of its expected period of usefulness. The indicator **26** can be any combination of a light, an audible alarm, a synthesized voice, or text that is displayed on a display device **28** that is integrated with the refrigerator or attached to a connected or separate computer system **16**. One method and apparatus for placing a display device on a refrigerator is shown in U.S. patent application Ser. No. 09/527,368 which is hereby incorporated by reference herein as if fully set forth in its entirety.

In another embodiment, the system **10** may also provide a print out of food and/or drink that is nearing the end of the expected period of usefulness. Another feature of the system **10** of the present invention is the ability of the processor **14** to access recipes that are stored on the processor **14** which include those food and/or drink items that are nearing the end of their expected period of usefulness. This makes using up leftover food and/or drink a fun exercise that can involve trying new and exciting recipes. Additionally, the system **10** can automatically access online databases **20** to update and/or download additional recipes. The user can also use the data entry device **18** to request recipes of a specific genre that use the food and/or drink items that are near the end of their expected period of usefulness. For example, the user can request that the processor **14** go online to find Chinese, Italian, Russian, Peruvian, barbeque, low-fat, and/or any other genre of recipes that incorporate those food and/or drink items that should be consumed in the near future. One method and apparatus for connecting and/or communicating between a processor and a computer network is shown in U.S. patent application Ser. No. 09/845,815 which is hereby incorporated by reference herein as if fully set forth in its entirety. A user can preferably contact the processor **14** by telephone or the Internet to identify a recipe and quantity of food to be prepared. For example, a user can access the processor **14** over the internet using a terminal, a personal digital assistant, PDA, email, or the like. Then, the processor **14** can determine whether all the needed ingredients are present in the refrigerator **12** or cupboards and can preferably automatically place an order with a selected supermarket for any missing ingredients. This allows one to plan last minute meals without having to inventory the contents of the refrigerator **12**.

Additionally, a user can enter the type of food being prepared and the system **10** can alert the user to any food and/or drink items that need to be used which are nearing the end of their expected period of usefulness. For example, one may be making spaghetti and meatballs and not realize that some squash is located in the back of the crisper that is about to spoil. When beginning to cook, the user enters spaghetti and meatballs into the data entry device **18**. When the processor **14** reviews the contents of the refrigerator **12**, the processor determines that squash is about to go bad, and an audible or visual alert is provided to the user, letting him or her know that some squash in the refrigerator **12** may be a good addition to the spaghetti sauce. Additionally, the processor **14** can use remote data entry devices that are located in cupboards to keep track of ingredients that are stored in the kitchen outside of the refrigerator. This data can be used by the processor to alert a user as to additional potential recipes of interest. Alternatively, the processor can preferably provide a list of all items in the refrigerator **12** and/or cupboards with any desired associated information, such as quantity or expected expiration dates.

The system **10** also simplifies shopping. When it is time to go shopping, a user can enter into the processor that a trip needs to be planned and how long it may be before another subsequent shopping trip takes place. When this data is entered, the processor **14** reviews the contents of the refrigerator and prints out or displays a list of items that may need to be replaced prior to the subsequent shopping trip. This can prevent one from failing to buy milk because there is milk in the refrigerator (which is nearing the end of its expected period of usefulness) when one does not plan to return to the grocery store after the day's grocery shopping for two weeks (which may be a week after the milk would have expired).

The system **10** preferably includes an organization function that can be integrated with the processor **14** or other memory device that keeps track of upcoming events. For example, if one's child has to bring cupcakes to school on Tuesday and a dinner party is being held on a Friday, the processor **14** can provide alerts a predetermined amount of time in advance reminding the user that certain ingredients need to be obtained beforehand. To elaborate on the above example, when the user selects cupcakes, the processor **14** can check the Internet or stored recipes and provide sample recipes that can also be ranked based on the currently available ingredients; when selecting the dinner party icon, the processor **14** can suggest recipes based on current ingredients. Additionally, the processor can store preselected themes, such as a Mexican dinner, holiday dinners, religious meals, or a wine and cheese cocktail party theme, that can be used to facilitate menu generation.

The system **10** can also be integrated with cooking appliances, such as stoves, microwaves, toasters, coffee makers, and the like. For example, if a dinner is scheduled for 8 PM, the processor **14** can place an order at a supermarket for missing ingredients and automatically start pre-heating the oven while a user drives to the supermarket from the office.

The system **10** can be integrated with speakers and music players or online music databases to provide coordinated music during cooking and/or eating. For example, the processor **14** can identify Italian opera pieces over the Internet while a user is preparing Italian food so that the music can be played to complement the occasion. The processor **14** can preferably also look up decorating ideas that match the theme of a meal. For example, the type of table settings, centerpieces, wall decorations, or the like can be suggested by the processor **14**. The processor **14** can also be linked

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with televisions or other monitors to provide coordinated pictures that relate to the culture from which a meal or theme originates.

Additionally, multiple systems **10** used by separate households can be linked to allow recipe and theme exchanges and the coordination of potluck type meals. For example, when planning a Mexican dinner, the systems **10** can use a common theme and select the individual dishes to be prepared by separate households based on maximizing the use of each household's current food inventory. Alternatively, if people are planning on cooking the entire meal at a single location, then the systems **10** can coordinate to advise guests which ingredients they should bring with them.

In addition, when a food and/or drink item is fully used, the data entry device **18** can be used to enter the information in the processor **14** to allow the automated generation of a shopping list. Additionally, the processor **14** can automatically place the order electronically with a supermarket server **30** or fax machine **30** so that the replacement of the necessary food and/or drink items is greatly simplified.

The system **10** also allows a user to remotely call/contact and access the system via a telephone or Internet connection to determine whether any food and/or drink items need to be purchased. This allows one to check while driving to the store or before leaving work. Additionally, the system **10** can be set so that the processor **14** sends emails or leaves voicemails at certain times of the day which can contain any pertinent information, such as recipes that incorporate food and/or drink items nearing the end of their expected period of usefulness so that one can make any necessary plans while still at the office or otherwise remote from the refrigerator **12**.

It is recognized by those skilled in the art, that changes may be made to the above-described embodiments of the present invention without departing from the broad inventive concept thereof. It is understood, therefore, that this invention is not limited to the particular embodiments disclosed, but is intended to cover all modifications which are within the spirit and scope of the invention as defined by the appended claims.

I claim:

1. A method of handling and/or organizing food and/or drink, comprising the steps of:
 - providing a refrigerator and an associated processor in communication with a data entry device;
 - placing an item of food and/or drink in the refrigerator, the item including a bar code;
 - communicating data identifying to the item via a bar code reader in communication with the associated processor;
 - estimating an expected period of usefulness for the item by the associated processor, wherein the associated processor derives the expected period of usefulness based on the identify of the item and data contained on at least one of the associated processor, a remote database, or a remote server;
 - automatically monitoring an expected period of usefulness for the item by the associated processor;
 - entering data into the associated processor regarding an upcoming food shopping trip and an expected date of a subsequent trip; and
 - the processor identifies those items that may reach the end of their expected period of usefulness between the two shopping trips.
2. The method of claim 1, further comprising the refrigerator automatically providing an audible or visual alarm when the item is nearing the end of its expected period of usefulness.

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3. The method of claim 1, further comprising:
 - entering data regarding specific courses included in a meal that is being planned; and
 - automatic checking of the food and/or drink that is contained in the refrigerator by the associated processor such that the associated processor determines whether there are any items of food and/or drink that are nearing the end of their expected period of usefulness which can be incorporated into the meal.

4. The method of claim 3, wherein the data corresponding to the item is entered via a bar code reader in communication with the associated processor.

5. The method of claim 1, wherein the data corresponding to the item is entered via a keypad on the refrigerator.

6. The method of claim 1, wherein the data corresponding to the item is entered via a touch screen on the refrigerator.

7. The method of claim 1, further comprising storing information regarding the food and/or drink in the refrigerator in the associated processor which is disposed on and/or in the refrigerator.

8. The method of claim 1, further comprising storing information regarding the food and/or drink in the refrigerator in the associated which is remote from the refrigerator.

9. The method of claim 1, further comprising automatic accessing by the associated processor of recipes that incorporate food and/or drink that is nearing the end of their expected period of usefulness.

10. The method of claim 9, wherein the recipes that are automatically reviewed by the associated processor are stored in the associated processor.

11. The method of claim 9, wherein the associated processor accesses remote databases to automatically identify recipes that may incorporate food and/or drink that is currently stored in the refrigerator.

12. The method of claim 1, wherein the associated processor automatically contacts a supermarket when the item needs to be replaced and places an order with the supermarket.

13. The method of claim 1, further comprising sending emails to a predetermined location when the item is near the expected period of usefulness.

14. The method of claim 1, further comprising making an automated telephone call to a predetermined number when the item is near the expected period of usefulness.

15. A method of handling and/or organizing food and/or drink, comprising, the steps of:

- providing a refrigerator and an associated processor on communication with a data entry device;
- placing an item of food and/or drink in the refrigerator;
- entering data corresponding to the item via the data entry device;
- entering date data corresponding to a date of purchase of the item via the data entry device;
- estimating an expected period of usefulness for the item by the associated processor, wherein the associated processor derives the expected period of usefulness based on the identity of the item and data contained on at least one of the associated processor, a remote database, or a remote server;
- monitoring an expected period of usefulness for the item of food and/or drink by the associated processor;
- the refrigerator automatically providing an audible or visual alarm when the item is nearing the end of its expected period of usefulness;
- entering data regarding specific courses included in a meal that is being planned; and

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automatic checking of the food and/or drink that is contained in the refrigerator by the associated processor such that the associated processor determines whether there are any items of food and/or drink that are nearing the end of their expected period of usefulness which can be incorporated into the meal.

16. The method of claim 15, wherein the data corresponding to the item is entered via a bar code reader in communication with the associated processor.

17. The method of claim 15, wherein the data corresponding to the item is entered via a keypad on the refrigerator.

18. The method of claim 15, wherein the data corresponding to the item is entered via a touch screen on the refrigerator.

19. The method of claim 15, further comprising storing information regarding the food and/or drink in the refrigerator in the associated processor which is disposed on and/or in the refrigerator.

20. The method of claim 15, further comprising storing information regarding the food and/or drink in the refrigerator in the associated processor which is remote from the refrigerator.

21. The method of claim 15, wherein the recipes that are automatically reviewed by the associated processor are stored in the associated processor.

22. The method of claim 15, wherein the associated processor accesses remote databases to identify recipes that may incorporate food and/or drink that is currently stored in the refrigerator.

23. A method of handling and/or organizing food and/or drink, comprising the steps of:

providing a refrigerator and an associated processor in communication with a data entry device;

placing an item of food and/or drink in the refrigerator;

entering data corresponding to the item via the data entry device;

entering date data corresponding to a date of purchase of the item via the data entry device;

estimating an expected period of usefulness for the item by the associated processor, wherein the associated processor derives the expected period of usefulness based on the identity of the item and data contained on at least one of the associated processor, a remote database, or a remote server;

monitoring an expected period of usefulness for the item of food and/or drink by the associated processor;

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entering data into the associated processor regarding an upcoming food shopping trip and an expected date of a subsequent trip; and

the processor identifies those items that may reach the end of their expected period of usefulness between the two shopping trips.

24. The method of claim 23, wherein the associated processor automatically contacts a supermarket when the item needs to be replaced and places an order with the supermarket.

25. The method of claim 23, further comprising sending emails to a predetermined location when the item is near the expected period of usefulness.

26. The method of claim 23, further comprising making an automated telephone call to a predetermined number when the item is near the expected period of usefulness.

27. A method of handling and/or organizing food and/or drink, comprising the steps of:

providing a refrigerator and an associated processor in communication with a bar code reader;

placing an item of food and/or drink in the refrigerator, the item including a bar code;

communicating data identifying the item via the bar code reader in communication with the associated processor;

estimating an expected period of usefulness for the item by the associated processor, wherein the associated processor derives the expected period of usefulness based on the identity of the item and data contained on at least one of the associated processor, a remote database, or a remote server; and

monitoring an expected period of usefulness for the item of food and/or drink by the associated processor;

sending at least one notification email when the item is near the end of the expected period of usefulness; and

a second refrigerator having a second processor in communication with the processor of the refrigerator to allow coordination therebetween.

28. The method of claim 27, wherein the associated processor automatically contacts a supermarket when the item needs to be replaced and places an order with the supermarket.

29. The method of claim 27, further comprising the associated processor also maintaining an inventory of ingredients that are stored in cupboards.

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