A refrigerator or freezer including at least one compartment for refrigerating, freezing and/or climate control and a display device. Information specific to at least one of the compartments can be displayed by the display device. The display device is interactive via an input device for user input, which input can be displayed by the display device.
Food Manager

Fresh Safe Instructions

Eggs
3-4 Weeks

Tomatoes
10 Days
REFRIGERATOR OR FREEZER

[0001] The present invention relates to a refrigerator or freezer having at least one zone for refrigerating, freezing and/or for climate control, and having a display device, it being possible to display on the display device information which is specific to the at least one refrigerating, freezing and/or climate zone.

[0002] An Internet refrigerator and an operating method for the latter are known from DE 101 00 826 A1. This refrigerator has a refrigerator control region for controlling important elements of the refrigerator, a touch panel for providing key signals which are associated with the operation of the refrigerator, and key signals for communicating with the Internet depending on a selection by the user. It is equipped with a display region, which is arranged on the outside of the refrigerator, for displaying information which is associated with the operation of the refrigerator, and information received from the Internet as a reaction to the key signals from the touch panel and the key signals from external devices through the Internet.

[0003] It is furthermore equipped with a main control region for bidirectional communication with the refrigerator control region and the Internet and for controlling the display region as a response to the key signals from the touch panel, the signals from the Internet and the key signals from the remote control system.

[0004] The refrigerator has a selected communication control region for managing the bidirectional communication between the refrigerator control region and the main control region.

[0005] The refrigerator has an Internet connection device which is connected between the Internet and the main control region by a selected communication line for bidirectional communication between the Internet and the main control region.

[0006] The known refrigerator and freezer are equipped with a plurality of storage locations. It has, for example, a refrigeration compartment, a freezer compartment and, according to the illustration in FIG. 9 of the patent application, also a dry zone.

[0007] The object of the invention is to further improve the refrigerator and freezer of the prior art.

[0008] According to the invention, this object is achieved in the case of a refrigerator and freezer of the type mentioned in the introduction in that the display device is interactive, in that there is an input device by means of which an operator can input data, and in that displays can be generated by the display device on the basis of data input by the operator.

[0009] The invention makes it possible for the operator to handle the refrigerator and freezer conveniently. The multizone refrigerator may be used correctly by it being possible to call up information relating to the optimum storage place of a product directly on the refrigerator via an interactive display. For the purposes of this invention, a product is a food, a medicine or pharmaceutical or any other good which can be stored in a specific climate, in particular a specific temperature and a specific humidity. For the purposes of the invention, inputting data is to be understood as selecting and controlling functions and also direct inputting or editing of data sets.

[0010] Advantageous developments may be found in the subclaims and in the description.

[0011] A refrigerator or freezer has proven particularly suitable in which there are detectors for detecting and controlling zone-specific data (control parameters for control circuits) zone by zone, this data being displayed by the display device in terms of zones. As a result, the microclimate in the individual zones may be set individually. A refrigerator or freezer is advantageous in which the temperature and/or the humidity can be detected by the detectors and can be displayed by the display device. The detectors can optionally be controlled or regulated.

[0012] The refrigerator or freezer is advantageously designed such that storage instructions or storage recommendations are displayed by the display device. Since all of the information about the refrigerator or freezer and about the food to be stored is available on the display of the refrigerator or freezer, the user does not need to refer back to information or use instructions in printed form. The user can set the optimum conditions for each product to be refrigerated or to be frozen with reference to the information displayed on the display.

[0013] A particular advantage in terms of storage is achieved when the display device displays those storage instructions and storage recommendations which are specific to the respective zone.

[0014] It is advantageous if the microclimate in each refrigerating, freezing and/or climate zone can be set individually.

[0015] In one advantageous refinement of the invention, the data, in particular storage instructions and storage recommendations, is called up on the display device from a database.

[0016] The data from the database is advantageously matched to associated climate zones.

[0017] A refrigerator or freezer in which the climate zones can be set individually and the database contains storage instructions and storage recommendations which can be correlated with current data of the refrigerating, freezing and/or climate zones may be used in various ways.

[0018] In one particular embodiment of the invention, the optimum storage place can be determined as a function of the data acquired by the correlation.

[0019] A database which is stored in an EPROM is suitable.

[0020] In order to implement the invention, a refrigerator or freezer is particularly suitable which is connected to the Internet, data which is relevant to the refrigerator or freezer being stored on a server. This data can be downloaded from the server and stored on a local memory, in particular an EEPROM.

[0021] Product- and food-specific information relating to the storage place, that is to say to the zone or to the compartment, and also relating to the storage life and to the period of freshness of the food is stored in the database.

[0022] A distinction may be drawn here between a static case and a dynamic case. In the static case, the climate zones
are fixed and cannot be set individually. The contents of the database are correspondingly matched to these.

[0023] In the dynamic case, the climate zones can be set individually. The database contains information relating to optimum storage which is correlated with current sensor data of the refrigerating zones. The optimum storage place is determined as a function of the correlation data. The scope and supply of the database may be adapted to the language and culture of the area in which the refrigerator or freezer is sold. If the database is stored in an EPROM, it can have only a limited scope. If, on the other hand, the database, provided that the appliance is Internet-compatible, is stored on a server computer, the size of the database is unlimited since it is not stored locally. Individual data sets may then be downloaded from the server computer and stored locally on an EEPROM.

[0024] According to another aspect of the invention, the refrigerator or freezer is equipped with a system for automatically recognizing goods, in particular for recognizing barcodes and transponder codes. All the information needed for the database is thus contained in the barcode or in the transponder code. The information is then processed by a data-processing system contained in the refrigerator or freezer, and data which is relevant to the user is displayed. The corresponding database set is accessed by means of the code of the recognized product.

[0025] In one embodiment of the invention, all of the data of the refrigerator or freezer, in particular the refrigerating, freezing and/or climate zones, can be displayed graphically, in particular in the form of a pictogram, in particular by means of LCDs.

[0026] A refrigerator or freezer is particularly suitable in which the display device has an imprint, applied in particular to the panel of the refrigerator or freezer with a breakdown of the refrigerating, freezing and/or climate zones.

[0027] According to the invention, in one embodiment, the refrigerator or freezer may, in particular, also comprise a display device with light guides and LEDs.

[0028] A refrigerator or freezer is likewise particularly suitable in which the microclimate can be set by the user for each zone individually.

[0029] The refrigerator or freezer is shown graphically with its climate zones, and the recommended compartment is displayed or graphically emphasized. In this case, there are several display possibilities, for example a pictogram illustrated by LCDs. Alternatively, a breakdown into zones is imprinted on a front panel or on the door of the refrigerator. A selected refrigerating zone is indicated by means of LEDs or by means of light guide technology, that is to say light from the LEDs is launched into the door and displayed in the door via light guides.

[0030] Overall, the invention has the advantage that storage instructions and recommendations can be called up at any time, to be precise wherever the information is needed, that is to say in the region in which the food or the product to be refrigerated is introduced into the refrigerator. A learning effect occurs with regular use of the database. The user is indirectly trained. In spite of individual climate zones, the user can utilize his refrigerator or freezer in an optimum manner.

[0031] The invention is explained in greater detail in an exemplary embodiment with reference to the drawings. The single FIGURE shows a display device.

[0032] A display device first has operating keys and secondly a display 2. The operating keys include an on/off switch 3, a key 4 with which the compressor can be switched to permanent operation in order to rapidly refrigerate or freeze a product, a menu key 5 and selection keys 6, 7 in order to select different submenus within the menus.

[0033] Furthermore, a status key 8 for confirmation and an alarm display 9 are provided. The status key 8 may possibly also be omitted.

[0034] When the menu key 5 is not operated, the instruction “Food manager” appears on the display 1 and instructs the operator that he may activate this by operating the menu key 5 in order to call up different submenus which he can call up in sequence by operating the selection keys 6, 7. However, he may return to the initial display “Food manager” at any time by pressing the menu key 5. A “Food manager” is understood to be storage instructions and storage recommendations for products to be refrigerated and frozen, tips and tricks for optimum handling and preparation for storing the products to be refrigerated and frozen, and the like.

[0035] After the menu key 5 has been operated once, a display “Fresh safe instructions” appears in a display region 20. The display advises the user that he can call up a large number of products, for example arranged in alphabetical order, with the aid of a following submenu by using one of the selection keys 6, 7.

[0036] Information in the form of a pictogram and in alphanumeric form then appears on the display. The instruction “Eggs—3-4 weeks” in conjunction with an arrow pointing to an upper refrigerating compartment 10 tells the user that eggs may be stored for a period of three to four weeks in the upper refrigerating compartment 10.

[0037] If, in alphabetical order, the operator reaches the term “Tomatoes” by further operation of one of the menu keys 6, 7, he is also suggested an optimum storage time of “10 days” for these. In this case, an indicating arrow points to a refrigerating compartment 11.

[0038] Depending on the number of menu keys, it is conceivable for the operator to call up a multiplicity of submenus.

1-18. (canceled)
19. A refrigerating or freezing apparatus, comprising:
   at least one zone for at least one of refrigerating, freezing or climate control; a display device for displaying information specific to at least one of said refrigerating, freezing or climate control zones;
   an input device coupled to said display device for inputting data by an operator; and
   said display device generating displays on the basis of data input by said operator.
20. The apparatus according to claim 19, including a plurality of detectors coupled to said input device for at least one of detecting, controlling or regulating zone-specific data of each of said zones and coupled to said display device for displaying said zone-specific data of each of said zones.
21. The apparatus according to claim 20, including at least one of said detectors detecting at least one of the temperature or humidity of said zones and said detected temperature or humidity can be displayed by said display device.

22. The apparatus according to claim 20, including said detectors can optionally be at least one of controlled or regulated.

23. The apparatus according to claim 19, including storage instructions or storage recommendations for a product in a zone can be displayed by said display device.

24. The apparatus according to claim 23, including said storage instructions or storage recommendations for a product in a specific zone can be displayed by said display device.

25. The apparatus according to claim 19, including the microclimate in each of said zones can be individually set.

26. The apparatus according to claim 19, including data including storage instructions or storage recommendations for a product in a specific zone are stored in a database and said data can be displayed by said display device from said database.

27. The apparatus according to claim 26, including said data from said database is matched to associated climate zones.

28. The apparatus according to claim 27, including said climate zones can be set individually and said database contains storage instructions and storage recommendations which can be correlated with current data in any one of said zones.

29. The apparatus according to claim 28, including the optimum storage zone can be determined as a function of said data acquired by said correlation.

30. The apparatus according to claim 26, including said database is stored in an EPROM device.

31. The apparatus according to claim 19, including said input device coupled to the Internet and data relevant to said zones is stored on a server and said data can be downloaded from said server and stored on a local memory device, such as an EPROM device.

32. The apparatus according to claim 19, including a system for automatically recognizing codes for specific goods, said codes including barcodes and transponder codes.

33. The apparatus according to claim 19, including said data from said zones can be displayed graphically by said display device in the form of a pictogram, for example by one or more LCD devices.

34. The apparatus according to claim 19, including said display device has a visual imprint applied to a panel of said apparatus with a breakdown of said zones.

35. The apparatus according to claim 19, including said display device includes light guides and LED devices.

36. The apparatus according to claim 19, including the microclimate of said zones can be set individually by a user.

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