Title: FOOD PACK AND COOKING MACHINE FOR THE SAME

Abstract: The invention generally relates to a food pack and a cooking machine for the same. The food pack attaches the food information in a contactless readable form, which required in cooking the food packed therein and is provided for each type of cooking machines. The cooking machine contactlessly reads the food information from a food pack and automatically cooks the food therein based on the food information. According to the present invention, the food pack and the cooking machine is advantageous in that, using the food information attached to the food pack, the cooking machine may cook the food in the food pack without detailed user operations.
FOOD PACK AND COOKING MACHINE FOR THE SAME

Technical Field

The present invention relates to a food packaging material on which various food information required for the cooking of food contained therein are provided for each of cooking appliances and are attached thereto in a form that can be read in a contactless manner by an external device, and a cooking appliance, which is capable of reading food information provided on the food packaging material in a contactless manner and automatically cooking the food using the food information.

Background Art

Currently, various types of food products, which can be conveniently cooked in microwave ovens or ovens, are provided, but there is inconvenience in that users must read the descriptions of corresponding food products, and manually set and operate cooking appliances to cook the food products. Furthermore, the respective food products have their own shelf lives, and the users must check the shelf lives, so that there may be danger in that health problems occur if the shelf life of food is disregarded due to the carelessness of the users and food whose self life
has expired is cooked.

Additionally, some food packaging materials, which cannot be used together with food contained therein at the time of cooking the food, may exist with respect to cooking appliances. For example, there are limitations in that metallic containers cannot be used in microwave ovens and containers that discharge harmful ingredients at a high temperature cannot be used in ovens. Such limitations must be observed by users to ensure safety and health. However, there may be danger in that food is cooked while such limitations are disregarded due to the carelessness of the users.

Detailed description of the Invention

Disclosure of the invention

Accordingly, an object of the present invention is to provide a food packaging material on which various food information required for the cooking of food contained therein are provided for each of cooking appliances and are attached thereto in a form that can be read in a contactless manner by an external device, and a cooking appliance, which is capable of reading food information provided on the food packaging material in a contactless manner and automatically cooking the food using the food
information.

Brief Description of the Drawings

FIG. 1 is a view showing an embodiment in which food packaging materials and a cooking appliance are used according to the present invention;

FIGS. 2A and 2B are views showing embodiments of food information provided on the food packaging materials according to the present invention;

FIG. 3 is a diagram showing an embodiment of the construction of the cooking appliance according to the present invention;

FIG. 4 is a flowchart showing an embodiment of an operation of the cooking appliance according to the present invention; and

FIGS. 5A and 5B are a view showing another embodiment of food information provided on a food packaging material and a flowchart showing another embodiment of an operation of a cooking appliance according to the present invention, respectively.

Best Modes

Embodiments of the present invention are described in detail with reference to the attached drawings below.
FIG. 1 is a view showing an embodiment in which food packaging materials 140 and 150, and a cooking appliance 110 are used according to the present invention. As shown in the drawings, the food packaging materials of the present invention can contain food therein, and refer to a more general concept including both of general "food containers" and "packing bags." The food packaging materials 140 and 150 are provided with food information units 160, 170 and 180 having a function of transmitting information in a contactless manner, and food information directly or indirectly related to the cooking of food contained in the food packaging materials 140 and 150 is stored in the food information units 160, 170 and 180.

Meanwhile, the control unit 120 of the cooking appliance 110 communicates with the food information units 160, 170 and 180 in a contactless manner, reads food information related to the cooking of food, and controls the cooking appliance 110 based on the food information. In the case where a food packaging material is a food container 140, it is mainly assumed that the food container 140, together with food, is inserted into the cooking appliance 110 and the food is cooked. In contrast, in the case where the food packaging material is a packing bag 150, it is mainly assumed that food is transferred to an additional container and inserted into the cooking appliance 110, and the packing bag 150 is used while
remaining held close to a sensing unit 130. The sensing unit 130 can be constructed to be exposed to the outside of the cooking appliance 110, or not to be exposed to the outside.

According to the present invention, a plurality of food information units 160, 170 and 180 can be provided on a single food packaging material. In the case of the food container 140 shown, the food information units 160 and 170 are attached to the body and cover of the food container 140, respectively. In this case, each of the food information units 160 and 170 has an individual reason for existence. For example, the food information unit 160 may exist for the information on the shelf life or recipe of food, and the food information unit 170 may exist for the information on the fact that a metallic cover must not exist in a microwave oven at the time of cooking food as described later. In this case, only a single food information unit 170 may be provided and all information may be included in the food information unit 170, and the sensing unit 130 is employed at the time of cooking food.

Meanwhile, the food information units 160, 170 and 180 used in the present invention must provide a function of transmitting information in a contactless manner, and be preferably provided with externally applied power. For this purpose, a well-known Radio Frequency Identification (RFID) technology can be preferably applied. Traffic cards widely
used at present include units for providing the above-described function.

FIGS. 2A and 2B are views showing embodiments of food information provided on food packaging materials 140 and 150 according to the present invention. It is preferable that the food information shown is stored in and provided by the memory spaces of the food information units 160, 170 and 180 shown in FIG. 1, and is read in a contactless manner and obtained by the control unit 120.

First, in an embodiment shown in FIG. 2A, food information includes shelf life information of food included in the food packaging materials 140 and 150; recipe information suitable for the cooking of the food for each of one or more cooking appliances, that is, the control sequence information of cooking appliances; information on whether the food information units are allowed to exist in the cooking appliance at the time of cooking; and authentication information for guaranteeing that the food information is original.

The shelf life information is information on the shelf life of the food. The shelf life information can include information on an expiration date, or information on a product's manufactured date and a usable period, so that the present invention is not limited to the above-described case. Furthermore, the food information provides the recipe information of the food for each of one or more
cooking appliances. Information for a single cooking appliance, that is, a cooking appliance identifier ID-k and recipe information RCP-k with respect to the cooking appliance ID-k are referred to as a “food information group.” Accordingly, the food information includes one or more food information groups, and each of the food information groups includes a cooking appliance identifier ID-k and recipe information RCP-k with respect to the cooking appliance. In this case, the recipe information RCP-k imports the control sequence information of the cooking appliance ID-k for the cooking of the food.

Furthermore, the food information provides information on whether the food information units 160, 170 and 180 are allowed to exist in the cooking appliance at the time of cooking the food. The information is information on whether the part of the packaging material, on which the food information units 160, 170 and 180 are attached, is allowed to exist in the cooking appliance at the time of cooking the food, so that the information is referred to as “attachment allowance/prohibition information” for convenience. In the case of the embodiment shown in FIG. 1, the attachment allowance/prohibition information of the food information stored in the food information unit 160 may be set to “attachment allowed.” In contrast, the attachment allowance/prohibition information of the food information stored in the food information
units 170 and 180 may be set to "attachment prohibited."

Furthermore, the food information provides the authentication information for guaranteeing that the food information is not counterfeited, and digital signatures based on the so-called Public Key Infrastructure (PKI) are suitable for the authentication information. Such digital signatures are issued by a certification authority, and used to prevent the counterfeiting of the food information. However, if such a technology is applied, there are problems in that the processing burden of the control unit 120 is great and the management of the food information units is complicated. Accordingly, counterfeit may be prevented using other methods. That is, if the food information units 160, 170 and 180 are inserted into a food packaging material, the food packaging material must be damaged to replace the food information units or change the contents of the food information units, so that such illegal counterfeiting may be practically impossible.

Meanwhile, an embodiment shown in FIG. 2B is different from the embodiment shown in FIG. 2A in that the "attachment allowance/prohibition information" is provided with respect to the type of cooking appliance. Since the characteristics of the cooking appliances are considerably different according to the types of cooking appliances, it is preferable that the attachment allowance or prohibition is determined according to the types of cooking appliances.
FIG. 3 is a diagram showing an embodiment of the construction of the cooking appliance 300 according to the present invention. The cooking appliance 300 shown includes a Radio Frequency (RF) module 310 capable of reading externally provided information in a contactless manner; a cooking appliance drive module 330 for operating the cooking appliance 300; a time management module 340 for managing information on current time; and a control module 320 for controlling the RF module 310, the cooking appliance drive module 330 and the time management module 340.

As described above with reference to FIGS. 1 and 2, when a cooking operation starts, the cooking appliance 300 is operated to communicate with a food information unit 350 provided on the food packaging material 140 or 150 in a contactless manner through the RF module 310, to read food information from the food information unit 350, to obtain recipe information corresponding to the cooking appliance 300, that is, control sequence information for the cooking appliance, by searching the food information, and to control the cooking appliance drive module 330 based on the control sequence information.

FIG. 4 is a flowchart showing an embodiment of an operation of the cooking appliance 300 according to the present invention. The cooking appliance 300 waits until the food is inserted thereinto and the operation thereof
starts at step S420, reads food information from the food
information unit 350 through the RF module 310 or a
separate sensing unit 130 at step S420, checks whether the
food information is original by verifying authentication
information at step S430, and preferably displays an error
on the user interface of the cooking appliance 300 and
discontinues the cooking operation for the food in the case
where time information provided by the time management
module 340 is compared with the shelf life information
included in the food information and it is determined that
the shelf life has expired at step S440.

Thereafter, in the case where the shelf life
inspection is passed in step S440, the attachment allowance/
prohibition information is inspected at step S450, and it
is preferable that an error is displayed on the user
interface of the cooking appliance 300 and cooking
operation for the cooking is discontinued in the case where
a food information unit, which is prohibited to exist in the
cooking appliance at the time of cooking, exists in the
cooking appliance 300.

Thereafter, in the case where the attachment
allowance/prohibition information inspection S450 is
passed, the cooking appliance 300 obtains control sequence
information, which corresponds to a corresponding cooking
appliance 300, from the food information, and performs the
cooking operation for the food by controlling the cooking
appliance drive module 330 based on the control sequence information at step S460.

FIGS. 5A and 5B are a view showing another embodiment of food information provided on a food packaging material and a flowchart showing another embodiment of an operation of a cooking appliance according to the present invention. In this embodiment, various recipe information for a single cooking appliance can be provided in food information. Accordingly, in the case where the recipe information is a plurality of pieces of recipe information, the cooking appliance 300 displays such recipe information to a user at step S560, receives the selection of a specific recipe from the user at step S570, and performs a cooking operation for the food by obtaining control sequence information corresponding to the selected recipe and controlling the cooking appliance drive module 330 based on the control sequence information at step S580.

**Industrial Applicability**

According to the food packaging material and cooking appliance of the present invention, the recipe information of food contained in the food packaging material is provided for each of cooking appliances and provided while remaining attached to the food packaging material, so that the present invention is advantageous in that a user can
cook the food without additionally manipulating the cooking appliance.

Furthermore, according to the food packaging material and cooking appliance of the present invention, the shelf life-related information of the contained food is provided while remaining attached to the food packaging material, so that the present invention is advantageous in that danger due to expired food can be avoided and the shelf life of food can be prevented from being counterfeited.

Furthermore, according to the food packaging material and cooking appliance of the present invention, the various recipe information of the contained food are provided for each of the cooking appliances and tastes, and provided while remaining attached to the food packaging material, so that the present invention is advantageous in that the user can conveniently cook the food according to the user's taste and preference.
Claims

1. A food packaging material including food information related to cooking food contained therein in a digital form, wherein:

   the food information comprises one or more food information groups;

   each of the food information groups includes cooking appliance identification information for identifying a type of a cooking appliance, and one or more pieces of control sequence information of the cooking appliance for cooking the food in the cooking appliance corresponding to the cooking appliance identification information;

   the food information is stored in a memory space of a food information unit;

   the food information unit comprises a wireless communication module and provides the food information stored in the memory space in a form that can be read in a contactless manner by an external device; and

   the food information unit, together with the food packaging material, is provided.

2. The food packaging material according to claim 1, wherein the food information further comprises information on a shelf life of the food.
3. The food packaging material according to claim 1, wherein the food information further comprises attachment allowance/prohibition information that determines whether the food information unit is allowed to exist in the cooking appliance at the time of cooking the food in the cooking appliance.

4. A cooking appliance capable of reading food information provided on a food packaging material and cooking food based on the food information, wherein:

the cooking appliance comprises a Radio Frequency (RF) module capable of reading externally provided information in a contactless manner, a cooking appliance drive module for operating the cooking appliance, and a control module for controlling the RF module and the cooking appliance drive module;

the cooking appliance (1) reads food information from a food information unit, which is provided on the food packaging material, while communicating with the food information unit in a contactless manner through the RF module, (2) obtains control sequence information, which corresponds to the cooking appliance, from the food information, and (3) controls the cooking appliance drive module based on the control sequence information.

5. The cooking appliance according to claim 4,
further comprising a time management module for managing information on current time;

wherein the cooking appliance obtains shelf life information of the food from the food information before controlling the cooking appliance drive module, and displays an error and discontinues a cooking operation for the food in the case where the shelf life information is compared with time information provided by the time module and it is determined that the shelf life has expired.

6. The cooking appliance according to claim 4, wherein the cooking appliance obtains attachment allowance/prohibition information, which is related to whether the food information unit is allowed to exist in the cooking appliance, from the food information before controlling the cooking appliance drive module, and displays an error and discontinues a cooking operation for the food in the case where it is determined that a food information unit whose attachment is prohibited exists in the cooking appliance based on the attachment allowance/prohibition information.

7. The cooking appliance according to claim 4, wherein in the case where control sequence information corresponding to the cooking appliance is a plurality of pieces of control sequence information, the cooking
appliance (1) displays contents of the pieces of control sequence information to a user, (2) receives selection of specific control sequence information from the user, and (3) controls the cooking appliance drive module based on the selected control sequence information.
### FIG. 2A

<table>
<thead>
<tr>
<th>Shelf Life Information</th>
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<tbody>
<tr>
<td>Cooking Appliance Identifier ID-1</td>
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<tr>
<td>Recipe Information RCP-1 for ID-1</td>
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<tr>
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</tr>
<tr>
<td>Cooking Appliance Identifier ID-N</td>
</tr>
<tr>
<td>Recipe Information RCP-1 for ID-N</td>
</tr>
<tr>
<td>Attachment Allowance/Prohibition Information</td>
</tr>
<tr>
<td>Authentication Information (Digital Signature)</td>
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### FIG. 2B

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<tr>
<td>Attachment Allowance/Prohibition Information for ID-1</td>
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<td></td>
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<tr>
<td>Cooking Appliance Identifier ID-N</td>
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<td>Recipe Information RCP-1 for ID-N</td>
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<tr>
<td>Attachment Allowance/Prohibition Information for ID-N</td>
</tr>
<tr>
<td>Authentication Information (Digital Signature)</td>
</tr>
</tbody>
</table>
FIG. 4

Start

Food Inserted?

Yes

Food Information Reading in a Contactless Manner

(S410)

No

Verify Authentication Information

(S420)

Check Shelf Life Information

(S430)

Check Attachment Allowance/Prohibition Information

(S440)

COOKING OPERATION

(S450)

Stop
FIG. 5A

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<tr>
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<td>Attachment Allowance/Prohibition Information</td>
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<td>Authentication Information (Digital Signature)</td>
</tr>
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FIG. 5B

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......

Display Recipe Information (S5O9)

User's Selection (S570)

Cooking Operation (S580)

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INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 G06F 19/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Patents and applications for inventions since 1975, Korean Utility models and applications for Utility models since 1975,
Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS, ESPACENET

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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Date of the actual completion of the international search

08 OCTOBER 2004 (08.10.2004)

Date of mailing of the international search report

11 OCTOBER 2004 (11.10.2004)

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Form PCT/ISA/210 (second sheet) (January 2004)
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