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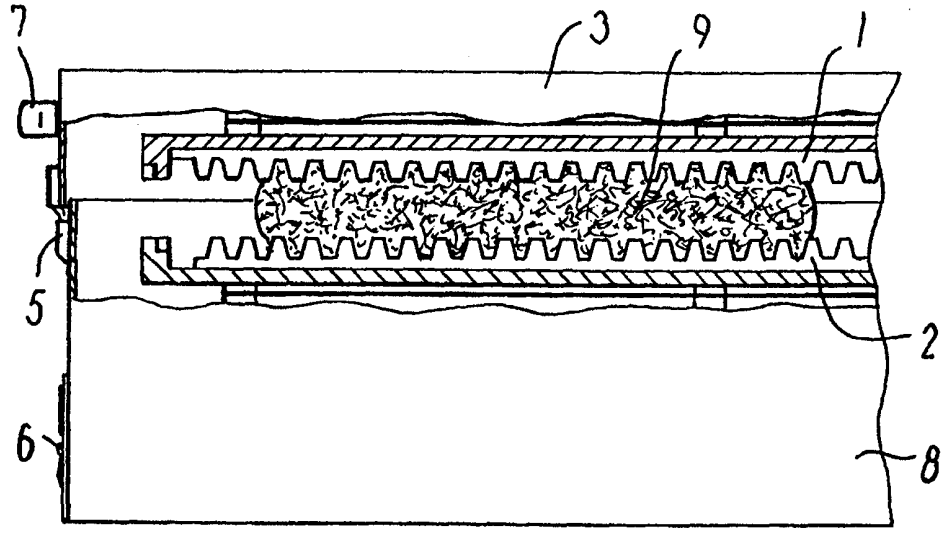
(54) Title: AN APPARATUS FOR THE HEAT TREATMENT OF ESPECIALLY ARTICLES OF FOOD



(57) Abstract

The invention concerns an apparatus especially for the heat treatment of food items, and comprising at least one pair of heat treatment plates (1, 2) which are arranged to be pressed towards each other, between which plates (1, 2) one or more food items (9) are placed, after which the plates (1, 2) are provided with electrical energy so that the heat treatment commences by virtue of the electrical resistance of the item(s) (9). The plates (1, 2) can be heated to a selected temperature before the heat treatment of the items (9). One or more plates (1, 2) can be provided with a form of profiling on the treatment surface, and of these plates (1, 2) at least one plate (1, 2) can have a replaceable profile. The invention also concerns the use of an apparatus, which is used especially for the heat treatment of food items (9) of relatively homogeneous thickness.

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An Apparatus for the Heat Treatment of Especially Articles of Food.

The invention concerns a heat treatment apparatus, especially for the heat treatment of items of food, comprising at least one pair of heat treatment plates, which are arranged to be pressed towards each other, and between which plates the item or items of food are placed.

THE KNOWN TECHNIQUE

Within the field of Fast Food, apparatuses are known for the preparation of food products that are divided into pieces or items. Many of these apparatuses consist of one or two frying plates. In the case of a single frying plate, as a rule this will function as a form of electrically heated or gas heated frying plate.

With the apparatuses that consist of two horizontal plates, when in use these are disposed in the horizontal position and opposite each other in a parallel manner. There is hereby achieved a heating and a slight pressing together of the items that are required to be heated.

The disadvantage with these known meat fryers with single or double frying plates is that they by the traditional frying method which they employ, where the meat is fried by the influence of heat on the outer sides of the meat, whereby the heat is transmitted slowly towards the centre or middle of the meat.

THE OBJECT OF THE INVENTION

The object of the invention is to achieve a uniform result of the heat treatment every time, and a shorter heat treatment time and a lower consumption of energy. This is especially advantageous, for example in the heat treatment or frying of meat, in that a high degree of assurance is achieved that upon completion of the treatment the meat has been fried until it is tender.

Moreover, by a pre-heating of the heat treatment plates, there is achieved a browning of the surface of the items due to the heat and the direct contact between the surface of the items and the heat treatment plates. According to the invention, this is achieved by supplying the plates with electrical energy so that the heat treatment is initiated by virtue of the electrical resistance of the food item(s).

In the following, the invention is explained in more detail with reference to the drawing, where

fig. 1 shows a heat treatment apparatus according to the invention in the open position,

fig. 2 shows a heat treatment apparatus according to the invention in the closed position, and

fig. 3 shows the heat treatment apparatus according to the invention closed around an item.

DESCRIPTION OF EMBODIMENTS

In a preferred embodiment, a heat treatment apparatus according to the invention will comprise an upper plate 1 and a lower plate 2, either of which or both of which can be profiled. These two plates 1, 2 are respectively mounted in a base part 8 and a cover part 3 by means of insulating holders (not shown), which ensure that the electrical current is not conducted further to the remaining parts of the apparatus, in that the user must not be able to receive an electric shock and because a voltage must only be built up between the plates 1, 2. The plates 1, 2 can be pre-heated by heating elements of some kind, but the actual heat treatment takes place on the basis of the resistance in an item 9 which is placed between the current-conducting plates 1, 2.

The plates 1, 2 can with advantage be provided with profiles that are suitable for the type of food item to be heat treated.

Between the base part 8 and the cover part 3 there is placed an equalising arrangement 4 which co-operates with the base part 8 and the cover part 3, and hereby also with the two plates 1,2 in such a manner that the distance between the plates 1, 2 is adjusted or equalised in accordance with an item 9 which is placed between the upper plate 1 and the lower plate 2. Such an equalising arrangement is necessary in that the items will not all be of the same thickness.

The cover part 3, which is hinged in a pivotal manner to the base part 8, is provided with a handle 7 for the opening and the closing of the cover part 3.

Between the cover part 3 and the base part 8 there can also be provided a closing/locking arrangement 5 which can be used for the locking of the apparatus in its position of use. In a special embodiment, this lock 5 can be used as a safety spacing device, so that the cover cannot fold completely down and hereby injure the hands or fingers of the user.

An operating panel 6 is preferably and most expediently provided on the front of the base part 8, but can be provided in other places on the apparatus.

When the heat treatment apparatus is in its position of use, the profiling of the plates 1, 2 will penetrate partly into the item(s) 9 in order to provide a good contact surface for the transfer of a current flowing through the item 9 between the plates 1,2.

A safety switch of some kind is provided in connection with the cover part 3 in order to ensure that there is no difference in voltage potential between the plates 1,2 when the apparatus is not closed, i.e. that current for the heating of the plates can only be applied even though that the apparatus is open.

The apparatus can also be provided with extraction means, for example via a flexible hose or pipe that is mounted on an extraction flange on the apparatus. The apparatus can also be used directly beneath an extraction hood or similar means of suction.

Moreover, the apparatus is easy to clean, in that cleaning can be effected using a spray with a special cleaning fluid over all of the open areas of the apparatus, which thereafter can be dried off with a cloth or paper. It is not expedient to use running water for the cleaning, since this can damage electrical parts and set the apparatus out of function.

In the heating of the plates 1,2, a temperature is reached which precludes the possibility of bacterial growth (150°).

When the apparatus is to be used, grill heat is switched on for the upper and the lower part 1,2. These parts can be used independently of each other depending on the purpose for which the apparatus is to be used. To achieve the shortest heating time, the apparatus should be closed.

When the apparatus is ready for use, the heat treatment time is set to the desired number of seconds via a timer. This is done on the operation panel 6.

When the heat treatment is finished, the items can be taken out. This is effected by turning the lock handle to the right, whereby a spring force will open the cover 3 so much that it is now possible to use the apparatus as a kind of heating cabinet.

Initially, the apparatus is delivered with plate profiles, which find all-round application for most kinds of items, but it will be possible to change to plates with other profiles to suit more specific requirements.

The apparatus does not require any special cleaning when changes are made between items of different types. This is because substantially no juice extraction occurs when the treatment times are set correctly. This provides the possibility, for example, of being able to prepare fruit in slices for dessert after the treatment of meat.

CLAIMS

1. Apparatus for the heat treatment of especially items of food and comprising at least one pair of heat treatment plates that are arranged to be pressed towards each other, and between which plates one or more items of food are placed, **characterized** in that the plates (1,2) are supplied with electrical energy so that the heat treatment commences by virtue of the electrical resistance of the item(s) 9.

2. Apparatus according to claim 1, **characterized** in that the plates (1,2) are heated to a selected temperature before the heat treatment of items (9).

3. Apparatus according to claim 1, **characterized** in that one or more plates (1,2) are provided with a form of profiling on the treatment surface.

4. Apparatus according to claim 3, **characterized** in that at least one plate (1,2) has a replaceable profile.

5. Use of the apparatus disclosed in one of the claims 1–4, **characterized** in that the apparatus is used especially for the heat treatment of food items (9) of relatively homogeneous thickness.

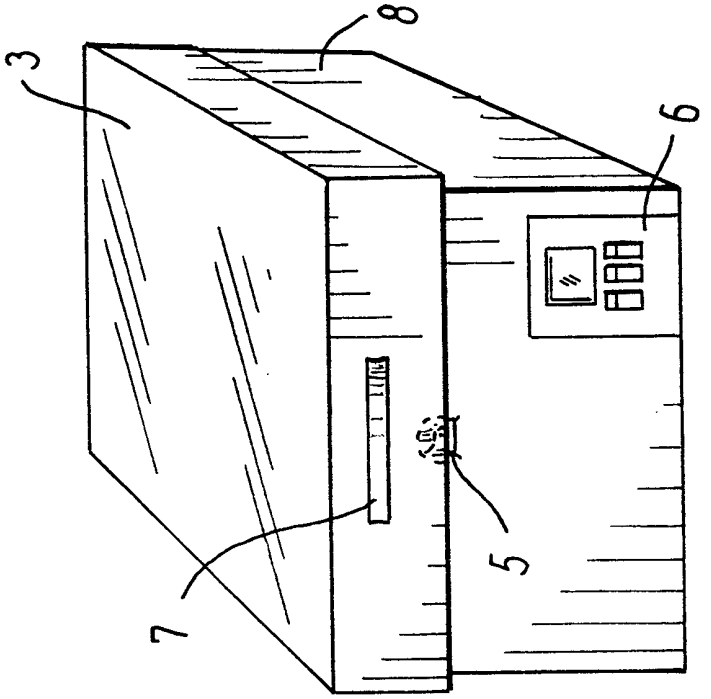

FIG. 2

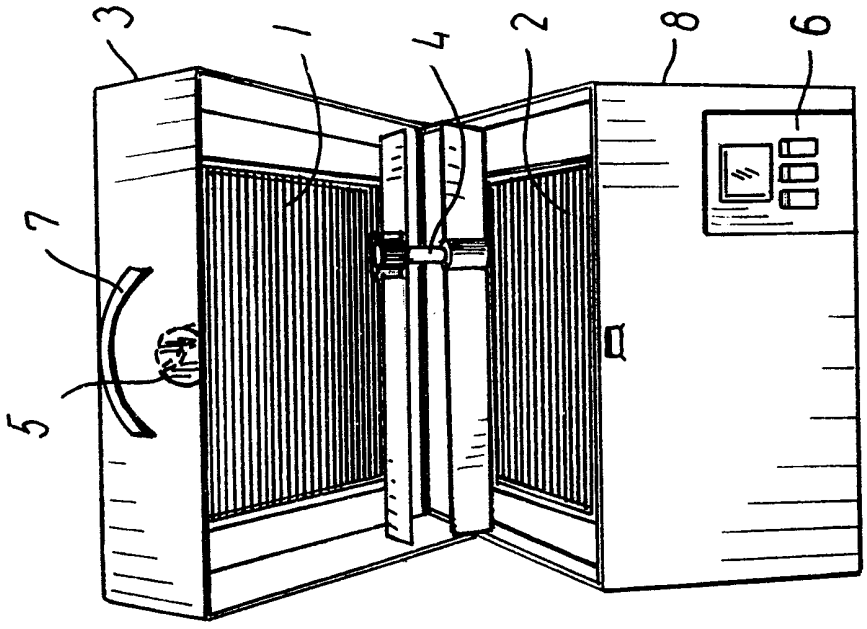

FIG. 1

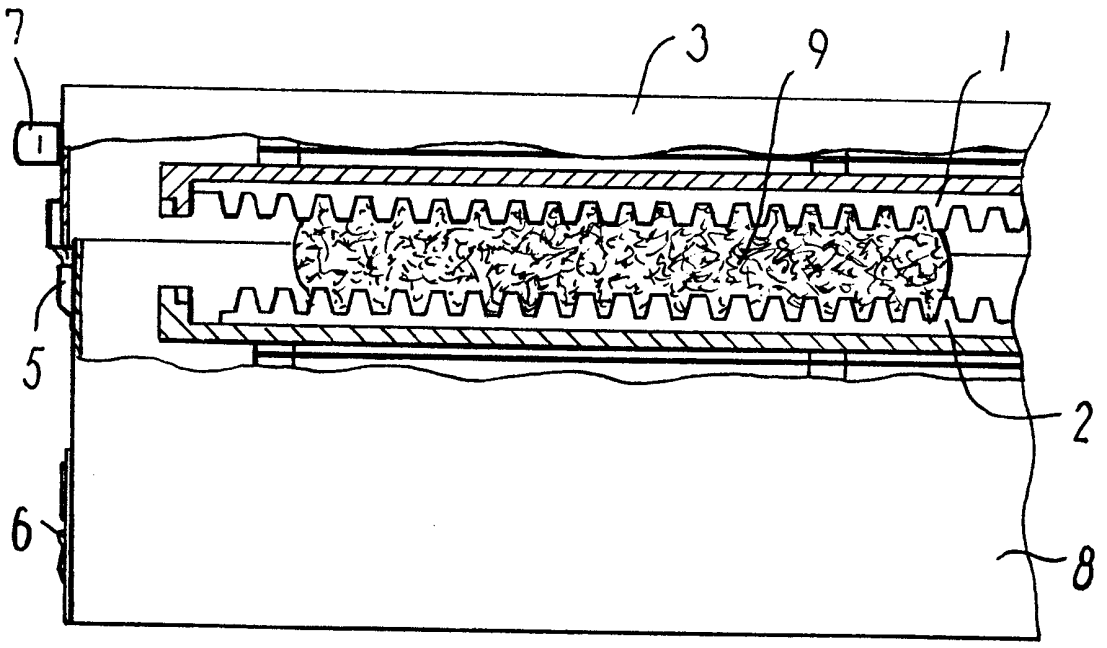

FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK 99/00604

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A47J 37/06
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: A47J

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

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5937742 A (STEEB ET AL), 17 August 1999 (17.08.99), figures 1-6, claims 1-5	1-6
X	DE 4338471 (CLOER ELEKTROGERÄTE GMBH), 18 May 1995 (18.05.95), figures 1-3, claims 1-4	1-6
X	US 3998145 A (MAISCH), 21 December 1976 (21.12.76), figures 1-2, claims 1-9	1-6
X	US 5983784 A (GOLDBERG), 16 November 1999 (16.11.99), figures 1-8, claims 1-24	1-6

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5253565 A (BURTON), 19 October 1993 (19.10.93), figures 1-5, claims 1-2 -- --------	1-6

INTERNATIONAL SEARCH REPORT

Information on patent family members

02/12/99

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US 5983784 A	16/11/99	NONE	
US 5253565 A	19/10/93	NONE	