

[54] SELF-WARMING CONTAINER FOR PRECOOKED FOODS

[76] Inventors: Vincenzo Grosso, 31 Via Felice Casati; Attilio Grosso, 1 Via Appiani, both of Milan, Italy

[22] Filed: Oct. 10, 1973

[21] Appl. No.: 404,928

[30] Foreign Application Priority Data

Aug. 3, 1973 Italy 27508/73

[52] U.S. Cl. 126/263, 206/219, 229/51 CE, 426/109, 426/113, 426/120

[51] Int. Cl. F24j 1/02, B65b 25/22

[58] Field of Search..... 126/263; 62/294; 206/219-222; 426/113, 114, 109, 119, 120, 106, 112, 124, 394, 398, 407; 229/51 CE, 51 R, 66, 85; 220/48

[56] References Cited

UNITED STATES PATENTS

1,929,599	10/1933	Millholland.....	229/51 CE
2,373,611	4/1945	Steven	126/263
2,801,930	8/1957	Paulucci	426/113 X
2,850,391	9/1958	Gunsberg.....	426/113 X
2,994,469	8/1961	Troup et al.....	229/51 CE
3,085,681	4/1963	Fazzari.....	206/222

3,287,140	11/1966	Brussell.....	426/113 X
3,422,992	1/1969	Brooks et al.....	206/222
3,638,918	2/1972	Denholtz.....	206/222 X
3,653,372	4/1972	Douglas	126/263
3,680,689	8/1972	Grundschober et al.	206/222

FOREIGN PATENTS OR APPLICATIONS

1,214,600	4/1966	Germany	206/222
1,156,334	6/1956	France	426/120

Primary Examiner—Frank W. Lutter
Assistant Examiner—Steven L. Weinstein
Attorney, Agent, or Firm—Finnegan, Henderson, Farabow and Garrett

[57] ABSTRACT

A self-warming container for precooked foods is hereby provided, of the kind operating by means of an exothermic reaction between calcium oxide and water, wherein the water required for the exothermic reaction is contained in a hermetically closed envelope, opening of which at the moment of use is caused by a cutting blade being a part of a practically rigid control strip, compelled to slide in a guide applied on said envelope and to be actuated from outside the container. The container can be mass produced in an automated way at low cost and its operation is reliable.

5 Claims, 4 Drawing Figures

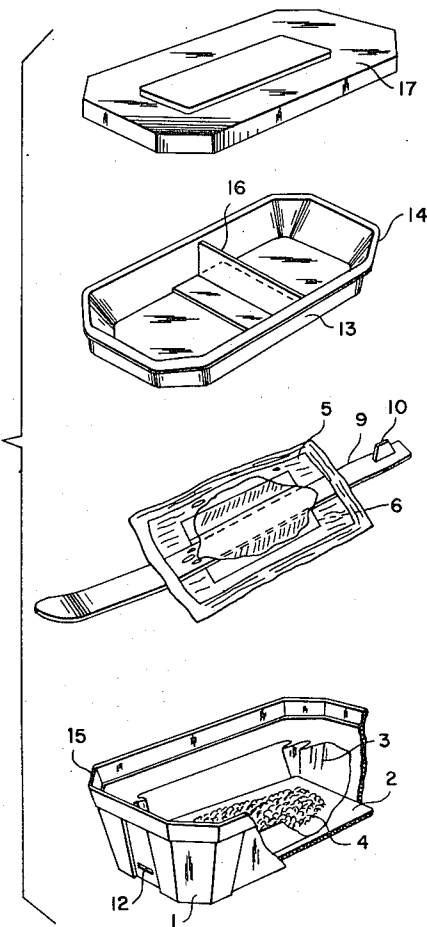
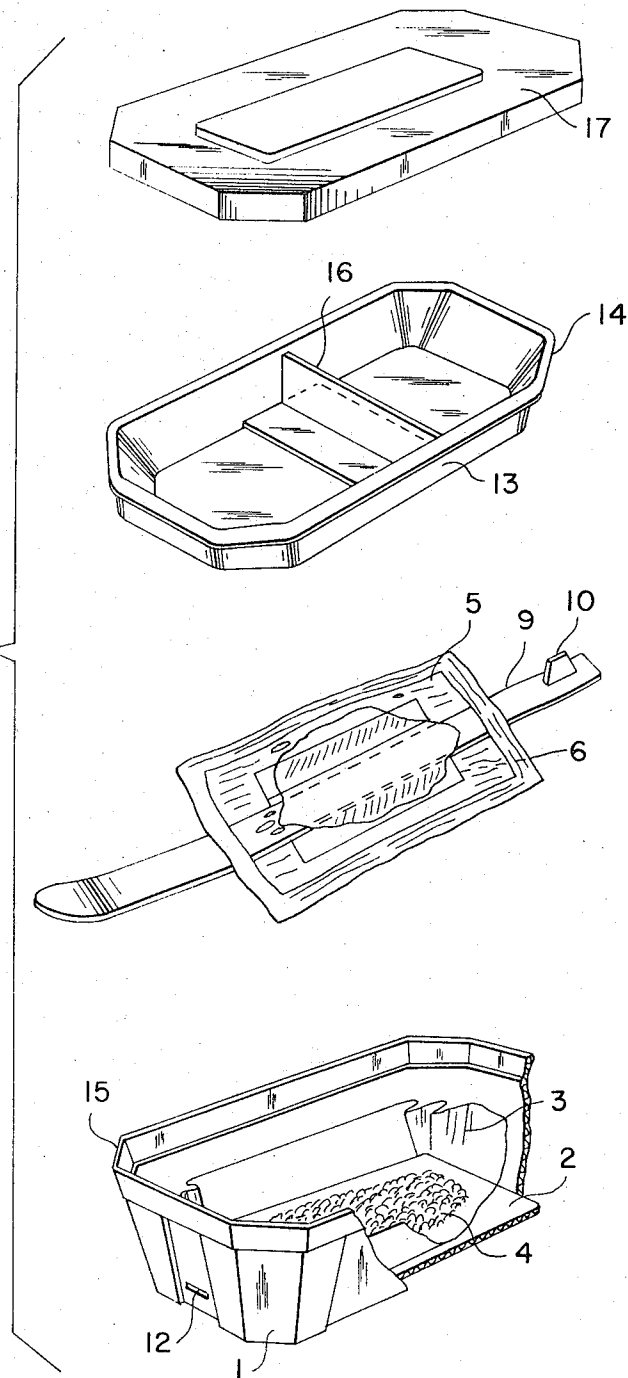


FIG. 1



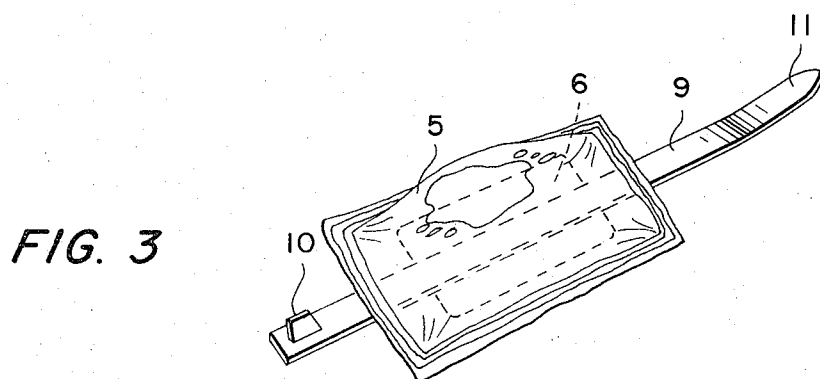
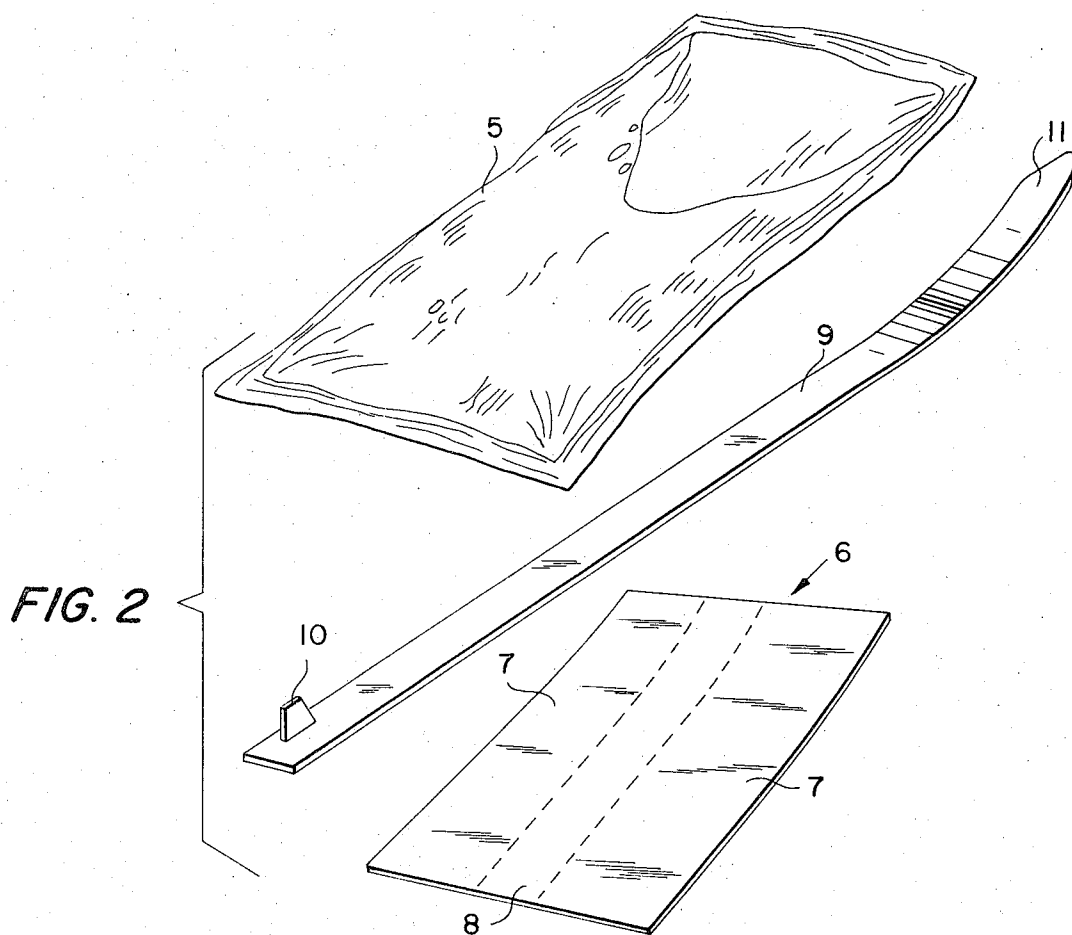
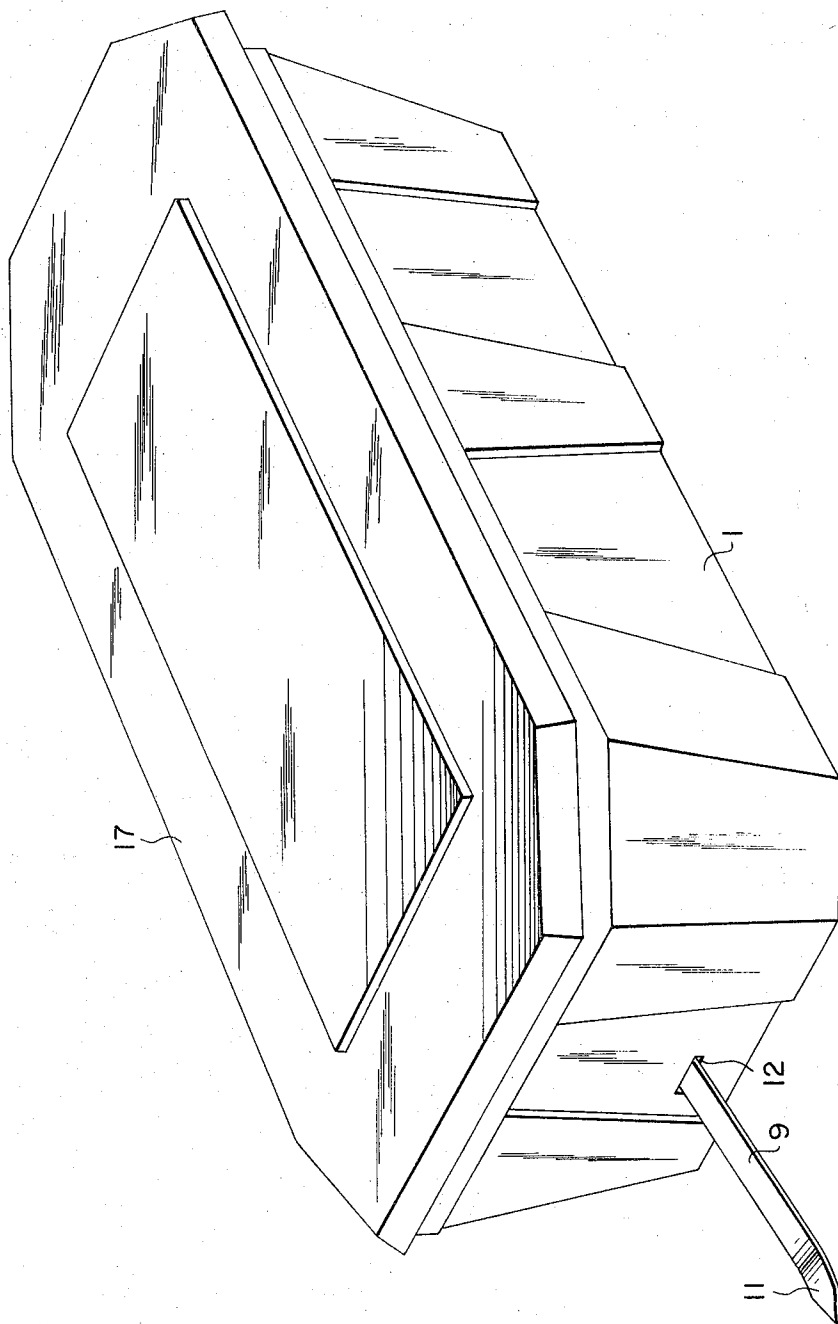


FIG. 4



SELF-WARMING CONTAINER FOR PRECOOKED FOODS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a self-warming container for precooked foods which may be manufactured in a completely automated manner at low price and high output.

2. State of the Art

Self-heating devices are already known, which are based on the principle of causing an exothermic reaction between water and calcium oxide, but these devices have complicated structure to manufacture, high cost and do not always provide a perfect operation, especially with regard to the system of opening the capsule containing the water which must be brought in contact with calcium oxide for starting the exothermic reaction.

SUMMARY OF THE INVENTION

The main object of the present invention is therefore to avoid said drawbacks and to carry out a self-warming container for precooked foods of easy construction, rapid automated assembling and reliable operation, although its manufacturing cost is considerably lower than that of the presently available devices.

These and other objects of the present invention are obtained by a self-warming container in which the water required for the exothermic reaction is contained in a hermetically closed envelope, opening of which at the moment of use is caused by a cutting blade being a part of a practically rigid control strip which is compelled to slide in a guide applied on said envelope and can be actuated from outside of the container.

The dose of calcium oxide is placed on a sheet arranged on the container bottom with interposition of a heat insulating layer, while the foods are placed in a tray fixed to the container and closing the top of the reaction chamber.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features and advantages of the self-warming container according to the present invention will be still more apparent from the following detailed description of a preferred embodiment, given as a non limiting example only, reference being had to the accompanying illustrative drawings, in which:

FIG. 1 is an exploded view of the container according to the present invention, showing the various elements of the device separated from one another, arranged in the logic sequence of assembling the container;

FIG. 2 is another exploded view of the water envelope, of its opening members and of the members guiding the cutting blade;

FIG. 3 is a perspective view of the same elements of FIG. 2 but in a position assembled on the water envelope; and

FIG. 4 is a perspective view of the self-warming container of the present invention, mounted, assembled and closed, ready for use.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the different figures of the accompanying drawings, the self-warming container ac-

cording to the present invention consists of a receptacle or box 1 of suitable material, such as pressed wood pulp, adapted to be made by moulding. On the bottom of box 1 and inside it there is a heat insulating layer 2 of corrugated board or other suitable refractory material, and on the layer 2 a sheet 3 of aluminum or other suitable material.

In the sheet 3 is then placed a predetermined dose 4 of an exothermic hydratable chemical reactant such as calcium oxide, preferably in the granulated form, and then on top of said dose 4 there is a hermetically closed envelope 5 containing water for the exothermic reaction.

The envelope 5 has a sheet 6 applied on one of the two sides, preferably the lower one, having two lateral adhesive zones 7 for application to the envelope and a central zone 8 without adhesive, which remains detached from the envelope 5 and forms a guiding and sliding channel for a control strip 9, preferably of practically rigid plastics, having a cutting blade 10 at one end while the other end 11 in the form of an actuating tongue is being passed through a cut 12 provided in one of the short sides of the box 1, so as to come outside the box in a position ready for use.

Also inside the box 1 is then applied a tray 13, also made of aluminum foil or other material being a good heat conductor, whose peripheral edge 14 is mechanically seam folded to the corresponding edge 15 of the box 1 so as to hermetically close the chamber where the exothermic reaction will take place. The tray 13 preferably has a movable partition 16 so as to divide it into two zones where for instance two different foods or two different courses of a meal will be placed. The box 1 is then completed by a cover 17 closing the whole container.

It has to be noted that all the various parts now described may be made and assembled entirely with machines, so that the container according to the present invention can be easily produced on a large scale in an economic and rapid way, so as to allow for the first time an industrialised production of containers of this kind.

The self-warming container so made is ready for use, and it will suffice to pull the tongue 11 for causing the control strip 9 to slide in the central guide 8 of the water envelope 5, until the cutting blade 10 will cut and open said envelope 5, whose water contents being poured on the dose 4 of calcium oxide will cause the exothermic reaction which will warm in an excellent way the foods contained in the tray 13, and which could also be taken in the same tray.

It has to be noted that the tongue 11 engages the whole slot or cut 12 of the box 1, and the strip 9 takes up most of the guide 8, so that deviations or other incorrect handling are not possible and therefore opening of the envelope by the cutting blade 10 is guaranteed. It has also to be noted that the chemical reaction is strictly restricted to the chamber hermetically closed by tray 13, so that the container is safe and develops all its calorific power for warming tray 13.

Therefore it will be understood from what has been described and illustrated, that the self-warming container according to the present invention wholly carries out the above mentioned objects, thus giving the solution to the problem of making an efficient, safe and economic self-warming container in an automated manner on an industrial scale.

3

It is also apparent that many variations, modifications, additions and replacements of elements may be made to the container according to the present invention, without departing however from its spirit and scope nor from its field of protection as defined in the appended claims.

We claim:

1. A self-warming container for precooked foods of the kind operating by means of an exothermic reaction between a chemical reactant and water disposed within the container comprising a closed envelope within the container containing the water, an exothermic hydratable chemical reactant located within the container for contact with the water when the envelope is opened and in an amount sufficient to heat the food when contacted with the water, a cutting blade adapted to open the envelope, a sliding control strip inside the container supporting said cutting blade, a guide for said control strip to move said cutting blade over said envelope, a tongue on said control strip extending outside the container, said guide for the control strip being a sheet adhesively secured to the envelope along two lateral zones leaving an unadhered central zone between the envelope and the guide, said control strip being situated in said central zone to be held in contact with the envelope whereby said control strip may be engaged by its tongue and pulled to move the strip in the central

4

zone and cause the cutting blade to open the envelope to free the water for contact with the calcium oxide within the container.

2. A self-warming container according to claim 1, wherein said chemical reactant is calcium oxide and an inert sheet is suitably arranged on the container bottom to receive the calcium oxide required for the reaction and a heat insulating layer is disposed between the inert sheet and the container bottom.

3. A self-warming container according to claim 1, wherein the control strip tongue is disposed at the end of the strip opposite to that where the cutting blade is placed and extends out through a suitable slot in one side of said container, where it can be engaged to pull the control strip and open the envelope for the reaction water.

4. A self-warming container according to claim 1, wherein a tray is disposed in said container to receive said foods, said tray having a seam folded to the container edges, the space between said tray and the container bottom forming a chamber for said reaction and a cover for closing said container.

5. A self-warming container according to claim 4, wherein the food tray has a movable partition for dividing it into two zones of variable capacity.

* * * * *

30

35

40

45

50

55

60

65