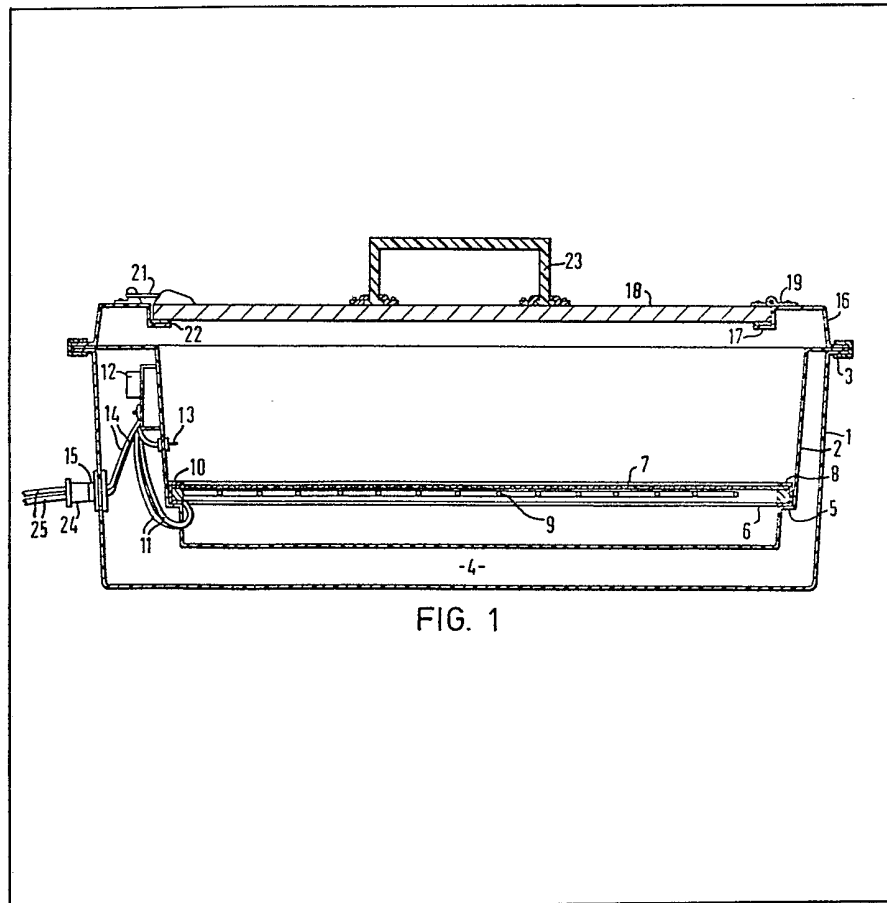


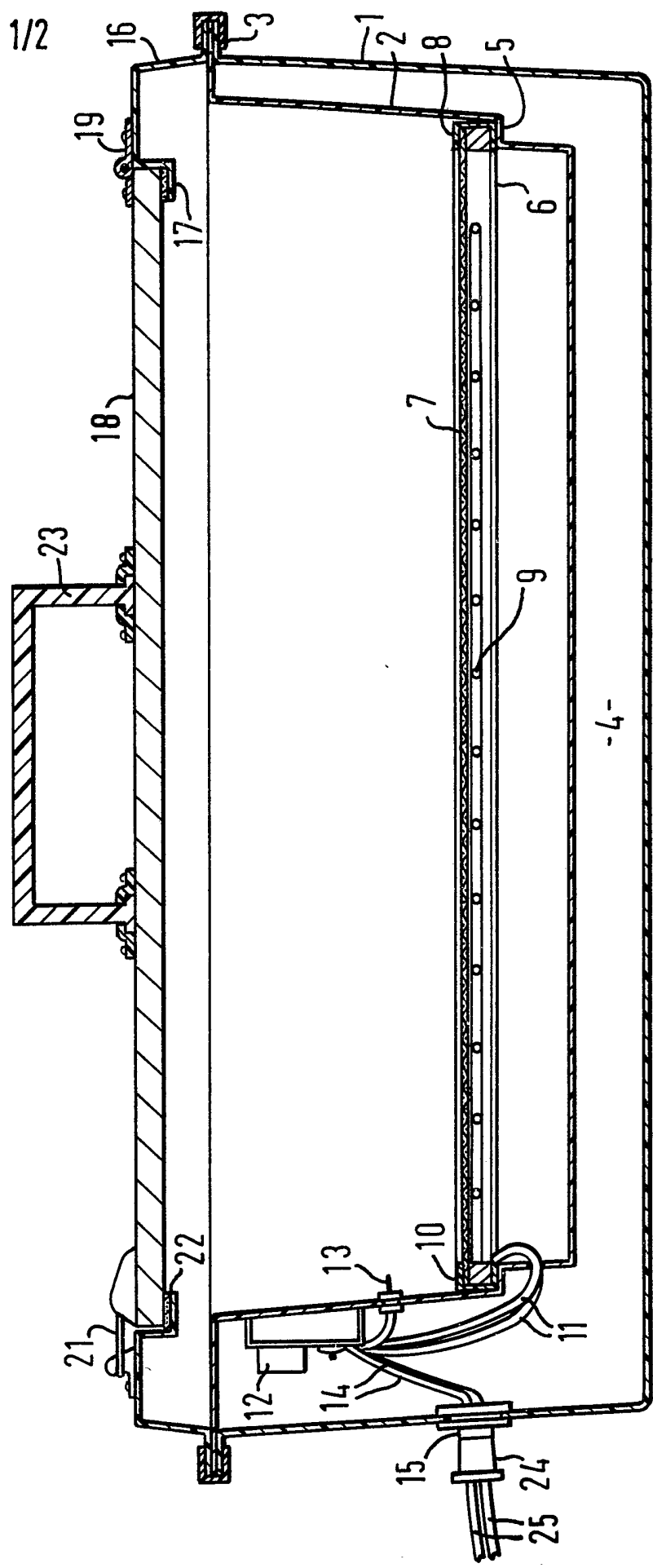
- (21) Application No **8014853**
- (22) Date of filing **2 May 1980**
- (30) Priority data
- (31) **79/25921**
- (32) **25 Jul 1979**
- (33) **United Kingdom (GB)**
- (43) Application published
18 Mar 1981
- (51) **INT CL³**
A47J 39/02
- (52) Domestic classification
A4D 9 X
A4A B1 B2
- (56) Documents cited
GB 1556796
GB 1428286
GB 1401138
GB 1333021
GB 1318680
GB 1228914
EP 0002563A
- (58) Field of search
A4A
A4D
A4G
B8P
- (71) Applicant
Thomas George Broad, 42
Marine Parade, Hythe,
Kent
- (72) Inventor
Thomas George Broad
- (74) Agents
R. R. Prentice & Co., 34
Tavistock Street, London
WC2E 7PB

(54) **Improvements in lunch boxes**

(57) A lunch box for keeping hot and/or for heating food placed therein comprises an open-topped container having an outer shell (1) and an inner shell (2), a heating element in the form of a resistance wire (9) mounted on a sheet (7) which rests on a ledge (5) provided on the side wall of the inner shell (2), a lid (18) adapted to cover the open top of the container and a toggle catch device (21) for releasably

securing the lid to the container. The outer and inner shells are secured together along their adjoining edges to define between them an enclosed space (4) which may be filled with thermally insulative material and a rim (16) for the top of the container is secured to the outer and inner shells at the location at which said shells are joined together. Heating of the resistance wire (9) is controlled by a thermostat (12).





-4-

FIG. 1

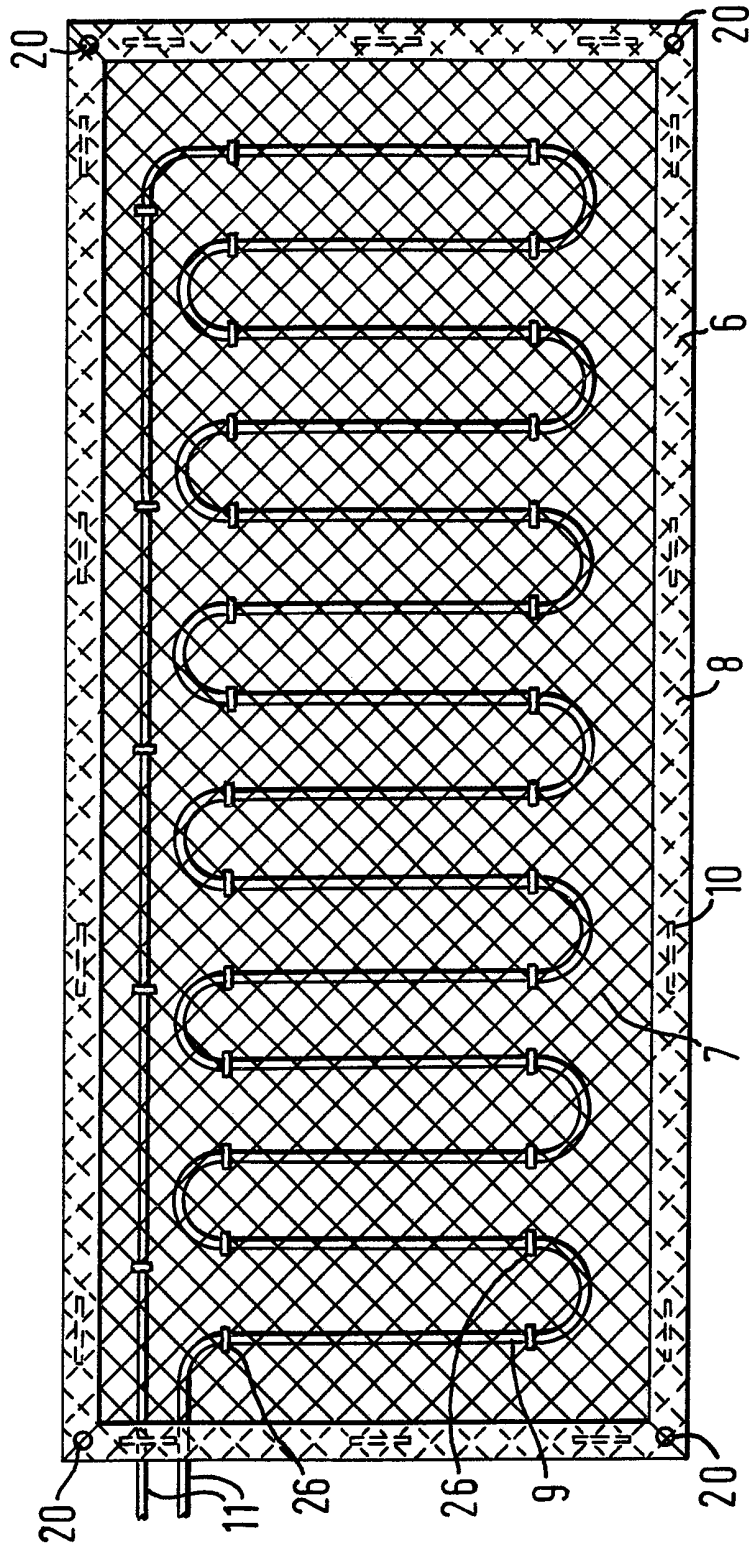


FIG. 2

SPECIFICATION

Improvements in lunch boxes

This invention relates to improvements in lunch boxes.

5 Conventional lunch boxes have the disadvantage that it is not possible to keep food hot inside them. Insulated containers have been suggested for solving this problem but such containers have not been wholly successful
10 because they are capable of keeping food only warm and not hot.

The present invention aims to overcome the disadvantages of known lunch boxes by providing a lunch box having means for keeping hot and/or
15 for heating food placed in the lunch box.

According to the invention, there is provided a lunch box for keeping hot and/or for heating food placed therein, said lunch box comprising an open-topped container having an outer shell and
20 an inner shell, a heating element mounted in or on the inner shell, a lid adapted to cover the open top of the container and means for releasably securing the lid to the container.

Preferably, the outer and inner shells consist of
25 glass-reinforced plastics material and are secured together along adjoining edges to define between them an enclosed space. A rim for the top of the container may be secured to the outer and inner shells at the location at which said shells are
30 joined to each other. The lid may be hingedly mounted on the rim or, alternatively, may be detachably secured thereto. The lid may be provided with a handle.

According to one embodiment of the invention,
35 the inner shell is provided with a ledge on its side wall and the heating element is mounted on a sheet adapted to rest at its edges on the said ledge. The sheet may comprise a solid sheet of aluminium or like material and the heating
40 element may be secured to one side of the sheet by means of aluminium foil secured to the sheet by adhesive or like means. Alternatively, the sheet may consist of expanded metal which is secured
45 to a frame which in turn is adapted to rest on the ledge on the inner shell. The sheet and/or frame is desirably secured to the inner shell by fastening means such as screws. A thermostat is desirably provided in the container to control the operation
50 of the heating element.

The invention will now be further described, by way of example, with reference to the drawings in which:—

Fig. 1 is a vertical section through one embodiment of a lunch box according to the
55 invention; and

Fig. 2 is a plan view of the heater element employed in the lunch box shown in Fig. 1.

Referring to the drawings, the lunch box comprises a container consisting of an outer shell
60 1 and an inner shell 2 which are connected together along their edges by a plastics beading 3. Except at the edges at which they are joined together, the two shells are spaced apart from each other to enclose a chamber 4. The inner shell

65 2 is provided in its side wall with a ledge 5 which extends all round the side wall of the inner shell 2 and serves to support the edges of a frame 6. Secured to one side of the frame 6 is a sheet of expanded metal mesh 7 and a bead or channel
70 of plastics material is fitted over the adjoining edges of the expanded metal sheet 7 and frame 6 and secured to the frame by staples 10. A heating element in the form of a resistance wire 9 is secured to the expanded metal sheet 7 on the side
75 which is secured to the frame 6 so that the heating element is located substantially wholly within the said frame. Two conductors 11 lead from the heating element 9 through one or two bores in the wall of the inner shell 2 to a
80 thermostat 12 which is mounted on the wall of the inner shell 2 in the chamber 4. A thermal sensor 13 is mounted in the wall of the inner shell 2 to sense the temperature within the compartment defined by said inner shell and this
85 sensor is also connected to the thermostat. The thermostat is also connected by conductors 14 to a socket 15 which is mounted in a bore in the wall of the outer shell 1.

The container further includes a rim 16 having
90 an outer edge which is connected to the edges of the outer and inner shells 1 and 2 by the beading 3 and a recessed ledge 17 at its inner edge. A lid 18 is connected along one side to the rim 16 by one or more hinges 19 (only one shown) and can be removably secured in position on the ledge 17
95 within the recess in the rim 16 by a toggle catch device 21. As an alternative, instead of the hinge(s) 19, toggle catch devices 21 may be provided at each end of the lid 18 so that the lid
100 can be completely removed from the container. A strip of resilient foam material 22 is secured to the ledge 17, e.g. by adhesive, to provide a substantially air-tight seal for the interior of the inner shell 2 when the lid 18 is secured in the
105 closed position. A handle 23 is secured to the upper surface of the lid 18 in a conventional manner.

Power for the heating element 9 is desirably derived from a battery (not shown), which may be
110 the battery for a motor vehicle but this is not essential and any suitable electric power source may be provided. A plug 24 connected by leads 25 to the power source (not shown) is insertable in the socket 15 to establish electrical connection
115 between the power source and the heating circuit of the lunch box. It follows that disconnection can be achieved simply by removing the plug 24 from the socket 15.

The outer and inner shells 1 and 2 of the
120 container as well as the rim 16 are preferably made from glass-reinforced plastics material although other materials may be utilised if desired. However, the use of this material enables the production of a strong article having a pleasing
125 appearance. The edges of the shells and the rim are preferably secured together by a suitable adhesive but may be secured by welding or bonding. If desired, the chamber 4 may be filled with a thermally insulative material such as glass

wool which should desirably be electrically insulative and non-inflammable. Further, the rim 16 is desirably also filled with thermally insulative material such as glass wool which is covered by a layer of aluminium foil secured to the edges of the rim by adhesive or other suitable means. The inner surface of the inner shell may also be provided with a coating, for example, a layer of aluminium foil secured to the inner shell by adhesive or other suitable means. The lid 18 may be made of wood or of glass-reinforced plastics material or a combination of both but this is not essential and any suitable material may be employed.

The frame 6 is preferably secured to the inner shell 2 on the ledge 5 by means of screws 20, one screw being provided at each corner of the frame. However, other suitable fixing means may be utilised if desired. The expanded metal sheet 7 may be covered, on its upper side, with a solid sheet made of a material having good thermal conductivity characteristics but this is not essential. The heating element 9 is preferably secured to the expanded metal sheet 7 by means of electrical clips 26 although other suitable means for fixing the element to the sheet may be employed if desired. The sheet 7 is desirably made of expanded aluminium or aluminium alloy but again this is not essential. The frame 6 is preferably made of wood.

In use, the lunch box is filled with hot food after which the lid 18 is closed and secured in place by means of the toggle catch device 21. The lunch box can then be transported by means of the handle 23 to a location at which the plug 24, which has previously been connected to an electric power source, is situated and the plug inserted in the socket 15. The heating element 9 will then be heated to keep the food hot and the temperature in the lunch box regulated by the sensor 13 which controls the thermostat 12 which in turn is effective to cut off the power supply to the heating element 9 when the temperature exceeds a predetermined value. When the temperature again falls below said value, the sensor 13 is effective to control the thermostat 12 to re-establish the power supply to the heating element 9. The electrical heating circuit in the lunch box is desirably arranged to operate between 6 and 48 volts. If desired, instead of placing hot food in the container, cold food may be placed therein and the heating element 9 used to heat up the cold food.

The invention is not restricted to the above described embodiment but modifications may be made without departing from the scope of the invention. For example, the outer and inner shells may, if desired, be made of a suitable metal or alloy such as aluminium instead of glass-reinforced plastics material. Moreover, the thermostat 12 could, if desired, be mounted on the wall of the outer shell 1 instead of on the wall of the inner shell 2 as shown in the drawing.

CLAIMS

1. A lunch box for keeping hot and/or for heating food placed therein, said lunch box comprising an open-topped container having an outer shell and an inner shell, a heating element mounted in or on the inner shell, a lid adapted to cover the open top of the container and means for releasably securing the lid to the container.

2. A lunch box according to claim 1, wherein the outer and inner shells consist of glass-reinforced plastics material and are secured together along adjoining edges to define between them an enclosed space.

3. A lunch box according to claim 2, wherein a rim for the top of the container is secured to the outer and inner shells at the location at which said shells are joined to each other.

4. A lunch box according to claim 3, wherein the lid is hinged mounted on the rim.

5. A lunch box according to claim 3, wherein the lid is detachably secured to the rim.

6. A lunch box according to any one of claims 3 to 5, wherein the rim is provided with a layer of insulating material.

7. A lunch box according to claim 6, wherein the insulating material is covered by a layer of aluminium foil secured to the rim by adhesive or like means.

8. A lunch box according to any one of claims 2 to 7, wherein the enclosed space between the inner and outer shells is filled with insulating material.

9. A lunch box according to any preceding claim, wherein the inner shell is provided with a ledge on its side wall and wherein the heating element is mounted on a sheet adapted to rest at its edges on the said ledge.

10. A lunch box according to claim 9, wherein the sheet comprises a solid sheet of aluminium or like material and wherein the heating element is secured to one side of the sheet by means of aluminium foil secured to the sheet by adhesive or like means.

11. A lunch box according to claim 9, wherein the sheet consists of expanded metal which is secured to a frame which in turn is adapted to rest on the ledge of said inner shell.

12. A lunch box according to any one of claims 9 to 11, wherein the sheet and/or frame is secured to the inner shell by fastening means.

13. A lunch box according to claim 12, wherein the fastening means comprise screws.

14. A lunch box according to any preceding claim, wherein a thermostat is provided to control the operation of the heating element.

15. A lunch box according to any preceding claim, wherein the inner shell is covered on its inner surface with a layer of aluminium foil.

16. A lunch box according to any preceding claim, wherein the lid is provided with a handle.

17. A lunch box substantially as described herein with reference to the drawings.