

May 10, 1960

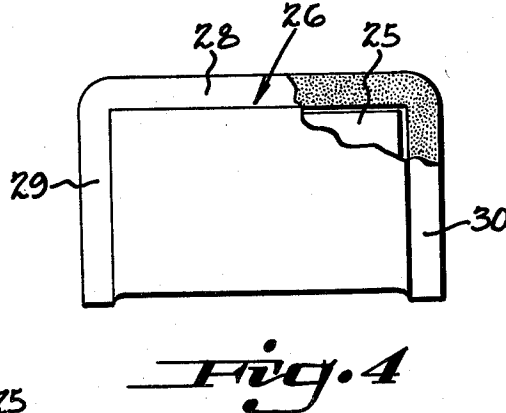
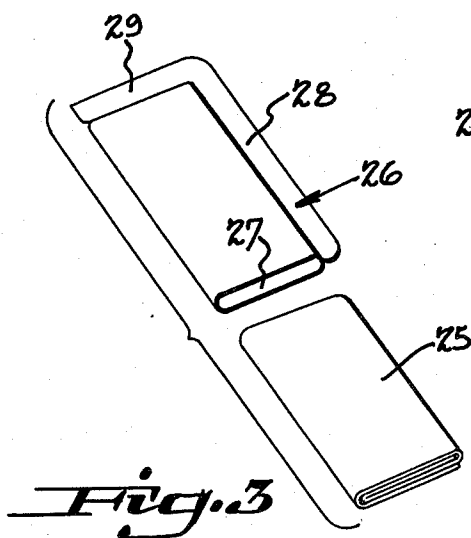
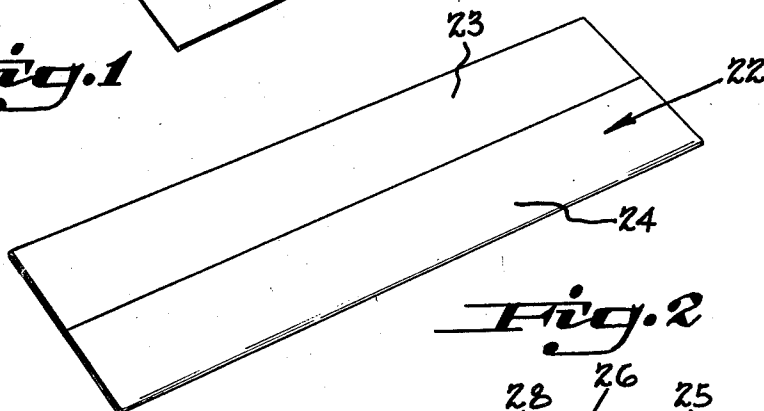
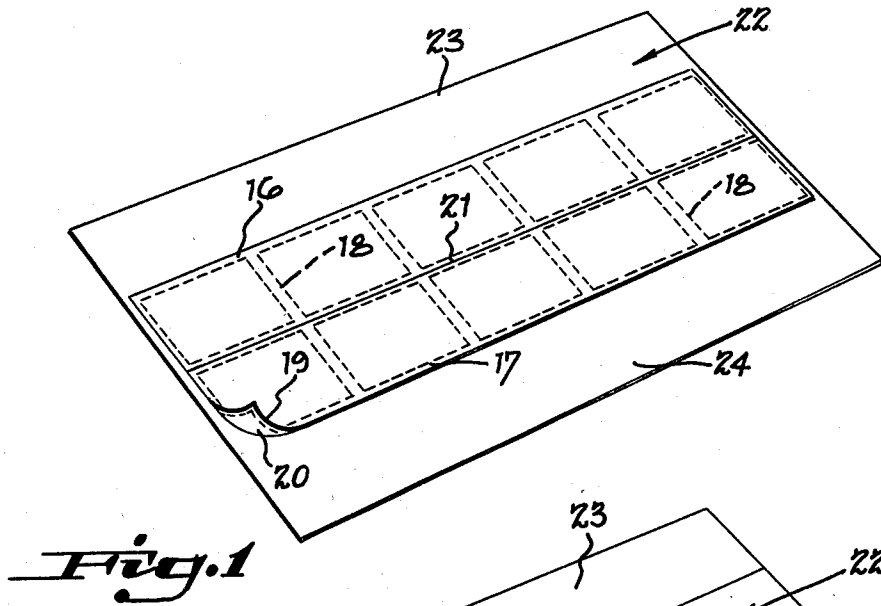
E. H. REIK

2,935,983

HEATER FOR CANNED FOOD

Original Filed May 17, 1954

4 Sheets-Sheet 1



INVENTOR.
Ella H. Reik.
BY
Wood, Heron & Evans
ATTORNEYS.

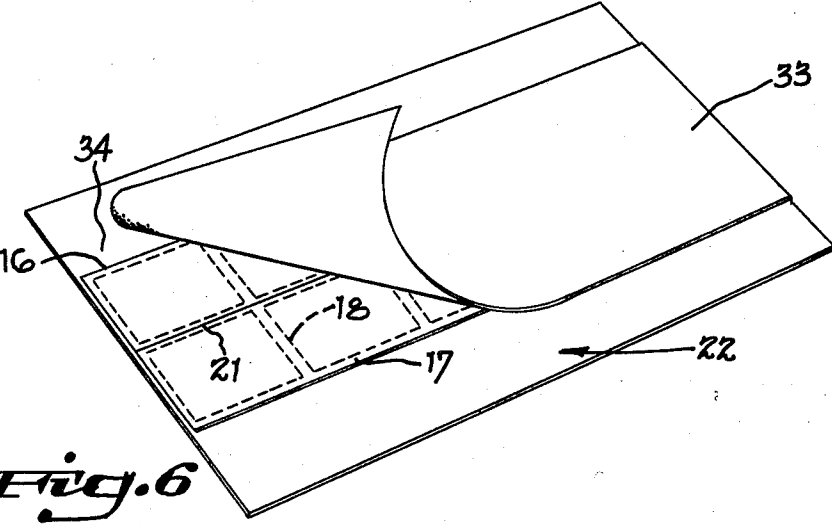
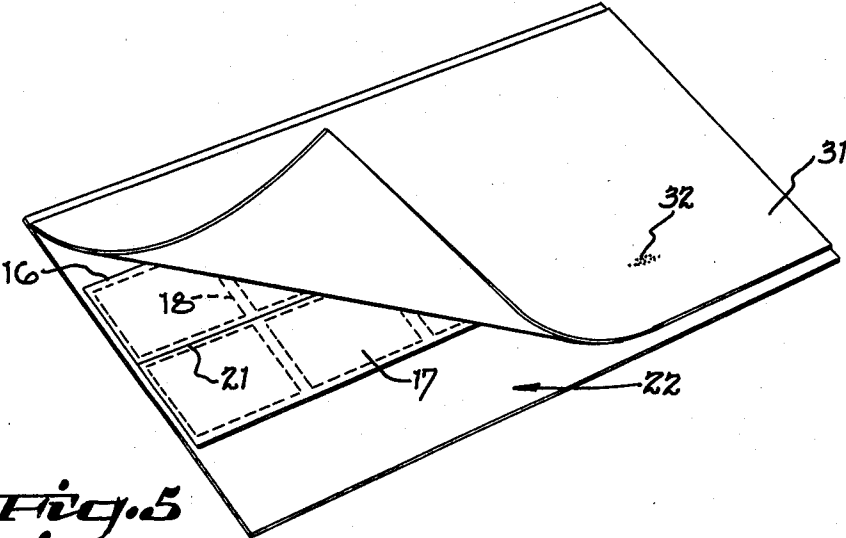
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E. H. REIK
HEATER FOR CANNED FOOD

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4 Sheets-Sheet 2



INVENTOR
Ella H. Reik.
BY *Wood, Heron & Evans.*
ATTORNEYS.

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E. H. REIK

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HEATER FOR CANNED FOOD

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4 Sheets-Sheet 3

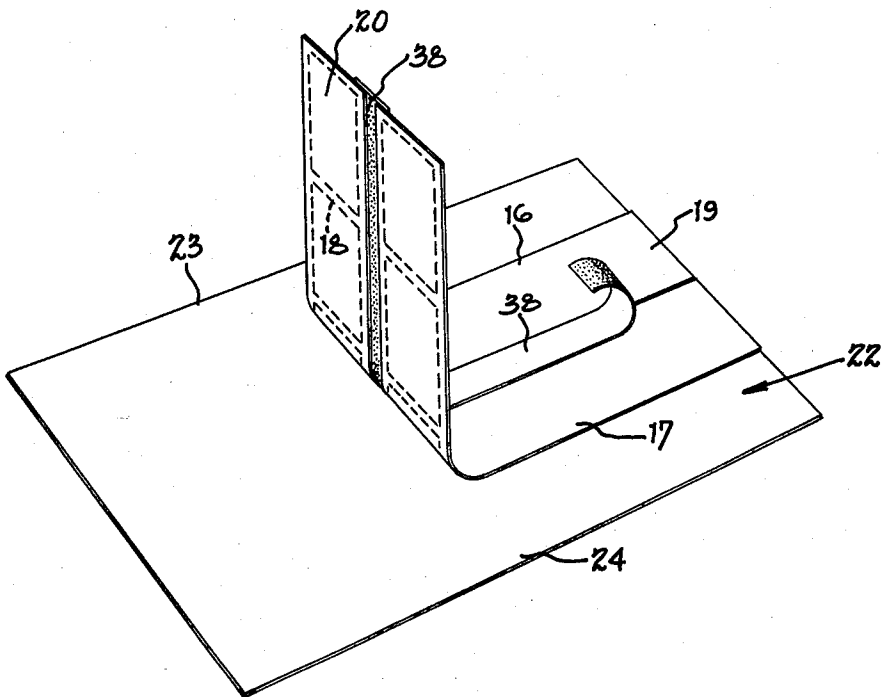


Fig. 8

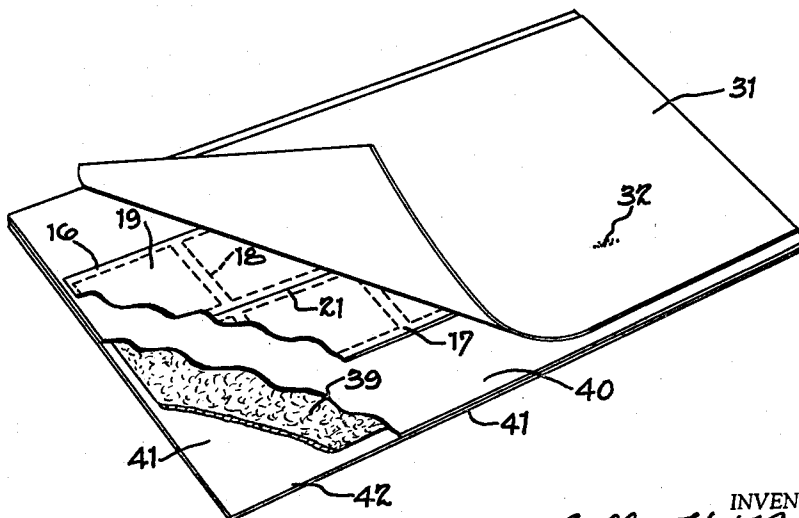


Fig. 9

INVENTOR.
Ella H. Reik.
BY
Wood, Herron & Co.,
ATTORNEYS.

May 10, 1960

E. H. REIK

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HEATER FOR CANNED FOOD

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4 Sheets-Sheet 4

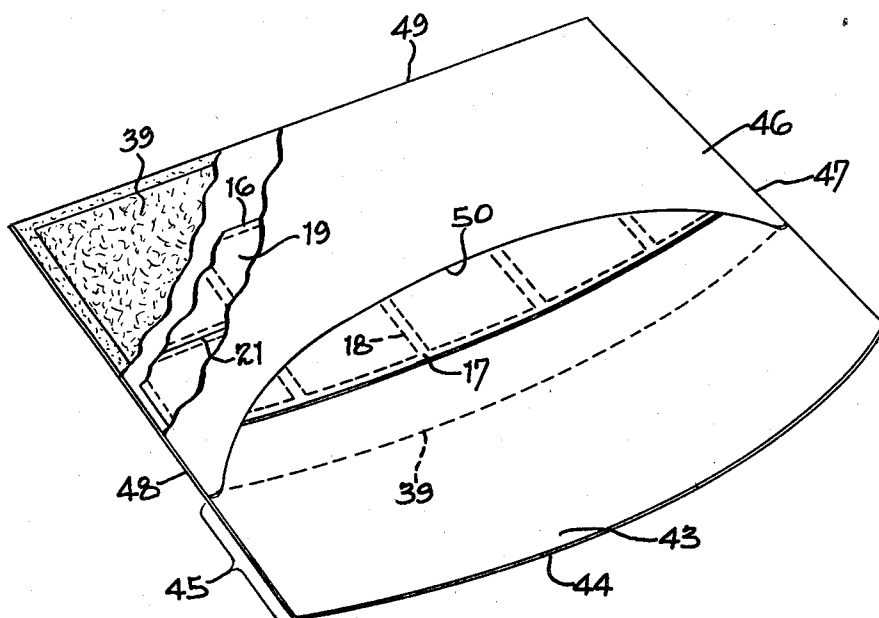


Fig. 10

INVENTOR.
Ella H. Reik.
BY *Wood, Heron & Kraus.*
ATTORNEYS.

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2,935,983

HEATER FOR CANNED FOOD

Ella H. Reik, Cincinnati, Ohio

Original application May 17, 1954, Serial No. 430,050, now Patent No. 2,814,288, dated November 26, 1957. Divided and this application March 15, 1957, Serial No. 650,807

7 Claims. (Cl. 126—263)

This invention is directed to a new article of manufacture which is designed to heat canned foods by means of water activated exothermic materials. The invention also concerns, as an article of manufacture, a packaged food heater of the type set forth.

The present application is a division of Serial No. 430,050, filed May 17, 1954, now Patent No. 2,814,288, which application was a continuation-in-part of Serial No. 270,157, filed February 6, 1952, now abandoned.

It is one of the objectives of the invention to provide an article of the type described which is adapted to accommodate a wide variety of different shapes and sizes of cans in which food is packaged. In the fulfillment of this objective, I provide a food heater which is adapted to be wrapped tightly around a can of food to conform to its contours. When thus wrapped around a can, the food heater completely seals in the can so that little of the heat generated upon the activation of the exothermic chemicals is lost.

It is a further objective of the invention to provide an article of the type set forth which may be folded up into a small and compact package substantially no larger than an ordinary wallet, so that it may be carried handily in a person's pocket. The small size of the heater also makes it possible, from a practical point of view, to package one or more heaters in a box or carton of canned rations of the type issued to members of our Armed Forces.

Another objective of the invention is to provide an article of the type set forth which is adapted to be manufactured in continuous strip form, and the individual heater units being cut from the continuous strip, in order to reduce manufacturing costs.

A further objective of the invention is to provide, as a unitary package, a heater of the type set forth which is folded into a small, compact bundle and which is enclosed within an envelope designed to protect the water activated exothermic materials from moisture in the air and to conserve their strength by protecting them from the deteriorating effects of oxygen in the air.

The food heater which is the subject of the invention is particularly well suited for use by troops in the field for heating canned rations and the like. However, it is not limited to this particular use, and it will be seen that it may be used on any occasion to heat canned or packaged foods where it is either impractical or impossible to provide or obtain ordinary heater facilities.

In the preferred embodiment the article comprises a strip of metal foil to which is affixed a plurality of rectangular, water activated exothermic pads. These pads are disposed in a pattern which permits the sheet to be folded to bring the pads one on top of the other so that when the sheet is completely folded up it is approximate-

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ly the same length and width as one of the pads. In use, the sheet is simply wrapped around the food or container to be heated, the exothermic pads moistened, and then the edges of the metal foil crimped together to completely enclose the food. The heat produced upon the activation of the pads is thus confined and, when a bright metal foil such as aluminum is used, little heat is lost through radiation. By entirely enclosing the food a surprisingly small amount of exothermic material is required, or as incorporated in the article, a surprisingly small number of pads of exothermic material is required.

The invention also contemplates a sheet of metal foil in which the exothermic pads are positioned at one end only, so that when the sheet is wrapped around a can or other food container (with the pads in contact with the container) a substantial portion of the sheet, free of pads, is available to be wrapped around the container, a number of times for insulation purposes.

In the latter form, a portion of the sheet not having exothermic pads upon it can be torn from the remainder of the sheet and be used to tightly enclose unpackaged foods, such as pre-cooked meats, to seal the food from the gases which are formed in an exothermic reaction, these gases usually being of a type which might impart an unpleasant taste to unpackaged or unsealed foods.

The invention also contemplates a heater in which an absorbent sheet of paper or other material is provided to prevent chemically saturated water from leaking out of the heater when it is being used. In addition to this, the invention contemplates the use of insulating material to serve as a means to better conserve the heat generated by the exothermic materials and to prevent serious burns should the heater be inadvertently handled after activation of the chemicals.

Other features and advantages of the invention will be readily apparent to those skilled in the art from the following description of the drawings in which:

Figure 1 is a perspective view showing a heater incorporating the principles of the present invention in which the individual exothermic pads are formed as part of a continuous strip.

Figure 2 is a perspective view of the heater of Figure 1 showing it in partially folded condition.

Figure 3 is a perspective view showing the heater of Figure 1 completely folded and ready for insertion into a protective enclosure.

Figure 4 is a side elevational view of a packaged heater unit with a portion thereof broken away to show a corner of the folded heater inside of the protective covering.

Figure 5 is a modification of the heater in which a sheet of moisture absorbent paper material is used to cover the exothermic pads.

Figure 6 is another modification in which a sheet of metal foil is provided to cover the exothermic pads.

Figure 7 is a perspective view illustrating the heater of this invention as it appears when wrapped around a can of food.

Figure 8 is another modification in which two individual strips of pads are utilized with means being provided to secure the two strips to the rectangular sheet of foil along its longitudinal center.

Figure 9 shows another modified form of the invention in which a layer of insulating material is provided.

Figure 10 is another modification in which the pads of exothermic material are disposed in a pocket and insulating material is provided.

The pads which are employed may include water acti-

vated exothermic materials of the type described in U.S. Patents No. 2,384,720, No. 2,239,410 or any other of the well known mixtures available commercially. Preferably, the chemicals of the mixture are enclosed in an envelope of paper or other material which will permit the ready passage of water. The pads should be substantially flat or thin. It is preferred that the pads be affixed to the metal foil sheet by an adhesive which is water resistant, adhesives of this sort also being well known and available commercially. The amount of chemicals used in the pads and the number of pads used is, of course, dependent upon the efficiency of the chemical mixtures. However, it is believed to be well within the knowledge of those skilled in the art to select the proper mixture for any one embodiment of the invention, inasmuch as the amount of heat required is a factor dependent upon the particular use to which the article is to be put.

Figure 1 shows a modified form of my heater in which the exothermic chemical pads are provided in strip form. Two such strips are utilized; one being indicated by the numeral 16 and the other by the numeral 17. The individual pads in each of these strips are indicated by 18. Each strip of pads comprises a band of water absorbent paper or cellulosic material 19 on one side thereof and a band of thin aluminum foil 20 on the opposite side thereof. The two bands are adhesively joined along both edges at the ends and at equally spaced intervals along transverse lines to define a plurality of rectangular pockets which are disposed lengthwise of the strip. Exothermic chemicals in powder form are enclosed within each of the pockets to provide the individual pads 18. If desired, the two strips 16 and 17 may be made as one with the water absorbent sheet material 19 adhesively joined to the thin aluminum sheet material 20 along the line designated 21 which extends longitudinally of the center of the heater. In this instance, the large, wrap around, outer rectangular, sheet of aluminum foil is designated 22. The two strips are disposed in the central area of the large sheet 22 so as to provide substantial marginal areas 23 and 24 which may be crumpled, crimped or twisted together when the heater is wrapped around a can of food as shown in Figure 1.

This modification of the heater may be folded up by bringing the two edgewise marginal areas of the aluminum foil sheet 22 on top of the respective strips of pads as is shown in Figure 2. The heater then may be folded on the transverse divisions between individual pads to provide the small packet designated 25 in Figure 3. This packet is then sealed in an envelope 26. The envelope is formed from a sheet of heavy paper such as kraft having an inner liner of plastic covered aluminum foil 27. The plastic coating of the liner 27 preferably is of the type which may be sealed by heat. In Figure 3 the envelope is shown doubled over with the two thicknesses sealed together along one edge 28 and at one end 29. Figure 4 shows the packet 25 inside of the envelope and with the second end, designated 30, closed by heat sealing. It is preferred that the air in the envelope be exhausted just prior to forming the final seal and that a dry, inert gas such as nitrogen be used to replace the air. In this way there is no danger of either the oxygen or the moisture in the air sapping the strength of the exothermic chemicals. The envelope with the packet 25 inside is approximately the size of an ordinary wallet so that it may be carried handily in a person's pocket or packed with canned rations.

In the modification shown in Figure 1, the foil side of each strip of exothermic pads is affixed to the sheet 22 by adhesive so that the water absorbent side of the pads is exposed when the heater is opened. The same type of arrangement is provided in the modification shown in Figure 5, however, in this instance an auxiliary sheet of water absorbent paper or cellulosic material designated 31 is used to cover substantially the entire inner face of

the heater. This auxiliary sheet may be affixed to the sheet 22 by a spot of adhesive such as that indicated at 32 so that it may be folded back to provide access to the pads for moistening them. The purpose of the large auxiliary sheet of absorbent material is to insure that excessive water, if carelessly applied in the initial activation of the chemical in the pads, does not drip from the heater when it is wrapped around a can of food. This is an advantageous feature because the chemicals or the reaction products of the chemicals may be toxic to some individuals.

Under certain circumstances or where highly toxic chemicals are utilized in the pads it may be found expedient to cover the pads with an auxiliary or inner sheet of aluminum foil such as the one indicated at 33 in Figure 6. In this instance, auxiliary sheet 33 is secured by adhesive 34 along one longitudinal edge thereof to the outer sheet of foil 22. This permits the auxiliary sheet to be raised so that moisture may be applied to the pads. After such moisture is applied, the sheet may be folded down over the pads and the heater then wrapped around the can of food in the manner previously described. The sheet 33 of foil, being between the pads and can of food, prevents toxic products from making contact with the can.

In the modification shown in Figure 8, the strips of pads are reversed relative to the outer sheet of foil 22. This particular modification has the advantage that the foil side of the strips is against a can of food to protect it against toxic products. The respective strips, with their foil sides up, are spaced from one another slightly along the midline of sheet 22 and a strip of adhesive tape 38 used to hinge and affix both strips to the wrap-around sheet of foil 22. In order to activate chemicals in the two strips of pads they may be swung up from the sheet. After being moistened they may be laid down and the heater used as described before.

The modification of Figure 9 is substantially like that shown in Figure 5 but with this difference. Instead of a single sheet 22 of wrap-around foil two are provided and a thin pad of insulating material 39, such as glass wool, is sandwiched between them, the inner sheet being indicated at 40 and the outer one at 41. The respective sheets 40 and 41 may be secured together by adhesive applied along their outer edges, as indicated at 42, to provide a pocket for enclosing the insulating pad 39. The insulating material, of course, functions to conserve the heat generated during the activation of pads 18.

Another form of the invention is shown in Figure 10 in which an insulating pad 39 is also employed. In this instance, however, the pad is sandwiched between two sheets 43 and 44 of wrap-around material which are substantially wider than sheet 22 so that an extension or flap 45 is provided at the one side of the heater. The two strips of pads, which may be affixed to the sheet 43 of foil by adhesive, like in Figure 1, are enclosed in a pocket constituted by a third sheet of aluminum foil 46 which is affixed by adhesive at its two ends 47 and 48 and at one side thereof to the corresponding ends and side of the sandwiched portions of outer sheets 43 and 44. This leaves an open side 50 to provide access to the pads in order to apply moisture for activating them. Once the pads have been moistened, the flap portion 45 of the two sheets 43 and 44 may be folded over the open side 50 of the pocket to entirely enclose the pads. After this, a can of food may be rolled up inside of the heater and the two marginal areas of the heater at the two ends of the can crumpled, crimped or twisted together to seal the can inside.

In all of the forms of my invention which I have disclosed, the outer sheet or sheets, including the insulated articles of Figures 9 and 10, is adapted to be wrapped around a can of food to entirely surround and enclose it. The substantial marginal portions at the two sides of the outer sheet, which are free of pads, are adapted to be

crumpled together at the respective opposite ends of the can of food. In each instance, the water activated exothermic pads, which are permanently secured to the inner face of the sheet, are adapted to embrace the sides of the can of food in intimate contact when the sheet is wrapped around the can as aforesaid. Furthermore, it will be noted that in every modification, the thin, individual pads are disposed in a spaced pattern which permits the outer sheet to be folded up at places between pads to provide a small packet which may be enclosed within a protective envelope such as the one indicated by the numeral 26.

The heater (and the modifications thereof) of the present invention has a number of advantages and features not found in exothermic food heating devices of the past. Perhaps most outstanding is the fact that the present heater is adapted to accommodate itself to a wide variety of differently shaped and different sizes of cans. Heretofore, exothermic food heaters have taken the form of rigid containers or stove-like devices of a particular size, whereas the wrap-around nature of food heaters embodying the principles of the present invention accommodates all sizes and shapes within reasonable limits. Equally important, the present food heater is adapted to be folded up into a small, compact packet which may be carried or packaged handily.

Having described my invention, I claim:

1. Means for heating a can of food in the field, said means comprising a rectangular sheet of aluminum foil which is adapted to be crumpled readily by hand, said sheet being adapted to be wrapped around said can circumferentially thereof to entirely surround it, said sheet having substantial marginal portions at the two opposite longitudinal side edges thereof which are adapted to be crumpled and twisted together at the respective opposite ends of said can to enclose the same when said sheet is wrapped around said can as aforesaid, at least one strip extending longitudinally of said sheet in the central area thereof inwardly of said marginal portions, said strip consisting of an inner sheet and an outer sheet, said inner sheet being adhesively affixed to said rectangular sheet of aluminum foil, said outer sheet made of water absorbent material, the respective inner and outer sheets being joined together adhesively along their respective longitudinal side edges, at their respective ends, and at transverse lines which are spaced equally longitudinally thereof to provide a plurality of flat, rectangular pockets, water activated exothermic material in powder form enclosed within each of said pockets, and the respective marginal portions of said rectangular sheet of aluminum foil adapted to be folded inwardly to cover said strip and the sheet of foil then folded up on said transverse lines into a small packet in which said exothermic material within the pockets is entirely enclosed by said sheet of foil.

2. Means for heating a can of food in the field, said means comprising a rectangular sheet of aluminum foil which is adapted to be crumpled readily by hand, a pair of strips disposed side by side and extending longitudinally of said rectangular sheet of foil in the central area thereof, each of said strips consisting of an inner sheet and an outer sheet, said inner sheet being adhesively affixed to said sheet of foil, said outer sheet being made of water absorbent material, the respective inner and outer sheets being joined adhesively along their longitudinal side edges, at their ends and at transversely disposed lines which are spaced equally longitudinally of the strip to provide a plurality of substantially thin, rectangular pockets, water activated exothermic material in powder form enclosed within each of said pockets, substantial marginal portions at the opposite longitudinal side edges of said sheet of foil which are free of said strips, said sheet of foil adapted to be wrapped around a can to entirely surround it circumferentially with said marginal portions of the sheet ex-

tending beyond the opposite ends of the can, whereby said respective marginal portions may be crumpled and twisted together at each end of the can to enclose and seal it therein, and the combined areas of the respective marginal portions being at least as large as the central area of the foil sheet which is covered by said strips, whereby said marginal portions may be folded inwardly to cover said strips, and the sheet of metal foil then may be folded up on the transverse lines between said pockets to provide a substantially small packet in which the exothermic material is enclosed entirely by foil.

3. Means for heating a can of food in the field, said means comprising a rectangular sheet of aluminum foil that may be wrapped circumferentially around said can by hand so as to entirely surround it, at least one strip extending longitudinally of said sheet in the central area thereof, said strip consisting of an inner sheet and an outer sheet, said inner sheet being adhesively affixed to said rectangular sheet of aluminum foil, said outer sheet being made of water absorbent material, the respective inner and outer sheets being joined together adhesively along their respective longitudinal side edges, at their respective ends, and at transverse lines which are spaced equally longitudinally thereof to provide a plurality of flat, rectangular pockets, water activated exothermic material in powder form enclosed within each of said pockets, additional aluminum foil sheeting to removably cover said exothermic strips when the heating means is activated and wrapped around a can of food so that the surface of the can does not contact said exothermic strips.

4. The means for heating a can of food in the field as set forth in claim 3 in which said flat, rectangular pockets are substantially thin and are disposed in a spaced pattern which permits the said means to be folded up at places between said pockets so as to provide a compact bundle in which the pockets are enclosed by said aluminum foil and are protected thereby for shipping purposes.

5. Means for heating a can of food in the field, said means comprising at least one rectangular sheet of aluminum foil which is adapted to be crumpled readily by hand, said sheet being adapted to be wrapped around said can circumferentially thereof to entirely surround it, said sheet having substantial marginal portions at the two opposite longitudinal side edges thereof which are adapted to be crumpled and twisted together at the respective opposite ends of said can to enclose the same when said sheet is wrapped around said can as aforesaid, at least one strip extending longitudinally of said sheet in the central area thereof inwardly of said marginal portions, said strip consisting of an inner sheet and an outer sheet, said inner sheet being adhesively affixed to said rectangular sheet of aluminum foil, said outer sheet made of water absorbent material, the respective inner and outer sheets being joined together adhesively along their respective longitudinal side edges, at their respective ends, and at transverse lines which are spaced equally longitudinally thereof to provide a plurality of flat, rectangular pockets, water activated exothermic material in powder form enclosed within each of said pockets, an auxiliary cover sheet being affixed to said rectangular sheet of aluminum foil so as to completely cover said strips of rectangular pockets containing the said water activated exothermic material, means to introduce water underneath said auxiliary cover sheet so as to contact the water absorbent face of said strips, the respective marginal portions of said rectangular sheet of aluminum foil being adapted to be folded inwardly to cover said auxiliary cover sheet and the sheet of foil then folded up on said transverse lines into a small packet in which said exothermic material within the pockets is entirely enclosed by said sheet of foil.

6. Means for heating a can of food in the field as set

forth in claim 5 in which the auxiliary cover sheet is composed of water absorbent material.

7. Means for heating a can of food in the field as set forth in claim 5 in which the auxiliary cover sheet is composed of metal foil.

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