Sept. 24, 1957 W. L. MORRISON 2,807,548

METHOD OF PACKAGING FOOD AND THE LIKE

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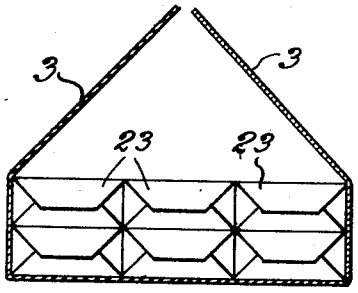


Fig. 1

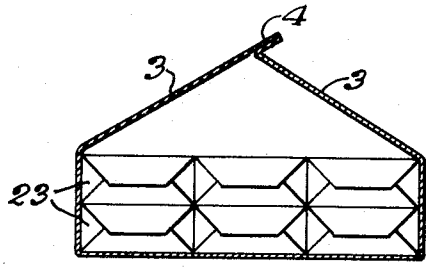


Fig. 2

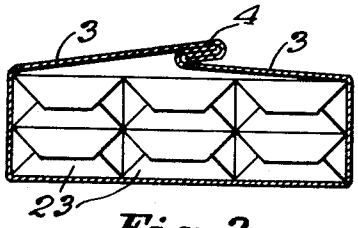


Fig. 3

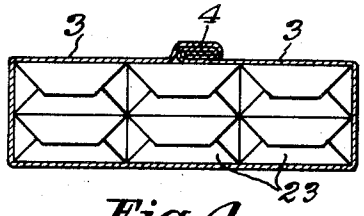


Fig. 4

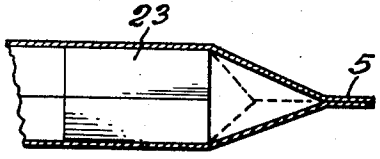


Fig. 5

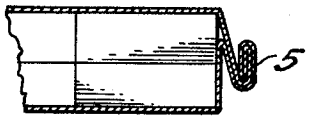


Fig. 6

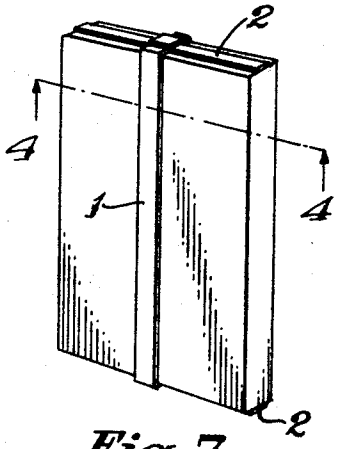


Fig. 7

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METHOD OF PACKAGING FOOD AND THE LIKE

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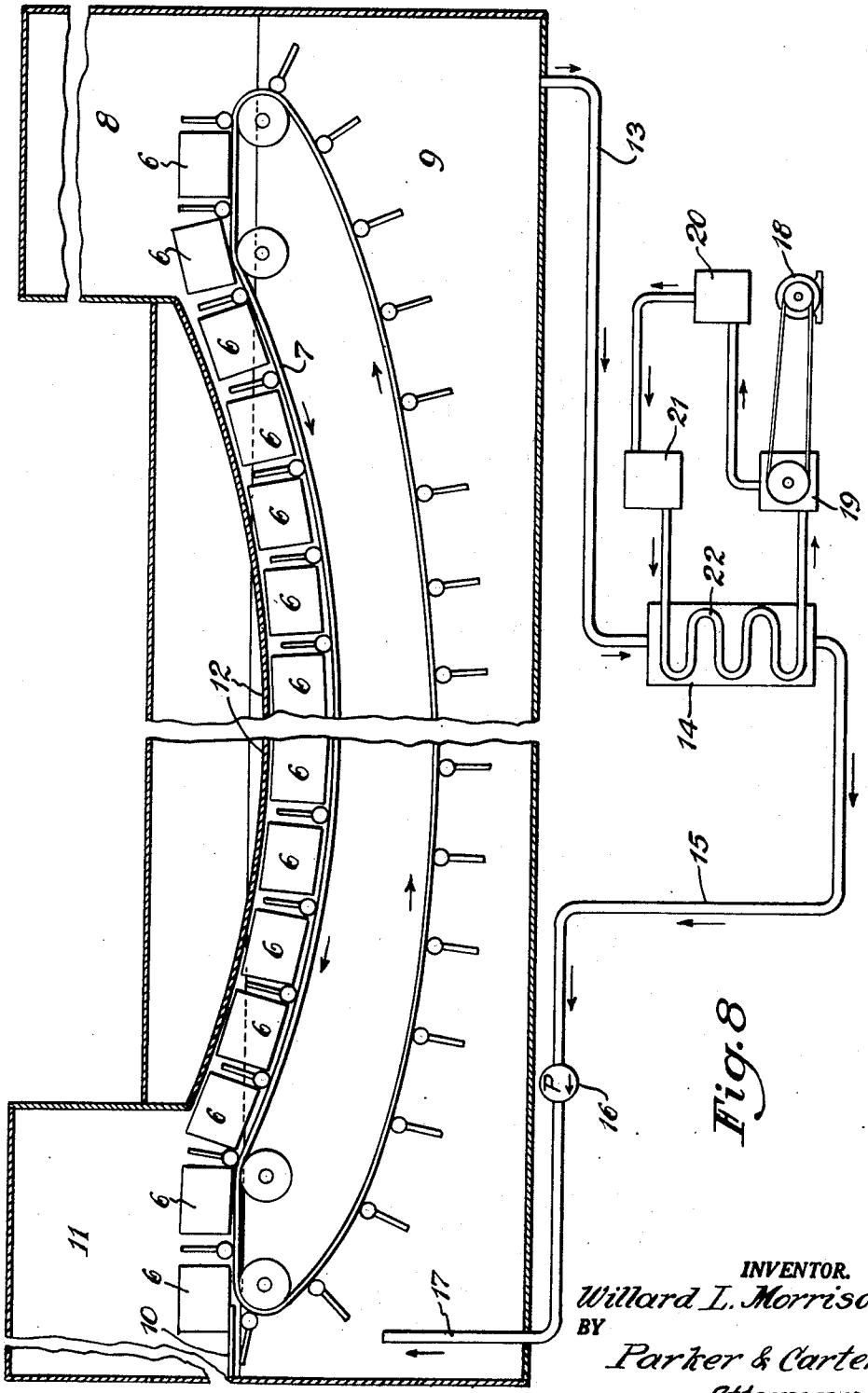


Fig. 8

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METHOD OF PACKAGING FOOD AND THE LIKE

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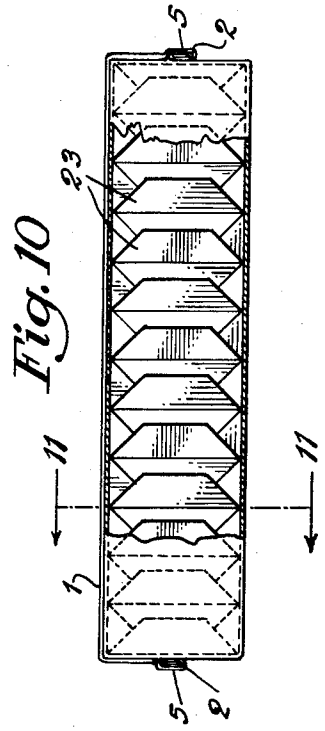


Fig. 10

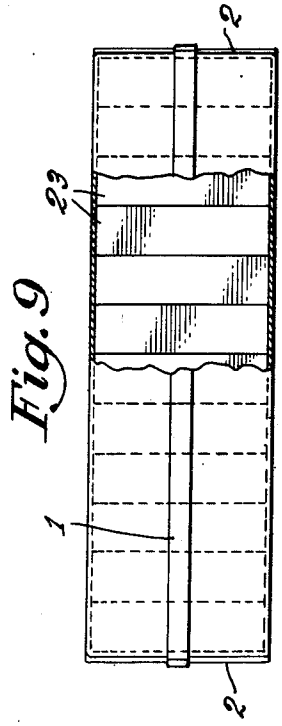


Fig. 9

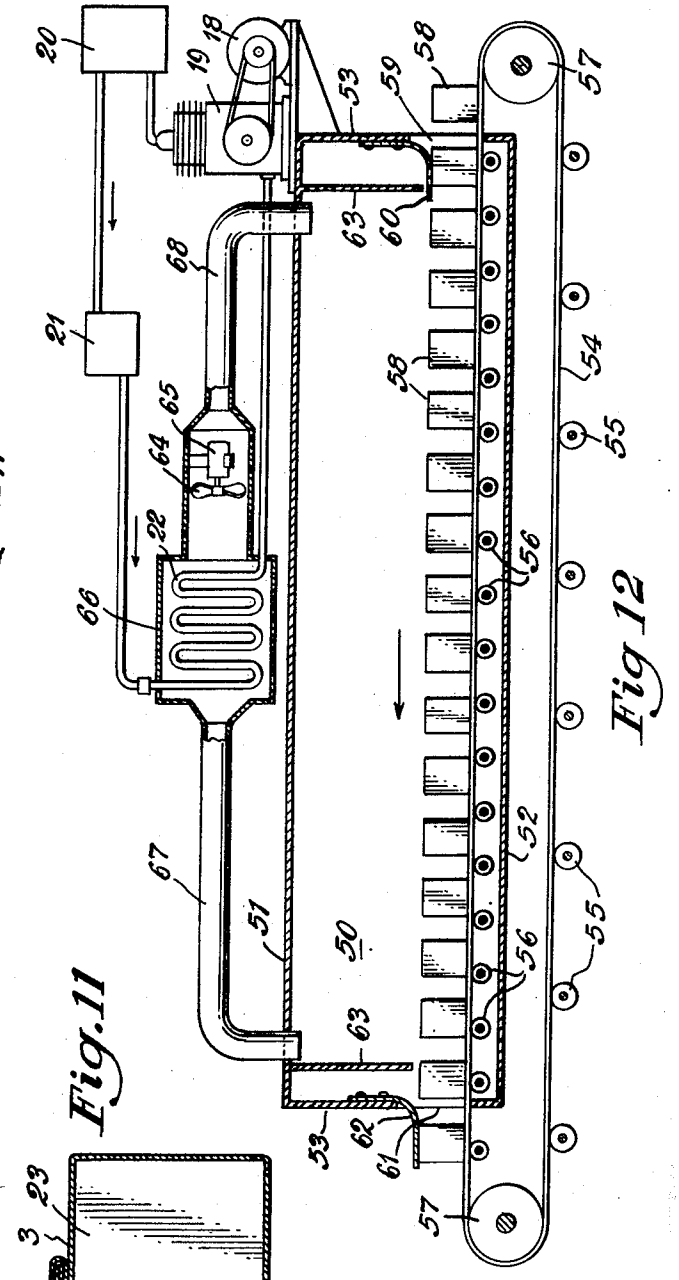


Fig 12

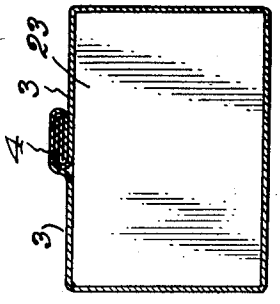


Fig. 11

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METHOD OF PACKAGING FOOD AND THE LIKE

Willard L. Morrison, Lake Forest, Ill.

Application February 5, 1954, Serial No. 408,322

4 Claims. (Cl. 99—171)

My invention relates to a method of packing food and the like, and to the resultant package.

This application is a continuation-in-part of my allowed application Serial Number 59,352, filed November 10, 1948, now abandoned.

One object of my invention is to provide an improved method of packing food for freezing and shipment.

Another purpose is to provide a means of preserving the aesthetic appearance of food packages.

Another purpose is to provide a means of packaging food cartons so that dehydration is eliminated.

Another purpose is to provide a means of packaging food cartons so that the weight of the food is maintained.

Another purpose is to provide a method of heat sealing food packages wherein the sealing act takes place at a point remote from the food.

Another purpose is to provide a means whereby frozen food stored in a humid room will remain dry.

Other purposes will appear from time to time in the course of the specification and claims.

Because food stuffs and the like are usually shipped and sold in frozen condition in decorated and labeled packages and because the buying public regards the appearance and condition of the package as important evidence of the character of the contents, it is of the utmost importance that the package be filled, frozen, shipped, stored, and displayed for sale with a minimum amount of deterioration of package appearance; and my invention therefore involves a process and a container which makes it possible to freeze the package, ship it, and store it, and present it to the ultimate purchaser in optimum condition and appearance.

It has been customary in the past to pack food in flat rectangular containers of paper or the like containing approximately one pound of food. These containers are then separately frozen and packed in a generally square box in which some of the containers are in contact with the outer wall of the box, other containers are spaced from the box wall. These individual packages are frozen to a very low temperature and, when they are packed in shipping boxes, this is done ordinarily in a room with a temperature higher than the temperature at which they were frozen. These packages are then moved from the freezing plant to storage or the dealer's salesroom. Under these temperature conditions, which are much higher than the temperature at which the freezing takes place, moisture forms on the outside of the square container and also on the food; and the container and food lose their appearance. Sometimes the food itself actually deteriorates.

Every step in handling every individual package in an atmosphere and at a temperature different from the temperature at which it was frozen is dangerous and causes some measure of deterioration of the package and its contents because of condensation. So, if handling steps can be eliminated, improved results are obtained.

It would be desirable to freeze these packages in the box or carton in which they are shipped. Unfortunately,

this cannot be done commercially because food is a poor conductor and, since some of the packages are embedded in the center of the carton, it takes too long to freeze them. Hence, the packages in the box have been separately frozen.

My solution of the problem then, comprises the method in which the separate individual packages are assembled in a rectangular group, edge to edge or end to end, or both, and in which the group is not more than two packages thick. I propose to wrap this group in a thin flexible metallic wrapper. The metal wrapper is a good conductor and, if that wrapper is stretched tightly about the individual packages, then when those packages are frozen, they will support the wrapper and make a tight smooth easily-handled tote box.

If the wrapper is sealed so that liquid and vapor cannot pass through the walls thereof, then the group of packages can be frozen as a unit provided the packages are so grouped in the wrapper or tote box that at least one side and preferably one of the longer or wider sides of each package is exposed to and in contact with the metal wall of the tote box or wrapper so that heat can pass through that wall directly to the individual containers and bring about rapid freezing.

I propose after the group of packages has been assembled to wrap them in a thin sheet metal wrapper, the edges of which are sealed preferably by heat and pressure in such a manner as to form a vapor seal. The metal itself being, of course, impervious to vapor. This seal must be formed in an area or zone out of contact with the material. Otherwise, local heat might and usually will damage the packages and the contents. Having formed the seal, the wrapping edges having been brought together for that purpose, I then propose to wind the sealed edges upon themselves to exert a tension on the wrapper, thus holding the individual package together until the seal has been brought to parallelism with and in contact with the box of material. This seal formation and subsequent folding takes place along the major axis and at both ends. As a result, I have a tote box which contains the food and which can be put into a freezing zone or a wind tunnel or into a freezing bath and when removed from that bath for handling and shipping, all condensation takes place on the outside of the tote box and when the tote box is finally opened in the grocer's store and the individual frozen packages removed, they will be in exactly the same condition as they were when they came out of the freezing bath or chamber.

My invention is illustrated more or less diagrammatically in the accompanying drawings wherein:

Figure 1 is a transverse section through the partially completed package with the long edges of the wrapper in position to be sealed.

Figure 2 is a section similar to Figure 1 with the long edges of the wrapper sealed.

Figure 3 is a similar section with the folding of the sealed wrapper edges partially completed.

Figure 4 is a similar section with the sealed wrapper edges folded against the group.

Figure 5 is a section through one end of the partially completed package with abutting ends of the wrapper sealed.

Figure 6 is a section similar to Figure 5 with the sealed end partially folded.

Figure 7 is a perspective elevation of the completed package.

Figure 8 is a diagrammatic view partly in section of an immersion freezing system using the sealed tote containers filled with food cartons.

Figure 9 is a plan view in part section of a modified form of package.

Figure 10 is a side elevation in part section of the package shown in Figure 9.

Figure 11 is a section on an enlarged scale along the line 11—11 of section 10.

Figure 12 is a section through a modified form of freezing device.

Like parts are indicated by like symbols throughout the specification and drawings.

Referring first to Figure 7, I show the approximate shape of the tote container with a seam 1 indicated along the full length of one long side, and seams 2 along the top and bottom or two end members.

Figures 1, 2, 3 and 4 are taken on the line 4—4 of Figure 7 and illustrate the process of sealing and folding the long fold 1. A vapor-proof material such as aluminum foil or metal is used to make the tote containers. Food packages 23 are packed inside this vapor-proof material. The material of the tote container is cut so that the sides 3 to be sealed are of general length. In Figure 2 the portion near the ends of both members 3 is treated with a cement, heat and pressure combination so as to form a seal 4. This seal 4 is at a distance far enough away from the food so that the heat and cement do not contact the packages of food. Cementing at this safe distance prevents any possibility of damage or disfigurement to the food or the packages.

The seal 4 is then folded over inwardly upon itself as shown in Figure 3. Figure 4 is a section through the completed package with the seal folded against the package.

The two ends 2 are then sealed in similar manner as shown in Figure 5. The wrapper material is sufficiently long so that the seal can be made at 5 near the end of the vapor-proof material or wrapper. This seal 5 is also at a sufficient distance from the food so that the cement and heat do not affect the food or the packages enclosed in the box. These end pieces are then folded in similar manner as the side. The folding of the ends is illustrated in Figure 6.

In Figure 8, I show the vapor-sealed packages 6 traveling on a belt 7. The packages are loaded in an air-conditioned room 8 onto the belt 7 which carries them through an immersion tank 9 of some convection freezing fluid. As the packages emerge at the left side, they slide or are pulled off the belt onto a loading platform 10. This loading room 11, also air-conditioned, can be any convenient size, as I have indicated by the broken away section. It is important that both rooms, 8 and 11, have a low moisture content.

Between the loading room 8 and the unloading room 11 is a downwardly curved wall 12 at a level such that it will be immersed in the liquid contained in the reservoir 9 intermediate the rooms 8 and 11. The coolant for this reservoir circulates through the pipe 13, heat exchange reservoir 14, pipe 15, pump 16, pipe 17, to the freezing reservoir 9.

A motor 18, a compressor 19, a condenser 20, receiver 21, and evaporator system 22 is needed to cool the coolant down to a point at which the liquid in the cooling tank will cool the material being treated.

The freezing process illustrated in Figure 8 is covered in my copending patent applications S. N. 784,953, "Apparatus for and Method of Preparing Frozen Food for Shipment," now Patent No. 2,582,789, and forms no part of this invention.

In the modified form of package shown in Figures 9 and 10 the cartons 23 instead of being arranged edge to edge as in Figures 1 to 7, inclusive, are arranged side by side so that when they are wrapped by the foil wrapper to make a tote box or package, all four edges of the cartons are in direct contact with the metal foil wrapper and the cross-sectional area of the package is the same as the flat cross-sectional areas of each carton.

In the modified form shown in Figure 12 the packages are sealed not by immersion in a liquid but by exposure

to cold air. In this arrangement 50 indicates a cold air tunnel having top wall 51, bottom wall 52, and apertured end walls 53. A belt conveyor 54 carried on rollers 55 outside the chamber end 56 inside the chamber travels around pulleys 57, the driving means, forming no part of the present invention, are not illustrated. Packages 58 are placed on the belt conveyor and carried inwardly through the entry port 59 past the flexible flap 60, are exposed to cold air in the tunnel and leave the tunnel through the exit door 61 and flexible flap 62, false walls 63 are arranged inside the walls 53 to additionally prevent the escape of cold air from the tunnel 50.

Cold air is circulated through the tunnel 50 by means of a fan 64 driven by a motor 65. Air discharged by the fan in the cooling chamber 66 passes across the cold coil 22 and is discharged through a duct 67 to one end of the tunnel 50. Spent air from the tunnel 50 is drawn through the duct 68 by the fan 64 for re-circulation. The coil 22 is cooled by circulation of a refrigerant just as in Figure 8, the difference being that the coil 22 cools air rather than liquid.

While it is standard practice to enclose food stuffs and the like for final dispensing and sale in cardboard cartons, there are many circumstances under which if the cartons themselves are wrapped in conductive metal foil either over the cardboard carton or in place of it and then assembled, just as the cardboard cartons are assembled, the presence of a multiplicity of metal-conducting surfaces alongside of and between the cartons will substantially increase the rate of heat flow so that freezing of the contents is accelerated.

The relatively thin flat cartons enclosed in a flexible thin foil-like metallic wrapper can be frozen even though the cardboard wrapper offers no substantial path for heat flow but when there is associated with the cardboard wrapper or when the food stuffs are wrapped entirely in foil, much more rapid heat flow can take place and thus faster or more effective freezing of the entire assembly may occur.

It will be realized that, whereas I have shown and described an operative device, still many changes might be made in the size, arrangement, number and disposition of parts without departing materially from the spirit of my invention. I wish, therefore, that my showing be taken as in a large sense diagrammatic and illustrative, rather than limiting me to the precise showing.

The use and operation of my invention are as follows:

In the process of freezing food, numerous difficulties have arisen such as dehydration, loss of weight, and sweating of packages. This dehydration of the food makes the food inferior and the sweating of the packages mars the appearance of the attractive labels on the packages and thus lessens its eye appeal.

To overcome these difficulties, I have devised a means of enclosing a group of approximately 32 food packages into one vapor-sealed package or container. I do this by using aluminum foil or a thin sheet metal to wrap the group of packages. The ends are sealed together by the use of cement, heat and pressure or in any other suitable manner. This sealing means does not form part of my invention. By forming the seal at a distance from the food packages I avoid any possibility of the heat or cement coming in contact with the food or the individual food package in a manner that might mar the appearance or quality of the food or the packages.

Thus, the food packages can be vapor-sealed in the aluminum foil or light-weight metal and then frozen by immersion in a coolant, or by placing in a wind tunnel, or by direct contact with the evaporator of a refrigeration circuit. In any of these methods, the appearance of the package and the food will be preserved. Dehydration and loss of weight cannot take place. If the containers are placed in a humid room, sweat will form on the outside container but the packages of food on the inside will remain dry.

I claim:

1. The method of packing perishable material, including food stuff, which consists in arranging a plurality of separate, relatively soft, rectangular paper packages of the material in a group, side by side and end to end, to form a flat, relatively thin, elongated, rectangular body not more than two packages thick, providing a thin, metallic wrapper for said body, the width and length of which are respectively substantially greater than the transverse and longitudinal circumferences of the body, sealing the longitudinal edges of the wrapper to form a tube about the body the width of the seal being substantially less than the distance from the seal to the body, then folding the sealed edges together in a plurality of successive folds until they exert a tension on the wrapper and the folded portion rests against and is parallel with the adjacent surface of the body and projects outwardly from the plane of the wrapper, then sealing the ends of the tube, the length of the seals being substantially less than the distance between each seal and the body, then folding the sealed ends together until a tension is exerted on the wrapper and the folded portions lie against and are parallel each with the adjacent end of the body and project outwardly from the plane of the wrapper.

2. The method of packing perishable material, including food stuff, which consists in arranging a plurality of separate, relatively soft, rectangular paper packages of the material in a group in side by side contact wherein the faces of each package, perpendicular to the sides thereof, are exposed to form an elongated, rectangular body, one package thick, providing a thin, metallic wrapper for said body, the width and length of which are respectively substantially greater than the transverse and longitudinal circumferences of the body, sealing the longitudinal edges of the wrapper to form a tube about the body the width of the seal being substantially less than the distance from the seal to the body, then folding the sealed edges together in a plurality of successive folds until they exert a tension on the wrapper and the folded portion rests against and is parallel with the adjacent surface of the body and projects outwardly from the plane of the wrapper, then sealing the ends of the tube, the length of the seals being substantially less than the distance between each seal and the body, then folding the sealed ends together until a tension is exerted on the wrapper and the folded portions lie against and are parallel each with the adjacent end of the body and project outwardly from the plane of the wrapper.

3. The method of packing perishable material, including food stuff, which consists in arranging a plurality of separate, relatively soft, rectangular metal foil wrapped packages of the material in a group in side by side contact wherein the faces of each package, perpendicular to the sides thereof, are exposed to form an elongated, rectangular body, one package thick, providing a thin, metallic wrapper for said body, the width and length of which are respectively substantially greater than the transverse and longitudinal circumferences of the body, sealing the longitudinal edges of the wrapper to form a tube about the body the width of the seal being substantially less than the distance from the seal to the body, then folding the sealed edges together in a plurality of successive folds until they exert a tension on the wrapper and the folded portion rests against and is parallel with the adjacent surface of the body and projects outwardly from the plane of the wrapper, then sealing the ends of the tube, the length of the seals being substantially less than the distance between each seal and the body, then folding the sealed ends together until a tension is exerted on the wrapper and the folded portions lie against and are parallel each with the adjacent end of the body and project outwardly from the plane of the wrapper.

4. The method of packing perishable material, including foodstuffs, which includes the steps of packing the material in individual, rectangular, identical packages, arranging the individual packages side by side and end to end to form a rectangular body not more than two packages thick, thereafter wrapping the body in a thin metal foil wrapper, the width and length of which are respectively, substantially greater than the transverse and longitudinal circumferences of the body, bringing the opposed edges of the wrapper together at a point spaced from the body, sealing said edges together at said points to form a vapor- and liquid-tight seal, the sealed areas of said wrapper being spaced from said body, and thereafter folding one pair of the sealed edges together in a plurality of successive folds until they exert tension on the wrapper and the folded portion rests against and is parallel with the adjacent surface of the body, then folding the other pair of sealed edges together in a plurality of successive folds until they exert a tension on the wrapper and a folded portion thereof rests against and is parallel with the adjacent surface of the body.

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