

July 23, 1963

H. B. SKEES

3,098,560

INSULATING MATERIAL FOR PREVENTION OF THE TRANSFER OF HEAT

Filed July 14, 1958

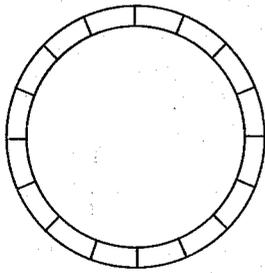


FIGURE 2

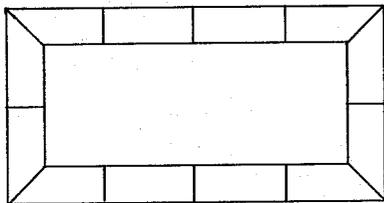


FIGURE 3

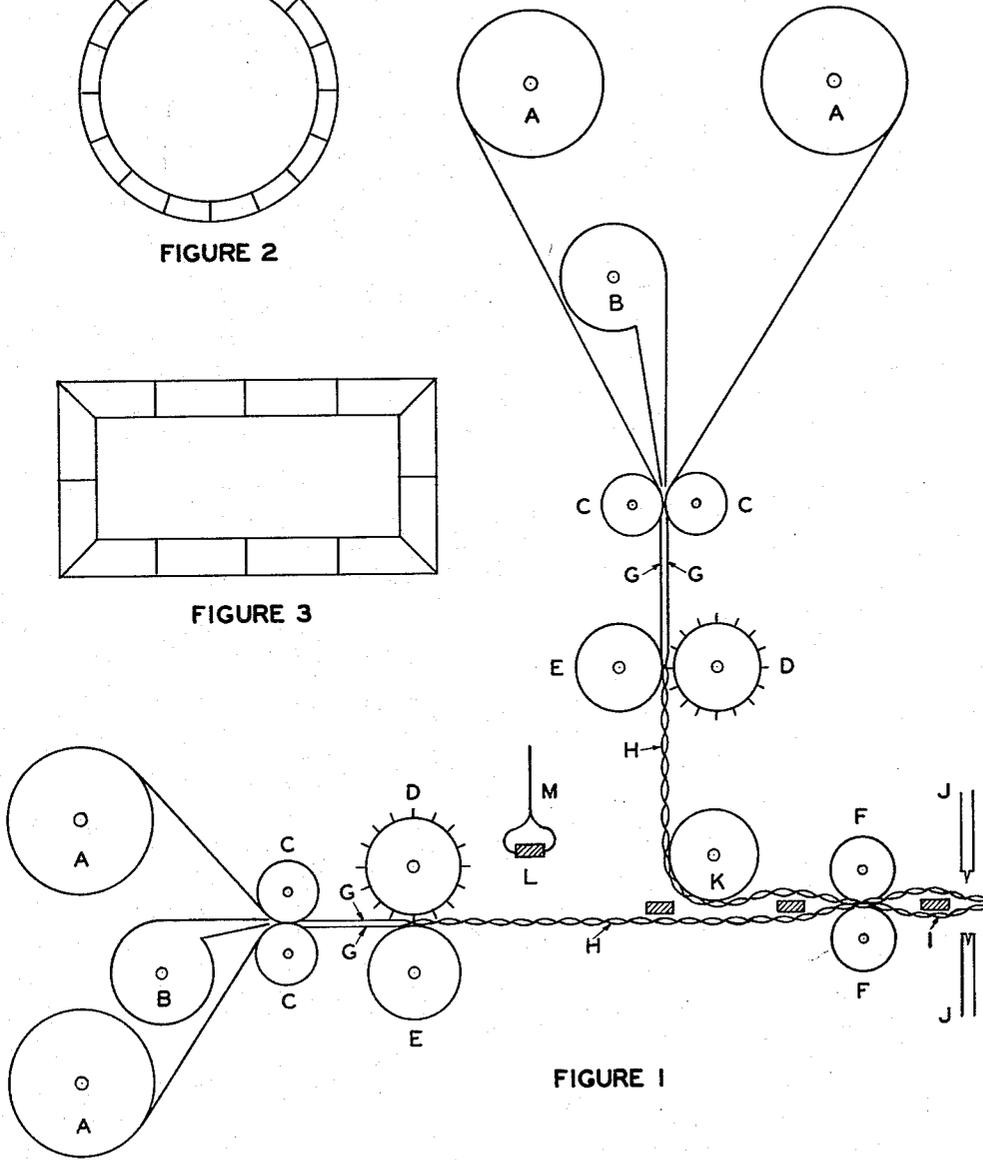


FIGURE 1

INVENTOR

Hugh B. Skees

1

3,098,560

INSULATING MATERIAL FOR PREVENTION OF THE TRANSFER OF HEAT

Hugh B. Skees, 10514 Sonata Drive, Afton 23, Mo.

Filed July 14, 1958, Ser. No. 748,455

10 Claims. (Cl. 206—45.33)

This invention relates to an improved heat barrier which insulates against the transfer of heat. More specifically, it relates to an improved material for use in packaging or wrapping foods and other items which are normally kept cold or normally kept hot. It also relates to an improved insulating material for clothing.

It is generally known that frozen foods should not be thawed or melted until they are ready for use, or else they will lose some of their flavor or other qualities. For this reason, it is essential that such foods be kept frozen during all stages of their processing, shipping, and sale. A problem has existed in this regard which has not previously been economically and practically solved. This is, when such frozen food items are purchased by the consumer, these items must be rushed home and placed in a freezer or refrigerator before they have time to thaw or melt. In fact, during hot weather, such frozen items will thaw, at least partially in a few minutes, unless the package is so constructed as to insulate it from absorption of heat.

An object of this invention is to provide such a package which will insulate the frozen food or other material from heat absorption sufficiently to prevent melting or thawing of the frozen item during a longer time than has been possible with other conventional types of wrappers or packages.

It is an object of this invention to provide an insulating wrapping or packaging material for any item which is normally kept cold and should be protected against the absorption of heat.

A problem has also existed in regard to food items which are normally kept hot. There are certain stores and restaurants which sell hot food "to go" which is taken home or to some other place to be eaten by the customer. If the time between the sale of this food and the eating of it is very long, the food, which was hot when it was brought, will become cold. It is an object of this invention to provide an insulating wrapper or package which will keep such items hot for a longer time than has been possible with conventional types of wrappers or packages.

Another object of this invention is to provide an improved insulating material to be used in the manufacture and construction of clothing. This insulating material makes it possible to produce clothing having extremely light weight combined with the ability to keep the wearer warm. The insulating material which this invention describes may be incorporated into articles of wearing apparel by using it as a third layer which is held between the lining and the outer fabric. This provides a dead-gas space without the use of any fiber or filler except gas, which can be made to any desired thickness, and which will prevent the loss of body heat.

The novel wrapper or package or clothing insulator which this invention describes is so constructed that a dead-gas space of relatively large volume is entrapped and held by two or more thin films, such as plastic films. Other wrappers or packages have been used in the past which consisted of two or more thicknesses of paper or other material, which may or may not have held very small amounts of air between them, but none of these were purposely inflated or had as their purpose to entrap a dead-gas space, or actually entrapped enough air or gas to provide appreciable insulation.

This invention is accomplished by wrapping the item

2

in a package prepared by the following method, or by using the inflated material so produced to effect insulation against the transfer of heat when used in the construction of clothing, or when used to prevent the transfer of heat to a cold item or away from a hot item.

Two sheets of a material, preferably a transparent plastic film, such as polyethylene, saran, etc., which can be heat-sealed, but which can be some other material of comparable properties, are laid one on top of the other so that their edges coincide. These edges are then sealed together, preferably by heat, so that an air-tight seal is obtained. Also, numerous points or lines over their common area are sealed such that the two sheets are sealed together at these points or lines. These may be points distributed at distances of from 1/8 inch to 2 inches apart or more, for example 1/4 inch to 1 1/2 inches, but preferably 1/2 inch to 1 inch, depending on the thickness of the material desired. These sealed patterns may be in the form of lines instead of dots, which lines may run the entire length or width of the sheet. In fact, for some applications, it is preferred that crossing lines be sealed over the area of the insulating material, thus producing what has the appearance of many tiny pillows all attached to each other at their edges. This type of sealing pattern isolates each segment so that if a puncture should occur, only that small area where the puncture occurs will become deflated. The accompanying drawings show some possible methods of manufacture of the type of insulating material described by this invention and its use for packaging.

FIGURE 1 is a diagrammatic view in front elevation of the apparatus for forming the heat insulating barrier members of this invention.

FIGURE 2 is a front elevation of an extrusion die for forming the heat insulating barrier member of this invention.

FIGURE 3 is a front elevation of still another embodiment of an extrusion die for forming the heat insulating barrier member of this invention.

The plastic film or other material is fed from rolls A in FIGURE 1. These sheets converge between rollers C which are so constructed that pressure and heat are applied where the edges of the sheets come together, and thus the edges of the two sheets are sealed to each other. As these sheets pass between rollers C, blower B directs a blast of air between them, inflating the space between them to form that section shown in FIGURE 1 as G. G passes between rollers E and D and in so doing roller D, which is heated, applies pressure against roller E, at the points of the spikes, thus sealing the two sheets together at regular points over their common surface. The force of air from blower B still maintains sufficient pressure at this point to keep the space between the sheets inflated.

Two such assemblies as this provide two strips or inflated double sheets of wrapping material which converge at roller K, which is only a guide roller. At a point before K is reached, some type of apparatus M places the item to be packaged on the strip which is moving horizontally. This is done at regular intervals as the strip moves along, so that the items are regularly spaced on the strip. As the two strips converge, they pass between rollers F, which apply pressure and heat at the edges of the two strips and seal them together. A sealing and cutting knife, J is so designed and synchronized with M that each time a packaged item passes, it severs the strips and seals them at the cut edge. This produces a packaged item which is wrapped according to the specifications of this invention, in a package which provides a dead-gas space which completely surrounds the item and insulates it against the absorption of heat.

It is to be understood that my invention is not to be limited by this process of manufacture of this inflated in-

insulating material, since numerous variations of equipment for manufacture are possible. Various materials might also be used, such as certain types of paper, or certain fabrics or cloth impregnated with plastic or some such material to make them resistant to the diffusion of gasses, but these other materials would not be as satisfactory. Also, other means of sealing, such as glue or adhesives may be used which would still be an embodiment of this invention. Another variation would be to seal lines across the area of the two sheets instead of points. Still another variation would be to extrude a sort of double-walled tube, such as would be obtained if the plastic material in a molten state were extruded through a die as shown in FIGURE 2 or FIGURE 3. In short, any method which has as its object or result the production of a wrapping or packaging material consisting of two or more sheets or films having the space between them inflated by air or other gas to such an extent that insulation from heat absorption is effected when a cold or frozen item is wrapped or packaged in it, or which effects insulation against the loss of heat from a warm or hot item when such an item is wrapped or enclosed in it, is acceptable for the practice of this invention.

An insulating material made as described above, consisting of a dead-gas space enclosed by two films of material sealed to provide a gas-tight space, which space is inflated with air or other gas, will then be used to wrap or package frozen foods or other items which are normally kept cold, or which are normally kept hot, or will be used in the construction of clothing. If this insulating material is made of a film which is sufficiently strong and resistant to puncture, no serious problem is encountered. When it is used as a packaging material, no other individual package is necessary. If a transparent plastic film is used, an additional advantage is afforded in that the packaged item is visible to view from any angle, thus increasing its appeal to the buyer.

What I claim is:

1. A heat insulating system consisting of an insulated object and a heat insulating barrier member enclosing said object, said heat insulating barrier member consisting of a plurality of spaced-apart relatively thin sheets

sealed together at their common edges and at various points over their respective common areas and being inflated with a gas, one of said sheets having one surface thereof facing said object and another of said sheets having one surface exposed to and facing the surroundings of the system, said object being at a temperature substantially the same as the temperature of said sheet surface facing said object and substantially different from the temperature of said sheet surface exposed to and facing the surroundings of the system.

2. The heat insulating system of claim 1 wherein said relatively thin sheets are each formed of thermoplastic organic material.

3. The heat insulating system of claim 1 wherein said object is a food.

4. The heat insulating system of claim 1 wherein said object is a food and said heat insulating barrier member is transparent.

5. The heat insulating system of claim 1 wherein said object is a cold food.

6. The heat insulating system of claim 1 wherein said object is a cold food and said heat insulating barrier is transparent.

7. The heat insulating system of claim 1 wherein said object is a hot food.

8. The heat insulating system of claim 1 wherein said object is a hot food and said heat insulating barrier is transparent.

9. The heat insulating system of claim 1 wherein said insulating barrier member is an article of clothing.

10. The heat insulating system of claim 1 wherein said insulating barrier member is a transparent article of clothing.

References Cited in the file of this patent

UNITED STATES PATENTS

2,449,591	Couse	Sept. 21, 1948
2,630,573	Rand	Mar. 10, 1953
2,731,652	Bishop	Jan. 24, 1956

FOREIGN PATENTS

539,712	Belgium	July 30, 1955
---------	---------	---------------