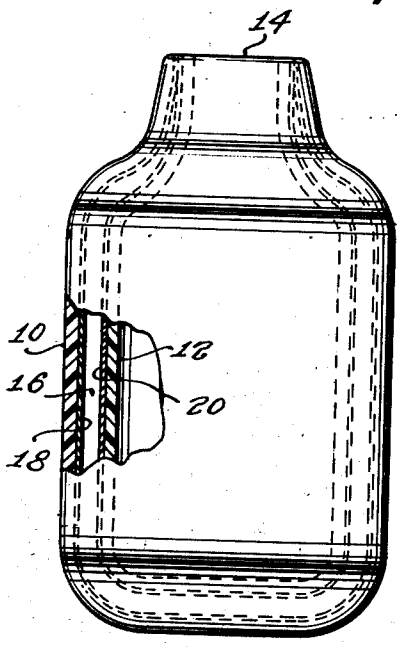
June 23, 1953 E. FREEDMAN 2,643,021

HEAT INSULATING CONTAINER

Filed May 24, 1950

FIG. 1.



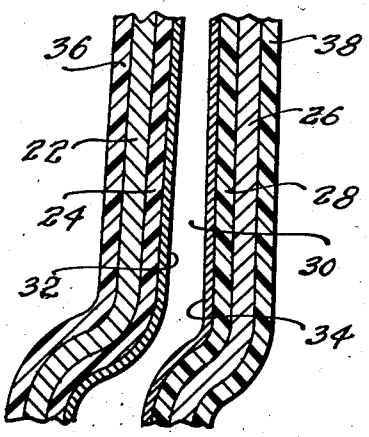


FIG. 2.

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HEAT INSULATING CONTAINER

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4 Claims. (Cl. 220—9)

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The present invention relates to a heat insulating container, and more particularly to an unbreakable heat insulating container which may have the shape of a bottle, flask, jug, pitcher, ice bucket, barrel, refrigerator box, shipping case or the like.

It is an object of the present invention to provide an unbreakable container of the kind described which holds the contents thereof at substantially the same thermal condition for an extended period of time.

An unbreakable heat insulating container according to the present invention comprises in combination, an outer jacket, an inner jacket arranged inside and spaced apart from the outer jacket, the jackets defining a gap between themselves, a first layer arranged on the inner surface of the outer jacket so as to cover substantially the entire inner surface of the outer jacket, and a second layer arranged on the outer surface of the inner jacket so as to cover substantially the entire outer surface of the inner jacket, the outer jacket and the first layer consisting one of a plastic material and the other of a gas-impermeable material, the inner jacket and the second layer consisting one of a plastic material and the other of a gas-impermeable material.

An embodiment of the present invention comprises an outer jacket consisting of a plastic material, an inner jacket consisting of a plastic material and arranged inside and spaced apart from the outer jacket, the jackets defining a gap between themselves, a first layer consisting of a gas-impermeable material and arranged on the inner surface of the outer jacket so as to cover substantially the entire inner surface of the outer jacket, and a second layer consisting of a gas-impermeable material and arranged on the outer surface of the inner jacket so as to cover substantially the entire outer surface of the inner jacket.

Preferably the layers are spaced apart from each other in the gap defined by the jackets. Preferably the layers define a space between them which is evacuated.

In preferred embodiment of the present invention polyethylene is used as a plastic material for the inner and outer jacket.

In a preferred embodiment of the present invention the gas-impermeable material of which the layers consist is a metal, preferably a radiation-reflecting one.

Another embodiment of the present invention comprises in combination, an outer jacket consisting of a solid gas-impermeable sheet material, a first layer consisting of a plastic material and arranged on the inside of the outer jacket so as to cover substantially the entire inner surface of the outer jacket, an inner jacket consisting of a solid gas-impermeable sheet material arranged inside and spaced apart from the first layer, and a second layer consisting of a plastic material and arranged on the outside of the inner jacket so as to cover substantially the entire outer surface of the inner jacket, the first and second layers being spaced apart and defining an evacuated gap between themselves.

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Preferably in this embodiment of the present invention radiation reflecting layers are arranged, respectively, on the inner side of the first layer and on the outer side of the second layer.

Preferably in this embodiment of the present invention a third layer consisting of a material having an appreciably lower heat conductivity than the outer jacket is arranged on the outside of the outer jacket so as to cover substantially the entire outer surface of the outer jacket whereas a fourth layer consisting of a material having an appreciably lower heat conductivity than the inner jacket is arranged on the inside of the inner jacket so as to cover substantially the entire surface of the inner jacket.

Preferably in this embodiment of the invention the solid gas-impermeable sheet material for the outer and inner jackets consists of metal. The plastic material of which the first layer and second layer consist is polyethylene which may also be used for the material having an appreciably lower heat conductivity than the inner jacket or outer jacket, respectively.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 is a section through a first embodiment of the present invention; and

Fig. 2 is a partial section at an enlarged scale through a second embodiment of the present invention.

Referring now to the drawings and first to Fig. 1, a container is shown having the shape of a thermos flask which, however, is not meant as a limiting feature of the present invention. The container consists of an outer jacket 10 consisting of a plastic material such as polyethylene

and an inner jacket 12 consisting of a plastic material such as polyethylene. The inner jacket 12 is arranged inside and spaced apart from the outer jacket 10. At the top 14 the outer jacket 10 and the inner jacket 12 merge into each other. The jackets 10 and 12 define a gap 16 between themselves which is partly filled by a first layer 18 consisting of a gas-impermeable material such as metal and arranged on the inner surface of the outer jacket 10 so as to cover substantially the entire surface of the outer jacket. A second layer 20 consisting of a gas-impermeable material such as metal is arranged on the outer surface of the inner jacket 12 so as to cover substantially the entire outer surface of the inner jacket. The layers 18 and 20 are spaced apart from each other in the gap 16 defined by the jackets 10 and 12 so as to define a space between the layers 18 and 20, which is evacuated. The inner surface of the metal layer 18 and the outer surface of the metal layer 20 may be reflecting surfaces for radiation; for instance the metal may be silver or chromium and its surface may be polished to a high degree.

Referring now to Fig. 2 showing at an enlarged scale a wall portion of a second embodiment according to this invention an outer layer 22 consisting of a solid gas-impermeable sheet material, for instance metal, carries a first layer 24 consisting of a plastic material such as polyethylene and arranged on the inside of the outer jacket 22 so as to cover substantially the entire inner surface of the outer jacket. Furthermore, the container comprises an inner jacket 26 consisting of a solid gas-impermeable sheet material such as metal which is arranged inside and spaced apart from the first layer 24 and carries a second layer 28 consisting of a plastic material such as polyethylene and arranged on the outside of the inner jacket 26 so as to cover substantially the entire outer surface of the inner jacket. The first layer 24 and the second layer 28 are spaced apart and define a gap 30 between themselves which may be evacuated. Radiation reflection layers 32 and 34 are arranged, respectively, on the inner side of the first layer 24 and on the outer side of the second layer 28. These layers 32 and 34 consist preferably of metal such as silver or chromium having a highly polished surface. On the outside of the outer layer 22 and the inside of the inner layer 26 are arranged, respectively, third and fourth layers 36 and 38 consisting of a material having an appreciably lower heat conductivity than the outer jacket 22 and the inner jacket 26. If the jackets 22 and 26 consist of metal the layers 36 and 38 are made preferably of polyethylene.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of heat insulating containers, differing from the types described above.

While I have illustrated and described the invention as embodied in an unbreakable heat insulating container, I do not intend to be limited to the details shown, since variations, modifications and structural changes may be made without departing in any way from the spirit of my invention.

Without further analysis, the foregoing will so fully reveal the gist of my invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What I claim as new and desire to secure by Letters Patent is:

1. An unbreakable heat insulating container comprising in combination, an outer jacket consisting of a solid gas-impermeable sheet material; a first layer consisting of a plastic material and arranged on the inside of said outer jacket so as to cover substantially the entire inner surface of said outer jacket; an inner jacket consisting of a solid gas-impermeable sheet material arranged inside and spaced apart from said first layer; a second layer consisting of a plastic material and arranged on the outside of said inner jacket so as to cover substantially the entire outer surface of said inner jacket, said first and second layers being spaced apart and defining an evacuated gap between themselves; a third layer consisting of a material having an appreciably lower heat conductivity than said outer jacket and arranged on the outside of said outer jacket so as to cover substantially the entire outer surface of said outer jacket; and a fourth layer consisting of a material having an appreciably lower heat conductivity than said inner jacket and arranged on the inside of said inner jacket so as to cover substantially the entire inner surface of said inner jacket.

2. An unbreakable heat insulating container comprising in combination, an outer jacket consisting of a solid gas-impermeable sheet material; a first layer consisting of a plastic material and arranged on the inside of said outer jacket so as to cover substantially the entire inner surface of said outer jacket; an inner jacket consisting of a solid gas-impermeable sheet material arranged inside and spaced apart from said first layer; a second layer consisting of a plastic material and arranged on the outside of said inner jacket so as to cover substantially the entire outer surface of said inner jacket, said first and second layers being spaced apart and defining an evacuated gap between themselves; a third layer consisting of a material having an appreciably lower heat conductivity than said outer jacket and arranged on the outside of said outer jacket so as to cover substantially the entire outer surface of said outer jacket; a fourth layer consisting of a material having an appreciably lower heat conductivity than said inner jacket and arranged on the inside of said inner jacket so as to cover substantially the entire inner surface of said inner jacket; and radiation-reflecting layers arranged, respectively, on the inner side of said first layer and on the outer side of said second layer.

3. An unbreakable heat insulating container comprising in combination, an outer jacket consisting of metal; a first layer consisting of polyethylene and arranged on the inside of said outer jacket so as to cover substantially the entire inner surface of said outer jacket; an inner jacket consisting of metal arranged inside and spaced apart from said first layer; a second layer consisting of polyethylene and arranged on the outside of said inner jacket so as to cover substantially the entire outer surface of said inner jacket, said first and second layers being spaced apart and defining an evacuated gap between themselves; a third layer consisting of polyethylene and arranged on the outside of said outer jacket so as to cover substantially the entire

outer surface of said outer jacket; and a fourth layer consisting of polyethylene and arranged on the inside of said inner jacket so as to cover substantially the entire inner surface of said inner jacket.

4. An unbreakable heat insulating container comprising in combination, an outer jacket consisting of metal; a first layer consisting of polyethylene and arranged on the inside of said outer jacket so as to cover substantially the entire inner surface of said outer jacket; an inner jacket consisting of metal arranged inside and spaced apart from said first layer; a second layer consisting of polyethylene and arranged on the outside of said inner jacket so as to cover substantially the entire outer surface of said inner jacket, said first and second layers being spaced apart and defining an evacuated gap between themselves; a third layer consisting of polyethylene and arranged on the outside of said outer jacket so as to cover substantially the entire outer surface of said outer jacket; a fourth layer consisting of polyethylene and arranged on the inside of said inner jacket so as to cover substantially the entire inner surface of said inner jacket; and radiation-reflecting layers arranged, respectively, on the inner side of said first layer and on the outer side of said second layer.

EPHRAIM FREEDMAN.

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