

Jan. 27, 1959

C. P. KULESZA
VACUUM PACKAGE

2,870,954

Filed May 15, 1956

2 Sheets-Sheet 1

FIG-1-

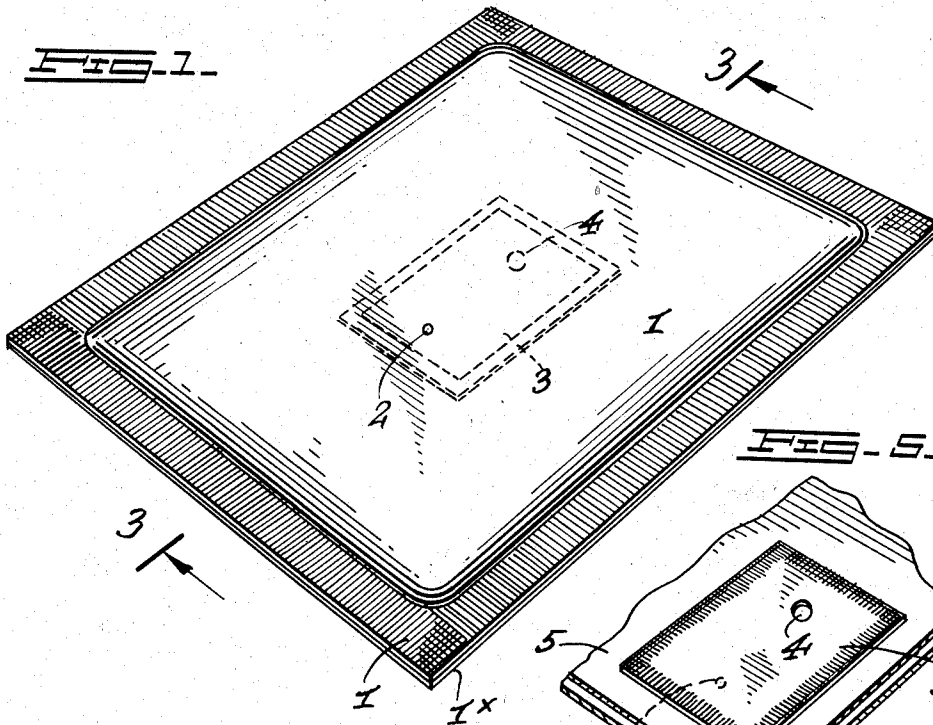


FIG-5-

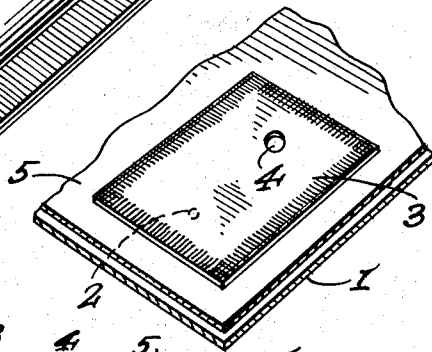


FIG-2-

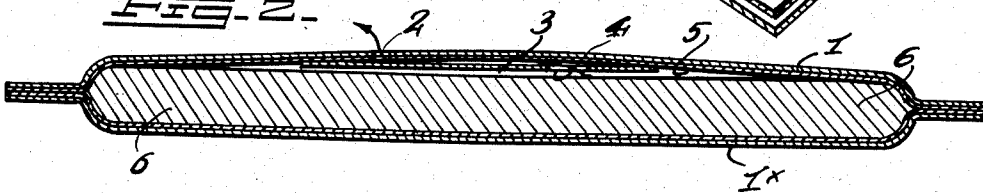


FIG-3-

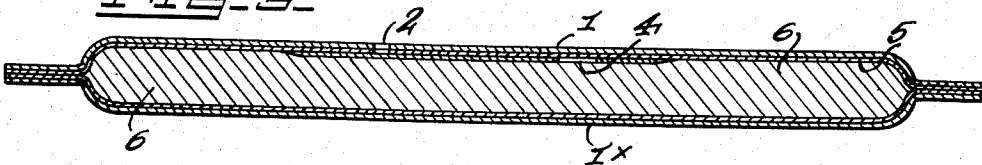
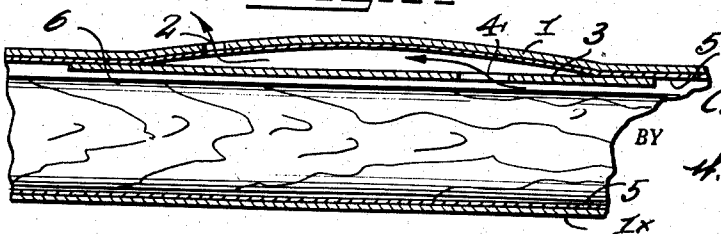


FIG-4-



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2 Sheets-Sheet 2

FIG-6-

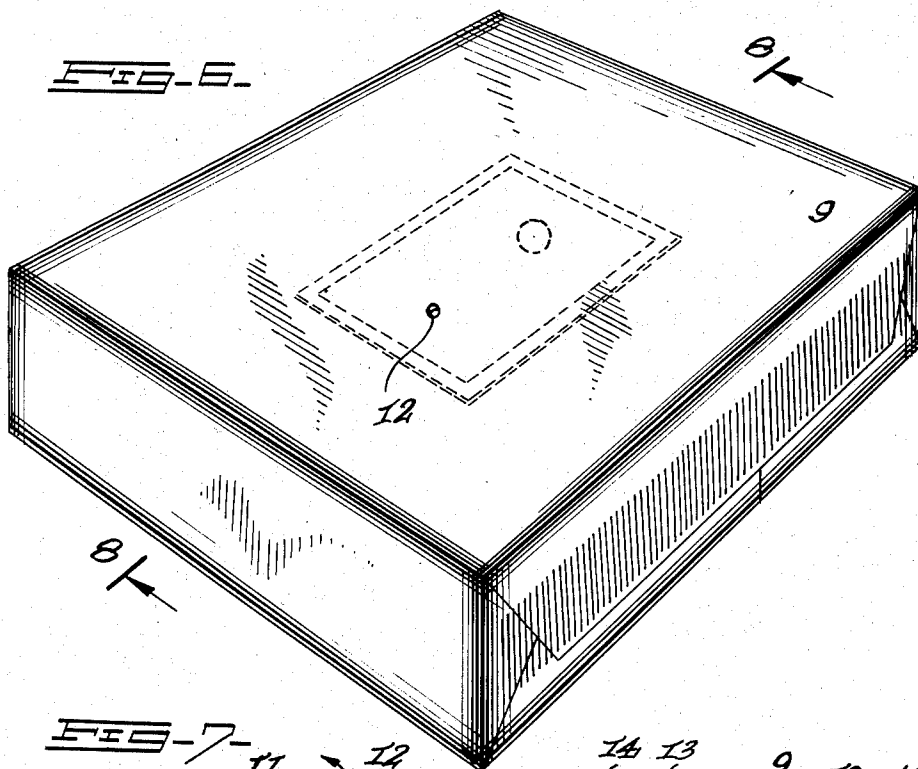


FIG-7-

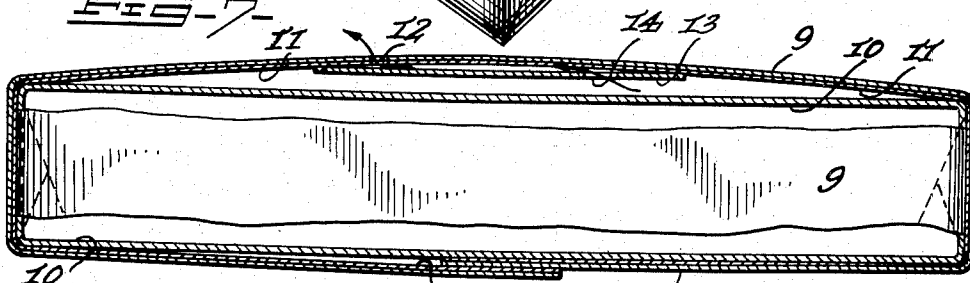


FIG-8-

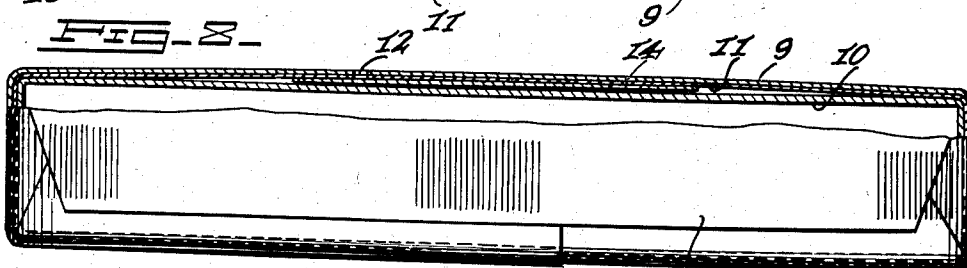
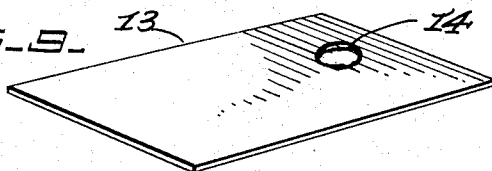


FIG-9-



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2,870,954

VACUUM PACKAGE

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Application May 15, 1956, Serial No. 584,905

1 Claim. (Cl. 229—62.5)

The object of the invention is to provide a package, pouch, envelope, or the like made from a flexible packaging material into which is built a very simple and inexpensive valve device which permits a vacuum to be drawn within the package after it has been filled and which will retain the vacuum for an extended period of time. This package is especially suitable for vacuum packaging of products subject to deterioration by air, oxygen, molds, bacteria moisture, or light. Some of these products are bacon, luncheon meats, cheeses, coffee, tea, dried milk powders, dried yeast, dehydrated meats, dehydrated soups, dehydrated vegetables, confections, frozen meats, frozen fish and fish products, frozen fruits and vegetables, and many other food items.

A characteristic of the package is that it may be made from a variety of materials, particularly aluminum foil bearing a heat sealing layer, the valve being made from a single additional layer of the foil or other material and which will lie so flat with respect to the wall of the package as not to affect its capacity or form in the least.

The invention will be described with reference to the accompanying drawings, in which,

Fig. 1 is a perspective view of an envelope package constructed in accordance with the invention, the valve piece lying against the upper wall of the envelope and being shown in dotted line;

Fig. 2 is a longitudinal section through the structure of Fig. 1, showing somewhat enlarged the manner in which vacuum-action withdraws air from the material within the package;

Fig. 3 is a view similar to Fig. 1, being taken on line 3—3 (Fig. 1) and showing the package sealed by the valve;

Fig. 4 is a fragmentary section generally on the line 3—3 (Fig. 1), and enlarged, showing the position of the valve during withdrawal of air from the interior of the envelope;

Fig. 5 is a perspective view showing the two wrapper sheets of the package, fragmentarily, the upper sheet having been applied exteriorly thereto the vacuum sealing valve;

Fig. 6 is a view similar to Fig. 1 but showing a box-like package, the valve piece lying against the upper wall of the overlying wrap;

Fig. 7 is a longitudinal section through the structure of Fig. 6 showing, somewhat enlarged, the manner in which vacuum action withdraws air from the package and its contents;

Fig. 8 is a view of the structure shown in Figs. 6 and 7, and in section, showing the package sealed by the valve; and

Fig. 9 is a perspective view of the valve piece.

A desirable material for the envelope of Fig. 1 or the wrap for the box-like package shown in Fig. 6 is aluminum foil carrying one of various heat-sealing layers. Inasmuch as such layers fill and seal the pinholes of exceedingly thin aluminum foil, the latter can be used in a very

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wide range as to thickness, as, for example, .00035" to .006". However, heat sealing films per se can be used but aluminum foil is preferred. For one reason it is impervious to harmful light rays which accelerate oxidation. Aluminum foil, when used, may be strengthened by one or more layers of paper, cellophane, or other suitable reinforcing materials.

Referring to the drawings, I have shown in Fig. 1 a sealed envelope which, it will be understood, contains a material for which protection against deterioration is desired. The envelope consists of two sheets, 1 and 1x, heat sealed together at their margins. Sheet 1 is formed with a very small perforation at 2 and a valve piece 3 lies over the said perforation at the under side of sheet 1. The valve piece is heat sealed at its margins to sheet 1 and is formed with an opening at 4 which is preferably larger than opening 2. As shown in Fig. 2 sheet 1 may have an inner heat sealing layer as at 5 and to which the valve piece 3 may be secured at its margin. In Figs. 2-4 the contents of the envelope are indicated at 6.

The valve piece must be as flat and smooth as possible and preferably is of the same material as sheets 1 and 1x. With some stocks, particularly those that have a hard or somewhat uneven surface a mastic compound such as microcrystalline wax can be applied within the margins of the valve piece to enable greater and longer vacuum retention. Of course, this mastic will not be required if the vent in the package is sealed off, as later to be described.

When the envelope is filled and heat sealed, being in the condition that its interior is under the same pressure as its exterior it may, along with a suitable number of like envelopes, duly filled, be placed in a vacuum chamber and all of the packages simultaneously evacuated upon an exhaustion of air from the chambers. It will be seen by reference to Figs. 1 and 4 that the air within the envelope and its contents will be drawn out first through aperture 4 of the valve piece and then through aperture 2 of sheet 1. Equilibrium of air pressure in the envelope and the vacuum chambers is very quickly reached, leaving a vacuum in the envelope. At this point air is quickly introduced into the vacuum chamber. The atmospheric pressure forces the walls of the envelope against the package product, and at the same time the atmospheric pressure forces the valve piece of the pouch closed and seated, sealing the package for maintaining vacuum therein for a long period of time. Thus in the use of an envelope wall-material of aluminum foil having a heat sealing layer which also serves as a "plastic" abutment, my package has been found to retain the vacuum for as long as one year, without heat sealing the area between the valve openings, and this has been found true whether the package material is flat or is irregular.

In the structure of Figs. 6-8 the valve piece is applied to a unitary wrapping sheet 9 applied over a cardboard box or form retaining member 10, sheet 9 having on its interior a heat sealing layer 11. Wrapping sheet 9 is applied to form retaining member 10 and its folds and laps of the folds are heat sealed and hermetically so. Sheet 9 is provided with a very small opening at 12. Under the opening and heat sealed to sheet 9 is the valve piece 13, the latter being provided with an opening 14.

When the package of Fig. 6 is filled and the wrap 9 applied and hermetically sealed at its folds and laps of its folds, the treatment thereof in a vacuum chamber will be the same as above described with reference to the package envelope, the application of vacuum in the chamber acting upon the valve piece in the manner shown in Fig. 7 and the sudden introduction of air into the chamber sealing the valve piece as indicated in Fig. 8.

If desired and after the packaging is completed by the

vacuum chamber action, the hole in the appropriate package sheet can be sealed off from the hole in the valve piece by heat sealing a small area around one of the holes, or by heat sealing across the valve piece intermediate the holes. The valve piece may be on the exterior or interior of the package, and it is sometimes of special utility that the sheet closest adjacent to the packaged material be stiff, particularly where the contents of the package are irregular. Since the outer area bulges out when subjected to a vacuum, permitting egress of air, it is preferred that the valve piece be stiffer and also that it lie within the outer wall and be concealed thereby.

What is claimed is:

An impervious flexible wrapping sheet adapted for the formation of hermetically sealed packages in general, consisting of at least one sheet of aluminum foil and a layer of heat sealing material carried thereby and of substantially uniform thickness, said sheet having an opening therein extending through the heat sealing layer, and a relatively stiff valve piece facing said heat sealing layer,

said valve piece being of flat impervious material sealed to the aluminum foil sheet by said heat sealing material at least along the periphery of the valve piece, leaving an intermediate area unsealed, said intermediate area being opposite the opening in the foil, and said valve piece having an opening spaced from the opening in the foil and within the unsealed intermediate area of the valve piece, the valve piece having a stiffness greater than the flexible wrapping sheet per se.

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