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(54) IMPROVEMENTS IN OR RELATING TO THE PACKAGING OF
 FOOD STUFFS

(71) We, DANEPAK LIMITED, a British Company of Caxton Way, Thetford, Norfolk, England do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention is for improvements in or relating to the packaging of foodstuffs and is particularly concerned with improvements in the packaging of perishable foodstuffs, which foodstuffs are packaged in a vacuum within a flexible container of a polyamide or polyethylene.

It is known to seal foodstuffs in a flexible container of these materials from which almost all the air has been removed. The effect of removing the air from the container is to ensure that the walls of the flexible container are compressed on the surface of the foodstuff. This also has the effect of removing the air from the package as a whole and preserving the foodstuff within the package as part of the general technique of vacuum packaging. Additionally the surplus flexible packaging material which extends beyond the outline of the foodstuff will often contain sharp creases.

If the foodstuff is of an angular nature this factor may result, in some instances, in the walls of the flexible container being damaged as the air is removed or during handling thereafter and this damage, in some instances, may be of such a nature as to cause a weakness or even a tear in the walls of the container.

In a case where a weakness has formed this may give rise to a pinhole or tear being formed through which, at a later date, air may enter the container and render the vacuum packaging ineffective. If this should happen the foodstuff will generally deteriorate to a point where it may no longer be edible and thus becomes waste.

It is, therefore, an object of the present invention to bring improvements to the process of vacuum packaging foodstuffs as herein discussed which minimises or eliminates this aforementioned disadvantage.

Accordingly the present invention provides a method of vacuum packaging foodstuff comprising inserting the foodstuff into an envelope of a polyamide or polyethylene material, in which the foodstuff inside the envelope is advanced along a conveyor to a first position whereat air is removed from the interior of the envelope and the envelope is sealed and thereafter advanced by a further conveyor through an oven to be subjected to a temperature sufficient to relieve stress in the envelope material and to ensure a conformity of the envelope material with the shape of the foodstuff.

The temperature may be in the order of 250°C and the period of time must be such that no damage is caused to the foodstuff itself, but it is found that by subjecting the packaging material to this elevated temperature for a short period of time, stresses existing in the walls of the envelope which are caused by packaging material being deformed onto the foodstuff when the air is withdrawn, are relieved. Thus crinkles, creases and wrinkles which may exist in the vacuum pack are largely removed after the heat treatment. This of course refers to the creases and wrinkles in the pack material and not in the foodstuff itself. The heat treatment will also have the effect that opposed internal surfaces of heat sealing medium on the polyamide or polyethylene material which extends beyond the outline of the foodstuffs are fused together so that damage to these areas of the material can take place without a consequent ingress of air to the foodstuff with resultant quality deterioration of it.

The present invention is particularly applicable to the packaging of bacon, it will be appreciated that in the packaging of bacon two essentially different types of pack are known.

The first is a relatively small pack in the order of 8oz. in which the bacon is normally packed in the form of a shingle, making a relatively flat pack. The other pack is one in which the bacon is packed in larger quantities as for example 5lb. weight and for such packs

it is not customary for the rashes to be shingled, the pack being substantially rectangular in shape and it is with packs of this kind that stresses are found to exist in the packaging material where the packaging material is forced onto the corners or edges of the packaged bacon pack.

The present invention is also applicable to other foodstuffs as for example the vacuum packaging of cheese.

Reference is now made to the accompanying drawings in which:—

Figure 1 is a general schematic view of an apparatus for carrying out the present invention;

Figure 2 is a cross sectional view on the lines 2-2 of Figure 1.

Referring firstly to Figure 1, there is illustrated generally at 1 a machine for receiving packs of foodstuffs 5 in flexible envelopes which are moved along by means of a conveyor 4. The packing material which forms the envelope enclosing the foodstuff is air impermeable and is heat softenable. Desirably it is a Laminate of Polyamide with Polyethylene (modified) as heat sealing medium. The packs are advanced to a station whereat they are vacuum sealed within a hood 6, hereinafter more particularly described. The packs are then advanced to the apparatus indicated generally at 2, which is an accurately controlled oven and from thence delivered to a stand indicated at 3 which may be a conveyor for moving the packed and sealed foodstuffs to a packing station.

Intermediate the machine 1 and the oven 2 is a conveying mechanism 7 which leads through a tunnel 9 to convey the packs, after having been vacuum sealed beneath the hood 6 to the oven 2. The oven 2 consists of appropriate heater elements controlled from a control panel 8 and the foodstuff in the packed condition advances through the oven 2 on a metal slatted conveyor. The temperature of the oven and the speed at which the foodstuff is advanced through the oven controls the amount of heating of the foodstuff itself. It will be appreciated that if it is a perishable foodstuff such as bacon it is important not to subject the foodstuff to sufficient heat for a sufficient period of time to cause any "cooking" of the foodstuff which may subsequently render the foodstuff unsuitable for cold or refrigerated storage.

The purpose of the oven is to flash heat the flexible packaging material so to relieve stresses and strains produced therein as it is forced down on to the foodstuff as a result of the removal of air from within the package and the effect of atmospheric pressure on the exterior surface of the flexible packaging material, and to seal together the internal surfaces of the packaging material. Therefore the length of time that the pack remains in the oven and the heat to which it is subjected is

such that only the heat has the chance to relieve those stresses and seal the surfaces and not to have any heating effect upon the foodstuff itself.

Thereafter the conveyor indicated at 10 delivers the packed foodstuff in the relieved condition to the stand 3 which may be a form of a conveyor 11 to a delivery packing or other convenient station.

As seen more particularly in Figure 2 the hood 6 is moved up and down by a hydraulically operated ram 14 and a pipe 13 leads to the interior 12 of the hood 6 and the pipe 13 is connectable to a source of negative pressure. The packed foodstuff 5 are entered into a position whereat the conveying mechanism 4 is arrested in its forward movement, the hood lowered by actuation of the cylinder which contains the ram 14 and an air tight seal formed around the interior 12. The air is then removed by connecting the pipe 13 to a source of negative pressure and as the air is removed from within the interior 12 the heated elements 15 and 16 make contact with each other and press the ends of a flexible packaging material together. After lifting of the hood 6 the force of atmospheric pressure will then force the flexible packing material into a creased and wrinkled condition onto the foodstuff.

The temperature of the oven 2 at which the packed foodstuffs are subjected to while in the oven 2 is approximately 250°C and the package is heated in the oven for a period of approximately 3 seconds. It is found in practice that packages treated according to the present invention have a lesser likelihood of the vacuum being lost by the creation of pin holes or other damage towards the packaging material such as exists in packages not so treated in accordance with this invention.

Thus the present invention results in preventing a deterioration to waste of vacuum packed foodstuff.

WHAT WE CLAIM IS:—

1. A method of vacuum packaging foodstuff comprising inserting the foodstuff into an envelope of a polyamide or polyethylene material, in which the foodstuff inside the envelope is advanced along a conveyor to a first position whereat air is removed from the interior of the envelope and the envelope is sealed and thereafter advanced by a further conveyor through an oven to be subjected to a temperature sufficient to relieve stress in the envelope material and to ensure a conformity of the envelope material with the shape of the foodstuff.

2. A method according to Claim 1 in which the conveyor for conveying the packed foodstuff through the oven is a metal slatted conveyor.

3. A method according to Claim 1 or Claim 2 in which the temperature is 250°C

and the period of time is insufficient to cause damage to the foodstuff.

4. A method of packing foodstuff substantially as described and illustrated herein
5 with reference to the accompanying drawings.

5. A vacuum packed foodstuff when pro-

cessed according to the method of any of the preceding claims.

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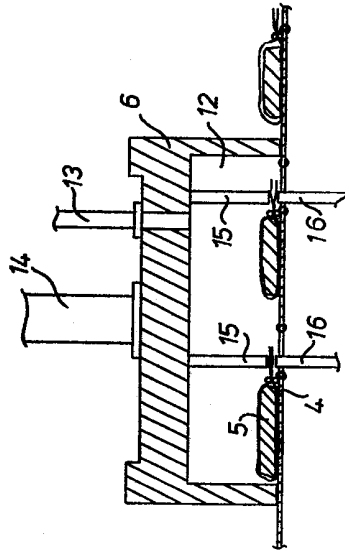


FIG. 2.

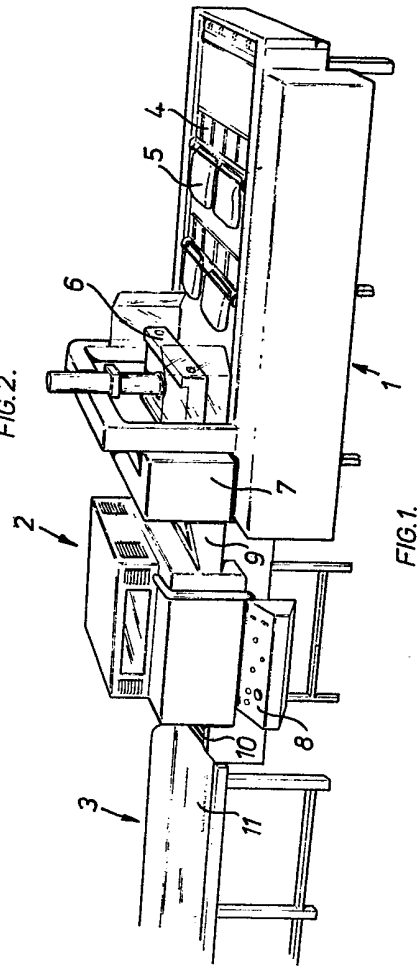


FIG. 1.