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(54) **Pack with directional seal**

(57) There is provided a pack formed of a length of material having an inner surface capable of adhering to other regions of the same inner surface, the pack having a seal formed by the inner surface of one edge region of the pack being peelably sealed to the inner surface of the opposite edge region of the pack, with only the

one edge region being readily manually grippable and with the opposing edge region being restrained, the arrangement being such that, in use, when the one edge region is gripped and pulled away from the opposing edge region, the seal opens to reveal the interior of the pack but only in a region adjacent to the one edge region.

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## Description

**[0001]** This invention relates to packs which are intended to be easy to open and to be provided with a peelable sealing lap.

**[0002]** Many foods (such as cheeses) and other products are packaged for sale and distribution in flow wrap (or pillow pack) form. These packs, produced on both vertical and horizontal machines, are often produced in films designed to give extremely strong and even hermetic seals. Such films are often themselves very strong and tear resistant, in order to give a high level of seal strength and thus product protection. However, such strong packs may be very difficult to open, and devices such as tear strips and end seal nicks are often included to allow the user easier access. These methods of gaining entry to the product inevitably tear the material from which the pack is produced, and consequently re-wrapping of any unused part of the contents is made difficult or ineffective. The preferred method of entry into the pack is therefore to open a seal, rather than to tear the film. On most systems the seals are heat-fused to a high degree and are therefore not easily openable, but peelable materials and adhesive systems do exist.

**[0003]** An ideal method of producing easily openable packs is to have some degree of peelability, if only in the seal areas. Such seal areas can be provided from a so-called T junction as depicted in Figures 1A and 1B of the accompanying drawings.

**[0004]** Where a single layer of material is folded round on itself to form a seal, three types of seal can be formed. The outer surface of the material is referred to as the A surface and the inner surface of the material is referred to as the B surface. The three types of seals which can be formed are as shown in Figures 2A, 2B and 2C of the accompanying drawings, which show, respectively, an A-A seal (outer surface to outer surface), a B-B seal (inner surface to inner surface), and an A-B seal (outer surface to inner surface). It will be appreciated that it is the B-B seal as shown in Figure 2B which can produce, on opening, a T-junction as shown in Figure 1B.

**[0005]** The A-B seal as shown in Figure 2C is a standard lap (overlap) and, depending on the nature of the A-B seal, can be peelable.

**[0006]** Where a surface of a sheet of material is to form a seal, which can be either a peelable seal or a non-peelable seal, the surface needs to have the ability to be tacky or sticky when suitably activated, typically upon heating. Where a sheet of material is to have the ability to be tacky on both the inner and outer surfaces, the layer of material could be formed from a laminate which could have, for example a polypropylene layer on the A side (outer surface), a polyethylene layer on the B side (inner surface), and a core of a nylon between the polypropylene and polyethylene. If desired additional layers could be present in the laminate. If desired, the laminate could be formed by coextrusion.

**[0007]** In terms of forming the bond, much will depend

upon the combination of temperature, pressure and duration, and these three factors can have a considerable effect on the resulting nature of the bond, in other words as to whether it will be peelable or non-peelable.

5 **[0008]** Typically, however, a polypropylene to polypropylene bond is not a strong bond; a polypropylene to polyethylene bond can be made to fuse together but, generally, is not a strong bond; and generally a polyethylene to polyethylene bond is very strong but, when using weaker bonding conditions, can be made peelable.

10 **[0009]** In the accompanying drawings Figure 3A denotes a seal intended to be peelable; Figure 3B denotes a seal intended to be non-peelable; and Figure 3C denotes the optional presence on a layer of an adhesive intended to be peelable which may be with or without a covering which serves as a protective layer to counter the effect of the adhesive until such time as any such covering is removed.

15 **[0010]** When a single length of a layer of material is used to wrap a product there will generally speaking be a longitudinally-extending seal such as one of the types mentioned above, as shown in Figure 4A of the accompanying drawings, and at each end of the product the wrapping material will need to be brought together and sealed, which is why it is generally necessary for the material to be capable of adhesion on its inner surface so that there is an inner surface to inner surface bond formed by a heated transverse pressure-member. However, it will be appreciated that when the pack is opened, the presence of the A-A bond in the region of any false gussets on either side will prevent the pack material from being fully opened, thus reducing the ease of access to the pack. Such gussets have a high shear strength, and do not readily peel open as they do not form a T-junction. During opening, the lap is peeled back from the peelable A-B seal in the top central region as shown in Figure 4A and is opened up but, as shown in Figure 4B, the material cannot be fully opened in view of the undesired seal in the region of the false gussets.

20 **[0011]** The problem associated with the arrangement shown in Figures 4A and 4B stems from the fact that the layer of material employed is potentially tacky on both its inner and outer surfaces. This is necessary in order to form the lap seal of the A-B type in the top central region of Figure 4A. A consequence of this, unfortunately, is that false gussets can be formed by the A-A bonding formed in the outer edge regions at the end regions of the pack, as a result of the pressure of the heated transverse pressure member.

25 **[0012]** In the aforementioned T junction arrangement as shown in Figure 1B, it can be appreciated that when the seal is peeled open the resulting opening may go to the left, or to the right, or even in both directions. Thus the opening of the seal lacks any sense of direction. This may not matter with many types of products but can cause considerable inconvenience with certain types of products such as wedges of cheese. This is because if the opening moves in the direction in which the wrapping

material converges towards the "nose" of the cheese, it can be difficult to remove the cheese through the relatively narrow opening. If, in contrast, the opening moves towards the larger end of the wedge of cheese, then it is relatively easy to remove the wedge from the package and to re-insert any unused cheese into the package prior to any resealing.

**[0013]** According to the present invention, there is provided a pack formed of a length of material having an inner surface capable of adhering to other regions of the same inner surface, the pack having a seal formed by the inner surface of one edge region of the pack being peelably sealed to the inner surface of the opposite edge region of the pack, with only the one edge region being readily manually grippable and with the opposing edge region being restrained, the arrangement being such that, in use, when the one edge region is gripped and pulled away from the opposing edge region, the seal opens to reveal the interior of the pack but only in a region adjacent to the one edge region.

**[0014]** Thus the seal in the pack according to the present invention is directional. The aforesaid opposite edge region can be doubled back on an adjacent region and held in place by an adhesive, which can thus prevent access to what will be the lower "fin" in the region of the seal.

**[0015]** Moreover, preferably the fin which is to be manually gripped is longer to ensure that it is that fin that is gripped rather than the other.

**[0016]** The longer fin can be provided with an adhesive region so that prior to initial opening, or upon re-sealing, that fin is secured in place by means of the adhesive to a region adjacent to the opposing end region.

**[0017]** It is to be noted that the material which is to be employed in the production of the pack in accordance with the present invention need be adhesive/tacky only on its inner surface, and the outer surface can be non-adhesive and non-tacky, to avoid formation of undesirable A-A seals in false gussets.

**[0018]** For a better understanding of the present invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings in which:

Figure 5 is a cross-section through one embodiment of a pack in accordance with the present invention;

Figure 6 is a cross-section through a second embodiment of a pack in accordance with the present invention;

Figure 7 is a cross-section through a third embodiment of a pack in accordance with the present invention;

Figures 8A and 8B show different lines of seals; and  
Figures 9A and 9B show those seals being opened.

**[0019]** Referring now to Figure 5, there is shown a length of material 101 having a tacky inner surface 102

and a non-tacky and non-adhesive outer surface 103. The sheet of material 101 has two opposing edge regions 104 and 105. Those two edge regions 104 and 105 are bonded to each other by a peelable seal 106 which is of the B-B variety. The edge region 105 is restrained by being adhered by an added adhesive 107 to an adjacent underlying outer surface of the material 101.

**[0020]** Figure 6 is similar to Figure 5 except that the one edge region 104 is considerably longer than the opposing edge region 105 and is bent so as to extend away from the package, thus making it easier to grip.

**[0021]** Turning now to Figure 7, this is generally similar to what is shown in Figure 5, except that one or more peelable adhesive regions, in this case two peelable adhesive regions 108 and 109, are applied to the free edge 104 and its opposing region, nearer to the free end of the edge 104 and the seal 106. The purpose of the adhesive 108 and 109 is to hold the access fin 104 in place to prevent accidental opening, and/or is to enable that fin to be re-secured after the package has been opened and when it is being re-sealed.

**[0022]** As has already been indicated, the strength of the various seals can be controlled by changing seal widths, temperature of sealing, pressure of sealing and duration of sealing, and to that there is now added provision to ensure that the pack is peeled in a particular direction.

**[0023]** It is acknowledged that it may be more difficult to peel across a large seal area than across a smaller one, and that with a straight seal the whole seal is being attempted to be opened simultaneously. With a view to reducing the amount of force required to open a seal, the line of the seal, instead of being longitudinal and parallel but offset to the axis of the product, can be in zig zag form or sinusoidal, as shown in the accompanying Figures 8A and 8B, respectively. When opening the seal is attempted, the result is that only a small length of the seal is being peeled at any one time, as is clear from Figures 9A and 9B respectively. Also it is advantageous for the peel seals to be narrower than any non-desired peel seal.

### Claims

1. A pack formed of a length of material having an inner surface capable of adhering to other regions of the same inner surface, the pack having a seal formed by the inner surface of one edge region of the pack being peelably sealed to the inner surface of the opposite edge region of the pack, with only the one edge region being readily manually grippable and with the opposing edge region being restrained, the arrangement being such that, in use, when the one edge region is gripped and pulled away from the opposing edge region, the seal opens to reveal the interior of the pack but only in a region adjacent to the one edge region.

2. A pack according to claim 1, wherein the said opposite edge region can be doubled back on an adjacent region and held in place by an adhesive, which can thus prevent access to what will be a lower "fin" in the region of the seal. 5
3. A pack according to claim 2, wherein the fin which is to be manually gripped is longer to ensure that it is that fin that is gripped rather than the other. 10
4. A pack according to claim 3, wherein the longer fin is provided with an adhesive region so that, prior to initial opening, or upon re-sealing, that fin is secured in place by means of the adhesive to a region adjacent to the opposing end region. 15

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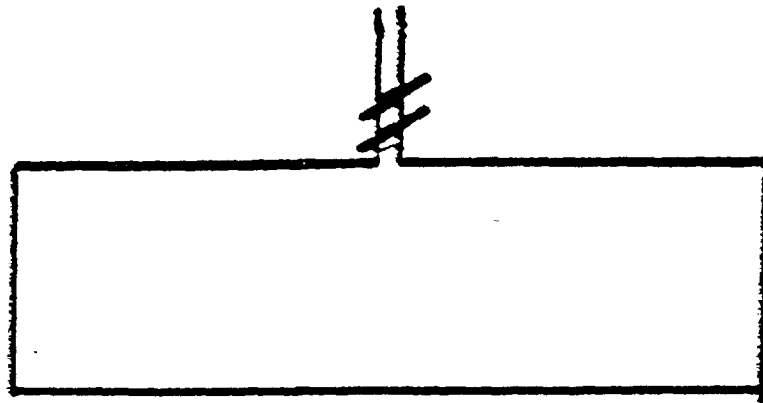


FIG. 1 A

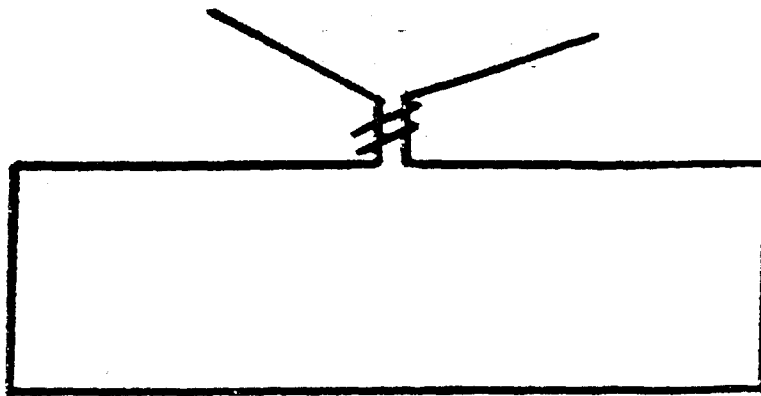


FIG. 1 B

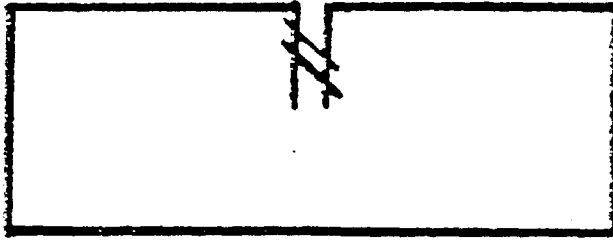


FIG. 2A

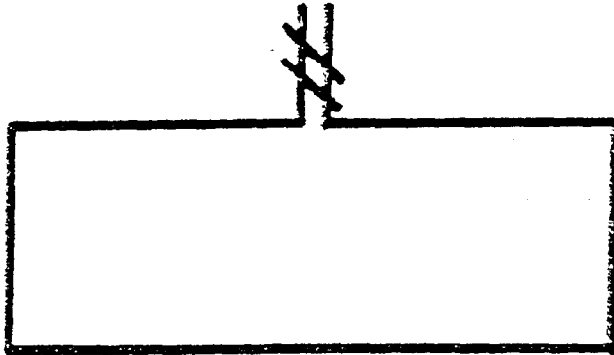


FIG. 2B

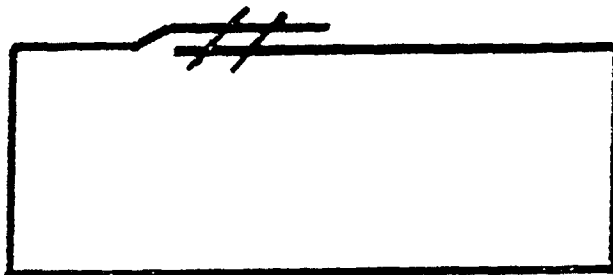


FIG. 2C

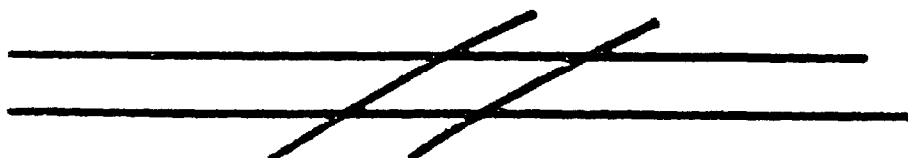


FIG. 3A.

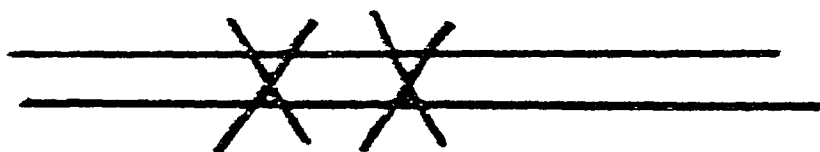


FIG 3B.



FIG 3C

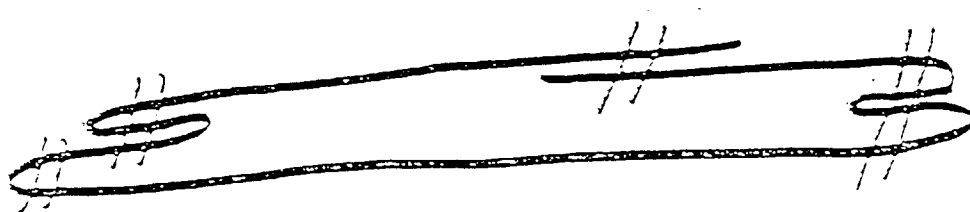


FIG 4A



FIG 4B.

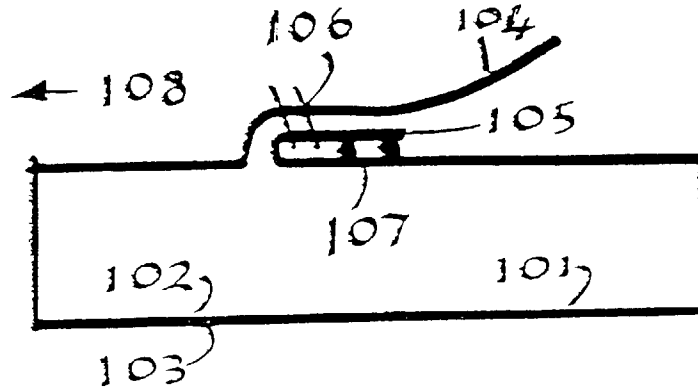


FIG 5

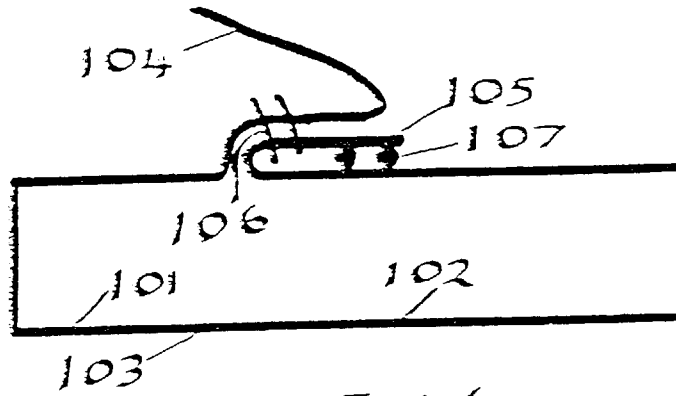


FIG 6

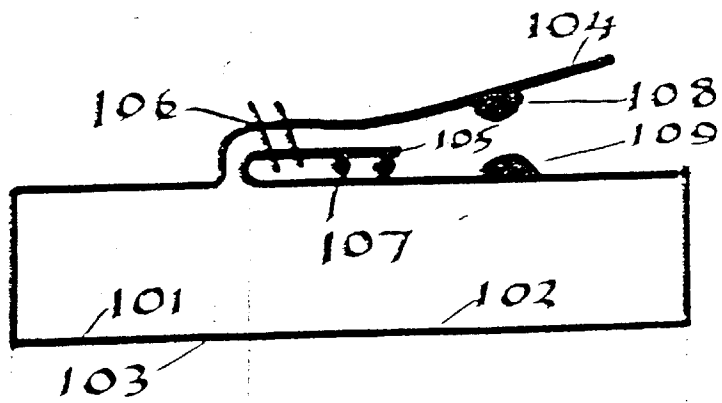


FIG 7



FIG. 8A



FIG. 8B



FIG. 9A



FIG. 9B



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EUROPEAN SEARCH REPORT

Application Number  
EP 99 30 3824

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Y	* column 9, line 37 - column 10, line 46; figures 16-24 *	2	
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
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Place of search	Date of completion of the search	Examiner	
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EPC FORM 1503 03.82 (P4/C01)

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