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Blister-pack and process for its production

The invention relates to a blister-pack with a frame consisting of plane material with a window-like cut-out and at least two lateral support sections at an angle to the outer periphery of the frame, to which a plastic foil is applied in the window in the form of a trough.

Blister packs of the type mentioned above are known from DE—GM 76 37 448. Their production consists of laying the frame, usually a corrugated cardboard blank, with the window over a positive mould, then laying a heated foil on the projections of the mould and the cardboard blank. By means of partial vacuum it is sucked close to the projections and the surface of the cardboard, and in doing so forms a skin on the surface of the cardboard, and finally after the mould release the embossed foil is pressed through the window to form the foil trough.

Blister-packs serve for the transportation and storage of packaged goods which are sensitive to impact and easily breakable. The blister-pack carrying the packaged goods is either enclosed in a despatch carton or two blister-packs surround the packaged goods and form in themselves the packing for transport when suitably fixed by a band.

In the packs formed from two blister-packs known from DE—GM 76 37 448, the blister-packs have windows of the size of the part of the packed goods lying in them. Whilst the packed goods are not meant to come in contact with the outer walls of the packing carton, the edges of the packed goods are to be partially retained by the window cut-outs in the plane material and to this end it is further provided that bent-over parts of the cardboard blanks located on the lateral support sections rest against the packed goods.

When corrugated cardboard is used, however, it has been found that the upright ridges in the corrugated cardboard area chafe through the foil, which affects the strength of the packaging, but also the packed goods are so badly damaged by the rubbing movements, even if the foil is not chafed right through, that for example in the case of veneered loud-speaker units the goods are no longer saleable.

Furthermore, in the case of corrugated cardboard which is in contact with the packed product, the deceleration figures for the drop test leave something to be desired, since in free fall there is a very strong braking action exerted on the packed product because of the high compression value.

GB 1 133 947 discloses packaging containers having supporting side tabs formed from a material such as cardboard and plastics film. The film may be sufficiently narrow that the supporting side tabs are not covered. However, there is no disclosure of packing articles in such a way that they cannot come into contact with the cardboard supporting member.

FR 1 287 287 discloses a sheet of plastics material provided with a plurality of depressions for keeping fruit. The fruit will be essentially the same shape as the depressions provided for them so that there is no disclosure of supporting an article at its base in a trough which extends away from its sides. The plastics sheet shown in FR 1 287 287 is supported in a frame by a gutter-shaped member moulded into the plastics sheet. This implies that the plastics sheet is substantially rigid and could not therefore be folded and unfolded easily. The ability to fold blister packs can be an important asset in their commercial use.

The invention is based on the problem of producing a blister-pack giving improved protection.

According to the present invention there is provided a blister-pack which comprises

- (a) a plane frame with a cut-out window,
- (b) a trough of plastics material within the window,
- (c) packaged goods within the trough,
- (d) at least two lateral support members joined at an angle to the frame at its outer periphery,
- (e) the height of the support members is at least as great as the depth of the trough of plastics material characterised in that
- (f) the plastics material extends over the frame substantially only as far as the periphery and is heat sealed to the frame,
- (g) the window is longer than the packaged goods or the section of the packaged goods contained in the trough, such that the packaged goods at no point come into contact with the inside edges of the frame,
- (h) the lateral part of the trough is not parallel to the outer surface of the packaged goods but runs outwardly from the edges of the surface of the packaged goods.

In the blister-pack according to the invention, the foil covers only the part of the frame as far as the points of junction or folding lines of the lateral support sections, or possible one millimetre beyond.

By means of heat sealing the foil is firmly joined to the plane material, which facilitates both a good adhesion to the plane material and also the avoidance of an adverse effect on the tearing strength at the inner edges of the window.

The production of the blister-packs according to the invention can for example take place by pushing the frames on to the upright sets of moulds in thermoforming machines, so that the lateral support sections are located in a vertical arrangement inside the set of moulds and are not sealed, or else one inserts the frames in line into the individual moulds which are simultaneously sealed to the foil and separated by a hot sealing plate, so that a deep-drawing

process takes place by means of contact heating and compressed air shaping in one working cycle, similar to what happens in the usual automatic deep-drawing machines for compound foil shaping in the foodstuffs industry.

Solid cardboard, corrugated cardboard or even laminated sealable plastic resembling corrugated cardboard can be used for the plane material for the frame, but corrugated cardboard is preferred.

The plastics foil, i.e. sheets or films used in the present invention are preferably transparent sheets suitable for deep-drawing especially polyethylene laminated foils, which are coated on the inner side, i.e. the one which comes into contact with the plane material, with an adhesion layer, e.g. of an ethylene polymer e.g., an ethylene/vinyl acetate co-polymer or an ethylene/acrylic acid/acrylate ester terpolymer. These co-polymers possess an excellent adhesion both to polyethylene and the plane material.

However, one can also coat the plane material in the sealing area first of all with polyethylene or an ethylene/vinyl acetate co-polymer dispersion or an ionomer resin dispersion, and then apply by means of hot sealing and simultaneous deep-drawing a normal polyethylene foil, ethylene/vinyl acetate co-polymer foil or ionomeric foil. The ionomers in question are pseudo-cross-linked, thermoplastic, transparent plastics, chiefly co-polymer of ethylene with monomers containing carboxyl groups. (See Römpps' *Chemielexikon*, 7th Edition, Frank'sche Verlagsbuchhandlung, Stuttgart 1973, pp 1622, 1623.) A particularly suitable ionomer is commercially obtainable under the trade name "Surlyn A" (Manufacturers: Du Pont).

Moreover, the plane material can be coated in the sealing area first of all with a coating containing polyvinylchloride, which makes possible the use of PVC foils.

To achieve greater stability laminated foils of three or more layers are used, in which the outer layer consists of a polyamide or polyester and the inner layer consists of plastic which can be sealed with the plane material, for example the abovementioned ethylene/vinyl acetate co-polymers, ethylene/acrylic acid/acrylate ester terpolymer ionomer resins. These foils also possess the advantage that during the heat sealing process they do not stick to the contact heating at high temperatures.

Packaging with the blister-packs according to the invention is done either by inverting a blister-pack over the goods to be packaged, which are prepared in a despatch box on anti-crush pad, or else by using two blister-packs which may be surrounded by a packing carton, in which case preferably care should be taken to see that both blister packs are given a certain amount of pre-tensioning.

The blister-packs of the invention possess at

least two lateral supporting sections. The strength of the blister-pack with only two supporting sections when assembled is thus, it is true, not optimum, but is adequate for some purposes, especially if the blister-packs are used in conjunction with packing cartons. If desired parts of the packing carton, especially flaps, could take over support functions as well. Without the use of a packing carton a considerably greater strength can be attained by means of lateral support sections on all four sides of the frame.

Naturally one must take care to see that the height of the supporting members is at least as great as the depth of the foil troughs.

The dimensions and shape of the frame and also the shape of the window are not subject in principle to any special restrictions provided that the blister-pack according to the invention has a window-like cut-out which is larger than the part of the packed goods to be accommodated. On grounds of economising on material one selects the frame to be only as wide as is absolutely necessary, but one should not go below a certain minimum width for reasons of breaking strength and foil adhesion. The shapes of the window and the trough are chosen to suit the dimensions of the goods to be packaged and the type of pack (one or two blister-packs, with or without packing carton).

The lateral parts of the foil trough in the blister pack containing the packed product do not run parallel to the external surfaces of the packed product lying there, but run outwards from the edges of the packed product surfaces located on the bottom of the foil trough. In respect of the blister-pack this means that the side walls of the foil trough from the inner edge of the window outwards do not run downwards vertically to the plane of the frame, but deviate inwards from the perpendicular by an angle amounting to at least about 10° . The top limit is determined by economic considerations, which would render angles of more than 70° of no interest. Generally speaking the angle is from 20° to 60° , preferably 30° to 50° , an angle of about 45° giving particularly good results in many cases. In most cases only a small depth of the foil trough is necessary, since it has only to be large enough to ensure that the packed product is fixed, e.g. between two blister-packs.

The trough may optionally be of smaller size than the window so that a border of plastics material, surrounding the inside edges of the window projects over the edge of the frame. This gives better protection to the packaged goods.

In a further advantageous design of the new blister-pack having a subdivided window with several separate troughs, these latter are separated by ridges not made of the frame material but formed of the foil. This has the advantage that one can produce blister-packs with a differing number of troughs from the same blank. In addition, with partitions con-

sisting of foil no safety gap is required as is the case with partitions of corrugated cardboard.

It has been found that assembling blister-packs provided only with four lateral support members or assembling blanks which are merely pre-creased requires such a high time outlay at the packing factory that the costs incurred by this are higher than the costs for the blank.

In accordance with the present invention there are provided blister-packs which may be collapsed by diagonal folding and stored in the collapsed condition. Further the blank used for the production of the blister-pack according to the invention may be stored in the collapsed condition (diagonally folded) and erected by the application of slight lateral pressure before the foil is applied. The finished blister-packs are then collapsed diagonally again, stored flat and despatched, and when used are again erected by a slight lateral pressure.

The plastics foil used in the present invention for these collapsible blister-packs is a flexible film material which can be readily folded and unfolded. Thus in a further advantageous design the blister pack according to the invention the frame is provided with fold lines which extend from at least two diagonally opposed corners of the frame to the window, and the support members are planar sheets joined to the frame at its periphery by creases and so arranged that the blister pack can be folded flat on removal of the goods contained therein.

The blister-pack may have four planar sheet support members each connected to the edges of a substantially rectangular frame by creases, and fold lines may be provided in opposed sheet support members. The blister-pack may have two opposed unconnected pairs of supports, the members of each pair being linked together at adjacent edges, and the fold lines in the opposed sheet members mentioned above connecting with the fold lines in the frame. Such an arrangement is described in more detail below in connection with Figure 3.

Alternatively all four support sheets may be connected together and the fold lines in the opposed support sheets in the central portion of the sheets and extend across the frame to the window. Such an arrangement is described below in more detail in connection with Figure 4.

The blister-pack may have a rectangular frame with one opposed pair of longer sides and another opposed pair of shorter support sheets. In this case the abovementioned fold lines in the support sheets are preferably in the shorter opposed support sheets. The fold lines in each of the two shorter support sheets preferably connect with the fold lines extending from the corner of the adjacent part of the frame to the window at such an angle that the crease between the shorter support sheet and the frame bisects the angle between the fold lines in

the shorter support sheet and the fold line extending from the corner of the frame to the window. It is to be understood that the fold line in the shorter support is to be distinguished from any fold lines which may separate the shorter support sheets from the longer support sheets.

In a further advantageous design the abovementioned blister-pack possesses four flaps hinged to the lateral support sections which together form a base. In this way one packaging unit can be formed from two blister-packs which, once the bases have been closed in a known manner and a strap has been applied, does not necessarily require an additional box for despatch. The blister-pack frames can rest against each other, so that the packed product is surrounded by foil on all sides. However, in many cases it is not necessary for the packed product to be enveloped completely in foil, but rather, once the packed product has been laid in position, a greater or lesser gap can exist between the flat surfaces of the frames, the packed product being held in a fixed position from two sides between the blister-packs. Advantageously the blister-packs are placed under a slight pre-tension, which can be done by dimensioning the despatch carton accordingly or using a strap. If the despatch carton is one involving a pull-over sheath or is a slide-on or banded box, this type of packing is particularly economic on material.

In one type of blister-pack according to the present invention the support sheets are trapezoidal with the broadest edge adjacent to the frame such that the fold lines in the opposed support sheets are almost parallel to both the connecting edges on either side of each fold line.

Flaps may be linked at least to the shorter support sheets by creases extending along the edge of the support sheet remote from the frame, and the fold lines in the support sheets extend also through the flap.

The blister-pack is advantageously provided with triangular projections at the front corners of the frame, said projections extending upwards from the frame i.e. in the opposite direction to the trough.

The above design with trapezoidal sections is advantageously used as a stackable fruit or vegetable crate.

The arrangement is described in more detail in connection with Figures 6 and 7.

In the case of a further advantageous pack two blister-packs with a rectangular frame having two lateral support sections, in each case on two sides only, preferably the long sides, are combined with a despatch carton with in each case four base and cover flaps, two base and two cover flaps being turned inwards and thus forming the two missing lateral support sections for the blister-packs. In this connection it is preferable for the flaps of the despatch carton which are to be turned in-

wards on the side edges to be reduced by the thickness of the material, so that a snug fit of the blister-packs is ensured. In a further advantageous design the reduction in material thickness does not extend over the entire flap, but towards the outer edge a lip-type projection is obtained. There are then located on the side edges of the blister-pack support sections corresponding recesses into which the lips of the box flaps fit. The two remaining base and cover flaps of the despatch carton in each case have only to ensure the closure of the pack. Forces exerted during transportation, e.g. by falling, are taken up by the cover and base flaps turned upwards without there being any risk of the pack coming open.

In a further advantageous pack the blister-pack after the packed product has been accommodated is top-sealed by a foil. This packing is suitable for goods sensitive to moisture and gas, e.g. to the effects of oxygen, and also for display packs, and in the case of packed products sensitive to impact or liable to break if dropped a padding, e.g. a compression pad, can be arranged between the packed product and the covering foil which does not appreciably affect the view. With this type of packaging vacuum packs with inspection windows can be produced by evacuating the air from the blister-pack accommodating the packed product before sealing with the cover foil.

In a further advantageous design along these lines a moisture-proof pack consists of two blister-packs with the trough apertures sealed to each other, a closure being welded in at a suitable point, this being facilitated preferably by the appropriate design of the blister packs.

At least some of the fold lines mentioned above may be creases in the material of the frame and support sheets. At least some however may be provided by slots in the blister-pack. These slots may result from slots cut in the blank from which the blister-pack is formed. Alternatively slot-shaped openings may be formed from a blank which itself does not contain slots as is shown in more detail in the description of the specific embodiments.

Below the invention is described in the drawings on the basis of advantageous designs.

Fig 1 shows a plan of a blister-pack according to the invention,

Fig 2 shows a longitudinal section through the blister-pack of Fig 1 along the line A—B,

Fig 3 shows a blank for a further form of embodiment of a blister-pack according to the invention,

Fig 4 shows a blank for a further form of embodiment of a blister-pack according to the invention,

Fig 5 shows a plan view of the finished blister-pack produced from the blank of Fig. 4,

Fig 6 shows a blank for a further form of embodiment of a blister-pack according to the invention,

Fig 7 shows a plan view of the finished

blister-pack produced from the blank of Fig 6,

Fig 8 shows a plan view of a further form of embodiment of a blister-pack according to the invention when laid flat, and,

Fig 9 shows a blank of a despatch carton for the blister-pack of Fig 8.

The blister pack shown in Figures 1 and 2 consists of the surrounding frame 2 with two lateral support sections 3, the corrugated cardboard blank, and the foil 4, which is joined to the frame as far as the point of junction of the lateral support sections 3 by means of hot-sealing. The foil is a polyethylene/ethylene vinyl acetate co-polymerisate transparent laminar foil, which is sealed with the ethylene vinyl acetate co-polymer side to the frame. The window 5 of the blister-pack is larger than the packed product accommodated, the lower part of a loudspeaker unit 6. A second blister-pack (not shown) is inverted over the top end of the loudspeaker unit 6, with its lateral support sections facing upwards. The entire arrangement is held together with slight pre-tensioning by a despatch carton (not shown). In this way the inside edges 7 of the window of the frame do not come into contact at any point with the packed product 6. The lateral parts 8 of the foil trough do not run parallel to the outer surfaces 9 of the packed product accommodated therein, but run from the edges 10 of the surface of the packed product lying on the floor of the foil trough outwards, so that the lateral parts 8 have an angle of inclination of 45° to the perpendicular in relation to the plane of the frame.

Figure 3 shows a further form of embodiment of a blister-pack according to the invention in blank form. This blank possesses four lateral support sections 21a, 21b, 22a, 22b, the shorter supporting sections 21a, 21b having side flaps 23a and 23b. The blank possesses a crease 25a, 25b running diagonally over the frame 24 which in each case continues in the shorter support sections 21a, 21b in such a way that the creases 27a, 27b between the frame and the shorter support sections 21a, 21b form the bisectors of the angles enclosed by the creases 25a, 26a and 25b, 26b. These creases make it possible to collapse the blank, after assembling and connecting the lateral support sections 21a, 22a, and 21b, 22b through the side flaps 23a and 23b by means of wire stitching. This blank is erected by a slight lateral pressure before the foil is applied. After the foil has been applied the finished blister-pack is collapsed by diagonal folding, stored in the flat state and despatched and again erected by slight lateral pressure.

Figure 4 shows a further form of embodiment of a blister-pack according to the invention, in the form of a blank, and Figure 5 shows a plan view of the finished blister-pack. The blister-pack possesses four lateral support sections 31a, 32a, 31b, 32b, which are joined together by the flap 34 by glueing, the flaps 35a, 36a, 35b, 36b forming the frame. The

shorter support sections 31a, 31b possess creases 33a, 33b running centrally and parallel to the connecting edges 38a, 38b, 38c, 38d of the supporting sections and which continue in the frame flaps 35a, 35b and the stiffening flaps 37a, 37b which are folded inwards when the blank is assembled. After the blank has been assembled it is not absolutely necessary to glue the slots 39a, 39b, 39c, 39d, as a good cohesion of the frame is achieved by the sealing on of the foil. After the foil has been sealed on, the finished blister-pack can be collapsed by a light pressure on the centre of the narrow lateral support sections 31a, 31b, when the frame flaps 35a, 36a, 35b, 36b open out and also the stiffener flaps 37a, 37b, the narrow lateral support sections 31a, 31b are folded inwards over the creases 33a, 33b and the broad support sections 32a, 32b come to lie on top of each other.

Figure 6 shows a further form of embodiment of a blister-pack according to the invention, in the form of a blank, and Figure 7 shows a plan view of the blister-pack produced from the blank of Figure 6. The blister-pack contains four lateral support sections 41a, 42a, 41b, 42b which are all joined to each other by the side flap 45 by glueing, flaps 43a, 44a, 43b, 44b forming the frame. These flaps are separated by diagonal slots 49a, 49b, 49c, 49d in such a way that when the blank is assembled triangular peaks 50a, 50b, 50c, 50d are left on the frame side. The shorter support sections 41a, 41b possess creases 48a, 48b running centrally and more or less parallel to the connecting edges 47a, 47b, 47c, 47d which creases continue in the narrow frame flaps 43a, 43b. After the blank has been assembled it is not absolutely necessary to glue the slits 49a, 49b, 49c, 49d, as a good cohesion of the frame is guaranteed by the sealing on of the foil. The lateral support sections 41a, 42a, 41b, 42b possess a trapezoidal shape, and broaden towards the frame side. This broadening is preferably selected so that the deviation from the right-angled shape amounts to a material thickness x . Because of the deviation of the lateral support sections from the right-angled cross-section the creases 48a, 48b do not run strictly parallel to the connecting edges 47a, 47b, 47c, 47d, but are somewhat displaced. The lateral support sections of the blister-pack with the triangular peaks located on them are inclined slightly outwards on all sides because of the trapezoidal shape, so that the blister-pack is capable of being stacked. Accordingly this form of embodiment of Figures 6 and 7 finds application as stackable fruit or vegetable crates.

The collapsing and assembling of the blanks and blister packs takes place exactly as in the case of the forms of embodiment of Figures 4 and 5.

Figure 8 shows a further form of embodiment of a blister-pack according to the in-

vention when laid flat. Two of these blister-packs are combined with a despatch carton, which is shown in Figure 9 as the blank, to form a single packing unit. The blister-pack possesses two support sections 51a, 51b located on the long sides and having recesses 52a, 52b. The projecting lips 62a, 62b located on the narrow flaps 61a, 61b of a despatch carton rest in these recesses. For packaging purposes an assembled blister-pack with support sections 51a, 51b, projecting outside is pushed into the despatch carton far enough so that the shorter cover flaps 61a₁, 61b₁ can be folded inwards, so that they lie against the lateral parts 63a, 63b, the lips 62a₁, 62b₁ resting in the recesses 52a, 52b of the blister pack and the edges of 64a₁, and 64b₁ rest against the frame 52 of the blister-pack. When the goods to be packaged have been inserted, a second assembled blister-pack is pushed in from the other end of the despatch carton, with support sections 51a, 51b sticking out, over which the cover flaps 61a₂, 61b₂, of the despatch carton can be tucked in. The entire packing unit is finally closed by the cover flaps 65a, 65b.

In the embodiment shown in Figure 7 flaps 46a, 46b corresponding to the flaps 37a and 37b of Figure 5 may be provided on the shorter support sections 41a and 41b, the grooves or creases (48a and 48b) of the shorter support section continuing in the flaps in the same way as the grooves in 33a and 33b Figure 5.

Claims

1. A blister-pack which comprises:
 - (a) a plane frame (2) with a cut-out window (5),
 - (b) a trough of plastics material (4) within the window,
 - (c) packaged goods (6) within the trough,
 - (d) at least two lateral support members (3) joined at an angle to the frame (2) at its outer periphery,
 - (e) the height of the support members (3) being at least as great as the depth of the trough of plastics material (4) characterised in that
 - (f) the plastics material (4) extends over the frame (2) substantially as far as the periphery and is heat-sealed to the frame (2),
 - (g) the window (5) is larger than the packaged goods (6) or the section of the goods contained in the trough, such that the packaged goods at no point come into contact with the inside edges (7) of the frame,
 - (h) the lateral part (8) of the trough is not parallel to the outer surface (9) of the packaged goods (6) but runs outwardly from the edges (10) of the surface of the packaged goods.
2. A blister-pack according to Claim 1 wherein the trough is of smaller size than the window so that a border of plastics material surrounds the inside edges (7) of the window.
3. A blister pack according to any one of the

preceding claims wherein the frame is provided with fold lines (25a, 25b, 49a, 49b, 49c, 49d) which extend from at least two diagonally opposed outside corners of the frame to the window, the plastics material is a flexible film, and the support members are planar sheets joined to the frame at its periphery by creases (27a, 27b) and so arranged that the blister-pack can be folded flat on removal of the goods contained therein.

4. A blister-pack according to Claim 3 wherein four planar sheet support members (21a, 21b, 22a, 22b) are each connected to the edges of a substantially rectangular frame by creases (27a, 27b) and fold lines (26a, 26b, 33a, 33b) are provided in opposed sheet support members.

5. A blister-pack according to Claim 4 wherein adjacent planar sheet support members (21a, 22a and 21a, 22b) are linked together to form two opposed unconnected pairs of supports and the fold lines (26a, 26b) in the support sheets connect with the fold lines (25a, 25b) in the frame.

6. A blister-pack according to Claim 4 in which all four support sheets are connected together and two opposed support sheets have fold lines (33a, 33b, 48a, 48b) in the central portion thereof which extend across the frame to the inside edge of the window.

7. A blister-pack according to any one of Claims 3 to 6 wherein the frame is rectangular and has a longer and shorter side and each side of the frame is connected by crease lines (27a, 27b) to corresponding longer and short planar support sheets, and in which the fold lines (26a, 26b, 33a, 33b, 48a, 48b) are in the opposed shorter support sheets.

8. A blister-pack according to Claim 7 wherein the fold lines in each of the two shorter support sheets (26a, 26b) connects with the fold lines (25a, 25b) extending from the corner of the adjacent part of the frame to the window at such an angle that the crease (27a, 27b) between the shorter support sheet and the frame bisects the angle between the fold lines (26a, 26b) in the shorter support sheet and the fold line (25a, 25b) extending from the corner of the frame to the window.

9. A blister-pack according to any one of Claims 3 to 8 where at least some of the fold lines are creases in the material of the frame and support sheets.

10. A blister-pack according to any one of Claims 3 to 8 wherein at least some of the fold lines are constituted by slots in the material of the frame and support sheets.

11. A blister-pack according to any one of Claims 6 to 10 wherein the support sheets (41a, 42a, 41b, 42b) are trapezoidal with the broadest edge adjacent to the frame, such that the fold lines in the opposed support sheets are almost parallel to both the connection edges (47a, 47b, 47c, 47d) on either side of each fold line.

12. A blister-pack according to any one of Claims 7 to 12 wherein flaps (37a, 37b) are linked at least to the shorter support sheets by creases extending along the edge of the support sheet remote from the frame, and the fold lines in the support sheets extend also through the flaps.

Revendications

1. Emballage du genre "blister" qui comprend:

(a) un cadre plan (2) à découpe en forme de fenêtre (5),

(b) une cuvette en matière plastique (4) disposée dans cette fenêtre,

(c) des objets conditionnés (6) logés dans cette cuvette,

(d) au moins deux éléments de support latéraux (3) reliés à la périphérie du cadre et faisant un certain angle avec celui-ci,

(e) la hauteur de ces éléments de support (3) étant au moins égale à la profondeur de la cuvette en matière plastique (4), emballage caractérisé en ce que

(f) la matière plastique (4) recouvre le cadre (2) sensiblement jusqu'à sa périphérie et est soudée à chaud à ce cadre (2),

(g) la fenêtre (5) est plus grande que les objets conditionnés (6) ou que la partie de ces objets logée dans la cuvette, de façon que ces objets ne viennent en aucun point en contact avec les bords intérieurs (7) du cadre, et

(h) la partie latérale (8) de la cuvette n'est pas parallèle à la surface extérieure (9) des objets conditionnés (6), mais s'écarte vers l'extérieur à partir des bords (10) de la surface de ces objets.

2. Emballage "blister" selon la revendication 1, dans lequel la cuvette a des dimensions plus faibles que la fenêtre, de sorte qu'une bordure de matière plastique entoure les bords intérieurs (7) de cette fenêtre.

3. Emballage "blister" selon l'une des revendications 1 et 2, dans lequel le cadre présente des traits, de pliage (25a, 25b, 49a, 49b, 49c, 49d) qui vont d'au moins deux angles extérieurs diagonalement opposés de ce cadre à la fenêtre; la matière plastique est une pellicule souple et les éléments de support sont des feuilles planes qui sont reliées à la périphérie dudit cadre par des rainures (27a, 27b) et qui sont disposées de manière que l'emballage puisse être replié à plat quand les objets qu'il contient en ont été retirés.

4. Emballage "blister" selon la revendication 3, dans lequel quatre éléments de support plans (21a, 21b, 22a, 22b) sont reliés chacun aux bords d'un cadre sensiblement rectangulaire par des rainures (27a, 27b) et des traits de pliage (26a, 26b, 33a, 33b) sont formés sur des éléments de support opposés.

5. Emballage "blister" selon la revendication 4, dans lequel les éléments plans de support adjacents (21a, 22a et 21b, 22b) sont articulés

l'un sur l'autre de façon à former deux paires non reliées de supports, et les traits de pliage (26a, 26b) de ces éléments de support se raccordent aux traits de pliage (25a, 25b) du cadre.

6. Emballage "blister" selon la revendication 4, dans lequel les quatre éléments de support sont reliés les uns aux autres, et deux éléments opposés présentent en leur milieu des traits de pliage (33a, 33b, 48a, 48b) qui se prolongent sur le cadre jusqu'au bord intérieur de la fenêtre.

7. Emballage "blister" selon l'une quelconque des revendications 3 à 6, dans lequel le cadre est rectangulaire et a un côté long et un côté court, et chacun de ces côtés est relié par un rainage (27a, 27b) à un élément de support plan long ou court correspondant et dans lequel les traits de pliage (26a, 26b, 33a, 33b, 48a, 48b) sont formés sur les éléments de support courts opposés.

8. Emballage "blister" selon la revendication 7, dans lequel les traits de pliage (26a, 26b) de chacun des deux éléments de support courts se raccordent aux traits de pliage (25a, 25b) qui vont de l'angle de la partie adjacente du cadre jusqu'à la fenêtre, sous un angle tel que les rainages (27a, 27b) formés entre ces éléments de support courts et ce cadre constituent le bissectrices de l'angle formé entre les traits de pliage (26a, 26b) de l'élément de support court et le trait de pliage (25a, 25b) s'étendant de l'angle de coin du cadre à la fenêtre.

9. Emballage "blister" selon l'une quelconque des revendications 3 à 8, dans lequel certains au moins des traits de pliage sont des rainages formés dans la matière du cadre et des éléments de support.

10. Emballage "blister" selon l'une quelconque des revendications 3 à 8, dans lequel certains au moins des traits de pliage sont constitués de fentes ou encoches formées dans la matière du cadre et des éléments de support.

11. Emballage "blister" selon l'une quelconque des revendications 6 à 10, dans lequel les éléments de support (41a, 42a, 41b, 42b) sont trapézoïdaux, leur grand côté étant adjacent au cadre, de façon que les traits de pliage des éléments de support opposés soient presque parallèles aux deux bords de raccordement (47a, 47b, 47c, 47d) situés de part et d'autre de chacun de ces traits.

12. Emballage "blister" selon l'une quelconque des revendications 7 à 11, dans lequel des pattes (37a, 37b) sont articulées sur au moins les éléments de supports courts par des rainages formés sur le bord de ces éléments opposé au cadre, et les traits de pliage desdits éléments de support se continuent aussi sur ces pattes.

Patentansprüche

1. Ein Blisterbord bestehend aus:

(a) einem flächigen Rahmen (2) mit einem Fensterausschnitt (5),

(b) einer Mulde aus Kunststoffmaterial (4)

innerhalb des Fensterausschnitts,

(c) zu verpackendes Gut (6) in der Mulde,

(d) mindestens zwei seitliche, am Aussenumfang des Rahmens (2) abgewinkelte Stützabschnitte (3),

(e) wobei die Höhe der Stützabschnitte (3) mindestens so gross wie die Tiefe der Mulde aus Kunststoffmaterial (4) ist, dadurch gekennzeichnet, dass

(f) das Kunststoffmaterial (4) sich im wesentlichen über den Rahmen (2) bis zu seinem Rande erstreckt und mit diesem durch Heissiegelung verbunden ist,

(g) der Fensterausschnitt (5) grösser als das zu verpackende Gut (6) oder der aufzunehmende Teil des Gutes ist, der verpackt werden soll, so dass das zu verpackende Gut an keinem Punkt mit dem inneren Rand (7) des Rahmens in Berührung kommt,

(h) die Seitenteile (8) der Mulde nicht parallel zu den Aussenflächen (9) des zu verpackenden Gutes (6), sondern von den Kanten (10) der am Boden der Mulde befindlichen Fläche des zu verpackenden Gutes nach aussen weiterlaufen.

2. Ein Blisterbord nach dem Anspruch 1, dadurch gekennzeichnet, dass die Öffnung der Mulde kleiner ist als der Fensterausschnitt, so dass ein Rand aus Kunststoffmaterial die Innenkante (7) des Fensterausschnittes umsäumt.

3. Ein Blisterbord nach jedem der vorhergehenden Ansprüche, dadurch gekennzeichnet dass der Rahmen mit Rillern (25a, 25b, 49a, 49b, 49c, 49d) versehen ist, welche wenigstens von zwei einander diagonal gegenüberliegenden ausseren Ecken des Rahmens zum Fensterausschnitt verlaufen, dass Kunststoffmaterial eine flexible Folie ist und dass die Stützabschnitte aus flächigem Material über Faltlinien (27a, 27b) mit den Aussenkanten des Rahmens verbunden sind und dass das ganze so gebaut ist, dass das Blisterbord flach zusammengelegt werden kann.

4. Ein Blisterbord nach Anspruch 3, dadurch gekennzeichnet, dass die 4 Stützabschnitte (21a, 21b, 22a, 22b) aus flächigem Material jeweils mit der Aussenkante des normalerweise rechteckigen Rahmens über Faltlinien (27a, 27b) verbunden sind und Riller (26a, 26b, 33a, 33b) in einander gegenüberliegenden Stützabschnitten eingepreßt sind.

5. Ein Blisterbord nach Anspruch 4, dadurch gekennzeichnet, dass die benachbarten Stützabschnitte (21a, 22a und 21b, 22b) aus flächigem Material so miteinander verbunden sind, dass zwei einander gegenüberliegende unverbundene Stützabschnittspaare entstehen und die Riller (26a, 26b) in den Stützabschnitten in die Riller (25a, 25b) des Rahmens übergangen.

6. Ein Blisterbord nach Anspruch 4, dadurch gekennzeichnet, dass alle vier Stützabschnitte miteinander verbunden sind und dass zwei einander gegenüberliegende Stützabschnitte mittig Riller (33a, 33b, 48a, 48b) haben, welche sich über den Rahmen bis zur Innenkante des Fensterausschnittes fortsetzen.

7. Ein Blisterbord nach jedem der Ansprüche 3 bis 6, dadurch gekennzeichnet, dass der Rahmen rechteckig ist und eine breitere und eine schmalere Seite hat und jede Seite des Rahmens unterm eine Faltlinie (27a, 27b) mit dem entsprechenden breiteren bzw. schmaleren flächigen Stützabschnitt verbunden ist und dass die Riller (26a, 26b, 33a, 33b, 48a, 48b) in den einander gegenüberliegenden schmaleren Stützabschnitten eingepreßt sind.

8. Ein Blisterbord nach Anspruch 7, dadurch gekennzeichnet, dass sich die Riller (26a, 26b) in den beiden schmaleren Stützabschnitten in den Rillern (25a, 25b) fortsetzen, die sich von der Ecke des jeweils benachbarten Teil des Rahmens bis zum Fensterausschnitt erstrecken und dass der jeweilige Winkel zwischen den Rillern (26a, 26b) auf den schmaleren Stützabschnitten und denen (25a, 25b) von der Ecke des Rahmens zum Fensterausschnitt von der Faltlinie (27a, 27b) zwischen Stützabschnitt und Rahmen halbiert wird.

9. Ein Blisterbord nach jedem der Ansprüche 3 bis 8, dadurch gekennzeichnet, dass die Riller

im Material des Rahmens und der Stützabschnitte Faltlinien sind.

10. Ein Blisterbord nach jedem der Ansprüche 3 bis 8, dadurch gekennzeichnet, dass wenigstens einige der Riller durch Schlitze im Material des Rahmens und der Stützabschnitte ersetzt werden.

11. Ein Blisterbord nach jedem der Ansprüche 6 bis 10, dadurch gekennzeichnet, dass die Stützabschnitte (41a, 42a, 41b, 42b) trapezartig geformt und mit ihrer breitesten Kante mit dem Rahmen verbunden sind, so dass die Riller in den einander gegenüberliegenden Stützabschnitten fast parallel zu den beiden jeweiligen Verbindungskanten (47a, 47b, 47c, 47d) verlaufen.

12. Ein Blisterbord nach jedem der Ansprüche 7 bis 11, dadurch gekennzeichnet, dass Klappen (37a, 37b) mindestens an den schmaleren Stützabschnitten mit Faltlinien an den dem Rahmen gegenüberliegenden Rand angebracht sind und dass die Riller in den Stützabschnitten auch durch die Klappen verlaufen.

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FIG.1

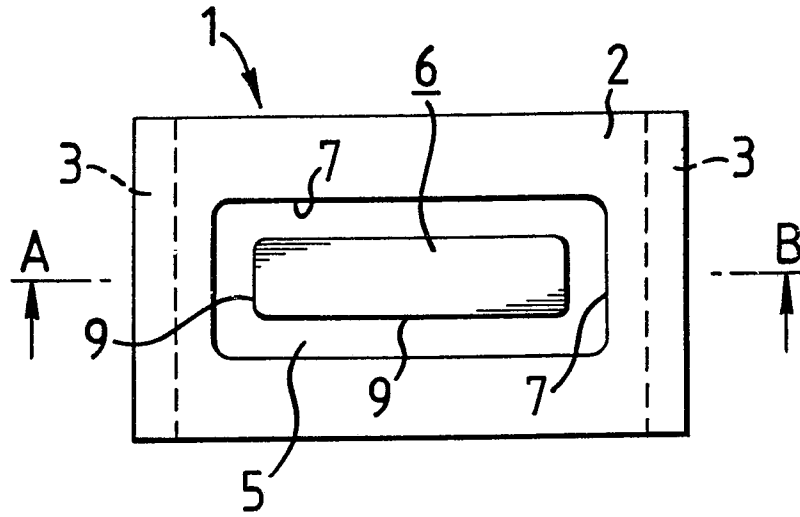


FIG.2

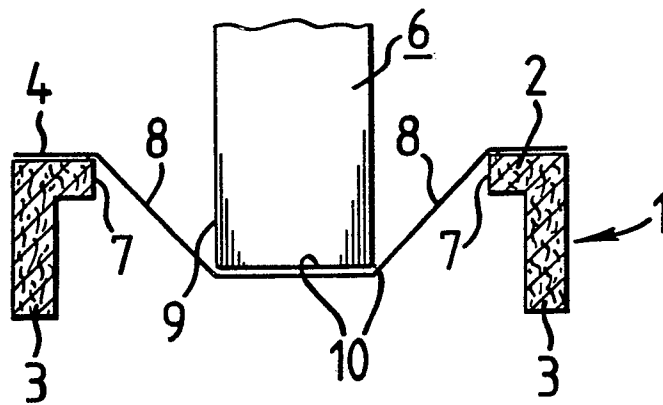


FIG. 3

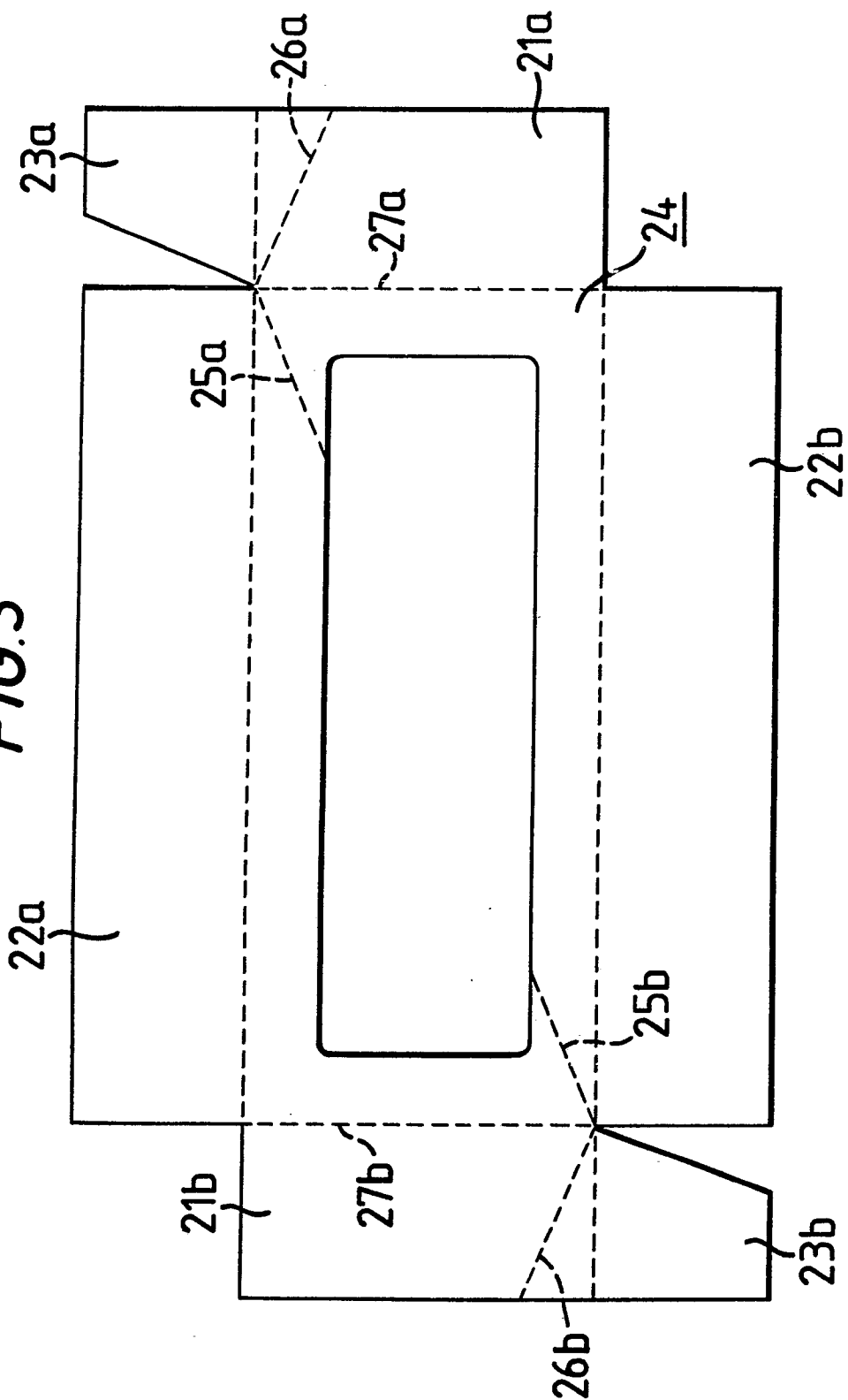


FIG. 4

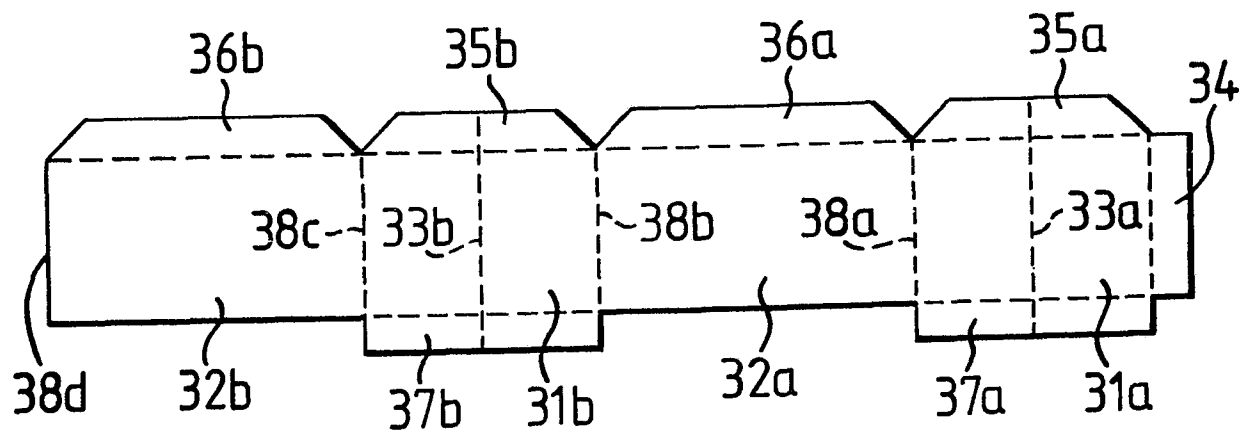


FIG. 5

