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(54) **Blister pack.**

(57) A blister or strip pack comprising a blister sheet (1) formed to provide one or more blister cavities (2) and a liding sheet (5) of paper adhered thereto to seal said cavity or cavities.

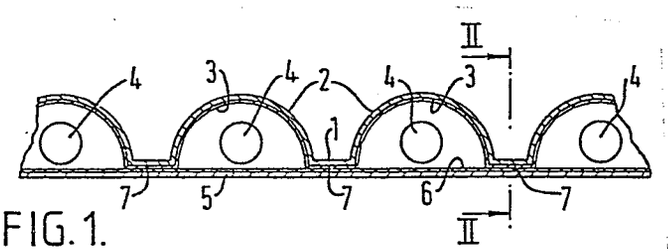

FIG. 1.

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BLISTER PACK

This invention relates to a blister pack of the kind which can be used for packing various kinds of articles, and which is particularly although not exclusively applicable for packing medicines in the form of tablets, capsules or the like.

One known form of blister pack consists of a polyvinyl chloride sheet which has been formed by heat and pressure into blisters. The articles to be packed are then placed in the blisters and a lidding sheet of aluminium foil applied over the flat surface of the blister sheet to seal the blisters. The lidding sheet is sealed to the blister sheet by various means, for example a hot melt adhesive in a heat sealing process. Because of the nature of the pack and the manufacturing process, it is only practicable to manufacture such packs under factory conditions. As a result, production is limited to the packaging of standard packs, for example aspirin tablets.

The object of the present invention is to provide a blister pack incorporating a low cost lidding sheet which can be applied without the use of specialised apparatus, and which is cheap to produce.

According to the present invention therefore a blister or strip pack comprises a blister sheet which is formed to provide one or more blister cavities and a lidding sheet of paper adhered thereto to seal said cavity or cavities.

The lidding sheet is preferably made from papers such as glassine, greaseproof, tracing or vegetable parchment which exhibit high burst and low tear resistance characteristics. Where it is desirable to heighten resis-

tance to moisture transmission, this can be achieved by suitable treatment during manufacture of the paper or by applying coatings subsequently. Certain adhesives with which the paper may be coated for adhesion to the blister sheet may also provide this barrier property.

Where child resistance is an important characteristic required in the blister pack, the adhesion between the paper lidding and the blister sheet is such that the paper tears rather than peels from the blister sheet. As a result, the residual ruptured lidding fragments remaining when one blister has been opened tear off if attempts are made to peel them back to open another blister.

In one embodiment, the lidding sheet and the blister sheet are both provided with coatings of mutually adherent high tack dry latex adhesive. A layer of such adhesive will only adhere to another layer of the same adhesive, thus obviating the necessity to provide protective release sheets. In another embodiment, the lidding sheet and the blister sheet are both provided with coatings of high tack self-adhesive, each carrying a release sheet which can be stripped from the adhesive layer when the pack is to be assembled.

Thus the pack components do not require factory conditions for assembly and can be put together by, for example, a pharmacist in a shop or hospital and used for packing tablets in a programmed dosage form. The lidding sheet may carry indicia and may be printed or typed upon prior to assembly so that dosage instructions specific to the patient can be set out on the pack.

Although of particular advantage for use in non-industrial contexts, the lidding sheet of the invention may of course be used in a factory context if required. In this case, a hot melt adhesive is applied so that the

lidding may be heat sealed, for example to polyvinyl chloride blister packs.

A suitably coated lidding sheet according to the invention can be used with many forms of blister sheet material, for example a sheet material made from a blend of cellulose and synthetic wood pulp fibres as set forth in the Applicants co-pending EPA No. filed 24.01.1984 Ref W.87 corresponding to United Kingdom Patent Application No. 83 03600 filed 9th February 1983.

If the articles to be packed are likely to be subject to hygroscopic or ultra violet generation, the lidding paper can embody a metal layer. This can be provided either by lamination or vacuum deposition and it may for example be of aluminium. Where such a metallic layer is provided, a similar layer may be provided on the blister sheet. The blister sheet may be provided with any number of blister cavities appropriate to the number of articles to be packed.

The invention will be further described with reference to the accompanying drawings in which :-

Figure 1 is a cross-sectional view of a blister pack according to the invention;

Figure 2 is a cross-sectional view on the line II-II of Figure 1; and,

Figure 3 is a cross-sectional view through a second embodiment which is suitable for use with tablets susceptible to hygroscopic or ultra violet degeneration.

In the construction shown in Figures 1 and 2 a blister sheet 1 is made from a mixture of cellulosic and fibrillated synthetic thermoplastic fibres as set forth in the Applicants' co-pending EPA No. filed 24.01.1984 Ref W.87 The synthetic fibres used are those sold under the Trade name SWP by Crown Zellerbach Corporation. The proportion of fibrillated thermoplastic polymer desirable in the paper sheet will vary with the deptch and configuration of the blister cavities to be formed. The thermoplastic polymer therefore is between 75% and 80% and is made up from approximately 75% fibrillated fibres and 25% particulate material. The remainder of the blend comprises the cellulosic and staple fibre material and this can be hardwood sulphate pulp.

In order to provide opacity to the sheet a proportion of pigement such as titanium dioxide is also included.

An alternative blend of materials suitable for the construction shown in Figures 1 and 2 comprises a blend of synthetic thermoplastic fibre material of the kind sold under the Trade name PULPEX EA by Solvay et Cie. In this blend high translucencey is achieved by including thermoplastic polymer amounting to about 85% of the blend, the remainder again being hardwood sulphate pulp. Once again with this embodiment at least 60% of the thermoplastic polymer is in fibrillated form, the remainder being particulate.

The sheet may be formed on a conventional papermaking machine and when it is to be made up into a blister sheet it is moulded by thermal deformation to provide blisters 2. The blister sheet 1 has coated thereon a layer of high tack dry latex adhesive 3 and contains within its blisters 3 drug tablets 4.

A lidding sheet 5 carries thereon a layer 6 of the same high tack dry latex adhesive. The adhesive layers 3 and 6 are mutually adhesive but will not adhere to any other surface. The are sealed together at the locations 7 between the blisters so that each tablet 4 is isolated.

The lidding sheet 5 is made of paper, and preferably of a paper having high burst and low tear resistance characteristics. This ensures that inadvertent rupture of the lidding sheet is minimised whilst ensuring that after intentional rupture, it will tear easily to release a selected tablet. Such papers are examplified by glassinge, greaseproof, tracing and vegetable parchment papers, burst and tear characteristics for which are set out in the following table :-

PAPER TYPE		UNITS	COATED GLASSINE (AS HEREIN DEFINED)	GLASSINE	TRACING	GREASEPROOF	VEGETABLE PARCHMENT
GRAMMAGE		grams per square metre (gm/m^2)	68	39	54	51	40
BRITISH STANDARD TEST METHOD 3137/1972	BURST	Kilo Newtons per square metre (KN/m^2)	138	104	163	139	130
	BURST FACTOR		2.0	2.7	3.0	2.7	3.3
BRITISH STANDARD TEST METHOD 4468/1969	MACHINE DIRECTION TEAR RESISTANCE	Milli Newtons (mN)	240	100	130	135	120
	TEAR FACTOR		357.9	239.9	263.7	257.7	304.6
BRITISH STANDARD TEST METHOD 4468/1969	CROSS DIRECTION TEAR RESISTANCE	Milli Newtons (mN)	280	120	160	180	120
	TEAR FACTOR		410.6	309.3	295.2	351.6	304.6

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In the foregoing embodiment, the use of layers of mutually adherent high tack dry latex adhesive has been proposed. However, it will be appreciated that self-adhesive layers may be readily substituted, in which case, release sheets, coated for example with silicone release coatings will be applied to the adhesive coatings as a protection, the release sheets being stripped off before the blister and lidding sheets are sealed together. Alternatively, where the lidding sheet is to be sealed to a blister sheet comprising thermoplastic material, such as polyvinyl choride or polyethylene, it may carry a layer of hot melt adhesive. In this case, the lidding sheet will be sealed to the blister sheet by appropriate heat sealing equipment.

Referring now to Figure 3, this shows a modification of the embodiment of Figures 1 and 2 particularly suited for packing articles 10 which are susceptible to ultra violet and/or hygroscopic degeneration. The construction and assembly of the blister pack is generally as described above with reference to Figures 1 and 2 and where appropriate, the various parts are designated by the same reference numerals. In this case however the outer surfaces of the blister and lidding sheets 1 and 5 are provided with metal layers in 11 and 12 respectively. The metal layers are provided by vacuum deposition. The provision of a metal layer has a further advantage in that it renders both the blister pack and lidding sheet opaque and thus conceals the contents from children who might otherwise identify them as sweets or candies.

CLAIMS

1. A blister or strip pack comprising a blister sheet formed to provide one or more blister cavities and a lidding sheet of paper adhered thereto to seal said cavity or cavities.

2. A blister or strip pack as claimed in claim 1 in which the lidding sheet paper is glassine, greaseproof, tracing or vegetable parchment.

3. A blister or strip pack as claimed in claim 1 or claim 2 in which the paper is coated to heighten resistance to moisture.

4. A blister or strip pack as claimed in claims 1 to 3 in which the adhesion of the lidding sheet to the blister sheet is such that the paper tears rather than peels from the blister sheet.

5. A blister or strip pack as claimed in claims 1 to 4 in which the lidding sheet and blister sheet are both provided with mutually adherent high tack dry latex adhesive.

6. A blister or strip pack as claimed in claims 1 to 4 in which the lidding sheet and blister sheet are both provided with coatings or high tack self-adhesive each carrying a release sheet which can be stripped from the adhesive layer when the pack is to be assembled.

7. A blister or strip pack as claimed in claims 1 to 6 in which the lidding sheet carries indicea.

8. A blister or strip pack as claimed in claims 1 to 4 in which the lidding sheet is heat sealed to the blister sheet.

9. A blister or strip pack as claimed in claims 1 to 8 in which the lidding sheet embodies a metal layer.

10. A blister or strip pack as claimed in claim 9 in which the metal layer is applied by lamination or vacuum deposition.

11. A blister or strip pack as claimed in claim 10 in which the metal layer is aluminium.

12. A blister or strip pack as claimed in claims 9 to 11 in which a similar metal layer is also applied to the blister sheet.

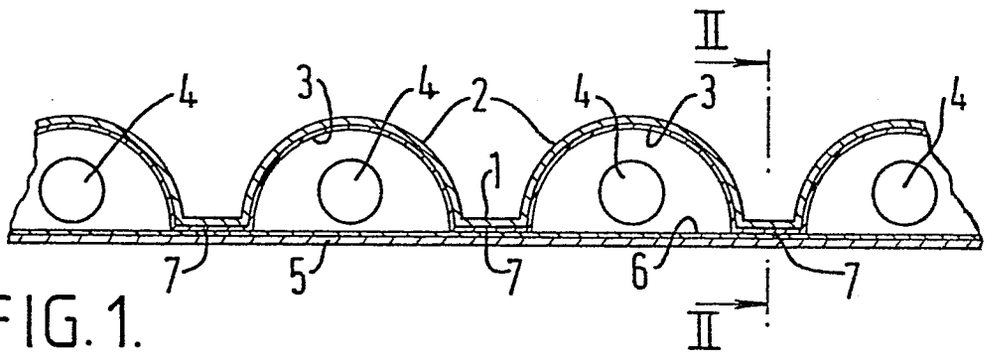

FIG. 1.

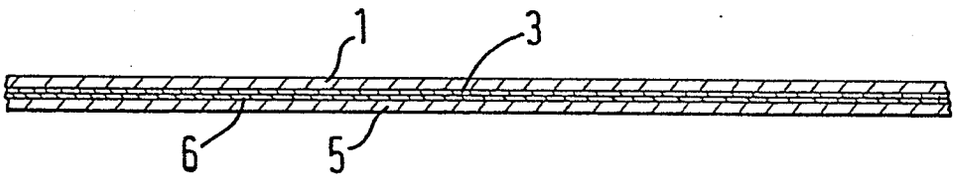

FIG. 2.

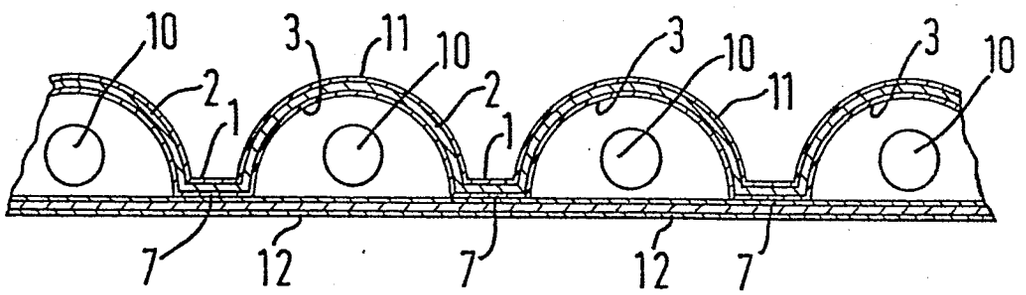

FIG. 3.

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Application number

European Patent Office

EUROPEAN SEARCH REPORT

EP 84300419.3

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
X	DE - A1 - 3 029 253 (DIXIE UNION) * Page 12, lines 1-10 *	1	B 65 D 75/34 B 65 D 85/56
A		9-12	
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A	DE - B - 1 276 993 (FELDMÜHLE AG) * Totality *	2,3	
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A	US - A - 3 202 277 (LEWI) * Totality *	1-8	
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A	US - A - 3 630 346 (BURNSIDE) * Pos. 22 *	6	

TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
B 65 D 65/00
B 65 D 75/00
B 65 D 85/00

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	28-05-1984	MELZER

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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