



(11) **EP 2 025 617 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.02.2009 Bulletin 2009/08

(51) Int Cl.:
B65D 75/36 *(2006.01)*

(21) Application number: **07015935.5**

(22) Date of filing: **14.08.2007**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE
SI SK TR**
Designated Extension States:
AL BA HR MK RS

(71) Applicant: **Ethiprint Ltd.**
Osmaton Park Industrial Estate
Derby
DE24 8SR (GB)

(72) Inventor: **Stonley, Carl**
Nottingham
NG8 2BB (GB)

(74) Representative: **Landgraf, Elvira**
Schulfeld 26
4210 Gallneukirchen (AT)

(54) **Aluminium foils with security features**

(57) The Invention deals with an aluminium foil stock **characterized in that** it is printed partially with a lacquer or printing ink and subsequently embossed, whereby the partial printing is essentially invisible when viewed at an

angle of 90 degrees, in relation to the foil surface (i.e. perpendicular to the surface) and becomes visible when viewed at an angle of about 20 - 45 degrees.

EP 2 025 617 A1

Description

[0001] The invention relates to aluminium foils especially to aluminium foils used as lidding material, especially for pharmaceutical blisters or food packages.

[0002] Aluminium foils are commonly used for pharmaceutical blister ridding applications or for covers of packages for milk based food.

The aluminium foils act as protective barrier against contamination e.g. humidity, dust and the like. Secondly they act as an access medium due to their frangible nature and low puncture resistance properties.

Typically these foils are lacquered on one side for thermal adhesion to PVC/PVdC blister materials or polyolefinic food packaging materials and lacquered on the other side with a coating to allow them to be printed with branding, consumer information and the like. The information is usually printed via direct printing processes, such as flexographic and gravure printing processes, sometimes via digital printing processes. Usually the coating has a surface energy in excess of 38 mN/m².

[0003] Especially pharmaceutical products are known to be counterfeited or sold in countries other than their intended destination as contraband goods.

[0004] Such practices reduce government tax revenues and potentially risk the health of unknowing consumers. The sale of counterfeited products also reduces the revenue of pharmaceutical companies responsible for inventing, developing and manufacturing authentic products, undermining the potential for future research.

[0005] Some measures have already been taken to protect blister foils in order to help secure product safety and protect brand image.

These measures have included printed and diffractive features such as holograms and the like.

[0006] Printed features include overt prints that are relatively difficult to reproduce by the counterfeiter such as micro printed features with a typical text height of about 200 - 400 microns.

Covert prints such as those lacquers incorporating UV fluorescent or IR pigments require the use of a dedicated reader to identify the presence of secure pigments, although their presence can sometimes be seen prematurely by the naked eye when applied to reflective aluminium foil.

Other features such as diffractive patterns like holograms are generally more secure than printed features but the cost of application, both in terms of origination, tooling and foil is much higher.

[0007] The primary objective of the invention is to create a secure blister foil that will help to protect products especially pharmaceutical products against counterfeiting and contraband trading practices.

[0008] A further objective of the invention is to create a secure foil that can be authenticated by both consumers and also by field inspectors without the need for sophisticated readers.

[0009] A further objective is to create a secure foil at

a cost effective price so that such a product could be widely adopted in many areas of the pharmaceutical market.

[0010] Object of the invention is therefore an aluminium foil stock characterized in that it is printed partially with a lacquer or printing ink and subsequently embossed, whereby the partial printing is essentially invisible when viewed at an angle of 90 degrees, in relation to the foil surface (i.e. perpendicular to the surface) and becomes visible when viewed at an angle of about 20 - 45 degrees.

[0011] The invention combines the techniques of printing on a plain aluminium foil stock and subsequently embossing of the printed foil so that when viewed directly, perpendicular to the foil, the deformed printed image cannot be seen at all or cannot be easily be seen.

[0012] The partial printing becomes overt when the printed and embossed foil is viewed at an angle of approximately 20 - 45, preferably about 30 degrees. No dedicated reader is required to verify the secure information. (Field inspector verification).

[0013] The partial printing therefore forms a hidden image. The hidden image may be in the form of characters, symbols, numbers, lines, pictures, a chain of characters, images or the like.

The hidden image may represent consumer information, brands, security information or the like.

[0014] In one embodiment of the invention the aluminium foil may also be printed with brand or consumer information which is visible even after embossing, when viewed perpendicular to the surface.

[0015] Printing may be carried out as full printing or selective printing for example in the form of lines or dots by conventional printing techniques, such as flexo- or gravure printing or a combination of both.

[0016] The partial printing may be done by use of a conventional lacquer or printing ink or colour containing visible dyestuffs or pigments, luminescent dyestuffs or pigments which fluorescence or phosphorescence in the visible range, effect pigments, such as liquid crystals, pearl lustre, bronzes and/or multilayer colour-change pigments and heat-sensitive or pressure sensitive or tactile colours or pigments. These can be employed in all possible combinations.

The printing may be carried out using one or more different colours. Preferably the different colours are recognized as clearly different colours after embossing and viewing at an angle from about 20 - 45 degrees, preferably about 30 degrees.

[0017] Subsequently the printed aluminium stock foil is embossed with an emboss pattern such as a pyramid pattern, a triangle pattern for example as a 2, 3, 4, 5 or 6 sided emboss structure and the like.

Usually the foils are embossed to a depth of about 20 to 100 microns, preferably 40 to 60 microns.

[0018] Using the described combination of techniques i.e. printing and subsequent embossing, it is possible to create a range of secure foils that can be authenticated

at various parts of the supply chain i.e.

- a. Completely covert messages that can be verified by field inspectors only.
- b. Semi - overt features in one or more colors that may be verified by educated consumers.
- c. A combination of covert and semi-overt features that could be verified by both consumers and field inspectors.

[0019] Appropriate foils are for example hard tempered aluminium foil (child resistant structure, preferably 30 micron), hard and soft tempered aluminium mono web foil grades - typically 10-50 microns, lacquer or printing ink (clear or coloured) coated and metallised aluminium foils (tear verification of hidden lacquer colour), lacquer or printing ink (clear or coloured) coated and selectively metallised aluminium foils, aluminium foil/aluminium foil laminates (clear or coloured adhesive for tear verification of hidden lacquer colour), aluminium foil/paper laminates or aluminium foil/polymer film laminates.

[0020] The invention is a cost effective solution to potential counterfeiting and contraband trading of pharmaceutical products packaged in blister pack format. The invention could also be used for protection of pharmaceutical products packaged in foil sealed bottles, strip packages, security labels or seals and bundle wrapping of cigarettes, high value cosmetics etc.

Example 1

[0021] A 30 micron hard tempered aluminium foil stock was printed with a clear lacquer incorporating 1% silver pigment concentrate with the word "secure". In the same gravure process, the pre-printed foil was printed with a standard black printing lacquer in order to provide branding and consumer information. Subsequently to printing, the printed foil was embossed with a 4 sided pyramid emboss pattern to a depth of 60 microns. During the embossing process, the overt "secure" text was substantially deformed, becoming hidden and covert when viewed at 90 degrees, perpendicular to the foil surface. The text was hidden due to a significant proportion of the print being deformed at a surface angle different to the general surface angle of the printed foil. The printed and embossed foil was then slit to size and then applied under heat and pressure to a PVC blister web containing tablets. The branded foil could be verified as authentic by a field inspector only by viewing the hidden information with the naked eye, at an angle close to 30 degrees.

Example 2

[0022] A 20 micron hard tempered aluminium foil stock was printed with a clear lacquer incorporating 2% blue pigment concentrate with the word "secure" and a second clear lacquer incorporating 2% red pigment concentrate with the word "OK". In a subsequent process, the pre-

printed aluminium foil was flexographically printed with a standard red printing lacquer in order to provide branding and consumer information. Subsequently to printing, the printed foil was embossed with a 3 sided triangular emboss pattern to a depth of 40 microns. During the embossing process the overt "secure" and "OK" texts became partly obscured and very difficult to read when viewed at 90 degrees. The foil was then slit to size and then applied under heat and pressure to a PVC blister web containing tablets. The branded foil and tablets could be verified as authentic by an educated consumer, by viewing the red and blue partially hidden information without a dedicated reader at an angle close to 30 degrees.

Claims

1. Aluminium foil stock **characterized in that** it is printed partially with a lacquer or printing ink and subsequently embossed, whereby the partial printing is essentially invisible when viewed at an angle of 90 degrees, in relation to the foil surface (i.e. perpendicular to the surface) and becomes visible when viewed at an angle of about 20 - 45 degrees.
2. Aluminium foil stock according to claim 1, **characterized in that** the partial printing becomes visible when viewed at an angle of about 30 degrees.
3. Aluminium foil stock according to claim 1 or 2, **characterized in that** the partial printing is in the form of characters, symbols, numbers, lines, pictures, a chain of characters or images.
4. Aluminium foil stock according to one of claims 1 to 3, **characterized in that** the partial printing is carried out with two or more different colours.
5. Aluminium foil stock according to one of claims 1 to 4, **characterized in that** the foil is embossed as a 2, 3, 4, 5 or 6 sided emboss structure.
6. Aluminium foil stock according to one of claims 1 to 5, **characterized in that** the foil is embossed to a depth of 20 to 100 microns.
7. Aluminium foil stock according to one of claims 1 to 6 **characterized in that** the partial printing is semi overt after embossing when viewed perpendicular to the surface and fully overt when viewed at about 20 - 45 degrees.
8. Aluminium foil stock according to one of claims 1 to 7 **characterized that** the partial printing shows two or more hidden colours which are visible and clearly different colours when viewed at an angle of about 20 - 45 degrees.

9. Aluminium foil stock according to one of claims 1 to 8 **characterized in that** the foil is also printed with overt printing details for example consumer information, brand logo or the like.

5

10. Use of the aluminium foil stock according to one of claims 1 to 9 for lidding of pharmaceutical blister packages, pharmaceuticals packed in foil sealed bottles, strip packages, security labels or seals and bundle wrapping of cigarettes, high value cosmetics.

10

15

20

25

30

35

40

45

50

55



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 01 5935

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	WO 03/010065 A1 (TOREN CONSULTING PTY LTD [AU]; TOREN THOMAS [AU]) 6 February 2003 (2003-02-06) * page 1, line 5 - line 16 * * page 3, line 26 - line 28 * -----	1-10	INV. B65D75/36
Y	US 5 199 744 A (SHENTON COLIN [GB]) 6 April 1993 (1993-04-06) * column 1, line 53 - column 2, line 17 * * column 2, line 31 - line 37 * -----	1-10	
A	EP 0 194 042 A2 (BRADBURY WILKINSON CHEQUES [GB]) 10 September 1986 (1986-09-10) * page 3, line 33 - page 4, line 12 * -----	1-10	
A	WO 94/29119 A (AUSTRALIA RESERVE BANK [AU]; JACKSON WAYNE KEVIN [AU]) 22 December 1994 (1994-12-22) * page 1, line 3 - page 5, line 30 * -----	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D B41M B41F G09F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 14 December 2007	Examiner Daintith, Nicola
CATEGORY OF CITED DOCUMENTS		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	
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			

1
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 01 5935

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

14-12-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 03010065 A1	06-02-2003	EP 1417140 A1	12-05-2004
US 5199744 A	06-04-1993	NONE	
EP 0194042 A2	10-09-1986	DE 3684719 D1	14-05-1992
		GB 2177975 A	04-02-1987
WO 9429119 A	22-12-1994	AT 209576 T	15-12-2001
		CA 2164629 A1	22-12-1994
		CN 1124940 A	19-06-1996
		DE 69429266 D1	10-01-2002
		DE 69429266 T2	04-07-2002
		DK 710183 T3	18-03-2002
		EP 0710183 A1	08-05-1996
		ES 2167366 T3	16-05-2002
		FI 955882 A	07-12-1995
		JP 8510967 T	19-11-1996
		JP 2003094870 A	03-04-2003
		NO 954908 A	04-12-1995
		NZ 267032 A	26-11-1996
		PT 710183 T	31-05-2002
		SG 44393 A1	19-12-1997
		US 5915731 A	29-06-1999