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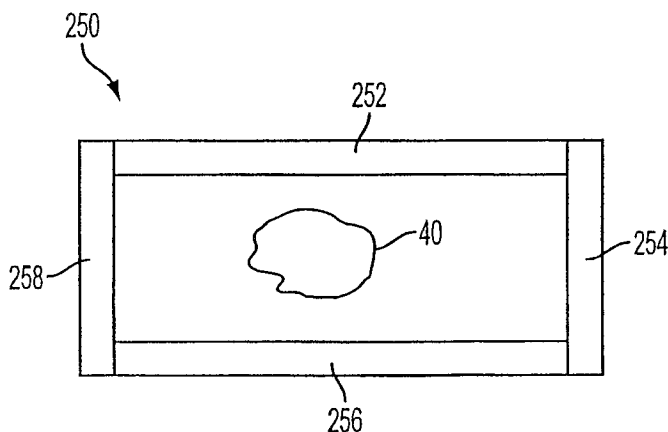
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(54) Title: VACUUM PACKAGING FILMS PATTERNED WITH PROTRUDING CAVERNOUS STRUCTURES



(57) Abstract: The present invention teaches a film having a pattern of protruding structures. When used in the vacuum packaging bag material context, the result is a vacuum packaging bag that a consumer can effectively evacuate and hermetically seal. The protruding structures tend to form channels that enable gas to evacuate from within a vacuum packaging bag. In certain embodiments, the protruding structures are formed only on an inner side of the vacuum packaging film, typically through a hot casting or heat-extrusion process. As a result, far less bag material is required than in the prior art patterned film formed through cold embossing processes. The present invention also contemplates a variety of applications for

the films, including preformed bags and bag rolls, as well as a variety of apparatus for manufacturing the films and appliances for utilizing the bags and bag rolls.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/26171

A. CLASSIFICATION OF SUBJECT MATTER
 IPC: **B65D 33/16**(2006.01),**33/01**(2006.01),**33/00**(2006.01),**30/08**(2006.01)

 USPC: 383/63,100,101,102,103,105,109
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
 U.S. : 383/63,100, 101, 102, 103,105,109

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US RE 34,929 A (KRISTEN) 09 May 1995 (09.05.1995) entire document.	1, 23, 24, 30-32, 38, 41, 44 ----- 1, 23-25, 29, 32-40, 42, 43
X --- Y	US 6,715,644 B2 (WILFORD) 06 April 2004 (06.04.2004) entire document.	50 ----- 1, 23-25, 29, 32-40
Y	US 4,782,951 A (GRIESBACH et al.) 08 November 1988 (08.11.1988), entire document.	42, 43

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:	"T"
"A" document defining the general state of the art which is not considered to be of particular relevance	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search: 22 January 2007 (22.01.2007) Date of mailing of the international search report: 12 MAR 2007

Name and mailing address of the ISA/US: Mail Stop PCT, Attn: ISA/US, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, Facsimile No. (571) 273-3201
 Authorized officer: Jes F. Pascua (Signature: Sharon W. Greene Jr), Telephone No. 571-272-3750

INTERNATIONAL SEARCH REPORT

International application No.

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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
 2. As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of any additional fees.
 3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

 4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1,23-44 and 50
- Remark on Protest**
- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
 - The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
 - No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
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BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1, 23-44 and 50, drawn to a vacuum packaging bag.

Group II, claim(s) 2-22, drawn to a vacuum packaing film.

Group III, claim(s) 45-47, drawn to method of manufacturing a multi-layer film.

Group IV, claim(s) 48, drawn to an apparatus for manufacturing a multi-layer film.

Group V, claim(s) 49, drawn to a system for a vacuum packaging a product.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The bag of Group I does not require the plurality of protruding cavernous structures of the film in Group II. Therefore, unity of invention is lacking since no common special technical feature exists between Groups I and II.

The inventions listed as Groups I and III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The claims to the bag of Group I is completely different from the claims to the method of manufacturing a multi-layer film of Group III. Unity of invention is lacking since no common special technical feature exists between the bag of Group I and the method of Group III.

The inventions listed as Groups I and IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The claims to the bag of Group I is completely different from the claims to the apparatus for manufacturing a multi-layer film of Group IV. Unity of invention is lacking since no common special technical feature exists between the bag of Group I and the apparatus of Group IV.

The inventions listed as Groups I and V do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The bag of Group I does not require the plurality of cavernous structures of the bag in Group V. Therefore, unity of invention is lacking since no common special technical feature exists between Groups I and V.

The inventions listed as Groups II and III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The film of Group II is known in the art. Therefore, the inventions of Group II and III lack unity since the film of Group II was not applicant's contribution over the prior art.

The inventions listed as Groups II and IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The film of Group II is known in the art. Therefore, the inventions of Group II and IV lack unity since the film of Group II was not applicant's contribution over the prior art.

INTERNATIONAL SEARCH REPORT

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The inventions listed as Groups II and V do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The claims to the film of Group II are completely different from the claims to the system of Group V. Unity of invention is lacking since no common special technical feature exists between the products.

The inventions listed as Groups III and IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The apparatus of Group IV was known in the art. Therefore, the inventions of Groups III and IV lack unity since the apparatus was not applicant's contribution over the prior art.

The inventions listed as Groups III and V do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The claims to the method of manufacturing a multi-layer film of Group III is completely different from the claims to a system for vacuum packaging a product of Group V. Unity of invention is lacking since no common special technical feature exists between the method and system.

The inventions listed as Groups IV and V do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The claims to the apparatus for manufacturing a multi-layer film of Group IV is completely different from the claims to a system for vacuum packaging a product of Group V. Unity of invention is lacking since no common special technical feature exists between the apparatus and system.