



(51) International Patent Classification:

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B29C 51/32 (2006.01)

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16 February 2018 (16.02.2018)

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English

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English

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(81) Designated States (*unless otherwise indicated, for every
kind of national protection available*): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ,

CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP,
KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA,
SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every
kind of regional protection available*): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ,
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: IMPROVEMENTS TO TRAYS

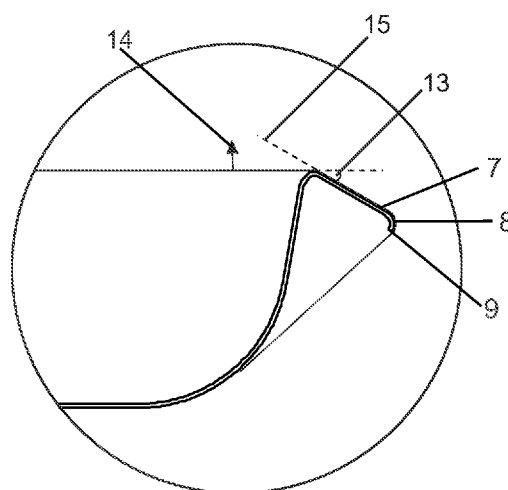


Figure 4

(57) Abstract: An improved open mouthed container having a profiled upper periphery about the mouth, and comprising a base, and a peripheral sidewall extending generally upwards from the base, wherein the profiled upper periphery comprises a rim region, and the rim region extending outwardly and downwardly from the peripheral sidewall of the improved open mouthed container.



PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 841755DIS	FOR FURTHER ACTION		see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/IB2018/050949	International filing date (<i>day/month/year</i>) 16 February 2018	(Earliest) Priority Date (<i>day/month/year</i>) 16 February 2017	
Applicant ALTO PACKAGING LIMITED			
This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau. This international search report consists of a total of 7 sheets. ☐ It is also accompanied by a copy of each prior art document cited in this report.			
1. Basis of the report a. With regard to the language, the international search was carried out on the basis of: ☒ The international application in the language in which it was filed. ☐ A translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)). b. ☐ This international search report has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)). c. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I. 2. ☐ Certain claims were found unsearchable (See Box No. II). 3. ☒ Unity of invention is lacking (See Box No. III). 4. With regard to the title, ☒ the text is approved as submitted by the applicant. ☐ the text has been established by this Authority to read as follows: 5. With regard to the abstract, ☒ the text is approved as submitted by the applicant. ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority. 6. With regard to the drawings, a. the figure of the drawings to be published with the abstract is Figure No. 4 ☐ as suggested by the applicant. ☐ as selected by this Authority, because the applicant failed to suggest a figure. ☒ as selected by this Authority, because this figure better characterizes the invention. b. ☐ none of the figures is to be published with the abstract.			

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:
the subject matter listed in Rule 39 on which, under Article 17(2)(a)(i), an international search is not required to be carried out, including
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:

See Supplemental Box for Details

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 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.:

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.

PCT/IB2018/050949

A. CLASSIFICATION OF SUBJECT MATTER

B65D 1/34 (2006.01) B29C 51/32 (2006.01) B29C 51/26 (2006.01)

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)

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)

EPOQUE – Databases PATENW: IPC/CPC (A47G19/02/low, A47G19/30/low, B26F1/38/low, B26F1/40/low, B26F2001/4427, B29C51/04/low, B29C51/265, B29C51/266, B29C51/306, B29C51/32/low, B29C51/34/low, B29C55/02/low, B29C67/0044, B29C2793/009, B29C2793/0027, B29D22/003/high, B29L2031/7132, B29L2031/7136, B29L2031/716, B65B5/026, B65D1/26/low, B65D1/34/low, B65D25/00/low, B65D77/003, B65D81/02/low, B65D81/34/low, B65D81/38/low, B65D85/30/low) and/or Keywords (slope, rim, counter, curve, wrap, seal, enhance, leak, prevent, heat, adhesive, stretch, blank, cut, perpendicular, tray, film, thermoform) & like terms

ESPACENET - Worldwide Database: Applicant/Inventor Names

Applicant(s)/Inventor(s) name searched in internal databases provided by IP Australia

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	



Further documents are listed in the continuation of Box C



See patent family annex

* "A"	Special categories of cited documents: document defining the general state of the art which is not considered to be of particular relevance	"T"	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 but 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 18 May 2018	Date of mailing of the international search report 18 May 2018
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaustalia.gov.au	Authorised officer Allan Smailes AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. +61262832154

INTERNATIONAL SEARCH REPORT		International application No.
C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		PCT/IB2018/050949
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	WO 2012064203 A1 (ALTO PACKAGING LTD) 18 May 2012 Abstract; Fig. 1-5; Pg. 7 L. 5-24 Abstract; Fig. 1-5; Pg. 7 L. 5-24	1-3, 5-20 21
X	US 3917788 A (PADOVANI) 04 November 1975 Abstract; Fig. 1-12; Col. 3 L. 42-44; Col. 4 L. 31-44	1-3, 5-11, 19-20
X	EP 0380250 A2 (ANSON PACKAGING LTD) 01 August 1990 Abstract; Fig. 1-3; Col. 2 L. 17-53	1-17, 19-20
X	WO 2013103884 A1 (PROGRESSIVE PACKAGING INC) 11 July 2013 Abstract; Fig. 1-13; Para. 23, 32	1-3, 5-9, 12-17, 19-20
X	US 4889231 A (FOOTE et al.) 26 December 1989 Abstract; Fig. 1-8; Col. 2 L. 42 - Col. 3 L. 51	1-9, 19-20
X	US 20020179607 A1 (IWASAKI et al.) 05 December 2002 Abstract; Fig. 2; Para. 17, 52-57	1, 4-9, 20
X	US 3185371 A (R. F. REIFERS) 25 May 1965 Fig. 1-6, 10-11; Col. 3 L. 15 - Col. 4 L. 34	1, 3-9, 19-20

Supplemental Box**Continuation of: Box III**

This International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept.

This Authority has found that there are different inventions based on the following features that separate the claims into distinct groups:

- Claims 1-11 and 19-20 (when appended to claims 1-11) are directed to an open mouthed container with a base with an upwardly extending peripheral sidewall having a rim region extending outwardly and downwardly from the sidewall. The feature of a rim extending outwardly and downwardly is specific to this group of claims.
- Claims 12-18, 21 and 19-20 (when appended to claims 12-18) are directed to a method (and product) of forming an open mouthed container with profiled upper periphery about the mouth comprising: stretching the profiled rim of the container preform to present a cutting zone perpendicular to a trimming cut locus, and trimming along the cut locus. The feature of stretching a profiled rim of a container to present a cut zone perpendicular to a trimming locus is specific to this group of claims.

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

When there is no special technical feature common to all the claimed inventions there is no unity of invention.

In the above groups of claims, the identified features may have the potential to make a contribution over the prior art but are not common to all the claimed inventions and therefore cannot provide the required technical relationship. The only feature common to all of the claimed inventions is an open mouthed container with a profiled upper peripheral rim region. However it is considered that this common feature is generic in this particular art.

Therefore this common feature cannot be a special technical feature. Hence there is no special technical feature common to all the claimed inventions and the requirements for unity of invention are consequently not satisfied *a priori*.

The search and examination for the second invention will require more than negligible additional search and examination effort over that for the first invention and as such one additional search fee was warranted.

INTERNATIONAL SEARCH REPORT		International application No.	
Information on patent family members		PCT/IB2018/050949	
This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.			
Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	Publication Date	Publication Number	Publication Date
WO 2012064203 A1	18 May 2012	WO 2012064203 A1	18 May 2012
		AU 2011326886 A1	13 Jun 2013
		AU 2011326886 B2	03 Mar 2016
		NZ 589111 A	28 Jun 2013
US 3917788 A	04 November 1975	US 3917788 A	04 Nov 1975
		AT A87972 A	15 Dec 1977
		AT 344982 B	25 Aug 1978
		AU 3885472 A	16 Aug 1973
		AU 458730 B2	06 Mar 1975
		BE 779280 A	30 May 1972
		CA 964824 A	25 Mar 1975
		CH 541402 A	15 Sep 1973
		DE 2163759 A1	31 Aug 1972
		DE 2163759 B2	30 Sep 1976
		ES 398735 A1	16 May 1975
		FR 2125275 A1	29 Sep 1972
		FR 2125275 B1	18 Oct 1974
		GB 1386672 A	12 Mar 1975
		IL 38653 A	25 Nov 1975
		LU 64773 A1	04 Jul 1972
		NL 7201707 A	15 Aug 1972
		US 3825166 A	23 Jul 1974
US 3912438 A	14 Oct 1975		
ZA 7200468 B	27 Sep 1972		
EP 0380250 A2	01 August 1990	EP 0380250 A2	01 Aug 1990
		EP 0380250 B1	04 May 1994
WO 2013103884 A1	11 July 2013	WO 2013103884 A1	11 Jul 2013
		US 2015001127 A1	01 Jan 2015
US 4889231 A	26 December 1989	US 4889231 A	26 Dec 1989
		CA 2018291 A1	06 Dec 1990
US 20020179607 A1	05 December 2002	US 2002179607 A1	05 Dec 2002
		AU 4120201 A	23 Oct 2001
		AU 757599 B2	27 Feb 2003
		CN 1366504 A	28 Aug 2002
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.			

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

INTERNATIONAL SEARCH REPORT Information on patent family members		International application No. PCT/IB2018/050949	
This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.			
Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	Publication Date	Publication Number	Publication Date
US 3185371 A	25 May 1965	EP 1193179 A1	03 Apr 2002
		JP 2001348003 A	18 Dec 2001
		JP 2001348020 A	18 Dec 2001
		NZ 515790 A	26 Sep 2003
		TW 534890 B	01 Jun 2003
		WO 0176955 A1	18 Oct 2001
		US 3185371 A	25 May 1965
		BE 641398 A	16 Apr 1964
		CH 451805 A	15 May 1968
		ES 294513 A1	16 Jan 1964
		FI 43283 B	02 Nov 1970
		GB 1042728 A	14 Sep 1966
		LU 45062 A1	19 Feb 1964
		NL 6400585 A	25 Nov 1964
		NO 115872 B	16 Dec 1968
SE 303250 B	19 Aug 1968		
End of Annex			
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001. Form PCT/ISA/210 (Family Annex)(July 2009)			

PATENT COOPERATION TREATY

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

AJ PARK
Level 22 State Insurance Tower
1 Willis Street
6011 WELLINGTON
New Zealand

PCT

NOTIFICATION OF TRANSMITTAL OF
INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Rule 71.1)

Date of mailing
(day/month/year) 13 June 2019

Applicant's or agent's file reference
841755 DIS/vcm

IMPORTANT NOTIFICATION

International application No.
PCT/IB2018/050949

International filing date (day/month/year)
16 February 2018

Priority date (day/month/year)
16 February 2017

Applicant
ALTO PACKAGING LIMITED

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary report on patentability and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translations to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the *PCT Applicant's Guide*.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed invention is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the IPEA/AU

AUSTRALIAN PATENT OFFICE
PO BOX 200, WODEN ACT 2606, AUSTRALIA
Email address: pct@ipaaustralia.gov.au

Authorised officer

Allan Smailes
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PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 841755 DIS/vcm	FOR FURTHER ACTION See Form PCT/IPEA/416																									
International application No. PCT/IB2018/050949	International filing date (<i>day/month/year</i>) 16 February 2018	Priority date (<i>day/month/year</i>) 16 February 2017																								
International Patent Classification (IPC) or national classification and IPC B65D 1/34 (2006.01) B29C 51/32 (2006.01) B29C 51/26 (2006.01)																										
Applicant ALTO PACKAGING LIMITED																										
1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of 6 sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: a. ☒ (<i>sent to the applicant and to the International Bureau</i>) a total of 20 sheets, as follows: ☒ sheets of the description, claims and/or drawings which have been amended and/or sheets containing rectifications authorized by this Authority, unless those sheets were superseded or cancelled, and any accompanying letters (see Rules 46.5, 66.8, 70.16, 91.2, and Section 607 of the Administrative Instructions). ☐ sheets containing rectifications not taken into account by this Authority because they were not available at the time when this Authority began to draw up this report, and any accompanying letters (Rules 66.4bis, 70.2(e), 70.16 and 91.2). ☐ Superseded sheets and any accompanying letters, where this Authority either considers that the superseding sheets contain an amendment that goes beyond the disclosure in the international application as filed, or the superseding sheets were not accompanied by a letter indicating the basis for the amendments in the application filed, as indicated in item 4 of Box No. I and the Supplemental Box (see Rule 70.16(b)). b. ☐ (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing, in the form of an Annex C/ST.25 text file, as indicated in the Supplemental Box Relating to Sequence Listing (see paragraph 3ter of Annex C of the Administrative Instructions).																										
4. This report contains indications relating to the following items: <table style="width: 100%; border: none;"> <tr> <td style="width: 10%;">☒</td> <td style="width: 20%;">Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td>☐</td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td>☐</td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td>☒</td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td>☒</td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td>☐</td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td>☐</td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td>☐</td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>			☒	Box No. I	Basis of the report	☐	Box No. II	Priority	☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	☒	Box No. IV	Lack of unity of invention	☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement	☐	Box No. VI	Certain documents cited	☐	Box No. VII	Certain defects in the international application	☐	Box No. VIII	Certain observations on the international application
☒	Box No. I	Basis of the report																								
☐	Box No. II	Priority																								
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☐	Box No. VI	Certain documents cited																								
☐	Box No. VII	Certain defects in the international application																								
☐	Box No. VIII	Certain observations on the international application																								
Date of submission of the demand 17 December 2018	Date of completion of this report 13 June 2019																									
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaaustralia.gov.au	Authorised officer Allan Smailes AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. +61262832154																									

Box No. I

Basis of the report

1. With regard to the **language**, this report has been established on the basis of:
- ☒ The international application in the language in which it was filed:
- ☐ A translation of the international application into , which is the language of a translation furnished for the purposes of :
- ☐ international search (under Rules 12.3(a) and 23.1 (b)).
- ☐ publication of the international application (under Rule 12.4(a)).
- ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a) and (b)).
2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):
- ☐ the international application as originally filed/furnished, or
- ☒ the description: pages , as originally filed/furnished
pages **1-11** , received by this Authority on **03 May 2019** with the letter of **03 May 2019**
- ☒ the claims: Nos. , as originally filed/furnished
Nos. , as amended (together with any statement) under Article 19,
Nos. **1-21** , received by this Authority on **03 May 2019** with the letter of **03 May 2019**
- ☒ the drawings: pages **1/4-4/4** , as originally filed/furnished
pages , received by this Authority on with the letter of
- ☐ a sequence listing - see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (specify):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since either they are considered to go beyond the disclosure as filed, or they were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in the Supplemental Box (Rules 70.2(c) and (*c-bis*)):
- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (specify):
5. ☐ This report has been established:
- ☐ taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rules 66.1(d-*bis*) and 70.2(e)).
- ☐ without taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rules 66.4*bis* and 70.2(e)).
6. With regard to top-up searches (Rules 66.1*ter* and 70.2(f)):
- ☒ A top-up search was carried out by this Authority on 13 February 2019.
- ☐ Additional relevant documents have been discovered during the top-up search.
- ☐ No top-up search was carried out by this Authority because it would serve no useful purpose.
7. ☐ Supplementary international search report(s) from Authority(ies)
has/have been received and taken into account in establishing this report (Rule 45*bis*.8(b) and (c)).

* If item 4 applies, some or all of those sheets may be marked "superseded."

Box No. IV**Lack of unity of invention**

1. ☐ In response to the invitation to restrict or pay additional fees the applicant has, within the applicable time limit:
- ☐ restricted the claims
 - ☐ paid additional fees
 - ☐ paid additional fees under protest and, where applicable, the protest fee
 - ☐ paid additional fees under protest but the applicable protest fee was not paid
 - ☐ neither restricted the claims nor paid additional fees
2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is:
- ☐ complied with.
 - ☒ not complied with for the following reasons:

See Supplemental Box

4. Consequently, this report has been established in respect of the following parts of the international application:
- ☒ all parts.
 - ☐ the parts relating to claims Nos.

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1-9, 13-21	YES
	Claims 10-12	NO
Inventive step (IS)	Claims 1-9, 14-21	YES
	Claims 10-13	NO
Industrial applicability (IA)	Claims 1-21	YES
	Claims NONE	NO

2. CITATIONS AND EXPLANATIONS:**CITATIONS**

D1: WO 2012064203 A1 (ALTO PACKAGING LTD) 18 May 2012
D2: US 3917788 A (PADOVANI) 04 November 1975
D3: EP 0380250 A2 (ANSON PACKAGING LTD) 01 August 1990
D4: WO 2013103884 A1 (PROGRESSIVE PACKAGING INC) 11 July 2013

NOVELTY (N)

NOTE:

In construing claim 10 it is to be noted that in line with Appendix A 5.26[1] of the PCT International Search and Preliminary Examination Guidelines, a product is not rendered novel merely by the fact that it is produced by means of a new process. Hence the process of trimming and stretching the container is not considered limiting per se on the scope of claim 10. The limitation provided by claim 10 amounts merely to the container being of a material that can be thermoformed and that the container is suitable for stretching. Similarly, the feature of a “cut edge” is not limiting on the scope except to the extent that the edge must have a form capable of having been produced by cutting.

Claims 10-12 are not novel and therefore do not comply with PCT Article 33(2) as they are disclosed by the following documents:

D1 discloses claim 10:

Claim 10 – a container (the container blank of figures 3-4) (c.f. figures 1-2 for reference numbering) with base (1) and upward sidewall (2), profiled upper periphery with rim region (3) extending from the sidewall outwardly (4) and downwardly (the first part of the curved periphery in figure 4), an inwardly rolled rim (the second part of the curved periphery in figure 4), and counter rolled region (9, figure 4) terminating in cutting zone (11) that is parallel to the rim region (4), has a perpendicular edge (figure 4) and is of a configuration that could be made by vertically trimming perpendicularly to the horizontal cutting zone (11); the container being formed of a stretchable thermoform material (abstract) (see the note on construing these claims with regard to features relating to stretching and cutting).

D3 discloses claims 10-11:

Claim 10 – a container (3) with base and upward sidewall (figure 1), profiled upper periphery with rim region (5, 6) extending from the sidewall outwardly (5) and downwardly (6) (figure 3) and an inwardly rolled rim (11 – see column 2, line 45) and counter rolled region (10) terminating in cutting zone (7) that is presented perpendicularly to a trimming direction (figure 2) to form a perpendicular cut edge (12); the container being formed of a stretchable thermoform material (abstract) (see the note on construing these claims with regard to features relating to stretching and cutting).

Claim 11 – the cut edge (12) is inward of the rolled rim (figure 3).

D4 discloses claims 10, 12 for analogous reasons:

See in particular the abstract, figures 1-13 and paragraphs 23, 32. Note that: the generally upwardly extending sidewall is taken as the sidewalls up to their highest point (i.e. at the location of the reference number 14 in figure 4) from which a rim

region extends (curves) outwardly and downwardly; the inwardly rolled region is the portion rolling in toward the wall (110) (figure 7B); and the counter rolled region is the region curving in the other direction and including a perpendicular cutting zone and edge (120) (figure 12); the tray of D4 is overwrapped with PVC or LDPE film (paragraph 32, figure 13).

Claims 1-9 and 13-21 are novel and therefore comply with PCT Article 33(2) as none of the prior art documents disclose:

Claims 1-9 – the claimed container having a sidewall with a rim region extending obliquely outwardly and downwardly therefrom, followed by a rolled rim rolling inwardly towards the sidewall.

Claim 13 – the claimed container overwrapped with plastic cling and the cut edge being out of contact with the cling wrap.

Claims 14-21 – stretching a container preform outwardly to deform a profiled rim until a cut zone is presented perpendicular to a trimming cut locus, trimming along the cut locus and allowing the trimmed container to relax and re-form the profiled upper periphery.

INVENTIVE STEP (IS)

Claims 10-13 do not involve an inventive step and therefore do not comply with PCT Article 33(3).

Given the above novelty objections, claims 10-12 do not involve an inventive step as they are not novel.

Further, claims 12-13 are obvious in light of D3 and do not meet the requirements of Article 33(3) of the PCT with regard to inventive step as overwrapping a tray with cling wrap is common general knowledge in the art.

Claims 1-9 and 14-21 involve an inventive step and therefore comply with PCT Article 33(3) because the prior art does not obviously suggest to a person skilled in the art the features of:

Claims 1-9 – the claimed container having an upwardly extending sidewall with a rim region extending obliquely outwardly and downwardly therefrom, followed by a rolled rim rolling inwardly towards the sidewall. The closest prior art is considered to be D1 that discloses a container (figure 1-2) with base (1) and upward sidewall (2), profiled upper periphery with rim region (3) extending outwardly (4) and downwardly (the first part of the curved periphery in figure 4), and having an inwardly rolled rim (the second part of the curved periphery in figure 4), with cut edge (7). However, D1 does not teach or obviously suggest the rim region extending *obliquely* outwardly and downwardly from the upwardly extending sidewall.

Claims 14-21 – stretching a container preform outwardly to deform a profiled rim until a cut zone is presented perpendicular to a trimming cut locus, trimming along the cut locus and allowing the trimmed container to relax and re-form the profiled upper periphery. The closest prior art is considered to be D1 that discloses a container preform (figures 3-5A) that is stretched outwardly to deform a profiled rim (figure 5B) and present a cut zone to a trimming cut locus (II-II), trimming along the cut locus and allowing the trimmed container to relax and re-form the profiled upper periphery (figure 5C); however D1 does not disclose or obviously suggest presenting the cut zone perpendicularly to the trimming locus.

INDUSTRIAL APPLICABILITY (IA)

The invention defined in the claims is considered to meet the requirements of Industrial Applicability under Article 33(4) of the PCT because it can be made by, or used in, industry.

Continuation of: **Box IV**

This Authority has found that there are different inventions based on the following features that separate the claims into distinct groups:

- Claims 1-9 are directed to an open mouthed container having a base with an upwardly extending periphery and a rim region extending obliquely outwardly and downwardly from the sidewall and joined to a rolled rim region rolling inwardly towards the peripheral wall and terminating in a cut edge. The feature of a rim extending obliquely outwardly and downwardly with a rolled rim region rolling inwardly toward the peripheral wall is specific to this group of claims.
- Claims 10-13 are directed to an open mouthed container having a base with an upwardly extending periphery and a rim region extending outwardly and downwardly from the sidewall and joined to a rolled rim region rolling inwardly towards the peripheral wall and further joined to a counter roll region extending away from the sidewall, the container made by stretching the profiled rim of the container preform to present a cutting zone perpendicular to a trimming cut locus, and trimming along the cut locus. The features of: a rim extending outwardly and downwardly with a rolled rim region rolling inwardly toward the peripheral wall; a counter roll region extending outwardly away from the sidewall; and stretching a profiled rim of a container to present a cut zone perpendicular to a trimming locus is specific to this group of claims.
- Claims 14-20 are directed to a method of forming an open mouthed container with profiled upper periphery about the mouth comprising: stretching the profiled rim of the container preform to present a cutting zone perpendicular to a trimming cut locus, and trimming along the cut locus. The feature of stretching a profiled rim of a container to present a cut zone perpendicular to a trimming locus is specific to this group of claims.

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

When there is no special technical feature common to all the claimed inventions there is no unity of invention. In the above groups of claims, the identified features may have the potential to make a contribution over the prior art but are not common to **all** the claimed inventions and therefore cannot provide the required technical relationship.

The only feature common to all of the claimed inventions is an open mouthed container with a profiled upper peripheral rim region terminating in a cut edge. However it is considered that this common feature is generic in this particular art.

Therefore this common feature cannot be a special technical feature. Hence there is no special technical feature common to all the claimed inventions and the requirements for unity of invention are consequently not satisfied *a priori*.

3 May 2019

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IP Australia
Patent Office
PO Box 200
Woden ACT 2606
AUSTRALIA

Dear Examiner

**RESPONSE TO SECOND WRITTEN OPINION
ALTO PACKAGING LIMITED
International (PCT) patent application PCT/IB2018/050949
IMPROVEMENTS TO TRAYS
AJP ref 841755 DIS/vcm**

Thank you for your written opinion of 13 February 2019.

Comments

We refer to the above-mentioned written opinion and respond as follows.

Claims 1-12

Claims 1-12 stand objected to as allegedly lacking novelty in light of documents D1-D4.

In response to the novelty objection, we understand that the examiner's issue is one of interpreting the phrase "outwardly and downwardly" as being sufficiently broad to cover configurations where the recited directions of extension are not simultaneous.

It is the intention of the claim to require that the rim region extends **obliquely** in a direction that is both outwardly and downwardly, as shown in the figures of the pending application (figures 3-6).

Accordingly, we have amended claim 1 to specifically recite that the rim region extends obliquely outwardly and downwardly from the peripheral side wall. We trust that this amendment clarifies what it is intended by the claim language and restricts the claim to an angled rim region that is slanted in orientation, and therefore is distinguished from these prior art documents which are not slanted outwardly and downwardly.

We submit the basis for this amendment can be found in the specification as originally filed from the figures and the passages on page 8 in particular, where the description says:

“... rim 7 forms an acute angle 13 from the horizontal plane.”

We submit that the amended claim language requires an obliquely angled (outwardly and downwardly) rim region extending between the upper periphery of the container and the claimed rolled rim region.

We submit that none of the cited prior art documents D1-D7 disclose the combination of the claimed obliquely angled rim, and terminating in a inwardly rolling rim portion as claimed.

Further, we submit that this unique combination of features results in a unique tray form suitable for plastic film overwraps with improved performance in sealing as described on page 8, lines 11-18.

Claims 1-12 – Inventive step

Claims 1-12 stand objected to as allegedly lacking inventive step as they are not considered novel. While claims 3, 6-9 and 12-13 are allegedly lacking inventive step in light of documents D1-D3.

As noted above, we submit that none of the cited prior art documents disclose or teach an open mouth container having the combination of features in the amended claims. Further, we submit that the cited prior art teaches alternative solutions for sealing trays utilising traditional horizontal rims (D1 and D3) and/or entirely different technologies (D5-D7) involving moulded paper trays and/or heat-sealed wraps.

Similarly, the teaching of document D4 is an entirely different rim and curled rim structure teaching away from the combination as claimed in the current claims.

Accordingly, we submit that a person skilled in the relevant art would not find it obvious to modify the teachings of any of the prior art documents either alone or in combination and arrive at the unique structure claimed in the present claims.

Claim 4 – Clarity

The examiner has objected to claim 4 as reciting “planar in cross-section”.

We have amended this claim to recite that the rim region is substantially “straight in cross-section” as suggested by the examiner.

Claims 15-20 – Clarity

The examiner has objected to these claims as being directed to “an open mouth container”, while they are appended to independent claim 14 that is directed “a method of forming an open mouth container”.

We have amended claim 16-20 to address this issue as suggested.

We look forward to your further consideration in due course.

Yours sincerely

A handwritten signature in blue ink, appearing to be 'DS', followed by a long horizontal line.

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IMPROVEMENTS TO TRAYS**FIELD OF THE INVENTION**

5 The present invention relates to trays, and/or methods of manufacturing trays. More particularly, but not exclusively, it relates to an improved rolled rim tray suitable for use with overwrapped film, and/or associated methods of manufacturing.

BACKGROUND OF THE INVENTION

10 Perishable goods such as meat, poultry, fish, fruit or vegetable are often sealed by transparent plastic film in trays to be displayed for inspection by customers. It is known that trays may be sealed using plastic film to protect the tray's contents while presenting an appealing aesthetic.

15 Trays with overwrapping offer an inexpensive packaging solution suitable for both automatic and manual wrapping applications. Typically, a tray is overwrapped with a plastic film that is stretched around the tray and adheres to itself where the overwrap film overlaps (usually under the base of the tray). When using this type of packaging, reduction of leaks becomes an important consideration, because if leaks occur, it can present a food safety hazard and/or lose customer appeal.

20 Failure to create an adequate seal may lead to contamination and/or food spoilage, because micro-organisms thrive in liquids derived from perishable goods like meat, and can also produce unpleasant odours. Accordingly, failure to seal adequately may detrimentally affect the quality, colour and/or taste of the meat (or produce). Further, exudate from meat is visually unappealing, and unappetising to consumer. Accordingly, it is preferred that exudate be minimised and/or contained within the tray.

25 One known solution to reduce leakage from produce trays is to heat seal plastic film onto the upper rim of the tray, thus creating a hermetic seal. However, such top sealing processes, require material and machinery that is comparatively much more costly than an overwrap film solution.

30 It is an object of the present inventions to provide an improved tray that overcomes or at least partially ameliorates one or more of the abovementioned disadvantages, or that at least provides the public with a useful choice.

35 In this specification, where reference has been made to external sources of information, including patent specifications and other documents, this is generally for the purpose of providing a context for discussing the features of the present invention. Unless stated otherwise, reference to such sources of information is not to be

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construed, in any jurisdiction, as an admission that such sources of information are prior art or form part of the common general knowledge in the art.

For the purpose of this specification, where method steps are described in sequence, the sequence does not necessarily mean that the steps are to be
5 chronologically ordered in that sequence, unless there is no other logical manner of interpreting the sequence.

SUMMARY OF THE INVENTION

According to a first aspect the invention broadly comprises an open mouthed container
10 having a profiled upper periphery about the mouth comprising:

a base,

a peripheral sidewall extending generally upwards from said base,

wherein said profiled upper periphery comprises a rim region extending
outwardly and downwardly from said peripheral sidewall, and a rolled rim region
15 extending from an outer edge of said rim region and rolling inwardly towards said
peripheral sidewall, and terminating at a cut edge.

According to a further aspect said cut edge is located inboard of an outermost extent of
said rolled rim region.

20 According to a further aspect said container is overwrapped by a plastics film that is stretched around said container to close a said open mouth, and overlaps itself, and clings to itself.

25 According to a further aspect said rim region is substantially planar in cross-section.

According to a further aspect said rim region is not concave upwardly in cross section.

According to a further aspect said rim region extends downwardly at approximately
30 between 20° and 70° from horizontal.

According to a further aspect said rim region extends downwardly at approximately
between 30° and 45° from horizontal.

35 According to a further aspect said rim region extends downwardly at approximately 30° from horizontal.

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According to a further aspect said rim region extends downwardly at approximately 45° from horizontal.

According to another aspect the invention broadly comprises an open mouthed

5 container having a profiled upper periphery about the mouth comprising:

a base,

a peripheral sidewall extending generally upwards from said base,

wherein said profiled upper periphery comprises:

10 a rim region extending outwardly and downwardly from said peripheral
sidewall, and

a rolled rim region extending from an outer edge of said rim region and
rolling inwardly towards said peripheral sidewall, and

15 a counter roll region extending from an edge of said rolled rim, and
extending outwardly away from said peripheral sidewall, and defining a
cutting zone, and

wherein said container is trimmed from a thermoformed preform, while said pre-
form is in a stretched state, and

20 wherein in said stretched state, said trimming occurs at said cutting zone and
said cutting zone is presented substantially perpendicular to a trimming direction,
thereby forming a perpendicular cut edge when cut.

According to a further aspect said cut edge is located inboard of an outermost extent of
said rolled rim region, when said container is in a relaxed state.

25 According to a further aspect said rim region extends outwardly and downwardly from
said peripheral sidewall.

According to a further aspect in cross section, said cutting zone is substantially parallel
to said rim region.

30

According to a further aspect the open mouter container further comprising a plastic
cling film overwrap.

35 According to a further aspect the invention broadly comprises a method of forming a
container according to any one of the previous clauses.

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According to a further aspect the invention broadly comprises a method of forming an open mouthed container including a profiled upper periphery about the mouth comprising:

stretching a preform of said container including said profiled upper periphery outwardly to deform said profile until a cut zone is presented perpendicular to a trimming cut locus,

trimming said preform along said cut locus,

allowing the trimmed container to relax and re-form said profiled upper periphery.

According to a further aspect said trimming occurs at an outermost location of said container, and forms a cut perimeter, and wherein in a relaxed and trimmed state, said cut perimeter is not at an outermost periphery of said container.

According to a further aspect in said stretched state, said rolled rim is at least for the most part, unfurled.

According to a further aspect wherein said trimming is by a punch and die set acting in a trimming direction.

According to a further aspect said trimming direction is substantially vertical.

According to a further aspect said trimming direction is transverse to the container material in the cutting zone.

According to a further aspect said cutting zone is presented substantially horizontal.

According to a further aspect the invention broadly comprises a container substantially as herein described with reference to any one or more of figures 3 to 4.

According to a further aspect the invention broadly comprises a container substantially as herein described with reference to any one or more of figures 5a to 5b.

According to a further aspect the invention broadly comprises a container substantially as herein described with reference to any one or more of figures 6a to 6b.

According to a further aspect the invention broadly comprises a method of forming a container substantially as herein described with reference to any one or more of figures 3 to 4.

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According to a further aspect the invention broadly comprises a method of forming a container substantially as herein described with reference to any one or more of figures 5a to 5b.

5

According to a further aspect the invention broadly comprises a method of forming a container substantially as herein described with reference to any one or more of figures 6a to 6b.

10 Other aspects of the invention may become apparent from the following description which is given by way of example only and with reference to the accompanying drawings.

As used herein the term "and/or" means "and" or "or", or both.

15

As used herein "(s)" following a noun means the plural and/or singular forms of the noun.

The term "comprising" as used in this specification and claims means "consisting at least in part of". When interpreting statements in this specification and claims which include that term, the features, prefaced by that term in each statement, all need to be present but other features can also be present. Related terms such as "comprise" and "comprised" are to be interpreted in the same manner.

20

BRIEF DESCRIPTION OF THE DRAWINGS

25 The invention will now be described by way of example only and with reference to the drawings in which:

Figure 1 is a perspective view of a typical rolled rim prior art tray.

Figure 2 is a close-up view of region A of Figure 1.

30

Figure 3 is a perspective view of an improved rolled rim tray.

Figure 4 is a close-up view of region B of Figure 3.

Figure 5a is a partial cross section of the peripheral side wall and rolled rim region of an untrimmed tray similar to the tray of Figure 3.

35

Figure 5b is a partial cross section of the peripheral side wall and rolled rim region of a tray similar to the tray of Figure 3, shown in a stretched state immediately before trimming.

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Figure 5c is a partial cross section of the peripheral side wall and rolled rim region of a tray similar to the tray of Figure 3, shown in a relaxed state after trimming.

Figure 6a is a partial cross section of the peripheral side wall and rolled rim region of an improved and untrimmed tray.

5 **Figure 6b** is a partial cross section of the peripheral side wall and rolled rim region of the tray of Figure 6a, shown in a stretched state immediately before trimming.

Figure 6c is a partial cross section of the peripheral side wall and rolled rim region of the tray of Figure 6a, shown in a relaxed state after trimming.

10 **Figure 6d** is a partial cross section of the peripheral side wall and rolled rim region of a further improved tray, shown in a relaxed state after trimming.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Overwrapped trays comprising plastic film stretched and wrapped around a tray, results in a tight package with aesthetic appeal for customers. As the overwrapped
15 film wraps around the tray and comes back into contact with itself, the overlapping film surfaces cling together to maintain tension in the stretched film membrane that seals the open topped tray. The plastic film wrap may be applied manually, or by automatic stretch wrapping machines, as is generally known in the industry.

Stretch wrapped packaged trays are relatively cheaper in comparison to their
20 top-seal tray counterparts e.g. modified atmosphere packaging (MAP). Top-sealed trays are usually more expensive due to the cost of machinery, gases filling, and specific film material for adhesion and hermetic sealing.

However, a known disadvantage with traditional stretch wrapped packaged trays are their tendency to leak. The most common leak path is past the region where
25 the film contacts the rim of the tray.

To reduce the likelihood of the overwrapped film 6 from being cut or punctured when it is in contact with a tray 1, rolled edge trays 1 as shown in Figure 1 (prior art), are often used in combination with stretch wrapped packaging. The rolled rim region 2 of the tray provides a smooth surface for overwrapped film 6 to come into
30 contact with.

To form rolled edged trays 1, a thermoforming technique is typically used. In a thermoforming process, a plastic sheet is first heated into a pliable form. Subsequently, a mould deforms the sheet into a specific shape, such as a rolled rimmed tray 1, illustrated in Figure 1. Finally, a trimming process (e.g. a mechanical punch and die set) cuts or punches out the final product form from the sheet, leaving scrap plastic.
35 The scrap may subsequently be recycled. However, as punch and die sets are necessary

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in a thermoforming process and are expensive to maintain and replace, it is preferable to reduce wear and blunting to extend their lifetime.

According to various aspects of the various embodiments of the present inventions as illustrated by the examples in Figures 3-6, there is provided a number of improvements to trays suitable for plastics film overwrapping, which will now be described. It will be appreciated that each of these improvements may be applied to a tray alone, or in combination, to achieve different product configurations.

An example rectangular tray 1 is shown in Figure 1, comprising a base 4, a surrounding peripheral side wall 3, defining an open mouth 5. At the upper extent of the side wall 3 is a rim region 2, provided by a horizontal rim 7, and outward of rim 7, a rolled rim region 8. An overwrapped film 6, with a wrap path as depicted in Figure 2, is stretched and wrapped around the tray 1.

Accordingly, a seal is formed between the rim 7 (and rolled rim 2), and the film 6. It will be appreciated that the seal is not a complete hermetic seal, but that the tension in the film 6, tends to pull the film surface into close contact with the rim 7, and rolled rim 8. This interaction between the film 6 and the rim region of the tray, provides an effective seal around the perimeter of the tray, that is capable of at least resisting inflow of exudate or other contaminants.

However, as shown in Figure 2, in the region of the film 6, adjacent the rim 7, any out of plane movement (as indicated by arrow 14), tends to lift film 6 away from contacting the rim 7. Accordingly, even relatively small deviations from the horizontal plane cause lift in the overwrapped film 6, and break the effective seal. Such out of plane movement of the film 6 can be commonly caused during transit or by retailers and/or customers handling the wrapped trays for example.

The disruption of the effective seal, can lead to an increased risk of leaks, and/or increased risk of exudate getting between the film 6 and rim 7, which can look very unappealing, and is generally undesirable.

With reference to Figures 3-4, one preferred feature of the present invention will be described. Tray 21 in its finished form is shown in Figure 3, and it will be appreciated that the tray 21 may be in the form of other shapes, for example, square, triangular, round, etc.

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The peripheral side wall 3 at its upper extent has a rim region 2 comprising an outwardly extending rim 7, leading to a rolled rim 8, and terminating at a cut edge 9. However, it will be appreciated that in some alternative configurations, the rolled rim 8 may not be present, and the rim 7 may terminate directly at cut edge 9

5

The improved tray is configured so that the substantially planar portion of the outwardly extending rim 7, forms an acute angle 13 from the horizontal plane. In its preferred embodiment, the outwardly extending rim 7, also extends downwards from the upper extent of the peripheral side wall 3. It is preferred that the rim 7, is wide enough to present an adequate surface for the film 6 to contact, and form an effective seal.

10

It has been found that this feature of present invention can improve the trays leak resistance. In contrast with the prior art tray (as shown in Figure 2), the improved tray 21 requires a greater out of plane deviation from the horizontal (shown by arrow 14), to lift the overwrapped film 6 out of contact with the outwardly (and downwardly) extending rim 7. With the improved angled rim 7, the overwrapped film 6 needs to deviate past the dashed 15, in order to lift the film away from a tight contacting relationship with the outwardly extending rim 7.

15

20

Accordingly, the present invention is less susceptible to leak risks, initiated by movement of the film 6, for example during handling of the overwrapped tray 21.

Preferably, the acute angle 13 is approximately between 20° and 70°, from horizontal.

25

More preferably still, the acute angle 13 is approximately between 30° and 45°.

Preferably, the rim 7 is substantially flat, and/or not concave upwardly.

30

The tray 21, may comprise of materials used in our PLIX™ range of containers, trays and the like. Examples of materials include, by way of example, unfoamed PET, PLA, CPET, PP and high impact polystyrene. Further, there are many foamed materials that may also be employed in the tray 21. The overwrapped film 6, may be PVC for example. However, it will be appreciated that any suitable materials for the tray 21 and/or film 6, may benefit from this improvement.

35

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The rolled rim region 8 is preferably arranged so that the tray 1 may be wrapped by an overwrapped film 6, in a way that the wrap path is less likely to encounter the cut edge 9, in order to reduce the likelihood of a puncture occurring if the cut edge 9 is sharp.

5

It is preferable that the cut edge 9, is faced away from the pathway of the overwrapped film 6. Accordingly there is a reduced risk of any sharp edges from the cut edge 9 tearing the overwrapped film 6.

10

In most preferred embodiments, the cut edge 9 is preferably located sufficiently inward of the overwrapped film 6, such that there is a reduced tendency for contact between the cut edge 9 and the overwrapped film 6.

15

A preferred method of reducing the risk of cut edge 9, damaging the film 6, will be described with particular reference to Figure 5a-5c. Figure 5a illustrates an untrimmed pre-form 16 of tray 21. The untrimmed preform 16 includes the sidewall 3, outwardly (and downwardly) extending rim 7, and an excess portion 12. It will be appreciated that when the excess portion 12 is trimmed off, the final form of the tray 21 is left.

20

25

In order to trim the tray, a co-operating die and punch set can be employed (not shown). In the most preferred method, the punching process first stretches the outer rim of the untrimmed tray as shown in figure 5b. The rolled rim 8 is preferably at least somewhat straightened out by the stretching process, such that the portion to be cut (illustrated by cutting line 17) is no longer located under the outer periphery of the rolled rim 8. Thus the stretching process makes it easier to trim the tray, by providing improved access to the cut zone.

30

In addition, after the cut is complete, the tray 21 can relax into an unstretched state as illustrated in figure 5c. The relaxing of the tray reforms the rolled rim 8, and the cut edge 9 can spring back to an orientation and/or position that minimises the cut edge 9 from puncturing an overwrapped film. That is, the cut edge 9 can face slightly inwards towards the tray sidewall 3, and/or may be located in board of the outermost extent of rolled rim 8.

35

It has been found that this improvement to trays suitable for overwrap packaging, operates well. However, a problem encountered when forming trays as

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illustrated, is the relatively rapid wear and blunting of the punch and die sets used to trim the trays. This issue arises due to the oblique angle at which the tray material is presented relative to the cut locus along which co-operating die and punch operates. That is, the cut locus (illustrated by line 17) is preferably vertical, and the tray material is presented at an angle that is not substantially perpendicular to the cut locus.

A further improved configuration will now be described with reference to figures 6a to 6. Figure 6a shows a preform of the untrimmed tray 1, comprising a rim region 7, a peripheral side wall 3, a base 4, and an open mouth 5. The rim 7 at its outer extent comprises a rolled rim 8 (curling towards the container sidewall 3), that blends into a counter roll 11 (that curls away from the container sidewall 3), before the of cut region 12 extends substantially horizontally. In particular, a cutting zone 10, is located between the counter roll 11, and the of cut region 12. The cutting zone 10 is preferably substantially parallel to the plane of the rim 7.

Figure 6b shows the outwardly stretched form of the untrimmed tray 21. The stretched form of the untrimmed tray presents the cutting zone 10, to the cut-line 17, such that the cut locus is substantially transverse through the material in the cut zone 10. The cut-line 17, is the path travelled by the punch and die sets used to trim off the of cut region 12, of the preform tray 1. Accordingly, the operating surfaces of the punch and die are not exposed to significant lateral pressure is which hasten blunting.

It will be appreciated that the geometry and shape of the preformed tray may influence the geometry and shape of the cutting zone 10. The objective of the cutting zone 10, is that it be presented substantially perpendicular to the cut locus, and outboard of the rim region, when the tray is in its stretched state.

The punch and die sets used in a thermoforming process wear out and blunt over time and are expensive to replace. It is thus preferable to prevent or minimise lateral forces on the punch and die to extend the lifetime of these tools. The lifetime of the punch and die sets may be extended, if the cutting 10 is substantially transverse to the cut-line II-II, thus minimising the lateral forces on the tools.

Figure 6c shows a final form of a trimmed tray 21, after it has relaxed from its stretched state. After the tray 21 has been trimmed, the rolled rim region 2 terminates at its cut edge face 9, leaving a leftover piece 12 (not shown in Figure 6c) which may be recycled or discarded.

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Preferably the cut edge 9 is close to the counter-roll region 11, to minimise the distance the cut edge 9 extends outward, in order to reduce the likelihood of this cut face 9 interfering with the film pathway (shown by broken line 18).

5 It is preferable that the cut edge 9, is faced away from the pathway of the overwrapped film 6. Accordingly there is a reduced risk of any sharp edges from the cut edge 9 tearing the overwrapped film 6.

10 With reference to figure 6d, an alternative form of tray 21 is shown. In this for consideration, the rolled rim 8, and counter roll 11, such that the cut edge 9 is located slightly on board the expected overwrap film path (shown by broken line 18).

15 To those skilled in the art to which the invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the scope of the invention as defined in the appended claims.

20 This invention may also be said broadly to consist in the parts, elements and features referred to or indicated in the specification of the application, individually or collectively, and any or all combinations of any two or more of said parts, elements or features, and where specific integers are mentioned herein which have known equivalents in the art to which this invention relates, such known equivalents are deemed to be incorporated herein as if individually set forth.

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CLAIMS

1. An open mouthed container having a profiled upper periphery about the mouth comprising:

a base,

a peripheral sidewall extending generally upwards from said base,

wherein said profiled upper periphery comprises a rim region extending obliquely outwardly and downwardly from said peripheral sidewall, and a rolled rim region extending from an outer edge of said rim region and rolling inwardly towards said peripheral sidewall, and terminating at a cut edge.

2. An open mouthed container as claimed in claim 1, wherein said cut edge is located inboard of an outermost extent of said rolled rim region.

3. An open mouthed container as claimed in claim 1 or claim 2, wherein said container is overwrapped by a plastics film that is stretched around said container to close a said open mouth, and overlaps itself, and clings to itself.

4. An open mouthed container as claimed in any one of the preceding claims, wherein said rim region is substantially straight in cross-section.

5. An open mouthed container as claimed in any one of the previous claims, wherein said rim region is not concave upwardly in cross section.

6. An open mouthed container as claimed in any one of the previous claims, wherein said rim region extends downwardly at approximately between 20° and 70° from horizontal.

7. An open mouthed container as claimed in any one of the previous claims, wherein said rim region extends downwardly at approximately between 30° and 45° from horizontal.

8. An open mouthed container as claimed in any one of the previous claims, wherein said rim region extends downwardly at approximately 30° from horizontal.

9. An open mouthed container as claimed in any one of claims 1 to 7, wherein said rim region extends downwardly at approximately 45° from horizontal.

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10. An open mouthed container having a profiled upper periphery about the mouth comprising:

a base,

a peripheral sidewall extending generally upwards from said base,

wherein said profiled upper periphery comprises:

a rim region extending outwardly and downwardly from said peripheral sidewall, and

a rolled rim region extending from an outer edge of said rim region and rolling inwardly towards said peripheral sidewall, and

a counter roll region extending from an edge of said rolled rim, and extending outwardly away from said peripheral sidewall, and defining a cutting zone, and

wherein said container is trimmed from a thermoformed preform, while said preform is in a stretched state, and

wherein in said stretched state, said trimming occurs at said cutting zone and said cutting zone is presented substantially perpendicular to a trimming direction, thereby forming a perpendicular cut edge when cut.

11. An open mouthed container as claimed in claim 10, wherein said cut edge is located inboard of an outermost extent of said rolled rim region, when said container is in a relaxed state.

12. An open mouthed container as claimed in any one of the previous claims, further comprising a plastic cling film overwrap.

13. An open mouthed container as claimed in the previous claim, wherein said overwrap is stretched over the profiled periphery of said open mouthed container, and overlaps with itself and said cut edge is out of contact with said overwrap.

14. A method of forming an open mouthed container including a profiled upper periphery about the mouth comprising:

stretching a preform of said container including said profiled upper periphery outwardly to deform said profile until a cut zone is presented perpendicular to a trimming cut locus,

trimming said preform along said cut locus,

allowing the trimmed container to relax and re-form said profiled upper periphery.

- 14 -

15. A method of forming an open mouthed container as claimed in claim 14,
wherein said trimming occurs at an outermost location of said container, and
forms a cut perimeter, and

5 wherein in a relaxed and trimmed state, said cut perimeter is not at an
outermost periphery of said container.

16. A method of forming an open mouthed container as claimed in the previous
claim, wherein in said stretched state, said rolled rim is at least for the most part,
10 unfurled.

17. A method of forming an open mouthed container as claimed in any one of claims
14 to 16, wherein said trimming is by a punch and die set acting in a trimming
direction.

15

18. A method of forming an open mouthed container as claimed in the previous
claim, wherein said trimming direction is substantially vertical.

19. A method of forming an open mouthed container as claimed in any one of claims
20 17 to 18, wherein said trimming direction is transverse to the container material in the
cutting zone.

20. A method of forming an open mouthed container as claimed in any one of claims
17 to 18, wherein said cutting zone is presented substantially horizontal.

25

21. A method of forming an open mouthed container as claimed in any one of claims
14 to 20, wherein said container is thermoformed from a plastic sheet.

- 12 -

CLAIMS

1. An open mouthed container having a profiled upper periphery about the mouth comprising:

a base,

a peripheral sidewall extending generally upwards from said base,

wherein said profiled upper periphery comprises a rim region extending obliquely outwardly and downwardly from said peripheral sidewall, and a rolled rim region extending from an outer edge of said rim region and rolling inwardly towards said peripheral sidewall, and terminating at a cut edge.

2. An open mouthed container as claimed in claim 1, wherein said cut edge is located inboard of an outermost extent of said rolled rim region.

3. An open mouthed container as claimed in claim 1 or claim 2, wherein said container is overwrapped by a plastics film that is stretched around said container to close a said open mouth, and overlaps itself, and clings to itself.

4. An open mouthed container as claimed in any one of the preceding claims, wherein said rim region is substantially ~~planar-straight~~ in cross-section.

5. An open mouthed container as claimed in any one of the previous claims, wherein said rim region is not concave upwardly in cross section.

6. An open mouthed container as claimed in any one of the previous claims, wherein said rim region extends downwardly at approximately between 20° and 70° from horizontal.

7. An open mouthed container as claimed in any one of the previous claims, wherein said rim region extends downwardly at approximately between 30° and 45° from horizontal.

8. An open mouthed container as claimed in any one of the previous claims, wherein said rim region extends downwardly at approximately 30° from horizontal.

9. An open mouthed container as claimed in any one of claims 1 to 7, wherein said rim region extends downwardly at approximately 45° from horizontal.

- 13 -

10. An open mouthed container having a profiled upper periphery about the mouth comprising:

a base,

a peripheral sidewall extending generally upwards from said base,

5 wherein said profiled upper periphery comprises:

a rim region extending outwardly and downwardly from said peripheral sidewall, and

a rolled rim region extending from an outer edge of said rim region and rolling inwardly towards said peripheral sidewall, and

10 a counter roll region extending from an edge of said rolled rim, and extending outwardly away from said peripheral sidewall, and defining a cutting zone, and

wherein said container is trimmed from a thermoformed preform, while said pre-form is in a stretched state, and

15 wherein in said stretched state, said trimming occurs at said cutting zone and said cutting zone is presented substantially perpendicular to a trimming direction, thereby forming a perpendicular cut edge when cut.

20 11. An open mouthed container as claimed in claim 10, wherein said cut edge is located inboard of an outermost extent of said rolled rim region, when said container is in a relaxed state.

12. An open mouthed container as claimed in any one of the previous claims, further comprising a plastic cling film overwrap.

25 13. An open mouthed container as claimed in the previous claim, wherein said overwrap is stretched over the profiled periphery of said open mouthed container, and overlaps with itself and said cut edge is out of contact with said overwrap.

30 14. A method of forming an open mouthed container including a profiled upper periphery about the mouth comprising:

stretching a preform of said container including said profiled upper periphery outwardly to deform said profile until a cut zone is presented perpendicular to a trimming cut locus,

35 trimming said preform along said cut locus,

allowing the trimmed container to relax and re-form said profiled upper periphery.

- 14 -

15. A method of forming an open mouthed container as claimed in claim 14,
wherein said trimming occurs at an outermost location of said container, and
forms a cut perimeter, and

5 wherein in a relaxed and trimmed state, said cut perimeter is not at an
outermost periphery of said container.

16. A method of forming an~~an~~ open mouthed container as claimed in the previous
claim, wherein in said stretched state, said rolled rim is at least for the most part,
10 unfurled.

17. A method of forming an~~an~~ open mouthed container as claimed in any one of
claims 14 to 16, wherein said trimming is by a punch and die set acting in a trimming
direction.

15

18. A method of forming an~~an~~ open mouthed container as claimed in the previous
claim, wherein said trimming direction is substantially vertical.

19. A method of forming an~~an~~ open mouthed container as claimed in any one of
20 claims 17 to 18, wherein said trimming direction is transverse to the container material
in the cutting zone.

20. A method of forming an~~an~~ open mouthed container as claimed in any one of
claims 17 to 18, wherein said cutting zone is presented substantially horizontal.

25

21. A method of forming an open mouthed container as claimed in any one of claims
14 to 20, wherein said container is thermoformed from a plastic sheet.

PATENT COOPERATION TREATY

From the:
INTERNATIONAL SEARCHING AUTHORITY

To:

AJ PARK
Level 22 State Insurance Tower
1 Willis Street
6011 WELLINGTON
New Zealand

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing (*day/month/year*)
18 May 2018

Applicant's or agent's file reference
841755DIS

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/IB2018/050949

International filing date (*day/month/year*)

16 February 2018

Priority date (*day/month/year*)

16 February 2017

International Patent Classification (IPC) or both national classification and IPC

B65D 1/34 (2006.01) B29C 51/32 (2006.01) B29C 51/26 (2006.01)

Applicant

ALTO PACKAGING LIMITED

1. This opinion contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|--|
| ☒ | Box No. I | Basis of the opinion |
| ☐ | Box No. II | Priority |
| ☐ | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| ☒ | Box No. IV | Lack of unity of invention |
| ☒ | Box No. V | Reasoned statement under Rule 43 <i>bis</i> .1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement |
| ☐ | Box No. VI | Certain documents cited |
| ☐ | Box No. VII | Certain defects in the international application |
| ☐ | Box No. VIII | Certain observations on the international application |

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA

AUSTRALIAN PATENT OFFICE
PO BOX 200, WODEN ACT 2606,
AUSTRALIA
Email address: pct@ipaustalia.gov.au

Date of completion of this opinion

18 May 2018

Authorised Officer

Allan Smailes
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(ISO 9001 Quality Certified Service)
Telephone No. +61262832154

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/IB2018/050949

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ The international application in the language in which it was filed
 - ☐ A translation of the international application into, , which is the language of a translation furnished for the purposes of international search (under Rules 12.3(a) and 23.1(b)).
2. ☐ This opinion has been established taking into account **the rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:
 - a. (means)
 - ☐ on paper
 - ☐ in electronic form
 - b. (time)
 - ☐ in the international application as filed
 - ☐ together with the international application in electronic form
 - ☐ subsequently to this Authority for the purposes of search
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/IB2018/050949

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the applicable time limit:
- ☒ paid additional fees
- ☐ paid additional fees under protest and, where applicable, the protest fee
- ☐ paid additional fees under protest but the applicable protest fee was not paid
- ☐ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
- ☒ not complied with for the following reasons:

See Supplemental Box for Details

4. Consequently, this opinion has been established in respect of the following parts of the international application:
- ☒ all parts
- ☐ the parts relating to claims Nos.

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY		International Application No. PCT/IB2018/050949															
Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement																
1. Statement <table style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2" style="width: 30%; vertical-align: top;">Novelty (N)</td> <td style="width: 40%;">Claims 21</td> <td style="width: 30%; text-align: center;">YES</td> </tr> <tr> <td>Claims 1-20</td> <td style="text-align: center;">NO</td> </tr> <tr> <td rowspan="2" style="vertical-align: top;">Inventive step (IS)</td> <td>Claims 21</td> <td style="text-align: center;">YES</td> </tr> <tr> <td>Claims 1-20</td> <td style="text-align: center;">NO</td> </tr> <tr> <td rowspan="2" style="vertical-align: top;">Industrial applicability (IA)</td> <td>Claims 1-21</td> <td style="text-align: center;">YES</td> </tr> <tr> <td>Claims NONE</td> <td style="text-align: center;">NO</td> </tr> </table>			Novelty (N)	Claims 21	YES	Claims 1-20	NO	Inventive step (IS)	Claims 21	YES	Claims 1-20	NO	Industrial applicability (IA)	Claims 1-21	YES	Claims NONE	NO
Novelty (N)	Claims 21	YES															
	Claims 1-20	NO															
Inventive step (IS)	Claims 21	YES															
	Claims 1-20	NO															
Industrial applicability (IA)	Claims 1-21	YES															
	Claims NONE	NO															
2. CITATIONS AND EXPLANATIONS: <u>CITATIONS</u> D1: WO 2012064203 A1 (ALTO PACKAGING LTD) 18 May 2012 D2: US 3917788 A (PADOVANI) 04 November 1975 D3: EP 0380250 A2 (ANSON PACKAGING LTD) 01 August 1990 D4: WO 2013103884 A1 (PROGRESSIVE PACKAGING INC) 11 July 2013 D5: US 4889231 A (FOOTE et al.) 26 December 1989 D6: US 20020179607 A1 (IWASAKI et al.) 05 December 2002 D7: US 3185371 A (R. F. REIFERS) 25 May 1965 <u>NOVELTY (N)</u> NOTE: In construing claims 10-11 it is to be noted that in line with Appendix A 5.26[1] of the PCT International Search and Preliminary Examination Guidelines, a product is not rendered novel merely by the fact that it is produced by means of a new process. Hence the process of trimming and stretching the container is not considered limiting per se on the scope of claims 10-11. The limitation provided by claims 10-11 essentially amounts to the container being of a material that can be thermoformed, that the perimeter of the material is not an outermost periphery of the container and that the container is suitable for stretching. Analogously the features relating to trimming and stretching the container of claim 12 provides no limitation on the scope other than suitability therefor, and claims 14-17 similarly provide minimal limitation on the scope of the claimed container. Claims 1-20 are not novel and therefore do not comply with PCT Article 33(2) as they are disclosed by the following documents: D1 discloses claims 1-2, 5-18, 20: Claims 1, 20 – see container (figure 1) (and implicitly the method of making it) with base (1) and upward sidewall (2), profiled upper periphery with rim region (3) extending outwardly (4) and downwardly (the curved periphery in figure 2) from the sidewall (alternatively the rim region can be considered just a portion of the arcuate outwardly and downwardly curved region); claim 2 – see inwardly rolled rim (6); claim 5 – the rim region is not upwardly concave (figure 2); claim 6-9 – in the case that the rim region is just a portion of the arcuate region the angle of the rim region can range from a few degrees from horizontal to more than 45 degrees depending on how much of the arcuate region is taken to be the rim region); claims 10-11 – with reference to the Note on construing claims 10-11, the container is formed of a stretchable thermoform material (abstract) and the perimeter (12) of the material is not an outermost periphery of the container (figure 2); claims 12, 18 – the blank of figure 3 is itself a container having outwardly extending rim region (4), inwardly rolled region (6) and counter rolled region (9, figure 4) termination in cutting zone (11) that is parallel to the rim region (4) and see the Note on construing these claims with regard to features relating to stretching and cutting; claim 13 – the rim region can be the combination of the outward region (4) and/or a portion of the downwardly arcuate region; claims 14-17 – with further reference to the Note on																	

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International Application No.

PCT/IB2018/050949

claim construction, the cutting zone (end of portion 11) is shown (figure 4) to be of a configuration that could be made by vertically trimming with a punch and die, perpendicularly to the horizontal cutting zone (11).

D2 discloses claims 1-2, 5-11, 20:

Claim 1 – see container (e.g. figure 7) with base (27), upward sidewall (26), profiled upper periphery with rim region (e.g. 30, figure 10) extending outwardly and downwardly from the sidewall (the arcuate portion extending from the highest portion of the sidewall); claim 2 – see the lower portion of the rim (30, figure 10) rolling inwardly towards the sidewall; claim 5 – the rim region (30) is upwardly convex; claims 6-9 – the rim region can be considered the region between the apex and any point on the outwardly and downwardly sloping arc and the angle of the rim region can be considered the angle this point makes with the apex; such points can be selected to achieve any angle between a few degrees from the horizontal, to about 45 degrees in the embodiment of figure 10 when the outermost point is selected; claims 10, 20 – the container is pre-formed (figures 1-3), the preform is then stretched (figures 3-4; Col. 3 L. 42-44; Col. 4 L. 31-37) and cut at an outermost perimeter in the stretched state (Col. 4 L. 40-43) and when in a relaxed trimmed state the cut perimeter is not at an outermost periphery (Col. 4 L. 43-44; figures 4-6, 10); claim 11 – see figure 4 with the stretched rim for the most part unfurled.

D3 discloses claims 1-2, 4-5, 10-17, 20:

Claims 1, 20 – see container (3) (and implicitly the method of making it) with base and upward sidewall (figure 1), profiled upper periphery with rim region (6) extending outwardly (5) and downwardly (6) from the sidewall (figure 3) (or alternatively the rim region can be (5, 6) extending outwardly (5) and downwardly (6)); claim 2 – see inwardly rolled rim (10); claims 4-5 – the rim region is (6) is planar and not concave; claims 10-11 – with reference to the Note on construing claims 10-11, the container (3) is formed of a thermoform material (abstract) and the stretchable perimeter (12) of the material is not an outermost periphery of the container (figure 3); claims 12-17 – with further reference to the Note, the features of these claims are disclosed in line with the explanation for claims 1-2 and see counter rolled region (the second half of (10)), and trimming is disclosed as perpendicular to a cutting zone (figures 2-3).

The claimed features are disclosed by the following documents for analogous reasons:

D4 discloses claims 1-3, 5-9, 12-17, 19-20 – see in particular the abstract, figures 1-13 and paragraphs 23, 32. Note that the rim region can be taken as outwardly extending region (14) with the downwardly extending curved edge, or merely as the curved edge extending from the highest point of the tray. The tray of D4 is overwrapped with PVC or LDPE film (paragraph 32, figure 13).

D5 discloses claims 1-2, 4-5, 20 – see the abstract and figures 1-8 with rim region (24) and inwardly rolled region (26) (figures 3, 7-8).

D6 discloses claims 1, 4-9, 20 – see the abstract, figure 2, paragraphs 17, 52-57 with the angle of the rim region (13) disclosed as 20-60 degrees (paragraph 17).

D7 discloses claims 1, 4-5, 20 – see column 3 line 15 to column 4 line 34, figures 1-6, 10-11, with rim region (18).

Claim 21 is novel and therefore complies with PCT Article 33(2) as none of the prior art documents disclose stretching a container preform outwardly to deform a profiled rim until a cut zone is presented perpendicular to a trimming cut locus, trimming along the cut locus and allowing the trimmed container to relax and re-form the profiled upper periphery.

INVENTIVE STEP (IS)

Claims 1-20 do not involve an inventive step and therefore do not comply with PCT Article 33(3).

Given the above novelty objections, claims 1-20 do not involve an inventive step as they are not novel.

Claims 3, 19 are obvious and do not meet the requirements of Article 33(3) of the PCT with regard to inventive step in the light of each of D1-D3, D5 and D7 as overwrapping a tray with cling wrap is common general knowledge in the art.

Claims 6-9 are obvious and do not meet the requirements of Article 33(3) of the PCT with regard to inventive step in the light of each of D3, D5 and D7 as the angle of the rim region is not specified in these documents, however the claimed angles are among the many obvious alternatives a skilled worker would be expected to select.

Claim 21 involves an inventive step and therefore complies with PCT Article 33(3) because the prior art does not obviously suggest to a person skilled in the art the features of stretching a container preform outwardly to deform a profiled rim until a cut zone is presented perpendicular to a trimming cut locus, trimming along the cut locus and allowing the trimmed container to relax and re-form the profiled upper periphery. The closest prior art is considered to be D1 that discloses a container preform (figures 3-5A) that

**WRITTEN OPINION OF THE
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is stretched outwardly to deform a profiled rim (figure 5B) and present a cut zone to a trimming cut locus (II-II), trimming along the cut locus and allowing the trimmed container to relax and re-form the profiled upper periphery (figure 5C); however D1 does not disclose or obviously suggest presenting the cut zone perpendicularly to the trimming locus.

INDUSTRIAL APPLICABILITY (IA)

The invention defined in the claims is considered to meet the requirements of Industrial Applicability under Article 33(4) of the PCT because it can be made by, or used in, industry.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International Application No.

Supplemental Box

PCT/IB2018/050949

Continuation of: **Box IV**

This International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept.

This Authority has found that there are different inventions based on the following features that separate the claims into distinct groups:

- Claims 1-11 and 19-20 (when appended to claims 1-11) are directed to an open mouthed container with a base with an upwardly extending peripheral sidewall having a rim region extending outwardly and downwardly from the sidewall. The feature of a rim extending outwardly and downwardly is specific to this group of claims.
- Claims 12-18, 21 and 19-20 (when appended to claims 12-18) are directed to a method (and product) of forming an open mouthed container with profiled upper periphery about the mouth comprising: stretching the profiled rim of the container preform to present a cutting zone perpendicular to a trimming cut locus, and trimming along the cut locus. The feature of stretching a profiled rim of a container to present a cut zone perpendicular to a trimming locus is specific to this group of claims.

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

When there is no special technical feature common to all the claimed inventions there is no unity of invention.

In the above groups of claims, the identified features may have the potential to make a contribution over the prior art but are not common to all the claimed inventions and therefore cannot provide the required technical relationship. The only feature common to all of the claimed inventions is an open mouthed container with a profiled upper peripheral rim region. However it is considered that this common feature is generic in this particular art.

Therefore this common feature cannot be a special technical feature. Hence there is no special technical feature common to all the claimed inventions and the requirements for unity of invention are consequently not satisfied *a priori*.

The search and examination for the second invention will require more than negligible additional search and examination effort over that for the first invention and as such one additional search fee was warranted.

MEJORAS PARA BANDEJAS

CAMPO DE LA INVENCION

La presente invención se refiere a bandejas y/o métodos de fabricación de bandejas. Con mayor particularidad, pero no exclusivamente, se refiere a una bandeja de reborde redondo mejorada y adecuada para usar con película de sobreenvoltura, y/o métodos asociados de fabricación.

ANTECEDENTES DE LA INVENCION

Los productos perecederos, como carne, aves de corral, pescado, fruta o verdura, a menudo se sellan con una película de plástico transparente en bandejas que se exhiben para la inspección de los clientes. Se sabe que las bandejas pueden sellarse con una película de plástico para proteger el contenido de la bandeja y al mismo tiempo presentar una estética atractiva.

Las bandejas con sobreenvoltura ofrecen una solución de envasado económica adecuada para aplicaciones de envoltura automática y manual. Típicamente, una bandeja se envuelve con una película de plástico que se estira alrededor de la bandeja y se adhiere a sí misma donde la película de envoltura se superpone (por lo general debajo de la base de la bandeja). Cuando se usa este tipo de envasado, la reducción de fugas se convierte en una consideración importante, porque si se producen fugas, estas pueden presentar un riesgo para la seguridad alimentaria y/o perder el atractivo para el cliente.

Si no se crea un sello adecuado, se pueden contaminar y/o deteriorar los alimentos, porque los microorganismos prosperan en líquidos derivados de productos perecederos como la carne, y también pueden producir olores desagradables. En consecuencia, la falta de sellado adecuado puede afectar negativamente la calidad, el color y/o el sabor de la carne (o producto). Además, el exudado de la carne es visualmente poco atractivo y poco apetitoso para el consumidor. Por consiguiente, se prefiere que el exudado sea minimizado y/o contenido dentro de la bandeja.

Una solución conocida para reducir las fugas de las bandejas de productos consiste en termosellar la película de plástico en el reborde superior de la bandeja, lo que crea un sello hermético. Sin embargo, tales procesos de sellado superior requieren material y maquinaria que es comparativamente mucho más costosa que una solución de película de sobreenvoltura.

Es un objeto de la presente invención proporcionar una bandeja mejorada que

supere o al menos mejore parcialmente una o más de las desventajas mencionadas anteriormente, o que al menos proporcione al público una opción útil.

En esta memoria descriptiva, cuando se hace referencia a fuentes externas de información, que incluyen memorias descriptivas de patentes y otros documentos, se hace por lo general con el fin de proporcionar un contexto para analizar las características de la presente invención. A menos que se indique específicamente lo contrario, la referencia a tales fuentes de información no debe interpretarse, en cualquier jurisdicción, como una admisión de que tales fuentes de información son el estado de la técnica o que forman parte del conocimiento general común en la técnica.

Para el propósito de esta memoria descriptiva, donde las etapas del método se describen en secuencia, la secuencia no necesariamente significa que las etapas deben ordenarse cronológicamente en esa secuencia, a menos que no haya otra forma lógica de interpretar la secuencia.

BREVE DESCRIPCIÓN DE LA INVENCION

De acuerdo con un primer aspecto, la invención comprende en términos generales un recipiente de boca abierta que tiene una periferia superior perfilada alrededor de la boca que comprende:

una base,

una pared lateral periférica que se extiende generalmente hacia arriba desde dicha base,

en donde dicha periferia superior perfilada comprende una región de reborde que se extiende hacia afuera y hacia abajo desde dicha pared lateral periférica, y

De acuerdo con un aspecto adicional, dicho recipiente comprende además una región de reborde redondo que se extiende desde un borde exterior de dicha región de reborde y que se enrolla hacia adentro en dirección a dicha pared lateral periférica.

De acuerdo con un aspecto adicional, dicho recipiente está sobreenvuelto por una película de plástico que se estira alrededor de dicho recipiente para cerrar dicha boca abierta, y se superpone y se adhiere a sí misma.

De acuerdo con un aspecto adicional, dicha región de reborde es sustancialmente plana en una sección transversal.

De acuerdo con un aspecto adicional, dicha región de reborde no es cóncava hacia arriba en sección transversal.

De acuerdo con un aspecto adicional, dicha región de reborde se extiende hacia abajo aproximadamente entre 20° y 70° desde el sentido horizontal.

De acuerdo con un aspecto adicional, dicha región de reborde se extiende

hacia abajo aproximadamente entre 30° y 45° desde el sentido horizontal.

De acuerdo con un aspecto adicional, dicha región de reborde se extiende hacia abajo a aproximadamente 30° desde el sentido horizontal.

De acuerdo con un aspecto adicional, dicha región de reborde se extiende hacia abajo a aproximadamente 45° desde el sentido horizontal.

De acuerdo con un aspecto adicional, dicho recipiente se recorta de una preforma termoformada, mientras que dicha preforma está en un estado estirado, y

en donde en dicho estado estirado, dicho recorte se produce en una ubicación más externa de dicho recipiente, y forma un perímetro de corte, y

en donde en un estado relajado y recortado, dicho perímetro de corte no está en la periferia más externa de dicho recipiente.

De acuerdo con un aspecto adicional en dicho estado estirado, dicho reborde redondo está al menos en su mayor parte desplegado.

De acuerdo con otro aspecto, la invención comprende en términos generales un recipiente de boca abierta que tiene una periferia superior perfilada alrededor de la boca que comprende:

una base,

una pared lateral periférica que se extiende generalmente hacia arriba desde dicha base,

en donde dicha periferia superior perfilada comprende:

una región de reborde que se extiende hacia afuera desde dicha pared lateral periférica, y

una región de reborde redondo que se extiende desde un borde exterior de dicha región de reborde y que se enrolla hacia adentro en dirección a dicha pared lateral periférica, y

una región de rollo opuesto que se extiende desde un borde de dicho reborde enrollado, y que se extiende hacia afuera lejos de dicha pared lateral periférica, y que define una zona de corte, y

en donde dicho recipiente se recorta de una preforma termoformada, mientras que dicha preforma está en un estado estirado, y

en donde en dicho estado estirado, dicho recorte se produce en dicha zona de corte y dicha zona de corte se presenta sustancialmente perpendicular a una dirección de recorte.

De acuerdo con un aspecto adicional, dicha región de reborde se extiende hacia afuera y hacia abajo desde dicha pared lateral periférica.

De acuerdo con un aspecto adicional en donde dicho recorte se realiza mediante un conjunto de punzón y troquel que actúa en una dirección de recorte.

De acuerdo con un aspecto adicional, dicha dirección de recorte es sustancialmente vertical.

De acuerdo con un aspecto adicional, dicha dirección de recorte es transversal al material del recipiente en la zona de corte.

De acuerdo con un aspecto adicional, dicha zona de corte se presenta sustancialmente horizontal.

De acuerdo con un aspecto adicional en sección transversal, dicha zona de corte es sustancialmente paralela a dicha región de reborde.

De acuerdo con un aspecto adicional, el recipiente de boca abierta comprende además una sobreenvoltura de película plástica adhesiva.

De acuerdo con un aspecto adicional, la invención comprende en términos generales un método para fabricar un recipiente de acuerdo con cualquiera de las cláusulas anteriores.

De acuerdo con un aspecto adicional, la invención comprende en términos generales un método para fabricar un recipiente de boca abierta que incluye una periferia superior perfilada alrededor de la boca que comprende:

estirar una preforma de dicho recipiente que incluye dicha periferia superior perfilada hacia afuera para deformar dicho perfil hasta que una zona de corte se presente perpendicular a un lugar de corte recortado,

recortar dicha preforma a lo largo de dicho lugar de corte,

permitir que el recipiente recortado se relaje y vuelva a formar dicha periferia superior perfilada.

De acuerdo con un aspecto adicional, la invención comprende en términos generales un recipiente como se describe sustancialmente en la presente con referencia a cualquiera o más de las Figuras 3 a 4.

De acuerdo con un aspecto adicional, la invención comprende en términos generales un recipiente como se describe sustancialmente en la presente con referencia a cualquiera o más de las Figuras 5a a 5b.

De acuerdo con un aspecto adicional, la invención comprende en términos generales un recipiente como se describe sustancialmente en la presente con referencia a cualquiera o más de las Figuras 6a a 6b.

De acuerdo con un aspecto adicional, la invención comprende en términos generales un método para fabricar un recipiente como se describe sustancialmente en

la presente con referencia a cualquiera o más de las Figuras 3 a 4.

De acuerdo con un aspecto adicional, la invención comprende en términos generales un método para fabricar un recipiente como se describe sustancialmente en la presente con referencia a cualquiera o más de las Figuras 5a a 5b.

De acuerdo con un aspecto adicional, la invención comprende en términos generales un método para fabricar un recipiente como se describe sustancialmente en la presente con referencia a cualquiera o más de las Figuras 6a a 6b.

Otros aspectos de la invención pueden resultar evidentes a partir de la siguiente descripción que se proporciona solo a modo de ejemplo y con referencia a los dibujos adjuntos.

Como se usa en la presente, el término "y/o" significa "y" u "o", o ambos.

Como se usa en la presente "(s)" después de un sustantivo significa las formas plurales y/o singulares del sustantivo.

La expresión "que comprende" como se usa en esta memoria descriptiva y reivindicaciones significa "que consiste al menos en parte de". Al interpretar las afirmaciones en esta memoria descriptiva y reivindicaciones que incluyen ese término, las características, precedidas por ese término en cada afirmación, deben estar todas presentes, pero también pueden estar presentes otras características. Los términos relacionados como "comprender" y "comprendido" se deben interpretar de la misma manera.

BREVE DESCRIPCIÓN DE LOS DIBUJOS

La invención se describirá ahora solo a modo de ejemplo y con referencia a los dibujos en los que:

La **Figura 1** es una vista en perspectiva de una bandeja del estado de la técnica de reborde redondo típica.

La **Figura 2** es una vista de primer plano de la región A de la Figura 1.

La **Figura 3** es una vista en perspectiva de una bandeja de reborde redondo mejorada.

La **Figura 4** es una vista de primer plano de la región B de la Figura 3.

La **Figura 5a** es una sección transversal parcial de la pared lateral periférica y la región de reborde redondo de una bandeja sin recortar similar a la bandeja de la Figura 3.

La **Figura 5b** es una sección transversal parcial de la pared lateral periférica y la región de reborde redondo de una bandeja similar a la bandeja de la Figura 3, que se muestra en un estado estirado inmediatamente antes del recorte.

La **Figura 5c** es una sección transversal parcial de la pared lateral periférica y la región de reborde redondo de una bandeja similar a la bandeja de la Figura 3, que se muestra en un estado relajado después del recorte.

La **Figura 6a** es una sección transversal parcial de la pared lateral periférica y la región de reborde redondo de una bandeja sin recortar mejorada.

La **Figura 6b** es una sección transversal parcial de la pared lateral periférica y la región de reborde redondo de la bandeja de la Figura 6a, que se muestra en un estado estirado inmediatamente antes del recorte.

La **Figura 6c** es una sección transversal parcial de la pared lateral periférica y la región de reborde redondo de la bandeja de la Figura 6a, que se muestra en un estado relajado después del recorte.

La **Figura 6d** es una sección transversal parcial de la pared lateral periférica y la región de reborde redondo de una bandeja aún más mejorada, que se muestra en un estado relajado después del recorte.

DESCRIPCIÓN DETALLADA DE LAS FORMAS DE REALIZACIÓN PREFERIDAS

Las bandejas sobreenvueltas que comprenden una película de plástico estirada y envuelta alrededor de una bandeja resultan en un envase apretado con un atractivo estético para los clientes. A medida que la película de sobreenvoltura envuelve la bandeja y vuelve a entrar en contacto consigo misma, las superficies de película superpuestas se adhieren entre sí para mantener la tensión en la membrana de película estirada que sella la bandeja abierta superior. La envoltura de película plástica se puede aplicar manualmente o mediante máquinas de envoltura estirable automática, como se conoce generalmente en la industria.

Las bandejas envasadas con envoltura estirada son relativamente más baratas en comparación con sus contrapartes de bandejas de sellado superior, por ejemplo, envasado en atmósfera modificada (MAP). Las bandejas con sellado superior suelen ser más caras debido al costo de la maquinaria, el llenado de gases y el material de película específico para la adhesión y el sellado hermético.

Sin embargo, una desventaja conocida con las bandejas envasadas con envoltura estirada tradicionales es su tendencia a tener fugas. La vía de fuga más común es más allá de la región donde la película entra en contacto con el reborde de la bandeja.

Para reducir la probabilidad de que la película de sobreenvoltura 6 se corte o perfore cuando está en contacto con una bandeja 1, las bandejas con reborde redondo 1 como se muestran en la Figura 1 (estado de la técnica), a menudo se usan en

combinación con el envasado con envoltura estirada. La región de reborde redondo 2 de la bandeja proporciona una superficie lisa para que la película de sobreenvoltura 6 entre en contacto.

Para formar bandejas con reborde redondo 1, se utiliza típicamente una técnica de termoformado. En un proceso de termoformado, una lámina de plástico se calienta primero en una forma plegable. Posteriormente, un molde deforma la lámina en una forma específica, como una bandeja con reborde redondo 1, ilustrada en la Figura 1. Finalmente, un proceso de recorte (por ejemplo, un conjunto de punzón y troquel mecánico) corta o perfora el producto final a partir de la lámina, mientras deja de lado los desechos de plástico. Los desechos pueden ser reciclados posteriormente. Sin embargo, como los conjuntos de punzón y troquel son necesarios en un proceso de termoformado y son caros de mantener y reemplazar, es preferible reducir el desgaste y la pérdida del filo para extender su vida útil.

De acuerdo con diversos aspectos de las diversas formas de realización de la presente invención como se ilustra por los ejemplos en las Figuras 3-6, se proporcionan una serie de mejoras a las bandejas adecuadas para la sobreenvoltura con películas de plástico, que se describirán a continuación. Se podrá apreciar que cada una de estas mejoras se puede aplicar a una bandeja sola, o en combinación, para lograr diferentes configuraciones de producto.

En la Figura 1 se muestra un ejemplo de bandeja rectangular 1, que comprende una base 4, una pared lateral periférica circundante 3, que define una boca abierta 5. En la extensión superior de la pared lateral 3 hay una región de reborde 2, provista por un reborde horizontal 7, y hacia afuera del reborde 7, una región de reborde redondo 8. Una película de sobreenvoltura 6, con una trayectoria de envoltura como se muestra en la Figura 2, se estira y se envuelve alrededor de la bandeja 1.

En consecuencia, se forma un sello entre el reborde 7 (y el reborde redondo 2) y la película 6. Se podrá apreciar que el sello no es un sello hermético completo, sino que la tensión en la película 6 tiende a hacer que la superficie de la película entre en contacto estrecho con el reborde 7 y el reborde redondo 8. Esta interacción entre la película 6 y la región de reborde de la bandeja, proporciona un sello efectivo alrededor del perímetro de la bandeja, que es capaz de resistir al menos la entrada de exudado u otros contaminantes.

Sin embargo, como se muestra en la Figura 2, en la región de la película 6, adyacente al reborde 7, cualquier movimiento fuera del plano (como se indica con la flecha 14), tiende a levantar la película 6 fuera de contacto con el reborde 7. En

consecuencia, incluso las desviaciones relativamente pequeñas del plano horizontal provocan la elevación de la película de sobreenvoltura 6 y rompen el sello efectivo. Tal movimiento fuera de plano de la película 6 puede ser causado comúnmente durante el tránsito o por minoristas y/o clientes que manipulan las bandejas envueltas, por ejemplo.

La interrupción del sello efectivo puede conducir a un mayor riesgo de fugas y/o un mayor riesgo de exudado entre la película 6 y el reborde 7, que puede parecer muy poco atractivo y generalmente no es deseable.

Con referencia a las Figuras 3-4, se describirá una característica preferida de la presente invención. La bandeja 21 en su forma terminada se muestra en la Figura 3, y se apreciará que la bandeja 21 puede tener otras formas, por ejemplo, cuadrada, triangular, circular, etc.

La pared lateral periférica 3 en su extensión superior tiene una región de reborde 2 que comprende un reborde 7 que se extiende hacia afuera, que conduce a un reborde redondo 8, y que termina en un borde cortado 9. Sin embargo, se podrá apreciar que en algunas configuraciones alternativas, el reborde redondo 8 puede no estar presente, y el reborde 7 puede terminar directamente en el borde cortado 9.

La bandeja mejorada está configurada de manera que la porción sustancialmente plana del reborde 7 que se extiende hacia afuera, forma un ángulo agudo 13 desde el plano horizontal. En su forma de realización preferida, el reborde 7 que se extiende hacia afuera, también se extiende hacia abajo desde la extensión superior de la pared lateral periférica 3. Se prefiere que el reborde 7 sea lo suficientemente ancho para presentar una superficie adecuada para que la película 6 entre en contacto y forme un sello efectivo.

Se ha descubierto que esta característica de la presente invención puede mejorar la resistencia a las fugas de las bandejas. A diferencia de la bandeja del estado de la técnica (como se muestra en la Figura 2), la bandeja mejorada 21 requiere una mayor desviación fuera del plano del sentido horizontal (que se muestra por la flecha 14), para levantar la película de sobreenvoltura 6 fuera de contacto con el reborde 7 que se extiende hacia afuera (y hacia abajo). Con el reborde 7 en ángulo mejorado, la película de sobreenvoltura 6 necesita desviarse más allá del borde discontinuo 15, para levantar la película fuera de una estrecha relación de contacto con el reborde 7 que se extiende hacia afuera.

Por consiguiente, la presente invención es menos susceptible a los riesgos de fuga, iniciados por el movimiento de la película 6, por ejemplo, durante la manipulación

de la bandeja sobreenvuelta 21.

Preferentemente, el ángulo agudo 13 es de aproximadamente entre 20° y 70°, desde el sentido horizontal.

Con mayor preferencia, el ángulo agudo 13 es de aproximadamente entre 30° y 45°.

Preferentemente, el reborde 7 es sustancialmente plano, y/o no cóncavo hacia arriba.

La bandeja 21 puede comprender materiales utilizados en nuestra gama PLIX™ de recipientes, bandejas y similares. Los ejemplos de materiales incluyen, a modo de ejemplo, PET sin espuma, PLA, CPET, PP y poliestireno de alto impacto. Además, hay muchos materiales espumados que también pueden emplearse en la bandeja 21. La película de sobreenvoltura 6, puede ser PVC, por ejemplo. Sin embargo, se podrá apreciar que cualquier material adecuado para la bandeja 21 y/o la película 6 puede beneficiarse de esta mejora.

La región de reborde redondo 8 está preferentemente dispuesta de modo que la bandeja 1 pueda estar envuelta por una película de sobreenvoltura 6, de tal modo que sea menos probable que la trayectoria de envoltura llegue al borde cortado 9, a fines de reducir la probabilidad de que ocurra una perforación si el borde cortado 9 es filoso.

Es preferible que el borde cortado 9 esté orientado hacia afuera de la trayectoria de la película de sobreenvoltura 6. En consecuencia hay un riesgo reducido de que los bordes afilados del borde cortado 9 rasguen la película de sobreenvoltura 6.

En las formas de realización de máxima preferencia, el borde cortado 9 se ubica preferentemente lo suficientemente hacia dentro de la película de sobreenvoltura 6, de modo que existe una tendencia reducida al contacto entre el borde cortado 9 y la película de sobreenvoltura 6.

Un método preferido para reducir el riesgo de que el borde cortado 9 dañe la película 6 se describirá con particular referencia a las Figuras 5a-5c. La Figura 5a ilustra una preforma 16 sin recortar de la bandeja 21. La preforma no recortada 16 incluye la pared lateral 3, el reborde 7 que se extiende hacia afuera (y hacia abajo) y una porción en exceso 12. Se apreciará que cuando se recorta la porción en exceso 12, queda la forma final de la bandeja 21.

Para recortar la bandeja, se puede emplear un conjunto de punzón y troquel cooperativos (no se muestra). En el método de máxima preferencia, el proceso de punzonado primero estira el reborde exterior de la bandeja sin recortar como se

muestra en la Figura 5b. El reborde redondo 8 se endereza preferentemente al menos un poco mediante el proceso de estiramiento, de modo que la porción a cortar (ilustrada por la línea de corte 17) ya no se encuentra debajo de la periferia exterior del reborde redondo 8. Por lo tanto, el proceso de estiramiento facilita el recorte de la bandeja, al proporcionar un mejor acceso a la zona de corte.

Además, después de completar el corte, la bandeja 21 puede relajarse en un estado no estirado como se ilustra en la Figura 5c. La relajación de la bandeja reforma el reborde redondo 8, y el borde cortado 9 puede regresar a una orientación y/o posición que minimiza el riesgo de que el borde cortado 9 perfora una película de sobreenvoltura. Es decir, el borde cortado 9 puede mirar ligeramente hacia adentro hacia la pared lateral 3 de la bandeja, y/o puede estar ubicado sobre la extensión más externa del reborde redondo 8.

Se ha descubierto que esta mejora en las bandejas adecuadas para el envasado de sobreenvoltura funciona bien. Sin embargo, un problema encontrado al fabricar bandejas como se ilustra es el desgaste y la pérdida del filo relativamente rápidos de los conjuntos de punzón y troquel utilizados para recortar las bandejas. Este problema surge debido al ángulo oblicuo en el que se presenta el material de la bandeja en relación con el lugar de corte a lo largo del cual opera el conjunto de punzón y troquel cooperativos. Es decir, el lugar de corte (ilustrado por la línea 17) es preferentemente vertical, y el material de la bandeja se presenta en un ángulo que no es sustancialmente perpendicular al lugar de corte.

A continuación se describirá una configuración mejorada adicional con referencia a las Figuras 6a a 6. La Figura 6a muestra una preforma de la bandeja sin recortar 1, que comprende una región de reborde 7, una pared lateral periférica 3, una base 4 y una boca abierta 5. El reborde 7 en su extensión exterior comprende un reborde redondo 8 (que se curva hacia la pared lateral del recipiente 3), que se funde en un rollo opuesto 11 (que se curva lejos de la pared lateral del recipiente 3), antes de que la región de corte 12 se extienda sustancialmente de manera horizontal. En particular, una zona de corte 10 está situada entre el rollo opuesto 11 y la región de corte 12. La zona de corte 10 es preferentemente paralela de manera sustancial al plano del reborde 7.

La Figura 6b muestra la forma estirada hacia afuera de la bandeja 21 sin recortar. La forma estirada de la bandeja sin recortar presenta la zona de corte 10, hasta la línea de corte 17, de modo que el lugar de corte es sustancialmente transversal a lo largo del material en la zona de corte 10. La línea de corte 17 es la

trayectoria recorrida por los conjuntos de punzón y troquel utilizados para recortar la región de corte 12, de la bandeja de preforma 1. En consecuencia, las superficies operativas del conjunto de punzón y troquel no están expuestas a una presión lateral significativa, lo que acelera que se desafilen.

Se podrá apreciar que la geometría y la forma de la bandeja preformada pueden influir en la geometría y la forma de la zona de corte 10. El objetivo de la zona de corte 10 es que se presente sustancialmente perpendicular al lugar de corte y fuera de la región de reborde, cuando la bandeja está en su estado estirado.

Los conjuntos de punzón y troquel utilizados en un proceso de termoformado se desgastan y pierden el filo con el tiempo y son costosos de reemplazar. Por lo tanto, es preferible evitar o minimizar las fuerzas laterales sobre el conjunto de punzón y troquel para extender la vida útil de estas herramientas. La vida útil de los conjuntos de punzón y troquel puede extenderse, si el corte 10 es sustancialmente transversal a la línea de corte II-II, lo que minimiza las fuerzas laterales sobre las herramientas.

La Figura 6c muestra una forma final de una bandeja recortada 21, después de que se ha relajado de su estado estirado. Después de que la bandeja 21 ha sido recortada, la región de reborde redondo 2 termina en su cara de borde cortado 9, mientras que queda una pieza sobrante 12 (no se muestra en la Figura 6c) que puede reciclarse o descartarse.

Preferentemente, el borde cortado 9 está cerca de la región de rollo opuesto 11, para minimizar la distancia en la que el borde cortado 9 se extiende hacia afuera, a fin de reducir la probabilidad de que esta cara cortada 9 interfiera con la trayectoria de la película (que se muestra mediante la línea discontinua 18).

Es preferible que el borde cortado 9 esté orientado hacia afuera de la trayectoria de la película de sobreenvoltura 6. En consecuencia hay un riesgo reducido de que los bordes afilados del borde cortado 9 rasguen la película de sobreenvoltura 6.

Con referencia a la Figura 6d, se muestra una forma alternativa de la bandeja 21. Para considerar, el reborde redondo 8 y el rollo opuesto 11, de modo que el borde cortado 9 esté ubicado ligeramente sobre la trayectoria esperada de la película de sobreenvoltura (que se muestra por la línea discontinua 18).

Para las personas del oficio de nivel medio a las que se refiere la invención, se sugerirán muchos cambios en la interpretación y formas de realización y aplicaciones de la invención muy diferentes sin apartarse del alcance de la invención tal como se define en las reivindicaciones adjuntas.

También se puede decir, en términos generales, que esta invención consiste en

las partes, los elementos y las características referidas o indicadas en la memoria descriptiva de la solicitud, individual o colectivamente, y cualquiera o todas las combinaciones de cualquiera de dos o más de dichas partes, elementos o características, y donde en la presente se mencionan números enteros específicos que tienen equivalentes conocidos en la técnica a la que se refiere esta invención, tales equivalentes conocidos se consideran incorporados en la presente como si se expusieran individualmente.

REIVINDICACIONES

1. Un recipiente de boca abierta que tiene una periferia superior perfilada alrededor de la boca que comprende:
 - una base,
 - una pared lateral periférica que se extiende generalmente hacia arriba desde dicha base,
 - en donde dicha periferia superior perfilada comprende una región de reborde que se extiende hacia afuera y hacia abajo desde dicha pared lateral periférica, y
2. Un recipiente de boca abierta de acuerdo con la reivindicación 1, en donde dicho recipiente comprende además una región de reborde redondo que se extiende desde un borde exterior de dicha región de reborde y que se enrolla hacia adentro en dirección a dicha pared lateral periférica.
3. Un recipiente de boca abierta de acuerdo con la reivindicación 1 o la reivindicación 2, en donde dicho recipiente está sobreenvuelto por una película de plástico que se estira alrededor de dicho recipiente para cerrar dicha boca abierta, y se superpone y se adhiere a sí misma.
4. Un recipiente de boca abierta de acuerdo con cualquiera de las reivindicaciones anteriores, en donde dicha región de reborde es sustancialmente plana en una sección transversal.
5. Un recipiente de boca abierta de acuerdo con cualquiera de las reivindicaciones anteriores, en donde dicha región de reborde no es cóncava hacia arriba en sección transversal.
6. Un recipiente de boca abierta de acuerdo con cualquiera de las reivindicaciones anteriores, en donde dicha región de reborde se extiende hacia abajo aproximadamente entre 20° y 70° desde el sentido horizontal.
7. Un recipiente de boca abierta de acuerdo con cualquiera de las reivindicaciones anteriores, en donde dicha región de reborde se extiende hacia abajo aproximadamente entre 30° y 45° desde el sentido horizontal.
8. Un recipiente de boca abierta de acuerdo con cualquiera de las reivindicaciones anteriores, en donde dicha región de reborde se extiende hacia abajo a aproximadamente 30° desde el sentido horizontal.
9. Un recipiente de boca abierta de acuerdo con cualquiera de las reivindicaciones 1 a 7, en donde dicha región de reborde se extiende hacia abajo a aproximadamente 45° desde el sentido horizontal.
10. Un recipiente de boca abierta de acuerdo con cualquiera de las

reivindicaciones 2 a 9, en donde dicho recipiente se recorta de una preforma termoformada, mientras que dicha preforma está en un estado estirado, y

en donde en dicho estado estirado, dicho recorte se produce en una ubicación más externa de dicho recipiente, y forma un perímetro de corte, y

en donde en un estado relajado y recortado, dicho perímetro de corte no está en la periferia más externa de dicho recipiente.

11. Un recipiente de boca abierta de acuerdo con la reivindicación anterior, en donde en dicho estado estirado, dicho reborde redondo está al menos en su mayor parte desplegado.

12. Un recipiente de boca abierta que tiene una periferia superior perfilada alrededor de la boca que comprende:

una base,

una pared lateral periférica que se extiende generalmente hacia arriba desde dicha base,

en donde dicha periferia superior perfilada comprende:

una región de reborde que se extiende hacia afuera desde dicha pared lateral periférica, y

una región de reborde redondo que se extiende desde un borde exterior de dicha región de reborde y que se enrolla hacia adentro en dirección a dicha pared lateral periférica, y

una región de rollo opuesto que se extiende desde un borde de dicho reborde enrollado, y que se extiende hacia afuera lejos de dicha pared lateral periférica, y que define una zona de corte, y

en donde dicho recipiente se recorta de una preforma termoformada, mientras que dicha preforma está en un estado estirado, y

en donde en dicho estado estirado, dicho recorte se produce en dicha zona de corte y dicha zona de corte se presenta sustancialmente perpendicular a una dirección de recorte.

13. Un recipiente de boca abierta de acuerdo con la reivindicación anterior, en donde dicha región de reborde se extiende hacia afuera y hacia abajo desde dicha pared lateral periférica.

14. Un recipiente de boca abierta de acuerdo con la reivindicación 12 o la reivindicación 13, en donde dicho recorte se realiza mediante un conjunto de punzón y troquel que actúa en una dirección de recorte.

15. Un recipiente de boca abierta de acuerdo con la reivindicación 12 o la

reivindicación 13, en donde dicha dirección de recorte es sustancialmente vertical.

16. Un recipiente de boca abierta de acuerdo con cualquiera de las reivindicaciones 12 a 15, en donde dicha dirección de recorte es transversal al material del recipiente en la zona de corte.

17. Un recipiente de boca abierta de acuerdo con cualquiera de las reivindicaciones 12 a 16, en donde dicha zona de corte se presenta sustancialmente horizontal.

18. Un recipiente de boca abierta de acuerdo con cualquiera de las reivindicaciones 12 a 17, en donde en sección transversal, dicha zona de corte es sustancialmente paralela a dicha región de reborde.

19. Un recipiente de boca abierta de acuerdo con cualquiera de las reivindicaciones anteriores, que comprende además una envoltura de película plástica adhesiva.

20. Un método para fabricar un recipiente de acuerdo con cualquiera de las reivindicaciones 1 a 19.

21. Un método para fabricar un recipiente de boca abierta que incluye una periferia superior perfilada alrededor de la boca que comprende:

estirar una preforma de dicho recipiente que incluye dicha periferia superior perfilada hacia afuera para deformar dicho perfil hasta que una zona de corte se presente perpendicular a un lugar de corte recortado,

recortar dicha preforma a lo largo de dicho lugar de corte,

permitir que el recipiente recortado se relaje y vuelva a formar dicha periferia superior perfilada.

RESUMEN DE LA INVENCION

Un recipiente de boca abierta mejorado que tiene una periferia superior perfilada alrededor de la boca, y que comprende una base, y una pared lateral periférica que se extiende generalmente hacia arriba desde la base, en donde la periferia superior perfilada comprende una región de reborde, y la región de reborde se extiende hacia afuera y hacia abajo desde la pared lateral periférica del recipiente de boca abierta mejorado.

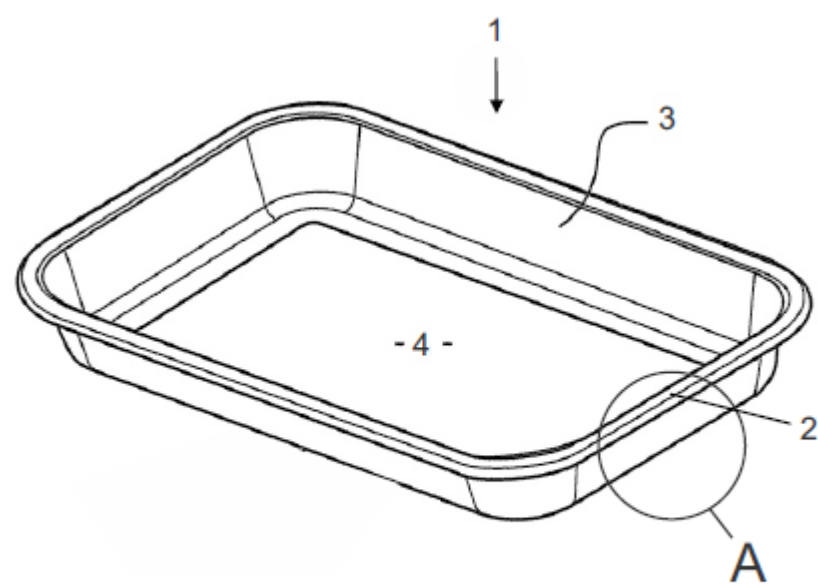


Figura 1

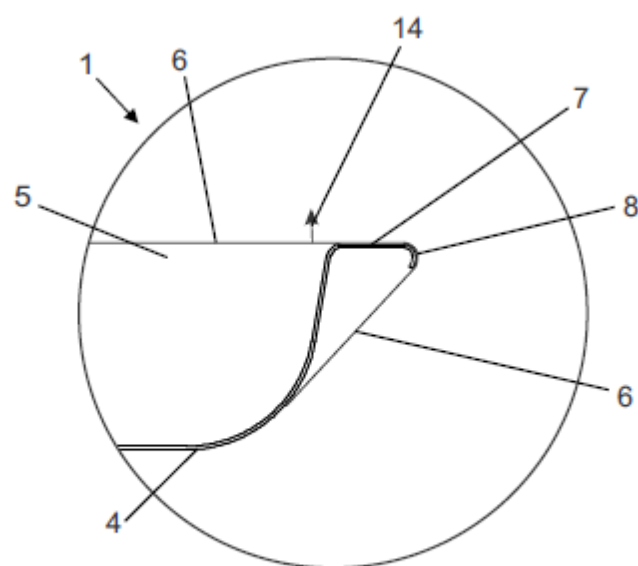


Figura 2

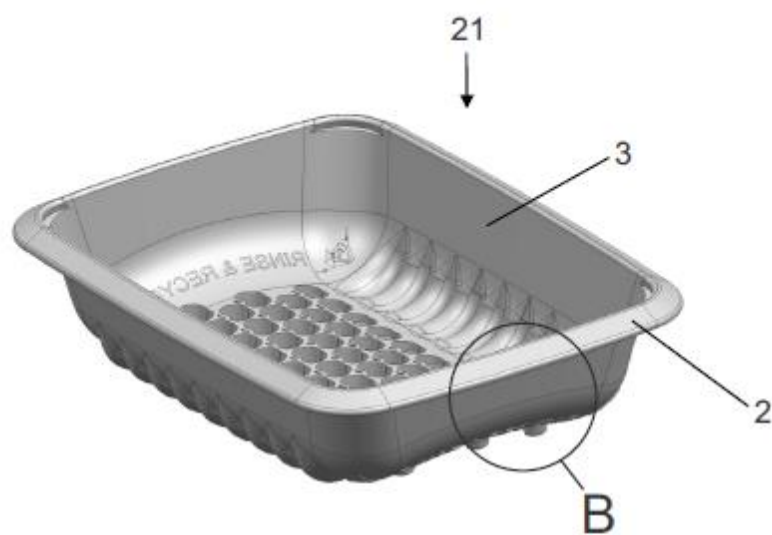


Figura 3

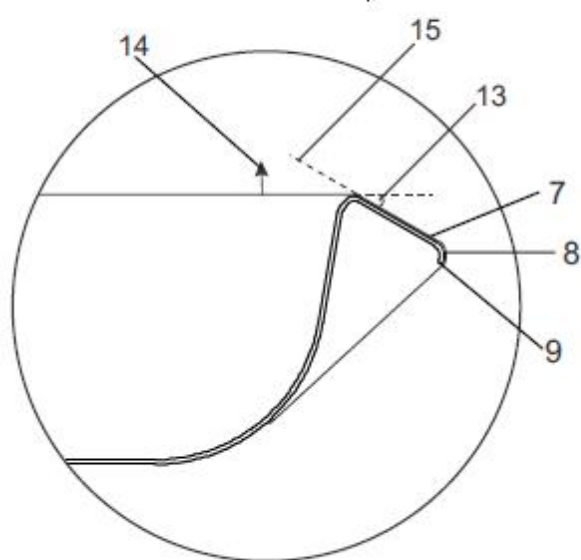


Figura 4

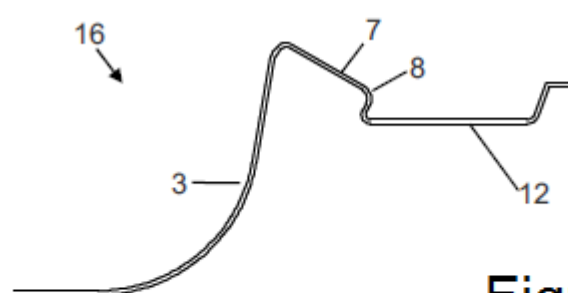


Figura 5a

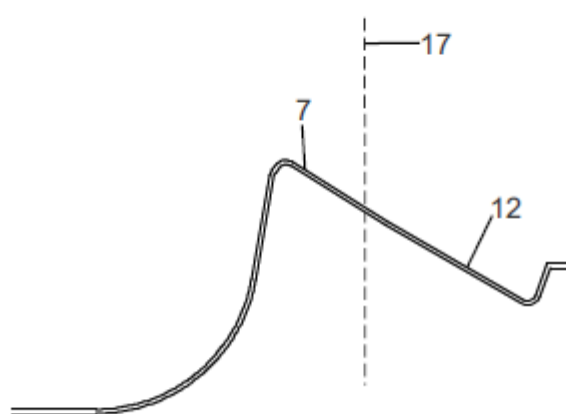


Figura 5b

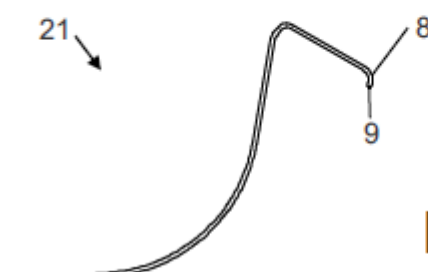


Figura 5c

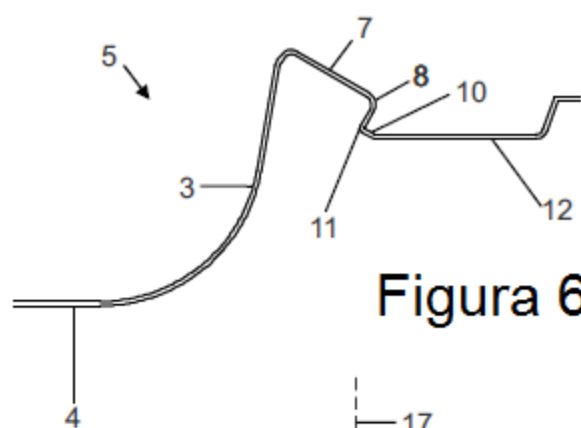


Figura 6a

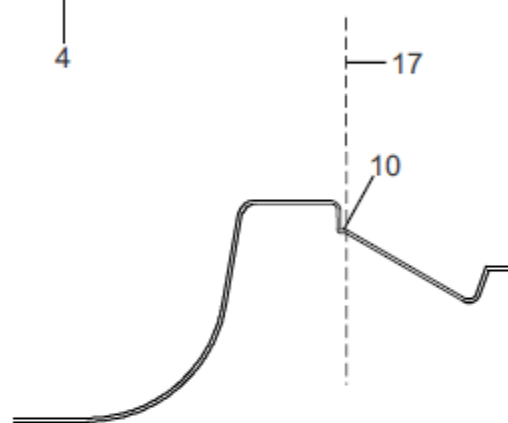


Figura 6b

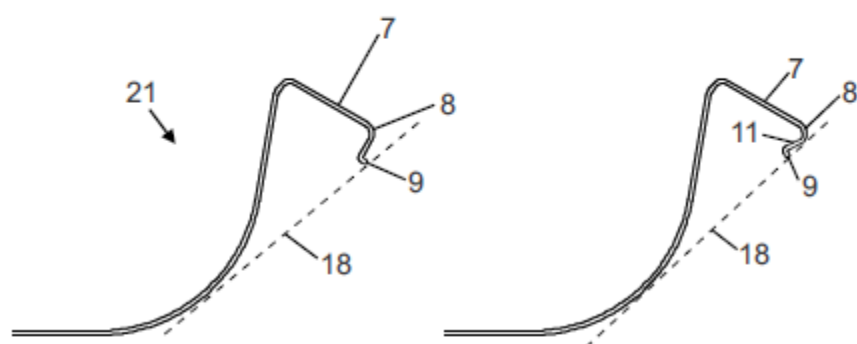


Figura 6c

Figura 6d