Abstract: A packaging container for a food product. The container includes a tray configured to support the food product. A film covers the tray. The film includes an opening configured to allow the film to be at least semi-permeable to gas. The opening is covered by a seal that may be removed when the food product reaches a retail location.
Published: with international search report (Art. 21(3))
PACKAGING SYSTEM FOR MODIFIED ATMOSPHERE CONTAINER

CROSS REFERENCE TO RELATED APPLICATIONS


BACKGROUND

[0002] The present application relates generally to the field of food product packaging. More specifically, the present application relates to a packaging system including a perforation system that forms a multitude of small openings or perforations in a plastic film for use in the packaging of a food product in a wrapping system.

[0003] Instead of being processed and packaged by a butcher at a retail location, carcasses are commonly cut at a meat packing location and shipped to the retail location as what is commonly known as case-ready (e.g., store-ready, shelf-ready, etc.) meat. The portions of meat are generally first individually wrapped in a film and then several wrapped cuts of meat are packaged in vacuum packages or modified atmosphere packages (MAP) that are configured to have an atmosphere (e.g., an atmosphere with a specific concentration of gasses such as nitrogen, carbon dioxide, carbon-monoxide, etc.) to delay spoilage of the meat such that it can be shipped and have a desired shelf life at the retail location. At the retail location, the outer packaging may be opened and the individually wrapped cuts of meat may then be placed on the shelf for purchase. The lack of oxygen in vacuum packages and some modified atmosphere packages can cause the meat to appear in its "true" color (e.g., dark reddish purple for beef and dark pink for pork). While this does not mean the meat is spoiled, consumers may be less likely to purchase the meat because it is not a more desirable color (e.g., bright red for beef and bright pink for pork), which is often associated with freshness. The film in which the individual portions of meat are wrapped may be perforated and oxygen permeable such that the meat can be exposed to oxygen once the
outer packaging is opened to "bloom" or turn to a more desirable color when on the shelf.

[0004] The vacuum packages or modified atmosphere packages, sometimes known as "mother bags," are typically constructed of an expensive film material so as to not allow air into the bag during storage and transportation. Present meat packers who use trays, must purchase the expensive container film with the modified atmosphere properties, from a limited number of suppliers who require a large amount of the film to be purchased at one time with a long lead time. As some packers use different width trays, they are forced to purchase, store, and inventory multiple sizes of expensive films to form the vacuum packages or modified atmosphere packages.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] Features, aspects, and advantages of the present invention will become apparent from the following description and the accompanying exemplary embodiments shown in the drawings, which are briefly described below.

[0006] FIG. 1 is a schematic exploded perspective view of a food container, according to an exemplary embodiment.

[0007] FIG. 2A is a schematic side view of a food product wrapping system for use with the food container of FIG. 1, according to an exemplary embodiment.

[0008] FIG. 2B is a schematic side view of a food product wrapping system for use with the food container of FIG. 1, according to another exemplary embodiment.

[0009] FIG. 3 is a schematic perspective view of food product wrapping system of FIG. 2A.

[0010] FIG. 4 is a top view of a seal for the food container of FIG. 1, according to an exemplary embodiment.

[0011] FIG. 5 is a cross-section of the seal of FIG. 4, taken along line 5-5.

[0012] FIG. 6 is a top view of a seal for the food container of FIG. 1, according to another exemplary embodiment.
FIG. 7 is a cross-section of the seal of FIG. 6, taken along line 7-7.

FIG. 8 is a top view of a seal for the food container of FIG. 1, according to another exemplary embodiment.

FIG. 9 is a cross-section of the seal of FIG. 8, taken along line 9-9.

FIG. 10 is a pictorial view of the food container of FIG. 1 with the seal affixed to the container.

FIG. 11 is a pictorial view of the food container of FIG. 1 with the seal removed from the container.

DETAILED DESCRIPTION

It is to be understood that the following detailed description are exemplary and explanatory only, and are not restrictive of the invention.

The packaging system described herein provides a novel system for wrapping a food product in a perforated film. The film includes a perforated portion and an unperforated portion. The packaging further includes a removable seal that covers the perforations in the perforated portion of the film.

It should be noted that the term "exemplary" as used herein to describe various embodiments is intended to indicate that such embodiments are possible examples, representations, and/or illustrations of possible embodiments (and such term is not intended to connote that such embodiments are necessarily extraordinary or superlative examples).

References herein to the positions of elements (e.g., "top," "bottom," "above," "below," etc.) are merely used to describe the orientation of various elements in the FIGURES. It should be noted that the orientation of various elements may differ according to other exemplary embodiments, and that such variations are intended to be encompassed by the present disclosure.

Referring to FIG. 1, a food container 10 is shown according to an exemplary embodiment. The container 10 includes a structure, shown as an open ended base.
housing or tray 12, and a film 14 enclosing a food product 16 in the tray 12. The tray 12 and the film 14 may have different properties. For example, the tray 12 may be formed of an opaque material, such as a rigid polymer or a polymer foam (e.g., polystyrene foam). The film 14 may be a transparent material, such as a polymer film (e.g., polypropylene film). A portion of the film 14 includes a multitude of openings, shown as perforations 15 to allow the film 14 to be semi-permeable to a gas such as oxygen. In one embodiment, the perforations 15 may be generally circular holes. In other embodiments, the perforations 15 may be another shape, (e.g., a slot, slit, etc.). According to an exemplary embodiment, the perforations 15 have a diameter between approximately 5 microns (0.0002 inch) to approximately 1270 microns (0.050 inch). While the embodiment in FIG. 1 shows four perforations 15 arranged in a rectangular pattern, in other embodiments, the food container may have a greater or fewer number of perforations 15 in any arrangement to achieve a desired amount of gas to pass through the film 14.

[0023] According to an exemplary embodiment, the food product 16 is a meat product (e.g., a portion of ground meat, whole muscle meat, etc.). In another embodiment, the food product packaging system 10 may be configured to package a food product formed completely or partially of vegetable material, soy, bread, or another food product that may benefit from being packaged in a perforated film.

[0024] The food container 10 further includes a removable seal 18 that is aligned with the perforations 15. The removable seal 18 is affixed to the film 14 over the perforations 15 in such a way that a gas cannot pass through the perforations 15. The seal 18 may be affixed to the film 14 by the packer to prevent the ingress of atmospheric gasses into the interior of the container 10 during shipping. The seal 18 may then be removed at a retail location to allow atmospheric gasses to enter the container 10. For example, the seal 18 may be removed to expose the food product 16 to oxygen to change the appearance of the food product 16.

[0025] Referring now to FIG. 2A-3, a packaging system 20 is shown according to an exemplary embodiment. The packaging system 20 allows the food product 16 to be
packaged in such a way that it is sealed in a vacuum or in a modified atmosphere for shipment without the use of a costly, airtight, over package (e.g., a mother bag), thereby reducing the cost of the food product 16. The packaging system 20 includes a perforation device or system 22 and a sealing device or system 24.

[0026] Wrapped food containers 10 are provided to the packaging system 20. The food containers 10 may be wrapped with a wrapping system configured to close a food product 16 in a tray 12 with a film 14. For example, the wrapping system may fold or wrap the film 14 around the tray 12 and seal the film 14 together around the food product 16 (e.g., around a rim 13 of the tray 12. The film 14 may be pre-printed with indicia or information (e.g., labels, graphics, nutritional information, price tags, cooking instructions, etc.). The film 14 is provided in an unperforated form (e.g., on a roll or other storage and dispensing device) and fed to the wrapping system 12. The film 14 may extend continuously from the dispensing device (e.g., roll) to the wrapping system.

[0027] The perforations 15 are formed in the film 14 by the perforation device or system 22. The perforation system 22 may be provided in close proximity to the wrapping system or may be provided remote from the wrapping system (e.g., at a different station in a packaging facility). In some embodiments, the perforation system 22 may be integrated into the wrapping system. The food container 10 is provided to the perforation system 22 by a conveyer system 28. The perforation system 22 includes a multitude of perforation forming elements, shown as pins 30 mounted in a pin holder 32. The pin holder 32 is mounted to an actuator, shown as a pneumatic cylinder 34. The pin holder 32 is moveable via the pneumatic cylinder 34 between a first position (e.g., home position, retracted position, disengaged position, upper position, etc.) and a second position (e.g., penetration position, engaged position, lower position, etc.). With the food container 10 at the perforation system 22, the cylinder 34 is extended to move the pin holder 32 to the second position so that the pins 30 penetrate the film 14 for a set amount of time to form the perforations 15. After the pins 30 have penetrated the film 14, the pneumatic cylinder 34 retracts to return the pin holder 32 to the first
position. After the perforations 15 have been formed in the film 14, the container 10 is moved along the conveyor system 28 from the perforation system 22 to the seal system 24. In other embodiments, the perforation system 22 may utilize lasers or any other suitable mechanism to form perforations 15 in the film 14.

[0028] The seal 18 is coupled to the film 14 over the perforations 15 by the seal system 24. The seal system 24 includes the seal 18 on a seal applicator, shown as a pad 40. According to an exemplary embodiment, the seal 18 is held on the pad 40 with vacuum. The pad 40 is mounted to an actuator, shown as a pneumatic cylinder 42. The pad 40 is moveable via the pneumatic cylinder 42 between a first position (e.g., home position, retracted position, disengaged position, upper position, etc.) and a second position (e.g., application position, engaged position, lower position, etc.). With the food container 10 at the seal system 24, the cylinder 42 is extended to move the pad 40 to the second position so that the seal 18 is coupled to the film 14 for a set amount of time such that the seal 18 covers the perforations 15. After the seal 18 is coupled to the film 14, the seal 18 is released from the pad 40 and the pneumatic cylinder 42 retracts to return the pad 40 to the first position. With the pad 40 in the first position, another seal 18 is fed out onto the pad 40 for the next cycle. The seals 18 may be provided, for example, from a roll 44. In other embodiments, the seal 18 may be applied by any suitable mechanism, such as by hand, wiped on automatically, or blown from the pad 40 to the film 14.

[0029] According to another exemplary embodiment, the perforation system 22 and the seal system 24 may utilize other actuators instead of the pneumatic cylinders 34 and 42, such as motor driven devices, hydraulic cylinders or any other linear or rotary actuator capable of moving the pins 30 or the seal 18 to the container 10.

[0030] Referring now to FIGS. 4-7, the seal 18 is shown in more detail. The seal 18 is formed from a material (e.g., film, paper, laminate) that is generally flexible and impermeable to gasses (e.g., oxygen). The seal 18 includes an adhesive 46 applied to the back side 19 of the seal 18 about the outer periphery of the seal 18. The seals 18 may be provided to the seal system 24 on a roll of a carrier 45. The carrier 45 may be
coated with a material, such as silicone, that allows for the easy removal of the seal 18 from the carrier 45.

[0031] The seal 18 has an outer periphery that is larger than the area of the film 14 that includes the perforations 15. The adhesive 46 does not contact the perforations 15 so that the perforations 15 are not obstructed by adhesive 46 left behind when the seal 18 is removed from the film 14, thereby allowing atmospheric gasses such as oxygen to freely pass through the perforations 15 in the film 14.

[0032] Referring to FIGS. 6-7, in some embodiments, the adhesive 46 may not extend to the outer periphery of the seal 18. Instead, the seal 18 may include an outer portion or tab 48 that extends outward beyond the adhesive 46. The tab 48 allows for easy removal of the seal 18 from the container 10 by the end user.

[0033] Referring to FIGS. 8-9, in some embodiments, the carrier 45 may be die cut such that a patch 47 is separated from the rest of the carrier 45. When the seal 18 is removed from the carrier 45, the patch 47 remains affixed to the adhesive 46. The patch 47 provides a barrier between the perforations 15 and the adhesive 46 when the seal 18 is coupled to the film 14.

[0034] The food container 10 may be subject to further processing after being perforated and sealed with the packaging system 20. The food container 10 may continue along the conveyor system 28 to be weighed, labeled, inspected, placed into a shipping carton, etc. Because the perforations 15 are covered by the seal 18, the food container 10 does not need to be wrapped or placed in an outer packaging to maintain the vacuum or modified atmosphere in the interior of the food container 10.

[0035] At a retail location, the food container 10 is removed from the shipping carton. The seal 18 is removed from the film 14 before placing the container 10 in a cooler for purchase, allowing the food product 16 to be exposed to atmospheric gasses, such as oxygen, passing through the perforations 15.

[0036] Referring back to FIG. 2A, the packaging system 20 is controlled by a control system 26. In an exemplary embodiment, the control system 26 includes a processor
52, a memory device 54, a user input device 56, and an output device 58. According to an exemplary embodiment, components of the control system 26 may be housed in an industrial cabinet to protect the components from the elements.

[0037] The processor 52 can be implemented as a general purpose processor, an application specific integrated circuit (ASIC), one or more field programmable gate arrays (FPGAs), a group of processing components, or other suitable electronic processing components. In another exemplary embodiment, the control system 26 may include a controller lacking a processor or memory. For example, the control system may be a linear circuit.

[0038] The memory device 54 (e.g., memory, memory unit, storage device, etc.) is one or more devices (e.g., RAM, ROM, Flash memory, hard disk storage, etc.) for storing data and/or computer code for completing or facilitating the various processes, layers and modules described in the present application. The memory device 54 may be or include volatile memory or nonvolatile memory. The memory device 54 may include database components, object code components, script components, or any other type of information structure for supporting the various activities and information structures described in the present application. According to an exemplary embodiment, the memory device 54 is communicably connected to the processor via the processing circuit and includes computer code for executing (e.g., by processing circuit and/or processor) one or more processes described herein.

[0039] The input device 56 is one or more devices that allow a user to input commands and control variables for the packaging system 20 (e.g., timing changes as required for different size seals 18, containers 10 and conveyor speeds, etc.). The input device 56 may be, for example, a touch screen monitor, a keyboard or keypad, push buttons, dials, switches, or any combination of devices. The output device 58 is one or more devices that allow a user to monitor the properties of the packaging system 20 and may be integrated with the input device 56. The output device 58 may be, for example, a monitor, a touch screen monitor, a text display, a numeric display, or a combination of devices.
The controller 26 controls the timing of the various systems and devices of the packaging system 20. The position of the container 20 on the conveyor system 28 is sensed by a detector, shown in FIGS. 2A-3 as a photoelectric eye 59. In other embodiments, the position of the container 20 may be sensed by another device, such as a mechanical switch, laser sensor or any other device capable of detecting the container 20 and transmitting a signal to the processor 52. When the eye 59 detects a container 10, the processor 52 starts a first timer A and a second timer B. The timer A is set as the time it takes for the container 10 to travel along the conveyor system 28 from the eye 59 to the perforation system 22. Once the first timer A expires, the perforation system 22 engages to form the perforations 15 in the film 14, as described above. A third timer C is started when the perforation system 22 engages (e.g., when the pin holder 32 is moved with the pneumatic cylinder 34 to the second position). Once the third timer C expires, the perforation system 22 disengages (e.g., the pin holder 32 is moved with the pneumatic cylinder 34 back to the first position). The timer B is set as the time it takes for the container 10 to travel along the conveyor system 28 from the eye 59 to the seal system 24. Once the second timer B expires, the seal system 24 engages to couple the seal 18 to the film 14, as described above.

In another embodiment, the packaging system 20 may not include an electronic controller 26. Instead, the perforations 15 may be formed in the film 14 and the seal 18 may be coupled to the film 14 manually. An operator may place one container 10 at time onto a plate or other fixture and manually actuate a perforation device to form the perforations 15 in the film 14. The operator may then manually apply the seal 18 to the film 14 to cover the perforations 15.

The present disclosure contemplates methods, systems and program products on any machine-readable media for accomplishing various operations. The embodiments of the present disclosure may be implemented using existing computer processors, or by a special purpose computer processor for an appropriate system, incorporated for this or another purpose, or by a hardwired system. Embodiments within the scope of the present disclosure include program products comprising
machine-readable media for carrying or having machine-executable instructions or data structures stored thereon. Such machine-readable media can be any available media that can be accessed by a general purpose or special purpose computer or other machine with a processor. By way of example, such machine-readable media can comprise RAM, ROM, EPROM, EEPROM, CD-ROM or other optical disk storage, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to carry or store desired program code in the form of machine-executable instructions or data structures and which can be accessed by a general purpose or special purpose computer or other machine with a processor. When information is transferred or provided over a network or another communications connection (either hardwired, wireless, or a combination of hardwired or wireless) to a machine, the machine properly views the connection as a machine-readable medium. Thus, any such connection is properly termed a machine-readable medium. Combinations of the above are also included within the scope of machine-readable media. Machine-executable instructions include, for example, instructions and data which cause a general purpose computer, special purpose computer, or special purpose processing machines to perform a certain function or group of functions.

[0043] It is important to note that the construction and arrangement of the food product packaging as shown in the various exemplary embodiments are illustrative only. Although only a few embodiments have been described in detail in this disclosure, those skilled in the art who review this disclosure will readily appreciate that many modifications are possible (e.g., variations in sizes, dimensions, structures, shapes and proportions of the various elements, values of parameters, mounting arrangements, use of materials, colors, orientations, etc.) without materially departing from the novel teachings and advantages of the subject matter described herein. For example, elements shown as integrally formed may be constructed of multiple parts or elements, the position of elements may be reversed or otherwise varied, and the nature or number of discrete elements or positions may be altered or varied. The order or sequence of any process or method steps may be varied or re-sequenced according to alternative embodiments.
WHAT IS CLAIMED IS:

1. A packaging container for a food product comprising:
   a tray configured to support the food product;
   a film covering the tray;
   wherein the film includes an opening configured to allow the film to be at least semi-permeable to gas; and
   wherein the opening is covered by a removable seal.

2. The container of claim 1, wherein the film includes a plurality of openings covered by the removable seal.

3. The container of claim 1, wherein the size of the openings is between 5 microns to 1270 microns.

4. The container of claim 1, wherein the removable seal is impermeable to gas.

5. The container of claim 1, wherein the removable seal is formed of flexible material.

6. The container of claim 1, wherein the film is impermeable to gas except for opening.

7. The container of claim 1, wherein the seal includes an adhesive located on one side of the seal for maintaining the seal in connection with the film.

8. The container of claim 7, wherein the one side of the seal includes a portion without adhesive.

9. The container of claim 8, wherein the portion without adhesive is located on the edge of the seal to thereby form a tab that may be grasped in order to remove the seal from the film.
10. The container of claim 8, wherein the portion without adhesive is located adjacent the opening in the film so that the adhesive does not obstruct the opening.

11. A method of manufacturing a container for a food product comprising:
   covering a tray containing the food product with film;
   after the tray is covered with film forming an opening in the film to thereby allow the film to be at least semi-permeable to gas;
   covering the opening with a removable seal.

12. The method of claim 11, wherein the step of forming the opening in the film includes perforating the opening using a pin.

13. The method of claim 11, wherein the step of covering the tray includes using film that is impermeable.

14. The method of claim 11, wherein the step of forming the opening includes forming a plurality of openings in the film and wherein all of the plurality of openings are covered with the removable seal.

15. The method of claim 12, wherein the pin is controlled to perforate the film for a predetermined period of time.

16. The method of claim 11, further comprising the step of removing the seal from a carrier prior to covering the opening with the seal.

17. The method of claim 16, wherein the step of removing the seal from the carrier includes removing a patch connected to a portion of the seal covered with adhesive.
18. The method of claim 11, wherein the step of forming an opening in the film is performed proximate to the step of covering the tray so that these steps may be integrated into the same machine.

19. The method of claim 11, wherein the food product is packed a modified atmosphere.

20. The method of claim 11, further comprising sensing the location of the tray between covering the tray with the film and forming the opening in the film.
A. CLASSIFICATION OF SUBJECT MATTER

B65D 81/20(2006.01)i, B65D 85/50(2006.01)i, B65D 65/22(2006.01)i, B65D 77/20(2006.01)i, B65D 53/08(2006.01)i, B65D 51/16(2006.01)i, B65D 1/34(2006.01)i, B65B 25/06(2006.01)i, B65B 31/02(2006.01)i

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)
B65D 81/20; 12 1D 10/02; B23K 26/40; B65D 85/00; B23K 26/38; B65B 1/04; B65D 1/24; A61L 2/00; B65D 85/50; B65D 65/22; B65D 77/20; B65D 53/08; B65D 51/16; B65D 1/34; B65B 25/06; B65B 31/02

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

Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic database consulted during the international search (name of database and, where practicable, search terms used)
eKOMPASS (KIPO internal)

& Keywords: package, tray, film, opening, permeable, seal, adhesive, gas, food, perforate

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>US 6221411 B1 (SANFILIPPO et al.) 24 April 2001 see column 1, lines 6-11; column 2, lines 20-50; column 3, line 11 - column 1, line 25; and figures 1-5.</td>
<td>1-20</td>
</tr>
<tr>
<td>Y</td>
<td>US 2012-0031795 A1 (VON GLASW, CHRISTIAN) 09 February 2012 see paragraphs [0026]-[0039], [0048]-[0065]; and figures 1-2, 4.</td>
<td>1-20</td>
</tr>
<tr>
<td>A</td>
<td>US 2008-0011755 A1 (VARRIANO-MARSTON et al.) 17 January 2008 see paragraphs [0024]-[0062]; and figures 1-5.</td>
<td>1-20</td>
</tr>
<tr>
<td>A</td>
<td>US 6085930 A1 (CURTIS, DANNY S.) 11 July 2000 see column 4, line 24 - column 5, line 32; and figures 1-2.</td>
<td>1-20</td>
</tr>
<tr>
<td>A</td>
<td>EP 1935553 A1 (VARRIANOMARSTON et al.) 25 June 2008 see paragraphs [0022], [0041]-[0042], [0057]; [0069H0071]; and figures 1-3, 6.</td>
<td>1-20</td>
</tr>
</tbody>
</table>

Further documents are listed in the continuation of Box C.

* Special categories of cited documents:
  *A* document defining the general state of the art which is not considered to be of particular relevance
  *E* earlier application or patent but published on or after the international filing date
  *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)
  *O* document referring to an oral disclosure, use, exhibition or other means
  *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
12 May 2016 (12.05.2016)

Date of mailing of the international search report
12 May 2016 (12.05.2016)

Name and mailing address of the ISA/KR

International Application Division
Korean Intellectual Property Office
189 Cheongsa-ro, Seo-gu, Daejeon, 35208, Republic of Korea

Facsimile No. +82-42-481-8578

Authorized officer
HWANG, Chan Yoon

Telephone No. +82-42-481-3347

Form PCT/ISA/210 (second sheet) (January 2015)
<table>
<thead>
<tr>
<th>Patent document cited in search report</th>
<th>Publication date</th>
<th>Patent family member(s)</th>
<th>Publication date</th>
</tr>
</thead>
<tbody>
<tr>
<td>US 6221411 Bl</td>
<td>24/04/2001</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>US 2012-0031795 Al</td>
<td>09/02/2012</td>
<td>CA 2795872 Al</td>
<td>14/10/2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 2010-115288 Al</td>
<td>14/10/2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 2010-0181318 Al</td>
<td>22/07/2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 7748560 B2</td>
<td>06/07/2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 7748561 B2</td>
<td>06/07/2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 2008-008201 A2</td>
<td>17/01/2008</td>
</tr>
<tr>
<td>EP 1935553 Al</td>
<td>25/06/2008</td>
<td>AT 505291 T</td>
<td>15/04/2011</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EP 1935553 Bl</td>
<td>13/04/2011</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ES 2364675 T3</td>
<td>12/09/2011</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 2008-0149604 Al</td>
<td>26/06/2008</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 8237084 B2</td>
<td>07/08/2012</td>
</tr>
</tbody>
</table>