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(54) **VACUUM PACK FOR UNITIZED DETERGENT PORTIONS**

(57) A vacuum pack comprising a label and unitized detergent portions.

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Description

FIELD OF THE INVENTION

[0001] The present invention is in the field of detergents. In particular, it relates to a package containing detergent in unitized form. The package is suitable for posting.

BACKGROUND OF THE INVENTION

[0002] E-commerce is becoming common practice. It involves shopping for a product on-line and the product sent to the buyer. Commonly, the product is delivered through the letter box. Letter boxes have a slot of fix geometry and size. Detergents have traditionally been packed to be stored in warehouses and then on shops shelves. Conventional packaging does not seem to be suitable for postal delivery.

[0003] WO2017/198564 A1 relates to a box for sending laundry detergent capsules. The box is made of any conventional box material, such as cardboard, plastics, wood and reinforced paper. The box of '564 either requires strong and expensive material or does not provide enough protection for the laundry detergent capsules. Protection is even more important in the case of liquid containing capsules because the capsules can leak and spoilt the rest of the capsules in the box.

[0004] There is a need for a package that uses less packing material, is more space efficient and protect the detergent products during posting.

SUMMARY OF THE INVENTION

[0005] According to the first aspect of the invention, there is provided a vacuum pack encasing unitized detergent portions. The vacuum pack has an on-pack label. It has been surprisingly found that by vacuum packing the unitized detergent portions, robustness and stability is conferred to the detergent portions contributing to the physical and chemical stability of the unitized detergent portions. The vacuum pack protects the unitized detergent portions from air, moisture and avoids the transfer of volatiles actives, such as perfume. The label can be either adhered to the inside or outside of the vacuum pack or can be printed on the inside or the outside of the vacuum pack. The label not only gives information about the product but also protects the detergent portions from the light. Some of the detergent portions contain light sensitive ingredients, such as metal catalysts, dyes and pigments, that can deteriorate with time if they are exposed to light. A significant advantage of vacuum packaging is that the pack volume is virtually the same as the product volume, with no 'empty' space inside the pack. This is very useful, especially during shipping. The pack is flexible but at the same time very robust. Flexibility can be achieved by arranging the unitized detergent portions in parallel rows, the pack can be bent along the lines formed by the aligned portions. Alternatively, the unitized detergent portions can be arranged in an off-set fashion, this arrangement confers rigidity to the pack. An example of off-set arrangement is brick configuration, i.e., as bricks are arranged to make a wall.

The pack is difficult to be open by pets. This is important because the pack can be delivered through the letter box and lay on the floor until the buyer gets home.

The pack may comprise a zipped lock that allows closure of the pack once it has been open to provide moisture and air protection to the unitized detergent portions after the pack has been open.

[0006] According to the second aspect of the invention, there is provided a process for making the vacuum pack of the invention.

[0007] According to the third aspect of the invention, there is provided a method of sending unitized detergent portions to a buyer wherein the method comprises delivering the pack of the invention to the buyer, preferably by post. The vacuum pack is sent without a secondary package, ie, the vacuum pack does not need to be inserted in a box or any other container. It has been surprisingly found that the vacuum pack provides enough strength for the unitized detergent portions during transport and delivery. The pack of the invention is light and flexible and therefore very convenient for transport and delivery even for delivery through letter boxes with difference shape slots.

[0008] The elements of the pack of the invention described in relation to the first aspect of the invention apply *mutatis mutandis* to the other aspects of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0009] As used herein, the articles including "the," "a" and "an" when used in a claim or in the specification, are understood to mean one or more of what is claimed or described.

[0010] As used herein, the terms "include," "includes" and "including" are meant to be non-limiting.

Unitized detergent portions

[0011] By "unitized detergent portion" is herein meant that the detergent is provided in a form that is sufficient for one cleaning operation, for example for one wash. Unitized detergent portions include tablets, sachets, capsules, pouches, etc. Preferred for use herein are portions enveloped by film, preferably water-soluble film, for example polyvinyl alcohol. Especially preferred detergent portions are wrapped in a polyvinyl alcohol film having a thickness of less than 100 μm. The unitized detergent portions packed in the vacuum pack of the invention preferably weigh from about 8 to about 25 grams, preferably from about 10 to about 20 grams.

[0012] Suitable water-soluble materials are known. In particular, the water-soluble material may include one or more water-soluble polymers. In one embodiment, the

water soluble material includes polyvinyl alcohol, a modified polyvinyl alcohol, polyvinyl acetate, polyacrylates, water soluble acrylate copolymers, polyaminopropyl sulfonic acid and salts thereof, polyitaconic acid and salts thereof, polyacrylamides, polyvinylpyrrolidone, pullalan, cellulosics (such as carboxymethylcellulose and hydroxypropyl methyl cellulose), water-soluble natural polymers (such as guar gum, xanthan gum, carrageenan and starch), water-soluble polymer derivatives (such as modified starches, including ethoxylated starch and hydroxylated propylstarch, poly(sodium acryloamido-2- methylpropane sulfonate, polymonomethylmaleate and salts thereof), copolymers thereof and combinations thereof. In some embodiments, the water soluble material includes, or consists essentially of, polyvinyl alcohol, a modified polyvinyl alcohol, polyvinyl acetate, carboxymethylcellulose or hydroxypropyl methyl cellulose. In particular embodiments, the water-soluble material includes, or consists essentially of, polyvinyl alcohol, polyvinyl acetate and/or a modified polyvinyl alcohol. Polyvinyl alcohol, polyvinyl acetate and modified polyvinyl alcohols can provide stable water-soluble substrates that have suitable dissolution rates. The water-soluble material may also contain one or more plasticizers. Examples of plasticizers include, but are not limited to glycerol, glycerin, diglycerin, ethylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, monopropylene glycol, polyethylene glycol, neopentyl glycol, trimethylpropane polyether polyols, sorbitol, ethanolamines and mixtures thereof. The plasticizer, when present, may be included in the water-soluble material in an appropriate amount, as generally known.

[0013] The detergent portions can be placed resting on one their bases and arranged side-to-side in rows without leaving space between them or leaving as little space as possible among them. The detergent portions can be arranged in monolayers, preferably the pack only comprises one monolayer. When the detergent portions are packed in this disposition the portions present good resistance to breakage and in the case of detergent portions containing liquid the chance of leaking is negated or greatly reduced. Preferably the rows are parallel. This disposition provides flexibility between the rows. The unitized detergent portions can be arranged off-set from one another in a brick like fashion.

[0014] The vacuum pack is not only beneficial in terms of physical robustness of the detergent portions but also contributes to the chemical stability of the detergent portions, especially when the detergent portions contain moisture sensitive ingredients such as bleach, enzymes, etc. In the case of unitized detergent portions comprising compositions in different forms, for example solid and liquid, avoid the transfer of components between the different forms and also the loss of volatiles such a perfume

[0015] Preferably, the unitized detergent portions are wrapped in a film, more preferably in a water-soluble film. Especially preferred herein are deformable unitized detergent portions such as capsules or pouches comprising loose powder and/or liquid compositions. Preferred unitized detergent portions include single and multi-compartment pouches, including multi-compartment pouches with liquids in the different compartments or multi-compartment pouches with powder and liquid in different compartments, as for example described in EP 1504994A1. Especially suitable for use herein are pouches comprising a powder compartment and superposed side-by side liquid compartments, as for example described in EP 1 392 812 A1.

The footprint of the unitized detergent portions may be circular, elliptical, triangular, square, rectangular, rounded square, rounded rectangle, truncated circle, squircle, pentagonal or hexagonal in shape. Preferably the footprint is square or rectangular.

[0016] The unitized detergent portions of the present invention preferably have a height of between 1.5 and 3 cm. The height allows the unitized detergent portions to be packaged in a two-dimensional array with a height of less than 3.1 cm. Accordingly, the vacuum pack can fit through a conventional mail slot. In some embodiments, the height of the capsule is in the range of 1.7 to 2.5 cm.

[0017] The unitized detergent portions base has a lateral dimension of between 2.0 and 5.0 cm, preferably in the range of 2.5 to 4.5 cm.

Unitized detergent portion composition

[0018] The detergent can be any surface treating composition. The surface treatment composition is selected from the group consisting of a fabric conditioner, a laundry conditioner, a fabric detergent, a laundry detergent, a laundry rinse additive, a hard surface cleaner, a hard surface treatment composition, an air care composition, a car care composition, a dishwashing composition, a composting composition, a cleaning product, and combinations thereof. Laundry and dishwashing compositions are preferred herein. If the detergent is wrapped with a water-insoluble film the film is removed before use. If the detergent is wrapped with a water-soluble film, then the water-soluble film would dissolve in water to release the detergent composition enclosed within it. Such detergent compositions may be in solid, granular, gel or liquid form or a combination thereof.

[0019] The detergent composition typically comprises surfactant, enzymes, builders and optionally bleach and other cleaning adjuncts. In the case of laundry detergent cleaning adjuncts include optical brightener, soil suspending polymer, etc. In the case of an automatic dishwashing detergent the composition comprises glass care agent, dispersant polymers, bleach, metal bleach catalyst, etc. The detergent can also comprise perfume and dyes.

Vacuum pack

[0020] Vacuum packing is a method of packaging that removes air from the package prior to sealing. This meth-

od involves (manually or automatically) placing items in a plastic film package, removing air from inside, and sealing the package. The film is flexible and have low oxygen permeability. Vacuum packing provides a tight fit to the contents. The intent of vacuum packing is usually to remove oxygen from the container package to improve the chemical stability of the unitized detergent portions. Even if the detergent portions are enveloped by a film, oxygen and moisture go through the film. The vacuum pack protects against oxygen and moisture transfer. During vacuum packaging air is evacuated either by nozzle vacuuming or by chamber vacuuming from package and same atmosphere is maintained till heat sealing, while doing so pressure difference exists between the package exterior and interior causing collapse in packages.

[0021] In order to maintain a vacuum high O2 barrier materials and high levels of seal integrity are required. Although the requisite O2 barrier for vacuum packaging depends on the type of detergent packaged, O2 transmission rates of less than 15 cm3 m-2 day-1 atm-1 are generally desirable. Also, packaging materials with low WVTRs should be used. Typical vacuum packaging materials consist of coextruded or laminated films such as OPP/EVOH/PE, PA/PE, PET/PE, OPP/PVDC/PE, OPP/PVDC/OPP and PVC/EVOH/PVC.

[0022] Vacuum packing can reduce the amount of packing material required to encase the unitized detergent portions. Chamber vacuum sealers or external sealers can be used to make the pack of the invention.

Labels

[0023] The label can be directly printed inside or outside the pack or can be an applied label inside or outside the pack. Printing can be selected from the group consisting of flexographic printing, gravure printing, lithographic printing, and pad printing. Applied labels can be attached or glued to the pack, generally after filling and closing. Such labels are attached, most commonly by sticking them on to the package. Applied labels are available plain (they have to be stuck on with a glue), or self-adhesive ready-glued (simple wetting is required prior to application). The label can further help to make the vacuum pack moisture and abrasion resistant.

Process for making the vacuum pack

[0024] The process comprises the step of:

a) providing a first plastic film;
b) introducing the unitized detergent portions in the package; and preferably arranging them in a monolayer disposition
c) covering the unitized detergent portions with a second film;
d) applying vacuum;
e) sealing the first and second films to make a vacuum pack; and
f) applying a label to the interior or exterior of the pack, before or after the films are sealed, preferably the label is applied by direct printing.

[0025] Alternatively, the vacuum pack can be made starting from an open pack rather than with two films. Preferably, at least one of the films has a structured surface. It has been found that the structured surface provides better sealing.

[0026] The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as "40 mm" is intended to mean "about 40 mm."

Claims

1. A vacuum pack comprising a label and unitized detergent portions.
2. A vacuum pack according to claim 1 wherein the unitized detergent portions are selected from the group consisting of tablets, capsules, sachets and pouches.
3. A vacuum pack according to any of claims 1 or 2 wherein the unitized detergent portions are enveloped by a film.
4. A vacuum pack according to the preceding claim wherein the film is water-soluble.
5. A vacuum pack according to any of the preceding claims wherein the unitized detergent portions are arranged in a monolayer.
6. A vacuum pack according to the preceding claim wherein the unitized detergent portions are arranged in parallel rows.
7. A vacuum pack according to any of the preceding claims wherein the unitized detergent portions are off set from one another.
8. A vacuum pack according to any of the preceding claims wherein the pack comprises a zipped lock.
9. A vacuum pack according to any of the preceding claims wherein the unitized detergent portions have a height of less than 4 cm.
10. A vacuum pack according to any of the preceding claims wherein the unitized detergent portions comprises more than one compartment.

11. A vacuum pack according to any of the preceding claims wherein the unitized detergent portions comprise a liquid composition.

12. A vacuum pack according to any of the preceding claims wherein the unitized detergent portions comprise a powder composition.

13. A vacuum pack according to the preceding claim wherein the unitized detergent portions are multi-compartment water-soluble pouches comprising a compartment comprising a powder composition and a compartment comprising a liquid composition.

14. A vacuum pack according to any of the preceding claim wherein the unitized detergent portions comprise a moisture sensitive ingredient.

15. A vacuum pack according to any of the preceding claims wherein the label is directly printed or applied inside or outside the pack.

16. A method of making a vacuum pack according to any of the preceding claims the method comprising the step of:

a) providing a first plastic film;
b) placing the unitized detergent portions on the first film;
c) covering the unitized detergent portions with a second film;
d) applying vacuum;
e) sealing the first and second films to make a vacuum pack; and
f) applying a label to the inside or to the outside of the pack before or after sealing the films.

17. A method of making a vacuum pack according to any of claims 1 to 15 the method comprising the step of:

a) providing an open package comprising a first film and a second film;
b) introducing the unitized detergent portions in the package;
c) applying vacuum;
d) sealing the first and second films to make a vacuum pack; and
e) applying a label to the inside or to the outside of the pack before or after sealing the films.

18. A method according to any of claims 16 or 17 wherein at least one of the films comprises a structured surface.

19. A method of sending unitized detergent portions to a buyer wherein the method comprises sending a pack according to any of claims 1 to 15 to the buyer by a delivery service.

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EUROPEAN SEARCH REPORT

Application Number
EP 20 15 5201

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 396 440 A1 (PROCTER & GAMBLE [US]) 10 March 2004 (2004-03-10)	1-4,7,8, 10-15, 17,19	INV. C11D17/00 C11D17/04
Y	* example 1 * * paragraphs [0007], [0010] *	5,6,9	B65D81/20 B65B31/02

X	WO 2006/114185 A1 (HENKEL KGAA [DE]; NITSCH CHRISTIAN [DE] ET AL.) 2 November 2006 (2006-11-02)	1-4,7,8, 10-15, 17,19	
Y	* claims 1, 3, 12, 14 *	5,6,9	

X	EP 3 245 142 A1 (MONOSOL LLC [US]) 22 November 2017 (2017-11-22)	16,18	
Y	* paragraph [0001] * * paragraph [0051] - paragraph [0052] * * figures 4-6 *	5,6,9	

A	WO 2019/168829 A1 (PROCTER & GAMBLE [US]) 6 September 2019 (2019-09-06) * page 2, line 3 - line 9 * * page 6, line 26 - line 31 * * page 7, line 1 - line 6 *	1-16	

TECHNICAL FIELDS SEARCHED (IPC)

C11D
B65D
B65B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	15 July 2020	Placke, Daniel

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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& : member of the same patent family, corresponding document

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 20 15 5201

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15-07-2020

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1396440 A1	10-03-2004	AU 2003268523 A1	29-03-2004
		BR 0314343 A	05-07-2005
		CA 2494524 A1	18-03-2004
		EP 1396440 A1	10-03-2004
		MX PA05002490 A	27-05-2005
		US 2004045861 A1	11-03-2004
		WO 2004022447 A1	18-03-2004
WO 2006114185 A1	02-11-2006	AT 541028 T	15-01-2012
		DE 102005025690 A1	09-11-2006
		EP 1907294 A1	09-04-2008
		ES 2377880 T3	02-04-2012
		PL 1907294 T3	29-06-2012
		US 2008261851 A1	23-10-2008
		WO 2006114185 A1	02-11-2006
EP 3245142 A1	22-11-2017	BR 112017015118 A2	10-04-2018
		CA 2972998 A1	21-07-2016
		CN 107207139 A	26-09-2017
		EP 3245142 A1	22-11-2017
		JP 2018502786 A	01-02-2018
		KR 20170104527 A	15-09-2017
		US 2016200501 A1	14-07-2016
		US 2017369230 A1	28-12-2017
		US 2020115148 A1	16-04-2020
		WO 2016115187 A1	21-07-2016
WO 2019168829 A1	06-09-2019	US 2019263575 A1	29-08-2019
		WO 2019168829 A1	06-09-2019

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2017198564 A1 **[0003]**
- EP 1504994 A1 **[0015]**
- EP 1392812 A1 **[0015]**