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(71) Applicant: **Fameccanica.Data S.p.A.**
66020 San Giovanni Teatino (CH) (IT)

(72) Inventors:
- **CORAZZA, Federico**
  66020 San Giovanni Teatino (Chieti) (IT)
- **BALDECCHI, Nicola**
  66020 San Giovanni Teatino (Chieti) (IT)
- **ZIROLLO, Angelo**
  66020 San Giovanni Teatino (Chieti) (IT)

(74) Representative: **Marchitelli, Mauro**
Buzzi, Notaro & Antonielli d'Oulx S.p.A.
Corso Vittorio Emanuele II, 6
10123 Torino (IT)

(54) **A RECLOSABLE CONTAINER**

(57) A reclosable container, comprising a container body (12) made of a cellulosic material and having a container aperture (14) and a movable cover (16) of a hydrosoluble thermoplastic material applied to said container aperture (14).

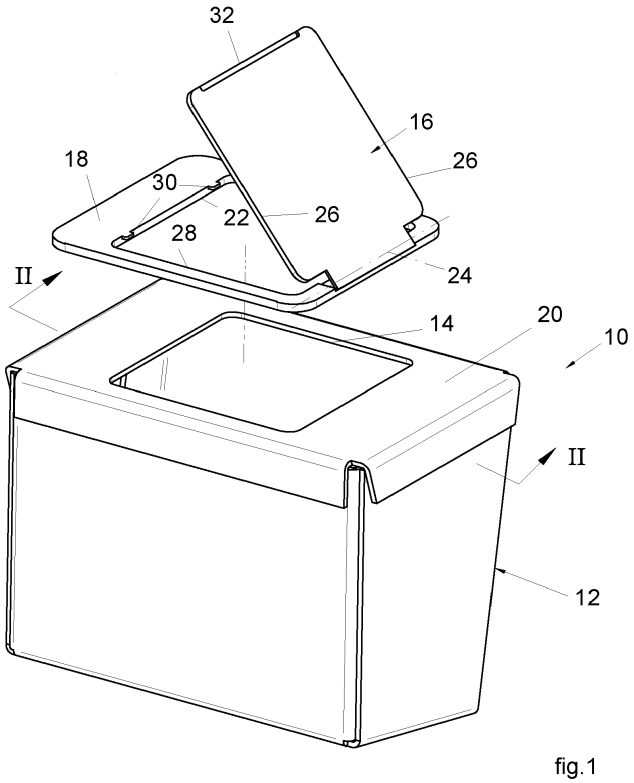

fig.1

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Description

Field of the invention

[0001] The present invention relates to containers, in particular to containers for household products.

[0002] The invention was developed in particular in view of its application to containers for laundry and dishwasher detergents, in particular detergent pods.

Prior art

[0003] Nowadays, reclosable containers for household products are almost entirely made of plastics (mono- or poly-coupled, flexible or rigid), which are produced from fossil resources and therefore have a significant energy and environmental impact both for their production and their recycling. The energy and environmental impact is not reduced even when recyclable plastics are used.

[0004] Therefore, there is a strong need of containers for household products that are recyclable in the paper chain.

[0005] However, containers made from paper materials have limitations regarding re-closable closures. In fact, paper materials, whether cellulose pulp, paper, or cardboard, do not have the same elasticity as plastics, and re-closable closures made from these materials cannot achieve the same functions as those achieved using plastic material. In particular, opening and closing operations tend to bend and wear out the closure elements, which after a short time are no longer capable to ensure an effective closure.

[0006] Additionally, if the containers are entirely made from paper materials it is difficult to ensure compliance with child-proof standards, such as UNI EN ISO 8317:2005 standard "Child-resistant packaging - Requirements and test procedures for reclosable packaging".

[0007] Eco-compatible plastic solutions are known. For instance, WO2016/207849 discloses a thermoplastic composition made of cellulose and a hydrolysable or hydrosoluble polyhydroxylated polymer which is water-soluble.

[0008] A container made of this material would be recyclable in the paper chain as it would dissolve in water and the residue after dissolution consists of cellulose.

[0009] However, water-soluble plastic materials are not suitable for producing containers for household products such as detergent pods, detergent powders, and the like. In fact, containers of household products are often stored in kitchen and bathroom compartments and are often exposed to moisture and water, which would rapidly deteriorate the containers. Also, the user may grasp such containers with wet hands, which would leave sticky residues on the hands of the user and would deteriorate the parts of the containers which have been in contact with water.

[0010] Additionally, water-soluble plastic materials have a plastic-like appearance, which may confuse the user about the correct way of conferring to the recycling waste collection. In fact, containers made of water-soluble plastic materials must not be disposed of in the plastic chain as they would pollute the plastic recycling chain, contrary to a first and immediate evaluation that could lead the user to a disposal as plastic.

[0011] Furthermore, water-soluble plastic materials are expensive and would substantially increase the packaging costs as compared to the costs of paper packaging.

Object and summary of the invention

[0012] An object of the present invention is to provide an eco-sustainable container for household products which overcomes the problems of the prior art.

[0013] More specifically, the present invention aims to provide a container that is entirely recyclable in the paper chain and has an appearance and a tactility that spontaneously induces the consumer to the correct option of conferring.

[0014] An additional object of the present invention is to provide a container which complies with the child-proof standards for reclosable containers.

[0015] In accordance with the present invention, these objects are achieved by a container according to claim 1.

[0016] Preferred features of the invention are defined in the dependent claims.

[0017] The claims form an integral part of the technical disclosure provided here in relation to the invention.

Brief description of the drawings

[0018] The present invention will now be described in detail with reference to the attached drawings, given purely by way of non-limiting example, wherein:

- Figure 1 is a partially exploded perspective view of a first embodiment of a container according to the present invention,
- Figure 2 is a cross-section taken along the line II-II of figure 1,
- Figure 3 is a partially exploded perspective view of a second embodiment of a container according to the present invention,
- Figures 4 is a cross-section taken along the line IV-IV of figure 3,
- Figure 5 is a partially exploded perspective view of a third embodiment of a container according to the present invention,
- Figure 6 is a cross-section taken along the line VI-VI of figure 5,
- Figure 7 is an enlarged detail of the part indicated by the arrow VII in figure 6,
- Figure 8 is a partially exploded perspective view of a fourth embodiment of a container according to the present invention,

- Figure 9 is a cross-section taken along the line IX-IX of figure 8,
- Figure 10 is a partially exploded perspective view of a fifth embodiment of a container according to the present invention,
- Figure 11 is a cross-section taken along the line XI-XI of figure 10,
- Figure 12 is a partially exploded perspective view of a sixth embodiment of a container according to the present invention, and
- Figure 13 is a cross-section taken along the line XIII-XIII of figure 12.

[0019] It should be appreciated that the attached drawings are schematic and various figures may not be represented in the same scale. Also, in various figures some elements may not be shown to better show other elements.

Detailed description

[0020] Figures 1-13 show six different embodiments of a reclosable container 10.

[0021] In all the different embodiments, the reclosable container 10 comprises a container body 12 made of a cellulosic material and having a container aperture 14. The reclosable container 10 comprises a movable cover 16 made of a hydrosoluble thermoplastic material applied to the container aperture 14 and movable between an open position and a closed position.

[0022] The term "cellulosic material" indicates a material primarily or completely made of cellulose, such as, paper, cardboard, cellulose pulp, and the like.

[0023] The definition "hydrosoluble thermoplastic material" indicates a material suitable to be submitted to common methods of heat forming, or thermoforming, of thermoplastic materials, and which dissolves in the presence of water. An example of a hydrosoluble thermoplastic material is disclosed in WO2016207849A1 which relates to a material formed by a combination of cellulose with a thermoplastic material comprising a hydrolysable or hydrosoluble polyhydroxylated polymer. The hydrosoluble thermoplastic material disclosed in WO2016207849A1 is marketed under the trade name "PolyPaper" by NextMaterials Srl, Milano, Italy. A remarkable feature of a hydrosoluble thermoplastic material according to WO2016207849A1 is that it is entirely recyclable in the paper chain. Therefore, a container including a container body 12 of cellulose material and a cover 16 made of a hydrosoluble thermoplastic material is recyclable in the paper chain without the need of separating the cover 16 of hydrosoluble thermoplastic material from the container body 12 of cellulose material.

[0024] In the embodiments shown in figures 1-7 the reclosable container 10 comprises a support frame 18 made of a hydrosoluble thermoplastic material. The support frame 18 is fixed to an outer surface 20 of the container body 12 and surrounds the container aperture 14. The support frame 18 may be fixed to the outer surface 20 of the container body 12 by water sealing or by glue. Water-sealing is a property of "Polypaper" which, having a PVOH matrix, partially melts in contact with water and can be bonded to cellulose-based materials.

[0025] The support frame 18 has a frame aperture 22 overlapped to the container aperture 14. The movable cover 16 is hinged to the support frame 18 along a hinge axis 24 and is pivotally movable about the hinge axis 24 between an open position and a closed position.

[0026] The movable cover 16 may be formed by a flat panel having panel edges 26 which in the closed position abut against respective aperture edges 28 of the support frame 18 to prevent the movable cover 16 from being pushed inside the container body 12.

[0027] The support frame 18 and the movable cover 16 comprise respective first and second closure elements integrally formed with the support frame 18 and with the movable cover 16 and cooperating with each other to retain the movable cover 16 in the closed position.

[0028] The first and second closure elements may comprise mutually cooperating teeth 30 and slot 32. In the embodiments of figures 1 and 3 one or more flexible teeth 30 are integrally formed on an edge of the frame aperture 22 and are configured for engaging a corresponding slot 32 set on a corresponding edge of the flat panel forming the movable cover 16. In the embodiment of figures 5-7, the flexible teeth 30 and the slots 32 are provided on respective ribs 34, 36 projecting from the flat panel forming the movable cover 16 and from the support frame 18. In the closed position, the flexible teeth 30 snap engage into the corresponding slots 32 and retain the movable cover 16 in the closed position.

[0029] In the embodiments of figures 1 and 3 the container body 12 may be formed by a cardboard box. In the embodiment of figure 5 the container body 12 may be formed by a flexible paper bag.

[0030] In the embodiments of figures 8 and 9, the movable cover 16 is substantially U-shaped and comprises a flat central wall 38 and a pair of lateral walls 40 perpendicular to the flat central wall 38. The flat central wall 38 is hinged to the container body 12 along a hinge axis 24 extending along an edge of the container aperture 14 and along an edge of the flat central wall 38.

[0031] The lateral walls 40 have respective hook formations 42 at the respective distal ends, which are configured to engage respective edges of the container aperture 14 in the open position to retain the movable cover 16 in an inclined open position.

[0032] The container body 12 may comprise a flap 44 of cellulosic material connected to a wall of the container body 12 along a folding line set on an edge of the container aperture 14. The flat central wall 38 of the movable cover 16 is overlapped and fixed to the flap 44, so that the folding line between the flap 44 and the wall of the container body 12 forms the hinge axis 24 around which the movable cover 16 is pivotally movable. The flat central

wall 38 may be fixed to the flap 44 by water sealing or by glue.

[0033] A strip 46 of hydrosoluble thermoplastic material may be fixed, e.g. by water sealing or by glue, to an outer surface of the container body 12 adjacent to an edge of the container aperture 14 opposite to the hinge axis 24. The movable cover 16 may comprise one or more teeth 30 integrally formed on an edge of the flat central wall 38, which in the closed position of the movable cover 16 engage an edge of the strip 46 to retain the movable cover 16 in the closed position.

[0034] In the embodiment of figures 10 and 11 the movable cover 16 comprises a flat panel 48 made of hydrosoluble thermoplastic material, slidable on the outer surface 20 of the container body 12 along a longitudinal direction A. The reclosable container 10 comprises a pair of straight guide sections 50 made of hydrosoluble thermoplastic material, fixed to the outer surface 20 of the container body 12, e.g. by water sealing or by glue. The straight guide sections 50 are parallel to the longitudinal direction A and extend outside of the container aperture 14. The flat panel 48 is slidably movable between the straight guide sections 50 along the direction A between an open position and a closed position. The straight guide sections 50 may be joined to each other by a transverse section 52.

[0035] The flat panel 48 comprises two flexible engagement teeth 54 integrally formed with the flat panel 48. In the closed position of the flat panel 48 the flexible engagement teeth 54 engage respective slots 56 formed in end portions of the straight guide sections 50 and retain the flat panel 48 in the closed position.

[0036] In the embodiment of figures 12 and 13 the container body 12 has a cylindrical shape and the container aperture 14 is formed at an open top end of the container body 12. The movable cover 16 is detachable from the container body 12 and comprises a cover top wall 56 and a cylindrical cover side wall 58 which engages into the container aperture 14. The cover side wall 58 comprises at least one flexible engagement tooth 60 integrally formed with the cover side wall 58. The at least one flexible engagement tooth 60 in the closed position of the movable cover 16 engages a respective through window 62 formed in the top end of the container body 12 to retain the movable cover 16 in the closed position. In the embodiment shown in figures 12 and 13 the cover side wall 58 of the movable cover 16 has two flexible engagement teeth 60 diametral opposite to each other, which engage respective through windows 62.

[0037] The container body 12 may comprise L-shaped formations 64 of hydrosoluble thermoplastic material fixed, e.g. by water sealing or by glue, on upper edges of respective through windows 62, to prevent damages to the edge of the through windows 62 during repeated opening and closing of the container.

[0038] In all the previously disclosed embodiments, the movable covers 16 of hydrosoluble thermoplastic material are only a small fraction of the total surface of the container body 12 and are therefore less prone to degradation when the container is exposed to water or moisture as compared to containers entirely made of hydrosoluble thermoplastic material. The movable covers 16 necessitate relatively small quantities of hydrosoluble thermoplastic material and therefore do not increase in a substantial way the cost of the container. Also, the movable covers 16 may ensure compliance with child-proof closure standards without compromising the recyclability of the containers in the paper chain.

[0039] Of course, without prejudice to the principle of the invention, the details of construction and the embodiments can be widely varied with respect to those described and illustrated, without thereby departing from the scope of the invention as defined by the claims that follow.

Claims

1. A reclosable container, comprising a container body (12) made of a cellulosic material and having a container aperture (14) and a movable cover (16) applied to said container aperture (14) and movable between an open position and a closed position, wherein said movable cover (16) is made of a hydrosoluble thermoplastic material.

2. The reclosable container of claim 1, comprising a support frame (18) made of a hydrosoluble thermoplastic material fixed to an outer surface (20) of said container body (12) and surrounding said container aperture (14), the support frame (18) having a frame aperture (22) overlapped to said container aperture (14), wherein the movable cover (16) is hinged to said support frame (18) along a hinge axis (24) and is pivotally movable about said hinge axis (24) between said open position and closed position.

3. The reclosable container of claim 2, wherein said support frame (18) and said movable cover (16) comprise mutually cooperating teeth (30) and slots (32) integrally formed with said support frame (18) and movable cover (16) and engageable with each other to retain the movable cover (16) in said closed position.

4. The reclosable container of claim 2 or claim 3, wherein said movable cover (16) is formed by a flat panel having panel edges (26) which in said closed position are in contact with respective aperture edges (28) of said frame aperture (22).

5. The reclosable container of claim 2, wherein said mutually cooperating teeth (30) and slots (32) are provided on respective ribs (34, 36) of said support frame (18) and said movable cover (16).

6. The reclosable container of any of claims 2-5, wherein said support frame (18) is fixed to said outer surface (20) of said container body (12) by water sealing or by glue.

7. The reclosable container of claim 1, wherein the movable cover (16) is substantially U-shaped and comprises a flat central wall (38) and a pair of lateral walls (40) perpendicular to said flat central wall (38), and wherein said flat central wall (38) is hinged to said container body (12) along a hinge axis (24) extending along an edge of said container aperture (14) and along an edge of said flat central wall (38).

8. The reclosable container of claim 7, wherein each of said lateral walls (40) has a hook formation (42) at a respective distal end, wherein in said open position said hook formations (42) engage respective edges of the container aperture (14).

9. The reclosable container of claim 7 or 8, comprising a strip (46) of hydrosoluble thermoplastic material, fixed to the container body (12) adjacent to an edge of said container aperture (14), and wherein said movable cover (16) comprises at least one flexible tooth (30) formed integrally on an edge of said flat central wall (38), and wherein in the closed position of the movable cover (16) said at least one flexible tooth (30) snap engages an edge of said strip (46) and retains the movable cover (16) in the closed position.

10. The reclosable container of any of claims 7-9, wherein the container body (12) comprises a flap (44) of cellulosic material connected to said container body (12) along a bending line forming said hinge axis (24), wherein said flat central wall (38) of said movable cover (16) is overlapped and fixed to said flap (44).

11. The reclosable container of claim 10, wherein said flat central wall (38) of said movable cover (16) is fixed to said flap (44) by water sealing or by glue.

12. The reclosable container of claim 1, wherein the movable cover (16) comprises a flat panel (48) of hydrosoluble thermoplastic material, slidable on an outer surface (20) of said container body (12) along a longitudinal direction (A), wherein the reclosable container (10) comprises a pair of straight guide sections (50) made of hydrosoluble thermoplastic material fixed to said outer surface (20) parallel to said longitudinal direction (A) and extending outside of said container aperture (14), wherein said flat panel (48) is slidably movable along said longitudinal direction (A) between said straight guide sections (50) between an open position and a closed position, wherein said flat panel (48) comprises two flexible engagement teeth (54) integrally formed with said flat panel (48) which in the closed position of the flat panel (48) engage respective slots (56) formed in end portions of said straight guide sections (50).

13. The reclosable container of claim 12, wherein said straight guide sections (50) are fixed to said outer surface (20) of the container body (12) by water sealing or by glue.

14. The reclosable container of claim 1, wherein the movable cover (16) is detachable from said container body (12)and comprises a cover top wall (56) and a cover side wall (58), wherein the cover side wall (58) engages into said container aperture (14), and wherein the cover side wall (58) comprises at least one flexible engagement tooth (60) integrally formed with said cover side wall (58), which engages at least one through window (62) formed in an edge portion of the container body (12) in the closed position of said movable cover (16).

15. The reclosable container of claim 14, wherein an L-shaped formation (64) of hydrosoluble thermoplastic material is fixed on an upper edge of said at least one through window (62).

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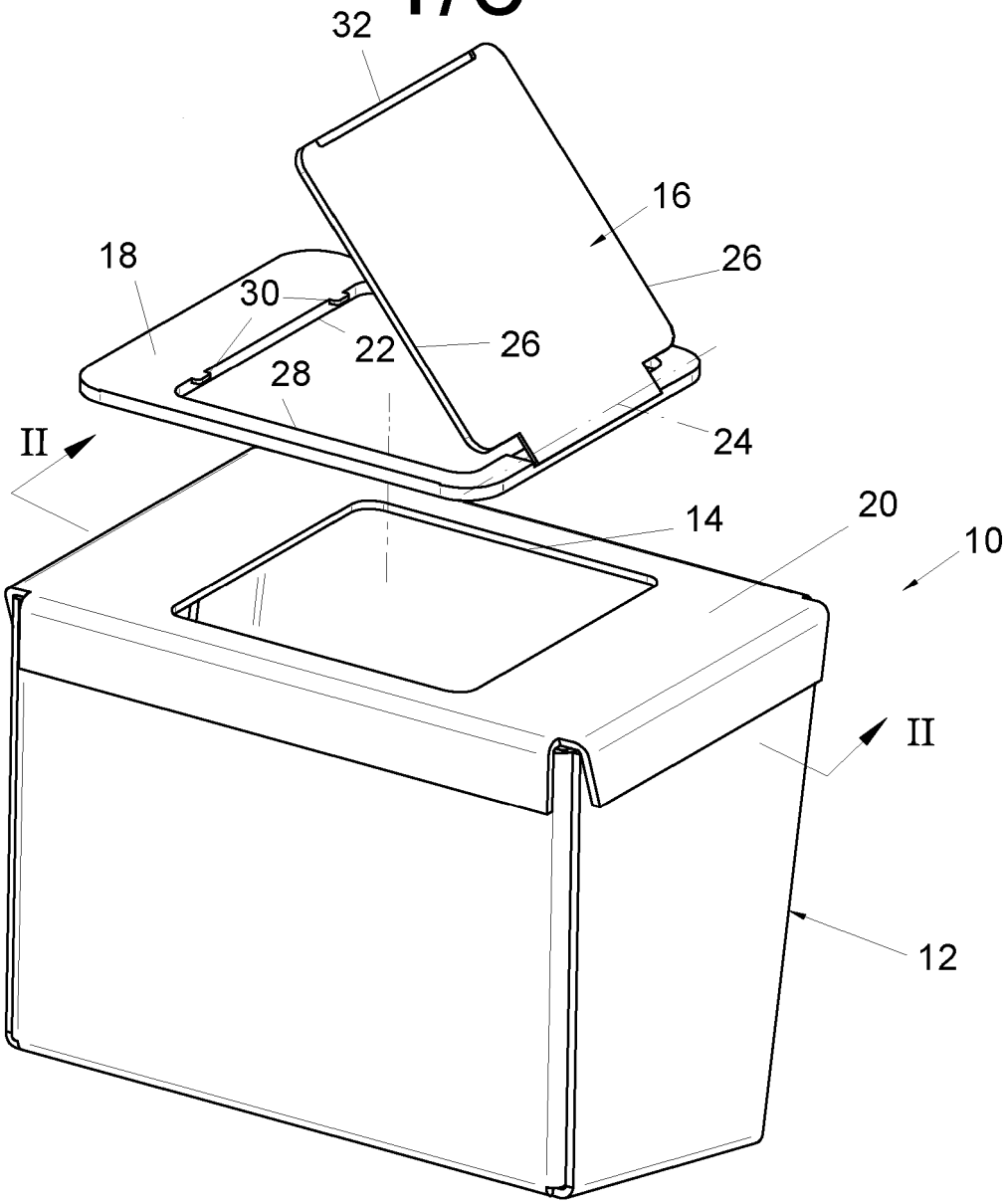

fig.1

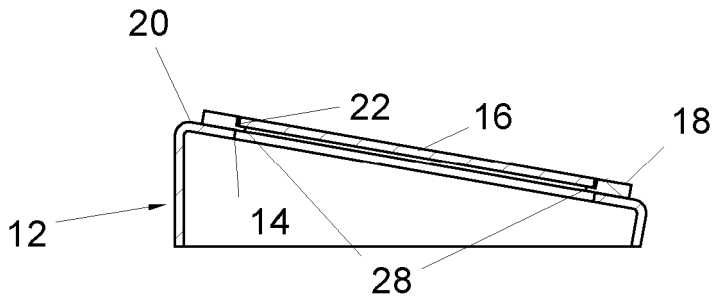

fig.2

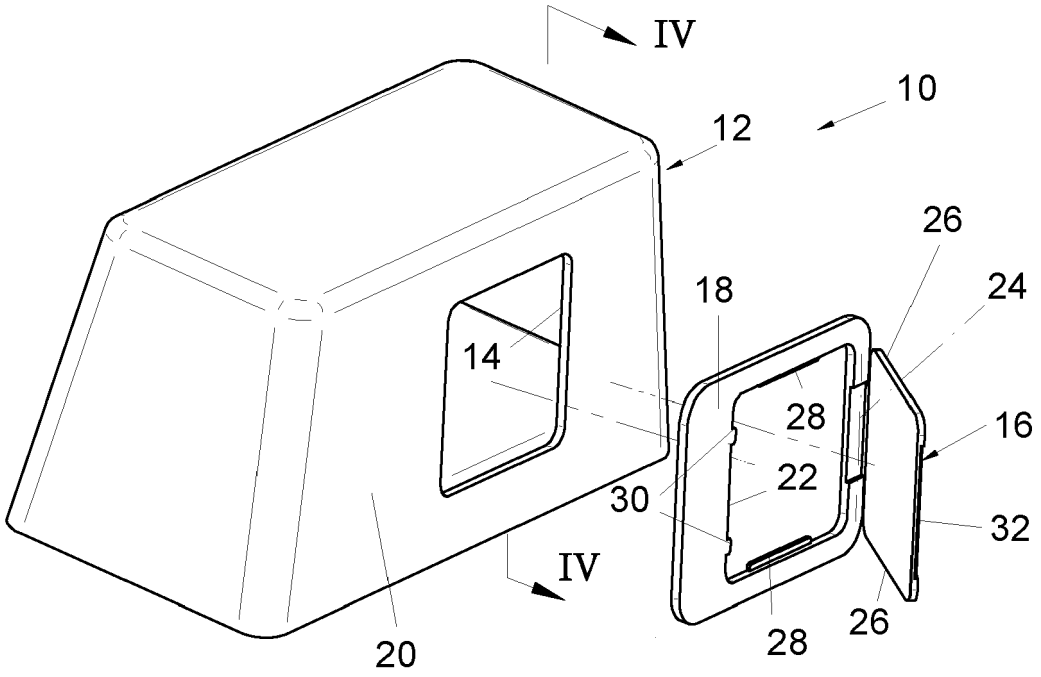

fig.3

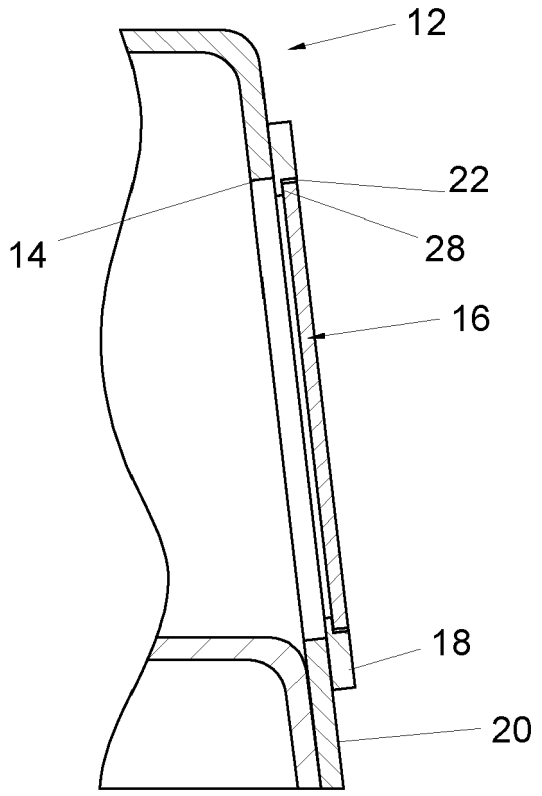

fig.4

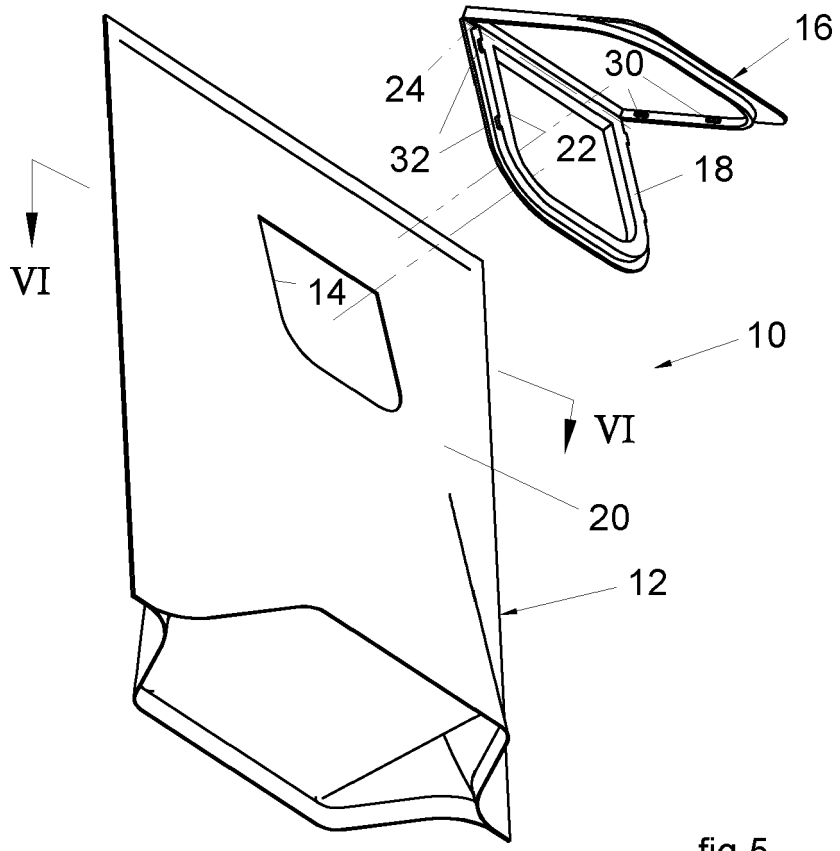

fig.5

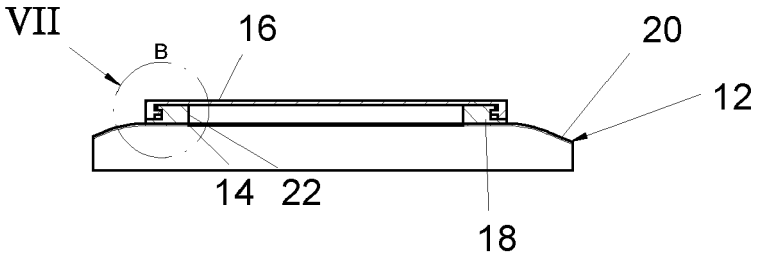

fig.6

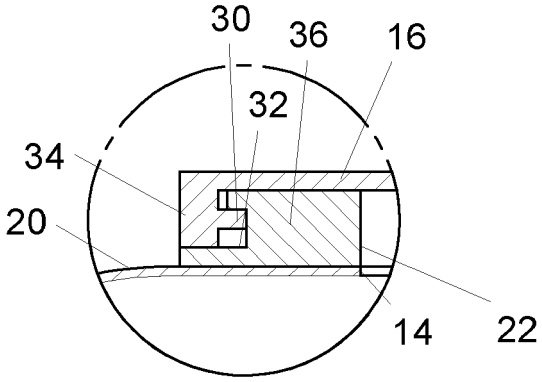

fig.7

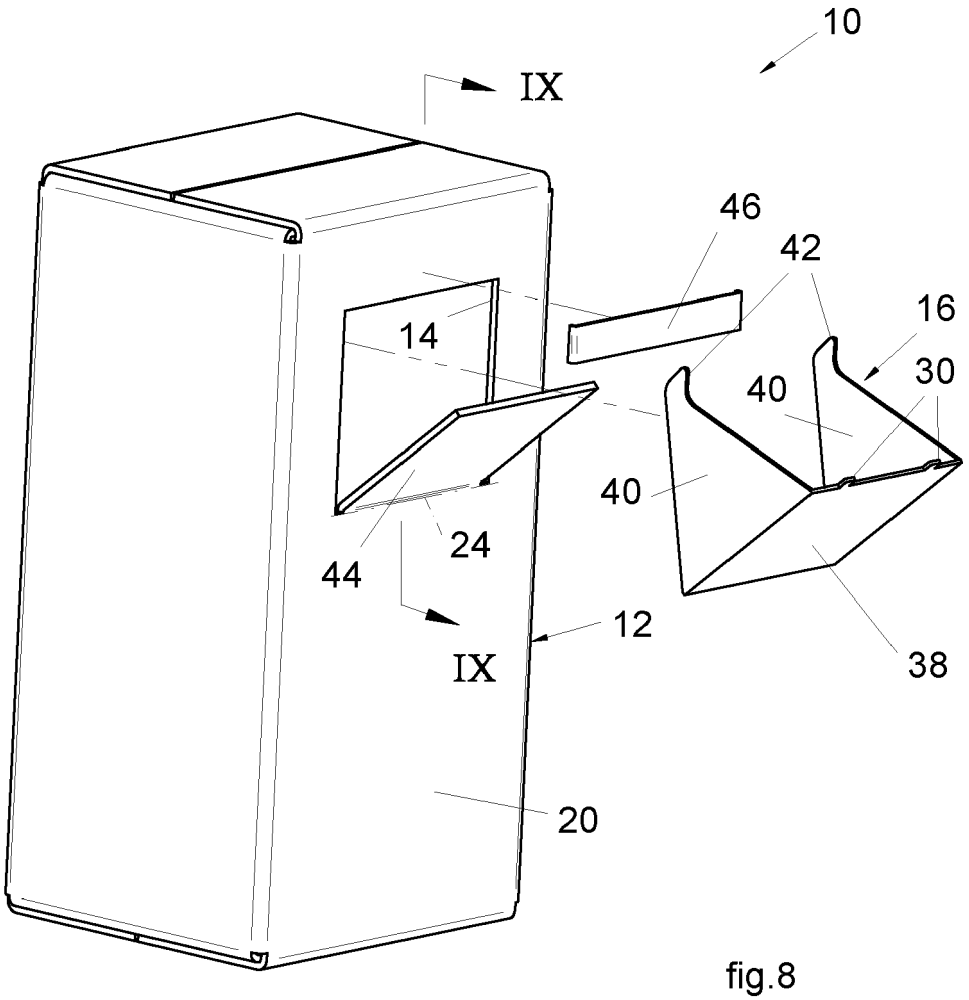
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fig.8

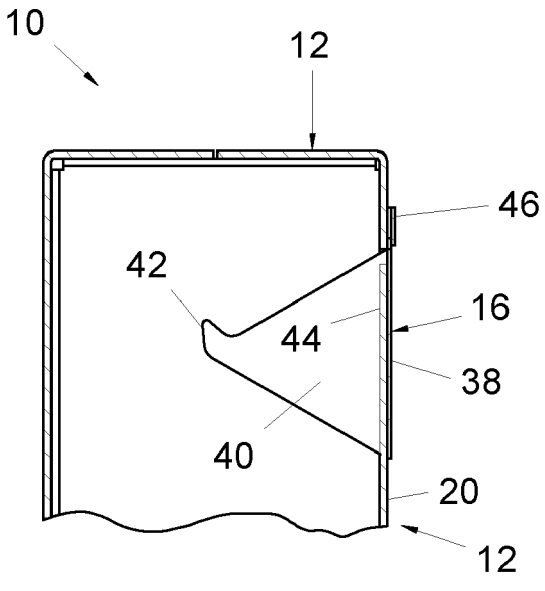
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fig.9

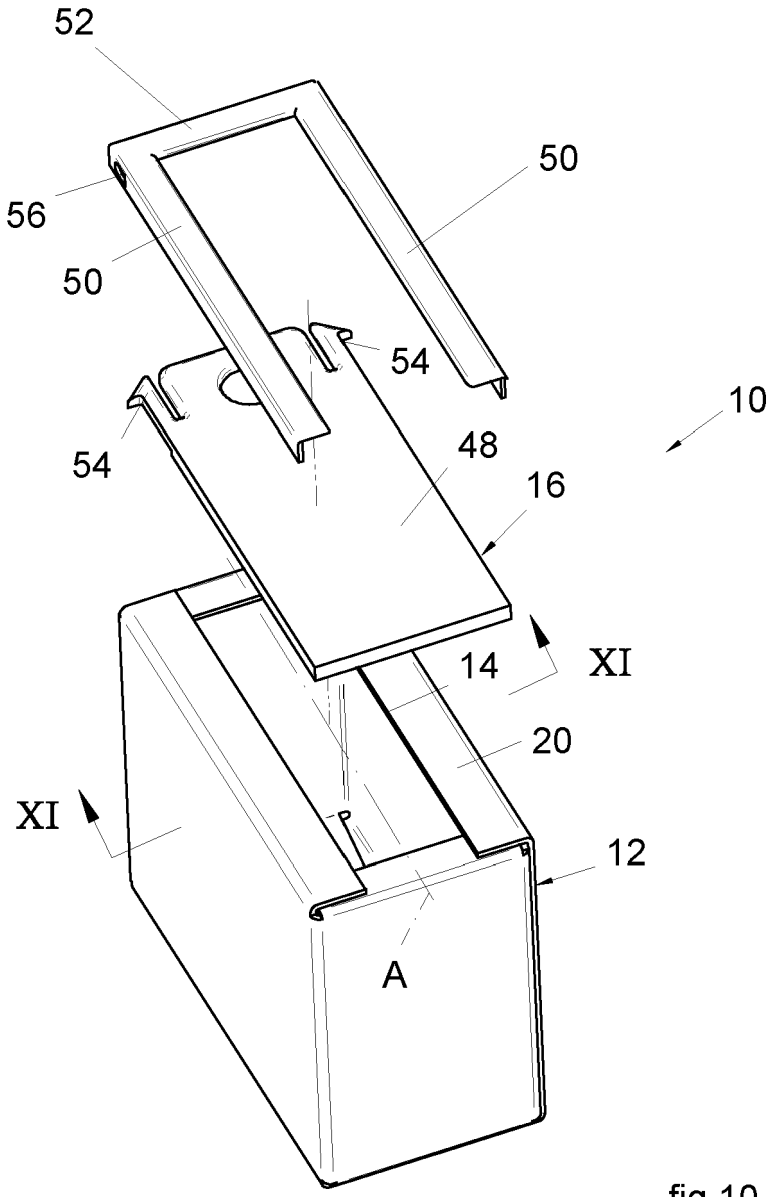

fig.10

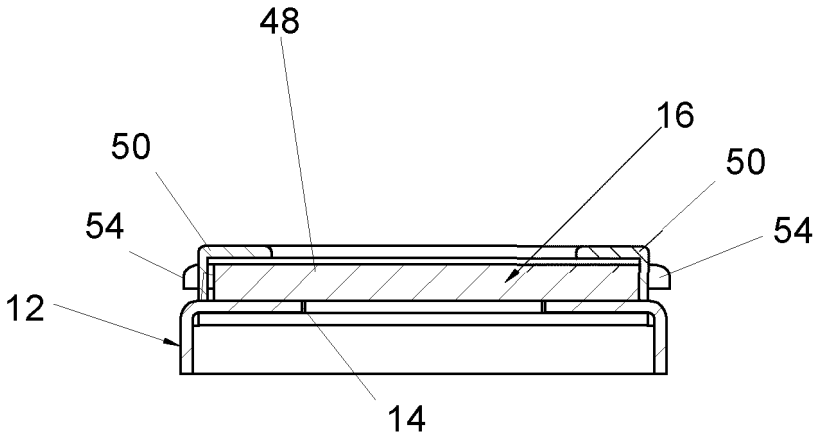

fig.11

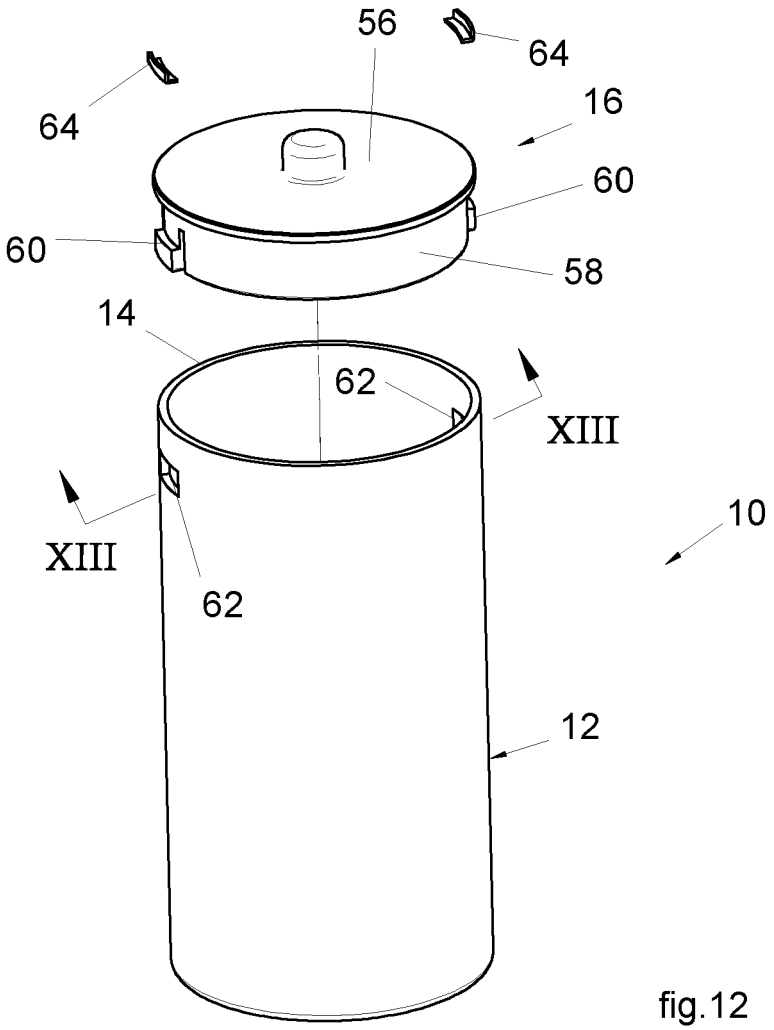
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fig.12

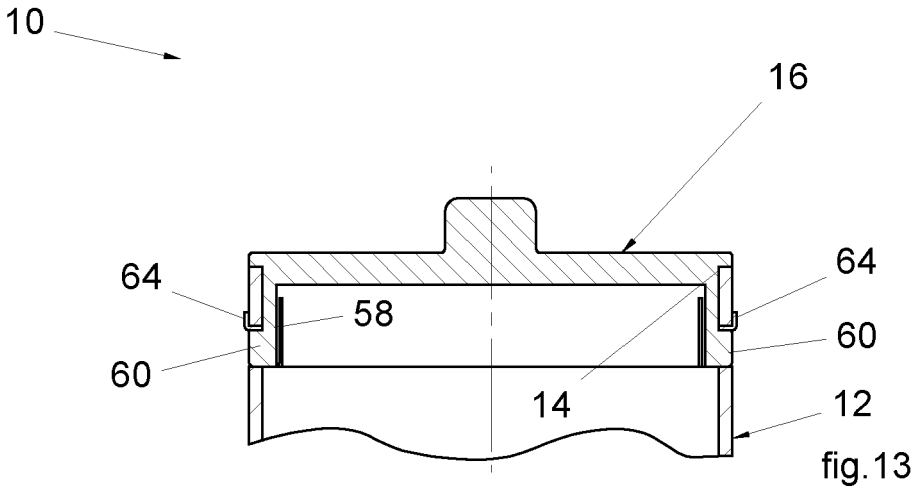
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fig.13

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EUROPEAN SEARCH REPORT

Application Number
EP 21 17 4117

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	WO 98/43877 A1 (SUNDS DEFIBRATOR IND AB [SE]; LUNDBERG T JOERGEN [SE]) 8 October 1998 (1998-10-08) * claim 1 * -----	1	

TECHNICAL FIELDS SEARCHED (IPC)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	21 October 2021	Bridault, Alain

CATEGORY OF CITED DOCUMENTS

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

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