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(54) **FIRE RETARDANT CONTAINER FOR INSULATION USE**

(57) A container for waste materials for use in the insulation of buildings, comprises a base, at least one side wall extending upwardly from the base, a top wall, an opening formed in at least one of the walls of the container, and a flap configured to form a closure over the opening, the flap having attachment means for securing the flap to form the closure, wherein the container is formed from a fire retardant material, and the base of the container is either coated or formed from a heat-reflecting material. The container is filled with one or more waste materials and used for insulation of a building.

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Description

[0001] The present invention relates to an improved product for insulation of buildings, the product comprising a fire retardant container that utilises domestic and/or commercial waste products to provide insulation for a range of buildings, such as residential or light commercial properties.

[0002] It is well known that effective thermal insulation in buildings contributes significantly to the thermal comfort of the building's occupants. Effective thermal insulation also contributes to reducing heat loss, thus leading to a reduction in energy demand on the building's heating system and an associated lowering of energy needs and costs. This is increasingly important in today's society, in which particular value is placed on reducing energy usage due to the carbon dioxide and other greenhouse gas emissions caused by energy production.

[0003] In many buildings, thermal insulation is provided within the loft space as an effective method of insulating the building and preventing heat loss through the roof. Typical types of loft insulation include foil-backed felt, rock fibre, glass fibre or mineral fibre, or sheep's wool blanket insulation, loose-fill loft insulation made from a variety of granular or lightweight materials such as cork granules, mineral wool or cellulose fibre, sheet or board insulation including cork, straw, or wood board, and blown-fibre insulation. Thermal insulation may also be provided by means of cavity wall insulation and/or through the use of draught excluders at doors or windows.

[0004] Another problem that the present invention seeks to address is the amount of domestic and/or commercial waste produced by the occupants of a building. The environmental and monetary costs of disposing of waste products are significant. An ever-increasing amount of waste products are collected and transported for recycling. However, the transport, storage, and processing of recyclable materials all require additional energy, with its associated costs and environmental impact.

[0005] Accordingly, it would be beneficial if there was a convenient use for such waste products within the building in which the waste materials had been produced.

[0006] Thus, the present invention seeks to provide the domestic consumer with a product which enables them to dispose of everyday waste packaging, fabrics, non-fibrous materials etc, in such a way as to reduce their energy consumption through the reduction of heat loss in their home whilst having the added benefit to the environment by utilising waste materials produced in the home thus reducing the associated ecological costs of transporting and re-cycling waste materials.

[0007] In accordance with the present invention, there is provided a container for waste materials for use in the insulation of buildings, the container comprising a base, at least one side wall extending upwardly from the base, a top wall, an opening formed in at least one of the walls of the container, and a flap configured to form a closure over the opening, the flap having attachment means for securing the flap to form the closure, wherein the container is formed from a fire retardant material, and the base of the container is either coated or formed from a heat-reflecting material.

[0008] The following definitions shall apply throughout the specification and the appended claims.

[0009] Within the context of the present specification, the term "comprises" is taken to mean "includes" or "contains", i.e. other integers or features may be present, whereas the term "consists of" is taken to mean "consists exclusively of".

[0010] Within the present specification, the term "about" means plus or minus 20%; more preferably plus or minus 10%; even more preferably plus or minus 5%; most preferably plus or minus 2%.

[0011] Preferably, the container according to the invention is generally box-shaped and the base of the container is square or rectangular. More preferably, the base of the container is generally rectangular.

[0012] One or more side walls extend upwardly from the base of the container. For example, there may be one, two, three, or four side walls. In one preferred embodiment, the container has three or four side walls. In one embodiment, the container has a square or rectangular base and the side walls extend upwardly from three edges of the square or rectangular base.

[0013] The container has an opening formed in at least one of the walls of the container which allows the user to fill the container with waste material. The opening may be of any desired shape, provided the dimensions are sufficient to allow the user to conveniently place waste materials within the container. For example, the opening may be circular, square, or rectangular. In one embodiment, the opening forms one entire wall of the container. For example, in one embodiment, the opening forms an entire side wall of the container. In another embodiment, the opening forms the entire top wall of the container.

[0014] The container conveniently has a flap configured to form a closure over the opening. Generally, a first end portion of the flap is attached to the base, a side wall, or the top wall of the container. A second end portion of the flap is conveniently provided with attachment means for securing the second end portion of the flap to the container, thus positioning and securing the flap in place over the opening.

[0015] In one preferred embodiment, the container has an opening formed in a side wall. In this embodiment, a first end of the flap may be attached to the base, and a second end of the flap has attachment means for securing the second end of the flap to the top wall of the container. Alternatively, a first end of the flap may be attached to the top wall, and a second end of the flap has attachment means for securing the second end of the flap to the base of the container. In a further alternative, a first end of the flap may be attached to a side wall, and a second end of the flap has attachment means for secur-

ing the second end of the flap to an opposing side wall of the container.

[0016] In another embodiment, the container has an opening formed in the top wall. In this embodiment, a first end of the flap may be attached to the top wall or a side wall, and a second end of the flap has attachment means for securing the second end of the flap to an opposing side wall of the container.

[0017] In one embodiment, the container may further comprise one, two or three additional flaps. Preferably, the container comprises two or three additional flaps. In one preferred embodiment, the container comprises two additional flaps. In another preferred embodiment, the container comprises three additional flaps. The additional flaps are conveniently configured to partially or fully cover the opening. The purpose of the additional flaps is to prevent the contents of the container from spilling out through any gap between the main flap forming the closure and the walls of the container. In one preferred embodiment, the additional flaps are attached to one of more of the base, the side walls, and the top wall of the container. In another preferred embodiment, the additional flaps are attached to the main flap configured to form a closure over the opening. In this embodiment, the additional flaps essentially form an integral part with the flap configured to form a closure over the opening.

[0018] In one preferred embodiment, the container has an opening formed in a side wall, a flap having a first end attached to the base of the container, the flap configured to form a closure over the opening, and two additional flaps, the additional flaps being attached to opposing side walls of the container. In an alternative embodiment, the container has an opening formed in a side wall, a flap having a first end attached to the top wall of the container, the flap configured to form a closure over the opening, and two additional flaps, the additional flaps being attached to opposing side walls of the container. In a further alternative embodiment, the container has an opening formed in a side wall, a flap having a first end attached to a side wall of the container, the flap configured to form a closure over the opening, and two additional flaps, the first additional flap being attached to the top wall of the container, and the second additional flap being attached to the base of the container. In another preferred embodiment, the container has an opening formed in a side wall, a flap having a first end attached to the base of the container, the flap configured to form a closure over the opening, and two additional flaps, the additional flaps being attached to opposing sides of the main flap configured to form a closure over the opening.

[0019] In a further embodiment, the additional flaps may form an integral part with the flap configured to form a closure over the opening. This arrangement is particularly preferred since it minimises spillage of any contents from the container.

[0020] The flap of the container is conveniently provided with attachment means for securing the flap to form a closure over the opening in the container. Preferably, the attachment means secures the free edges of the flap in place to form the closure, which may be an air-tight closure.

[0021] The attachment means may be of any suitable type which can be conveniently used to secure the flap in place over the opening. The attachment means should be sufficient to securely close the container so as to maintain its fire retardant qualities. For example, the attachment means may comprise one or more of the following: a button and button-hole, a button and loop, a zip, a Velcro fastening, a fastening snap, a magnetic snap, a toggle, a fabric cord and loop, a sham tie closure, a buckle, a prym fastening, a clasp, a press stud, self adhesive tape, or any combination thereof.

[0022] Preferably, the attachment means comprises a loop which will fasten over a button. In a preferred embodiment, the loop is provided on the second end of the flap, and the button is provided on the base, a side wall, or the top wall of the container. This arrangement is particularly preferred in that the loop can serve a dual purpose by allowing the container to be hung up in a convenient manner while it is open and being filled by the user. In an alternative preferred embodiment, the attachment means comprises a Velcro fastening. In this embodiment, one or more strips of Velcro are conveniently provided on one or more of the base, the side walls, and the top wall of the container, and a corresponding strip or strips of Velcro are provided on the flap configured to form a closure over the opening, and optionally on the additional flap or flaps.

[0023] Any suitable material may be used to manufacture the container provided that the resultant container is fire retardant. For example, the container may be made from a fire retardant hessian fabric. Alternatively, the container may be made from a hessian fabric which has been treated with a fire retardant coating. Suitable fire retardant coatings include 'Envirograf 321 Fire Retardant spray' amongst others. Other fire retardant fabrics or fabrics treated to have fire retardant qualities may alternatively be used. The material should be of sufficient thickness to ensure that it is durable and is not easily damaged. For example, where the container is made from a hessian fabric, preferably the thickness of the fabric is from about 1.5 mm to about 2 mm. The materials used to produce the container should be chosen to ensure that the container complies with the relevant fire and safety regulatory requirements for insulated materials as set out in EN13501-1.

[0024] The base of the container is either coated or formed from a heat-reflecting material. Preferably, the material is a silver heat-reflecting fabric or material. Such a heat-reflecting layer acts to increase the product's insulating properties.

[0025] The container may have any suitable dimensions that allow the product to be used in the desired type of thermal insulation.

[0026] In one preferred embodiment, the container has suitable dimensions to allow the product to be used in

loft insulation and to ensure that the product complies with current building regulations. In particular, the height of the container is preferably at least about 270 mm. For example, the height of the container may be from about 270 mm to about 500 mm, more preferably from about 270 mm to about 300 mm. Such a height ensures that when a number of containers are used as insulation, e.g. in the loft of a building, the height of the insulation layer is at least about 270 mm, in accordance with current standards. The depth and width of the container may be of any suitable dimensions such that the container is easy to store and manoeuvre into position for the average user. For example, the container may have a depth of from about 200 mm to about 1000 mm, and a width of from about 200 mm to about 1000 mm. Preferably, the container has a depth of from about 250 mm to about 300 mm, and a width of from about 400 mm to about 500 mm. In one particular embodiment, the container has a depth of about 276 mm, a width of about 450 mm, and a height of about 270 mm.

[0027] In another preferred embodiment, the container has suitable dimensions to allow the product to be used in cavity wall insulation and to ensure that the product complies with current building regulations.

[0028] In a further preferred embodiment, the container has suitable dimensions to allow the product to be used as a draft excluder, for example, a draft excluder for placement at the base of a typical door. In particular, the width of the container should be sufficient to extend across the majority of the base of a door with which it is designed to be used. Typical standard sized external doors fitted to modern houses in the UK have a width of about 780 mm, whilst narrower doors may be present in older housing stock, and wider external doors may also be used to facilitate access. Accordingly, the width of the container is preferably at least about 600 mm. For example, the width of the container may be from about 600 mm to about 1000 mm, more preferably from about 700 mm to about 850 mm, most preferably from about 750 mm to about 800 mm. The depth and height of the container may be of any suitable dimensions such that the container is easy to store and manoeuvre into position for the average user. For example, the container may have a depth of from about 80 mm to about 120 mm, and a height of from about 80 mm to about 120 mm. Preferably, the container has a depth of about 100 mm, and a height of about 100 mm. In one particular embodiment, the container has a width of about 780 mm, a depth of about 100 mm, and a height of about 100 mm.

[0029] A number of different dimensions of container may be produced to suit the needs of different individual users and/or for use in different types of thermal insulation.

[0030] In one embodiment, the container further comprises an air tight polythene bag situated within the container. Such an arrangement enables the user to place dry garden waste materials, such as dry grass clippings, in the container, in order to provide suitable insulation. A particular advantage of such a container that can accommodate garden waste materials is that the user is able to access larger quantities of insulating materials at certain times, for example, following mowing a lawn, clipping a hedge etc.

[0031] In this embodiment, the air tight polythene bag may be completely separate from the container but located within it. Alternatively, the air tight polythene bag may be fixedly attached to the container. For example, the external surface of the air tight polythene bag may be secured to the internal surface of the container.

[0032] The polythene bag preferably has a separate closure mechanism to that of the container. The separate closure mechanism ensures that the filling materials do not become damp thus losing their heat insulating properties while in use. The closure mechanism may be of any suitable type that will ensure that the bag is air tight, thus preventing ingress of moisture. For example, suitable closure mechanisms may include string, a wire, e.g. a metal wire or plastic-coated metal wire, a twist tie, a rubber band, a cable tie, zip tie, or tie-wrap, a self-adhesive flap or edge of the polythene bag, or a zip fastener, e.g. a plastic zip fastener.

[0033] The container is designed so that it may be filled with any suitable waste material with heat insulating properties. The waste material is preferably shredded prior to filling the container. For example, the container may be filled with one or more of the following materials:

- paper (shredded and/or non-shredded/folded)
- dried grass clippings (secured in waterproof plastic container)
- cardboard (shredded and non-shredded/folded)
- fabrics and textiles e.g. wool, cotton fabrics
- saw dust
- cards
- inorganic fibres
- wood pulp
- straw
- glass fibres
- other materials with heat insulating properties

[0034] Once filled, the container can be securely fastened and the filled container is then suitable for use as insulation. Accordingly, the present invention also provides a container as described herein filled with one or more waste materials. A number of such filled containers may be placed within a roof space of a building in order to form an insulating layer. Alternatively, a single filled container may be used as a draft excluder. Accordingly, the present invention also provides for the use of one or more filled containers as described above for insulation of a building.

[0035] The container of the present invention may advantageously be designed and/or marketed as a dual-purpose product or a multi-purpose product. For example, the container may be utilised as a shopping bag prior to its being filled with waste materials and used in the

insulation of buildings. The container may be used as a shopping bag on a single occasion, or it may be utilised as a shopping bag on multiple occasions, prior to its being filled with waste materials and used in the insulation of buildings. Accordingly, in one embodiment of the invention, the container has a secondary purpose as a shopping bag. The present invention also provides for the use of the container according to the invention as a shopping bag.

[0036] An embodiment of the invention will now be described by way of an example, with reference to the following figures in which:

Figure 1 shows a perspective view of one embodiment of the container of the invention.

Figure 2 shows a perspective view of a second embodiment of the container of the invention.

Figure 3 shows a perspective view of a third embodiment of the container of the invention.

Figure 4 shows a perspective view of a fourth embodiment of the container of the invention.

Figure 5 shows a perspective view of a fifth embodiment of the container of the invention.

Figure 6 shows a perspective view of a sixth embodiment of the container of the invention.

[0037] Figure 1 shows a container 101 comprising a base 102, side walls 103 extending upwardly from the base, a top wall 104, and an opening 105 formed in a side wall of the container. A flap 106 is configured to form a closure over the opening and has a loop 107. A button 108 is provided on the top wall of the container. The container is formed from a fire retardant material, and the base of the container is either coated or formed from a heat-reflecting material.

[0038] The container 101 may conveniently be hung up using loop 107 while it is being filled up with suitable waste materials. Once full, the user simply fastens the loop 107 over button 108 to secure the flap over the opening 105 thus forming a closure. The filled container may then be used as insulation for a building by placing it within the roof space of a building.

[0039] Figure 2 shows an alternative container 201 comprising a base 202, side walls 203 extending upwardly from the base, a top wall 204, and an opening 205 formed in a side wall of the container. The container also comprises a flap 206 configured to form a closure over the opening, two additional flaps 209a and 209b, and a loop 207. A button 208 is provided on the top wall of the container. The container is formed from a fire retardant material, and the base of the container is either coated or formed from a heat-reflecting material.

[0040] The container 201 may conveniently be hung up using loop 207 while it is being filled up with suitable waste materials. Once full, the user simply folds the additional flaps 209a and 209b over the opening, then folds flap 206 over the opening and fastens loop 207 over button 208 to secure the flap 206 and additional flaps 209a and 209b in place, thus forming a closure. The filled container may then be used as insulation for a building by placing it within the roof space of a building.

[0041] Figure 3 shows another alternative container 301 comprising a base 302, side walls 303 extending upwardly from the base, a top wall 304, and an opening 305 formed in a side wall of the container. The container also comprises a flap 306 configured to form a closure over the opening, two additional flaps 309a and 309b which are formed integrally with flap 306, and a loop 307. A button 308 is provided on the top wall of the container. The container is formed from a fire retardant material, and the base of the container is either coated or formed from a heat-reflecting material.

[0042] The container 301 may conveniently be hung up using loop 307 while it is being filled up with suitable waste materials. Once full, the user simply folds the additional flaps 309a and 309b over the opening, then folds flap 306 over the opening and fastens loop 307 over button 308 to secure the flap 306 and additional flaps 309a and 309b in place, thus forming a closure. The filled container may then be used as insulation for a building by placing it within the roof space of a building.

[0043] Figure 4 shows yet another alternative container 401 comprising a base 402, side walls 403 extending upwardly from the base, a top wall 404, and an opening 405 formed in the top wall of the container. A flap 406 provided in the top wall 404 is configured to form a closure over the opening.

[0044] The toothed strip 412A of a zip fastener 412 is attached to the flap 406 along its free edges 409, 410 and 411. The other toothed strip 412B of the zip fastener 412 is attached to the upper edges of the three side walls of the container that are adjacent to the free edges of the flap when the flap is closed. The container is formed from a fire retardant material, and the base of the container is either coated or formed from a heat-reflecting material.

[0045] When the zip fastener 412 is open, as is shown in Figure 4, the flap 406 may be folded open to allow the container to be filled up with suitable waste materials. Once full, the user simply folds the flap 406 over the opening 405 and secures the flap 406 in place by securing adjacent edges of the flap and the container with the zip fastener 412, thus forming a closure. The filled container may then be used as insulation for a building by placing it within the roof space of a building.

[0046] Figure 5 shows yet another alternative container 501 comprising a base 502, side walls 503 extending upwardly from the base, and a top wall 504. The container also comprises a flap 506, which is shown in a closed position such that it forms a further side wall of the container. The attachment means by which the flap 506 is secured in place is not shown, but may comprise any

suitable fasterner, such as a zip fastener, a button and loop arrangement, or other suitable means as described above. The container is formed from a fire retardant material.

[0047] The container 501 is filled up with suitable waste materials, then the flap 506 is secured in place to form a closure. The filled container may then be used as a draught excluder for insulating a building.

[0048] Figure 6 shows yet another alternative container 601 which has been placed in an upright position for filling the container. When subsequently used for insulation purposes, the container is securely closed and then rotated such that it rests on its base 602. The container 601 comprises a base 602, side walls 603 extending upwardly from the base when in use for insulation purposes, a top wall 604, and an opening 605 formed in a side wall of the container. The container also comprises a flap 606 configured to form a closure over the opening, two additional flaps 609a and 609b which are formed integrally with and extend from the sides of flap 606. Strips of Velcro 613A are provided on two side walls and the top wall of the container, and corresponding strips of Velcro 613B are provided on the flap 606 and additional flaps 609a and 609b. The container is formed from a fire retardant material, and the base of the container is either coated or formed from a heat-reflecting material.

[0049] The container 601 may conveniently be hung up using handle 314 while it is being filled up with suitable waste materials. Once full, the user simply folds flap 606 and additional flaps 609a and 609b over the opening, then fastens the Velcro strips 613A to the Velcro strips 613B to secure the flap 606 and additional flaps 609a and 609b in place, thus forming a closure. The filled container may then be used as insulation for a building by placing it within the roof space of a building.

[0050] For the purposes of clarity and a concise description, features of the invention are described herein as part of the same or separate embodiments. However it will be appreciated that the scope of the invention may include embodiments having combinations of all or some of the features described.

Claims

1. A container for waste materials for use in the insulation of buildings, the container comprising a base, at least one side wall extending upwardly from the base, a top wall, an opening formed in at least one of the walls of the container, and a flap configured to form a closure over the opening, the flap having attachment means for securing the flap to form the closure, wherein the container is formed from a fire retardant material, and the base of the container is either coated or formed from a heat-reflecting material.

2. A container according to claim 1, wherein the base of the container is generally rectangular.

3. A container according to claim 1 or claim 2, wherein the container has three or four side walls.

4. A container according to any of claims 1 to 3, wherein the opening is provided in a side wall of the container, and optionally forms an entire side wall of the container, optionally wherein a first end of the flap is attached to the base, and a second end of the flap has attachment means for securing the second end of the flap to the container.

5. A container according to any of claims 1 to 4, further comprising one, two or three additional flaps.

6. A container according to any of claims 1 to 4, further comprising two additional flaps, optionally wherein the opening is provided in a side wall of the container, the flap has a first end attached to the base of the container, and the two additional flaps are attached to opposing side walls of the container.

7. A container according to claim 5 or claim 6, wherein the additional flaps form an integral part with the flap configured to form a closure over the opening.

8. A container according to any of claims 1 to 7, wherein the attachment means comprises one or more of the following: a button and button-hole, a loop and a button, a zip, a Velcro fastening, a fastening snap, a magnetic snap, a toggle, a fabric cord and loop, a sham tie closure, a buckle, a prym fastening, a clasp, a press stud, self adhesive tape, or any combination thereof.

9. A container according to claim 8, wherein the attachment means comprises a loop and a button, optionally wherein the loop is provided on the second end of the flap, and the button is provided on the container, optionally wherein the button is provided on the base of the container.

10. A container according to any of claims 1 to 9, wherein the container is made from a fire retardant hessian fabric or a hessian fabric treated with a fire retardant coating.

11. A container according to any of claims 1 to 10, wherein the container has a height of from about 270 mm to about 500 mm, a depth of from about 200 mm to about 1000 mm, and a width of from about 200 mm to about 1000 mm.

12. A container according to any of claims 1 to 11, further comprising an air tight polythene bag, optionally wherein the polythene bag has a closure mechanism.

13. A filled container comprising a container according to any of claims 1 to 15, and one or more waste materials, optionally wherein the waste materials are selected from the group consisting of paper, dried grass clippings, cardboard, fabric, textiles, saw dust, cards, inorganic fibres, wood pulp, straw, glass fibres, and any combinations thereof.

14. A filled container according to claim 13, wherein the waste material is shredded.

15. Use of one or more filled containers according to claim 13 or claim 14 for insulation of a building.

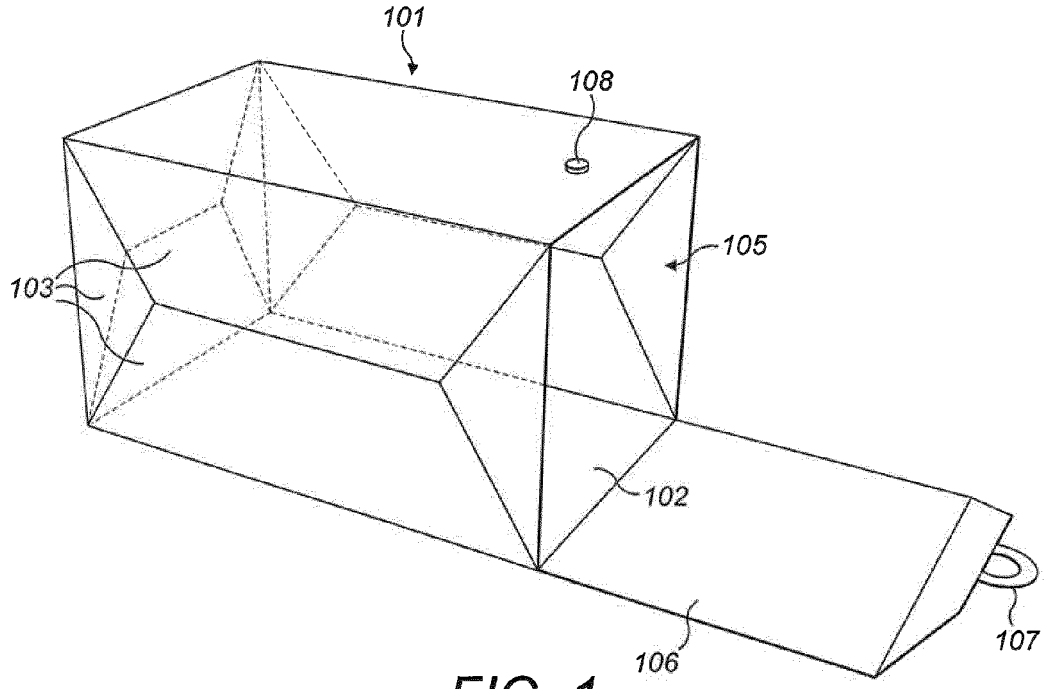

FIG. 1

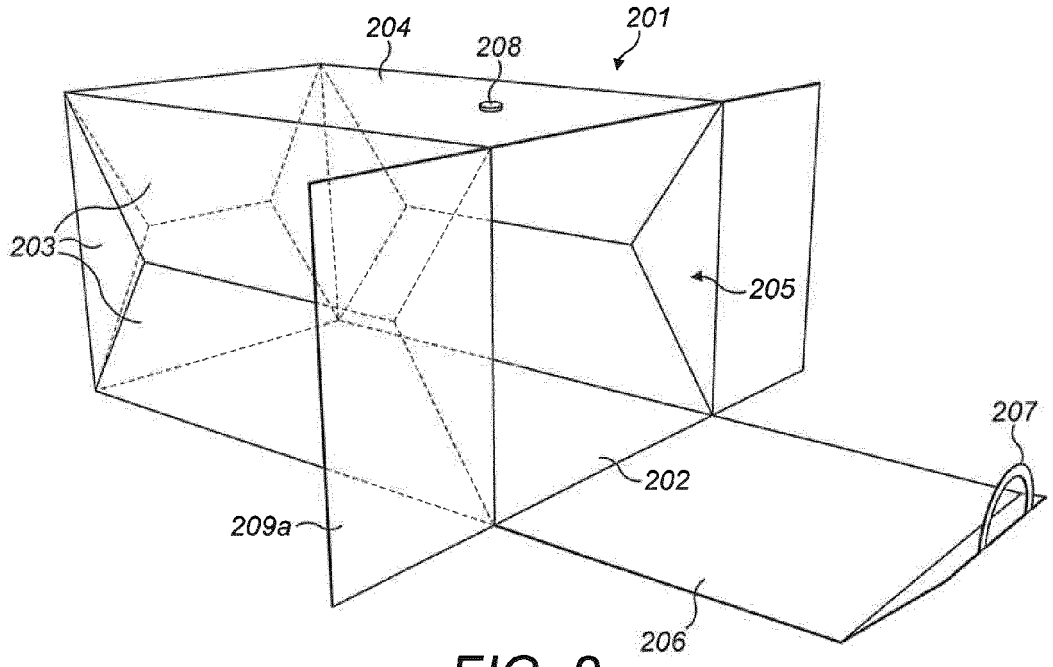

FIG. 2

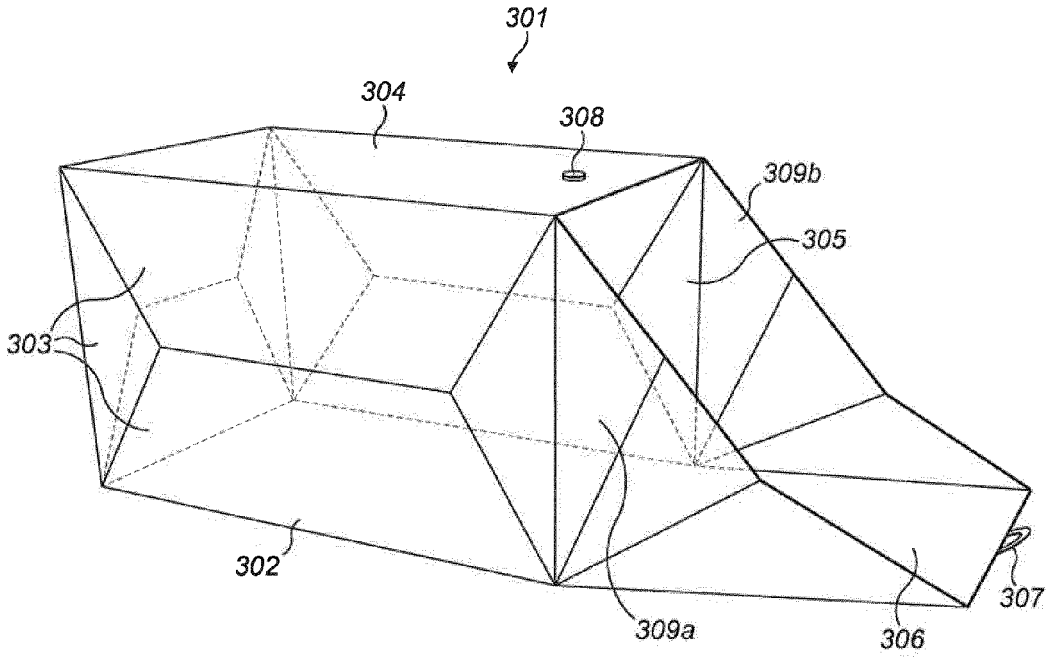

FIG. 3

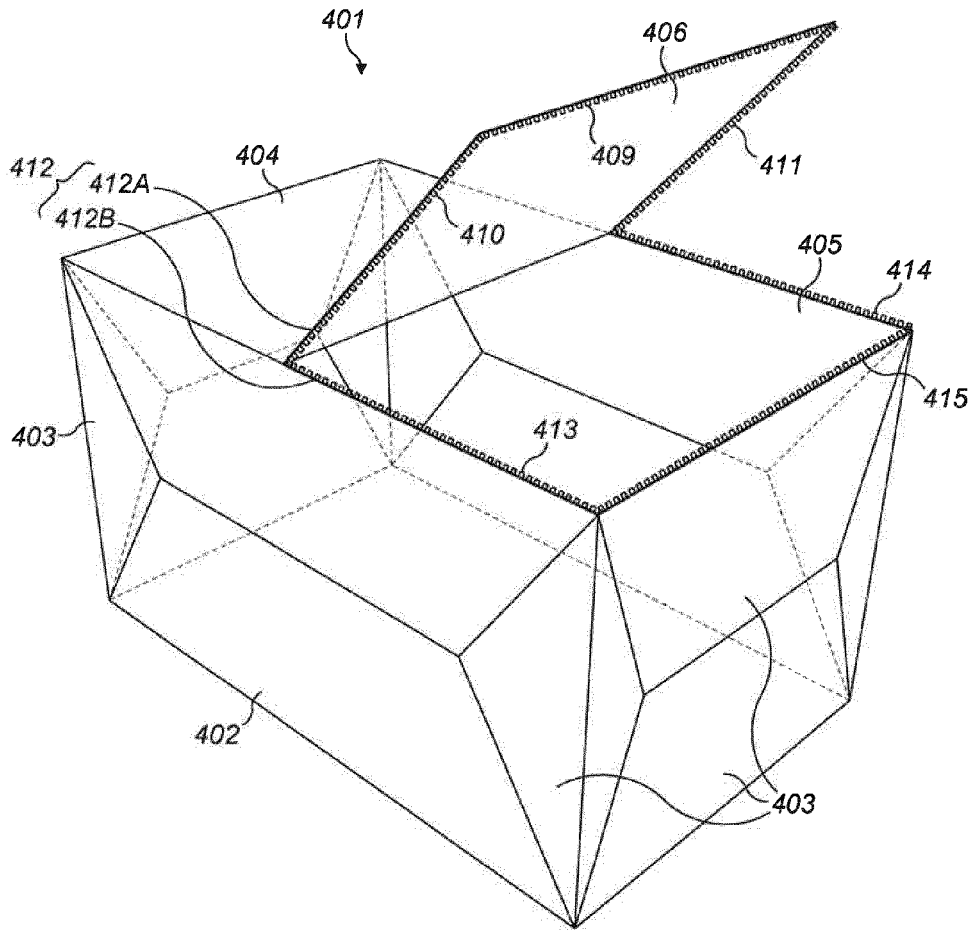
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FIG. 4

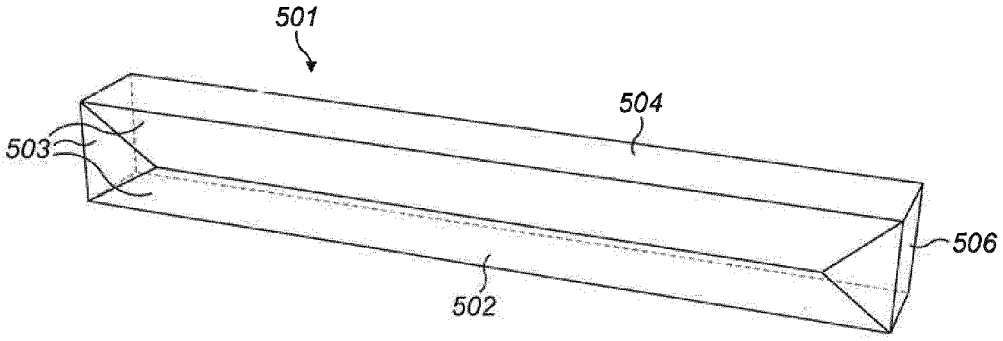
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FIG. 5

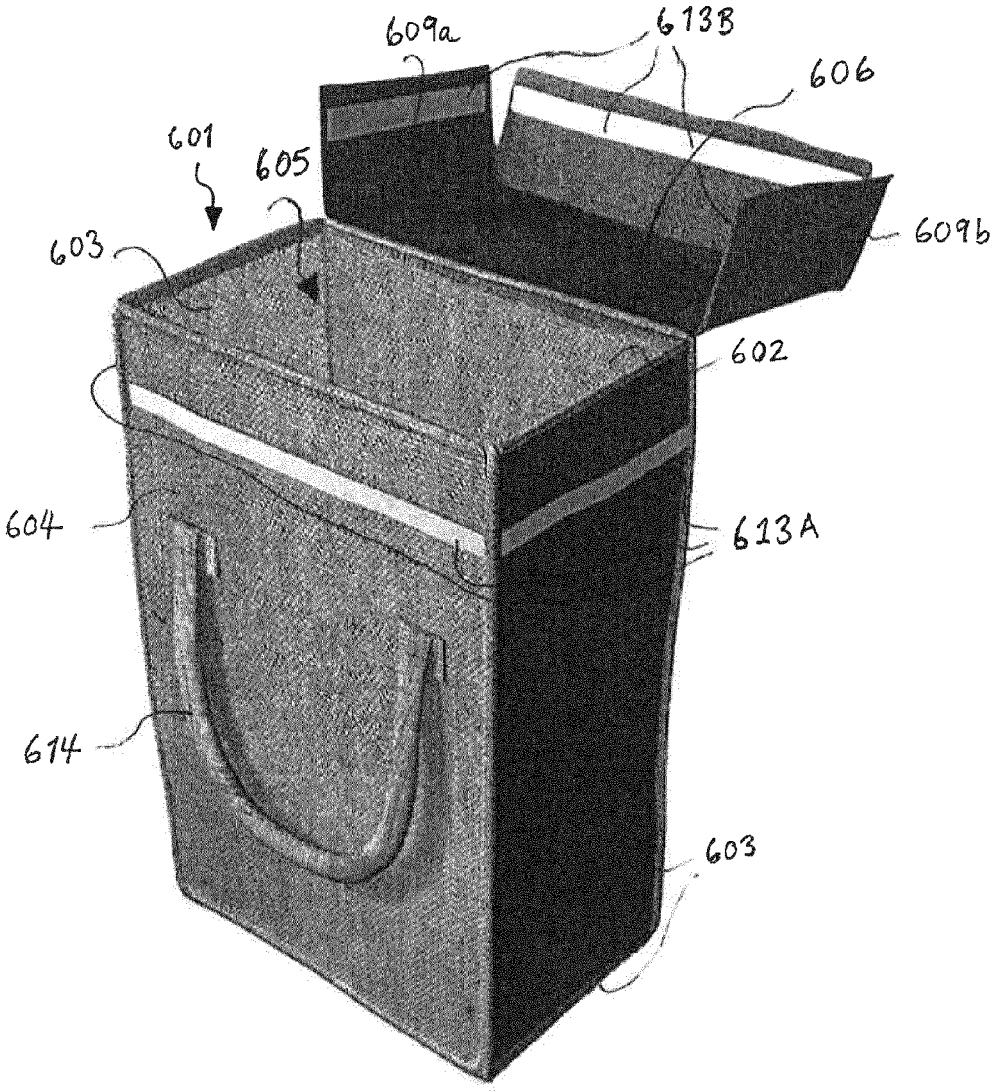

FIG. 6

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European Patent Office
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EUROPEAN SEARCH REPORT

Application Number
EP 15 16 3579

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 Y	US 3 692 235 A (FRANIEL CAROL ANN) 19 September 1972 (1972-09-19) * column 1, line 2 - column 2, line 44 * * figure 1 *	1-9, 11-14 10	INV. E04B1/78 A45C3/04 E04B1/74 E04B1/76
A	US 3 669 344 A (ANDERSSON ROLF URBAN ET AL) 13 June 1972 (1972-06-13) * column 1, line 41 - line 46 * * figure 6 *	6,7	
A	GB 294 755 A (ROWLAND HUNT) 2 August 1928 (1928-08-02) * page 1, line 43 - line 52 * * figure 1 *	8,9	
Y	GB 727 163 A (COMMERCIAL PLASTICS LTD) 30 March 1955 (1955-03-30) * page 1, line 9 - line 24 *	10,15	
Y A	US 2010/064614 A1 (TSU DAVID V [US] ET AL) 18 March 2010 (2010-03-18) * paragraph [0045] * * paragraph [0047] - paragraph [0048] *	15 12,14	TECHNICAL FIELDS SEARCHED (IPC) E04B A45C
A	EP 1 939 370 A2 (VIOL MICHAEL [AT]) 2 July 2008 (2008-07-02) * paragraph [0007] - paragraph [0011] * * figures *	15	
A	US 4 446 660 A (MILLER LEROY [US] ET AL) 8 May 1984 (1984-05-08) * column 1, line 61 - column 2, line 49 * * figures *	15	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	21 September 2015	López-García, G

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

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