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(54) **Box for products to be kept cold and use of such a box**

Schachtel für kalt zu haltende Produkte und deren Verwendung

Boîte pour produits à maintenir froids ainsi que l'utilisation d'une telle boîte

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EP 0 940 352 B1

Description

[0001] This invention relates in general to boxes and in particular to portable boxes defining a space for containing a product.

[0002] Foodstuffs to be consumed in passenger aircraft are carried onto the aircraft in boxes contained in metal canisters which are stacked in the aircraft and which have front openings from which the boxes can be removed.

[0003] In the case of frozen foods such as ice creams, frozen yoghurts, and other frozen desserts, the box is usually made of foamed plastics material such as polystyrene, and packets of solid carbon dioxide (known as dry ice) are placed inside the box with the product. Such boxes are expensive. Although they are re-usable, they are quite easily damaged during use. Furthermore, since they are generally useful for other purposes, they are often not re-used for the intended purpose. The packets of solid carbon dioxide come into contact with the product, adversely affecting its texture, and they can also cause injury to the hands of anyone removing the product from the box.

[0004] Thus there is a need for a box in which a product can be kept cold and from which consumers of the product can safely help themselves. Conventional cardboard boxes are not suitable for this purpose.

[0005] It is conventional for food producers to pack foodstuffs (such as frozen foods, chilled foods, perishable foods, and foods prepared ready for cooking) in thermally insulated containers which are transported to locations of use or retail sale, where the foodstuffs are unloaded from the containers and temporarily stored in suitable storage means such as freezers or refrigerators. The thermally insulated containers, which are expensive and easily damaged, are then returned to the producer.

[0006] Foodstuffs supplied in this way to temporary or mobile outlets such as outdoor events, large-scale indoor events, hot dog stalls, ice cream vendors, and galleys on aircraft or trains, for example, are transferred to refrigerated storage or to ovens (e.g. microwave ovens) as appropriate. The handling involved introduces the risk of contaminating the foodstuff or not keeping it at the required temperature.

[0007] US-A-2 038 218 (issued 21 April 1936) discloses a box with insulated walls. The box includes a hinged lid on the underside of which there is a receiver for holding dry ice.

[0008] US-A-2 734 349 (issued 14 February 1956) and US-A-2 807 402 (issued 24 September 1957) disclose portable boxes in which a separate tray or insert for containing ice is placed on top of the product in the box before the box is closed. In US-A-2 734 349 the box has a body made of folded sheet material of poor conductivity, such as fibreboard or corrugated fibreboard. In US-A-2 807 402 the box comprises multiple inter-fitting bodies of folded paperboard, such that there are at

least five layers of paperboard between the exterior and the interior, on all sides of the box.

[0009] EP-A-0 153 975 discloses a portable box in accordance with the precharacterising part of claim 1. The box disclosed has a removable lid incorporating a compartment which accommodates a cold accumulator and which is open at one end. The box is made of moulded plastics material.

[0010] What is desired is a container which is inexpensive to manufacture and in which a food product which is to be served chilled or frozen or which is to be heated and served hot can be supplied by the producer, temporarily stored, and made easily available to the user of the product.

[0011] The present invention provides a portable box as set forth in claim 1.

[0012] Preferred and optional features are set forth in the sub-claims.

[0013] The invention will be described further, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a box constructed of sheet material, viewed from one end and above, with a lid of the box being open;

Figure 2 is a sectioned side view of the box;

Figure 3 is a plan view of a first component of the box, being an outer body part;

Figure 4 is a part-sectioned side view of the outer body part;

Figure 5 is a plan view of a second component of the box, being an inner body part or liner;

Figure 6 is a side view of the liner;

Figure 7 is an end view of the liner;

Figure 8 is a plan view of a third component of the box, being a peripheral spacer;

Figure 9 is a plan view of the peripheral spacer;

Figure 10 is a side view of a double-walled lid of the box, being a fourth component, with a compartment lining, being a fifth component;

Figure 11 is an underneath view of the lid;

Figure 12 is an end view of a container, being a sixth component of the box;

Figure 13 is a side view of the container;

Figure 14 is a plan view of the container;

Figure 15 is an end view of a modified container; and

Figure 16 is a side view of the modified container.

[0014] The box illustrated has an outer body part 1 constructed from a single blank of sheet material and having front and rear end walls 2,3, side walls 4 which are longer than the end walls, and a base 6 which, by virtue of the overlapping of the sheet material as indicated in Figures 2 and 3, is twice as thick as the end and side walls. A lip 7 of the sheet material extends inwards from the rear end of one side wall 4 and overlaps the inner surface of the rear end wall 3, for a purpose

explained below.

[0015] An inner body part or liner 8 constructed from a single blank of sheet material is a sliding fit in the outer part 1 and has a front end wall 9 and side walls 11, which are all of equal height and lower than the corresponding walls 2,4 of the outer part 1, and has a rear end wall 12 substantially equal in height to the outer rear end wall 3 but with a middle recess 12a in its upper edge. In the present embodiment the liner 8 has no base. A lip 13 of the sheet material extends inwards from the rear end of one side wall 11 and overlaps the outer surface of the rear end wall 12, for a purpose explained below.

[0016] An optional peripheral spacer 14 (Figures 8 and 9) of low height, constructed from a single strip blank of sheet material, is a sliding fit in the liner 8 and rests on the base 4 of the outer body part 1. The purpose of the spacer 14 is explained below.

[0017] A lid 16 constructed from a single blank of sheet material has an outer wall 17 and an inner wall 18, between which a compartment 19 is defined, as well as side walls 21 which are a sliding fit between the side walls 4 of the outer body part 1. When the lid 16 closes the box it rests on the upper edges of the front end wall 2 and side walls 11 of the liner 8.

[0018] A compartment lining 22, consisting of a single blank of sheet material, fits in the compartment 19 with its side edges in contact with the side walls 21 and its upper surface in contact with the lower surface of the outer wall 17. Flaps 23 stamped out of the inner wall 18 are bent up and inserted into transversely extending recesses 24 in the lining 22 in order to define sub-compartments 19a. The flaps 23 have extensions 25 for a purpose explained below. The lining 22 has an extension 26 (with an integral hinge 27) which fits between the rear end walls 3 and 12 of the outer and inner body parts 1 and 8 and which is laterally guided by the above-mentioned lips 7 and 13, which also space the end walls 3 and 12 apart.

[0019] The lining 22 extends through the front end of the lid 16 to form a grippable flap 28. The front end is closed by an openable closure flap 29 which is integral with the inner wall 18 and which has a lip 31 which engages frictionally with the lining 22. A similar flap is provided at the opposite end.

[0020] The inner wall 18 of the lid 16 has large apertures 32 spaced along the side edges and therefore adjacent the side walls 11 of the liner 8 of the box. One or more narrower apertures 33 are also provided. There are also apertures 34 and 36 adjacent the front and rear ends respectively. Accordingly, the gas-permeability of the inner wall 18 is at a maximum near the liner 8 (owing to the apertures 32,34,36).

[0021] A container 37, for containing individual packets of food, is constructed from a single blank of sheet material and extends across the interior of the box. There are further containers, arranged side by side. The container 37 has side walls 38 which are spaced from the side walls 11 of the liner 8 in order to provide con-

vection paths. The end walls 38 and side walls 39 have apertures 41 also providing convection paths. The upper end of the container 37 is open. The above-mentioned extensions 25 of the flaps 23 restrict movement of the container 37.

[0022] The application of the above-described box to the transportation and temporary storage of packets of food which has to be kept cold (e.g. frozen food, chilled food, or frozen desserts such as ice cream, ice lollipops, sorbets, and frozen yoghurts) will now be described.

[0023] The producer loads the food packets (which have been cooled to the required temperature for storage) into the containers 37 and loads the containers into the box. The box is then stored under refrigerated conditions, e.g. at -18°C . When the box is subsequently taken out of storage, the lid 16 is loaded with packets of dry ice (solid carbon dioxide) as a cooling agent. For this purpose, with the flaps 23 flush with the inner wall 18 and with the closure flap 29 open, three dry ice packets are loaded into the compartment 19 one by one. After the first has entered the rear sub-compartment 19a, the flap 23 in front of it is raised, and so on. Finally the flap 29 is closed and then the lid 16 is lowered to close the box.

[0024] The dry ice, which is at a temperature of below -78.5°C , cools the air in the compartment 19. The cold air falls over the food packets and also falls down between the liner 8 and the containers 37. The dry ice sublimates at -78.5°C , extracting heat from the interior of the box and producing cold CO_2 gas which falls through the apertures in the inner wall 18 of the lid, over the food packets and below the liner 8 and the containers 37. The inner wall 18 prevents direct contact between the dry ice packets and the food packets, on the one hand, and a person opening the lid, on the other hand.

[0025] The box is transported to the point of sale or use and is stored there. If the dry ice sublimates completely, the empty packets are removed from the compartment 19 and replaced with new dry ice packets. The food packets are removed from the box one by one, by opening the lid 16 and reaching into the box, as they are required by the consumer. The lid falls back to the closed position under its own weight and the weight of the dry ice.

[0026] The sheet material from which the above-described box is made is corrugated cardboard and is therefore of poor thermal conductivity. The outer and inner body parts 1,8 have two corrugated layers alternating with three flat layers, the outer surfaces having a water-resistant coating. The container 37 has a single corrugated layer between two flat layers, the outer surfaces having a water-resistant coating. The remaining components have a single corrugated layer between two flat layers. These materials provide adequate thermal insulation.

[0027] Various modifications may be made within the scope of the invention. For example, the sheet material of poor thermal conductivity used for constructing the

components of the box may be plastics material.

[0028] Figures 15 and 16 show a modified container 37' which has at the bottom corners feet 42 which space the container 37' from the base 6 of the box, from the liner 8, and from an adjacent container, thereby facilitating convective flow around the contents of the container. This renders the peripheral spacer 14 superfluous. To assist heat transfer, further apertures 41' are provided adjacent the bottom of the container 37' in this embodiment.

[0029] By inverting the box, so that the compartment is at the bottom, the box could be converted for use for heating its contents. In this case suitable heating means would be inserted into the compartment and the heat would rise by convection. The heating means may comprise an electric heater or a hot-body or a packet containing chemicals which react exothermically, for example.

[0030] Instead of dry ice as the cooling means, packets containing other frozen substances or packets containing chemicals which react endothermically could be used, for example.

[0031] As mentioned above, the box could be used selectively for heating and cooling. For example, a cooked or partially cooked or uncooked foodstuff could be transported and stored in a chilled or frozen condition and then heated or cooked in the box by replacing the cooling means by heating means.

[0032] Poorly conductive sheet material such as cardboard is inexpensive and recyclable. It is easy to print on for marketing purposes. Depending on the average time required to keep a given volume of product frozen, it is possible to compute the amount of dry ice required in the compartment and to select the optimum configuration (size, shape, distribution, etc.) of the apertures in the partition in order to minimise costly dry ice usage. It is easy to form the required apertures in the partition. In particular the partition can include "cut-outs" defined by lines of weakness (e.g. perforated lines as indicated in Figs. 1 and 11), which cut-outs can be selectively removed to form the required apertures. Alternatively or additionally, the compartment may contain a movable sheet having holes which selectively overlap the apertures in the partition in order to adjust their effective area. The movable sheet may be connected with the compartment lining forming the integral hinge for the lid.

Claims

1. A portable box for containing a product to be kept cold, the box comprising a body which has one side open and a lid (16) which closes the open side, the lid (16) being hollow and incorporating a compartment (19) for containing a cooling means, the compartment (19) being at the open side of the body when the lid (16) is closed and having an open end through which the cooling means can be loaded into

the compartment when the lid is open, the lid (16) having a perforated inner wall (18) which separates the compartment (19) from the remaining lower space in the body for containing the product to be carried in the box and which substantially prevents the cooling means from coming into contact with the product, **characterised in that:**

(a) the body and the lid (16) are constructed of poorly conductive sheet material, e.g. cardboard;

(b) the lid (16) is hinged to the body so that a person can open the lid with one hand and reach into the said space with the other hand;

(c) the lid (16) includes an openable closure (29) at its open end, the inner wall (18) and the closure (29) substantially preventing the cooling means from coming into contact with the hand reaching into the said space; and

(d) the compartment (19) includes at least one element (23) which is movable from a position in which it permits loading of the cooling means into the compartment (19), through the open end of the lid, to a position in which it inhibits movement of the cooling means in the compartment (19).

2. A box as claimed in claim 1, in which the perforated inner wall (18) has apertures (32-36) at least adjacent its major edges, permitting cold air or gas to fall from the compartment (19) into the lower space.

3. A box as claimed in claim 1 or 2, in which the lid (16) has an extension (26) which fits between inner and outer walls (12,3) of one side of the body adjacent the open side, the extension (26) having an integral hinge (27).

4. A box as claimed in any preceding claim, having an upper side, a lower side, and peripheral sides extending between the upper and lower sides, the said sides defining an enclosed volume, the said sheet material being arranged such that heat entering the enclosed volume through each said side has to pass through at least two thicknesses of the said sheet material.

5. A box as claimed in any preceding claim, in which the compartment (19) is divided into sub-compartments (19a) by the said element (23).

6. A box as claimed in any preceding claim, in which the said element consists of a flap (23) on the inner wall (18) insertable into a recess (24) in an opposite wall of the compartment (19).

7. A box as claimed in any preceding claim, in which the said material is cardboard including at least one

corrugated layer.

8. A box as claimed in any preceding claim, in which at least the surfaces defining the said space have a substantially liquid-impermeable coating.

9. A box as claimed in any preceding claim, in which the body comprises an outer body part (1) constructed from poorly conductive sheet material and having front and rear walls (2,3), opposed side walls (4), and a base (6), and an inner body part (8) constructed from poorly conductive sheet material and having front and rear walls (9,12) and opposed side walls (11), the inner body part (8) being fitted in the outer body Part (1).

10. A box as claimed in any preceding claim, in which a lining (22) of poorly conductive sheet material is provided adjacent the upper wall of the lid (16).

11. A box as claimed in any preceding claim, in which a base lining of poorly conductive sheet material rests on the base (6) of the body.

12. A box as claimed in any preceding claim, containing at least one container (37;37') for holding the product, the container having apertures (41;41') for creating convection paths.

13. A box as claimed in claim 12, in which the container (37') has external protuberances (42) for creating convection paths.

14. A package comprising a box according to any preceding claim, a product, e.g. a frozen food, in the said lower space, and cooling means, e.g. dry ice, in the said compartment (19).

15. A method of delivering foodstuffs from a production location to an aircraft or train, including packing the foodstuffs in boxes, carrying the boxes onto the aircraft or train, and storing them there, **characterised in that:**

- (a) each box is a portable box according to any of claims 1 to 13,
- (b) the foodstuffs are loaded into the boxes at the production location and remain in the boxes until after the boxes have been stored on the aircraft or train; and
- (c) cooling means, preferably packets of dry ice, are loaded into the compartment (19) before the boxes are stored on the aircraft or train.

16. A method as claimed in claim 15, in which, after the foodstuffs have been loaded into the boxes and before the cooling means are loaded into the compartment (19), the boxes are kept under refrigerated

conditions.

Patentansprüche

1. Transportable Schachtel für das Aufnehmen eines kalt zu haltenden Produktes, wobei die Schachtel aufweist: einen Körper, der eine Seite offen aufweist; und einen Deckel (16), der die offene Seite schließt, wobei der Deckel (16) hohl ist und eine Kammer (19) für das Aufnehmen eines Kühlmittels enthält, wobei sich die Kammer (19) auf der offenen Seite des Körpers befindet, wenn der Deckel (16) geschlossen ist, und ein offenes Ende aufweist, durch das das Kühlmittel in die Kammer eingefüllt werden kann, wenn der Deckel offen ist, wobei der Deckel (16) eine perforierte innere Wand (18) aufweist, die die Kammer (19) vom restlichen unteren Raum im Körper für das Aufnehmen des in der Schachtel zu befördernden Produktes trennt, und die im wesentlichen verhindert, daß das Kühlmittel mit dem Produkt in Berührung kommt, **dadurch gekennzeichnet, daß:**

(a) der Körper und der Deckel (16) aus schlecht leitendem Bogenmaterial, beispielsweise Karton, konstruiert sind;

(b) der Deckel (16) am Körper gelenkig befestigt ist, so daß eine Person den Deckel mit einer Hand öffnen und mit der anderen Hand in den Raum hineinreichen kann;

(c) der Deckel (16) einen zu öffnenden Verschuß (29) an seinem offenen Ende umfaßt, wobei die innere Wand (18) und der Verschuß (29) im wesentlichen verhindern, daß das Kühlmittel mit der Hand in Berührung kommt, die in den Raum hineinreicht; und

(d) die Kammer (19) mindestens ein Element (23) umfaßt, das aus einer Position, in der es das Einfüllen des Kühlmittels in die Kammer (19) durch das offene Ende des Deckels gestattet, in eine Position beweglich ist, in der es die Bewegung des Kühlmittels in der Kammer (19) hindert.

2. Schachtel nach Anspruch 1, bei der die perforierte innere Wand (18) Öffnungen (32-36) mindestens angrenzend an ihre Hauptränder aufweist, die gestatten, daß kalte Luft oder Gas aus der Kammer (19) in den unteren Raum sinkt.

3. Schachtel nach Anspruch 1 oder 2, bei der der Deckel (16) eine Verlängerung (26) aufweist, die zwischen die innere und die äußere Wand (12, 3) der einen Seite des Körpers angrenzend an die offene Seite paßt, wobei die Verlängerung (26) ein integriertes Gelenk (27) aufweist.

4. Schachtel nach vorhergehenden Ansprüchen, die eine obere Seite, eine untere Seite und periphere Seiten aufweist, die sich zwischen der oberen und der unteren Seite erstrecken, wobei die Seiten ein geschlossenes Volumen definieren, wobei das Bogenmaterial so angeordnet ist, daß die durch jede Seite in das geschlossene Volumen gelangende Wärme durch mindestens zwei Dicken des Bogenmaterials passieren muß.
5. Schachtel nach vorhergehenden Ansprüchen, bei der die Kammer (19) durch das Element (23) in Unterkammern (19a) geteilt wird.
6. Schachtel nach vorhergehenden Ansprüchen, bei der das Element aus einer Klappe (23) an der inneren Wand (18) besteht, die in eine Aussparung (24) in einer gegenüberliegenden Wand der Kammer (19) eingesetzt werden kann.
7. Schachtel nach vorhergehenden Ansprüchen, bei der das Material Karton ist, der mindestens eine gewellte Lage umfaßt.
8. Schachtel nach vorhergehenden Ansprüchen, bei der mindestens die Flächen, die den Raum definieren, eine im wesentlichen flüssigkeitsundurchlässige Beschichtung aufweisen.
9. Schachtel nach vorhergehenden Ansprüchen, bei der der Körper aufweist: ein äußeres Körperteil (1), das aus schlecht leitendem Bogenmaterial konstruiert ist und eine vordere und eine hintere Wand (2, 3), gegenüberliegende Seitenwände (4) und eine Basis (6) aufweist; und ein inneres Körperteil (8), das aus schlecht leitendem Bogenmaterial konstruiert ist und eine vordere und eine hintere Wand (9, 12) und gegenüberliegende Seitenwände (11) aufweist, wobei das innere Körperteil (8) in das äußere Körperteil (1) eingepaßt wird.
10. Schachtel nach vorhergehenden Ansprüchen, bei der eine Auskleidung (22) aus schlecht leitendem Bogenmaterial angrenzend an die obere Wand des Deckels (16) bereitgestellt wird.
11. Schachtel nach vorhergehenden Ansprüchen, bei der eine Basisauskleidung aus schlecht leitendem Bogenmaterial auf der Basis (6) des Körpers aufliegt.
12. Schachtel nach vorhergehenden Ansprüchen, die mindestens einen Behälter (37; 37') für das Aufnehmen des Produktes enthält, wobei der Behälter Öffnungen (41; 41') für das Erzeugen von Konvektionswegen aufweist.
13. Schachtel nach Anspruch 12, in der der Behälter (37') äußere Vorsprünge (42) für das Erzeugen von Konvektionswegen aufweist.
14. Verpackungsbehälter, der aufweist: eine Schachtel nach vorhergehenden Ansprüchen; ein Produkt, z. B. ein gefrorenes Lebensmittel, im unteren Raum; und ein Kühlmittel, beispielsweise Trockeneis, in der Kammer (19).
15. Verfahren für das Liefern von Lebensmitteln von einem Produktionsstandort zu einem Flugzeug oder Zug, das die folgenden Schritte umfaßt: Verpacken der Lebensmittel in Schachteln; Befördern der Schachteln in das Flugzeug oder den Zug; und Lagern dieser dort, **dadurch gekennzeichnet, daß:**
 - (a) jede Schachtel eine transportable Schachtel nach den Ansprüchen 1 bis 13 ist;
 - (b) die Lebensmittel in die Schachteln am Produktionsstandort eingefüllt werden und in den Schachteln verbleiben, bis die Schachteln im Flugzeug oder Zug gelagert wurden; und
 - (c) das Kühlmittel, vorzugsweise Pakete Trockeneis, in die Kammer (19) eingefüllt wird, bevor die Schachteln im Flugzeug oder Zug gelagert werden.
16. Verfahren nach Anspruch 15, bei dem, nachdem die Lebensmittel in die Schachteln gefüllt wurden, und bevor das Kühlmittel in die Kammer (19) eingefüllt wurde, die Schachteln unter gekühlten Bedingungen gehalten werden.

Revendications

1. Boîte portable pour contenir un produit à conserver au froid, la boîte comprenant un corps possédant un côté ouvert et un couvercle (16) fermant le côté ouvert, le couvercle (16) étant creux et incorporant un compartiment (19) destiné à contenir un moyen de refroidissement, le compartiment (19) étant situé du côté ouvert du corps lorsque le couvercle (16) est fermé et comportant une extrémité ouverte à travers laquelle le moyen de refroidissement peut être chargé dans le compartiment lorsque le couvercle est ouvert, le couvercle (16) comportant une paroi intérieure perforée (18) qui sépare le compartiment (19) de l'espace inférieur restant dans le corps pour contenir le produit à transporter dans la boîte et qui empêche sensiblement le moyen de refroidissement d'entrer en contact avec le produit, **caractérisé en ce que:**
 - (a) le corps et le couvercle (16) sont construits à partir d'un matériau en feuille peu conducteur, par exemple du carton;
 - (b) le couvercle (16) est articulé au corps pour

qu'une personne puisse ouvrir le couvercle avec une main et atteindre l'intérieur dudit espace avec l'autre main;

(c) le couvercle (16) comprend une fermeture ouvrable (29) au niveau de son extrémité ouverte, la paroi intérieure (18) et la fermeture (29) empêchant sensiblement le moyen de refroidissement d'entrer en contact avec la main atteignant l'intérieur dudit espace; et

(d) le compartiment (19) comprend au moins un élément (23) qui est mobile depuis une position dans laquelle il permet le chargement du moyen de refroidissement dans le compartiment (19), à travers l'extrémité ouverte du couvercle, à une position dans laquelle il empêche tout mouvement du moyen de refroidissement dans le compartiment (19).

2. Boîte selon la revendication 1, dans laquelle la paroi intérieure perforée (18) comporte des ouvertures (32 à 36) au moins adjacentes à ses bords principaux, permettant à de l'air ou à un gaz froid de tomber du compartiment (19) dans l'espace inférieur.

3. Boîte selon la revendication 1 ou 2, dans laquelle le couvercle (16) comporte une extension (26) s'insérant entre les parois intérieure et extérieure (12, 3) d'un côté du corps adjacent au côté ouvert, l'extension (26) comportant une charnière d'un seul tenant (27).

4. Boîte selon l'une quelconque des revendications précédentes, comportant un côté supérieur, un côté inférieur et des côtés périphériques s'étendant entre les côtés supérieur et inférieur, lesdits côtés définissant un volume fermé, ledit matériau en feuille étant configuré de sorte que la chaleur entrant dans le volume fermé à travers chaque dit côté doit traverser au moins deux épaisseurs dudit matériau en feuille.

5. Boîte selon l'une quelconque des revendications précédentes, dans laquelle le compartiment (19) est divisé en sous-compartiments (19a) par ledit élément (23).

6. Boîte selon l'une quelconque des revendications précédentes, dans laquelle ledit élément est constitué d'un rabat (23) sur la paroi intérieure (18) pouvant être inséré dans un évidement (24) dans une paroi opposée du compartiment (19).

7. Boîte selon l'une quelconque des revendications précédentes, dans laquelle ledit matériau est un carton comprenant au moins une couche ondulée.

8. Boîte selon l'une quelconque des revendications précédentes, dans laquelle au moins les surfaces

définissant ledit espace comportent un revêtement sensiblement imperméable aux liquides.

9. Boîte selon l'une quelconque des revendications précédentes, dans laquelle le corps comprend une partie de corps extérieure (1) construite à partir d'un matériau en feuille peu conducteur et comportant des parois avant et arrière (2, 3), des parois latérales opposées (4) et un fond (6), et une partie de corps intérieure (8) construite à partir d'un matériau en feuille peu conducteur et comportant des parois avant et arrière (9, 12) et des parois latérales opposées (11), la partie de corps intérieure (8) étant emboîtée dans la partie de corps extérieure (1).

10. Boîte selon l'une quelconque des revendications précédentes, dans laquelle une doublure (22) de matériau en feuille peu conducteur est disposée adjacente à la paroi supérieure du couvercle (16).

11. Boîte selon l'une quelconque des revendications précédentes, dans laquelle une doublure de fond de matériau en feuille peu conducteur repose sur le fond (6) du corps,

12. Boîte selon l'une quelconque des revendications précédentes, contenant au moins un bac (37; 37') destiné à contenir le produit, le bac comportant des ouvertures (41; 41') destinées à créer des chemins de convection.

13. Boîte selon la revendication 12, dans laquelle le bac (37') comporte des saillies externes (42) destinées à créer des chemins de convection.

14. Emballage comprenant une boîte selon l'une quelconque des revendications précédentes, un produit, par exemple un aliment surgelé, dans ledit espace inférieur, et un moyen de refroidissement, par exemple de la glace sèche, dans ledit compartiment (19).

15. Procédé de livraison de denrées alimentaires provenant d'un lieu de fabrication à un avion ou un train, comprenant les étapes consistant à emballer les denrées alimentaires dans des boîtes, transporter les boîtes dans l'avion ou le train et les stocker à cet endroit, **caractérisé en ce que:**

(a) chaque boîte est une boîte portable selon l'une quelconque des revendications 1 à 13,

(b) les denrées alimentaires sont chargées dans les boîtes sur le lieu de fabrication et restent dans les boîtes jusqu'à un moment ultérieur au stockage des boîtes dans l'avion ou le train; et

(c) un moyen de refroidissement, de préférence des paquets de glace sèche, est chargé dans

le compartiment (19) avant le stockage des boîtes dans l'avion ou le train.

16. Procédé selon la revendication 15, dans lequel, après que les denrées alimentaires ont été chargées dans les boîtes et avant que le moyen de refroidissement soit chargé dans le compartiment (19), les boîtes sont maintenues dans des conditions réfrigérées.

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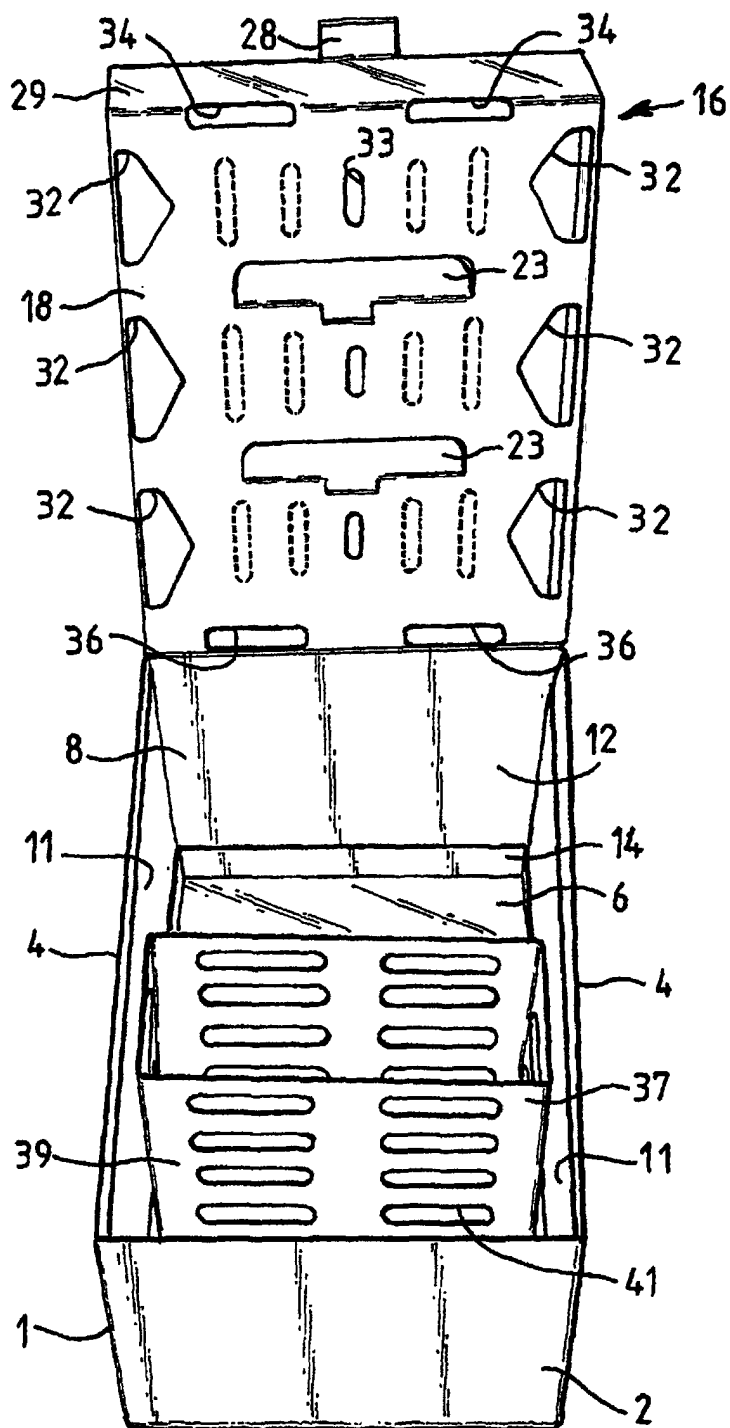


Fig. 1

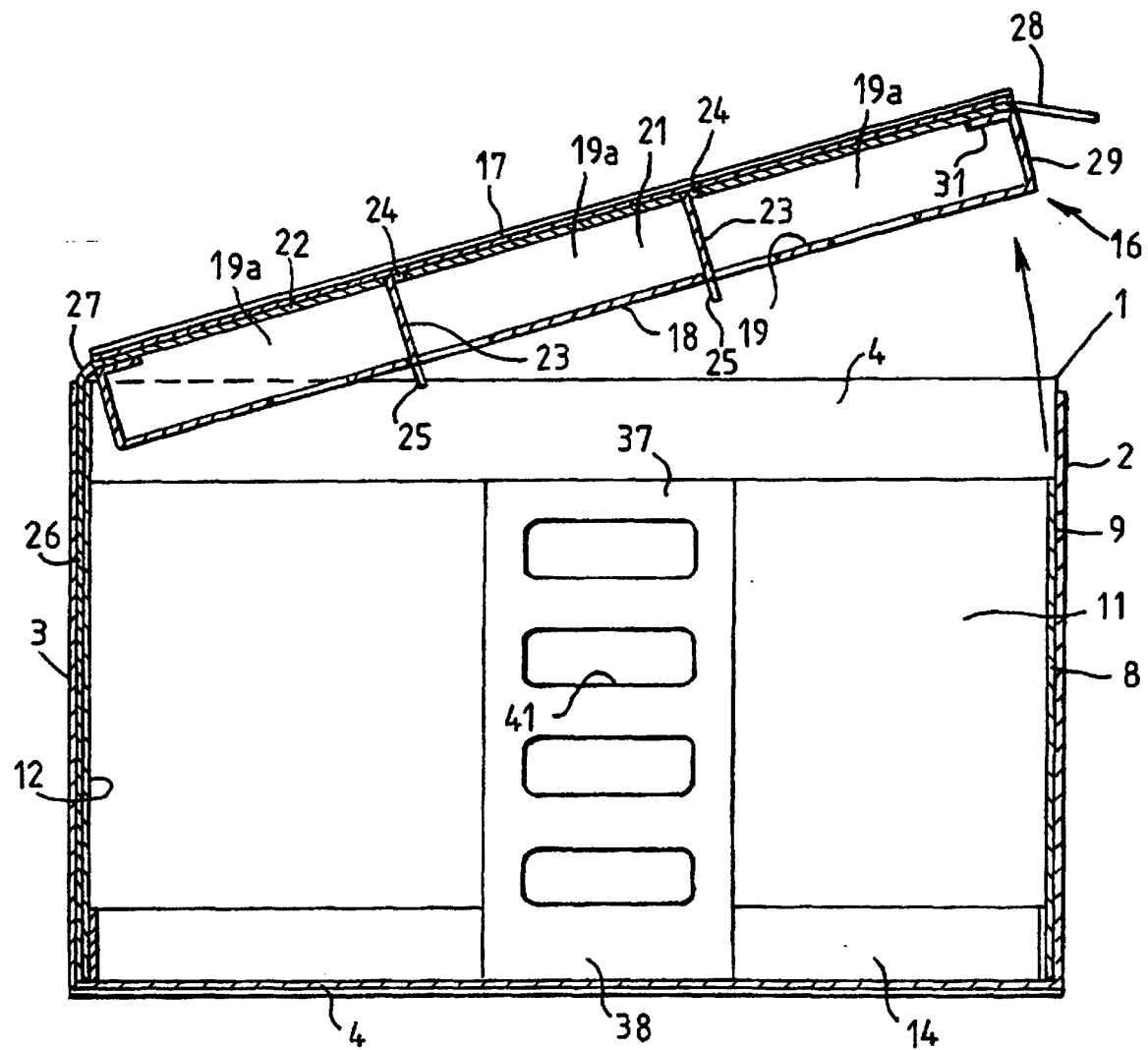


Fig. 2

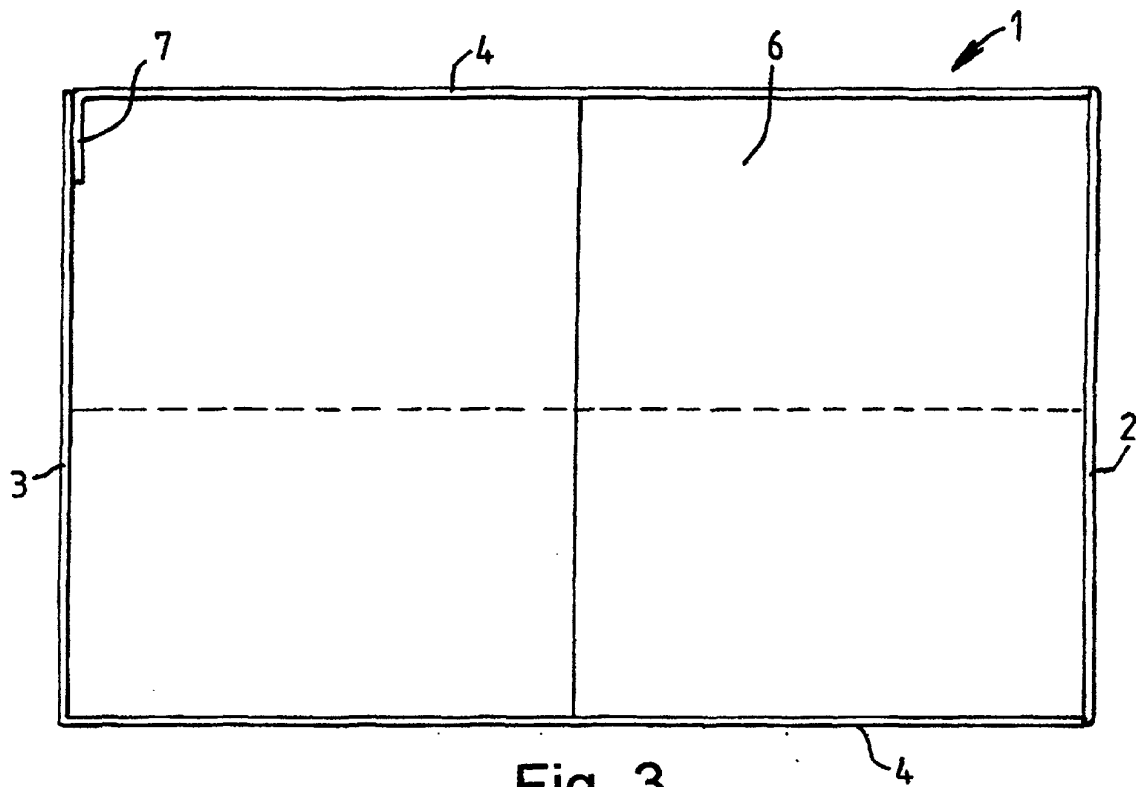


Fig. 3

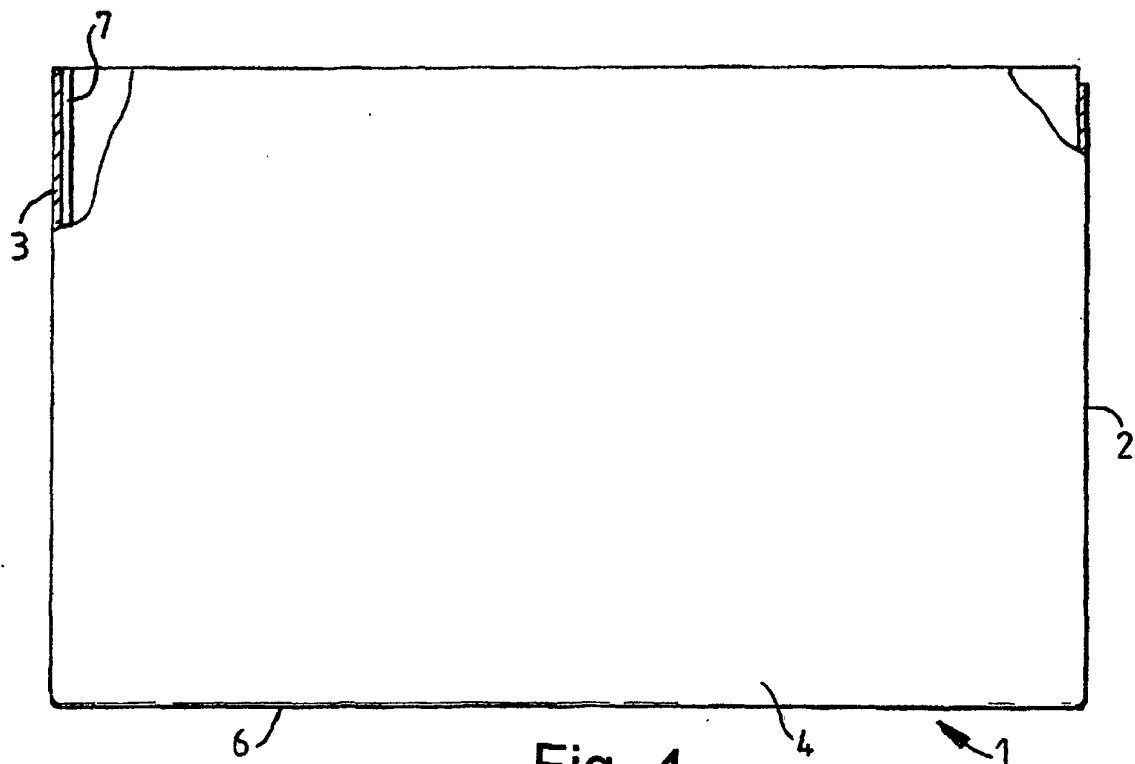


Fig. 4

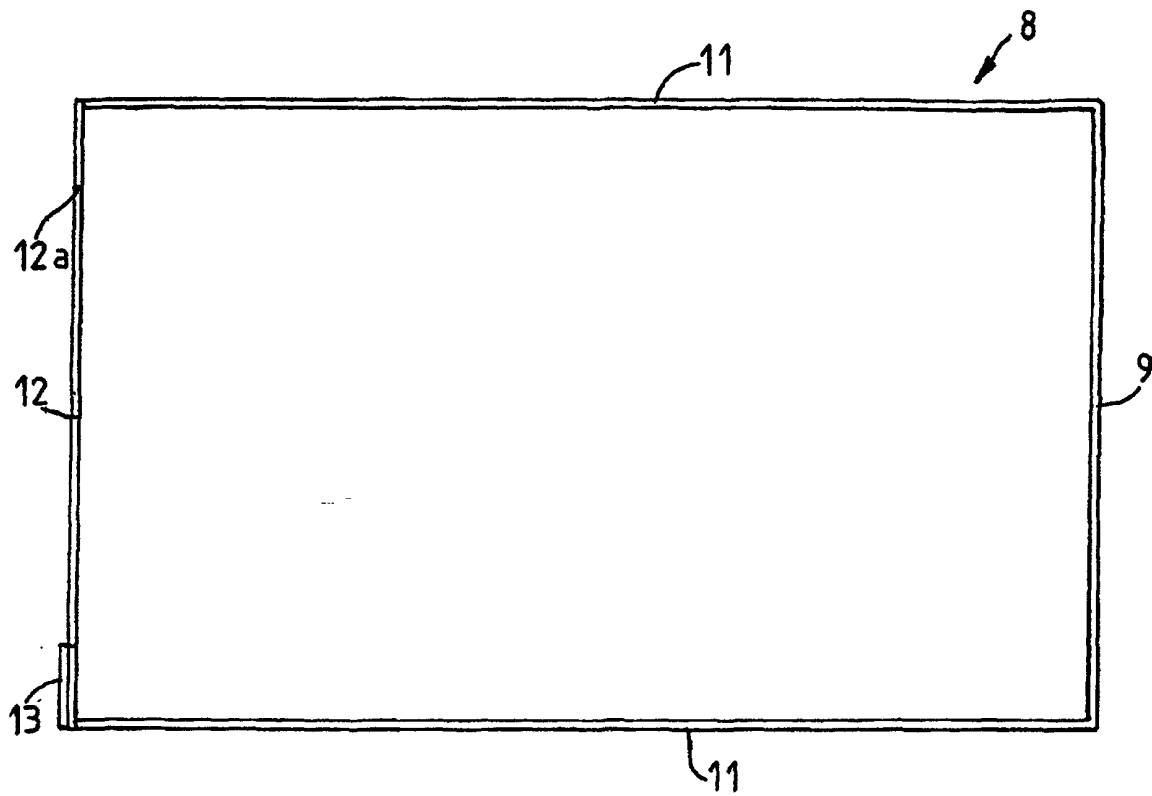


Fig. 5

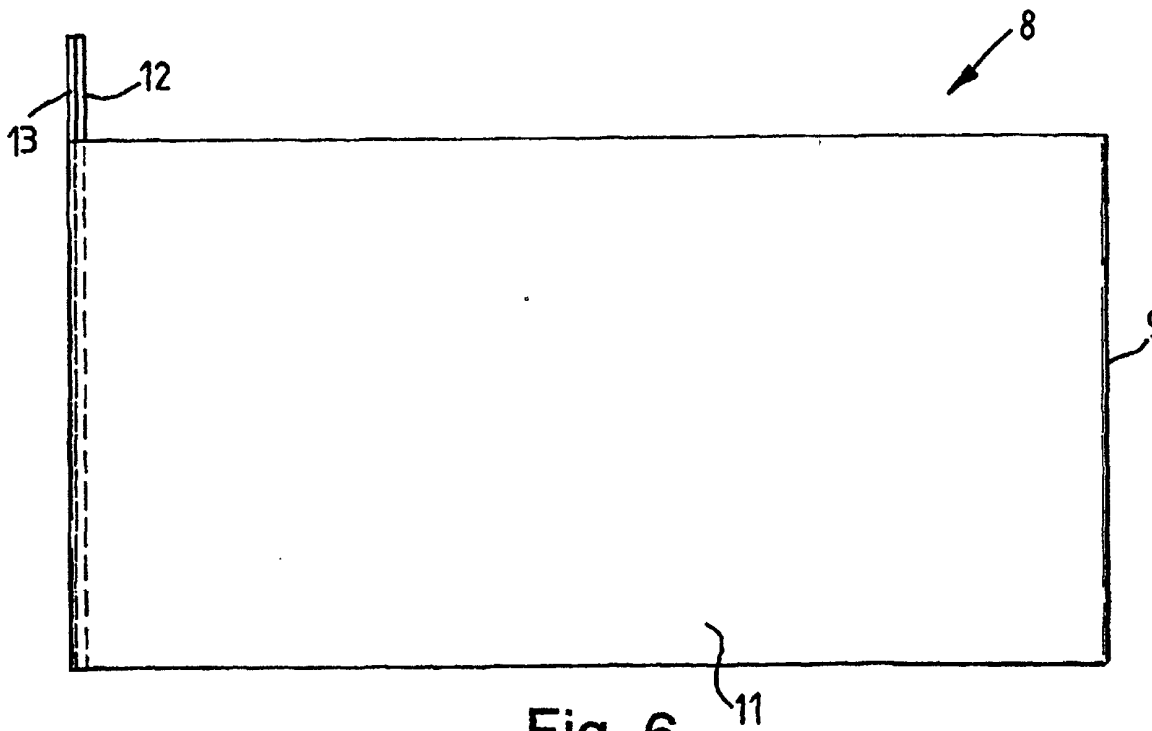


Fig. 6

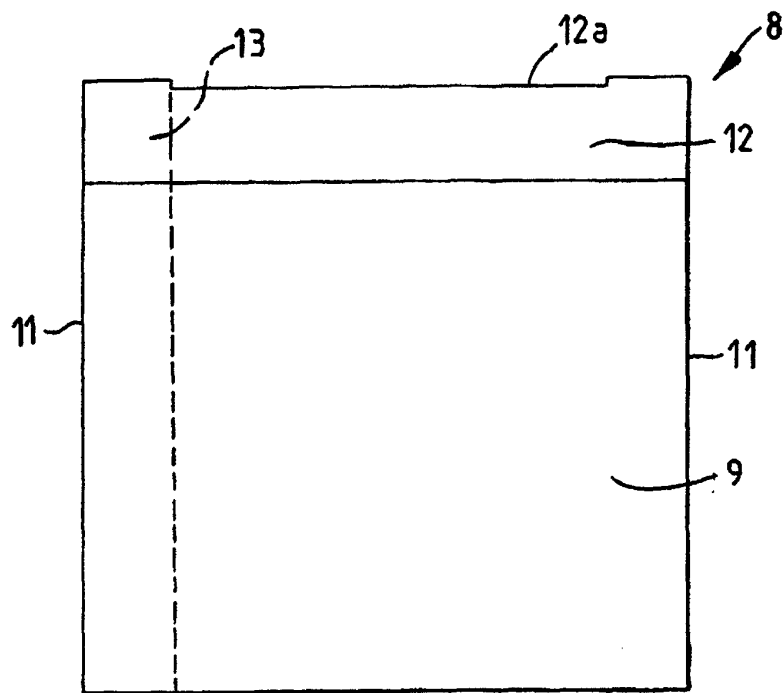


Fig. 7

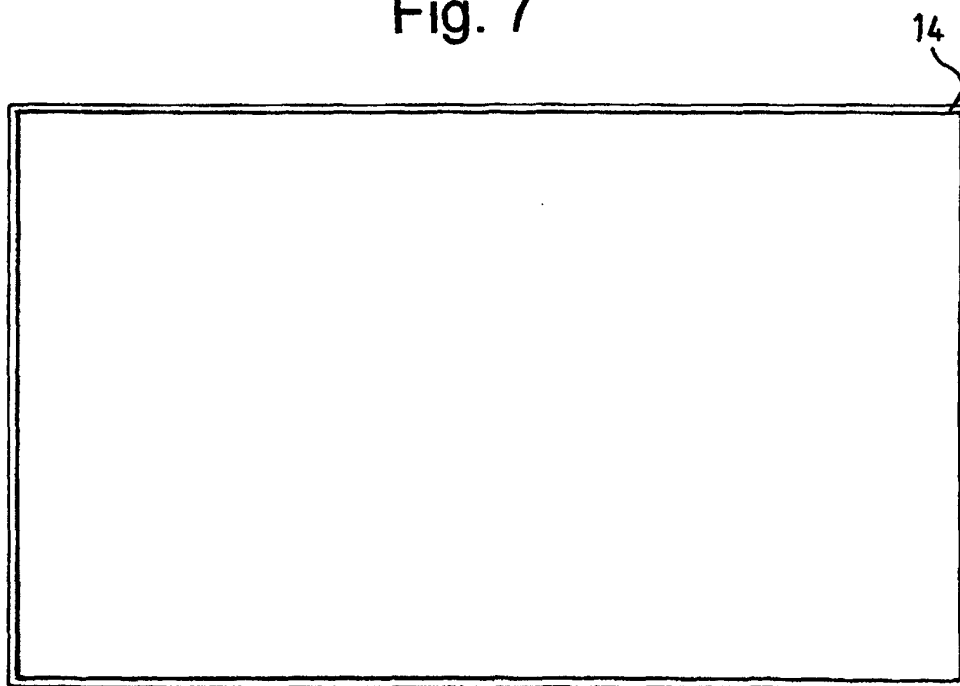


Fig. 8



Fig. 9

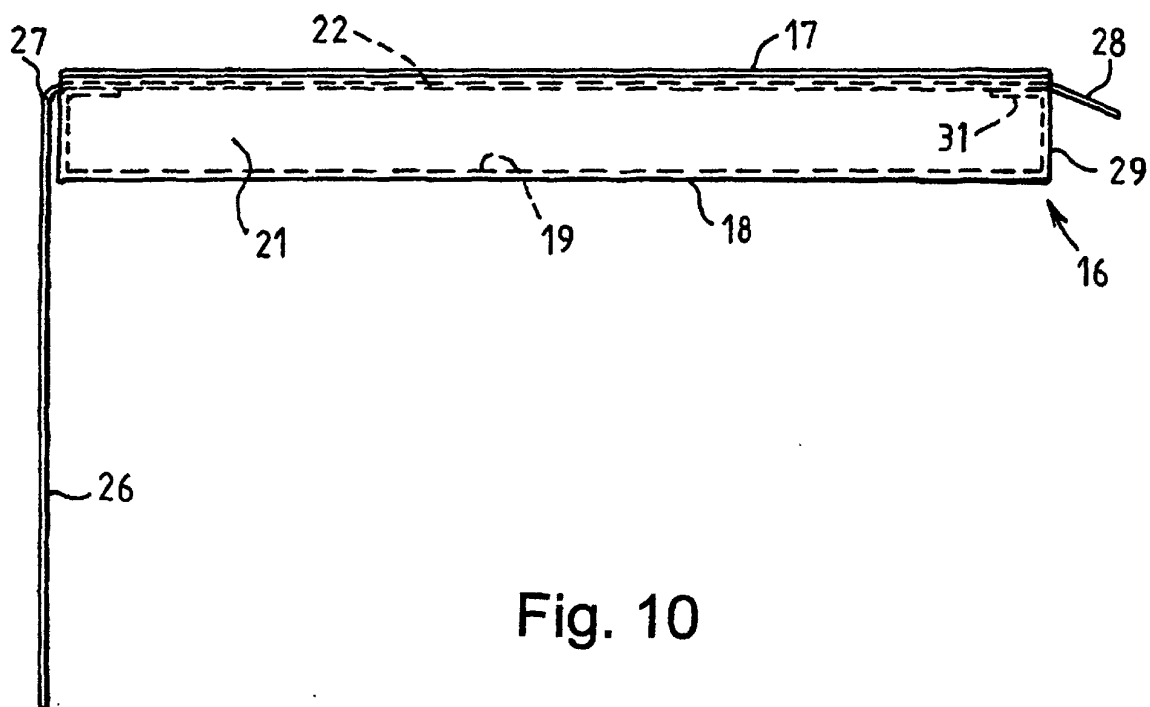


Fig. 10

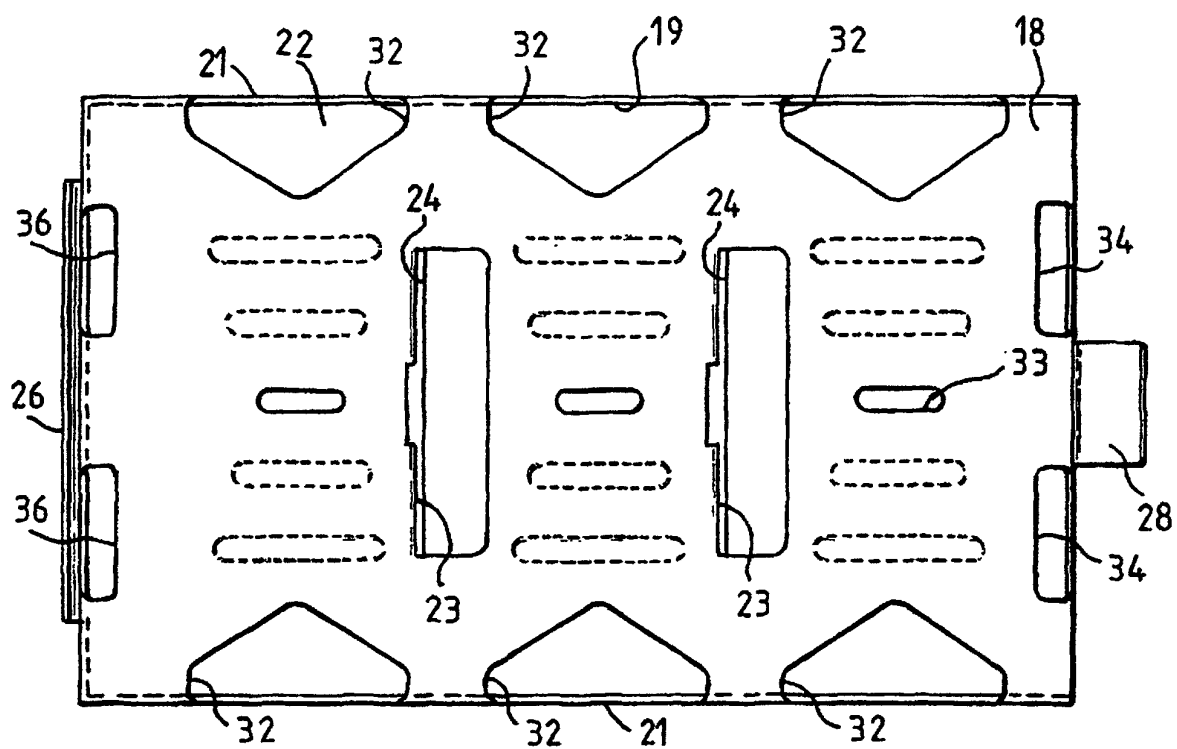


Fig.11

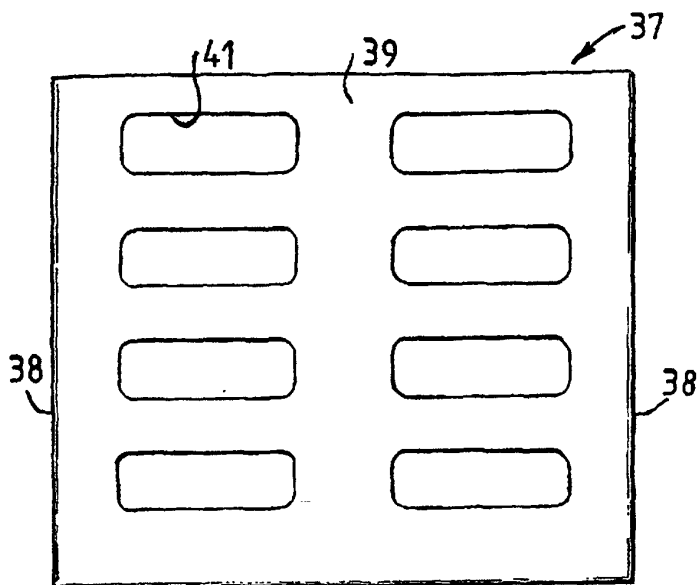


Fig. 12

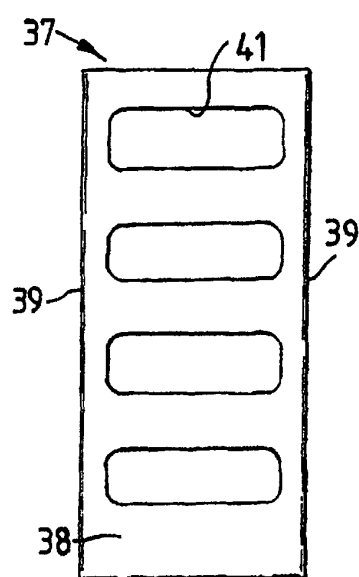


Fig. 13

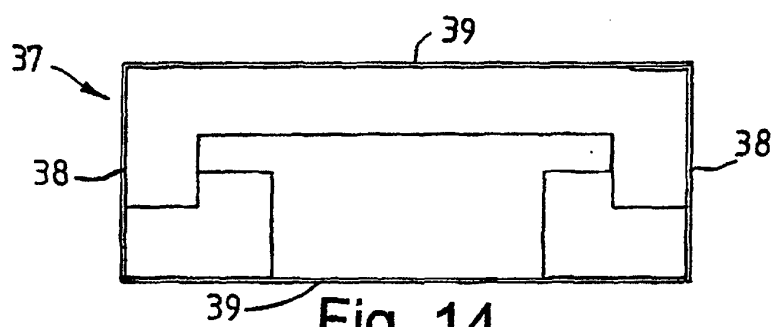


Fig. 14

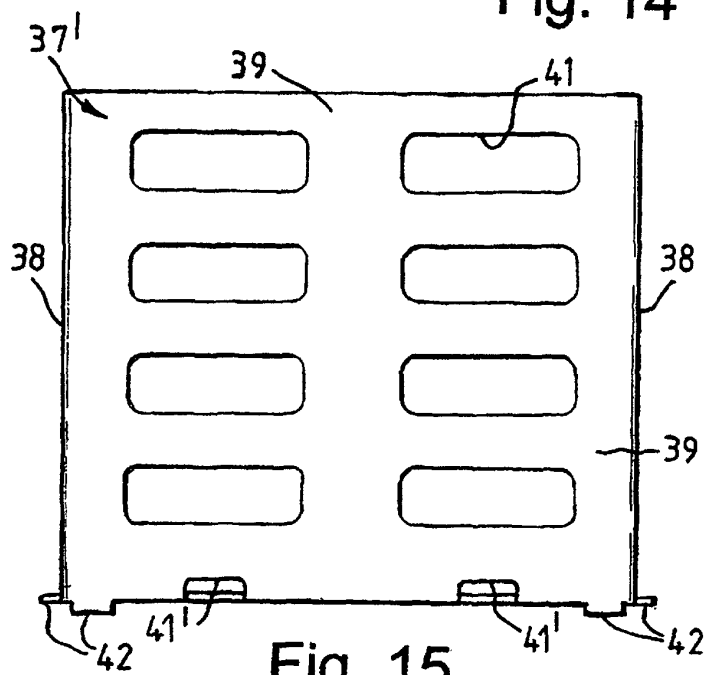


Fig. 15

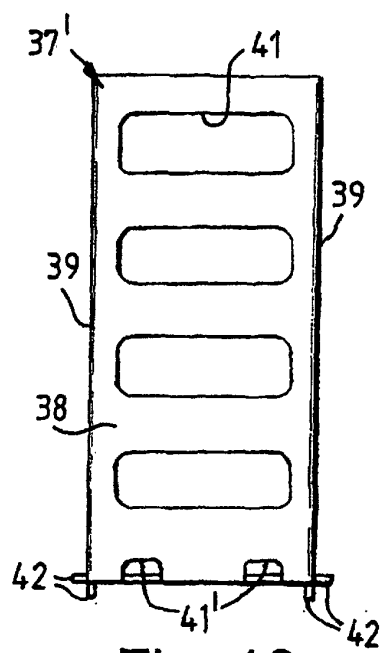


Fig. 16