(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 624 141 B1**

(12) # EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: **22.11.95** (51) Int. Cl.[6]: **B65D 81/26**

(21) Application number: **93902111.9**

(22) Date of filing: **26.01.93**

(86) International application number:
PCT/DK93/00026

(87) International publication number:
WO 93/14995 (05.08.93 93/19)

(54) **A PACKAGE TRAY FOR LIOUID-CONTAINING FOOD PRODUCTS, SUCH AS MEAT.**

(30) Priority: **27.01.92 DK 97/92**

(43) Date of publication of application:
17.11.94 Bulletin 94/46

(45) Publication of the grant of the patent:
22.11.95 Bulletin 95/47

(84) Designated Contracting States:
AT BE CH DE ES FR GB IT LI NL SE

(56) References cited:
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US-A- 3 155 303
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EP 0 624 141 B1

Description

The invention concerns a package tray for liquid-containing food products, such as meat, said package tray being made of e.g. sheeting and having a storage space which - seen in the normal position of rest of the tray - is defined downwardly by a bottom and by upright side walls along the sides, said bottom being provided with a plurality of projections having upwardly converging walls.

Today such trays are used in very large numbers for the distribution of ready-for-sale food products, which are placed in the trays, which are generally then coated with a thin, transparent plastics sheet permitting the customers to inspect the respective article. The food products can hereby be displayed freely accessibly in refrigerated display cases in retail outlets, from which the customers, according to the self-service principle, can then select and pick up the article which appeals most to them.

It goes without saying that the appearance plays a decisive role. However, during the stay in these refrigerated display cases e.g. fresh meat tends to release blood and other tissue fluids in which the meat is then partly immersed in conventional trays. The customers find this unsightly and unhygienic, and this is later a major nuisance to the consumer when the consumer unpacks the soaked meat, because the consumer and the surroundings can easily get soiled by the dripping blood. To this should be added that the part of the meat which has been immersed in blood and tissue fluids for an extended period of time can undergo changes which impair the quality and freshness of the meat. For example, it has been found that the affected areas of the meat may be a hotbed of a rapidly growing bacteria flora.

It has been attempted to solve the above-mentioned problems by means of a tray which is described in GB patent specification 813 415. The bottom of this tray is provided with narrow grooves for conveying the juice to some collection pockets, but between the grooves there are some relatively large, plane faces on which the blood and the tissue fluid remain owing to the capillary effect. This construction cannot therefore effectively drain off the exuding juices from the meat. The tray is moreover made of moulded pulp which tends to absorb meat juice and is not attractive as a package owing to its structure and colour.

GB patent specification 974 180 discloses a thin walled tray of thermoplastics having longitudinal and transverse ribs in the bottom. The distance of the ribs from the opening of the tray decreases with the distance from the side edges, resulting in the formation of a fall toward these in the spaces between the ribs. This entails that the meat juices are conveyed to the edge area of the tray where the juice is clearly visible from the outside.

GB patent specification 1 527 212 describes a package tray for storing sausages. In this case the tray has a plane bottom provided with rows of uniform, pyramidal projections which are so dimensioned that a sausage can be accommodated between two rows. The purpose of this structure is to obtain air circulation around the sausages, but the plane bottom does not enable possible meat juice to be drained off to a non-visible location, and the great distance between the projections does not ensure separation between a possible meat article and the meat juice.

GB patent specification 2 003 836 discloses a tray for perishable food products exuding juices. The bottom consists of a plane face whose center has a recessed collection area. Further, the bottom is formed with a plurality of grooves extending inwardly from the edges to the collection area. Alternatively, a hygroscopic material may be placed in the collection area for absorbing the juices. Owing to the relatively large, plane faces between the grooves some of the meat juice cannot be effectively conveyed down to the collection are owing to the capillary effect. If a hygroscopic material is used, which must be placed in a bag or under a porous cover, this will lead to a considerable increase in the manufacturing costs, and if such a hygroscopic material is not used, the packaged meat article might hang down in the relatively large collection area with the consequent risk of touching the juice.

GB patent specification 2 059 920 describes a tray whose bottom is provided with a system of ribs and grooves serving to convey exuding liquids from the packaged article to grooves or areas along the side edges where the juices are readily visible to the customers. This tray has a relatively sturdy construction and is intended for the transport of meat pies and cannot therefore be regarded as a package tray proper.

DK 155 789 discloses an open box of relatively great thickness. The bottom is formed with a plurality of upwardly extending knobs having a plane surface, which collectively form a face sloping downwards toward the center of the bottom, while the actual bottom forms a face sloping downwards toward the side walls. The side walls are moreover formed with holes for discharge of liquid, and the box is particularly intended for the transport of fish. The plane top sides of the knobs form a relatively large contact area with the articles.

The object of the invention is to provide a package tray of the type mentioned in the opening paragraph, which can be manufactured at small costs and in a simple structure, and which is capable of effectively separating the packaged food

product from exuding juices better than known before and conceal them during storage.

This is achieved by the novel and unique features of the invention, which are that the walls of each of said projections converge to form an apex, and that between the side walls and a predetermined central area the bottom has a zone where the height of the projections increases successively with the distance from the side walls, and that the bottom in this zone slopes downwardly and inwardly toward the central area. Exuding juices, e.g. blood and tissue fluids from meat, run down the inclined parts of the bottom face toward the central area, which is normally entirely covered by the food product. The juices cannot therefore be seen from the outside and will not touch the food product because of the particularly great height which the projections have in the central area. For most food products, it will be advantageous when the projections in this central area all have the same height.

In a particularly advantageous embodiment the package tray may have a skirt extending downwardly on the outer side of the side walls from their upper rim. When the height of the skirt is greater than that of the side walls, the skirt then serves as a foot on which the tray can stand in the position of rest. With a suitable selection of the height of the skirt the tray can rest on a horizontal base with the central area in addition to the foot, when the tray is filled and is in the position of rest. The projections may have the shape of cones or truncated cones with rounded tops, and to avoid perforation of the surface of the packaged food product by these tops, the area of each top may be determined by the surface pressure between the top and the food product part which rests on the top in use being slightly smaller than the pressure which the surface of the food product can resist without being broken.

The invention will be explained more fully by the following description of embodiments, which just serve as examples, with reference to the drawing, in which

fig. 1a is a perspective view of a first embodiment of the package tray of the invention,
fig. 1b is a top view of the same,
fig. 1c is a sectional view of the same,
fig. 2a is a top view of a second embodiment of the package tray of the invention,
fig. 2b is a top view of the same,
fig. 3a is a perspective view of a third embodiment of the package tray of the invention,
fig. 3b is a top view of the same,
fig. 3c is a longitudinal sectional view of the tray,
fig. 3d is a transverse sectional view of the tray,
fig. 4a is a top view of a fourth embodiment of the package tray of the invention,
fig. 4b is a longitudinal sectional view of the tray,
fig. 4c is a transverse sectional view of the tray,
fig. 5a is a view of a fifth embodiment of the package
tray of the invention in an unloaded state, and
fig. 5b is a view of the same, but loaded by a food product.

It is contemplated that the first embodiment of the package tray shown in figs. 1a-1c is made of vacuum-formed thermoplastics sheeting which may optionally consist of a laminate. In this case the tray is equilateral and has side walls 10 extending from a base 11 upwardly to a bent rim 12. A skirt 14 extends downwardly from this rim 12 over a distance which is slightly longer than the height of the side walls. The lower edge 15 of the skirt will hereby serve as a foot for the tray. The edge of the skirt may be cut clean or, as shown, be provided with a relatively small, outwardly directed flap for stiffening the shell and forming a suitable supporting face for the package tray.

A plurality of upwardly directed pyramids 17 are provided along the entire base, each of said pyramids having a square foot 18 and a relatively pointed top 19. These tops are arranged equidistantly and are so pointed as to form the least possible area of contact with the food product which they carry. However, the tops may not be so pointed as to damage the food product by perforating its surface. This is obtained by dimensioning each top with an area which is just so large that the surface pressure between the respective top and the food product will be slightly smaller than the pressure which the surface of the food product can resist without being perforated.

As will be seen from fig. 1c, the height of the pyramids increases successively with the distance from the side walls 10. The tray is empty in the shown case. A face containing the tops 19 slopes downwards toward a central point 2 in the tray, while the actual base slopes downwards toward this center. The underside 4 of the central point rests against a plane support 6 together with the edge 15.

Alternatively, the package tray may be constructed such that in the unloaded state of the tray the underside 4 is raised slightly, e.g. 1-2 mm, with respect to the embodiment shown in fig. 1c. When the tray is filled with food products, the weight of these presses the underside 4 down to engage the support 6 and thereby transfers the weight to this support together with the edge 15.

In the second embodiment of the package tray of the invention shown in figs. 2a and 2b the projections 20 are conical with rounded tops 21. The structure otherwise corresponds to the first embodiment shown in figs. 1a, b, c, each cone

having a foot 22, and the height of the tops 21 increasing successively with the distance from the side walls to a central point 2. Here the actual base forms a face 23 which may be continuous or divided into separate areas when the feet 22 of the cones adjoin each other. This embodiment has the advantage that it is easy to manufacture, and that with respect to the first embodiment there is more space for collection of liquid between the cones around the central point 2.

Rectangular package trays are preferred in many cases to the above-mentioned rectangular package trays. Figs. 3a-3d thus show a rectangular package tray which corresponds to the tray shown in figs. 1a-1c, except that its sides do not have the same length. Correspondingly, figs. 4a-4c show a rectangular package tray which corresponds to the package tray shown in figs. 2a-2b. Since the rectangular trays do not have sides of the same length, the bases 30 and 40, respectively, may have a central area 3 proper instead of a central point in the bases, said central area having a plurality-of projections 31, 41 of the same height in the longitudinal direction of the tray. Each row extends transversely to the longitudinal direction, and merely one such row is provided in a specific variation of this embodiment.

In the fifth embodiment of the package tray of the invention shown in figs. 5a and 5b the base 50 of the tray is formed such that in an unloaded state (fig. 5a) it is plane and has projections 52 whose height increases successively toward the center 2. The projections 52 are arranged at such a great mutual distance that the spaces between them form a reservoir having a considerably capacity for collecting exuding liquid from the packaged liquid. In fig. 5b, this product 54 is now placed on the projections 52. As will be seen, the weight of the product 54 forces the center 2 of the tray down to contact the support 6. A face containing the tops of the projections 52 is substantially plane, and the base forms a large reservoir centrally below the food product to receive exuding liquid, which cannot contact the food product and cannot be seen from the outside.

All of the embodiments of the package tray of the invention described above have the advantage that exuding liquid from the packaged food product is collected in a well-defined central area where the liquid is not visible form the outside, and which can easily accommodate so much liquid that this is kept spaced from the product with certainty when the tray is in a position of rest. Although the tray is made of relatively thin sheeting, it is extremely stable because of its structure and does not tend to tilt when it is filled with products. The trays are moreover stackable.

The described and shown embodiments of the projections just serve as examples, and the projections may thus have other geometrical shapes, e.g. truncated pyramids having a hexagonal foot or truncated cones.

Furthermore, the distance between the tops of the projections may vary in a given section through the base. For example, the distance between the tops may be smallest closest to the side walls and increase toward the central area of the base. The number of tops per unit of area must be so large that the product resting on the tops does not hang so far down as to contact the liquid in the base. The central point or the central area having the greatest projection height does not necessarily have to be in the center of the tray if the shape of the food product, or other conditions, should make it expedient to displace this point or area with respect to the geometrical center of the tray.

Claims

1. A package tray for liquid-containing food products, such as meat, made of e.g. sheeting and having a storage space which - seen in the normal position of rest of the tray - is defined downwardly by a base (11; 30; 50) and by upright side walls (10) along the sides, said base being provided with a plurality of projections (17; 20; 31; 41; 52) having upwardly converging walls, **characterized** in that the walls of each of said projections converge to form an apex (19), and in that between the side walls (10) and the central area the base (11; 30; 50) has a zone where the height of the projections (17; 20; 31; 41; 52) increases successively with the distance from the side walls (10), and that the base (11; 30; 50) in this zone slopes downwards and inwards toward the central area.

2. A package tray according to claim 1, **characterized** in that the projections in the central area have substantially the same heigth.

3. A package tray according to claims 1 and 2, **characterized** in that it comprises a skirt (14) which extends downwardly on the outer side of the side walls (10) from the upper rim (12) of these.

4. A package tray according to claim 3, **characterized** in that the height of the skirt is greater than that of the side walls.

5. A package tray according to claim 3 or 4, **characterized** in that the height of the skirt (14) is selected such that together with the

central area (4) it rests on a plane, horizontal support when the storage space of the tray is filled with the desired product and the tray is in, the position of rest.

6. A package tray according to claim 3, **characterized** in that the skirt - seen in a vertical section in the position of rest of the tray - extends slightly, e.g. 1-2 mm, downwardly beyond the base when this is unloaded.

7. A package tray according to any of claims 1-6, **characterized** in that the projections (20; 41) have the shape of cones or truncated cones with rounded tops.

8. A package tray according to claim 7, **characterized** in that the area of each top is determined by the surface pressure between the top and the food product part which rests on the top in use being slightly smaller than the pressure which the surface of the food product can resist without being perforated.

9. A package tray according to any of claims 1-8, **characterized** in that the projections (17; 20; 31; 41; 52) are distributed across the base with a mutual distance which does not exceed the transverse dimensions of the respective projections at the foot.

10. A package tray according to any of claims 1-9, **characterized** in that the projections have the same transverse dimensions at the foot.

Patentansprüche

1. Verpackungstablett für flüssigkeitshaltige Lebensmittel wie Fleisch, und das z. B. aus Folie hergestellt ist und einen bei normaler Ruheposition des Tabletts von einem unteren Boden (11; 30; 50) sowie von senkrechten Seitenwünden (10) abgegrenzten Füllraum aufweist, wobei der Boden mit mehreren Vorsprüngen (17; 20; 31; 41) mit aufwürts konvergierenden Wünden versehen ist, dadurch **gekennzeichnet**, dass die Wünde jedes Vorsprungs zur Bildung einer Spitze (19) konvergieren, dass zwischen den Seitenwünden (1O) und dem zentralen Bereich des Bodens (11; 30; 50) eine Zone vorgesehen ist, wo die Hühe der Vorsprünge (17; 20; 31; 41; 52) mit deren Abstand von den Seitenwünden (10) sukzessiv zunimmt, und dass der Boden (11; 30; 50) in dieser Zone zum zentralen Bereich hin einwüts abfült

2. Verpackungstablett nach Anspruch 1, dadurch **gekennzeiet**, dass die Voraprüge im zentralen Bereich im wesentlichen die gleiche Hühe aufweisen

3. Verpackungstablett naeh den Ansprüchen 1 und 2, dadurch **gekennzeichnet**, dass es eine sich vom oberen Rand (12) der Seitenwünde (10) aussenseitig nach unten erstreckende Schürze (14) aufweist,

4. Verpackungstablett nach Anspruch 3, dadurch **gennzeichnet**, dass die Hühe der Schürze grüsser ist als die der Seitenwünde.

5. Verpackungatablett nach Anspruch 3 oder 4, dadurch **gekennzeichnet**, dass die Hühe der Schürze (14) so bemessen ist, daas diese zusammen mit dem zentralen Teil (4) des Bodens auf einer ebenen, waagerechten Unterlage ruht, wenn der Füllraum des Verpackungstabletts mit der gewünschten Ware,gefüllt ist und das Tablett sich in der Ruheposition befindet,

6. Verpeckungstablett nach Anspruch 3, dadurch **gekennzeichnet,** dass die Schürze - im senkrechten Schnitt - in der Ruheposition des Tabletts sich etwas, z. B. 1-2 mm am Boden vorbei nach unten erstreckt.

7. Verpackungstablett nach einem beliebigen der Ansprüche 1-6, dadurch **gekennzeichnet**, dass die orsprünge (20; 41) konisch oder kegelstumpffürmig mit abgerundeter Spitze ausgebildet sind.

8. Verpackungstablett nach Anspruch 7, dadurch **gekennzeichnet,** dass die Flüche des oberen Endes jedes vorsprungs vom Flüchendruck zwischen dem Vorsprung und dem auf dem Vorsprung ruhenden Flächenteil des Lebensmittels bestimmt ist, und dass der Flächendruck etwas niedriger ist als derjenige Druck, dem die Lebensmitteloberflüche ohne Perforation derselben widerstehen kann.

9. Verpackungstablett nach jedem beliebigen der Ansprüche 1-8, dadurch **gekennzeichnet**, dass die Vorsprünge (17; 20; 31; 41; 52) auf dem Boden mit einem gegenseitigen Abstend verteilt sind, der die Querabmessung der betreffenden Vorsprünge am Fuss derselben nicht Ïbersteigt.

10. Verpackungstablett nach jedem beliebigen der Ansprüch 1-9, dadureh **gekennzeichnet**, dass die Vorsprünge am ihrem Fuss die gleichen Querabmessungen aufweisen.

Revendications

1. Plateau d'emballage destiné à des produits alimentaires contenant un liquide, tels que de la viande, fabriqué par exemple en feuille et possédant un espace de stockage qui, lorsque le plateau est en position d'appui normale, est défini vers le bas par une embase (11:30;50) et par des parois latérales (10) droites placées le long des côtés, cette embase étant pourvue d'une pluralité de saillies (17;20;31;41;52) qui possèdent des parois convergant vers le haut, caractérisé en ce que les parois de chacune de ces saillies convergent de manière à réaliser un sommet (19), et en ce que l'embase (11;30:50) possède une zone, située entre les parois latérales (10) et la région centrale, dans laquelle la hauteur des saillies (17;20;31;41;52) s'accroît successivement avec l'éloignement par rapport aux parois latérales (10), et en ce que l'embase (11;30;50) s'incline dans cette zone vers le bas et vers l'intérieur en direction de la région centrale.

2. Plateau d'emballage selon la revendication 1, caractérisé en ce que les saillies de la région centrale possèdent sensiblement la même hauteur.

3. Plateau d'emballage selon les revendications 1 et 2, caractérisé en ce qu'il comprend une jupe (14) qui s'étend vers le bas sur le côté extérieur des parois latérales (10) à partir du rebord supérieur (12) de celle-ci.

4. Plateau d'emballage selon la revendication 3, caractérisé en ce que la hauteur de la jupe est supérieure à celle des parois latérales.

5. Plateau d'emballage selon la revendications 3 ou 4, caractérisé en ce que la hauteur de la jupe (14) est choisie de manière telle qu'avec la région centrale (4), elle est en appui sur un support horizontal plan lorsque l'espace de stockage du plateau est rempli avec le produit désiré et le plateau est en position d'appui.

6. Plateau d'emballage selon la revendication 3, caractérisé en ce que la jupe, vue en coupe verticale lorsque le plateau est en position d'appui, s'étend légèrement, par exemple de 1 à 2 mm, vers le bas au-delà de l'embase lorsque le plateau n'est pas chargé.

7. Plateau d'emballage selon l'une quelconque des revendications 1 à 6, caractérisé en ce que les saillies (20;41) possèdent la forme de cône ou de tronc de cône avec des sommets arrondis.

8. Plateau d'emballage selon la revendication 7, caractérisé en ce que l'aire de chaque sommet est déterminée de sorte que la pression superficielle qui s'exerce entre ce sommet et la partie de produit alimentaire qui appuie sur ce sommet soit légèrement inférieure à la pression que la surface du produit alimentaire peut supporter sans être perforée

9. Plateau d'emballage selon l'une quelconque des revendications 1 à 8, caractérisé en ce que les saillies (17;20;31;41;52) sont disposées sur l'embase avec un espacement mutuel qui n'excède pas les dimensions transversales des saillies respectives au niveau de leur pied.

10. Plateau d'emballage selon l'une quelconque des revendications 1 à 9, caractérisé en ce que les saillies sont de même dimensions transversales au niveau de leur pied.

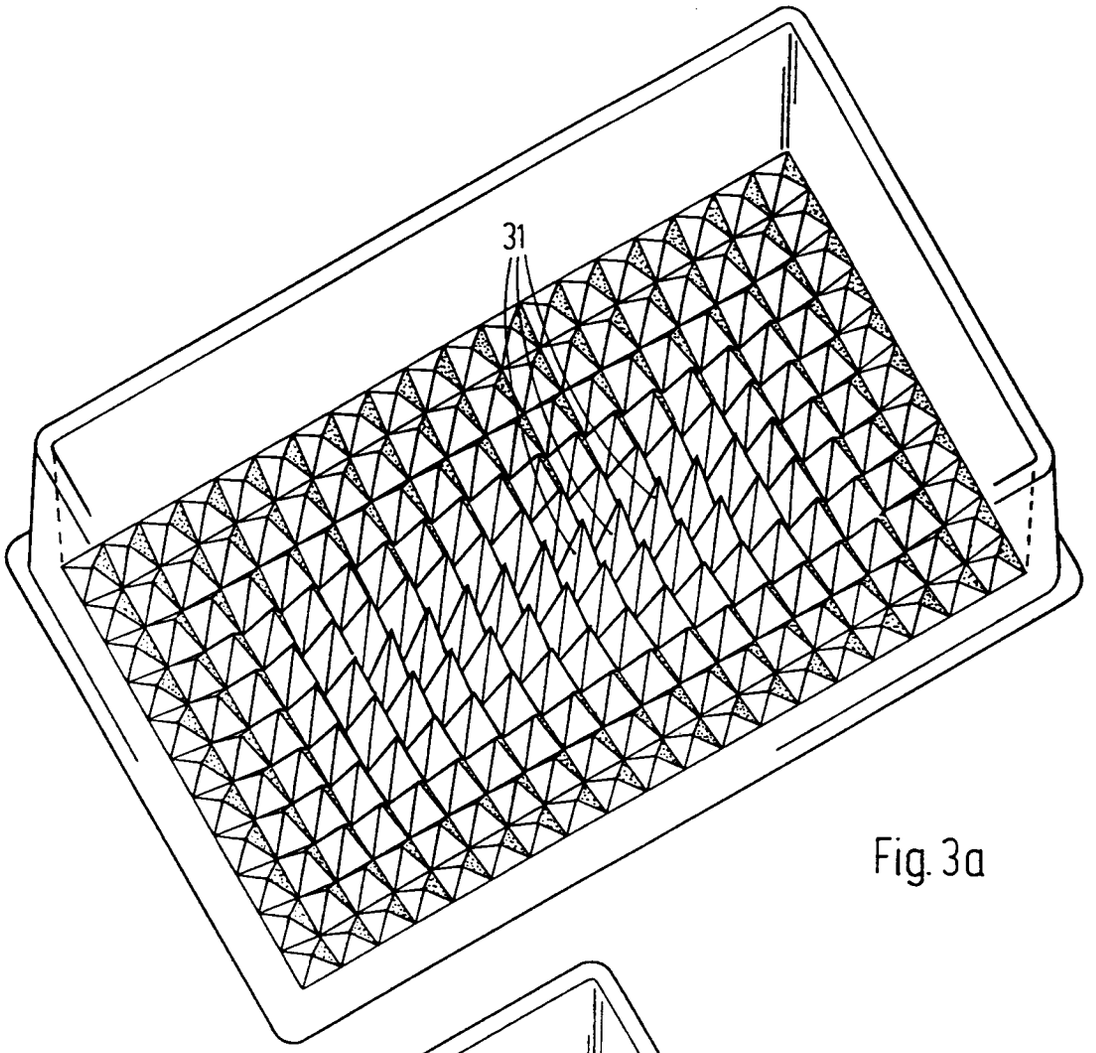

Fig. 3a

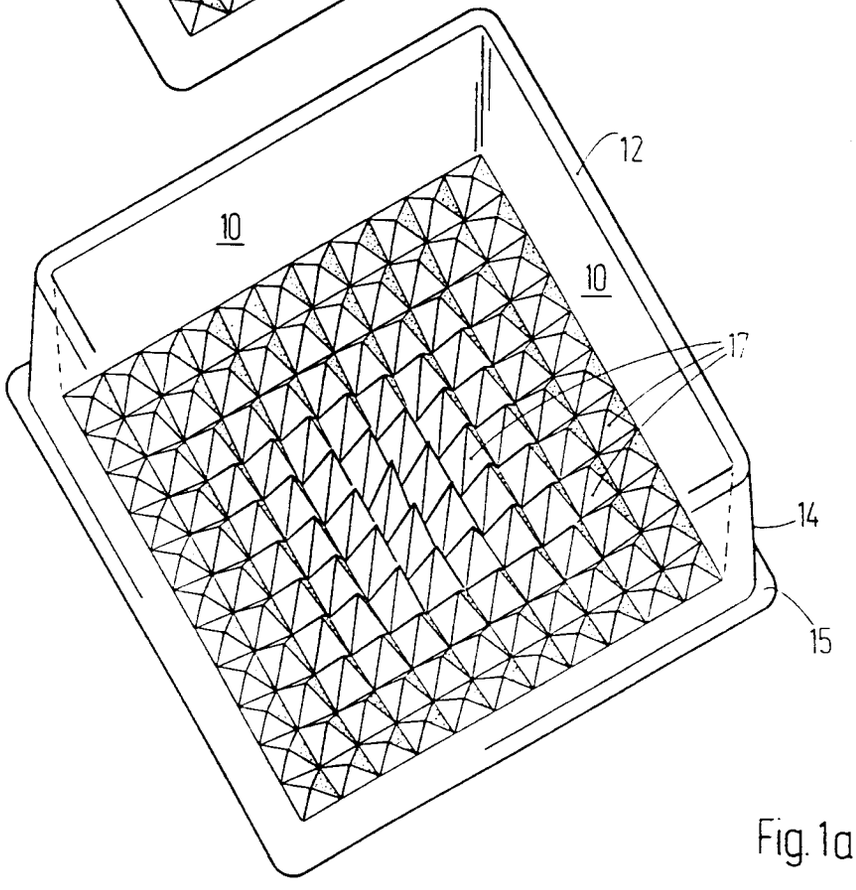

Fig. 1a

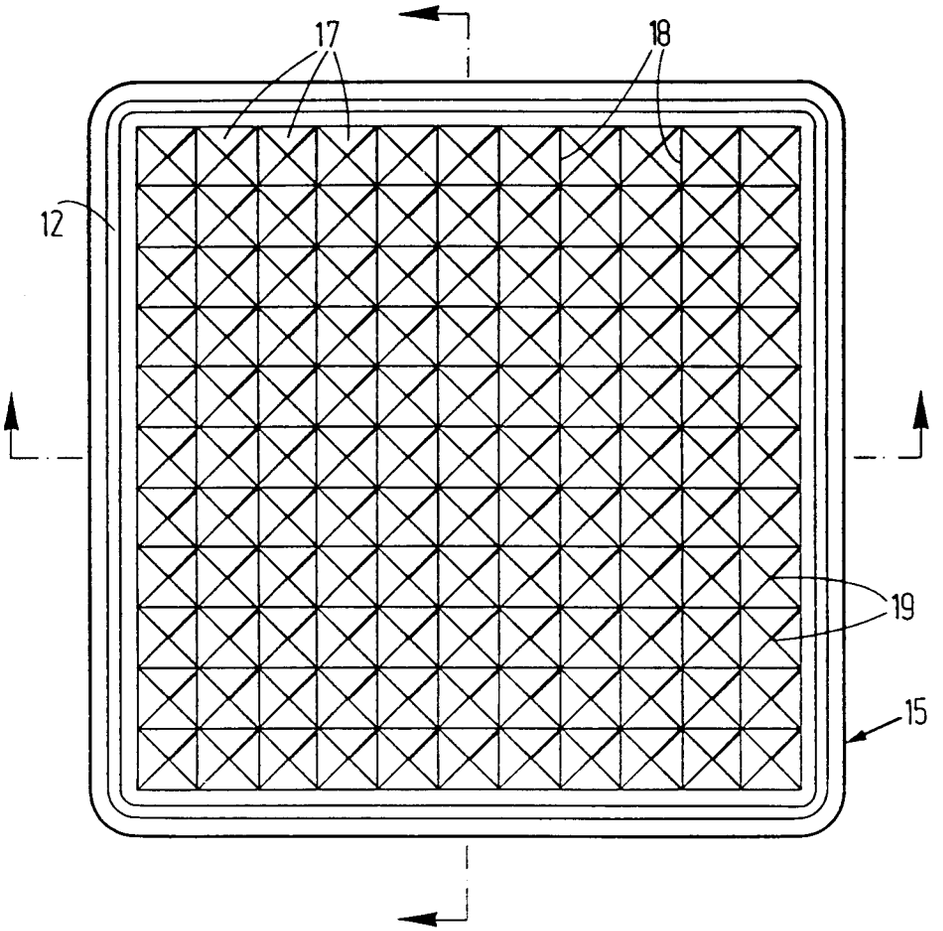

Fig.1b

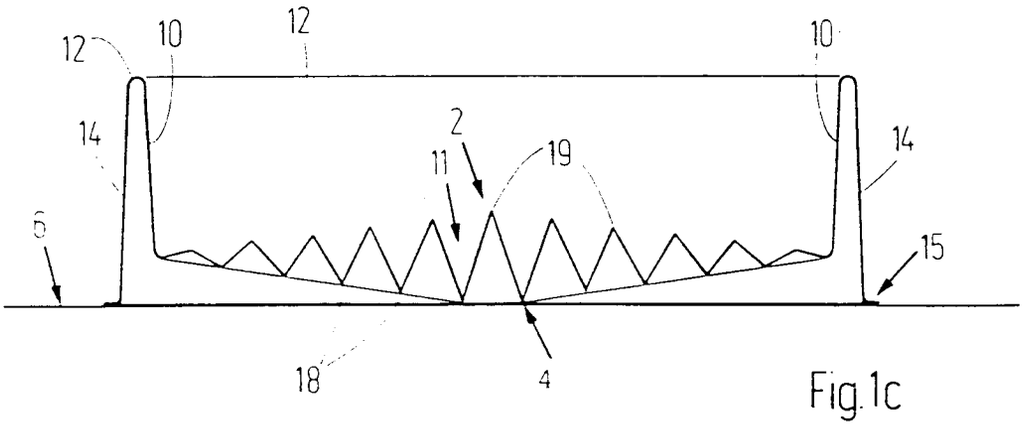

Fig.1c

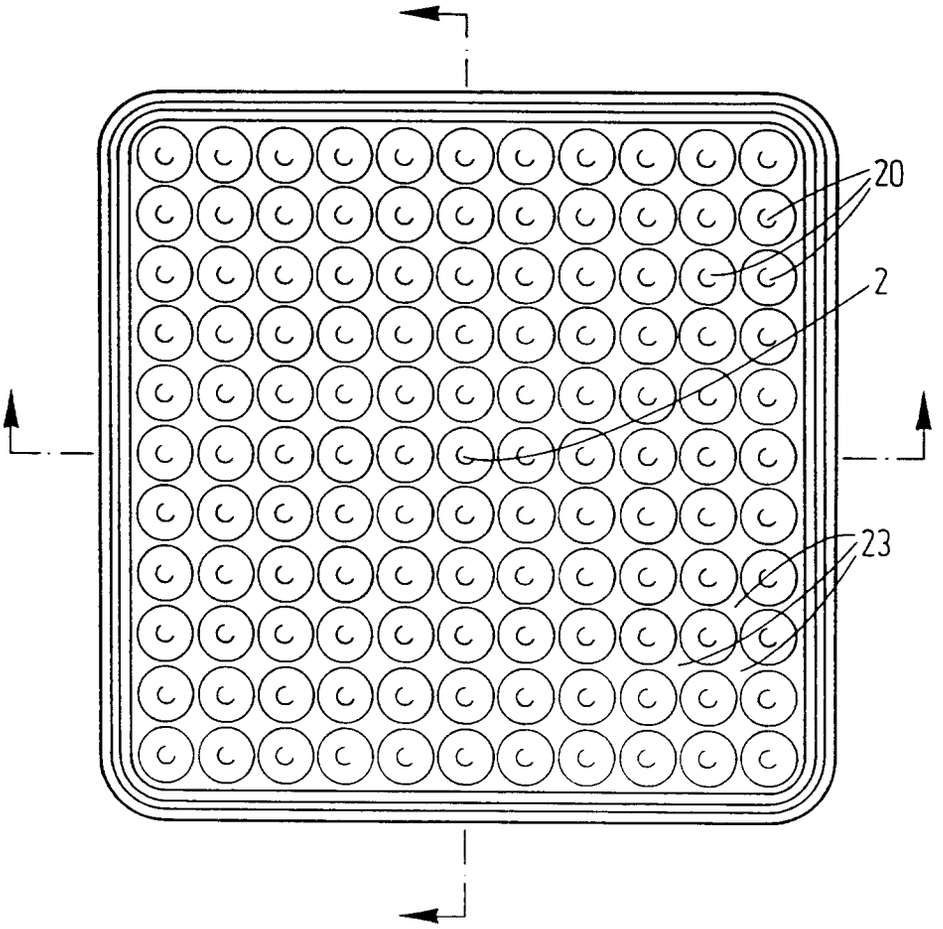

Fig. 2a

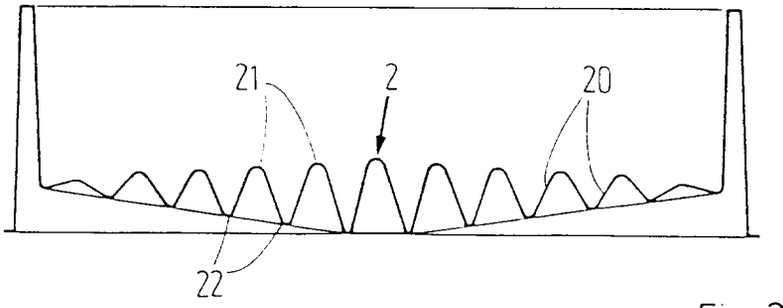

Fig. 2b

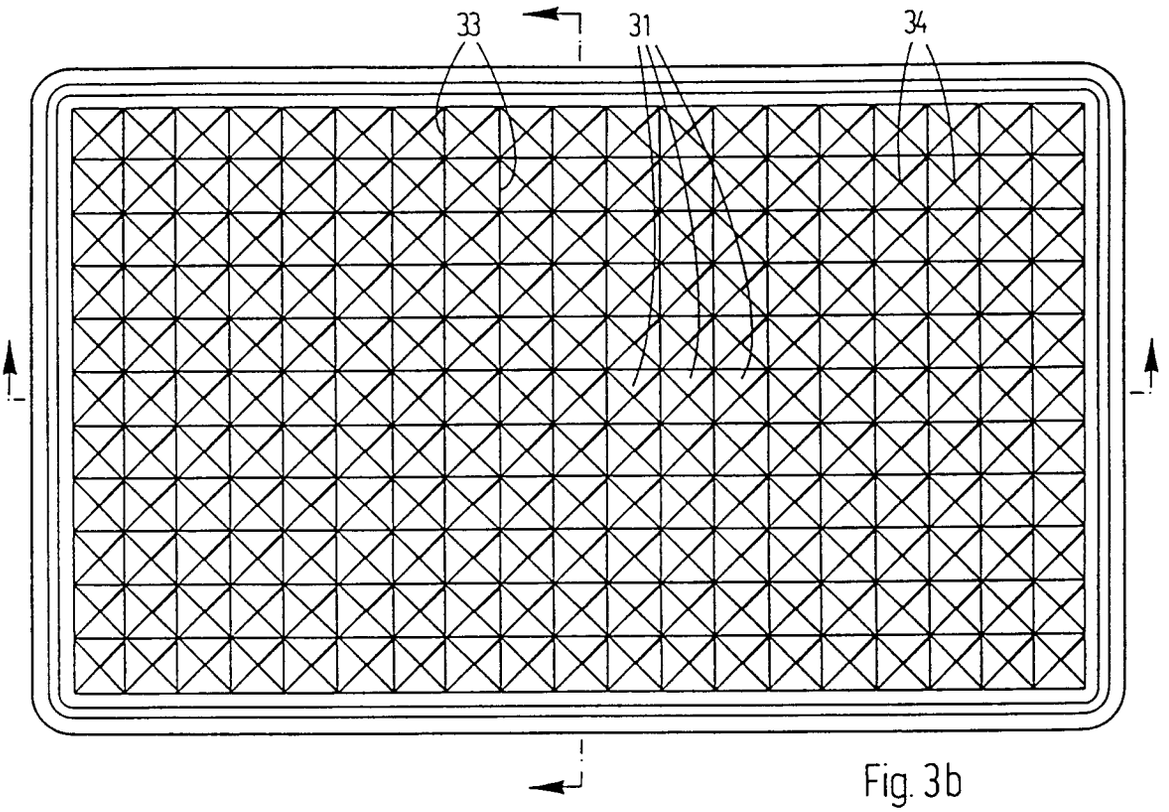

Fig. 3b

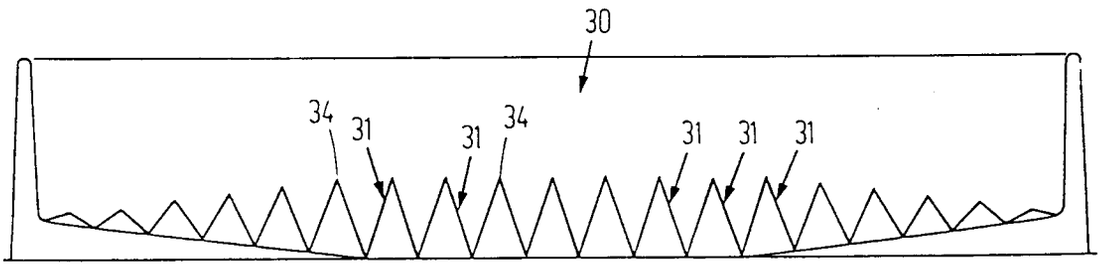

Fig. 3c

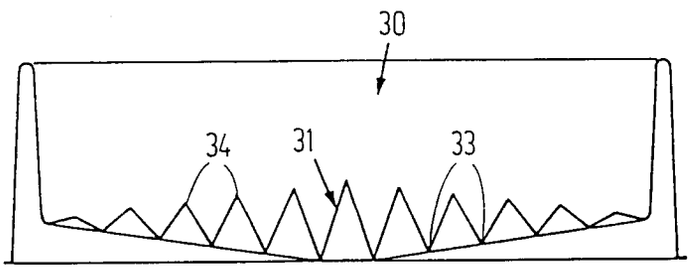

Fig. 3d

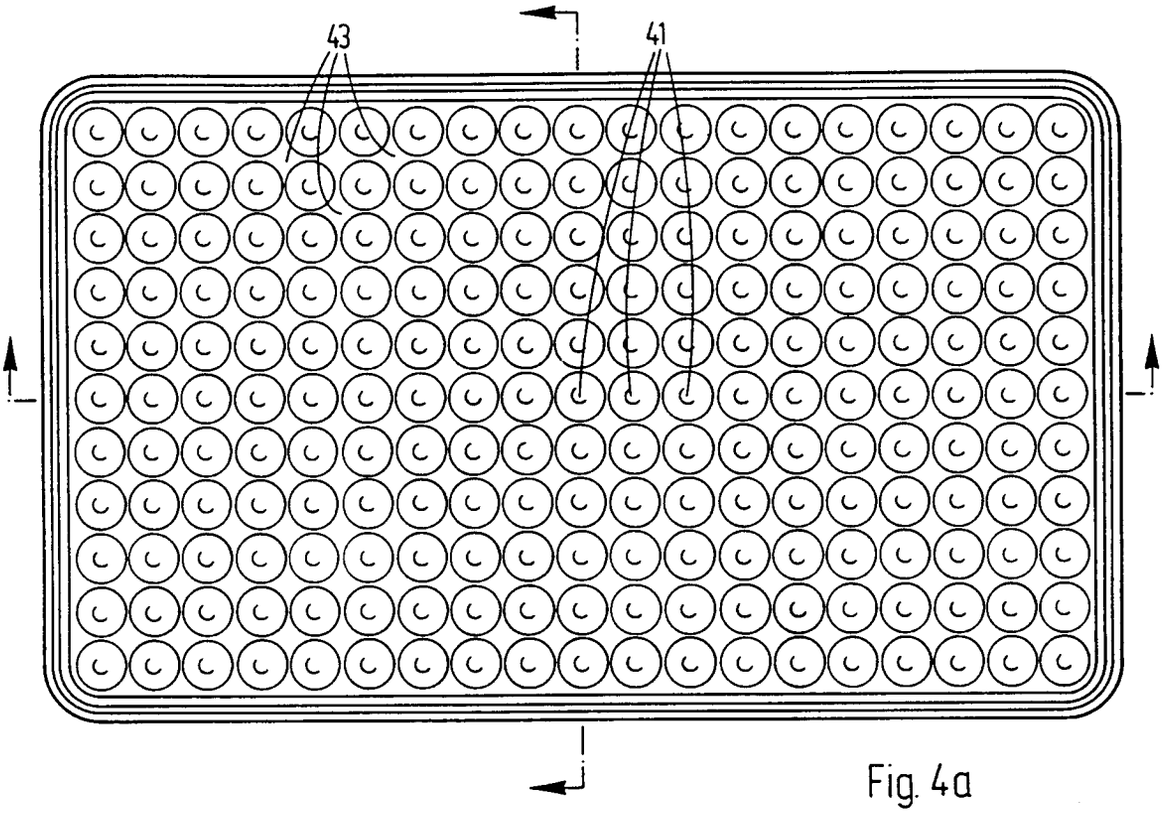

Fig. 4a

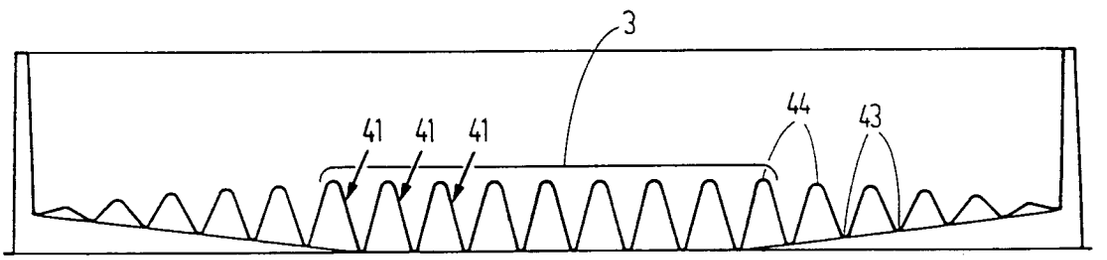

Fig. 4b

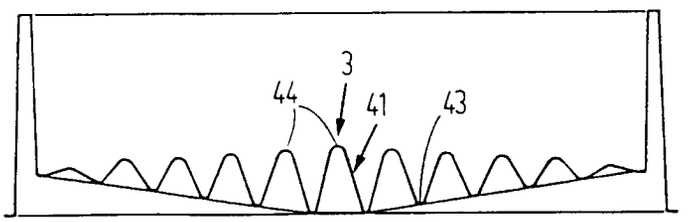

Fig. 4c

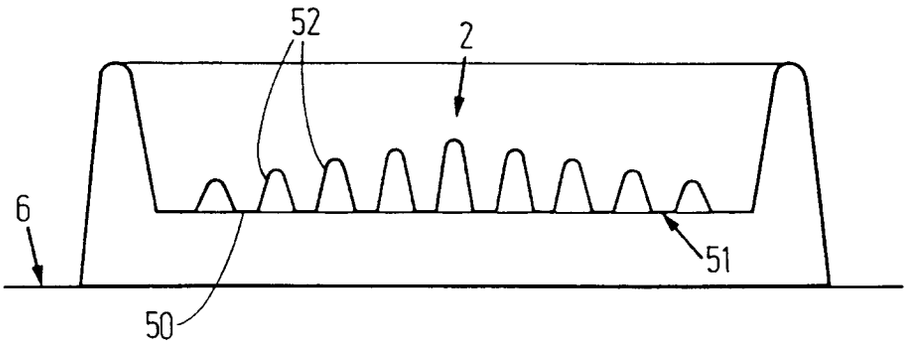

Fig. 5a

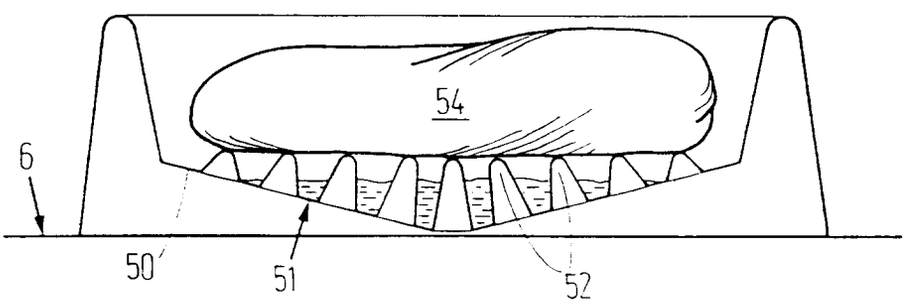

Fig. 5b