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(11) **EP 1 554 195 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
22.11.2006 Bulletin 2006/47

(21) Application number: **03759077.5**

(22) Date of filing: **23.10.2003**

(51) Int Cl.:
B65D 85/32 (2006.01)

(86) International application number:
PCT/NL2003/000719

(87) International publication number:
WO 2004/037678 (06.05.2004 Gazette 2004/19)

(54) **EGG TRAY**

EIERTRAGPLATTE

EMBALLAGE A OEUFS

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR**

(30) Priority: **23.10.2002 NL 1021727**

(43) Date of publication of application:
20.07.2005 Bulletin 2005/29

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Description

[0001] The present invention relates to an egg tray according to the preamble of claim 1.

[0002] Such an egg tray is known from US-A-2 662 659.

[0003] A further egg tray or egg pack is known from GB 1086941. In this case the pockets are provided with ribs in their side walls. These ribs serve to prevent packs in the stack from sticking together during the transportation of packs without eggs. Furthermore, these ribs give further strength and are in contact with the eggs in such a way that the latter are situated at some distance from the wall.

[0004] These days increasingly high requirements are being set for the strength of egg packs. The aim is to place as many packs as possible on top of one another. This applies in particular to stacking on pallets. A current requirement is for six trays each filled with eggs to be stacked on top of one another, after which an intermediate layer (in general made of cardboard) is placed, and this is followed by a new layer of six trays stacked on top of one another. At the present time a height of four layers of six trays each time is possible. However, the pressure on the bottom trays is great, and is found soon to cause collapse, resulting in the eggs being damaged and broken.

[0005] It is known from the prior art to reinforce the projections or the ribs by adding chemicals during the process of making the egg packs from molded cardboard. Examples of such chemicals are starch (modified or otherwise), wet strength agents, guar gum and dry strength agents.

[0006] It has, however, been found that these additions are either expensive or inadequate. The strength is considerably reduced at high air humidity in particular.

[0007] This problem would be simple to solve by locally increasing the wall thickness of the molded fibrous material. However, this increases the weight of the pack. For that reason, such a simple increase in the wall thickness is not acceptable in the market.

[0008] It is also found that the reinforcing ribs of the type described in British Patent 1086941 do not give sufficient strength to prevent trays stacked on top of one another from also collapsing when there is a high load. These ribs are placed on the walls as "additional" material. In other words, at the position of the ribs the wall thickness is greater, which involves additional material use.

[0009] It is the object of the present invention to avoid this disadvantage and to provide an egg tray by means of which it is possible to achieve substantial stacks filled with eggs.

[0010] This object is achieved in the case of an egg tray having the features of claim 1.

[0011] Such reinforcing ribs must be distinguished from concave or convex parts for supporting eggs. Such parts are disclosed in, for example, FR 11 72 220A. Ow-

ing to their relatively great "width", they do not provide reinforcement. For the latter, "sharper" ribs are required, which on contact with the egg would damage it. The polygonal body of revolution described above corresponds to an egg to be placed in the carton.

[0012] It has been found according to the invention that if the end face of the pockets in which the eggs are placed is provided with ribs internally or externally, the compression strength of the pack or cartons increases considerably.

[0013] During the formation of the ribs as an additional thickening, hardly any more material is required, while the production costs (heating costs) barely increase.

[0014] As indicated above, the reinforcing ribs for obtaining the increase in strength are of a "sharp" design. In other words, they have a relatively low thickness, which is preferably less than double the average material thickness of the egg tray. More particularly, this thickness is less than 4 mm, and more particularly is less than 3 mm. This means that a considerable reinforcement between end face and side face can be obtained.

[0015] According to an advantageous embodiment of the invention, the reinforcing ribs comprise indentations. That means that to the extent to which the ribs project inward into the pockets or project outward out of the pockets a corresponding opening is provided in the opposite wall of the end face. In other words, the wall thickness remains substantially uniform. This means that there is little or no increase in material used for increasing the strength.

[0016] According to an advantageous embodiment of the invention, the reinforcing ribs are provided on the inside of the pockets. Furthermore, according to an advantageous embodiment of the invention, these reinforcing ribs extend not only over the end face, but also into the adjacent side wall. In other words, a sort of strut is obtained between side wall and end wall.

[0017] According to an advantageous embodiment of the invention, the projections of the egg tray merge on its underside into the pockets, and side faces are always placed between two projections, and the reinforcing ribs extend from the centre of said side faces. If the pocket is bounded by four projections, four reinforcing ribs are present.

[0018] The ribs preferably extend over at least a quarter of the end face of the pockets. If the ribs also extend over the side face between the projections, according to an advantageous embodiment these ribs extend over at least one third, and more particularly at least half the height of said side faces.

[0019] It will be understood that special adaptations are present near the edge of the egg tray, in which case the projections are generally only partially present.

[0020] The invention will be explained in greater detail below with reference to an exemplary embodiment illustrated in the drawings, in which:

Fig. 1 shows very diagrammatically in perspective

an egg tray according to the present invention;
 Fig. 2 shows, partly cut away, a detail of the construction according to Fig. 1;
 Fig. 3 shows a detail of the underside of the tray shown in Figs. 1 and 2; and
 Fig. 4 shows diagrammatically the positioning of an egg and the reinforcing ribs according to the invention.

[0021] The egg tray according to the present invention is shown by reference numeral 1 in Fig. 1. This egg tray is to be filled with eggs 2. The tray consists of a number of projections 3. A pocket 4 is bounded between four projections 3. Side faces are situated between the projections. These side faces are indicated by 5 (the transverse wall) and 6 (longitudinal wall). An end face 7 is bounded on the underside of the projections or pocket 4. The projections are provided with a supporting face 9 on the top side. In the in-use positions filled trays are placed on top of one another. By always turning the trays a quarter turn relative to each other, stacking is possible and the end face 7 of the one tray comes into contact with the supporting face 9 of the following tray. If a large number of trays are placed on top of one another, the load on the supporting faces and end faces increases. It has been found that in particular the load on the end faces of the pockets 4 is great. Reference numeral 15 indicates the concave faces on which the egg rests. These are relatively broad faces that provide an optimum contact face between egg and pack, for the purpose of transferring loads on the egg to the pack by way of as large a surface as possible, in order to prevent breakage.

[0022] In order to increase the strength of the trays without supplying additional material, it is proposed according to the invention to provide ribs 8. These ribs 8 extend, as can be seen from Fig. 2, both in the transverse walls 5 and longitudinal walls 6 respectively and in the end face 7. In Figure 2 the total height of the transverse wall 5 and longitudinal wall 6 respectively is indicated by h, and the height of the rib 8 is indicated by a. It is found that this height is approximately half the height h.

[0023] The width of the end face is indicated by b, and the distance over which the rib 8 extends is indicated by c. It is found that c is greater than a quarter of b.

[0024] The thickness of the reinforcing rib at its end face is indicated by d. Said thickness is less than 4 mm, and is preferably approximately 3 mm, in other words approximately double the average wall thickness of the egg tray. After the boundary with the wall of the egg tray, the interior of the reinforcing rib will be hollow. After its free end, away from the wall, the rib will be relatively solid in its interior.

[0025] The underside of the tray is shown in Fig. 3. It can be seen from this figure that at the position of the ribs 8 indentations 19 are made on the side lying opposite. In other words, the ribs are not simply achieved by applying more material, but by a radical change in the design of the inside shape of the pocket.

[0026] Fig. 4 shows the positioning of an egg relative to the reinforcing rib. It can be seen from this figure that the egg rests upon the concave faces, as shown in Figs. 1 and 2, and lies at some distance from the reinforcing rib, since the reinforcing rib is so "sharp" that contact with the egg would probably lead to breakage.

[0027] Although the invention is described above with reference to a preferred embodiment, the person skilled in the art will understand that numerous modifications can be made to it without going beyond the scope of the appended claims.

Claims

1. Egg tray (1) made of molded paper material, comprising a number of pockets (4) for accommodating eggs (2), and projections (3) extending upward from said pockets in the in-use position, which projections at their free ends are provided with a supporting face (9) for supporting a further egg tray, and which pockets comprise a side wall and an end face (7), said end face (7) being embodied to rest upon the supporting face of a following tray, and said side walls comprise a concave part for supporting eggs, **characterized in that** said pockets are provided with reinforcing ribs (8) extending in said end face (7) from said side wall into said end face and are designed in such a way that they lie outside the boundary of an egg-shaped body of revolution that touches said concave parts (15).
2. Egg tray as claimed in claim 1, wherein on the accommodation side of said pocket said reinforcing ribs (8) extend into said end face (7).
3. Egg tray as claimed in one of the preceding claims, wherein said pocket (4) is bounded between four projections (3) and a side face (5, 6) always extends between two projections, and wherein said reinforcing ribs are provided substantially in the center of said side face, in other words between said projections.
4. Egg tray as claimed in one of the preceding claims, wherein the wall face lying opposite the wall face from which the reinforcing ribs (8) project is provided with a recess.
5. Egg tray as claimed in claim 4, wherein the wall thickness of said reinforcing ribs (8) substantially corresponds to the wall thickness of the remaining part of said pocket.
6. Egg tray as claimed in one of the preceding claims, comprising four reinforcing ribs (8).
7. Egg tray as claimed in one of the preceding claims,

wherein said reinforcing ribs extend from at least one third (a) of the height (h) of said side walls to at least a quarter (c) of the width (b) of the end face.

8. Egg tray as claimed in claim 7, wherein said reinforcing ribs (8) extend from at least half (a) the height (h) of said side walls.
9. Egg tray as claimed in one of the preceding claims, wherein said reinforcing ribs (8) are sharp ribs.
10. Egg tray as claimed in claim 9, wherein near their free end the thickness (d) of the reinforcing ribs (8) is at least twice the average wall thickness of said egg tray.
11. Egg tray as claimed in claim 10, wherein said thickness (d) is less than 4 mm.

Patentansprüche

1. Eiertragpalette bzw. -platte (1), die aus geformtem Papiermaterial hergestellt ist, umfassend eine Anzahl von Taschen (4) zum Aufnehmen von Eiern (2) und Vorsprüngen bzw. Erhebungen (3), die sich nach oben von den Taschen in der Benutzungsposition erstrecken, wobei die Vorsprünge an ihren freien Enden mit einer abstützenden bzw. Unterstützungsfläche (9) versehen sind, um eine weitere Eiertragplatte zu unterstützen, und wobei die Taschen eine Seitenwand und eine Endfläche (7) umfassen, wobei die Endfläche (7) ausgebildet ist, um auf der Support- bzw. Unterstützungsfläche einer nachfolgenden Platte aufzuruhen, und wobei die Seitenwände ein konkaves Teil zum Unterstützen von Eiern umfassen, **dadurch gekennzeichnet, daß** die Taschen mit verstärkenden bzw. Verstärkungsrippen (8) versehen sind, die sich in der Endfläche (7) von der Seitenwand in die Endfläche erstrecken und in einer derartigen Weise ausgebildet sind, daß sie außerhalb der Grenze eines eiförmigen Rotationskörpers liegen, welcher die konkaven Teile (15) berührt.
2. Eiertragplatte nach Anspruch 1, wobei auf der Aufnahme­seite der Tasche sich die Verstärkungsrippen (8) in die Endfläche (7) erstrecken.
3. Eiertragplatte nach einem der vorhergehenden Ansprüche, wobei die Tasche (4) zwischen vier Vorsprüngen (3) und einer Seitenfläche (5, 6) begrenzt ist, die sich immer zwischen zwei Vorsprüngen erstreckt, und wobei die Verstärkungsrippen im wesentlichen in der Mitte der Seitenfläche, in anderen Worten zwischen den Vorsprüngen angeordnet sind.

4. Eiertragplatte nach einem der vorhergehenden Ansprüche, wobei die Wandseite, die gegenüberliegend der Wandseite liegt, von welcher die Verstärkungsrippen (8) vorragen, mit einer Ausnehmung bzw. Vertiefung versehen ist.
5. Eiertragplatte nach Anspruch 4, wobei die Wandstärke bzw. -dicke der Verstärkungsrippen (8) im wesentlichen der Wandstärke des verbleibenden Teils der Tasche entspricht.
6. Eiertragplatte nach einem der vorhergehenden Ansprüche, umfassend vier Verstärkungsrippen (8).
7. Eiertragplatte nach einem der vorhergehenden Ansprüche, wobei sich die Verstärkungsrippen von wenigstens einem Drittel (a) der Höhe (h) der Seitenwände bis zu wenigstens einem Viertel (c) der Breite (b) der Endfläche erstrecken.
8. Eiertragplatte nach Anspruch 7, wobei sich die Verstärkungsrippen (8) von wenigstens einer Hälfte (a) der Höhe (h) der Seitenwände erstrecken.
9. Eiertragplatte nach einem der vorhergehenden Ansprüche, wobei die Verstärkungsrippen (8) scharfe Rippen sind.
10. Eiertragplatte nach Anspruch 9, wobei nahe ihrem freien Ende die Dicke (d) der Verstärkungsrippen (8) wenigstens das Doppelte der mittleren Wanddicke der Eiertragplatte ist.
11. Eiertragplatte nach Anspruch 10, wobei die Dicke (d) weniger als 4 mm ist.

Revendications

1. Plateau à oeufs (1) constitué d'un matériau de type papier, moulé, comprenant un certain nombre de poches (4) pour recevoir des oeufs (2), et des parties saillantes (3) s'étendant vers le haut depuis lesdites poches dans la position d'utilisation, lesquelles parties saillantes sont pourvues, à leur extrémité libre, d'une face de support (9) pour supporter un autre plateau à oeufs, et lesquelles poches ont une paroi latérale et une face d'extrémité (7), ladite face d'extrémité (7) étant façonnée de manière à reposer sur la face de support d'un plateau suivant, et lesdites parois latérales comprennent une partie concave pour supporter les oeufs, **caractérisé en ce que** lesdites poches sont pourvues de nervures de renfort (8) s'étendant dans ladite face d'extrémité (7), depuis ladite paroi latérale jusque dans ladite face d'extrémité, et conçues de telle sorte qu'elles se trouvent à l'extérieur du pourtour d'un corps de révolution en forme d'oeuf touchant lesdites parties concaves

(15).

2. Plateau à oeufs selon la revendication 1, dans lequel, sur le côté réception desdites poches, lesdites nervures (8) s'étendent jusqu'à ladite face d'extrémité (7). 5
3. Plateau à oeufs selon l'une des revendications précédentes, dans lequel ladite poche (4) est délimitée par quatre parties saillantes (3), et il y a toujours une face latérale (5, 6) qui s'étend entre deux parties saillantes, et dans lequel lesdites nervures de renfort sont formées essentiellement au centre de ladite face latérale, en d'autres termes, entre lesdites parties saillantes. 10 15
4. Plateau à oeufs selon l'une des revendications précédentes, dans lequel la face de paroi se trouvant en regard de la face de paroi d'où font saillie les nervures de renfort (8) est pourvue d'un creux. 20
5. Plateau à oeufs selon la revendication 4, dans lequel l'épaisseur de la paroi desdites nervures de renfort (8) correspond essentiellement à l'épaisseur de la paroi du restant de ladite poche. 25
6. Plateau à oeufs selon l'une des revendications précédentes, comprenant quatre nervures de renfort (8). 30
7. Plateau à oeufs selon l'une des revendications précédentes, dans lequel lesdites nervures de renfort s'étendent depuis une position située à au moins un tiers (a) de la hauteur (h) desdites parois latérales jusqu'à une position située à au moins un quart (c) de la largeur (b) de la face d'extrémité. 35
8. Plateau à oeufs selon la revendication 7, dans lequel lesdites nervures de renfort (8) s'étendent depuis au moins la moitié (a) de la hauteur (h) desdites parois latérales. 40
9. Plateau à oeufs selon l'une des revendications précédentes, dans lequel lesdites nervures de renfort (8) sont des nervures pointues. 45
10. Plateau à oeufs selon la revendication 9, dans lequel, à proximité de leur extrémité libre, l'épaisseur (d) des nervures de renfort (8) est égale à au moins deux fois l'épaisseur moyenne de paroi dudit plateau à oeufs. 50
11. Plateau à oeufs selon la revendication 10, dans lequel ladite épaisseur (d) est inférieure à 4 mm. 55

Fig 1

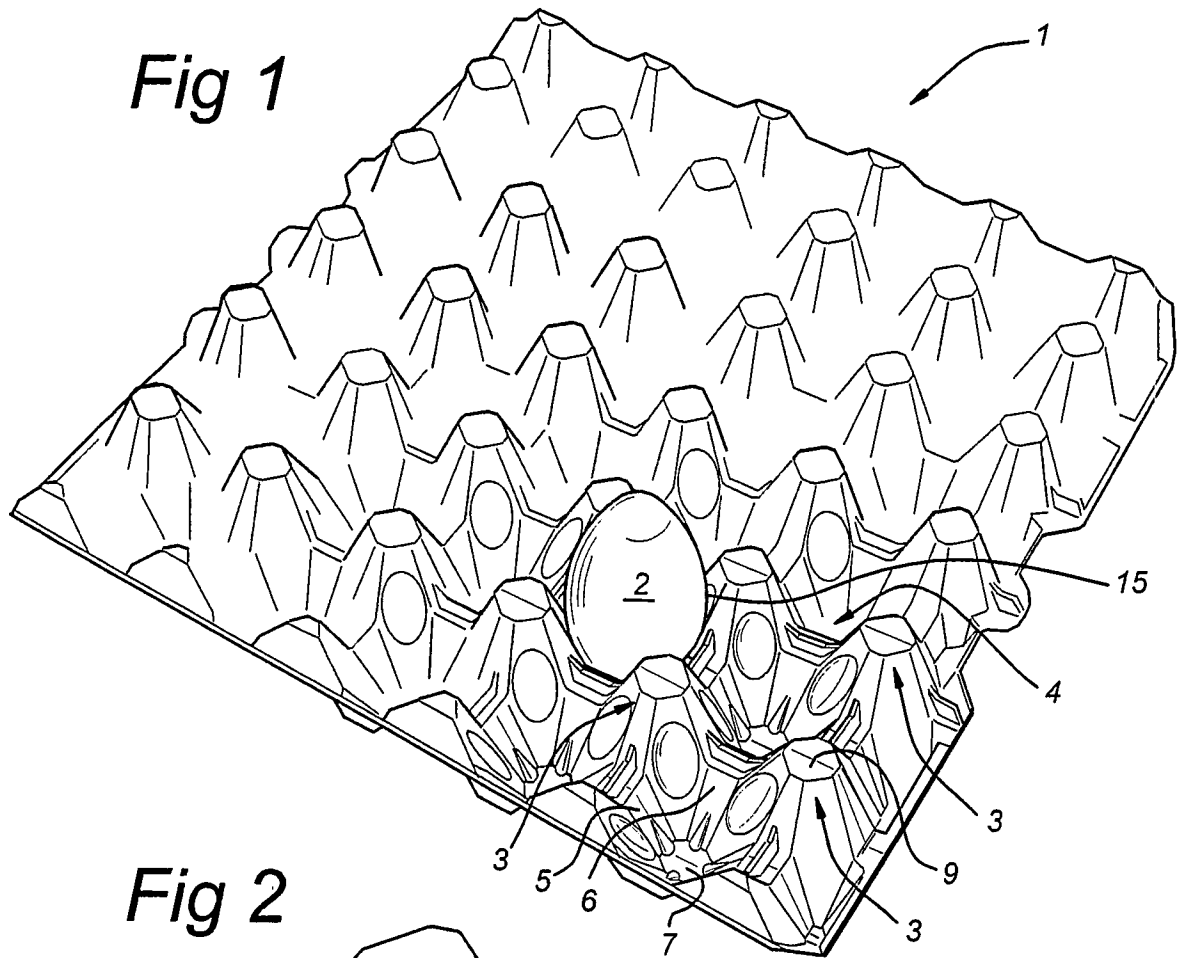


Fig 2

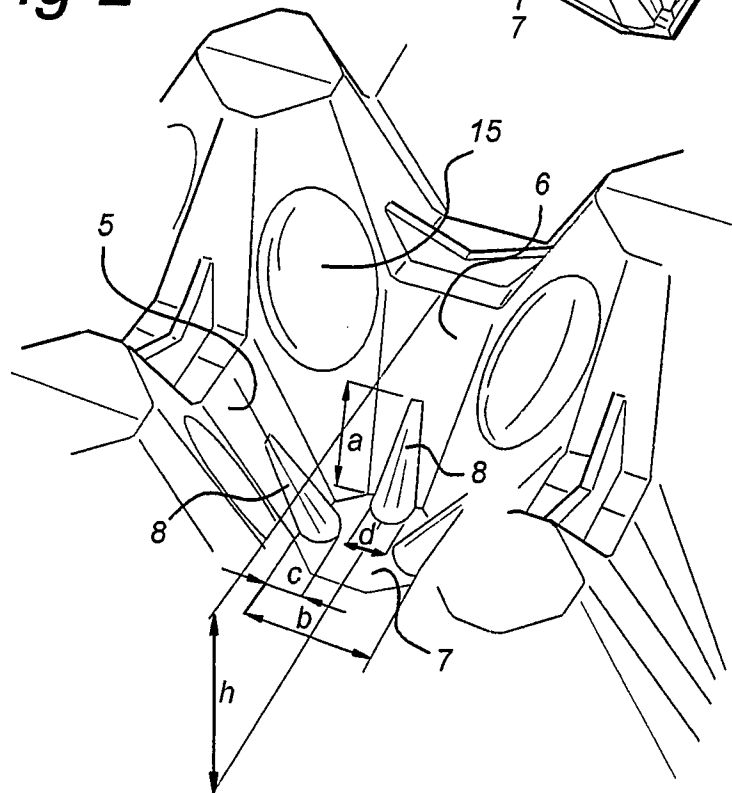


Fig 3

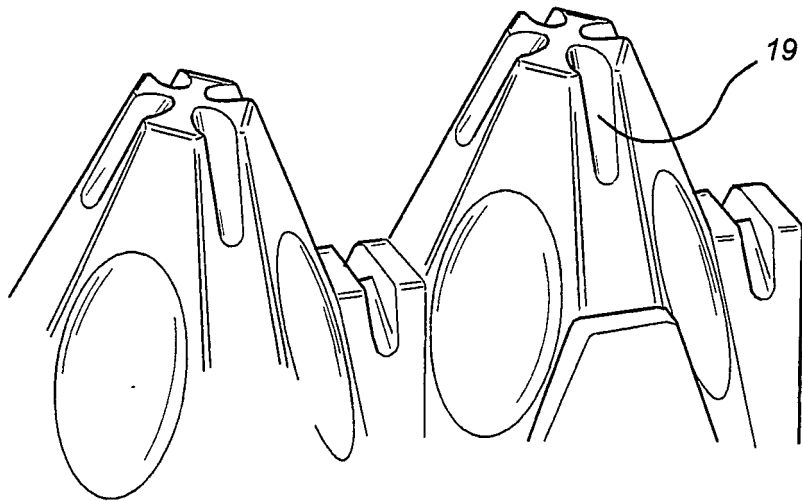


Fig 4

