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(71) Applicant: **Brødrene Hartmann A/S**
2820 Gentofte (DK)

(72) Inventors:
- **Mascheck, Andreas**
16303 Schwedt/Oder (DE)
- **Hahn, Jacob**
6270 Tønder (DK)
- **Rasmussen, Torben**
2765 Smørum (DK)

(74) Representative: **Roerboel, Leif**
Budde Schou A/S
Vester Søgade 10
1601 Copenhagen V (DK)

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(54) Egg package

(57) The invention pertains to an egg package 2 formed by suction moulding of a fibrous material. The egg package 2 comprises a bottom part 4 with a plurality of egg-receiving compartments 8 having non-planar side surfaces 10 so as to match at least partially the outer contours of an egg. The plurality of compartments 8 are arranged in parallel rows with upwardly extending projections 12 located between the rows of compartments 8, the upwardly extending projections (12) defining a slip angle. The egg package 2 also comprises a cover part 6 connected to the bottom part 4 by a hinge 14 so as to allow the cover part 6 to move between an open position and a closed position. The bottom part 4 and cover part 6 are so constructed that the inner and outer surfaces of the bottom part 4 as well as the inner surfaces and outer surfaces of the cover part 6 are complementary, so that when the egg package 2 is fully open it may be nested with other, identical egg packages 2 for shipment and/or storage. The cover part 6 has downwardly extending projections 16 being so formed and arranged relative to each other that they 16 are disposed substantially adjacent to the top 18 of the upwardly extending projections 12 of the bottom part 4 when the cover 6 is in the closed position. The slip angle defined by the upwardly extending projections 12 of the bottom part 4 permits a nesting distance, to other identical egg packages 2 that is smaller than standard nesting distance, especially smaller than 11 mm.

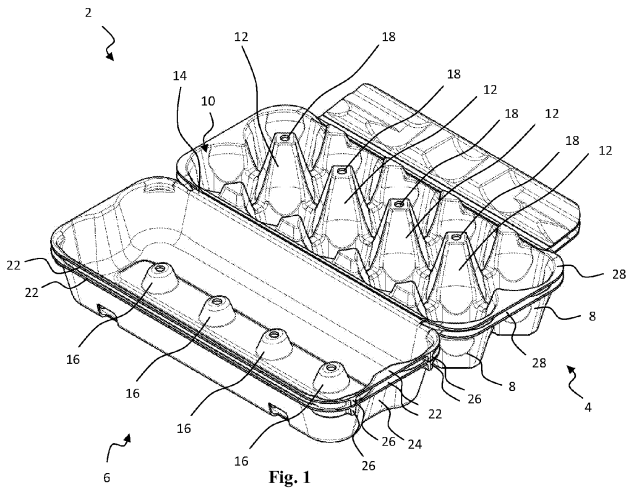

Fig. 1

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Description

TECHNICAL FIELD

[0001] The present invention pertains to an egg package of the kind set forth in the preamble of claim 1.

BACKGROUND OF THE INVENTION

[0002] Packages of the above kind, i.e. egg packages formed by suction moulding of a fibrous material are known in within the art. Among these a large number of different packages have been described. Such packages generally comprise a bottom part with a plurality of egg-receiving compartments. The plurality of egg receiving compartments is usually arranged in at least two parallel rows. The bottom part is often hingedly connected to a cover part so as to allow the cover part to move between an open position and a closed position. There is, furthermore, usually provided a number of upwardly extending projections located between the rows of compartments in order to provide support for the cover, when it is in the closed position.

[0003] Mostly, the bottom part and cover part are being so constructed that the inner and outer surfaces of the bottom part as well as the inner surfaces and outer surfaces of the cover part are complementary, so that when the egg package is fully open it may be nested with other, identical egg packages for shipment and/or storage. Usually, the egg packages are formed in such a way, that one fully open egg package fits within the egg package immediately preceding it in a stack. This kind of stacking of egg packages is a very compact way of stacking them together, and it is this way of stacking them together that is usually referred to as nesting.

[0004] The distance between similar features of two immediately consecutive egg packages in the stack is referred to as the nesting distance. The nesting distance thus poses a limit on how many egg packages that may be placed in a stack of a given height.

[0005] De-nesting of the egg packages in the stack is usually mechanically handled by a machine, in conjunction with packaging of eggs. By de-nesting is simply understood the separation of egg packages that are nested together. De-nesting is as mentioned usually performed by a machine, - a so called de-nesting machine, which can handle huge amounts of egg packages in a much shorter time than is possible if the de-nesting was performed by human operator.

[0006] In the known egg packages, the nesting distance cannot be made arbitrarily small without compromising the de-nesting. This is partly due to the vacuum effect that is created when two closely spaced objects are separated from each other. Since, egg packages made by suction moulding of a fibrous material exhibit certain softness or deformability; this vacuum effect may lead to an improper interaction between the mechanical features of the de-nesting machine and the egg packages to be de-nested.

[0007] Egg packages of the above mentioned kind are manufactured and handled in huge numbers. Thus, the ease at how they may be handled is a critical for the value of the egg packages. Especially, the ability for the egg package to be de-nested quickly and freely, for example onto factory conveying equipment, repeatedly and without error is a very important factor in the cost effective and efficient use of the egg packages.

[0008] For many decades, at least the past 50 to 70 years it has been customary to use egg packages that have certain outer dimensions that are adapted to fit snugly into storage, and display containers or shelves in supermarkets. Furthermore, it has been customary to provide the egg packages with a nesting distance of 11 mm. for at least as long a time. This implies that for many decades all the existing de-nesting machines used in conjunction with the packaging of eggs are configured to handle huge number of egg packages that are nested together at a nesting distance of 11 mm., which nesting distance therefore has become a de-facto standard for egg packages of the above mentioned kind.

[0009] However, despite this de-facto standard, it is highly desirable to provide an egg package with a smaller nesting distance that at the same time may be de-nested without error by a machine, because it would then be possible to both transport, and store more egg packages in a given transport or storage volume, and facilitate an efficient usage of the egg packages at a packaging facility.

SUMMARY OF THE INVENTION

[0010] It is thus an object of the present invention to provide an egg package that allows for a reduced nesting distance and at the same time allows for proper mechanical machine handled de-nesting.

[0011] According to the present invention, the above-mentioned and other objects are fulfilled by an egg package formed by suction moulding of a fibrous material, the egg package comprising the following main parts:

- a bottom part comprising a plurality of egg-receiving compartments having non-planar side surfaces so as to match at least partially the outer contours of an egg, the plurality of compartments being arranged in at least two parallel rows and upwardly extending projections located between the rows of compartments, the upwardly extending projections defining a slip angle,

- a cover part being connected to the bottom part by a hinge so as to allow the cover part to move between an open position and a closed position,

- the bottom part and cover part being so constructed that the inner and outer surfaces of the bottom part as well as the inner surfaces and outer surfaces of

the cover part are complementary, so that when the egg package is fully open it may be nested with other, identical egg packages for shipment and/or storage,

- wherein the cover part has downwardly extending projections being so formed and arranged relative to each other that they are disposed substantially adjacent to the top of the upwardly extending projections of the bottom part when the cover is in the closed position, and

- wherein the slip angle defined by the upwardly extending projections of the bottom part permits a nesting distance, to other identical egg packages that is smaller than standard nesting distance.

[0012] When manufacturing egg packages, a number of factors constrains or limits the freedom of the design. These factors are, among other, that the egg receiving compartments must be of such a size and shape so as to accommodate a standard egg. Additionally, the outer dimensions of the egg package must be of such a size and shape so as to be used in standard egg packaging machines presently used in the industry.

[0013] The cover of an egg package of the above mentioned kind, i.e. one that is made by suction moulding of a fibrous material, is usually too soft to support layers of additional egg packages, filled with eggs, on top of each other. Without the upwardly extending projections located between the rows of compartments to support the cover when the egg package is closed, the weight of the additional egg filled egg packages will rest on the eggs of the lower packages in the stack, which then may break during storage and transport.

[0014] By providing downwardly extending projections on the cover, that are so formed and arranged relative to each other that they are disposed substantially adjacent to the top of the upwardly extending projections of the bottom part when the cover is in the closed position, it is possible, within the above mentioned design constraints, to provide an egg package wherein the slip angle defined by the upwardly extending projections permits a nesting distance, to other identical egg packages, that is smaller than the standard nesting distance, preferably smaller than the de-facto standard.

[0015] In order to provide upwardly extending projections of the bottom part that are sufficiently long so as to provide sufficient support for the cover when stacking egg filled packages, the slip angle used in prior art egg packages is usually approximately 8 degrees.

[0016] By providing a wider slip angle it is possible to provide a lower nesting distance. But a wider slip angle will imply that the upwardly extending projections of the bottom part will be too short for providing sufficient support to the cover during stacking of full egg packages. Hence, it is seen that by the combination of features of the characterizing portion of claim 1, a synergetic effect is achieved allowing a reduced nesting distance as compared to the present industry standard, and at the same time comply with the design constraints mentioned above.

[0017] Investigations performed by the applicant have shown that effective error free de-nesting may be achieved if the existing de-nesting machines are modified in that they are provided with a slightly modified gripping feature in order to account for the reduced nesting distance between the egg packages. Compared to the tremendous reduction in the transportation costs associated with an egg package according to the invention as compared to the de-facto standard egg packages, the modification of the de-nesting machine comprises a negligible expense. Since the outer dimensions of the egg package according to the invention are kept within the design constraints mentioned above, no other modifications to the packaging storage and display equipment is needed.

[0018] The slip angle is preferably defined as the angle between a side of the upwardly extending projections and a vertical plane, i.e. as half of the angle that two opposing sides of the upwardly extending projections form in relation to each other.

[0019] In a preferred embodiment of the invention the slip angle is substantially greater than 9 degrees, for example somewhere in the range from 10 degrees to 20 degrees, preferably in the range from 11 degrees to 17 degrees, for example 11 degrees, 12 degrees, 13 degrees or 14 degrees. This allows for a nesting distance of 8 mm. or less.

[0020] When it is mentioned that the cover part has downwardly extending projections being so formed and arranged relative to each other that they are disposed substantially adjacent to the top of the upwardly extending projections of the bottom part when the cover is in the closed position, it is understood that by the wording adjacent means that the downwardly extending projections are close to, for example within 2 mm from, the top of the upwardly extending projections, when the cover is in its closed position. This will give a flexible egg package that is able to support the cover in its closed position.

[0021] However, in a preferred embodiment, the downwardly extending projections are being so formed and arranged relative to each other that they rest on the top of the upwardly extending projections of the bottom part when the cover is in the closed position, instead of being disposed adjacent to the top of the upwardly extending projections of the bottom part, when the cover is in the closed position. Hereby is achieved an enhanced support of the cover, when multiple, egg filled, egg packages are stacked on top of each other.

[0022] Preferably, the egg package is moulded as one piece. This allows for a simple and efficient way of providing the above mentioned hinge connecting the bottom part and the cover part, namely by a weakening in the moulded material of the egg package.

[0023] The egg package is preferably made of moulded pulp, although other materials of suitable resilience,

and strength could be used.

[0024] In a preferred embodiment, the egg package comprises a plurality of de-nesting projections. The de-nesting projections aid in counteracting the above mentioned vacuum effect. Thus, when the nested egg packages are de-nested for use, these de-nesting projections eases the mechanical de-nesting of the egg packages.

[0025] In a preferred embodiment the distance between, two fully open, similar egg packages in a stack is determined by the extension of the de-nesting projections, which thereby define an effective nesting distance, which is smaller than or equal to 8 mm., but larger than the nesting distance which is solely defined by the slip angle. Hereby is achieved that any egg package that is nested together with another similar egg package will rest on the de-nesting projections. This leads to a smaller "contact surface" between the two egg packages, because the "contact surface" is substantially defined by the de-nesting projections. Hence, the before mentioned vacuum effect during de-nesting will be reduced.

[0026] In a preferred embodiment, embodiment the de-nesting projections are 10% - 20% larger than the nesting distance defined by the slip angle. This means that the effective nesting distance will be 10% - 20% larger than the nesting distance defined by the slip angle.

[0027] Preferably, the den-nesting projections are approximately 1 mm. larger than the nesting distance defined by the slip angle.

[0028] In order to further ease the de-nesting of the egg packages, the de-nesting projections may be distributed over both the cover part and the bottom part. Hereby is achieved that the individual egg packages in the stack may be more precisely aligned, for example caused by unevenness or ruggedness of the opposing surfaces of two consecutive egg packages in the stack is not allowed to accumulate through the stack, when the egg packages are nested together.

[0029] In an advantageous embodiment, the cover part may further comprise a rim portion extending outward from the cover part and where at least some of the de-nesting projections are provided substantially adjacent to the rim portion of the cover part. The rim portion of the cover part will further ease the de-nesting, because it will function as a "gripping area" for a de-nesting machine.

[0030] Advantageously, the bottom part may comprise a rim portion extending outward from the bottom part and where at least some of the de-nesting projections are provided adjacent to the rim portion of the bottom part.

[0031] In one embodiment, at least some of the de-nesting projections may be provided at the underside of the egg package between neighboring egg receiving compartments in each row.

[0032] Alternatively, or in addition to this, at least some of the de-nesting projections may be provided at the underside of the egg package between neighboring egg receiving compartments across each row.

[0033] In a preferred embodiment, at least some of the de-nesting projections are provided at the underside of the egg package between neighboring egg receiving compartments.

[0034] An egg package formed by suction moulding of a fibrous material, such as pulp, will usually have an uneven, rugged or coarse surface. This ruggedness may lead to differences in the surface on the order of magnitude of 1 mm. - 3 mm., and may thus compromise the possibility of achieving a reduced effective nesting distance. Thus, in a preferred embodiment, the egg package has a substantially smooth outer surface. Alternatively, or in addition to this, the egg package may in one embodiment have a substantially smooth inner surface.

[0035] However, in a preferred embodiment the egg package may have an outer surface that is substantially smoother than the inner surface of the egg package. This will provide an egg package that is easier to produce, than if both the inner and outer surfaces have to be smoothed, that at the same time may be easily mechanically de-nested without error.

[0036] The above mentioned surface smoothness may for example be achieved by an after pressing of the freshly moulded, and thereby still wet egg packages during the manufacturing process.

[0037] In a preferred embodiment of an egg package according to the invention, the slip angle defined by the upwardly extending projections of the bottom part permits a nesting distance, to other identical egg packages that is smaller than 11 mm., preferably smaller than 9 mm., even more preferably equal to 8 mm. or smaller than 8 mm. such as for a example 6 mm., or 5 mm.

[0038] Most preferably, the slip angle defined by the upwardly extending projections of the bottom part permits a nesting distance, to other identical egg packages that is between 3 mm. and 6 mm., such as for example 4 mm., 5 mm. or 5,2 mm.

[0039] Hereby is achieved an egg package that may be very compactly nested with other, identical egg packages. Since egg packages of the kind disclosed in the present patent description is a commodity that is produced in tremendously high volumes, a reduction of the nesting distance by few millimeters may lead to a tremendous reduction of transportation and shipment costs.

BREIF DESCRIPTION OF THE DRAWINGS

[0040] A further understanding of the nature and advantages of the present invention may be realized by reference to the remaining portions of the specification and the drawings. In the following, preferred embodiments of the invention is explained in more detail with reference to the drawings, wherein

Fig. 1 shows an embodiment of an egg package nested together with another identical egg package,

Fig. 2 shows the egg packages illustrated in Fig. 1 as seen from the underside,

Fig. 3 shows an end view of the egg packages illus-

trated in Fig. 1 when they are nested together in the fully open position,

Fig. 4 shows the nested egg packages illustrated in Fig. 1 seen from above,

Fig. 5 shows cross section A - A of the egg packages illustrated in Fig. 1,

Fig. 6 shows cross section B - B of the egg packages illustrated in Fig. 1,

Fig. 7 shows cross section C - C of the egg packages illustrated in Fig. 1, and

Fig. 8 shows cross section D - D of the egg packages illustrated in Fig. 1.

DETAILED DESCRIPTION

[0041] The present invention will now be described more fully hereinafter with reference to the accompanying drawings, in which exemplary embodiments of the invention are shown. The invention may, however, be embodied in different forms and should not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. Like reference numerals refer to like elements throughout. Like elements will, thus, not be described in detail with respect to the description of each figure.

[0042] The figures 1 - 4 illustrate two egg packages 2 according to a preferred embodiment of the invention as seen from different viewpoints.

[0043] In figures 5 - 8 is illustrated different cross sections of the egg packages 2 illustrated in figures 1 - 4. The lines along which the cross sections are drawn are illustrated in Fig. 4.

[0044] Fig. 1 shows an embodiment of an egg package 2 according to the invention nested together with another identical egg package 2. The illustrated egg packages 2 are formed by suction moulding of a fibrous material. The egg packages 2 are similar, in fact substantially identical in size and shape, so the description of the technical features of one of them also applies to the other one. The egg package 2 comprises a bottom part 4 and a cover part 6. The bottom part 4 comprises a plurality of egg-receiving compartments 8, of which only two are marked with the designation number 8 in order to increase the intelligibility of the figure. The egg receiving compartments 8 have non-planar side surfaces 10 so as to match at least partially the outer contours of an egg. The plurality of compartments 8 being arranged in at least two parallel rows with upwardly extending projections 12 located between the rows of compartments 8.

[0045] The cover part 6 is connected to the bottom part 4 by a hinge 14 so as to allow the cover part 6 to move between an open position and a closed position. In the illustrated example the egg package 2 is fully open, i.e. the cover 6 in its full open position.

[0046] As illustrated, the bottom part 4 and cover part 6 are being so constructed that when the egg package 2 is fully open it may be compactly nested with other, identical egg packages 3 for shipment and/or storage.

[0047] The cover part 6 is equipped with downwardly extending projections 16 being so formed and arranged relative to each other that they (16) are disposed substantially adjacent to the top 18 of the upwardly extending projections 12 of the bottom part 4 when the cover 6 is in the closed position.

[0048] In order to provide an enhanced support of the top 20 of the cover 6, the downwardly extending projections 16 are preferably being so formed and arranged relative to each other that they (16) rest on the top 18 of the upwardly extending projections 12 of the bottom part 4 when the cover 6 is in the closed position, instead of being disposed adjacent to the top 18 of the upwardly extending projections 12 of the bottom part 4, when the cover 6 is in the closed position.

[0049] As will be explained in more detail with respect to the description of Fig. 7, the upwardly extending projections 12 of the bottom part 4 define a slip angle that permits a nesting distance, to other identical egg packages, of less than 8 mm.

[0050] The illustrated egg packages also have a rim portion 22 extending outward from the cover part 6. At the gable portion 24 of the cover 6 there are provided de-nesting projections 26 adjacent to the rim portion 22.

[0051] In a preferred embodiment according to the invention, the de-nesting projections 26 are larger than the nesting distance defined by the slip angle θ. Hereby it is achieved that an effective nesting distance between the egg packages 2 is defined by the de-nesting projections 26. When de-nesting egg packages 2 of the illustrated kind a mechanical feature of a de-nesting machine (not shown) engages the rim portion 22 and separates the egg packages 2 from each other.

[0052] As illustrated, the bottom part 4 also has a rim portion 28. Thus, when de-nesting egg packages 2 of the illustrated kind a mechanical feature of a de-nesting machine (not shown) may also or alternatively engage the rim portion 28 in order to separate the egg packages 2 from each other.

[0053] Fig. 2 shows the egg packages 2 as seen from the underside. In the illustrated example there are provided de-nesting projections 27 at the underside of the egg package 2 between neighboring egg receiving compartments 8.

[0054] The illustrated de-nesting projections 26 and 27 aids in keeping the egg packages 2 separated from each other so that the above mentioned vacuum effect may be diminished during the mechanized de-nesting. The egg package 2 also comprises a flap 30 hingedly connected to the bottom part 4. The flap 30 is equipped with two outwardly projecting retainment means 32, which are configured to cooperate with complimentary retainment means 34 on the cover part 6 in such a way that the cover 6 may be held in a closed position, when the retainment means 32 are engages the complimentary retainment means 34 on the cover part 6.

[0055] Fig. 3 shows an end view of the egg packages 2 when they are nested together in the fully open position. The egg packages 2 are moulded in one piece, and in this view the hinge 14 between the bottom part 4 and the cover part 6 is more clearly illustrated as a weakening in the material of the egg package 2 at the place where the bottom part 4 and the cover part 6 are connected to each other. Similarly, the hinge 36 between the flap 30 and the bottom part 4 is provided as a weakening in the material of the egg package 2 at the places where the two (the cover 4 and flap 30) are connected to each other. The back side of the cover 6 is denoted by the designation number 45. The bottom part 4 egg packages 2 have a plurality of upwardly extending projections 38 placed along the front side 40 of the bottom part 4 and a plurality of upwardly extending projections 42 placed along the back 44 of the bottom part 4.

[0056] Fig. 4 shows the nested egg packages 2 from above. The arrows A - A, B - B, C - C, and D - D and corresponding straight lines, illustrates four different cross sections of the illustrated egg packages 2.

[0057] The first cross section along the line A - A is shown in Fig. 5. When the egg package 2 is in its closed position the flap 30 will be turned in relation to the hinge 36 until the top 46 of the projections 38 engages the surface 48 of the inwardly extending projections 50. The cover 6 is then turned in relation to the hinge 14 until the inner side 52 of the back side 45 of the cover 6 engages the side 54 of the projections 42. The non planar side surfaces 10 of the egg receiving compartments 8 generally define an angle λ. In the illustrated embodiment the angle λ is 30 degrees. However, it is understood that this angle could be larger or slightly smaller in other embodiments.

[0058] The second cross section B - B is illustrated in Fig. 6. Apart from the features already discussed in relation to the previous figures, there is illustrated two angles α and β. The angle α is generally defined by the slopes of the sides 56 of the upwardly extending projections 12 and the slope of the sides 58 of the upwardly extending projections 42 placed at the back 44 of the bottom part 4. In the illustrated embodiment the angles α is 36 degrees to 37 degrees.

[0059] The angle β is generally defined by the slope 60 of upwardly extending projections 38 placed at the front 40 of the bottom part 4 and a line parallel to the edge of the rim 28 of the bottom part 4, which effectively is a horizontal line, when the egg package 2 is placed in its fully open position on a flat horizontal surface. In the illustrated embodiment, the angle β is 117 degrees to 119 degrees, for example 117,5 degrees or 118 degrees.

[0060] In Fig. 7 is illustrated the cross section C - C. As can be seen the upwardly extending projections 12 between the rows of egg receiving compartments 8 (not explicitly shown in this figure) in the bottom part 4 defines an angle θ. The angle θ is actually twice the slip angle, because the slip angle is defined as slope of the surface 62 or 64 relative to a vertical plane, i.e. e a plane that is vertical when the egg package 2 is placed on a horizontal surface. The angle θ defined by the overall slope of the two opposing sides 62 and 64 of the upwardly extending projections 12 is therefore directly and unambiguously related to the slip angle. In this illustrated cross section C - C, the nesting distance between two consecutive egg packages 2 that are nested together is the distance between the tops 18 of the illustrated upwardly extending projections 12. By widening the slip angle, which is equivalent to widening the angle θ, it is possible to lower this nesting distance. However, a widening of this slip angle cannot be done indiscriminately, because then the upwardly extending projections 12 between the rows of egg receiving compartments 8 will then become too short to provide adequate support for the top 20 of the cover 6 when it is in a closed position. However, since the cover part 6 has downwardly extending projections 16 being so formed and arranged relative to each other that they (16) are disposed substantially adjacent to the top 18 of the upwardly extending projections 12 of the bottom part 4 when the cover 6 is in the closed position, there is provided an egg package, which may be compactly nested together with other, identical egg packages, with a nesting distance below the standard nesting distance, preferably below 11 mm., even more preferably below 8 mm.. For example around 4 mm. - 11 mm., or around 6 mm. to 9 mm. or around 6 mm. to 9 mm. for example 6 mm., 7 mm. or 8 mm.. In the illustrated embodiment the angle θ is 22 degrees, which corresponds to a slip angle of $\theta/2$ = 11 degrees.

[0061] Furthermore, a widening of the slip angle has to be done under the design constraints that the outer dimensions of the egg package 2 has to fulfill certain requirements regarding size and shape or otherwise it cannot be used in conventional automatic packaging machines used in the industry today. In addition to this the shape and size of the egg receiving compartments 8 must comply with the dimensions of a standard egg.

[0062] In prior art egg packages, it has been customary to use a slip angle of approximately 10 degrees, which leads to a nesting distance of at least 8 mm.

[0063] In a preferred embodiment according to the invention the slip angle θ is chosen to be in the interval from 15 degrees to 25 degrees, such as for example 18 degrees or 22 degrees.

[0064] In tests performed by the applicant it has been possible to construct an egg package 2 having a slip angle of 11 degrees and a correspondingly reduced effective nesting distance fulfilling all the design constraints mentioned above and that can be effectively de-nested by a de-nesting machine of the screw type without error at the same speed as de-nesting prior art egg packages having a larger effective nesting distance.

[0065] Fig. 8 shows the cross section along the line D - D. In the illustration the downwardly extending projections 16 of the cover part 6 are shown in cross section. The de-nesting projections 16, 27 ensure an even nesting of the egg packages 2 and at the same time provide an

air gap between the inner surface of the egg receiving compartments 8 of the lower egg package 2 and the outer surface of the egg receiving compartments 8 of the upper egg package 2 as well as an air gap between the inner surface of the cover 6 of the lower egg package 2 and the outer surface of the cover 6 of the upper egg package 2. Thus, the de-nesting projections also aid in counteracting the before mentioned vacuum effect encountered during de-nesting of the egg packages 2.

LIST OF REFERENCE NUMBERS

[0066] In the following is given a list of reference numbers that are used in the detailed description of the invention.

2 egg package,

4 bottom part,

6 cover part,

8 egg-receiving compartments,

10 non-planar side surface of egg-receiving compartments,

12 upwardly extending projections located between the rows of egg-receiving compartments,

14 hinge between bottom part and cover part,

16 downwardly extending projections of the cover part,

18 top of the upwardly extending projections 12,

20 top of cover part,

22 rim portion of cover part,

24 gable portion of the cover part,

26 de-nesting projections of the cover part,

27 de-nesting projections on the bottom part,

28 rim portion of the bottom part,

30 flap,

32 retainment means on the flap,

34 complimentary retainment means on the cover part,

36 hinge between the cover part and the flap,

38 upwardly extending projection at the front of the bottom part,

40 front of the bottom part,

42 upwardly extending projection at the back of the bottom part,

44 back of the bottom part,

45 back side of the cover part,

46 top of the projections 38,

48 surface of inwardly extending projections on the flap,

50 inwardly extending projections on the flap,

52 inner side of the back side of the cover,

54 side of the projections 42,

56 a side of the upwardly extending projections 12,

58 a side of the upwardly extending projections 42,

60 slope of upwardly extending projections 38,

62, 64 two opposing sides of the upwardly extending projections 12.

Claims

1. An egg package (2) formed by suction moulding of a fibrous material, the egg package (2) comprising:

- a bottom part (4) comprising a plurality of egg-receiving compartments (8) having non-planar side surfaces (10) so as to match at least partially the outer contours of an egg, the plurality of compartments (8) being arranged in at least two parallel rows and upwardly extending projections (12) located between the rows of compartments (8), the upwardly extending projections (12) defining a slip angle,
- a cover part (6) being connected to the bottom part (4) by a hinge (14) so as to allow the cover part (6) to move between an open position and a closed position,
- the bottom part (4) and cover part (6) being so constructed that the inner and outer surfaces of the bottom part (4) as well as the inner surfaces and outer surfaces of the cover part (6) are complementary, so that when the egg package (2)

is fully open it may be nested with other, identical egg packages (2) for shipment and/or storage,

characterized in that
the cover part (6) has downwardly extending projections (16) being so formed and arranged relative to each other that they (16) are disposed substantially adjacent to the top (18) of the upwardly extending projections (12) of the bottom part (4) when the cover (6) is in the closed position, and wherein the slip angle defined by the upwardly extending projections (12) of the bottom part (4) permits a nesting distance, to other identical egg packages (2) that is smaller than standard nesting distance.

2. An egg package (2) according to claim 1, wherein the egg package (2) is moulded as one piece.

3. An egg package (2) according to claim 1 or 2, wherein the egg package (2) is made of moulded pulp.

4. An egg package (2) according to claim 1, 2, or 3, further comprising a plurality of de-nesting projections (26, 27).

5. An egg package (2) according to claim 4, wherein the de-nesting projections (26, 27) are distributed over both the cover part (6) and the bottom part (4).

6. An egg package (2) according to claim 4 or 5, wherein the cover part (6) further comprises a rim portion (22) extending outward from the cover part (6) and where at least some of the de-nesting projections (26) are provided substantially adjacent to the rim portion (22) of the cover part (6).

7. An egg package (2) according to claim 4, 5 or 6, wherein the bottom part (4) further comprises a rim portion (28) extending outward from the bottom part (4) and where at least some of the de-nesting projections (26, 27) are provided adjacent to the rim portion (28) of the bottom part (4).

8. An egg package (2) according to any of the claims 4 - 7, wherein at least some of the de-nesting projections (27) are provided at the underside of the egg package (2) between neighboring egg receiving compartments (8) in each row.

9. An egg package (2) according to any of the claims 4 - 8, wherein at least some of the de-nesting projections (27) are provided at the underside of the egg package (2) between neighboring egg receiving compartments (8) across each row.

10. An egg package (2) according to any of the claims 4 - 7, wherein at least some of the de-nesting projections (27) are provided at the underside of the egg package (2) between neighboring egg receiving compartments (8).

11. An egg package (2) according to any of the preceding claims, having a substantially smooth outer surface.

12. An egg package (2) according to any of the claims 1 - 10, having an outer surface that is substantially smoother than the inner surface of the egg package (2).

13. An egg package (2) according to claim 1, wherein the downwardly extending projections (16) of the cover part (6) are being so formed and arranged relative to each other that they (16) rest on the top (18) of the upwardly extending projections (12) of the bottom part (4) when the cover (6) is in the closed position, instead of being disposed adjacent to the top (18) of the upwardly extending projections (12) of the bottom part (4), when the cover (6) is in the closed position.

14. An egg package (2) according to claim 1, wherein the slip angle defined by the upwardly extending projections (12) of the bottom part (4) permits a nesting distance, to other identical egg packages (2) that is smaller than 11 mm., preferably smaller than 8 mm., even more preferably smaller than 6 mm., such as 5 mm..

Amended claims in accordance with Rule 137(2) EPC.

1. An egg package (2) formed by suction moulding of a fibrous material, the egg package (2) comprising:

- a bottom part (4) comprising a plurality of egg-receiving compartments (8) having non-planar side surfaces (10) so as to match at least partially the outer contours of an egg, the plurality of compartments (8) being arranged in at least two parallel rows and upwardly extending projections (12) located between the rows of compartments (8), the upwardly extending projections (12) defining a slip angle,
- a cover part (6) being connected to the bottom part (4) by a hinge (14) so as to allow the cover part (6) to move between an open position and a closed position,
- the bottom part (4) and cover part (6) being so constructed that the inner and outer surfaces of the bottom part (4) as well as the inner surfaces and outer surfaces of the cover part (6) are complementary, so that when the egg package (2) is fully open it may be nested with other, identical egg packages (2) for shipment and/or storage,

characterized in that
the cover part (6) has downwardly extending projections (16) being so formed and arranged relative to each other that they (16) rest on the top (18) of the upwardly extending projections (12) of the bottom part (4) when the cover (6) is in the closed position, and wherein the slip angle defined by the upwardly extending projections (12) of the bottom part (4) is greater than 9 degrees, thereby permitting a nesting distance, to other identical egg packages (2) that is smaller than standard nesting distance.

2. An egg package according to claim 1, wherein the slip angle is somewhere in the range from 10 degrees to 20 degrees.

3. An egg package (2) according to claim 1 or 2, wherein the egg package (2) is made of moulded pulp.

4. An egg package (2) according to claim 1, 2, or 3, further comprising a plurality of de-nesting projections (26, 27).

5. An egg package (2) according to claim 4, wherein the de-nesting projections (26, 27) are distributed over both the cover part (6) and the bottom part (4).

6. An egg package (2) according to claim 4 or 5, wherein the cover part (6) further comprises a rim portion (22) extending outward from the cover part (6) and where at least some of the de-nesting projections (26) are provided substantially adjacent to the rim portion (22) of the cover part (6).

7. An egg package (2) according to claim 4, 5 or 6, wherein the bottom part (4) further comprises a rim portion (28) extending outward from the bottom part (4) and where at least some of the de-nesting projections (26, 27) are provided adjacent to the rim portion (28) of the bottom part (4).

8. An egg package (2) according to any of the claims 4-7, wherein at least some of the de-nesting projections (27) are provided at the underside of the egg package (2) between neighboring egg receiving compartments (8) in each row.

9. An egg package (2) according to any of the claims 4-8, wherein at least some of the de-nesting projections (27) are provided at the underside of the egg package (2) between neighboring egg receiving compartments (8) across each row.

10. An egg package (2) according to any of the claims 4-7, wherein at least some of the de-nesting projections (27) are provided at the underside of the egg package (2) between neighboring egg receiving compartments (8).

11. An egg package (2) according to any of the preceding claims, having a substantially smooth outer surface.

12. An egg package (2) according to any of the claims 1-10, having an outer surface that is substantially smoother than the inner surface of the egg package (2).

13. An egg package (2) according to claim 1, wherein the slip angle defined by the upwardly extending projections (12) of the bottom part (4) permits a nesting distance, to other identical egg packages (2) that is smaller than 11 mm., preferably smaller than 8 mm., even more preferably smaller than 6 mm., such as 5 mm.

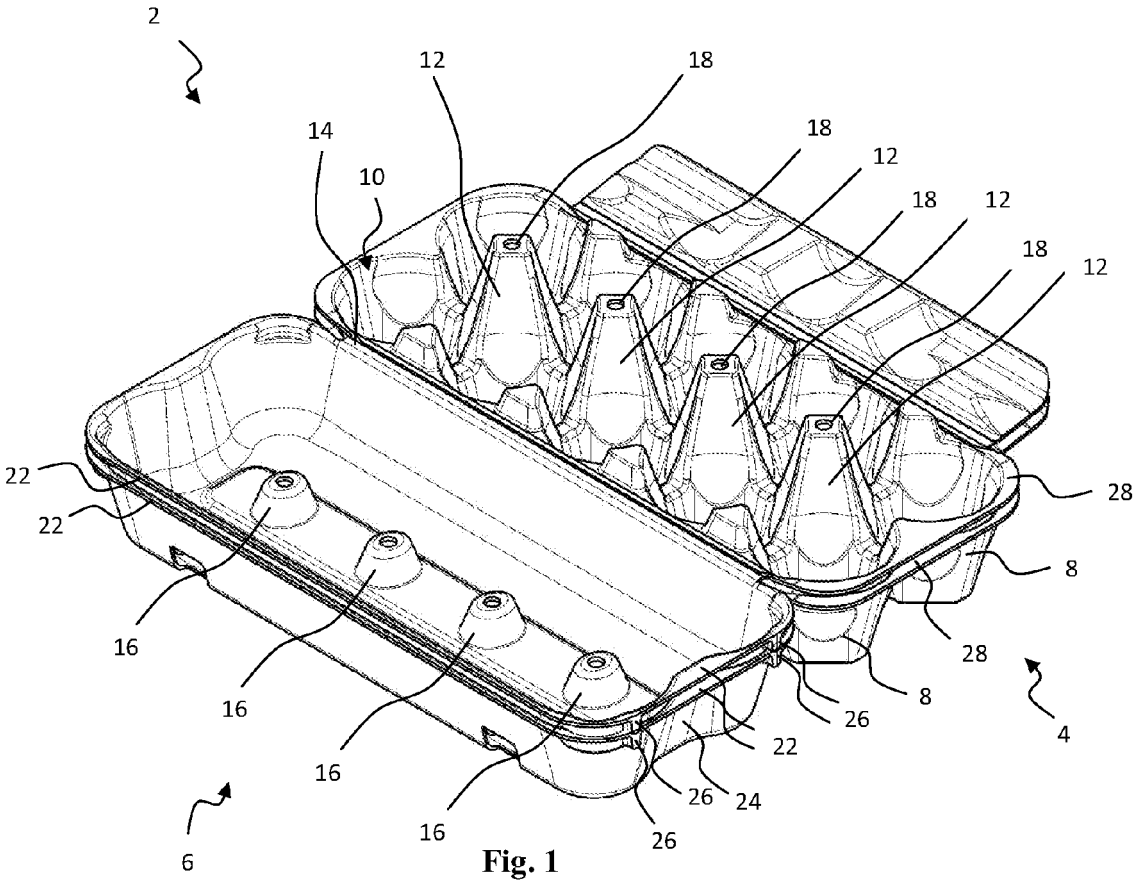
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Fig. 1

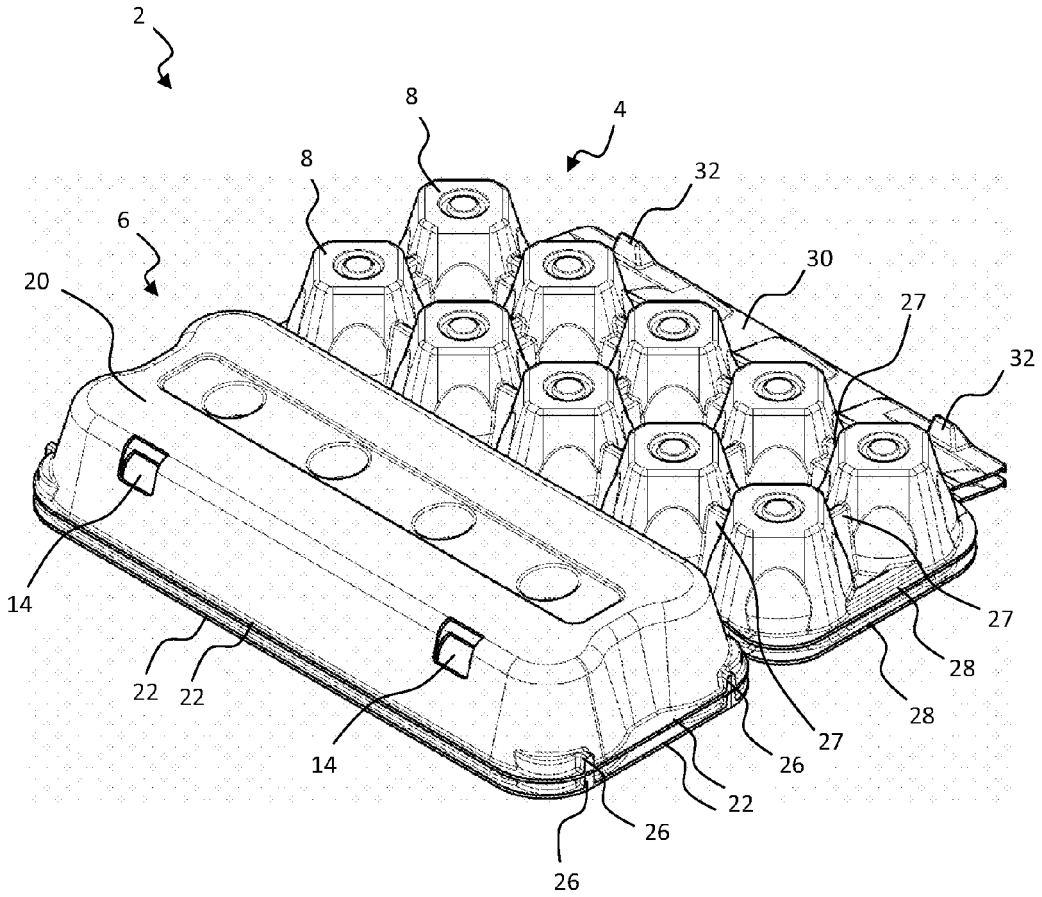

Fig. 2

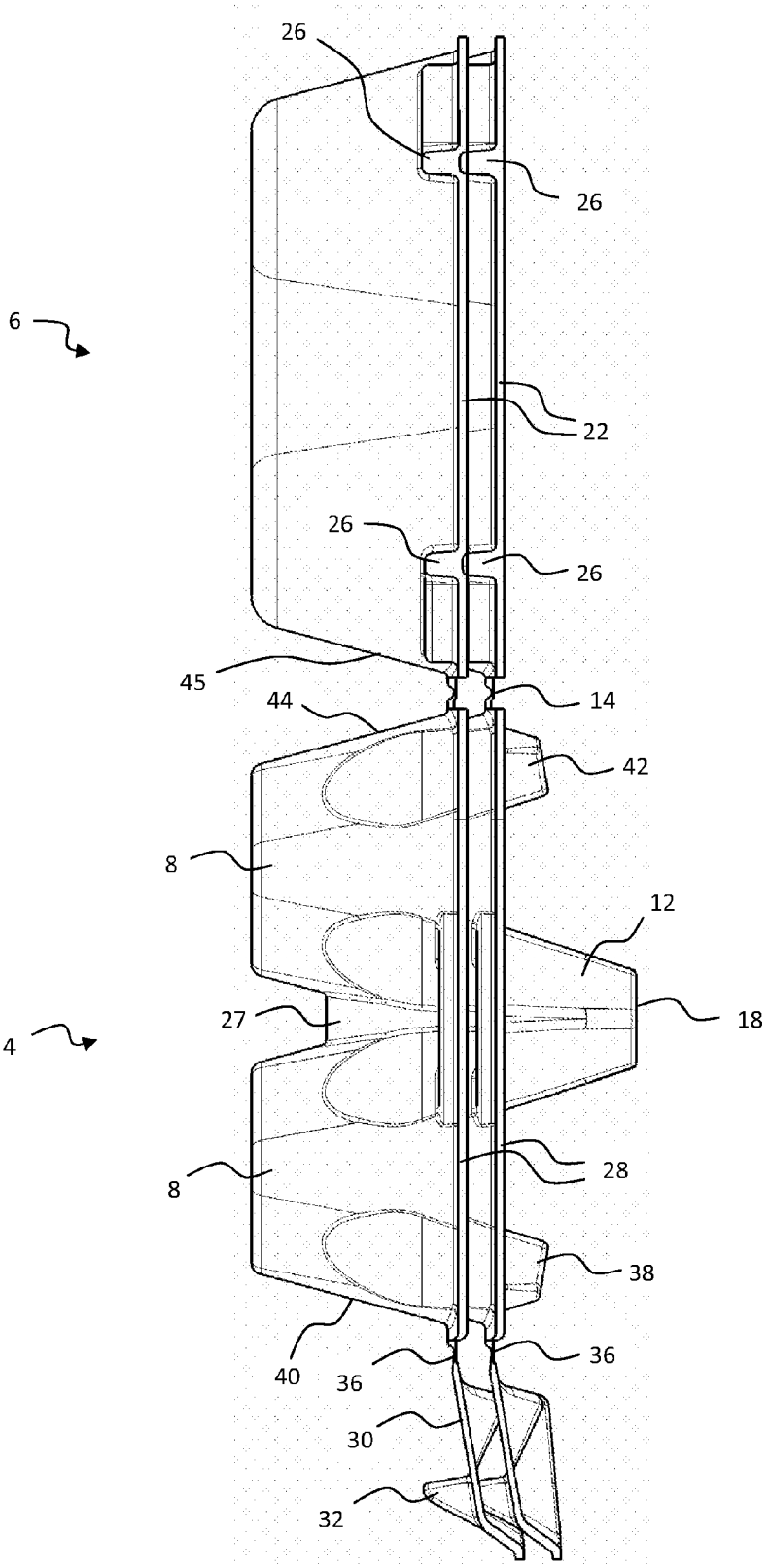

Fig. 3

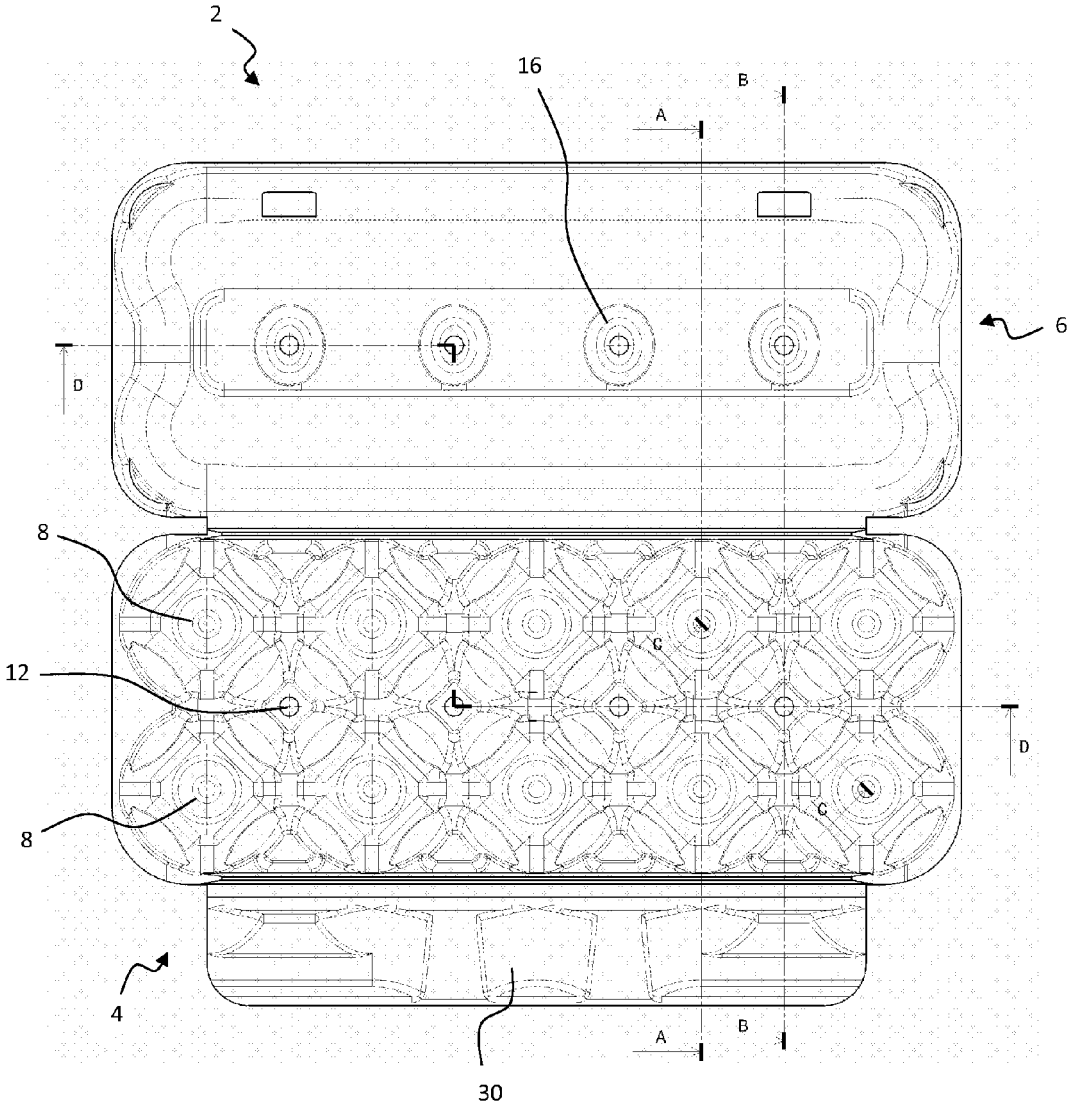

Fig. 4

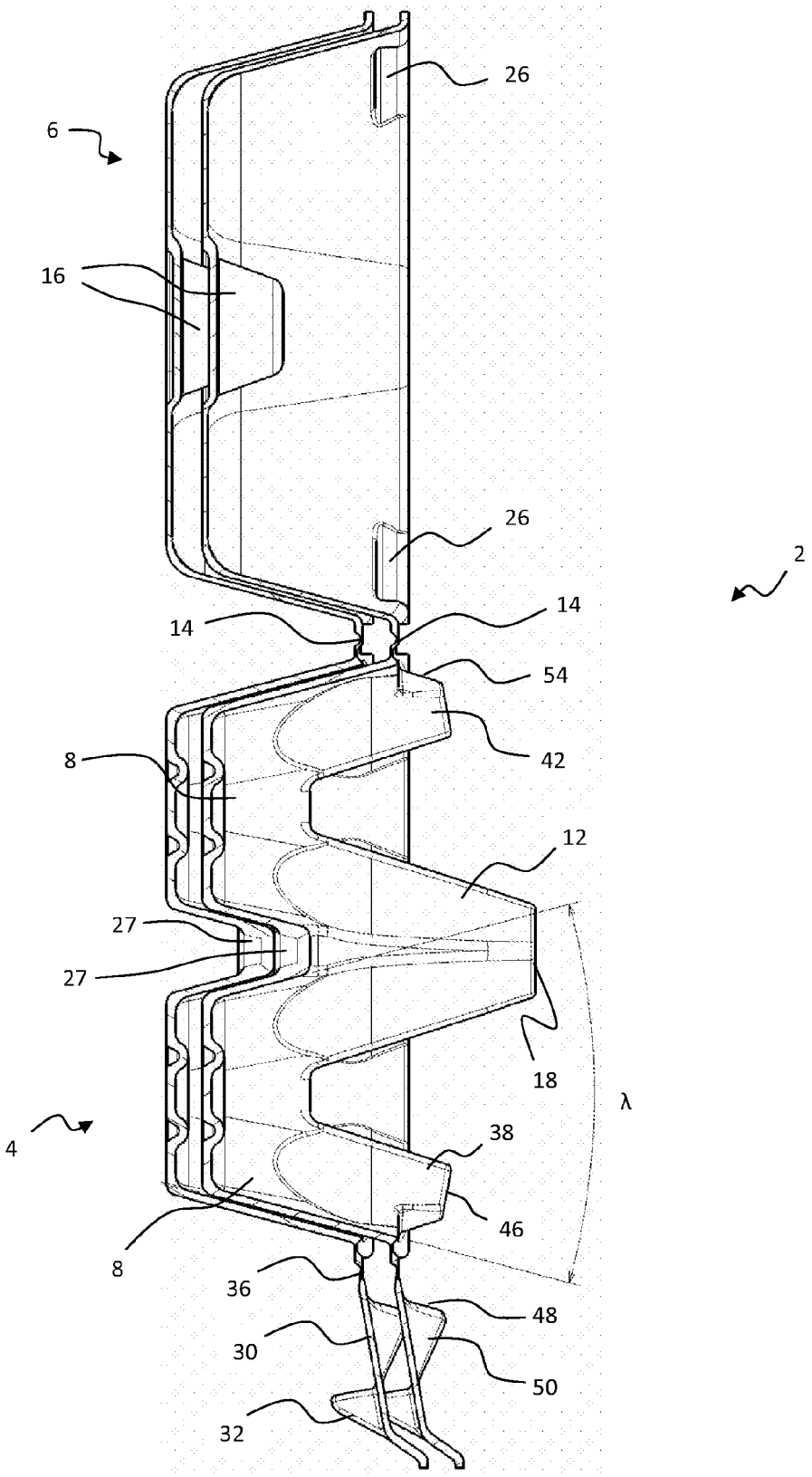

Fig. 5

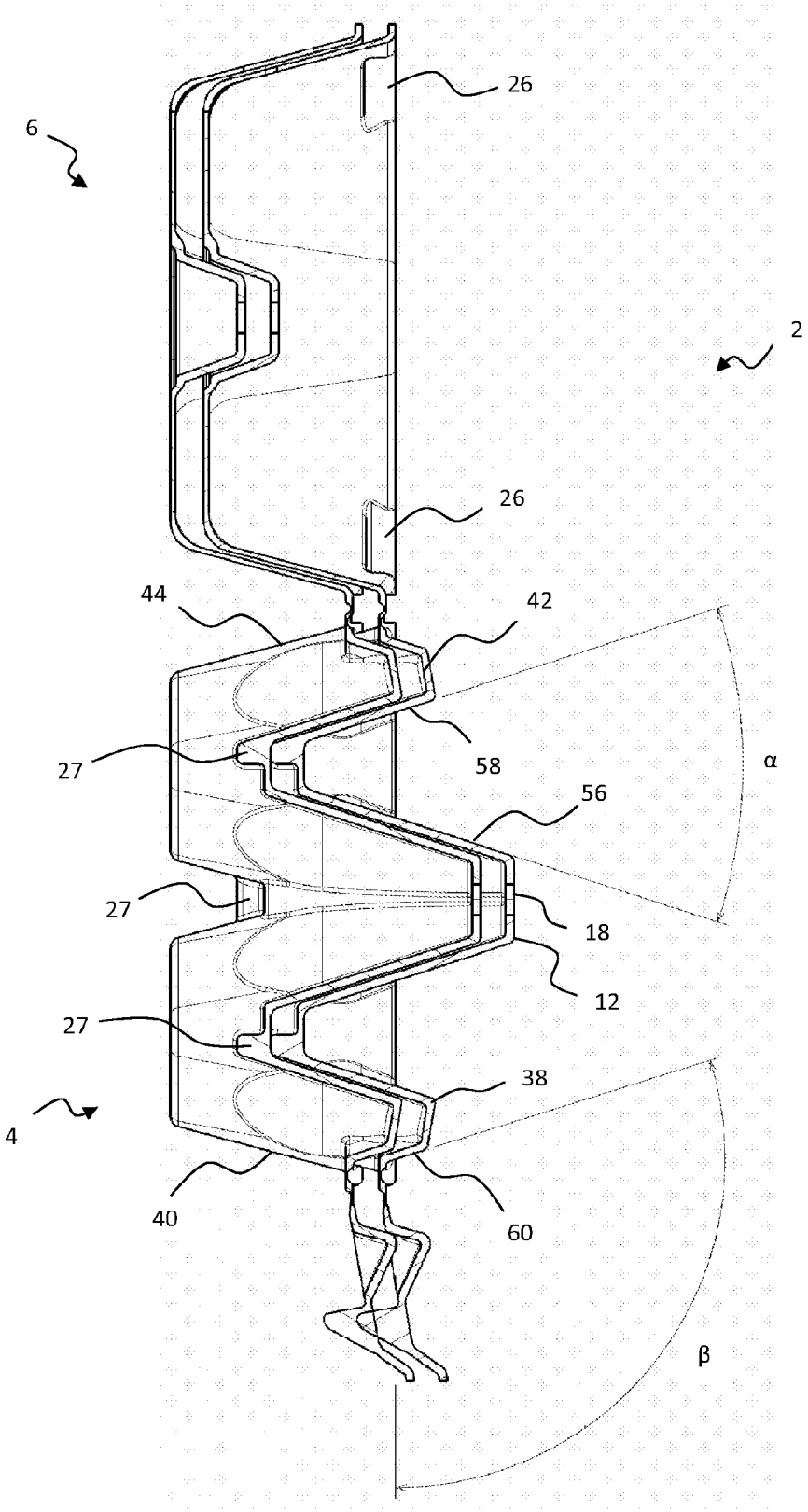

Fig. 6

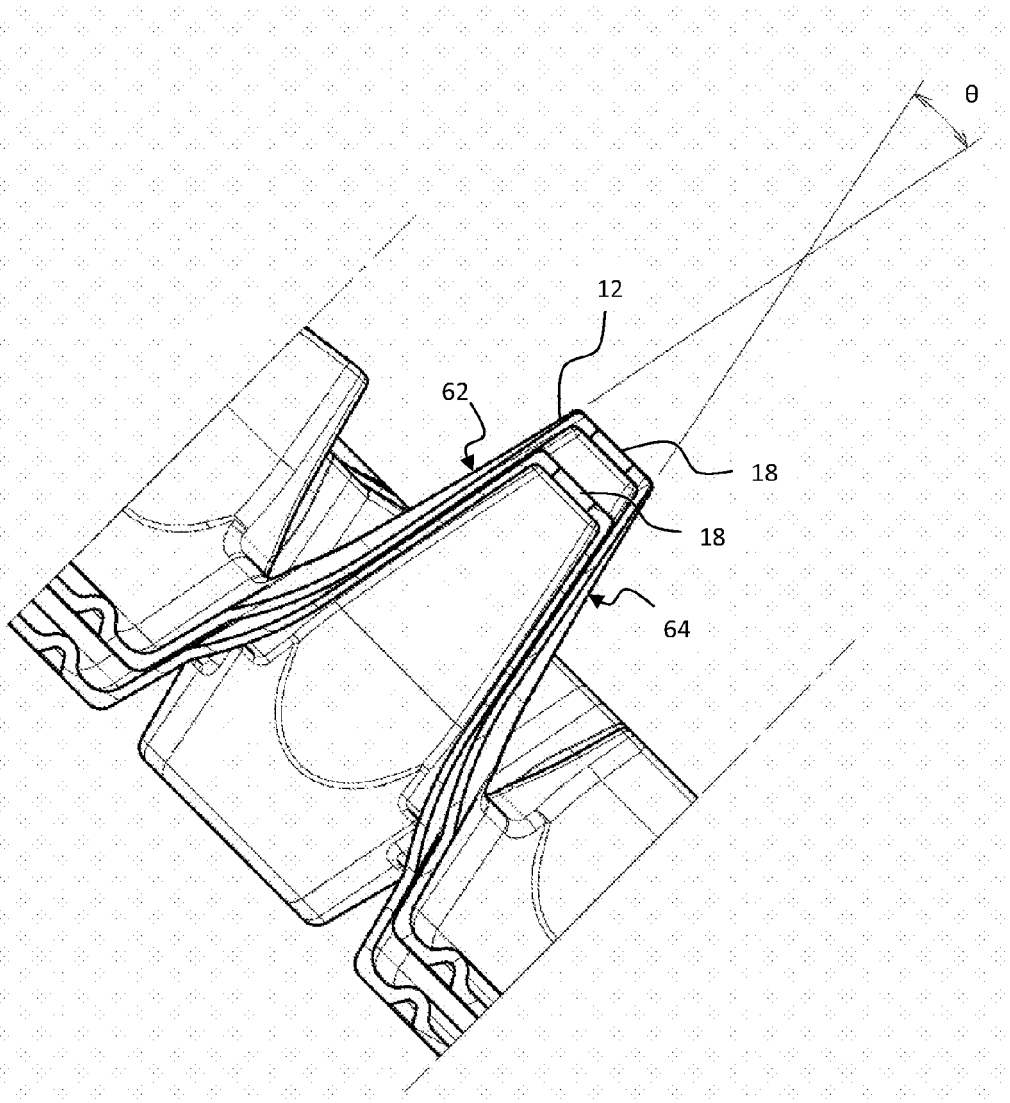

Fig. 7

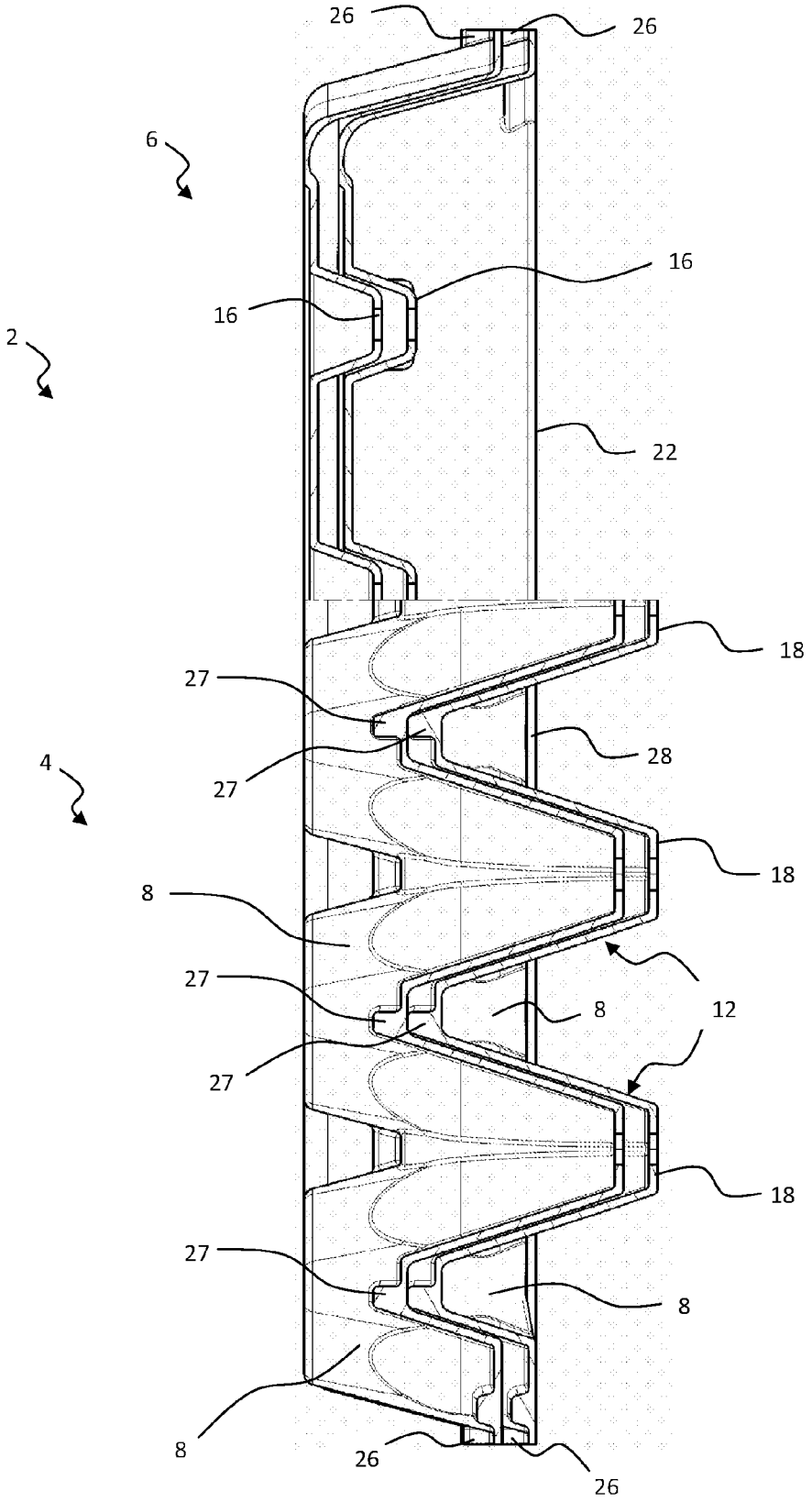

Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
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-/--

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	25 October 2010	Piolat, Olivier

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EUROPEAN SEARCH REPORT

Application Number
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	25 October 2010	Piolat, Olivier

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