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(54) **A dual package**

(57) The invention provides a dual package (1) for a sterile substance, e.g. for a pharmaceutical drug or composition. The package comprises first and second inner packages (2,4) and an outer package (6,7) housing both of the inner packages. The outer package is separated into two individual compartments (6,7) which each houses one of the inner packages (2,4) in a sterile condition

and which allows removal of one of the inner packages from the compartment in which it is contained without influencing the sterility of the other compartment. The invention thus facilitate packaging e.g. of a batch of a product together with a sample of the product and to enter a sterile facility for processing or testing the sample independent from the batch itself.

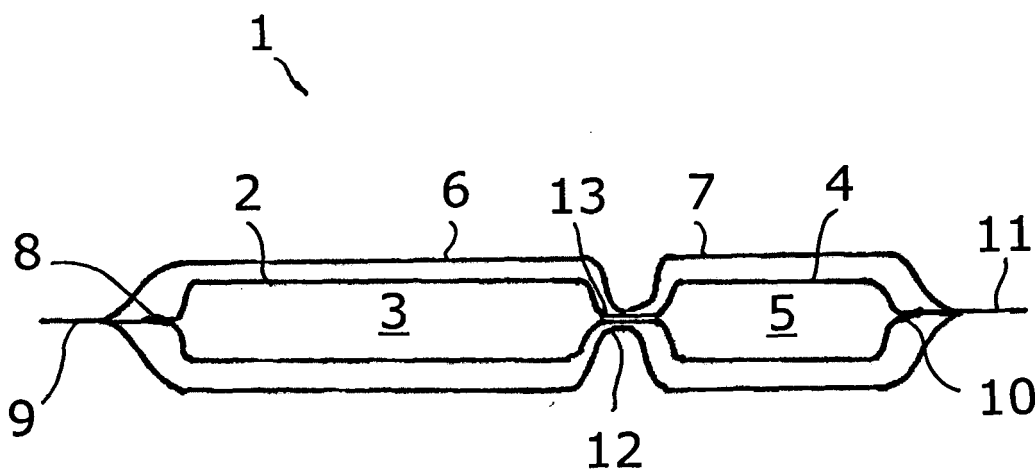


Fig. 1

Description

INTRODUCTION

[0001] The present invention relates to a dual package for a sterile substance such as for a drug substance, and in particular for a sterile substance for which testing of a sample portion is necessary e.g. to document the quality or purity of the substance. In particular, the invention relates to a package for packaging two portions of a substance individually, e.g. one sample portion and one main portion of a substance.

BACKGROUND OF THE INVENTION

[0002] Substances which require sterility are often packed in hermetically sealed bags or boxes. The substance could be sterile at the moment of packing, or the completed package could be sterilised by known techniques e.g. by radiation, heating etc.

[0003] In food processing, and in similar processes which are characterised by non-uniform ingredients, a process parameter may depend on characteristics of an applied ingredient. As an example, the amount of necessary artificial sweetener may depend on the natural sugar content of a primary produce, and an applied amount of a drug substance in a pharmaceutical composition naturally depends on the purity of the drug substance in question.

[0004] When the substance requires further processing before use, it is sometimes desired to analyse a sample of the substance prior to the further processing. For this purpose, suppliers of non-uniform primary produces sometimes offer a sample of the produce either prior to the delivery of the produce or simultaneously with the delivery of the produce.

[0005] In order for the purchaser to evaluate the produce, the sample must inevitably originate from the same batch, origin, process, or production facility as the produce itself. If the produce and the sample are packed in individual packages, these packages must bear an identification which links the sample to the produce. Sometimes, the identification does not provide the customer sufficient guaranty for identical qualities of the substance in the individual packages. As an example, the packages could have been exposed to different thermal conditions or the individual packages could provide different levels of protection of the substance.

[0006] To maintain identical qualities of the substance in the two packages, one attempt is to pair the packages in an outer package. In this way, the customer may be convinced that the protection offered at least by the outer package is identical for both portions, and that the packages have been exposed to identical external conditions.

[0007] Since the packages are located in the same outer package, opening of one package requires opening of the outer package. Since the package which is not yet opened is thereby protected differently, the qualities of

the contents of the two packages may after a period of time become different irrespective of equal qualities of the contents at the time of packaging, and a customers verification of the quality of a sample portion in one of the packages may be insignificant for the evaluation of the portion in the other package.

DESCRIPTION OF THE INVENTION

[0008] It is an object of the invention to improve packaging of sterile substances. Accordingly, the invention, in a first aspect, provides a dual package for a sterile substance, said package comprising one joined set of components including an inner package and an outer package, the inner package comprising a first inner package with a cavity containing a first portion of the sterile substance, and a second inner package with a cavity containing a second portion of the sterile substance, the outer package comprising a first compartment in which the first inner package is sterily contained, and a second compartment in which the second package is sterily contained, the first and second compartments being separated from each other to allow removal of one of the first and second packages from the compartment in which it is contained without influencing the sterility of the other compartment.

[0009] Since the components are joined, equal treatment and exposure to external conditions of the two portions is provided, and due to the containment of the first and second packages in individual and sterile compartments of the outer package, an unaffected protection of one of the packages may be maintained independent on opening of the other package, and the customer may e.g. make experiments with a sample portion without reducing the shelf time of a main produce contained in the other inner package.

[0010] In this context the components are set to be joined if they are formed in one unit, e.g. from one single piece of package material, if they are glued or adhered together, if they are contained inside each other so that separation is prevented without changing the structure of the package, or if they in any way stick together.

[0011] The first package could e.g. contain a minor portion of the substance, i.e. less than 50% of the substance, and the second package could contain a major portion of the substance. As an example, the first package may contain a sample portion by which the substance may be examined. In this case, the separation of the outer package in first and second separated compartments supports entrance into a sterile room for the examination of the sample portion. In this procedure, the outer package is placed in an airlock or in similar room which forms a passage into the sterile room. In this room, the first compartment is opened and the first package is removed from the outer package and taken to the sterile room. In accordance with the present invention, this procedure is made possible without influencing the sterility of the content in the second package and without influencing the

sterility of the compartment in which the second package is housed, i.e. an outer surface of the second package may remain sterile so that the second package, contained sterilely in the second compartment, may be brought into a sterile room in a corresponding procedure at a later point in time.

[0012] As aforementioned, it is desired to obtain an indication that the two portions of the substance have an identical quality, that they originate from the same batch, or that they have been exposed to identical external conditions such as temperatures, pressure, humidity etc. Accordingly, the inner packages may be solidly fixed to each other or they may be formed in one piece. In addition, or alternatively, the first and second compartments of the outer package may be solidly fixed to each other or they may be formed in one piece.

[0013] In one embodiment, the first and second package could be formed between a front and a back layer of a continuous sheet or several continuous sheets of a first foil material, i.e. so that at least one sheet forms part of both the first and second package. In such a package, the first and second packages have in no doubt been maintained together at all times. Correspondingly, the outer package may be formed between a top and a bottom layer of a second sheet or several sheets of a second foil material.

[0014] To improve sterility and protection of the substance, at least one of the first and second foil materials may comprise a gas barrier. Typically, at least one of the foils are made of a polymeric material such as polyethylene, polypropylene, polyvinylpropylene, polyvinylchloride, or Teflon®, in particular a material with a gas barrier, e.g. a polymer-aluminium compound foil. At least the first foil material may have a double-sided heat-seal possibility.

[0015] Both the inner packages and the outer package may be made by forming from the foil material one elongated sleeve or bag in which the first and second package or compartment, respectively, are separated from each other by a sealing line.

[0016] In one embodiment, the first and second packages are formed as two separate elements, or the first and second packages are formed from one sheet of a foil material and subsequently separated from each other. The packages are then individually arranged in the compartments of the outer package. In this embodiment, the unbroken, i.e. one piece outer package joins the components and thus verifies identical treatment of the two portions of the substance. In this embodiment, the first and second foil material could be identical materials which facilitate bonding of inner surfaces to each other, e.g. heat adhesive bonding for forming the packages and the compartments between layers which are joined along sealing lines.

[0017] In an alternative embodiment, the first and second packages are in one piece, and the inner packages may thus facilitate joining of the components and thus further improve the verification of identical treatment of

the two portions of the substance. In this embodiment, the outer package may be formed in two pieces which are joined to the one-piece inner package to encapsulate the first package and the second package individually, or the outer package may be formed in one piece thereby further improving the joining of the components and the verification of identical treatment. To separate the compartments from each other and thereby enable opening of one compartment without opening the other compartment, the outer package may be separated by a sealing line along which the outer package is bonded, e.g. by a heat adhesive bonding, to an outer surface of the inner packages in a transition zone between the first and second package.

[0018] The dimensions of the package may play an important role in connection with sterilisation, and in particular in connection with electron beam sterilisation. In connection with such a process, it is an object to facilitate proper penetration of the electrons into the substance. The smallest dimension (typically corresponding to the thickness) is of course of particular relevance, and in one embodiment of the package, a smallest dimension (the thickness) of the package is in the range of 0.3-20 cm, e.g. 0.5-10 cm, such as 1-7 cm. Preferably, the substance in the package has a substantially regular box shape. The package may e.g. have the form of a thin block where the ratio between the largest dimension (typically corresponding to the length) and the smallest dimension (typically the thickness) is at least 5: 1, such as at least 7:1 or at least 10: 1.

[0019] In order to shape the package into a proper shape, and to increase safety and reduce the risk of subsequent rupture of the package and thereby damage of sterile substance, it is preferred that the outer package is at least partly enclosed within, and preferably fully enclosed within, or wrapped in a dimensionally stable package, e.g. made from a more rigid material, e.g. a paperboard, cardboard or plastic box. Such a box may force the substance into a well-defined shape, e.g. with a specific thickness and/or density which, as previously mentioned may have an impact on the sterilisation process.

[0020] The sterilised substance could comprise a substance selected from the group consisting of amoxicillin, ampicillin, penicillin G procaine, cephalosporin, erythromycin, neomycin, streptomycin, tetracycline, ivermectin, cloxacillin, and gentamicin, or the substance could contain a mixture of the mentioned substances or a mixture of the mentioned substances with other substances, e.g. a mixture of a penicillin substance and a painkilling substance.

[0021] In a second aspect, the invention provides a method of packing a sterilised bulk of a substance in a dual package, the method comprising the steps of:

- providing the bulk of the substance;
- packing a first portion of the bulk in a first package and sealing said first package,

- packing a second portion of the bulk in a second package and sealing the second package,
- packing the first package in a first compartment of an outer package and sealing the first compartment,
- packing the second package in a second compartment of the outer package and sealing the second compartment, and
- sterilising the package.

[0022] The order in which the first and second packages are provided, in which the packages are arranged in the compartments, and in which the compartments are sealed is not decisive. Sterilisation may, however, advantageously be performed after the compartments have been sealed so that the content in the inner package and the space between the inner and the outer package are sterilised simultaneously in one and the same process. The first and second packages could be made in one continuous process in which the first and second packages are produced alternately from one long bag, pouch or sleeve (in the following referred to as sleeve). The package could be made from an elongated inner sleeve which defines a front layer and a back layer of a foil material made from one or several sheets, and which forms an elongated cavity extending in an axial direction, the packing process comprising:

- conveying the inner sleeve in the axial direction,
- joining the front layer and the back layer along a first sealing line extending transverse to the axial direction to form a bottom part of the first package,
- filling the cavity with the main portion of the bulk,
- joining the front layer and the back layer along a second sealing line extending transverse to the conveying direction to form a top part of the first package and a bottom part of the second package,
- filling the cavity with the sampling portion of the bulk, and
- joining the front layer and the back layer along a third sealing line extending transverse to the conveying direction to form a top part of the second package.

[0023] The inner sleeve could be made from one or more sheets of a foil material with axially extending rim portions which are joined in a seam to define the elongated cavity. Preferably, at least one sheet forms part of both the first and the second package.

[0024] To enable easier separation of the first package from the second package, the front layer and the back layer may further be joined along a fourth sealing line

which extends transverse to the conveying direction to form an additional seal between the second and third sealing line.

5 **[0025]** To further facilitate separation of the packages, a weakening of the foil material may be provided between the second and fourth sealing lines.

[0026] Corresponding to the inner package, the outer package could be made from an elongated outer sleeve which defines a top layer and a bottom layer of a foil material and which forms an elongated cavity extending in an axial direction. The packing process may e.g. comprise: arranging the inner sleeve inside the outer sleeve, joining the top layer and the bottom layer to each other or to an outer surface of the inner sleeve along a top sealing line extending transverse to the axial direction to close a top part of the outer package, joining the top layer and the bottom layer to each other or to an outer surface of the inner sleeve along a bottom sealing line extending transverse to the axial direction to close a bottom part of the outer package, and joining the top layer and the bottom layer to an outer surface of the inner sleeve along a first separation sealing line extending transverse to the axial direction to separate the first compartment from the second compartment.

25 **[0027]** The top layer and the bottom layer could further be joined along a second separation sealing line extending transverse to the conveying direction between the first separation sealing line and one of the top and bottom sealing lines to enable separation of the first compartment from the second compartment at a location between the first and second separation sealing lines without opening either of the compartments. A weakening provided in the foil material between the first and second separation sealing lines may further facilitate the separation.

35 **[0028]** In order further to facilitate separation of the first package from the second package without opening the inner package and the outer package, the sealing lines may be provided to form an intermediate outer package zone between the first and second compartment which encapsulates an intermediate inner package zone between the first package and the second package. To separate the packages, the user may cut or tear the packages apart in the intermediate zone without risking opening of the packages. The intermediate zone could be visualised e.g. by a colour of the package, a line or by a tear off weakening line.

45 **[0029]** Likewise the inner sleeve, the outer sleeve could be made from a single sheet or from several sheets of a foil material, at least one of which forms part of both in the first and second compartment. Rim portions of the sheets could be joined in an axially extending seam which joins inner surfaces of the foil material or which joins the foil material to the inner package to define the elongated cavity.

55 **[0030]** The inner and outer package may further be packaged in a dimensionally stable package which is made from a material which is rigid relative to the material

of the outer package and relative to the material of the first and second package and which therefore can form the outer package into a pre-specified thickness.

DETAILED DESCRIPTION OF THE INVENTION

[0031] In the following, preferred embodiments of the invention will be explained in further details with reference to the drawing in which:

Figs. 1-3 illustrate side views of various embodiments of a package according to the invention,

Fig. 4 illustrates an embodiment of a package wherein a plurality of portions are packed in a long row of packages,

Fig. 5 illustrates a package seen from above, and

Fig. 6 illustrates a packaging process according to the invention.

[0032] Fig. 1 illustrates a dual package 1 for a sterile substance. The package comprises an inner package 2, 4 and an outer package 6, 7. The inner package is enclosed in the outer package whereby the inner package and the outer package are joined. The inner package comprises a first inner package 2 with a cavity 3 containing a first portion of the sterile substance, and a second inner package 4 with a cavity 5 containing a second portion of the sterile substance. The outer package 6, 7 comprises a first compartment 6 in which the first inner package 2 is sterilely contained, and a second compartment 7 in which the second inner package 4 is sterilely contained. The outer and inner package are made from bags of a foil material, the bags being closed in opposite ends by end sealing lines 8-11 which in a preferred embodiment are combined sealing lines wherein the inner and outer packages are closed by one and the same sealing line, e.g. by adhering inner surfaces of the inner package to each other and by adhering inner surfaces of the outer package to outer surfaces of the inner package. The first and second package, and the first and second compartment are separated by separation sealing lines 12 (of the outer package) and 13 (of the inner package) so that one of the first and second packages can be removed from its compartment by cutting or tearing at a location which does not destroy the separation sealing lines 12-13, i.e. without influencing the sterility of the other compartment.

[0033] The inner package is joined to the outer package by the separation sealing line 12 along which the foil of the outer package 6, 7 is joined to the foil of the inner package 2, 4.

[0034] Fig. 2 illustrates the package of Fig. 1 encapsulated in a cardboard box 14 which is dimensionally more stable than the foils of the outer and inner packages. The cardboard box 14 forms the shape of the other packages of the dual package so that sterilisation e.g. by elec-

tron beams is facilitated.

[0035] Fig. 3 illustrates an alternative embodiment of the invention in which the inner packages 15, 16 are two separate components arranged inside an outer package 17 which is divided into two compartments by a separation sealing line 18.

[0036] Fig. 4 illustrates an embodiment of the package, wherein the outer package is formed in one long row comprising a plurality of large and small compartments 19, 20. The large and small compartments are located alternately, and they are separated by an intermediate outer package zone 21 in which the compartments can be separated by cutting or tearing. The compartments contain inner packages, e.g. made in a similar manner, i.e. as one long row of first and second packages arranged alternately.

[0037] Fig. 5 illustrates a package seen from above. The outer package 22 is made from an elongated outer sleeve which defines a top layer and a bottom layer of a foil material, and which forms an elongated cavity extending in an axial direction indicated by the arrow 23. The sleeve is made from a single piece of a foil material with rim portions which are joined in an axially extending sealing line 24. The inner packages 25, 26 are arranged in the cavity, and a top sealing line 27 and a bottom sealing line 28 extending transverse to the axial direction are made to close top and bottom parts of the outer package. An inner sealing line 29 extending transverse to the axial direction separates the first compartment from the second compartment, and a second separation sealing line 30 extending transverse to the axial direction between the first separation sealing line and one of the top and bottom sealing lines enables separation of the first compartment from the second compartment at a location between the first and second separation sealing lines without opening either of the receptacles.

[0038] Referring to Fig. 6, equipment for packing in accordance with the invention may comprise a product inlet 31 for entering the substance into a hopper 32, from which the bulk is released in portions into the funnel 33. The disclosed equipment can be used both for making the inner and the outer package. The web 34 of a foil material is allowed to rotate to release the foil material into a foil processing part of the equipment. The web is folded to form a sleeve which extends in an axial direction, indicated by the arrow 35. An axially extending sealing line at the rim opposite the folded edge, c.f. Fig. 5 numeral 24 is made to form an elongated hose like cavity. By means of the heated grippers 36, the sleeve is sealed essentially transverse to the axial direction thereby forming the first and second packages or the first and second compartments. Between each actuation of the grippers, bulk is released from the funnel into the sleeve. The size of each formed receptacle can be varied, e.g. by running the web at a constant speed through the equipment and by actuating the grippers and releasing the bulk from the funnel at a variable frequency. The equipment further comprises a CO₂ supply equipment 37 receiving CO₂ via

the pipe 38 and releasing the CO₂ via the pipes 39, 40 and 41 into three different area of the equipment. The CO₂ displaces other gasses around the substance, in particular O₂. Via the pipe 42, gas is sucked out of the sleeve prior to the sealing of each receptacle, and the removed gas is analysed in the analysing equipment 43. The equipment may contain two sets of the foil processing parts so that an inner sleeve and an outer sleeve are made in one continuous process. This however requires that the inner sleeve facilitates bonding of the outer sleeve to an outer surface thereof.

[0039] If the foil of the outer package is sealed onto the foil of the inner package, it is an object to facilitate complete removal of the outer package from the foil of the inner package.

[0040] With reference to Fig. 7, the following example explains manufacturing and opening of the package when the outer package foil is sealed to the inner package foil:

[0041] The package 44 comprises a first package within a first compartment 45 and a second package within a second compartment 46 (for the sake of simplicity, packages and corresponding compartments are indicated by one numeral each). The package comprises a first zone 47 in which the inner packages are separated from each other by adherence of inner surfaces of the inner package foil material to each other. The first zone is hatched in Fig. 7. The package comprises a second and third zone 48, 49 in which an inner surface of the outer package foil is sealed to the inner package, the second and third zones are black in Fig. 7. Between the second and third zones, the outer and inner packages are weakened to facilitate tearing, or a line indicates where to cut the packages apart, c.f. line 50. Packaging may be explained as follows:

- 1) Every inner package, i.e. a first and second package is separated from a chain of packages, c.f. the chain in Fig. 4,
- 2) The inner package is arranged in a tube/sleeve of an outer foil material,
- 3) The axially opposite open ends of the tube are sealed by sealing of an inner surface of the outer foil on an inner surface of the outer foil.
- 4) Between the two bags two sealing seams are placed by sealing an inner surface of the outer foil on an outer surface of the inner package.
- 5) A tear seam is placed between the two sealing seams mentioned under pt. 4.
- 6) Both bags can be separated from each other along the tear seam (drawing line 1)
- 7) To separate the outer package foil from the inner package, the second or third sealing zone (whichever corresponds to the compartment which is to be removed from the corresponding package) is cut away leaving a compartment of the outer package open while the inner package in that compartment is still sealed.

[0042] If the first and second compartments are separated, it must be ensured that the inner packages are not opened. For this purpose, a sign where to cut, i.e. indicating the position of the second and third zones, must be placed on the outer package where it is visible to the user.

Claims

1. A dual package (1) for a sterile substance, said package comprising one joined set of components including an inner package (2, 4) and an outer package (6, 7), the inner package comprising a first inner package (2) with a cavity (3) containing a first portion of the sterile substance, and a second inner package (4) with a cavity (5) containing a second portion of the sterile substance, the outer package (6, 7) comprising a first compartment (6) in which the first inner package (2) is sterilely contained, and a second compartment (7) in which the second inner package (4) is sterilely contained, the first and second compartments (6, 7) being separated from each other to allow removal of one of the first and second packages (2, 4) from the compartment in which it is contained without influencing the sterility of the other compartment.
2. A package according to claim 1, wherein each first and second package (2, 4) is formed between a front and a back layer of a first foil material, the layers being joined along a sealing line (13) to separate the cavity (3) of the first package from the cavity (5) of the second package.
3. A package according to claim 2, wherein the outer package (6, 7) is formed between a front and a back layer of a second foil material, the front layer being attached to the front layer of the first and second packages, and the back layer being attached to the back layer of the first and second packages.
4. A package according to claims 2-3, wherein at least one of the first and second foil materials comprises a gas barrier.
5. A package according to claims 3-4, further comprising a dimensionally stable package (14) made from a material which is more rigid than the first and second foil materials.
6. A package according to claim 5, wherein contact between the dimensionally stable package (14) forms the shape of other parts of the dual package.
7. A package according to any of the preceding claims, wherein the first and second packages (2, 4) are connected to each other, and wherein the first and second compartments (6, 7) of the outer package are

separated from each other by fixation of the outer package to the first and second packages in a separation sealing line (12).

8. A package according to any of the preceding claims, containing a drug substance selected from a group consisting of amoxicillin, ampicillin, penicillin G procaine, cephalosporin, erythromycin, neomycin, streptomycin, tetracycline, and gentamicin.

9. A method of packing a sterilised bulk of a substance in a dual package, the method comprising the steps of:

- providing the bulk of the substance;
- packing a first portion of the bulk in a first package and sealing said first package,
- packing a second portion of the bulk in a second package and sealing the second package,
- packing the first package in a first compartment of an outer package and sealing the first compartment,
- packing the second package in a second compartment of the outer package and sealing the second compartment, and
- sterilising the package.

10. A method according to claims 9, wherein the first and second package is made from an elongated inner sleeve which defines a front layer and a back layer of a foil material, and which forms an elongated cavity extending in an axial direction, the packing process comprising:

- conveying the inner sleeve in the axial direction,
- joining the front layer and the back layer along a first sealing line extending transverse to the axial direction to form a bottom part of the first package,
- filling the cavity with the main portion of the bulk,
- joining the front layer and the back layer along a second sealing line extending transverse to the conveying direction to form a top part of the first package and a bottom part of the second package,
- filling the cavity with the sampling portion of the bulk, and
- joining the front layer and the back layer along a third sealing line extending transverse to the conveying direction to form a top part of the second package.

11. A method according to any of claim 13, wherein the inner sleeve is made from a single piece of a foil material with rim portions which are joined in a seam to define the elongated cavity.

12. A method according to claims 10-11, further comprising joining the front layer and the back layer along a fourth sealing line extending transverse to the conveying direction to form an additional seal between the second and third sealing line to enable separation of the first package from the second package at a location between the fourth sealing line and the second sealing line without opening either of the receptacles.

13. A method according to claim 12, further comprising weakening the foil material between the second and fourth sealing lines.

14. A method according to claims 10-13, wherein the outer package is made from an elongated outer sleeve which defines a top layer and a bottom layer of a foil material, and which forms an elongated cavity extending in an axial direction, the packing process comprising:

- arranging the inner sleeve inside the outer sleeve,
- joining the top layer and the bottom layer to each other or to an outer surface of the inner sleeve along a top sealing line extending transverse to the axial direction to close a top part of the outer package,
- joining the top layer and the bottom layer to each other or to an outer surface of the inner sleeve along a bottom sealing line extending transverse to the axial direction to close a bottom part of the outer package, and
- joining the top layer and the bottom layer to an outer surface of the inner sleeve along a first separation sealing line extending transverse to the axial direction to separate the first compartment from the second compartment.

15. A method according to claim 14, further comprising joining the top layer and the bottom layer along a second separation sealing line extending transverse to the conveying direction between the first separation sealing line and one of the top and bottom sealing lines to enable separation of the first compartment from the second compartment at a location between the first and second separation sealing lines without opening either of the receptacles.

16. A method according to claim 15, further comprising weakening the foil material between the first and second separation sealing lines.

17. A method according to claim 15, wherein the sealing lines are provided to form an intermediate outer package zone between the first and second compartment which encapsulates an intermediate inner package zone between the first package and the

second package.

- 18.** A method according to claims 14-17, wherein the outer sleeve is made from a single piece of a foil material with rim portions which are joined in a seam to define the elongated cavity. 5
- 19.** A method according to claims 14-17, wherein the outer sleeve is made from a single piece of a foil material with rim portions which are joined to the inner sleeve to form the elongated cavity. 10
- 20.** A method according to any of the preceding claims, further comprising packing the outer package in a dimensionally stable package which is made from a material which is rigid relative to the material of the outer package and relative to the material of the first and second package. 15
- 21.** A method according to claim 20, wherein the dimensionally stable package forms the outer package into a pre-specified thickness. 20

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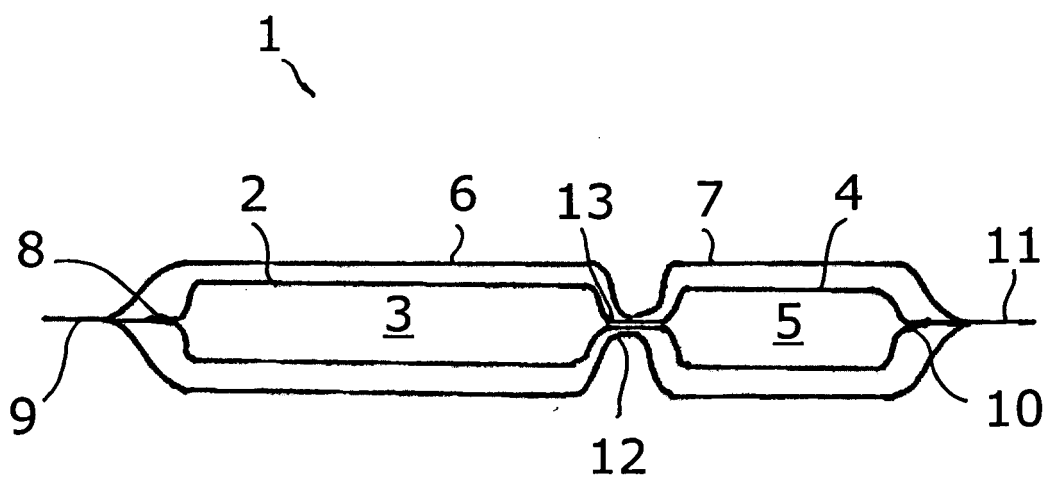


Fig. 1

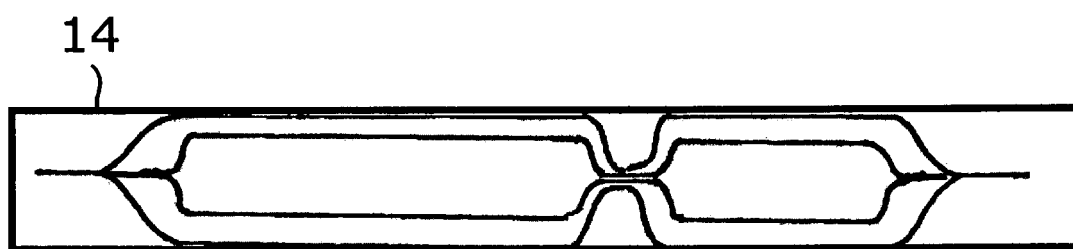


Fig. 2

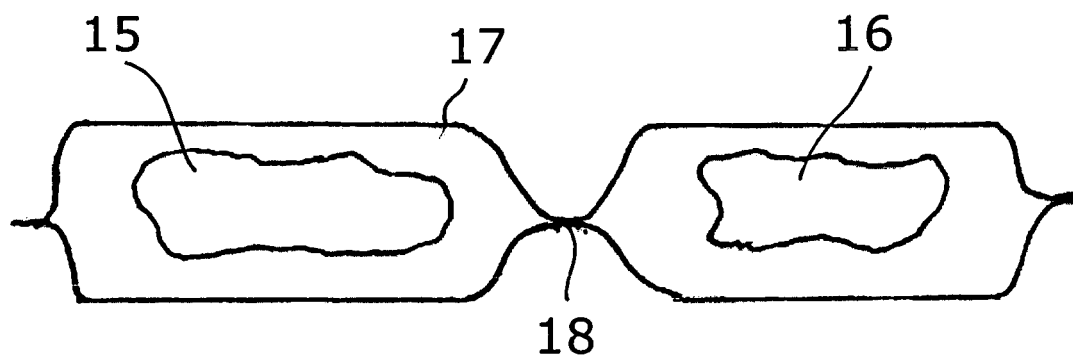


Fig. 3

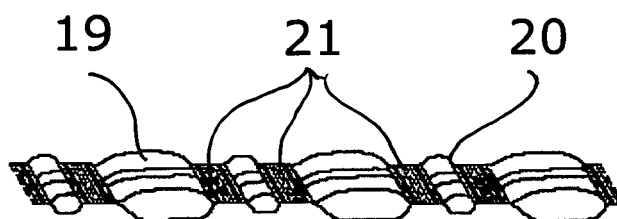


Fig. 4

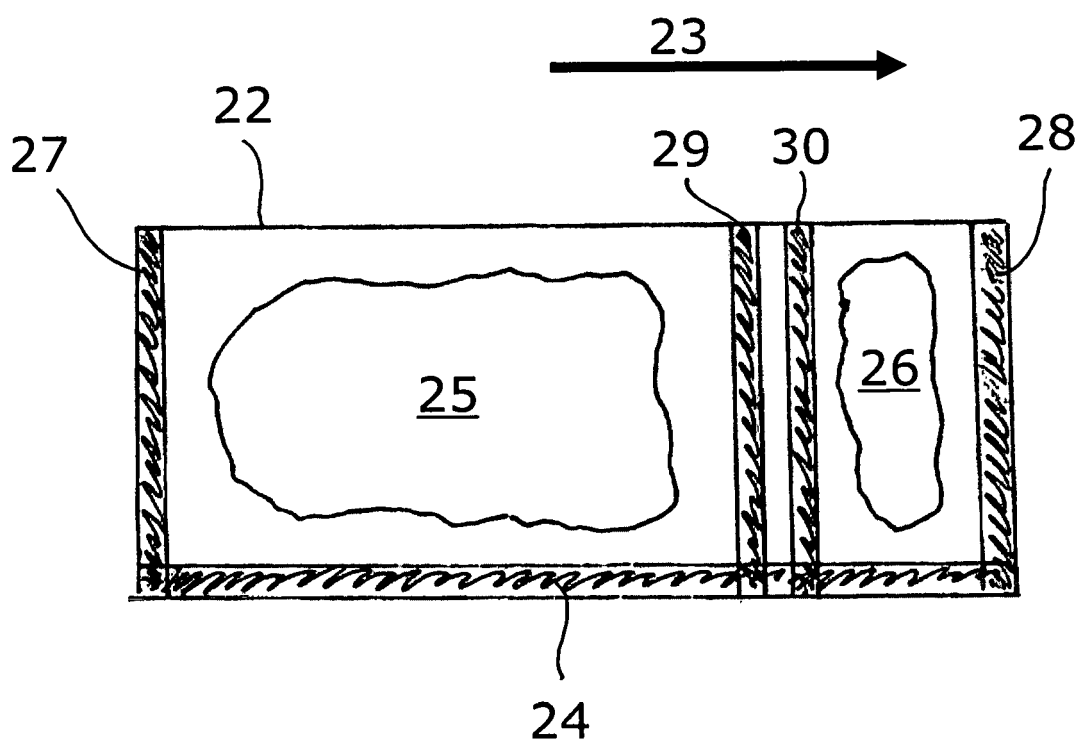


Fig. 5

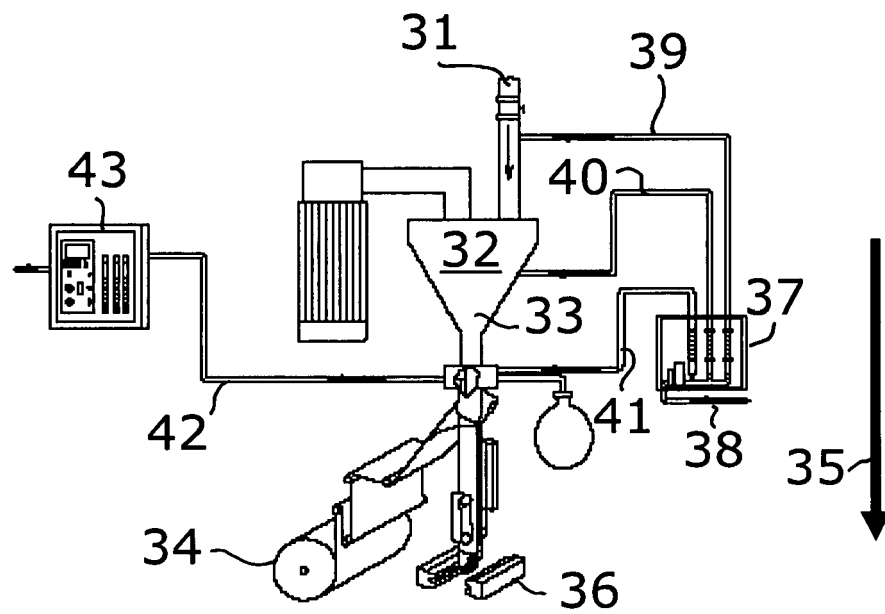


Fig. 6

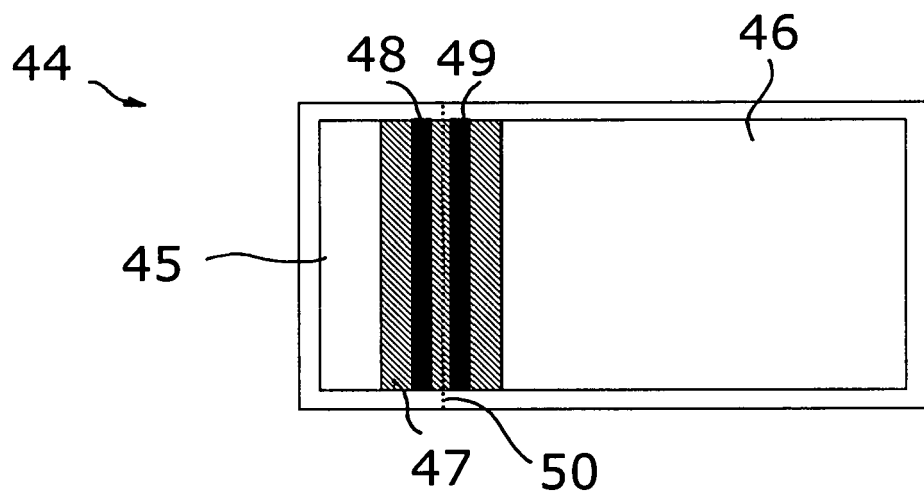


Fig. 7



DOCUMENTS CONSIDERED TO BE RELEVANT			
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Place of search Munich		Date of completion of the search 11 October 2006	Examiner Pollet, Didier
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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