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Askew et al.(10) **Pub. No.: US 2015/0140179 A1**(43) **Pub. Date: May 21, 2015**(54) **INFUSION PACKET AND ITS
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Englewood Cliffs, NJ (US)(72) Inventors: **Sarah Elizabeth Askew, Bedford (GB);**
Suzanne Emma Axe, Thrapston (GB)(73) Assignee: **CONOPCO, INC., D/B/A UNILEVER,**
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§ 371 (c)(1),

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(57)

ABSTRACT

The present invention relates to an infusion packet (51) comprising a top (52), a bottom (53), a first side (54) and a second side (55); wherein the bottom (53) of the packet is defined by a gusset (61) and each side (54, 55) of the packet is defined by a seal that extends between the top (52) and bottom (53) of the packet; the packet (51) being characterised in that the seals defining the sides (54, 55) are arranged such that the packet has a compartment with a substantially trapezoidal cross-section.

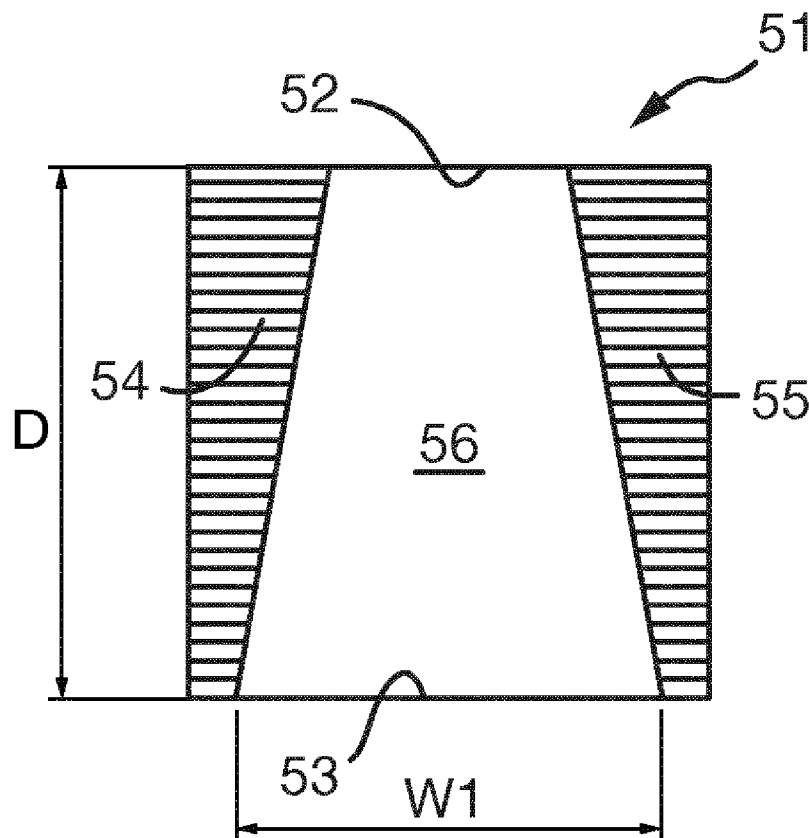


Fig. 1a

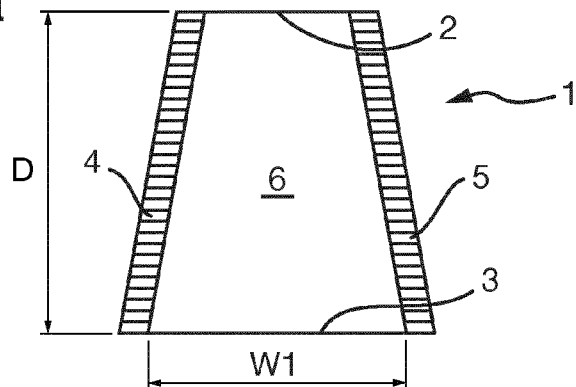


Fig. 1b

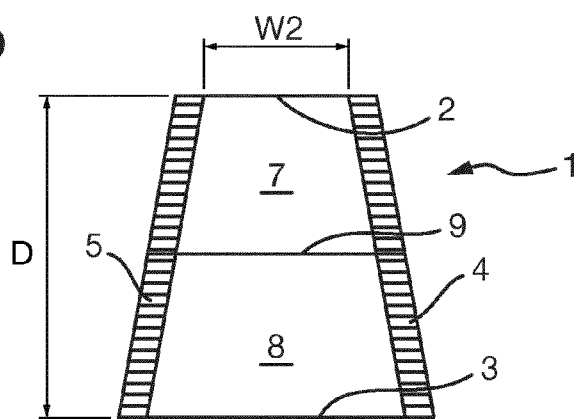


Fig. 1c

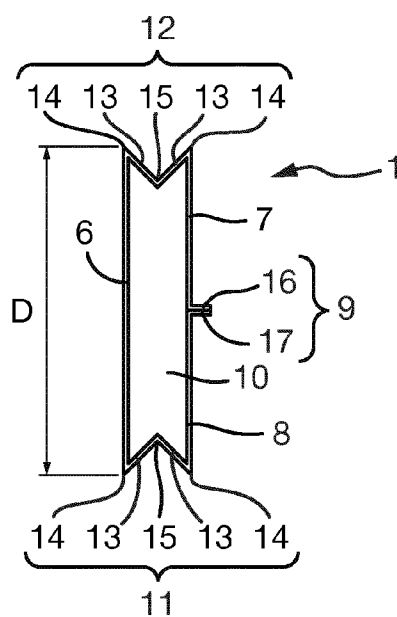


Fig. 2

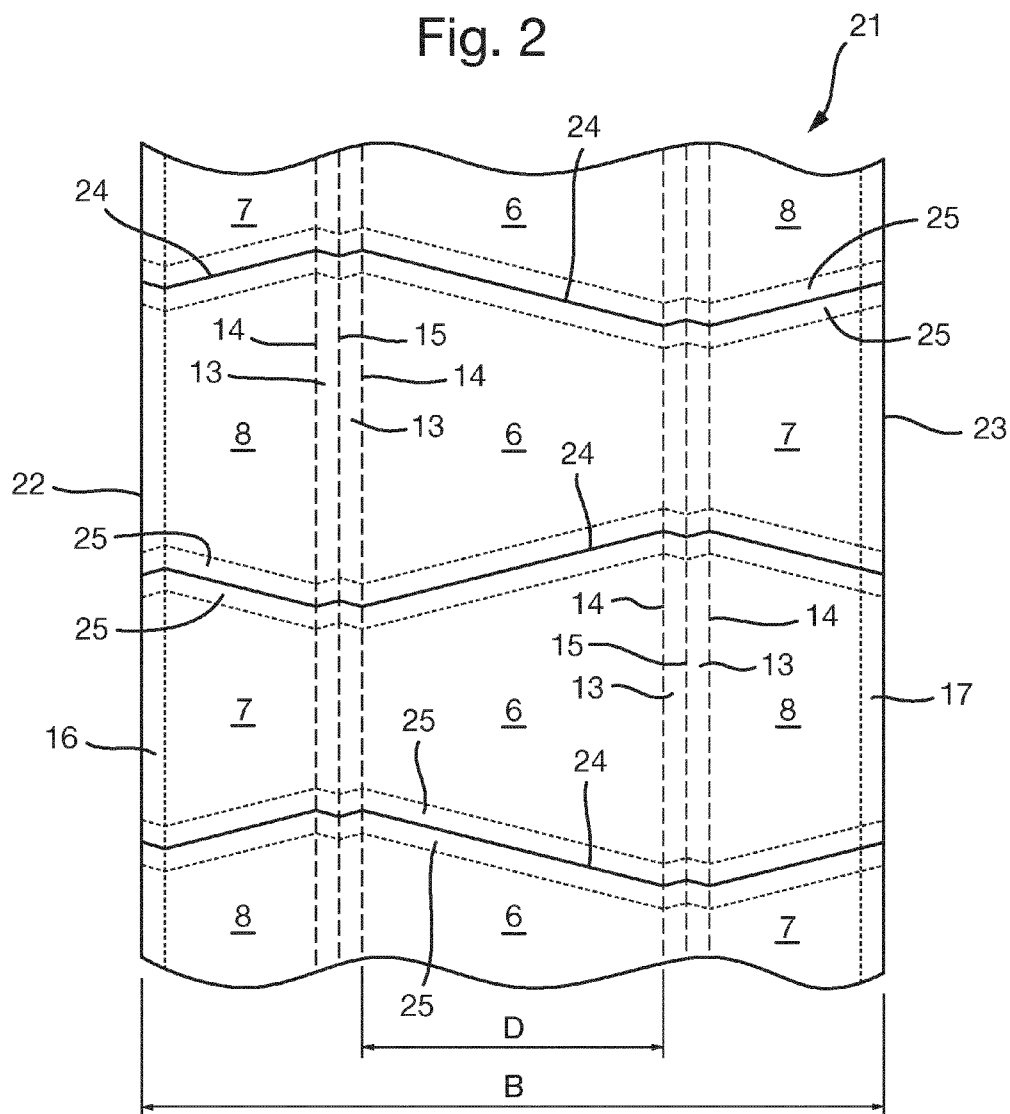


Fig. 3a

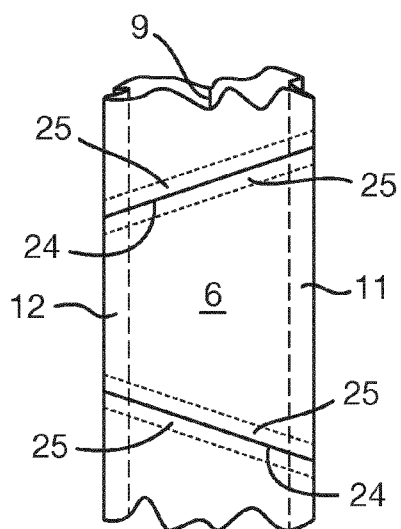


Fig. 3b

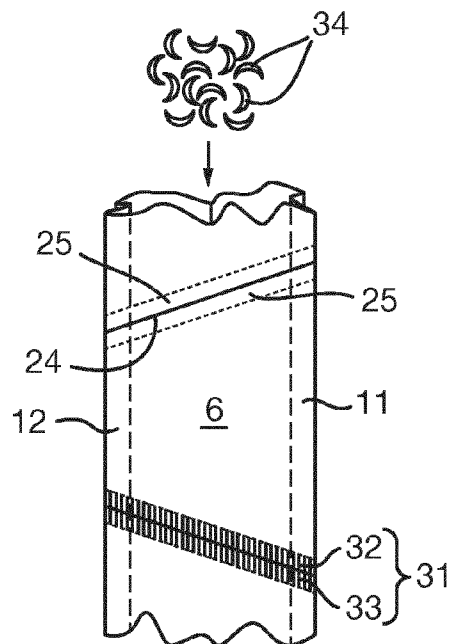


Fig. 3c

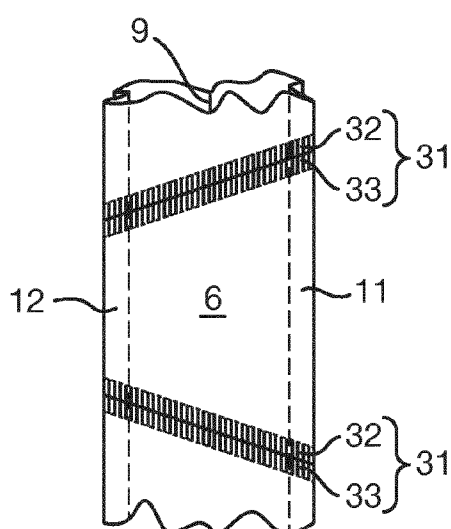


Fig. 3d

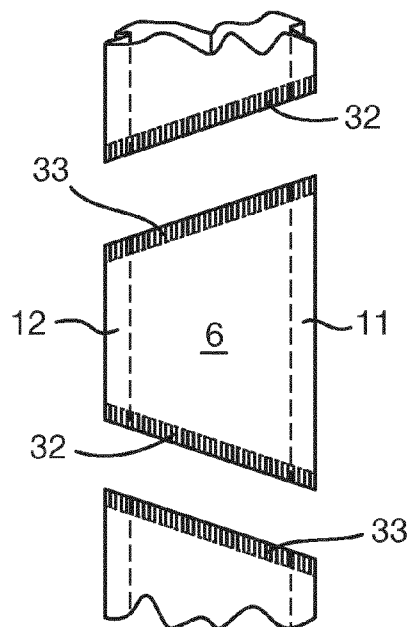


Fig. 4a

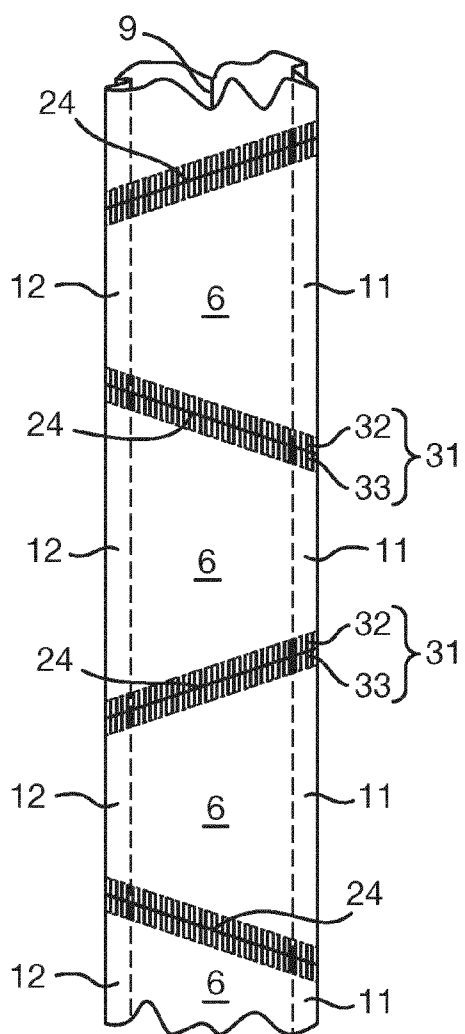


Fig. 4b

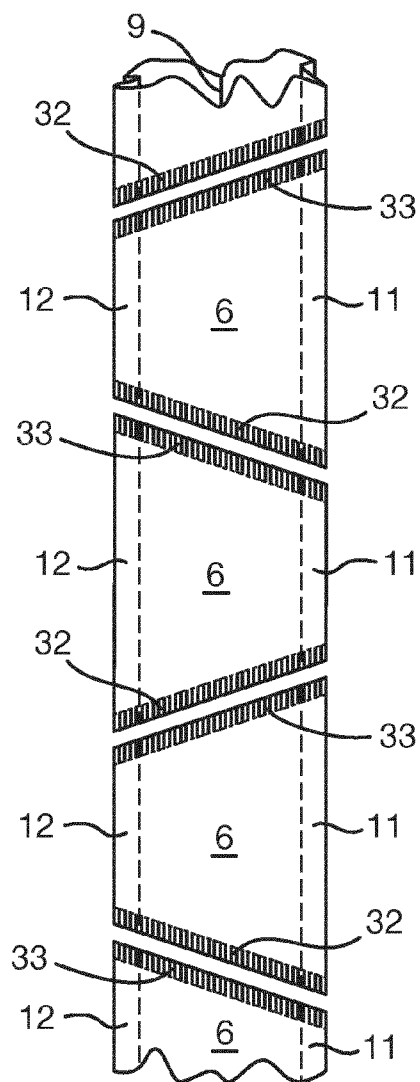


Fig. 5a

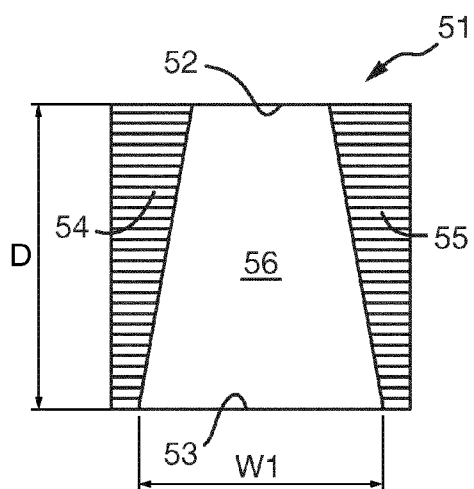


Fig. 5b

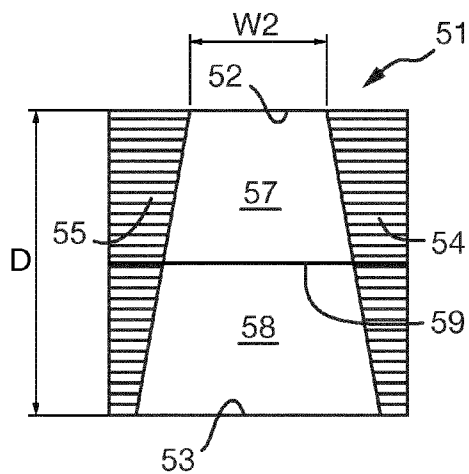


Fig. 6a

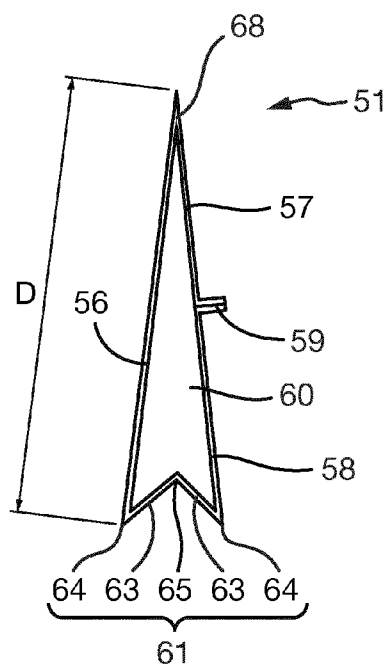


Fig. 6b

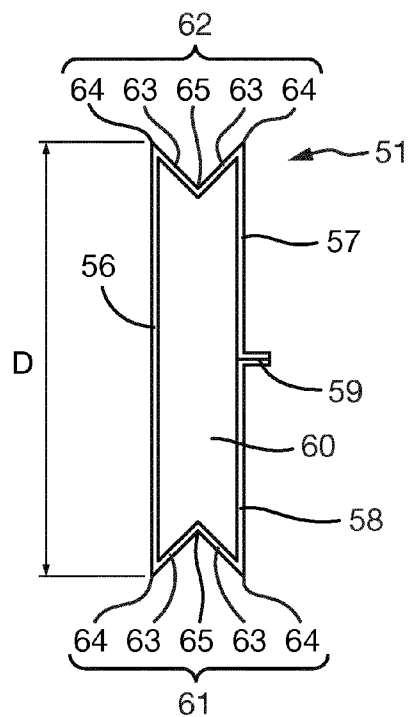


Fig. 7a

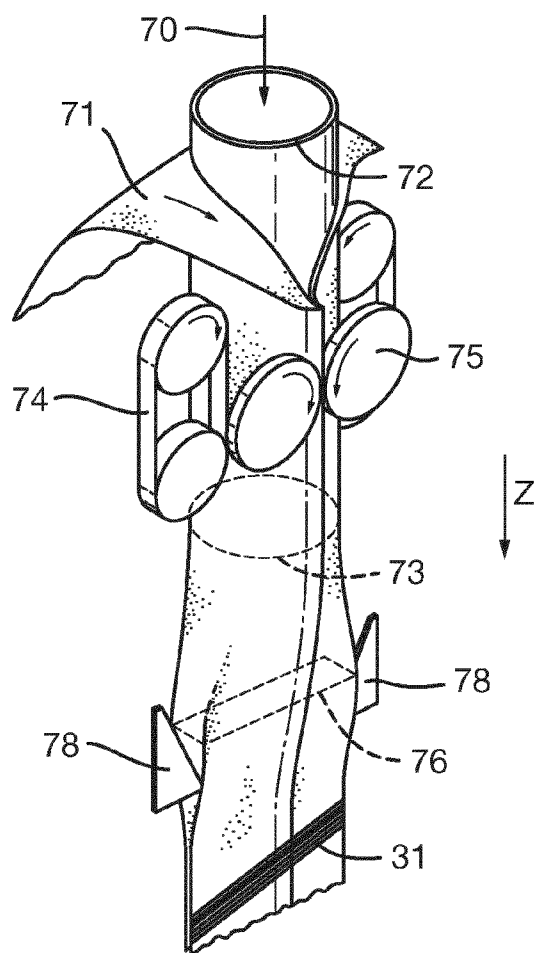


Fig. 7b

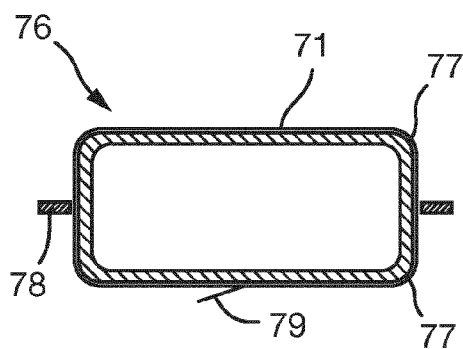
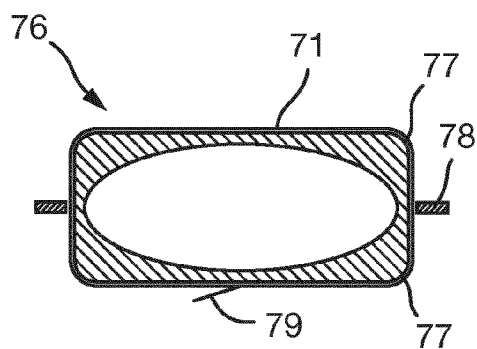


Fig. 7c



INFUSION PACKET AND ITS MANUFACTURE

TECHNICAL FIELD OF THE INVENTION

[0001] The present invention concerns infusion packets, and also methods for producing such packets. In particular, the present invention relates to infusion packets containing infusible material such as tea.

BACKGROUND OF THE INVENTION

[0002] In the past, conventional infusion packets (e.g. tea bags) have typically been flat, comprising a single chamber filled with infusible material (e.g. leaf tea, herbal mixtures). This type of packet often comprises infusible material sandwiched between square or round sheets of porous material. Such packets restrict the movement of the infusible material within the packet to substantially two dimensions. As a result, the infusion performance of such packets is limited.

[0003] Double-chamber infusion packets such as those described in U.S. Pat. No. 2,593,608 (A.G.F. Rambold) are also known. In such infusion packets, the infusible material is contained in two chambers, with each chamber being attached to the other at the base and apex. This type of infusion packet is thought to enable faster infusion by allowing an increased flow of water around the infusible material. However, a drawback of double-chamber infusion packets is that they require significantly more porous packet material than their single-chamber counterparts.

[0004] GB 2 053 668 (H. C. Fornari) describes the use of disposable sachets in the preparation of infusions of tea, coffee and other similar infusible substances. The shape of the sachets is generally that of an elongated double wedge. The sachets are elongate because they are designed to be gripped at their upper end, while their bottom end is dipped into a vessel which contains water. The elongate nature of these sachets means that they require a considerable amount of packaging material.

[0005] Thus there is a need for an infusion packet which overcomes or ameliorates one or more of the aforementioned disadvantages.

SUMMARY OF THE INVENTION

[0006] In a first aspect the invention relates to an infusion packet comprising a top, a bottom, a first side and a second side; wherein the bottom of the packet is defined by a gusset and each side of the packet is defined by a seal that extends between the top and bottom of the packet; wherein the seals defining the sides of the packet are arranged such that the packet has a compartment with a substantially trapezoidal cross-section.

[0007] Such a packet is substantially flat prior to use and hence convenient to pack and handle. However, the packet can nonetheless swell upon immersion in an infusion liquid such that it adopts a more three-dimensional shape. This swelling is thought to permit an increased flow of the infusion liquid around the infusible material and hence facilitate faster infusion. In order to further facilitate swelling of the packet, it is preferred that the packet comprises two gussets (i.e. a first gusset defining the bottom of the packet and a second gusset defining the top of the packet).

[0008] The packet of the present invention has a compartment which preferably contains a substance, more preferably a particulate substance (e.g. an infusible material such as tea leaves and/or stem).

[0009] The combination of the shape of the compartment together with the presence of the gusset(s) is thought to encourage the substance to collect towards the bottom of the packet. Hence the filled packet can maintain an upright position, particularly when in use (i.e. when immersed in an infusion liquid). Without wishing to be bound by theory, we believe that this is due to the filled packet having a low centre of gravity. This may help to keep the substance (e.g. tea leaves and/or stem) submerged in the infusion liquid. Additionally or alternatively, the low centre of gravity together with the presence of the bottom gusset enables the packet to stand upright for display purposes (e.g. during presentation and selection).

[0010] In a second aspect the invention relates to a method of manufacturing an infusion packet from a web of packaging material, the method comprising the steps of:

[0011] (a) sealing the web of packaging material to form a tubular web;

[0012] (b) indenting the tubular web to introduce creases into the packaging material, the creases defining at least one gusset;

[0013] (c) forming a first seal across the tubular web;

[0014] (d) dosing a substance into the tubular web; and

[0015] (e) forming a second seal across the tubular web, wherein the first and second seals are formed such that they define a compartment with a substantially trapezoidal cross-section.

[0016] The method permits the manufacture of infusion packets according to the first aspect of the invention whilst incurring substantially no wastage of packaging material.

[0017] In order to produce individual packets, it is particularly preferred that the method comprises the additional step of:

[0018] (g) separating the compartment defined by the seals into individual packets by severing the web at the seals.

[0019] From the point of view of a consumer, it is believed that the packets are perceived to be premium quality due to their exciting shape. As such, the method permits the manufacture of a premium product at a competitive cost.

DEFINITIONS

[0020] As used herein the term “comprising” encompasses the terms “consisting essentially of” and “consisting of”. It should be noted that in specifying any range of values or amount, any particular upper value or amount can be associated with any particular lower value or amount. The disclosure of the invention as found herein is to be considered to cover all embodiments as found in the claims as being multiply dependent upon each other irrespective of the fact that claims may be found with multiple dependency or redundancy.

Trapezium

[0021] As used herein the term “trapezium” refers to a convex quadrilateral with one pair of parallel sides and one pair of non-parallel sides. A “trapezoidal cross-section” refers to a cross-section that has the shape of a trapezium. A trapezium in which the two non-parallel sides are of equal

length is referred to as an “isosceles trapezium”. For the avoidance of doubt, it is noted that an infusion packet according to the present invention has a compartment with a substantially trapezoidal cross-section when viewed from the front or the rear of the packet.

Porous Packaging Material

[0022] Since the packet of the present invention is an infusion packet, it is preferred that the packet is formed from porous packaging material. As used herein the term “porous packaging material” is used to describe a water-insoluble, liquid-permeable packaging material which has openings that permit liquids, especially aqueous liquids, to pass through. Suitable packaging materials include non-wovens, wet laid non-wovens and wovens made with polymers of cellulosic/polymer blends (e.g. cellulose or cellulose PP blends) or perforated films.

[0023] The packaging material may be heat-sealable or non-heat sealable. In order to facilitate a high rate of infusion packet manufacture, in a preferred embodiment the packaging material is heat-sealable.

Beverage

[0024] As used herein the term “beverage” refers to a substantially aqueous drinkable composition suitable for human consumption.

Infusible Material

[0025] The packet of the present invention preferably contains infusible material. As used herein the term “infusible material” refers to a food-grade substance that when steeped or soaked in an aqueous liquid releases certain soluble substances into the liquid, e.g. flavour and/or aroma molecules. As such, the infusible material can be contacted with an aqueous liquid such as water to provide a beverage. This process is referred to as brewing. Brewing may be carried out at any temperature but is preferably carried out at least 40° C., more preferably at least 55° C., more preferably still at least 70° C. and preferably less than 120° C., more preferably less than 100° C., more preferably still less than 90° C., most preferably less than 80° C.

[0026] It is preferred that the infusible material is at least partially insoluble (i.e. does not dissolve completely when steeped or soaked in water).

[0027] The infusible material preferably comprises plant material. For example, the infusible material may comprise plant material derived from *Camellia sinensis*, *Aspalathus linearis*, *Mentha piperita*, *Matricaria recutita* and/or mixtures thereof.

Tea Material

[0028] In a preferred embodiment, the infusible material comprises tea material. As used herein the term “tea material” refers to material derived from the plant *Camellia sinensis* var. *sinensis* and/or *Camellia sinensis* var. *assamica*.

[0029] The tea material may have been subjected to a “fermentation” step wherein the tea material is oxidised by certain endogenous enzymes that are released during the early stages of “black tea” manufacture. This oxidation may even be supplemented by the action of exogenous enzymes such as oxidases, laccases and peroxidases. Alternatively the material may have been partially fermented (“oolong tea”) or may have remained substantially unfermented (“green tea”).

[0030] In a particularly preferred embodiment the infusible material comprises tea leaves and/or stem. As used herein, the term “tea leaves and/or stem” refers to tea material that is derived from the leaves and/or stem of the tea plant and that has not been subjected to an extraction step.

Tea-Based Beverage

[0031] As mentioned above, the packet of the invention is preferably a porous infusion packet which contains infusible material. In a particularly preferred embodiment, the infusible material comprises tea material, more preferably tea leaves and/or stem. Such a packet can be used to prepare a tea-based beverage, e.g. by contacting the infusion packet and its contents with an aqueous liquid (i.e. brewing). As used herein the term “tea-based beverage” refers to a beverage comprising at least 0.01% by weight dissolved tea solids. The term “tea solids” refers to dry material that is extractable from tea leaves and/or stem, and which is soluble in boiling water.

DETAILED DESCRIPTION

[0032] Certain embodiments of the invention are illustrated by the figures, in which:

[0033] FIG. 1a is a front view of an infusion packet according to an embodiment of the invention;

[0034] FIG. 1b is a rear view of the packet of FIG. 1a;

[0035] FIG. 1c is a cross-sectional side view of a preferred embodiment of the packet shown in FIGS. 1a and 1b;

[0036] FIG. 2 is a view of a web of packaging material for making the packet of FIG. 1;

[0037] FIGS. 3a to 3d are a series of perspective front views showing steps in the formation of a packet according to an embodiment of the invention;

[0038] FIGS. 4a and 4b are perspective front views showing packets being made according to an embodiment of the invention;

[0039] FIG. 5a is a front view of a packet according to an alternative embodiment the present invention;

[0040] FIG. 5b is a rear view of the packet of FIG. 5a;

[0041] FIG. 6a is a cross-sectional side view of an embodiment of the packet of FIG. 5;

[0042] FIG. 6b is a cross-sectional side view of an alternative embodiment of the packet of FIG. 5;

[0043] FIG. 7a shows an apparatus which is suitable for producing packets according to the present invention; and

[0044] FIGS. 7b and 7c show cross-sectional views of alternative embodiments of the conduit outlet of the apparatus of FIG. 7a viewed from above.

[0045] FIGS. 1a to 1c show three different views of an infusion packet as per a preferred embodiment of the present invention.

[0046] FIG. 1a shows an infusion packet 1 viewed from the front, wherein the packet 1 has a top 2, a bottom 3, a first side 4 and a second side 5. The packet 1 has a front face which consists of a trapezium-shaped front panel 6. In this embodiment, the sides of the packet 4, 5 are arranged such that the front panel 6 has the shape of an isosceles trapezium. Each side 4, 5 is defined by a seal that extends between the top 2 and bottom 3 of the packet. In this preferred embodiment each seal has a substantially uniform breadth. However in certain other embodiments one or both of the seals may have a variable breadth (see, for example, FIG. 5).

[0047] The top 2 and the bottom 3 of the packet are substantially parallel to one another and are separated by a dis-

tance D. The magnitude of the distance D will depend on the intended use of the packet. For example, in a particularly preferred embodiment where the packet is an infusion packet, it is desirable that the packet will fit in a cup, a mug and/or a teapot. Thus in such an embodiment, the distance D is preferably no more than 85 mm, more preferably no more than 70 mm, still more preferably no more than 65 mm and most preferably no more than 60 mm.

[0048] It is preferred that the infusion packet is able accommodate sufficient infusible material to produce a flavourful beverage, for example preferably from 1 to 5 g of infusible material, more preferably from 1.3 to 4 g and most preferably from 1.6 to 3 g. In order to allow the infusion material room to move and/or improve the flow of water around the infusible material, it is preferred that the distance D is at least 30 mm, more preferably at least 35 mm, still more preferably at least 40 mm and most preferably at least 45 mm.

[0049] FIG. 1b shows a view of the infusion packet of FIG. 1a viewed from the rear, wherein the packet 1 has a rear face which consists of two back panels 7, 8. In this preferred embodiment, a longitudinal seal 9 runs across the rear face of the packet defining a boundary between the two back panels 7, 8.

[0050] In the infusion packet shown in FIGS. 1a and 1b, the seals defining the sides of the packet are arranged such that they co-planar (i.e. both of the seals are in the same plane). This facilitates efficient manufacture of the infusion packet. Furthermore, the seals are not parallel to each other. Therefore, the distance between the seals is not constant. The seals are separated by a width W1 at the bottom of the packet and by a width W2 at the top of the packet. W1 is wider than W2 (i.e. $W1 > W2$). The contents of a packet will tend to collect towards the bottom of the packet, hence a packet wherein $W1 > W2$ has a low centre of gravity and/or will tend to maintain an upright position.

[0051] The size of W1 and W2 will depend on the intended use of the packet. For example, it may be desirable that the infusion packet will fit in a cup, a mug and/or a teapot and/or that the packet is able accommodate sufficient infusible material to produce a flavourful beverage. W1 is preferably from 30 to 80 mm, more preferably from 35 to 75 mm, most preferably from 40 to 70 mm. W2 is preferably from 20 to 70 mm, more preferably from 25 to 65 mm, most preferably from 30 to 60 mm.

[0052] So long as W1 is wider than W2, the sizes of W1 and W2 may be selected independently of one another. For example, if the intention is to provide an infusion packet suitable for a teapot, an infusion packet wherein W1 is 80 mm and W2 is 20 mm is envisaged, as is an infusion packet wherein W1 is 80 mm and W2 is 60 mm.

[0053] FIG. 1c shows a cross-sectional side view of a preferred embodiment of the infusion packet of FIGS. 1a and 1b. The infusion packet 1 has a compartment 10, wherein the compartment is defined by a top wall, a bottom wall, a first side wall and a second side wall. The first side wall consists of the front panel 6 and the second side wall consists of the two back panels 7, 8 which are joined together by the longitudinal seal 9. The bottom wall of the packet consists of a first gusset 11 and the top wall of the packet consists of a second gusset 12. As such, the first gusset 11 defines the bottom 3 of the packet and the second gusset 12 defines the top 2 of the packet.

[0054] In this preferred embodiment each gusset 11, 12 is "M"-shaped, and consists of two gusset panels 13. An outer

crease 14 defines a boundary between a gusset panel 13 and a front panel 6 or a back panel 7, 8. An inner crease 15 defines a boundary between two gusset panels 13.

[0055] More generally, a gusset defining the top 2 or bottom 3 of the packet consists of:

[0056] n gusset panels 13;

[0057] two outer creases 14; and

[0058] (n-1) inner creases 15,

where n is an even number.

[0059] The size of the gussets 11, 12 is not fixed, and will depend on several factors such as the magnitude of the distance D, and the amount of infusible material contained within the packet.

[0060] It is preferred that each gusset panel 13 has a width (i.e. distance between the outer crease 14 and the inner crease 15) of no more than 20 mm. Preferably each gusset panel 13 has a width of from 3 to 20 mm, more preferably from 4 to 12 mm and most preferably from 5 to 8 mm.

[0061] In embodiments where the gusset(s) are "M"-shaped, it is preferred and the total width of each gusset 11, 12 (i.e. the distance between the two outer creases 14 when the gusset is fully extended) is no more than 40 mm. Furthermore, each "M"-shaped gusset 11, 12 preferably has a total width of from 6 to 40 mm, more preferably from 8 to 24 mm and most preferably from 10 to 16 mm.

[0062] The presence of the gusset(s) means that the infusion packet can swell upon immersion in an infusion liquid so as to adopt a more three-dimensional shape. This swelling is thought to permit an increased flow of the infusion liquid around the infusible material and hence facilitate faster infusion. Although infusion packets which adopt a three-dimensional shape are already known (e.g. tetrahedral-shaped packets such as those described in WO 95/01907), the inherent three-dimensional nature of such packets means that they are somewhat inconvenient to pack and handle. By contrast, the infusion packets of the present invention are substantially flat prior to use and thus can be packaged more conveniently and/or efficiently.

[0063] As described previously, the boundary between the two back panels 7, 8 is preferably defined by the longitudinal seal 9. In the embodiment shown in FIG. 1c, the longitudinal seal 9 is a fin seal formed by sealing together edge margins 16, 17 of a web of packaging material. In alternative embodiment (not shown) the longitudinal seal 9 is a lap seal.

[0064] FIG. 2 shows a web 21 of packaging material suitable for making infusion packets such as those illustrated in FIGS. 1a to 1c.

[0065] The web 21 of packaging material has edges 22, 23 separated by a width B. Each packet comprises a portion of the web 21, although the web itself can be of indefinite length. The portion of the web 21 from which a single packet is ultimately formed is delimited from adjacent portions of the web 21 by side boundaries 24. The side boundaries 24 extend across the full width B of the web in the embodiment shown.

[0066] As shown in FIG. 2, side margins 25 flank each side boundary 24. These side margins 25 are incorporated in the seals when packets according to this embodiment are formed, wherein the seals ultimately define the sides 4, 5 of the finished packets (see, for example, FIG. 1a). The formed packets are eventually separated from each other by severing the web 21 of packaging material along the side boundaries 24.

[0067] Edge margins 16, 17 extend along the edges 22, 23 of the web 21 of packaging material. When packets are formed, the edge margins 16, 17 are incorporated in the

longitudinal seal 9. The longitudinal seal defines the boundary between the two back panels 7, 8 (see, for example, FIG. 1 b).

[0068] The web 21 of packaging material shown in FIG. 2 is suitable for making infusion packets comprising a first gusset 11 and a second gusset 12 (see, for example, FIG. 1 c). Each gusset 11, 12 extends between the seals and consists of two gusset panels 13, two outer creases 14 and one inner crease 15.

[0069] A single infusion packet comprises packaging material that covers an area A. The area A is a convenient measure of the amount of packaging material required to form each packet. In order to minimise environmental impact, it is desirable to limit the amount of packaging material used to form each packet. However, the amount of packaging material used to form a packet should ideally not be restricted to such an extent that undue force is exerted on the seals since this could cause the seals to split resulting in unwanted release of the package contents. Additionally or alternatively it is undesirable to restrict the amount of packaging material to such an extent that the infusion performance of the packet is compromised.

[0070] Thus in order to balance environmental impact, packet integrity and/or infusion performance, a single infusion packet according to the present invention preferably consists of packaging material that covers an area A of less than 12000 mm². Preferably A is from 5000 to 11000 mm², more preferably from 5500 to 9500 mm² and most preferably from 6000 to 8000 mm².

[0071] FIGS. 3a to 3d are a series of perspective views which illustrate a sequence of process steps that can be carried out to form an infusion packet from a continuous web of packaging material.

[0072] Firstly, the edge margins 16, 17 of the web are sealed together with a longitudinal seal 9 to give the web a tubular form, and the tubular web is indented so as to introduce creases that define one or more gusset(s). For example, FIG. 3a shows a preferred embodiment in which two “M”-shaped gussets 11, 12 have been introduced into the tubular web.

[0073] The web travels vertically (downwards) to a sealing zone where seals 31 that define the individual packets are formed. A seal 31 is formed comprising the side margins 25 of the web of packaging material such that the seal 31 defines a first side wall 32 of the present packet and a second side wall 33 of the preceding packet (FIG. 3b), and an input device delivers a dose of a substance, in this case infusible material 34, into the tubular web.

[0074] As shown in FIG. 3c, a further seal 31 is then formed. This further seal 31 defines a second side wall 33 of the present packet and the first side wall 32 of the succeeding packet. Thus the tubular web is filled with doses of infusible material 34 as it is formed into a chain of packets defined by the seals 31.

[0075] The chain of packets is subsequently separated into individual packets by severing the web at the seals 31 along the side boundaries 24 as shown in FIG. 3d.

[0076] In an alternative embodiment (not shown), it is possible to seal and cut in a single operation rather than having these operations performed serially.

[0077] FIGS. 4a and 4b show a preferred means of producing infusion packets according to the present invention.

[0078] FIG. 4a is a perspective view which illustrates a chain of infusion packets. Each packet comprises a top wall, a bottom wall, a first side wall 32 and a second side wall 33.

[0079] FIG. 4b is a perspective view illustrating the formation of individual packets from the chain of infusion packets shown in FIG. 4a, wherein the chain of packets has been severed at the seals 31. The non-parallel nature of the seals means that where the first gusset 11 forms the bottom wall for a given packet, this first gusset 11 will form the top wall of the preceding and succeeding packets. Similarly, where the second gusset 12 forms the bottom wall of a given packet, this second gusset 12 will form the top wall of the preceding and succeeding packets. Forming the packets in this way results in minimal wastage of packaging material and/or facilitates rapid production of filled packets.

[0080] FIGS. 5a and 5b show two different views of an infusion packet according to an alternative embodiment of the present invention.

[0081] FIG. 5a shows an infusion packet 51 viewed from the front, wherein the packet 51 has a top 52, a bottom 53, a first side 54 and a second side 55. Each side 54, 55 is defined by a seal that extends between the top 52 and bottom 53 of the packet.

[0082] The packet 51 has a front face which consists of a substantially rectangular front panel 56. Nevertheless, the arrangement of the seals ensures that the packet has a compartment which is substantially trapezoidal in cross-section when viewed from the front or back. As such, in this embodiment the seals have a variable breadth, wherein the breadth of the seal is wider at the top 52 of the packet than it is at the bottom 53.

[0083] The top 52 and the bottom 53 of the packet are substantially parallel to one another and are separated by a distance D. As described above, the magnitude of the distance D will depend on the intended use of the packet.

[0084] FIG. 5b shows a view of the packet of FIG. 5a viewed from the rear, wherein the packet 51 has a rear face which consists of two back panels 57, 58. In this preferred embodiment, a longitudinal seal 59 runs across the rear face of the packet defining a boundary between the two back panels 57, 58.

[0085] In the embodiment of the packet shown in FIGS. 5a and 5b, the seals defining the sides of the packet are arranged such that the packet comprises a compartment with a substantially trapezoid cross section when viewed either from the front (FIG. 5a) or from the rear (FIG. 5b). In this embodiment, the substantially trapezoid cross-section is achieved by the non-uniform nature of both the breadth of the seals and the distance between the seals. The seals are separated by a width W1 at the bottom of the packet and be a width W2 at the top of the packet wherein W1 is wider than W2 (i.e. W1>W2).

[0086] FIGS. 6a and 6b are cross-sectional side views of two alternative embodiments of infusion packets.

[0087] FIG. 6a shows a cross-sectional side view of an infusion packet, such as the infusion packet of FIGS. 5a and 5b. The packet 51 has a compartment 60 defined by a top wall, a bottom wall, a first side wall and a second side wall. The first side wall consists of the front panel 56 and the second side wall consists of the two back panels 57, 58 which are joined together by the longitudinal seal 59. The bottom wall of the compartment consists of a first gusset 61 while the top wall of the compartment is defined by a crease 68.

[0088] In this embodiment the gusset 61 is “M”-shaped, and consists of two gusset panels 63, two outer creases 64 and one inner crease 65. As described previously, each outer crease 64 defines the boundary between a gusset panel 63 and

the front panel **56** or the back panel **57, 58**; while the inner crease **65** defines the boundary between the two gusset panels **63**.

[0089] In order to form an infusion packet comprising a single gusset, the process of FIG. **3** can be adapted such that only one gusset is introduced into the tubular web.

[0090] It should be noted that while the packet of FIGS. **1a** and **1b** preferably has the cross-sectional side view shown in FIG. **1c**, in an alternative embodiment this packet can have a cross-sectional side view as per FIG. **6a**.

[0091] FIG. **6b** shows a cross-sectional side view of an alternative embodiment of an infusion packet (e.g. the packet of FIG. **5**). The packet **51** is essentially the same as the one depicted in FIG. **6a**, except that in this embodiment the packet comprises two gussets. As such, the top wall of the compartment consists of a second gusset **62** (as opposed to being defined by a crease **68** as per the embodiment shown in FIG. **6a**). It is particularly preferred that both the first **61** and second **62** gussets are “M”-shaped.

[0092] FIG. **7a** illustrates an embodiment of an apparatus for manufacturing packets according to the present invention, for example the apparatus can implement the process shown in FIG. **3**.

[0093] The apparatus has a single production path being supplied with a substance **70** (such as infusible material) by a doser (not shown). A web of packaging material **71** is fed over a shaping guide near an inlet **72** of a conduit **73**. Preferably the conduit inlet **72** has a circular cross-section. Here the web takes up the tubular form of the conduit exterior and is drawn down the tube by one or more guide elements **74** while its opposite edge margins are sealed together longitudinally by a longitudinal sealer **75**. In a preferred embodiment, the longitudinal sealer **75** is adjacent to the conduit and in a particularly preferred embodiment the longitudinal sealer **75** comprises a pair of heating and pressing rollers that weld the side margins together to form a longitudinal fin seal **79**.

[0094] The tubular web is drawn along the conduit **73** and past an outlet **76** of the conduit, preferably by the guide elements **74**. Preferably, the conduit outlet **76** has an external cross-section comprising at least two vertices **77** (see FIGS. **7b** and **7c**).

[0095] The tubular web is indented between the vertices **77** by at least one forming member **78**. Preferably the forming member(s) **78** are situated adjacent to the conduit outlet **76**. For example, FIGS. **7a** to **7c** show preferred embodiments in which the tubular web is indented by two forming members **78**, with each forming member introducing an “M”-shaped gusset.

[0096] The apparatus of FIG. **7a** can implement the process shown in FIG. **3**.

[0097] FIGS. **7b** and **7c** show cross-sectional views of alternative embodiments of the conduit outlet of the apparatus of FIG. **7a** viewed from above.

[0098] The conduit outlet **76** has an internal cross-section and an external cross-section which can be the same shape (see FIG. **7b**) or different shapes (see FIG. **7c**). In particular, it is preferred that the conduit outlet **76** has an external cross-section comprising at least two vertices **77**.

[0099] The conduit preferably transitions from having a circular cross-section (both externally and internally) at its inlet **72** to having an external cross-section at its outlet **76** that comprises at least two vertices **77**. More preferably the external cross-section of the conduit outlet **76** comprises at least two vertices **77** that delimit a face, and in especially preferred

embodiment, such as the ones illustrated in FIGS. **7b** and **7c**, the external cross-section of the conduit outlet **76** is substantially rectangular.

[0100] In order to maximise the flow of infusible material through the conduit, in certain embodiments it is preferred that the internal cross-section of the conduit outlet is the same shape as the external cross-section, for example as illustrated in FIG. **7b**.

[0101] It may be desirable to prevent accumulation of infusible material at the vertices of the internal cross-section of the conduit outlet **76**. Therefore, in certain alternative embodiments, the internal cross-section of the conduit outlet **76** may comprise fewer vertices than the external cross-section, for example as illustrated in FIG. **7c**.

[0102] In the apparatus illustrated in FIG. **7a**, the indented web is drawn vertically (downwards) in a direction **Z** to sealing elements (not shown). The sealing elements form successive seals **31** across the width of the indented tubular web. The sealing elements are arranged such that packets manufactured using the apparatus have a compartment with a substantially trapezoidal cross-section.

[0103] The progress of the tubular web, which preferably moves at a substantially uniform speed, and the timing of the sealing elements are adapted such that the widths **W1** and **W2** between successive seals are of appropriate sizes.

[0104] The indented tubular web is filled with doses of infusible material as it is formed into a chain of packets defined by the seals **31**. In a preferred embodiment, an input device delivers the infusible material via the conduit such that each sealed compartment comprises a single dose of infusible material. The compartmented tubular web is subsequently separated into individual packets by severing the web at the seals **31**. In an alternative embodiment, it is possible to seal and cut in a single operation rather than having these operations performed serially.

[0105] The web of packaging material **71** may be heat-sealable or non-heat sealable. In order to facilitate a high rate of infusion packet manufacture, in a preferred embodiment the packaging material is heat-sealable.

1. An liquid-permeable infusion packet comprising a top (**2, 52**), a bottom (**3, 53**), a first side (**4, 54**) and a second side (**6, 55**); wherein the bottom (**3, 53**) of the packet is defined by a gusset (**11, 61**) and each side (**4, 5, 54, 55**) of the packet is defined by a seal that extends between the top (**2, 52**) and bottom (**3, 53**) of the packet; the packet (**1, 51**) being characterised in that the seals defining the sides (**4, 5, 54, 55**) are arranged such that the packet has a compartment (**10, 60**) with a substantially trapezoidal cross-section, wherein infusible material is enclosed within the compartment (**10, 60**).

2. An infusion packet as claimed in claim 1 wherein the packet (**1, 51**) comprises a first gusset (**11, 61**) defining the bottom the packet and a second gusset (**12, 62**) defining the top of the packet.

3. An infusion packet as claimed in claim 1 or claim wherein the compartment (**10, 60**) has a substantially isosceles trapezoidal cross-section.

4. An infusion packet as claimed in claim 1 wherein each gusset (**11, 12, 61, 62**) consists of two gusset panels (**13, 63**) and three gusset creases (**14, 15, 64, 65**).

5. (canceled)

6. An infusion packet as claimed in claim 1 wherein the infusible material enclosed within the compartment (**10, 60**) is tea and/or herb plant material.

7. An infusion packet as claimed in claim 1 wherein the seals defining the sides (4, 5, 54, 55) of the packet are separated by a width W1 of 30 to 80 mm at the bottom (3, 53) of the packet and by a width W2 of 20 to 70 mm at the top (2, 52) of the packet, and wherein W1 is wider than W2.

8. An infusion packet as claimed in claim 1 wherein the top (2, 52) and bottom (3, 53) of the infusion packet are separated by a distance D of 35 to 80 mm.

9. An infusion packet as claimed in claim 1 wherein the packet comprises packaging material that covers an area A of less than 12000 mm².

10. An infusion packet as claimed in claim 8 wherein the area A is from 5000 to 11000 mm².

11. A method of manufacturing an infusion packet from a liquid-permeable web of packaging material (21, 71), the method comprising the steps of:

- (a) sealing the web of packaging material (21, 71) to form a tubular web;
- (b) indenting the tubular web to introduce creases (14, 15, 64, 65) into the packaging material, the creases defining at least one gusset (11, 12, 61, 62);

(c) forming a first seal (31) across the tubular web;

(d) dosing (70) a substance comprising infusible material (34) into the tubular web; and

(e) forming a second seal (31) across the tubular web,

wherein the first and second seals are formed such that they define a compartment (10, 60) with a substantially trapezoidal cross-section.

12. A method according to claim 10 wherein the method comprises the additional step of:

(g) separating the compartments (10, 60) defined by the seals into individual packets by severing the web at the seals.

13. A method according to claim 10 wherein the infusible material (34) is tea material.

14. (canceled)

15. A method according to claim 10 wherein the packaging material is heat sealable.

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