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Infusion Package

5 The present invention relates to infusion packages such as tea bags or coffee bags which contain a substance to be infused in a liquid.

Tea bags are sealed porous bags containing tea leaves which are placed in boiling water in a cup or
10 tea-pot, for example, in order to make tea. It is usual, particularly in the case where the bags are placed in a cup or mug to remove the tea bags prior to the tea being drunk. However, when the tea bag is removed, it still contains liquid and thus tends to drip
15 and leave liquid on any surface below it. This is undesirable in view of the strongly staining nature of tea (and other infusible substances). It is usual therefore to squeeze the tea bag into a relatively dry state when it is removed, using a teaspoon, for example,
20 to remove excess liquid from the tea bag. However, this method of removing the excess liquid from the tea bag is not particularly efficient. It is difficult to remove the liquid whilst ensuring that it all remains within the cup or mug, and it not always convenient or possible
25 to have a teaspoon or other utensil readily to hand.

A number of methods have been proposed to overcome the above problem, and to provide an efficient and convenient method for removing the residual liquid from an infusion package such as a tea bag. In most of these
30 prior art methods, some form of device for applying an external pressure to the infusion package to squeeze out the liquid is provided. For example, in WO 91/13580 a string is provided which is fixed to one side of the infusion package and passes through the package, so that
35 after use the package may be compressed by pulling on the string whilst pressing down on the side of package from which the string exits in order to squeeze the

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opposite sides of the package together. A piece of cardboard may be provided on the string with which to press on the infusion package.

The above device has a number of disadvantages.

- 5 Firstly, if a card is not provided, then some other means such as the user's fingers must be found to press down on the infusion package, which is clearly not significantly any more convenient than simply using a tea spoon or other utensil to press on the package. The
10 card itself, if provided, has a tendency to become saturated with the expelled liquid and thus may drip, thereby negating the desired effect. Furthermore, the squeezing effect is solely between opposite points on the edge of the package, thus it is not very efficient
15 and does not tend to remove all the residual liquid in the infusion package.

- An alternative approach to the above which also uses string which is pulled to compress the package, is to provide a loop of string located in the peripheral
20 margin of the infusion package such that it surrounds the package, which when pulled acts to compress the package. An example of this type of design is disclosed in US-A-3415656. In that document, the loop of string is enclosed in a channel in the peripheral margin of the
25 infusion package so that it is free to move within this channel. The opposite ends of the loop of string may be pulled apart in order to close the loop and compress the package. In this design, the location of the loop of string within the peripheral margin of the infusion
30 package means the string must be accurately positioned in the peripheral margin and the margin then carefully sealed to form a channel, thus, this package is extremely difficult to manufacture automatically at high speed, without excessive wastage due to faulty packages.
35 The package is US-A-3415656 is not therefore particularly suited to commercial production.

A further approach in an attempt to solve the above

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problems has been proposed in WO 92/6903. In that document, a pair of drawstrings extend into the interior of the infusion package through a seal between the panels of the package at a first location on the peripheral margin of the package and extend across the interior of the package to an anchoring point at a generally opposed location on the peripheral margin of the package. Each drawstring is anchored by being held between two sealed portions of the panels. Pulling the drawstrings in generally opposed directions pulls the walls of the package together, and thus causes the infusion package to collapse to express residual liquid therefrom.

It is an object of the invention to provide an improved infusion package of the general type disclosed in WO 92/6903.

According to one aspect of the present invention, there is provided an infusion package comprising two panels of porous material which are sealed together around a peripheral margin of the package to define an infusion containing compartment, the panels further being sealed together in at least one region which is spaced inwardly from the peripheral margin, and a drawstring which enters and exits the infusion containing compartment of the package via the peripheral margin and which is looped within the compartment around the sealed together region of the panels in such a way that pulling on end portions of the drawstring in opposite directions causes the package at least partially to collapse, thereby expressing liquid from the package.

In the present invention, the drawstring is used as in the prior art to pull the walls of the package together to collapse the infusion package to remove any residual liquid. As in WO 92/6903 the drawstring extends internally through at least part of the tea containing compartment of the package. However, rather

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than being anchored in the sealed margin, an intermediate portion of the drawstring is looped loosely within the tea containing compartment around a further sealed region of the panels which is spaced inwardly from the sealed peripheral margin of the package. In this way it is envisaged that there may be less tendency to tear the bag when removing the liquid. Furthermore, the panel to panel seal of the sealed region which retains the drawstring within the infusion containing compartment and facilitates the squeezing effect is stronger than a string to panel seal and thus the drawstring arrangement of the present invention may provide a somewhat improved squeezing action on the package.

Further, the arrangement of the present invention potentially has manufacturing advantages in that it avoids the need for the intermediate portion of the drawstring to be anchored in the margin during sealing which requires relatively close tolerances for string positioning and could potentially damage the seal.

Preferably two or more spaced-apart, discrete sealed regions are provided between the panels. The drawstring can then be looped around both of these regions. This arrangement allows the infusion package to be compressed more efficiently when the ends of the drawstring are pulled.

The sealed region or regions are preferably in the form of discrete, small islands. The islands preferably have rounded corners, but their overall shape can be any form.

In one embodiment, the drawstring is a single length of string which enters and exits the infusion containing compartment at spaced apart locations on the peripheral margin and extends around two sealed regions within the package which are located at opposing corners of the package. By means of this arrangement, pulling the ends of the drawstring in generally opposed

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directions acts to compress the package in two dimensions, whereby liquid may be efficiently expressed therefrom.

Alternative arrangements include providing four
5 sealed together regions within the package with one region being adjacent each corner of the infusion containing compartment close to the peripheral margin, and the drawstring passing between each sealed region and the peripheral margin and crossing over itself
10 before exiting the package, so as to form a loop around the edge of the infusion containing compartment.

The ends of the drawstring outside the infusion package are preferably provided with tags. This makes the drawstring easier to hold. Each end can be tagged
15 separately, or a single tag may be provided which can be torn apart when it is necessary to pull on the drawstring. A tag having a size of similar dimensions to the infusion package may be used. In this case, the tag can be folded neatly against the package for packing
20 and also provides a support for the infusion package when it has been used and is awaiting disposal. If a single tag for a drawstring having two ends is provided, the tag may be perforated or partially cut through along a centre line, so that it can be pulled apart more
25 easily.

The sealing of the panels on the peripheral margin at the entry and exit points of the drawstring is preferably interrupted in order to avoid damage to the seal because of the presence of the string and to allow
30 the string to slide more easily through the margin when in use, thereby lessening any risk of damage to the package.

The arrangement of the drawstring and sealed regions within the compartment is preferably symmetrical
35 about a plane of symmetry passing through the centre of the infusion package. This provides a more efficient arrangement for expressing liquid from the infusion

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package.

The infusion package of the present invention could be any size or shape. It is envisaged that it will have greatest application in relation to infusible substances for the preparation of beverages. It is particularly applicable to tea bags and coffee bags, and as such would generally be of a rectangular, square or circular shape.

A number of preferred embodiments of the present invention will now be described by way of example only and with reference to the accompanying drawings, in which like reference numerals refer to like features throughout the Figures, and wherein:

Figure 1 shows a first embodiment of the infusion package of the present invention;

Figure 2 shows a variation of the infusion package shown in Figure 1;

Figure 3 shows a second embodiment of the infusion package of the present invention; and

Figure 4 shows a third embodiment of the infusion package of the present invention.

In Figure 1 a first embodiment of the infusion package of the present invention is shown generally at 1. It comprises a closed package or bag 2 formed from panels of porous material which are sealed together at the peripheral margin 3 to form a compartment 4 for containing the infusible substance 5 which is interposed between the panels. The panels may be made of many suitable porous material used in manufacture of such packages, and will typically comprise paper. The sealing of the panels is again accomplished by any suitable sealing method known in the art, for example heat sealing.

The infusible substance located within the compartment 4, may comprise for example 2.5 grammes of tea, or any other suitable infusible substance.

The panels are also sealed together at two regions

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6 within the compartment 4 for containing the infusible substance which are spaced inwardly from the peripheral margin 3.

5 The sealed regions 6 within the compartment 4 are formed with rounded corners, but their overall shape is unimportant.

10 A drawstring 7 which lies between the panels of the package is provided in the package 1. The drawstring enters the compartment 4 through the peripheral margin at one location 8 thereon, is looped around the sealed regions 6 near the opposed peripheral margin, and then exits the compartment 4 through the peripheral margin at a location 9 on the same side as the entry point 8, but spaced-apart therefrom. In this embodiment, the
15 drawstring 7 has two free ends, which are secured to two layers of paper to form separate tags 10. These tags are optional, and the drawstring may also form a closed loop, without its ends being separated.

20 The seal in the peripheral margin at the entry point 8 and exit point 9 of the drawstring, may be relieved or interrupted in order to avoid damaging the seal and to allow the string to slide through the margin in use.

25 In use, the bag 2 is placed within the container containing hot water in which the substance is being infused, with the string 7 and tags 10 hanging over the side of the container. Once infusion of the substance is completed, the bag 2 may be removed by means of the tags 10 and drawstring 7, and the residual liquid is
30 expressed from the bag 2 by pulling on the tags 10 to pull the drawstrings in generally opposed directions. For the most efficient removal of liquid, the ends drawstring 7 should be pulled in opposed lateral directions as indicated by the arrows 11. Pulling on
35 the drawstring causes the sealed-together regions 6 and the entry 8 and exit 9 points to move towards each other as the loop of string reduces in size. This action also

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acts to draw the walls of the compartment 4 inwards, such that the compartment 4 collapses, thereby expressing liquid from the compartment. It should be noted that it is the action of the collapsing walls of the compartment 4 which apply the force to expel the liquid therefrom, rather than simply the action of the string on the infusible substance. Since the string 7 is itself free to move within the bag 2 and is not fixedly attached to either of the panels, there is reduced danger of the panels becoming damaged or tearing as the drawstring 7 is pulled. The string 7 is retained within the compartment 4 by the panel to panel seal of the regions 6. This panel to panel seal is stronger than a seal achievable by sealing the string directly to the panels, and thus there is less tendency for the string to pull through the sealed region and thus out of the package.

Figure 2 shows an alternative embodiment of infusion package of the present invention, in which the drawstring 7 outside the bag 2 is shorter, and the single tag 10 attached thereto is of a similar size to the bag 2. Both ends of the drawstring 7 are attached to the single tag 10, which is partially slit through along the centre line 12, such that in use the tag 10 may be torn apart and then used to pull on the drawstring in order to express the liquid from the bag. The larger tag 10 can be folded neatly against the bag 2 for packing, and may also act as a support for the infusion package when carrying it after use to dispose of it.

A further embodiment having two sealed regions 6 within the compartment 4 is shown in Figure 3. In this case, the drawstring 7 enters and exits compartment 4 at opposed locations 8, 9 on the peripheral margin thereof. Two sealed regions 6 are provided within the compartment 4 at the two corners of which the drawstring 7 does not enter or exit. Again, by pulling on the drawstring in

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generally opposed directions, the looped string between the sealed regions 6 and the peripheral margin 3 acts to cause the bag 2 to collapse.

A further embodiment having four sealed regions 6 within the compartment 4 is shown in Figure 4. In this embodiment, a sealed region 6 is provided in each corner of the compartment 4, and the drawstring 7 is arranged so as to pass around each sealed region 6, between the sealed region and the peripheral margin 3. The drawstring 7 crosses itself within the compartment 4, thus forming a complete loop around the edge of the compartment 4. Pulling on the ends of the drawstring 7 in opposed directions thus causes this loop to contract, thereby collapsing the bag 2. In this embodiment, the drawstring has a small single tag 10 connected to both ends thereof, which is partially cut through along the line 12.

It should be noted that the number of sealed regions 6 within the compartment 4 is not critical as long as the drawstring 7 can be effectively looped so as to allow the bag 2 to collapse efficiently in use. The fewer the number of sealed regions 6, the easier the infusion package is to manufacture.

The infusion package of the present invention can be efficiently manufactured on a large scale. As in conventional infusion-package manufacture, the infusible substance may be placed on a continuous web of porous material and another continuous web brought together therewith and the two webs heat sealed together e.g. by sealing rollers. In the present invention, the drawstring should also be laid between the two individual webs prior to the heat sealing step, and the webs further heat sealed together at the region or regions within the package. The completed package may then be cut from the web as in conventional tea bag manufacture.

It can be seen that the infusion package in the

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present invention is both efficient in use for removing residual liquid from the package, and is suitable for manufacture using a high-speed automatic process. There is also significantly reduced risk of the package itself
5 becoming damaged when attempting to remove the liquid therefrom after use.

Claims

1. An infusion package comprising two panels of porous material which are sealed together around a peripheral margin of the package to define an infusion containing compartment, the panels further being sealed together in at least one region which is spaced inwardly from the peripheral margin, and a drawstring which enters and exits the infusion containing compartment of the package via the peripheral margin and which is looped within the compartment around the sealed together region of the panels in such a way that pulling on end portions of the drawstring in opposite directions causes the package at least partially to collapse, thereby expressing liquid from the package.
2. An infusion package as claimed in claim 1, wherein two or more spaced-apart, discrete sealed regions are provided between the panels and the drawstring is looped around each sealed together region.
3. An infusion package as claimed in claim 1 or 2, wherein the sealed region or regions are in the form of discrete, small islands.
4. An infusion package as claimed in claim 3, wherein the islands have rounded corners.
5. An infusion package as claimed in any preceding claim, wherein the drawstring is a single length of string which enters and exits the infusion containing compartment at spaced apart locations on the peripheral margin and extends around two sealed regions within the package which are located at opposing corners of the package.
6. An infusion package as claimed in any preceding





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- claim, comprising four sealed together regions within the package with one region being adjacent each corner of the infusion containing compartment close to the peripheral margin, and the drawstring passing between each sealed region and the peripheral margin and crossing over itself before exiting the package, so as to form a loop around the edge of the infusion containing compartment.
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- 10 7. An infusion package as claimed in any preceding claim, wherein the ends of the drawstring outside the infusion package are provided with tags.
- 15 8. An infusion package as claimed in claim 7, wherein both ends of the drawstring are attached to a single tag which can be torn apart in use.
- 20 9. An infusion package as claimed in claim 8, wherein the single tag is perforated or partially cut through along a centre line.
- 25 10. An infusion package as claimed in claim 7, 8 or 9, wherein the tag has a size of similar dimension to the infusion package.
- 30 11. An infusion package as claimed in any preceding claim, wherein the sealing of the panels on the peripheral margin at the entry and exit points of the drawstring is interrupted.
- 35 12. An infusion package as claimed in any preceding claim, wherein the arrangement of the drawstring and sealed regions within the infusion containing compartment is symmetrical about a plane of symmetry passing through the centre of the infusion package.
13. An infusion package substantially as hereinbefore



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described with reference to Figure 1, 2, 3 or 4 of the accompanying drawings.

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AMENDED CLAIMS

[received by the International Bureau on 16 February 1996 (16.02.96);
new claims 14-21 added; other claims unchanged (3 pages)]

described with reference to Figure 1, 2, 3 or 4 of the
accompanying drawings.

14. An infusion package comprising two panels of porous
5 material which are sealed together around a peripheral
margin of the package to define an infusion containing
compartment, the panels further being sealed together in
at least one region which is spaced inwardly from the
peripheral margin, and a drawstring which enters and
10 exits the infusion containing compartment of the package
via the peripheral margin and which is looped within the
compartment around the sealed together region of the
panels, wherein, in use, pulling on end portions of the
drawstring in opposite directions causes the drawstring
15 to slide through the margin at the entry and exit points
of the drawstring and to move around the sealed together
region in such a manner that the package at least
partially collapses, thereby expressing liquid from the
package.

20
15. An infusion package as claimed in any preceding
claim, wherein the sealing of the panels on the
peripheral margin at the entry and exit points of the
drawstring is relieved or interrupted to allow the
25 drawstring to slide more easily through the margin when
pulled.

16. An infusion package as claimed in any preceding
claim, wherein two or more spaced-apart, discrete sealed
30 regions are provided between the panels and the
drawstring is looped around each sealed together region.

17. An infusion package as claimed in any preceding
claim, wherein the package is rectangular in shape, and
35 only two spaced-apart, discrete sealed regions located
at opposing corners along one side edge of the package
are provided between the panels, and wherein the





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drawstring is a single length of string which enters and exits the infusion containing compartment at spaced apart locations on the peripheral margin along the side edge of the package opposed to said two sealed regions and extends around said two sealed regions within the package.

18. An infusion package as claimed in claim 16 or 17, wherein the drawstring is looped around each sealed together region in such a manner that pulling on end portions of the drawstrings in opposite directions causes the sealed together regions to move towards each other as the package collapses.

19. An infusion package as claimed in any one of claims 14 to 18, wherein the ends of the drawstring outside the infusion package are attached to a single tag which is is perforated along a centre line to allow the tag to be more easily torn apart in use.

20. An infusion package as claimed in any one of claims 14 to 18, wherein the ends of the drawstring outside the infusion package are attached to a single tag which is is partially cut through along a centre line to allow the tag to be more easily torn apart in use.

21. An infusion package comprising two panels of porous material which are sealed together around a peripheral margin of the package to define an infusion containing compartment, the panels further being sealed together in at least one region which is spaced inwardly from the peripheral margin, and a drawstring which enters and exits the infusion containing compartment of the package via the peripheral margin and which is looped within the compartment around the sealed together region of the panels in such a way that the drawstring is free to move around the sealed together region when pulled, wherein,



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in use, pulling on end portions of the drawstring in
opposite directions causes the drawstring to slide
through the margin at the entry and exit points of the
drawstring in such a manner that the package at least
5 partially collapses, thereby expressing liquid from the
package.

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