June 4, 1963 H. O. IRMSCHER 3,092,242

COMPRESSIBLE INFUSION PACKAGE

Filed May 24, 1961 3 Sheets-Sheet 1

FIG. 1a

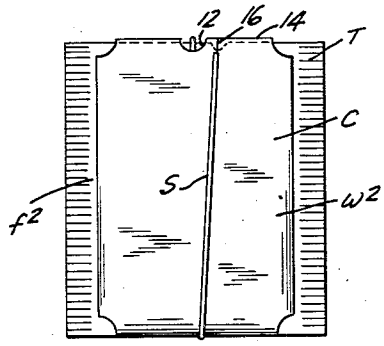
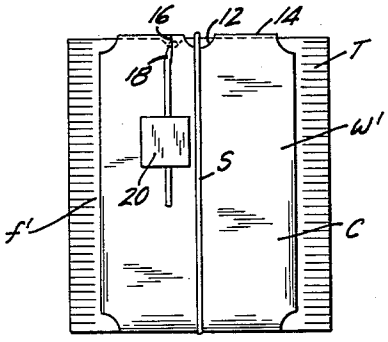


FIG. 1b



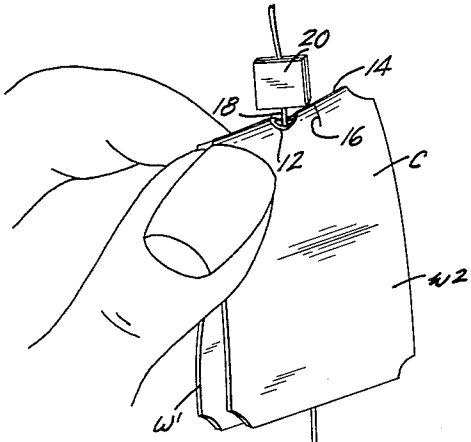


FIG. 3

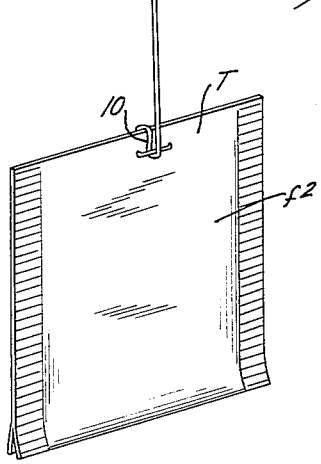
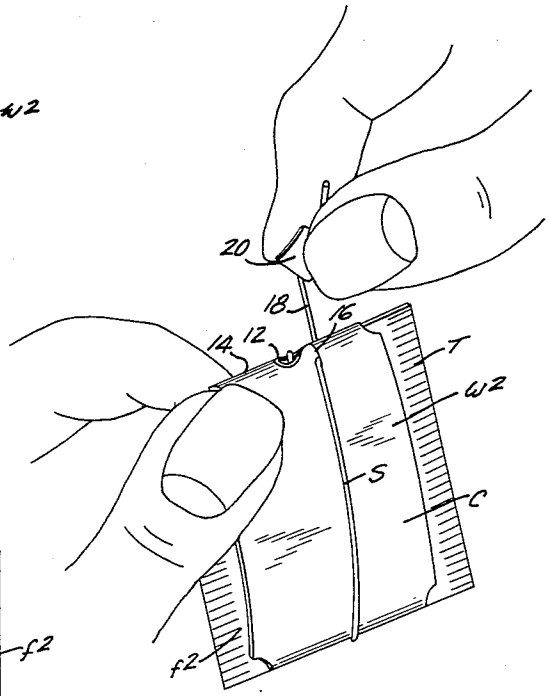


FIG. 2



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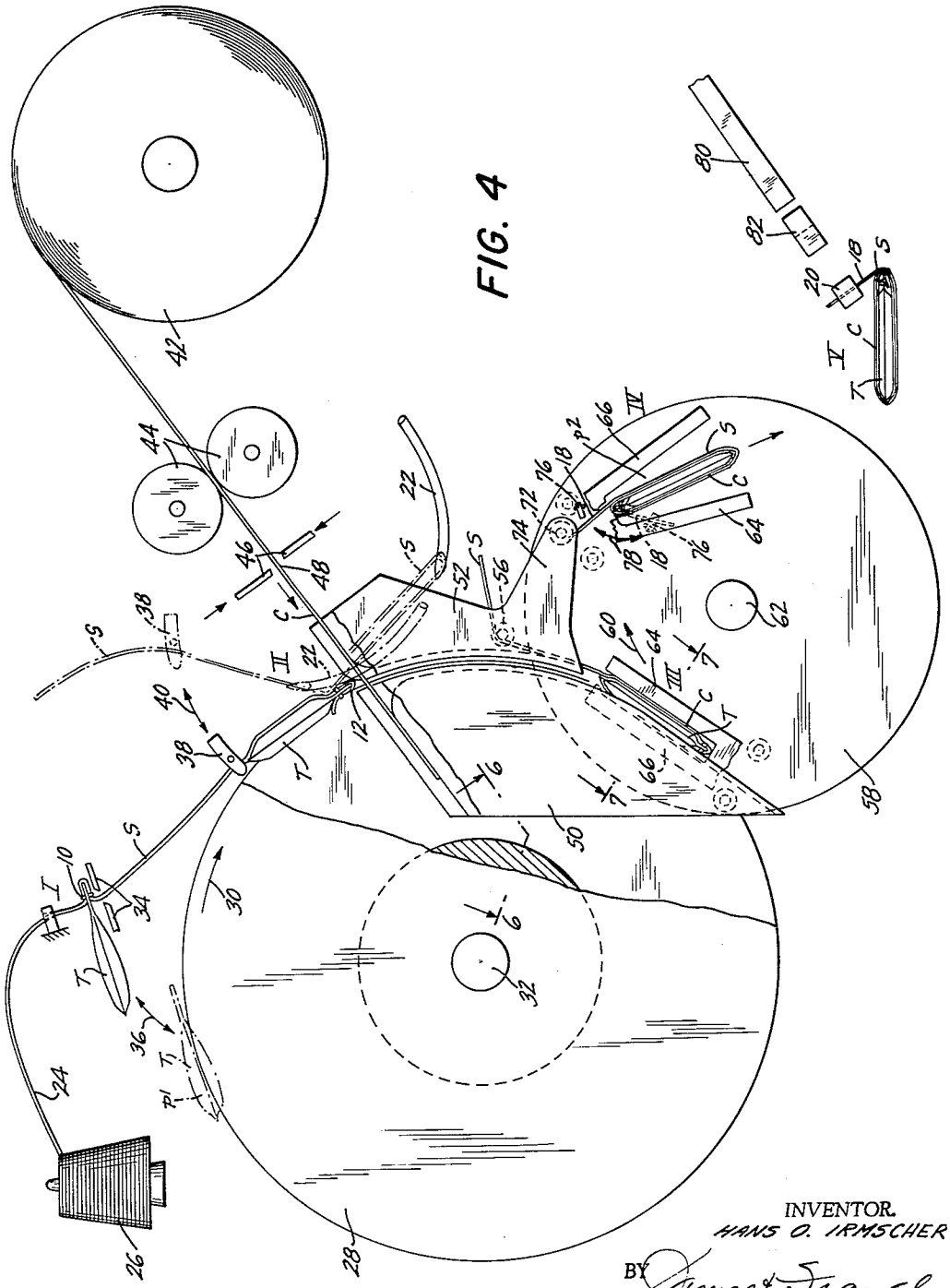
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FIG. 4



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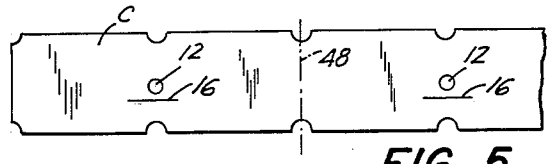


FIG. 5

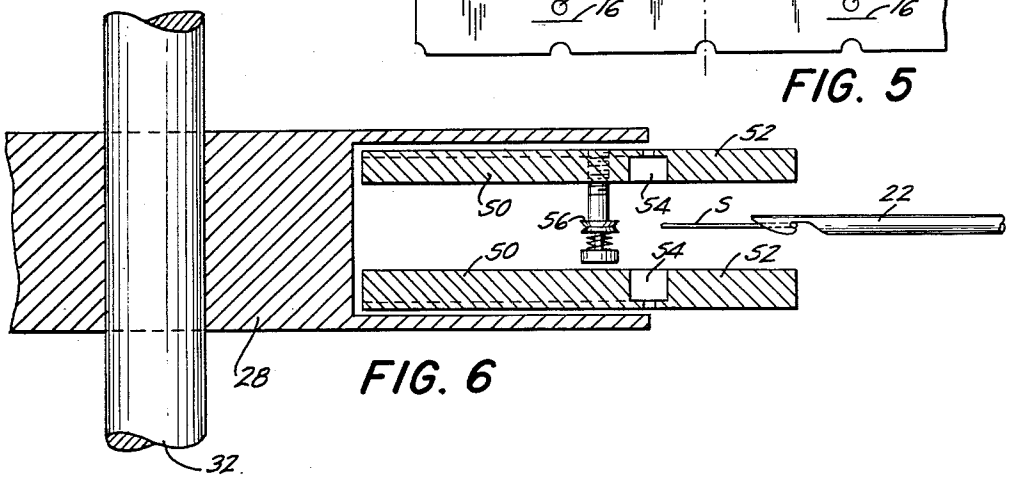


FIG. 6

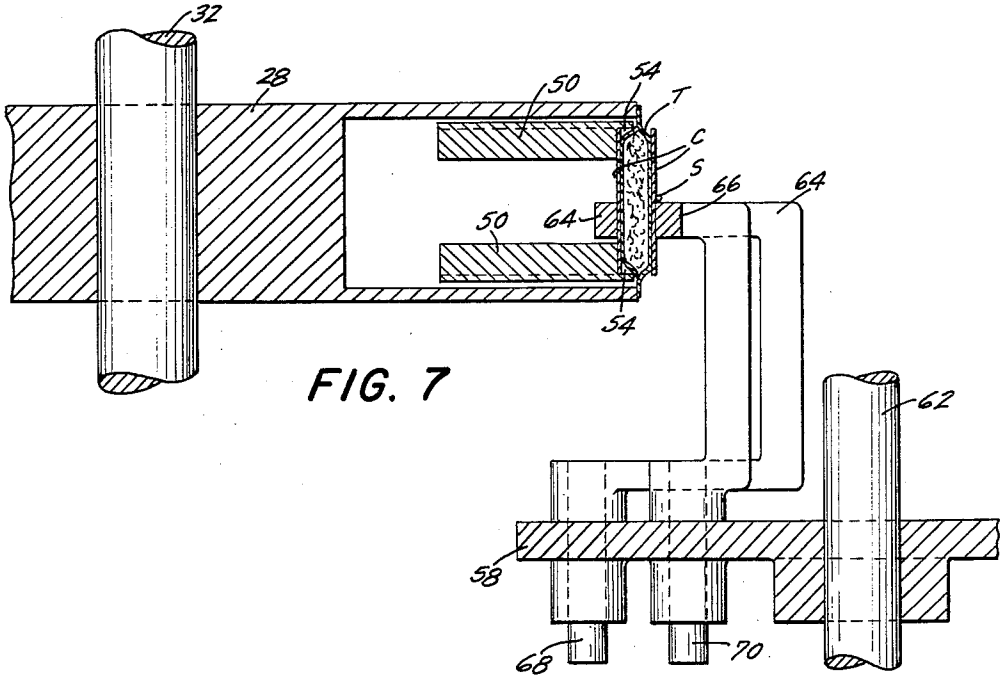


FIG. 7

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3,092,242

COMPRESSIBLE INFUSION PACKAGE

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Filed May 24, 1961, Ser. No. 112,250
2 Claims. (Cl. 206—.5)

This invention relates to a compressible infusion package, and more particularly to a compressible tea bag package and to a method of producing the same.

It has been proposed to combine a tea bag with a cover member formed with wings which may be folded over the tea bag to engage the faces of the same and which may be pressed between one's fingers to compress and squeeze the tea bag for the purpose of expelling residual fluid therefrom after an infusion step. Tea bags are commonly made with suspending strings which function as a means for suspending and holding the bag for the act of immersion and withdrawal of the bag from the tea cup. It has been suggested or proposed to so associate the cover member with a string suspendable tea bag that the cover normally embraces the dry tea bag, is withdrawn therefrom to serve as a handhold of the suspended tea bag during the infusion step and is then returned in position over the tea bag upon withdrawal from the tea cup for the compression step.

The prime object of my present invention relates to the making of a compressible tea bag of this type, in which the tea bag, the cover member and the suspending string are combined to produce a composite tea bag package, having the following structural and functional properties and uses:

(1) In the composite package, the cover member forms a wrapper embracing the bag; and the string is wound about and encircles the assembly of the tea bag and wrapper-cover and is then anchored to the same to form a means for firmly tying the wrapper to the tea bag, with the result that a unitary firmed-up package is produced highly serviceable for box-packaging handling;

(2) In the manner of producing the package, by applying the wrapper-cover and winding the string thereabout and anchoring the string thereto, the dry infusion contents of the tea bag are so redistributed as to result in the production of a flat, as well as firmed-up, tea package, which in its flattened form is highly desirable for the most efficient box packaging and transportation use;

(3) The suspending string is so anchored to the package assembly that it may be readily detached from its anchored position by a simple pull applied to the end of the string, upon which the tea bag may be dropped into the tea cup with the cover serving as a handhold for the bag in its infusion step, the cover then being capable of being returned in position to act as the compression member.

To the accomplishment of the foregoing objects and such objects as may hereinafter appear, my invention relates to the compressible infusion package and to the method of making the same which is sought to be defined in the appended claims, taken together with the following specification and the accompanying drawings, in which:

FIGS. 1*a* and 1*b* are opposite face views of the completed compressible infusion package of the present invention showing the same in its closed package form;

FIG. 2 is a perspective view depicting the manner of opening the package for use;

FIG. 3 is a perspective view depicting the positioning that the parts of the package assume during an infusion step;

FIG. 4 is a view of the elemental apparatus employed in the process of producing the compressible tea bag package;

FIG. 5 is a view of the sheet material employed in making the wrapper-cover for the package;

FIG. 6 is a fragmentary view shown to an enlarged scale of a part of the elemental apparatus shown in FIG. 4 taken in cross-section in the planes of the lines 6—6 of FIG. 4; and

FIG. 7 is also a fragmentary view shown to an enlarged scale of a part of the apparatus shown in FIG. 4 taken in cross-section in the plane of the line 7—7 in FIG. 4.

Referring now more in detail to the drawings, and first to FIGS. 1*a* to 3 thereof, the compressible infusion package of my present invention comprises an infusion such as a tea bag T, a suspending string S attached to an end such as to the top of the tea bag T and a flexible cover member C folded over the said top end of the infusion bag and defining two wings w' and w^2 engaging the faces f' and f^2 of the infusion bag. The said string S is attached to the top end of the tea bag preferably by being stapled thereto as at **10**, and the said string is loosely threaded through an orifice **12** in the fold **14** of the cover member C, the said cover member being also provided with a slit **16** in its fold.

To form the package, the string S is wound about and encircles the cover member C and the infusion bag T, the cover member than forming a wrapper for the tea bag, and the free end **18** of the string S is received and drawn into the slit **16** in the cover member C, thereby firmly tying the wrapper-cover to the tea bag and thereby also detachably anchoring the string to the package. The free end **18** of the string is also provided with a finger tab **20** attached thereto in a position above the part of the string which is detachably inserted in the cover slit.

In this composite package, as depicted in FIG. 1*a* and FIG. 1*b*, the cover member forms a wrapper embracing the faces of the bag; and the string wound about and encircling the bag-cover assembly and anchored in the fold-slit of the cover forms a means for tightly and firmly tying the wrapper to the tea bag, with the result that a unitary firmed-up package is produced. As will be further shown below, the parts of the package are so assembled in the process of producing the same, that the dry infusion contents of the tea bag, which normally tend to gravitate to the tea bag bottom, are uniformly redistributed in the bag, resulting in the production of not only a firmed-up but also of a flattened tea package. The integrity of the thus produced package is maintained in the steps of box-packaging a group of such tea bag packages, thereby enabling a uniform and compact assembling of the same in a box, and also in the subsequent steps of transporting the same to the ultimate purchaser since the dry tea contents, in the thus compacted packaged condition, is prevented from being shaken up with migratory results, in the movements and vibrations to which the box-package is normally subjected.

FIGS. 2 and 3 of the drawings depict the manner of handling the package for consumer use. The package is opened by grasping the finger tab **20** between the fingers of one hand and by then simply exerting a slight pull applied to the free end **18** of the string S, thereby freeing this string end from the friction grip of the fold-slit **16**, the fingers of the other hand at the same time holding the cover-wrapper C, all as depicted in FIG. 2 of the drawings. The string S and the bag T are then released while the cover-wrapper C is still finger held, with the result depicted in FIG. 3 of the drawings, the tea bag T falling to its suspended condition for the infusion or brewing step, the string S freely falling through the orifice **12** in the cover C until stopped by the engagement with the cover of the finger tab **20**, the cover C serving as a handhold for the bag during the infusion of brewing step. Upon withdrawal of the tea bag from the tea cup the

finger tab **20** is then again grasped between the fingers of the user and the cover C is then returned to its position with its wings w' and w^2 overlying the faces of the tea bag, the wings being then compressed between the user's fingers for compressing and squeezing the tea bag to expel the residual fluid therein.

In FIGS. 4 to 7 of the drawings I show the method of the present invention for making the compressible infusion package. Considered in its generic aspects, and as best shown in FIG. 4 of the drawings, the method comprises the steps of attaching at one station, designated as I, a string S to the top end of an infusion bag, such as the tea bag T, moving said bag, with said top end forward, together with the attached string S to a second station, designated as II, at which is positioned a flexible member which is to form the cover C, the said flexible member being provided with an orifice **12** and a slit **14** (as best shown in FIG. 5 of the drawings), then pulling the free section of said string S through said orifice at said second station II by means of a looper **22**, continuing the movement of said bag T, end forward, into said flexible member at the orifice and slit thereof, thereby folding said member thereat over the two faces of the bag, then continuing the movement of said bag and the folded member assembly through subsequent stations designated as III and IV, while holding the free section of said string S, this movement being accomplished by rotating the said assembly about or around said string, thereby winding the said string about and encircling said assembly and then drawing the end portion **18** of said string S at the station IV through the slit in the fold of the cover member C. Thereafter at a station, designated as V, where the assembly from station IV is deposited, the terminal tab **20** is attached to the string end **18**.

It may be noted at this point that in the sequential steps of the described method the bag T is rotated, in the package forming process, from a position p' at station I to a position p^2 at station IV, during which rotation the dry tea contents of the bag, normally gravitated to the bag bottom, are redistributed, and under the pressure of the wrapper and string parts, whereby the bag is changed from a bulbous condition to a uniformly flattened condition as depicted in FIG. 4 of the drawings, with the result, as above stated, that not only is there obtained a firmed-up but also a flattened tea package, enabling the advantages in box packaging and in the maintenance of the integrity of the individual tea packages above referred to to be attained.

The described method is a continuous method of making the compressible infusion package, the steps of which will now be described more in detail.

The string material **24** for forming the individual strings S are fed from a continuing supply source or spool **26**. The tea bags T held by grippers (not shown) are deposited on a carrier wheel **28** which is intermittently rotated in the direction of the arrow **30** about a central axis defined by the shaft **32**, and when a tea bag reaches the position shown in FIG. 4, the grippers move the tea bag to the station I where the string material **24** is attached by means of a staple **10** to the tea bag end. The string material is then cut or severed by means of the cutters **34**, after which the bag T is returned to the carrier wheel **28**, the movement of the bag from and to the carrier wheel being indicated by the double arrow **36**. Just prior to the string severing operation the string S of the next preceding bag T is engaged by fingers **38**.

In the next step of the process the bag T with its attached string is moved to station II by the rotation of the carrier wheel **28**. The fingers **38** are then moved with the gripped string S from the full line position to the dotted line (retracted) position shown in FIG. 4, the full cycle of movement of the fingers **38** being indicated by the double arrow **40**. In the retracted and thus held position of the string S the looper **22** (see also FIG. 6) is moved upwardly through the orifice **12** of the cover material C, engages the string S and is then moved downwardly to a retracted condition, thereby pulling the string S through the said orifice, the looper in this operation being moved between the full and dotted line positions shown in the drawings.

During the movement of the bag from station I to station II, the material for forming the flexible cover C is fed from a continuing supply source (reel) **42** by means of feed rollers **44** to the station II and is severed by means of the cutters **46** along the line **48** (see FIG. 5).

In the next step of the process the bag T, on the carrier wheel **28**, is moved, end forward, into the now severed flexible cover member C at the orifice and slit thereof, thereby folding said cover member C about a fold (which includes the orifice and the slit) over the end of the bag T, the bag now with the two wings of the cover engaging the faces thereof moving from station II to station III. In this movement the bag and cover assembly is engaged between a set of interior plates **50**, **50** and a set of exterior plates **52**, **52** (see FIG. 6), the bag and cover assembly moving in the spaces **54**, **54** between the two sets of plates and being confined by the walls of these spaces. In this movement the string S, releasably held by the looper **22** is frictionally engaged by tension disks **56** mounted on one of the interior plates **50** (see particularly FIG. 6), the string being thereby frictionally (and slidably) restrained by the tension disks. In this movement the string S is laid over one side of the bag and cover assembly as clearly shown in FIG. 4.

In the next step of the proces the assembly thus far produced is transferred to another rotatable carrier **58** rotatable in a direction opposite to that of carrier **28**, as indicated by the arrow **60**. The carrier **58** rotatable about an axis defined by the shaft **62** carries sets of gripper fingers **64** and **66** pivotally oscillatable on the carrier **58** about shafts **68** and **70** respectively (see FIG. 7), the said fingers being movable from a closed condition at station III to an open position at station IV. In the finger closed position at station III the embryo package assembly produced is transferred from the carrier wheel **28** to the carrier **58**, the parts at this stage of the step being best shown in FIG. 7 of the drawings. Referring to FIG. 7 it will be noted that the body of the bag T, just released from the space between the interior and exterior plate sets is in a flat condition with the tea contents uniformly distributed and with the wings of the cover C firmly in contact with the faces of the bag T, the string S adding its effect by exerting a pull on the outer face of the embryo assembly.

In the next step of the process the embryo bag assembly is moved by the carrier **58**, held between the fingers **64** and **66** from station III to station IV. During this movement the string S is engaged by a second set of tension disks **72** fixed to an extension **74** on one of the exterior plates **52**; and as the embryo assembly is rotated from the station III to the station IV position, the string S completes its encirclement, under tension, of the bag and cover assembly, the assembly being maintained in its flattened state. At this station IV grippers **76** movable over the arc designated by the double arrow **78**, take hold of the end **18** of the string S and move the same from the full line to the dotted line position shown in FIG. 4, thereby drawing the string end into the slit **16** and firmly anchoring the string in said slit at the cover fold.

In the next step of the process the fingers **64** and **66** are oscillated to their open position (as shown at station IV) and the now nearly completed assembly descends to station V. At this station adhesive tab material **80** fed from a continuing supply source is severed into sections **82** which are folded and applied to the string ends **18** to form the finger tabs **20**.

The compressible infusion package of my present invention, the method of making the same, and the uses and advantages thereof will, it is believed, be fully apparent from the above detailed description thereof. It will be further apparent that changes may be made in the

design of the package and in the steps of the method of making the same without departing from the principles of the invention defined in the following claims.

I claim:

1. A compressible infusion package comprising an infusion bag, a suspending string attached to an end of the infusion bag, a flexible cover member folded over said end of the infusion bag and defining two wings engaging the faces of the infusion bag, the fold of said cover being provided with an orifice for the loose reception of a portion of said string and being also provided with a slit for the tight reception of another portion of said string, the said string being loosely threaded through said orifice, being wound about and encircling the assembly of said member and infusion bag, and having its free end detachably received and anchored in said slit, the said cover member thereby serving the triple function of a packaging wrapper for the infusion bag held closed by said encircling and anchored string, a handhold for the bag in its infusion use and a means for compressing and squeezing the infused contents of said infusion bag.

2. A compressible infusion package comprising an infusion bag, a suspending string stapled to the top of the infusion bag and provided with a finger tab at its free end, a cover sheet folded over the top of the infusion bag and defining two wings embracing the faces of the infusion bag, the fold of said cover being provided with an orifice for the loose reception of a portion of said string and being also provided with a slit for the tight reception of another portion of said string, the said string being loosely threaded through said orifice, being wound about to encircle the assembly of said folded sheet and infusion bag, and having its free end below said tab detachably received and anchored in said slit, the said folded sheet thereby serving the triple function of a packaging wrapper for the infusion bag held closed by said encircling and anchored string, a handhold for the bag in its infusion use and a means for compressing and squeezing the infused contents of said infusion bag.

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