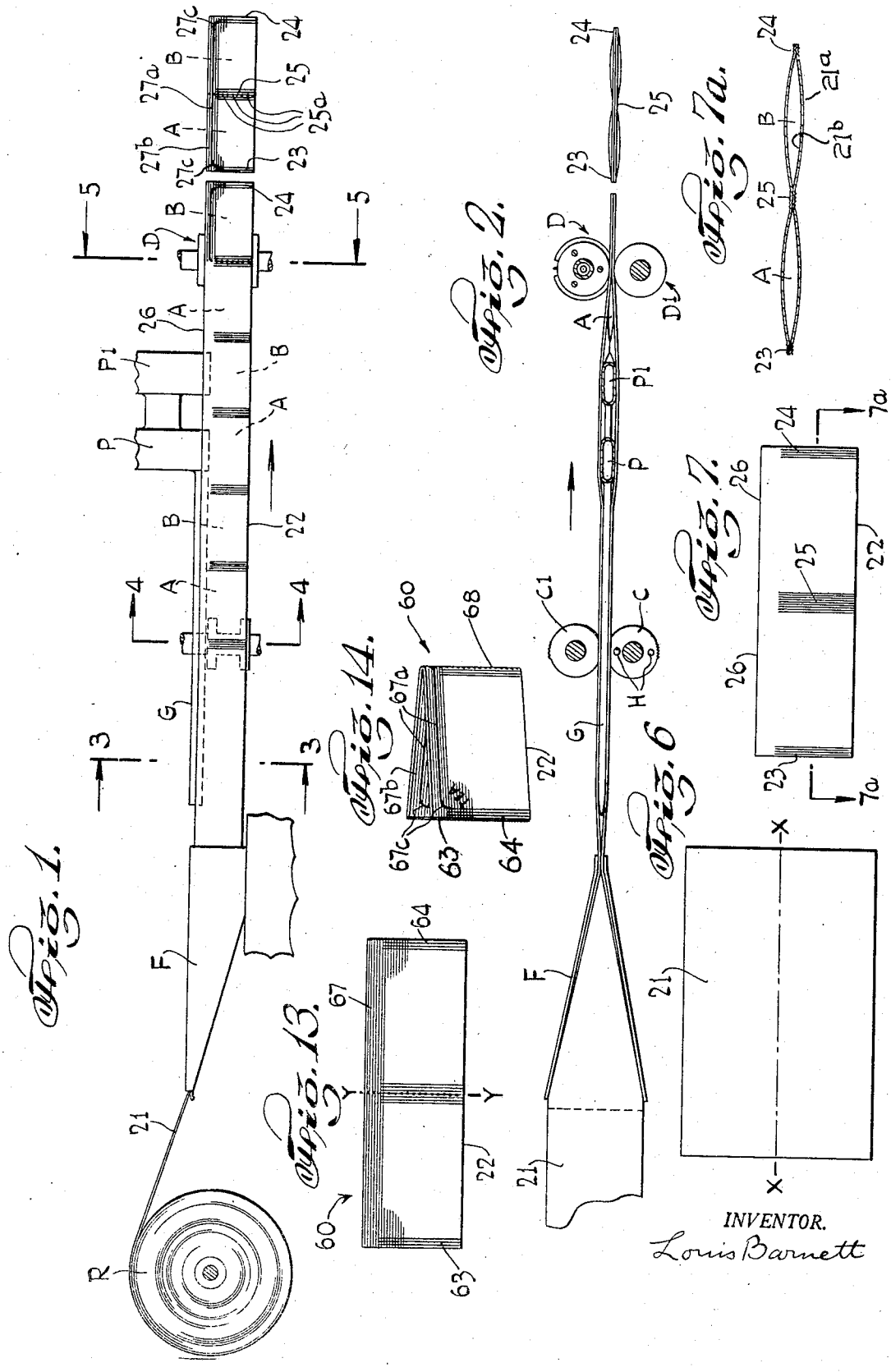
Nov. 14, 1944. L. BARNETT 2,362,459

INFUSION PACKAGE AND THE MANUFACTURE THEREOF

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Fig. 5.

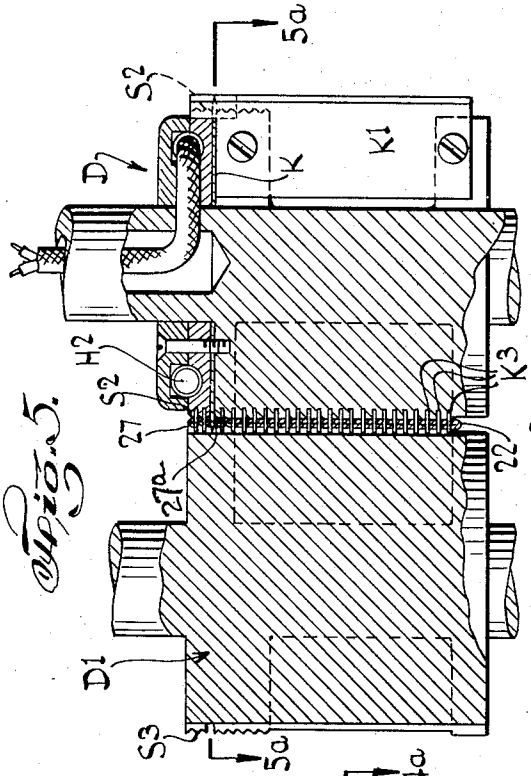


Fig. 5a.

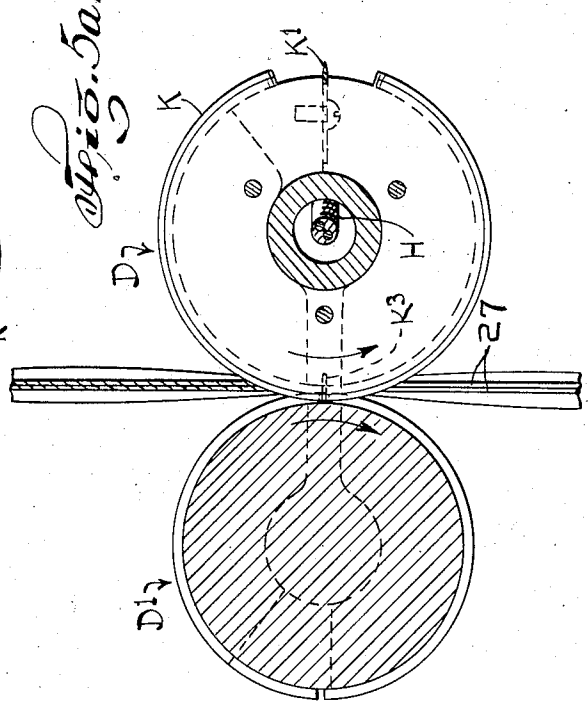


Fig. 4.

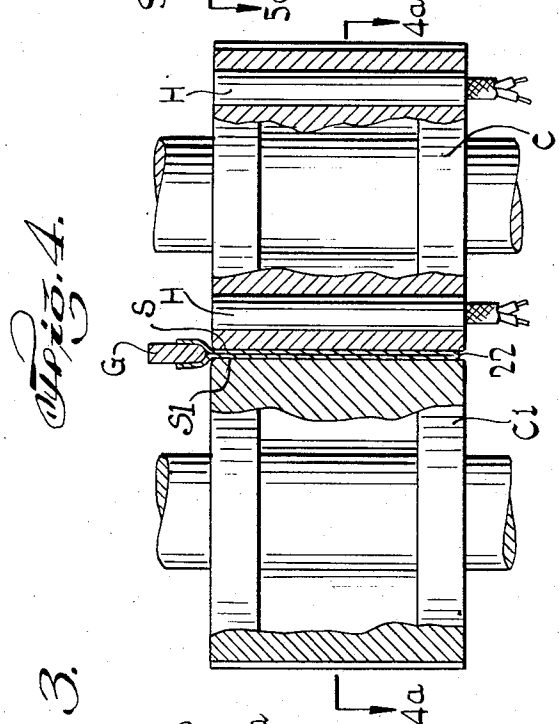


Fig. 4a.

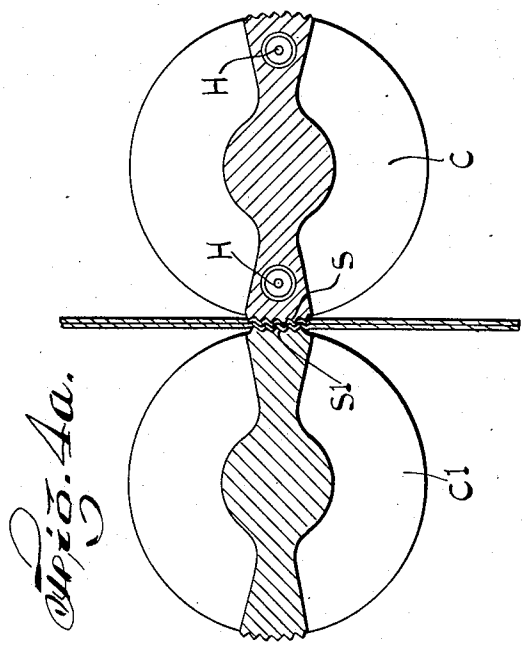
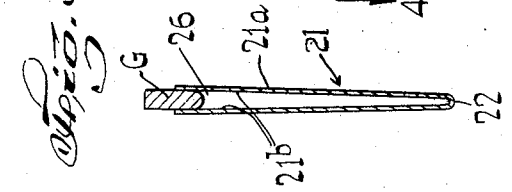


Fig. 3.



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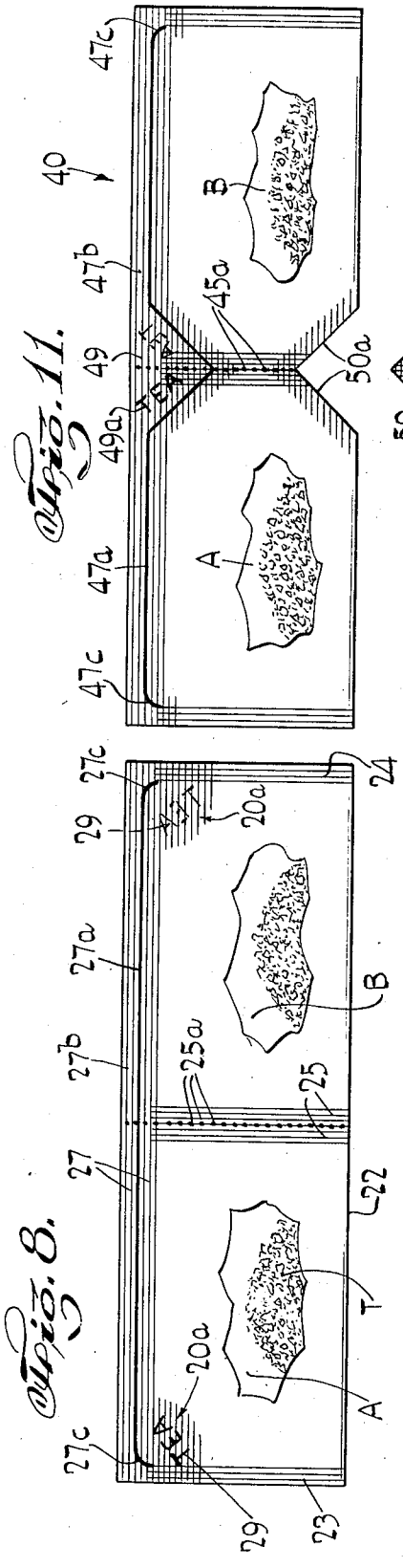


Fig. 8.

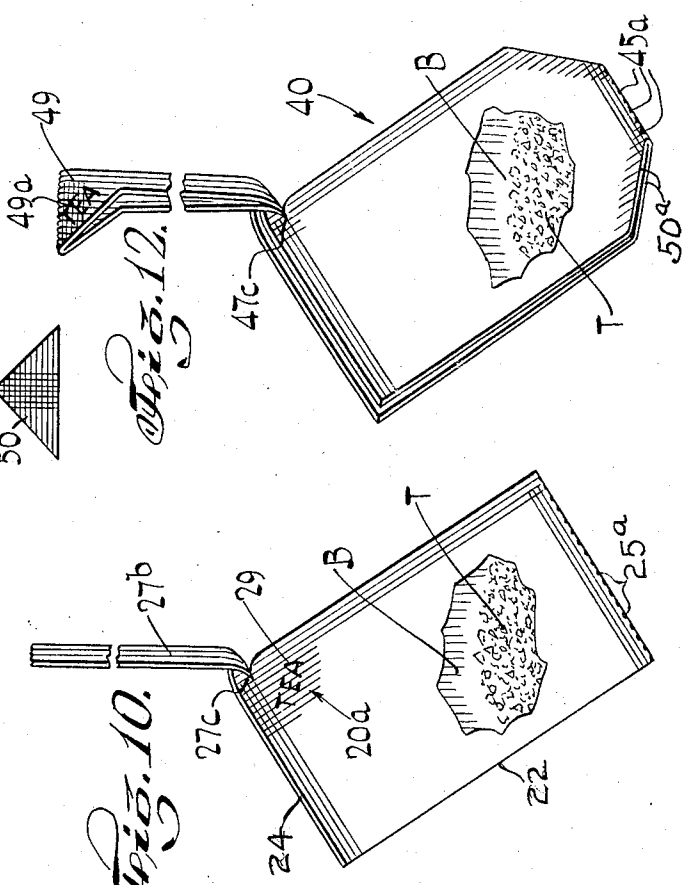


Fig. 12.

Fig. 10.

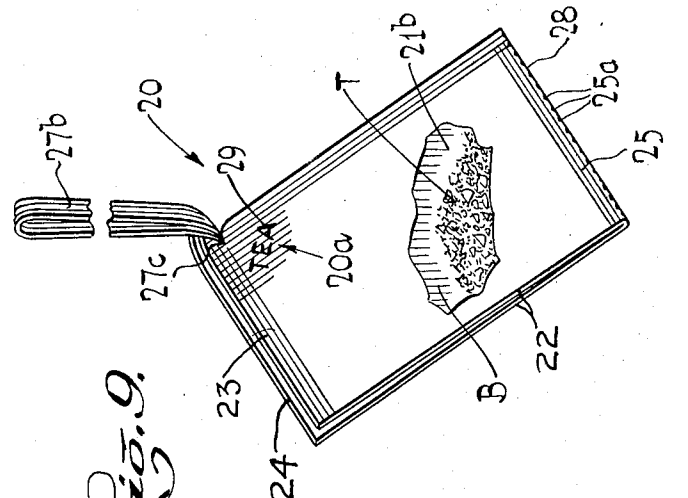


Fig. 9.

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INFUSION PACKAGE AND THE MANUFACTURE THEREOF

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Application February 7, 1942, Serial No. 429,893

20 Claims. (Cl. 99—77.1)

This invention relates to the manufacture of filled containers or bags and more particularly is directed to the manufacture of infusion packages, such as tea-balls and the like.

Among the objects of the invention is to generally improve the construction of filled containers or bags in the form of infusion packages as inexpensive articles of manufacture, which shall comprise few and simple parts requiring a minimum of material, which shall be easy and cheap to manufacture in quantity production on automatic high-speed packaging machines, which shall provide an improved form of integral handle, and which article and manufacture thereof shall be practical and efficient to a high degree in use.

This application is a continuation in part of application, Serial No. 380,628, filed February 26, 1941.

Other objects of this invention will in part be obvious and in part hereinafter pointed out. The invention accordingly consists of features of construction and method, combinations of elements, arrangements of parts and steps in the process of manufacture which will be exemplified in the construction and method hereinafter described and of which the scope of the application will be indicated in the following claims.

In the accompanying drawings in which are shown various possible illustrative embodiments of this invention.

Figs. 1 and 2 are side elevational and top plan views respectively, showing a manufacture of infusion packages embodying the invention;

Figs. 3, 4, and 5 are cross sectional views taken on lines 3—3, 4—4, and 5—5, respectively, showing web folding, spaced transverse seam joint making, and top closure-handle segment forming operations, respectively;

Figs. 4*a* and 5*a* are cross section views taken on lines 4*a*—4*a* and 5*a*—5*a*, respectively;

Figs. 6, 7, 8, and 9 are views showing progressive steps in the manufacture of infusion packages shown in Figs. 1 and 2, Fig. 6 showing a portion of the web as it comes off the roll before being folded along lines X—X, Fig. 7, a section of the web after being folded and provided with edge and intermediate partition transverse seam joints corresponding to bag portion of the infusion package immediately to the right of lines 4—4 in Fig. 1, Fig. 8 an infusion package completed but in a spread out condition corresponding to the cut off sections at the extreme right in Figs. 1 and 2, and Fig. 9 a folded completely manufactured infusion package shown in a depending position with the segment handle extended for suspending the infusion package in brewing or the like operation;

Fig. 7*a* is a cross sectional view taken in lines 7*a*—7*a* in Fig. 7;

Fig. 10 is a view similar to Fig. 9 showing a sectionalized separated portion of the improved infusion package to use halves thereof individually;

Figs. 11 and 12 are views similar to Figs. 8 and 9, respectively, showing a modified manufacture of the improved infusion package with a tag portion formed to terminate the handle segment, and

Figs. 13 and 14 are views showing progressive steps in the manufacture of infusion packages, Fig. 13 showing a sealed infusion package in spread condition prior to through-slitting of a seam joint to provide a segment-handle, and Fig. 14 the folded package with the through-slit.

Referring in detail to the drawings, 20 denotes an improved construction of a filled infusion package in the form of a rectangular shaped tea-ball manufactured to embody the invention. As seen from Figs. 6 to 9, inclusive, tea-ball 20 may comprise an initially elongated bag portion made of a strip of filter sheet material 21 folded over on itself on line X—X to form a bottom edge fold 22 as shown in Figs. 6 and 7, thus providing two superimposed layers, that is, overlying portions forming side walls of the tea-ball 20 which have end marginal edge areas adhesively secured at the spaced border end joint seams or flanges 23 and 24 as shown in Figs. 7 and 8. If desired, a similar central partition seam joint 25 may be provided extending midway between end joint flanges 23 and 24 to provide two sections or compartments A and B. The latter may be partially filled through an upper open side 26, shown in Figs. 3 and 7 with an essence containing product T, such as tea, forming the contents thereof, after which said open side 26 has the marginal edge area adhesively secured by border joint seam or flange 27 as shown in Fig. 8.

The strip of sheet material 21 may be supplied from a suitable source such as roll R in the form of a web 21 of the required width in the well understood manner, a sufficient length of said web 21 being folded and cut to form a tea-ball bag in the manner herein described. Or precut strips of sheet material 21 of proper shape and length may form such supply source if desired. Sheet material 21 is of foraminous construction, as for example, filter paper, perforated parchment paper or Cellophane, cotton gauze and the like. That used in the practice of the invention and

shown in Fig. 3 may comprise a filter paper base layer 21*a* coated on one side with a thermosetting "partially fused" plastic lamina 21*b* of the character described in my said application, Serial No. 380,628, or of any other suitable filter sheet base layer having a thermosetting plastic means for forming the heat sealed border joint seams or flanges 23, 24 and 25 in the manner hereinafter more fully described.

A suitable filter paper sheet for forming base layer 21*a* may be made of a vegetable fibrous pulp stock, said layer 21*a* with thermosetting coating or lamina 21*b* being such that when made into the tea-ball bag has sufficient wet strength to withstand immersion in boiling water without damage or disintegration and without undue loss of tensile strength. The filtering sheet material 21 comprising the layer 21*a* and coating 21*b* when forming the tea-ball bags must be such as to permit ready infusion, that is, passage therethrough of the water of immersion for brewing and straining the filling or tea contents T, said layer 21*a*, coating 21*b* and flanges 23, 24 and 25 being of such composition that they are non-toxic, insoluble in hot boiling water, and impart no odor or taste even to the slightest degree to the brew.

It has been found in practice that a 6½ pound fibrous stock sheet of approximately .001 of an inch thick of high wet tensile strength forms a practical filter paper layer 21*a* for the purposes described herein. On such layer 21*a* a finely powdered copolymer of vinyl chloride and vinyl acetate may be uniformly sprinkled or sprayed, "partially fused" by heat to 60° C., and pressure rolled thereon for providing a pervious, dry and extremely thin coating of lamina 21*b* which does not materially affect the filtering capacity of the layer 21*a*. Approximately three ounces of such vinyl powder for each pound of said layer 21*a* will form coating or lamina 21*b* of normally less than .0005 of an inch thick.

Sheet material 21 after taken from roll R or precut to the required size, has the coating 21*b* of the folded sheet material 21 positioned to form the interior surfaces of the tea-ball bags so that the border edge joint seams or flanges 23, 24, and 27 are sealed on placing said coating 21*b* in face to face relation and applying pressure and heat to a fusion temperature by suitable clamping means of any well known construction. With the coating or lamina 21*b* formed of the "partially fused" vinyl powder permanent sealing fusion will take place when pressure and heat of approximately 130° C. is applied.

In the manufacturing of infusion packages 20 as tea-balls and the like, it has heretofore been found desirable to include as part of the package some form of handle to manipulate the tea-ball during the brewing operation particularly when carried out in a cup, and also to provide a tag which bears a legend such as the name or trademark of the manufacturer, grade of tea, etc. Such handles are most frequently provided by a string or stitched thread attached to the tea-ball bag, the free end of the string handle being terminated by the tag. The provision of such string handles and tags in the construction of such complete tea-balls not only increases the cost of manufacturing by employing various additional materials, but also requires in the production process intricate additional steps and when made on a high speed automatic machine necessitates the use of a complicated expensive apparatus.

To simplify the manufacture and to make available less expensive high-speed automatic machinery for the production of tea-balls with handles and means for carrying legends, the fusion package manufacture so far described above and shown in Figs. 1 to 8, inclusive, with heat sealed joint seams or flanges 23, 24 and partition seam joint 25 may be carried out by the improved method embodying the invention. Thus as seen from Figs. 1 and 2 the travelling web 21 as it leaves the roller R passes through a fold former F which longitudinal folds the web at 22 with the lamina coated surface portions 21*b* facing each other as shown in Fig. 3. The edge borders of the web 21 are retained separated by passing along the opposite side of a bar guide G until the folded web reaches a pair of co-acting pressure roller C and C1 which produces the spaced permanently heat sealed joint seams 23, 24, and seam joint 25 if desired extending transverse the length of the web fold 22. Said rollers C and C1 may have suitable complementary corrugated raised pressure surface portions S and S1 respectively, for producing said joint seams 23, 24 and 25 with the compartments A and B in between. The heating of said rollers C and C1 may be provided in any suitable manner as through the use of electric heaters H of any understood construction incorporated in roller C as shown in Figs. 4 and 4*a*.

The folded moving web after passing through the rollers C and C1 to form compartments A and B reaches a filling station where they may be simultaneously charged through spaced spouts P and P1 respectively, with measured quantities of essence containing products, such as tea T, as shown in Figs. 1 and 2 from suitable apparatus of conventional construction (not shown).

As has already been explained, tea-balls 20 preferably are made rectangular in shape with a long dimension in the direction of the travelling movement of the web so that more time for the filling operation is provided than would otherwise be possible. As the filled compartments A and B portion of the web proceeds it may pass between a second set of co-acting rollers D and D1 which permanently heat seal the top opening 26 by forming closure joint seam 27, said rollers D and D1 having raised complementary corrugated pressure surface portions S2 and S3, respectively, for forming said joint seam 27.

The rollers D and D1 may carry a circular shaped cutting means, as for example, knife K carried by the roller D which cuts a through-slit 27*a* in said seam joint 27 along a mid-portion thereof while retaining the closure thereat intact as shown in Fig. 5. For supplying heat to pressure surfaces S2 and S3 a circular shaped electric heater H2 of any conventional construction carried by the roller D as shown in Fig. 5 may be provided. The circular shaped knife K terminates in spaced ends and forms said through-slit 27*a* along the long dimension of the spread-out package stopping just short of complete severance at opposite ends to provide the integral segment-handle 27*b* for the package.

The roller D may also carry a straight blade or knife K1 extending in a direction transverse the web fold 22 for severing a package unit from the leading end. When perforations 25*a* along partition seam joint 25 is desired roller D may be provided with a perforating cutter K3 as shown in Fig. 5, said perforations will then be formed along a mid-portion of said joint 25 while retaining the closure thereat intact.

The severed packages after passing rollers D and D1 may be packed for shipment in a flattened condition and may be used by folding along the perforations 25*a* so that segment-handle 27*a* and the folded package portions are in register. The looped segment-handle 27*a* thus formed may be flexed out of the plane of the folded package and suspended in the manner shown in Fig. 9.

While the manufacture of infusion packages 20 as described is simply for tea balls, it is to be understood that by using the two compartment A and B package and two filling spouts P and P1, one of the compartments may, if desired, be filled with tea and the other with either powdered milk, dry fluent sugar or dry powder lemon essence, or a mixture of such milk and sugar, or, of lemon essence and sugar. Thus package 20 can be utilized to supply ingredients for making a more complete beverage or drink than is possible with tea balls now available.

It is also to be understood that the manufacture of tea-ball 20 as shown in Figs. 1 and 2, and described above, may be carried out to include a step of folding to provide the tea-balls 20 in the form with a double fold 28 shown in Fig. 9 instead of furnishing the flattened-out construction shown in Fig. 8.

The tea-ball 20 above described may also be provided with a legend bearing portion 20*a* incorporated therein for indicating a brand name or trade-mark of the distributor or manufacturer. As shown in Figs. 8 and 9, a legend 29 being embossed or otherwise imprinted in said tea-ball portion 20*a* which, as shown, occupies unfilled corners of the tea-ball 20, that is, said portion 20*a* is located adjacent the end of handle 27*c* so that the legend 29 may appear in an upright legible position in said corner 20*a*.

It should be noted that bag portion of tea-balls 20 when made with a greater dimension in the length thereof as compared with the height as shown in Fig. 9, that a longer handle 27*b* is provided, and since in such construction the proportionally greater length of bag gives a longer distance to be travelled in the filling operation of the package when passing a contents filler portion of an automatic tea-ball making machine, more leeway is allowed in feeding successive charges of the contents. Furthermore, the shorter height of the tea-ball bag gives a more convenient proportional size for making a brew in a cup as is clear from Fig. 9.

A modified construction of the invention is shown in Figs. 11 and 12 at 40. This form of tea-ball 40 may be manufactured in the identical manner described above, for the packages 20 with the exception that each through-slit 47*a* is cut to shape the segment-handle 47*b* at a mid-portion thereof with an enlargement 49 in alignment with the perforations 45*a*. This enlargement 49 forms a legend carrying area or integral tag when the package 40 is in folded condition on which the legend 49*a* may be impressed as shown in Fig. 12. If desired the shape of the package 40 may be made more symmetrical by cutting away a piece 50 from the package the adjoining seam joints 50*a* being left with the closures thereat intact, as shown in Figs. 11 and 12.

An extremely simplified embodiment of the invention is shown in Figs. 13 and 14 as tea balls 60 and may be manufactured in the same manner as described above for tea-balls 20, and as shown in Figs. 1 and 2, except that the tea-balls 60 with heat sealed joint seams or flanges 63 and 64, and a closure seam joint 67 may each be folded over on itself along lines Y—Y to form doubled edge fold 68 the overfolded heat sealed seam joint 67 thereof being then slitted through by cut 67*a* extending through a mid-portion of the length thereof. Said cut 67*a* extends from the outer edge of the fold 68 and terminates at 67*c* a short distance inward from the edges of flanges 63 and 64 thereby only partially severing a portion of the flange 67 to provide an integral non-tangling four-ply handle 67*b* for the tea-ball 60.

The ends 67*c* of said cut 67*a* may be curved in a direction of the length of the flanges 63 and 64 to "tear-proof," that is, serve as an effective means for preventing the accidental tearing of the flange material between said end 67*c* and the adjacent free edges of the flanges 63 and 64. The curves of the cut at 67*c* also aid in producing a balanced stabilized suspension of the tea-ball 60 when manipulated by the segment-handle 67*b*.

In a like manner tea-balls 20 and 40 may each be provided with "tear-proofed" curve cut ends 27*c* on slits 27 and curve cut ends 47*c* on slits 47 respectively, if desired.

The utility of the invention when constructed like tea-balls 20, 40, or 60 described above will now be apparent. Said tea-balls may be manufactured using successive steps described above and shown in the drawings. A portion of the heat-sealed closure joint seam in each case extending along the bag being made sufficiently wide to permit partial severing thereof by cut or split 27*a*, 47*a* or 67*a*, to provide completely formed integral segment-handles 27*b*, 47*b*, and 67*b* which are integral with the tea-ball bag structure, and requiring no other material or attachments.

It is therefore seen that there is provided an improved method and article of manufacture in which the several objects of the invention are achieved and which are well adapted to meet the conditions of practical use.

As various other possible embodiments of the invention may be made in the above invention and as various changes may be made in the embodiments and method above set forth, it is to be understood that all matters herein set forth and shown in the accompanying drawings are to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention I claim as new and desire to secure by Letters Patent:

1. In a method of manufacturing infusion packages of the character described, the steps of enclosing an essence containing product in a filter sheet material to form an elongated flattened package with an edge border closure seam, and through-slitting a mid-portion of the seam extending the long dimension of the package short of complete severence at both ends of the slit to provide an integral segment-handle for the package while retaining a closure at said slitted seam intact.

2. In the method defined in claim 1 including a step of folding the package across a mid-portion thereof for locating said through-slitting in forming the segment-handle with the unsevered ends thereof in registered relation.

3. In the method defined in claim 1 including steps of folding the package across a mid-portion thereof for locating said through-slitting in forming the segment-handle with the unsevered ends thereof in registered relation, and

shaping a folded portion of said handle with an enlargement to provide a tag while retaining the closure at the portion of said edge border seam adjacent the enlargement intact.

4. A method of manufacturing infusion packages of the character described including the steps of enclosing an essence containing product in a filter sheet material to form an elongated flattened package with an edge border closure seam, folding said package across a mid-portion transverse the long dimension thereof, and through-cutting said edge border seam of the folded package structure short of complete severance to provide an integral segment-handle for suspending the package in manipulating the package during brewing while retaining the closure at said edge border seam intact.

5. The manufacturing method as defined in claim 4 including a step of shaping the through-cut to enlarge the free end of the handle to provide an integral tag.

6. The manufacturing method defined in claim 4 including the step of sectionalizing the package into equal portions by making a partition seam joint across said mid-portion to extend to the edge border seam prior to said folding.

7. In the method defined in claim 1 including the step of sectionalizing the elongated flattened package into equal portions by making a partition seam joint extending centrally transverse the package to join the through-slitted seam portion forming the segment-handle.

8. A method of manufacturing infusion packages of the character described including the steps of enclosing an essence containing product in a filter sheet material to form an elongated flattened package with an edge border closure seam, sectionalizing the package into equal portions by extending a partition seam joint across a mid-portion transverse the long dimension, perforating and folding said package along said seam joint while retaining the closure thereat intact, and through-cutting said edge border seam of the package structure short of complete severance to provide an integral segment handle for selectively suspending of the package as a whole and as separated sectionalized portions severed at the perforations while retaining the closure at said edge border seam and partition joint intact.

9. In a method of manufacturing infusion packages of the character described, the steps of enclosing an essence containing product in a filter sheet material to form an elongated flattened package with edge border closure seams, sectionalizing said package into equal portions by making a partition seam joint extending centrally transverse the package, perforating said seam joint while retaining the closure of said joint intact to provide a tear means for separating the sectionalized portions for independent use, and through-slitting a mid-portion of an edge border seam extending the long dimension of the package short of complete severance at both ends of the slit to provide an integral segment handle for the selective suspension of the package as a whole and as separated sectionalized portions during brewing while retaining the closure at said edge border seams intact.

10. An infusion package of the character described comprising an elongated bag of filtering sheet material formed with an edge border closure seam extending lengthwise of the bag, an essence containing product enclosed in said bag, a fold extending across a mid-portion transverse the long dimension of the bag, and an integral segment-handle for suspending the package in brewing transformed from split portions of said edge border seam while retaining the closure thereat intact.

11. An infusion package defined in claim 10 which includes an enlargement at the free end of said segment handle to provide an integral tag.

12. The infusion package defined in claim 10 in which a seam joint is provided to extend across said mid-portion transverse the long dimension of the bag at said fold for sectionalizing the package.

13. In an infusion package construction of the character described, an elongated bag of a filtering sheet material, edge border closure seams for said bag, and an essence containing product enclosed in the bag, one of said edge border closure seams extending the long dimension of the package having a through-slit in a mid-portion thereof, said through-slit terminating short of a complete severance at both ends thereof while retaining the closure at said slitted seam portions intact, the severed portion of said edge border seam providing a handle when suspending the package in brewing manipulation.

14. In the infusion package construction defined in claim 13 in which a fold is provided to extend across the mid-portion of the package for locating the through-slit and said portion of the edge border seam forming the segment-handle in a superimposed registered relation.

15. In the infusion package construction defined in claim 13 in which a fold is provided to extend across the mid-portion of the package for locating the through-slit and said portion of the edge border seam forming the segment-handle in a superimposed registered relation, and an enlargement at the free end of said folded segment-handle to provide a tag while retaining the closure at the portion of the edge border seam adjacent the enlargement intact.

16. In the infusion package construction defined in claim 13 in which a partition joint seam for sectionalizing the package into two equal portions is provided to extend centrally transverse the package and the through-slitted seam portion forming the segment-handle.

17. An infusion package of the character described comprising an elongated bag of filter sheet material formed with an edge border closure seam extending lengthwise the bag, an essence containing product enclosed in said bag, a partition joint seam extending across a mid-portion transverse the long dimension of the bag for sectionalizing the package with the enclosed product into substantially equal portions, and a fold extending along said partition joint seam, said fold being perforated to provide a tear means for separating the sectionalized portion for independent use while retaining the closure at said partition joint seam intact, said edge border seam of the folded structure being centrally through-slitted short of complete severance to provide an integral segment-handle for selectively suspending during brewing the package as a whole and as sectionalized independent portions while retaining the closure at said edge border seam intact.

18. In an infusion package construction of the character described, an elongated bag of a filtering sheet material, edge border closure seams for said bag, an essence containing product enclosed in the bag, one of said edge border closure seams extending the long dimension of the package having a through-slit in a mid-portion there-

of, said through-slit terminating short of complete severance at both ends thereof while retaining a closure at said slitted seam portion intact, the severed portion of said edge border seam providing a segment-handle for suspending the package in brewing manipulation, a partition joint seam extending across a mid-portion transverse the long dimension of the bag for sectionalizing the package and enclosure, said joint seam being perforated to provide tear means for separating the sectionalized portions for independent use while retaining the closure of said partition joint seam thereat intact.

19. In a method of making individual infusion packages, the steps comprising forming bag material into the form of a strip having a closed bottom and open top, sealing the bag forming material of such strip at predetermined spaced intervals to provide side joint seams of a series of bag section units, filling the bag section units through the open top, successively cutting off filled bag section units leaving the sealing of the side joint seams intact, sealing said open top, and through-splitting the sealing at said open top to form a segment-handle leaving said sealing of said open top intact.

20. In the method of making individual infusion packages defined in claim 19 including the step of folding each filled bag section unit on itself prior to said through-splitting step.

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