Sept. 16, 1941. P. B. HULTKRANS 2,255,975

ART OF PACKING

Filed May 16, 1940 2 Sheets-Sheet 1

Fig. 1.

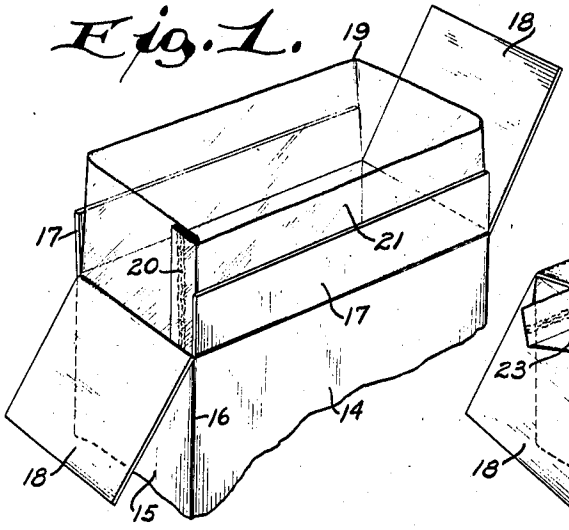
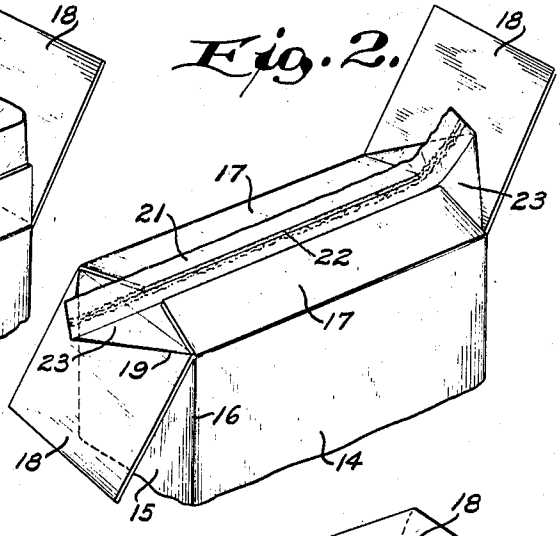


Fig. 2.



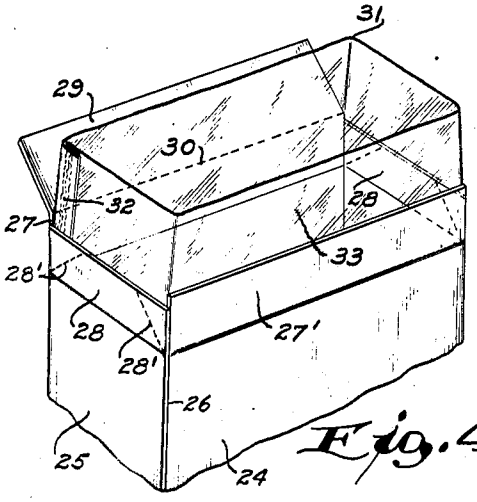


Fig. 4.

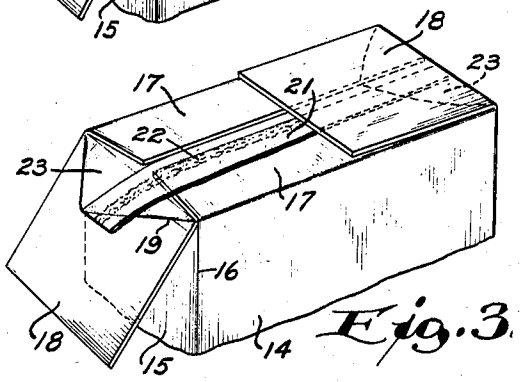


Fig. 3.

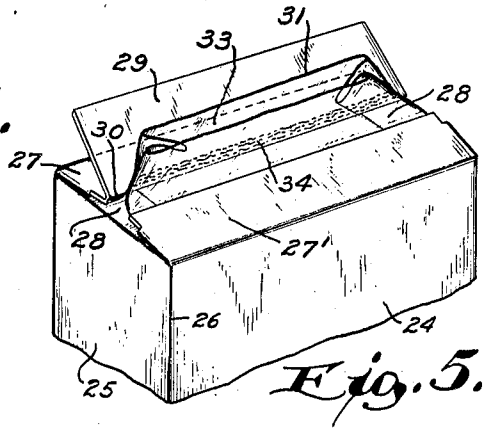


Fig. 5.

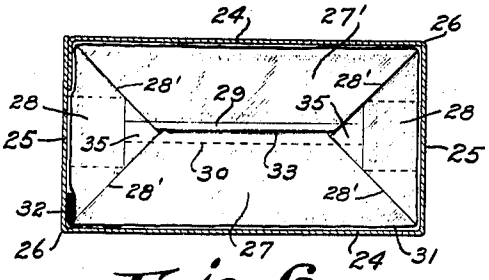


Fig. 6.

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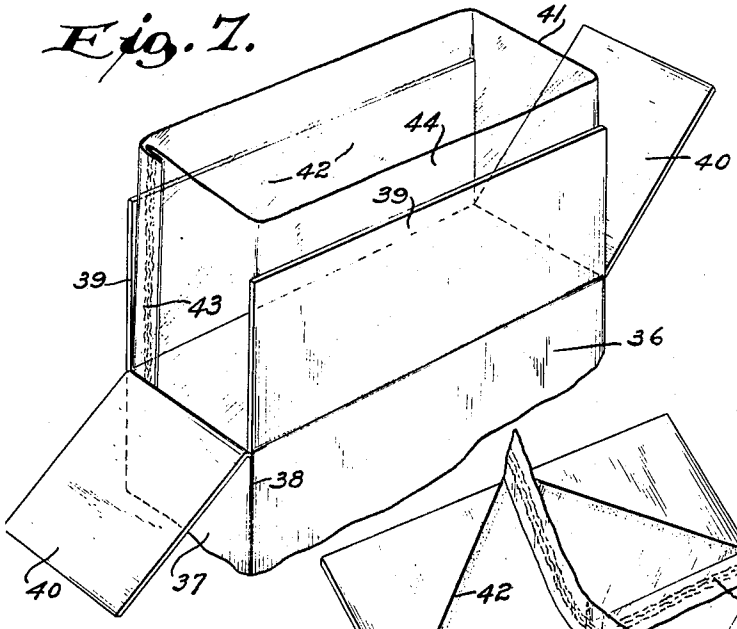
ATTORNEYS.

Sept. 16, 1941. P. B. HULTKRANS 2,255,975

ART OF PACKING

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Fig. 7.



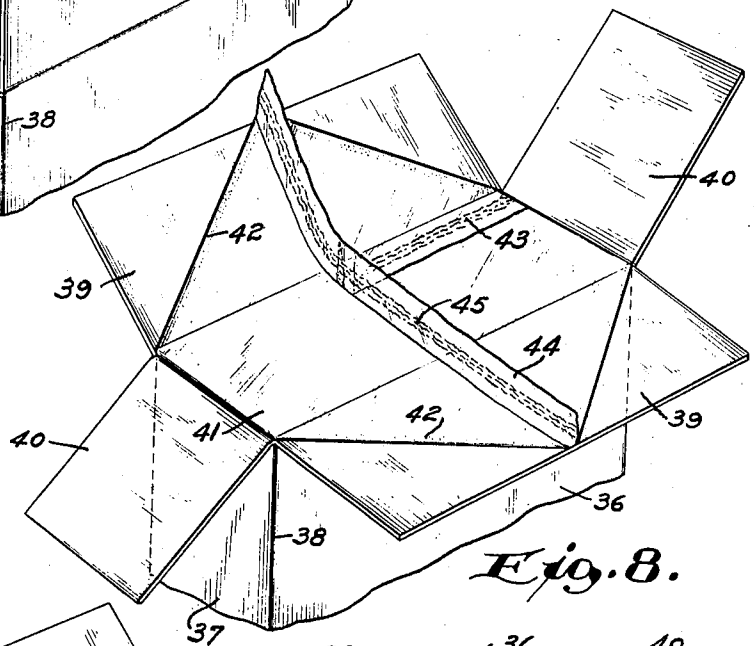
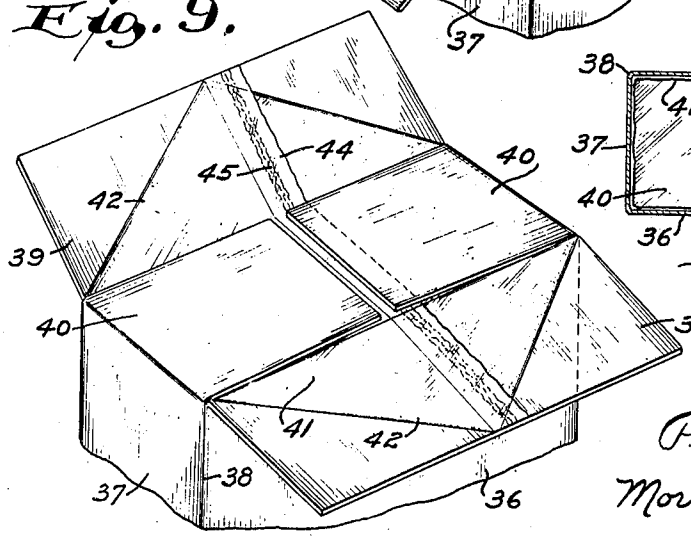


Fig. 8.

Fig. 9.



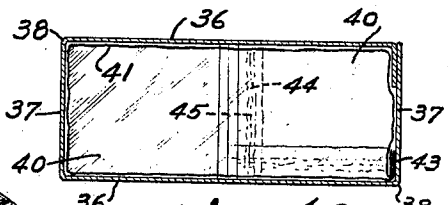


Fig. 10.

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UNITED STATES PATENT OFFICE

2,255,975

ART OF PACKING

Paul B. Hultkrans, Shorewood, Wis., assignor to Milprint, Inc., Milwaukee, Wis., a corporation of Wisconsin

Application May 16, 1940, Serial No. 335,509

10 Claims. (Cl. 93—6)

My invention relates in general to improvements in the art of packing various commodities in hermetically sealed containers, and relates more specifically to an improved method of sealing the ends of containers of the type forming the subject of Brooks application Serial No. 330,853, filed April 22, 1940.

An object of the present invention is to provide an improved method of insuring tight sealing of one or both ends of a composite container comprising a relatively rigid outer carton lined with flexible sheet material.

It has heretofore been proposed as set forth in the above-identified application, to initially firmly attach a relatively thin and flexible sheet of material to the interior of a foldable and comparatively rigid carton blank, and to intimately connect the opposite side edges of the thin sheet when the blank has been folded into box formation, so as to form a tubular impervious lining for the container. The box blank may be formed of cardboard or other inexpensive sheet stock, and the liner is preferably formed of material such as "Pliofilm" adapted to be readily and effectively heat sealed; and when the lining has been sealed along the side edges and the box walls have been interconnected, the opposite ends of the lining tube should project beyond the adjacent open ends of the carton so as to permit closing in order to finally confine and conceal the commodity. Because of the specific characteristics of the lining material which is extremely flexible, thin and has a tendency to cling to adjacent structure due to static electrical charging, it is very difficult to handle the protruding tube ends for neat folding, sealing and final confinement within the outer container, unless some method or means for effecting such folding and sealing are provided.

It is therefore a more specific object of my invention to provide an improved mode of effecting neat and efficient positioning, sealing and folding of the end or ends of a lining confined within a box, whereby tight closure of the lining tube will be insured.

Another specific object of my invention is to provide an improved closure for a bag or tubular sheet confined within a protective outer covering, which closure can be quickly and readily effected to provide a gas and liquid tight seal.

A further specific object of the invention is to provide an improved method of end closing a composite wrapper having a flexible inner lining permanently attached within a relatively rigid outer blank, whereby most effective enclosure of the packed commodity is made possible.

Still another object of this invention is to provide a new method of facilitating the closure and heat sealing of bag-like containers formed of sheet material such as rubber hydrochloride or regenerated cellulose.

These and other specific objects of my invention will be apparent from the following detailed description.

A clear conception of the several steps constituting my new method as applied to several types of foldable cartons provided with flexible liners, may be had by referring to the drawings accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the various views.

Fig. 1 is a perspective view of one of the open ends of a composite wrapper after assembly thereof into box formation and preparatory to closure of the end;

Fig. 2 is a similar view of the wrapper end, showing the opposite side flaps folded inwardly to bring the ends of the inner liner into engagement, and also showing the latter joined by heat sealing;

Fig. 3 is another similar view showing the final step of sealing this type of composite wrapper and box;

Fig. 4 is a perspective view of one of the open ends of a modified type of compound wrapper or box, showing the same preparatory to closure and sealing;

Fig. 5 is a similar view of the box or wrapper assembly of Fig. 4, but showing the side and end flaps folded inwardly and the coacting ends of the lining heat sealed;

Fig. 6 is a transverse section through the assemblage of Fig. 5, showing the interior of the final end closure;

Fig. 7 is a perspective view of one of the open ends of another modified type of compound wrapper, showing the assemblage preparatory to closing;

Fig. 8 is a similar view of the lined carton of Fig. 7, showing the side flaps swung out to position the edges of the lining in contact with each other, and also showing the latter heat sealed;

Fig. 9 is another similar view of the wrapper assembly of Figs. 7 and 8, showing the sealed joint folded and one of the end flaps also finally folded; and

Fig. 10 is a transverse section through the as-

semblage of Fig. 9, showing the interior of the final closure.

While I have shown the invention applied to a compound wrapper of the type disclosed in the Brooks application above-identified, and comprising a cardboard outer blank lined with a sheet of material such as "Pliofilm," and have also shown only three types of blanks, it is not the intent to thereby unnecessarily limit the scope or utility of the improvement.

Referring specifically to Figs. 1 to 3 inclusive, the outer box of the composite wrapper is formed of a single blank comprising rigid relatively foldable wide and narrow side walls 14, 15 respectively connected along score lines 16, the wide walls 14 being provided with oppositely disposed end flaps 18; and an inner flexible sheet or liner 19 permanently attached to the interiors of the walls 14, 15 and having its opposite longitudinal edge portions heat sealed along a seam 20 to form an approximate tube the extreme end 21 of which projects considerably beyond the open ends of the carton. The box blank is preferably formed of comparatively inexpensive but stiff sheet material such as cardboard, while the lining sheet 19 is preferably formed of thin, transparent, heat-sealable material such a "Pliofilm" or the like; and the longitudinal seam 20 may be formed by heat sealing the overlapping side edges of the sheet 19 either before or after this sheet has been adhesively attached to the interior of the carton blank, and the walls of the latter have been initially assembled into box formation.

When the composite wrapper has been preliminarily assembled with the flaps 17, 18 disposed as shown in Fig. 1, the projecting end portion 21 of the lining 19 may be contracted by swinging the flaps 17 inwardly toward each other as shown in Fig. 2, to bring the extreme opposite end parts of the portion 21 into approximate engagement with each other, whereupon a seal 22 may be applied entirely across the coacting lining end parts. This seal 22 may be effected with the aid of an electrically heated clamp, and provides an hermetical closure for the entire end of the lining tube, while at the same time producing triangular corners 23 as shown in Fig. 2. After the flaps 17 have been folded inwardly and the seal 22 has been produced, the sealed flange may be folded over one of the flaps 17, and the other set of flaps 18 may be folded to simultaneously fold the triangular corners 23 inwardly, over the adjacent ends of the flaps 17, as illustrated in Fig. 3. Adhesive applied to the inner faces of the flaps 18 will serve to firmly attach these flaps 18 to the flaps 17, thereby improving the closure at the end of the liner 19, and concealing and protecting the seal 22 and the corners 23. This package may obviously be readily opened for access to the enclosed commodity, by removing one or both flaps 18 and by cutting off either one of the corners 23, or the entire sealed end of the lining 19.

Referring more specifically to Figs. 4 to 6 inclusive, the modified form of the invention shown therein, again utilizes a composite wrapper comprising, an outer box formed of a single blank and having rigid relatively foldable wide and narrow side walls 24, 25 respectively, connected along fold lines 26, the wide walls 24 being provided with oppositely disposed end flaps 27, 27', while the narrow walls 25 have oppositely disposed end flaps 28 provided with diagonal score lines 28'; a closure flap 29 foldably connected to the swinging end of the flap 27 along a score and tear line 30; and an inner flexible sheet or liner 31 permanently attached to the interior of the walls 24, 25 and to the inner surfaces of the flaps 27, 27', 28, and having its opposite longitudinal edge portions heat sealed along a seam 32 to form a rectangular sectioned tube the extreme end 33 of which projects considerably beyond the flaps 27, 27', 28. The modified box blank may again be formed of cardboard or the like, while the lining sheet 31 should preferably be formed of thin, transparent, heat-sealable sheet material, and the longitudinal seam 32 may be formed by heat sealing the overlapping side edges of the lining sheet either before or after this sheet has been adhesively attached to the inner surface of the carton blank.

When the modified composite wrapper has been properly constructed and assembled with the flaps 27, 27', 28 disposed as shown in Fig. 4, the projecting end portion 33 of the lining 31 may be contracted by swinging the flaps 27, 27' toward each other, and by simultaneously folding the end flaps 28 inwardly beneath the flaps 27, 27', as illustrated in Fig. 5. This displacement of the flaps causes the extreme opposite end parts of the lining portion 33 to approximately contact each other so as to permit application of a heat seal 34 entirely thereacross, thus hermetically sealing the end of the tubular lining 31 while at the same time providing triangular corners 35 disposed within the enclosure, see Fig. 6. The seal 34 may be subsequently folded flat against the outer surface of the flap 27', after which the final closure flap 29 may be swung down and adhesively attached to the top of the flap 27' to conceal and protect the sealed portion 33. In order to open this package, it is only necessary to release the closure flap 29 and to thereafter cut away the seal 34.

Referring especially to Figs. 7 to 10 inclusive, the further modified embodiment of the invention shown therein, also utilizes a composite wrapper consisting of an outer carton formed of a single blank having rigid relatively foldable wide and narrow side walls 36, 39 respectively, connected along score lines 38, the wide walls 36 being provided with oppositely disposed flaps 39, while the narrow walls 37 have oppositely disposed flaps 40; and an inner flexible lining sheet 41 permanently attached to the interior of the walls 36, 37, and to the wide flaps 39 by diagonal lines of adhesive 42. The liner sheet 41 has its opposite longitudinal edges sealed along a seam 43, and the extreme end portion 44 of the inner sheet preferably projects outwardly beyond the ends of the flaps 39 when the latter are disposed in the planes of the adjacent walls 36. The box blank may again be formed of relatively rigid sheet material such as cardboard, while the lining sheet 41 is preferably formed of transparent, thin, heat sealable sheet material as previously indicated, which may be adhesively attached to the interiors of the walls 36, 37. The flaps 39 are of approximately the same length as the distance between the wide walls 36, while the flaps 40 are of length approximately one-half the distance between the narrow walls 37.

After the modified composite wrapper has been properly made and assembled as in Fig. 7, with the lining sheet 41 sealed into tubular form and adhesively attached within the walls 36, 37 and flaps 39, the flaps 39 may be swung outwardly to the position illustrated in Fig. 8, thereby contracting the opening at the liner end, and caus-

ing the opposite extreme end portions 44 to substantially contact each other. The contacting end portions 44 may then be united by a heat seal 45 extending from the extreme end of one flap 39 to the extreme end of the other flap 39, and entirely across the tubular lining 41, as clearly indicated in Fig. 8. The heat sealed projecting portion 44 may then be folded flat against the lining sheet 41 as in Fig. 9, whereupon the end flaps 40 may be folded inwardly as shown, to retain the portion 44 in folded condition. Adhesive may be subsequently applied to the inner surfaces of the flaps 39, whereupon these flaps together with the triangular portions of the lining sheet associated therewith, may be folded inwardly over the flaps 40, and over each other to complete the closure. The interior of the box will then have only a single relatively short seam extending from one wall 36 to the other, and in order to open this package it is only necessary to remove the flaps 39 and to cut away one of the triangular lining portions attached to the interior of one of these flaps 39.

From the foregoing detailed description it will be apparent that my present invention provides an improved method of sealing a box having a flexible lining and flaps adjacent to the protruding end of the lining, which is easily carried on and which produces a most effective seal at the box end. The method comprises only a few relatively simple steps, namely, folding the box flaps to bring the opposite edge portions of the lining sheet into approximate engagement with each other, uniting the adjoining edge portions to form a seal, and subsequently confining the seal closely adjacent to the end of the box by folding the flaps thereover. While each of the embodiments shows a box having side walls of greater length than the end walls, the box may, of course, be square with all walls of equal width. In each instance the seal produced at the end of the box provides no undesirable projections within the enclosure, and this is especially true of the embodiments shown in Figs. 3 and 9. Both ends of the box may be sealed in like manner, and in all cases the seal is effectively protected by the flaps, while being readily accessible for access to the packed commodity. The improved seals have proven highly satisfactory in actual use, and it has been found that by utilizing material such as "Pliofilm," the package can be readily used to confine either liquids or solids for an indefinite period, without leakage or spoilage of the product. The seals can be readily and quickly applied to containers of diverse sizes and shapes, and when one end of a container has been sealed to produce a cup-shaped receptacle, commodities such as solids or liquids can be readily introduced into the receptacles and subsequently hermetically confined.

It should be understood that it is not desired to limit this invention to the exact details of construction or to the precise steps of the method, herein disclosed and described, for various modifications within the scope of the claims may occur to persons skilled in the art.

I claim:

1. The method of sealing a box having a flexible lining and side flaps of approximately one half the box width located adjacent to the protruding end of the lining, which comprises, folding the box flaps inwardly to bring opposite edge portions of the lining into approximate flat surface engagement with each other, permanently uniting said edge portions while thus held by the flaps to form a seal, and subsequently confining the seal closely adjacent to the end of the box.

2. The method of sealing a box having a flexible lining and side and end flaps of approximately one half the box width and length respectively located adjacent to the protruding end of the lining, which comprises, folding the side flaps inwardly to bring opposite edge portions of the lining into approximate flat surface engagement with each other, permanently uniting said edge portions while thus held in engagement by the folded side flaps to form a seal, and finally folding said end flaps over said sealed edge portions of the lining to confine and conceal the seal.

3. The method of sealing a box having a flexible heat sealable lining and pairs of oppositely disposed side and end flaps of approximately one half the box width and length respectively located adjacent to the protruding end of the lining, which comprises, folding the pair of side flaps inwardly to bring opposite edge portions of the lining into approximate flat surface engagement with each other, heat sealing the edge portions while thus held in engagement by the folded side flaps to form a complete enclosure at the protruding lining end, and subsequently folding the pair of end flaps over the folded side flaps to confine the heat sealed lining portion therebetween.

4. The method of sealing a box having a flexible heat sealable lining and pairs of oppositely disposed side and end flaps each approximately one half the corresponding box width and located adjacent to the protruding end of the lining, which comprises, folding the pair of side flaps inwardly to bring opposite edge portions of the lining into approximate flat surface engagement with each other, heat sealing the edge portions to form a complete enclosure at the protruding lining end, folding the heat sealed edge portions of the lining downwardly against the folded side flaps, and finally folding the pair of end flaps over the folded side flaps and against the heat sealed lining portion to permanently confine the same.

5. The method of sealing a box having foldable flaps at an end thereof of approximately the same combined width as the corresponding box width and a flexible tubular impervious lining projecting beyond the box end, which comprises displacing the flaps to bring the opposite edge portions of the protruding tube end into approximate flat surface engagement with each other, and permanently sealing the contacting tube edge portions while thus held by the displaced flaps.

6. The method of sealing a box having foldable flaps at an end thereof of approximately the same combined width as the corresponding box width and a flexible heat-sealable tubular impervious lining projecting beyond the box end, which comprises, displacing the opposite flaps to bring the opposite edge portions of the protruding tube end into approximate flat surface engagement with each other, and heat sealing the coacting edge portions of the tube entirely across the latter while said portions are being held in engagement by the displaced flaps.

7. The method of sealing a box having foldable side and end flaps at an end thereof and a flexible tubular lining secured thereto and projecting beyond the box end, which comprises, folding a side flap to contract the tube end, permanently sealing the contracted end while being

thus held by the folded side flap, and folding an end flap over the side flap to confine the seal.

8. The method of sealing a box having foldable side and end flaps at an end thereof and a flexible heat-sealable tubular lining secured thereto and projecting beyond the box end, which comprises, folding a side flap to contract the tube end, heat sealing the entire contracted end while being thus held by the folded side flap, and folding an end flap over the side flap and against the heat sealed end.

9. The method of sealing a box assemblage having inwardly foldable opposite side flaps the combined width of which is slightly less than the adjacent box width and also having a flexible heat-sealable tubular lining within the box and projecting outwardly beyond the flaps, which comprises, folding the side flaps inwardly into a common plane to cause the opposite sides of the projecting tube end to contact each other while extending outwardly beyond the flap edges, heat sealing the contacting tube portions entirely across the tube, and finally clamping the sealed tube portion against the flaps.

10. The method of sealing a box assemblage having inwardly foldable opposite side flaps the combined width of which is slightly less than the adjacent box width and end flaps foldable inwardly over the side flaps and also having a flexible heat-sealable tubular lining secured within the box and projecting outwardly beyond the side flaps, which comprises, folding the side flaps inwardly into a common plane to cause the opposite sides of the projecting tube end to contact each other while extending outwardly beyond the edges of the side flaps, heat sealing the contacting tube portions entirely across the tube, and folding the end flaps over the side flaps to confine the sealed tube portion therebetween.

PAUL B. HULTKRANS.