

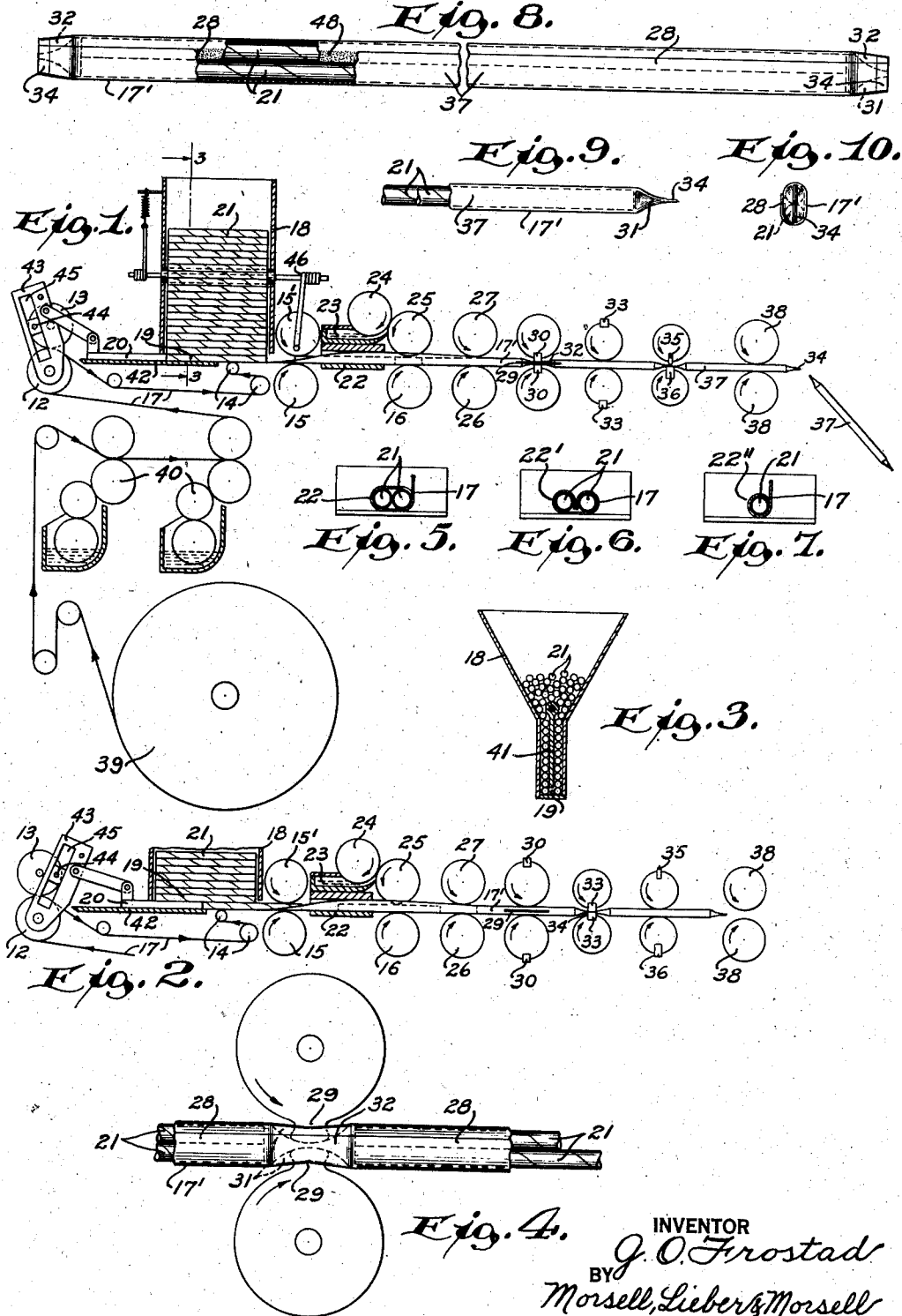
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METHOD OF PACKAGING SODA STRAWS

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## METHOD OF PACKAGING SODA STRAWS

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The present invention relates in general to improvements in the art of wrapping relatively frail elongated objects in packages containing batches of one or more of the objects, and relates more specifically to improvements in the construction of packages for soda straws or the like and to an improved method of producing such packages.

Generally stated, an object of my invention is to provide an improved soda straw package, and an improved method of producing soda straw packages or the like.

It has long been customary in an effort to protect and to maintain soda straws in sanitary condition during handling and dispensation thereof, to wrap these elongated relatively frail objects in batches of either one or a pair, within relatively thin tissue or similar paper containers. These soda straw wrappings must be relatively inexpensive, should rather loosely confine the straws so as to permit ready stripping of the wrapping sheath from the confined objects, and must above all effectively conceal and confine the straws so as to prevent exposure to unsanitary conditions. In order to minimize the cost of wrapping these straws, it must be possible to rapidly and accurately segregate the objects into the desired batches and to quickly confine the successive batches in relatively inexpensive wrapping stock without damaging the straws or wasting the stock. The wrapping operation must be such that the material is not folded or otherwise applied too tightly about the straws, so as to interfere with ultimate removal of the objects by stripping. And regardless of the speed of the wrapping operation, this operation must be performed in a manner whereby each batch of straws is most effectively and neatly confined and sealed within its individual wrapper. The prior soda straw wrapping processes and machines have not been able to meet all of these important requirements, and the packages heretofore produced were either too costly for general use, or the wrappers too snugly embraced the straws, or they were insufficiently durable and tightly sealed to insure the necessary protection. The prior packages of this type when rapidly produced, moreover did not present a neat and attractive appearance, and could not be compactly confined within a receptacle because of the extremely loose and uneven application of the wrapping sheets.

It is therefore a more specific object of my present invention to provide a new and useful method whereby frail elongated objects such as soda straws, may be quickly and effectively

wrapped in relatively inexpensive paper to produce attractive, and tightly sealed successive packages.

Another specific object of the present invention is to provide an improved method of producing soda straw packages automatically, accurately and in rapid succession, without waste of either straws or wrapping stock, and at minimum cost.

Still another specific object of the invention is to provide an improved wrapping for one or more elongated objects such as soda straws, which is inexpensive, durable, effective as a concealing means, and which may be readily removed without damaging the objects.

An additional specific object of this invention is to provide an improved soda straw package, containing one or more straws, and which is compact and neat in appearance, and wherein the straws are most effectively concealed and protected.

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

A clear conception of the several steps constituting my improved soda straw wrapping method, and of the construction of the improved package, may be had by referring to the drawing 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 diagram showing schematically the various elements of a machine for carrying on commercial exploitation of the improved method of packing soda straws, the tuckers and cutters being shown in action and the pinch welders being inactive;

Fig. 2 is a fragment of a similar diagram showing the pinch welders in action while the tuckers and cutters are inactive;

Fig. 3 is a vertical section through the straw supply hopper, taken along the line 3—3 of Fig. 1;

Fig. 4 is an enlarged top view showing the side tuckers in action on a fragment of wrapping tube;

Fig. 5 is an enlarged end view looking into one type of web folding tunnel cooperating with two-straw batches and adapted to overlap the opposite web edges;

Fig. 6 is a similar view looking into another type of folding tunnel for wrapping the web edges between the two straws of each batch;

Fig. 7 is another similar view looking into the

web wrapping tunnel of a single straw wrapping machine;

Fig. 8 is a plan view of one of the completed soda straw packages, portions thereof having been broken away to show internal structure;

Fig. 9 is a side view of one end of the package of Fig. 8; and

Fig. 10 is an end view of the same package.

While the invention has been shown and described herein as being especially useful for automatically wrapping or packing either one or two soda straws in each of a succession of wrappers formed of tissue paper and while the web of wrapping stock is constantly advancing, it is not my desire or intent to thereby unnecessarily restrict the scope or utility of the improvement. The term "soda straw" as used herein is intended to include any elongated object having similar shape, whether hollow or solid. The term "tissue paper" is intended to include any more or less porous and thin wrapping stock, and the term "adhesive" is intended to include glue or any other material capable of uniting the web edges.

Referring to Figs. 1 to 4 inclusive of the drawing, the machine for packaging soda straws in accordance with my improved method, comprises in general any suitable means such as revolving rollers 12, 13, 14, 15, 16 for guiding and for continuously feeding a web 17 of thin sheet material such as tissue paper along a definite path; means such as a supply hopper 18 having a lower discharge portion 19 and a reciprocating feed plunger 20 cooperating therewith to deposit endwise separated successive batches of straws 21 upon the advancing web 17; wrapping means such as a tunnel 22 for folding the opposite side edges of the advancing web 17 upwardly, and at least one of these edges inwardly over the adjacent straw 21; adhesive applying means including a liquid adhesive supply reservoir 23, a transfer roll or disk 24, and an applying disk 25 cooperable with one or both side edges of the web 17 after leaving the tunnel 22; a pair of press rolls 26, 27 for folding the web 17 into tubular formation about the advancing straws 21 and for forming an adhesive seam 28 extending throughout the tube length; a pair of coating revolving side tuckers 29 disposed at the opposite sides of the advancing tubular web 17 and cooperating with initial revolving presser shoes 30 to form opposite inwardly directed approximately triangular tucks 31 at the spaces 32 between successive batches of the advancing straws 21; a pair of cooperating revolving compression or pinch welding blocks 33 cooperable with the tubular web 17 transversely across the medial wider portions of each set of tucks 31 and medially of each space 32 to form pinch welded areas 34; a revolving cutter knife 35 cooperating with a revolving anvil element 36 to sever the advancing assemblage medially of each welded area 34 into successive completed packages 37; and a pair of discharge rolls 38 coacting with the soda straw packages 37 to deliver the same from the machine.

The continuous web 17 which is preferably formed of relatively inexpensive and porous sheet material so that the adhesive may readily permeate the welded areas 34, may be derived from a supply roll 39 and may be passed through suitable printing and decorating apparatus 40 before reaching the feed rolls 12, 13. The printing apparatus 40, and the various guide and feed rolls and other wrapping, sealing and packaging elements may be operated in synchronism in any

suitable manner, so that each operation is properly timed with respect to all others. When the straws 21 are to be packed in batches of two, the straw supply hopper 18 may be provided with a central vertical partition 41 disposed within its lower portion 19 and adapted to deliver the straws 21 in parallel pairs into the path of the reciprocating plunger 20 and upon the adjacent traveling web 17, see Fig. 3. In cases where single straws 21 are to be packed in individual packages, a hopper 18 having a narrower lower discharge portion 19 may be used, or one of the vertical lanes formed by the partition 41 may be blocked off. The straw removing plunger 20 is reciprocable upon a fixed plate 42 by means of a lever 43 operable by a crank pin and block 44 carried by the feed roll 13 and coacting with a slot 45 in the lever, and the length of the plunger reciprocations may be varied so as to vary the lengths of the spaces 32 between successive batches of straws. The hopper 18 may also be provided with agitator mechanism 46 operable by the upper straw feed roll 15' as shown in Fig. 1, to cause the straws 21 to assume parallel positions and to properly gravitate through the hopper portion 19; and this upper feed roll 15' cooperates with the lower roll 15 to feed the successive batches of straws 21 removed from the hopper 18 by the plunger 20, into the folding tunnel 22.

The initial folding tunnel which is located in the path of travel of the web 17 and of the successive batches of straws 21, may be of different types as shown in Figs. 5, 6 and 7, depending upon the form of package desired. The tunnel 22 shown in Fig. 5, is adapted to fold both of the longitudinal edges of the web 17 upwardly, but folds only one of these edges inwardly to horizontal position while the other edge remains vertical. The type of wrapping tunnel 22' shown in Fig. 6, is adapted to fold both of the longitudinal web edges upwardly, inwardly and downwardly around the adjacent straws 21. The type of tunnel 22'' shown in Fig. 7, is adapted to fold both longitudinal edges of the sheet 17 upwardly, but only one edge portion inwardly and downwardly about the single straw 21, and other types of tunnels may be provided as required. When the web 17 leaves the tunnels 22, 22', one edge portion thereof is in upright position, but when the web leaves a tunnel 22'' both edge portions are folded downwardly between the straws 21.

The adhesive applying roller or disk 25 is adapted to receive adhesive such as glue from the transfer roll 24 which in turn withdraws the adhesive from the receptacle 23 in a well known manner. The revolving disk 25 is adapted to deposit a stripe or layer 48 of adhesive upon the inwardly folded edge portion of the advancing strip 17 as shown in Fig. 1, or between the downwardly folded web edge portions if a tunnel 22' is used. The initial pressing rollers 26, 27 are adapted to subsequently fold the upstanding web edge portion over the adhesive layer 48, or in the case of Fig. 6, to press the intumed web edges together, thus completing the tubular web 17 within which the endwise separated successive batches of straws 21 are confined.

The revolving tuckers 29 are adapted to form the opposite approximately triangular side tucks 31 in the tubular web 17 at each of the successive spaces 32 between batches of the straws 21, as clearly shown in Fig. 4, after the longitudinal seam 28 has been completed; and the revolving

presser shoes 30 coact with the tubular web 17' at the spaces 32 when the tuckers 29 are in action and assist the latter in forming neat tucks 31, while at the same time flattening and contracting the tube to some extent between the ends of the straws 21. Following the tucking operations, the welding blocks 33 are adapted to engage the flattened tubular web 17' transversely across each set of tucks 31 to tightly pinch and swage the material, and to thereby form the local welded areas 34. While the compression of the porous material at the areas 34 is sufficiently high to cause the overlapping sheets and tucks to be firmly connected and thoroughly welded, the pinching action will also cause the moist adhesive at the seam 28 to spread and permeate at least a portion of the areas 34, thus enhancing the union. The revolving cutter 35 coacts with the reaction element 36 following each welding operation, to transversely sever the tubular web 17' medially of each welded area 34 into successive completed soda straw packages 37 which are discharged into a suitable receptacle by the delivery rolls 38.

While the several steps of my improved method of packaging soda straws or the like, should be apparent from the foregoing detailed description of the construction and operation of apparatus for carrying on the commercial exploitation of the method, a short résumé of the steps involved will again be set forth. The flat web 17 which is continuously withdrawn from the supply roll 39 may be printed or decorated in the apparatus 40, whereupon the feed and guide rolls 12, 13, 14, 15, 16 constantly advance the web 17 beneath the straw supply hopper 18 and through the tunnel 22. While the web 17 is travelling beneath the hopper 18, successive batches of straws 21 are deposited thereon in endwise spaced relation, and while passing through the tunnel 22, the opposite web edges are folded upwardly and inwardly to loosely embrace the straws. Adhesive is subsequently applied to the turned edge portion and the upstanding opposite edge portion is folded over the adhesive stripe 48 to form a seam 28 and to complete the tubular web 17'. The advancing tube is then provided with the tucks 31 following which the welded areas 34 are produced; and when the tubular web 17' is finally severed medially across each welded area 34, the completed improved soda straw packages 37 result. Since all of the movable elements are operated at relatively high speed and in synchronism, the method is carried on at high speed and with positive assurance that all of the packages 37 will be uniform in structure and neat in appearance.

It will be apparent from the foregoing detailed description and résumé, that my present invention provides an improved method of rapidly and effectively packing elongated objects such as relatively frail soda straws, without danger of damaging the straws. The new method is adapted to be carried on by hand, but the rapidity of packing can be greatly enhanced and uniform packages will be assured, by utilizing improved apparatus of the type hereinabove described. With my improved method, the straws 21 whether packed singly or in pairs, will not be too tightly wrapped to prevent stripping of the wrapper; but on the other hand, the wrapping will be sufficiently snug to provide neat appearing and tightly sealed successive packages 37. The tucks 31 and welds 34 while thoroughly sealing the package ends, also present neat appearing tabs which may be torn off when the straws

21 are to be removed, and the use of porous, inexpensive wrapping stock is preferable both because it facilitates pinch welding and it also permits the adhesive to permeate the welds. The improved process has proven highly satisfactory in actual commercial use, and results in the production of improved packages of durable construction at relatively low cost, without tearing the web stock or otherwise wasting materials.

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

I claim:

1. The method of wrapping soda straws, which comprises, continuously longitudinally advancing a web of wrapping material, feeding successive batches of the straws in endwise spaced relation upon the advancing web, folding the advancing web about the straws and securing the longitudinal web edges to provide a tubular enclosure, forming opposite inwardly extending approximately triangular tucks in the advancing tube at each space between successive batches of straws and collapsing the adjacent tube portions against the tucks, and swaging the advancing tube at said spaces and transversely across the tucks to seal the tube at the opposite ends of each batch.

2. The method of wrapping soda straws, which comprises, continuously longitudinally advancing a web of wrapping material, feeding successive batches of the straws in endwise spaced relation upon the advancing web, folding the advancing web about the straws and securing the longitudinal web edges to provide a tubular enclosure, forming opposite inwardly extending approximately triangular tucks in the advancing tube at each space between successive batches of straws and collapsing the adjacent tube portions against the tucks, swaging the advancing tube at said spaces and transversely across the tucks to seal the tube at the opposite ends of each batch, and severing the tube medially of each swaged area to segregate the successive packages.

3. The method of wrapping soda straws, which comprises, continuously longitudinally advancing a web of wrapping material, depositing successive like batches of straws upon the advancing web in endwise spaced relation, wrapping the web about the straws to form a tube having the endwise spaced batches of straws enclosed therein, tucking the opposite sides of the advancing tube inwardly at each space between successive batches of straws and collapsing the adjacent tube portions snugly against the tucks, and compressing the advancing tube transversely of the tucks to provide successive pinch welded areas extending across the tube and the medial portions of the tucks.

4. The method of wrapping soda straws, which comprises, continuously longitudinally advancing a web of wrapping material, depositing successive like batches of straws upon the advancing web in endwise spaced relation, wrapping the web about the straws to form a tube having the endwise spaced batches of straws enclosed therein, tucking the opposite sides of the advancing tube inwardly at each space between successive batches of straws and collapsing the adjacent tube portions snugly against the tucks, compressing the advancing tube transversely of the tucks to provide successive pinch welded areas extending

across the tube and the medial portions of the tucks, and severing the tube medially of each welded area to segregate the successive packages.

5. The method of wrapping soda straws or the like, which comprises, continuously longitudinally advancing a web of porous wrapping material, depositing successive batches of straws upon the advancing web in endwise spaced relation, folding the web about the straws and adhesively uniting the web edges to form a tube having endwise spaced batches of straws confined therein, tucking the sides of the advancing tube inwardly at each space between successive batches of straws and simultaneously snugly collapsing the adjacent tube portions against the tucks, and thereafter pinching the advancing tube transversely and centrally of each tucked area to provide successive welded zones permeated by the adhesive.

6. The method of wrapping soda straws or the like, which comprises, continuously longitudinally advancing a web of porous wrapping material, depositing successive batches of straws upon the advancing web in endwise spaced relation, folding the web about the straws and adhesively uniting the web edges to form a tube having endwise spaced batches of straws confined therein, tucking the sides of the advancing tube inwardly at each space between successive batches of straws and simultaneously snugly collapsing the adjacent tube portions against the tucks, thereafter pinching the advancing tube transversely and centrally of each tucked area to provide successive welded zones permeated by the adhesive and severing the tube transversely and medially of each welded zone to segregate the successive completed packages.

7. The method of wrapping soda straws, which comprises, longitudinally disposing a web of wrapping material, depositing successive batches of the straws in endwise spaced relation longitudinally upon the web, folding the web about the straws to provide a tubular enclosure, forming opposite inwardly directed approximately triangular tucks in the tube at each space between successive batches of the straws and simultaneously collapsing the adjacent tube portions snugly against the tucks, and thereafter firmly compressing the tube at each of said spaces and across the widest portions of the tucks to seal the tube at the opposite ends of each batch.

8. The method of wrapping soda straws, which comprises, longitudinally disposing a web of wrapping material, depositing successive batches of the straws in endwise spaced relation longitudinally upon the web, folding the web about the straws to provide a tubular enclosure, forming opposite inwardly directed approximately triangular tucks in the tube at each space between successive batches of the straws and simultaneously collapsing the adjacent tube portions snugly against the tucks, thereafter firmly compressing the tube at each of said spaces and across the widest portions of the tucks to seal the tube at the opposite ends of each batch, and severing the tube medially of each compressed area to segregate the successive packages.

9. The method of wrapping soda straws, which comprises, flatly longitudinally disposing a web of thin wrapping stock, depositing successive batches of straws in endwise uniformly spaced relation longitudinally upon the web and loosely folding the web about the straws to provide a relatively loose tubular enclosure, forming opposite inwardly directed approximately triangular tucks in the tube at each space with the widest portions of the tucks approximately midway between the adjacent ends of the successive batches of straws to contract the tube width medially of each space, and thereafter pinching the tube transversely across the widest portion of each set of tucks to provide a press welded flat seal at the opposite ends of each batch.

10. The method of wrapping soda straws, which comprises, flatly longitudinally disposing a web of thin wrapping stock, depositing successive batches of straws in endwise uniformly spaced relation longitudinally upon the web and loosely folding the web about the straws to provide a relatively loose tubular enclosure, forming opposite inwardly directed approximately triangular tucks in the tube at each space with the widest portions of the tucks approximately midway between the adjacent ends of the successive batches of straws to contract the tube width medially of each space, thereafter pinching the tube transversely across the widest portion of each set of tucks to provide a press welded flat seal at the opposite ends of each batch, and severing the tube medially of each welded area to segregate the successive packages.

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