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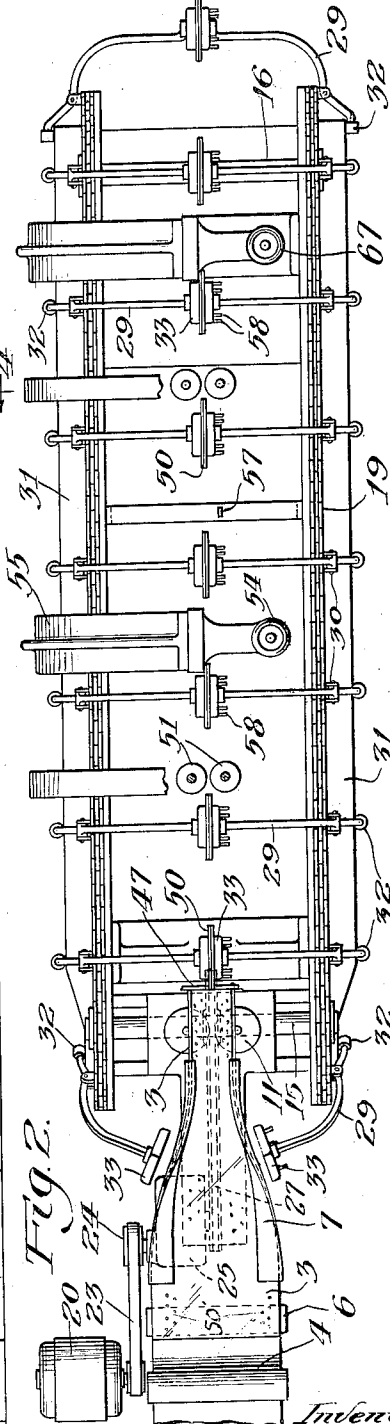
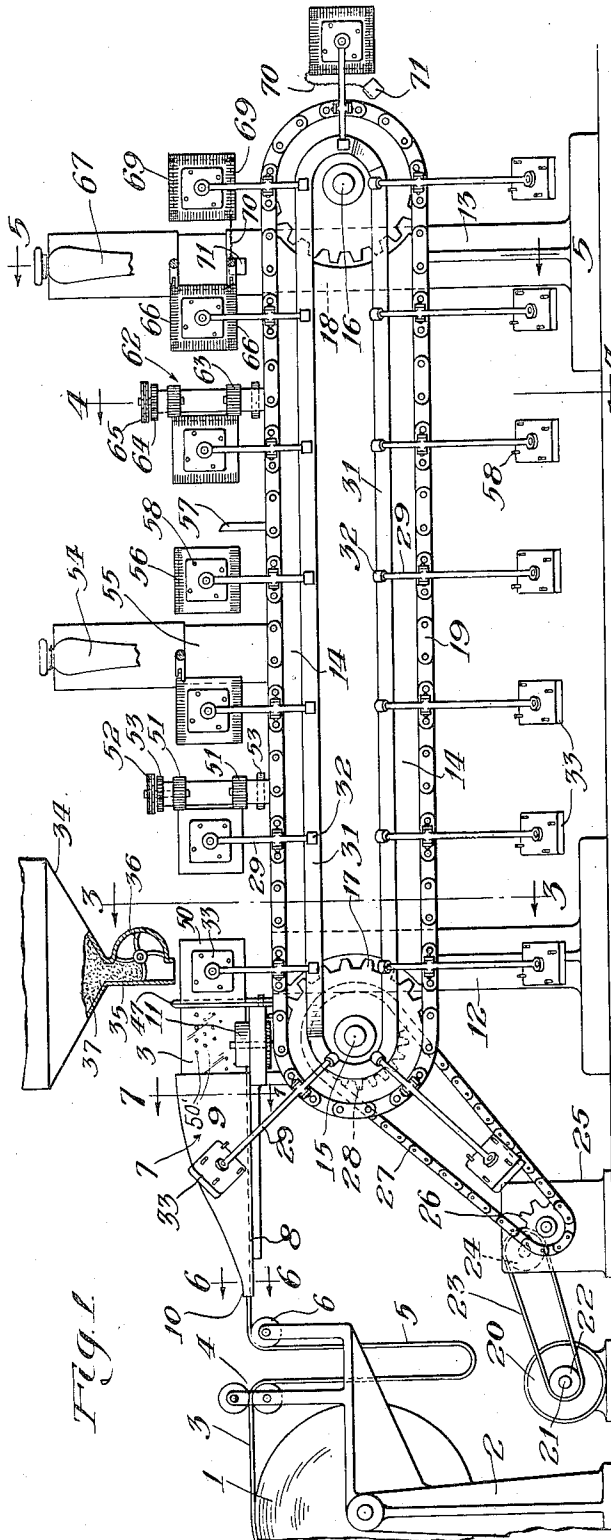
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2,027,643

METHOD OF MANUFACTURE OF CELLOPHANE BAGS

Filed Dec. 31, 1934

3 Sheets-Sheet 1



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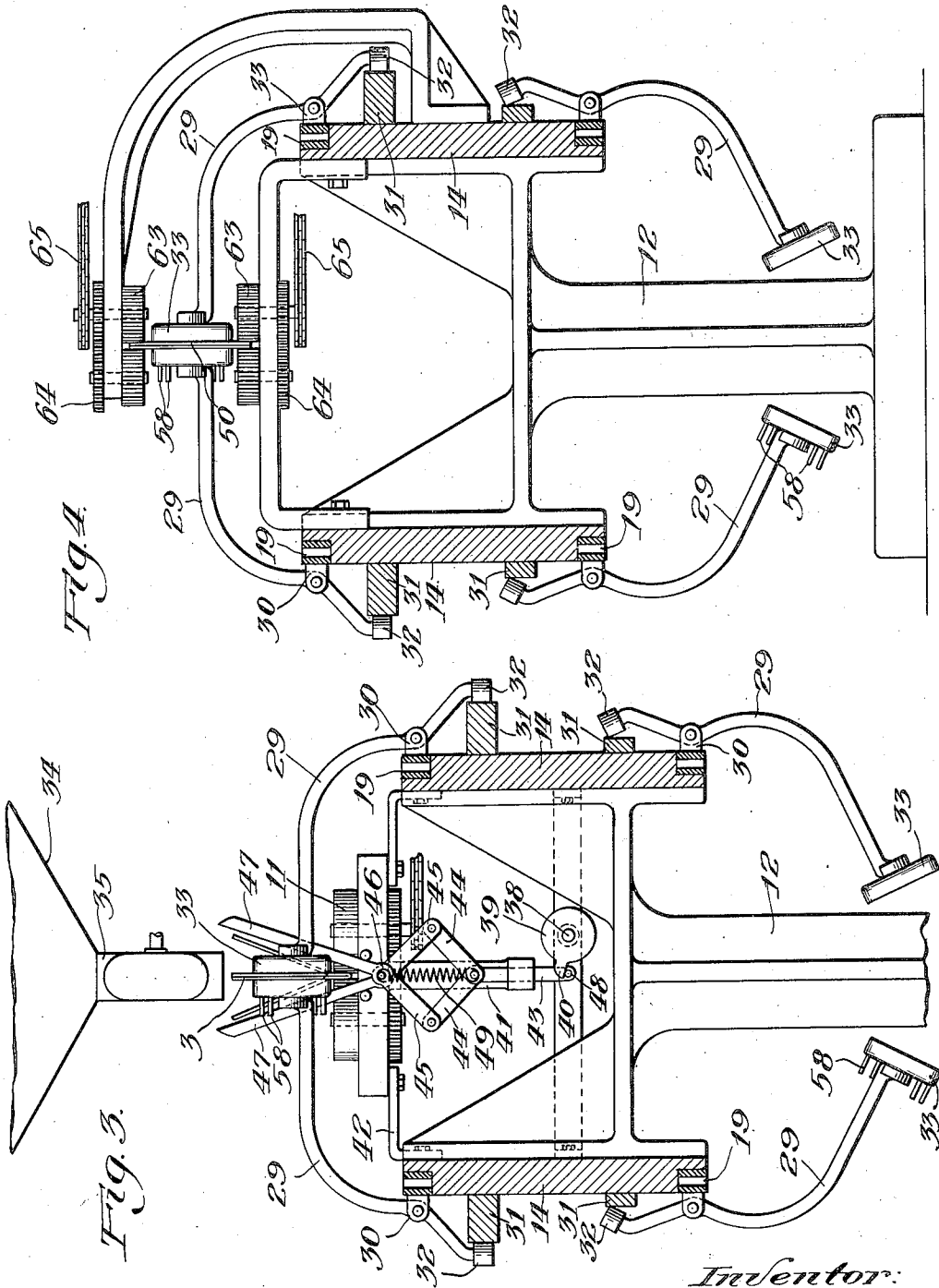
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METHOD OF MANUFACTURE OF CELLOPHANE BAGS

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3 Sheets-Sheet 2



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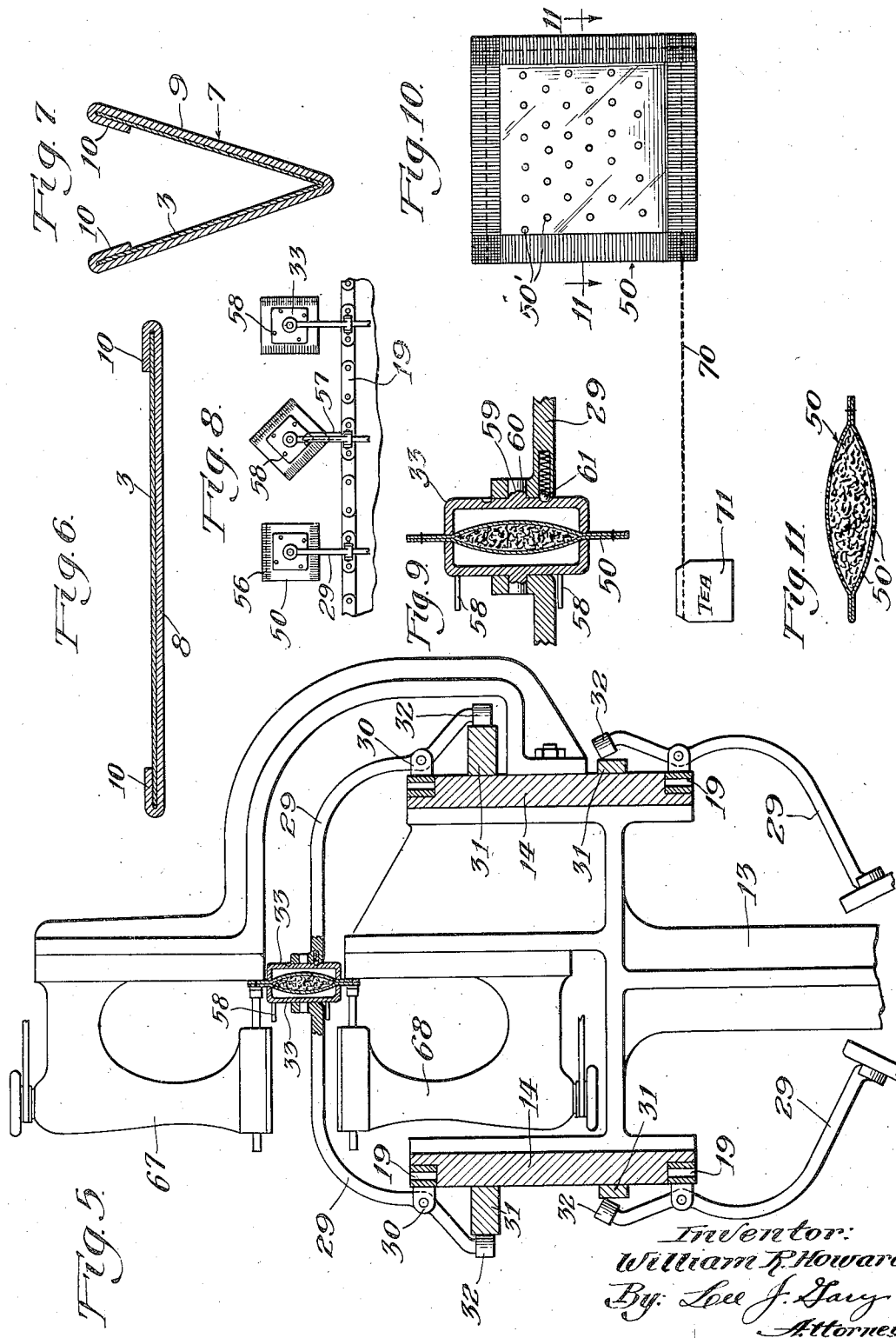
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METHOD OF MANUFACTURE OF CELLOPHANE BAGS

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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METHOD OF MANUFACTURE OF
CELLOPHANE BAGS

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4 Claims. (Cl. 226—53)

This invention relates to improvements in a method and apparatus for packaging tea or such like material, and refers specifically to the packaging of tea or the like in bags of water resistant, transparent material, such as cellophane or the like, and sewing said bags as a continuous operation.

In the packaging of tea or other like material in bags of cellophane, great difficulty has been encountered due to the substantial impossibility of holding two edges of such a bag together, and sewing the same without having the edges buckle and slip, thus producing a large percentage of seconds or imperfect bags.

To partially combat this tendency of the material comprising the bags, it has heretofore been the practice to use an overlapping stitch. However, this does not entirely cure the situation and results in a bag which has a bulky appearance which is far from being neat or attractive.

My present process is directed to facilitating the handling of such bags and briefly comprises: passing a web of perforated cellophane to a forming guide which creases the web longitudinally into a V shape, filling the V thus formed with a predetermined quantity of tea or the like, clamping the sides of the V together and severing that portion of the cellophane carrying the tea from the remainder of the web, carrying the bag contained tea forwardly to a set of knurling or crimping rolls which crimp opposite edges of the bag, sewing that edge of the bag opposite the V crease, rotating the bag through an angle of 90° and crimping and sewing the two opposite sides of the bag, during which latter operation a tag may be attached to the bag.

Other objects and advantages of my invention will be apparent from the accompanying drawings and following detail description.

In the drawings, Fig. 1 is a diagrammatic, side elevational view of a suitable machine for carrying out my process.

Fig. 2 is a top plan view of the device shown in Fig. 1.

Fig. 3 is a transverse sectional view taken on line 3—3 of Fig. 1.

Fig. 4 is a transverse sectional view taken on line 4—4 of Fig. 1.

Fig. 5 is a transverse sectional view taken on line 5—5 of Fig. 1.

Fig. 6 is a sectional view taken on line 6—6 of Fig. 1.

Fig. 7 is a sectional view taken on line 7—7 of Fig. 1.

Fig. 8 is a diagrammatic, detailed view of the bag rotating mechanism.

Fig. 9 is a sectional view of the bag clamp illustrating the same in clamping position.

Fig. 10 is a face view of the finished cellophane tea bag.

Fig. 11 is a sectional view taken on line 11—11 of Fig. 10.

Referring in detail to the drawings, 1 indicates a roll of transparent waterproof material having perforations 50; which for purposes of description, will be referred to as cellophane. The roll may be supported by standards 2. A web 3 may be continuously drawn from roll 1 by means of draw rolls 4 which may be driven by any suitable means (not shown). After passing through the draw unit 4 web 3 may be formed in a loop 5, which, as will be hereinafter more fully described, is adapted to compensate for the intermittent operation which is performed upon the web at a subsequent period of travel.

Web 3, after forming loop 5 is passed over guide roll 6 and is carried forwardly into a guiding mechanism 7 which may comprise a continuous sheet disposed flat at one end as shown best at 8 in Fig. 6, and which gradually assumes the form of a V as shown at 9 in Fig. 7. The edges of the plate may be turned inwardly as shown at 10 in Figs. 6 and 7, and the web 3 carried from roll 6 is adapted to be disposed upon the plate, the edges of said web being confined beneath the inwardly turned flanges 10.

The purpose of the guide 7 is to transform the horizontally travelling web 3 into a V-shape, the angle of the V being coincident with the longitudinal axis of the web. Although the instrumentality utilized to thus transform the passing web is described as being a plate of gradually changing conformation, the same may comprise a pair or series of pairs of inclined rollers which, of course, would perform the same function, that is, transform the horizontal web into a V-shape.

After passing from the guide 7 the central portion of the web, that is, the folded portion thereof is carried between a set of co-acting driven rollers 11 which function both as draw rolls and also to crease the central portion of the cellophane web. Draw rolls 11 may be driven by any suitable means (not shown). However, in view of the fact that during the period when the tea is deposited in the open side of the V, the web is maintained stationary, the driving mechanism of rolls 11 must be such as to intermittently carry the web forwardly.

A supporting standard 12 may be positioned adjacent guide 7 and rolls 11, and may be spaced a predetermined distance from a similar standard 13. Sides 14 may be secured to each of the standards 12 and 13 and may span the distance between said standards. A shaft 15 may be journaled at one end of the sides 14 and a shaft 16 may be journaled at the opposite end thereof. A pair of sprocket wheels 17 may be mounted upon shaft 15 and a similar pair of sprocket wheels 18 may be mounted upon shaft 16. An endless sprocket chain 19 may pass over each pair of sprocket wheels 17 and 18 upon each side of the standards 12 and 13, said chains being guided in grooves provided at the outer corners of the sides 14.

A motor 20 having shaft 21 upon which may be mounted pulley 22 may serve to drive chains 19. A belt 23 may connect pulley 22 to a cooperating pulley 24, mounted in the gear reduction mechanism 25 wherein the rotative velocity of the motor is reduced. A sprocket wheel 26 constituting the output of the gear reduction mechanism 25 may be connected by means of sprocket chain 27 to sprocket wheel 28 mounted upon shaft 15.

Each of the chains 19 may carry a plurality of spaced arms 29, each of which may be pivotally journaled in lugs 30 carried upon the links of chain 19. Arms 29 carried by chain 19 on one side of the mechanism are disposed directly opposite the arms carried by the chain on the opposite side and each of said pairs of arms is capable of swinging away from or toward each other. A cam rail 31 may be mounted upon each of the sides 40 and may follow the path traced by the endless chains 19, said cam rails projecting outwardly from said sides. Rollers 32 mounted upon the ends of arms 29 may be adapted to ride upon said cam rails and at the upper portion or upper cycle of travel of chain 19, the ends of arms 29 which carry rollers 32 may be spread away from each other. In other words, cam rails 31 paralleling the upper path of travel of chain 19 projected a greater distance from sides 14 than those portions of the cam rails which parallel the lower path of travel.

The upper ends of each of the arms 29 carry cup-shaped members 33, said members being so disposed as to have the open portion of the cups of each pair of arms facing each other.

A hopper 34 may be positioned above the path of travel of the feeding web 3 and may be provided with a discharge 35, the discharge carrying a rotary valve 36. The hopper 34 is adapted to contain a quantity of tea or the like 37 and each quarter revolution of the rotary valve 36 is adapted to discharge a predetermined quantity of said tea, for instance, a sufficient quantity to brew a cup or predetermined number of cups of tea. The folded web 3 may be carried forwardly beneath the discharge 35 by means of the co-acting rolls 11 and after said folded web moves beneath the discharge, valve 36 is operated to permit a charge of tea to be passed to the V-shaped web. At the period when all of the tea has been discharged into the folded V-shaped web, chains 19 will have so traveled as to position a pair of arms 29 in alignment with the axis of the discharge 35 and cam rails 31 are so constructed as to move the lower ends of arms 29 outwardly when said arms coincide in position with the longitudinal axis of the discharge 35. In this manner the endmost portion of the folded web 3 is gripped by the cup-shaped members 33 and the arrangement is such

that the mechanism driving chains 19 at this period momentarily stops.

A continuously rotating shaft 38 may be positioned beneath rolls 11, said shaft being independently driven by suitable means (not shown). A cam 39 may be mounted upon shaft 38 and carries a lug 40. A hollow sleeve 41 may be mounted upon the lower portion of frame member 42 carried by support 12 and rod 43 may be slidably positioned within said sleeve. A pair of linkages 44 may be pivotally connected at the upper end of rod 43, the opposite ends of said links being pivotally connected to members 45. Members 45 may be joined at a common pivot 46 and blades 47 may comprise extensions of said members. As shaft 38 rotates, lug 40 contacts pin 48 carried at the lower end of rod 43 and thereby pulls linkages 44 downwardly. The downward movement of linkages 45 causes rotation of members 47 to take place in shears fashion. Members 47 embrace the V-shaped web 33 and are positioned between draw-rolls 11 and discharge 35. When chains 19 stop, as has been hereinbefore described, the timing of the apparatus is so adjusted that lug 40 contacts pin 48 causing members 47 to come together. Said members may be sharpened and serve to sever the folded web 3. After lug 40 moves pin 48 downwardly and disengagement takes place, members 47 comprising the shears blades are returned to their normal position by means of the compression spring 49 confined between the pivot 46 and upper end of rod 43.

As can readily be seen a unit bag or receptacle 50 is provided which contains a predetermined quantity of tea, said receptacle being supported by the opposed cup shaped members 33. After the shears 47 operated to sever the folded web 3, chains 19 again resume their movement and the unit receptacle 50 is carried forwardly by the opposed arms 29.

As the individual members 50 progress forwardly, being carried by arms 29, the upper and lower edges of said receptacle are passed between pairs of knurling or crimping rolls 51 which may be driven by sprocket wheel 52, each pair of knurling rolls being geared together by means of gears 53. By crimping or knurling the upper edge of the cellophane receptacle 50, said upper edges comprising the receptacle are temporarily held together and will not readily slide upon each other or buckle. In view of the fact that the lower edge of the receptacle 50 comprises a fold, it is not necessary that the same be knurled or crimped in order to retain the edges in contact with each other. However, in view of the fact that the knurling or crimping of the upper edge shortens that edge, it is essential that the lower folded edge be similarly acted upon in order that the resulting container have opposite sides of equal length.

The bags or packages 50 carried by the members 33, after passing between the knurling or crimping rolls 51, are passed in sequence beneath a sewing machine 54 mounted upon a suitable support 55. In passing beneath the machine 54 the upper knurled edges of the bag or package are stitched together as indicated at 56 in Fig. 1. In this manner both the upper and lower edges are confined or secured together, the lower edge being folded and the upper edge being stitched.

After stitching, the bags or packages are carried forwardly in sequence until they become positioned opposite arm 57 which projects upwardly from the machine. Each of the cup

shaped members 33 carried upon arms 29 upon one side of the machine carry four outwardly projecting lugs 58 which are positioned upon the outer face of the cup-shaped member slightly removed from the corner thereof. As each of the arms 29 pass the upwardly projecting arm 57, said latter arm contacts a pin 58 adjacent the lower right hand corner of the cup-shaped member carried by the arm 29. All of the cup-shaped members 33 carry pintles 59 which are journaled bearings 60 provided at the ends of arms 29 so that said cup-shaped members will be rotatable upon said arms. Consequently, when the pin 58, hereinbefore mentioned, contacts arm 57, the cup-shaped members will be rotated through an angle of 90°, thereby disposing the crimped opposite sides of the bag or package 50 vertical. If desired, a spring pressed ball 61 may be carried by one of the arms 29 whereby the members 33 will be prevented from swinging too freely. It is to be understood, however, that other means may be provided for preventing undue rotation of the members 33.

After being rotated by arm 57 the members 33 carrying the bags or packages 50 pass a second knurling or crimping unit 62 which comprises an upper and lower pair of crimping rolls 63, said rolls being geared together by gears 64 and being driven by sprocket chains 65 from a suitable source of power (not shown). The upper and lower edges of the packages 50 in passing through the crimping unit 62 are crimped or knurled as indicated at 66 in Fig. 1. The purpose of so crimping these edges of the package is to prevent slipping or buckling of said edges during the subsequent sewing operation which will be hereinafter described. After the crimps 66 have been formed in the upper and lower edges of the bags 50, the same are passed beneath two oppositely positioned sewing machines 67 and 68, being respectively an upper and lower machine. In so passing beneath said machine the upper and lower edges are stitched as indicated at 69 in Fig. 1, thereby completely confining the material 37 within the bag 50. When leaving the sewing machines 67 and 68, the thread from the machine 67 may be immediately cut. The thread from machine 68 may be maintained in uncut condition and a chain-like string 70 may thus be formed. While the machine 68 is thus forming the string 70, a tag 71 may be passed beneath the foot of the machine and may be secured to the end of the string. Thereafter the string may be severed.

After the severing of the string from the machine 68, the arms 29 carried by chain 19 pass around wheel 18 and rollers 32 carried at the lower ends of said arms ride from the high portion of the cam rails to the low portion thereof, thereby causing the juxtaposed cup-shaped members 33 to separate, permitting the stitched bag 50 to be discharged therefrom.

It is to be understood that, the concept of

crimping or mutually deforming the opposed edges of a cellophane bag adapted to hold tea or the like, is of primary importance. If desired, instead of folding a continuously moving strip or web of cellophane in the manner hereinbefore described, registerable pairs of pieces of cellophane may be stamped and after the tea or the like has been inserted between said pieces of cellophane, the edges thereof may be mutually deformed or crimped as hereinbefore described and subsequently stitched.

I claim as my invention:

1. A method of packaging dry, loose material such as tea or the like which comprises, discharging a predetermined quantity of tea into a folded piece of cellophane, crimping opposite edges of said folded piece of cellophane including the folded edge thereof, sewing one of said crimped edges, rotating said folded cellophane, crimping the remaining opposite edges and sewing the same.

2. A method of packaging dry, loose material such as tea or the like in individual cellophane bags which comprises, folding a strip of cellophane longitudinally, discharging a predetermined quantity of said dry material into a portion of said folded strip, gripping that portion of the strip holding said material and severing the same from the strip, passing said gripped portion forwardly, crimping opposite edges of said forwardly carried portion, sewing one of said crimped edges, rotating said gripped portion through an angle of 90°, crimping the remaining opposite edges of said portion and sewing the same.

3. A method of packaging dry, loose material such as tea or the like which comprises, longitudinally folding an intermittently passing web of perforated cellophane, discharging a predetermined quantity of said material to be packaged into a portion of said folded web, gripping that portion of the web holding said material and severing the same from the web, crimping opposed edges at opposite sides of said folded portion including the folded edge thereof, stitching the crimped edges opposite said folded side, rotating said portion through an angle of 90°, crimping the remaining opposed edges and stitching the same.

4. A method of packaging dry, loose material such as tea or the like which comprises, longitudinally folding an intermittently passing web of perforated cellophane so as to dispose the folded edge lowermost, discharging a predetermined quantity of said material into an endmost portion of said folded web, gripping that portion of the web holding said material, severing said portion from the web proper to form a unit package, crimping the upper and lower edges of said package, stitching the upper crimped edge thereof, rotating said package through an angle of 90°, crimping the upper and lower edges of the rotated package, and stitching said last mentioned crimped edges.

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