

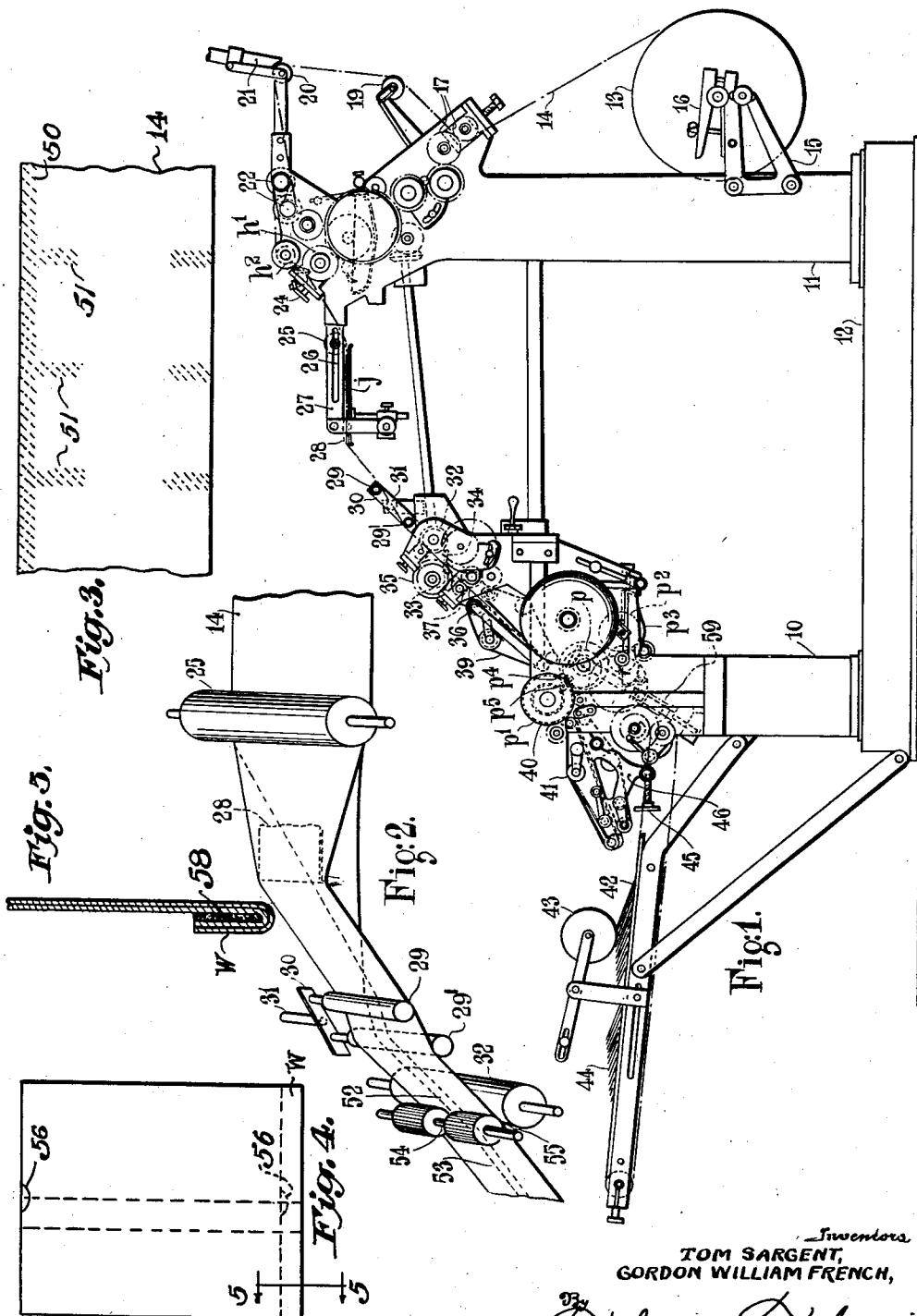
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T. SARGENT ET AL

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MANUFACTURE OF BAGS, PACKETS, ENVELOPES AND THE LIKE

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Inventors
TOM SARGENT,
GORDON WILLIAM FRENCH,

By *Paulmi & Paulmi*
Attorneys

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MANUFACTURE OF BAGS, PACKETS,
ENVELOPES, AND THE LIKE

Tom Sargent and Gordon William French,
Whitehall, Bristol, England, assignors to
Strachan & Henshaw, Limited, Bristol, Eng-
land, a corporation of Great Britain

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This invention relates to the manufacture of bags, packets, envelopes and like covers and wrappings.

One object of the present invention is to produce from a web drawn continuously from a reel a bag of the kind having a bottom closure effected by gluing the inner surfaces of the bag together.

A further object of the present invention is to produce a bag made of transparent cellulosic material of which the open edges will not readily tear.

A further object of the invention is to utilize in bag making the more liquid and transparent adhesives which can be disposed in baths beneath the pasters.

Apparatus made according to the present invention comprises a folding device extending centrally across the web and having a length corresponding to the width of the flat tube to be formed from the web which engages the unpasted portions only of the web and which in the direction of the web creases the web longitudinally as a preliminary step in the formation of a flat tube, pasting mechanism for applying adhesive to the web, the said pasting mechanism comprising means for applying adhesive continuously to at least one longitudinal edge of the web and means for intermittently applying adhesive transversely to the web from opposite edges of the web so as to leave an unpasted portion centrally of the web corresponding to the width of the folding device, and folding rollers which are arranged to cooperate with the said folding device to complete the longitudinal folding of the web after it leaves said folding device, the arrangement being such that when the web is converted into a flat tube there is no folding plate or like means inside the tube.

The apparatus may further comprise severing mechanism for severing the flat tube with a straight line cut and pasting and folding apparatus for again pasting and folding the already glued bottom of the bag.

One way of carrying out the present invention applicable to the manufacture of bags and the like from a web of paper or manufactured cellulose material or the like in sheet form is illustrated by way of example in the drawing left herewith, wherein:—

Fig. 1 is an elevation of the complete machine;

Fig. 2 is a perspective view of the means adopted for longitudinal folding;

Fig. 3 is a detail view showing the method of pasting;

Fig. 4 illustrates a completed bag;

Fig. 5 is a section on an enlarged scale taken on line 5—5, Fig. 4.

Referring to the drawing, the machine is mounted on vertical pillars 10, 11, bolted to a base plate 12. The reel 13 on which the web 14 is wound is mounted in brackets 15 secured to the pillar 11, known means (not shown) being provided for side-tracking the reel 13 for alignment purposes. A known braking device 16 is also provided and arranged in conjunction with the reel bar to prevent the overrunning of the roll and also to keep a proper tension in the web for subsequent manipulation. From the reel 13 the web 14 passes through punching rolls 17, screws 18 being provided for adjusting the punch relatively to the web. After passing through the punch roll 17 the web passes over guide rolls 19 and 20. Adjacent the guide roll 20 a suction pipe 21 is provided to remove the web parts stamped out by the punch roll 17. The web is now passed through draw rolls 22 over guide roll 23 and through pasting mechanism 24. After leaving the pasting mechanism 24 the web passes under guide roll 25 which is mounted in a slot 26 provided in a frame 27. This method of mounting permits the position of the roll 25 to be adjusted for correct break away point to suit various widths of web. The web now passes over a short folding plate 28 and thence over rollers 29, 29' carried on an arm 30 from which they project perpendicularly and which is pivoted centrally on pivot pin 31, whence the web is passed through rollers 32 which complete the longitudinal fold in the manner hereafter more fully described. The folded and pasted web now passes through severing mechanism comprising knives 33 and 34, of which 33 is carried on a rotating roller 35 and 34 is fixed in position, the knives 33 and 34 severing the web transversely into lengths corresponding to the length of the bag blank. The severed blanks are now passed by rolls 37, 38 into a forwarding tape mechanism 39; thence through a dipping and pasting mechanism 40 and then to a delivery tape unit 41 of known construction, the finished bags being delivered by unit 41 to a delivery table 42 below a pressing roller 43. The passage of the web and blanks through the apparatus is indicated throughout by dot and dash line 14.

The foregoing description is a general outline of the mechanism shown in Fig. 1. The operation will now be described in greater detail.

The web first passes through the rolls 17, 17 where a thumb hole is stamped out of the centre of the web intermittently, the distance between the centre of one stamped out aperture and the centre of the next being equal to the length of the bag blank. The strip passes over guide rolls 19, 20 and over parallel draw rolls 22, 22 which are adjacent each other, but not in contact. The web is caused to make a large arc of contact around both the rolls 22, 22, the coil friction caused thereby drawing the webs from the reel, the said draw rolls being suitably rotated by mechanical means in conjunction with other portions of the machine to feed a predetermined length of web. The web is then guided by roll 23 through the pasting device 24. The pasting roller h^1 is provided with a pasting device h^2 which applies the paste both longitudinally and transversely to the underneath surface of the sheet in the manner indicated in Fig. 3 by hatching 50 and 51. The hatching 50 is continuous along one longitudinal edge of the web. The paste is applied transversely for parts of the width as indicated at 51. The hatching 51 occurs at intervals equal to the length of the bag blank. On leaving the pasting device the web passes under the guide roll 25 and over the folding plate 28 which is equal in width to the width of the finished bag. The plate 28 is so disposed in the path of the web as to contact with that portion of the web to which adhesive is not applied. The longitudinal folding of the sheet is effected in some cases (i. e. when the device 29, 30, 31 is omitted as hereafter explained) by co-operation between this guide 28 and the rolls 25 and 32. The leading edge of the web with the longitudinal edges turned down and folded back on the web (as shown at 52, 52) is passed by hand through the draw rolls 32. As the web passes through the draw rolls 32 the longitudinal folds 52, 52 are made. After the initial turning down of the longitudinal edges, on manual insertion of the leading edge into the draw rolls 32, 32, it is found that the folding proceeds automatically the folds being effected along the line 53, 53 parallel to the edges of the web. It will be seen that the upper roll 32 is provided with a central cut-away portion 54, and that the flat tube overhangs the edges of the upper roll 32 as indicated at 55.

With certain materials it has been found that there is a tendency for the longitudinal creases in the web to "spread" before they pass through the folding rolls 32. In order to allow for this the device 29, 30, 31 is provided. If spreading is in evidence the web 14 is passed over the rollers 29 in the manner shown in Figure 2 and the arm 30 can be moved around its pivot 31 until all traces of spreading disappear. When the device 29, 30, 31 is used in this manner the longitudinal folding is effected by the guide 28 in co-operation with the rollers 25 and 29, the flat tube being formed before the web reaches the roller 29 as indicated by the dotted lines in Fig. 2 indicating the folded longitudinal edges. In this case the rollers 32 serve as draw rolls. As the flat tube emerges from the rolls 32, 32 it is glued continuously along the whole of its length by reason of the line of paste 50, and transversely corresponding to the lines of paste 51, the latter forming the bottoms of the bags when completed.

By this method of tube formation internal former plates, guides, fingers and like devices hitherto employed in bag making are entirely eliminated, and this coupled with the special form

of feeding rolls and draw rolls, enables tube formation to be accomplished with a reduction in web tension not hitherto possible, as well as providing a means whereby it is made possible to introduce the adhesive for sealing the bottom of the bag on to the inside of the bag tube, and by means of these devices as combined in our invention bags can be readily produced from materials which have hitherto been considered unsuitable or difficult for manufacturing into bags by known mechanical means.

It should be noted that in the device shown in Fig. 1 the proper tension is maintained on the web not locally at the reel 13 but between the rolls 22 and the rolls 32, the tension being adjusted as desired by rotating the rolls 22 more slowly or more quickly.

On leaving the rolls 32, 32, the flat tube passes through the severing knives 33, 34. This severing mechanism cuts the bags transversely in straight lines parallel with and immediately in front of the transversely pasted portions 51. The prepared blanks now pass through the holding rolls 36, 37 and through a forwarding device 39 consisting of forwarding tapes of known construction, and are passed by the latter through the pasting mechanism 40 which is of the kind described in the earlier patent specification No. 1,787,549. This mechanism 40 consists of a rotatably mounted gripper roll p^1 —together with dipping and adhesive applying roll p^2 working in conjunction with a suitably arranged and disposed adhesive container or box p^3 , the arrangement being such that a short portion of the leading edge of the forwarded bag blank is tucked by means of a dipper p^4 carried on the roll p into a gripping device p^5 carried by the roll p^1 , and at and in conjunction with this operation a transverse line of adhesive is applied to hold the margin w (Figs. 4 and 5) thus turned up, and thereby complete the sealing and making of the bag. In this way effective bottom sealing of the bag is assured. The finished bags 44 are now passed by a delivery tape unit 41 on to a delivery table 42 on which they are arranged in ordered quantities under pressing roll 43 by any known form of mechanism which is indicated in Fig. 1 quite generally by the numeral 59. The mechanisms 39 and 41 may be of the kind described in the earlier patent specification No. 1,740,552. The angle of the delivery unit 41 can be varied by the screw 45 which works in a threaded aperture in the bracket 46.

A complete bag is illustrated in Fig. 4. The notch 56 is formed by the punches 17, 17, the transverse cut 57 effected by the knives 33, 34 being effected through the punched hole, so that one portion of the aperture is at the top of the bag and the remainder is included in the folded up bottom portion of the next bag.

It should be mentioned that the roller p^1 of the pasting mechanism p , the roller 35 and the roller h^1 of the pasting mechanism 24 are all geared to rotate once for a length of the web equal to the length required for one bag.

The section shown in Fig. 5 illustrates the bottom sealing of the bag. It will be seen that the bottom edges of the bag are first sealed by means of the paste applications 51 whereupon the sealed bottom of the bag is folded up and again sealed on one side of the bag by means of the paste 58 which is subsequently applied by the pasting mechanism 40. This method of sealing provides a powder-tight bag.

Printing mechanism may be incorporated in

the machine for the purpose of printing the bags. Such printing mechanism may be incorporated at any suitable part of the machine.

5 The method of folding the longitudinal edges of the web according to the present invention permits the bottom closure of the bag to be effected in a novel manner, i. e. the adhesive is applied between opposite faces of the bag. A short margin of the sealed bottom of the bag may 10 subsequently be folded over on to one surface of the bag and glued thereto.

The present invention permits the use of the more liquid and transparent adhesives, which can be disposed in baths beneath the pasters.

15 Any suitable materials including papers such as are commonly used for bag making may be used as the web material in carrying out the invention. The invention is of particular advantage in connection with the production of bags 20 from transparent sheets or films of artificial cellulose material, for example, regenerated cellulose and cellulose esters, hereinafter referred to as of "artificial cellulose composition". It has been found that with bags made from such materials it is undesirable to provide a folding plate 25 of the known kind, which remains inside the flat tube after its initial formation, and further it is advisable to eliminate serrated edges with these materials since these constitute a source of weakness inasmuch as tearing can easily start from such serrated edges.

30 Since the folding device according to the invention is at no time inside the formed flat tube, it may be in the form of a rod, bar or tube, or 35 other suitable form.

The process and apparatus according to the invention may be used for making flat paper bags, gusseted or tucked bags, or wrappers open at both ends, as distinct from bags which are closed at one end. In this modification the pasting 40 mechanism for applying the lateral streak of paste may either not be provided, or may be thrown out of action for the time being.

What we claim and desire to secure by Letters Patent is:—

45 1. In apparatus for the continuous production of bags, packets, envelopes and like covers and wrappings from a single web, a folding device extending centrally across the web and having a length corresponding to the width of the flat tube 50 to be formed from the web which engages the unpasted portions only of the web and which in the direction of the web creases the web longitudinally as a preliminary step in the formation of a flat tube, pasting mechanism for applying 55 adhesive to the web, the said pasting mechanism comprising means for applying adhesive continuously to at least one longitudinal edge of the web and means for intermittently applying adhesive transversely to the web from opposite edges 60 of the web so as to leave an unpasted portion centrally of the web corresponding to the width of the folding device, and folding rollers which are arranged to co-operate with the said folding device to complete the longitudinal folding of the web after it leaves said folding device, the arrangement being such that when the web is converted into a flat tube there is no folding plate or like means inside the tube, substantially as and 70 for the purpose described.

2. In apparatus for the continuous production of bags, packets, envelopes and like covers and wrappings from webs, pasting mechanism for applying adhesive transversely to that side of the 75 web corresponding to the inner surface of the

bag or the like, a folding device which in the direction of the web creases the web longitudinally as a preliminary step in the formation of a flat tube, folding rollers which are arranged to co-operate with the said folding device to complete 5 the longitudinal folding of the web after it leaves said folding device, the arrangement being such that when the web is converted into a flat tube there is no folding plate or like means inside the tube, a pivotally mounted arm disposed between 10 the folding device and the folding rollers, and rollers carried on the said arm over which the web can be passed in order to maintain the initial line of fold imparted by the folding device.

3. In apparatus for the continuous production 15 of bags, packets, envelopes and like covers and wrappings from a single web, a folding device extending centrally across the web and having a length corresponding to the width of the flat tube to be formed from the web which engages 20 the unpasted portions only of the web and which in the direction of the web creases the web longitudinally as a preliminary step in the formation of a flat tube, pasting mechanism for applying adhesive to the web, the said pasting mechanism 25 comprising means for applying adhesive continuously to at least one longitudinal edge of the web and means for intermittently applying adhesive transversely to the web from opposite edges 30 of the web so as to leave an unpasted portion centrally of the web corresponding to the width of the folding device, folding rollers which are arranged to co-operate with the said folding device to complete the longitudinal folding of the web after it leaves said folding device, the arrangement being such that when the web is converted 35 into a flat tube there is no folding plate or like means inside the tube, and severing mechanism for severing the flat tube with a straight line cut, substantially as and for the purpose 40 described.

4. In apparatus for the continuous production of bags, packets, envelopes and like covers and wrappings from webs, pasting mechanism for applying adhesive transversely to that side of 45 the web corresponding to the inner surface of the bag or the like, a folding device which in the direction of the web creases the web longitudinally as a preliminary step in the formation of a flat tube, folding rollers which are arranged to 50 co-operate with the said folding device to complete the longitudinal folding of the web after it leaves said folding device, the arrangement being such that when the web is converted into a flat tube there is no folding plate or like means inside 55 the tube, a pivotally mounted arm disposed between the folding device and the folding rollers, rollers carried on the said arm over which the web can be passed in order to maintain the initial line of fold imparted by the folding device, and 60 severing mechanism for severing the flat tube with a straight line cut.

5. In apparatus for the continuous production of bags, packets, envelopes and like covers and wrappings from webs, pasting mechanism for applying adhesive transversely to that side of the 65 web corresponding to the inner surface of the bag or the like, a folding device which in the direction of the web creases the web longitudinally as a preliminary step in the formation of a 70 flat tube, folding rollers which are arranged to co-operate with the said folding device to complete the longitudinal folding of the web after it leaves said folding device, the arrangement being such that when the web is converted into a 75

flat tube there is no folding plate or like means inside the tube, a pivotally mounted arm disposed between the folding device and the folding rollers, rollers carried on the said arm over which the web can be passed in order to maintain the initial line of fold imparted by the folding device, severing mechanism for severing the flat tube with a straight line cut, forwarding mechanism for the severed blanks, and pasting and folding apparatus for again pasting and folding the already glued bottom of the bag.

6. In apparatus for the continuous production of bags, packets, envelopes and like covers and wrappings from webs, pasting mechanism for applying adhesive transversely to that side of the web corresponding to the inner surface of the bag or the like, a folding device which in the direction of the web creases the web longitudinally as a preliminary step in the formation of a flat tube, folding rollers which are arranged to co-operate with the said folding device to complete the longitudinal folding of the web after it leaves said folding device, the arrangement being such that when the web is converted into a flat tube there is no folding plate or like means inside the tube, a pivotally mounted arm disposed between the folding device and the folding rollers, rollers carried on the said arm over which the web can be passed in order to maintain the initial line of fold imparted by the folding device, severing mechanism for severing the flat tube with a straight line cut, forwarding mechanism for the severed blanks, pasting and folding apparatus for again pasting and folding the already glued bottom of the bag, draw rolls for feeding the web to the pasting mechanism and delivering mechanism for delivering the finished bags.

7. In apparatus for the continuous production of bags, packets, envelopes and like covers and wrappings from webs, pasting mechanism for applying adhesive transversely and longitudinally to that side of the web corresponding to the inner surface of the bag or the like, a folding device which in the direction of the web creases the web longitudinally as a preliminary step in the formation of a flat tube, folding rollers which are arranged to co-operate with the said folding device to complete the longitudinal folding of the web after it leaves said folding device, the arrangement being such that when the web is converted into a flat tube there is no folding plate or like means inside the tube, a pivotally mounted arm disposed between the folding device and the folding rollers, and rollers carried on the said arm over which the web can be passed in order to maintain the initial line of fold imparted by the folding device.

8. In apparatus for the continuous production of bags, packets, envelopes and like covers and wrappings from a single web, pasting mechanism for applying adhesive transversely and longitudinally to that side of the web corresponding to the inner surface of the bag or the like, a folding device which engages the unpasted portions only of the web and which in the direction of the web creases the web longitudinally as a preliminary step in the formation of a flat tube, folding rollers which are arranged to co-operate with the folding device to complete the longitudinal folding of the web after it leaves said folding device, the arrangement being such that when the web is converted into a flat tube there is no folding plate or like means inside the tube, a pivotally mounted arm disposed between the folding device and the folding rollers, rollers carried

on the said arm over which the web can be passed in order to maintain the initial line of fold imparted by the folding device, and severing mechanism for severing the flat tube with a straight line cut.

9. In apparatus for the continuous production of bags, packets, envelopes and like covers and wrappings from webs, pasting mechanism for applying adhesive transversely and longitudinally to that side of the web corresponding to the inner surface of the bag or the like, a folding device which in the direction of the web creases the web longitudinally as a preliminary step in the formation of a flat tube, folding rollers which are arranged to co-operate with the said folding device to complete the longitudinal folding of the web after it leaves said folding device, the arrangement being such that when the web is converted into a flat tube there is no folding plate or like means inside the tube, a pivotally mounted arm disposed between the folding device and the folding rollers, rollers carried on the said arm over which the web can be passed in order to maintain the initial line of fold imparted by the folding device, severing mechanism for severing the flat tube with a straight line cut, forwarding mechanism for the severed blanks, and pasting and folding apparatus for again pasting and folding the already glued bottom of the bag.

10. In apparatus for the continuous production of bags, packets, envelopes and like covers and wrappings from webs, pasting mechanism for applying adhesive transversely and longitudinally to that side of the web corresponding to the inner surface of the bag or the like, a folding device which in the direction of the web, creases the web longitudinally as a preliminary step in the formation of a flat tube, folding rollers which are arranged to co-operate with the said folding device to complete the longitudinal folding of the web after it leaves said folding device, the arrangement being such that when the web is converted into a flat tube there is no folding plate or like means inside the tube, a pivotally mounted arm disposed between the folding device and the folding rollers, rollers carried on the said arm over which the web can be passed in order to maintain the initial line of fold imparted by the folding device, severing mechanism for severing the flat tube with a straight line cut, forwarding mechanism for the severed blanks, pasting and folding apparatus for again pasting and folding the already glued bottom of the bag, draw rolls for feeding the web to the pasting mechanism and delivering mechanism for delivering the finished bags.

11. In apparatus for the continuous production of bags, packets, envelopes and like covers and wrappings from a single web, a folding device extending centrally across the web and having a length corresponding to the width of the flat tube to be formed from the web which engages the unpasted portions only of the web and which in the direction of the web creases the web longitudinally as a preliminary step in the formation of a flat tube, pasting mechanism for applying adhesive to that side of the web corresponding to the inner surface of the bag or the like, the said pasting mechanism comprising means for applying adhesive continuously to at least one longitudinal edge of the web and means for intermittently applying adhesive transversely to the web from opposite edges of the web so as to leave an unpasted portion centrally of the web corresponding to the width of the folding device, and folding rollers

which are arranged to co-operate with the said folding device to complete the longitudinal folding of the web after it leaves said folding device, the arrangement being such that when the web is converted into a flat tube there is no folding plate or like means inside the tube, substantially as and for the purpose described.

12. In apparatus for the continuous production of bags, packets, envelopes and like covers and wrappings from a single web, a folding device extending centrally across the web and having a length corresponding to the width of the flat tube to be formed from the web which engages the unpasted portions only of the web and which in the direction of the web creases the web longitudinally as a preliminary step in the formation of a flat tube, pasting mechanism for applying adhesive to that side of the web corresponding to the inner surface of the bag or the like, the

said pasting mechanism comprising means for applying adhesive continuously to at least one longitudinal edge of the web and means for intermittently applying adhesive transversely to the web from opposite edges of the web so as to leave an unpasted portion centrally of the web corresponding to the width of the folding device, folding rollers which are arranged to co-operate with the said folding device to complete the longitudinal folding of the web after it leaves said folding device, the arrangement being such that when the web is converted into a flat tube there is no folding plate or like means inside the tube and severing mechanism for severing the flat tube with a straight line cut, substantially as and for the purpose described.

TOM SARGENT.
GORDON WILLIAM FRENCH.