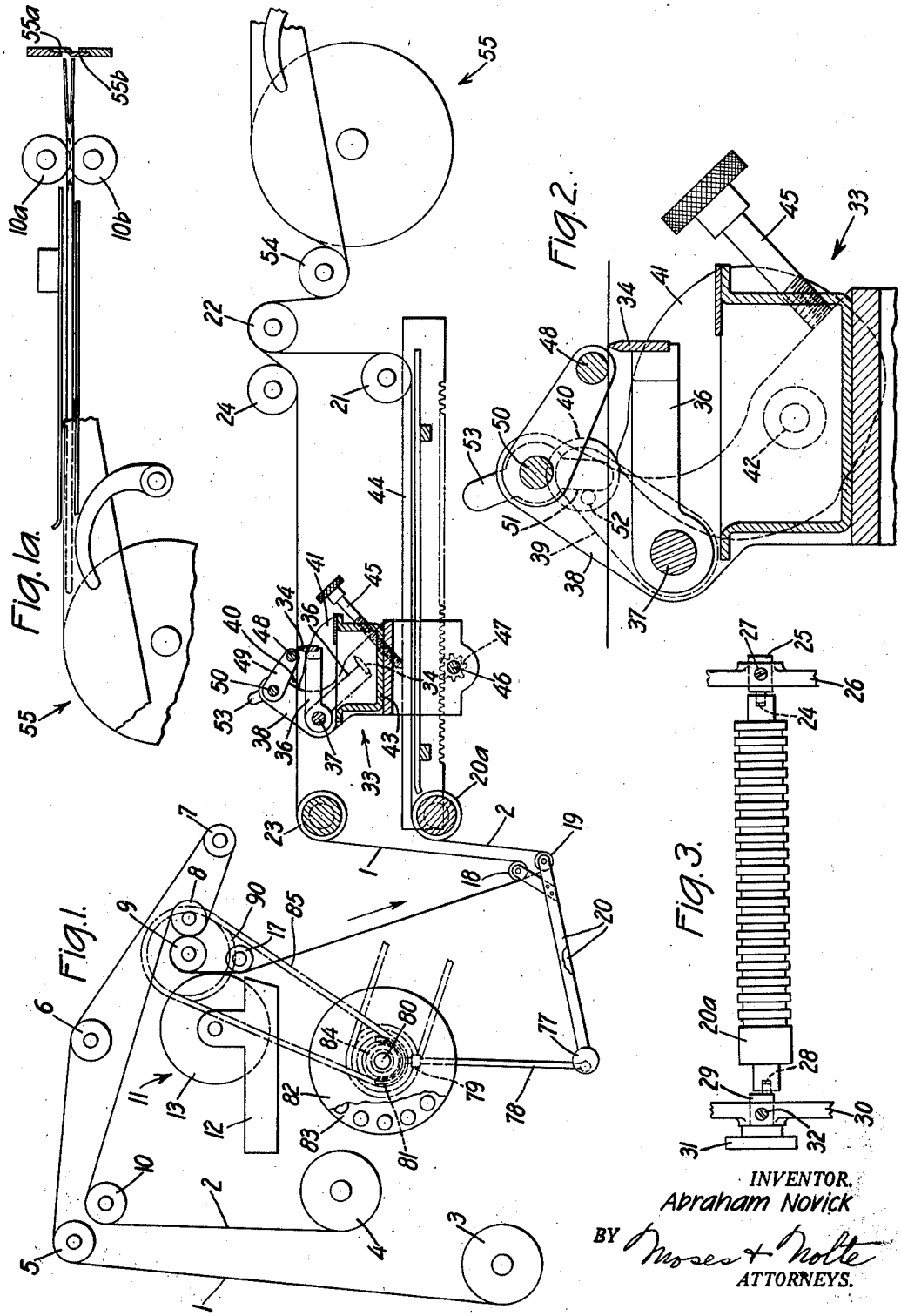
Feb. 21, 1939. A. NOVICK 2,147,856

BAG MANUFACTURE

Filed May 28, 1935 3 Sheets-Sheet 1



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BAG MANUFACTURE

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Fig. 4.

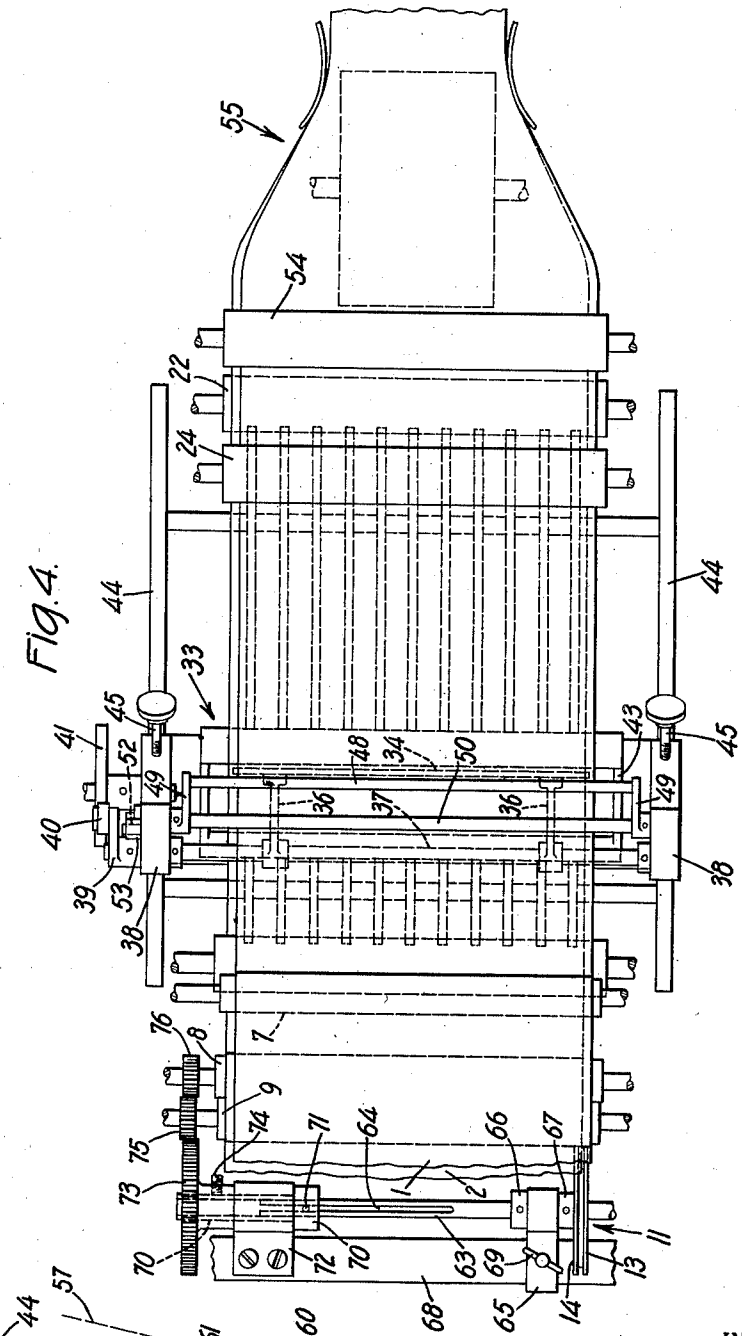
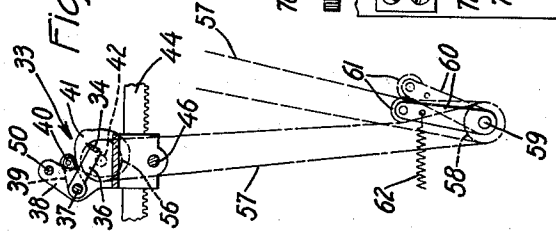


Fig. 4a.



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Fig. 5.

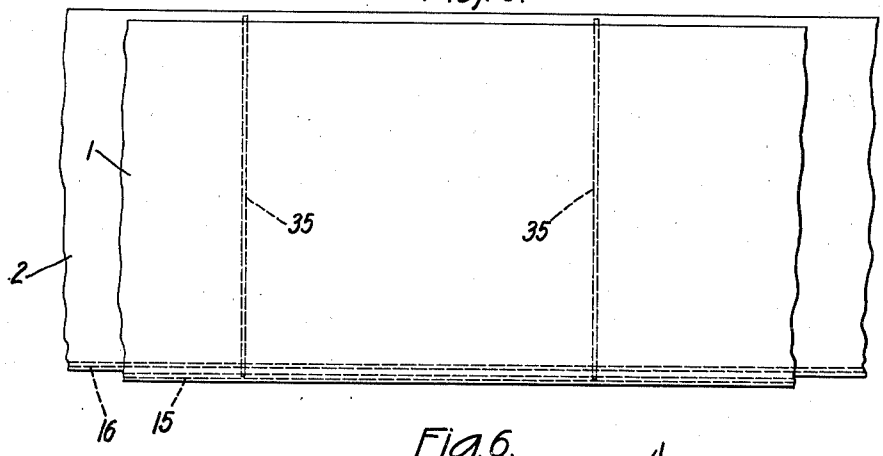


Fig. 6.

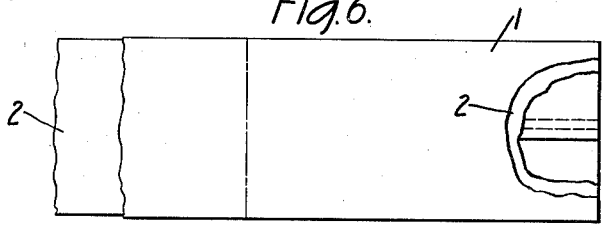


Fig. 7.

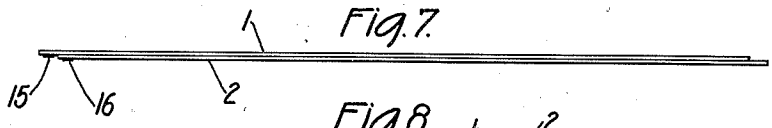


Fig. 8.

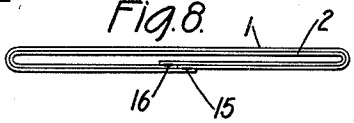
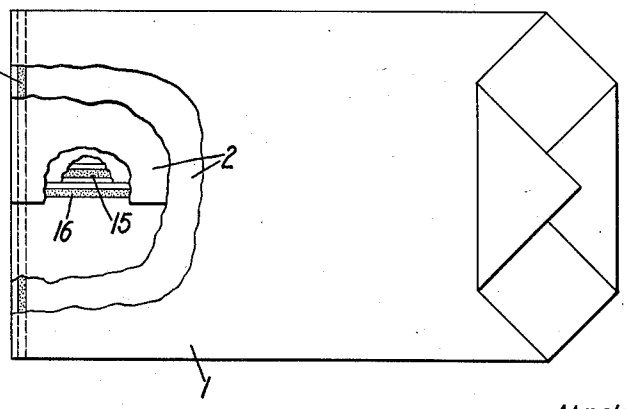


Fig. 9.



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Patented Feb. 21, 1939 2,147,856

UNITED STATES PATENT OFFICE

2,147,856

BAG MANUFACTURE

Abraham Novick, Flushing, N. Y., assignor to F. L. Smithe Machine Co., Inc., New York, N. Y., a corporation of New York

Application May 28, 1935, Serial No. 23,846

10 Claims. (Cl. 93—8)

This invention relates to bag manufacture and has for its primary object to provide mechanism for manufacturing lined or plural ply bags from continuous webs of sheet material.

It is a feature of the invention that provision is made for feeding webs into superposed but laterally displaced relation and of means for simultaneously gumming corresponding margins of both webs at a single operation preparatory to folding the webs longitudinally into tubular form.

It is a further feature of the invention that provision is made for feeding the webs in separated relation together with means for cross gumming a side of one of the webs which faces the other web, and means for guiding the webs into juxtaposition to cause the webs to be united.

It is a further feature of the invention that the cross gumming means may be adjusted longitudinally of the path of web travel and relative to the web severing means so as to cause the adhesive union between the webs to occur in the finished bags adjacent the mouths thereof.

It is a further feature that provision is made of feeding means for drawing the webs from the source of web supply in advance of the tube forming mechanism, and of common means under the control of the webs for regulating such feeding.

A further feature of the invention has to do with means for preventing lateral creep of the webs so as to assure correct alignment of the webs with one another and with the operating instrumentalities.

Features of novelty reside in the method of making bags, and in the mechanism for carrying out the method.

Other objects and advantages will hereinafter appear.

In the drawings forming part of this specification,

Fig. 1 is a fragmentary, sectional view in side elevation, illustrating a portion of a bag making machine embodying features of the invention;

Fig. 1*a* is a small, diagrammatic view showing the web severing means;

Fig. 2 is a detail sectional view in side elevation illustrating particularly the transverse gumming means employed;

Fig. 3 is a fragmentary view in front elevation of one of the web guiding rollers;

Fig. 4 is a fragmentary plan view illustrating substantially the same portion of the machine shown in Fig. 1;

Fig. 4*a* is a detail, sectional view illustrating features of the gumming bar drive;

Fig. 5 is a fragmentary, plan view showing the two superposed webs after they have been gummed longitudinally and transversely, but before they have been folded into tubular form;

Fig. 6 shows the webs of Fig. 5 folded into tubular form;

Fig. 7 is an end view of the webs of Fig. 5;

Fig. 8 is an end view of the folded tube of Fig. 6; and

Fig. 9 is a plan view, partly broken away, showing the finished bag.

Webs 1 and 2 of paper, "cellophane" or other suitable bag making material are supplied from reels 3 and 4. The web 1 travels around rollers, 5, 6 and 7 and thence between feed rollers 8 and 9. This web supplies the material for the outer walls of the finished bags. The web 2 travels around a roller 10 and roller 8 and thence between the rollers 8 and 9, the two webs coming into juxtaposed relation as they approach the bight of the rollers 8 and 9. The webs are not led into exact register but are so disposed that the web 1 has its left hand margin, as shown in Fig. 7, extending beyond the left hand margin of the web 2, and the web 2 has its right hand margin disposed to extend beyond the right hand margin of the web 1.

The juxtaposed webs are drawn forward by other feeding mechanism including rollers 10*a* and 10*b* and travel past a gumming disc 11 which runs in a gum pot 12. The gumming disc 11 has spaced flanges 13 and 14, Fig. 4, for engaging the margins of the respective webs to apply longitudinal gum stripes 15 and 16 to them. After gumming, the webs travel over a guide roller 17 and thence respectively around rollers 18 and 19 carried by floating arms 20. The rollers 9 and 17 guide the web to engage a narrow arc of the gumming disc 11, but do not exert positive pressure against the disc.

The floating arms 20 form part of a clutch controlling mechanism for regulating the operation of the feed rollers 8 and 9. This feature, as well as the mounting and the drive of the gumming disc 11, will be described more fully at a subsequent point. The floating arm performs the further function of causing the webs to bear against the gumming disc with substantially uniform, predetermined pressure.

From the roller 19 web 2 travels over a ribbed roller 20*a* and thence around a roller 21 to a roller 22. The web 1 takes a different path and travels over a ribbed roller 23 and a guide roller 24 to the roller 22, being again brought into juxtaposed relation to the web 2 while passing around the last mentioned roller.

It is important that the rollers **20***a* and **23** feed the webs in a true path. To this end provision is made for adjustably mounting said rollers. The mounting of roller **20***a* illustrated in Fig. 3 is the same as the mounting of the roller **23**, and a description of it is applicable to the mounting of roller **23** as well. The roller **20***a* has axial sockets in its end. One of these sockets receives a stub shaft **24** carried by a block **25** which is fixedly secured to a stationary frame member **26** as by a screw **27**. The other socket of the roller **20***a* is journalled upon a stub shaft **28** which is eccentrically carried by a shaft **29** journalled in a stationary frame member **30**. The shaft **29** is provided with a hand wheel **31** for turning it and may be fixed in adjusted position by means of a set screw **32**. Rotation of the hand wheel **31** is effective to change the angular disposition of the axis of the roller **20***a* and hence to alter the direction in which the roller tends to guide the web.

Provision is made of a cross gumming device **33** for acting upon the inner face of the web **1** between the rollers **23** and **24**. This device comprises an oscillating gumming bar **34** which applies a cross stripe **35** of gum to the web **1** at regular intervals. The gumming bar **34** is carried by crank arms **36** fast upon a transverse shaft **37**. The shaft **37** is journalled in a frame **38** and also has fast upon it a crank arm **39** which carries a cam follower **40**. The cam follower engages a cam **41** fast on a shaft **42** which is journalled in the frame **38**. Rotation of the cam **41** causes the gumming bar **34** to swing down into a gum pot **43** carried by the frame **38** and up into momentary contact with the lower face of the web, the operation being continuous.

The frame **38** is adjustably mounted upon a pair of stationary rack bars **44** which extend in the direction of web travel. The purpose of the adjustment is to enable the gum stripe to be applied at a greater or less distance from the point at which the severing of the individual blanks subsequently occurs. The machine is designed to make bags of different lengths as desired, and the adjustment of the cross gummer makes it possible to locate the gum stripe always at a point which will be near the mouth of the finished bag.

The frame **38** is locked in adjusted positions by means of set screws **45** which are threaded through it and into engagement with the upper faces of the stationary racks **44**. Adjustment is effected when the screws **45** are loosened, by means of a cross shaft **46** carried by the frame **38**. The shaft **46** may be rotated by a handle, not shown, and has fast upon it pinions **47** which mesh with the racks **44**.

Provision is made of a cross rod **48** for engaging the upper side of the web **1** adjacent the point at which the gumming bar **34** engages the lower side of the web. The rod **48** yieldingly opposes upward movement of the web in response to pressure exerted by the gumming bar, and thereby causes the gum to be properly applied to the web. The rod **48** is carried by crank arms **49** fast upon a shaft **50** which is freely journalled in the frame **38**. The bar is urged downward by gravity and is limited in its downward movement by engagement of a stop arm **51** fast upon the shaft **50** with a stop pin **52** fixed upon the frame **38**. The rod **48** may be swung upward and out of the way when desired and is arrested and held stationary by engagement of a stop arm **53** fast on the shaft **50** with the stop pin **52**.

As the webs **1** and **2** are again brought into juxtaposition in passing around the roller **22**, the gum stripe **35** on the web **1** is pressed against the web **2**, causing an adhesive union to be formed between the webs. The webs then pass together around a guide roller **54**, and thence to the tube folding and severing instrumentalities **55** which are shown only fragmentarily because they are of known construction. The instrumentalities for completing the manufacture of the superposed webs into finished bags may be of the same construction as that illustrated in my pending application Serial #734,977 filed July 13, 1934 for Bag making machines. These instrumentalities include the rollers **10***a* and **10***b* for drawing the webs forward, means for folding them so that their margins overlap, knives **55***a* and **55***b* for severing the duplex tube thus formed into individual bag blanks, and means for forming the bottoms of the bags.

The cam shaft **42** has a sprocket **56** fast upon it, Fig. 4*a*, which is driven by a chain **57** from a sprocket **58** mounted upon a drive shaft **59**. The sprocket **58** is located below and substantially midway of the path of adjustment of the cross gumming device **33**. Provision is made of a take-up device for the chain to prevent the occurrence of slack. The take-up device comprises an arm **60** loosely journalled on the shaft **59**, an idler sprocket **61** carried by the arm, and a spring **62** connected to the arm and to a stationary frame part for drawing the idler sprocket **61** against the chain.

The construction of the finished bag will be best understood from an examination of Figs. 5 to 9. When the superposed webs are folded from the condition of Fig. 7 into that of Fig. 8, two tubes are formed one within the other. A bag length is severed at a point closely adjacent the cross gum stripe **35** so that in the finished bag the upper margins of the two blanks are secured to one another. This avoids the liability of accidentally loading the filling material into the space between the inner and outer plies of the bag. It also increases the strength and reduces the flexibility of the mouth portion of the bag. The mouth of the bag is less likely to be torn and this is particularly true where the bag is made of a material like Cellophane which can hardly be torn at all so long as the edge remains intact but which affords practically no resistance to tearing once a rip or slit is started. If either ply has a slight rip or slit in it it is protected and guarded against tearing by its union with the other ply.

The machine is adapted to be used for making bags of different lengths and of different widths. In the part of the machines with which the present application is concerned the only adjustment for length which is required is the adjustment of the cross gummer which has been already described.

Provision is made for adjusting the longitudinal gumming discs **11** for different widths of tubes employed. The discs **11** are fixed upon a shaft **63** which has a longitudinal slot **64** formed therein. A bracket **65** embraces the shaft and forms a journal for the shaft. The bracket is received between collars **66** and **67** fast on the shaft. The bracket **65** also embraces a frame member **68** which extends parallel to the shaft. A set screw **69** threaded through the bracket may be turned into binding engagement with the frame member **68** to lock the shaft in adjusted position. The slotted end of the shaft **63** extends into a sleeve **70** which is provided internally with a driving pin **71** for driving the shaft **63** from the sleeve **70**. The sleeve **70** is journalled in a bracket

72 fast on frame member 68 and is engaged at one side by a shoulder of the sleeve 70. A driving gear 73 has a hub portion secured to the sleeve 70 by means of a set screw 74. The gear 73 meshes with a gear 75 fast on the shaft of feed roller 9 and the gear 75 in turn meshes with a gear 76 fast on the shaft of feed roller 8, the gear ratios preferably being such that the gumming disc 11 is driven at the same peripheral speed as the feed rollers 8 and 9.

The mechanism controlled by the floating arms 20 for operating the feed rollers 8 and 9 is the same as the corresponding mechanism disclosed in my application Serial #734,977 referred to above. Briefly this mechanism comprises a shaft 77 to which the arm 20 is fixed. The shaft 77 has an upwardly extending thrust rod 78 eccentrically connected to it. The rod 78 engages in a socket formed in one arm of a bell crank 79. The bell crank is mounted on a horizontal pivot disposed at right angles to a drive shaft 80. One arm of the bell crank extends upward and is bifurcated to form a clutch shifting fork 81. The fork shifts one clutch member 82 toward and from the other clutch member 83 of a friction clutch. When the clutch members 82 and 83 are in coacting relation the shaft 80 acts through the clutch and a sprocket 84 which is fast on one of the clutch members to drive a chain 85, which chain in turn drives a sprocket 90 fast upon the shaft of feed roller 9. The rollers 8 and 9, when set into operation, advance the webs a little more rapidly than the webs are drawn forward and consumed by the subsequent operating instrumentalities. As a consequence the arms 20 gradually descend, causing the rod 78 to be thrust upward and to release the clutch. When the rollers 8 and 9 are thus retarded or stopped the arm 20 is drawn upward by the consumption of the webs and the clutch is again made effective.

I have described what I believe to be the best embodiments of my invention. I do not wish, however, to be confined to the embodiments shown, but what I desire to cover by Letters Patent is set forth in the appended claims.

I claim:

1. In a machine for making plural ply bags, in combination, means for feeding a plurality of webs into juxtaposed but laterally staggered relation, and means for simultaneously gumming corresponding margins of the webs, means for securing said gumming means in different adjusted positions laterally of the machine, and means for driving the gumming means in all adjusted positions thereof.

2. In a machine for making plural ply bags, in combination, means for advancing a plurality of webs in spaced relation, mechanism for applying a gum stripe transversely to a face of one of the webs, and means for thereafter leading the webs into juxtaposed relation with the gum stripe disposed between them, said transverse gumming mechanism comprising means for causing the gum to be applied periodically and being adjustable longitudinally of the path of the web to control the location on the web at which the gum is applied.

3. In a machine for making plural ply bags, in combination, means for advancing a plurality of webs in spaced relation, mechanism for applying a gum stripe transversely to a face of one of the webs, and means for thereafter leading the webs into juxtaposed relation with the gum stripe disposed between them, said transverse gumming mechanism comprising an oscillating gumming bar, a cam for operating the bar, means for rotating the cam, and means for adjusting the bar and cam in unison longitudinally of the path of the web to which the gum is applied.

4. In a machine for making plural ply bags, in combination, means for advancing a plurality of webs in spaced relation, mechanism for applying a gum stripe transversely to a face of one of the webs, and means for thereafter leading the webs into juxtaposed relation with the gum stripe disposed between them, said transverse gumming mechanism comprising an oscillating gumming bar, a cam for operating the bar, means for rotating the cam and means for adjusting the bar and cam in unison longitudinally of the path of the web to which the gum is applied, and driving means for the cam including a driving train automatically maintaining an operative connection to the cam in all adjusted positions thereof.

5. In a machine of the kind described, in combination, web feeding means, means comprising a reciprocating gumming bar for transversely gumming the web at intervals, means for supporting and guiding the web at a plurality of points at opposite sides of the point of gum application but at points remote therefrom so that the web bridges the gap between said supporting means and intersects the path of the gumming bar near one of the limits thereof, and a yielding pressure bar for engaging the web at the opposite side from the gumming bar adjacent the point of gum application but slightly out of line therewith.

6. In a machine of the kind described, in combination, web feeding means, means comprising a reciprocating gumming bar for transversely gumming the web at intervals, means for supporting and guiding the web at a plurality of points at opposite sides of the point of gum application but at points remote therefrom so that the web bridges the gap between said supporting means and intersects the path of the gumming bar near one of the limits thereof, and a yielding pressure bar for engaging the web at the opposite side from the gumming bar adjacent the point of gum application but slightly out of line therewith, said pressure bar being movable between effective and ineffective positions, and means for arresting it in said positions.

7. In a machine for making plural ply bags, in combination, means for feeding a plurality of webs into juxtaposed but laterally staggered relation, and means for simultaneously gumming corresponding margins of the webs and comprising two telescoping members, a disc secured to one of said members and means for constantly rotating the other of said telescoping members.

8. A mechanism of the class described, comprising the elements combined and cooperating as set forth in claim 7 and further characterized by said disc having a plurality of spaced apart peripheral flanges and means for securing the disc in adjusted position laterally of the machine with its flanges in engagement with the margins of the webs.

9. In a machine for making plural ply bags, in combination, means for advancing a plurality of webs in spaced relation, mechanism for applying a gum stripe transversely to a face of one of the webs, and means for thereafter leading the webs into juxtaposed relation with the gum stripe disposed between them, said trans-

verse gumming mechanism comprising a frame adjustable in the direction of advancement of the webs, means for securing said frame in an adjusted position, a gumming member movably mounted on said frame, means for applying gum to said gumming member and power driven means for causing said gumming member to periodically engage the face of said one web irrespective of the position of adjustment of said frame.

10. In a machine of the class described, in combination, web feeding means, spaced apart guide rollers for supporting and guiding the web at a plurality of points, a transverse gumming member, power driven means for causing said gumming member to repeatedly cross the path of travel of the web between said guide rollers and means for raising or lowering one side of the web at its region of contact with said gumming member and comprising a fixed bearing for one end of one of said guide rollers, an adjustable bearing for the other end thereof and means for adjustably supporting said adjustable bearing.

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