Oct. 6, 1970 P. G. FRANKE 3,532,582

SLEEVEMAKING APPARATUS AND METHOD

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Fig. 1

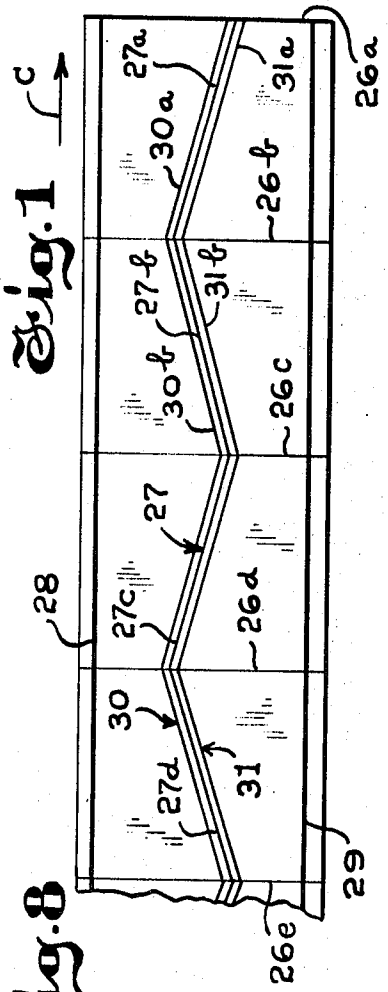


Fig. 2

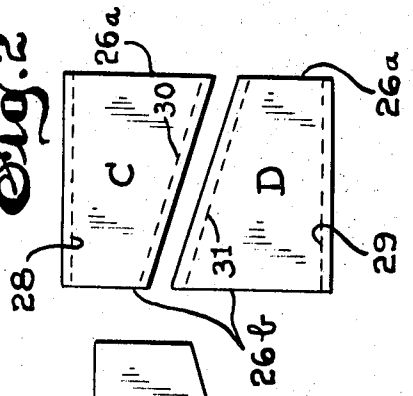


Fig. 3

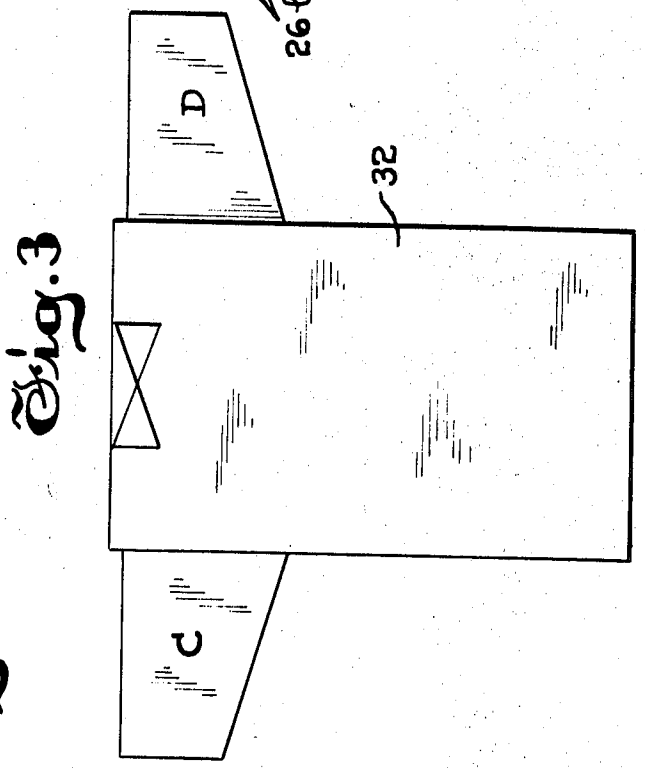


Fig. 8

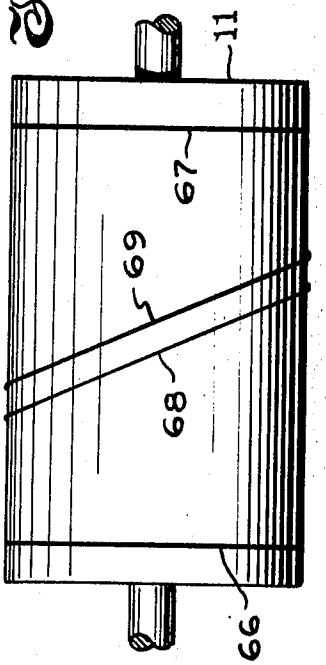
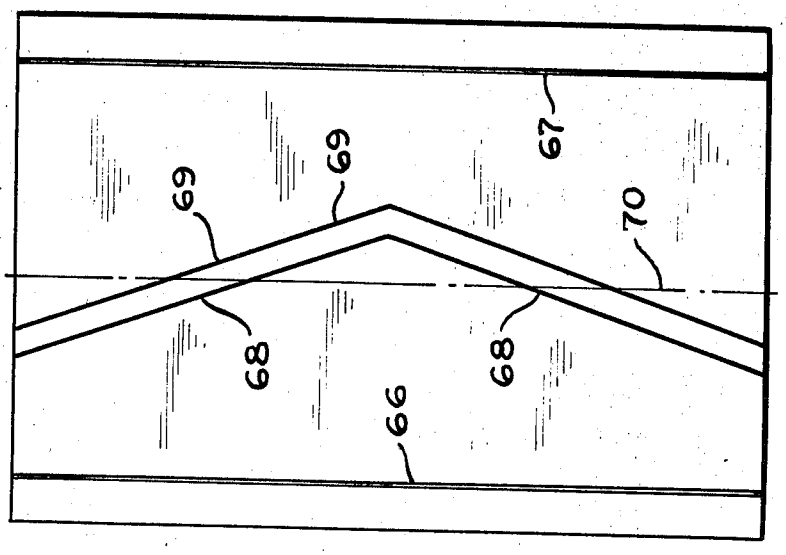


Fig. 9



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SLEEVEMAKING APPARATUS AND METHOD

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Fig. 4

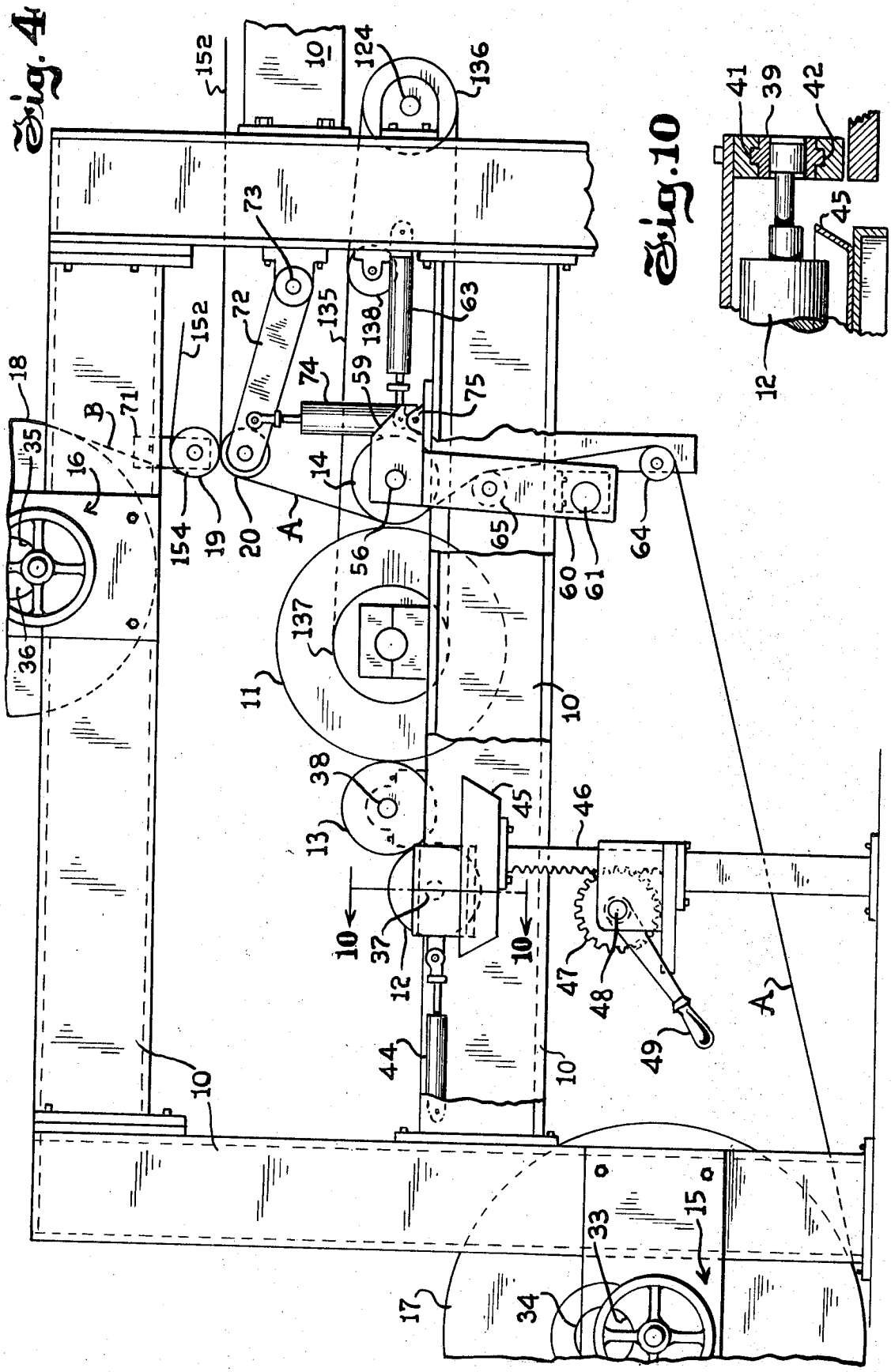


Fig. 10

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Fig. 5

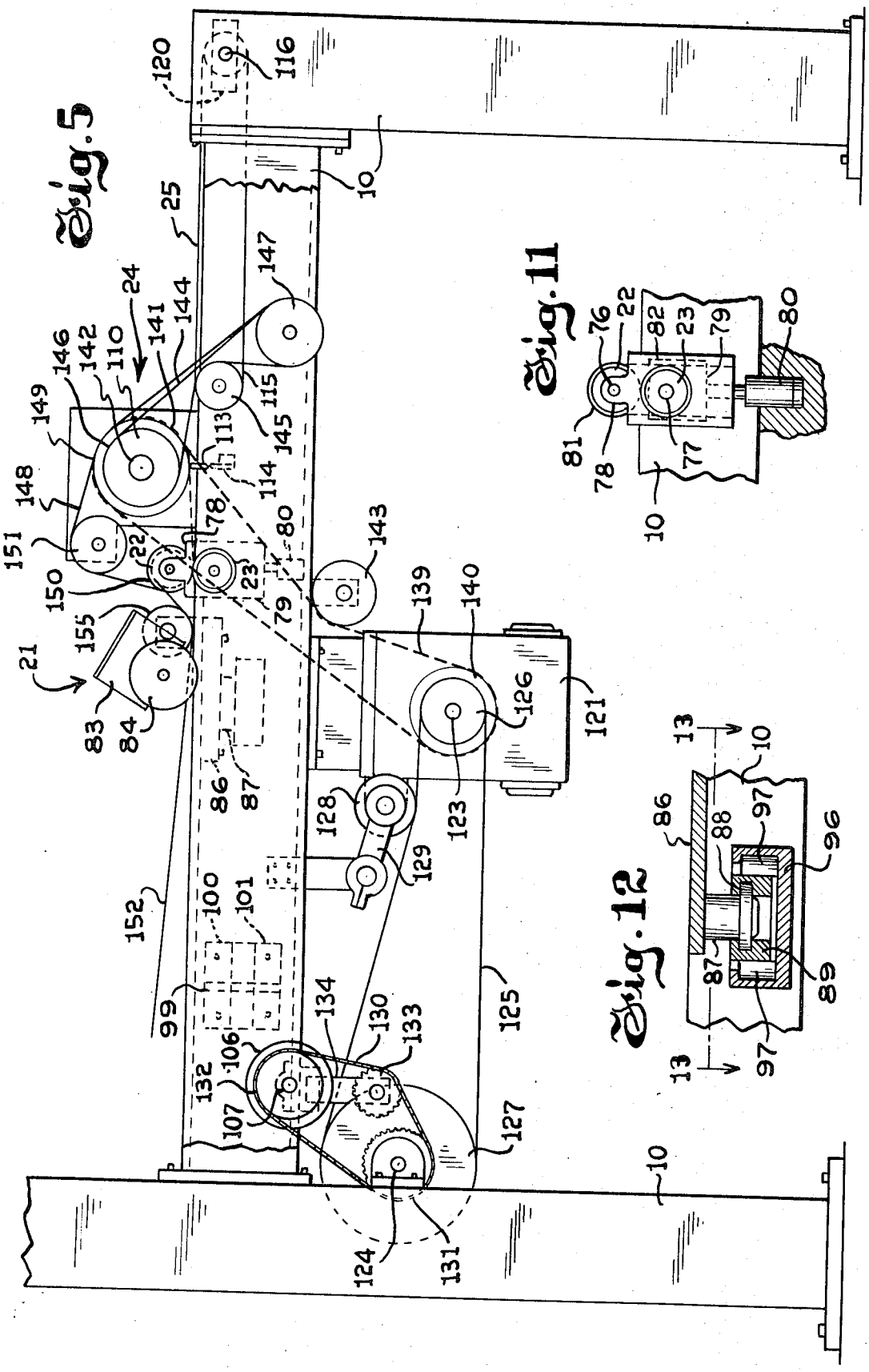


Fig. 11

Fig. 12

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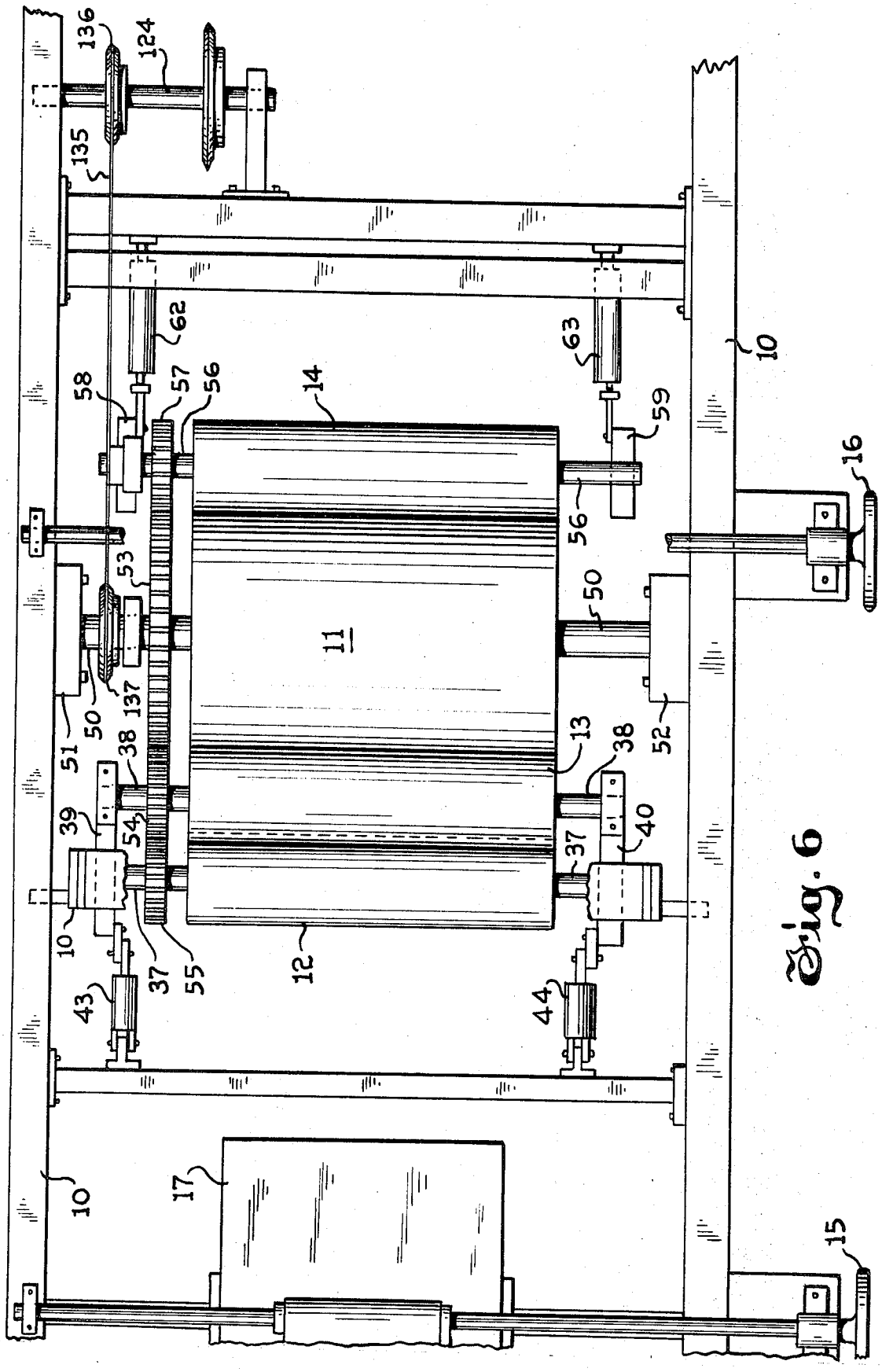


Fig. 6

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Fig. 7

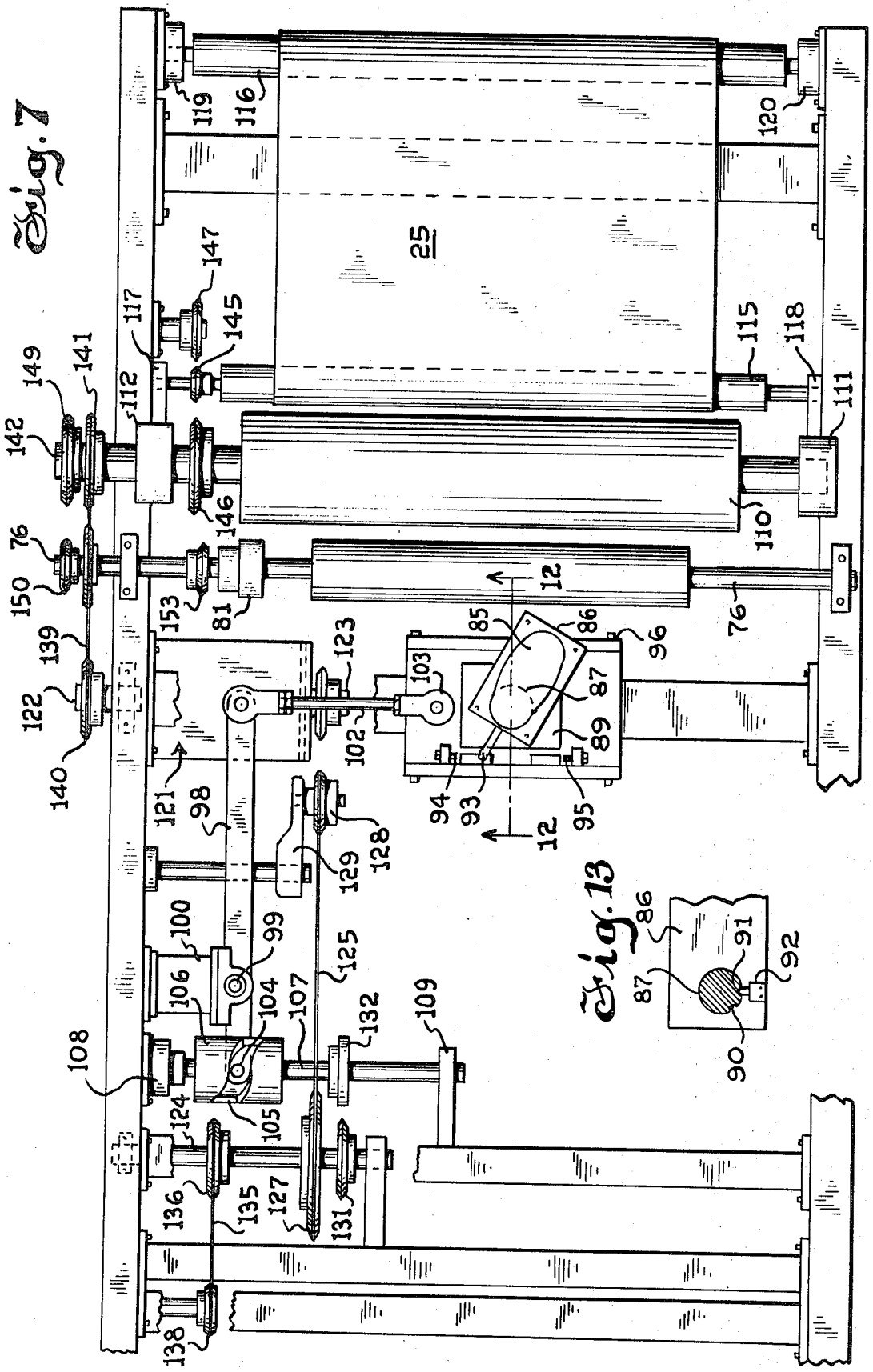


Fig. 13

United States Patent Office 3,532,582 Patented Oct. 6, 1970

3,532,582

SLEEVEMAKING APPARATUS AND METHOD

Paul G. Franke, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis., a corporation of Delaware

Filed Dec. 27, 1966, Ser. No. 605,050
Int. Cl. B32b 31/18; A41d 27/10
U.S. Cl. 156—516 3 Claims

ABSTRACT OF THE DISCLOSURE

An apparatus for making garment sleeves C and D out of sheet material, including a glue print roll **11** for printing two side lines **28** and **29** and two intermediate zig-zag lines **30** and **31** of adhesive on a web A, a pair of rolls **19** and **20** for pressing the web B to glue it to the web A using these glue lines, a transversely reciprocating rotary cutter wheel **84** for cutting the composite web A–B or zig-zag lines **27***a*, **27***b*, etc., between the zig-zag glue lines **30** and **31**, and a cutter **24** for transversely cutting the composite web A–B at places at the ends of the reciprocations of the cutter wheel **84**.

BACKGROUND OF THE INVENTION

The invention relates to an apparatus and method for making sleeves for garments out of webs of sheet material.

It has previously been proposed in a patent application of Marion A. McCurry, Ser. No. 536,739, filed Mar. 23, 1966, and now abandoned to provide a gown made up of front and rear panels of sheet material glued together along their top and side edges. A pair of sleeves, also made up of sheet material, are glued into the garment between the front and rear panels at the side edges, and each of these sleeves is composed of two pieces of sheet material glued together along the edges. These latter pieces of sheet material are each in the form of a trapezoid having parallel end edges of unequal length with the largest end being that end which is glued between the front and rear panels at the side edges of these panels.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an improved apparatus, machine and method for automatically making such sleeves without it being necessary to perform any manual steps or operations prior to removing the completed sleeves from the apparatus.

A preferred form of the apparatus comprises a glue print roll which has raised glue applying strips on its periphery, a pair of the strips extending circumferentially around the roll adjacent its ends and a pair of other strips being intermediately located and being in zig-zag form extending back and forth toward the opposite ends of the roll, mechanism for applying glue onto these strips, a backup roll having a nip with the glue print roll and particularly with the outer surfaces of these strips so that a web of sheet material may be passed between the glue print roll and the backup roll for applying glue in a pattern on the web, a pair of press rolls for pressing another web of sheet material onto the web which has been printed by the glue print roll, a motor driven cutter wheel which is reciprocated back and forth so as to cut between the zig-zag glue lines applied by the print roll as the web passes beneath the cutter wheel, and a knife assembly for cutting the composite web transversely along lines which coincide with the ends of the reciprocations of the cutter wheel.

The invention consists of the novel constructions, arrangements, devices and methods for carrying out the above stated objects, and such other objects, as will be

apparent from the following description of a preferred form of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a pair of webs of sheet material which have been glued together along certain glue lines and which have been cut along certain cut lines by the apparatus of the invention in order to form garment sleeves of sheet material;

FIG. 2 is a plan view of a pair of sleeves;

FIG. 3 is a plan view of a gown utilizing such a pair of sleeves;

FIG. 4 is a side elevational view of the forepart of a machine for making the sleeves;

FIG. 5 is a side elevational view of the terminal end of the machine;

FIG. 6 is a plan view of the forepart of the machine, corresponding to FIG. 4;

FIG. 7 is a plan view of the terminal end of the machine, corresponding to FIG. 5;

FIG. 8 is a plan view of a glue print roll incorporated in the machine;

FIG. 9 is a developed view of the periphery of the glue print roll;

FIG. 10 is a sectional view taken on line **10—10** of FIG. 4;

FIG. 11 is a side elevational view of a pair of pull rolls incorporated in the machine;

FIG. 12 is a sectional view taken on line **12—12** of FIG. 7; and

FIG. 13 is a sectional view taken on line **13—13** of FIG. 12.

Like reference characters designate like parts in the several views.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, the illustrated sleevemaking machine may be seen to comprise, in general, a frame **10**, a glue print roll **11** for printing an outline of adhesive onto a web A, a glue pickup roll **12**, a glue transfer roll **13** having a nip with both the roll **12** and the roll **11** for transferring glue from the roll **12** to the roll **11**, a backup or press roll **14** having a nip with the roll **11** for pressing the paper web A onto the roll **11**, supports **15** and **16** for rolls **17** and **18** of webs A and B respectively, a pair of press rolls **19** and **20** for pressing the webs A and B together after a pattern of glue has been applied to the web A from the roll **11**, a slitter **21** that travels back and forth transversely across the webs A and B as they travel over the slitter and subsequent to glueing of the webs A and B together, a pair of pull rolls **22** and **23** operative on the composite web A–B after it has been slit by the slitter **21**, a knife assembly **24** for cutting the composite web A–B transversely, and a conveyor belt **25** from which the finished product may be removed.

The finished product, as it comes onto the conveyor belt **25**, is illustrated in FIG. 1 and comprises the web B disposed on the web A and having the side edges of the webs A and B in alignment. The composite web A–B is cut along transverse lines **26***a*, **26***b*, **26***c*, **26***d*, etc., which are produced by the knife assembly **24**; and the composite web is also cut along a zig-zag or serrated line **27** having slantwise extending components **27***a*, **27***b*, etc., which are produced by the oscillating slitter **21**. It will be noted that alternate component lines **27***a*, **27***c*, etc., extend slantwise in the same direction with respect to the longitudinal direction of the composite web A–B and that the alternate component lines **27***b*, **27***d*, etc., extend in the same slantwise direction, so that the com-

ponent lines 27*a*, 27*b*, 27*c*, 27*d*, etc., constitute a single connected serrated cut or slit line 27 of the composite web A–B. The composite web A–B is glued along lines 28 and 29 extending parallel with and adjacent to the side edges of the composite web, and the composite web is also glued along serrated or zig-zag lines 30 and 31. The lines 30 and 31, respectively, have component segments 30*a*, 30*b*, etc., and 31*a*, 31*b*, etc., which are parallel to and slightly spaced from the component cut lines 27*a*, 27*b*, etc.

The composite web A–B, after being cut as above-mentioned, form sleeves, such as the sleeves C and D illustrated in FIG. 2 provided by the composite material between cuts 26*a* and 26*b*. These sleeves are composed of portions of the web B laid on the web A, and sleeve C, for example, is glued along its longitudinal edges by glue lines 28 and 30. The sleeve D has the same shape as the sleeve C and its glued along its longitudinal edges by the glue lines 31 and 29. Due to the serrated shape of the cut lines 27*a*, 27*b*, etc., the individual sleeves, such as sleeves C and D, each has a large and a small end; and it will be apparent that the cut lines subsequent to the lines 26*b* and 27*a* produce sleeves identical with sleeves C and D which are illustrated in FIG. 2.

The sleeves are adapted to be used in a gown of the type illustrated in the co-pending application of Marion A. McCurry, Ser. No. 536,739, filed Mar. 23, 1966, for Cellulosic Product, and this application may be referred to for details of the gown. Very briefly, the gown comprises a pair of rectangular sheets 32 of sheet material glued together along the side edges and also glued partially along the top edges (see FIG. 3), and the wide ends of the sleeves C and D are glued between the sheets 32 at the side edges of the sheets 32.

Although the webs A and B and sheets 32 may be of any type of flexible sheet material, such as a fabric, for example, it is preferred that the webs and sheets shall preferably be made of relatively inexpensive material such as paper or creped wadding which has been strengthened by filaments or fibers provided in the wadding or by a sheet of such filaments which is bonded to the paper, so that the garment may be disposed of after one or a few wearings, without the necessity of laundering.

The support 15 for the roll 17 includes a pair of cradles 33 supported from the frame 10 for receiving the opposite ends of a coreshaft 34 for the roll 17. The support 16 for the roll 18 is similar to the support 15 and comprises a pair of cradles 35 for the coreshaft 36 of the roll 18.

The glue pickup roll 12 is fixed on a supporting shaft 37 and the glue transfer roll 13 fixed on a supporting shaft 38 are journaled by means of these shafts in side frames 39 and 40, and the side frames 39 and 40 are movably supported on the frame 10 by means of splines 41 slidably disposed in grooves 42 provided in portions of the frame 10. A pair of piston cylinder assemblies 43 and 44 are connected between the frame 10 and side frames 39 and 40 for the purpose of adjusting the clearance between the roll 13 and the roll 11. The rolls 12 and 13 are both rubber covered, and the rolls 12 and 13 have a nip between them for the purpose of metering adhesive from the roll 12 onto the roll 13.

A pan 45 for liquid adhesive is provided below the roll 12, and the roll 12 is adapted to be partially submerged in the liquid adhesive within the pan 45. The pan 45 is supported by means of racks 46 disposed on parts of the frame 10 in such a manner that the racks may have sliding vertical movement. Gears 47 fixed on a shaft 48 are in mesh with the racks 46, and a handle 49 is provided for moving the racks 46 vertically for thereby adjusting the height of the pan with respect to the glue pickup roll 12.

The roll 11 is disposed on a shaft 50 journaled in bearings 51 and 52 which are fixed to the frame 10 for supporting the roll 11.

The rolls 12 and 13 are driven from the roll 11 so that the latter rolls have peripheral speeds substantially the same as that of the roll 11. For this purpose, a gear 53 is fixed on the shaft 50 supporting the roll 11, and the gear 53 is in mesh with a gear 54 fixed on shaft 38 which in turn meshes with a gear 55 fixed on the shaft 37.

The backup roll 14 is also driven from the roll 11. The backup roll 14 is fixed on a shaft 56, and a gear 57 is fixed on the shaft 56 and is in mesh with the gear 53 for this purpose.

The shaft 56 is journaled in bearing blocks 58 and 59 which are fixed and supported by swing arms 60. The arms 60 are journaled on shafts 61 carried by opposite parts of the frame 10, and a pair of piston cylinder assemblies 62 and 63 are respectively connected with the bearing blocks 58 and 59 for the purpose of pulling the roll 14 out of a nipped relationship with respect to the roll 11 as desired.

The web A from the roll 17 travels through the nip between the rolls 11 and 14 and is directed into the nip by means of web guide idler rolls 64 and 65 which are rotatably supported in the frame 10. The web A, as it passes through the nip between the rolls 11 and 14, has liquid adhesive applied to it in a certain pattern, and this pattern is determined by strips of rubber-like material fixed onto the surface of the roll 11. Referring to FIGS. 8 and 9, the roll 11 may be seen to be provided with circumferentially extending endless strips 66 and 67 of rubber-like material on the periphery of the roll 11 adjacent its ends. The roll 11 is also provided with similar strips 68 and 69 which are spaced from each other and each of which extends toward one end of the roll 11 for half the roll circumference and extends toward the other end of the roll 11 for the other half of the circumference. The strips 68 and 69, on the average, have half of their lengths on one side of a central plane 70 and the other half is on the other side of the plane 70, so that there is as much area on the roll periphery on one side of the strip 69 as there is on the other side of the strip 68.

The web A passes from the nip between the rolls 11 and 14 to the nip between the press rolls 19 and 20, and the web B from the roll 18 also passes to the nip between the rolls 19 and 20, so that the two webs A and B are glued together as they pass between the latter rolls. The roll 19 is rotatably mounted between a pair of depending supports 71 fixed on the frame 10, and the roll 20 is rotatably mounted between a pair of swinging arms 72. The arms 72 are swung about studs 73 fixed to the frame 10, and a pair of piston cylinder assemblies 74 are fixed to the arms 72 and to brackets or supports 75 fixed to the frame 10 for the purpose of swinging the arms 72 and changing the vertical position of the roll 20.

The composite web A–B is drawn from the rolls 19 and 20 toward the terminal end of the machine by means of the pull rolls 22 and 23 which are respectively fixed on shafts 76 and 77 (see FIG. 11). The shaft 76 is rotatably mounted with respect to the frame 10 by pillow blocks 78, and the shaft 77 is mounted between a pair of vertically reciprocable bearing blocks 79 which are acted on by means of piston cylinder assemblies 80 so as to provide the desired pressure in the nip between the rolls 22 and 23. Gears 81 and 82 are respectively fixed on the shafts 76 and 77 and are in mesh for the purpose of synchronizing the speeds of the rolls 22 and 23.

The slitter 21 comprises an electric motor 83 driving a slitter wheel 84 which has a very sharp peripheral edge. The motor 83 is mounted on a base 85 which is received by and is mounted on a carriage 86 (see FIGS. 7 and 12). The carriage 86 is fixed on a downwardly depending shaft 87 which is rotatably disposed by means of a bearing 88 in a carriage 89. The shaft 87 is provided with a pair of detent depressions 90 and 91 in its surface (see FIG.

13), and a spring loaded plunger **92** mounted on the carriage **89** is adapted to enter into the depressions **91** for yieldably holding the carriage **86** in either of two rotative end positions. The carriage **86** is provided with an outwardly extending tang **93** adapted to contact either a stop **94** or a stop **95** as the carriages **86** and **89** are reciprocated, as will be described. The carriage **89** is reciprocably mounted in a fixed table **96** by means of rollers **97** (see FIG. 12).

Reciprocation of the carriages **86** and **89** is provided from a reciprocating lever **98** pivoted on a stud **99** that extends through supports **100** and **101** fixed with respect to the frame **10**. One end of the lever **98** is connected with the carriage **89** by means of a link **102** and a uniball connection **103**. The other end of the lever **98** has a cam follower roller **104** fixed to it, and the roller **104** is disposed in the slot **105** provided in a cam **106**. The slot **105** is of such a form that, as the cam **106** rotates, the follower roller **104** reciprocates causing a reciprocation of both ends of the lever **98** and thereby of the carriage **89**. The cam **106** is fixed on a cam shaft **107** that is rotatably disposed in bearings **108** and **109** which are fixed with respect to the frame **10**.

The knife assembly **24** comprises a knife roll **110** (see FIGS. 5 and 7) rotatably mounted in bearings **111** and **112** and carrying a radially extending knife blade **113** protruding from its periphery. A bed knife **114** is fixed with respect to the frame **10**, and the knife blade **113** is adapted to pass over and have shearing engagement with the bed knife **114** as the roll **110** is rotated.

The conveyor belt **25** is mounted on a pair of spaced rolls **115** and **116**. The roll **115** is rotatably mounted in pillow blocks **117** and **118**, and the roll **116** is rotatably mounted in pillow blocks **119** and **120**.

The various movable parts of the machine are driven from a motor transmission assembly **121** having a pair of opposite output shafts **122** and **123** (see FIGS. 5 and 7). A jack shaft **124** is driven directly from the output shaft **123** by means of a chain **125** passing over a sprocket **126** fixed on the shaft **123** and a sprockets **127** fixed on the shaft **124**. An idler sprocket **128** disposed on an arm **129** rests on the chain **125** for takeup purposes.

The cam shaft **107** is driven from the jack shaft **124** by means of a chain **130** which passes over a sprocket **131** fixed on the shaft **124** and over a sprocket **132** fixed on the shaft **107**. An idler **133** on an arm **134** rests on the chain **130** for takeup purposes. The glue print roll **11** is driven from the jack shaft **124** by means of the chain **135** that extends over a sprocket **136** fixed on the shaft **124** and over a sprocket **137** fixed on the shaft **50** carrying the roll **11**. A takeup idler sprocket **138** is provided for the chain **135**. As has been previously described, the backup roll **14** is driven from the roll **11** by means of the gears **53** and **57**; and the rolls **12** and **13** are driven from the roll **11** by means of gears **53**, **54** and **55**.

The knife roll **110** is driven from the output shaft **122** by means of a chain **139** passing over sprockets **140** and **141** fixed respectively on the shaft **122** and on a shaft **142** of the roll **110**. A takeup sprocket **143** is provided for taking up the slack in the chain **139**.

The conveyor belt **25** is driven by means of a chain **144** that passes over a sprocket **145** fixed on the roll **115** and over a sprocket **146** fixed on the shaft **142**. The chain **144** extends also over a takeup sprocket **147**, and it will be noted that the chain **144** is so disposed over the sprockets **145**, **146** and **147** that the exterior (rather than the interior) surface of the chain is in contact and passes over the sprocket **145**, this being for the purpose of giving the proper rotation to the roll **115** supporting the belt **25**.

The pull roll **22** is driven from the shaft **142** by means of a chain **148** that passes over a sprocket **149** fixed on the shaft **142** and a sprocket **150** fixed with respect to the roll **22**. An idler or takeup sprocket **151** is also provided for the chain **148**.

The press roll **19** is driven from the pull roll **22** by means of a chain **152** passing over a sprocket **153** fixed on the pull roll shaft **76** and passing over a sprocket **154** fixed with respect to the pull roll **19**. An idler sprocket **155** is provided for the chain **152**.

In operation, the nipped pull rolls **22** and **23**, the nipped press rolls **19** and **20**, and the nipped glue print roll **11** and backup roll **14** all have the web A or else the two webs A and B passing between them; and the webs A and B are thus pulled through the machine and are passed onto the conveyor belt **25**. The composite web A–B moves along with the belt **25** in the direction indicated by the arrow C in FIG. 1. The rolls **12** and **13** and the knife roll **110** are also driven, and the carriages **86** and **89** are reciprocated; and all of these roll rotations and carriage reciprocations are in timed relationship to each other, since there is a common prime mover (unit **121**) for all of these parts.

The web A is pulled off of its supply roll **17**, over guide rolls **64** and **65**, through the nip between the rolls **11** and **14** and between the rolls **19** and **20**, due to the driving of the rolls **11** and **14** and of the rolls **19** and **20**. The web A, as it passes between the rolls **11** and **14**, has liquid adhesive applied to it by the outermost surfaces of the strips **66**, **67**, **68** and **69**; and the web A is thus printed with adhesive in the pattern defined by the lines **28**, **29**, **30** and **31**. The circumferentially disposed strips **68** and **69** on the periphery of the roll **11** print the glue lines **28** and **29**, and the strips **68** and **69** on the periphery of the roll **11** print the zig-zag glue lines **30** and **31** on the web A, due to the zig-zag pattern of the strips **68** and **69** on the surface of the roll **11**.

Liquid adhesive is applied onto the exterior surfaces of the strips **66**, **67**, **68** and **69** from the glue transfer roll **13**, and the roll **13** is supplied with liquid adhesive from the glue pickup roll **12** which has its lowermost surface immersed in a body of liquid adhesive contained in the pan **45**. The roll **12** picks up glue from the pan **45**, and the nip between the rolls **12** and **13** assures that only a predetermined amount of glue is carried by the roll **13** as the roll **13** rotates and has engagement with the outermost surfaces of the strips **66** to **69**. The clearance between the rolls **11** and **13** may be adjusted by utilizing piston cylinder assemblies **43** and **44** for the purpose of changing the amount of glue applied onto the strips **66** to **69**, and the pressure on the web A in the nip between the rolls **11** and **14** may be changed by changing the adjustment of the piston cylinder assemblies **62** and **63**.

The two webs A and B are pressed together by the rolls **19** and **20** having a nip between them, and the webs A and B are thus glued together along the lines **28**, **29**, **30** and **31**; and the composite web A–B passes from the rolls **19** and **20** to the slitter **21**.

The carriages **86** and **89** of the slitter **21**, together with the motor **83** and slitter wheel **84**, are reciprocated from side to side as the composite web A–B passes beneath the slitter **21**. The reciprocations of these parts are caused by the reciprocating movement of the lever **98** having its follower roller **104** positioned within the cam slot **105** and acted on by the sides of the slot. The carriage **86** and the slitter wheel **84** are swung with respect to the carriage **89** every time the end of a reciprocation is reached, and this is due to the action of the stops **94** and **95** acting on the tang **93**. As the tang **93** hits the stop **94** at the end of a reciprocation, the carriage **86** is swung or rotated with respect to the carriage **89** within the bearing **88** so that the plane of the slitter wheel **84** extends in the direction of the cut line **27*b*** illustrated in FIG. 1, and at this particular time the carriages **86** and **89** start their reciprocating movement away from the stop **94** toward the stop **95**. The result is that the slitter wheel **84** extends in the same direction as the

cut line 27*b* and in the direction in which the center of the shaft **87** traverses the composite web A–B as the webs move and as the carriages **86** and **89** reciprocate. When the reciprocation of the carriages **86** and **89** is completed in the opposite direction, the tang **93** strikes the stop **95** and turns the carriage **86** and the wheel **84** to extend in the opposite direction, in the direction of the cut line 27*c*, so that in this case also the slitter wheel **84** extends in the same direction as the center line of the shaft **87** travels along the webs A and B.

It is important in this connection that the reciprocating movement of the carriages **86** and **89** be synchronized with the movement of the webs A and B and with the rotation of the roll **11**, and such synchronization is maintained due to the fact that a single prime mover, namely the unit **121**, is utilized for moving all of the moving parts of the machine. The synchronization between the roll **11** and the slitter wheel **84** in its reciprocation is such that the carriages **86** and **89** change direction and the tang **93** strikes the stop **94** or the stop **95** to swing the slitter **21** from one slantwise direction to the other slantwise direction when the apexes of the glue lines **30** and **31** at the intersections of the component glue lines (the lines **30***a* and **30***b* or the glue lines **31***a* and **31***b*, for example), pass beneath the slitter wheel **84**. The component lines of cut **27***a*, **27***b*, etc., are thus in the same zig-zag form as are the glue lines **30** and **31**, and the cut line **27** is intermediate the glue lines **30** and **31**; and the components of the lines **27**, **30** and **31** in alignment with each other transversely of the webs A and B, for example, the components **27***a*, **30***a* and **31***a*, are all adjacent and parallel to each other. Due to this swinging movement of the cutter wheel **84**, it does not tend to force the webs A and B either way transversely as the cuts **27***a*, **27***b*, etc., are made.

The composite web A–B passes from the slitter **21** to the knife assembly **24**, and each time the knife blade **113** carried by the roll **110** passes across the bed knife **114**, a transverse cut of the composite web A–B is made, the knife assembly **24** thus producing the spaced transverse cuts **26***a*, **26***b*, **26***c*, etc. The roll **110** is synchronized with the slitter **21** so that these transverse cuts are located in the composite web A–B at the places measured along the webs at which the ends of the reciprocations of the carriages **86** and **89** take place, at which the slitter wheel **84** is swung from one diagonal direction to the other by the action of the tang **93** on the stops **94** and **95**, and at which the apexes of the zig-zag lines **27**, **30** and **31** occur. The ends of the sleeves produced by the knives **113** and **114** are straight lines, since the knives **113** and **114** are straight; and the side edges of each of the sleeves are also defined by straight lines due to this synchronization between the slitter **21**, the roll **11** and the movements of the webs A and B. The sleeves C and D and all the other sleeves produced by the machine are thus identical, assuming that the slantwise extending cut lines **27***a*, **27***b*, **27***c*, etc., extend as far to one side as the longitudinal center of the composite web A–B as to the other, which is intended to be the case. The composite web A–B, as so cut into sleeves, passes onto the conveyor **25**, and the individual sleeves may be removed from this conveyor for subsequent glueing into place between pairs of rectangular sheets **32** for forming the completed gowns.

If it is desired, it will be apparent that the knife **113** may be removed or put out of action in order to form continuous lengths of serrated composite web A–B that may be wound into rolls. Such continuous lengths of composite web A–B may be subsequently cut transversely so as to form the individual sleeves, and such rolls may well be more easily handled in automatic apparatus for making the complete gowns.

The sleevemaking apparatus of the invention advantageously manufactures sleeves of sheet material at a high rate of speed and without manual assistance.

I claim:

1. In a machine for making sleeves of sheet material, an adhesive print roll having a pair of spaced raised circumferential strips extending around the periphery of the roll and located adjacent to the ends of the roll and having third and fourth zig-zag shaped strips extending around the roll periphery with the segments of said third and fourth strips extending parallel to each other, means for applying liquid adhesive onto the outer surfaces of said strips, a rotatably disposed backup roll having a nip with said raised strips on said print roll, a pair of press rolls, a first supply roll of web of the sheet material so positioned that the web may pass between said print roll and said backup roll to have lines of adhesive printed on the web, a second supply roll of the web material, said press rolls being so positioned as to receive the first web from between said print roll and said backup rolls and also to receive the second web from said second supply roll so that the two webs are glued together along the adhesive lines provided by said print roll, a pair of pull rolls for pulling the two webs through the machine from said press rolls, a slitter disposed in the path of travel of said two webs from said press rolls, means for reciprocating said slitter transversely of said webs, and means for drivingly rotating said print roll and said pull rolls and for reciprocating said slitter in timed relationship to each other so that said slitter slits the web intermediate the zig-zag adhesive lines provided by said zig-zag shaped strips.

2. In a machine for making sleeves of sheet material as set forth in claim **1**, said adhesive applying means including a glue pan for a body of liquid adhesive and a rotatable glue roll having the lower part of its periphery disposed in the body of adhesive, said slitter comprising a slitter wheel and means for drivingly rotating the slitter wheel, and means for swinging said slitter wheel back and forth as it reaches the ends of its reciprocations so that the slitter wheel is substantially aligned with the cut that it makes in the webs.

3. In a machine for making sleeves as set forth in claim **2** and including a cutter roll carrying a knife on its periphery and a stationary bed knife adapted to have shearing contact with the said first named knife as the cutter roll rotates; said cutter roll being positioned to transversely cut the two webs after they are slit; and means for driving said cutter roll in timed relationship with said print roll, said pull rolls and said slitter so that said knives tranversely sever the webs at lines that pass through the apexes of the glue lines and of the cut line produced by said slitter.

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