Nov. 22, 1949 W. S. RIDDLE 2,488,685

SPOT CEMENTING APPARATUS FOR LAMINATING MACHINES

Filed June 2, 1945 3 Sheets-Sheet 1

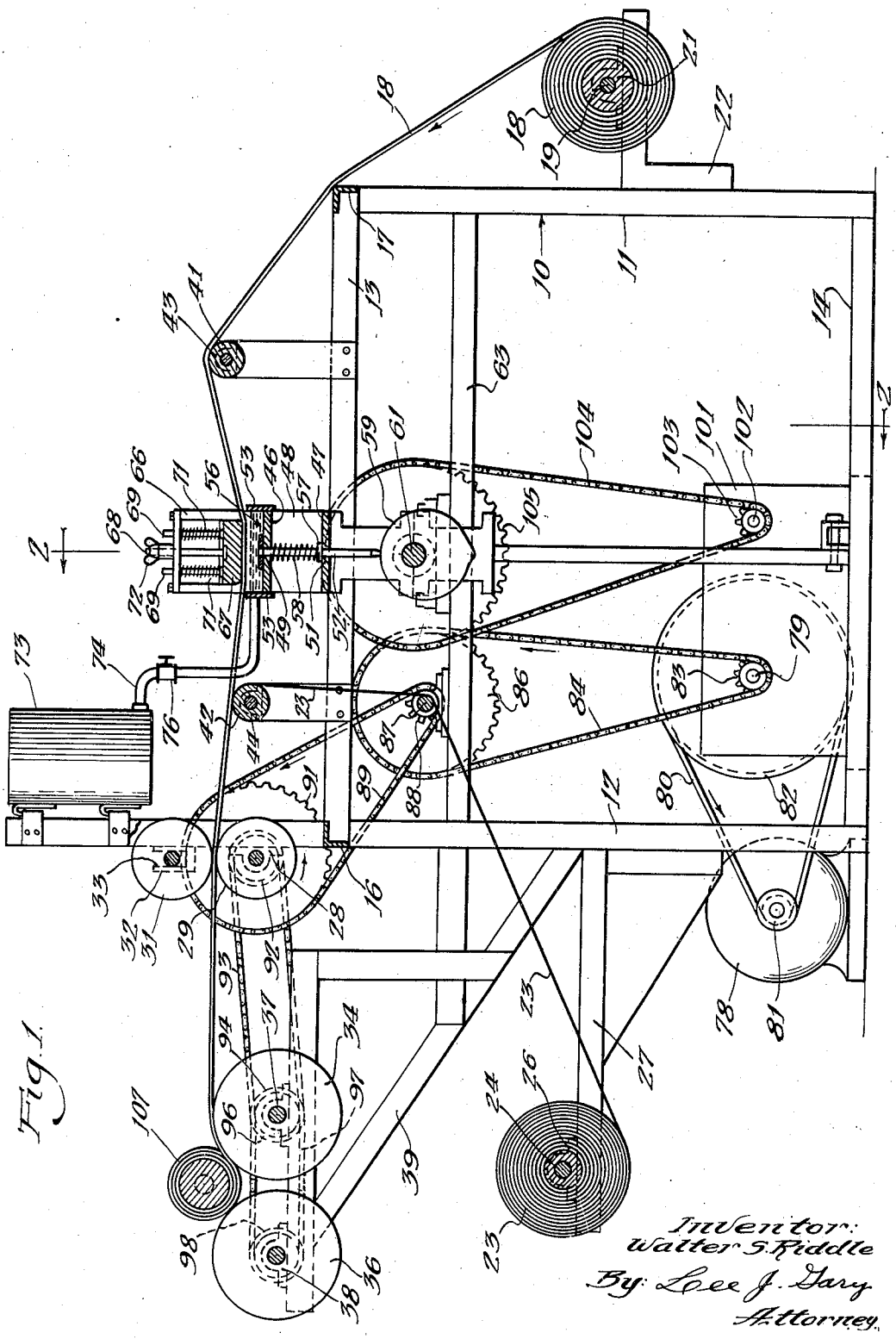


Fig. 1.

Inventor:
Walter S. Riddle
By: Lee J. Gary
Attorney

Nov. 22, 1949 W. S. RIDDLE 2,488,685

SPOT CEMENTING APPARATUS FOR LAMINATING MACHINES

Filed June 2, 1945 3 Sheets-Sheet 2

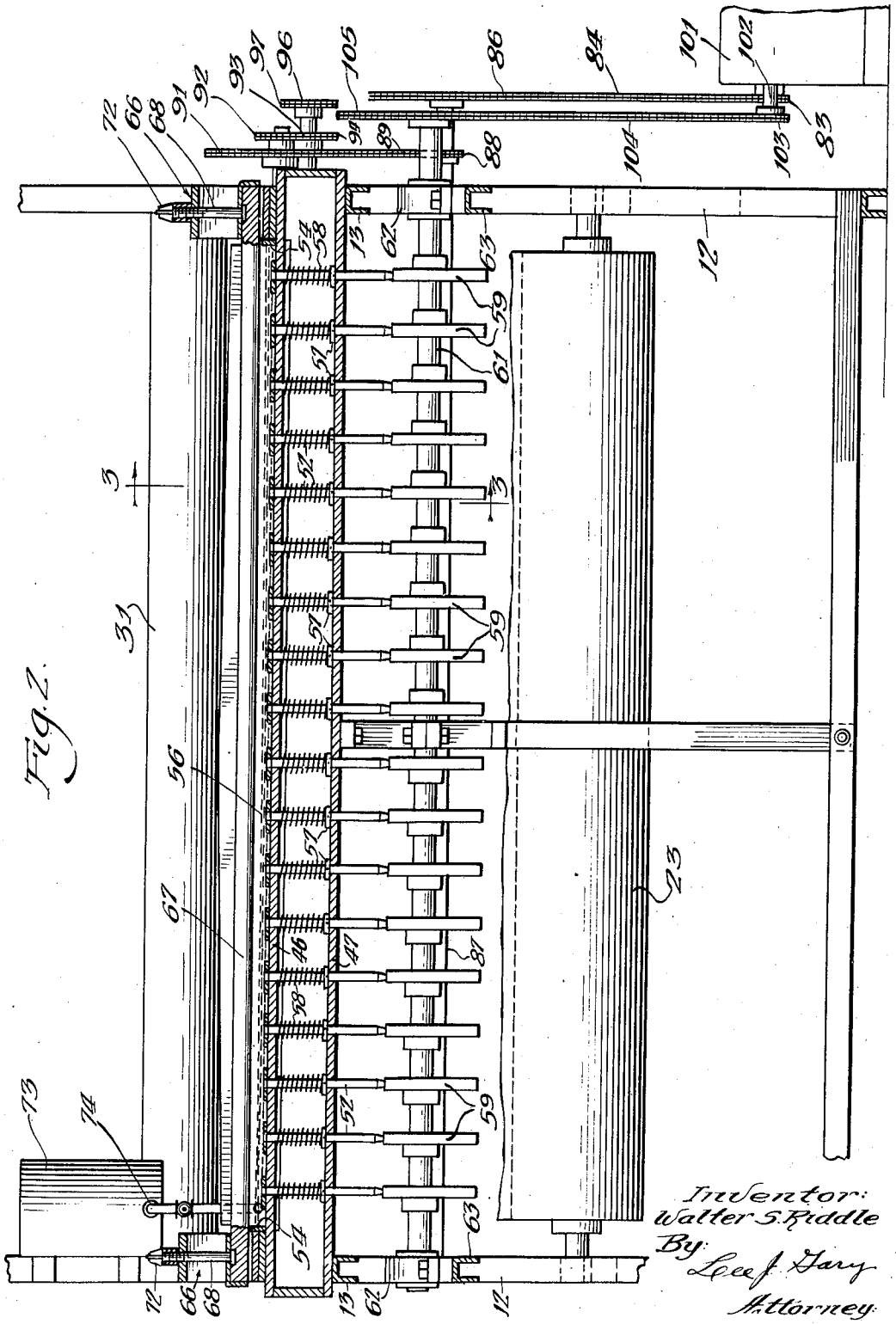


Fig. 2.

Inventor:
Walter S. Riddle
By: Leef Gary
Attorney

Nov. 22, 1949 W. S. RIDDLE 2,488,685

SPOT CEMENTING APPARATUS FOR LAMINATING MACHINES

Filed June 2, 1945 3 Sheets-Sheet 3

Fig. 3.

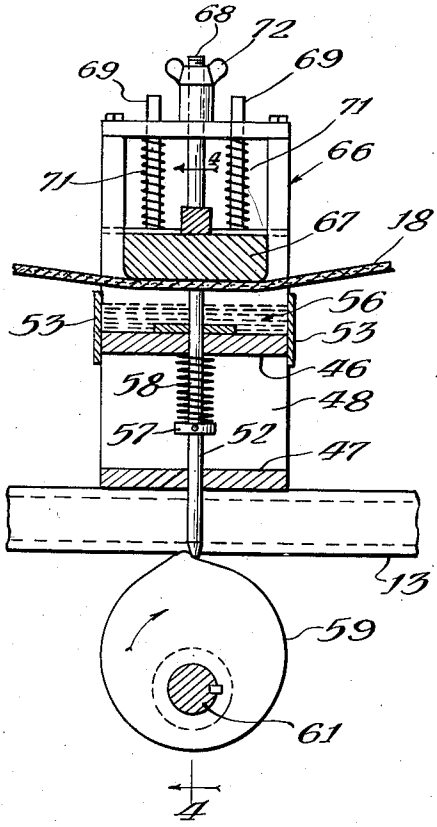


Fig. 4.

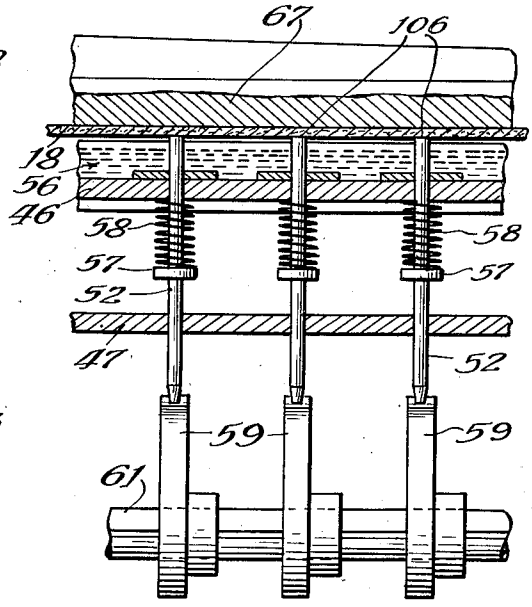
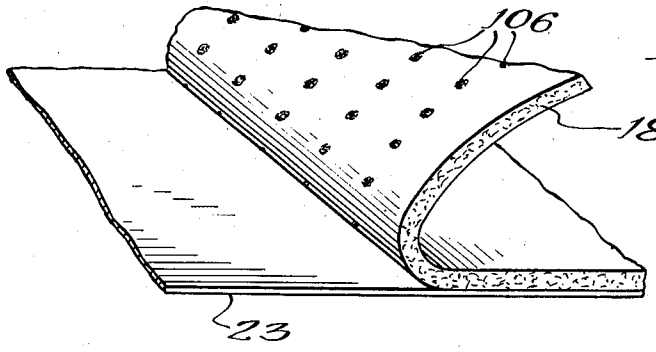


Fig. 5.



Inventor:
Walter S. Riddle
By: Lee J. Gary
Attorney

Patented Nov. 22, 1949

2,488,685

UNITED STATES PATENT OFFICE

2,488,685

SPOT CEMENTING APPARATUS FOR LAMINATING MACHINES

Walter S. Riddle, Chicago, Ill., assignor to Seaman Paper Company, Chicago, Ill., a corporation of Illinois

Application June 2, 1945, Serial No. 597,289

2 Claims. (Cl. 91—47)

1

This invention relates to a machine adapted for use in cementing two or more strips of fibrous material together to form a multi-ply strip. More particularly, this machine is adapted for use in forming multi-ply strips of cotton batting of the type commonly employed as an insulating material for use in automobiles, airplanes and the like.

The present invention contemplates the provision of a machine adapted to apply spots of adhesive in transverse rows across the surface of one strip of fibrous material, and then to bring the adhesive coated strip into tight engagement with another strip of material to form a multi-ply strip. The spots of adhesive material are preferably applied to the surface of one strip by means of reciprocable plungers arranged for vertical movement through a tank of adhesive fluid and then into spot contact with the surface of the strip to be coated. During the adhesive applying operation, the treated strip and an untreated strip are drawn into tight engagement with each other by means of a pair of feed rolls which determine the linear speed of the strips and also serve to compress same transversely to form a firm bonded connection between the two strips.

This invention embodies other novel features, details of construction and arrangement of parts which are hereinafter set forth in the specification and claims and illustrated in the accompanying drawings wherein:

Fig. 1 is a side elevational view, partly in section, showing a spot cementing machine embodying features of this invention.

Fig. 2 is a transverse sectional view taken along the line 2—2 of Fig. 1.

Fig. 3 is an enlarged sectional view taken along the line 3—3 of Fig. 2.

Fig. 4 is a sectional view taken along the line 4—4 of Fig. 3.

Fig. 5 is a fragmentary view illustrating two strips of material, one of which has spots of adhesive applied to one surface thereof for cementing the two strips together.

Referring now to the drawings for a better understanding of this invention, a spot cementing and laminating machine is shown as comprising a rectangular frame 10 formed of angle iron and having vertical members 11 and 12 connected together at their ends by means of longitudinal members 13 and 14 and transverse members 16 and 17. A roll of strip material to be spot cemented and laminated is supported on a mandrel 19 journaled in suitable side bearings 21. The

2

side bearings 21 are secured upon brackets 22 supported on vertical members 11 at one end of the frame 10.

A second roll of strip material 23 to be laminated is mounted on a mandrel 24 journaled in a pair of bearings 26 which in turn are secured to a pair of brackets 27 mounted on the vertically disposed frame members 12 at the opposite end of the frame 10 from the roll 18.

The vertical frame members 12 extend upwardly beyond the longitudinal frame members 13 to support a pair of bearings 28 provided to receive a driving feed roll 29. A companion feed roll 31 is mounted for vertical adjustment above the driving feed roll 29 by means of a pair of bearings 32 formed with vertically disposed guide slots 33. A pair of winding rolls 34 and 36 are journaled in bearings 37 and 38, respectively, supported in spaced relation upon a suitable angle iron framework 39 mounted on the vertical frame members 12.

A pair of guide rolls 41 and 42 are journaled in bearings 43 and 44, respectively, mounted on the longitudinal frame members 13. A pair of plates 46 and 47 extend transversely of the machine frame 10 and are supported upon longitudinal frame members 13. The plates 46 and 47 are secured in parallel spaced relation by means of end plates 48 and are provided with bearing apertures 49 and 51 to snugly receive a plurality of reciprocable plungers 52. A pair of side plates 53 and end plates 54 are secured on the transversely extending plate 46 to define therewith an adhesive supply tank 56. As more particularly illustrated in Fig. 2, the several plungers 52 are disposed in spaced relation transversely across the machine and are each provided with a stop shoulder 57 and a helical compression spring 58. The compression springs 58 are disposed between the plate 46 and the stop shoulders 57 to yieldably resist upward movement of the plungers 52. A plurality of cams 59 are secured to a cam shaft 61 to actuate their respective plungers 52, the cam shaft being journaled at its ends in suitable bearings 62 mounted on a pair of channel members 63 having their ends secured to the vertical frame members 11 and 12.

A pair of rectangular guide bearings 66 are supported upon opposite ends of the plate 46 to receive the ends of a guide and abutment bar 67 which is supported for vertical movement within the guide bearings by means of bolts 68 and guide rods 69. The inner ends of the bolts 68 and guide rods 69 are secured to the abutment bar 67 and

have their outer ends projecting through apertures provided in the upper end of their respective guide bearings 66. A pair of helical compression springs 71 are mounted on the guide rods 69 to yieldably resist upward movement of the abutment bar 67. The outer end of the bolt 68 is threaded to receive a wing nut 72 which is employed to adjustably position the abutment bar 67 with respect to the plungers 52. An adhesive supply reservoir 73 is mounted upon the upper end of the vertical frame members 12 and provided with a conduit 74 leading to the adhesive tank 56 to supply liquid adhesive to the tank under control of a valve 76.

An electric motor 78 is employed to drive a gear box shaft 79 by means of a sprocket chain 80 and sprockets 81 and 82. A sprocket 83 is also secured to the gear box shaft 79 and acts through a sprocket chain 84 to drive a sprocket 86 secured on an intermediate shaft 87. Another sprocket 88 is secured on the intermediate shaft 87 to act through a sprocket chain 89 and sprocket 91 to drive the feed driving roller 29 in a counter-clockwise direction. A sprocket 92 is secured on the driving feed roller 29 to act through a sprocket chain 93 to drive a sprocket 94 secured to the winding roll 34. Another sprocket 96 is secured on the winding roll 34 to act through sprocket chain 97 to drive a sprocket 98 secured on the winding roll 36.

The driving shaft 79 is adapted to act through a plurality of gears, not shown, provided within the gear box 101 to drive a shaft 102. A sprocket 103 is secured to the shaft 102 to act through a sprocket chain 104 to drive a sprocket 105 secured on the cam shaft 61.

In the operation of the machine thus described, strip material 18 is adapted to pass over the guide roll 41, thence under the abutment bar 67 and over the guide roll 42 for engagement between the feed rolls 29 and 31. Strip material 23 is directed around the intermediate shaft 87 and upwardly around the guide roll 42 and thence between the feed rolls 29 and 31.

During the passage of the strip material 18 under the abutment bar 67, the cams 59 act to move their respective plungers 52 upwardly for spot contact engagement with the under side of the strip material. As the upper ends of the plungers 52 move upwardly through the liquid adhesive provided within the tank 56, a small amount of the adhesive is carried upon the top flat contact surfaces of the plungers and is applied to the under side of the strip material in the form of spots, as indicated at 106 in Fig. 5. As the strip material 18 moves along under the abutment bar 67, it will be seen that the plungers 52 act to apply spots of adhesive 106 in transverse rows to the under side of the strip. After the spots of adhesive material 106 have been applied to the under surface of the strip material 18, this treated strip is brought into engagement with the untreated strip material 23 to form a two-ply strip which passes between the feed rolls 29 and 31 and is formed into a roll 107 by means of the winding rolls 34 and 36.

While this invention has been shown in but one form, it is obvious to those skilled in the art that it is not so limited but is susceptible of various changes and modifications without departing from the spirit and scope of the claimed invention.

I claim as my invention:

1. In a machine for progressively spot coating a web, a trough-shaped tank adapted to receive a liquid adhesive and having apertures formed in its bottom, a guide plate disposed in spaced parallel relation below the bottom of said tank and formed with apertures in registry with said tank apertures, plungers mounted for vertical reciprocable movement through said tank apertures and guide plate apertures, a guide frame, an abutment bar disposed in spaced parallel relation above said tank and in vertical alignment with said plungers, said abutment bar being mounted for vertical reciprocable movement along said guide frame, said abutment bar being formed with a flat abutment face to engage the upper side of the web, compression springs to yieldably resist upward movement of said abutment bar during upward movement of said plungers, adjustable stop means to limit the downward movement of said abutment bar, and actuating means to reciprocate said plungers.

2. In a machine for progressively spot coating a web, a trough-shaped tank adapted to receive a liquid adhesive and having apertures formed in its bottom, a guide plate disposed in spaced parallel relation below the bottom of said tank and formed with apertures in registry with said tank apertures, plungers mounted for vertical reciprocable movement through said tank apertures and guide plate apertures, a guide frame, an abutment bar disposed in spaced parallel relation above said tank and in vertical alignment with said plungers, said abutment bar being mounted for vertical reciprocable movement along said guide frame, said abutment bar being formed with a flat abutment face to engage the upper side of the web, compression springs to yieldably resist upward movement of said abutment bar during upward movement of said plungers, adjustable stop means to limit the downward movement of said abutment bar, actuating means to reciprocate said plungers, said actuating means including a cam shaft, individual cams mounted on said cam shaft to engage the lower ends of their respective plungers, and compression springs to yieldably resist upward movement of their respective plungers.

WALTER S. RIDDLE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
425,544	Lake	Apr. 15, 1890
857,423	Trismen	June 18, 1907
1,005,486	Thoma	Oct. 10, 1911
1,019,494	Borde et al.	Mar. 5, 1912
1,312,567	Ordway	Aug. 12, 1919
1,935,031	Joslin	Nov. 14, 1933
2,029,922	Heckel et al.	Feb. 4, 1936
2,147,856	Novick	Feb. 21, 1939
2,236,968	Cunnington	Apr. 1, 1941

FOREIGN PATENTS

Number	Country	Date
163,909	Great Britain	June 2, 1921
50,275	Denmark	May 14, 1935