Feb. 18, 1941. E. W. PALMER ET AL 2,232,134

METHOD OF BINDING BOOKS

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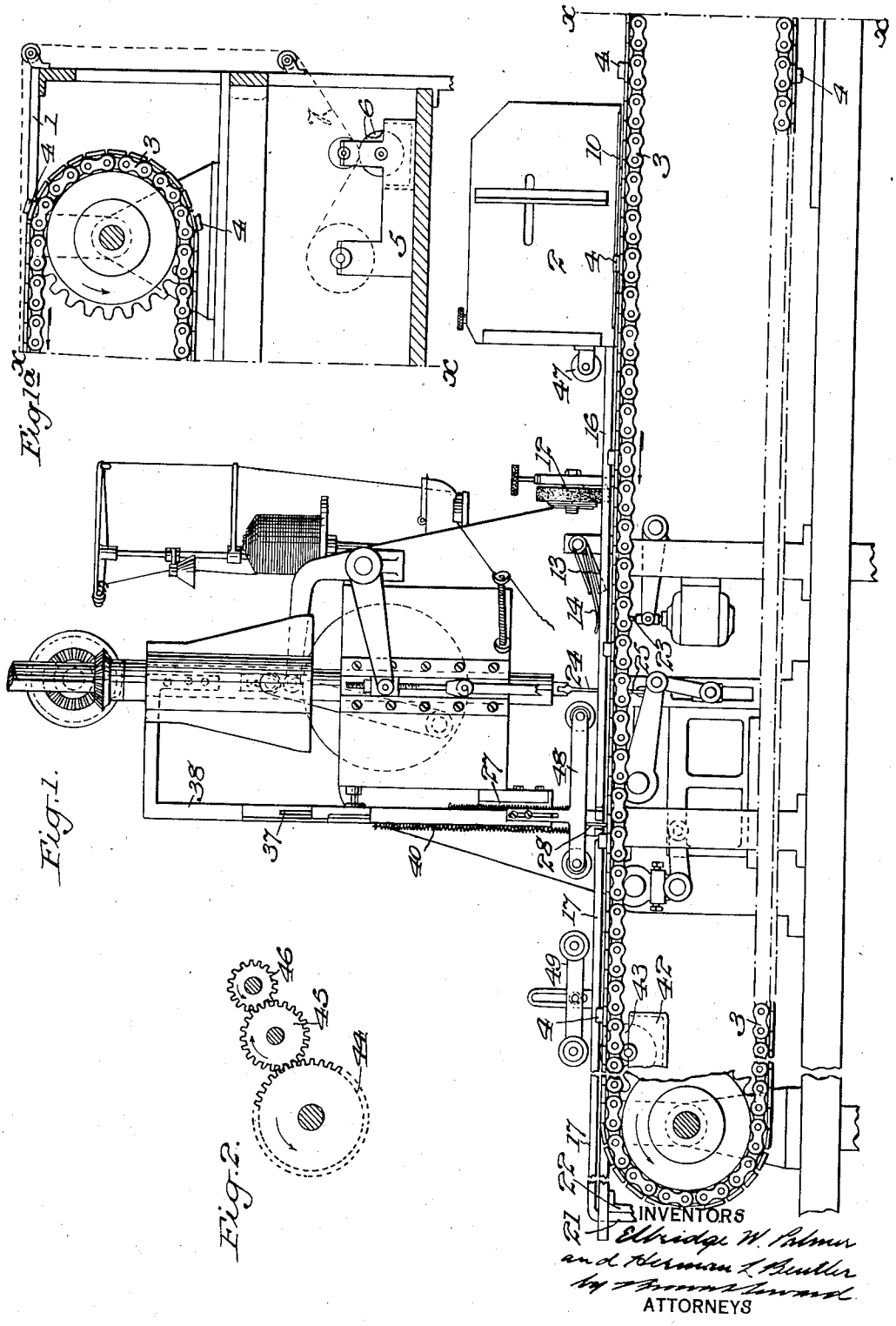


Fig. 1a.

Fig. 1.

Fig. 2.

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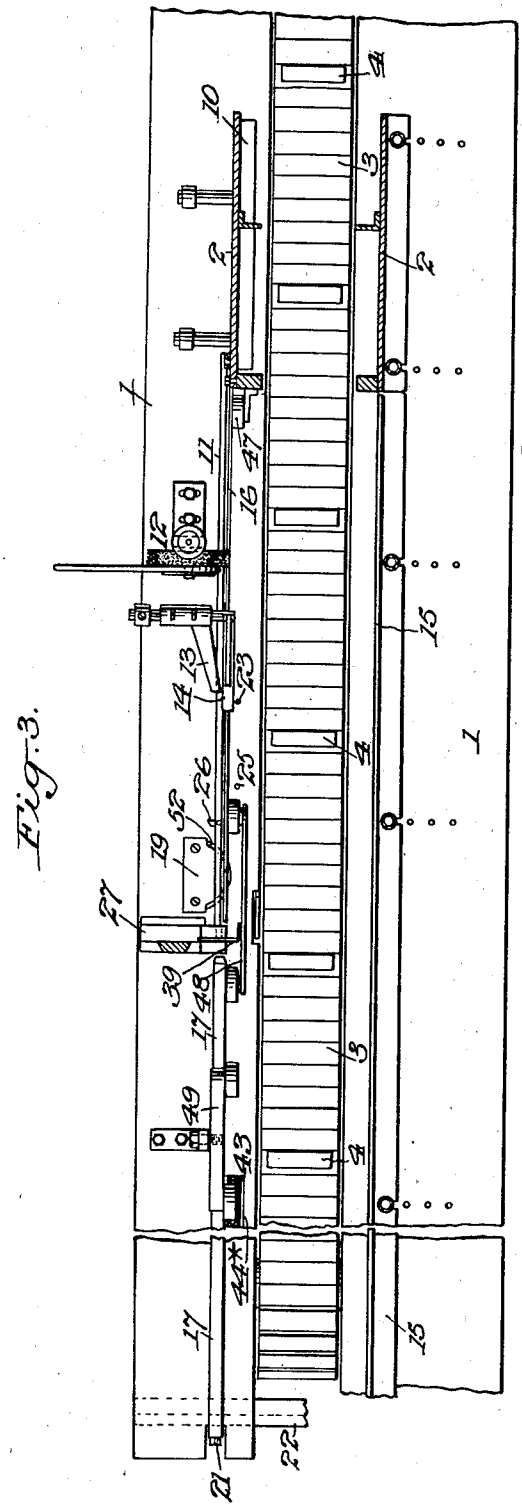


Fig. 3.

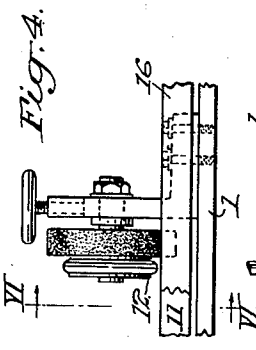


Fig. 4.

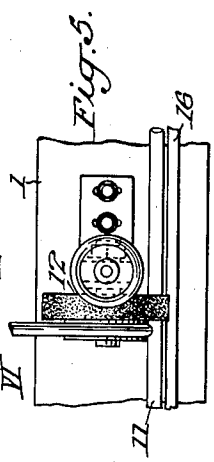


Fig. 5.

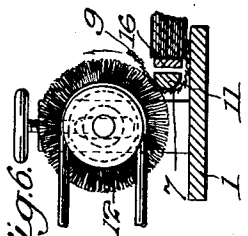


Fig. 6.

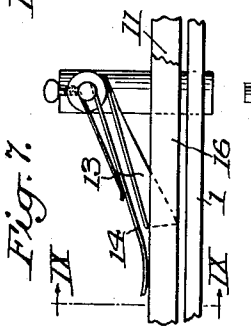


Fig. 7.

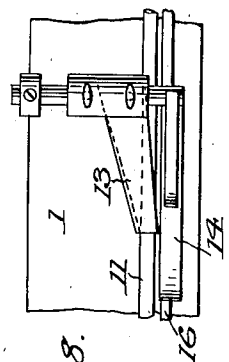


Fig. 8.

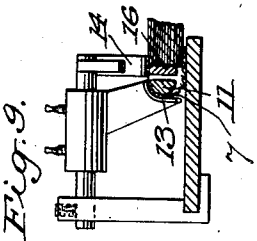


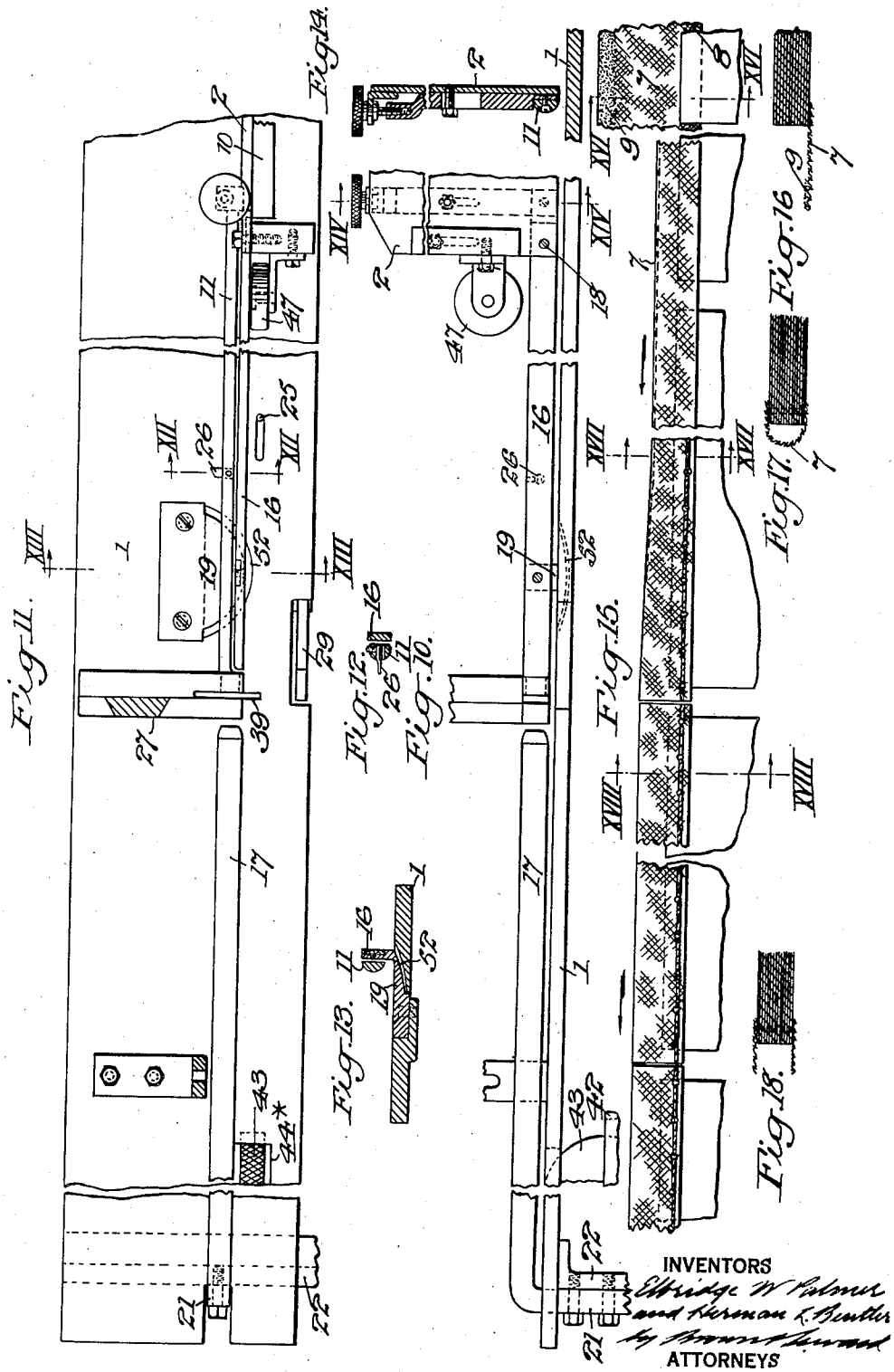
Fig. 9.

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METHOD OF BINDING BOOKS

Filed Nov. 14, 1940 4 Sheets-Sheet 3




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Fig. 24.

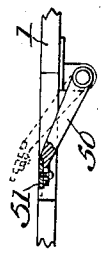



Fig. 23.

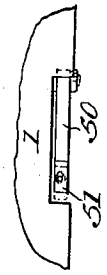



Fig. 22.

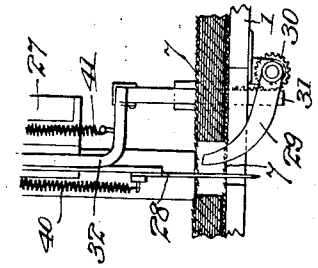



Fig. 21.

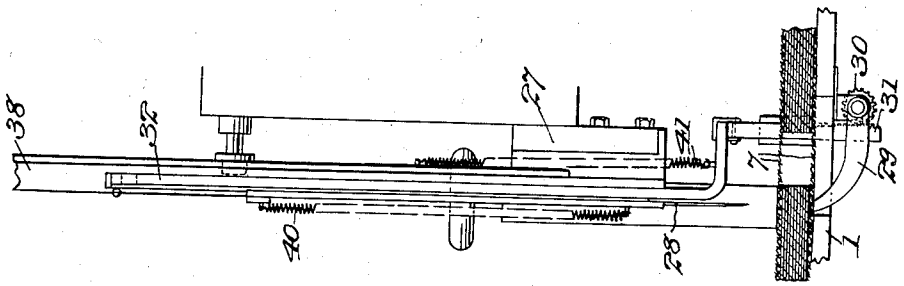



Fig. 20.

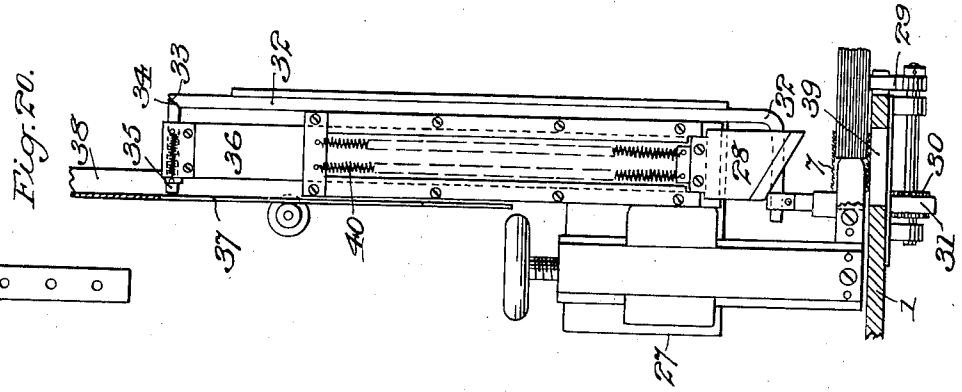
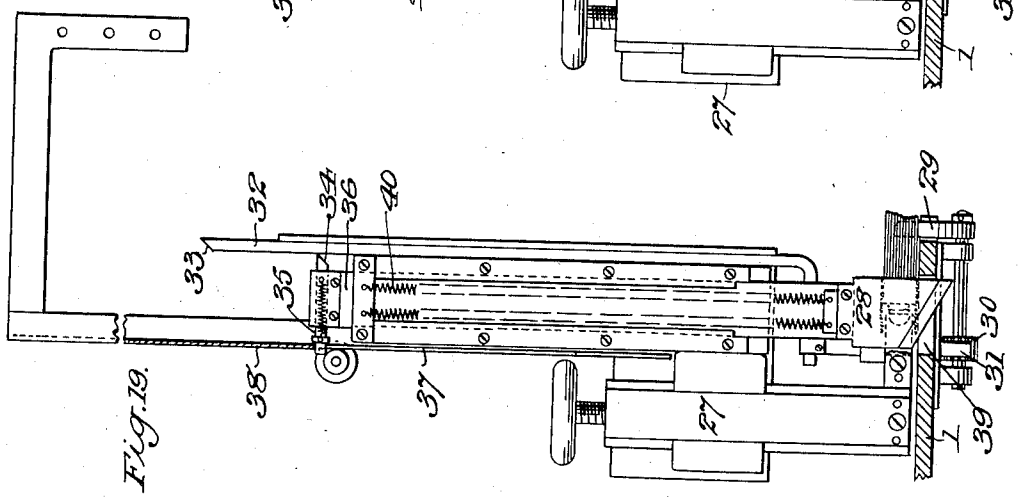



Fig. 19.




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Patented Feb. 18, 1941 2,232,134

# UNITED STATES PATENT OFFICE

2,232,134

## METHOD OF BINDING BOOKS

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Application November 14, 1940, Serial No. 365,593

13 Claims. (Cl. 11—1)

Our invention consists in a novel and efficient method of providing book bodies with hinge strips, said method including the following steps: advancing successive book bodies along a suitable support; causing the edges of a wide tape to overlap the opposite sides of the advancing book bodies; securing the overlapping edges to the book bodies; slitting the wide tape into two narrow tapes; and severing the narrow tapes between successive book bodies to form the hinge strips therefor.

Our invention more specifically comprises one or more of the following additional steps: gumming one face of the wide tape along its opposite edges; causing one gummed edge to overlap and adhere to the under sides of the advancing book bodies; guiding the book bodies; turning the wide tape to cause its other gummed edge to overlap and adhere to the upper sides of the advancing book bodies; drilling the overlapping edges, and book bodies, and stitching them together; and gluing the stitches.

A machine for carrying out our method is shown and described herein, such machine forming the subject matter of our copending application filed of even date herewith, its Serial No. being 365,592.

In the accompanying drawings:

Fig. 1 represents a detail side view, partly in section, of the machine;

Fig. 1ª represents a continuation of Fig. 1 from the line *x*—*x*;

Fig. 2 represents a detail section showing the drive for the stitch gluing mechanism;

Fig. 3 represents a detail horizontal section with the stitcher removed;

Fig. 4 represents a detail enlarged side view showing the rotary brush element of the wide tape turning mechanism;

Fig. 5 represents a top plan view of the same;

Fig. 6 represents a cross section taken in the plane of the line VI—VI of Fig. 4;

Fig. 7 represents a detail side view of the other elements of the wide tape turning mechanism;

Fig. 8 represents a top plan view of the same;

Fig. 9 represents a detail cross section taken in the plane of the line IX—IX of Fig. 7;

Fig. 10 represents a detail side view showing more clearly the mountings for the former bar and the rear edge gage bar;

Fig. 11 represents a detail plan view of the same;

Fig. 12 represents a detail cross section taken in the plane of the line XII—XII of Fig. 11 and showing more clearly the slitting knife;

Fig. 13 represents a detail cross section taken in the plane of the line XIII—XIII of Fig. 11;

Fig. 14 represents a transverse vertical section taken in the plane of the line XIV—XIV of Fig. 10;

Fig. 15 represents a detail plan view showing the several steps in the attaching of the wide tape to the book bodies and the slitting and severing of the tape to form the hinge strips;

Fig. 16 represents a cross section taken in the plane of the line XVI—XVI of Fig. 15;

Fig. 17 represents a cross section taken in the plane of the line XVII—XVII of Fig. 15;

Fig. 18 represents a cross section taken in the plane of the line XVIII—XVIII of Fig. 15;

Fig. 19 represents a detail face view partly in section showing the web severing knife in its lowered position;

Fig. 20 represents a similar view showing the knife in its raised position;

Fig. 21 represents an edge view showing the knife in its raised position;

Fig. 22 represents a detail edge view with the knife in its lowered position;

Fig. 23 represents a detail plan view of a modified form of the trip lever which controls the operation of the knife; and

Fig. 24 represents a detail side elevation, partly in section, of the same.

The supporting table is denoted by 1. The magazine for supplying the book bodies is denoted by 2. The intermittently moving endless conveyor is denoted by 3 and it is provided with blocks 4 positioned to advance successive book bodies in spaced relationship from the magazine into positions for the several operations thereon.

The support for the roll of wide tape which is later to form the hinge strips for the book bodies, is denoted by 5. A means 6 is provided for gumming one face of the wide tape 7 along the opposite edges thereof, said gummed edges being denoted by 8 and 9.

A longitudinally disposed guard 10 is located in the magazine 2 in position to prevent the under side of the bottom book body from contacting with the gummed edge 8 of the wide tape 7 until the book body has left the magazine.

The book body front and back gage bars form guides between which the book bodies are advanced from the magazine by the endless conveyor 3.

The longitudinally disposed former bar around which the wide tape is turned to cause its free gummed edge 9 to overlap and adhere to the upper sides of the book bodies after they have

left the magazine, is denoted by 11. The means for turning the tape may comprise a rotary brush 12, a curved guide 13 and the spring pressed finger 14, which finger coacts with the former bar 11 to hold the wide tape in its turned-over position as it approaches the stitcher.

The front gage bar 15 is adjustable toward and away from the back gage bar for different widths of book bodies. The back gage bar is herein shown as made in two aligned separated sections 16 and 17. End supports 18 and 19 are provided for the first section 16 of the back gage bar, the end support 19 uprising from the table 1. The second back gage bar section 17 is supported only at one end, in the present instance by a downward branch 21 secured to the table supporting frame 22.

The former bar 11 is adjustably supported at one end by the magazine 2 and at the other end by the cutter support to be hereinafter described.

The stitcher in the present instance includes bottom and top drills 23 and 24, the needle 25 and their usual operating mechanisms which serve to cause the bottom drill 23 to cut holes upwardly part way through the book bodies and their associated wide tape, and the top drill 24 to complete the holes, said needle 25 operating through said holes with its thread to stitch the overlapping edges of the wide tape to the book bodies as the holes are completed.

The means for slitting the wide tape 7 into upper and lower tapes after the overlapping edges of the wide tape have been stitched to the book bodies, comprises a slitting knife 26 projecting rearwardly from the former bar 11.

A guillotine cutter support 27 is mounted on the table 1, the knife 28 of which cutter is operated at predetermined intervals by the stitcher to sever the wide tape between successive book bodies to form hinge strips therefor. Means controlled by the advance movement of the book bodies are provided for permitting the operation of the knife at the desired intervals, said means comprising the following elements: a trip lever 29 is held normally depressed by contact with the under sides of the book bodies and permitted to rise into the space between successive book bodies when opposite the same. This trip lever 29 is provided with a pinion 30 which meshes with a rack 31 carrying a cam bar 32. This cam bar 32 is provided at its upper end with a cam 33 so that when the cam bar is lifted by the upward swing of the trip lever into the space between two successive book bodies the said cam will engage a cam 34 on a spring retracted latch 35 carried by the shank 36 of the knife 28 to force the latch into a slot 37 in the reciprocating bar 38 operatively connected to the stitcher. The downward movement of the bar 38 will cause it to engage the latch 35 and thereby move the knife 28 downwardly between the adjacent ends of the back gage bar sections 16 and 17 and through a slot 39 in the table 1.

Springs 40 may be used to hold the tape severing knife 28 in its raised inoperative position. A spring 41 is provided for yieldingly holding the trip lever 29 in its raised position.

Means may be provided for gluing the exposed stitches along one of the hinge strips of each book body, said means comprising a glue fountain 42 and its glue applying roll 43, said roll being located in the present instance in position to project upwardly through a slot 44* in the table. This gluer may be driven from the endless conveyor 3 through the train of gears 44, 45, 46 (shown in Fig. 2).

Pressure means may be applied to the upper sides of the book bodies as they pass from the magazine 2 to the delivery end of the endless conveyor 3, said means comprising the pressure roller 47 at the magazine, the pressure rollers 48 located at the cutter and the pressure rollers 49 located at the gluer.

A modified form of the trip lever 50 (shown in Figs. 23 and 24) may be provided with an extension foot 51 to accommodate the trip lever to successive book bodies having longer spaces between them.

To by-pass the free portion of the lower narrow tape around the end support 19 of the back gage bar section 16 the table 1 may be provided with an open ended curved slot 52, through which the said free portion of the lower narrow tape is passed beneath said support 19.

In operation, the wide tape as it passes from the supply roll carried by the support 5 is led through the gummer 6 to gum one face of the tape along its opposite edges. The tape is then led to and along the table 1 with one gummed edge passing through the magazine 2 between the endless conveyor 3 and the guard 10. After the bottom book body is advanced from the magazine by the endless conveyor the under side of the book body will contact with and adhere to the gummed edge 8 of the wide tape. It will be seen that the wide tape is thus advanced by the movement of the book bodies. As the book bodies reach the turning mechanism the transversely disposed rotary brush 12 serves to turn the wide tape around the bar 11 sufficiently to cause the tape to be engaged by the curved guide 13 and completely turned over the former bar to cause the gummed free edge 9 of the wide tape to overlap and adhere to the upper sides of the book bodies. The spring finger 14 serves to exert pressure upon the turned-over edge of the wide tape to cause the gummed edge 9 to adhere to the book body.

The book bodies with the turned-over wide tape are then advanced by the endless conveyor 3 into position to be drilled and stitched. The wide tape is then slit by the knife 26 into two narrow tapes. The free portion of the lower narrow tape is passed through the slot 52 beneath the back gage bar support 19 to by-pass the said free portion around said support. After the slitting operation the narrow tapes and the line of stitching are severed between successive book bodies, said severing mechanism operating only when the free end of its controlling trip lever 29 is permitted to swing upwardly into the space between two successive book bodies. It is understood that the trip lever 29 is held depressed by its contact with the under sides of the advancing book bodies except when the spaces between successive book bodies come opposite the free end of the trip lever.

The book bodies are then advanced to a position where the exposed stitching along the under side hinge strips may be glued in the usual manner, to lock the stitches.

It will be understood that the former bar is vertically adjustable to center it with respect to the wide tape irrespective of the width of the book bodies. It will also be understood that the back gage bar sections may be either vertically adjustable or replaceable by other bar sections of a different width to center the back gage bar with respect to different widths of book bodies.

While we have shown the stitcher as a sewing machine, it is evident that we wish to cover other means, such as staplers, if so desired, without departing from the spirit and scope of our invention.

What we claim is:

1. The method which comprises, advancing successive book bodies, causing the edges of a wide tape to overlap the opposite sides of the book bodies, securing said overlapping edges to the book bodies, slitting the wide tape into two narrow tapes, and severing the narrow tapes to form hinge strips for the book bodies.

2. The method which comprises, advancing successive book bodies, causing the gummed edges of a wide tape to overlap and adhere to the opposite sides of the book bodies, further securing said overlapping edges to the book bodies, slitting the wide tape into two narrow tapes, and severing the narrow tapes to form hinge strips for the book bodies.

3. The method which comprises, advancing successive book bodies, causing the gummed edges of a wide tape to overlap and adhere to the opposite sides of the book bodies, drilling the said overlapping edges and book bodies and stitching them, slitting the wide tape into two narrow tapes, and severing the narrow tapes to form hinge strips for the book bodies.

4. The method which comprises, advancing successive book bodies, causing the gummed edges of a wide tape to overlap and adhere to the opposite sides of the book bodies, stitching the said overlapping edges to the book bodies, slitting the wide tape into two narrow tapes, severing the narrow tapes to form hinge strips for the book bodies, and gluing the stitches.

5. The method which comprises, advancing successive book bodies, causing the gummed edges of a wide tape to overlap and adhere to the opposite sides of the book bodies, drilling the said overlapping edges and book bodies and stitching them, slitting the wide tape into two narrow tapes, severing the narrow tapes to form hinge strips for the book bodies, and gluing the stitches.

6. The method which comprises, advancing successive book bodies, gumming the edges of one face of a wide tape, causing said gummed edges to overlap and adhere to the opposite sides of the book bodies, further securing the said overlapping edges to the book bodies, slitting the wide tape into two narrow tapes, and severing the narrow tapes to form hinge strips for the book bodies.

7. The method which comprises, advancing successive book bodies, feeding a wide tape with one edge overlapping the under sides of the book bodies, turning the wide tape to cause its other edge to overlap the upper sides of said book bodies, securing the overlapping edges to the book bodies, slitting the wide tape into two narrow tapes, and severing the narrow tapes between successive book bodies to form hinge strips therefor.

8. The method which comprises, advancing successive book bodies, feeding a wide tape having gummed edges with one gummed edge overlapping and adhered to the under sides of the book bodies, turning the wide tape and causing its other gummed edge to overlap and adhere to the upper sides of said book bodies, additionally securing the overlapping edges to the book bodies, slitting the wide tape into two narrow tapes, and severing the narrow tapes between successive book bodies to form hinge strips therefor.

9. The method which comprises, advancing successive book bodies, feeding a wide tape having gummed edges with one gummed edge overlapping and adhered to the under sides of the book bodies, turning the wide tape and causing its other gummed edge to overlap and adhere to the upper sides of said book bodies, drilling the said overlapping edges and book bodies and stitching them, slitting the wide tape into two narrow tapes, and severing the narrow tapes between successive book bodies to form hinge strips therefor.

10. The method which comprises, advancing successive book bodies, feeding a wide tape having gummed edges with one gummed edge overlapping and adhered to the under sides of the book bodies, turning the wide tape and causing its other gummed edge to overlap and adhere to the upper sides of said book bodies, drilling the said overlapping edges and book bodies and stitching them, slitting the wide tape into two narrow tapes, severing the narrow tapes between successive book bodies to form hinge strips therefor, and gluing the stitches.

11. The method which comprises, advancing successive book bodies, feeding a wide tape, gumming the edges of one face of the wide tape, passing one gummed edge underneath and adhering it to the under sides of successive book bodies, turning the other gummed edge over and adhering it to the upper sides of the book bodies, additionally securing the overlapping edges to the wide tape, slitting the wide tape into two narrow tapes, and severing the narrow tapes between successive book bodies to form hinge strips therefor.

12. The method which comprises, advancing successive book bodies, feeding a wide tape, gumming the edges of one face of the wide tape, passing one gummed edge underneath and adhering it to the under sides of successive book bodies, turning the other gummed edge over and adhering it to the upper sides of the book bodies, drilling the said overlapping edges and book bodies and stitching them, slitting the wide tape into two narrow tapes, and severing the narrow tapes between successive book bodies to form hinge strips therefor.

13. The method which comprises, advancing successive book bodies, feeding a wide tape, gumming the edges of one face of the wide tape, passing one gummed edge underneath and adhering it to the under sides of successive book bodies, turning the other gummed edge over and adhering it to the upper sides of the book bodies, drilling the said overlapping edges and book bodies and stitching them, slitting the wide tape into two narrow tapes, severing the narrow tapes between successive book bodies to form hinge strips therefor, and gluing the stitches.

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