No. 782,750. PATENTED FEB. 14, 1905.

F. H. H. HOFFSTEDT.

MACHINE FOR MAKING END PAPERS FOR BOOKS.

APPLICATION FILED APR. 23, 1904.

5 SHEETS—SHEET 1.

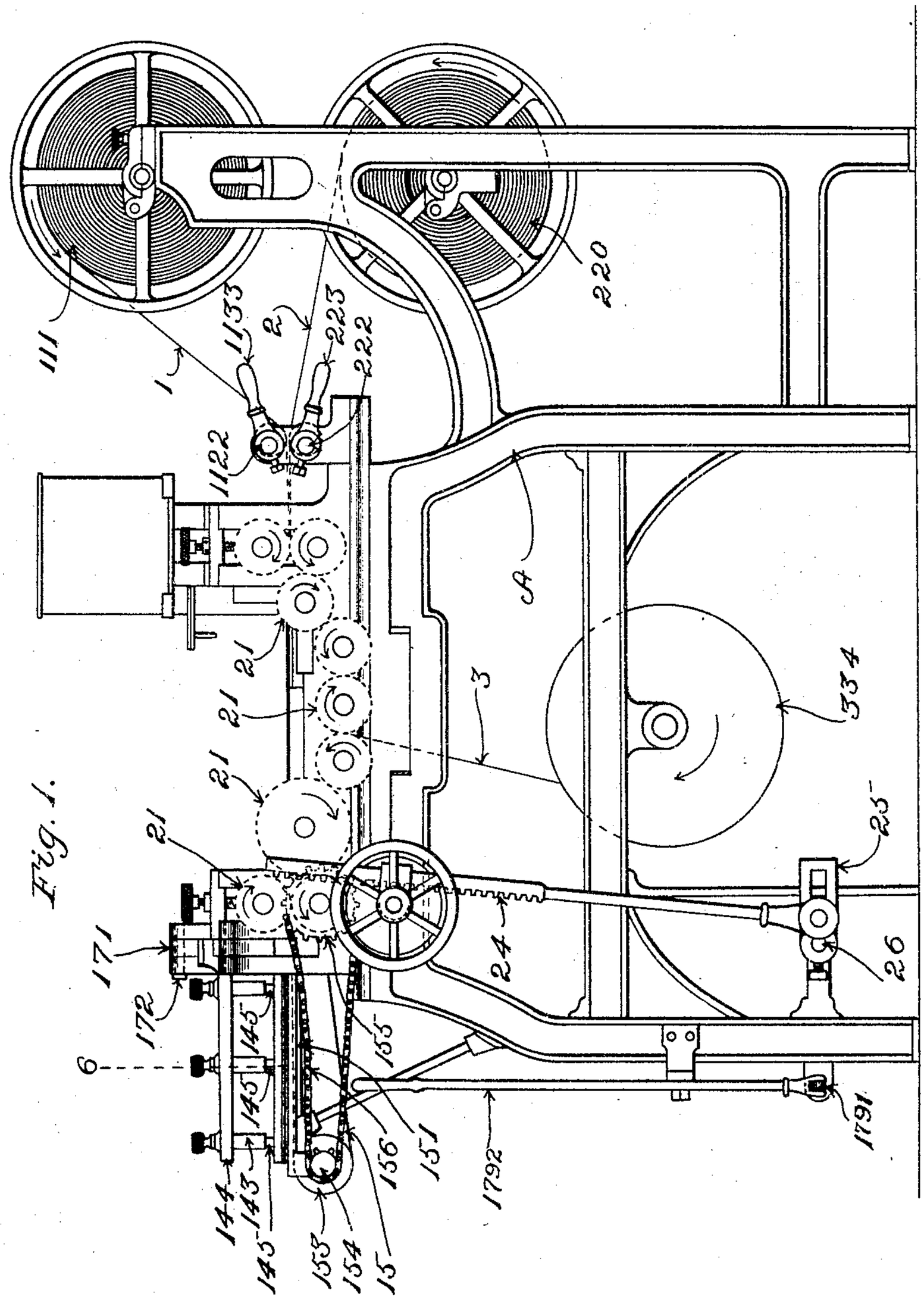

Fig. 1.

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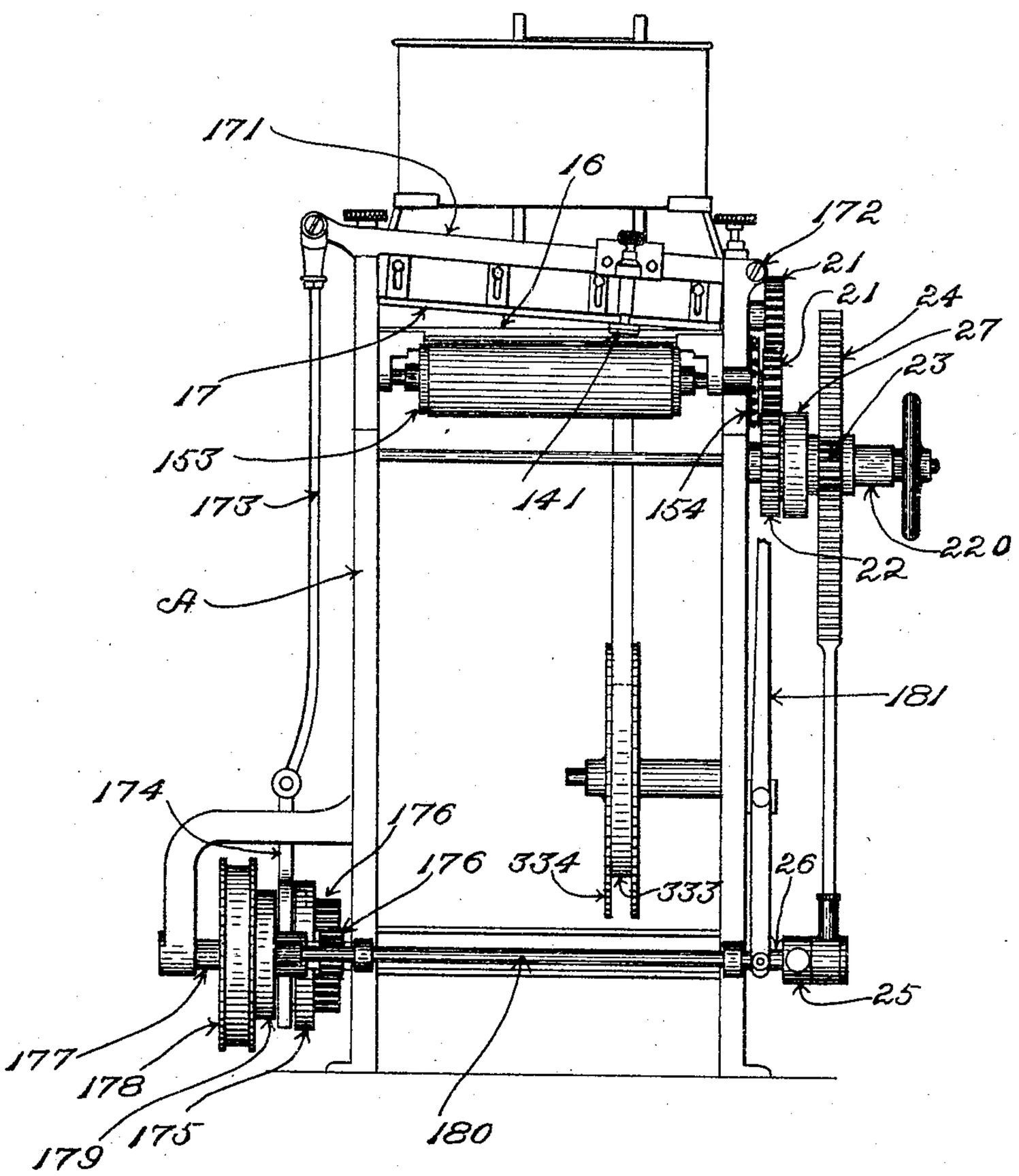
5 SHEETS—SHEET 2.

Fig. 2.



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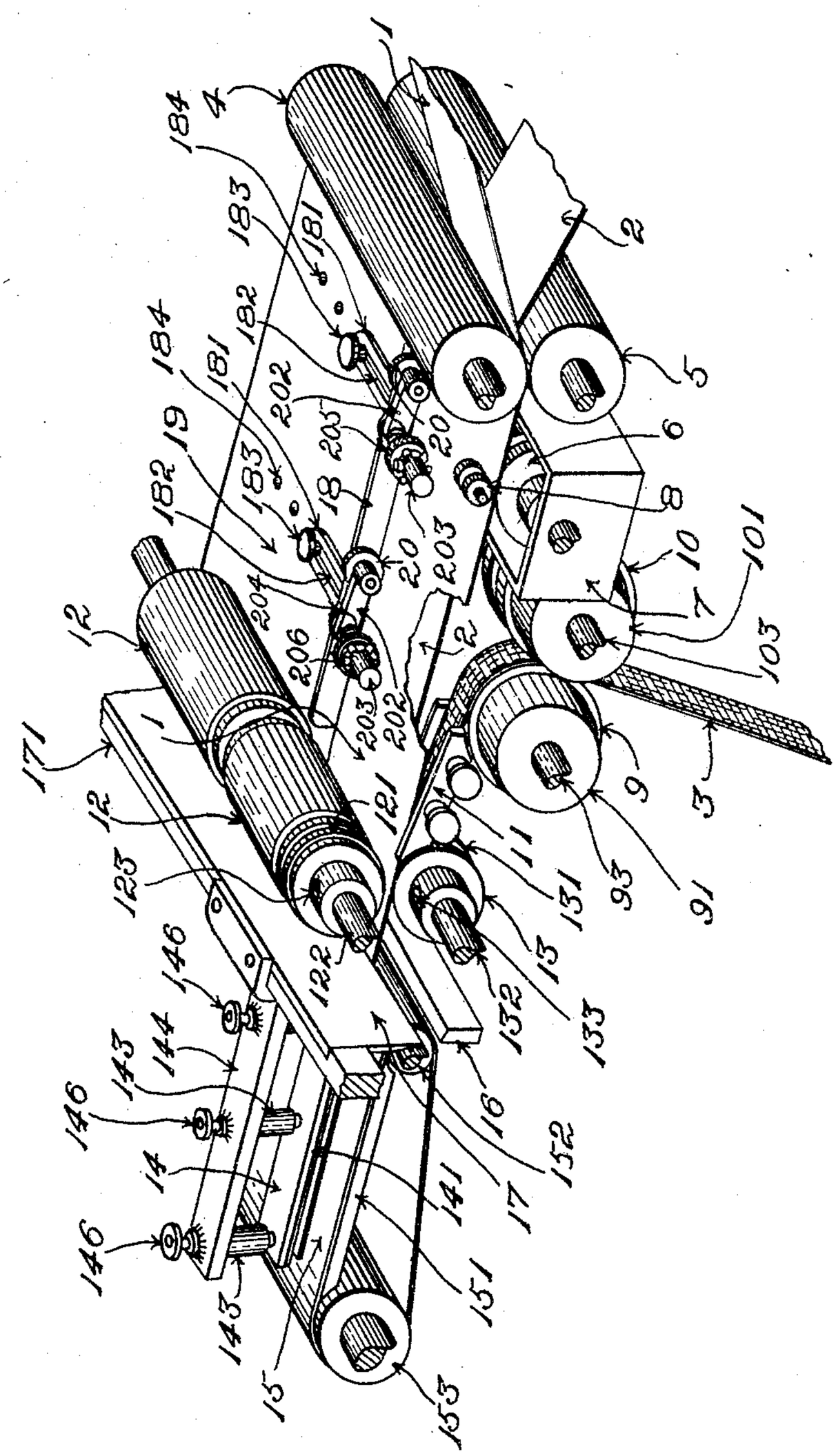
5 SHEETS—SHEET 3.

Fig. 3.



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5 SHEETS—SHEET 4.

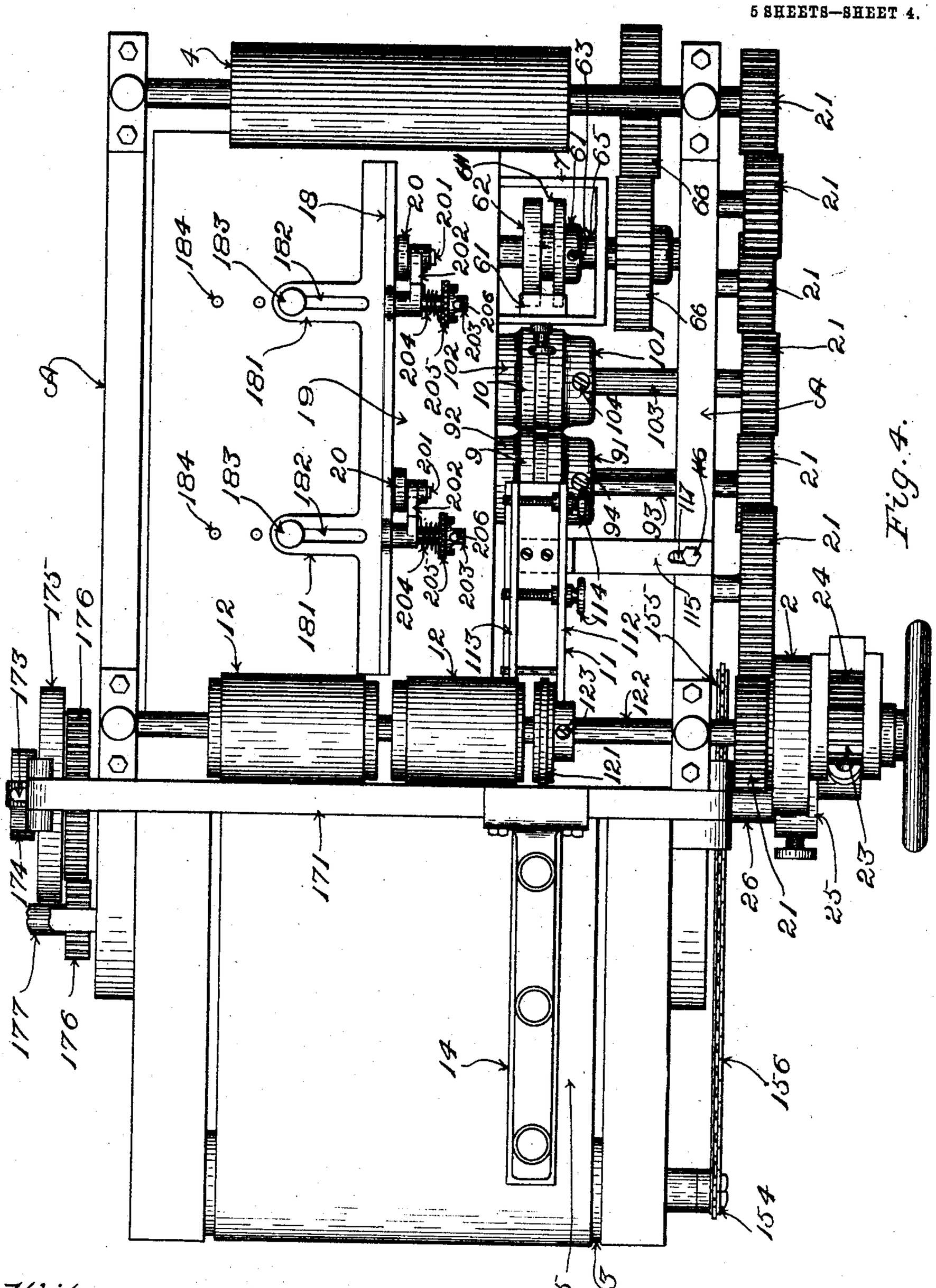

Fig. 4.

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5 SHEETS—SHEET 5.

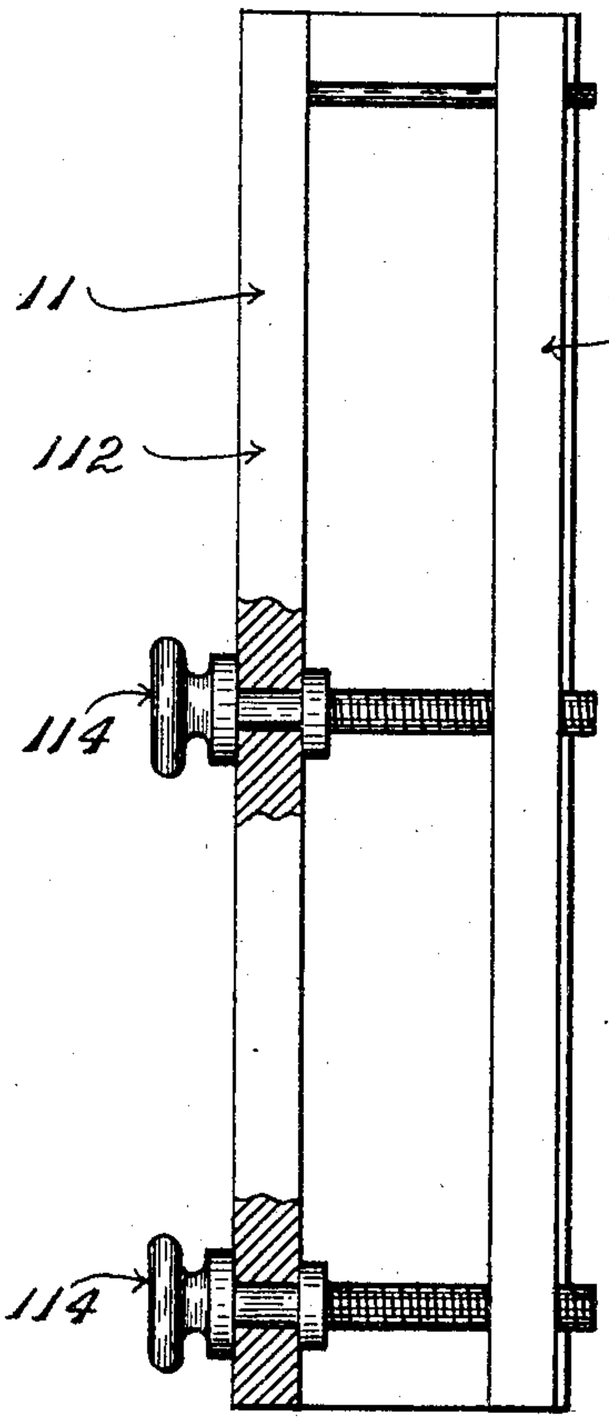

Fig. 5.

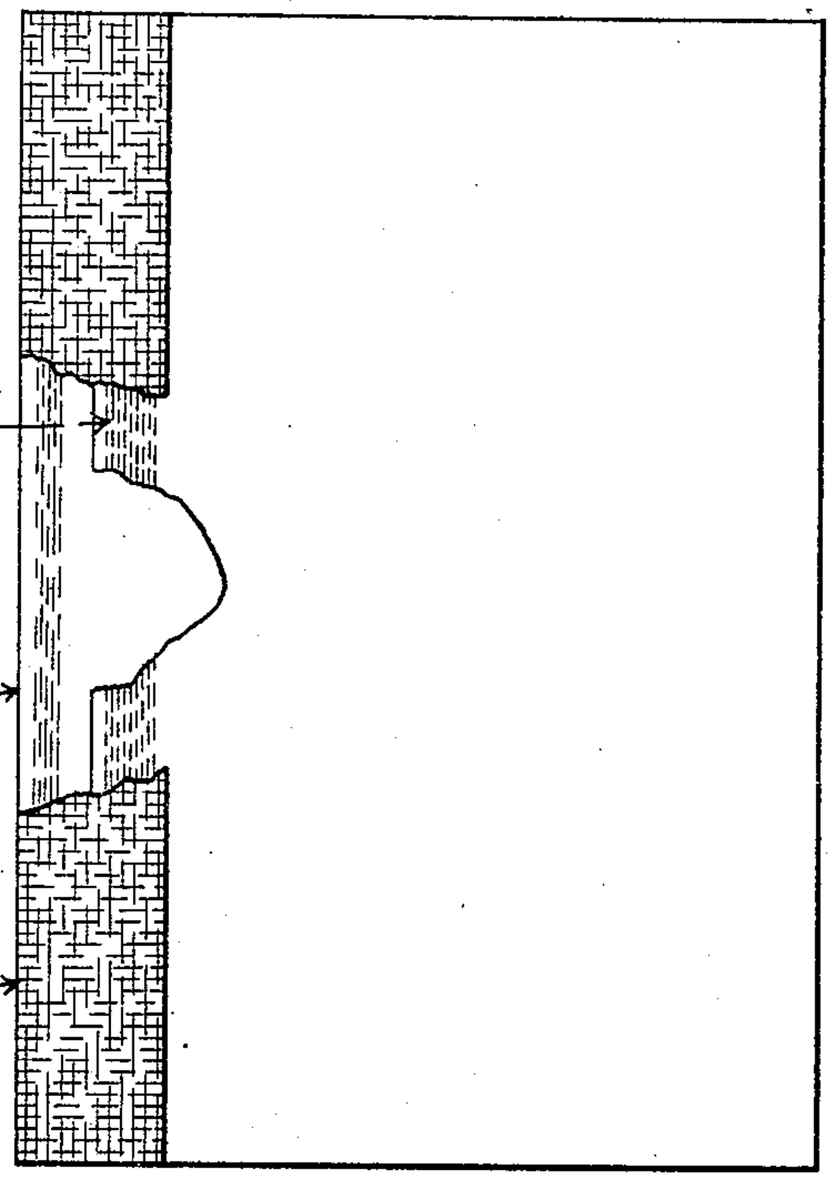

Fig. 7.

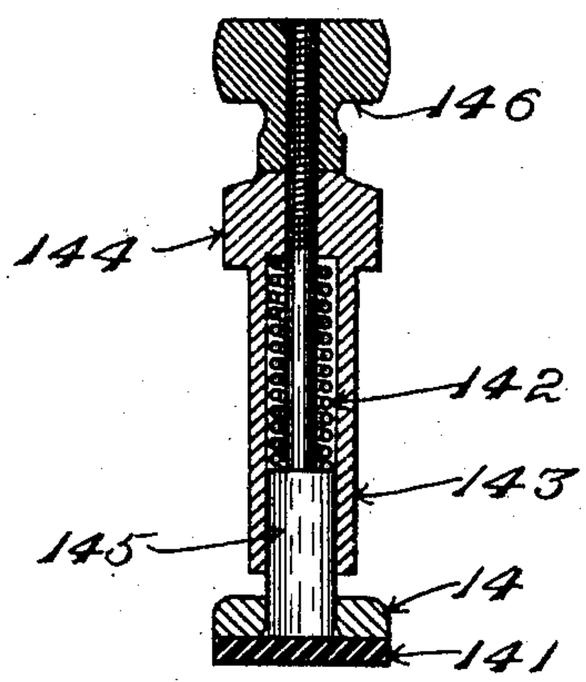

Fig. 6.

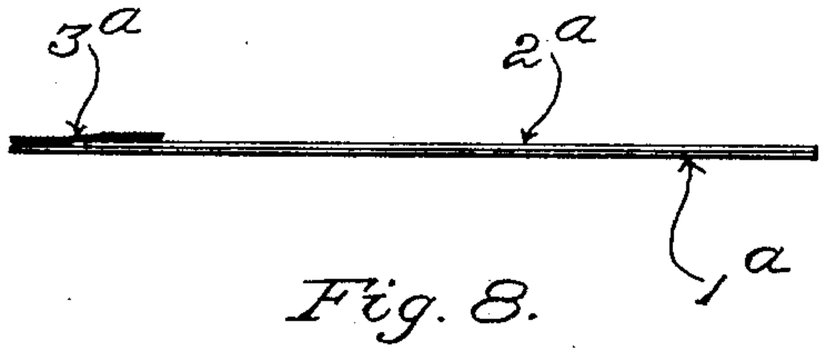

Fig. 8.

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No. 782,750. Patented February 14, 1905.

UNITED STATES PATENT OFFICE.

FRITHEOF H. H. HOFFSTEDT, OF SOMERVILLE, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO WILLIAM J. MARSH, OF CAMBRIDGE, MASSACHUSETTS.

MACHINE FOR MAKING END PAPERS FOR BOOKS.

SPECIFICATION forming part of Letters Patent No. 782,750, dated February 14, 1905.

Application filed April 23, 1904. Serial No. 204,596.

To all whom it may concern:

Be it known that I, FRITHEOF H. H. HOFFSTEDT, a citizen of the United States, residing at Somerville, in the county of Middlesex, State of Massachusetts, have invented a certain new and useful Improvement in Machines for Making End Papers for Books, of which the following is a specification, reference being had therein to the accompanying drawings.

In the drawings, Figure 1 shows in side elevation an end-paper machine embodying the invention. Fig. 2, Sheet 2, is an end elevation of the delivery end of the said machine. Fig. 3, Sheet 3, is an isometric showing the essential features of the machine and indicating the operation of the latter. Fig. 4, Sheet 4, shows the machine in plan, omitting, however, the supply-rolls of paper, the guides adjacent such supply-rolls, the corresponding end of the machine-frame, the presser-roll 8, the supply-receptacle for paste and its supports, and the sheets or webs of paper and band or tape. Fig. 5, Sheet 5, is a partly-sectional plan of the guide for the band or tape. Fig. 6, Sheet 5, is a detail view of the presser, showing the latter in vertical section on the plane that is indicated by the dotted line 6 in Fig. 1. Fig. 7, Sheet 5, shows an end paper in completed condition with portions of the band or tape and of the lining-sheet broken away in order to show more clearly the relations of the marginal portions of the sheets and the band or tape to one another. Fig. 8, Sheet 5, is an edge view of an end paper.

In binding some books, more especially what are termed "stitched" books—namely, those having the signatures, &c., composing the same secured together by stitches passing entirely through from front to back—it is the practice prior to making application of the cover to place at the front and back of the assembled signatures, &c., which are comprised in a book so-called "end papers," one of which is represented in Figs. 7 and 8, Sheet 5, of the drawings. Each of the said end papers comprises two sheets of paper, as 1^a 2^a, having the marginal portions thereof connected together along one edge of each by means of a band or tape, as 3^a, the latter consisting usually of woven material. The marginal portion of one of the said sheets, as 1^a, projects beyond the corresponding edge of the other sheet, 2^a. The band or tape 3^a extends lengthwise of the two sheets and is attached to the marginal portion of sheet 2 and the projecting portion of sheet 1 by paste or glue, as indicated by the shading in Fig. 7 and by the black lines in Fig. 8. The band or tape constitutes a flexible hinge connecting the pair of sheets together. The stitches by which the leaves of the book and the end papers are secured together are passed through the band or tape and the projecting marginal portion of sheet 1^a. The sheet 1^a of each end paper constitutes a fly-leaf of the book at the front or back of the book, as the case may be. The other sheet, 2^a, of each end paper is pasted to the inner surface of the corresponding side of the cover to constitute a lining therefor. When the lining-sheet 2^a is secured to the front or back of the cover, the inner edge of the said sheet coincides in position with the inner edge of the board forming part of such portion of the cover and does not extend inward past the line on which the back bends in opening the book. If the paper lining-sheet 2^a extended inward past the said line, it would crack on the line of bending as a result of the straining to which it would be subjected in turning back the sides of the cover.

Heretofore the work of assembling the sheets of an end paper in the required relative positions and attaching the band or tape thereto so as to complete the end paper and place the latter in readiness for use has been performed wholly by hand, so far as I am aware.

The invention consists in an automatic machine for performing such work, the said machine comprising, essentially, devices for feeding the fly-leaf, lining-sheet, and hinging band or tape and assembling the said elements with one marginal portion of the fly-leaf sheet projecting beyond the edge of the lining-sheet and with the band or tape overlapping the corresponding marginal portions of both of the said sheets, means to render adhesive

the uniting surfaces of the said elements, and means to press the said elements together.

In its broader phases the invention is not restricted with reference to the manner or mode of feeding and assembling, or with reference to the means of rendering the uniting surfaces adhesive, or with reference to the manner or precise means of pressing the said uniting surfaces together. Various known modes of feeding and bringing together paper in sheet form may be utilized in carrying my invention into effect under the broader phases of the latter.

I have illustrated in the accompanying drawings an embodiment of the preferred principles—namely, a machine which operates upon continuous sheets or webs of paper and a band or tape of continuous length, the said sheets or webs and band or tape being fed forward through the machine, brought into proper relationship with each other therein, and united to one another, the united sheets or webs and band or tape then being severed at intervals to divide the same into sections, each of the latter of proper length for an end paper. However, except as specified in the claims at the close of this specification, I do not limit my invention to the employment of sheets of paper and bands or tapes of continuous length.

The characteristic features and mode of operation of the preferred embodiment of the invention are illustrated by Fig. 3, Sheet 3. In the said figure the sheets or webs of paper are designated 1 and 2, respectively, and the continuous band or tape is designated 3. The sheets or webs 1 and 2 advance in unison from the source or sources of supply and pass together between a pair of rolls 4 5, which preferably are driven and act as feed-rolls for the webs. As thus brought together the margin of the upper sheet or web 1 along one edge of the latter is caused to project transversely beyond the corresponding edge of the lower sheet or web 2 to the extent of the overlap of the respective sheets in the completed end paper. In this instance the overlap is secured by a difference in the width of the two sheets or webs of paper. In advance of the rolls 4 5 is a second pair of rolls 12 13, which are driven and act as feed-rolls. In passing from the rolls 4 5 to the rolls 12 13 the said sheets or webs travel together past a device whereby they are prepared for adhesion to the band or tape 3. The said device in this instance is an adhesive-applying roll 6, working in a trough 7, containing the supply of adhesive. By means of the said roll the adhesive is applied to the marginal portions of the respective sheets or webs, the application being made in stripes which respectively are located a short distance from the extreme edges of the respective sheets or webs, leaving the edge portions themselves dry. (See Fig. 7.) A presser-roll 8, Fig. 3, insures contact of the sheets or webs with the periphery of the adhesive-applying roll 6. The band or tape 3 on its way to join the sheets or webs 1 and 2 passes between a pair of rolls 9 and 10, which preferably are driven and act as feed-rolls for the band or tape, and thence through a guide 11, by means of which latter it is conducted to the portions of the said sheets or webs to which the adhesive has been applied. The sheets or webs and band or tape are brought together at or adjacent the pair of feed-rolls 12 13, between which they all pass and by which they are drawn forward through the machine. By means of the said feed-rolls 12 13 the assembled and now more or less completely adherent sheets or webs and band or tape are advanced to the action of devices to press the elements 1, 2, and 3 together to complete and perfect the union thereof. The said pressing devices in the drawings comprise a presser 14 and an opposing surface 15. By a relative closing movement of these two the layers of paper and the band or tape are compressed together, thereby forcing the band or tape into intimate contact with the portions of the paper to which the adhesive has been applied and causing the parts to become completely and properly united. The assembled sheets or webs and band or tape then are severed transversely into proper lengths to constitute end papers. The severing is effected by means of shears 16 17. After the layers of paper and the band or tape have been brought into contact with one another at and between rolls 12 13, so as to adhere more or less perfectly together, it is not strictly material whether the cutting is effected in advance of the presser or at the other side thereof. In the present instance the shears are located in advance of the presser between the latter and the feed-rolls 12 13.

The supply of the sheets or webs 1 and 2 is contained in wound rolls 111 221, Fig. 1, which are suitably mounted upon the framing A of the machine; that of the band or tape 3 is contained in a roll 333, Fig. 2, which is wound upon a spool 334, Figs. 1 and 2, that also is mounted upon the said framing. Between the supply-rolls 111 221 and the feed-rolls 4 5 the sheets or webs 1 and 2 pass partly around and between guide-rods 1122 222, the latter being eccentrically journaled on the machine-framing and being provided with handles 1133 223, by means of which the eccentric guide-rods may be turned to cause the proximate surfaces thereof to approach or separate from each other. By turning the said guide-rods so as to separate their surfaces opportunity is afforded for inserting the sheets or webs 1 and 2 between them, after which the guide-rods may be restored to approximately the position shown in Fig. 1 to cause the sheets or webs to approach close to each other in passing the guide-rods.

In order that it may apply adhesive to the sheets or webs 1 and 2 in stripes, as aforesaid,

one upon the sheet or web 2, close to the edge thereof, but separated by a narrow distance from the said edge, and the other upon the projecting marginal portion of the sheet or web 1 at a short distance from the adjacent edge of sheet or web 2 and close to but separated by a narrow distance from the edge of the said sheet or web 1, the adhesive-applying roll 6 is provided with peripheral acting portions corresponding in width with the said stripes and separated by a proper distance from each other in the direction of the length of the roll. (See Fig. 4.) The outer of these peripheral acting portions is less in width than the marginal projecting portion of the sheet or web 1 and is located so as to act upon the latter near the outer edge thereof, having a dry space next the adjacent edge of sheet or web 2, so that after the tape has been united to the two sheets or webs the portion of sheet or web 1 which in the completed end paper bends in opening the cover of a book is free of adhesion to the fly-leaf. The stripe of paste that is applied to the sheet or web 2 does not extend entirely to the outer edge of the same or to the outer edge of the tape, the object being to leave space to accommodate such portions of adhesive as may be displaced laterally by the pressure when the tape and sheets or webs are compressed together. If the stripe of paste went entirely to the said edges, the expressed portions of the adhesive would appear upon the outer service of the sheet or web 2 and would intervene between band or tape 3 and sheet or web 1. In conjunction with the roll 6 a scraper or doctor 61, Fig. 4, is provided for the purpose of removing from the surface of the roll any excess of adhesive prior to the transfer of the latter to the sheets or webs.

In passing from the feed-rolls 4 5 to the feed-rolls 12 13 the two sheets or webs move along a table 19, having in connection therewith means engaging with the said sheets or webs to guide them in proper relationship with each other. The present machine has been constructed with more especial reference to operating upon sheets or webs, of which that designated 1 is wider than that designated 2, the difference in width corresponding with the extent to which the marginal portion of sheet or web 1 is required to project beyond that of sheet or web 2 at the side of the end paper at which the band or tape 3 is applied. A single edge-guide 18 accordingly is provided, it extending in the direction of the travel of the sheets or webs and by its contact with the edges of the latter opposite the edges thereof at which the adhesive is applied serving to maintain the former edges in register with each other. The edge-guide 18 is mounted upon the table 19 with capacity for adjustment transversely with relation to the direction of movement of the sheets or webs in order that it may be positioned to suit sheets or webs of various widths. The attachment and adjustment of the edge-guide 18 are provided for in the present instance by furnishing the edge-guide with transversely-extending plates 181 181, having therein slots 182 182, which extend in the direction transverse with relation to the line of the travel of the sheets or webs, and by the employment of screws 183 183, the stems of which pass through the said slots into threaded holes 184 184, that are tapped in the table 19. To give a wide range of adjustment, a transverse series of the said holes 184 184 is formed in the table for each clamping-screw 183. For the purpose of preventing the sheets or webs from buckling and rising intermediate the rolls 4 5 and the rolls 12 13, which might result in the edges of one or both of the said sheets or webs becoming displaced with reference to the adhesive-applying roll 6, presser rolls or disks 20 20, Figs. 3 and 4, are provided. These rest upon the upper surface of the sheet or web 1 and serve to hold the sheets or webs pressed together and the lower one thereof against the surface of the table 19. The rolls 20 20 are mounted upon pins 201 201, projecting horizontally from arms 202 202, the latter being pivoted in turn to the edge-guide 19, with capacity to swing vertically. The presser-rolls may rest by gravity upon the sheets or webs, although preferably gravity is aided by the employment of springs, as shown. The arms 202 202 are hung upon pins or studs 203 203, projecting horizontally from ears or lugs on the edge-guide 18. The springs are shown at 204 204. They are spiral springs and are fitted upon the pins or studs 203 203, the inner extremity of each spring being engaged with the corresponding arm 202, while the outer extremity thereof is engaged with an adjusting-collar 205, which is mounted upon the pin or stud 203 and held from rotating thereon through the engagement of a radial pin 206, with which the pin or stud 203 is provided, with the sides of notches in the outer face of the said collar. A series of notches is formed around the said face, so that by turning the collar more or less around the pin or stud 203 and fixing it in the desired position by means of the pin and notches the tension of the spring 204 may be varied to regulate the force of the pressure exerted by the roll 20 and its action upon the sheets or webs 1 and 2.

The guide 11 for the band or tape 3 has opposite edge-guides 112 and 113 for engagement with the corresponding edges of the band or tape.

The rolls 12 and 13, which may be termed "delivery-rolls," are constructed to apply pressure to the sheets or webs and band or tape only at the places where adhesive has not been applied to the sheets or webs. The main acting portion of each of the said rolls terminates at one side of the inner stripe of adhe-

sive, and beyond the said acting portion the roll is reduced in diameter at its end, so as not to exert pressure. Beyond the said main acting portion each of the said rolls is furnished with a narrow boss 121 or 131, as the case may be, the width of which is less than the dry space intervening between the two stripes of adhesive. The narrow bosses 121 131 of the two rolls compress between them the sheets or webs and band or tape along the said dry space. The purpose in not applying pressure at the delivery-rolls along the places where the adhesive is located is to obviate expressing the adhesive from between the outer edges of the band or tape and the sheet or web 1 and also more or less across the dry space between the stripes of adhesive, as well as beyond the inner edge of the band or tape onto the exposed surface of the lining sheet or web 2.

The shears 16 and 17 operate to sever the assembled sheets or webs and band or tape as the same pass forward from the delivery-rolls 12 and 13. The shears comprise a fixed blade 16 and a movable blade 17, the latter being carried by a swinging arm 171, which is pivoted at one end thereof, as at 172, Fig. 2, upon the framing A, the other end of the said arm being operatively joined by a connecting-rod 173 with a yoke 174, which last is engaged by a cam 175 and moved thereby for the purpose of actuating the movable shear-blade. The cam 175 is mounted upon a suitable rotatable axis, as 26, Fig. 1, which is supported upon the machine-framing A and is actuated by means of gearing 176 176, Figs. 2 and 4, from a drive-shaft 177, Fig. 2, the latter being provided with a band-pulley 178, which is mounted loosely upon the said drive-shaft, but has provided in connection therewith the clutch 179, the said clutch being rendered operative and inoperative, as required for driving the machine or arresting the motion thereof through the medium of a slide-bar 1791 and shipper-handle 1792 in well-known manner.

The effective pressure by means of which the tape and sheets or webs of paper are caused to become united properly to one another is applied by means of the presser 14. The latter in the present instance is mounted upon the arm 171 of the moving shear-blade 17. The surface 15, with which the said presser coacts, is constituted by a delivery-apron which travels adjacent the said presser over a fixed bed or plate 151, the said apron passing at the opposite ends of the said plate around supporting-rolls 152 153, these latter being suitably journaled in the machine-framing. As soon as a sufficient length of the assembled sheets or webs 1 2 and band or tape 3 has been advanced upon the upper surface of the apron 15 by the action of the feed and delivery rolls the movable shear-blade 17 is caused to descend toward the fixed blade 16, and in the descent thereof the presser 14 squeezes the assembled layers of paper and band or tape together against the apron 15. Thereby the different elements of the end paper are caused to become united properly to one another, while at the predetermined point in the descent of the movable shear-blade it coacts with fixed blade 16 in severing the sheets or webs and band or tape. The apron 15 is caused to move in proper unison with the working of the other parts of the machine, so as to discharge the finished end paper as soon as the latter is released by the rise of the presser. To this end the outer supporting-roll 153 of the said apron has attached thereto a sprocket-wheel 154, Fig. 1, around which and a companion sprocket 155 on the shaft of the delivery-roll 13 a sprocket-chain 156 passes. By means of the said sprocket-gearing the apron 15 is moved whenever the feed and delivery rolls are moved. The feed and delivery rolls and the apron 15 are actuated intermittingly by devices whereby when the shear-blades are separated and the presser 14 is retracted the said rolls and apron are caused to move and whereby they are brought to rest at the time of the action of the shears and presser. In this instance by means of toothed wheels 21 21 21, &c., the feed-rolls of each pair are geared together and the respective pairs of rolls are also connected together, the train of wheels 21 21, &c., being in gear connection with an actuating toothed wheel 22. At the side of the said wheel 22 a pinion 23 is mounted loosely upon the sleeve 220 of the said wheel, the said pinion being in mesh with a rack 24, which latter is connected with a crank 25 of adjustable throw, the said crank being fixed upon the shaft 26 of the cam 175. For the purpose of causing movement to be transmitted to the wheel 22 and the parts which are in driving connection therewith through the movement of the rack 24 in one direction, while leaving the said wheel and connected parts at rest during the return movement of the rack, an intermittingly-acting clutch 27 of suitable or usual construction is employed in connection with the said pinion 23 and said wheel 22.

The presser 14 is provided with a soft facing 141, Fig. 6, to make contact with the upper surface of the web 1. For the purpose of cushioning the action of the presser it is backed up by a series of springs 142, which are contained in sleeves 143 upon a bar 144, projecting from the arm 171 of the movable shear-blade. The presser 14 has connected therewith a series of studs 145, the respective studs entering the respective sleeves 143. The spring 142 that is contained in each sleeve 143 is compressed between a shoulder at the upper end of the sleeve and a shoulder upon the stud 145, as shown in Fig. 6. The upper portion of each stud is screw-threaded. Such portion projects through a hole in the bar 144 and extends above the said bar 144, where it has screwed thereon the head or nut 146. By turning the heads or nuts 146 the tension

of the springs 142 and the height of the presser with relation to the bar 144 may be regulated as desired.

In order to adapt the machine to the employment of bands or tapes 3 of various widths and differences in the amount of overlap of the sheets or webs 1 and 2, provision for adjustment is made in connection with the adhesive-applying roll 6, the feed-rolls 9 10, the guide 11, and the delivery-rolls 12 13. The boss 611 of the adhesive-applying roll 6 is made adjustable toward and from the companion boss 62 of such roll. The manner of effecting such adjustment in this instance consists in loosening the binding-screw 63, which is represented in Fig. 4 and by means of which the boss 611 is clamped to the shaft 65 of the roll 6, sliding the boss 611 upon the said shaft toward or from the boss 62, according as may be required, and tightening up the said binding-screw again. Feed-rolls 9 10 are shown as consisting, respectively, of bosses 91 92 upon a shaft 93 and 101 102 upon a shaft 103, the bosses 91 101, respectively, being fastened to their shafts by means of binding-screws 94 104 and adjustable toward and from the companion bosses 92 102 in manner like unto the boss 61 of the roll 6. The edge-guides 112 and 113 of guide 11 are adjustable relative to each other to enable the distance between them to be varied to suit the width of the band or tape that may be employed. In the present instance the outer edge-guide 112 is fixed with relation to the guide, and the inner edge-guide 113 is movable in the direction toward and from the former, and for convenience of adjustment adjusting-screws 114 114 are provided, these being journaled in well-known manner in the fixed edge-guide 112—as, for example, in the manner shown in Fig. 5—so as to be held from longitudinal movement with relation to the latter and having the threaded stems of the same screwed into threaded holes which are tapped in the movable edge-guide 112. On turning the said adjusting-screws the movable edge-guide will be shifted toward or from the fixed edge-guide, as the case may be. The guide 11 is supported upon a stand 115, Fig. 4, upon which it may be shifted in the direction of the width of the machine when necessary to locate the relatively fixed edge-guide 112 in the required working position. The said stand is shown secured to the machine-frame by means of a bolt 116, the stand being longitudinally slotted, as at 117, for the passage therethrough of the stem of said bolt, the slot permitting the stand and the guide mounted thereon to be adjusted in the direction stated. The bosses 121 131 of the delivery-rolls are adjustable lengthwise of the shafts 122 132 of the latter toward and from the main acting portions of the said rolls. To provide for such adjustment, binding-screws 123 133 are shown in the present instance.

The adhesive-applying roll is driven in the present instance by gearing 66 66, Fig. 4, from the lower feed-roll 5.

I claim as my invention—

1. A machine for making end papers for books, comprising, in combination, devices to assemble the fly-leaf sheet lining-sheet and hinging band or tape with one marginal portion of the fly-leaf sheet projecting beyond the edge of the lining-sheet and with the band or tape overlapping the corresponding marginal portions of both of said sheets, means to render adhesive the uniting surfaces of the said elements, and means to press the said elements together.

2. A machine for making end papers for books, comprising, in combination, means to guide two sheets with a marginal portion of one thereof projecting beyond an edge of the other, means to deliver a hinging band or tape to the overlapping portions of the said sheets, means to render adhesive the uniting surfaces of the end-paper elements, means to feed the assembled sheets and band or tape, and a presser to act thereon.

3. In combination, devices for progressively assembling two sheets or webs and a hinging band or tape and placing the uniting surfaces thereof in contact with one another with a marginal portion of one sheet or web projecting beyond one edge of the other sheet or web and the band or tape overlapping marginal portions of both sheets or webs, and means for rendering the said uniting surfaces adhesive to effect their union.

4. In combination, devices for progressively assembling two continuous sheets or webs and a hinging band or tape and placing the uniting surfaces thereof in contact with one another with a marginal portion of one sheet or web projecting beyond an edge of the other sheet or web and the band or tape overlapping marginal portions of both sheets or webs, means for rendering the said uniting surfaces adhesive to effect the union when thus placed in contact with one another, and means to sever the sheets or webs and tape transversely into lengths.

5. A machine for making end papers for books, comprising, in combination, devices for assembling the fly-leaf sheet lining-sheet and hinging band or tape with one marginal portion of the fly-leaf sheet projecting beyond an edge of the lining-sheet and with the said band or tape overlapping the corresponding marginal portions of both of the said sheets, means to render adhesive the uniting surfaces of the said elements, and a presser to unite the said surfaces to one another.

6. A machine for making end papers for books, comprising, in combination, means to guide two sheets or webs with a marginal portion of one thereof projecting beyond an edge of the other, means to deliver a hinging band or tape to the overlapping portions of the said sheets or webs, means to render adhesive the

uniting surfaces of the end-paper elements, means to feed the assembled sheets or webs and band or tape, a presser, and means to sever the sheets or webs and tape transversely into lengths.

7. In combination, means to conduct two sheets or webs into contact with each other and guide the same with the marginal portion of one projecting beyond the edge of the other, means to render the said marginal portion and the adjoining marginal portion of the other sheet or web adhesive, means to conduct a band or tape into position to unite with the said marginal portions, and means to press the sheets or webs and band or tape together to effectuate the union thereof.

8. In combination, means to conduct two webs into contact with each other and guide the same with the marginal portion of one projecting beyond the edge of the other, means to render the said marginal portion and the adjoining marginal portion of the other web adhesive, means to conduct a band or tape into position to unite with the said marginal portions, means to press the webs and band or tape together to effectuate the union thereof, and means to sever the same transversely into predetermined lengths.

9. In combination, means to assemble two sheets or webs with a marginal portion of one thereof projecting beyond an edge of the other, devices to render the said sheets or webs adhesive in stripes along, respectively, the said marginal portion adjacent to but at a slight distance from the edge thereof, and the corresponding marginal portion of the other sheet or web, also slightly removed from the edge of the latter sheet or web, means to conduct a hinging band or tape into contact with the said marginal portions of the said sheets or webs, and a feed-roll having a narrow boss acting upon the dry interval between the adhesive stripes.

10. In combination, means to assemble two sheets or webs with a marginal portion of one thereof projecting beyond an edge of the other, devices to render the said sheets or web adhesive in stripes along, respectively, the said marginal portion adjacent to but at a slight distance from the edge thereof, and the corresponding marginal portion of the other sheet or web, also at a slight distance from the edge of the latter sheet or web, means to deliver a hinging band or tape to the said marginal portions of the sheets or webs, and a pair of feed-rolls having narrow bosses acting upon the dry interval between the adhesive stripes.

11. In combination, means to assemble two sheets or webs with a marginal portion of one thereof projecting beyond the adjacent edge of the other, devices to render the same adhesive in stripes along the said marginal portion adjacent to but at a slight distance from the edge thereof, and also along the marginal portion of the other sheet or web at a slight distance from the edge aforesaid, means to deliver a hinging band or tape to the adhesive portions of the sheets or webs, feeding devices acting upon the assembled sheets or webs and band or tape in the dry interval between the adhesive stripes, means to apply pressure to unite the parts, and means to sever the latter transversely into predetermined lengths.

12. A machine for making end papers for books, comprising, in combination, devices to assemble two thicknesses of web material and a hinging band or tape with a marginal portion of one of said thicknesses projecting beyond the edge of the other thereof, and with the band or tape overlapping the corresponding marginal portions of both of the said thicknesses, means to render adhesive the uniting surfaces of the said elements, and means to press the said elements together.

In testimony whereof I affix my signature in presence of two witnesses.

FRITHEOF H. H. HOFFSTEDT.

Witnesses:
CHAS. F. RANDALL,
WILLIAM A. COPELAND.