A. C. PETERSON.

PAD MACHINE.

APPLICATION FILED MAR. 27, 1911.

1,021,068. Patented Mar. 26, 1912.

4 SHEETS—SHEET 1.

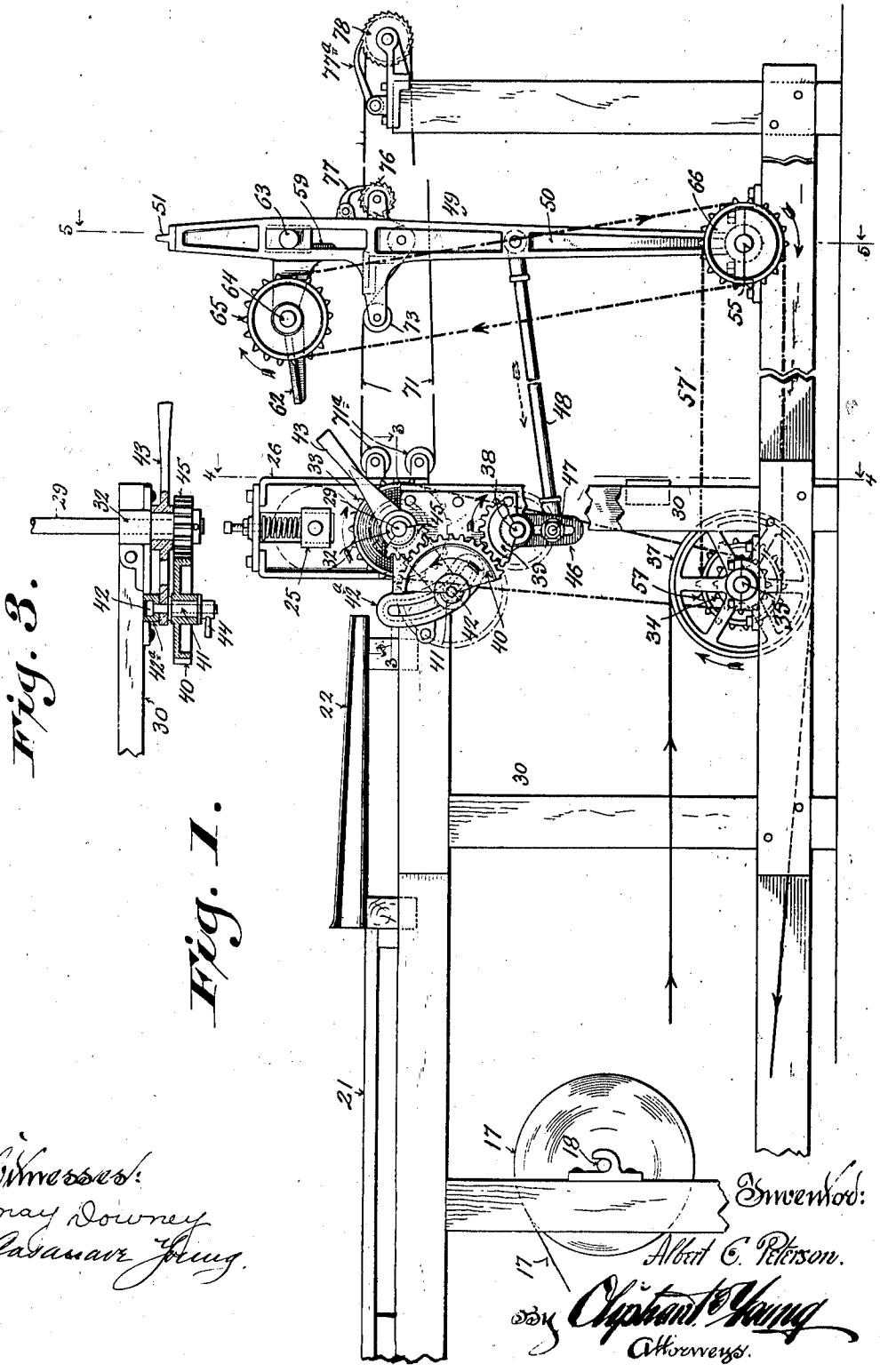

Fig. 1.

Fig. 3.

Witnesses:
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Casaaar Young.

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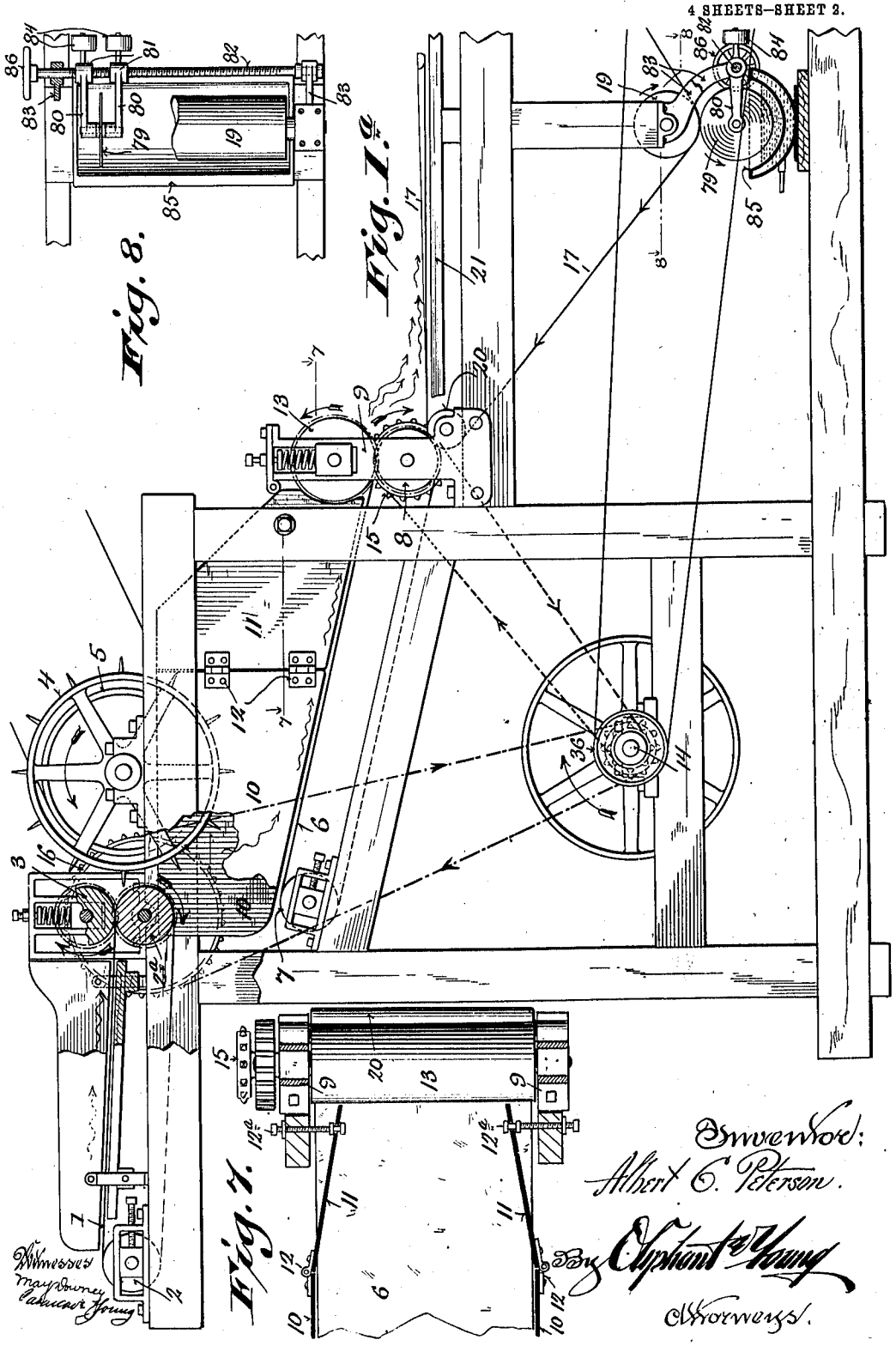

Fig. 8.

Fig. 1.

Fig. 7.

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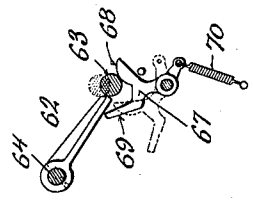

Fig. 6.

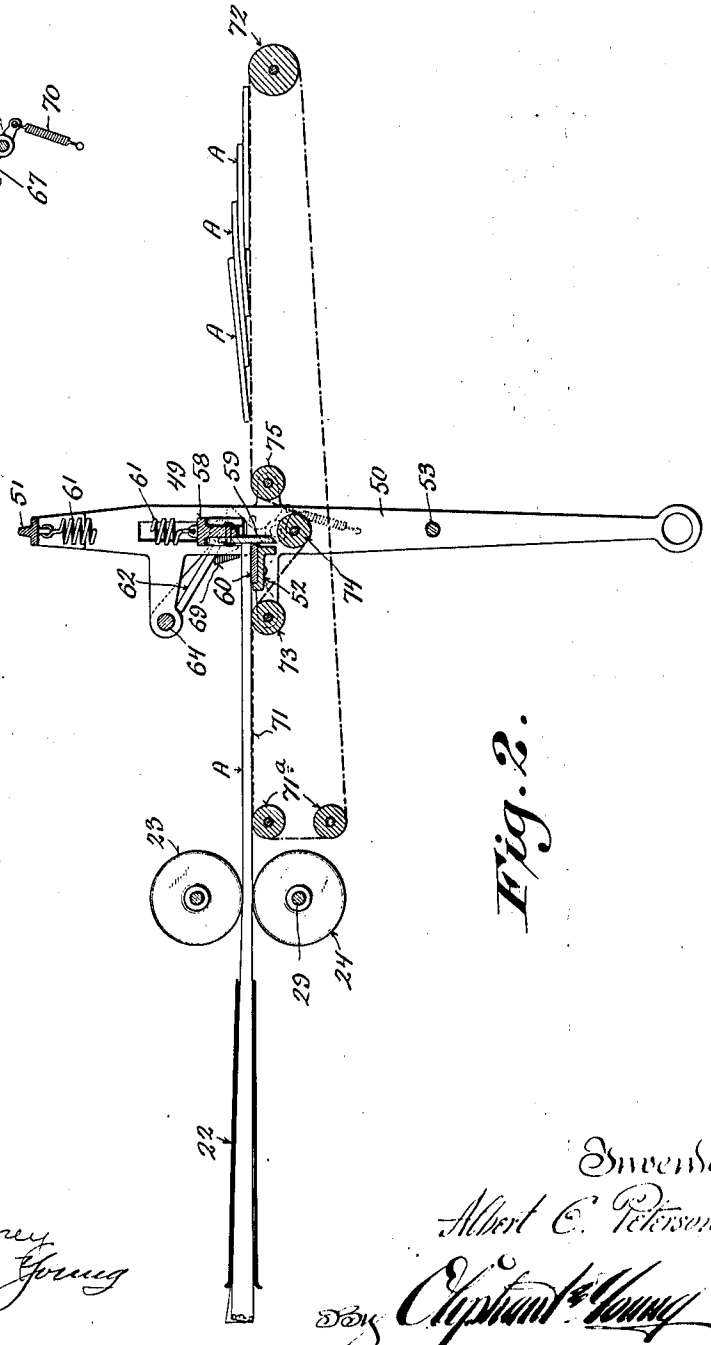

Fig. 2.

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4 SHEETS—SHEET 4.

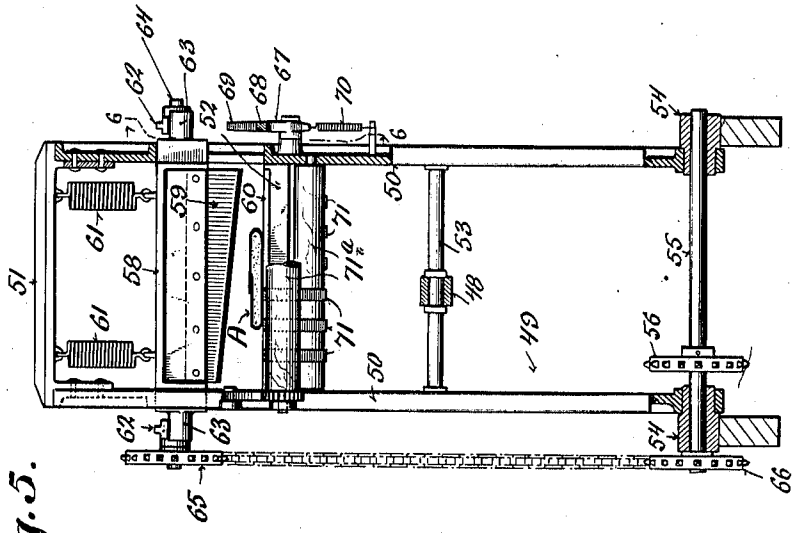

Fig. 5.

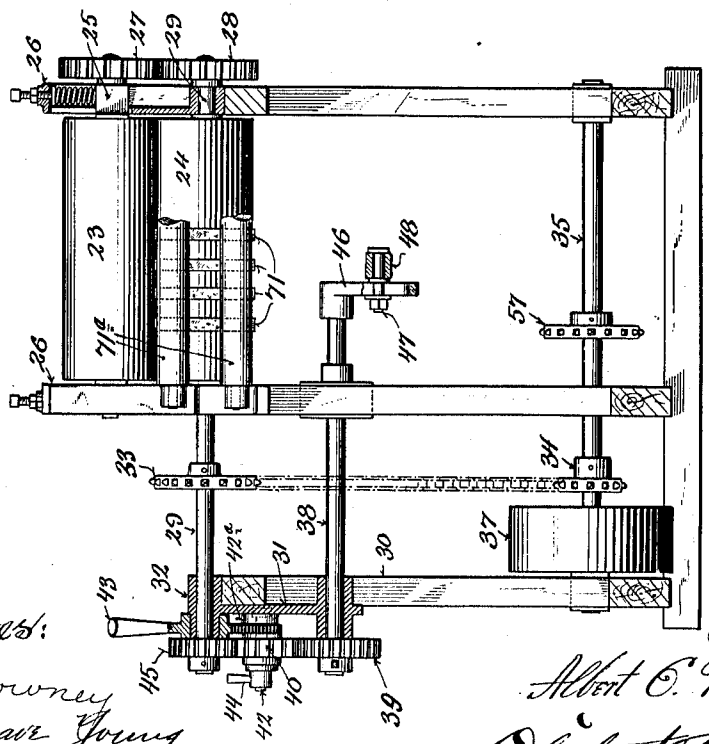

Fig. 4.

Witnesses:
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UNITED STATES PATENT OFFICE.

ALBERT C. PETERSON, OF SHEBOYGAN, WISCONSIN.

PAD-MACHINE.

1,021,068. Specification of Letters Patent. Patented Mar. 26, 1912.

Application filed March 27, 1911. Serial No. 617,116.

To all whom it may concern:

Be it known that I, ALBERT C. PETERSON, a citizen of the United States, and resident of Sheboygan, in the county of Sheboygan and State of Wisconsin, have invented certain new and useful Improvements in Pad-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object to provide a simple and effective machine for manufacturing packing pads of various predetermined sizes, the construction and arrangement being such that an elastic filling is first thoroughly disintegrated by passing through a series of rolls and deposited in an even layer of predetermined width and thickness upon a paper wrapper strip, which strip is thereafter folded upon the filler and sealed. The pad, after being formed by passing through a suitable templet, is compressed between rolls which travel at constant speed, the pad being thereafter supported upon intermittently driven tapes and cut into suitable lengths by a horizontally reciprocative knife mechanism under crank control. The reciprocative movement of the knife mechanism is arranged to travel at approximately the same speed as the travel of the pad during the cutting operation, whereby buckling of said pad coincident to cutting is avoided. By utilizing a link or crank movement for obtaining the horizontal cutting mechanism action, a smooth and continuous movement is the result and thus the machine is capable of high speed and economy in the manufacture of pads. By utilizing an intermittently fed endless tape for supporting the severed pads the action of the mechanism tends to stack the severed pads one upon the other and thus economy in the length of the tapes is had, together with rendering it unnecessary to provide an operator for removing the severed pads at the instant of delivery.

Another object of my invention is to provide a novel rotatory gluing disk having provision for adjustment, whereby glue may be placed upon the edge of the paper in any desired position relative to its width.

With the above objects in view the invention consists in certain pecularities of construction and combination of parts as set forth hereinafter with reference to the accompanying drawings and subsequently claimed.

In the drawings Figure 1 represents a side elevation of the forward or cutting end of a pad machine embodying the features of my invention, parts being broken away and in section to illustrate certain details; Fig. 1ª, a corresponding view of the rear or feed end of the machine with parts broken away and parts in section to more clearly illustrate certain details of construction; Fig. 2, a longitudinal sectional view of the cutting mechanism with the pressure rolls, forming templet and endless tapes shown diagrammatically in their relative positions to said cutting mechanism; Fig. 3, a detail sectional view of an interchangeable driving gear connection for the pressure rolls, the section being indicated by line 3—3 of Fig. 1; Fig. 4, a transverse sectional view as indicated by line 4—4 of Fig. 1; Fig. 5, a transverse sectional view of the cutting mechanism as indicated by line 5—5 of Fig. 1; Fig. 6, a detail sectional view of the cutting mechanism as indicated by line 6—6 of Fig. 5, said view illustrating in detail a starting mechanism for the knife; Fig. 7, a sectional plan view as indicated by line 7—7 of Fig. 1ª, showing adjustable wings for controlling the width of the pad filler which is delivered to the paper strip, and Fig. 8, a detail sectional plan view of the adjustable gluing mechanism.

Referring by numerals to the drawings, 1 indicates a feed apron mounted upon rolls 2, 2ª, which rolls are supported within bearings upon a suitable frame as shown in Fig. 1ª. A spring-controlled roll 3 is mounted above the apron roll 2ª, these rolls being in spur-gear connection with each other and are provided as feeders for the elastic filler, which filler is preferably excelsior. These rolls deliver the excelsior to a toothed cylinder 4 that is mounted upon suitable bearings in the frame and is driven at a high rate of speed by a pulley 5, which pulley is

in independent belt connection with a suitable source of power. The toothed cylinder disintegrates the excelsior and delivers it to a second endless apron 6, which apron is mounted upon an idle roll 7, and a forwardly driven roll 8, the latter having its bearings in a bracket 9 that is secured to the frame. The excelsior is guided upon the face of the belt 6 by means of fixed side-plates 10. To the forward ends of these side plates is connected a pair of adjustable wings 11, by means of hinges 12, the wings being arranged to be adjusted laterally by means of bolts 12^a, which engage the wings and are in screw-threaded connection with the machine frame, as shown in Fig. 1^a and Fig. 7. These wings terminate adjacent to a spring-controlled feed-roller 13, which feed-roller is mounted within the bracket 9 and adapted to exert pressure upon the bottom roll 8, with which roll it is in spur-gear connection.

A main drive-shaft 14 is mounted in suitable bearings carried by the frame and this drive-shaft carries sprocket-gears, one of which is in link-belt connection with a sprocket-gear 15 that is fast upon the shaft of roll 8, whereby motion is transmitted thereto. Another sprocket-gear is carried by the shaft 14 and is in link-belt connection with a large-sprocket-wheel 16, which sprocket-wheel is mounted upon the shaft of roll 2^a, and thus motion is imparted to this roll and from thence to its companion roll 3 through the spur-gear connection previously mentioned.

Referring to Fig. 1, a roll of paper 17, is mounted upon a spindle 18, and this spindle is supported in bearing-brackets carried by one of the vertical standards of the frame. Paper from the roll is passed under an idle roller 19 that is supported in bearings secured to the frame, as shown in Fig. 1^a, and from the roller 19 the paper passes upwardly and over a second idle roller 20, which latter roller is revolubly mounted in bearings provided in the brackets 9. The paper 17 passes between the face of the idle roller 20 and roller 8, and from thence it extends forward upon a table 21 to the front end of the machine and, as shown in Fig. 1, it is then arranged to be passed through a tubular templet 22, where it is folded over upon itself about the filling, and from said tube the folded paper or pad is passed between compression rolls 23, 24, which rolls not only serve to compress and seal the glued-lapped ends of the paper, but also draw and feed the paper strip forward together with the filler material, which material is delivered upon said paper from between the rollers 8 and 13 at the feed end of the machine and thus a pad is formed, a cross-section of which is shown at A, Fig. 5.

The spindle of the compression roll 23 is mounted in bearing-blocks 25 that are opposed by coiled springs supported in brackets 26, which brackets are also provided with slots that serve as guides for the bearing-blocks. One end of the spindle of roller 23 carries a spur-gear 27, which is meshed with a similar spur-gear 28 fast on a shaft 29, upon which the roller 24 is mounted. This shaft 29 is journaled in the brackets 26, and one end thereof extends outwardly from the main frame of the machine and is there supported upon a supplemental frame 30, which frame carries a bracket 31, provided with a suitable bearing 32 for the end of said shaft. The shaft 29, intermediate of the main and supplemental frames, has mounted thereon a sprocket-wheel 33 that is in link-belt connection with a sprocket-pinion 34, which pinion is fast upon a counter-shaft 35 that is journaled in suitable bearings carried by the supplemental and main frame respectively. The counter-shaft receives its motion from a pulley 36 that is fast upon the main drive-shaft 14, as shown in Fig. 1^a, said pulley being in belt connection with a larger pulley 37 that is fast on the counter-shaft 35.

A crank-shaft 38 is revolubly mounted in bearings, one of which extends from the bracket 31, the other being carried by the main frame. A spur-gear 39 is fast upon the front end of the crank-shaft and this spur-gear has meshing engagement with a transmission gear-wheel 40, which wheel is loosely mounted upon a sleeve 41 that is fitted over a stud 42, the stud being carried by an arm 43. The stud 42 projects through the arm into a segmental slot 42^a, that forms part of the bracket 31, which slot is struck from the axis of shaft 29. The head of the stud 42 is housed within the slot and the outer end of said stud is screw-threaded for the reception of a locking-nut 44. The arm 43 is loosely mounted upon a sleeve that projects from bearing 32 of shaft 29, and said arm is provided with a handle extension for the purpose of adjusting the mechanism.

The driving gear mechanism just described is provided for the purpose of obtaining variable speed of the crank-shaft 38, the variation being accomplished by removing the spur-gear 39 and substituting therefor spur-gears of different diameters. After securing a spur-gear 39 upon the crank-shaft, the arm 43 is rotated so as to cause gear-wheel 40 to mesh with the spur-gear 39, after which the nut 44 is tightened upon the stud 42, whereby a locking engagement between said stud, arm 43 and segmental slot is effected. This spur gear-wheel 40 is in constant engagement with a pinion 45 that is fast upon the compression roller shaft 29, whereby motion is transmitted from said

shaft through the train of gear-wheels to the crank-shaft 38.

A slotted crank-arm 46, is secured to the inner end of the crank-shaft, there being an adjustable crank-pin 47 mounted in the crank-arm slot for the reception of a pitman 48, the opposite end of which pitman is connected to a yoke 49. This yoke comprises vertical standards 50, connected by transverse-bars 51, 52 and 53, the lower ends of the standards being loosely mounted upon sleeve extensions of a set of bearings 54 that are supported upon lower longitudinal timbers of the machine frame.

The bearings 54 have mounted thereon an arbor 55 which carries a sprocket-wheel 56 that is connected to a similar sprocket-wheel 57 by a link belt 57′. The sprocket-wheel 57 is fast upon the counter-shaft 35 and, as shown in Fig. 1, the sprocket-wheel 66 being of the same size and alined with the sprocket-wheel 56, the latter does not appear, said sprocket-wheels 56 and 66 being clearly shown in Fig. 5. By this link belt connection between the counter-shaft 35 and arbor 55 motion is transmitted to the cutting mechanism.

The upper ends of the yoke standards 50 are slotted to form guides for a reciprocative cross-head 58, that carries a shear-blade 59, which shear-blade is adapted to engage a shear-plate 60, that is seated upon the transverse-bar 52 of the yoke. The cross-head is normally held against the upper end of the slots in which it is guided by means of coiled-springs 61, said cross-head being reciprocative in opposition to the springs by means of tappet-arms 62, which are adapted to engage lugs 63, that extend from either end of the cross-head, the tappet-arms being fast upon a transversely disposed rotatory shaft 64, that is mounted in bearings extending from the yoke standards. The shaft 64 also carries a sprocket-wheel 65, which is in link-belt connection with a similar sprocket-wheel 66, that is fast upon one end of the arbor 55. By this arrangement rotatory motion is imparted to the tappet-arms, whereby in each completed revolution they engage the yoke and thus cause the knife or shear-blade 59 to be reciprocated, whereby a cutting movement is effected in conjunction with the shear-plate 60. After the tappet-arms have passed beyond the line of travel of the lug 63, the coiled springs 61 will retract the knife-carrying yoke to its normal position. Owing to the fact that the cutting edge of the knife-blade 59 is obliquely disposed, the same, when depressed, will present a greater frictional area to the shear-plate 60 upon the lower side of the blade, and thus, when said yoke has been released by the tappets, it has been found in practice that there is a slight tendency of the knife to "stick" and not respond quickly to the retractive force of the springs. To overcome this tendency I provide a mechanism such as shown in Fig. 6 for imparting an initial positive starting movement to free the knife from the shear-blade, this mechanism being arranged to operate upon that end of said blade which is of greatest width.

The starting mechanism shown primarily consists in an anchor 67, which is pivotally mounted upon the adjacent yoke standard and is provided with a cam-face 68 and a finger 69, the anchor being held in its normal position against a stop-pin by a coiled spring 70, that is connected to the standard and an arm of said anchor.

As shown in Fig. 6, the tappet-arm has depressed the lug 63 of the yoke to its limit. The next movement of said tappet causes it to engage finger 69 of the anchor and thus rock the same upon its axis. This movement causes the cam-face 68 to engage the lug 63 and thus positively impart an initial upward movement thereto, whereby the knife is freed from the shear-plate or started upon its return stroke, the completion of which is obtained through the coiled springs.

A series of longitudinally disposed endless tapes 71 are arranged to extend outwardly from the compression rolls 23 and 24 and between the yoke standards. These endless tapes are supported upon inner rolls 71ª and an outer roll 72, the upper stretch of the tapes being passed over a guide-roll 73, under a second guide-roll 74 and over a third guide-roll 75, all of which rolls are carried by the yoke and serve to deflect the tapes in such position that they will clear the shear-plate and knife when a cutting operation is effected.

The guide-roller 75 is provided at one end with a ratchet-wheel 76, which ratchet-wheel is engaged by a pawl 77 that is carried by the adjacent yoke standard. The outer tape-supporting roller 72 is also provided with a ratchet-wheel 78, that is engaged by a pawl 77ª, which pawl is fulcrumed to a bracket fast to one of the pair of brackets that are carried by the frame standards, said brackets being provided for the purpose of forming bearings for the roller trunnions. By this arrangement it will be understood that when the yoke is moved in a forwardly direction (as indicated by the arrow in Fig. 1) the pawl and ratchet connection of roller 76 will prevent the same from rotating and thus the frictional engagement with said roller will cause the endless tapes to move at the same speed and in the direction of travel as said yoke. In this feed movement of the tapes, roller 76 is free to revolve and the pawl 77 simply rides upon the face of the ratchet-wheel 78. On the return stroke of the yoke, (as indicated by the arrow in

Fig. 1) the pawl and ratchet in connection with roller 72 will prevent movement of the tapes due to the locking effect in connection with said roller, while in this latter movement all of the guide rollers carried by the yoke are free to revolve idly upon the tapes, the pawl and ratchet in connection with guide roller 75 in this instance being free to permit rotation of the latter roller.

In Fig. 1 of the drawings the yoke is shown upon its return or idle stroke, having completed one-half of said stroke. When the return stroke has been completed by a quarter rotation of the crank-arm 46, a length of pad has in the meantime been fed forward by the compression rollers between the shear-plate and knife-blade, which is now open. There is no cutting movement effect upon the initial movement of the forward or feed stroke of the yoke, but when said yoke has approximately completed half of its forward stroke, the tappets 63 cause the knife to descend and a cutting operation is obtained, while the pad is moving at the same speed as said yoke and thus "bunching" or buckling of the pad section rearward of the yoke is obviated. The severed pad section is then carried forward with the yoke and moving tapes for a distance equal to the complete stroke of said yoke, at which point it rests upon the tapes that are now idle. Owing to this movement the next severed pad will be moved forward and slightly overlap the same, as shown in Fig. 2, and thus the severed pads will assume a position, lapped one upon the other, as shown in Fig. 2, the number of such pads depending upon the length of the tapes. By this arrangement a group of pads are stacked upon the tapes and the same may be thus economically and more readily handled than in a case wherein the tapes have a continuous movement.

It is obvious that by increasing or decreasing the speed of the crank-shaft and adjusting the crank-pin, the length of the severed pads may be controlled, and by utilizing a continuous rotatory movement for the tappets which act upon the knife, a smooth and easy running cutting mechanism is obtained, the timing of the various movements being thus insured by the positive gear connections.

The gluing mechanism comprises a disk 79, which is revolubly mounted within a bracket 80, having internally threaded bosses 81, which are in screw-threaded engagement with a rod 82, that extends transversely of the machine and is rotatable in bearings of hangers 83, which hangers also constitute bearings for the paper guide roll 19, as shown in Figs. 1ª and 8. The disk 79 is held against the strip of paper 17 by means of weights 84, which weights are connected to the brackets 80. The disk thus pressed upwardly contacts with the paper strip, which passes between said disk and roll 19. The bottom edge of the disk revolves in a suitably heated glue-basin 85, from which basin glue is picked up by the disk and deposited in a thin layer upon the paper strip as it passes under the roller 19 in its travel. The rod 82 is provided with a hand-wheel 86 for the purpose of rotating said rod, whereby the disk may be transversely adjusted so as to deposit the glue upon the paper strip at any desired position with relation to its width.

I claim:

1. In a pad machine having a pair of compression feed rollers for the pad stock, one or more longitudinally disposed endless tapes located adjacent to the discharge side of the feed rollers, front and rear supporting rollers for the tapes, an oscillatory yoke through which the tapes are adapted to pass, a series of guide rollers for the tapes carried by the yoke, a shear-plate secured to said yoke, a reciprocative cutting blade mounted upon the aforesaid yoke for engagement with the shear-plate, a ratchet-wheel revoluble with one of the guide-rollers, a pawl carried by the yoke for engagement with the ratchet-wheel, and a stop-pawl-and-ratchet-wheel mechanism in connection with one of the tape supporting rolls.

2. In a pad machine having a pair of compression feed rollers for the pad stock, a rotatory arbor, a yoke supported about the arbor axis, the yoke being located at the discharge side of the feed rollers, a shear-plate secured to the yoke, a reciprocative knife-carrying cross-head guided upon said yoke, springs connecting the cross-head and yoke, a rotatory shaft mounted in bearings carried by the yoke, tappet-arms secured to the shaft for engagement with the cross-head, and driving-gears connecting the shaft and arbor.

3. In a pad machine having a pair of compression feed rollers for the pad stock, one or more intermittently movable longitudinally disposed endless tapes located adjacent to the discharge side of the feed rollers, an oscillatory yoke through which the tapes are adapted to pass, a shear-plate carried by the yoke, a spring-controlled knife-carrying cross-head mounted upon said yoke, the knife being adapted to engage the shear-plate, a rotatory shaft carried by the aforesaid yoke, and tappet-arms secured to the shaft for engagement with the cross-head.

4. In a pad machine having a pair of compression feed rollers for the pad stock, a spring-controlled knife-carrying cross-head, a shear-blade disposed under the cross-head, with which the cross-head knife is adapted

to frictionally engage, a tappet mechanism for actuating the cross-head in opposition to its spring-control, and a trip-cam release mechanism for the cross-head engageable with the tappet.

In testimony that I claim the foregoing I have hereunto set my hand at Port Washington in the county of Ozaukee and State of Wisconsin in the presence of two witnesses.

ALBERT C. PETERSON.

Witnesses:
FRANK S. ZANG,
O. E. MORSER.