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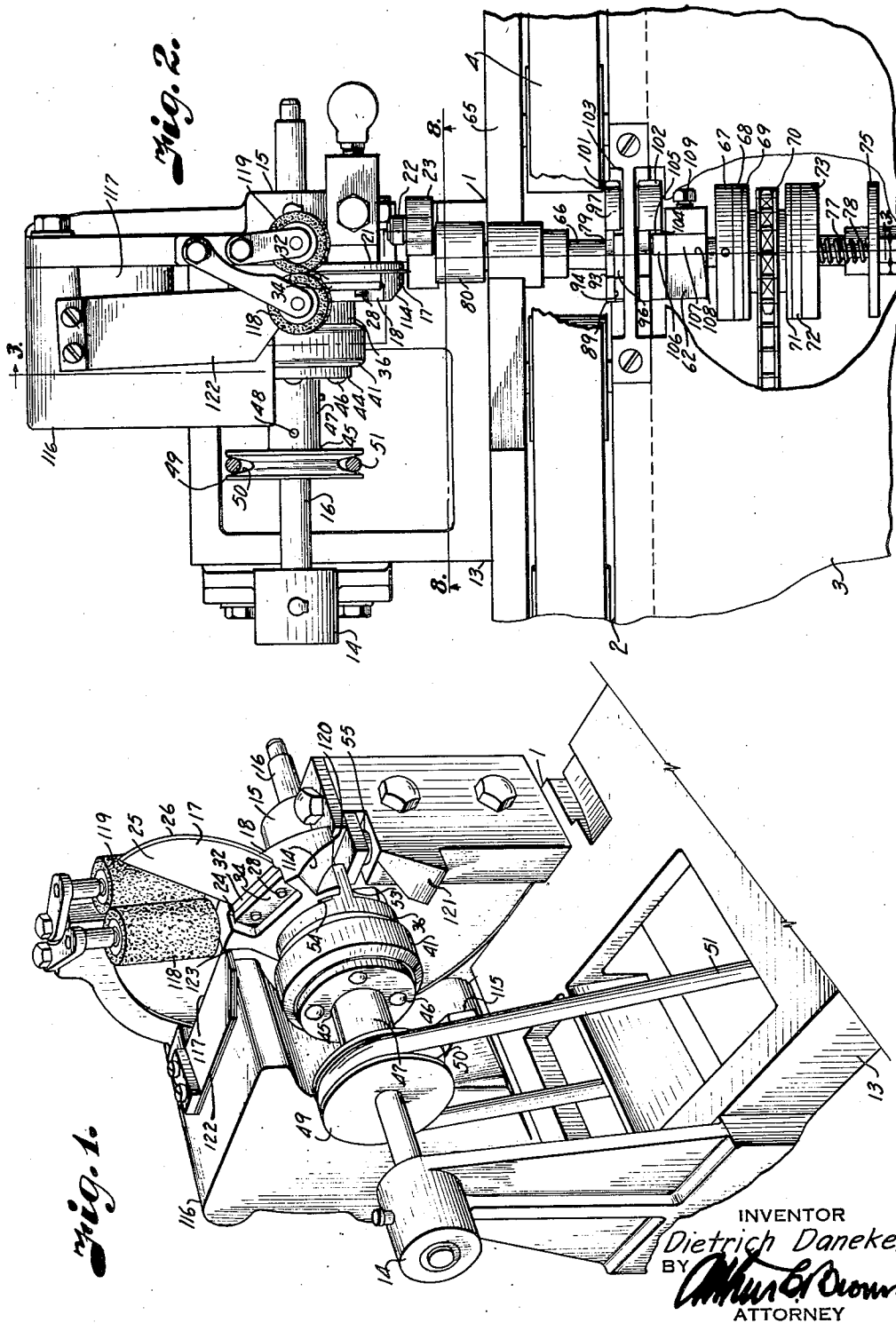
D. DANEKE

2,098,413

STRIPPING MACHINE

Filed Oct. 16, 1936

4 Sheets-Sheet 1



Nov. 9, 1937.

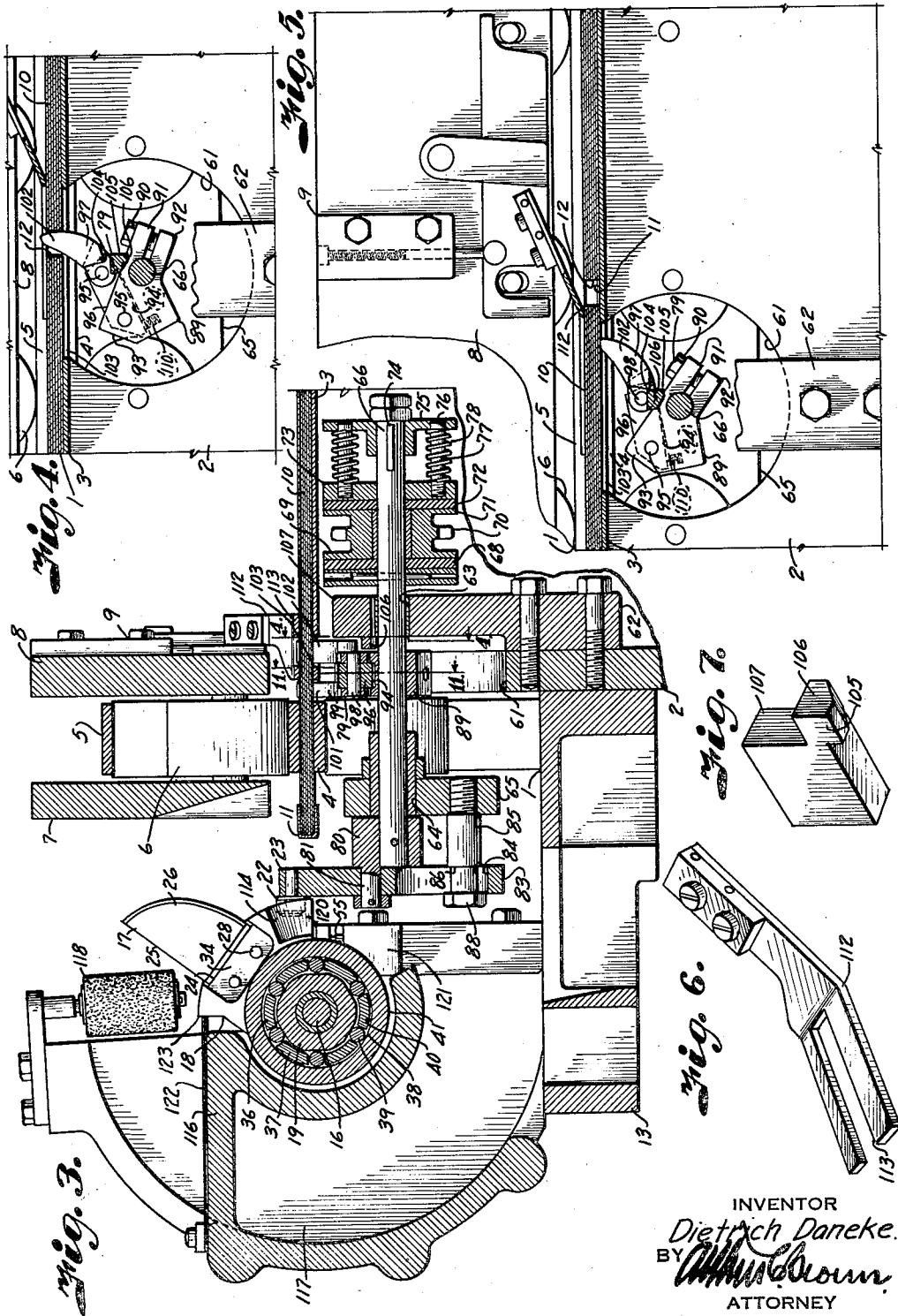
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STRIPPING MACHINE

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4 Sheets-Sheet 2



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STRIPPING MACHINE

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4 Sheets-Sheet 3

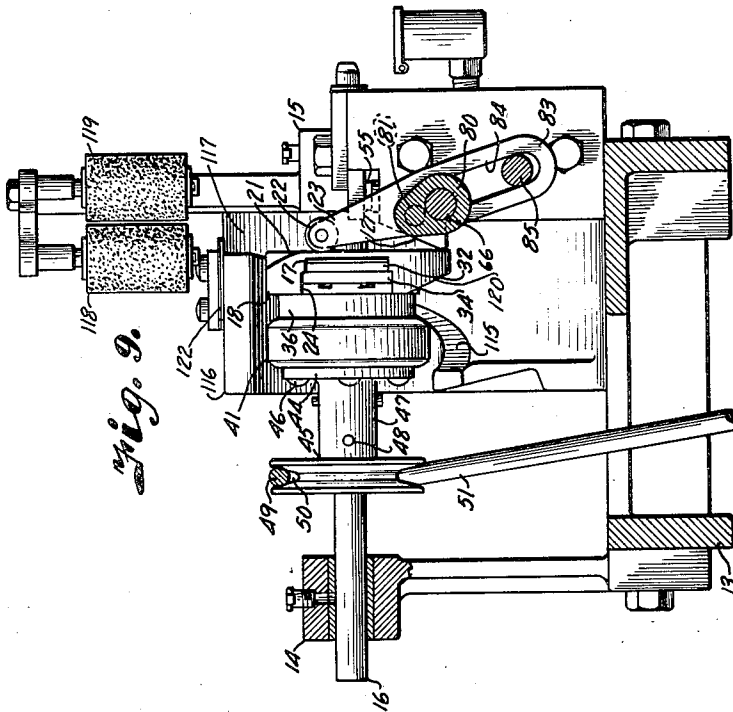


Fig. 9.

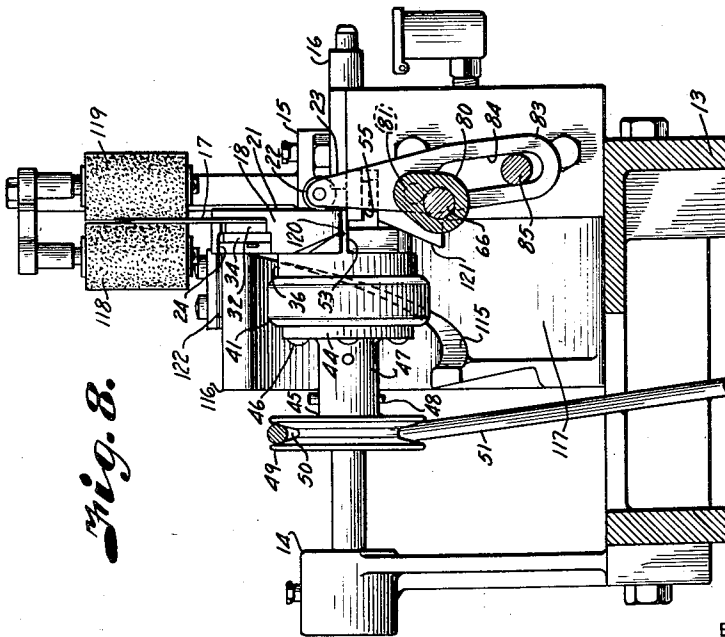
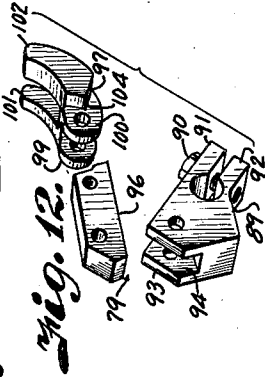


Fig. 8.



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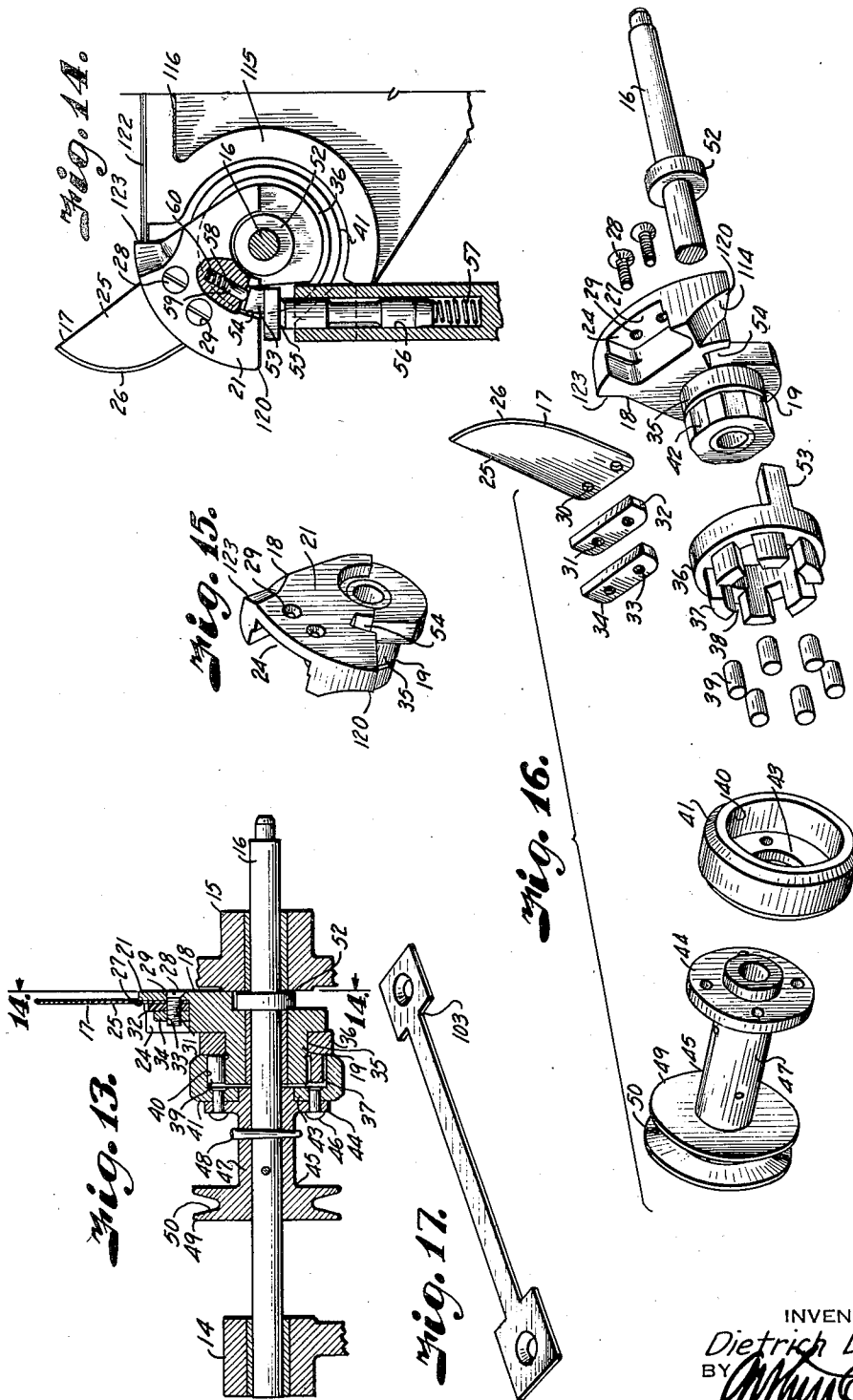
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2,098,413

STRIPPING MACHINE

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4 Sheets-Sheet 4



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2,098,413

STRIPPING MACHINE

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Application October 16, 1936, Serial No. 105,924

15 Claims. (Cl. 164—68)

This invention relates to stripping and similar machines wherewith a strip is applied to individual work-pieces such as tablets, signatures, booklets or the like. In machines of this character the work-pieces are fed through the machine in successive order and the strip is applied thereto in continuous form, the individual work-pieces being subsequently separated by a knife movable through the strip at the points of spacing between the work-pieces. In order that the machine may be operated at maximum capacity it is essential that the spacing between the work-pieces be reduced to minimum; however, unless the knife is operated in exact timed relation with the spacing, the knife cuts into the ends of the work-pieces resulting in damage thereto, and possibly to the knife and its operating mechanism. It is, therefore, a principal object of the present invention to provide for accurate operation of the knife in exact timed relation with the spacing between the work-pieces and to effect shifting movement of the knife with movement of the work-pieces.

It is also an important object of the invention to effect automatic operation of the knife incidental to movement of the work-pieces so that the cuts are made in the desired place without consideration as to lengths of the work-pieces.

It is also an important object of the invention to provide a latch mechanism for retaining the knife in inoperative latched position until tripped by a trigger mechanism engageable between the ends of the respective work-pieces.

In accomplishing these and other objects of the invention, as hereinafter pointed out, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a portion of a stripping machine equipped with a knife and knife operating mechanism embodying the features of the present invention.

Fig. 2 is a plan view of the portion of the stripping machine and knife illustrated in Fig. 1, a part of the table being broken away to better illustrate the knife tripping mechanism.

Fig. 3 is a vertical section on the line 3—3 of Fig. 2.

Fig. 4 is a section on the line 4—4 of Fig. 3 showing the trigger mechanism in tripped position.

Fig. 5 is a similar view showing the trip held in latched position by the work-pieces.

Fig. 6 is a detail perspective view of the foot

for retaining the work-pieces in engagement with the trip.

Fig. 7 is a perspective view of the trip retaining detent.

Fig. 8 is a cross-section on the line 8—8 of Fig. 2, showing the knife in inoperative position.

Fig. 9 is a similar view showing the knife in operative position.

Fig. 10 is a detail perspective view of the crank mechanism for effecting engagement of the knife operating clutch.

Fig. 11 is a detail section through the trigger and its pivotal support on the line 11—11 of Fig. 3.

Fig. 12 is a detail perspective view of the parts shown in Fig. 11 in disassembled spaced relation to better illustrate their construction.

Fig. 13 is a longitudinal section through the knife and its operating clutch.

Fig. 14 is a detail section on the line 14—14 of Fig. 13, particularly illustrating the knife stop for holding the knife in inoperative position.

Fig. 15 is a detail perspective view of the knife carrier.

Fig. 16 is a detail perspective view of the knife and its operating parts shown in disassembled spaced relation to better illustrate their construction.

Fig. 17 is a perspective view of the bridge bar.

Referring more in detail to the drawings:

1 designates a portion of a stripping machine including a side frame 2 and a table 3. Carried on the outer face of the side frame is a belt 4 cooperating with an upper belt 5 to move work-pieces along the length of the table with the edges thereof projecting from the outer side of the belts, as shown in Fig. 3. The upper belt 5 operates over suitable rollers 6 journaled in side plates 7 and 8 of an upper frame 9, as in conventional stripping machine construction.

The work-pieces 10 are moved in successive order across the table and have a binding strip 11 applied to the edge thereof projecting from between the belts and which has been applied as a continuous strip in another part of the machine (not shown). The work-pieces 10 are moved in spaced relation as indicated at 12, to provide room for accommodating a knife that severs the strip to separate the work-pieces, as now to be described.

Supported from the side frame 2 adjacent the point at which the strip is to be severed is a bracket 13 carrying spaced bearings 14 and 15 for rotatably mounting a knife operating shaft 16 that extends parallel with and in substantially the

plane of the work-pieces as best shown in Fig. 3, the shaft being spaced laterally from the normal travel of the strip 11 to accommodate a knife 17 that is rotatable about the axis of the shaft 16 and movable across the strip 11 to separate the individual work-pieces. The knife 17 includes a knife carrier 18 having a hub 19 rotatably mounted on the shaft 16 adjacent the bearing 15. The knife carrier includes an arcuate shaped arm 20 projecting radially from the hub and having a flat face 21 adapted to be contacted with a roller 22 of a control lever 23, later described.

The arm 18 is provided on its opposite face with a recess 24 to mount the knife 17. The knife consists of a flat flexible blade 25 having an arcuate shaped cutting edge 26 positionable in the path of the strip to be severed thereby. The knife is secured against the bottom face 27 of the recess 24 by fastening devices such as screws 28 extending through openings 29 in the arm, registering openings 30 in the knife blade, 31 in a block of rubber 32, and into threaded openings 33 of a retaining bar 34. The knife is thus held in yielding contact against the face 27 incidental to the resiliency of the rubber block 32.

Rotatably mounted on a bearing portion 35 of the hub 19 of the knife carrier is a roller retaining ring 36 having lateral spaced fingers 37 projecting parallel with the axis of the hub to form recesses 38 to accommodate rollers 39, having selective rolling contact with the periphery of the hub and with the inner face 40 of a clutch member 41. The portions of the hub contacted by the rollers are flattened, as indicated at 42, so that when the rollers are retained in the center of the flattened portions the outer peripheries thereof are supported from wedging engagement with the surface 40 of the clutch member 41. The clutch member 41 includes an inwardly extending flange 43 that is fixed to a flange 44 on a sleeve 45 by means of fastening devices, such as rivets 46.

The sleeve 45 includes a portion 47 secured to the shaft by means of tapered pins or the like 48, as best shown in Fig. 13. Also formed as a part of the sleeve is a pulley 49 having a groove 50 in the face thereof mounting a drive belt 51. The drive pulley (not shown) for the belt 51 is preferably located out of the plane of the pulley 49 in the direction of the knife so that the pull on the belt slides the shaft 16 longitudinally in the direction of the bearing 15 to retain a stop collar 52 on the shaft in engagement therewith as best shown in Fig. 13. When the shaft is in this position an arm 53 on the ring 36 projects through a notch 54 in the knife carrier and on the side of the arm in the direction of rotation of the shaft. The arm 53 also engages the head of a plunger 55 that is slidable in a socket 56 formed in a plate attached to the bearing 15, as shown in Fig. 1.

The plunger is normally retained in contact with the arm 53 by a coil spring 57 having one end bearing against the bottom of the socket and its other end against the plunger as shown in Fig. 14. The bottom face of the notch 54 is provided with a bore 58 having a plunger 59 retained in contact with the arm by means of a coil spring 60 seated in the bore and bearing against the plunger, as best shown in Fig. 14. When in this position the roller carrying ring is supported so that the rollers 38 are centered

on the flat sides of the hub and retained from wedging contact with the inner face of the clutch member 40 so that the knife carrier remains in idle position while the shaft is rotating within the bore of the hub.

In order to selectively release the knife, I provide a tripping mechanism operable incidental to passage of the work-pieces as now to be described. Formed in the side frame 2 at a point above the bracket 13, is a substantially cylindrical opening 61 so located that it intersects the upper edge of the frame at a point adjacent the side edge of the table, as best shown in Figs. 4 and 5. Fixed to the inner face of the side frame 2 at a point in alignment with the opening 61 is a bearing bracket 62 having a bearing opening 63 cooperating with a bearing opening 64 in a side bar 65 that extends longitudinally of the frame 2 in spaced relation therewith at a point below the side plate 7 for mounting a shaft 66.

Fixed on the shaft 66 at the inner side of the bearing bracket 62 is a disk 67 supporting a friction washer 68 engageable with the end flange 69 of a sprocket 70, the sprocket 70 being loosely mounted on the shaft to rotate independently thereof under certain conditions. Formed on the opposite side of the sprocket is a flange 71 engaging a friction washer 72 yieldingly supported by a disk 73 that is slidably mounted on the shaft. Fixed on the outer end of the shaft by a spline 74 is a disk 75 having openings 76 slidably mounting pins 77 projecting laterally from the disk 73. The disk 73 is thus retained in driving relation with the disk 75 by the pins and is yieldingly supported in frictional engagement with the washer 72 by means of coil springs 78 sleeved over the pins and having their ends bearing relatively against the disks 73 and 75, as shown in Fig. 4. Action of the springs normally retains the frictional washers in driven relation with the sprocket so that operation of the sprocket effects drive of the shaft 66 through the disks 67, 73 and 75, however, the shaft is normally prevented from rotation by means of a trip mechanism 79.

Fixed on the outer end of the shaft is a crank 80 having a crank pin 81 extending therefrom to pivotally mount the control lever 23, previously mentioned. The control lever 23 includes a bar having a depending lower end 83 provided with a slot 84 engaging a pin 85 projecting from the bar 65. The pin 85 has its outer end shouldered, as at 86, to cooperate with a nut 88 on the reduced end thereof to retain the control arm in guided pivotal relation with the crank. The upper end of the control arm carrying the roller projects into alignment with the arm of the knife carrier 22 so that when the crank 80 rotates in an anti-clockwise direction (Fig. 8) the knife carrier, including the shaft, is moved laterally toward the bearing 14 to move the arm 58 out of engagement with the head of the plunger 55. When this occurs the spring 60 acts against the plunger 59 to cause relative shifting movement between the hub of the knife carrier and the roller retaining ring allowing the rollers 39 to wedge between the hub and the inner annular surface 40 of the clutch member 41, thereby causing planetation of the knife to sever the strip 11.

In order to insure that the knife is operated directly at the time the space between the work-pieces aligns therewith, I provide the tripping mechanism 79 now to be described. The tripping mechanism 79 includes an arm 89 that is clamped to the shaft by means of a screw 90 extending through ears 91 and 92 as shown in Fig. 11. The

arm 89 has a substantially triangular shaped outer end 93 provided with a slot 94. Pivotally mounted within the slot 94 on a pin 95 is a trip supporting lever 96 carrying a trip 97 that is pivotally retained thereon by a pin 98 extending through ears 99 and 100 of the trip and through an opening in the end of the arm as best shown in Figs. 11 and 12. The trip 97 is of arcuate shape and terminates in forked ends 101 and 102 engaging upon opposite sides of a bridge bar 103 that is supported in the plane of the table as best shown in Figs. 2 and 3. The free ends of the trip are rounded to engage under the tablets as shown in Fig. 5.

In order to relieve pressure of the trip against the bottom of the tablets the side of the trip has a tooth 104 engageable with a shoulder 105 on a lug 106 that is provided on a block 107 that is inset in a groove 108 of the bearing bracket 62, as shown in Fig. 2. The inset block is retained in position by means of a set screw 109 threaded in the side of the bearing bracket and having its end engaging against the insert. When the ends of the trip engage under the tablets the tooth 104 engages the shoulder 105 of the lug 106 as shown in Fig. 4, to prevent rotation of the shaft; however, as soon as one of the spaces 12 aligns with the end of the trip, tendency for the shaft to rotate causes the trip to move upwardly into the space between the tablets a sufficient distance to release the tooth of the trip from engagement with the shoulder. The shaft is, therefore, free to rotate in an anticlockwise direction (Figs. 4 and 5) to cause the rocking movement of the control lever that effects release of the knife as just described. As soon as the shaft 66 has made one revolution the tooth on the trip reengages the stop shoulder to prevent further rotation thereof until the trip engages another space between the adjacent ends of the succeeding tablets. The trip is normally retained in latched engagement by a spring 110 engaging under the trip supporting lever and in a socket 111 formed in the trip arm 89, as best shown in Fig. 11.

To assure retention of the tablets against the table, the side of the inner bar 8 carries a presser foot 112 having a slotted forward end 113 to accommodate the ends of the trip when they move through one of the spaces as shown in Fig. 4.

In order to restore the knife to its original position after it has made one revolution, the forward edge of the knife carrying arm is provided with a cam surface 114 that engages a cam track 115 formed as a part of a knife guard 116. The knife guard 116 includes a substantially semicircular housing having a passageway 117 for the knife as it moves toward the outer side of the machine. To remove any of the adhesive from the knife after it has cut through the trip the guard is provided with a pair of wiping rollers 118 and 119 to contact the knife as it is returned to its rest position.

The knife carrier, after being tripped, is positively shifted in the direction of movement of the work-pieces by engagement of the forward edge 120 of the knife arm with a cam 121 formed as a part of the bearing bracket support. As the knife is returning toward its at rest position, a leaf latch spring 122 rides into engagement with a shoulder 123 on the retractive side of the knife arm to prevent its retractive movement or rebound when it engages the lug on the plunger.

In using an apparatus constructed and assembled as described the work-pieces 10 are fed along the table 3 between the belts 4 and 5 with

the edges thereof carrying the binding strip 11 projecting over the edge of the table and in the path of the knife. As the tablets move over the trip 97 the trip is held in depressed condition with the tooth 104 thereof in engagement with the shoulder 105 of the lug 106. The shaft 66 is thus retained against rotation; however, due to the slip clutch, the sprocket 70 continues to rotate, so that when the trip slides off the retractive end of one of the work-pieces and engages in the space 12 therebetween to release the tooth 104, the sprocket is in condition for driving the shaft 66.

Rotation of the shaft 66 actuates the eccentric 80 to cause lateral shifting movement of the roller 22 to shift the knife carrier and its driving assembly in the direction of travel of the work-pieces and in opposition to pull of the belt 51. This shifting movement of the knife assembly causes the knife arm to ride laterally off the stop 53. When this occurs the knife carrier is free to rotate and the roller 39 will therefore be wedged in driving relation with the inner face 40 of the clutch member 41. The knife carrier will then be positively driven to carry the knife across the space between the respective work pieces for severing the binding strip. As the knife moves through the binding strip the fore edge 120 of the knife carrier engages against the cam 121 formed as a part of the bearing supporting post 15 so that the knife is shifted in the same relative position as the movement of the work pieces to effect a perpendicular cut through the binding strip and avoid striking the ends of the work-pieces.

As the knife completes its rotation the cam 114 engages the cam track 115 to effect lateral shifting movement of the knife assembly and its shaft in a reverse direction until the knife carrier arm is in alignment with the plunger 55 whereupon the plunger 59 strikes the arm 53 thereby stopping rotation of the knife carrier and effecting disengagement of the clutch rollers. The clutch member 41 is then free to rotate about the cage member which carries the rollers 39 and the knife is retained in idle position.

Simultaneously with engagement of the knife with the arm 53 of the plunger, the leaf spring 122 on the member 116 drops back of a shoulder 123 on the retractive side of the knife carrying arm, as best shown in Fig. 14. It is thus apparent that the knife is locked between the ends of the spring leaf and the arm 53 on the plunger so as to prevent further movement of the knife until it is again tripped by the tripping mechanism.

During return movement of the knife assembly to its latched position the roller 22 has been moved by the eccentric away from engagement therewith incidental to the continued movement of the shaft 66. As soon as the shaft 66 has made one revolution the trip is again carried into position for engaging under the succeeding work-pieces and the tooth thereof has reengaged the lug 106 to stop rotation of the shaft 66 until the space between the succeeding work-pieces again aligns with the trip, whereupon the trip again operates to effect actuation of the knife and severance of the binding strip.

It is thus obvious that I have provided a severing mechanism that is operated in timed relation with movement of the work-pieces and the knife is therefore operated to sever the binding strip in the time necessary to prevent

damage to the work-pieces. With this arrangement it is obvious that the machine requires no adjustment when variable length work-pieces are run through the machine, and in fact, work-pieces of different lengths may be moved successively through the machine and the cuts are made at the proper intervals for the reason that the knife is operated under control of the work-piece spacings.

10 What I claim and desire to secure by Letters Patent is:

1. In a machine of the character described, means for moving work pieces in a fixed path while connected in spaced relation by a continuous strip, means for severing said strip including a knife, means mounting the knife for movement across and shifting movement in the direction of movement of the work pieces, knife operating means, a clutch connecting the knife with said operating means, means supported in contact with the work pieces to enter said spaces between the work pieces as said spaces approach the knife, and means actuated by said contact means to render the clutch effective in actuating the knife to sever the strip.

2. In a machine of the character described, means for moving work pieces in a fixed path while connected in spaced relation by a continuous strip, means for severing said strip including a knife, means mounting the knife for rotary movement across and shifting movement in the direction of movement of the work pieces, knife operating means, a clutch connecting the knife with said operating means, a trip, means supporting the trip in engagement with the work pieces to enter said spaces between the work pieces as said spaces approach the knife, and means connecting the trip with the clutch to render said clutch effective for actuating the knife to sever the strip.

3. In a machine of the character described, means for moving work pieces in a fixed path while connected in spaced relation by a continuous strip, means for severing said strip including a knife, means mounting the knife for rotary movement across and shifting movement in the direction of movement of the work pieces, knife operating means, a clutch connecting the knife with said operating means, means for latching the knife from rotary movement, a trip, means supporting the trip in contact with the work pieces to enter said spaces between the work pieces as said spaces approach the knife, and release mechanism connected with the trip and controllably engaging with the knife to effect release of the knife from said latch means.

4. In a machine of the character described, means for moving work pieces in a fixed path while connected in spaced relation by a continuous strip, means for severing said strip including a knife, means mounting the knife for rotary movement across and shifting movement in the direction of movement of the work pieces, knife operating means, means for latching the knife from rotary movement, a trip, means supporting the trip in contact with the work pieces for entering said spaces between the work pieces as said spaces approach the knife, and release mechanism connected with the trip and engageable with the knife to effect release of the knife from said latch means.

5. In a machine of the character described, means for moving work pieces in a fixed path while connected in spaced relation by a continuous strip, means for severing said strip including

a knife, means mounting the knife for rotary movement across and shifting movement in the direction of movement of the work pieces, knife operating means, an over-running clutch connecting the knife with said operating means, means for latching the knife from rotary movement and to retain the clutch in disengaged condition, a trip, means supporting the trip in engagement with the work pieces for entering said spaces between the work pieces as said spaces approach the knife, release mechanism connected with the trip and engageable with the knife to effect release of the knife from said latch means and driving engagement of the over-running clutch, and means for effecting shifting movement of the knife.

6. In a machine of the character described, means for moving work pieces in a fixed path while connected in spaced relation by a continuous strip, means for severing said strip including a knife, a shaft supporting the knife, means mounting the shaft for longitudinal shifting movement in the direction of travel of the work pieces, a carrier mounting the knife on the shaft, a clutch on the shaft for connecting the carrier in driving relation with the shaft, means for actuating the shaft including means for retaining the knife carrier in retractive position, and means actuated by the work pieces for effecting shifting of the shaft in the opposite direction to shift the knife with movement of the work pieces.

7. In a machine of the character described, means for moving work pieces in a fixed path while connected in spaced relation by a continuous strip, means for severing said strip including a knife, a shaft supporting the knife, means mounting the shaft for longitudinal shifting movement in the direction of travel of the work pieces, a carrier mounting the knife on the shaft, a clutch on the shaft for connecting the knife carrier in driving relation with the shaft, latching means for the knife carrier, means for actuating the shaft including means for retaining the knife carrier in latched position, and means actuated by the work pieces for shifting the shaft to effect release of the knife carrier and engagement of the clutch to actuate the knife.

8. In a machine of the character described, means for moving work pieces in a fixed path while connected in spaced relation by a continuous strip, means for severing said strip including a knife, a shaft supporting the knife, means mounting the shaft for longitudinal reciprocatory movement in the direction of travel of the work pieces, a carrier mounting the knife on the shaft, a clutch on the shaft for connecting the knife carrier in driving relation with the shaft, latching means for the knife carrier, means for actuating the shaft including means for retaining the knife carrier in latched position, a rock lever bearing on the knife carrier to move the knife carrier out of latched position, and trip mechanism contacting the work pieces including means for actuating the rock lever.

9. In a machine of the character described, means for moving work pieces in a fixed path while connected in spaced relation by a continuous strip, means for severing said strip including a knife, a shaft supporting the knife, means mounting the shaft for longitudinal shifting movement in the direction of travel of the work pieces, a carrier mounting the knife on the shaft, a clutch on the shaft for connecting the knife carrier in driving relation with the shaft,

latching means for the knife carrier, means for actuating the shaft including means for retaining the knife carrier in latched position, a rock lever bearing on the knife carrier to move the knife carrier out of latched position, a trip shaft, an eccentric on the trip shaft for actuating the rock lever, means for rotating the trip shaft including a slip clutch, and a trip mechanism for normally preventing rotation of the trip shaft and engageable between the work pieces to effect release of the shaft and actuation of the knife.

10. In a machine of the character described, means for moving work pieces in a fixed path while connected in spaced relation by a continuous strip, means for severing said strip including a knife, a shaft supporting the knife, means mounting the shaft for longitudinal shifting movement in the direction of travel of the work pieces, a carrier mounting the knife on the shaft, a clutch on the shaft for connecting the knife carrier in driving relation with the shaft, latching means for the knife carrier, means for actuating the shaft including means for retaining the knife carrier in latched position, a rock lever bearing on the knife carrier to move said knife carrier out of latched position, a trip shaft, an eccentric on the trip shaft for actuating the rock lever, means for rotating the trip shaft including a slip clutch, a trip carrier on the trip shaft, a trip on the trip carrier, and means for latching the trip to prevent rotation of the trip carrier when the trip is engaged under the work pieces and releasable when the trip engages the ends of the respective work pieces to effect actuation of the knife.

11. In a machine of the character described, means for moving work pieces in a fixed path while connected in spaced relation by a continuous strip, means for severing said strip, means for actuating the severing means and means controlling actuation of said severing means including a trip shaft, means for rotating the trip shaft including a slip clutch, a trip carrier on the trip shaft, a trip on the trip carrier, and means for latching the trip to prevent rotation of the trip carrier when the trip is engaged under the work pieces and releasable when the trip engages the ends of the respective work pieces.

12. In a machine of the character described, means for moving work pieces in a fixed path

while connected in spaced relation by a continuous strip, means for severing said strip including a knife, means mounting the knife for rotary movement across and shifting movement in the direction of movement of the work pieces, knife operating means, an over-running clutch connecting the knife with said operating means, means for latching the knife from rotary movement, and a cam for returning the knife to latched position.

13. In a machine of the character described, means for moving work pieces in a fixed path while connected in spaced relation by a continuous strip, means for severing said strip including a knife, a shaft supporting the knife, means mounting the shaft for longitudinal shifting movement in the direction of travel of the work pieces, a carrier mounting the knife on the shaft, a clutch on the shaft for connecting the knife carrier in driving relation with the shaft, latching means for the knife carrier, means for actuating the shaft including means for retaining the knife carrier in latched position, means for moving the knife carrier out of latched position, and a cam for returning the knife carrier to latched position.

14. In a machine of the character described, means for moving work pieces in a fixed path and connected in spaced relation by a continuous strip, means for severing said strip, means for moving the severing means across said strip and through the space between said work pieces, means for shifting the severing means in the direction of movement of the work pieces at the time the severing means is passing through said strip, and cam means for returning the knife.

15. In a machine of the character described, means for moving work pieces in a fixed path while connected in spaced relation by a continuous strip, means for severing said strip including a knife, means for operating the knife, a clutch connecting the knife with said operating means, means latchingly retaining the knife in retracted position, a trip, means supporting the trip in contact with the work pieces to enter said spaces, and release mechanism connected with the trip and controllably engaging with the knife to effect release of the knife from said latch means.

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