

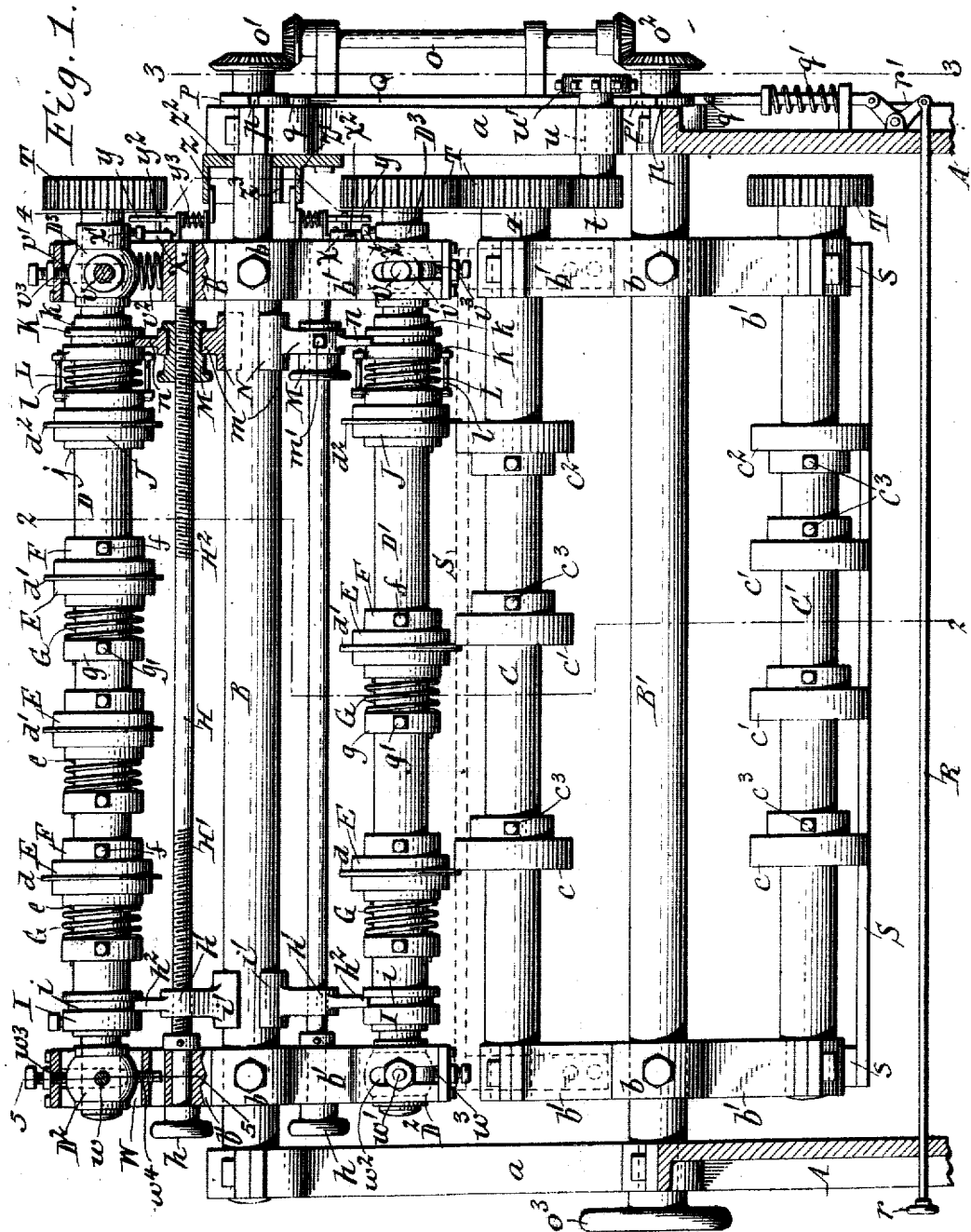
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PATENTED JUNE 19, 1906.

W. J. LUPTON.
PAPER SLITTER.

APPLICATION FILED NOV. 27, 1905.

2 SHEETS--SHEET 1.



Louis W. Gatz.
 Ruth Farrell.

Witnesses.

William J. Lupton, Inventor
by Geyer & Papp Attorneys

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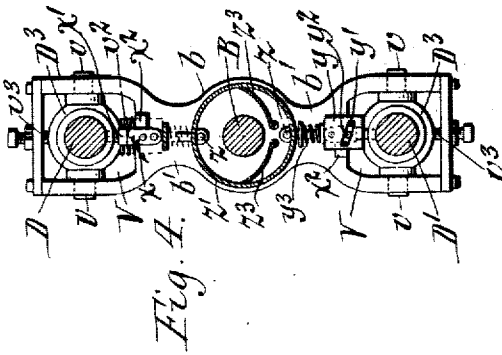
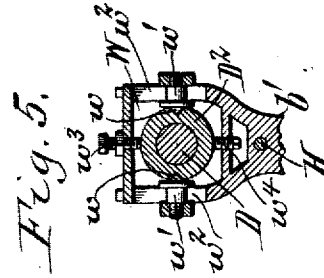
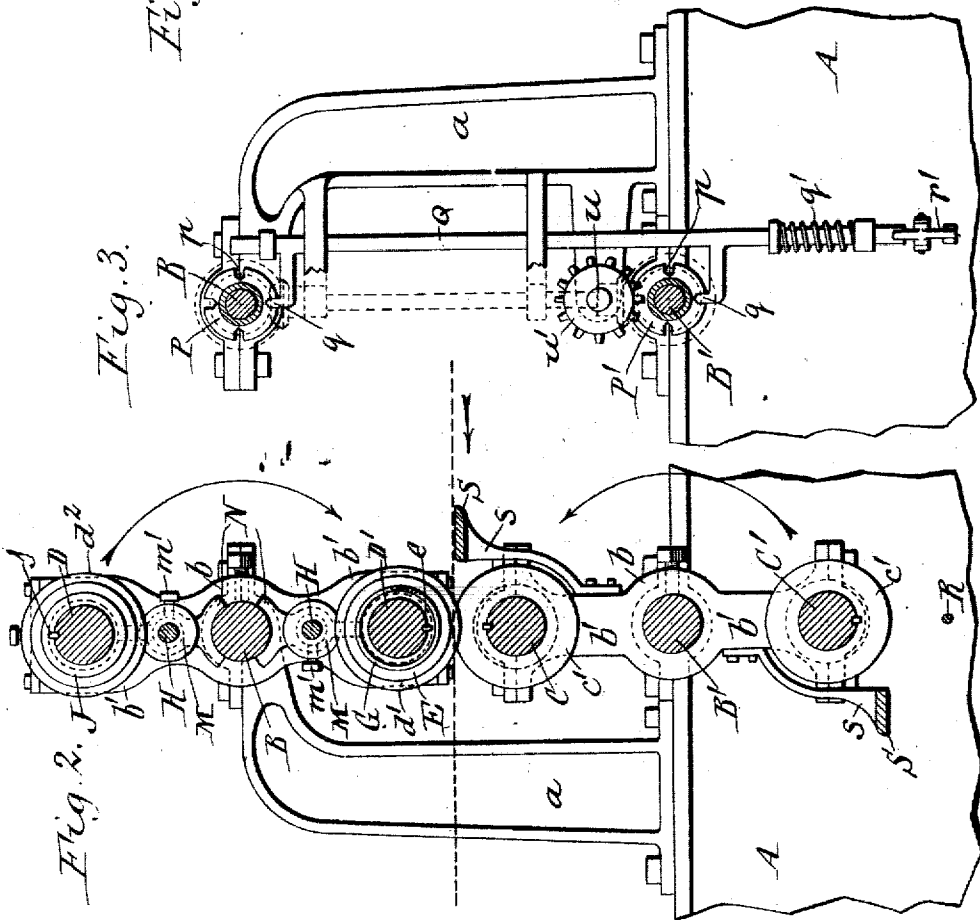
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2 SHEETS--SHEET 2.



Witnesses:
Louis W. Gratz.
Ruth Tarbell.

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UNITED STATES PATENT OFFICE.

WILLIAM J. LUPTON, OF LOCKPORT, NEW YORK

PAPER-SLITTER.

No. 823,797.

Specification of Letters Patent.

Patented June 19, 1906.

Application filed November 27, 1905. Serial No. 289,205.

To all whom it may concern:

Be it known that I, WILLIAM J. LUPTON, a citizen of the United States, residing at Lockport, in the county of Niagara and State of New York, have invented a new and useful Improvement in Paper-Slitters, of which the following is a specification.

This invention relates to a paper-slitter for dividing a web or sheet of paper into a plurality of strips or bands as the same leaves the paper-making machine.

The object of this invention is to provide an efficient slitter for this purpose whereby the change from one size or width of strips to another size can be effected quickly and without the necessity of breaking down the web, which is very compact in construction.

In the accompanying drawings, consisting of two sheets, Figure 1 is a fragmentary vertical section of my improved paper-slitter, taken transversely of the path of the web to be divided. Figs. 2, 3, 4, and 5 are vertical sections in the correspondingly-numbered lines in Fig. 1, taken in direction lengthwise of the path of the web.

Similar letters of reference indicate corresponding parts throughout the several views.

The frame upon which the working parts of my improved slitter are mounted may be of any suitable construction; but I prefer to utilize part of the frame of the paper-cutting machine for this purpose.

In the drawings, A A represent the usual side pieces of the paper-making machine, and a a two overhanging standards mounted on these side frames, which parts serve as the means for supporting the mechanism of my improved slitter.

B B' represent two horizontal reversing shafts arranged parallel one above the other and on opposite sides of the path of the web to be cut. The upper shaft B is journaled in bearings at the upper ends of the standard, and the lower shaft B' is journaled in similar bearings at the upper end of the side pieces of the main frame. Each of the reversing shafts is provided with a pair of hubs or collars b, which are secured to the same near opposite ends thereof, each hub being provided on diametrically opposite sides with supporting-arms b' b', so that each shaft has two pairs of such arms, which are arranged in line and on opposite sides thereof.

C C' represent two lower cutter-shafts,

which are arranged horizontally on opposite sides of the lower reversing shaft and parallel therewith and each of which is journaled at its ends in bearings on the adjacent supporting-arms. Each of the cutter-shafts is provided with a plurality of cutter blades, disks, or wheels c c' c'. The number of these cutter-disks may be varied, and the disks on one cutter-shaft are spaced differently from that of the disks on the other cutter-shaft to enable a web of paper of a given width to be cut into strips of different widths. As shown in Fig. 1, one of the lower cutter-shafts is provided with a set of three cutter-disks, which are spaced to trim off the side edges of the web and divide the same centrally into two strips, while the other lower cutter-shaft is provided with a set of four cutter-disks, which are adapted to trim off the side edges of the web and divide the same into three strips or bands of equal width. Each of the lower cutters may be shifted lengthwise on its shaft into the required position and held in its adjusted position by a set-screw c² or otherwise. In the organization of the machine shown in the drawings either set of lower cutter-disks is in its operative position when it is arranged vertically above the lower reversing shaft, in which position the web of paper from the paper-making machine is fed horizontally over the operative set of disks. By rotating the lower reversing shaft either set of cutter-disks may be brought into working position, and the sheet or web of paper may be divided according to the spacing of the disks of that particular set.

D D' represent two upper reversing shafts which are arranged horizontally on opposite sides of the upper reversing shaft and parallel therewith and each of which is journaled at its opposite end in bearings D² D³, mounted in the supporting-arms on the corresponding side of the upper reversing shaft. Upon each of these upper cutter-shafts is mounted a set of rotary cutter disks or wheels d d' d', the same being adjustable lengthwise on their shafts to permit of cutting the web of paper into different widths on cooperation with the lower cutting-disks. Either set of upper disks is in its operative position when it is arranged vertically below the upper reversing shaft and cooperates with the lower set of cutters, which at this time is above the lower reversing shaft. By turning the upper re-

versing shaft either of its sets of cutters may be brought in the working position. As shown in Fig. 1, one of the upper cutter-shafts is provided with a set of three cutter-disks, which have their peripheral positions engaging against the side of a corresponding set of lower cutting-disks, whereby the web of paper, which is fed horizontally between the same from the paper-making machine, is trimmed off on its opposite marginal-edges and divided into two strips. The other set of upper cutters at this time is above the upper reversing shaft and comprises four disks, which are adapted to cooperate with the set of four lower cutting-disks upon rotating the reversing frames half a turn, whereby the web is trimmed off at its side edges and divided into three strips or bands.

Each of the reversing shafts and the supporting-arms at opposite ends thereof form a rotary reversing frame which carries two sets of rotating cutters on opposite sides of its center, each set being adapted for cooperation with the corresponding set of cutters upon the other frame upon turning both frames into the position to bring the companion cutters into operative relation. While the two companion sets of cutters of the two reversing frames are in their operative position for cutting the web into strips of certain sizes, the companion cutters on the other cutter-shafts are in an inoperative position and free to be adjusted for cutting the web into strips of different widths. In order to change the cutting of the web from one size to another, it is therefore only necessary to turn both frames so as to move the companion operative cutters out of the working position and the companion inoperative cutters into the working position.

It has been found desirable to effect the trimming of the edge of the web by engaging the upper marginal cutters d d^2 with the outer side of the lower marginal cutters c c^2 in order to throw the waste which is removed downwardly, and thereby prevent the same from passing on to the following mechanism and interfering with the operation thereof. It is immaterial, however, on which side the intermediate lower cutters c' are engaged by the upper cutters d' ; but in the drawings these intermediate cutters are engaged relatively to each other, the same as the cooperating cutters c d , which trim the left edge of the web.

In setting the companion sets of cutters of both frames for producing a trimming or division of the web along certain predetermined lines the lower cutting-disks of the respective set are first adjusted along their respective shaft until their cutting edges are in the desired position. Each of the upper sets of cutters is then adjusted for properly cooperating with its companion lower set of cutters by the following means. E represents

the hubs of the upper cutters d d' , which are mounted on their respective shafts and operatively connected therewith by means of splines e , so as to compel the same to turn with their shafts, but permit the cutters to be adjusted lengthwise thereof. F F represent a plurality of stop-collars which are secured by set-screws f to the upper cutter-shafts on the rear sides of the hubs of the upper cutters d d' , so as to limit the axial movement of these cutters on these shafts in a direction from left to right. Each of these cutters is held with its hub yieldingly against its respective stop-collar by means of a spring G , interposed between the front side of the cutter-hub, and another stop-collar g , adjustably secured to the respective shaft by means of a set-screw g' or otherwise. Each of the upper cutter-shafts is adjustable axially, together with the cutters d d' , mounted thereon, by means of a horizontal adjusting-shaft H , journaled in bearings on the adjacent arms of the reversing frame, but held against axial movement therein, right and left screw-threads H^1 H^2 , arranged on opposite ends of said adjusting-shaft, a hand-wheel h , secured to one end of said screw-shaft for turning the same, a screw-nut h' , working on the thread at the left end of the shaft, and a coupling-finger h^2 , projecting laterally from the screw-nut h' into the groove i of a collar I , secured to the left end of the adjacent cutter-shaft. Tilting of this screw-nut is prevented by means of a guide-foot i' , projecting laterally from the opposite side of the nut and sliding lengthwise on the surface of the adjacent reversing shaft. J represents the hubs of the cutters d^2 , which trim off the right margin of the web in cooperation with the right-end cutters c^2 of the lower reversing frame. Each of the upper right-end cutter-hubs is mounted on its respective shaft by means of a spline j , which compels this cutter to turn with its shaft, but permits the same to move lengthwise thereon. K represents grooved coupling-collars which are arranged on the upper cutter-shafts on the right-hand cutter-hubs and which are connected by splines k to said shaft. Springs L are mounted on the upper cutter-shafts between the right-end cutter-hubs and the coupling-collars K for yieldingly separating these parts, this separation being limited in any suitable way, but preferably by means of stop rods or bolts l , which are connected at one end with lugs on the coupling-collars K , while their opposite ends slide loosely through lugs on the cutter-hubs J and are provided with heads or shoulders engaging with the last-mentioned lugs, as shown in Fig. 1. M represents a screw-nut engaging with the thread on the right end of the adjusting-shaft H and secured to a carrier m , having a finger n on one side, which engages with the groove in the coupling-collar K , while its opposite side is provided with

a guide-foot N, which slides lengthwise on the surface of the adjacent reversing shaft. The screw-nut M is provided with shoulders engaging with opposite sides of the carrier *m*, so that upon turning this nut in one direction or the other the carrier will be moved lengthwise of the adjusting-shaft H, together with the right-end cutter *d*², which is coupled therewith. After this cutter has been adjusted to the proper position the screw-nut M is held against turning in the carrier by means of a set-screw *m*¹.

After the cutter-disks of one set on the lower rotary frame have been adjusted to the required position the companion upper left-end marginal cutter *d* and intermediate cutters *d*¹ are adjusted on their respective shaft so as to stand in the proper position relatively to their companion lower cutters by adjusting the rear stop-collars F accordingly on their shaft. The companion upper right-end marginal cutter *d*² is also adjusted on its shaft by means of the screw-nut M, so that it cooperates with the right-end marginal cutter *c*² of the companion lower set. After such adjustment of the upper set of cutters has been effected and preparatory to moving the same and the companion lower cutters into their working position the adjusting-shaft H is turned in the direction for causing the upper cutter-shaft and the left-end and intermediate cutters thereon to be moved toward the left a short distance while the right-end cutter is moved a similar distance toward the right, this opposite movement of these parts being effected by reason of the screw-threads H¹ H², which engage with the screw-nuts *h*¹ J, inclining in opposite directions. The upper set of adjusted cutters having been now moved slightly out of their operative position, the two rotary frames are reversed, so as to bring the upper and lower sets of adjusted cutters into their operative position above and below the path of the web which is to be trimmed and divided. The adjusting-shaft H of the operative upper cutters is now turned in the reverse direction, whereby the operative upper cutter-shaft, together with the left marginal cutter *d* and the intermediate cutters *d*¹, are carried toward the right and engaged with the left side of their companion lower cutters *c* *c*¹, while at the same time the right marginal cutter *d*² is moved toward the left and engaged with the right side of its companion lower right-hand marginal cutter *c*². If one of the upper cutters should engage its companion lower cutter somewhat in advance of the other cutters in the same set, the springs G I, whereby the same are backed up, yield the required extent, thus preventing injury to the parts, while permitting all of the cutters to properly engage each other without necessitating absolutely perfect adjustment of the upper and lower cutters relatively to each other.

The two frames supporting the two sets of cutters may be turned by any suitable means for moving two companion sets into the working position and the other two companion working sets out of the working portion. The reversing of these frames is preferably effected in unison by means of a vertical intermediate shaft *o*, journaled in suitable bearings on the stationary part of the machine and operatively connected at its opposite ends by means of intermeshing bevel-gears *o*¹ *o*², connecting the same with the adjacent ends of the upper and lower reversing shafts. These shafts are preferably turned by means of a hand-wheel *o*³, applied to the front end of the lower reversing shaft, as shown in Fig. 1.

In the use of the splitter it is necessary to hold the reversing frames rigidly in the different positions in which the same are adjusted, which positions are preferably four in number—viz., the working positions of either companion sets of cutter while the other companion sets are out of working position and two intermediate positions, in which all of the sets of cutters are out of working position. The preferred means for holding the reversing frames rigidly in different quarters of their rotary movement consists of locking-disks P P', secured to the corresponding ends of the reversing shafts and each provided in its periphery with four equidistant notches or recesses *p*, a vertically-movable locking-bar Q, guided on the adjacent part of the main frame and provided with locking pawls or dogs *q*, adapted to engage with corresponding notches on the under sides of the locking-disks, a spring *q*¹, operating to shift the locking-bar in the direction for holding the dogs in engagement with the locking-disks, and a horizontal shifting-rod R, having a handle *r* at its front end and its rear end connected with the lower end of the locking-bar by means of an elbow-lever *r*¹, so that upon pulling the rod forwardly the dogs *q* will be disengaged from the locking-disks to permit of rotating the reversing frames when desired.

The web is guided between the operative cutter-disks by arranging a guide-bar S lengthwise in front of each lower set of cutter-disks and supporting the same at its ends by brackets *s* on the adjacent supporting-arms of the lower reversing frame, as shown by full lines in Fig. 2 and by dotted and full lines in Fig. 1. In addition to directing the paper between the cutter-disks the same is prevented from resting on the lower disks and being marred thereby.

The notches in the locking-disks are so arranged that each reversing frame may be held in the positions in which either one or the other of its set of cutting-disks is in its operative position, or the same may be held in a midway position, in which its two sets of cutter-disks are arranged horizontally side

by side, in which position both sets of cutters are out of operation and the web passes from the paper-machine through the slit without being trimmed or divided into strips. Various means may be provided for rotating the cutter-shafts in the direction for moving their opposing portions in the same direction in which the web of paper moves which is being severed when these cutters are in their working position. The preferred means for this purpose shown in the drawings are constructed as follows: T represents gear-wheels arranged on the corresponding ends of the several cutter-shafts. Upon turning these frames so that two of their companion sets of cutters are in a working position the peripheries of the gear-wheels which are mounted on the respective cutter-shafts intermesh and cause these cutters to rotate in unison. Upon turning these frames so that the companion sets of cutters are not in a working position their companion gear-wheels are disengaged, so that the rotation of these cutters is arrested. Motion is transmitted to the operative cutters by means of a pinion f engaging the gear-wheel of one of the cutter-shafts of a set of cutters while in its operative position. As shown in Fig. 1, this pinion engages with the lower side of the gear-wheel on the shaft of the lower set of cutters while the same is in working position. This pinion is secured to a horizontal driving-shaft u , which is journaled in the adjacent part of the frame and driven by a belt passing around a sprocket-wheel u' on the driving-shaft or by any other suitable means. Each of the gear-wheels of the lower shafts is engaged with this driving-pinion as the respective lower set of cutters is moved into its operative position, but is again disengaged therefrom when this set of cutters is moved out of its operative position.

In order to prevent injury to the gear-wheels T if the teeth of the companion pair should engage each other end to end upon reaching their operative position, means are provided for permitting one of the cutter-shafts to yield until these gear-wheels during their continued rotation drop into proper mesh. For this purpose each of the upper cutter-shafts has its right-end bearing D^3 , which is next to the driving gear-wheel T, so mounted that it is movable radially on the reversing frame, while the bearing D^2 at the opposite end of said shaft is swiveled on the adjacent part of the reversing frame. As shown in Figs. 1 and 4, each of the radially-movable bearings D^3 is arranged in a recess V in the outer end of the respective supporting-arm and provided on opposite sides with pins or lugs v , which are guided in slots v' formed in said arm on opposite sides of said recess and is constantly moved outwardly by means of a spring v^2 , interposed between the inner side of this bearing and the bottom of

the recess V, while its inward movement is limited by means of an adjustable stop v^3 , consisting of a screw arranged in a cap which closes the outer end of said recess. Each of the swiveled or pivoted bearings D^2 is arranged in a recess W, formed in the outer end of the adjacent supporting-arm, and is provided on opposite sides with conical seats, which are engaged by correspondingly-shaped pivots w . These pivots are formed on the inner ends of bolts w' , which are arranged in radial slots w^2 , formed in the adjacent supporting-arm on opposite sides of the recess W and each having its head bearing against the inner wall of said recess, while its nut bears against the outer wall of the same, as shown in Figs. 1 and 5, for holding the pivots w adjustably in place. As the upper cutter-shaft is deflected at its right end by improper engagement of its gear-wheel with that of the companion lower gear-wheel the same turns bodily on the pivots w out of its normal position and compresses the spring v^2 ; but when the teeth of the two wheels stand in their proper position relatively to each other the deflected shaft is shifted into its normal position by the resilience of said spring and the gear-wheels are retained in proper driving engagement with each other.

w^3 w^4 represent adjusting-screws arranged on the left upper arms at the inner and outer ends of their recesses W and engaging with the corresponding ends of the swivel-bearings. By turning the screws w^3 w^4 and also the screws v^2 in the proper direction the upper cutter-shafts may be moved radially on the upper reversible frame to a limited extent for adjusting the lap of the upper cutters to the lower cutters and compensating for any wear on the periphery of the same.

In order to hold the upper cutter-shafts rigidly in their working position after the driving gear-wheel of each of these shafts is in engagement with its companion lower gear-wheel the following means are provided, which are best shown in Figs. 1 and 4. x x represent two movable latches, which are pivoted at their inner ends on the adjacent supporting-arms of the upper rotary frame, in which the radially-movable bearings are guided. Each of these latches is movable laterally with its free outer end into and out of engagement with an adjustable abutment or shoulder x' on the outer end of the adjacent radially-movable bearing, said abutment preferably consisting of a screw. The movement of the latch when its outer end reaches its operative position underneath the screw x' is arrested by means of a stop x^2 on the adjacent supporting-arm, as shown in Fig. 4. The lateral movement of this latch into and out of its operative position is effected by a radially-movable slide y , having a cam-shaped slot y' , which receives a pin y^2

on the adjacent latch. The slide is moved inwardly, or in the direction for shifting the latch into engagement with the abutment-screw x' , by means of a spring y^3 , which surrounds the latch and bears at one end against a shoulder thereon and at its opposite end against a part of the upper reversing frame. The inward movement of the slide for moving the latch out of the path of the abutment-screw x' is effected by means of a tappet or shifting-finger z , arranged at the inner end of the slide, a stationary guide-ring z' , arranged concentrically about the adjacent part of the upper reversing shaft and secured to a supporting-plate z^2 , and two movable cams z^3 , which are arranged tangentially or eccentrically within the guide-ring and are pivoted at their inner ends to the supporting-plate z^2 , so as to leave an intervening space between the same, while their outer ends rest loosely against the bore of said guide-ring, as represented in Figs. 1 and 4. When one of the upper cutter-shafts is in its lower operative position, with its gear T properly in mesh with that of the companion gear-wheel on a lower cutter-shaft, the finger z of the shifting slide y is resting on the bottom of the guide-ring, as shown in Figs. 1 and 4, and said slide holds the latch with its free end over the abutment x' of the lower radially-movable bearing, so that the operative upper cutter-shaft cannot rise, thus compelling its cutters to shear the web of paper which is being operated upon and preventing the web from lifting said cutters. Upon rotating the upper cutter-frame a half-turn the shifting-finger z of the slide y engages with the under side of one of the cams z^3 and lifts the same, and as this finger clears the free end of this cam the latter again drops back into its normal position against the bore of the guide-ring. At the same time the shifting-finger of the other shifting slide y is moved from the top of the guide-ring downwardly along the opposite inner side of the same and over the other cam z^3 . The latter acts on the shifting-finger z of the downwardly-moving slide and raises the latter, whereby the latch is moved laterally out of the path of the abutment-screw x' , thus permitting the radially-movable shaft-bearing to yield inwardly if its gear-wheel should climb with its teeth on top of those of the lower companion gear-wheel. On account of the continued rotation of these parts while thus improperly engaged the teeth will soon be shifted in position so that they will mesh properly by the time the reversing frame has completed a half-turn and the upper cutters have been shifted into their operative position above their companion lower cutters. As the rotary frame completes its half-turn the shifting-finger z drops off the inner end of the cam z^3 and through the space between the same and the inner end of the other cam z^3 and upon the lower

side of the guide-ring z' , whereby the slide is shifted in the direction for again bringing the latch over the abutment-screw x' and holding the respective radially-movable bearing in position.

By employing two retracting-cams z^3 , which are arranged eccentrically within the guide-ring, the controlling-slides are operated regardless of whether the cutter-frames are rotated in one direction or the other. If these frames are rotated constantly in one direction in changing from one cutter to another, it will only be necessary to employ one of the retracting-cams, and the same may be made stationary instead of movable.

I claim as my invention—

1. A paper-slitter comprising two frames arranged on opposite sides of the path of the web to be cut and each pivoted on an axis parallel to the plane of said web and capable of making a complete turn, two sets of cutters mounted on each frame, and means for turning said frames and bringing the companion sets of cutters thereof into coöperative relation, substantially as set forth.

2. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, two sets of cutters mounted on each of said frames on opposite sides of its pivot, and means for turning said frames for bringing each of its sets of cutters between the two pivots of the two frames, substantially as set forth.

3. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, coöperating cutters mounted respectively on said frames and connecting mechanism between said frames operating to turn the same together substantially as set forth.

4. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, coöperating cutters mounted respectively on said frames and connecting mechanism between said frames operating to turn the same together and consisting of an intermediate shaft and bevel-gearing connecting said shaft with the pivot of said frames, substantially as set forth.

5. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, coöperating cutters mounted respectively, on said frames, and a locking device for holding both of said frames against turning, consisting of locking-disks arranged on the pivots of said frames and each having notches or recesses in its periphery, a reciprocating locking-bar, and pawls arranged on said bar and constructed to enter the notches or recesses of said disks, substantially as set forth.

6. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, coöperating cutters mounted respectively on said frames, and a

locking device for holding both of said frames against turning, consisting of locking-disks arranged on the pivots of said frames and each having notches or recesses in its periphery, a reciprocating locking-bar and pawls arranged on said bar and constructed to enter the notches or recesses of said disks, a spring for moving said bar in one direction and a shifting-rod connected by an elbow-lever with said bar and operating to move the same in the opposite direction, substantially as set forth.

7. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, cutter-shafts journaled on each of said frames on opposite sides of its pivot and parallel therewith, cutters mounted on each of said cutter-shafts, and a gear-wheel mounted on each cutter-shaft, the gear-wheel of the companion cutter-shaft of the two frames being movable into and out of engagement with each other upon rotating said frames, substantially as set forth.

8. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, cutter-shafts journaled on each of said frames on opposite sides of its pivot and parallel therewith, cutters mounted on each of said cutter-shafts, gear-wheels mounted on said cutter-shafts, and the gear-wheels of the companion shafts of both frames being movable into and out of engagement upon rotating said frames, and a driving gear-wheel arranged to be engaged by one of each pair of companion gear-wheels upon turning said frame into an operative position, substantially as set forth.

9. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, cutter-shafts arranged on said frames and parallel therewith, swiveling bearings pivoted on one of said frames and each supporting one end of one of its cutter-shafts, a radially-movable bearing guided on said last-mentioned frame supporting the opposite end of one of its cutter-shafts, and a gear-wheel secured to the last-mentioned cutter-shaft adjacent to its radially-movable bearing and adapted to move into and out of engagement with a gear-wheel on the other cutter-shaft, substantially as set forth.

10. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, cutter-shafts arranged on said frames and parallel therewith, swiveling bearings pivoted on one of said frames and each supporting one end of one of its cutter-shafts, a radially-movable bearing guided on said last-mentioned frame supporting the opposite end of one of its cutter-shafts, a gear-wheel secured to the last-mentioned cutter-shaft adjacent to its radially-movable bearing and adapted to move into and out of engagement with a gear-wheel and the other cutter-shaft, and springs operating to

hold said radially-movable bearing yieldingly in its normal position, substantially as set forth.

11. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, cutter-shafts arranged on said frames and parallel therewith, swiveling bearings pivoted on one of said frames and each supporting one end of one of its cutter-shafts, a radially-movable bearing guided on said last-mentioned frame supporting the opposite end of one of its cutter-shafts, a gear-wheel secured to last-mentioned cutter-shaft adjacent to its radially-movable bearing and adapted to move into and out of engagement with a gear-wheel on the other cutter-shaft, and radially-adjustable pivots mounted on one of said frames and supporting said swiveling bearing, substantially as set forth.

12. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, cutter-shafts arranged on said frames and parallel therewith, swiveling bearings pivoted on one of said frames and each supporting one end of one of its cutter-shafts, a radially-movable bearing guided on said last-mentioned frame and supporting the opposite end of one of its cutter-shafts, a gear-wheel secured to last-mentioned cutter-shaft adjacent to its radially-movable bearing and adapted to move into and out of engagement with a gear-wheel on the other cutter-shaft, and pivots for said swiveling bearing arranged on bolts which are adjustable radially in slots formed in one of said frames, substantially as set forth.

13. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, cutter-shafts arranged on said frames and parallel therewith, swiveling bearings pivoted on one of said frames and each supporting one end of one of its cutter-shafts, a radially-movable bearing guided on said last-mentioned frame supporting the opposite end of one of its cutter-shafts, a gear-wheel secured to said last-mentioned cutter-shaft adjacent to its radially-movable bearing and adapted to move into and out of engagement with a gear-wheel and the other cutter-shaft, pivots for said swiveling bearing adjustable radially on one of said frames and adjusting-screws mounted on said last-mentioned frame and engaging with the inner and outer sides of said swiveling bearing, substantially as set forth.

14. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, cutter-shafts arranged on said frames and parallel therewith, swiveling bearings pivoted on one of said frames and each supporting one end of one of its cutter-shafts, a radially-movable bearing guided on said last-mentioned frame supporting the opposite end of one of its cutter-shafts,

a gear-wheel secured to last-mentioned cutter-shaft adjacent to its radially-movable bearing and adapted to move into and out of engagement with a gear-wheel and the other cutter-shaft, a spring arranged on said last-mentioned frame and bearing against the inner side of said radially-movable bearing, and an adjusting-screw arranged on said last-mentioned frame and bearing against the outer side of said radially-movable bearing, substantially as set forth.

15. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, cutter-shafts arranged on said frames and parallel therewith swiveling bearings pivoted on one of said frames and each supporting one end of one of its cutter-shafts, a radially-movable bearing guided on said last-mentioned frame and supporting the opposite end of one of its cutter-shafts, a gear-wheel secured to the last-mentioned cutter-shaft adjacent to its radially-movable bearing and adapted to move into and out of engagement with a gear-wheel on the other cutter-shaft, and a locking device for holding said radially-movable bearing in its normal position, substantially as set forth.

16. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, cutter-shafts arranged on said frames and parallel therewith, swiveling bearings pivoted on one of said frames and each supporting one end of one of its cutter-shafts, a radially-movable bearing guided on said last-mentioned frame and supporting the opposite end of one of its cutter-shafts, a gear-wheel secured to last-mentioned cutter-shaft adjacent to its radially-movable bearing and adapted to move into and out of engagement with a gear-wheel on the other cutter-shaft, and an automatic locking device for holding said radially-movable bearing in its normal position and operated by the rotation of said last-mentioned frame, substantially as set forth.

17. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, cutter-shafts arranged on said frames and parallel therewith, swiveling bearings pivoted on one of said frames and each supporting one end of one of its cutter-shafts, a radially-movable bearing guided on said last-mentioned frame and supporting the opposite end of one of its cutter-shafts, a gear-wheel secured to the last-mentioned cutter-shaft adjacent to its radially-movable bearing and adapted to move into and out of engagement with a gear-wheel on the other cutter-shaft, and a locking device for holding said radially-movable bearing in its normal position consisting of a latch mounted on the last-mentioned frame and engaging with an abutment on said radially-movable bearing, and a cam operatively connected with said latch, substantially as set forth.

18. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, cutter-shafts arranged on said frames and parallel therewith, swiveling bearings pivoted on one of said frames and each supporting one end of one of its cutter-shafts, a radially-movable bearing guided on said last-mentioned frame and supporting the opposite end of one of its cutter-shafts, a gear-wheel secured to the last-mentioned cutter-shaft adjacent to its radially-movable bearing and adapted to move into and out of engagement with a gear-wheel on the other cutter-shaft, and a locking device for holding said radially-movable bearing in its normal position consisting of latches pivoted on the frames and normally engaging abutments on said last-mentioned bearings, a slide guided on said last-mentioned frame and having a cam-slot engaging with a pin on said latch, a spring for shifting said slide in a direction for moving said latch into its normal position, and an actuating-cam operating to move said slide in the opposite direction, substantially as set forth.

19. A paper-slitter comprising two rotary frames pivoted on opposite sides of the path of the web to be cut, cutter-shafts arranged on said frames and parallel therewith, swiveling bearings pivoted on one of said frames and each supporting one end of one of its cutter-shafts, a radially-movable bearing guided on said last-mentioned frame and supporting the opposite end of one of its cutter-shafts, a gear-wheel secured to the last-mentioned cutter-shaft adjacent to its radially-movable bearing and adapted to move into and out of engagement with a gear-wheel on the other cutter-shaft, and a locking device for holding said radially-movable bearing in its normal position consisting of a latch pivoted on the last-mentioned frame and normally engaging an abutment-screw on said radially-movable bearing, a stop arranged on said last-mentioned frame and limiting the movement of said latch in one direction, a slide arranged on said last-mentioned frame and having a cam-slot which receives a pin on said latch, a spring operating to move said slide in the direction for moving the latch into its normal operative position, a stationary guide-ring which receives a shifting-finger on said slide, and a pivoted cam engaging its free end with said guide-ring and arranged to be engaged by said shifting-finger for moving said slide in the direction for retracting the latch from said abutment-screw, substantially as set forth.

20. A paper-slitter comprising a supporting-frame, a cutter-shaft journaled on said frame and capable of axial movement a plurality of cutters mounted on one end of said shaft so as to normally move axially therewith, a single cutter mounted on the opposite end of said shaft but constantly free to move

axially independent thereof, an adjusting-shaft journaled on said frame and having screw-threads inclining in opposite directions, and screw-nuts engaging said threads and operatively connected with said shaft and with said single cutter, substantially as set forth.

21. A paper-slitter comprising a supporting-frame, a cutter-shaft journaled on said frame and capable of axial movement, a plurality of cutters mounted on one end of said shaft so as to normally move axially therewith, front and rear stop-collars secured to said shaft on opposite sides of each of said plurality of cutters, a spring interposed between each front stop-collar and the front side of the adjacent cutter, a grooved coupling-collar connected with said shaft, a single cutter mounted on the opposite end of said shaft but constantly free to move axially independent thereof, a groove coupling-collar mounted on said shaft and loosely connected with said single cutter, a spring interposed between said single cutter and the last-mentioned coupling-collar, an adjusting-shaft journaled on said frame and having screw-threads inclining in opposite directions, and nuts engaging with said threads and having

fingers engaging with the grooves of said coupling-collars, substantially as set forth. 30

22. A paper-slitter comprising a supporting-frame, a cutter-shaft journaled on said frame and capable of axial movement a plurality of cutters mounted on one end of said shaft so as to normally move axially therewith, a single cutter mounted on the opposite end of said shaft but constantly free to move axially independent thereof, an adjusting-shaft journaled on said frame and having screw-threads inclining in opposite directions, a nut engaging with one of said threads and loosely connected with said shaft, a carrier loosely coupled with said single cutter, a nut engaging with the other thread and journaled in said carrier but held against axial movement relatively thereto, and a set-screw for holding the last-mentioned nut against turning in said carrier, substantially as set forth. 35 40 45

Witness my hand this 21st day of November, 1905. 50

WILLIAM J. LUPTON.

Witnesses:

THEO. L. POPP.

E. M. GRAHAM.

Corrections in Letters Patent No. 823,797.

It is hereby certified that in Letters Patent No. 823,797, granted June 19, 1906, upon the application of William J. Lupton, of Lockport, New York, for an improvement in "Paper-Slitters," errors appear in the printed specification requiring correction, as follows: In line 5, page 2, the word "positions" should read *portions*; and line 52, same page, the word "engaged" should read *arranged*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 10th day of July, A. D., 1906.

[SEAL.]

E. B. MOORE,

Acting Commissioner of Patents.

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