Aug. 20, 1940. F. F. SCHRIER 2,212,457

SLITTING MACHINE

Filed Nov. 18, 1939 3 Sheets-Sheet 1

Fig. 1.

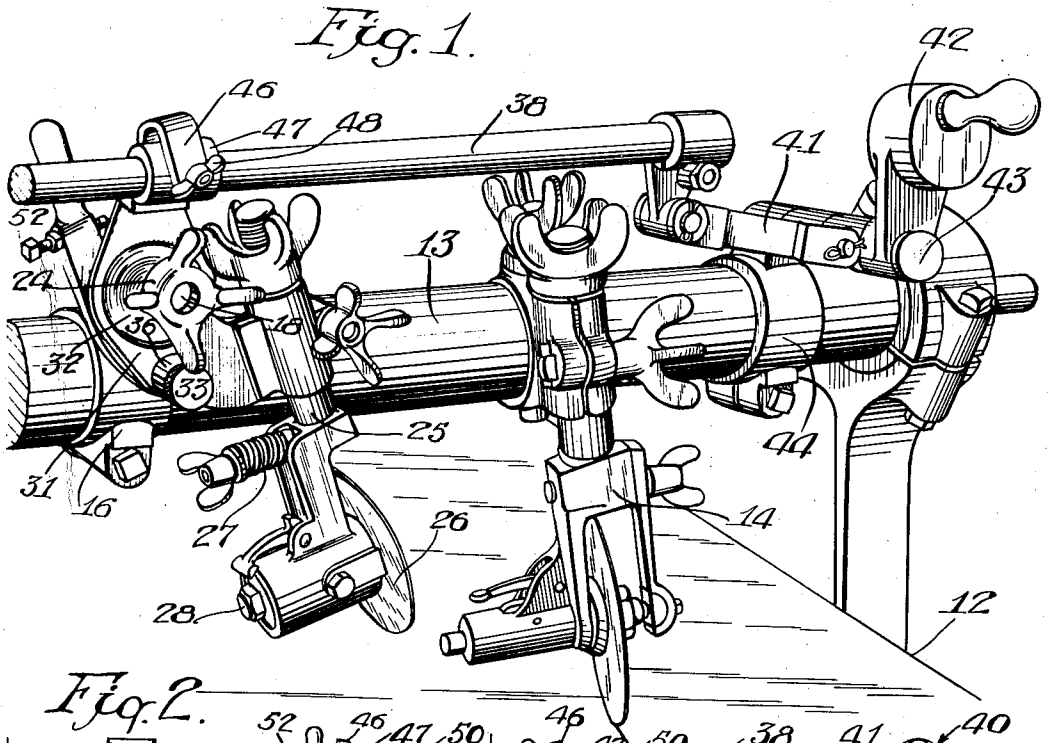


Fig. 2.

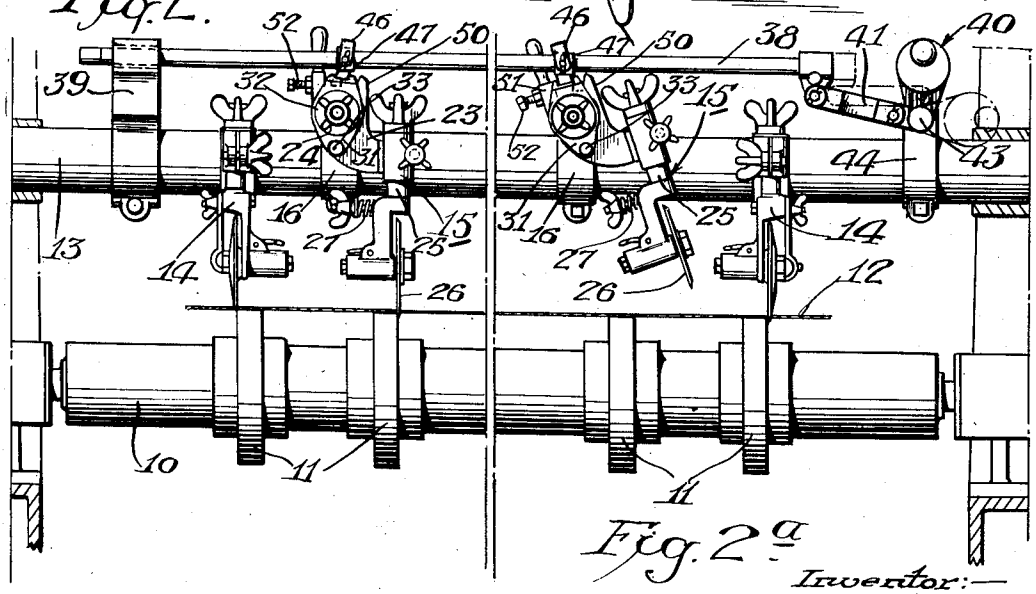


Fig. 2a

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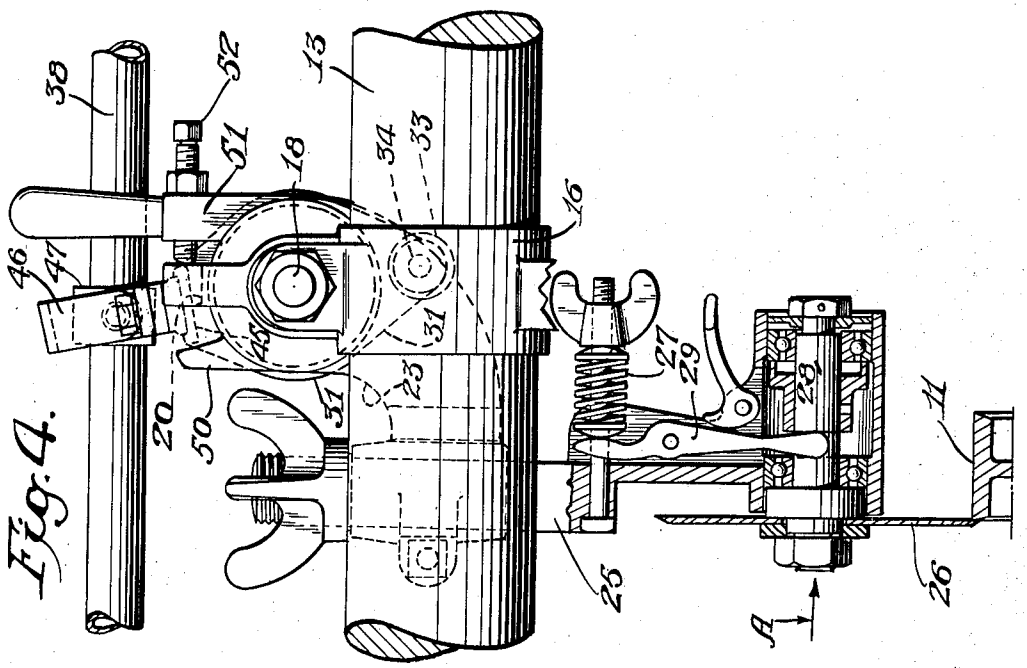


Fig. 4.

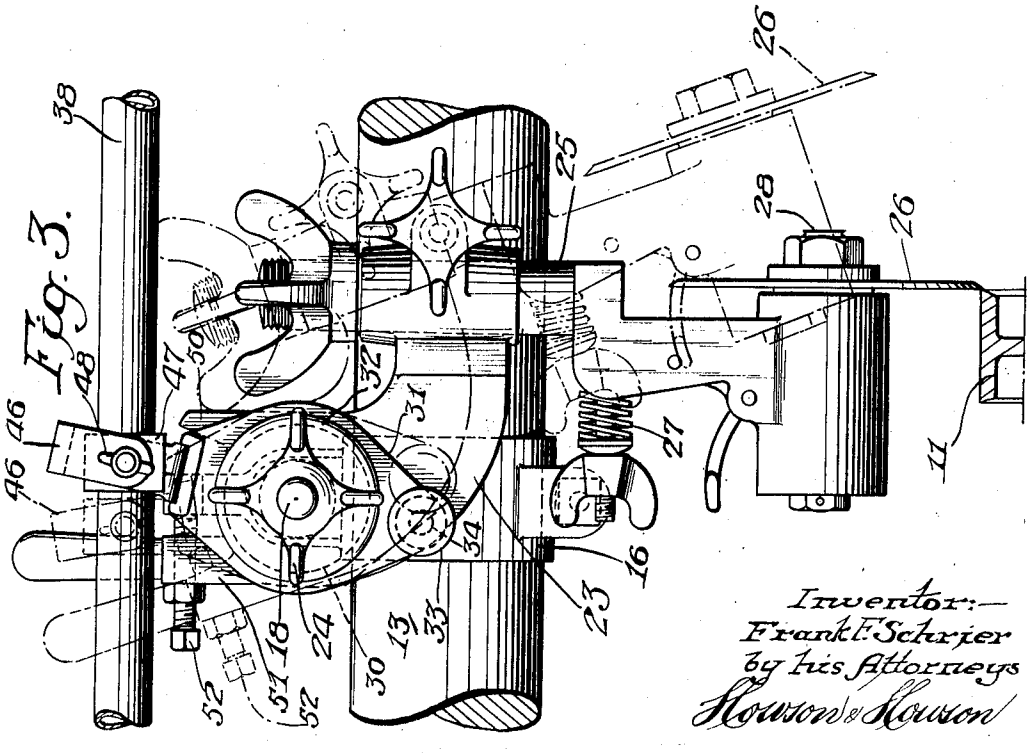


Fig. 3.

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Fig. 5.

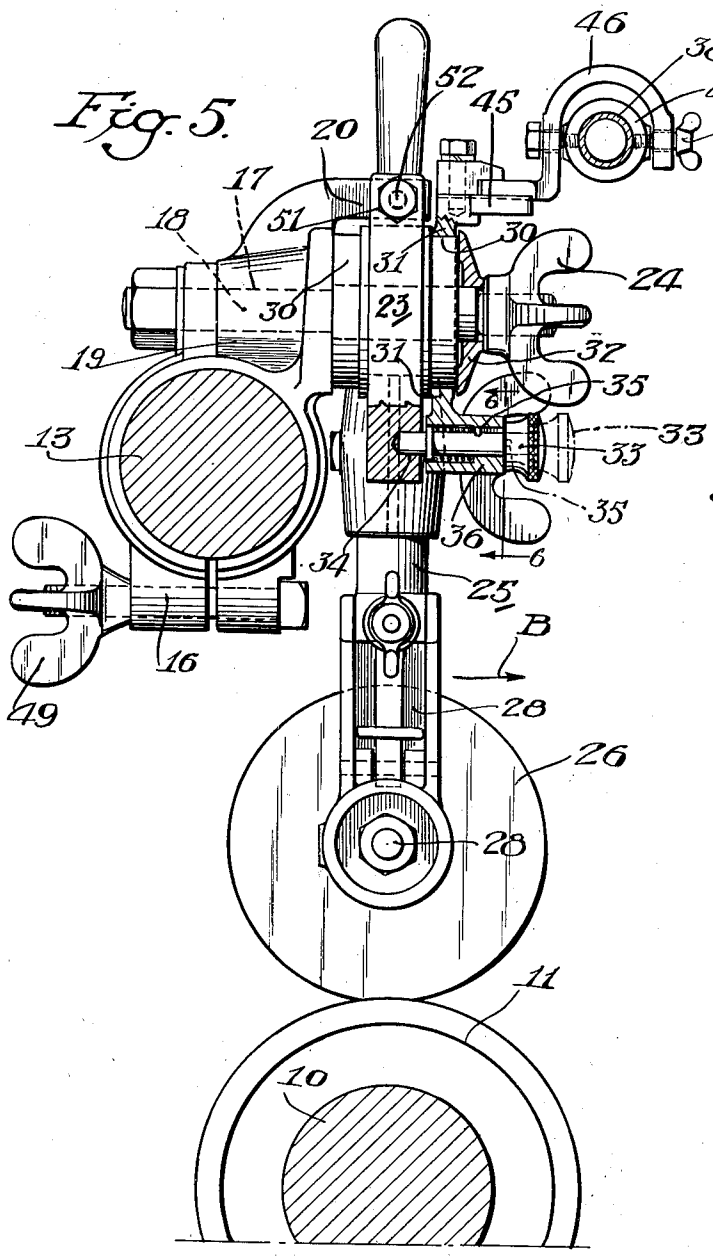
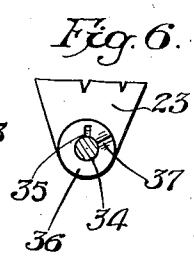


Fig. 6.



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UNITED STATES PATENT OFFICE

2,212,457

SLITTING MACHINE

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Application November 18, 1939, Serial No. 305,183

11 Claims. (Cl. 164—60)

This invention relates to slitting machines and, more particularly, to machines of this type usually employed in slitting paper. In the ordinary slitting machine, when a wide web of paper is threaded therethrough and it is desired to slit the web into numerous widths, all the slitters are engaged during the threading operation. This results in the loss of a considerable amount of paper, since the operators have to handle each slit width separately, and is inconvenient for the operators in that each of the slit widths must be drawn up squarely and at the proper tension to insure proper winding on the winding shaft. Of the slitters employed in such a machine, the end slitters serve merely to trim the edges of the paper and the intermediate slitters determine the width of the various sheets which are being formed. It is desirable in threading the paper that all such intermediate slitters be removed from engagement with the paper, permitting the full width web to be threaded through and engaged with the winding shaft. This full width web can be very readily properly tensioned and squared to the winding shaft under these circumstances, thus eliminating considerable waste and insuring better winding.

An important object of this invention is the provision of a construction enabling all of the intermediate slitter elements to be moved from their operative positions and to be rapidly and conveniently returned to service after the paper web has been threaded through the machine.

Another object of the invention is the provision of a construction of this character which may be very readily incorporated in the ordinary slitter construction, or substituted for the elements of such a construction already existing in a machine.

Another object of the invention is the provision of a structure of this character incorporating the features above outlined, which may at the same time be adjusted as to its position with the same facility as the ordinary slitter elements now employed.

These and other objects I attain by the construction shown in the accompanying drawings wherein, for the purpose of illustration, I have shown a preferred embodiment of my invention and wherein:

Fig. 1 is a fragmentary perspective view of slitter mechanism constructed in accordance with my invention;

Fig. 2 is a fragmentary front elevation showing the left-hand side of the machine;

Fig. 2a is a fragmentary front elevation showing a portion of the opposite side of the machine;

Fig. 3 is a front elevation of a slitter element, the structure being shown in solid lines in its operative position and in dotted lines in its inoperative position;

Fig. 4 is a rear elevation thereof partially broken away;

Fig. 5 is a side elevation thereof partially broken away; and

Fig. 6 is a section on line 6—6 of Fig. 5.

Referring now more particularly to the drawings, the numeral 10 generally designates a rotatable shaft bearing a plurality of slitter discs 11, over which the sheet 12 which is to be slit travels. Arranged above the shaft 10 is a bar 13 bearing a plurality of top slitter elements. The top slitter elements include end slitters 14 and intermediate slitters 15, each coacting with one of the slitter discs 11. The function of the end slitters is that of trimming the edges of the sheet, while the intermediate slitters 15 cut the sheet into various widths, as desired. It is often necessary to shift the position of the intermediate slitters due to the desire to produce varying widths of sheets from the parent sheet delivered from the paper machine, and to this end it is desirable that the intermediate slitter elements 15 be mobile and conveniently controllable. The end slitters are, on the contrary, seldom in need of adjustment and may be of any usual or ordinary construction, such, for example, as that herein illustrated. The construction of these elements forms no part of the present invention and, accordingly, no description thereof is here given.

The intermediate slitters 15 comprise a bracket 16 adapted to clamp upon the bar 13 and to be slidably adjustable therealong. This bracket embodies a transversely extending bore 17 mounting a stud 18, this bore being formed in a boss 19 on the bracket. The boss 19 further incorporates a lateral finger 20 the purpose of which will appear hereinafter.

Stud 18 pivotally mounts an arcuate arm 23, the arm being maintained in position upon the stud by a wing nut 24. The free end of this arm mounts a standard 25 bearing a slitter wheel 26. This slitter wheel may be equipped with any suitable spring tensioning device such as is commonly incorporated in devices of this character to maintain engagement of the wheel with the associated slitter disc 11. As at present shown, the wheel is urged in the direction of the arrow A, Fig. 4, by a spring 27 acting upon the shaft 28 upon which this wheel is mounted through a lever 29; any other suitable construction accomplish-

ing the same end may, however, be substituted for that herein illustrated.

The arm 23 is formed with a bearing 30 about which a collar 31 is mounted for oscillation, this collar being retained in position by the wing nut retained washer 32. Collar 31 embodies a spring-pressed latch plunger 33 the nose of which is adapted to engage in a socket 34 formed in arm 23. This latch may, however, be held in its withdrawn position, illustrated in dotted lines in Fig. 5, by simply withdrawing the same until the pin 35 may be rotated to engage the end surface of the lug 36 on collar 31 in which this latch is mounted. Retention of the pin in its withdrawn position may be insured by notching the end surface of the lug, as indicated at 37, if so desired.

Mounted above and slightly to the front of bar 13 is a reciprocable shaft 38, one end of which is mounted in a suitable guide 39, so constructed as to permit a slight vertical play of the shaft. The opposite end of this bar has connected thereto a shifting means 40, so constructed as to lock the bar at either limit of its shifting movement. As at present shown, this shifting mechanism is illustrated as a toggle 41 operated through a counterweighted crank 42 secured to a shaft 43 which is rotatably mounted in a bracket 44 secured to bar 13. Any other suitable means may, however, be provided for controlling movement of the bar.

The collars 31 are each provided with a clamping arm 45 in which is secured a yoke 46 straddling the shaft 38 and bearing a collar 47 surrounding the shaft and adapted to be clamped thereto as by means of wing screw 48. The clamping arm is preferably formed in sections which, upon separation, will free yoke 46 and permit swinging movement of the slitters in the direction of arrow B Figure 5, when the clamping nut 49 of the bracket 16 has been released, thus enabling the slitter mechanism to be swung outwardly and permit release of the slitter wheel standard 25 when it becomes necessary to replace the same for any reason.

The arcuate arm 23 has a pair of lugs 50, 51, the lug 51 having an adjusting set screw 52 directed therethrough and adapted to engage the finger 20 of bracket 16, and serving to limit the extent of engagement of the slitter wheel 26 with its associated slitter disc 11. Lugs 50 serve the purpose of limiting the upward swinging movement of the wheel-bearing arm and constitute merely a safety device to prevent over-manipulation of shaft 38.

In operation of the machine, during the actual slitting operation, the intermediate slitters occupy the position shown in Figure 2, which figure, with Figure 2*a* shows opposite ends of the machine between which any number of intermediate slitters may be disposed.

Assuming that it becomes necessary to change the widths of the paper being cut from the web 12, toggle mechanism 40 is first manipulated to throw all of the intermediate slitters which are in operation from the position shown in Fig. 2 to that shown in Fig. 2*a*, this being accomplished by movement of the handle element controlling the toggle from its dotted-line position in Figure 2*a* to its solid-line position in that figure. This having been done, the entire width of web may be threaded through the slitter and connected to the winding shaft as a unit, insuring uniform tension in the sheet and greatly facilitating the operation of connecting to the winding shaft as compared with the ordinary type of machine in which the slitters must all be in position and, accordingly, the web having passed the slitters is in the form of a plurality of strips which must be individually attached to the shaft at the proper tension. It is then merely necessary to shift the toggle mechanism to its dotted-line position, at which time all intermediate slitters which are to go into service will be moved to the position shown in Figure 2. When it is desired to render any selected intermediate slitter temporarily inoperative, it is only necessary to shift shaft 38 to the left, which raises all of the operative intermediate slitters out of the path of the paper, then clamp the wing nut 24 and release the pin 33 of the selected slitter. This will free collar 31, permitting this collar to oscillate idly as shaft 38 is shifted to place the remaining slitters in operation. To return the inoperative slitter to operation, the shaft 38 is again shifted to the left, moving all of the operative slitters to the inoperative position and thereafter re-engaging the pin 33 of the inoperative slitter.

It will be obvious that with a construction of this character it is possible to very rapidly shift from one type of slitting to another and, where the arrangement has been predetermined, this may be accomplished while the machine is still in operation.

Since the construction illustrated is but one of of many forms which my invention may assume, I do not wish to be understood as limiting myself thereto except as hereinafter claimed.

I claim:

1. In a slitter of the type described, a plurality of discs over which a sheet to be slit is adapted to pass, a support thereabove, a plurality of slitter mechanisms carried by the support and each embodying a slitter wheel for coaction with one of the discs, said mechanisms each including a pivoted support for the slitter wheel whereby said wheels may be moved into and out of engagement with said discs and a sheet passing thereover, in a plane generally paralleling the axes of said discs and means to simultaneously move said pivoted supports to engage said slitter wheels with or disengage said slitter wheels from the discs and a sheet passing thereover.

2. In a slitter of the type described, a plurality of discs over which a sheet to be slit is adapted to pass, a support thereabove, a plurality of slitter mechanisms carried by the support and each embodying a slitter wheel for coaction with one of the discs, said mechanisms each including a pivoted support for the slitter wheel whereby said wheels may be moved into and out of engagement with said discs and a sheet passing thereover, means to simultaneously move said pivoted supports, and means to individually secure said pivoted supports against movement by said moving means.

3. In a slitter of the type described, a plurality of discs over which a sheet to be slit is adapted to pass, a rotatable shaft on which the discs are adjustably mounted, a stationary bar paralleling the shaft, a plurality of slitter mechanisms carried by the bar and each embodying a slitter wheel for coaction with one of the discs, said mechanisms each including a bracket adjustably secured to the bar and a support for the slitter wheel pivoted to the bracket whereby said wheels may be moved into and out of engagement with said discs and a sheet passing thereover, means to simultaneously move said pivoted supports, and means to individually se-

cure said pivoted supports against movement by said moving means.

4. In a slitter of the type described, a plurality of discs over which a sheet to be slit is adapted to pass, a support thereabove, a plurality of slitter mechanisms carried by the support and each embodying a slitter wheel for coaction with one of the discs, said mechanisms each including a pivoted support for the slitter wheel whereby said wheels may be moved into and out of engagement with said discs and a sheet passing thereover, means to simultaneously move said pivoted supports, and means to individually secure said pivoted supports against movement by said moving means comprising a member oscillatable about the pivot of each support, an operative connection between the moving member and said oscillatable members, releasable means to connect the oscillatable members to their respective pivoted supports and means to rigidly secure the pivoted supports to the pivots thereof.

5. In a slitter of the type described, a plurality of discs over which a sheet to be slit is adapted to pass, a rotatable shaft on which the discs are adjustably mounted, a stationary bar paralleling the shaft, a plurality of slitter mechanisms carried by the bar and each embodying a slitter wheel for coaction with one of the discs, said mechanisms each including a bracket adjustably secured to the bar and a support for the slitter wheel pivoted to the bracket whereby said wheels may be moved into and out of engagement with said discs and a sheet passing thereover, means to simultaneously move said pivoted supports, and means to individually secure said pivoted supports against movement by said moving means comprising a member oscillatable about the pivot of each support, an operative connection between the moving member and said oscillatable members, releasable means to connect the oscillatable members to their respective pivoted supports and means to rigidly secure the pivoted supports to the pivots thereof.

6. In a slitter of the type described, a plurality of discs over which a sheet to be slit is adapted to pass, a rotatable shaft on which the discs are adjustably mounted, a stationary bar paralleling the shaft, a plurality of slitter mechanisms carried by the bar and each embodying a slitter wheel for coaction with one of the discs, said mechanisms each including a bracket adjustably secured to the bar and a support for the slitter wheel pivoted to the bracket for movement in a plane substantially parallel to the shaft axis whereby said wheels may be moved into and out of engagement with said discs and a sheet passing thereover, and means to simultaneously move said pivoted supports to engage said slitter wheels with or disengage said slitter wheels from the discs and a sheet passing thereover.

7. In a slitter of the type described, a plurality of discs over which a sheet to be slit is adapted to pass, a rotatable shaft on which the discs are adjustably mounted, a stationary bar paralleling the shaft, a plurality of slitter mechanisms carried by the bar and each embodying a slitter wheel for coaction with one of the discs, said mechanisms each including a bracket adjustably secured to the bar and a support for the slitter wheel pivoted to the bracket for movement in a plane substantially parallel to the shaft axis whereby said wheels may be moved into and out of engagement with said discs and a sheet passing thereover, and means to simultaneously move said pivoted supports comprising a reciprocable shaft operatively connected to said pivoted supports, means to shift said shaft and means to hold the shaft in adjusted positions.

8. In a slitter of the type described, a plurality of discs over which a sheet to be slit is adapted to pass, a rotatable shaft on which the discs are adjustably mounted, a stationary bar paralleling the shaft, a plurality of slitter mechanisms carried by the bar and each embodying a slitter wheel for coaction with one of the discs, said mechanisms each including a bracket adjustably secured to the bar and a support for the slitter wheel pivoted to the bracket for movement in a plane substantially parallel to the shaft axis whereby said wheels may be moved into and out of engagement with said discs and a sheet passing thereover, means to simultaneously move said pivoted supports, and means to individually secure said pivoted supports against movement by said moving means.

9. In a slitter of the type described, a plurality of discs over which a sheet to be slit is adapted to pass, a rotatable shaft on which the discs are adjustably mounted, a stationary bar paralleling the shaft, a plurality of slitter mechanisms carried by the bar and each embodying a slitter wheel for coaction with one of the discs, said mechanisms each including a bracket adjustably secured to the bar and a support for the slitter wheel pivoted to the bracket for movement in a plane substantially parallel to the shaft axis whereby said wheels may be moved into and out of engagement with said discs and a sheet passing thereover, and means to simultaneously move said pivoted supports comprising a reciprocable shaft operatively connected to said pivoted supports, means to shift said shaft, means to hold the shaft in adjusted positions, and means to individually secure said pivoted supports against movement by said moving means.

10. A slitter comprising a rotatable disc, a bar paralleling the axis of the disc, a pivot on said bar and disposed in a plane perpendicular to the axis of the disc, an arm mounted on said pivot and bearing a slitter wheel for engagement with the disc, a member mounted for oscillation about the same axis as the arm, releasable means connecting said arm and member, means to oscillate said member, and means to hold said member in adjusted positions.

11. A slitter comprising a rotatable disc, a bar paralleling the axis of the disc, a pivot on said bar and disposed in a plane perpendicular to the axis of the disc, an arm mounted on said pivot and bearing a slitter wheel for engagement with the disc, a member mounted for oscillation about the same axis as the arm, releasable means connecting said arm and member, means to oscillate said member, means to hold said member in adjusted positions, and means to clamp said arm against rotation about said pivot.

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