To all whom it may concern:

Be it known that I, SAMUEL M. LANGSTON, a citizen of the United States, and resident of Camden, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in Slitters and Rewinders, of which the following is a specification.

In machines of this character as commonly employed, sheet material such for instance as paper, is delivered from a roll, slit into separate, continuous strips by rotary cutters, and rewound in separate but narrower rolls.

My invention relates particularly to the mechanism for slitting the material and guiding it to the re-winding mechanism and involves the use of a plurality of freely V-edge resiliently pressed against the material so as to cut through the latter as it passes over the polished surface of a hardened steel rotated roller adjacent to but separate from the winding mechanism. By means of my improved construction, the lint, dust and minute shreds resulting from the cutting action are permitted to drop away from the fresh cut edges without being rewound with the separate strips and the latter are prevented from any lateral movement such as might cause them to overlap or interweave.

Reference is to be had to the accompanying drawings in which similar reference characters indicate corresponding parts throughout the several views, and in which—

Figure 1 is an end view of a machine embodying my invention; Fig. 2 is a front elevation; Fig. 3 is a side view of one of the cutting rollers and its supporting arm; Fig. 4 is a front view of the parts shown in Fig. 3; and Fig. 5 is a perspective view of one of the spreaders.

The specific machine illustrated includes two main end frames 10 mounted on a suitable base and held rigid in respect to each other. In the rear is a suitable support 11 for the roll A of material to be slitted and rewound, and from this roll the paper passes over a series of rollers 12, 13 and 14 to the first of the two drums or rollers 15 and 16. These latter are positively driven in the same direction and at the same speed and are of sufficient size and strength to support the rolls of slit material freely resting thereon and guided vertically by standards 17 engaging with the ends of the axis of the allied rolls B. The rolls are held down on the drums by a pressure roller 18 which may be carried by links 19 on the free ends of pivoted arms 20 and may be positively driven by suitable chains and gearing as shown in my prior Patents, 1,000,756, and 1,008,154, issued November 26th, 1911. In the main the features so far referred to do not involve any novel feature of my present invention.

The rollers 12 and 13 act mainly as guiding and tension rollers and are free to be rotated by the paper, while the roller 14 is mounted closely adjacent to the first of the two rewinding drums 15 and preferably a slight distance below the same and is positively driven at substantially the same surface speed as the drums 15 and 16. This roller presents a polished hardened steel surface and is so mounted that the paper passes over the front side thereof just prior to passing over the first drum 15. Mounted to press directly against the roller 14 at a point where the paper is in direct contact with the latter, I mount a plurality of cutters 21 each in the form of a freely rotatable steel disk with a sharp V-edge. Each cutter is carried by an arm made up of two sections 22 and 23 pivotally connected together. The upper section 22 terminates in a yoke within which the cutter blade is rotatably mounted while the lower section 23 is mounted on a shaft 24. At the pivotal connection between the two arm sections I provide spring means normally tending to move the upper section in respect to the lower and about the pivot so as to press the cutter toward the roller 14. Preferably this means includes a leaf spring 25 secured to the lower section and having its upper end pressing against the upper section and at the upper end there is preferably provided a regulating screw 26 whereby the tension of the spring may be readily controlled. It is of course evident that other forms of tension springs and other regulating means might be employed in place of the specific means shown.

The several arms are independently mounted on the shaft 24 and are so connected to the latter that they may be moved either axially or circumferentially of the latter, so as to space them at any desired distance apart to control the width of the finished strips and to bring any or all of
the cutters into operative or inoperative position. The connection between the arms and the shaft may be of any suitable character, for instance, I may employ merely a set screw through the collar forming the lower end of the lower arm section 23. The shaft 24 is normally held against rotative movement so as to hold the several cutters against the roller 14 and under the desired tension of the springs 25. It may be permanently held against rotation although preferably it is mounted so that it may turn and thus permit the simultaneous movement of all of the cutters out of or into operative position and for the simultaneous variation in the pressure with which the cutters are held against the roller 14. The bearings for the ends of the shaft 24 may be made so that they may be tightened and clamp the shaft or the shaft at one end may have an arm 27 rigidly secured thereto and terminating adjacent one end of the frame 10. This arm when clamped to the end frame will prevent the rotation of the shaft and being of considerably greater length than the radius of the shaft permits of a close adjustment of the rotative position of the shaft.

The roller 11 against which the cutters are pressed has, as previously stated, a polished hardened steel surface. This roller need not be of solid steel in fact it may be hollow. Instead of making the entire surface of one piece of steel it may be subdivided transversely into sections, so that in case any one section becomes scratched or scored it may be removed and replaced by a new one without necessitating the replacement or repolishing of the entire roller. The polished hardened steel surfaces of the kind required are comparatively expensive and in my improved construction I am able to make the roller of the minimum size and weight. It does not act as a support for the rewound material and therefore it may be of small size and only of sufficient rigidity to sustain its own weight, the tension of the paper drawing over it and the tension of the springs pressing the cutters against it. A great saving is thus effected over a construction in which the hardened steel roller serves at the same time as one of the rewinding drums and serves to support the weight of the rewound material.

In the cutting of certain kinds of paper a very fine dust or lint is liberated along the slit and this when rewound with the paper, is often in sufficient quantity to become objectionable when the paper is used in connection with delicate mechanism such for instance as a stock ticker or some forms of adding, tabulating or recording machines.

In my improved machine I permit the slitted material to pass across a narrow space between the roller 14 and the first 65 rewinding drum 15 and while passing across this space I apply to the surface of the paper at the slitted edges fingers or spreaders 28 mounted on a rod 29 so as to be longitudinally and angularly adjustable. These 70 act not only to insure the complete separation of the adjacent paper strips but also to prevent overlapping or interleaving of the edges and to liberate the dust or lint from the edges and prevent it from being wound into the rolls. The spreaders also tend to remove the very minute feather or hair-like selvage from the strips, which selvage on adjacent strips might otherwise become interwoven in the rewinding, so as 80 to even render it difficult if not impossible to separate the adjacent rolls after they have been rewound.

Having thus described my invention, what I claim as new and desired to protect by Letters Patent is:

1. A slitter and rewinder having a pair of drums for supporting between them the roll of rewound material and rotating the latter, a roller adjacent one of said drums and over which paper passes to said drum, a plurality of cutters resiliently pressed against said roller for slitting said paper as it passes over said roller, and a plurality of spreaders pressing against the surface of the paper as it passes from said roller to said drums.

2. A slitter and rewinder having a hardened steel roller, a plurality of cutter disks individually resiliently pressed against said roller and rewinding mechanism including two drums for supporting and rotating the roll of rewound material, one of said drums receiving the material directly from said roller and a plurality of fingers having flat ends pressing against the surface of said material intermediate of said roller and said drum.

3. A slitter and rewinder having a pair of drums for supporting between them a roll of rewound material and rotating the latter, a slitting mechanism including a plurality of cutters, spreader mechanism including a plurality of spreaders, and a supporting rod, each of said spreaders being adjustable lengthwise of the rod and also adjustable about its own axis and in the direction of its length.

Signed at Camden, in the county of Camden and State of New Jersey, this 21st day 120 of July, A. D. 1913.

SAMUEL M. LANGSTON.

Witnesses:

ANNA W. KUENZEL, HELEN H. YERGER.