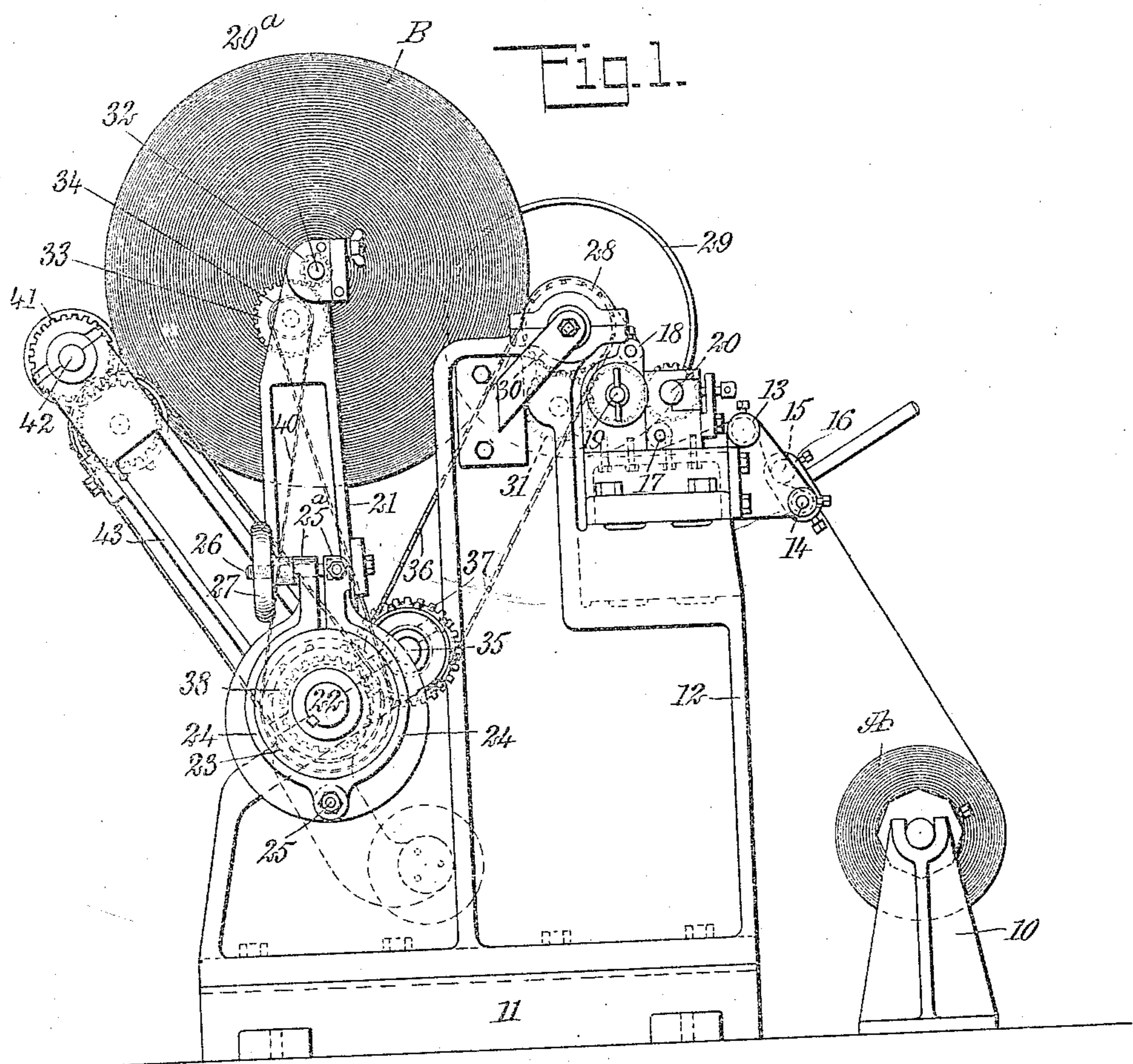


S. M. LANGSTON.
PAPER SLITTER.
APPLICATION FILED MAY 29, 1909.

Patented Dec. 14, 1909.
2 SHEETS—SHEET 1.

943,357.



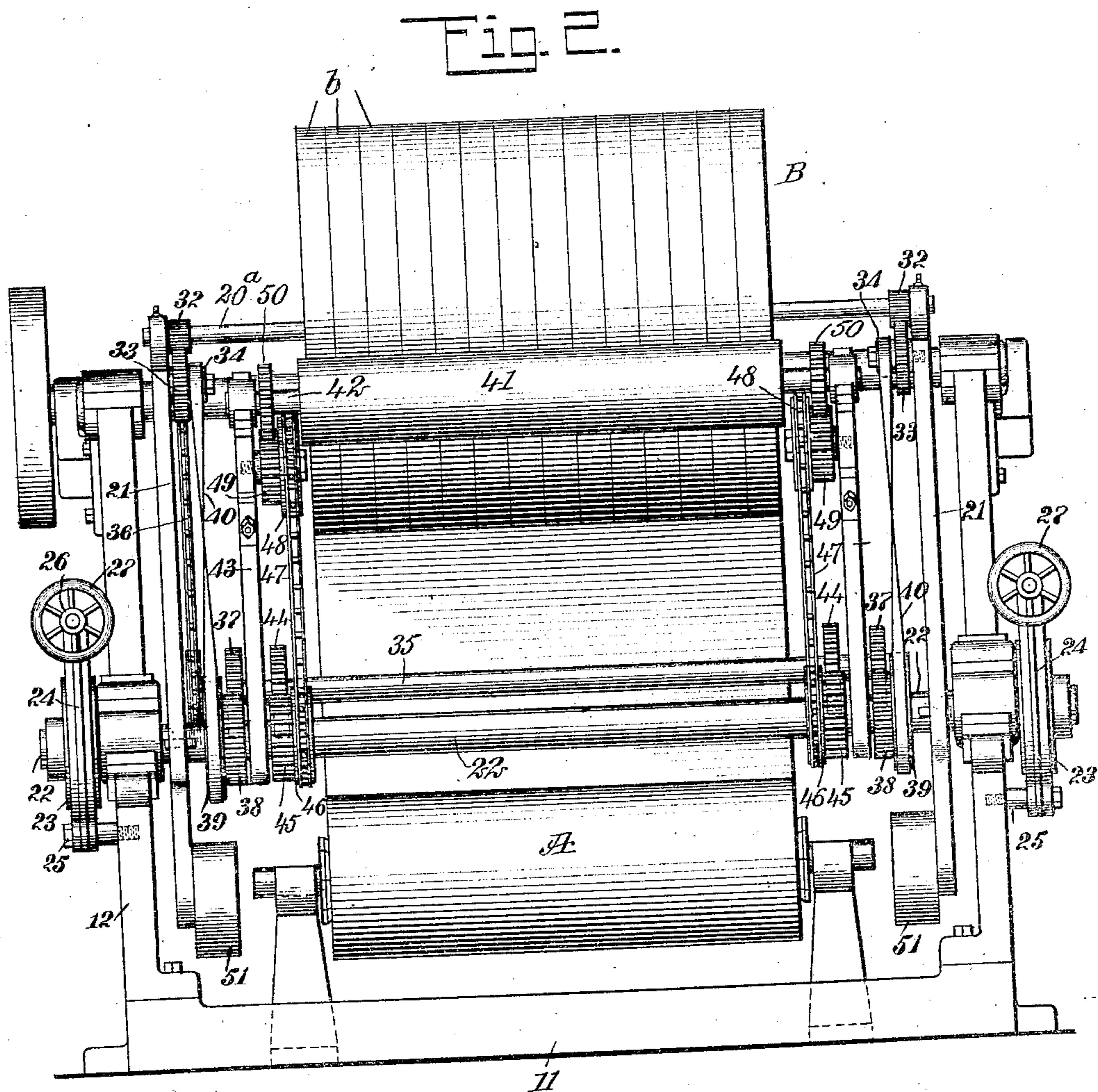
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SAMUEL M. LANGSTON, OF CAMDEN, NEW JERSEY.

PAPER-SLITTER.

943,357.

Specification of Letters Patent.

Patented Dec. 14, 1909.

Application filed May 29, 1909. Serial No. 499,161.

To all whom it may concern:

Be it known that I, SAMUEL M. LANGSTON, a citizen of the United States, and a resident of Camden, in the county of Camden and State of New Jersey, have invented a new and Improved Paper-Slitter, of which the following is a full, clear, and exact description.

My improved machine is designed for cutting or slitting a strip of paper into a plurality of narrower strips and rewinding the narrower strips side by side upon a suitable reel.

The special feature of my machine embodying the present invention resides in the rewinding mechanism and the means which I employ for maintaining uniform surface friction upon the rewound strips during the entire rewinding operation.

In my improved machine the reel upon which the strips are rewound is disposed between two friction drums rotating in engagement with the surface of the accumulated material on the reel. The reel and the two drums are relatively movable so that as the size of the roll increases, the two friction drums are spread apart and still maintain the same relationship to the drums. The relative movement of these parts is resisted so as to create the desired rubbing action on the material.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both the figures, and in which—

Figure 1 is an end view of a machine constructed in accordance with my invention; and Fig. 2 is a side elevation of the machine viewed from the left-hand side of Fig. 1.

The roll of material A which is to be slitted or subdivided into a plurality of rolls of narrower material, may be supported in any suitable manner, as, for instance, upon standards 10 mounted adjacent the machine. The material is unwound from this roll and passes first through a tension device, thence past the cutters which subdivide the material, and thence to the roll B, which latter is made up of a plurality of narrow rolls b arranged side by side upon the same shaft. The tension-creating device and the cutters involve no special feature of my present invention and may be of any suitable character, although I preferably use a row of cutter heads of substantially the form shown

in my previous patent, Number 692,155, issued January 28, 1902, all arranged on the same shaft. The tension device, the cutters and the rewinding mechanism preferably are all mounted on the same frame, which latter may be of any desired form. As illustrated, the frame includes a base 11 and end standards or uprights 12, 12 spaced apart and supporting the several shafts which extend from one standard to the other. The specific tension device illustrated includes two parallel rollers 13 and 14, over both of which the paper passes, and a third roller 15 intermediate the two first-mentioned rollers and movable in respect thereto. The paper passes beneath the intermediate roller 15, and this roller is carried by two loosely pivoted arms 16. The weight of the roller 15 is supported by the paper, so as to maintain the desired tension on the paper. The paper then passes beneath a roller 17 and thence upwardly between the cutters to an upper roller 18. The cutters are mounted on two parallel shafts 19 and 20, which are rotated at the same speed by intermeshing gears and the two cutters cooperate to subdivide the material into a plurality of separate strips, which pass over the roller 18. The rollers 13, 14, 15, 17 and 18 are preferably merely idlers and are not positively driven.

The paper after passing from the roller 18 is delivered to my improved rewinding mechanism. The rewinding mechanism includes a spool or reel 20^a, journaled at the upper and outer ends of two parallel swinging arms 21, 21. The two arms are journaled at their lower ends on a shaft 22, which latter is supported in the frame of the machine. The spool or reel 20^a comes at a slightly higher elevation than the cutting mechanism, and is free to swing toward and from the latter, although such swinging is restricted by a friction device hereinafter described.

Adjacent the roller 18, which guides the paper from the cutters, is a friction drum 28, over which the paper passes to the spool or reel 20^a, and this friction drum is so disposed that when the arms 21 are swung to one limiting position, the spool or reel 20^a will contact with the surface of the drum. The drum is positively driven and its shaft preferably comprises the main drive shaft of the machine and carries a drive pulley 29. The shaft carries a gear wheel 30,

shown in dotted lines in Fig. 1, by means of which motion is transmitted to an idler 31 and thence to the two cutters in succession. The spool or reel 20^a is driven to wind the material thereon, but its speed of rotation of course decreases as the roll increases in size. For rotating the reel, I provide said reel with a pinion 32 intermeshing with a gear wheel 33 journaled on a stub shaft carried by one of the arms 21. On this same stub shaft is a small pulley 34 for receiving a driving belt. Adjacent to the stationary shaft 22 and parallel therewith, I provide a shaft 35, positively driven from the main drive shaft of the friction drum 28. A chain 36 and suitable sprocket wheels will serve for this purpose. The shaft carries a gear wheel 37 intermeshing with a gear wheel 38 loosely mounted on the shaft 22 and rigidly secured to the gear wheel 38 is a pulley 39 in the plane of the pulley 34. A crossed belt 40 connects these pulleys and drives the pulley 34 from the pulley 39. As the arms 21 which carry the reel are journaled on the shaft 22, and as the gear wheel 38 and pulley 39 are loosely mounted on said shaft, it is evident that the swinging of the shaft does not interfere with the positive driving of the spool or reel. The belt 40 is loose, so that although it tends to rotate the pulley 34 and the spool, yet it can slip and travel at a greater rate of speed than the spool as the roll of material on the spool increases in size. The friction drum 28 is positively driven at a uniform speed, as is also the shaft 35, and the reel 20^a is rotated in the reverse direction to the friction drum 28 and may rotate at a continually decreasing rate as the roll grows in size. The second friction drum 41 is of substantially the same size as the friction drum 28 and is also positively driven and is movable in respect to the reel. The friction drum 41 is carried by a shaft 42 journaled at the outer ends of two parallel swinging arms 43, 43, which latter are keyed at their lower ends on the shaft 22. For driving the friction drum 41, I provide the shaft 35 with a gear wheel 44 meshing with a gear wheel 45 loosely mounted on the shaft 22. The gear wheel 45 has a sprocket wheel 46 rigidly secured thereto, and this wheel carries a chain 47 extending over a sprocket wheel 48 mounted on a stub shaft adjacent the outer end of one of the arms 43. On the same stub shaft with the sprocket wheel 48 is a gear wheel 49 meshing with a gear wheel 50 on the shaft 42 of the drum. Thus as the arms 43 swing with the shaft 22 and this shaft has the sprocket wheel 46 loosely mounted thereon, it is evident that the position of the arms 43 does not in any way affect the positive driving of the drum.

The shaft 22 has a small drum or disk 23 keyed thereto, adjacent each end, and the

frame carries two semi-circular clamping jaws 24, 24. These jaws are pivotally connected together and pivoted to the frame by a suitable pivot bolt 25, and at their upper ends they are provided with means for drawing them together to frictionally bind the drums 23. Each clamping jaw 24 is provided with an upwardly-extending terminal flange 25^a and a screw bolt 26 extends through these two flanges. By tightening the hand wheel 27 on this bolt, the flanges may be drawn together and the jaws caused to clamp the drum or disk 23 with any desired degree of pressure. The drum 23 is locked to the shaft and serves to retard rotation of the latter in respect to the frame. As the jaws 24, 24 are carried by the frame, it is evident that the resistance to the rotation of the shaft may be increased or decreased as desired.

The distances from the center of the shaft 22 to the centers of the two friction drums and the center of the reel, are all substantially the same, and as the drum 28 is stationary and the reel 20^a and the drum 41 are movable, it is evident that the relative positions of all three may be changed as the material increases on the reel. The material is held between the drums 28 and 41 by the frictional resistance to the movement of the arms 43, and the weight of the material is counterbalanced by a weight 51 carried by a downwardly-extending arm or branch 52 rigid with its corresponding arm 21. The counterweights, as well as the driving mechanisms for the reel and for the drum, may be duplicated at each end of the machine, if desired.

The material after being slitted or cut into separate strips passes over the friction drum 28 and to the reel 20^a. The reel tends to rotate slightly faster than the drum 28, so that the material is tightly wound, and, furthermore, the drum tightly presses the material against the reel due to the friction clutches on the arms 43. The drum 41 is pressed against the material at the opposite side of the reel and rotates at a slightly greater speed than the rate of surface travel of the material on the reel, so as to continually rub the surface of the material and draw it tightly on to the roll and insure the firm and compact winding of said material. The shaft 22 is so positioned in respect to the drum 28, that when the material has accumulated to form a roll of the desired size, the reel is substantially directly above the shaft 22. During the accumulating of the roll, the latter has been moved laterally and upwardly, and as gravity resists an upward movement of the roll, it is evident that this aids the clamping jaws 23 in holding the roll firmly against the drum 28. With the arms 21 extending vertically upward, when the roll is completed, the operator may loosen

the clamping members and swing the arms outwardly and downwardly to bring the roll closely adjacent the floor. It may now be removed from the machine without lifting and without the necessity for any special tackle or hoisting mechanism.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

10 1. In combination, a cutting mechanism for subdividing a strip of paper or the like longitudinally, and rewinding mechanism including a reel for receiving the material and a plurality of friction drums for en-
15 gagement with the rewound material upon opposite sides of the reel, one of said drums receiving the subdivided strip and delivering the same to the reel, said drums and reel being relatively movable.

20 2. In combination, a cutting mechanism for subdividing a strip of paper or the like longitudinally, and rewinding mechanism including a reel for receiving the material and a plurality of friction drums for en-
25 gagement with the rewound material upon opposite sides of the roll, one of said drums receiving the sub-divided strip and delivering the same to the reel.

30 3. In combination, a cutting mechanism for subdividing a strip of paper or the like longitudinally, and rewinding mechanism, including a drum and a reel, and upwardly
35 extending pivoted arms for supporting said reel and maintaining the material in frictional engagement with said drum.

40 4. In combination, a cutting mechanism for subdividing a strip of paper or the like longitudinally, and rewinding mechanism, including a friction drum, a reel for receiving the material and maintaining the sur-
45 face of the material in engagement with said drum, upwardly-extending pivoted arms for supporting said drum, a second pair of upwardly-extending pivoted arms, and a second drum carried by said last-mentioned arms and in frictional engagement with the material on said reel.

50 5. In combination, a cutting mechanism for subdividing a strip of paper or the like longitudinally, and rewinding mechanism,

including a friction drum, a reel for receiving the material and maintaining the surface of the material in engagement with said drum, upwardly-extending pivoted arms for supporting said drum, a second pair of up- 51
wardly-extending pivoted arms, a second drum carried by said last-mentioned arms and in frictional engagement with the material on said reel, and means for positively rotating said drums and reel. 60

6. In combination, a cutting mechanism for subdividing a strip of paper or the like longitudinally, and rewinding mechanism, including a friction drum, a reel for receiving the material and maintaining the sur- 65
face of the material in engagement with the drum, upwardly-extending pivoted arms for supporting said drum, a second pair of upwardly-extending pivoted arms, a second drum carried by said last-mentioned arms 70
and in frictional engagement with the material on said reel, means for rotating said drums at a uniform rate, and means for rotating said reel and permitting the speed of rotation to decrease on the accumulation 75
of material on the reel.

7. In combination, a cutting mechanism for subdividing a strip of paper or the like longitudinally, and rewinding mechanism, including a friction drum over which the 80
material passes, upwardly-extending arms, a reel carried by said arms, pivotal supports for said arms, friction means for resisting the movement of said arms about said pivots so as to retain the material in engagement 85
with the drum, a second friction drum on the opposite side of the reel from the first-mentioned drum, upwardly-extending arms for supporting the last-mentioned drum, pivotal supports for said arms, and a coun- 90
terweight for maintaining said last-mentioned drum in engagement with the material on the reel.

In testimony whereof I have signed my name to this specification in the presence of 95
two subscribing witnesses.

SAMUEL M. LANGSTON.

Witnesses:

CLAIR W. FAIRBANK,
PHILIP D. ROLLHAUS.