No. 685,329. Patented Oct. 29, 1901.

J. B. GURY.

CLOTH CUTTING MACHINE.

(Application filed Jan. 11, 1901.)

(No Model.) 3 Sheets—Sheet 1.

Fig.1.

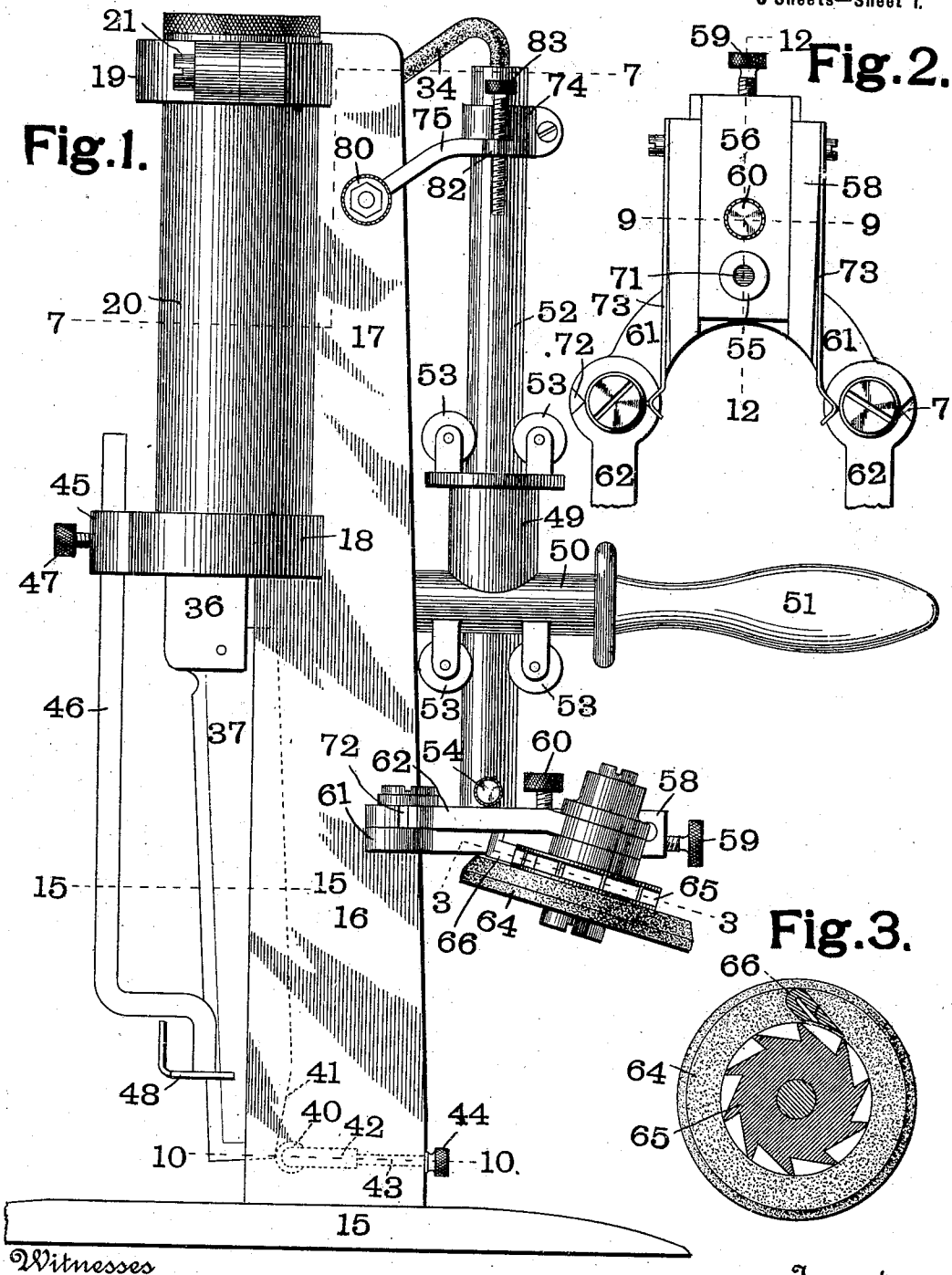


Fig.2.

Fig.3.

Witnesses

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3 Sheets—Sheet 2.

Fig.4.

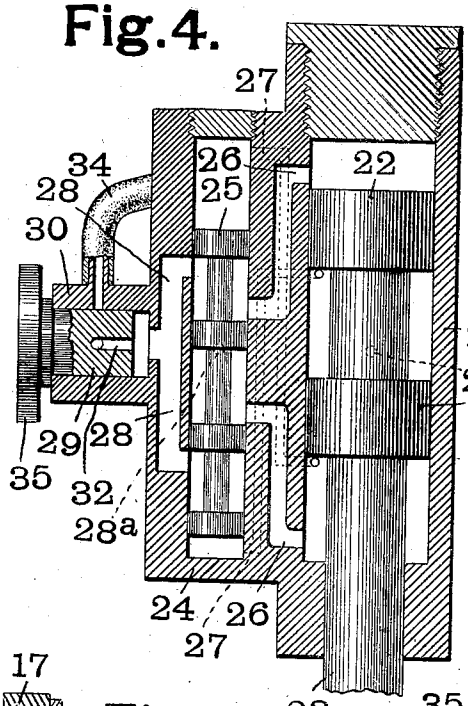


Fig.5.

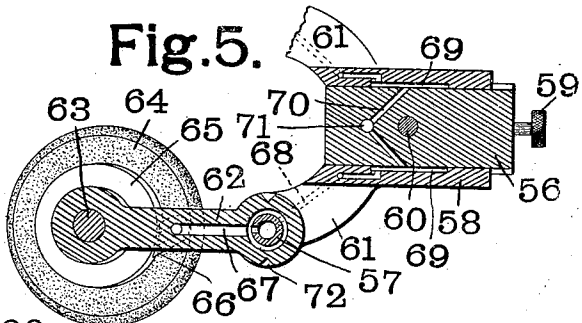


Fig.6.

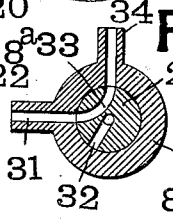


Fig.7.

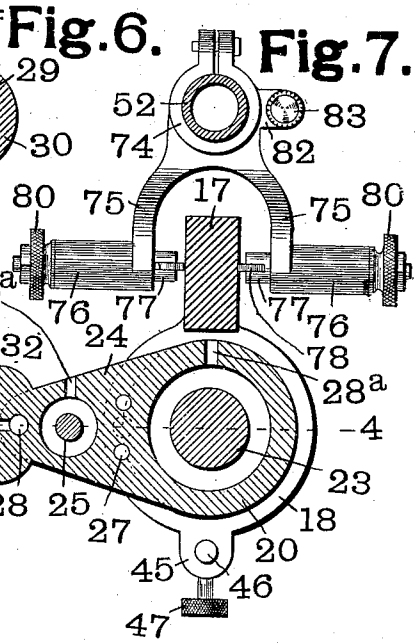


Fig.8.

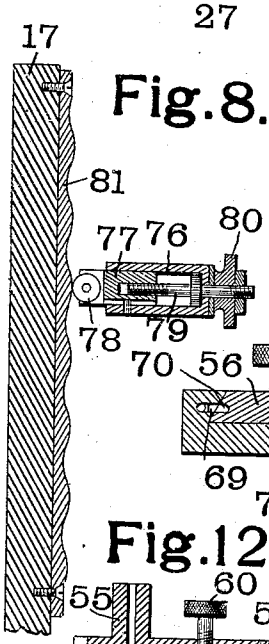


Fig.9.

Fig.10.

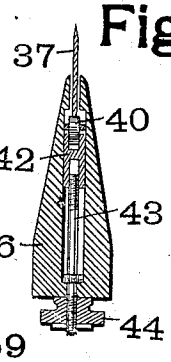


Fig.11.

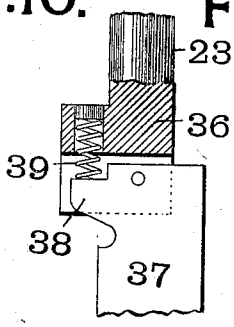
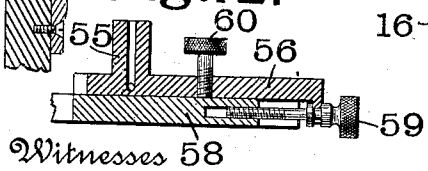


Fig.12.



Witnesses

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No. 685,329. Patented Oct. 29, 1901.

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CLOTH CUTTING MACHINE.

(Application filed Jan. 11, 1901.)

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Fig.13.

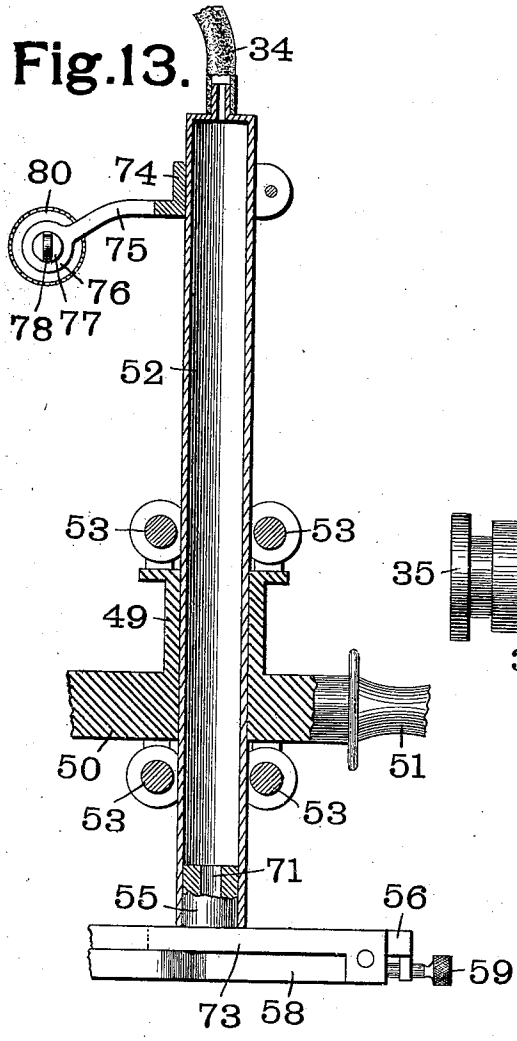


Fig.14.

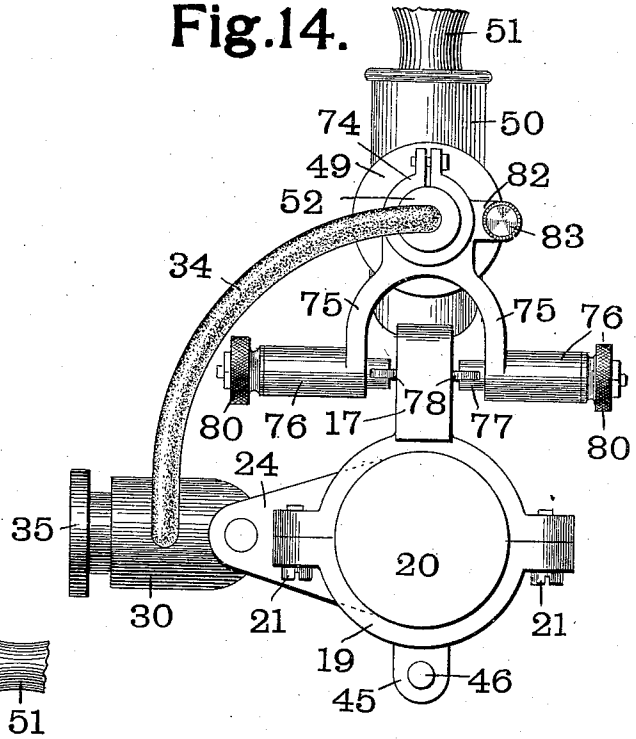
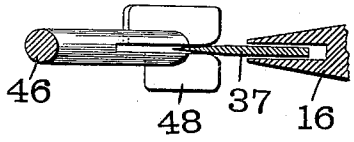


Fig.15.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN B. GURY, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO IKE BLOCK, OF ST. LOUIS, MISSOURI.

CLOTH-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 685,329, dated October 29, 1901.

Application filed January 11, 1901. Serial No. 42,837. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. GURY, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a certain new and useful Cloth-Cutting Machine, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

One object of my invention is to provide improved means for imparting vertical reciprocating motion to the knife of a cloth-cutting machine.

Another object of my invention is to so construct a cloth-cutting machine that all the layers of the material will be cut in the same shape.

Still another object of my invention is to provide improved grinding mechanism for sharpening the knife of a cloth-cutting machine.

My invention consists in various novel features and details of construction, all of which will be described in the following specification and pointed out in the claims affixed hereto.

In the accompanying drawings, which illustrate one form of cloth-cutting machine made in accordance with my invention, Figure 1 is a side view of the complete machine. Fig. 2 is a top plan view of a portion of the grinding mechanism. Fig. 3 is a section on the line 3 3 of Fig. 1. Fig. 4 is a section on the line 4 4 of Fig. 7. Fig. 5 is a sectional view, on a slightly-reduced scale, of a portion of the grinding mechanism. Fig. 6 is a section on the line 6 6 of Fig. 7. Fig. 7 is a horizontal section on the line 7 7 of Fig. 1. Fig. 8 is a sectional view showing a slight modification of a portion of the grinding mechanism. Fig. 9 is a section on the line 9 9 of Fig. 2. Fig. 10 is a section on the line 10 10 of Fig. 1. Fig. 11 is a view, partly in section, showing the manner of securing the knife to the piston-rod. Fig. 12 is a section on the line 12 12 of Fig. 2. Fig. 13 is a vertical section showing the parts carrying the grinding mechanism. Fig. 14 is a top plan view, and Fig. 15 is a section on the line 15 15 of Fig. 1.

Like marks of reference refer to similar parts in the several views of the drawings.

15 is the base-plate, which is adapted to pass under the material to be cut in the usual manner. Carried by the base-plate 15 is a standard 16, in which the knife of the machine works, as will be hereinafter described. The standard 16 is provided with an upward extension 17, preferably formed integral therewith. At the upper end of the standard 16 and preferably formed integral therewith is a ring 18, and at the upper end of the extension 17 is a ring 19. Between these rings 18 and 19 is secured the cylinder 20 of the motor. The ring 19 is formed in two semicylindrical parts secured together by screws 21, so as to allow the insertion or removal of the cylinder 20. Within the cylinder 20 is a double piston 22, carried by a piston-rod 23. Working in a valve-chest 24 of the cylinder 20 is a piston-valve 25. The interior of the valve-chest 24 communicates with the cylinder 20 by means of ports 26 and 27, Figs. 4 and 7. The operation of a motor of this form is well known and need not be described in detail. The air or other fluid for driving motor is admitted to the chest 24 through ports 28 and is exhausted from said chest 24 and the cylinder 20 through exhaust-ports 28^a, Figs. 4 and 7. The admission of the air is controlled by means of a rotary valve 29, turning in a casing 30, and provided with a head 35, by means of which it is turned.

31 is the air-supply passage leading to the casing 30. The valve 29 is provided with a port 32, which when brought into register with the supply-passage 31 connects said passage with the ports 28. The said valve 29 is also provided with a port 33, Fig. 6, which when brought into register with the supply-passage 31 connects the said passage with a flexible tube 34, leading to the grinding device, hereinafter to be described. The lower end of the piston-rod 23 is provided with an enlarged portion 36, Figs. 1 and 11, in which is pivoted the upper end of the knife 37. The upper end of the knife has a forward extension 38, Fig. 11, against which bears a coil-spring 39. The rear edge of the knife 37 works in a slot in the standard 16, as best shown in Figs. 1 and 10. The action of the

spring 39 is to throw the lower end of the knife farther into the standard 16 than the upper end, and so cause the edge of the knife to stand at a slight angle to the perpendicular. This movement of the lower end of the knife is limited by means of a roller 40, Figs. 1 and 10, contained in the lower part of the standard 16. The lower end of the rear edge of the knife is beveled at 41, Fig. 1, so that when the knife descends its lower end will be forced outward until the edge of the knife is perpendicular. Owing to this movement the knife makes a drawing cut, and at the same time the edge of the knife is brought perpendicular at very short intervals, so that in cutting a thick layer of goods all the layers are cut alike, which would not be the case if the edge of the knife was at all times at an angle to the perpendicular. In order to allow for adjustment to compensate for wear of the knife, the roller 40 is mounted in a sliding block 42, which can be moved to or from the knife by means of a screw 43, provided with a thumb-nut 44. The ring 18 is provided with a projecting portion 45, through which passes a guide 46, Figs. 1 and 15, the lower end of which is provided with a presser-foot 48, which bears against the goods and prevents their being raised during the upward movement of the knife and also prevents the knife from coming in contact with anything except the goods. The guide 46 can be adjusted by means of a screw 47.

Projecting rearwardly from the standard 16 is a bar 50, to which is secured the handle 51, by means of which the machine is guided. Passing through the bar 50 and a bearing-block 49, carried thereon, is a tube 52, carrying the grinding-wheels, hereinafter to be described. The tube 52 runs between groove-rollers 53, so as to lessen the friction. The upper end of the tube 52 is connected to the flexible tube 34, hereinbefore described, and the lower end of the said tube is secured by means of a screw 54 to a boss 55, carried on a plate 56, as best shown in Fig. 13. Means is thus provided for the passage of the air or other fluid from the valve to the plate 56, from which it passes to the motor for driving the grinding-wheels, as will hereinafter be described. The plate 56 is wider at the bottom than at the top, as best shown in Fig. 9, and slides in a dovetailed groove in a block 58. The movement between the plate 56 and block 58 is regulated by means of a screw 59, Figs. 1, 5, and 12. Passing through the plate 56 is a screw 60, the lower end of which rests on the block 58. The block 58 is provided with arms 61, Figs. 1, 2, and 5, to which are pivoted arms 62, in which are journaled the shafts 63 of the grinding-wheels 64. Each of the grinding-wheels 64 has secured to its upper face a suitable motor, preferably in the form of a turbine wheel 65, adjacent to the periphery of which is a nozzle 66, carried by the arm 62. The nozzle 66 communicates with passages 67 in the arms 62. These passages 67 in turn communicate with passages 68 in the arms 61 and block 58 through openings in the pivots 57, Fig. 5, connecting said arms 61 and 62. Each of the passages 68 terminates in an elongated port 69, as shown in Figs. 5 and 9. These ports 69 communicate with passages 70 in the plate 56 and allow the plate to be moved with respect to the block without interrupting the communication between the passages 68 and 70. The passages 70 communicate with an opening 71, Figs. 2 and 5, in the boss 55 and thence through the tube 52 and flexible tube 34 to the controller-valve 29. Each of the arms 62 is provided with two notches 72, adapted to engage with springs 73, Fig. 2, carried by the block 58. These springs retain the arms 62 either in the position shown in Figs. 2 and 5 or in the position shown in Fig. 1.

Secured around the upper end of the tube 52 is a collar 74, provided with arms 75, which embrace the upward extension 17 of the standard 16. Carried by each of the arms 75, Figs. 1 and 7, is a sleeve 76, in which slides a short rod 77. In the end of each of the rods 77 is journaled a roller 78, adapted to bear against the extension 17. The rod 77 is moved in or out of the sleeve 76 by means of a screw 79, provided with a milled head 80. In case a knife with a straight edge is used the rollers 77 bear directly on the extension 17; but in case a knife with a sinuous edge is used I secure to each side of the extension 17 a plate 81, Fig. 8, having a sinuous face. Carried by the collar 74 is a lug 82, Figs. 1 and 7, through which passes a screw 83 for regulating the downward movement of the tube 52.

The operation of my machine is as follows: When the machine is to be put in use, the arms 62, carrying the grinding-wheels 64, are folded back, as shown in Fig. 1, so as to remove the grinding-wheels from the knife, or, if so desired, the plate 56 and block 58, carrying the grinding-wheels, may be entirely removed from the machine by loosening the screw 54. To start the machine, the rotary valve 29 is turned until the port 32 registers with the supply-passage 31. This will place the air in communication with the cylinder 20 and impart to the piston 22 and piston-rod 23 a rapid vertical movement, which is communicated to the knife as the knife is directly connected to the piston-rod. The knife makes a drawing cut on the goods in its descent; but owing to the action of the roller 40 on its beveled rear edge 41 the lower edge is forced outward until the edge of the knife is perpendicular, thus allowing the machine to turn a corner and cut both the top and bottom layers of the goods alike. The foot 48 prevents the goods from being drawn upward during the upward movement of the knife. When it is desired to sharpen the knife, the valve 29 is rotated until the port 33 connects the supply-passage 31 with the flexible tube 34, Fig. 6. The air passes through the flexible tube 34 to the tube 52 and thence through

the passages 71, 70, 69, 68, and 67 and the nozzle 66 to the turbine wheel 65, thus rotating the grinding-wheels 64. When the grinding-wheels 64 are properly adjusted in the direction of the width of the knife by means of the screw 59, the screw 60 is tightened. This draws the inclined edges of the plate 56 up firmly against the corresponding faces of the block 58, and thus makes a tight joint, so that the air will not escape in passing from the passages 69 to the passages 70. It also prevents the wheels from being further adjusted in the direction of the width of the knife until the screw 60 is again loosened. By rotating the thumb-nuts 80 the tube 52 is rotated on its bearings, thus adjusting the grinding-wheels laterally until one of said wheels 64 is brought in contact with one edge of the knife. The tube 52 can then be raised and lowered, drawing the grinding-wheel along the edge of the knife until the same is completely sharpened, the rollers 78 acting as guides, so as to insure the edge being made perfectly straight. The milled nuts 80 are again rotated until the other grinding-wheel is brought in contact with the other edge of the knife, and the operation is completed, thus completing the sharpening of the knife. In order to sharpen the lower edge of the knife, the beveled parts of the grinding-wheels are used, the knife being swung outwardly on its pivot. During this operation the screw 83 is adjusted, thus limiting the longitudinal movement of the grinding devices, so as to hold the grinding-wheels at the proper height. The pivotal connection between the arms 62 and 61 not only allows the grinding-wheels to be folded back out of the way when they are not in use, but also prevents injury to the knife in case the guide is improperly set, as the springs 73 will allow the arms to yield if the grinding-wheel is brought too forcibly in contact with the knife, and thus prevent injury to the knife.

I am aware that cloth-cutting machines have been heretofore made in which a rotary knife was driven by a compressed-air motor and also that vertically-reciprocating knives have been driven by electric or similar rotating motors, and therefore do not claim such construction except as used in connection with the novel features of my invention.

Many changes may be made in the form and construction of my machine without departing from the spirit of my invention, and I therefore do not wish to be limited to the construction shown and described except where the same is specifically set forth in the claims.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a cloth-cutting machine, the combination with a base, of a pivotally-mounted knife, of a spring tending to hold said knife from movement on its pivot, and means for reciprocating said knife longitudinally.

2. In a cloth-cutting machine, the combination with a base, of a reciprocating knife coöperating therewith and provided at its rear edge with a bevel, means for actuating said knife, and an adjustable abutment cooperating with said bevel to force the lower end of said knife outwardly.

3. In a cloth-cutting machine, the combination with a base, of a reciprocating knife coöperating therewith and provided at its rear edge with a bevel, means for actuating said knife, and an adjustable antifriction-roller coöperating with said bevel to force the lower end of said knife outwardly.

4. In a cloth-cutting machine, the combination with a longitudinally-reciprocating knife, of a longitudinally-movable rock-shaft, a laterally-projecting arm carried by said rock-shaft, a grinding-wheel carried by said arm and adapted to be brought into contact with said knife by the movement of said rock-shaft on its axis, and means for rotating said grinding-wheel.

5. In a cloth-cutting machine, the combination with a longitudinally-reciprocating knife, of a longitudinally-movable rock-shaft, adjustable means for limiting the longitudinal movement of said shaft, a laterally-projecting arm carried by said shaft, a grinding-wheel carried by said arm and adapted to be brought into contact with said knife by the movement of said rock-shaft on its axis, and means for rotating said grinding-wheel.

6. In a cloth-cutting machine, the combination with a longitudinally-reciprocating knife, of a longitudinally-movable rock-shaft, a laterally-projecting arm carried by said rock-shaft, means for adjusting said arm in the direction of the width of said knife, a grinding-wheel carried by said arm and adapted to be brought into contact with said knife by the movement of said shaft on its axis, and means for rotating said grinding-wheel.

7. In a cloth-cutting machine, the combination with a longitudinally-reciprocating knife, of a longitudinally-movable rock-shaft, a laterally-projecting arm carried by said shaft, a grinding-wheel carried by said arm and adapted to be brought into contact with said knife by the movement of said shaft on its axis, adjustable means for limiting the movement of said shaft on its axis, and means for rotating said grinding-wheel.

8. In a cloth-cutting machine, the combination with a reciprocating knife, of a grinding-wheel movable longitudinally of the knife, means for adjusting said grinding-wheel in the direction of the width of the knife, means for adjusting said grinding-wheel laterally, and means for rotating said grinding-wheel.

9. In a cloth-cutting machine, the combination with a reciprocating knife, of a grinding-wheel movable longitudinally of the knife, a fluid-motor carried by said grinding-wheel, and means for supplying fluid to said motor.

10. In a cloth-cutting machine, the combi-

nation with a reciprocating knife, of a grinding-wheel movable longitudinally of the knife, a turbine carried by said grinding-wheel, and means for supplying compressed fluid to said turbine.

11. In a cloth-cutting machine, the combination with a reciprocating knife, of a member movable longitudinally of the knife, a laterally-swinging member pivoted to said movable member, a grinding-wheel carried by said laterally-swinging member, and means for rotating said grinding-wheel.

12. In a cloth-cutting machine, the combination with a reciprocating knife, of a member movable longitudinally of the knife, means for adjusting said movable member in the direction of the width of the knife, a laterally-swinging member carried by said movable member, a grinding-wheel carried by said laterally-swinging member, and means for rotating said grinding-wheel.

13. In a cloth-cutting machine, the combination with a reciprocating knife, of a longitudinally-movable rock-shaft, a grinding-wheel carried by said rock-shaft and adapted to coöperate with said knife, adjustable means for moving said rock-shaft on its axis, and means for rotating said grinding-wheel.

14. In a cloth-cutting machine, the combination with a reciprocating knife, of a rock-shaft, a grinding-wheel carried by said rock-shaft and adapted to coöperate with said knife, means for rotating said grinding-wheel, two arms carried by said rock-shaft, and members carried by said arms and adapted to move against a suitable guide.

15. In a cloth-cutting machine, the combination with a reciprocating knife, of a rock-shaft, a grinding-wheel carried by said rock-shaft and adapted to coöperate with said knife, means for rotating said grinding-wheel, two arms carried by said rock-shaft, and adjustable members carried by said arms and adapted to move on a suitable guide.

16. In a cloth-cutting machine, the combination with a reciprocating knife, of a fluid-motor for actuating said knife, a grinding-wheel, a fluid-motor for driving said grinding-wheel coöperating with said knife, a fluid-supply, and means for shifting said supply from one of said motors to the other.

17. In a cloth-cutting machine, the combination with a reciprocating knife, of a fluid-motor for actuating said knife, a grinding-wheel coöperating with said knife, a turbine wheel for driving said grinding-wheel, an air-supply, and means for shifting said supply from said motor to said turbine wheel.

18. In a cloth-cutting machine, the combination with a reciprocating knife, of a hollow shaft, a grinding-wheel carried by said shaft and coöperating with said knife, a fluid-motor carried by said grinding-wheel, communications between said hollow shaft and said fluid-motor, and means for supplying fluid to said hollow shaft.

19. In a cloth-cutting machine, the combination with a reciprocating knife, of a fluid-motor for actuating said knife, a hollow shaft movable longitudinally of said knife, a grinding-wheel carried by said shaft, a turbine carried by said grinding-wheel, communications between said hollow shaft and turbine, an air-supply, and means for shifting said air-supply from said motor to said hollow shaft.

20. In a cloth-cutting machine, the combination with a reciprocating knife, of a hollow shaft, a plate carried by said shaft and provided with beveled edges, passages in said plate, a block provided with a groove to receive said plate, passages in said block communicating with the passages in said plate, means for forcing the beveled edges of said plate firmly against the edges of the groove in said block, and a grinding-wheel carried by said block and coöperating with said knife.

In testimony whereof I have hereunto set my hand and affixed my seal in the presence of the two subscribing witnesses.

J. B. GURY. [L. S.]

Witnesses:
I. BLOCK,
JAMES H. BRYSON.