No. 767,552. PATENTED AUG. 16, 1904.

G. P. EASTMAN.

CLOTH CUTTER.

APPLICATION FILED DEC. 9, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

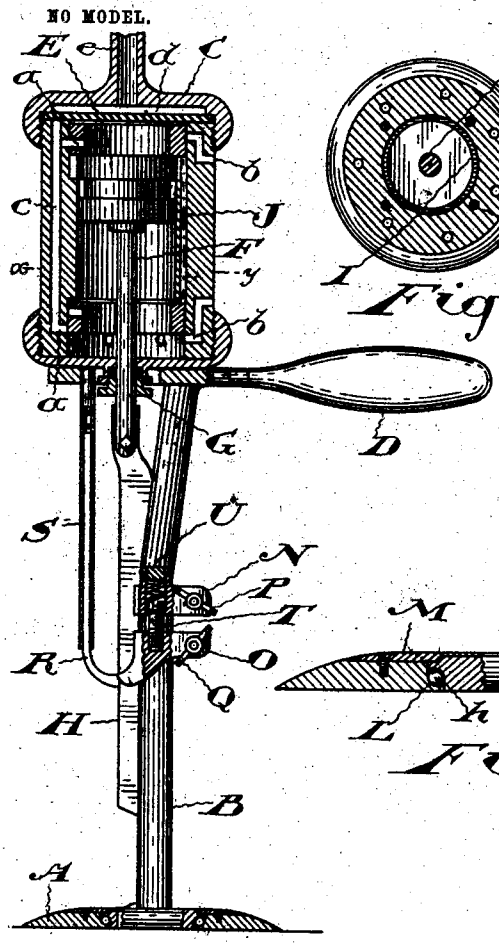



Fig. 1.




Fig. 2.




Fig. 4.

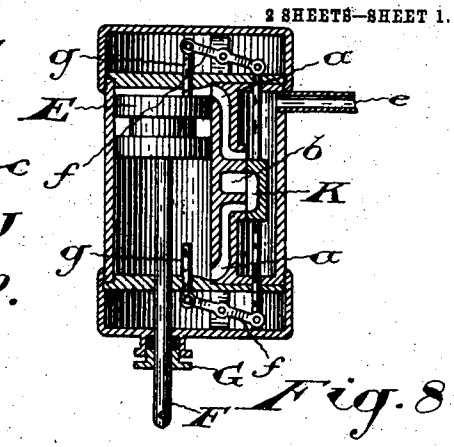



Fig. 8.

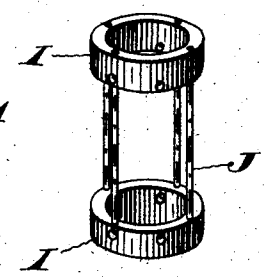



Fig. 5.

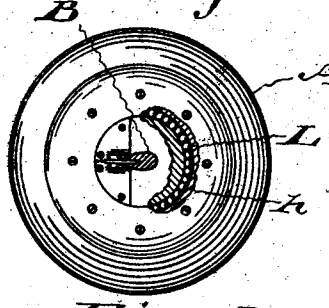



Fig. 3.

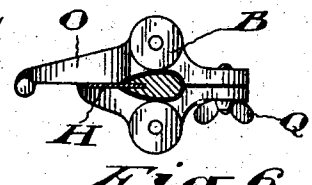



Fig. 6.

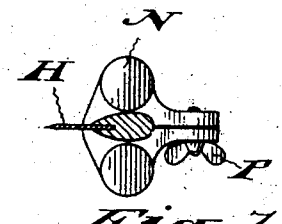



Fig. 7.

Witnesses

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CLOTH CUTTER.

APPLICATION FILED DEC. 9, 1902.

NO MODEL. 2 SHEETS—SHEET 2.

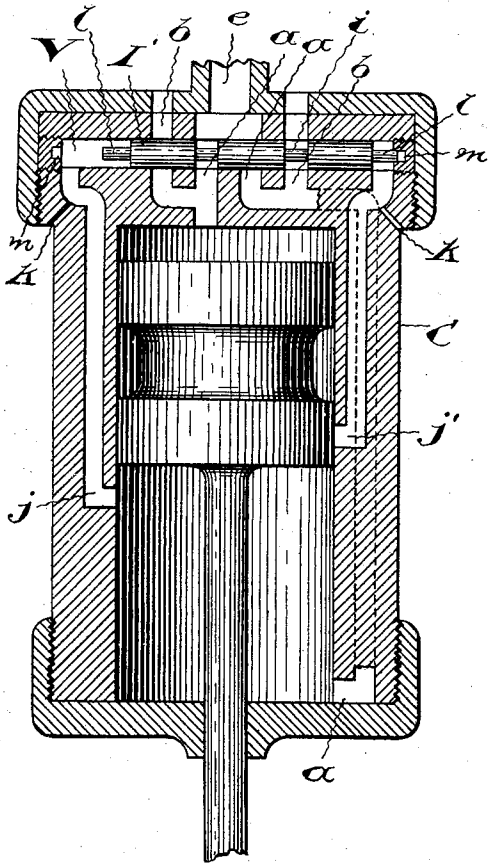



Fig. 9.

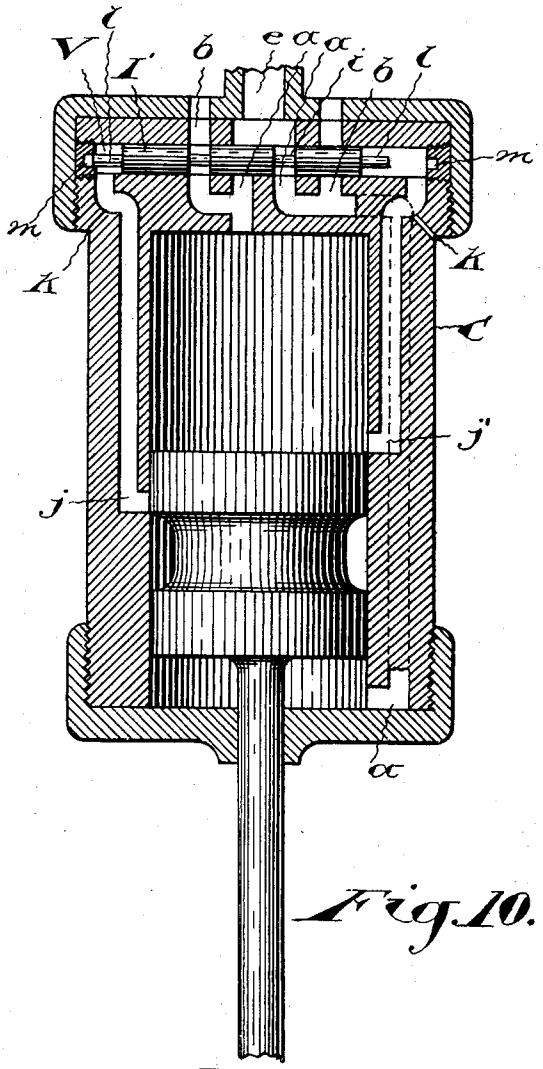



Fig. 10.

Witnesses

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No. 767,552. Patented August 16, 1904.

# UNITED STATES PATENT OFFICE.

GEORGE P. EASTMAN, OF TORONTO, CANADA.

## CLOTH-CUTTER.

SPECIFICATION forming part of Letters Patent No. 767,552, dated August 16, 1904.

Application filed December 9, 1902. Serial No. 134,488. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE PETER EASTMAN, of the city of Toronto, county of York, Province of Ontario, Canada, have invented certain new and useful Improvements in Cloth-Cutters, of which the following is a specification.

The object of my invention is to devise a cloth-cutter which may be operated by compressed air, which is readily turned without wrinkling up the under layers of cloth, and which accommodates itself to any variation in the level of the upper surface of the layers of cloth being operated on. I attain these objects by attaching the knife to the piston-rod of an air-cylinder provided with a suitable valve operated by the reciprocation of the piston, by making the central portion of the base to which the standard is connected revoluble in or upon the outer portion, and by making the presser-foot in two parts, the lower being free to move vertically within predetermined limits and normally pressed down by suitable springs, the whole being constructed in detail substantially as hereinafter more specifically described and then definitely claimed.

Figure 1 is a sectional elevation of my improved cutter. Fig. 2 is a sectional plan taken through the line $x\ y$ in Fig. 1. Fig. 3 is a plan view of the base, partly in section. Fig. 4 is a sectional detail of a portion of the base. Fig. 5 is a perspective view of the valve. Fig. 6 is a plan view of the lower part of the presser-foot. Fig. 7 is a similar view of the upper part of the presser-foot. Fig. 8 is a sectional elevation showing an alternative form of a compressed-air cylinder. Fig. 9 is a sectional elevation of a preferred form of air-cylinder, the piston being shown at the commencement of its downward movement. Fig. 10 is a similar view showing the piston just before the end of its downward movement.

In the drawings like letters of reference indicate corresponding parts in the different figures.

Referring particularly to Fig. 1, A is the base of the apparatus, B the standard connected to the center of the base, and C a compressed-air cylinder suitably connected to the upper part of the standard B. Connected with the standard or cylinder is a suitable handle D. The cylinder C has a piston E, operating therein and provided with a piston-rod F, extending through the bottom of the cylinder. A suitable stuffing-box G is of course provided around the piston-rod. Connected with the lower end of the piston-rod is the knife H, which is of ordinary construction and is guided in the ordinary manner within the standard B. At each end of the cylinder I provide inlet-ports $a$ and exhaust-ports $b$. There may be any suitable number of these provided to suit the amount and pressure of air employed. The inlet-ports $a$ preferably communicate with air-channels $c$, formed within the sides of the cylinder and communicating with the air-space $d$ at one end thereof. The exhaust-ports $b$ lead out through the sides of the cylinder, substantially as shown. The interior of the cylinder is preferably counterbored at each end to receive the rings I I forming the valve. These rings are connected by rods J or in any other suitable manner. It is convenient to have these rods extending through holes bored in the walls of the cylinder. (See Fig. 2.) The rings I I of the valve are adapted for engagement by the piston, as shown in Fig. 1. The result of the construction described is that when air is admitted to the air-space $d$ through the inlet $e$ air is admitted to one end of the cylinder and allowed to exhaust from the other. The piston is thus driven to the opposite end, striking the valve, and thus closing the inlet and exhaust ports which were previously open and opening those which were previously closed. This reciprocation of the piston, and consequent operation of the valve, goes on as long as air is admitted to the cylinder. The result is that the knife H is rapidly reciprocated.

In Fig. 8 I show a modification of the cylinder, in which an ordinary slide-valve K is substituted for the rings I I. This slide-valve is operated by being pivotally connected with levers $f$, pivoted at opposite ends of the cylinder and provided with suitably guided and pivoted striking-pieces $g$, which are adapted to be operated by the piston E in the same manner as the rings I I. This construction, it will be seen, is substantially similar in effect to that shown in Fig. 1, but is more compli-

cated, as it requires more parts liable to work loose. In Figs. 9 and 10 I illustrate a cylinder which I consider in many respects preferable to either of those already described, in that the valve is not operated by direct contact with the piston, but by air-pressure, thus avoiding the noise occasioned by the striking of the piston on the valve. In this form I employ a piston-valve comprising a cylindrical valve I′, longitudinally movable within a chamber V, intersecting the inlet and exhaust ports *a a* and *b b*. The valve I′, as shown, is reduced in diameter at certain parts to form ports *i*, adapted to register with the inlet and exhaust ports, as shown. The ends of the chamber V communicate with the interior of the cylinder by means of the passage-ways *j j′*. Through the cylinder I prefer to form restricted air-exits *k*, providing a restricted leakage from behind the ends of the cylindrical valve. The operation of this valve is substantially as follows: When the piston has just commenced its downward stroke, the valve, as shown, is in position to admit air through the inlet *e* to the upper end of the piston. At the same time the air is permitted to exhaust from below the piston. Just before the piston reaches the end of its downstroke the passage-way *j′* is uncovered, admitting the air-pressure to the right-hand end of the piston-valve, throwing the cylinder I′ over to the left, as shown in Fig. 10. Compressed air is now admitted below the piston and the upper part of the cylinder placed in communication with the exhaust, causing a reverse movement of the piston to be performed. It is desirable to cushion the ends of the cylindrical valve I′, so as to prevent noise when it is thrown from side to side. This may be done in various ways. In the drawings I show the ends of the cylindrical valve provided with reduced portions *l*, adapted to enter small recesses *m* in the walls of the air-cylinder C, forming air-cushions. The reduced portions of course fit very closely the sides of the air-cushions. Of course rubber disks might be employed in the recesses *m* instead of the air, if desired. It will be noticed that when the piston has opened one of the passage-ways *j j′* to air-pressure the residual air in the other one is compressed by the movement of the cylindrical valve I′, as almost immediately after the air-pressure has been admitted to one of these passage-ways the air-pressure within the cylinder, and consequently within the passage-way, is exhausted the compressed air in the other passage-way would tend to force back the cylindrical valve I′ to its original position. I overcome this objection by providing a restricted leakage through the air-exits *k*, which restore the equilibrium in the air-passages at opposite ends of the cylindrical valve under the conditions just described. These exits are not sufficiently large to prevent the proper operation of the cylindrical valve by the air-pressure, at the same time equalizing the pressure with sufficient rapidity, as described.

Other variations might be made in the compressed-air cylinder while maintaining the same principle of causing the movements of the piston to operate the valve.

In Figs. 3 and 4 are shown more particularly the construction of the base A. It will be seen it is formed in two portions—a central circular portion and an outer annular portion—having a ball-race L formed between them, in which are placed a series of balls *h*. The ball-race is so constructed that the central portion of the base rests on and is supported by the balls. In order to retain the parts together when the apparatus is lifted, I provide a ring M, which is secured to the outer part of the base by suitable screws and overlaps the central circular portion.

It is found that when an ordinary solid base is employed that in turning it under the goods the lower layer of cloth is very apt to be twisted and wrinkled, thus spoiling it. By my constructions the central portion alone turns when the knife is being caused to follow around a short curve, and thus wrinkling and spoiling the goods is completely obviated. Variations also might be made in this construction of the base, the essential feature being the connecting together of the two parts of the base, so that the central portion may turn independently of the outer.

The presser-foot is formed in two parts N and O. The upper part, N, surrounds the standard and is split at its rearward side. A thumb-screw P is provided, by means of which the split parts may be drawn together to clamp the presser-foot upon the standard, thus making it vertically adjustable. The lower part of the presser-foot is made in two portions for the purpose of placing it in position on the standard, and the parts are held together by means of the thumb-screw Q. This part of the presser-foot slides freely on the standard. (See Fig. 6.) Between the front parts of this portion of the presser-foot the knife H is inclosed. One part of the presser-foot is brought into line with the front edge of the knife and is extended vertically to form the guard-rod R. This guard-rod is sleeved within the downwardly-depending tube S, secured to the supports of the cylinder or otherwise suitably held from a stationary part. As the presser-foot is vertically adjusted the rod R is extended or retracted to suit the position of the presser-foot, always efficiently guarding the knife. The two parts of the presser-foot are held together by means of the headed screws T, which are screwed into the lower part of the presser-foot and engage with their heads shoulders formed at the bottom of the holes *i*, formed in the upper part of the presser-foot. These holes are closed by means of the screw-caps U, and coil-springs *j* are lo-

cated between these caps and the heads of the screws T. These springs normally maintain the heads of the screws in contact with the shoulders formed in the holes *i*, and thus hold the lower part O of the presser-foot normally extended with a spring-pressure. In case of any unevenness in the thickness of the cloth being operated on the lower part of the presser-foot is free to yield upwardly, in this manner accommodating itself very exactly to all variations. In this part of my device various changes might also be made in the details of construction, the essential features being the construction of the presser-foot in two portions, the upper being vertically adjustable on the standard and the lower vertically movable with relation to the upper and normally held extended by spring-pressure, another feature of the presser-foot being the telescopic guard connected with the lower part of the presser-foot and some stationary part.

What I claim as my invention is—

1. In a cloth-cutter, a base and a standard connected thereto in combination with a presser-foot made in two parts, the upper part adjustable vertically on the standard, and the lower part vertically movable on the upper part within predetermined limits; and a spring normally maintaining the said lower part extended, substantially as described.

2. In a cloth-cutter, a base and a standard connected thereto in combination with a presser-foot made in two parts, the upper part adjustable vertically on the standard, and the lower part vertically movable on the upper part within predetermined limits; a spring normally maintaining the said lower part extended; a stationary vertical tube supported from a stationary part by its upper end; and a vertical rod connected with the front of the lower part of the presser-foot and sleeved within the said tube, substantially as described.

3. In a cloth-cutter, a base and a standard connected thereto in combination with a presser-foot vertically adjustable on the said standard; a stationary vertical tube supported from a stationary part by its upper end; and a vertical rod connected with the front of the lower part of the presser-foot and sleeved within the said tube, substantially as described.

Toronto, December 4, 1902.

GEORGE P. EASTMAN.

In presence of—
J. EDW. MAYBEE,
A. J. COLBOURNE.