H. STEIN.

Machine for Cutting Cloth and other Fabrics.

No. 226,427. Patented April 13, 1880.

Fig. 1.

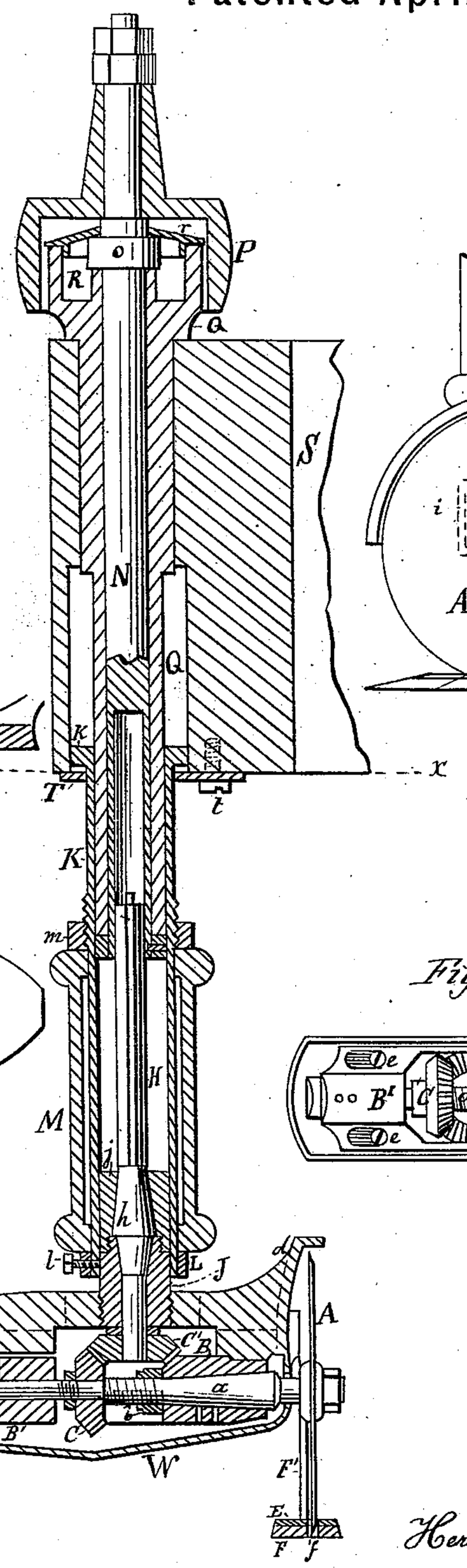


Fig. 2.

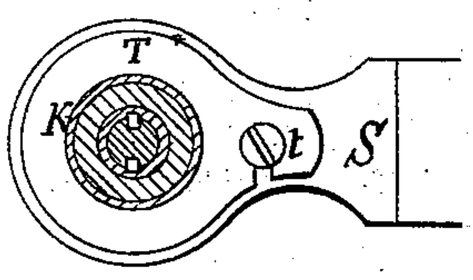


Fig. 3. a.

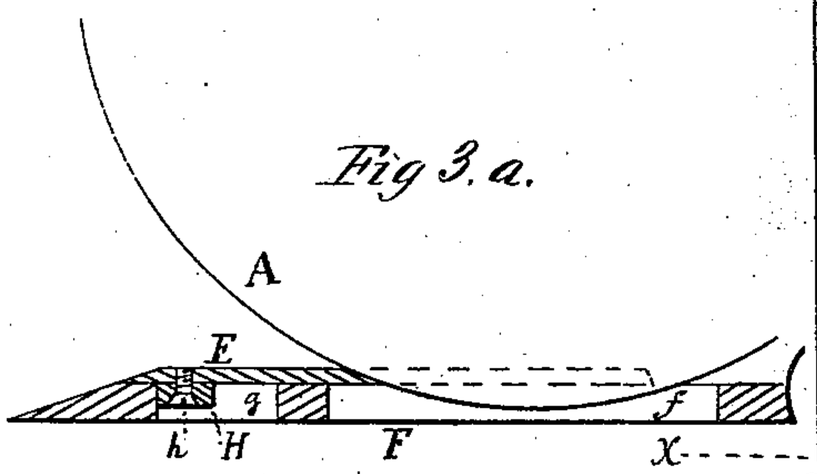


Fig. 3. b.

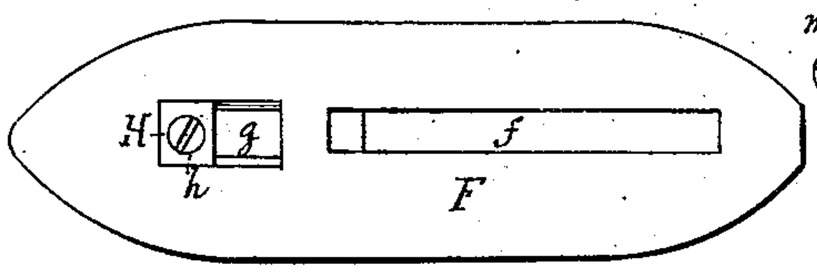


Fig. 3. c.

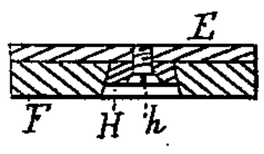


Fig. 4.

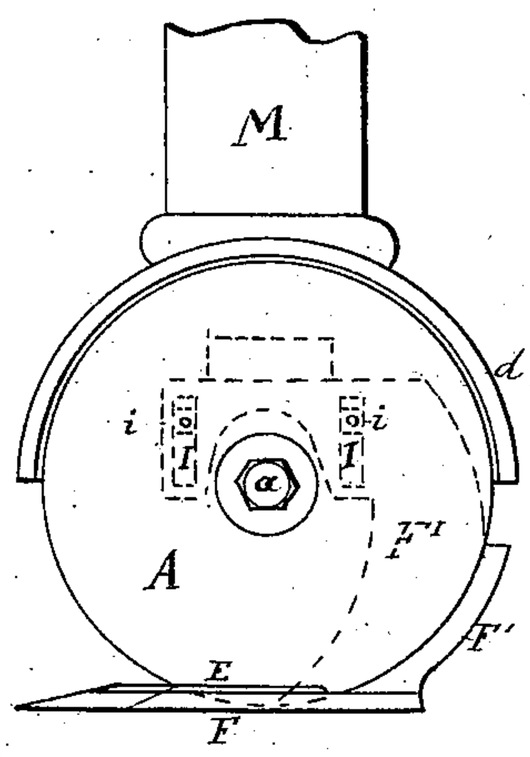
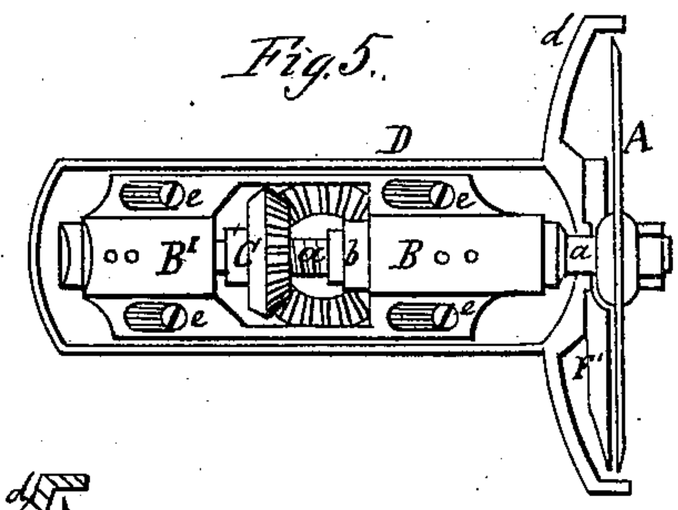


Fig. 5.



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UNITED STATES PATENT OFFICE.

HERRMANN STEIN, OF BERLIN, PRUSSIA, GERMANY, ASSIGNOR TO JACOB PHILIPPSOHN AND WILHELM LESCHZINER, OF SAME PLACE.

MACHINE FOR CUTTING CLOTH AND OTHER FABRICS.

SPECIFICATION forming part of Letters Patent No. 226,427, dated April 13, 1880.

Application filed October 28, 1879. Patented in Germany February 28, 1878, and November 27, 1878, in England August 30, 1878, in Belgium September 9, 1878, in France September 14, 1878, and in Austria January 23, 1879.

To all whom it may concern:

Be it known that I, HERRMANN STEIN, of Berlin, in the Kingdom of Prussia and Empire of Germany, have invented a new and useful Improvement in Machinery for Cutting out after Patterns Linen, Cloth, and other Fabrics, (which improvement has been patented in Germany, No. 2,510, dated February 28, 1878, and No. 5,612, dated November 27, 1878; in Belgium, No. 46,119, dated September 9, 1878; in England, No. 3,440, dated August 30, 1878; in France, No. 126,542, dated September 14, 1878; and in Austria, No. 38,053, dated January 23, 1879,) of which the following is a specification.

My invention relates to machinery adapted for cutting out to a pattern layers of cloth in a pile, and to that particular class of cloth-cutting machinery in which a rotating and traversing cutter-disk is connected to horizontally-swinging arms, and is driven by belts and gearing, similar to the machine described in Letters Patent of the United States No. 129,327, which were granted to Fenno and Howe on July 16, 1872.

My invention consists in the combination, with the foot or throat plate, of a notched steel plate, wherein the circular cutter revolves, and which is adjustably secured upon said foot or throat plate, to be moved toward the circumference of the cutter when, from its use, the latter has been ground down to a smaller diameter, that the cloth to be cut may find always a good support close to the cutting-edge of the disk.

My invention also consists in adjustably attaching the foot or throat plate to and against the casing by screws passed through slotted holes of the foot-plate standard, to admit a change of position vertically whenever a decrease of diameter of the cutter makes it desirable.

My next improvement consists in providing the journal-boxes of the cutter-spindle with oblong holes, for securing the same by screws to the casing in a manner to be longitudinally adjustable.

My next improvement consists in providing the cutter-spindle with a tapering journal and with an adjustable collar to the end of the box, for compensating the wear of the bearings.

My next improvement consists in the arrangement of two driving-shafts, one sliding into the other, and in a telescopic connection between the cutter mechanism and the end of the swinging arm, in order to admit of a vertical lift of the cutter.

My next improvement consists in the combination, with the tube holding the cutter-gearing, of a cylindrical handle secured thereupon and having a recess which forms an air-chamber around said tube, for the purpose of insuring said handle against being heated from the friction of the journals.

My next improvement consists in the combination, with the upper or pulley shaft, of a tubular brass bushing inserted into the end of the swinging arm and having an annular oil-chamber in its enlarged upper end, wherefrom the whole mechanism will be kept lubricated; and, finally, my invention consists in the construction and arrangement of the several parts, as more fully hereinafter will be described.

In the accompanying drawings, Figure 1 represents a vertical section through the end of the swinging arm and through the center of the cutter device. Fig. 2 represents a sectional view on line *x x* of Fig. 1. Fig. 3^a is a longitudinal vertical section through the center of the foot or throat plate. Fig. 3^b is a bottom view of the foot-plate. Fig. 3^c is a vertical cross-section through the foot or throat plate. Fig. 4 represents a front elevation of the cutter-disk, the guard-flange, and foot-plate; and Fig. 5 is a bottom view of the casing holding the cutter-spindle, journal-bearings, and gearing.

Similar letters in the several figures of the drawings indicate corresponding parts.

In the drawings, the letter A denotes the revolving cutter-disk, which, by means of a washer and screw-nut, is secured against a collar to the end of the spindle *a*. The forward portion of this spindle *a* is turned conical, and is fitted into a conically-bored bearing, B, and has an adjustable collar, *b*, which is screwed upon the spindle to compensate for the wearing of the journal and bearing, and

to insure thereby a steady motion for the cutting-disk. The rear end of the spindle is pivoted in a second box, B′, and both journal-boxes B and B′ are secured to the casing D by screws *e*, passed through oblong slots in the flanges of said boxes, that they may be longitudinally shifted for adjusting the cutter-disk A to occupy its correct position.

The casing D has a semicircular plate, *d*, to its forward upper end, with a projecting flange, which covers the cutter-edge in the shape of a fender as a guard for the operator's hand.

F is the foot or throat plate, which is sharpened in front to pass under the cloth to be cut, and has a slit, *f*, into which the lower cutting-edge of disk A extends. By means of a vertical curved plate, F′, having oblong slots I, this foot-plate F is secured to the casing D by two screws, *i*, so as to be vertically adjustable, for accommodating it to the size of the cutter-disk A, as its diameter becomes smaller by frequent sharpening.

The upper face of foot-plate F is covered with a steel plate, E, which is notched to closely fit over the cutter-disk edge, and which is adjustably secured upon the said foot-plate by a screw, *h*, passed through a nut-plate, H, which is fitted to move in a dovetailed slot, *g*, in the foot-plate, in a manner that by loosening said screw from below the plate E can be shifted toward the circumference of the cutter, that, as the same becomes smaller in diameter by frequent grinding, the said plate E can be adjusted to remain in close proximity of the cutting-edge, for the purpose of giving the cloth a good support close to the cutter, and to prevent the fibers of the cloth from being torn into the machine by the cutter.

W is a shell, which is secured by screws against the under side of casing D, for hermetically closing in and protecting the interior machinery against dust, and to form an oil-receptacle for lubricating the journals of spindle *a*, and for preventing the oil from dripping upon the cloth to be cut.

A cylindrical plug, J, is screwed into the upper wall of casing D, and to the upper end of this plug J is screwed another cylindrical plug, *j*, of equal diameter, and both plugs, J and *j*, are bored out tapering to form the bearing for a biconical journal, *h*, of shaft H, which has attached to its lower end a bevel-gear wheel, C′, engaging with a similar wheel, C, which is mounted upon the spindle *a*.

The plugs J *j* are inserted into the lower end of a tube, K, and are held rigid therein by a set-screw, *l*, which is tapped through a loose collar, L, and through the tube K, and upon said tube K is secured a cylindrical wooden handle, M, between collar L and a screw-nut, *m*. This handle M is bored out to have a recess for forming an air-jacket around tube K, which will prevent it from getting heated by the friction in the journal-bearings of the shafts if the same should not be sufficiently lubricated.

S denotes the end of the arm, which is pivotally connected with its opposite end to the end of another arm, which radially swings from a stationary standard in a manner that the operator is enabled to lead the cutting apparatus everywhere upon the table, the arrangement of said arms being the same as described in the patent to Fenno and Howe, heretofore cited.

The end of arm S is bored vertically, and is counterbored from the bottom for rigidly holding a bushing-tube, Q, in its upper or smaller bore, and in its lower or counterbore, to form an annular or cylindrical chamber around the smaller and downwardly-projecting portion of said bushing-tube. This bushing-tube is bored out cylindrically, and to its upper end it has a head, in which is formed an annular oil-receptacle, R. Through the bushing is placed a shaft, N, having a collar, *o*, which shoulders against the inner lower wall of oil-receptacle R, and both the oil-receptacle and the collar *o* are covered by a washer-like cap, *r*, that the oil may be in contact with said collar, and thence be carried downward to lubricate the whole machinery, and to collect finally in the shell W.

The shaft N, above the collar *o*, is extended for holding the pulley P by two screw-nuts upon its end. The lower portion of shaft N is bored out concentrically, to be hollow and to pass over the end of shaft H, which has a groove engaging with a projecting pin or feather in the bore of shaft N, so that one shaft can slide into the other without interfering with the rotating motion transmitted from one shaft to the other.

Upon the lowermost end of shaft N is secured a collar, which forms a shoulder against the end of the bushing Q, for holding said shaft vertically in position.

The tube K has an exterior flange, *k*, to its upper extremity, which fits into the counterbore of arm S, to be free to slide vertically therein, and a ring-plate, T, placed over the tube K, has an extension with an arc-shaped notch, by which and by a screw, *t*, it is secured against the under face of arm S, for forming a stop to flange *k*. This plate T can be uncoupled from arm S by loosening the screw *t* sufficiently to release the notched portion of plate T, which is then turned to clear the screw, when the whole cutting apparatus can be detached.

By the above-described arrangement, as will be seen, of tube K sliding upon bushing Q and into the counterbore of arm S, and of the shaft H sliding into shaft N, all in the manner of a telescope, the foot of the machine, besides its axially-free movement, can follow and pass over the undulations of the table, and the cutting apparatus can be lifted out from the cloth by the operator whenever desirable.

The cloth or linen to be cut may be spread on the table for cutting by this machine in layers piled up to the number of one hundred, or to a thickness of about two inches, the uppermost carrying the design of the pattern. The

speed of the cutting-disk is to be about four thousand revolutions per minute.

The operator will take hold of the handle M, will push the foot F under the cloth, and will lead the cutter along the line of the pattern.

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

1. In combination with the rotating cutter-disk A, the foot or throat plate F, having notched plate E adjustably connected therewith, as and for the purpose described.

2. In combination with the rotating cutter-disk A, the foot or throat plate F, having dove-tailed slot *g*, for adjustably connecting notched plate E by nut H and screw *h*, substantially as and for the purpose described and shown.

3. The foot or throat plate F, having a standard-plate, F′, arranged parallel with the cutter-disk, and provided with a recess to allow the shaft to pass through, and slots I in each side of said recess, for adjustably securing it by screws *i* to casing D, substantially in the manner and for the purpose set forth.

4. In combination with the rotating cutter-disk A and casing D, the foot or throat plate F, having standard F′, with slots I, for adjustably securing it by screws *i*, and having the adjustably-connected and notched plate E, all constructed and arranged as and for the purpose described and shown.

5. In combination with the spindle *a*, the cutter-disk A, having a conical journal and an adjustable collar, *b*, and the conically-bored journal-box B, substantially as and for the purpose set forth.

6. The spindle *a* of cutter-disk A, pivoted in journal-boxes B B′, each provided with slotted flanges, for securing them by screws *e* to casing D in the manner to be longitudinally adjustable, substantially in the manner set forth.

7. In combination with spindle *a*, the cutter-disk A, having conical journal and adjustable collar *b*, the conically-bored box B and box B′, each provided with slotted flanges, for securing it to casing D by screws *e* in a manner to be longitudinally adjustable, the same being constructed and arranged substantially in the manner set forth.

8. In combination with bushing Q, the arm S, hollow shaft N, carrying pulley P, the shaft H, carrying gear-wheel C′, and tube K, rigid with the cutter device, all being constructed and arranged to form a telescopic connection between the driving power and the cutter device, as and for the purpose described and shown.

9. In combination with the tube K, rigidly connected with the cutter-casing, the handle M, bored with a recess for forming an air-jacket around said tube, and secured between collar L and screw-nut *m*, as and for the purpose set forth.

10. In combination with arm S, the tubular bushing Q, for holding shaft N, having the collar *o*, said bushing Q being provided with an annular oil-chamber, R, and cover *r*, all substantially as and for the purpose described and shown.

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

HERRMANN STEIN.

Witnesses:
ARMAND SCHRÖDER,
ALBERT GUMPERT.