No. 796,708. PATENTED AUG. 8, 1905.

I. L. CONKLING.

ROTARY CUTTER.

APPLICATION FILED JAN. 11, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

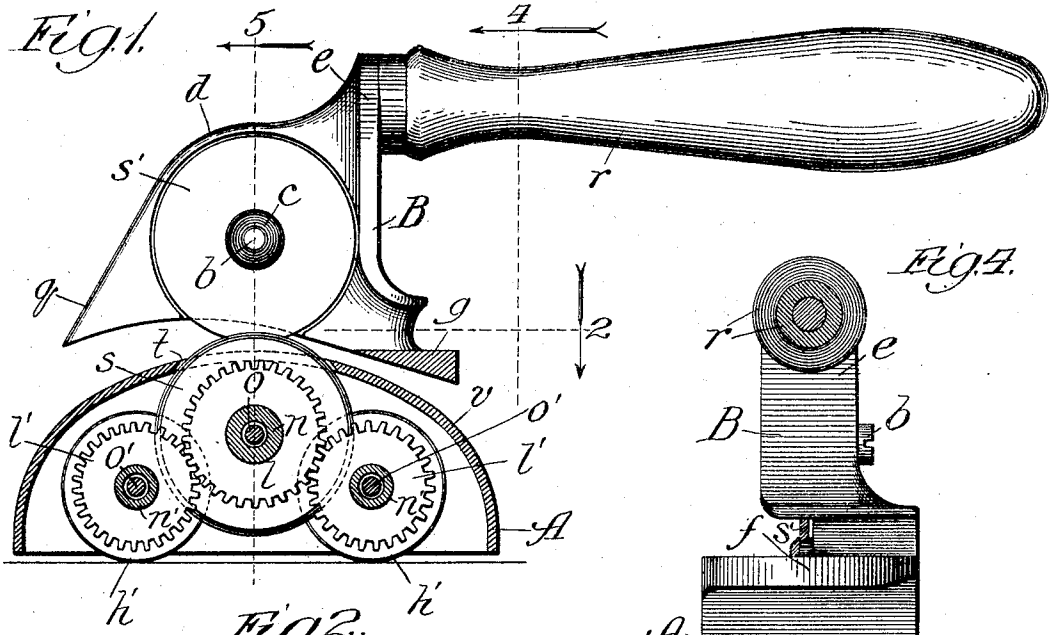


Fig. 2.

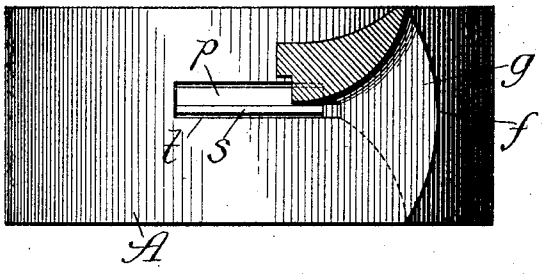


Fig. 4.

Fig. 3.

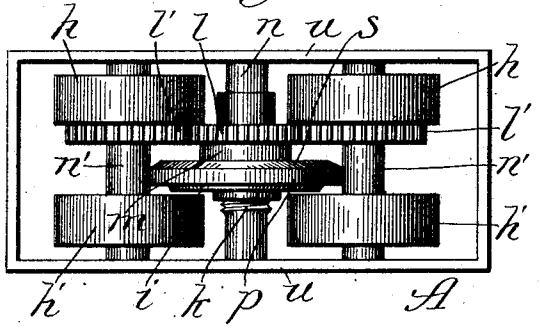


Fig. 5.

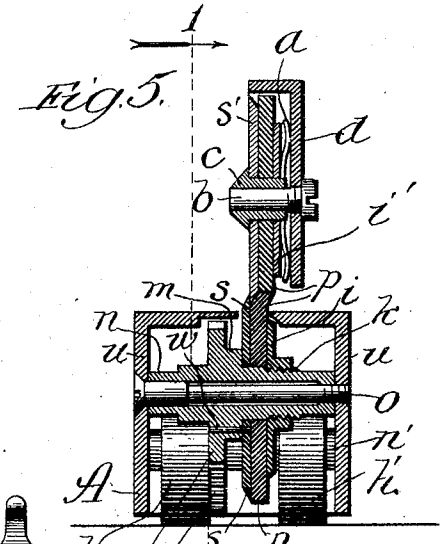


Fig. 6.



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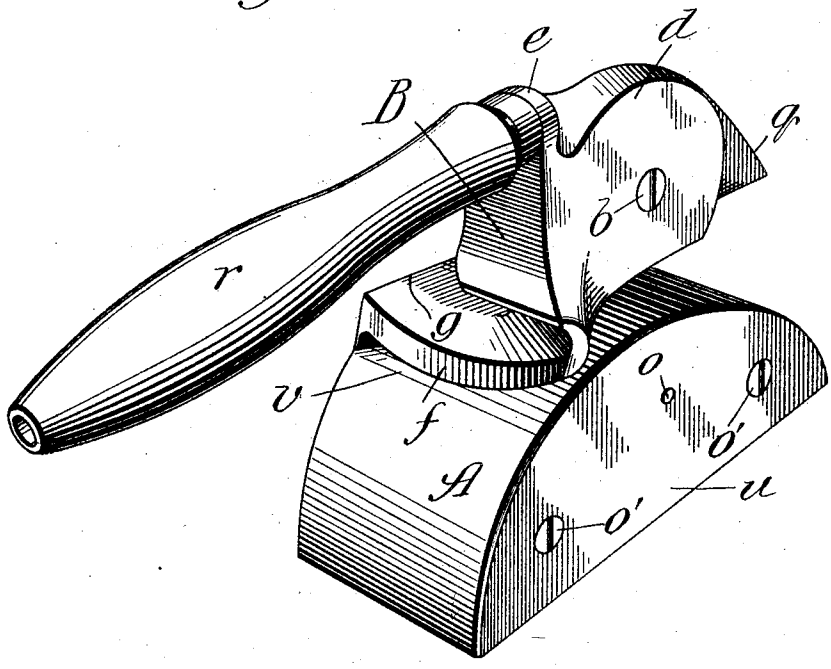
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2 SHEETS—SHEET 2.

Fig. 7.



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UNITED STATES PATENT OFFICE.

IRA L. CONKLING, OF PHILADELPHIA, PENNSYLVANIA.

ROTARY CUTTER.

No. 786,708. Specification of Letters Patent. Patented Aug. 8, 1905.

Application filed January 11, 1904. Serial No. 188,511.

To all whom it may concern:

Be it known that I, IRA L. CONKLING, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Rotary Cutters, of which the following is a specification.

My invention relates to apparatus of the class known as "rotary cutters" for cutting cloth and analogous material; and my object is to provide a construction whereby greater steadiness is obtained than in previous devices for the same purpose, as well as superior facility and accuracy in guiding the device along the pattern, with a free delivery of the severed edges even in the cutting of complicated patterns.

The nature of my improvements will appear from the following description, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of the device, taken on the line 1 of Fig. 5 and viewed in the direction of the arrow. Fig. 2 is a horizontal section taken on the line 2 of Fig. 1 and viewed in the direction of the arrow. Fig. 3 is a bottom view of the device with the handle removed. Fig. 4 is a vertical section taken on the line 4 of Fig. 1 and viewed in the direction of the arrow. Fig. 5 is a vertical section taken on the line 5 of Fig. 1 and viewed in the direction of the arrow. Fig. 6 is a detail view, and Fig. 7 a perspective view of the device.

A is a metal housing open at its base, arched longitudinally, as shown at *v*, and provided with vertical sides *u*. In the arched top of the housing is a slot *t*, through which the lower rotary cutter *s* protrudes, and surmounting the housing and integral with it or rigidly secured to it is an extension B, which carries the upper rotary cutter *s'*, the handle *r*, and the guide *q*. Each of the rotary cutters is annular in form, has the usual beveled edge, and is faced with an annular disk *p*, of india-rubber. When in place, the beveled edges of the cutters overlap, and the india-rubber disks are in peripheral contact with each other, so that the rotation of the lower cutter rotates the upper one in the contrary direction. The vertical sides *u* of the housing serve as bearings for the shaft *o* of the lower cutter, the shaft being shown in the form of a screw, which is the most desirable construction. The manner of mounting the lower cutter and its attendant parts in the housing constitutes one of the features of my invention and is clearly shown in section in Fig. 5. Surrounding the shaft *o* and turning thereon is a metal sleeve *n*, extending from one inner wall of the housing to the other and provided with the shoulder *m*, which may be made integral with it or be rigidly secured to it and which serves as the abutment for the annular cutter *s*, which is slipped over the sleeve. Separated from the cutter by the shoulder *m* is the pinion *l*, which likewise may be made integral with the sleeve or rigidly attached to it. For the purpose of securing the cutter firmly in position against the shoulder *m* the sleeve *n* is externally screw-threaded for a sufficient portion of its length adjacent to the india-rubber disk, as shown at *k*, to receive an annular internally-threaded washer *i*. The cutter may be additionally locked against rotation, as by means of a recess in its inner face engaging a stud upon the shoulder, such as is formed by the projecting end of the pin *w*. The vertical walls of the housing also serve as bearings for two shafts *o'*, similar to the shaft *o*, each of which carries two rollers *h* and *h'*, rigidly mounted upon a sleeve *n'*. The tread portion of each roller is preferably formed of india-rubber, and all four project slightly below the housing. Rigidly fixed upon each sleeve *n'*, against the inner face of each roller *h*, is a pinion *l'*, meshing with the pinion *l* of the lower cutter, whereby rotation of the rollers, as by frictional contact with a surface over which the device is moved, imparts the required rotation to both cutters. In practice I find it of advantage to employ four driving-rollers, owing to the firm and even bearing which they afford while the device is moved forward and guided in the devious directions required to follow the lines of the pattern; but the features included in the subjoined claims may be used without reference to the number of rollers employed.

The extension B, which surmounts the housing, is of somewhat complicated shape, and several different functions are performed by its different parts. The initial portion consists of a plate extending in an approximately horizontal position backward for a short distance, as shown at *g*, and then transversely over the housing and somewhat above it, as shown at *f*, whereby when the fabric is subjected to the action of the cutters one of the severed margins passes over the part *g* and the other passes under the part *f*. By thus

deflecting the severed portions of the material to different planes I avoid all hitching and crimping, with consequent irregularity in cutting. From the part *f* the extension B is continued upward and forward, the vertical portion *e* carrying the handle *r* and the forward portion forming the recessed bearing *d* for the upper rotary cutter *s'*, whence it is prolonged into the guide *q*. The manner of mounting the cutter *s'* in the bearing *d* is shown in section in Fig. 5 and also forms one of the features of my invention. The cutter is provided with a fixed internal sleeve or hub *c*, projecting at each end. The india-rubber disk *p* is firmly embraced between the cutting-disk and a washer *i'*, secured in place upon the sleeve. A screw, with threads adjacent to its head engaging threads in the rear wall of the bearing *d*, forms a spindle *b*, upon which the cutter is loosely mounted by means of the sleeve, and a flat spring *a*, between the washer and the rear wall, tends to force the cutter outward. The cutter *s'* is retained within the recess of the bearing *d* solely by its engagement with the cutter *s*, and the purpose of the spring *a* is to maintain the overlapping portions of the cutters in contact.

The mechanism above described may be variously modified in detail without departing from my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus for cutting cloth and analogous material, the combination of a housing open at its base and having a slot in its top, rollers forming the support for the housing, a lower rotary cutter geared with the rollers and projecting through said slot, an extension surmounting said housing and having a recess, an upper rotary cutter receiving motion from the lower cutter and arranged in said recess, and means for guiding the material to said cutters consisting of an upper guide on the extension coöperating with the housing-top.

2. In an apparatus for cutting cloth and analogous material, the combination with friction-rollers and a rotary cutter *s* mounted in a housing and gearing connecting the rollers and cutter, of an extension mounted upon the top of the housing and carrying the handle and cutter *s'*, the base of said extension forming the plate *g f*, extending backward from the cutters and then transversely over the housing out of contact with the same, and an upper guide *q* extending forwardly of the extension and coöperating with the housing-top to guide the material, substantially as described.

3. In an apparatus for cutting cloth and analogous material, the housing A, shaft *o* supported in the housing, sleeve *n* loosely mounted on the shaft *o* and provided with the shoulder *m* and external screw-threads *k*, pinion *l* rigid upon the sleeve *n* at one side of the shoulder *m*, cutter *s* abutting against the opposite side of the shoulder *m*, and holding-plate *i* securing the cutter in place, in combination with a cutter *s'* supported above the cutter *s* in frictional contact with the latter, and rollers and gearing for imparting rotation to the cutter *s*, substantially as described.

4. In an apparatus for cutting cloth and analogous material, the combination with a housing for the lower cutter and actuating-rollers of an extension B upon the housing carrying a bearing *d* provided with a circular recess, a spindle *b* projecting from the rear wall of the recess, a rotary cutter mounted upon the spindle, and a spring between the rear wall of the recess and the rotary cutter, and guiding means for the material consisting of a guide *q* on the extension coöperating with the housing-top, substantially as described.

5. The combination with a suitable frame, of a drive-wheel journaled therein, a pair of cutter-disks intergeared with and driven by said drive-wheel and having a shearing engagement with each other, and a guide arranged to direct the material acted upon into engagement with the disks.

6. The combination with a supporting-frame constructed to form a casing, of a drive-wheel journaled in said frame and protruding at its lower side, a pair of cutter-disks intergeared with and driven by said drive-wheel, a prow arranged to direct the fabric into engagement with the cutter-disk, and a handle connected with said frame.

IRA L. CONKLING.

In presence of—
A. L. KERSHAW,
THOS. F. KEOGH.