

(No. Model.)

E. M. WARING.
CLOTH CUTTING MACHINE.

No. 581,092.

Patented Apr. 20, 1897.

Fig-2.

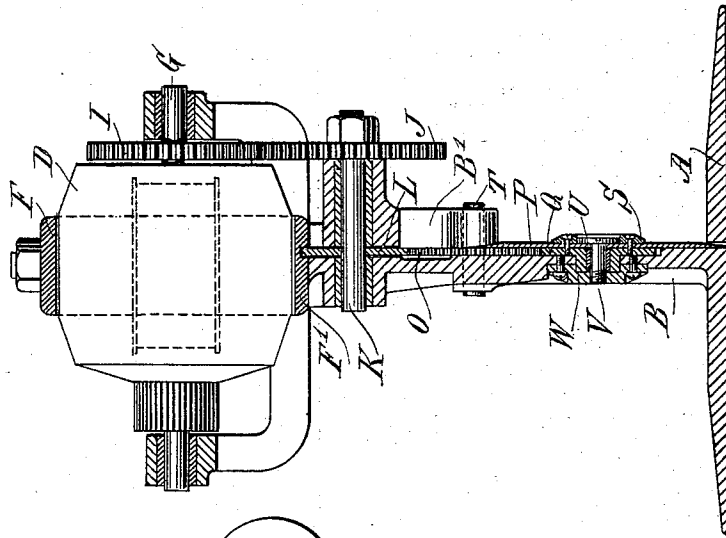
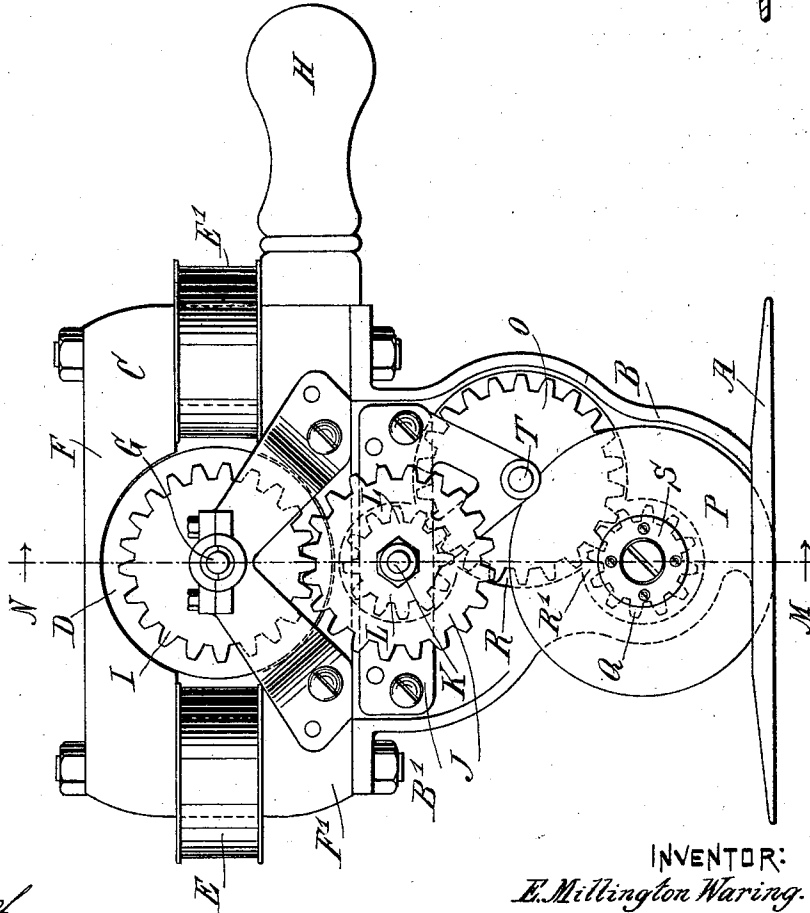


Fig-1.



WITNESSES:

Henry T. Hiseh

J. H. Mothershead

INVENTOR:

E. Millington Waring.

J. L. Townsend
ATTORNEY.

UNITED STATES PATENT OFFICE.

EDWARD MILLINGTON WARING, OF BROOKLYN, NEW YORK.

CLOTH-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 581,092, dated April 20, 1897.

Application filed August 19, 1893. Serial No. 483,580. (No model.)

To all whom it may concern:

Be it known that I, EDWARD MILLINGTON WARING, a citizen of the United States, and a resident of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Electric Cloth-Cutting Machines, of which the following is a specification.

My invention relates to that class of cloth-cutting machines in which a rotary cutter is employed and is driven by an electric motor and intermediate mechanism, all mounted on a foot and supporting-standard freely movable over the table supporting the goods.

The object of my invention is to provide a rotary cloth-cutting machine of simple and efficient construction which shall at the same time be capable of cutting material of nearly or quite a thickness equal to the diameter of the rotary cutter; shall be well balanced by reason of having its cutting-disk in or about the central line of the driving-motor supported above, and shall have a low center of gravity.

To these ends my invention consists of the combinations of devices organized in the manner hereinafter described and claimed.

My invention consists, further, in certain details of construction relating to the journaling and supporting of the rotary cutter in the standard.

It has been before proposed to increase the depth or height of cut in that class of machines where the power is transmitted from a fixed shaft through hinged supporting-arms by using two cutters, one above the other, geared together, but in such machine the cutters were necessarily located out of the central line of the mechanism in order to provide space for the upper cutter to revolve. This construction, applied to a self-contained cutting-machine, would necessarily destroy the balance of the machine by bringing the supporting-standard to one side of the central line of the superior parts besides involving the use of an extra cutter, which by my invention is dispensed with.

In other machines the attempt has been made to secure greater depth of cut by imparting power to the cutter through a friction-disk engaging one of the surfaces of the knife near its upper side, but this form of

machine, being incapable of transmitting any considerable power with certainty and involving the use of parts which would interfere with the passage of the cutter through work of the full depth of the cutter, has been unsatisfactory.

In another class of machines the cutting-disk has been mounted on a shaft extending from the vertical standard laterally to a vertical line to one side of the driving-motor and there provided with a spur-gear engaging with a wheel which is geared to a wheel on the electric-motor shaft, but such construction, while securing a tolerably low center of gravity, a result partly nullified by the type of motor employed whose center of gravity was high, was capable of cutting only to a thickness of about one-third the diameter of the cutting-disk.

In still another type of cloth-cutting machines the cutter-disk has a pinion engaging with a gear-wheel which has a bevel-gear upon its side engaging a bevel-gear upon the vertical axis of the motor, but this construction practically limited the depth of cut to something less than half the diameter of the disk, while, moreover, necessitating the location of the disk to one side of the center of the machine, thus destroying the balance. The type of motor employed for this purpose, moreover, has a comparatively high center of gravity.

A machine organized and constructed in accordance with my invention is free from the above objections, while at the same time it possesses all the much-sought characteristics of simplicity, depth of cut, balance, and low center of gravity.

In the accompanying drawings, Figure 1 shows in side elevation my improved cloth-cutting machine. Fig. 2 is a vertical section thereof, taken on the line M N in Fig. 1.

A is a base or foot which is flat and of the usual form adapting it to enter under the layer of goods and to be moved about without disturbing the lay.

B is the supporting-standard, which carries the cutter, some of the intermediate gear, and at its top the driving electric motor. This standard, as shown clearly in Fig. 2, is located in the vertical line passing through the center of the motor as nearly as possible, so that the weights which would tend to tip the ma-

chine over are practically balanced. The standard, as well understood, should be of such shape as to offer the least resistance in moving through the cut and for such purpose is made as thin as possible.

D is the armature of the electric motor C, mounted on said standard, while E and E' are the field-magnet coils of the motor, and F F' the pole-pieces. As will be seen, in this type of motor the field-coils and the armature are all mounted in practically the same horizontal plane and the center of gravity of the motor itself is low.

K is a horizontal shaft parallel with the horizontal armature-shaft G. The shaft K, supported in the standard B, carries at its outer end a gear meshing with a gear on the armature-shaft and at its inner end and in or about the vertical line passing through the center of the motor and through the standard carries spur-gear L.

The cutting-disk P of the machine is secured to a pinion Q, that meshes with an intermediate gear-wheel O, by which the motion is transmitted direct from the inner spur-gear L. The gears O and Q are made of steel and very thin and are located in recesses R R' in the standard B. The bearings of the knife P and gear Q and also the gear-shafts T and K are all in the upright standard. Shafts T and K may also be supported by the bracket B', secured to the standard in any suitable way, as by screws, substantially as illustrated. A handle H is secured to any convenient part of the machine for moving it about in the cutting operation. The standard B is preferably formed in one piece with the base and bolted to the pole-pieces of the field-magnet.

As will be seen, the construction and organization of parts produce a simplified, compact, and convenient form of electric cloth-cutting machine, and the cutting-disk may operate in a lay of a thickness practically the same as the diameter of the disk itself. It will be seen, moreover, that the standard is at the same time in the central line of the machine, so that the apparatus is well balanced and that the center of gravity of the apparatus is also low.

The gear Q, carrying the cutting-disk, is mounted in the standard in the following manner:

V is a stud on which the gear carrying the cutting-disk is journaled. The hub of the gear, which is journaled in said stud, is elongated as much as possible in order to afford a firm bearing capable of standing severe strains and of working easily at high speeds; but the elongation is mainly by preference in a direction toward the standard. The bearing-stud V instead of being supported from the face of the standard on the same side with the gear is supported from a block or piece W on the opposite side of the standard and passes through an opening in the standard sufficiently large to allow the hub to have a bear-

ing in the stud within the line of the standard itself and extending, if desired, nearly through the same. As will be seen, by this means I obtain a longer bearing for the gear without undue thickness of the parts at or around the center of the disk and its gear. Moreover, the parts which project beyond the center line of the standard are not all at one side, but are partly distributed at opposite sides of the central line of the standard, which is a distinct advantage in so far as it keeps all parts so far as possible in the line of the standard where they will not unnecessarily interfere with the movement of the machine through the cloth.

U is a loose bushing on the stud to afford a removable wearing journal-lining for the hub of the gear. The hub is, however, free to turn on said bushing and the bushing also upon the stud, thus giving a double bearing. The wear on the bushing or sleeve is equalized, owing to the fact that it may turn freely. Were it fixed the wear would all be on one side.

The block W may be let into the standard, as shown, and fastened thereto by screws, as indicated. The bearing-stud V is by preference detachably secured thereto in any suitable way, preferably by using the block W as a nut and the bearing-stud as a screw which screws into the hub, and the head of the screw, as shown, holds the gear upon its bearing. By thus constructing and combining the parts upon which most wear comes they may be readily replaced, while, moreover, the wearing parts have wide bearings, but at the same time do not unduly project laterally.

To aid in fastening the disk to the gear and to also strengthen the disk at or near its central opening, as well as to avoid other difficulties, I provide a ring S, which is applied to the outer face of the disk and surrounds the head of the screw stud or bearing V.

The fastening devices here indicated as screws pass through the ring and disk into the outer face of the gear, as shown, and clamp the disk firmly to the face of the gear. This ring also forms a mask or guard for the head of the screw V.

In previous machines the headed screws employed to fasten the disk directly to the gear caused much trouble by catching in the work, but the attempt to remove the difficulty by countersinking the heads in the disk was unsuccessful, since the thin disk cut the heads off in a short time.

What I claim as my invention is—

1. In an electric cloth-cutting machine having a supporting-foot carrying a standard and driving electric motor on said standard, the combination, substantially as described, of the electric-motor armature-shaft horizontally mounted centrally over said standard, a gear upon said armature-shaft a counter-shaft immediately beneath the motor and parallel to said armature-shaft, a spur-gear upon the outer end of said counter-shaft in mesh with the gear upon the armature-shaft,

a spur-gear at the inner end of said counter-shaft in line with the standard and cutter and practically coincident with the central line of the motor, a cutting-disk journaled on said standard and having a pinion or spur-wheel secured thereto, and a spur-wheel journaled in the standard and meshing both with the pinion on the inner end of the counter-shaft and with the pinion or spur-wheel to which said cutting-disk is fastened, substantially as and for the purpose set forth.

2. In a rotary cloth-cutting machine, the combination with the standard thereof, of a nut removably secured to the standard on one side thereof, a headed bearing-stud screwed into said nut from the other side of the standard and passing through an enlarged opening in the standard, a gear provided with a hub projecting into the body of the standard and journaled on said stud, and

a cutting-disk fastened to said gear, substantially as and for the purpose set forth.

3. The combination in a cloth-cutting machine, of the cutting-disk, the gear carrying the same on its outside face, the headed bearing-stud on which the gear is journaled, the flat ring surrounding the head of said stud and borne on the outer face of the cutting-disk, and fastening pins or screws passing through said ring and disk for securing the disk to the gear, as and for the purpose described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 18th day of August, 1893.

E. MILLINGTON WARING.

Witnesses:

T. H. TEMPLETON,
JOHN C. L. DALY.