No. 798,538. PATENTED AUG. 29, 1905.

W. H. STEDMAN.

GRINDING MACHINE.

APPLICATION FILED JAN. 6, 1904.

Fig. 1.

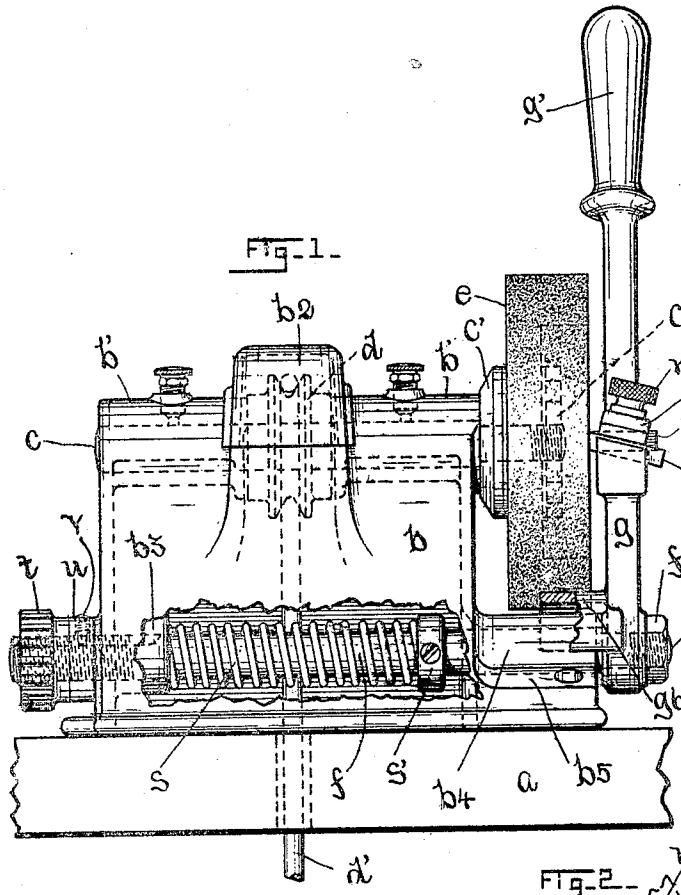


Fig. 4.

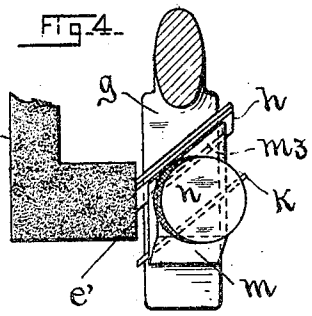


Fig. 3.

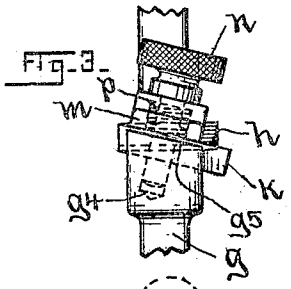


Fig. 2.

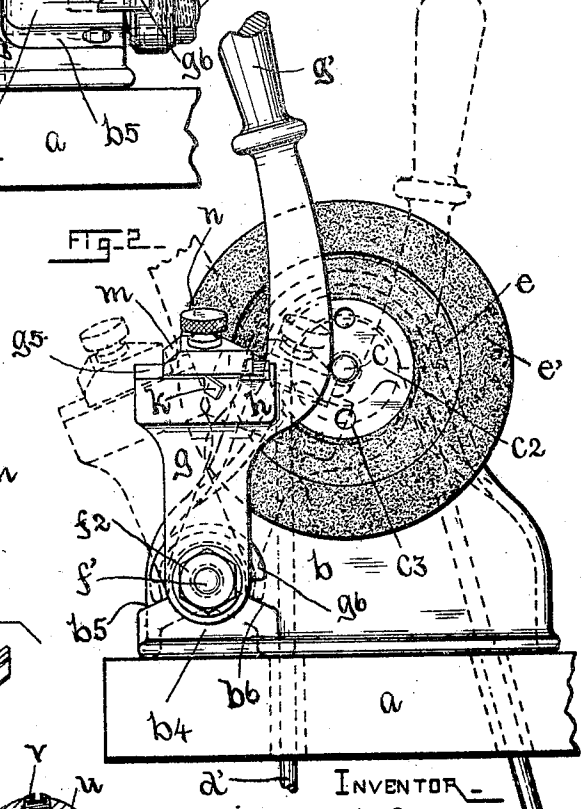


Fig. 5.

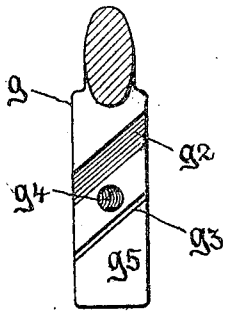


Fig. 6.

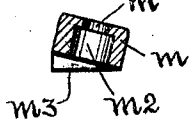


Fig. 8.

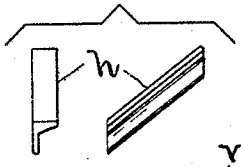
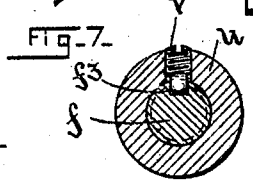


Fig. 7.



WITNESSES.

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WILLIAM H. STEDMAN, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE MERROW MACHINE COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

GRINDING-MACHINE.

No. 798,538. Specification of Letters Patent. Patented Aug. 29, 1905.

Application filed January 6, 1904. Serial No. 187,966.

To all whom it may concern:

Be it known that I, WILLIAM H. STEDMAN, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Grinding-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention has for its object the provision of a grinding-machine of simple construction, particularly though not exclusively adapted for the grinding or sharpening of the knives or cutters of sewing-machine trimming devices.

The invention as embodied in the machine illustrated in the drawings contemplates a tool for bench use and comprises a frame supporting a main shaft, to which a driving-wheel is secured and also a grinding-wheel of emery or other suitable material, the grinding-wheel shown being of the class commonly known as "cup-wheels." Also mounted in the machine-frame and extending parallel with the main shaft is a rock-shaft having at its end adjacent the grinding-wheel an arm or lever, which forms a carrier for the cutters or tools to be ground. In rocking the carrier the cutters are moved in a plane parallel with the side face of the grinding-wheel and are carried across the said face to effect the operation of grinding. Means are provided for the longitudinal adjustment of the rock-shaft, whereby the degree of engagement between the grinding-wheel and the cutters is controlled, and in addition to the general features of the machine just described there are other details of construction, all of which will be fully pointed out and described hereinafter.

In the accompanying drawings, Figure 1 is a front elevation of the grinding-machine with the frame broken away to expose interior mechanism and with the carrier partly in section to show a certain detail of construction. Fig. 2 is an end elevation of the machine and shows in dotted lines the limits of movement of the arm or lever which carries the cutters. Fig. 3 is a front elevation of a portion of the carrier and shows the cutters secured thereto in position for grinding. Fig. 4 shows in plan the elements of Fig. 2 and in section the adjacent portion of the grinding-wheel. Fig. 5 is a plan view of the portion of the carrier shown in Figs. 3 and 4. Fig. 6 is a cross-sectional view of a clamp used in securing the cutters to the carrier. Fig. 7 illustrates in cross-section certain details of construction pertaining to the adjustment of the rock-shaft. Fig. 8 embodies side and front elevations of a peculiar form of cutter which the machine is adapted to sharpen.

Throughout the accompanying drawings like letters of reference indicate the same parts.

The letter a denotes the bench or table on which the machine is secured; b, the machine-frame; b', the main-shaft bearings; c, the main shaft, and d the driving-pulley, secured to the main shaft, preferably between the bearings b'. A cap b^2 covers the wheel d, which latter is connected with power, usually beneath the bench a, by a belt d', or the cap may be dispensed with and the wheel belted to power from an overhead point.

The letter e denotes the grinding-wheel, which is secured to the shaft c between a washer c', engaging a shoulder on the shaft, and a nut c^2, mounted upon a threaded portion of the shaft and provided with wrench-holes c^3.

The longitudinally-adjustable rock-shaft f is supported in bearings b^3 b^4, and the cutter-carrier lever g, having the handle g', is secured to the end of the rock-shaft adjacent the grinding-wheel. The said end of the shaft is somewhat reduced in diameter, as at f', to receive the carrier and is threaded for a nut f^2, between which and the shoulder on the shaft caused by reducing its diameter the said carrier is secured.

The drawings show two styles of cutters h and k as being ground; but other forms could as well be ground and either one of the two shown may be ground without grinding the other.

The point of location of the shaft f relatively to the shaft c and the points of securing the cutters h and k to the carrier g are such that the portions of the cutters engaged by the grinding-wheel move in an arc the portion of which crossing the wheel-rim e' corresponds very nearly with a line radiating from the center of the shaft c.

The carrier g is preferably of substantially the shape shown in Figs. 1 and 2. The cutters h and k are placed in grooves g^2 g^3, respectively, in the carrier g, in which they

are held while being ground, it being obvious that the direction or angle of the groove relatively to the grinding-face of the wheel *e* will determine the angle with reference to its length at which the cutter will be ground. The groove g^2, it will be observed, presents the cutter *h* to the grinding-wheel in such way that the end of the cutter is ground at an angle to its axial line, while the groove g^3 for the cutter *k* presents the last-named cutter to the grinding-wheel in such manner that the end of the cutter is ground on a bevel to both its flat sides and its edges.

The cutter or cutters, as the case may be, are secured to the carrier *g* by the clamp *m*, which is held in place by the thumb-screw *n* passing through a hole *m'* in the clamp and entering a tapped hole g^4 in the carrier, located in this instance between the grooves g^2 g^3. The hole *m'* is preferably countersunk, as at m^2, to provide a seat for one end of a coiled spring *p*, which encircles the screw *n*, and the other end of which engages the carrier to permit the insertion and withdrawal of the cutters without entirely removing the clamp from the carrier and to provide means whereby the cutters are retained in their grooves while being adjusted.

Of the cutters shown the cutter *h* is angular in cross-section. That the clamp *m* may properly retain the cutter in the groove g^2 the said clamp is provided with a rib m^3 to engage the said cutter. As it is desired to grind the cutter *k* in the manner already described, the carrier *g* is beveled, as at g^5, to permit the clamp to engage the cutter, as shown, thus necessitating the forming of the holding edge of the clamp-rim m^3 at an angle to the clamp, as shown in Fig. 6. The positions of the cutters in the carrier and the shape of the said cutters determines the shape of the clamp *m* and of the adjacent portion of the carrier.

The shaft *f* is adjusted longitudinally by a thumb-nut *t* on its rear end to move the carrier toward the grinder, a spring *s*, surrounding the shaft within the frame and bearing against a collar *s'* on the shaft, serving to move the latter in the opposite direction. Between the nut *t* and the machine-frame there is a collar *u*, which has sliding keyed connection with the shaft *f* by means of a screw *v* in the collar engaging a keyway f^3 in the shaft, thus insuring the rotation of the collar *u* and nut *t* with the shaft and guarding against the possibility of accidental rotation of the nut on the shaft which might occur from friction if in direct contact with the frame *b*.

To prevent emery or like substance from the grinding-wheel entering the bearing b^4, the carrier *b* is provided with a semicircular hood g^6 concentric with its pivotal point and which partially encircles the bearing b^4. The hood g^6 not only protects the bearing, but the lower edges of the said hood are adapted to engage fixed points or projections b^5 b^6 on the machine-frame, which act as stops to limit the swinging of the carrier in its forward and backward movements, as shown in dotted lines in Fig. 2.

In operating the machine the cutters are secured in the carrier with their ends to be ground adjacent the grinding-wheel, and should it be desired to grind only one cutter such cutter is set with its said end somewhat nearer the wheel than is the case with its companion cutter. The carrier is then rocked forward and backward to carry the cutters across the grinding-surface of the grinding-wheel, and the rock-shaft is adjusted, by means of the nut *t*, against the tension of the spring *s* to secure and maintain the required engagement between the cutter or cutters and the grinding-wheel.

Having thus described my invention, I claim—

1. In a grinding-machine, a frame, a shaft mounted therein, a grinding-wheel on the shaft and means for rotating the shaft; in combination with a rock-shaft mounted in the frame, a tool-carrier secured to the rock-shaft and means for longitudinally adjusting the rock-shaft embodying a spring adapted to force the shaft in one direction, a nut to draw the rock-shaft in the opposite direction and a sliding collar intermediate the nut and the machine-frame and having key connection with the rock-shaft for the purpose set forth; substantially as described.

2. In a grinding-machine, a frame, a shaft mounted therein, a grinding-wheel on the shaft and means for rotating the shaft; in combination with a rock-shaft supported in the frame, a tool-carrier secured to the rock-shaft and a hood on the carrier for protecting the rock-shaft bearing adjacent the said carrier and fixed stops adapted to be engaged by the hood to limit the oscillation of the tool-carrier; substantially as described.

3. In a grinding-machine, in combination, a grinding-wheel and means for supporting and rotating the same, an oscillating tool-carrier and means for its support, grooves in the tool-carrier to receive the tools and a clamp on the carrier to retain the tools in position.

4. In a grinding-machine, in combination, a grinding-wheel and means for supporting and rotating the same, a tool-carrier and means for its support, a clamp for securing tools to the carrier and a spring intermediate the carrier and the clamp; substantially as described.

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Witnesses:
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