(No Model.)

2 Sheets—Sheet 1.

C. SEYBOLD.

KNIFE GRINDER.

No. 532,104.

Patented Jan. 8, 1895.

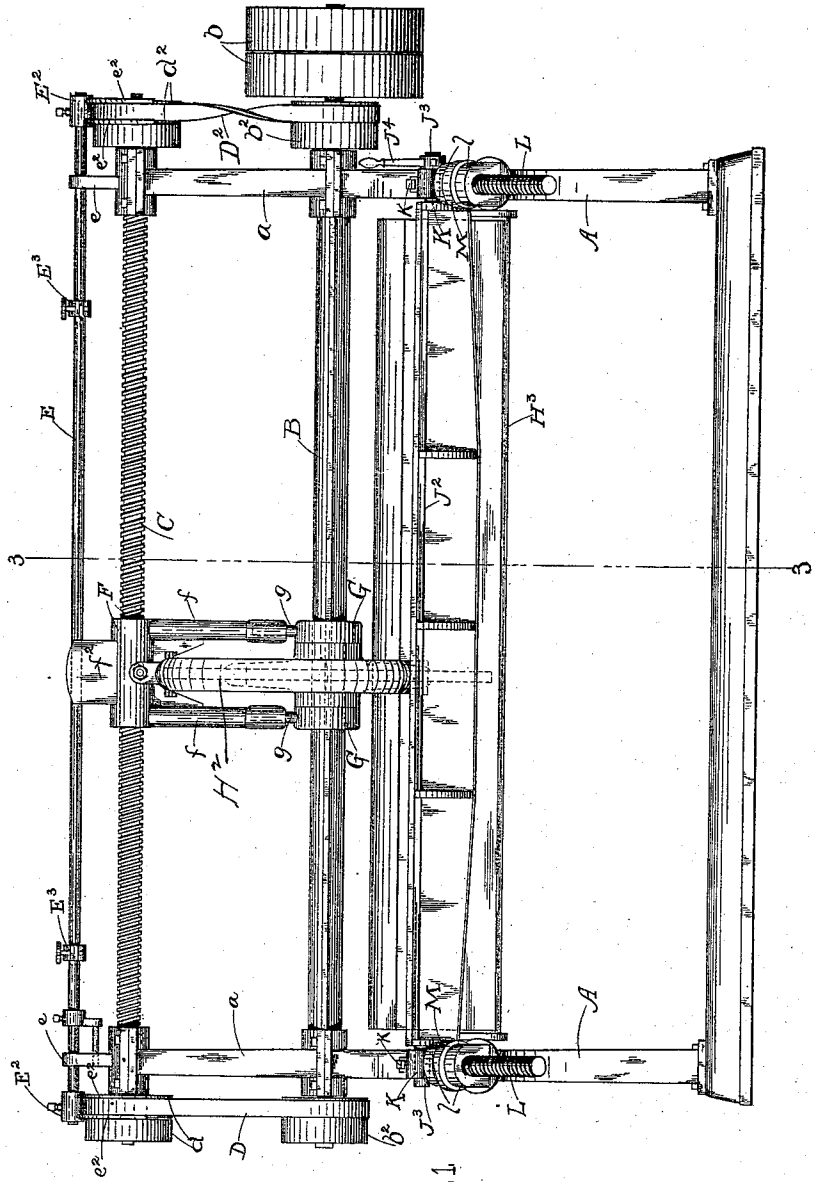

Fig. 1.

WITNESSES:
Chas. J. Ruffini.
Chas. H. Higgins

INVENTOR
Charles Seybold
BY
O. M. Hill
ATTORNEY.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

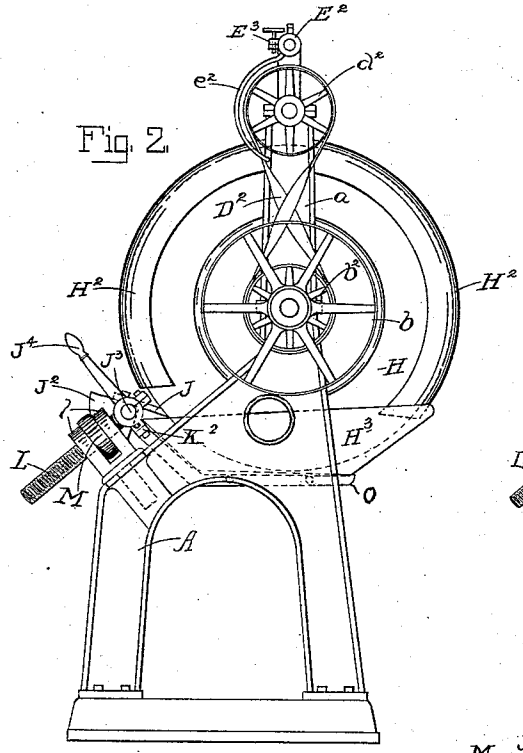


Fig. 3.

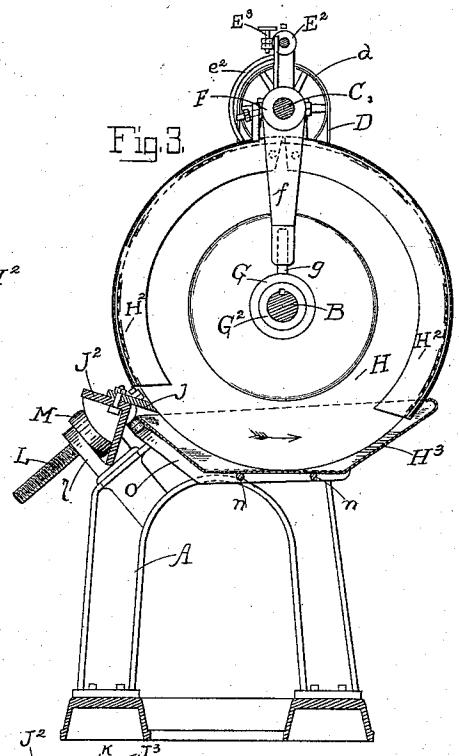
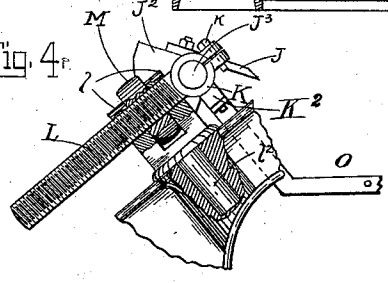


Fig. 4.



WITNESSES:

Chas. J. Ruffin

Chas. H. Higgins

INVENTOR

Charles Seybold

BY

O. M. Hill

ATTORNEY.

UNITED STATES PATENT OFFICE.

CHARLES SEYBOLD, OF DAYTON, OHIO, ASSIGNOR TO THE SEYBOLD MACHINE COMPANY, OF SAME PLACE.

KNIFE-GRINDER.

SPECIFICATION forming part of Letters Patent No. 532,104, dated January 8, 1895.

Application filed January 12, 1894. Serial No. 496,613. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SEYBOLD, a citizen of the United States, residing at Dayton, Montgomery county, State of Ohio, have invented certain new and useful Improvements in Knife-Grinders, of which the following is a specification, reference being had to the accompanying drawings.

The object of my invention is to construct a simple and effective device for grinding knives for paper cutting machines, said device being so constructed as that the grind-stone or emery wheel will travel horizontally along the cutting edge of the knife, the latter remaining stationary, as will hereinafter appear.

In the accompanying drawings:—Figure 1, is a front elevation of a machine embodying my invention in an operative position and as preferably constructed. Fig. 2, is an end elevation taken at right hand in Fig. 1. Fig. 3, is a vertical section on dotted line 3, 3, of Fig. 1, looking toward the left hand in said figure. Fig. 4, is an enlarged detail view, partially in section, of the preferred form of adjustable journal bearings for the knife-bed, said view also showing the preferred mode of connecting the said bearings (one at each end of the machine) to the end frames.

In the accompanying drawings,—A, represents the end frames having an upward extension, *a*, upon which are mounted the bearings for the driving-shaft B, which latter is provided with the usual tight and loose pulleys, *b*.

C, represents a screw-rod journaled in suitable bearings on the top of the end frames, to which rod, at each end thereof, are connected the pulleys *d d*, and d^2 d^2, which pulleys are connected with the pulleys b^2 on the main shaft by means of the belts D and D^2, as shown.

An automatic device is provided for shifting the aforesaid belts to obtain a reverse movement of the screw-rod C, which device is preferably constructed as shown and consists of the horizontal rod E passed loosely through the top plates *e*, said rod having at each end a sleeve E^2, the latter having the two guards e^2 which curve outward and downward at each side of the belts, as more clearly shown in Figs. 2 and 3. This rod, E, is also provided with adjustable stop-lugs, E^3, for limiting the horizontal movement of the grinder and also for shifting the belts, as will appear from the description of the operation hereinafter contained.

F, represents a hollow screw-threaded lug or sleeve mounted upon the screw-rod, C, which sleeve is preferably provided with the downwardly extending portions, *f*, made hollow at the lower end, within which the pins *g* enter as shown by dotted lines, said pins being connected to the collars G which surround the journal bearing G^2 (see Fig. 3) upon which the grind-stone or emery wheel, H, is mounted. The sleeve F is also provided with an upward extension f^2 which is adapted to strike the stop-lugs E^3 on the belt-shifter, as will hereinafter appear.

H^2, represents the shields which are adjustably connected to the sleeve F, which shields partially encircle the periphery of wheel H to prevent splashing the water out of the trough H^3 when said wheel is rotated.

The knife, J, is attached to the angular plate or bed J^2, which latter, at each end is rigidly connected to the journals, J^3, the latter engaging within the bearings, K, as shown. These bearings are preferably split, and provided at their extensions with a tightening screw, *k*, as more clearly shown in Fig. 4, which screws are for the purpose of tightening the bearings around the journals J^3 to retain the bed J^2 and its knife in proper adjusted position relative to the emery wheel, H. To the end of one journal J^3 is attached a lever, J^4, for adjusting the knife after the set-screws *k* are loosened, as will more fully hereinafter appear.

To each bearing K is rigidly attached a screw-rod, L, which latter engages within the brackets, *l*, the latter being preferably cast with an extension l^3 which latter engages within a socket on each side frame of the machine, and as more clearly shown in Fig. 4. Between the two bracket extensions, *l*, at each end of the machine, and upon each screw-rod, L, is mounted a screw-threaded collar M, which has a rotary movement between said brackets for the purposes hereinafter stated.

The operation of my improved knife-grinder, when constructed as shown, is as follows:

The knife is first secured to its bed-plate, which latter may be adjusted at any desired angle according to the degree of bevel desired upon the knife, which is regulated by operating the lever J^4. After having tilted the knife-bed J^2 to the proper angle, it is rigidly held in that position by tightening the bolts *k*, as hereinbefore stated. The knife is moved up to or away from the emery wheel, H, by rotating the nuts or collars M, in the proper direction, which latter, being secured in position on their respective screw-rods L between the stationary brackets *l*, will cause said screw-rods to travel toward or away from the driving-shaft B when said collars are rotated—the said screw-rods being mounted on an angle diverging centrally from said driving-shaft upon which the emery wheel is mounted, as shown. After the knife-bed is once set to grind the desired bevel on the knife, said knife-bed requires no further adjustment. As the emery wheel becomes worn away, the knife is moved up against said wheel by operating the nuts M in the proper direction, as aforestated; and the adjusting screws L, being set on an angle divergent from the shaft upon which said emery wheel is mounted, will cause the latter to grind the same bevel upon the knife until said wheel is worn down to a minimum capacity.

In operation the knife remains stationary while the emery wheel rotates and travels horizontally against the bevel of the former. The horizontal movement of said wheel, in either direction, is limited by the stop-lugs E^3 upon the shifting-rod E. So soon as the projection f^2 on the traveling-nut F strikes either of said stop-lugs, the belt-shifter acts to throw the belts D and D^2 to cause a reverse rotary movement of the screw C, which movement causes the emery wheel to travel back over the knife in the manner aforestated.

Another feature of my invention consists in mounting the trough H^3 upon the end supports, O, which latter are rigidly attached to some convenient part of the knife-bed, preferably by bending said supports at an angle and bolting said angular portions to the lugs K^2 cast with the bearings K, (one lug on each bearing) as more clearly shown in Fig. 4. To these supports are preferably attached the horizontal rods, *n*, upon which the trough rests when constructed as shown in Fig. 3. By this arrangement, any upward angular adjustment of the knife (in the manner aforestated) will cause an upward elevation of said trough so that the periphery of the wheel will rotate near the bottom of the latter at all times and come into contact with the water therein.

The advantages of my invention are many and apparent—the device being simple of construction and operation, ready of adjustment and durable in construction. The emery wheel, traveling horizontally along the edge of the knife, insures a uniform bevel to its cutting edge throughout its entire length; and, having once adjusted the knife to the desired angle, all that is required is for the operator to occasionally adjust the knife up to the emery wheel or stone, until sufficiently ground—the reversing of the movement of the wheel being automatic in operation. The feature of adjusting the water trough simultaneously with that of the knife, is also a valuable feature, as but little care or attention is required to retain a sufficient quantity of water in said trough when thus adjusted.

The machine is capable of grinding any length of knife up to the full length of the knife-bed. To grind a short knife, all that is required is simply to adjust the stop lugs E^3 to the proper position on the shifting-rod.

Any suitable operative mechanism may be employed, other than that herein specifically set forth, for adjusting the stationary knife up to the traveling stone or emery wheel, and for automatically reversing the action of the latter.

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

1. The emery wheel H suitably mounted and being capable of a rotary and horizontal movement as set forth, in combination with the adjustable knife-bed, and a water-trough capable of vertical adjustment within which said wheel travels, and suitable means for rotating the latter and for reversing its horizontal movement.

2. In a knife-grinder, the combination of a grinding wheel, adjustable knife-bed and a water trough within which said wheel is adapted to operate, said trough having its support attached to said adjustable knife-bed, and suitable mechanism for operating said wheel and for adjusting said knife-bed.

3. In a knife-grinder having an emery wheel mounted substantially as set forth, the knife-bed J^2, trough H^3, and screw-rods L, said trough resting upon the longitudinal rods *n* attached to the transverse bars O, the latter being connected with the knife-bed, said screw-rods being suitably mounted and connected to the bearings of said knife-bed, substantially as set forth.

CHARLES SEYBOLD.

Witnesses:
D. K. ALLISON,
LEWIS W. GUNCKEL.