No. 630,019. Patented Aug. 1, 1899.

C. H. WORTHEN.

CUTTING DEVICE.

(Application filed Oct. 6, 1898.)

(No Model.)

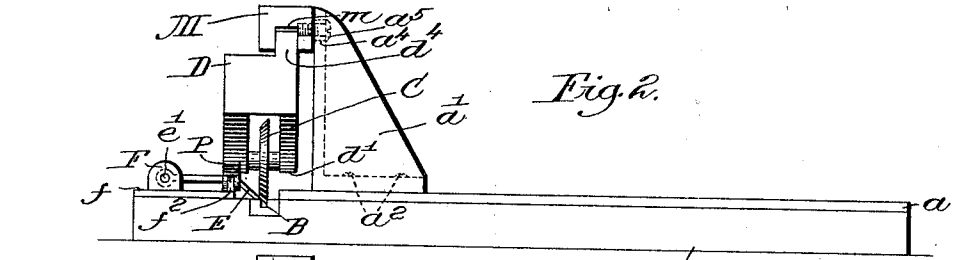


Fig. 2.

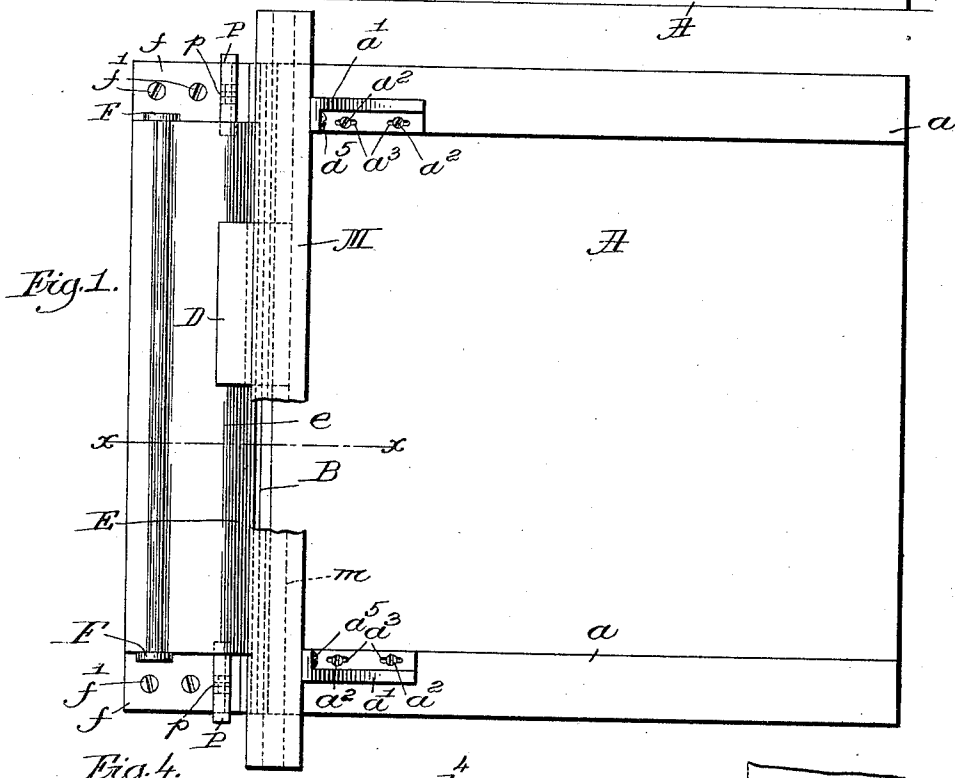


Fig. 1.

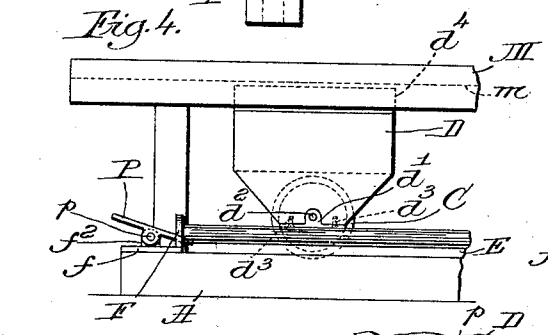


Fig. 4.

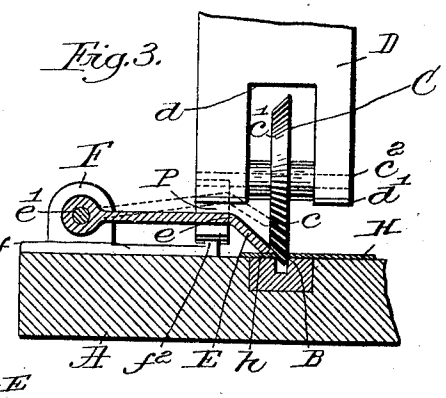


Fig. 3.

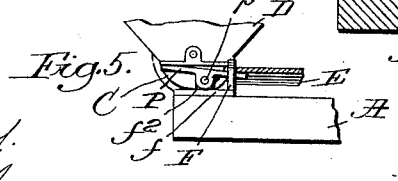


Fig. 5.

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UNITED STATES PATENT OFFICE.

CHARLES HENRY WORTHEN, OF TAUNTON, MASSACHUSETTS.

CUTTING DEVICE.

SPECIFICATION forming part of Letters Patent No. 630,019, dated August 1, 1899.

Application filed October 6, 1898. Serial No. 692,800. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HENRY WORTHEN, of Taunton, county of Bristol, State of Massachusetts, have invented an Improvement in Cutting Devices, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

Photographic prints must have clean-cut sharply-defined edges, necessitating the use of an extremely keen trimming-cutter, and the print in course of trimming is placed commonly upon a glass or metal support to aid in securing the desired smoothness of edge. Inasmuch as each print must, as a rule, be trimmed separately the keenness of the cutter wears off very rapidly under the conditions noted, and the cutter must be sharpened frequently, with considerable annoyance and no small expense. To obviate the attrition of the hard surface of the metal or glass upon the cutter, a trimmer has been provided in which a rotary cutter, supported from above by a trolley-like arrangement and rotated positively by a belt, is moved along the end of a board, over which projects the print to be trimmed; but the trolley-support bends under the pressure of the operator's hand, the cutter gets below its proper cutting position, and adding to these the absence of suitable supporting and clamping means for the projecting portion of the print the result is that the latter is frequently crimped over and chewed off instead of being cut properly.

I have instanced the difficulties of trimming photographic prints properly as typical of the severest requirements to which a successful and durable cutting device is subject; and my invention has for its object the production of a cutting device which shall meet these requirements fully and be perfectly adapted for use as a photographic-print trimmer; but I contemplate its utilization in any class of work for which it may be qualified by the improvements constituting my invention.

The various features of my invention will be illustrated and described fully in the accompanying drawings and specification and set forth in the claims.

In the drawings, Figure 1 is a plan view of a trimming-board or cutting device in the construction of which my invention has been embodied, parts being broken away. Fig. 2 is a side elevation of the same, and Fig. 3 a similar detail view, on an enlarged scale, on the section-line x x, Fig. 1. Fig. 4 is a view in rear elevation—*i. e.*, looking from left to right, Fig. 2; and Fig. 5 is a similar detail view showing the parts in a different relative position and broken away partly for the sake of clearness.

In the embodiment of my invention selected as a convenient form for illustration and description, A designates a work-support, taking the form in this instance of a common type of trimming-board and which may be of any suitable material, preferably wood for the sake of lightness, and if of wood provided, preferably, with a cutting "edge" B, which may conveniently be constructed of a bar of metal inlaid flush with the surface of the support and having a longitudinal surface groove, one wall of which constitutes the edge. The work-support may be and preferably is provided with one or more suitable guides a, slightly raised above its surface, and its shape and proportions may vary as desired or found convenient.

In accordance with my invention a traveling cutting member is provided having a cutter with a straight edge to run along and cooperate with the wall or edge B, and an inclined or beveled abutment is also provided parallel with the edge B and preferably taking the form of a clamping member to clamp the work adjacent the edge, the traveling member having a beveled portion to ride along the beveled portion of the abutment, which latter is inclined toward the edge B, so that the effect is that when the members are in operative relation and the cutting member is being run along the edge of the abutment it tends constantly to slide down the beveled portion of the latter until its straight edge engages the fixed edge.

The disposition of the beveled abutment and the coöperating bevel on the traveling member may be varied somewhat; but I have found a convenient arrangement thereof to be afforded by forming the bevel of the traveling member on the cutter itself, and in the instance illustrated have made use of a rotary cutter C, mounted for convenience of

manipulation in a carriage D of desired or suitable contour.

The form of beveled abutment which can be used most conveniently with a beveled rotary cutter of the type illustrated is shown at E, being closely adjacent the fixed edge and being formed of a piece of sheet metal or other suitable material, which is preferably hinged or pivoted at its rear end or edge on an axis parallel with the fixed edge to permit the abutment to be swung upward from the latter. To prevent undue protrusion of the abutment above the support, it is bent, preferably, as at *e*, (see Fig. 3,) and for the sake of stability may be mounted in suitable bearings F on the support A, being shown in this instance as lugs bent up from a metal plate *f*, secured to the board A by suitable fastening means, as the screws *f'*, these lugs receiving a spindle *e'*, which serves as the axis of the abutment. When thus constructed, the abutment may be utilized as a clamping member or means to clamp the edge of the photograph-print or other work adjacent the fixed edge, and such a clamp is particularly desirable when use is made of a beveled rotary cutter, inasmuch as such a cutter tends constantly to cut in a circle, and the print can be firmly held to prevent it from being cramped under this circular action of the rotary cutter, which otherwise would be communicated to it.

The use of the beveled abutment as a clamping member is facilitated by the coöperating beveled surfaces, as will be readily understood from Fig. 3, where it will be seen that downward pressure upon the carriage D will be communicated through the cutter C to the abutment E, and at the same time that said bevel is causing the straight edge *c* to engage firmly with the fixed edge B the cutter is forcing the abutment to clamp the edge *h* of the print or other work H against the surface of the work-support, holding it firmly during the cutting operation. It will be understood readily that by this arrangement the clamping pressure is applied to the member E automatically at the point and time when it is most needed—that is, just as the cutter, rotary or otherwise, is approaching the cutting-point—the effect of the pressure on the member E of course extending for a little distance before and behind the point at which the cutter may be at any given instant. Furthermore, the friction of the bevel on the cutter against the beveled abutment rotates the cutter positively, and as the inner annular shoulder of the bevel on the cutter is of less diameter than the cutting periphery *c* it follows that the cutting periphery rotates relatively faster and exerts a positive shearing action against the face of the edge—an advantage over a mere rolling of the cutter periphery on a flat surface.

The carriage D may be of any suitable form and the cutter mounted therein in any convenient fashion, in this instance the carriage taking the form of a block, in a recess *d* of which is mounted the cutter C on a journal c^2, entering suitable bearings *d'* of the carriage, said bearings being illustrated as metal plates with holes d^2 at the end of the journal and attached to the carriage by suitable fastening means, as the screws d^3. (See Fig. 4.)

It is within the spirit of my invention to use the cutter without any guide or track other than the fixed edge and abutment, but it may be found convenient to use a guide rail or track, and accordingly I have illustrated for use, when desired, a rail M, supported above the surface of the work-support to permit passage of the work thereunder and having a contour suitable to coöperate with the carriage D, such coöperation being effected, in the instance illustrated, by an undercut groove *m* in the rail, into which enters an upward projection d^4 from the carriage. (See Fig. 2.) The rail M may be supported in desired position by any suitable means, and one convenient form of such means is shown in the shape of risers *a'*, secured to the work-support by suitable fastening means, as screws a^2, the latter preferably passing through slots a^3 for the sake of adjustment, while similar adjustment may be provided for between the rail M and the risers *a'* by slot-and-screw connections a^4 a^5.

As, in accordance with my invention, the traveling member coöperates with the clamping member to operate the latter to clamp the work to the work-support during cutting traverse, so, also, in the preferred form of my invention it is adapted to operate the clamping member to give clearance to the work for insertion or withdrawal. Any suitable means to effect this end may be adopted, and I have illustrated one form of construction for the purpose, comprising a lever P, fulcrumed at *p* on an upturned lug or projection f^2 of the plate *f*, one arm of the lever being extended into position to engage the clamping member E, while the other end is extended into and near the end of the path of the traveling cutting member, so that when the latter is brought into the position shown in Fig. 5 the lever is tipped and raises the member to give clearance for insertion or withdrawal of the work. One of these levers or equivalent means may be provided, if desired, at each side of the clamping member, as illustrated.

Considerable variation in the construction and arrangement of parts may be made without departing from the spirit of my invention, and I do not limit myself to the exact construction illustrated and described otherwise than as set forth in the claims.

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

1. In a cutting device; a work-support having a cutting "edge;" a clamping member adapted to clamp the work to said support near said "edge," and a traveling cutting member adapted to traverse said support and

work; said cutting member coöperating with said clamping member to maintain the same in clamping relation with said support and work, and being directed against said "edge" by engagement with said clamping member.

2. In a cutting device; a work-support having a cutting "edge;" a clamping member adapted to clamp the work to said support near said "edge," and a traveling cutting member adapted to traverse said support and work; said cutting member coöperating with said clamping member to maintain the same in clamping relation with said support and work, and being directed against said "edge" by engagement with said clamping member; and means to hold said traversing member up to its work.

3. In a cutting device; a work-support having a cutting "edge;" a beveled abutment parallel with said "edge;" and a traveling cutting member provided with a cutter, and having a beveled portion adapted to travel along said beveled abutment; said bevels cooperating under cutting pressure to cause said cutter to enter into cutting relation with said "edge."

4. In a cutting device; a work-support, provided with a cutting "edge" and a parallel rail; a clamping member adapted to clamp the work to said support, and having a beveled portion adjacent to, and parallel with, said "edge;" and a traveling cutting member adapted to traverse said support, working between said rail and "edge," and having a beveled edge and a straight, or cutting, edge, said beveled edge coöperating with said beveled portion of said clamp, and said straight edge with said fixed "edge."

5. In a cutting device; a work-support; a clamping member adapted to clamp the work thereto; a traveling rotatable cutting member adapted to traverse said work-support in rolling contact with said clamping member to press the same against said support, said contact being with an annular region lying inside the periphery of said rotatable member and causing said cutter to rotate with a positive peripheral speed greater than the speed at which said cutter periphery would attain if rolling upon said work-support, said positive rotation causing said cutter to exert a positive shearing action upon said work.

6. In a cutting device; a work-support; a clamping member adapted to clamp the work thereto; and a traveling cutting member adapted to traverse said work-support and to engage said clamping member to operate the latter to hold the work during cutting traverse, and means also operated by said traveling member to raise said clamp to give clearance for insertion or withdrawal of said work.

7. In a cutting device; a work-support; a clamping member adapted to clamp the work thereto; a traveling cutting member adapted to traverse said work-support; and means to enable said traveling member to operate said clamping member to give clearance for insertion or withdrawal of said work.

8. In a cutting device; a work-support; a clamping member mounted thereon and rotatable about a longitudinal axis, a traveling cutting member adapted to traverse said support; and a lever adapted to be engaged and operated by said traveling member to rotate said clamping member to give clearance for insertion or withdrawal of said work.

9. A cutting device comprising the following instrumentalities, viz: a bed or work-support provided with a flush, grooved, cutting bar or "edge," and a runway or rail supported in parallelism with said groove above the surface of said support; a clamping member rotatable about an axis parallel with said groove and presenting a beveled clamping edge adjacent said groove; a traveling cutting member comprising a carriage having a portion adapted to coöperate with said rail, and provided with a rotary cutter adapted to enter and travel in said groove, said cutter being beveled peripherally on the side adjacent said clamping member; and a lever in, and near the end of, the path of said carriage, and adapted to be engaged and operated by the latter and to engage said clamping member to rotate the same and give clearance for insertion or withdrawal of said work.

10. A trimming-board or cutting device comprising the following instrumentalities, viz: a work-support A, having guides *a*, risers *a'* carrying a carriage-rail M, and an "edge" B; a clamping member E mounted rotatably in bearings F on said support; releasing-levers P; and a traveling carriage D provided with a rotary cutter C, said parts coöperating substantially in the manner and for the purpose set forth.

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

CHARLES HENRY WORTHEN.

Witnesses:
WILLIAM H. FOX,
WARREN A. SWIFT.