H. A. DOUGALL.

BOX CUTTER AND TRIMMER.

APPLICATION FILED APR. 10, 1916.

1,235,192.

Patented July 31, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

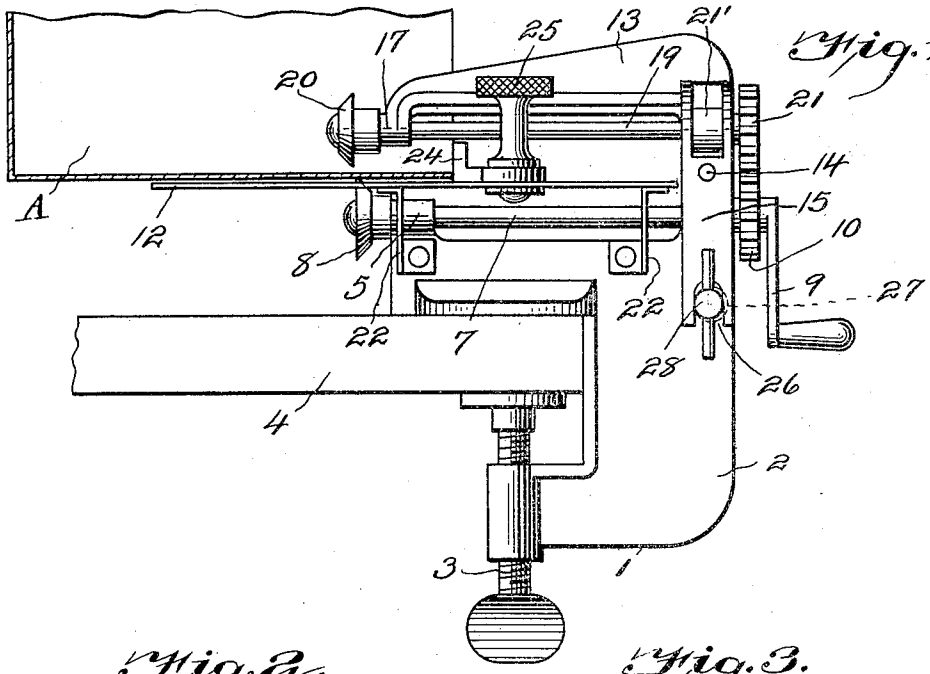


Fig. 2.

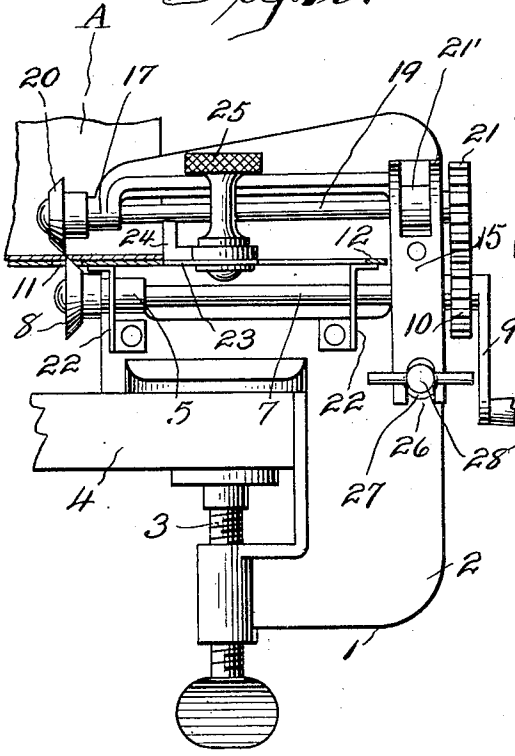
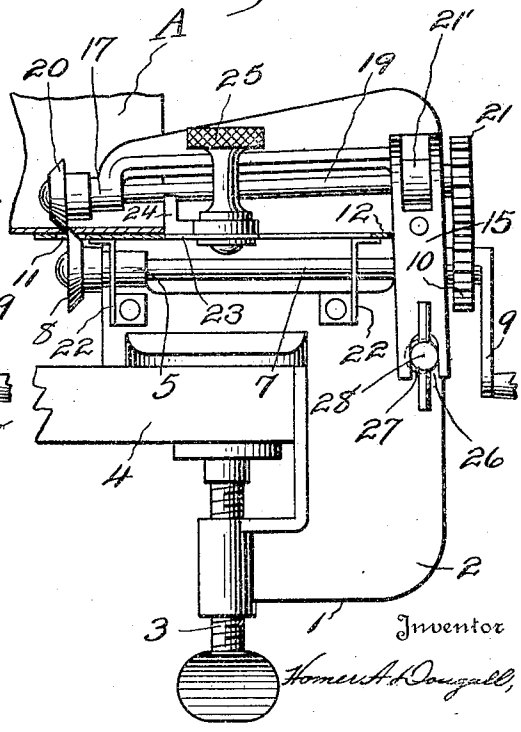


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

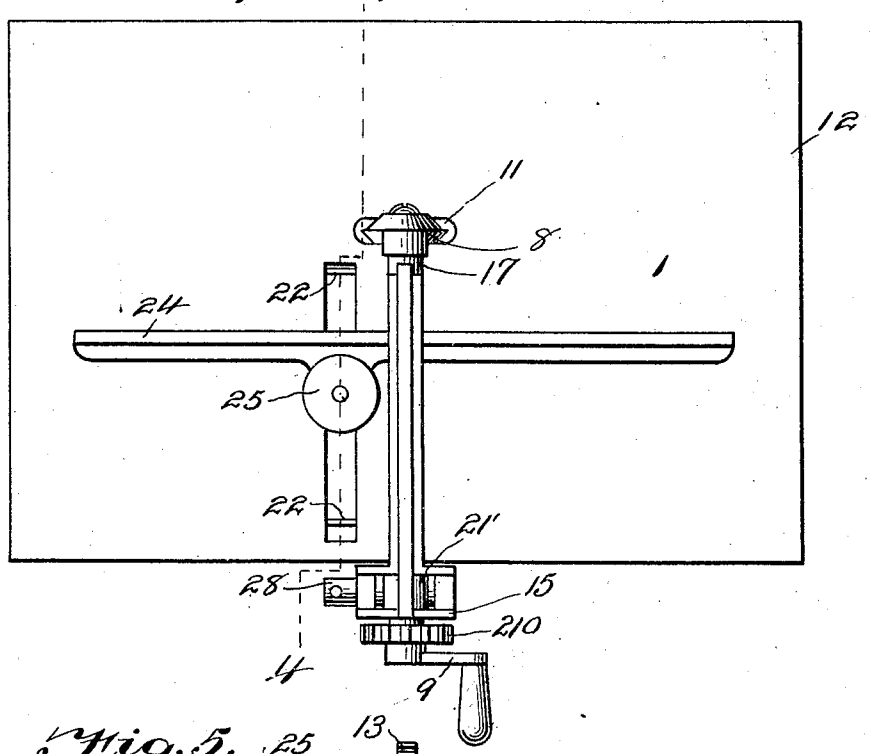


Fig. 5.

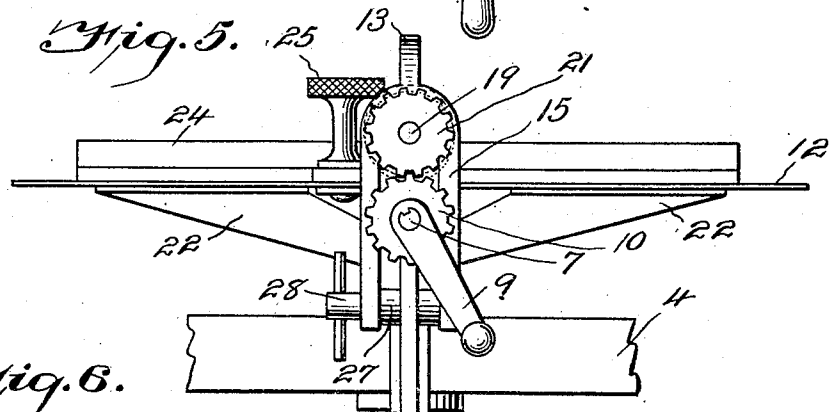
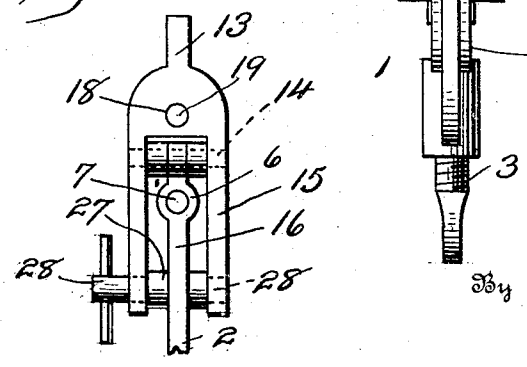


Fig. 6.



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UNITED STATES PATENT OFFICE.

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BOX CUTTER AND TRIMMER.

1,235,192. Specification of Letters Patent. Patented July 31, 1917.

Application filed April 10, 1916. Serial No. 90,197.

To all whom it may concern:

Be it known that HOMER A. DOUGALL, citizen of the United States, residing at Clarendon, in the county of Alexandria and State of Virginia, has invented a certain new and useful Improvement in Box Cutters and Trimmers; and he does declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to a card-board box cutting or trimming machine, and has for its object to provide a device particularly designed for the trimming or cutting down of card-board packing boxes so as to reduce their height to more properly fit them to shelves or the like, or to better adapt them to receive goods or articles for shipment.

With this object in view, the invention consists in the novel construction of the cutting or trimming device and particularly in the construction for driving and positioning the cutters.

The invention further consists in certain other novel details of construction and combination of parts, all of which will be first fully described and afterward specifically pointed out in the appended claims.

Referring to the accompanying drawings:

Figure 1 is a side elevation of a box cutting or trimming machine constructed in accordance with my invention.

Fig. 2 is a similar view showing the cutters entering a box or the like, taken on line 4—4 of Fig. 4.

Fig. 3 is a similar view showing extreme closed position of cutters, taken on line 4—4 of Fig. 4.

Fig. 4 is a top plan view of machine.

Fig. 5 is a front elevation illustrating the positions of the cutter driving pinions and

Fig. 6 is a fragmentary elevation of cutter positioning cam and pivoted arm.

Like numerals of reference indicate the same parts throughout the several figures in which:

1 indicates the machine which includes a C clamp 2 having a tightening thumb screw 3 for attaching the machine to a bench, table, counter or the like 4.

The C clamp 2 is provided with two bearings 5 and 6 for journaling the lower cutter shaft 7, which as shown in the drawings carries the lower circular knife-edge cutter 8 on its inner end and a crank 9 and pinion 10 on its outer end, the said cutter 8 being positioned so as to slightly extend through a slot 11 in the box-supporting table 12 of the machine.

13 indicates a rigid L-shaped cutter-mounting arm pivoted to the C clamp body 2 at 14, the portion 15 of the arm 13 being bifurcated as shown in Figs. 5 and 6 to straddle the vertical body 16 of the C clamp. It will be seen from the drawings that the arm 13 is provided with two bearings 17 and 18 for journaling the upper cutter shaft 19, which carries the upper circular knife-edge cutter 20 on its inner end and the shaft and cutter driving pinion 21, on its outer end meshing with the pinion 10 on the lower shaft 7, a sleeve 21^1 being provided on the upper shaft 19 in the bearing 18, so as to position and hold the said shaft 19 and cutter 20 in proper transverse position so as to insure a proper cutting relation between the two cutters 8 and 20.

The box-supporting table 12 being suitably secured to the C clamp as by brackets 22, or in any other suitable manner, said table is preferably of a thin sheet metal and is provided with a transverse slot within which operates the elongated stud 23 of the transversely adjustable box stop or guide 24, said stop or guide 24 being set in position on the table 12 by means of a thumb nut 25.

Referring now to the bifurcated portion 15 of the arm 13 and particularly to Figs. 1 and 6, it will be seen that each arm of the bifurcated portion 15 is itself bifurcated to provide vertical slots or recesses 26 which straddle the cam shaft 27, which is mounted in the vertical body of the C clamp, the extensions 28 of the shaft 27, having their centers eccentric to the axis of the shaft 27 so that upon rotation of the shaft 27, the eccentric portions 28 thereof bear against the walls of the bifurcated portions 15 of the arm 13 to swing said arm on its pivot 14 to raise or lower said arm 13 and its cutter 20 as shown in Figs. 1, 2 and 3.

Having thus fully described the several parts of the invention its operation is as follows:

The machine being in position for operation, the box stop or guide is set at the desired position on the table 12, said position being of course determined by the extent of the trimming desired. The cam shaft 27 is then turned into position shown in Fig. 1, which swings the lower end of the bifurcated portion 15 of the arm 13 inwardly and raises the upper cutter 20 into position as shown in Fig. 1. The box designated by the letter A is then placed upon the table 12 and the edge of the box is passed between the two cutters 8 and 20 until said edge engages the stop or guide 24. The cam shaft 27 is then turned a half revolution and into position as shown in Fig. 3, which brings the upper cutter 20 through the position shown in Fig. 2 and into position shown in Fig. 3. The crank 9 is then rotated and as the pinions are 1 to 1 the two cutter shafts 7 and 19 and their cutters 8 and 20 are rotated in opposite directions imparting a rotary shearing action to the said cutters and progressing and cutting the box until the same has been trimmed on all four sides. If desired the lower cutter 8 may be of slightly larger diameter than the upper cutter so that its cutting edge travels faster than that of the upper cutter 20 to increase the shearing action between the two cutters.

While it is entirely evident that the relative positions of the two pinions 10 and 21 change in accordance with the position of the cam shaft 27 and the arm 13 as indicated by dotted lines in Fig. 5, it will be understood that as said pinions are very close to the pivoted point 14, a proper and effective meshing of said pinions is not impaired.

Having thus fully described the invention I do not wish to be understood as limiting myself to the exact details of construction shown and described, but consider myself clearly entitled to all such changes and modifications as fall within the limit and scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A box cutting and trimming machine including means for attachment to a bench or the like, a flat box receiving table, a circular knife edge cutter under said box receiving table, a shaft for said cutter, a pinion and a crank on said shaft, an L shaped pivoted arm above said box receiving table, a circular knife-edge cutter movable with said arm, a shaft journaled in said pivoted arm, a pinion on said shaft meshing with said pinion on said first mentioned cutter shaft, and a rotatable cam shaft in engagement with said L shaped arm to swing said arm on its pivot to raise and lower the second mentioned cutter with respect to the said table and the first mentioned cutter.

2. A box cutting and trimming machine including means for attachment to a bench or the like, a flat box receiving table, a circular knife-edge cutter under said box receiving table, a shaft for said cutter, a pinion and a crank on said shaft, an L shaped pivoted arm above said box receiving table, a circular knife-edge cutter movable with said arm, a shaft journaled in said pivoted arm, a pinion on said shaft meshing with said pinion on said first mentioned cutter shaft, and means for swinging said arm on its pivot to raise and lower the second mentioned cutter with respect to said table and the first mentioned cutter.

3. A box cutting and trimming machine including means for attachment to a bench or the like, a flat box receiving table, a circular knife-edge cutter under said box receiving table, a shaft for said cutter, a pinion and a crank on said shaft, an L shaped pivoted arm above said box receiving table, a circular knife-edge cutter movable with said arm, a shaft journaled in said pivoted arm, a pinion on said shaft meshing with said pinion on said first mentioned cutter shaft, means for raising and lowering said arm to position the second mentioned shaft with respect to said table and the first mentioned cutter, and box stop or guide adjustable on said table with respect to said cutters.

4. A cutting and trimming machine including a body portion, a circular cutter and shaft mounted in said body, a pinion on said shaft and a crank for rotating said pinion, shaft and cutter, a work receiving table above said cutter, an arm pivoted to the body portion, a circular cutter and shaft mounted in said arm, a pinion on said shaft meshing with said first mentioned pinion to be driven thereby to rotate the second mentioned shaft and cutter in a direction opposite to that of the first mentioned shaft and cutter, and a cam shaft mounted in the body portion and in engagement with the pivoted arm to raise and lower the second mentioned cutter with respect to the first mentioned cutter.

5. A cutting and trimming machine including a body portion, a circular cutter and shaft mounted in said body, a pinion on said shaft and a crank for rotating said pinion, shaft and cutter, a work receiving table above said cutter, an arm pivoted to the body portion, a circular cutter and shaft mounted in said arm, a pinion on said shaft meshing with said first mentioned pinion to be driven thereby to rotate the second mentioned shaft and cutter in a direction opposite to that of the first mentioned shaft and cutter, and means for raising and lowering the second mentioned cutter with respect to the first mentioned cutter.

6. A cutting and trimming machine including a body portion, a circular cutter mounted therein, a work receiving table above said cutter, an arm pivoted to said body portion, a circular cutter mounted therein, means for rotating one of said cutters, means for communicating rotary movement of one cutter to the other cutter to rotate the cutters in opposite directions and means for raising and lowering the second mentioned cutter with respect to the first mentioned cutter.

In testimony whereof, I affix my signature, in presence of two witnesses.

HOMER A. DOUGALL.

Witnesses:
C. HUGH DUFFY,
P. C. ALTHEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."