May 6, 1930. P. A. FRAZIER 1,757,623

BOOK TRIMMING MACHINE

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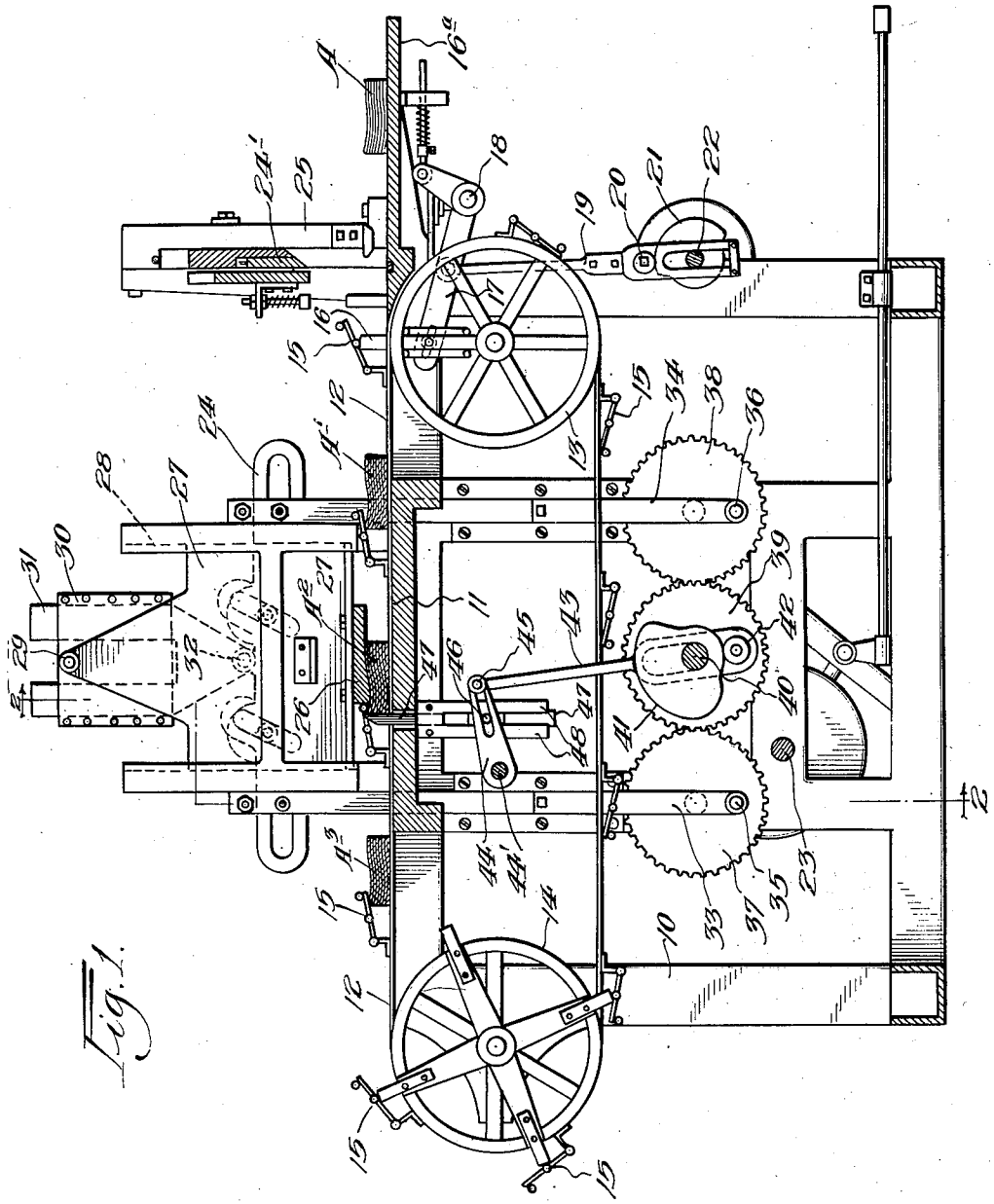


Fig. 1.

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Fig. 2.

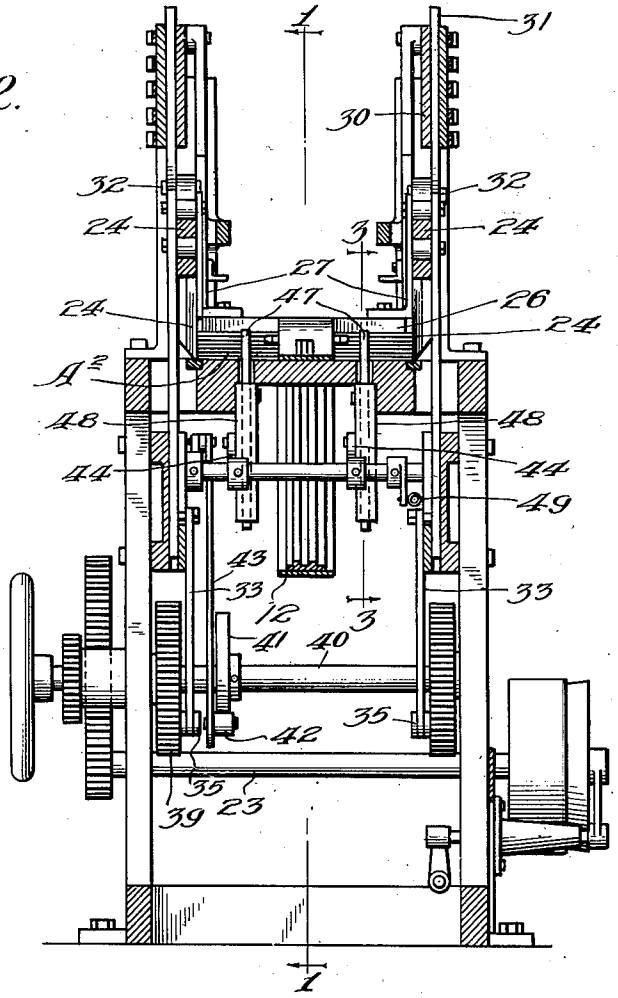
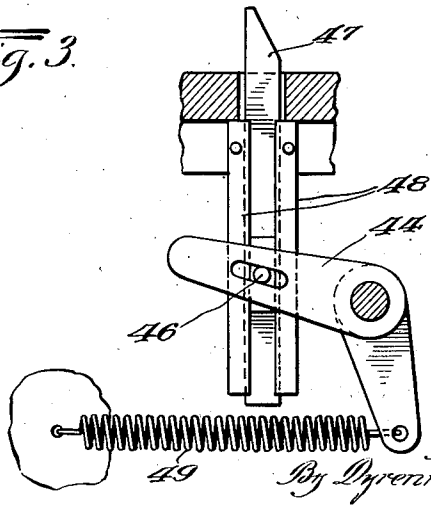


Fig. 3.



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UNITED STATES PATENT OFFICE

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BOOK-TRIMMING MACHINE

Application filed May 28, 1927. Serial No. 194,948.

This invention relates to book trimming machines.

An object of the invention is to provide means for preventing warping and twisting of the book during the operation of trimming the ends of the book.

This and other objects are accomplished by this invention which includes a pad adapted to accurately fit the top of the pile of books together with means for insuring that the pad will always fall at the same place on the top of each pile of books as they pass through the machine.

The invention is fully described in the following specification and shown in the accompanying drawings, in which:—

Figure 1 is a longitudinal vertical section through a trimming machine embodying the invention;

Fig. 2 is a transverse section on the broken line 2—2 of Fig. 1; and

Fig. 3 is a partial vertical section on the line 3—3 of Fig. 2.

This invention is an improvement on the patent to Welch No. 1,003,679 granted September 19, 1911, and differs therefrom only in the particulars which will be hereinafter shown and described.

The embodiment illustrated comprises a frame 10 having a horizontal bed or way 11 upon which slides a flat steel belt 12 which runs over pulleys 13 and 14, the latter being intermittently driven as explained in the Welch patent. This steel belt carries a series of clamps 15 which are equally spaced on the belt, this spacing being equal to the amount the belt 12 is moved at each actuation of the pulley 13. Thus, the clamps 15 stop at definite points after each forward movement. Positive means (not shown) is used to prevent slippage between the pulley and the steel belt.

A feeding table 16^a is placed in front of the pulley 13 and at the level of the bed 11 so that piles of books to be trimmed may be fed by hand (or by mechanism not shown) to the clamp 15. This is held open, as shown in Fig. 1, by the stop 16 which at the same time serves as a stop for books fed to the conveyor belt. This stop 16 is raised by a lever arm 17 which is pivotally mounted at 18 and is actuated by a rod 19 having a cam follower 20 operating on the cam 21. This cam is keyed on a shaft 22 which is driven in timed relation to the main drive shaft 23 by gears (not shown herein) which are fully shown in the said patent to Welch.

The clamps 15 are equally spaced on the steel belt 12 and the belt is advanced by mechanism not shown herein but fully shown and described in said patent to Welch, each actuation advancing the belt the distance between successive clamps.

The stop 16 lifts the clamp 15 as it rises above the table 16^a as shown in Fig. 1, so that a pile of books A to be trimmed may be slid under the clamp 15 along the table 16^a by hand or by mechanism not shown. The stop 16 then disappears through the table permitting the clamp 15 to grip the pile of books A. A knife 24′ carried in a suitable guiding frame 25 then descends to trim the front of the book while so held.

The pulleys 13, 14 are then actuated to advance the steel belt 12, the distance between successive clamps thereby bringing the book to the position A′. On its next forward actuation, it is moved to the position A^2 beneath a pressure pad 26 which is carried by side plates 27, one at each side of the steel belt 12.

Up to this point the structure is not materially different from that of the patent to Welch. Here, the present invention enters.

In trimming piles of books in this way, the pile does not remain flat on top but takes a characteristic curve, the shape of the curve varying with each kind of book. A pad 26 is accordingly made to fit accurately the form of this curve for each particular book. This pad is carried on guide members 27, one at each side, which operate in vertical guideways 28 and each of which has pivotally connected thereto at 29, a friction member 30 which frictionally encloses a U-shaped member 31 which in turn is pivotally connected at 32 to one of the knives 24.

The knives 24 are operated by the connecting rods 33 and 34 from pins 35 and 36 on the sides of gears 37 and 38 which are driven by the gear 39 on the shaft 40. This shaft is

driven by gears (not shown) from the main shaft 23. The gears 37, 38 and 39 are all of the same size so that they have the same rotational speed and they are driven in timed relation to the intermittent drive for the belt 13 so that the gears 37, 38 and 39 make one revolution for each intermittent forward movement of the conveyor 12.

The gear 39 carries a cam 41 upon which rides a follower 42 which is carried by the rod 43 which is pivoted at its upper end to a lever 44 by means of a pin 45. The lever 44 is movable about a shaft 44′ and has a pin 46 which is carried by a stop member 47 which is vertically guided in channels 48 and extends through openings in the table 11, one stop lying on each side of the conveyor 12 as shown in Fig. 2. A spring 49 keeps the follower 42 pressed against the cam 41 and serves to raise the stop 47.

The cam 41 raises the stop 47 while the books are moving from the position A′ to the position A^2 and the stop 47 is so placed as to stop the pile of books A^2 about an eighth of an inch before it would normally be brought to rest by the belt 12. Thus the pile of books A^2 are caused to slip somewhat beneath the clamp 15.

Thus the pile of books at A^2 are always stopped at the same point with respect to the pad 26, which is the point desired to be attained. Without such a stop, the piles of books do not stop at the same point each time due to variations in the point at which they are gripped and due to inequalities in the points at which the conveyor belt is stopped. This insures that the pad 26 carefully formed to fit the top of the pile of books will always fall at the proper place thereon.

While I have shown and described but a single embodiment of this invention, it is to be understood that it is capable of many modifications. Changes therefore in the construction and arrangement may be made which do not depart from the spirit and scope of the invention as disclosed in the appended claims.

I claim:

1. In a book-trimming machine, intermittently operating book-feeding means, a knife for trimming the book at an edge thereof extending at an angle to the bound edge of the book, a pressure-pad for holding the book while being trimmed, said pad having its presser face of such shape as to approximately fit the contour of the top of the book against which it is pressed, and means for accurately positioning the book beneath said pad.

2. In a book-trimming machine, an intermittently operated conveyor having book-gripping mechanism, a knife for trimming the book at an edge thereof extending at an angle to the bound edge of the book, a pressure-pad for holding the book while being trimmed, said pad having its presser face of such shape as to approximately fit the contour of the top of the book against which it is pressed, and a stop for the book so positioned with respect to the stopping point of the book-gripping mechanism of the conveyor as to cause the book to stop just prior to stopping the conveyor for accurately positioning the book beneath said pad.

3. In a book trimming machine, intermittently operating book feeding means, a knife for trimming the book at an edge thereof extending at an angle to the bound edge of the book, a pressure-pad for holding the book while being trimmed said pad having its presser face curved to approximately fit the contour of the top of the book against which it is pressed, and means for accurately positioning the book beneath said pad.

4. In a book trimming machine, an intermittently operating conveyor having book-gripping mechanism, a knife for trimming the book at an edge thereof extending at an angle to the bound edge of the book, a pressure pad for holding the book while being trimmed, and a stop for the book and so positioned with respect to the book-gripping mechanism of the conveyor as to cause the book to stop just prior to stopping the conveyor for accurately positioning the book beneath said pad.

5. In a book trimming machine, an intermittently operating conveyor having book-gripping mechanism, a knife for trimming the book at an edge thereof extending at an angle to the bound edge of the book, a pressure-pad for holding the book while being trimmed, a stop member for engagement by the bound edge of the book and movable into and out of a stop-forming position, and means for actuating said stop member so timed in its operation relative to the book-gripping mechanism of the conveyor as to cause the book to stop just prior to stopping the conveyor for accurately positioning the book beneath the pad.

In testimony whereof I have hereunto set my hand and seal this 23rd day of May, 1927.

PHILIP A. FRAZIER.