March 9, 1926. 1,575,648

C. SEYBOLD

PAPER CUTTING MACHINE

Filed Oct. 24, 1923 2 Sheets-Sheet 1

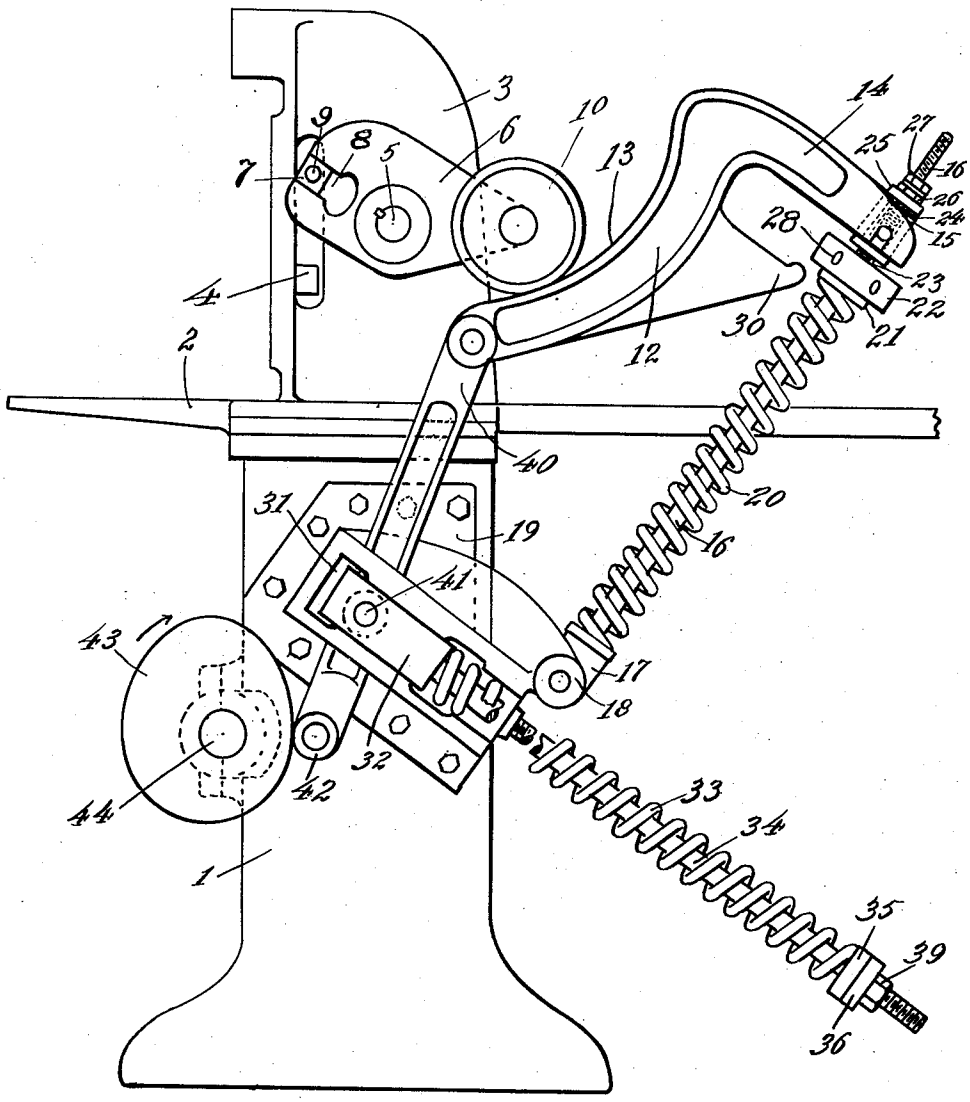


Fig. 1.

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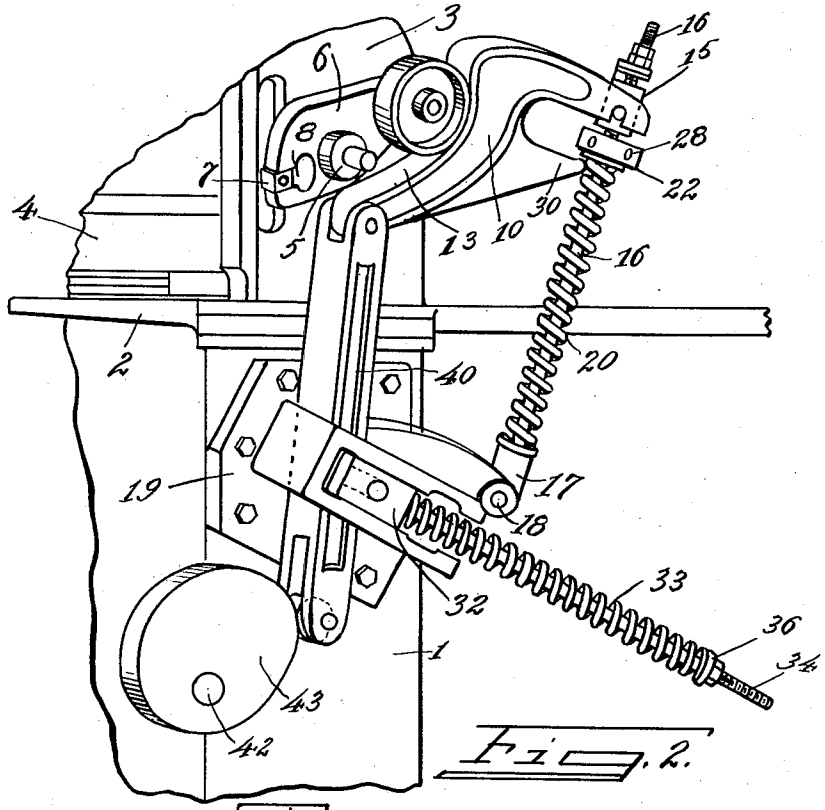


Fig. 2.

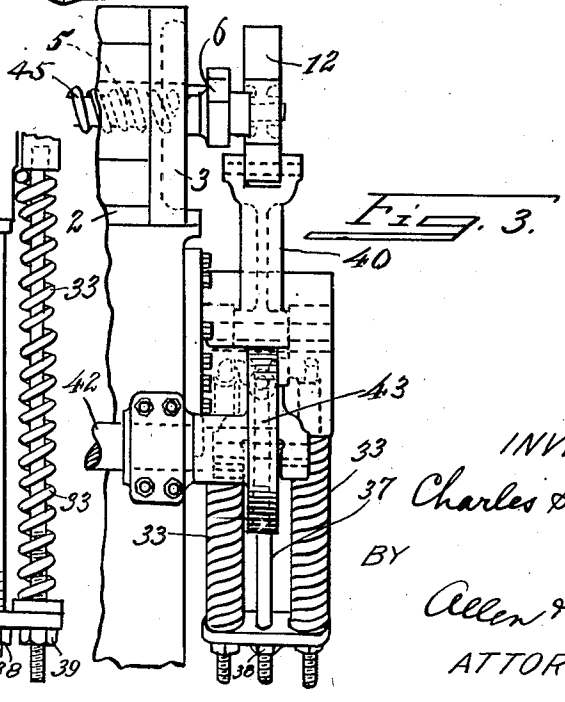


Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLES SEYBOLD, OF DAYTON, OHIO.

PAPER-CUTTING MACHINE.

Application filed October 24, 1923. Serial No. 670,571.

To all whom it may concern:

Be it known that I, CHARLES SEYBOLD, a citizen of the United States, and a resident of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Paper-Cutting Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

The object of my invention is to provide a construction for the application of the pressure required for holding the piles of paper to be cut or trimmed, in any of the ordinary types of power operated paper cutting machines, in which compression springs may be utilized for the application of the necessary clamping pressure which shall be automatically controlled to vary the pressure in proportion to the height of the pile, a moderate pressure when the pile is low and automatically increasing as the height of the pile increases.

Heretofore, so far as I am aware, compression springs have not been successful, for reason that inasmuch as the clamp pulling bars must have a throw of a uniform distance whether the pile of paper is high or low, it has been necessary to provide springs which would be capable of compressing an amount equal to the full movement of the clamp. With such springs the pressure on the high pile would not be sufficient or if sufficient, stiff springs were employed for the high pile, it would be impossible to compress such springs the extent required for the low pile without breakage.

It is to obviate this difficulty that my invention is directed and it consists of that certain novel construction and arrangement of parts to be hereinafter particularly pointed out and claimed whereby the leverage exerted on the clamp bar shall be automatically increased or diminished in proportion to the height of the paper pile without the undue compression of the springs for the full throw of the clamp bar.

In the drawings:

Figure 1 is a side elevation of the frame of a paper cutter with my clamp mechanism applied thereto with the clamp in raised position.

Figure 2 is a perspective view of the same showing the clamp in low position.

Figure 3 is a front elevation of the clamp mechanism, and

Figure 4 is a plan view of the lever holding springs.

I have illustrated only such parts of the paper cutter as may be necessary to show the application of my invention to an ordinary paper cutter of typical construction, and it will be understood that the mechanism can readily be applied to any of a great variety of familiar types of machines. As illustrated, 1 is one of the side standards of such a machine with table 2, and end frame or housing 3, in which the cutting head with the knives, and the clamp bar 4 are mounted. The clamp rock shaft 5 is mounted on this housing with a clamp pressure lever 6 secured at each end of the clamp shaft to which levers the clamp bar 4 is swiveled by boxes 7 mounted in slots 8 in the clamp lever, and secured to the clamp 4 by wrist pins 9.

The outer end of one of these clamp levers 6 carries a roller 10 which is engaged by a pressure lever 12, having a curved track 13 upon which the roller rides. The outer end 14 of this pressure lever carries a swivel 15 in its slotted end to which a spring rod 16 is secured. The lower end of this spring rod is secured in a swivel 17, hinged to the nose 18 of a bracket casting 19 which is securely bolted to the side of the standard 1.

The spring rod 16 carries the compression spring 20 which surrounds the rod and bears at its lower end on the swivel 17, and at its upper end on a collar 21. The spring rod is of reduced diameter at this end and mounted to slide thereon is a pressure adjusting nut 22. This nut has a screw threaded extension 23 which is screwed into the swivel 15 and through which the spring rod 16 passes. The outer end of the spring rod is threaded and carries a leather washer 24, and a steel washer 25 with a nut 26 and lock nut 27 to hold the washers in place, normally with the leather washer bearing on the swivel 15.

The tension of the spring 20 is adjusted by the nut 22, which is provided with a number of radial holes 28 for the insertion of

a rod or pin for turning. In order to prevent too great a compression of the spring 20 in careless adjustment, a projection 30 on the lever 12 acts as a stop in the adjustment of the nut 22.

The bracket 19 secured to the standard is provided with an inclined slot 31 and in this slot is mounted a sliding box 32, which can move outwardly and downwardly a short distance against the spring resistance of a pair of coiled springs 33. These springs are guided on spring rod 34, which is screwed into the box 32. At the outer ends the springs are held in position by collars 35 with a bridge plate 36 connecting the springs. A central guide rod 37 is provided screwed into the bracket 19 and passing through the bridge plate, and by means of the nut 38, the position of the sliding box 32 can be adjusted in the bracket, while the tension of the springs 33 is adjusted by the nuts 39.

The pressure lever 12 is pivoted at its lower end to a rocker arm 40 which is in turn pivoted at 41 to the box 32. The rocker arm extends downwardly and at its lower end carries a roller 42 which bears against a cam 43 fixed on the front crank shaft 44 of the machine.

In the operation of the machine the crank shaft 44 and cam 43 rotate clockwise and this movement rocks the rocker arm and if there is no paper in the machine, the springs 33 which are adjusted nearly to their maximum compression limit, hold the box 32 and the pivot 41 of the rocker arm in fixed position while the compression spring 16 which is also adjusted to its maximum capacity holds the pressure lever 12 in position as if a continuation of the rocker arm. The result of rocking the rocker arm therefore, is to bring the lever 12 to bear on the roller 10 on the clamp lever 6, and to rock the clamp shaft 5 and lower the clamp to the table. In this movement the roller 10 rides up the curved surface of the lever 12, and the power of the lever 12, decreases and is at its minimum when the clamp reaches the table, or reaches a low pile of a few sheets of paper. When the pile of paper is reached, and the resistance of the paper pile exceeds the spring resistance of the compression springs, the further movement of the rocker arm, until the dwell of the cam is reached, causes the spring 20 to compress and a slight space appears between the leather washer 24 and the swivel 15.

When a high pile of paper is to be cut the clamp compresses the paper, when the roller 10 has moved only a slight distance on the lever 12, in which position the leverage is most powerful, the spring 20 compresses within its limits, which is only a short distance, and then to permit the full throw of the cam and rocker arm, the block 32 shifts under the compression of the springs 33. The higher the pile the greater extent the slide block has to yield.

With this construction, it is obvious the full throw of the cam can be had without any excessive compression of the springs. I am also able to employ comparatively light springs even to obtain very powerful compression on the pile when a full pile is under treatment and maximum compression is required.

After the cutting operation, the clamp is returned to its normal raised position by any suitable spring, the construction I have adopted being a coiled spring 45 mounted on the clamp shaft as is customary for raising the clamp.

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

1. In a device of the character specified, a paper support, and a clamp bar to hold the paper pile on the paper support, mechanism for operating the clamp bar to move it to the paper support, power means for actuating said mechanism, a resilient means operating upon said mechanism at one point to hold the clamp under tension on the paper pile and through which resilient means the ultimate clamp pressure is applied, with resilient means at another point to permit the clamp mechanism to yield for the full operation of the power means while maintaining the tension of the first resilient means.

2. In a device of the character specified, a paper support, and a clamp bar, and mechanism for operating the clamp bar to move it to the paper support, power means for actuating said mechanism, a spring operating on said mechanism at one point to hold the clamp under spring tension on the paper pile and through which resilient means the ultimate clamp pressure is applied, with spring means at another point to permit the mechanism to yield for the full operation of the power means while maintaining the tension of the first mentioned spring.

3. In a device of the character specified, a paper support, and a clamp bar to hold the paper pile on the paper support, a rock shaft and connection therefor with the clamp bar to operate same, a jointed lever to rock the rock shaft, a spring operating on the free end of said lever to hold the clamp under spring tension on the paper pile and through which the pressure is applied, power means to actuate said lever, and means to permit the lever to yield, for the full operation of the power means, while maintaining the tension on the paper pile.

4. In a device of the character specified, a paper support, and a clamp bar to hold the paper pile on the paper support, a rock shaft and connection therefor with the clamp bar to operate same, a lever to rock the rock

shaft, a spring operating on the free end of said lever to hold the clamp under spring tension on the paper pile and through which the pressure is applied, a rock arm to which the lever is pivoted, a power driven cam to engage the rock arm and actuate the lever, and a yieldable pivot for the rock arm, to permit the full throw of the cam while maintaining the tension on the paper pile.

5. In a device of the character specified, a paper support, and a clamp bar to hold the paper pile on the support, mechanism for operating the clamp bar to move it to the paper support, comprising in part a jointed lever with spring to hold the free end of the lever under tension and through which the ultimate pressure is applied, power means to actuate said lever and means to permit the lever to yield for the full operation of the power means while holding the lever under tension.

6. In a device of the character specified, a paper support, and a clamp bar to hold the paper pile on the support, mechanism for operating the clamp bar to move it to the paper support, comprising in part a jointed lever of two members with spring to hold the free end of the lever under tension and through which the ultimate pressure is applied, power means to actuate said lever, and a second spring means to permit the lever to yield for the full operation of the power means while holding the lever under tension.

7. In a device of the character specified, a paper support, and a clamp bar to hold the paper pile on the support, a jointed lever to actuate said clamp bar, a spring operating on the free end of said lever to hold the clamp under spring tension on the paper pile, and through which the ultimate pressure is applied, power means to actuate said lever, and means to permit the lever to yield for the full operation of the power means, while maintaining the tension on the paper pile.

8. In a device of the character specified, a paper support, and a clamp bar to hold the paper pile on the paper support, a rock shaft and connection therefor with the clamp bar to operate same, a lever to rock the rock shaft, a spring operating on said lever to hold the clamp under spring tension on the paper pile, a rock arm to which the lever is pivoted, a power driven cam to engage the rock arm and actuate the lever, a slidable block on which said rock arm is pivoted with a spring to hold said block in position adapted to yield to permit the full throw of the cam while maintaining the tension on the paper pile.

CHARLES SEYBOLD.