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2,881,834

BACK GAUGE SLOT CLOSING MEMBER

Filed Oct. 9, 1956

2 Sheets-Sheet 1

FIG. 1

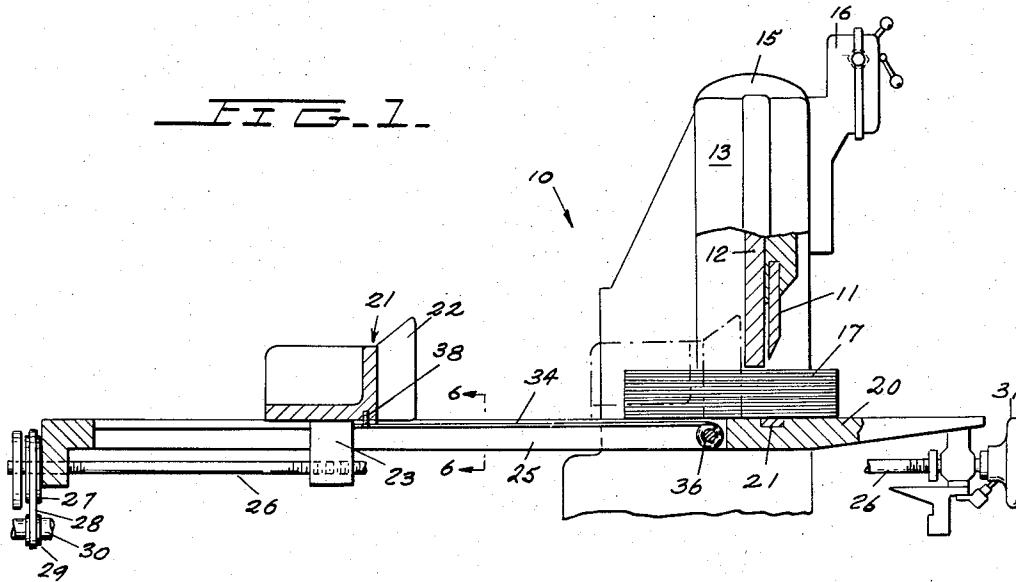
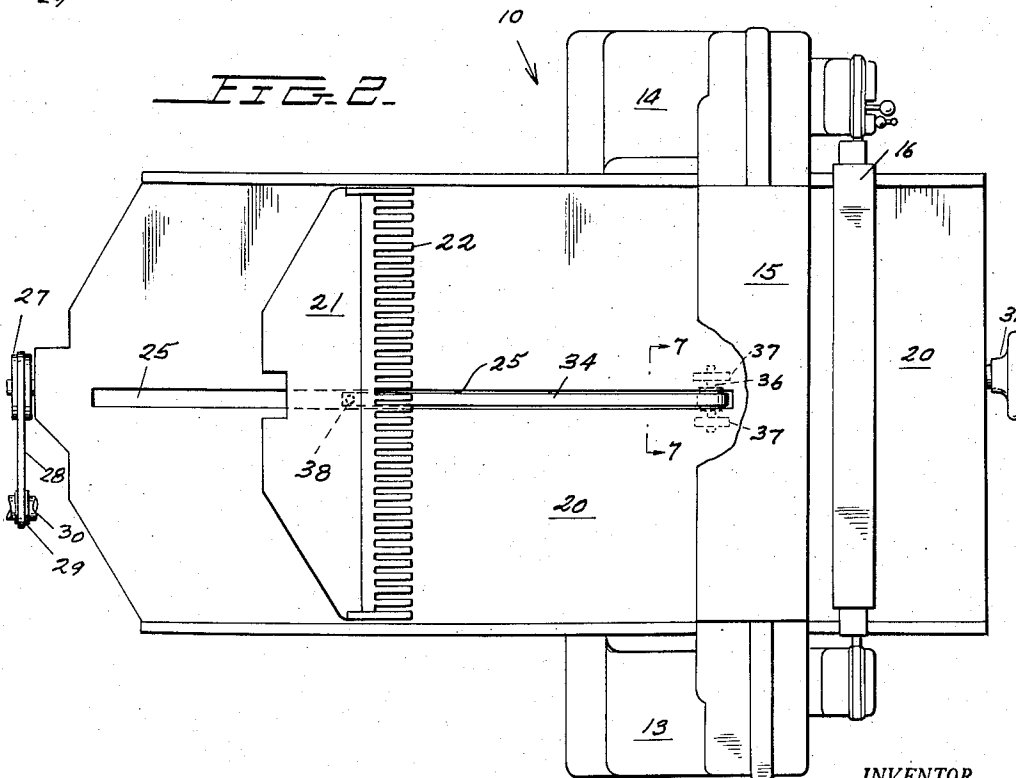


FIG. 2



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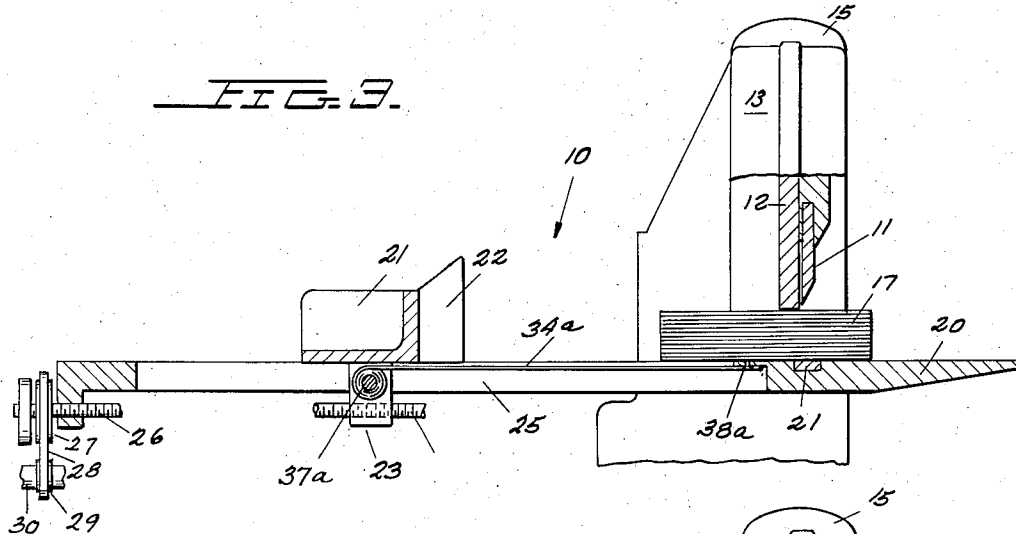
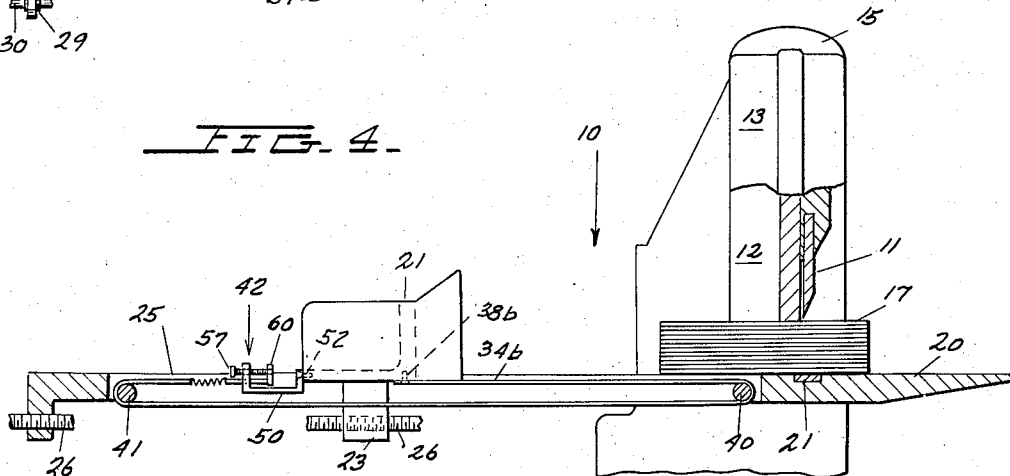
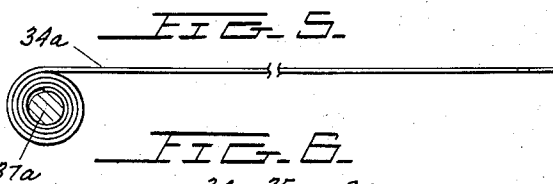
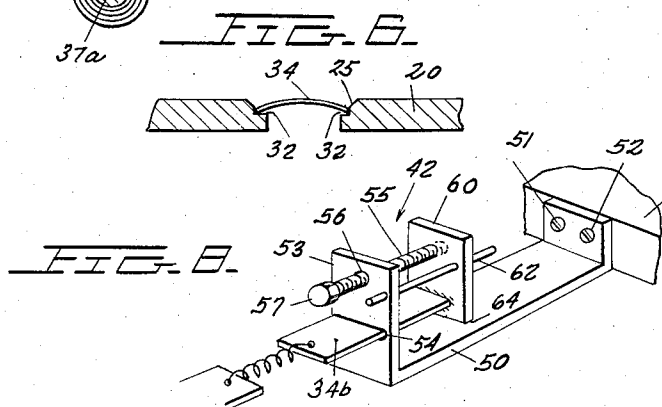
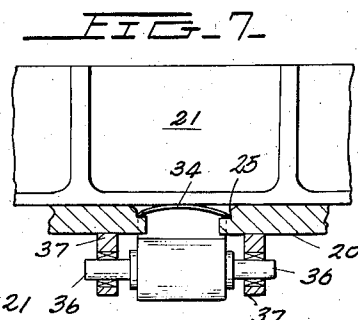
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2,881,834

BACK GAUGE SLOT CLOSING MEMBER

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2 Sheets-Sheet 2



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2,881,834

BACK GAUGE SLOT CLOSING MEMBER

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4 Claims. (Cl. 164—59)

My present invention relates to paper cutting and trimming machines of the type which are provided with a back gauge which is movable by manual, motor driven or automatic means toward and away from the cutting position in order to move the pile of paper to be cut to the desired location beneath the cutting knife and clamp.

Paper cutting and trimming machines have reached the stage of refinement where accuracy of the order of $\frac{1}{4,000}$ of an inch and less is expected in day-in day-out operation including thousands of cuts per day. Various problems have arisen, however, in the operation of the back gauge which at times have limited the quantity of paper which may be operated on at a single time to less than the quantity which may actually fit between the cutting knife and the table; this is particularly so in the case of paper which is cut at high speeds and which is relatively soft and compressible.

In particular, the back gauge is operated by a drive which frequently includes a driving screw beneath the table, a nut on the driving screw, the said nut being in an extension of the back gauge, which extension passes through a slot in the table. This slot is almost invariably centrally located along the longitudinal axis of the table and at the center of the back gauge. Where on occasion the size of paper to be cut is such that an edge of the paper lies over or adjacent to this slot, then some irregularity in the movement of the paper may on occasion occur. Most important, when paper is loaded from the side of the rear table, it is snagged by the slot as it is pushed across the table. This is the main reason for the need for bridging the slot. This also applies when a pile of paper is swung or rotated so that corners do not snag.

My present invention has for its primary object a means for closing this slot and maintaining the closure of the slot at least between the back gauge and the cutting position at all times irrespective of the position of the back gauge and without interfering in any way with the operation of the back gauge.

More specifically, my invention contemplates the utilization of a spring-like member which is transversely resilient as well as longitudinally resilient and so arranged that inherently it will always return to its coiled shape after being uncoiled. Such a spring has come to be known generally as a negator spring. The transverse bowing of the material of the spring when it is extended provides a substantially rigid support for the paper as the spring closes the slot.

The foregoing and many other objects of my invention will become apparent in the following description and drawings in which:

Figure 1 is a side view in cross-section of a part of a paper cutter showing the manner in which my invention is used and applied.

Figure 2 is a top plan view of the structure of Figure 1.

Figure 3 is a side view in cross-section corresponding to that of Figure 1 showing a modified form of application of the slot closing member.

Figure 4 is a side view in cross-section corresponding

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to that of Figure 1 showing another modification of my invention.

Figure 5 is a side view of the slot closing member of Figure 3.

Figure 6 is a cross-sectional view showing the slot closing member taken on line 6—6 of Figure 1.

Figure 7 is a cross-sectional view of a portion of the slot closing member taken on line 7—7 of Figure 2.

Figure 8 is a view in perspective of a detail of the slot closing securement in Figure 4.

Referring first to Figures 1 and 2, I have here shown a cutting machine 10 of the general type shown in Patent No. 2,737,158. The cutting machine comprises a cutting knife 11 and a clamping member 12 supported in appropriate side frames 13, 14 braced by a cross frame 15. The cutting device is also provided with various control means 16 mounted across the front of the cutting device utilized as shown in the above-mentioned patent for control of the operation of the back gauge hereinafter described.

The means for operating the cutting knife 11 and the clamp 12 are now well-known in the art and require no further description here. It is sufficient to point out that in operation of the cut-off, a pile of paper 17 is placed on the table 20 in the desired position so that an appropriate section of the pile of paper will be cut by the knife 11. When the cutting elements are operated, the clamp 12 descends first and then the knife 11 passes through the paper pile 17 to the cutting stick 21 in the table 20 to effect a cut. The knife 11 then leaves the paper pile first and then the clamp 12 is withdrawn.

The back gauge 21 is provided with a plurality of vertical fins 22 against which the rear of the pile of paper may be placed.

In this set of drawings the paper pile 17 is shown removed from the back gauge so that the elements of the machine will be clear.

In operation, a long pile of paper 17 is placed against the back gauge 21 and the back gauge 21 is then moved toward the front of the machine until the correct amount of the pile of paper 17 projects beyond the blade of knife 11. This is performed by various means either manually or by motor driven means or by automatic operation as described in Patent No. 2,737,158.

After a cut is made and the cut paper removed, the back gauge is driven forward again to the next cutting position, and so on. At the completion of the series of cuts, the back gauge 21 is moved back so that another pile of paper may be inserted and the operation is repeated.

The back gauge 21 has a vertical extension 23 substantially centrally located extending down beneath the table 20 through a longitudinal slot 25 in the table 20. The nut 23 is in threaded engagement with the driving screw 26 which may be driven in any suitable manner as, for instance, by the pulley 27, belt 28, pulley 29 and motor shaft 30. In addition, the screw 26 may be operated by a handwheel 31 at the front of the machine.

As previously pointed out, problems arise in operation owing to the necessary existence of the slot 25 in the table 20. Where attempts have been made to obviate the need of the slot, such attempts have required an overhead suspended drive for the back gauge placing elements above the table which interfered with servicing and adjustment so that it has become common practice to place all driving members for the back gauge 21 beneath the table.

My invention is directed to my novel means for closing the slot 25 in front of the back gauge. This novel means comprises a longitudinal spring member which has the characteristic especially not only of inherently tending to coil itself which is also transversely resilient so that as the longitudinal spring member is extended, a transverse resilient bow is formed. As shown in Figure 6, the slot

25 is provided with a pair of longitudinal lips 32. The longitudinally and transversely resilient member 34 is so arranged that when it enters the slot 25, the edges thereof will rest on the lips 32 and the longitudinal spring member 34 is further arranged so that the bow formed by its transverse resiliency will be convex with respect to the top of the table 20, thereby forming a substantially rigid closure for the slot 25.

As shown in Figure 1, one end of the longitudinally and transversely resilient coil spring ribbon or member is secured to the shaft 36 adjacent the front of the machine at a point at the end of the slot 25. Shaft 36 is supported beneath the slot 25 by appropriate bearings 37, 37 carried in a recess in the underside of table 20. The opposite end of the resilient member 34 is secured in any suitable manner as by the locking screws 38 at the forward end of the back gauge 21.

Now as the back gauge 21 moves back, it pulls out the resilient member 34 from its coil around shaft 36 with the edges of the resilient member 34 riding on the lips 32 and providing the transversely bowed support shown in Figures 6 and 7.

As the back gauge 21 is moved toward the front of the machine, the inherent resiliency of the spring member 34 winds it up around the shaft 36 to maintain a taut spring 34 in the slot 25, the transverse resiliency of the spring 34 providing the bowed support in slot 25. Thus, irrespective of the position of the back gauge 21, the portion of the slot 25 in front of the back gauge or between the back gauge and the cutting position is always closed.

In Figures 3 and 5 I have shown a slightly modified form of the structure of Figures 1 and 2 in which the shaft 36 to which one end of the spring 34 is secured is carried by the nut 23 on the back gauge and the opposite end of the spring 34a is secured in any appropriate manner as by the locking screws 38a at the front end of the cutting table.

In Figures 4 and 8 I have shown another modified form of slot closing plate in which the spring member 34b is a continuous member riding over rollers 40 and 41 at opposite ends of the slot 25 with one end of the spring member 34b secured by screws 38b at the forward end of back gauge 21 and the opposite end of the spring member being secured by the adjustable member 42 to the rear end of the back gauge. A spring is provided to provide additional yield due to the impossibility of keeping lengths absolutely constant under all operating conditions.

The adjustable securement includes, as shown in Figures 4 and 8, a bracket 50 secured in any suitable manner as by the screws 51, 52 to the rear end of the back gauge 21, the bracket having a vertical leg 53; a slot at 54 is provided in the vertical leg 53. An adjustment screw 55 is in threaded engagement with the threaded opening 56 in the vertical leg 53 of bracket 50. The head 57 of the screw is appropriately shaped so that it may readily be rotated. The opposite end of the screw 55 is rotatably captured in the securement block 60 which rests on the bracket 50. The securement block 60 is secured to the end of the slot closing member 34b at the rear of the back gauge. Rotation of the screw 55 will tension the member 34b.

Member 34b in Figures 4 and 8 must be a resilient member to obtain the bowed effect shown in Figure 6 to ensure that a support is furnished for paper over the slot, and so that paper can be fed from the side without catching on the edges.

In order to prevent rotation of the securement member 60 when the adjustment screw is rotated, there is also provided a guide rod 62 which is secured to one of the members 60 and 53 and passes through an opening in the other of the members 60 and 53. Also, the fact that the lower edge 64 of the securement member 60 rests on and is parallel to the bracket 50 will prevent relative rotation.

In the foregoing I have described my invention solely

in connection with specific illustrative embodiments thereof. Since many variations and modifications of my invention will now be obvious to those skilled in the art, I prefer to be bound not by the specific disclosures herein contained but only by the appended claims.

I claim:

1. In a paper cutting machine having a cutting table for supporting a pile of paper to be cut, a cutting knife and clamp located above the table adjacent one end of the table, a back gauge parallel to the cutting knife and operable on said table toward and away from said cutting knife, means for driving said back gauge, a longitudinal slot in said table, an extension from said back gauge passing through said longitudinal slot and engaging said back gauge driving means; the invention which comprises means for closing at least the portion of said longitudinal slot between the back gauge and cutting knife, said slot closing means comprising a longitudinally resilient and transversely resilient spring ribbon; a shaft; either the back gauge extension or the table at the end of the slot adjacent the cutting knife carrying said shaft; an end of said spring ribbon being secured to said shaft; the other end of said spring being secured to either said back gauge extension or the table at said end of said slot; said ribbon being unwound from said shaft as the back gauge moves away from the cutting end and being rewound on said shaft as the back gauge moves toward the cutting end; a recessed ledge on each side of said longitudinal slot within said slot; said recessed ledge supporting the longitudinal edges of said ribbon within said slot; said spring ribbon member being transversely convexly bowed in said slot, said slot sides being outwardly flared from respective ledges to the upper surface of said table.

2. In a paper cutting machine having a cutting table for supporting a pile of paper to be cut, a cutting knife and clamp located above the table adjacent one end of the table, a back gauge parallel to the cutting knife and operable on said table toward and away from said cutting knife, means for driving said back gauge, a longitudinal slot in said table, an extension from said back gauge passing through said longitudinal slot and engaging said back gauge driving means; the invention which comprises means for closing at least the portion of said longitudinal slot between the back gauge and cutting knife, said slot closing means comprising a longitudinally resilient and transversely resilient spring ribbon; said back gauge being operable on movement away from the cutting end to draw said resilient ribbon into said slot and said spring ribbon being removable from said slot on movement of the back gauge toward the cutting end; a recessed ledge on each side of said longitudinal slot within said slot; said recessed ledge supporting the longitudinal edges of said ribbon within said slot; said spring ribbon member being transversely convexly bowed in said slot, said slot sides being outwardly flared from respective ledges to the upper surface of said table.

3. In a paper cutting machine having a cutting table for supporting a pile of paper to be cut, a cutting knife and clamp located above the table adjacent one end of the table, a back gauge parallel to the cutting knife and operable on said table toward and away from said cutting knife, means for driving said back gauge, a longitudinal slot in said table, an extension from said back gauge passing through said longitudinal slot and engaging said back gauge driving means; the invention which comprises means for closing at least the portion of said longitudinal slot between the back gauge and cutting knife, said slot closing means comprising a longitudinally resilient and transversely resilient spring ribbon; a recessed ledge on each side of said longitudinal slot within said slot; said recessed ledge supporting the longitudinal edges of said ribbon within said slot; said spring ribbon member being transversely convexly bowed in said slot, said slot sides being outwardly flared from respective ledges to the upper surface of said table.

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4. In a paper cutting machine having a cutting table for supporting a pile of paper to be cut, a cutting knife and clamp located above the table adjacent one end of the table, a back gauge parallel to the cutting knife and operable on said table toward and away from said cutting knife, means for driving said back gauge, a longitudinal slot in said table, an extension from said back gauge passing through said longitudinal slot and engaging said back gauge driving means; the invention which comprises means for closing at least the portion of said longitudinal slot between the back gauge and cutting knife, said slot closing means comprising a ribbon; a guide member at each end of the slot beneath the table; said ribbon being connected from the forward end of the back gauge around the guide means to the rear end of the back gauge; a recessed ledge on each side of said longitudinal slot within

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said slot; said recessed ledge supporting the longitudinal edges of said ribbon within said slot said ribbon being longitudinally and transversely resilient; said ribbon being transversely convexly bowed in said slot, said slot sides being outwardly flared from respective ledges to the upper surface of said table.

References Cited in the file of this patent

UNITED STATES PATENTS

971,146	Repp	Sept. 27, 1910
995,972	Larsen	June 20, 1911
1,937,175	Tyler	Nov. 28, 1933
2,647,743	Cook	Aug. 4, 1953
2,760,571	Dayton	Aug. 28, 1956