Sept. 16, 1941. S. K. GRAMMER 2,255,846

PAPER-TRIMMING MACHINE

Filed Dec. 30, 1940 2 Sheets-Sheet 1

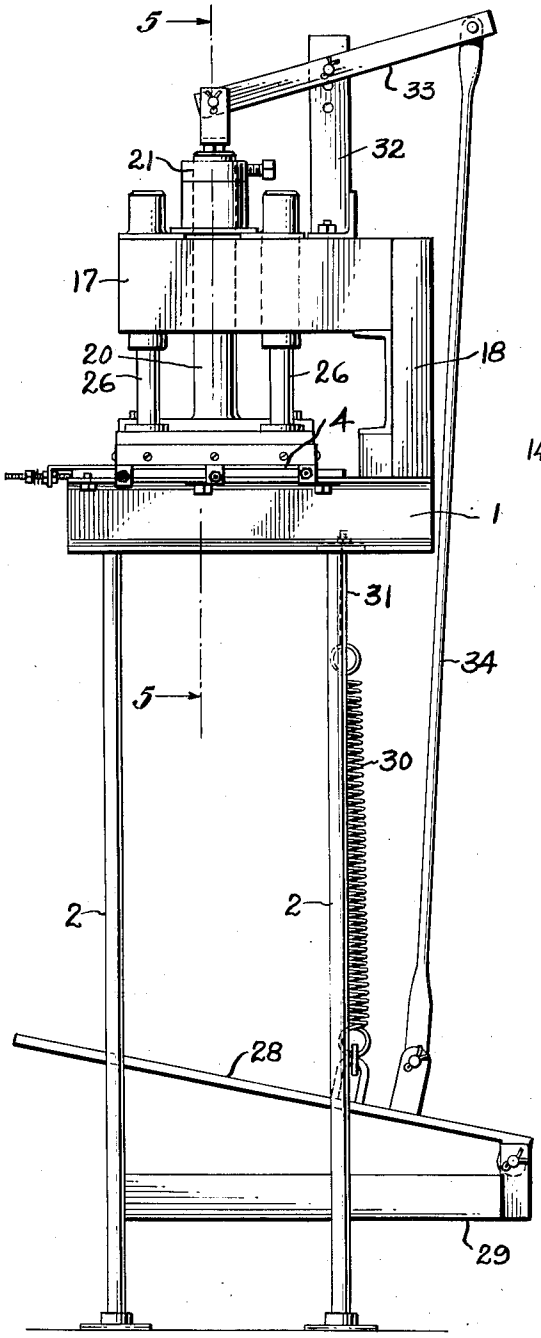
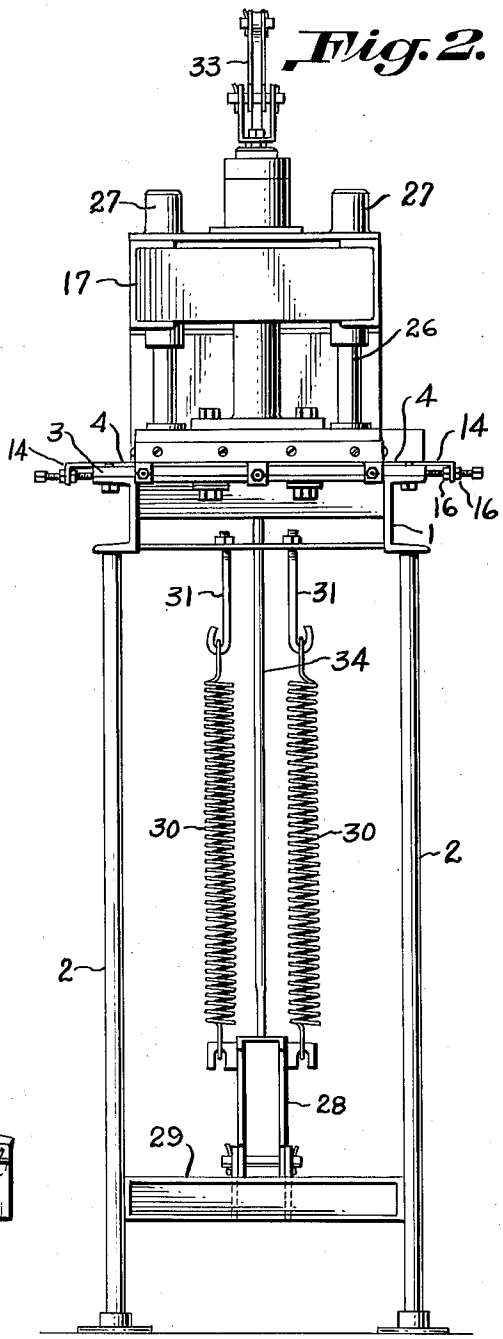


Fig. 1.

Fig. 2.



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Fig. 3.

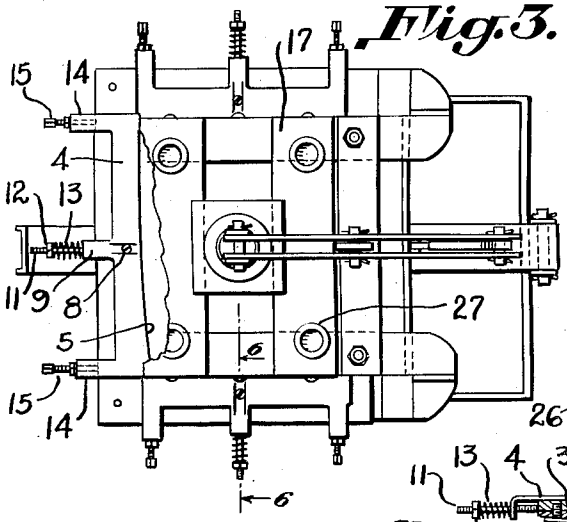


Fig. 5.

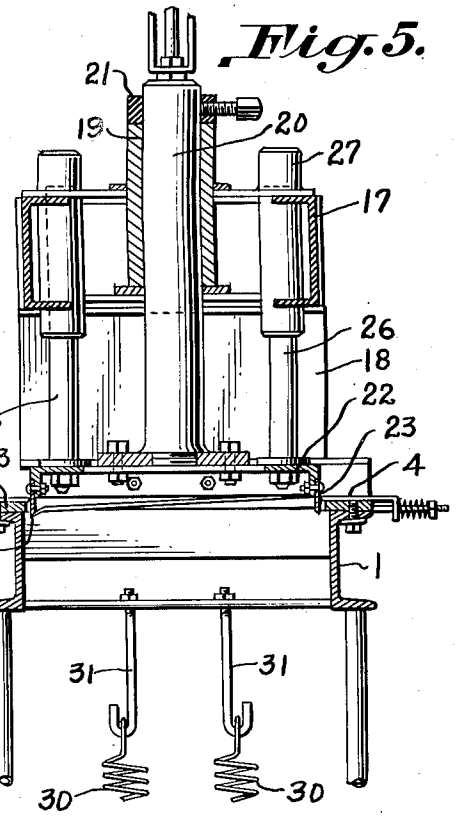


Fig. 4.

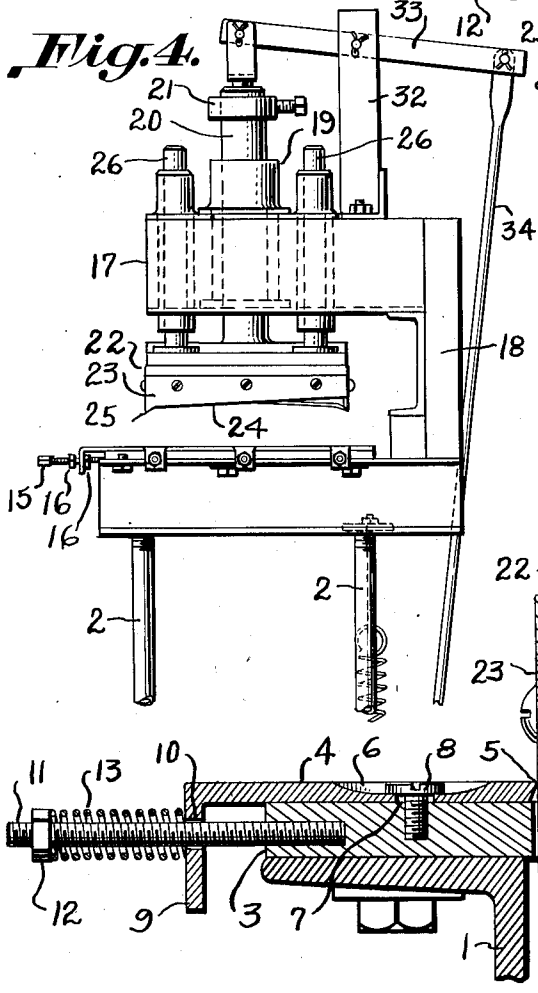
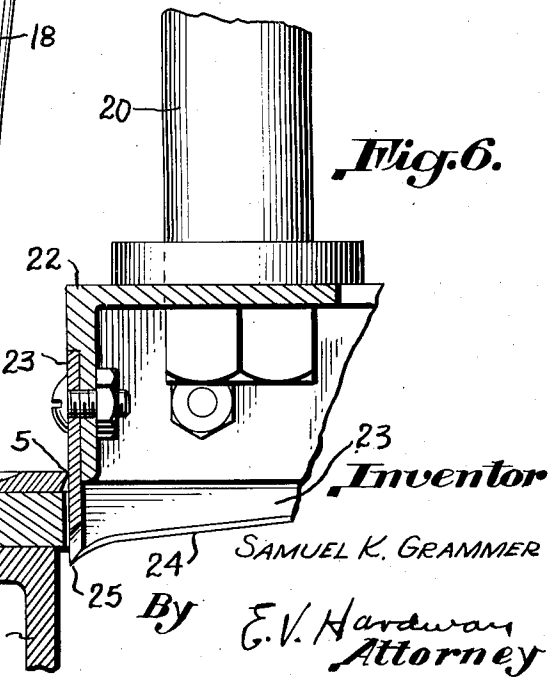


Fig. 6.



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PAPER-TRIMMING MACHINE

Samuel King Grammer, Houston, Tex.

Application December 30, 1949, Serial No. 372,367

4 Claims. (Cl. 164—47)

This invention relates to a paper trimming machine.

An object of the invention is to provide a machine of the character described for cutting, or trimming, paper such as blue print paper.

A further object of the invention is to provide a paper trimming machine consisting of a frame having a knife support thereon with a plurality of individual knives on the support arranged to surround a polygonal area, said knives being yieldably mounted for horizontal oscillation with adjustable means for limiting the range of movement of said knives, said machine also having a reciprocating ram with a plurality of knives mounted thereon for cooperation with the knives on the stationary support for simultaneously trimming the edges of a sheet of paper, and with means to reciprocate the ram toward the stationary knife support.

With the above and other objects in view the invention has particular relation to certain novel features of construction, operation and arrangement of parts, an example of which is given in this specification and illustrated in the accompanying drawings, wherein:

Figure 1 shows a side elevation of the machine.

Figure 2 shows a front elevation.

Figure 3 shows a plan view partly broken away.

Figure 4 shows a fragmentary side elevational view showing the ram in elevated position.

Figure 5 shows a fragmentary cross-sectional view taken on the line 5—5 of Figure 1, and

Figure 6 shows an enlarged fragmentary cross-sectional view taken on the line 6—6 of Figure 3.

Referring now more particularly to the drawings wherein like numerals of reference designate the same parts in each of the figures, the numeral 1 designates a frame which is preferably rectangular in form and which is supported on the legs 2.

Mounted on the frame there is a knife support 3 which is also rectangular in shape, as shown in the present illustration.

Mounted on the knife support are the four individual knives 4 whose inner margins are upwardly bevelled to provide the sharp cutting edges 5. Each knife 4 is provided with a radially elongated recess 6 and a central bearing 7 and a set screw 8 is fitted through said bearing and screwed into the knife support 3 beneath. The set screw has an enlarged head which is countersunk in the groove 6.

Each blade 4 has an outwardly extended downwardly turned bracket 9 having a bearing 10 therethrough and an outwardly threaded rod 11 is extended through said bearing and screwed into the support 3 and has an adjusting nut 12 screwed onto the outer end thereof. A strong coil spring 13 surrounds each rod 11 and is interposed between the corresponding nut 12 and bracket 9.

Each blade 4 has the outwardly extended end brackets 14, 14 whose outer ends are downwardly turned and threaded through said brackets are the adjustable stops 15, 15 whose inner ends are opposite the corresponding side members of the knife support 3. These stops 15 may be fixed at any selected point of adjustment by means of the lock nuts 16, 16 which are secured thereon on opposite sides of the downwardly turned ends of the corresponding brackets 14.

Above the knife support there is a head 17 which is fixed in position relative to the frame 1 by means of the standard 18, whose lower end is secured to the frame. This head has a vertical bearing 19 through which the upstanding stem 20 works. The upper end of the stem has a collar 21 adjustably secured thereto and forming a stop to limit the downward movement of the stem 20.

Secured to the lower end of the stem there is a ram 22. In the present illustration, this ram is shown as rectangular in horizontal cross-section and has the knives 23 countersunk in the outer sides thereof and secured thereto and provided with the downwardly directed cutting edges 24. The cutting edges of these knives are arranged to cooperate with the cutting edges 5 of the knives 4 for simultaneous action. It will be noted from an inspection of Figures 4, 5 and 6 that the cutting edges of the knives 23 are correspondingly pitched, or tapered, and at their wide ends terminate in downwardly directed sharp tangs 25 to readily penetrate the paper to start the cut.

The ram has the upstanding guide rods 26 which work through corresponding guide bearings 27 of the head 17.

There is a pedal 28 which is pivoted at one end to a U-shaped bracket 29 attached to the legs 2. Strong coil springs 30 are connected at their lower ends to the pedal 28 and at their upper ends these springs are connected to the hooks 31 which in turn are attached to the frame.

Upstanding from the head 17 there is a fulcrum bar 32 on which a lever 33 is pivoted. One end of this lever is pivotally connected to the upper end of the stem 20 and its other end is pivotally connected to the link 34. The lower end of this link is pivotally connected to the pedal between the pivoted end of the pedal and the

springs 30 so that the ram and the knives 33 carried thereby will be forced downwardly by the pull of the springs 30 when the pedal 28 is released. When it is desired to elevate the ram the pedal 28 may be depressed and this will operate through the link 34 and the lever 33 to elevate the ram.

With the ram elevated a sheet of paper to be trimmed may be placed in position on the cutters 4 and beneath the cutters 23. The end of each cutter 4, opposite the corresponding tang 25 should be adjusted, by the corresponding adjustable stop 15, so that when the ram is lowered the tangs 25 of the knives 23 will pass closely by the corresponding ends of the knives 4. The adjustable stops 15 at the other ends of the knives 4 should be adjusted so that the other ends of the knives 4 will be held, by the springs 13, slightly inwardly of the planes along which the co-operating knives cut.

Upon downward movement of the ram 22, the tangs 25 of the knives 23 will first penetrate the paper to be trimmed at the corners, said tangs 25 passing closely by the cutting edges 5 at the corresponding ends of the blades 4 and as the knives 23 move on downwardly they will co-act with the edges 5 of the blades 4 with shear-like effect, said corresponding edges being held in yielding cooperating relation by the corresponding springs 13 until the cut is completed.

In practice it has been found that a better shearing action will be obtained if the edges 5 of the blades 4 are slightly concaved from end to end. This particular shape of the cutting edges 5 has been illustrated in Figure 3, somewhat exaggerated for the sake of clearness. When the cut has been completed the pedal 28 may be depressed and the ram thus elevated so that the machine may receive another sheet to be cut.

The drawings and description are illustrative merely while the broad principle of the invention will be defined by the appended claims.

What I claim is:

1. In a paper trimming machine the combination of a frame, a stationary knife support on the frame, four individual knives mounted on said support arranged to surround a rectangular area, each of said knives being hingedly mounted midway of its length for horizontal oscillation, compression springs on pins in line with the hinged mounting of said knives whereby each of said knives gives yieldingly in its horizontal movement, adjustable stops fastened to each knife and located near the ends of each knife for limiting the extent of the horizontal movement of the knives, a reciprocating ram, four individual knives mounted on said ram for cooperation with the first named four knives for simultaneously trimming the four edges of a sheet of paper, and means to reciprocate said ram toward said stationary knife support.

2. In a paper trimming machine the combination of a frame, a stationary knife support on the frame, a plurality of individual knives mounted on the support, arranged to surround a polygonal area, each of said knives being pivotally mounted intermediate its ends for horizontal oscillation, yieldable means in alignment with the pivotal mounting of the knives whereby each of said knives gives yieldingly in its horizontal movement, adjustable stops on each knife on opposite sides of the pivotal mounting of each knife for limiting the extent of the horizontal movement of the knife, a reciprocable ram, a plurality of individual knives mounted on said ram for cooperation with the knives on the frame for simultaneous trimming the edges of a sheet of paper and means to reciprocate the ram toward the stationary knife support.

3. In a paper trimming machine the combination of a frame, a stationary knife support on the frame, a plurality of individual knives mounted on said support arranged to surround a polygonal area, each of said knives being pivotally mounted intermediate its ends for horizontal oscillation, the inner margins of the knives terminating in arcuate cutting edges, compression springs supported in alignment with the pivotal mounting of the knives whereby each of said knives gives yieldingly in its horizontal movement, adjustable stops on each knife located on opposite sides of the pivotal mounting of each knife for limiting the extent of the horizontal movement of the knives, a reciprocable ram, knives mounted on the ram corresponding in number to the knives on the knife support and terminating in downwardly directed cutting edges for cooperating with the edges of the knives on the support for simultaneously trimming the edges of a sheet of paper and means to reciprocate said ram toward the stationary knife support.

4. In a paper trimming machine the combination of a frame, a stationary knife support on the frame, four individual knives mounted on said support arranged to surround a rectangular area, each of said knives being pivotally mounted intermediate its ends for horizontal oscillation, yieldable means mounted in alignment with the pivotal mounting of the knives whereby each of said knives gives yieldable in its horizontal movement, adjustable stops fastened to each knife on opposite sides of the pivotal mounting of said knife for limiting the extent of the horizontal movement of the knives, a reciprocating ram, four individual knives mounted on the ram and terminating at their corresponding ends in downwardly directed tangs and provided for cooperation with the first named four knives for simultaneously trimming the four edges of a sheet of paper and means to reciprocate said ram toward said stationary knife support.

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