July 14, 1936. W. R. ZWOYER 2,047,243

SEVERING MECHANISM

Original Filed Nov. 28, 1933 2 Sheets-Sheet 1

Fig. 1.

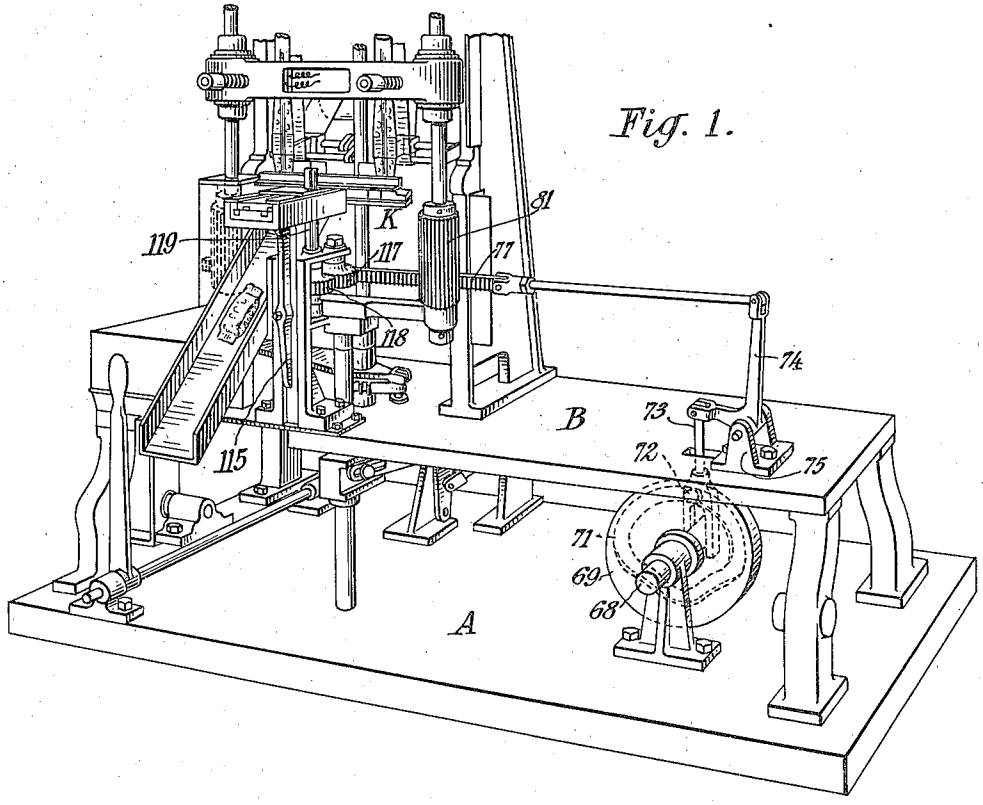



Fig. 2.

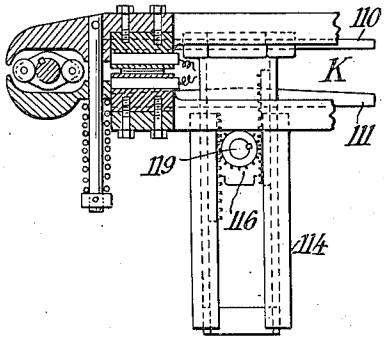



Fig. 3.

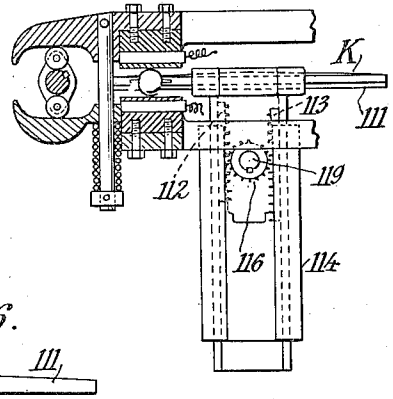
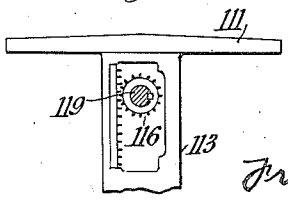



Fig. 6.




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Fig. 4.

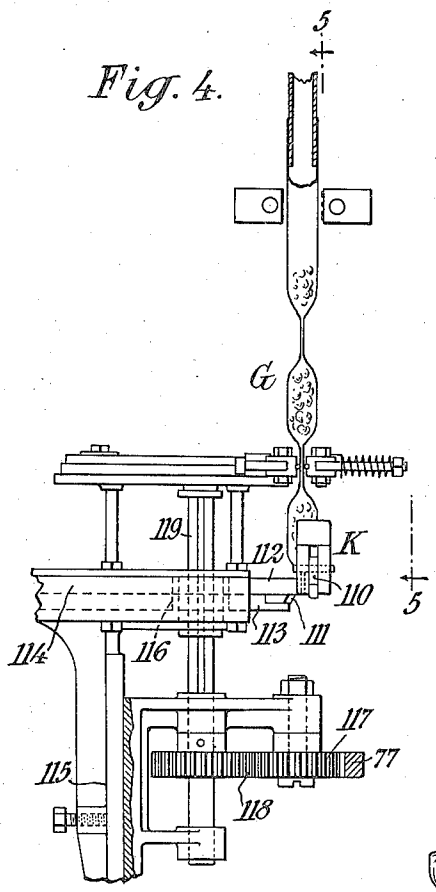



Fig. 5.

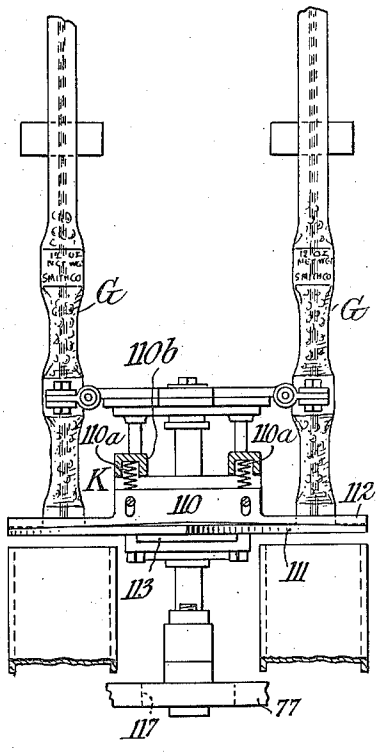
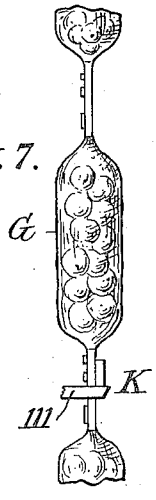



Fig. 7.




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Patented July 14, 1936 2,047,243

# UNITED STATES PATENT OFFICE

2,047,243

## SEVERING MECHANISM

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Original application November 28, 1933, Serial No. 700,097, now Patent No. 1,986,422, dated January 1, 1935. Divided and this application November 30, 1934, Serial No. 755,423. In Canada May 17, 1934

4 Claims. (Cl. 164—47)

This invention relates to mechanism for cutting material produced in strip form into a plurality of separate parts by severing the material crosswise of the strip, and is particularly adapted for use as a part of any more comprehensive machine in which there may be a need to include such a mechanism, as, for example, the machine disclosed in United States application, Serial No. 700,097, filed November 28, 1933 (now Patent No. 1,986,422, dated January 1, 1935), of which this application is a division.

The invention consists of a severing device comprising a pair of cutting knives disposed substantially at right angles to each other, the edge of each blade being so located as to extend at an acute angle with respect to the adjacent surface of the opposed blade, and, preferably, the knives may be provided with means for moving them towards and from each other comprising a rack for each knife and a common driving pinion for the racks, and, if desired, one of the knives may be provided with means whereby it may be yieldingly moved in a direction substantially at right angles to its direction of movement towards the other when the knives are forcibly pressed together whereby they may be caused to cut with a scissors-like action when severing a strip of material.

Referring to the drawings which are illustrative of one form of the invention,—

Figure 1 is a perspective view of a part of a machine including severing mechanism embodying the invention and its operating means.

Fig. 2 is a top view, partly in horizontal section, of parts of a machine including severing mechanism embodying the invention.

Fig. 3 is a view similar to Fig. 2, but showing the parts in different positions.

Fig. 4 is an elevation of a part of a machine showing a cutting mechanism embodying the invention in detail.

Fig. 5 is a view taken at right angles to Fig. 4, certain parts being shown in section.

Fig. 6 is a detail view of the lower cutting knife.

Fig. 7 is a side view of a strip of material represented as having been cut through by the blades of a severing mechanism embodying the invention.

A severing device embodying the invention in the form of the one illustrated by the accompanying drawings is adapted to cut material by severing portions from two strips produced and fed to the device concomitantly, in a side-by-side relation, by a duplex machine of which the severing mechanism only will be disclosed and claimed herein. This severing mechanism is designated generally where it appears in the various figures of the drawings by the reference character K.

Details of the cutting mechanism are best illustrated in Figs. 2, 3, 4 and 5. In these figures the upper knife is indicated by the reference numeral 110 and the lower knife by the numeral 111. The lower knife (as best seen in Fig. 6) is somewhat angularly formed so that as it passes under the upper knife it will have a slight shearing action. The upper knife is also given a slight V-shape (as best seen in Fig. 5) but at right angles to the lower knife, so that the upper knife in fact rises during the cutting stroke against the tension of springs 110a suitably housed in the upper knife carrier 110b. The operating mechanism for the knives in the duplex form shown is connected with them at their middles and the two projecting ends are designed to cut two parallel strips of material G, G (Fig. 5). One such strip is shown being cut in Fig. 7.

Any suitable operating mechanism may be employed but that illustrated comprises a pair of rack slides 112, 113, which are carried in a slide box 114 fastened to a bracket 115, as best seen in Figs. 1 and 4. Each of the racks is moved by a pinion 116, as best seen in Figs. 2 and 3, this pinion being located between the racks and operating to move the knives in opposite directions to separate them to permit the down feed of the strips G, G, between them and to close them to sever the strips.

The driving mechanism for the knives is best seen in Figs. 1 and 4. Referring to these figures it will be seen that there is mounted on the base A of the machine a mechanism which may be driven from any desired source of power, not shown, said mechanism comprising a cam shaft 68 carrying a rotary cam 69 provided with a cam track 71, shown in dotted lines in Fig. 1, in which cam track is mounted a cam roller 72 connected by a pitman 73 to the short arm of a bell-crank lever 74 mounted in a bearing 75 on the table B. The cam movement is such as to reciprocate the pitman 73 in a vertical direction, which movement, being translated by the bell-crank lever, insures a horizontal reciprocation of an elongated rack 77. This rack 77, which is best seen in Figs. 1 and 4, transmits motion to the pinion 117, which in turn meshes with a similar pinion 118, to which is fixed a shaft 119 carrying the pinion 116 midway of its length, as shown in dotted lines in Fig. 4 and in plan in Figs. 2 and 3. The proportions of the gears are so designed that the reciprocations of the rack 77 afford the neces-

sary opening and closing movements of the knives, and these are best timed to close and sever the strips G while they are held stationary by strip feeding means not herein specifically disclosed and claimed.

What is claimed is:—

1. A mechanism for severing material from a strip comprising a pair of shearing blades having their respective edge opposing surfaces disposed in planes which intercept each other at a blunt angle, the edge of each blade being inclined at an acute angle with respect to the opposed surface of the other, and each blade being movable in a direction having a crosswise component with respect to the plane of the edge opposing surface of the other, the edge opposing surfaces of the blades, the inclinations of their edges, and their directions of relative movement being such that movement of one blade towards the other will bring their edges in a point-to-point contact and further movement of the same blade in the same direction will tend to cause the other to move in a direction such that the point of contact between the blades will travel along the line of intersection between the planes of their edge opposing surfaces whereby the device may cut with a scissors-like action.

2. A severing mechanism, as defined by claim 1, of which the edge opposing surfaces are disposed in planes which intercept at right angles.

3. A severing mechanism, as defined by claim 1, of which the respective blades move in directions parallel with the planes of their edge opposing surfaces.

4. A severing mechanism, as defined by claim 1, comprising means for forcibly moving one of the blades towards the other and means for yieldingly opposing the movement of the other blade.

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