No. 676,795. Patented June 18, 1901.

W. F. HUTCHINSON.

PAPER CUTTER.

(Application filed Mar. 13, 1900.)

(No Model.)

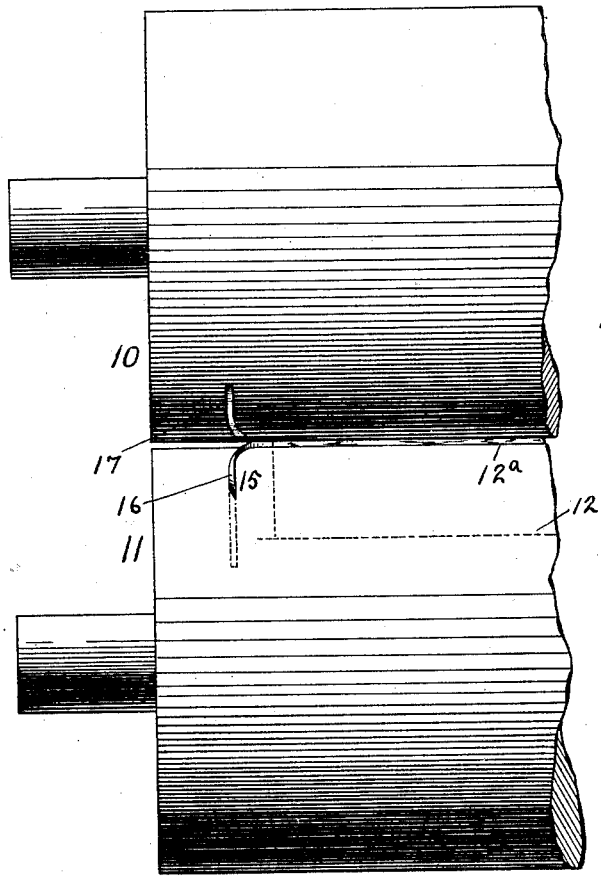

FIG. 1

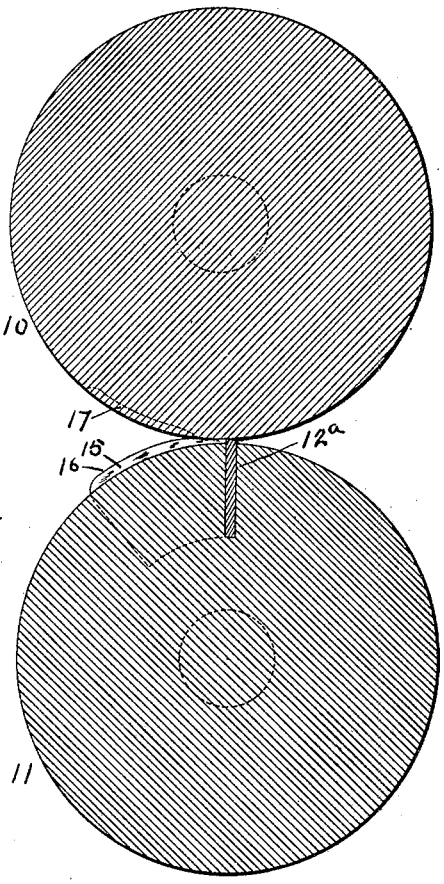

FIG. 2

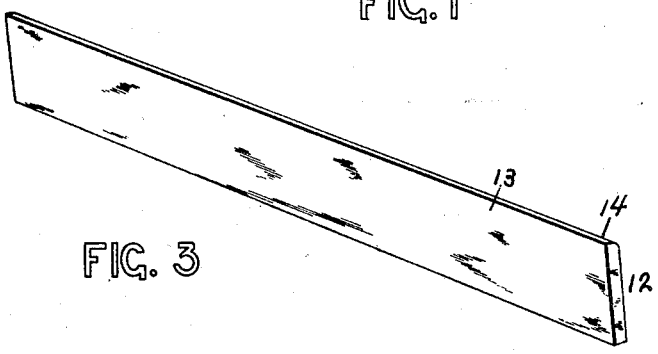

FIG. 3

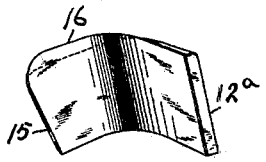

FIG. 4

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PAPER-CUTTER.

SPECIFICATION forming part of Letters Patent No. 676,795, dated June 18, 1901.

Application filed March 13, 1900. Serial No. 8,456. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. HUTCHINSON, of Boundbrook, Somerset county, State of New Jersey, have invented certain new and useful Improvements in Paper-Cutters, of which the following is a full, clear, and exact description.

My invention relates to improvements in paper-cutters, and especially to rotary paper-cutters.

The object of my invention is to produce a simple rotary machine into which a roll of paper or paper-stock may be fed and which will draw the stock through and at the same time cut it cleanly. Such a paper-cutter can be made to simply cut paper into the desired dimensions; but it is particularly applicable for cutting any desired pattern, so as to form folding boxes or packages. It will of course be understood that the pattern to be cut can be developed or laid out at will. Many attempts have been made to produce a practicable rotary paper-cutter; but people familiar with the trade know that paper is very difficult to cut, and in using a rotary machine it has been found that in cutting across the grain with a knife-edge the stock can be cut cleanly for a short time; but very soon the knife dulls and the paper is torn or imperfectly cut. On the other hand, in cutting with the grain or at an angle to the plane of the rotary cutter the stock can be cut with the knife-edge.

After exhaustive and expensive experiments I discovered that if two rollers were used, one having a perfectly smooth hard surface and serving as a bearing-roller and the opposite one having a severing-bar arranged so that one corner would strike against or nearly against the bearing-roller, they would cut or transform paper cleanly and for a long time and that the only thing necessary was to keep the rollers perfectly parallel, so that the severing-bar would have an even bearing along its corner, and after long use the severing-bar can be ground on its face, so as to maintain perfect parallelism with its bearing-roll. When so arranged, the rollers can be turned rapidly and the severing-bar will run for a long time and produce perfect work. The severing-bar can be made with a perfectly flat face, producing a sharp cutting-corner, or, preferably, the corner which does the cutting can be left to bear upon the opposed roller and the face of the severing-bar relieved slightly in front of the severing-corner, so as to not jam or injure the stock.

To these ends my invention consists of a paper-cutter the construction and arrangement of which will be hereinafter specifically described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar figures of reference refer to similar parts throughout the several views.

Figure 1 is a broken detail front elevation of a pair of rollers arranged in accordance with my ideas and illustrating my invention. Fig. 2 is a cross-section through the rollers. Fig. 3 is a detail of a severing-bar adapted to produce a straight cut, and Fig. 4 is a detail of a severing-bar adapted to produce a curved cut in the stock.

In carrying out my invention two opposed rollers 10 and 11 are used, and they are timed so as to turn in unison, thereby preventing dragging of the stock on the severing-bars, and it will be seen that to produce the best result the rollers should be revolved; but perhaps for certain purposes they might be oscillated without affecting the invention. The roller 10 may be placed above or below or at one side of the roller 11, the only essential thing being that the two rollers be parallel, and the roller 10 has its face case-hardened or made of hard steel, so as to be as hard as possible, and it is also perfectly smooth except where it has recesses for severing parallel or essentially parallel to the grain of the stock. The roller 11 is provided with a severing bar or bars 12 or 12^a, the former being straight and the latter curved, as will be hereinafter described. These bars may be secured in any way, a convenient and secure means being shown by which they are let into recesses in the roller 11; but obviously the knives might be integral with the roller or attached thereto in any well-known manner. For transverse severing or for severing essentially transverse to the feed of the stock and to the grain thereof a bar 12 is used, one side 13 of which is radial to the roller 11 and to the

axis thereof, being left perfectly straight and unbeveled. Of course the shape of the bar, however, is immaterial, except near the severing part, which should have one corner straight and true and adapted to bear evenly and to a nicety upon the face of the roller 10. The face of the bar 12 may be perfectly flat for many purposes, and I have used it largely in this way; but for other purposes it is better to relieve the front portion of the face, as shown at 14.

In Fig. 4 I have shown the combination severing-bar 12^a adapted to sever transverse to the grain of the stock and also parallel with the grain, the severing-bar being curved between these two points, so as to make a round or a curved corner on the pattern cut. Now in cutting parallel to the grain or feed a cutting edge may be used. To this end the wing 15 of the bar 12^a, which is essentially parallel to the stock-feed, has a cutting edge 16 substantially like ordinary knives, which is adapted to cut through the stock and shear into a corresponding recess 17 in the roller 10. It will be seen that this compound knife cuts across the grain of the stock parallel with the grain and also on a curve between these two directions, so that it gradually shifts from the relatively flat-faced bar to the ordinary cutting-knife.

I have shown no particular pattern on the rollers, as in cutting boxes, for instance, there would be a different pattern for every style of box, and it is obvious that the bars may be arranged to cut any desired pattern, the only thing essential being that where the cut is transverse or partly transverse to the feed or grain of the stock the knife shall cut by having one corner engage the stock and press through or nearly through upon the roller 10. I am well aware that at a first view this cutting arrangement seems a very slight departure from the ordinary rotary cutting scheme; but I have tried the ordinary methods with great persistency and find that they will not cut paper-stock practically; but by using the severing-bar corner, as specified, the stock is perfectly severed or transformed. As I understand this action it is a wedge action—that is to say, the corner striking the stock brings a wedge-like part to bear, which spreads and separates the fiber of the stock, and as this takes place quickly a clean cut results. Of course it will be seen that if the stock is of such a nature that the separation takes place before the knife or projecting part passes quite through it, in such case the bearing-roller need not be hardened. The importance of this will be readily seen by one in the trade, as it is known that cutting-rollers of this kind can be rapidly rotated and stock cut many times as fast as it can be by ordinary reciprocating machines.

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

In a paper-cutter the combination of a smooth bearing-surface moving in the arc of a circle, and a severing-bar opposed to the said bearing-surface and also moving in the arc of a circle, said severing-bar having its rear surface in the plane of the axis of the bar-carrier and its top surface slightly beveled toward the front, as set forth.

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Witnesses:
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