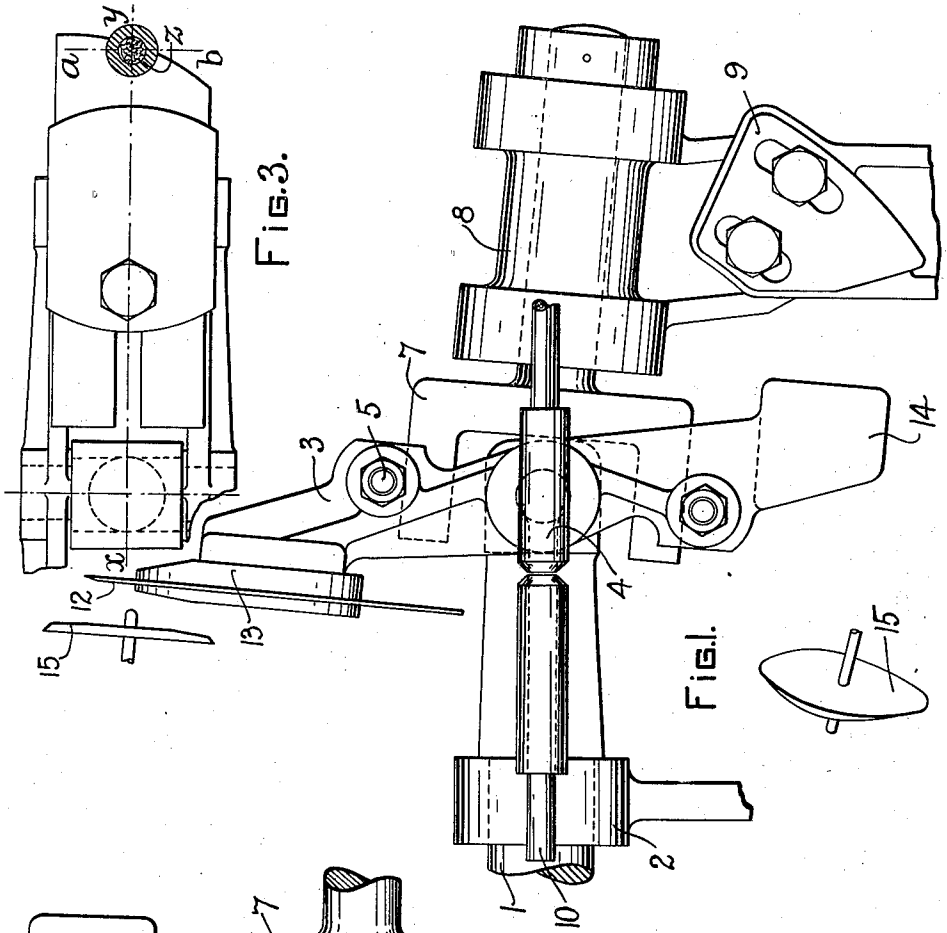
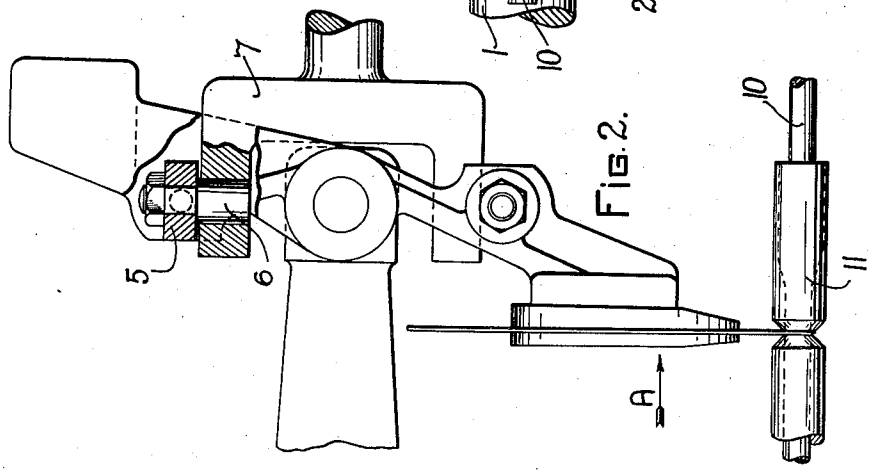
May 24, 1932. W. E. MOLINS 1,860,197

CIGARETTE MAKING MACHINERY

Filed Sept. 9, 1929





INVENTOR

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UNITED STATES PATENT OFFICE

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CIGARETTE MAKING MACHINERY

Application filed September 9, 1929, Serial No. 391,497, and in Great Britain September 25, 1928.

This invention is for improvements in or relating to cigarette making machines, and more particularly to a device for severing an axially moving rod into lengths and has for its object the provision of means whereby a cutting device may be provided which is simple in its operation and easy to manufacture.

The practical modern cigarette making machine operates at tremendous speeds and in the continuous rod type of machine in which the axially moving rod is required to be severed into lengths to form the individual cigarettes the extreme rapidity of movement of the rod makes it necessary to impart movement axially of the rod to the cutting element at the instant at which cutting takes place in order that the cutting element may travel with the rod during the severing operation.

Various arrangements have been proposed in order to effect the two distinct simultaneous movements of the cutting element, namely the movement axially of the rod and the movement transverse to the rod, these arrangements involving the provision of reciprocating mechanism engaging the cutting element to effect the axial movement thereof. It has been found, however, that in the high speed machine the extreme rapidity with which these mechanisms must be reciprocated resulted in the development of serious vibrations in the machine, affecting the uniformity of the cigarettes produced and reducing the maximum speed at which the machine could be operated.

It is therefore an object of the present invention to provide a cutting element to which the requisite simultaneous movements are imparted by means of rotating rather than reciprocating mechanism. One solution of this problem has been pointed out in my prior Patent No. 1,630,132, granted May 24, 1927, of which the present invention is a modification. The apparatus constructed in accordance with the present invention is nevertheless simpler in construction than that described in my prior patent by reason of the elimination of a number of parts illustrated in the patent. By reason of the elimination of these parts, the extreme accuracy of movement of the cutting element obtained with the patented apparatus is somewhat impaired but sufficient accuracy is obtained to enable the machine to operate satisfactorily from a practical standpoint and the elimination of additional parts is highly desirable not only by reason of the reduction in cost but because the dynamic forces resulting from the rapid movement of these parts is eliminated.

It is therefore a further object of the invention to provide a simplified apparatus for severing an axially moving rod in which the cutting element moves with the rod during the severing operation and occupies planes substantially perpendicular to the axis of the rod during passage therethrough, together with rotating means for effecting the axial and transverse movements of the cutting element.

Further objects and features of the invention will be apparent from the following description taken in connection with the accompanying drawings, in which —

Fig. 1 shows a side elevation of a cigarette making apparatus constructed according to the invention.

Fig. 2 is a partial plan of Fig. 1, with the cutting mechanism shown in a different position.

Fig. 3 is a diagrammatic view in direction of arrow "A", Fig. 2.

Referring to the drawings: 1 is a main shaft carried in bearings 2, only one of which is shown. At one end of the main shaft a blade carrying bar 3 is pivoted on a pin 4. The bar 3 is made up of two separate links bolted together by bridge pieces 5, and each bridge piece has a pin 6 secured at its centre. The pins 6 fit into holes in a yoke 7 which is carried in a bearing 8 mounted at an angle to

the main shaft 1. The inclination of the bearing 8 is adjustable by means of a quadrant 9. The cigarette rod 10 is fed through a ledger plate 11 which is illustrated diagrammatically and may be of the usual reciprocating pattern.

A knife blade 12 is clamped in a holder 13 at one end of the carrying bar 3 and a counter weight 14 is provided at the other end.

When the main shaft 1 is rotated the same carries around with it the bar 3 and the yoke 7, and owing to the angular disposition of the latter, the blade 12 receives a reciprocating movement which is equal in speed to the linear speed of the rod, and during the time the blade is cutting through the cigarette, the plane of the blade is substantially at right angles to the axis of the cigarette rod. Owing to the method of construction, it is possible to grind the knives on rotary discs 15 which are located in positions relatively to the axis of the main shaft as shown in Fig. 1.

The manner in which the rod is severed by the moving blade is illustrated in Figure 3 of the drawings and it will be observed by analysis of the movement imparted to the cutting element that during the actual cutting of the rod this element occupies planes which are substantially perpendicular to the axis of the rod. As a matter of fact, during the cutting operation there is a slight swinging movement of the blade about the vertical line *ab* in Figure 3 or some line parallel thereto but there is no swinging of the blade during the severing of the rod about the horizontal line *xy* or lines parallel thereto.

It will thus be seen that the present invention provides a simple and efficient apparatus for severing a moving rod in which the deviation from the theoretically correct path of movement of the cutting element is so slight as to be negligible and in which the number of moving parts has been reduced to a minimum.

What I claim as my invention and desire to secure by Letters Patent is:—

1. A cutting device for severing an axially moving rod into lengths comprising a cutting blade, a rotatable element, a carrier for said blade, said carrier and blade being supported on said element for rotation therewith and for simple swinging movement about an axis transverse to the rotational axis of said element only, a second element rotatable about an axis inclined to the rotational axis of said first element, said second element having a portion thereof in engagement with said carrier, whereby a movement combining rotation and axial translation with respect to said first element is imparted to said blade.

2. A cutting device for severing an axially moving rod into lengths comprising a cutting blade, a rotatable element, a carrier for said blade, said carrier and blade being supported on said element for rotation therewith and for simple swinging movement about an axis transverse to the rotational axis of said element only, a second element rotatable about an axis inclined to the rotational axis of said first element, and a pivotal connection between a portion of said second element remote from the axis thereof and said carrier, whereby a movement combining rotation and axial translation with respect to said first element is imparted to said blade.

3. A cutting device for severing an axially moving rod into lengths comprising a rotatable element, a carrier, a cutting blade fixedly mounted on said carrier, said carrier having a pivotal connection with said element about an axis perpendicular to the rotational axis of said element, a second element rotatable about an axis intersecting the axis of said first element at an obtuse angle, means carried by said second element having a pivotal connection with said carrier about an axis perpendicular to the axis of said first named pivotal connection, and means for supporting a rod for axial movement across the path of movement of said blade in a plane parallel to the plane containing the axes of both elements.

4. A cutting device for severing an axially moving rod into lengths comprising a rotatable element, a carrier, a cutting blade fixedly mounted on said carrier, said carrier having a pivotal connection with said element about an axis perpendicular to the rotational axis of said element, a second element rotatable about an axis intersecting the axis of said first element at an obtuse angle, means carried by said second element having a pivotal connection with said carrier about an axis perpendicular to the axis of said first named pivotal connection, and means for supporting a rod for axial movement across the path of movement of said blade in a plane parallel to the plane containing the axes of both elements, with said rod disposed parallel to the axis of the first named element and intersecting the axis of said first named pivotal connection.

5. A cutting device for severing an axially moving rod into lengths comprising a cutting blade, a rotatable element, a carrier for said blade, said carrier and blade being supported on said element for rotation therewith and for simple swinging movement about an axis transverse to the rotational axis of said element only, a second element rotatable about an axis inclined to the rotational axis of said first element, said second element having a portion thereof in engagement with said carrier, whereby a movement combining rotation and axial translation with respect to said first element is imparted to said blade, and means whereby adjust-

ment of the inclination of the axis of the second element with respect to the axis of the first element may be effected.

6. In a cutting device for severing an axially moving rod into lengths, the combination with a rotatable driving element, of a driven element rotatable about an axis inclined with respect to the axis of the driving element, an intermediate member having a pivotal connection with each of said elements about axes perpendicular to each other and perpendicular to the axes of the respective elements, and a cutting blade rigidly carried by said member.

In testimony whereof I hereunto affix my signature.

WALTER EVERETT MOLINS.