J. FROEHLICH.

CUTTING MECHANISM.

APPLICATION FILED APR. 24, 1914.

1,262,189.

Patented Apr. 9, 1918.

3 SHEETS—SHEET 1.

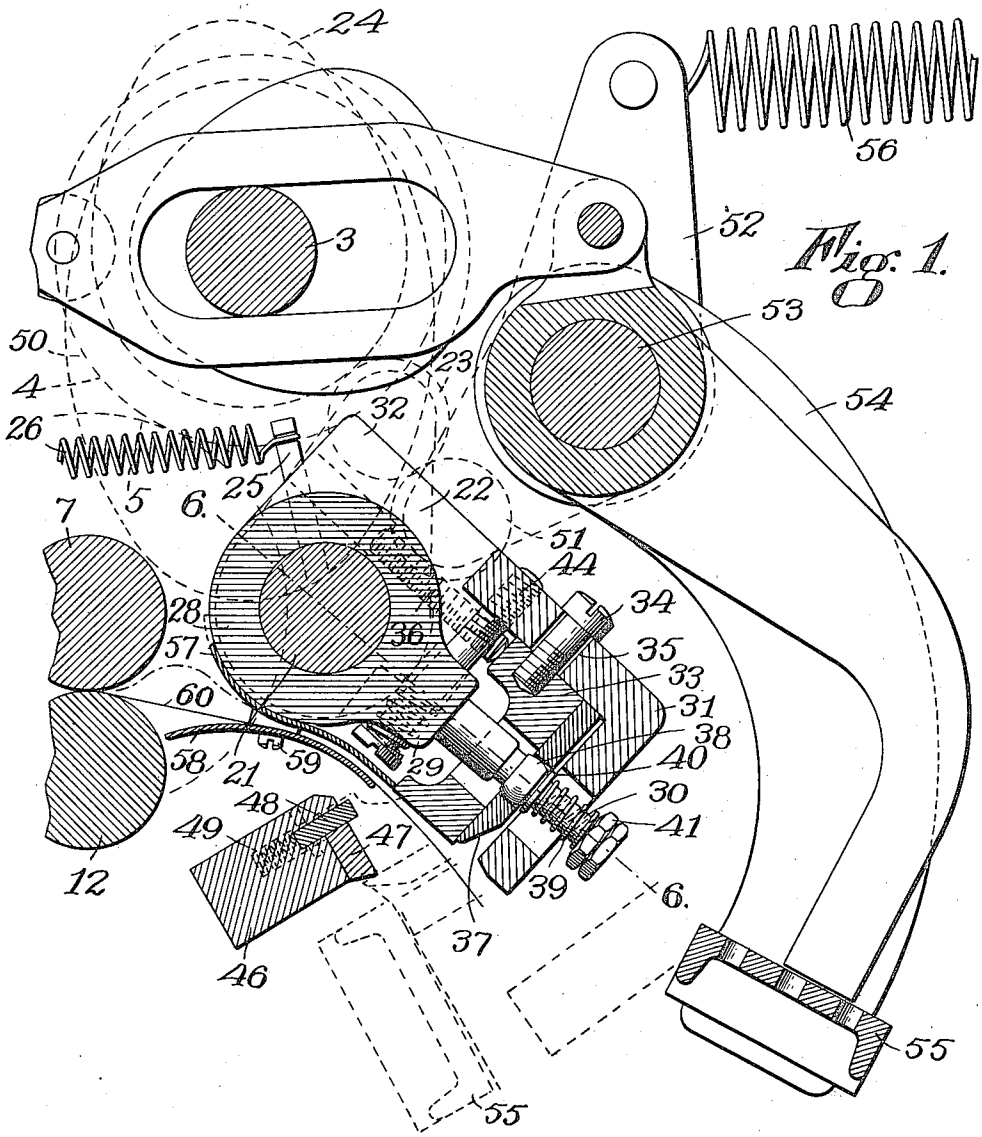


Fig. 1.

Witnesses
R. D. Tolman.
Penelope Comberbach.

Inventor
Joseph Froehlich.
By Rufus B. Fowler
Attorney

J. FROEHLICH.

CUTTING MECHANISM.

APPLICATION FILED APR. 24, 1914.

1,262,189.

Patented Apr. 9, 1918.

3 SHEETS—SHEET 2.

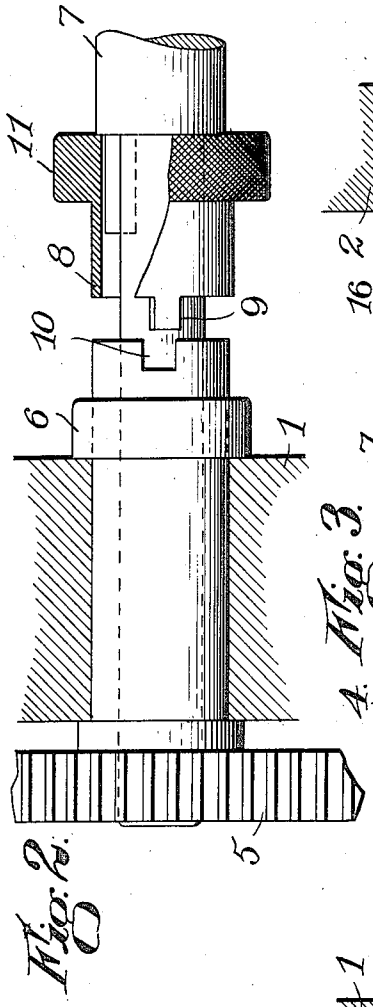


Fig. 2.

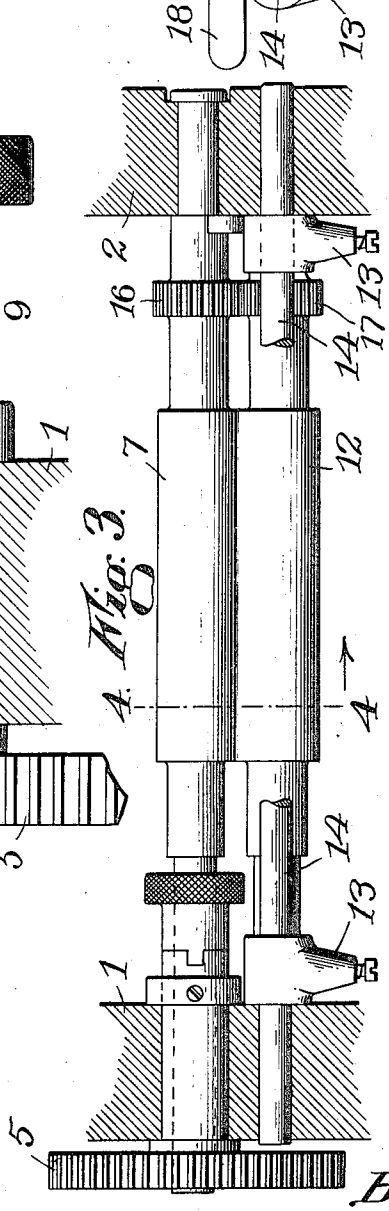


Fig. 3.

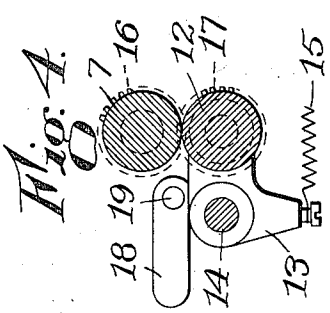


Fig. 4.

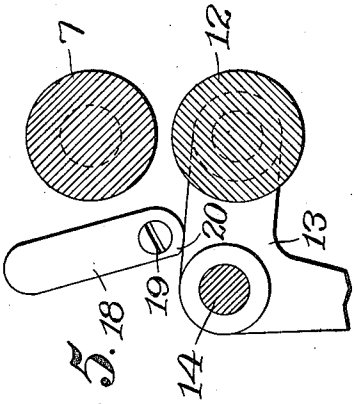


Fig. 5.

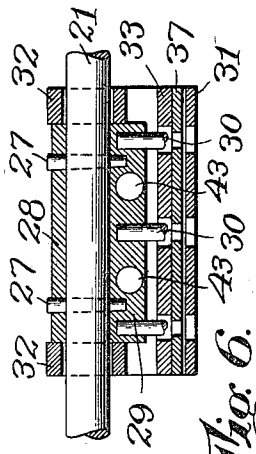


Fig. 6.

Witnesses

T. D. Tolman.

Penelope Comberbach.

Inventor

Joseph Froehlich.

By Rufus B. Fowler

Attorney

J. FROEHLICH.

CUTTING MECHANISM.

APPLICATION FILED APR. 24, 1914.

1,262,189.

Patented Apr. 9, 1918.

3 SHEETS—SHEET 3.

Fig. 7.

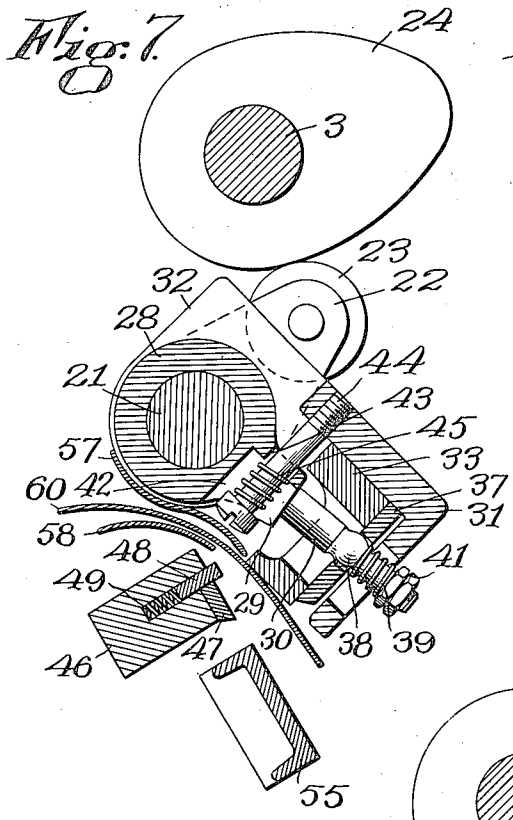


Fig. 8.

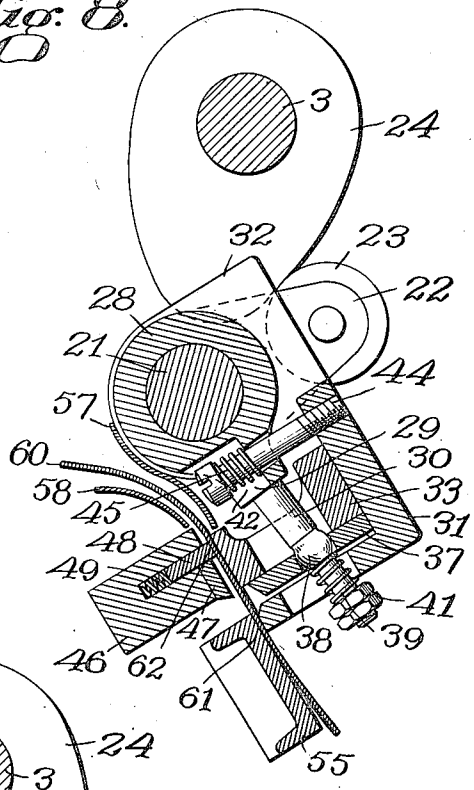
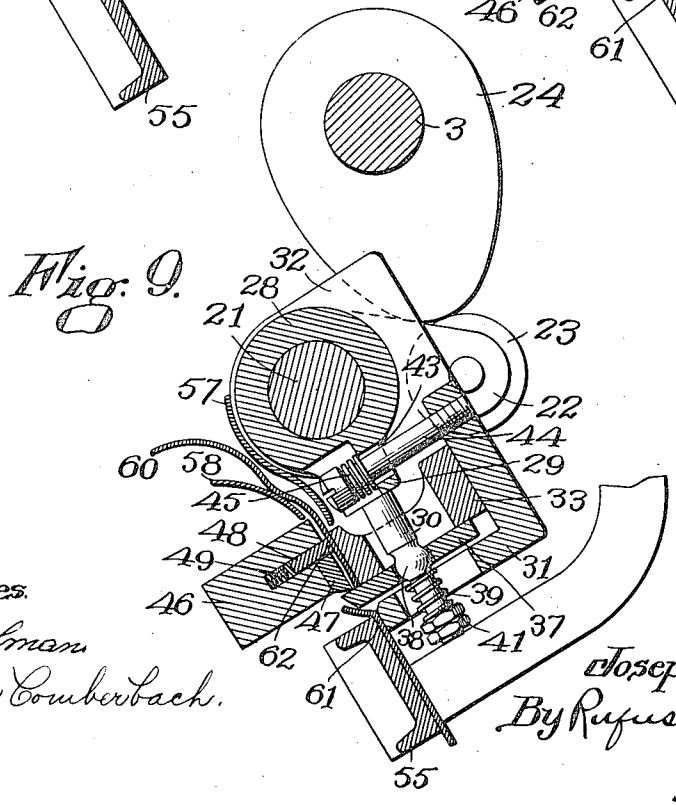


Fig. 9.



Witnesses.

R. D. Tolman

Penelope Comberbach.

Inventor

Joseph Froehlich.

By Rufus B. Fowler

Attorney

UNITED STATES PATENT OFFICE.

JOSEPH FROEHLICH, OF BROOKLYN, NEW YORK, ASSIGNOR TO UNITED STATES ENVELOPE COMPANY, OF SPRINGFIELD, MASSACHUSETTS, A CORPORATION OF MAINE.

CUTTING MECHANISM.

1,262,189. Specification of Letters Patent. Patented Apr. 9, 1918.

Original application filed January 22, 1909, Serial No. 473,621. Patent No. 1,108,734, dated August 25, 1914. Divided and this application filed April 24, 1914. Serial No. 834,120.

To all whom it may concern:

Be it known that I, JOSEPH FROEHLICH, a citizen of the United States, residing at Brooklyn, in the county of Kings, State of New York, have invented a new and useful Improvement in a Cutting Mechanism, of which the following, taken in connection with the accompanying drawings, is a specification.

The present invention constitutes a division of my co-pending application Serial No. 473,621, for an envelop machine, filed January 22, 1909, which has matured into Patent No. 1,108,734, dated August 25, 1914, and relates particularly to the mechanism therein shown and described for successively severing short lengths or strips from a continuously moving web or ribbon of transparent paper or fabric, which strips are thereafter utilized as the transparent patches for the well known window envelops, which constitute the product of said envelop machine.

The cutting mechanism forming the subject matter of the present application, however, is not limited to use in connection with an envelop machine, but is applicable in general to all machines requiring the cutting of a moving web of paper or other fabric into strips.

The present invention contemplates the provision of mechanism adapted at intervals to seize upon and hold stationary at two points in its length, the continuously moving web, and to sever or divide the same intermediate said points. Furthermore, provision is made for a guideway in which the continuously fed web is permitted to buckle when so held, whereby upon the release of the holding means, after the completion of the severing operation, the forward end of the web is advanced rapidly out of said guideway, due to the resilient action of the buckled portion thereof. Other and further objects will be apparent from the following detailed description and the claims annexed thereto.

In the accompanying drawings,

Figure 1 is a vertical sectional view of a cutting mechanism embodying my invention, showing the application thereof to an envelop machine.

Fig. 2 is a detailed view showing a clutch mechanism for one of the feed rolls employed in moving the web.

Fig. 3 is a side view of the two feed rolls.

Fig. 4 is a sectional view on line 4—4, Fig. 3, looking in the direction of the arrow.

Fig. 5 is a view similar to Fig. 4, showing the two feed rolls separated.

Fig. 6 is a sectional view on line 6—6, Fig. 1, looking in the direction of the arrow.

Figs. 7, 8 and 9 are sectional views similar to Fig. 1 showing different positions assumed by the cutting mechanism in operation.

Like reference characters are used to indicate like parts in the several figures.

The mechanism is preferably carried by spaced supporting frames 1 and 2, Figs. 2 and 3, in which the several shafts hereinafter referred to are journaled. Included among such shafts is a shaft 3, constituting the main operating shaft of the machine, which is rotated continuously from a source of power, not shown. The shaft 3 carries a gear wheel 4, shown in dotted lines in Fig. 1, which meshes with a gear wheel 5 secured to a sleeve 6, Figs. 2 and 3, journaled loosely on the shaft of an upper feed roll 7, mounted to rotate between the frames 1 and 2. The shaft of said feed roll 7 has splined thereon adjacent the sleeve 6, a clutch sleeve 8, having a tongue 9 which, upon movement of said sleeve 8 to the left in Fig. 2, engages in a notch 10 formed in the sleeve 6, thereby transmitting the rotation of shaft 3 to the upper feed roll 7. The sleeve 8 has a flange having a knurled surface 11, by means of which the feed roll 7 may be rotated by hand when the above described clutch mechanism is disengaged.

A lower feed roll 12 is journaled in spaced apart arms 13, mounted on a rock shaft 14, which is supported by the side frames 1 and 2. Springs 15 are connected to the lower ends of the arms 13 and to a fixed portion of the framework, for the purpose of yieldingly maintaining the lower feed roll 12 against the upper feed roll 7. The two feed rolls have intermeshing gears 16 and 17 by which the lower roll is driven from the upper roll. A lever 18, mounted on a fixed stud 19, has at its end a cam like projection

20 which engages one of the arms 13, for the purpose of separating the feed rolls, when moved into the position shown in Fig. 5, whereby to permit the insertion between said rolls of the strip or web of paper, which is unwound from a supply reel, of any ordinary construction, not shown.

Referring to Figs. 1, 7, 8 and 9, 21 denotes a rock shaft, which is carried at each end in the side frames 1 and 2. An arm 22 is secured to said shaft, and carries at its free end a cam roll 23 which is held in contact with a cam 24 on the shaft 3. A stud 25, projecting radially from the shaft 21 has connected thereto a spring 26 which maintains the cam roll 23 against the periphery of the cam 24.

Secured to the shaft 21 by means of pins 27, is a sleeve 28 having a downwardly directed lateral extension 29 which carries a series of studs 30, Fig. 6. A knife blade carrier 31, in the form of a housing having an open lower end, is loosely mounted on the shaft 21 by means of rearwardly extending side portions 32, which engage said shaft beyond the ends of the sleeve 28. A knife guide bar 33 is secured to the knife blade carrier 31 by screws 34 passing through slotted holes 35 in the top of said knife blade carrier. The knife guide bar 33 is adjustable within the knife blade carrier by means of screws 36, Fig. 1, carried by said knife blade carrier and acting against the rear face of the knife guide bar.

The studs 30 heretofore referred to, pass loosely through alined openings in the knife guide bar and knife blade carrier, and have disposed thereon, between said elements, the knife blade 37, which is likewise provided with openings to receive said studs. Each stud, at that portion of its length on which the knife blade 37 is supported, is given a spherical conformation, as shown at 38, to prevent binding of the knife blade thereon. The knife blade is yieldingly maintained against the opposing face of the knife guide bar 33 by means of springs 39, carried by said studs 30 and bearing against washers 40 in contact with the face of the knife blade, the tension of said springs being adjustable by means of the confining nuts 41 on the ends of the studs.

The extension 29 of the sleeve 28 has in its under side a recess 42, with a plurality of apertures 43 leading therefrom to the other side of said extension. Passing loosely through each aperture 43 is a stud 44, screw threaded into the upper wall of the knife blade carrier 31 and carrying between its head and the wall of the recess 42, a spring 45. Said springs 45 act normally to maintain the knife blade 37 in the position shown in Figs. 1, 7 and 8, with respect to the knife blade carrier.

A cross bar 46, Figs. 1, 7, 8 and 9, supported by the side frames 1 and 2 below the shaft 21, supports a stationary knife 47 along its upper edge, and is provided with a longitudinal slot, in which is slidably mounted a bar 48, yieldingly maintained in the position shown in Figs. 1 and 7 by means of a series of springs 49, positioned below it in said slot.

Secured to the shaft 21 is a cam 50, adapted in its rotation to contact with a cam roll 51 on one end of a lever 52. Said lever 52 is mounted on a rock shaft 53, Fig. 1, which is journaled in the side frames 1 and 2, and carries two arms 54, joined at their free ends by a transverse member 55. The member 55 is maintained in normal position, shown in dotted lines in Fig. 1, and in full lines in Figs. 7, 8 and 9, by a spring 56 secured to the outer end of the lever 52; the engagement of the high portion of cam 50 with the cam roll 51 rocks the shaft 53 and intermittently moves the member 55 to the full line position, Fig. 1.

The knife blade carrier 31 has secured to its under side a guideway for the strip or web of paper, consisting of an upper curved plate 57 and a lower plate 58, having a reverse curvature to the upper plate so that a flaring opening is provided for said guideway at its end which receives the web from the feed rolls 7 and 12. The plates 57 and 58 are held in spaced relation, and secured to the knife blade carrier 31 by screws 59 which permit a free passage of the paper through the guide channel formed by said plates.

In Figs. 1, 7, 8 and 9 the web of paper to be operated upon is indicated by the numeral 60, the same being taken from the supply reel, not shown, and continuously fed, by the coöperating feed rolls 7 and 12 through the guideway formed by the plates 57 and 58, the position of the mechanism at the beginning of the cutting operation being shown in Fig. 7.

During the operation of cutting, the member 55 remains in the position shown in Figs. 7, 8 and 9, and it will be understood, that for the purposes of this invention, said member 55 may be considered as a stationary member, since its movement forms no part of the operation of cutting, but is utilized merely to convey the strips of paper cut off to another location, as fully set forth and claimed in my copending application hereinbefore referred to. The rolls 7 and 12 and the cam 24 rotate in synchronism; upon the feeding forward of a proper length of the web to be cut, the high portion of the cam 24 begins to come into contact with the cam roll 23, causing a movement of the knife blade carrier 31 to the position shown in Fig. 8, by reason of the rocking of the shaft 21, which is transmitted to the knife blade carrier through the studs 44. In this posi-

tion the web is firmly held at two points, namely, between the knife blade carrier and the member 55, as shown at 61, Figs. 8 and 9, and between the knife guide bar 33 and the yielding bar 48, as shown at 62, Figs. 8 and 9. Further movement of the cam 24 effects a downward movement of the knife blade 37, which previously had been held in fixed relation to the knife blade carrier 31 by the pressure of the springs 45. The coaction of the knife blade 37 with the stationary knife 47 effects a severance of the web between the points 61 and 62, as shown in Fig. 9.

It will be apparent that the continuous feeding of the web from the time when it is firmly held stationary, as shown in Fig. 8, until the movement of the knife blade carrier away from the bar 48 subsequent to the cutting operation, will cause a buckling of the web in the guideway formed by the plates 57 and 58, as shown at 63 and 64, in Figs. 1 and 9.

When the mechanism resumes the position shown in Fig. 1, the resiliency of the paper forming this buckle will cause the end of the web to be projected forwardly through the guideway into the position shown in Fig. 7, in readiness for the above described cutting operation to be repeated.

I claim,

1. In a machine of the class described, a pivoted knife blade carrier, a guideway secured to said carrier, means for continuously feeding a web of paper into said guideway, and means for moving said carrier to cause a buckling of said web within said guideway.

2. In a machine of the class described, a pivoted knife blade carrier, yielding means coöperating with said carrier to hold a web of paper at two points in its length, and a swinging knife blade for severing said web between said points.

3. In a machine of the class described, a rock shaft, a knife blade movable with said rock shaft, a carrier for said knife blade yieldingly connected thereto, and means for arresting the movement of said carrier during movement of said rock shaft.

Dated this 20th day of April 1914.

JOSEPH FROEHLICH.

Witnesses:
WESLEY H. TAYLOR,
JOHN BARNETT.