E. KENNY.

ROTARY CUTTER.

APPLICATION FILED JAN. 22, 1913.

1,111,751.

Patented Sept. 29, 1914.

2 SHEETS—SHEET 1.

*Fig. 1.*

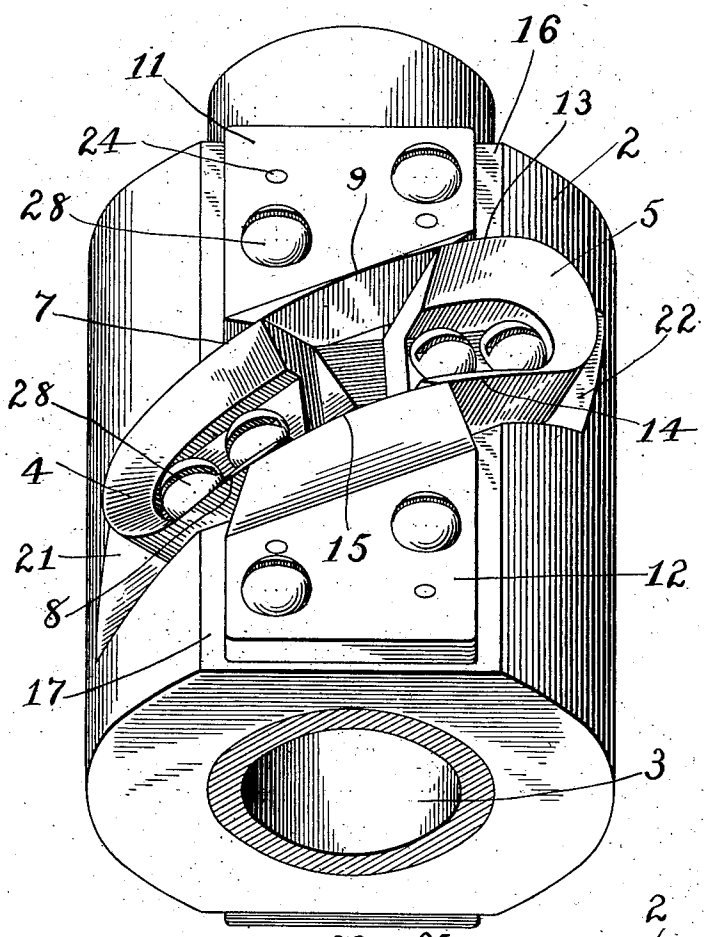



*Fig. 2.*

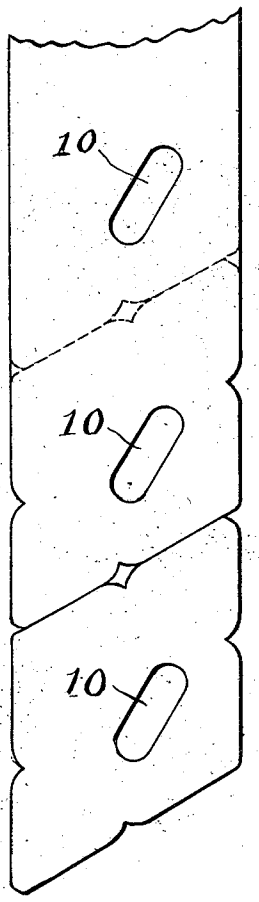
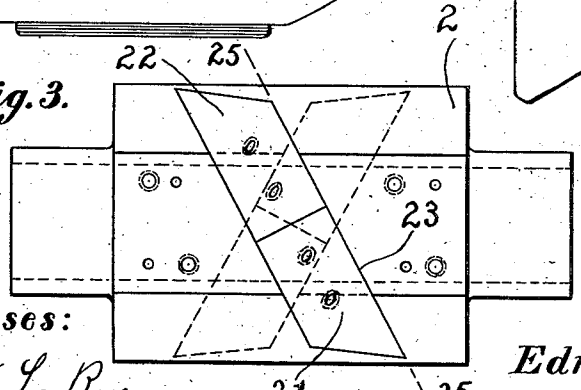



*Fig. 3.*




*Witnesses:*

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Arthur Frisch

*Inventor:*

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*by Wilbur M. Stone*

*Attorney.*

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2 SHEETS—SHEET 2.

*Fig. 4.*

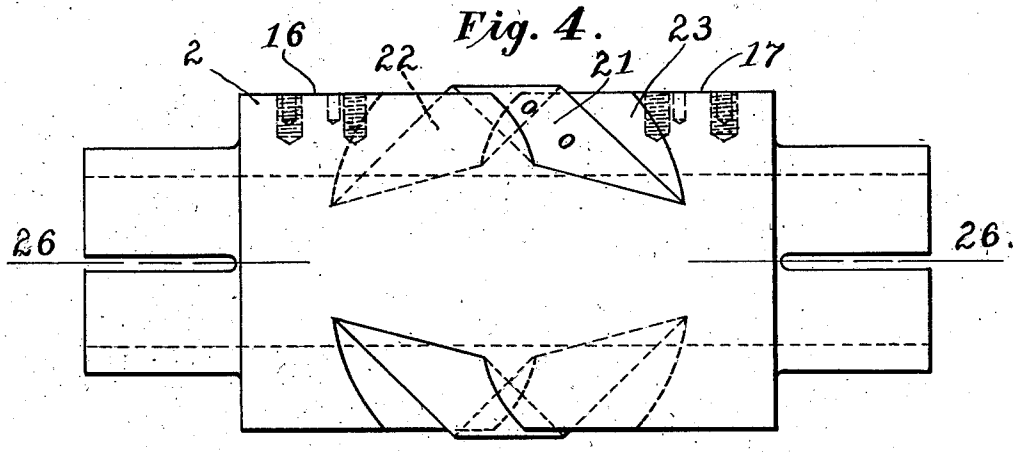



*Fig. 5.*

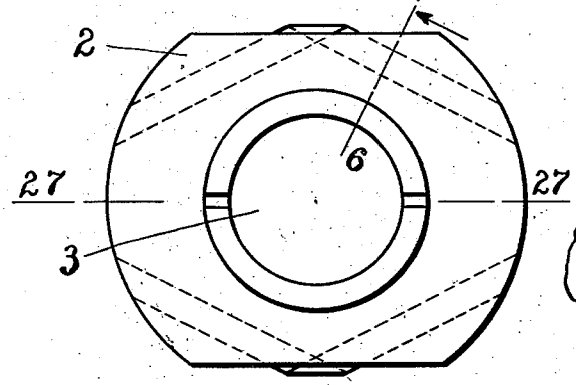



*Fig. 6.*

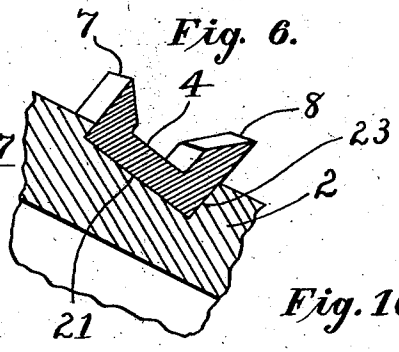



*Fig. 10.*

*Fig. 7.*

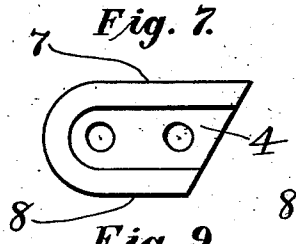
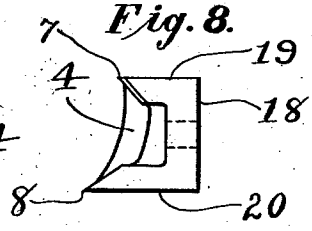



*Fig. 8.*



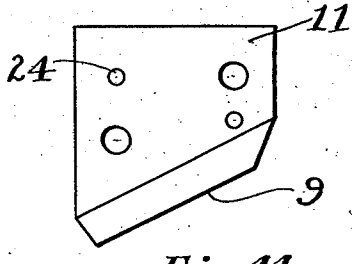




*Fig. 9.*

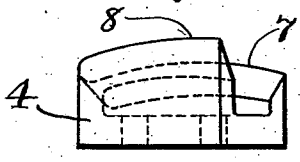



*Fig. 12.*

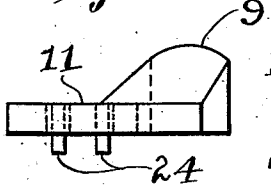
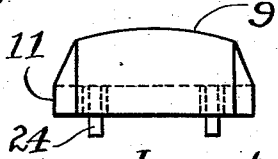



*Fig. 11.*




*Witnesses:*

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# UNITED STATES PATENT OFFICE.

EDMOND KENNY, OF NEW BRIGHTON, NEW YORK, ASSIGNOR TO MERCANTILE CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

## ROTARY CUTTER.

1,111,751. Specification of Letters Patent. Patented Sept. 29, 1914.

Application filed January 22, 1913. Serial No. 743,472.

*To all whom it may concern:*

Be it known that I, EDMOND KENNY, a citizen of the United States, and a resident of New Brighton, in the county of Richmond and State of New York, have invented certain new and useful Improvements in Rotary Cutters, of which the following is a specification.

This invention relates to rotary cutters and particularly to that class thereof provided for cutting portions from sheets or webs, as of paper or the like. Such cutters are commonly operated in coaction with a rotary cylindrical anvil, between which and the cutter, the sheet or web is passed.

The object of my improvements is to provide a cutter of the class specified, having cutting members which may be readily adjusted relatively to each other and which cutting members may be readily removed for sharpening or for replacing by others.

To these ends my improvements comprise features illustrated in their preferred embodiment in the drawings accompanying this specification wherein—

Figure 1 is a perspective view of my improved cutter. Fig. 2 is a plan view of a web illustrating one form of product of said cutter. Fig. 3 is a plan view of the body member of my improved cutter. Fig. 4 is a side elevation thereof. Fig. 5 is an end view corresponding therewith. Fig. 6 is a cross-sectional view on line 6, 6 of Fig. 5, looking in the direction of the arrow. Figs. 7, 8 and 9 are respectively a plan view, end elevation and side elevation of one of the cutting members. Figs. 10, 11 and 12 are similar views respectively of another cutting member. Figs. 4 to 12 inclusive are to one scale, Fig. 1 is to a greater scale and Figs. 2 and 3 to smaller scales than said Figs. 4 to 12.

Before describing the invention in detail I desire to have it understood that the invention is not limited to the particular construction and arrangement of parts which I have illustrated and shall hereinafter describe, and that various changes may be made in the mechanism shown without departing from the spirit or scope of the invention, and that the phraseology which I employ is for the purpose of description and not of limitation.

I have chosen to illustrate my improvements as applied to a rotary cutter particularly adapted for cutting successive window openings in a web, said openings being skewed relatively to the lengthwise edge of said web, and which web is designed to be afterward severed diagonally into diamond shaped blanks, to be thereafter folded into envelops wherein said openings lie parallel with the longitudinal edges respectively of said envelops.

To cause the straight portions of the cutting edges of the cutting members to lie at the chosen angle to the cutter axis in conformity with the surface of a cylinder and at the same time to cause contiguous straight portions of the cutting members to meet or overlap in planes respectively normal to a plane through the axis of the rotary cutter requires a peculiar coarrangement of the cutting member seats in said body member, the relation of said seats being inter-dependent, a change in the angularity of those portions of the cutting edges lying in planes, relatively to the cutter axis, requiring corresponding changes in the seats.

My improved cutter comprises body 2 which may be of general cylindrical form, having an axial hole 3 therethrough for mounting on the usual shaft not shown. Said body 2 is illustrated as arranged for two diametrally opposite sets of cutting members so that at each complete rotation of the cutter two consecutive openings 10 are cut in the sheet or web. It will be obvious however that said cutter might equally well be provided with only one set of cutting members or with more than two sets. For the specific purpose illustrated herein I prefer to provide four members in each set, comprising two pairs, each having two like members. One pair consists of two members 4, 5 each having a U shaped cutting edge including two parallel portions as 7, 8 curved in conformity with the surface of a cylinder and lying in parallel planes, so that when mounted on body 2 said cutting edges will rotate at a constant distance from the cutter axis. Furthermore said cutting members 4, 5 are mounted on said body so as to bring the planes of the parallel portions 7, 8 into oblique relation to the cutter axis and normal to a plane through said axis. Also

said U shaped cutters are arranged with their open ends facing one another or with the ends of the parallel portions 7, 8 of one, adjacently opposed to the ends of the parallel portions 13, 14 of the other, so that those opposite adjacent parallel portions lie in two common planes respectively. The other pair of like cutting members 11, 12 each have a cutting edge as 9 in conformity with the surface of the same cylinder to which the cutting edges of the U shaped cutting members conform, and said cutting edge 9 lies in the same plane, oblique to the cutter axis, as that in which edge 7 of cutting member 4 and edge 13 of cutting member 5 lie.

Edge 15 of cutting member 12 bears the same relation to edges 8 and 14 as that just described relatively to edges 9, 7 and 13. By this arrangement cutting edges 9 and 15 provide a continuation of the cutting edges of members 4, 5 from one member to the other thereof. This arrangement of cutting members requires that peculiar corresponding arrangement of cutting member seats which I will now describe.

Cutting members 11 and 12 may be conveniently mounted on seats 16, 17 preferably lying in one plane and parallel with the cutter axis. Cutting members 4 and 5 however, are preferably formed with flat backs, as 18 to cutting member 4, and with parallel sides 19, 20, respectively, normal to said back 18. The seats 21 and 22 for these cutting members are arranged obliquely relatively to the cutter axis and said seats are each normal to a common plane, indicated by line 25, 25 in Fig. 3, which plane is oblique to the cutter axis and normal to a plane indicated by line 26, 26 in Fig. 4 and line 27, 27 in Fig. 5 through the cutter axis. Also if body 2 is of sufficient size said seats 21, and 22 may each be provided with one or two side walls, as 23 to seat 21, normal to said seat. Also as said wall 23 is normal to seat 21 it is also normal to plane 26, 26. It will also be observed that oblique seats 21, 22 are arranged symmetrically relatively to the plane of seats 16, 17 whereby all four cutting members 4, 5, 11 and 12 are symmetrically disposed. Said cutting members may be secured to their respective seats by dowels as 24 and screws as 28.

It will be noted that the longitudinal edges of cutting members 4, 5 and 11, 12 will obviously cut lines of ogee form, closely approximating straight lines. Also by slightly modifying those cutting edges by stoning, even closer approximation to straight lines may be had. Also it will be apparent that the larger the diameter of the cylinder in which the cutting edges lie the closer will be the approximation to straight lines in the longitudinal portions of the resulting cuts.

By the foregoing described arrangement I provide a rotary cutter for the purpose specified, in which the members may be relatively adjusted or replaced conveniently and expeditiously.

I claim:

1. A rotary cutter including in combination a body, having a flat cutting member seat whose longitudinal direction is oblique to the cutter axis, and a cutting member, having flat parallel side walls, fixed to said seat, said side walls being normal to a plane through the cutter axis.

2. A rotary cutter including in combination a body, having a cutting member seat out of parallelism with the cutter axis and normal to a plane oblique to said axis, said plane being normal to a plane through said axis, and a cutting member fixed to said seat.

3. A rotary cutter including in combination a body, having two cutting member seats which are inclined to one another and out of parallelism with the cutter axis and normal to a common plane and which common plane is oblique to the cutter axis and normal to a plane through said axis, and a cutting member fixed to each seat.

4. A rotary cutter including in combination a body, having a plurality of cutting member seats, one or more of which are parallel with the cutter axis and two of which are oblique to said axis, said oblique seats each having a side wall normal thereto respectively and normal to a plane through the cutter axis, and a cutting member fixed to each seat.

5. A rotary cutter including in combination a body, having four flat cutting-member seats, two of which are in one plane, parallel with the cutter axis and two of which are oblique to said axis, said oblique seats being normal to a common plane and which common plane is oblique to the cutter axis and normal to a plane through said axis, and a cutting member fixed to each seat.

6. A rotary cutter including in combination a body, having four flat cutting-member seats, two of which are in one plane, parallel with the cutter axis and two of which are oblique to said axis, said oblique seats being normal to a common plane and which common plane is oblique to the cutter axis and normal to a plane through said axis, said oblique seats being arranged symmetrically relatively to the plane of said first two seats, and a cutting member fixed to each seat.

7. A rotary cutter including in combination a cutting member having a U shaped edge in conformity with the surface of a cylinder including two parallel portions lying in planes respectively oblique to the cutter axis and normal to a plane through said axis, a second cutting member having an edge in conformity with the surface of said cylinder, said edge lying in a plane

having the same obliquity to the cutter axis as the planes of the parallel portions of the U-shaped cutting member and being so disposed relatively to said U-shaped cutting member as to provide a continuation of one of the parallel portions of the cutting edge of said U shaped cutting member.

8. A rotary cutter including in combination a pair of oppositely disposed cutting members, each having a U-shaped cutting edge including two parallel portions lying in planes respectively oblique to the cutter axis and normal to a plane through said axis, said cutting edges being in conformity with the surface of a cylinder, said parallel portions of the cutting edge of one cutting member being adjacently opposed to the similar portions respectively of the edge of the other cutting member; a third cutting member having an edge in conformity with the surface of said cylinder and disposed in a plane at the same oblique angle to the cutter axis as the planes of the parallel portions of said U shaped cutting members, the edge of said third cutting member being so disposed relatively to said U-shaped cutting members as to provide a continuation from one of the parallel portions of one of the cutting edges of one U-shaped cutter to the adjacent parallel portion of the cutting edge of the opposite U shaped cutter.

9. A rotary cutter including in combination a body, having four cutting-member flat seats, two of which are in one plane, parallel with the cutter axis and two of which are oblique to said axis, said oblique seats each being normal to a common plane and which common plane is oblique to the cutter axis and normal to a plane through said axis, said oblique seats being arranged symmetrically relatively to the plane of said first two seats, there being mounted on said oblique seats respectively a pair of oppositely disposed cutting members, each having a U shaped cutting edge including two parallel portions lying in planes respectively parallel to the above mentioned common plane, said cutting edges being in conformity with the surface of a cylinder, said parallel portions of the cutting edge of one cutting member being adjacently opposed to the similar portions respectively of the edge of the other cutting member; a second pair of oppositely disposed cutting members mounted on said first two seats parallel with the cutter axis, each of said cutting members having an edge in conformity with the surface of said cylinder and disposed in a plane at the same oblique angle to the cutter axis as the planes of the parallel portions of said U shaped cutting members, the edges respectively of said second pair of cutting members being so disposed relatively to said U-shaped cutting members respectively as to provide a continuation of the parallel portions of the cutting edge from one U-shaped cutting member to the adjacent parallel portions of the cutting edge of the opposite U-shaped cutting member respectively.

Signed at New York, in the county of New York and State of New York, this 20 day of January, 1913, before two subscribing witnesses.

EDMOND KENNY.

Witnesses:
WILBUR M. STONÉ,
J. S. CAMPBELL.