March 3, 1931. J. A. CAMERON ET AL 1,794,398

SLITTING DEVICE

Filed May 20, 1929

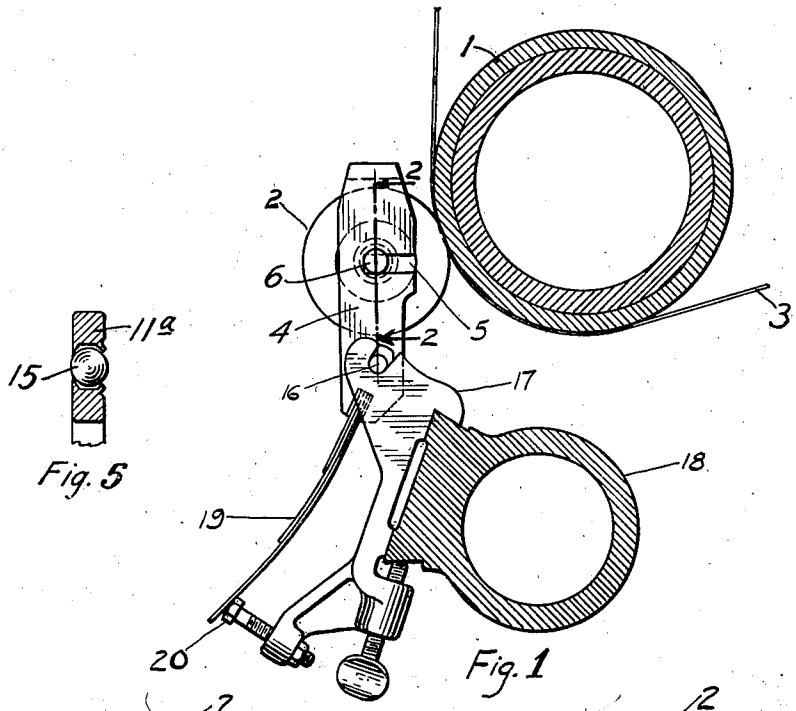


Fig. 1

Fig. 5

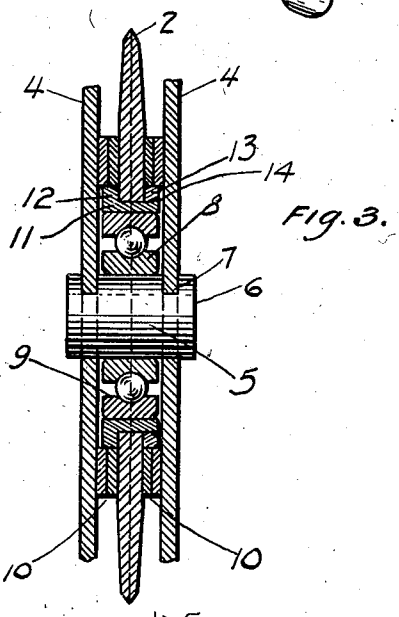


Fig. 3.

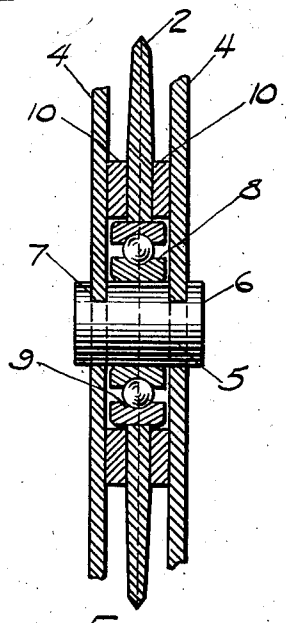


Fig 2

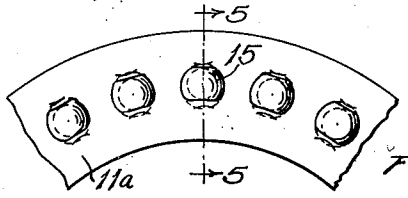


Fig. 4.

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UNITED STATES PATENT OFFICE

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SLITTING DEVICE

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This invention relates generally to slitting devices and has more particularly reference to a device that employs a circular blade of relatively thin material as a slitting means.

In the accompanying drawings the invention disclosed in several concrete and preferred forms in which

Fig. 1 is a general side view, partly in section, of a device employing a relatively thin slitting blade associated, in this instance, with a backing member;

Fig. 2 is a vertical sectional view substantially on the plane of line 2—2 of Fig. 1 and on an enlarged scale;

Fig. 3 is a view similar to Fig. 2 but showing a modified form of the invention;

Fig. 4 is a fragmentary side view of a modified form of steadying-washer; and

Fig. 5 is a sectional view substantially on the plane of line 5—5 of Fig. 4.

The slitting mechanism consists here of a backing member 1 having a "glass-hard" surface with which engages a "score-cut" member 2. The function of members 1 and 2 is to slit a web of flexible material 3 as it passes between them. The score-cut member is a circular blade as shown and is provided with a somewhat blunt peripheral cutting edge in a manner well understood so that the action is that of "cleaving" rather than of cutting. It will also be understood that while the material here is actually severed or slitted, I do not intend to limit the device to this function as it may be employed for "scoring" cardboard instead of for actually cutting and the term "slitting" as here used is to be understood in that sense.

The web is a traveling web, being pulled by a suitable web-pulling machine such as a winder and the backing roll may or may not be driven. Be that as it may it will be understood that member 2 will cut the material more evenly if it rotates with a surface speed substantially equal to that of the advancing web, because if there is a tendency on the part of the cutter to hang back it will distort the paper or other material of the web. Likewise, if member 2 "wobbles" it will not keep in a single trace but will produce an undulating or wavy line of severance. Here then we have a double problem of so mounting the circular blade 2 as to rotate freely and also to steady it to keep it from "wobbling". A suitable holder composed in part of two side-cheeks 4 that are spaced apart is provided. Said cheeks have straight slots 5 to receive a center support 6 and this latter is grooved at 7 so that said support is held stationary in said cheeks. Suitable means (not shown) are employed to close the ends of the open slots. It will be observed that circular blade 2 is of less thickness than the space between the cheeks and that a circular anti-friction bearing of greater width than the thickness of the blade but of less width than the distance between the cheeks is interposed between said blade and the center support. Specifically, inner race 8 of a ball bearing is mounted on center support 6, and outer race 9 of said ball bearing is fitted to blade 2 so as to move as one member therewith. 10 indicates two anti-friction steadying-washers or spacing means, one on each side of the blade, interposed between the blade and the cheeks and occupying a space outwardly beyond the circular anti-friction center bearing. In this case washers 10 are independently rotatable and are made of suitable anti-friction material such as bronze. By the foregoing means the blade is kept very steady, being closely confined, and yet is perfectly free to rotate.

In Fig. 3 is shown a modified form of the invention in which the blade is imbedded in a base, or rather a collar 11 is pressed into the circular opening of said blade. This collar has, at one side, a shoulder 12 integral therewith and a ring 13 riveted to the collar as at 14 engages the other side of the blade. The collar is fitted to the outer race 9 of the ball bearing so as to move as one member therewith. In this case a plurality of spacing-washers are arranged on each side of the blade.

It will be observed, both in Figs. 2 and 3, that the circular anti-friction means or center bearing is free of engagement with the cheeks, and that the washers or spacing means act as centering means not only for the blade

but also keep the circular anti-friction means out of contact with the cheeks.

Steadying-washers 10 may be constructed in many different ways. In Figs. 4 and 5 is shown a modification in which instead of making the washers 11ª of anti-friction material they are provided with balls 15 that engage the cheeks and the blade. In this case, the washers need not be freely rotatable but may be stationary.

The holder, composed of the two side cheeks, may be mounted in any suitable way. For instance, said holder may have trunnions 16 resting in open brackets 17 which latter are carried on a rockable support 18 which by its rocking movement brings the slitter into and out of engagement with the backing member. A spring 19 is interposed between the end of the holder and bearing point 20 on the bracket. This part of the device is old and well known in the art.

While the invention has been described as being primarily directed to a slitting means, it will be understood that the novel features described can be employed to mount a member other than a slitting or score-cut blade.

We claim:

1. The combination with a center support and spaced-apart side cheeks associated therewith, of a blade of less thickness than the distance between the cheeks rotatably mounted, between the cheeks, on said center support, circular anti-friction means between the blade and the center support, said anti-friction means being of less width than the distance between the cheeks, and anti-friction spacing means to engage both the blade and the cheeks to steady said blade and to keep the circular anti-friction means out of engagement with the cheeks.

3. A slitting device including: a center support, spaced-apart side cheeks associated with said support, a circular slitting blade of less thickness than the distance between the cheeks rotatably mounted, between the cheeks, on said center support, circular anti-friction means between the blade and the center support, and anti-friction steadying-washers, at least one on each side of the blade, interposed between the blade and the cheeks and occupying a space outwardly beyond the circular anti-friction means.

3. A sliting device including: a center support, spaced-apart side cheeks associated with said support, a circular slitting blade of less thickness than the distance between the cheeks rotatably mounted, between the cheeks, on said center support, circular anti-friction means between the blade and the center support, and independently rotatable anti-friction steadying-washers, at least one on each side of the blade, interposed between the blade and the cheeks and occupying a space outwardly beyond the circular anti-friction means.

Signed at the city of New York, in the borough of Brooklyn, county of Kings, and State of New York, this 16 day of May, 1929.

JAMES A. CAMERON.
ROBERT McC. JOHNSTONE.