

July 21, 1959

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2,895,553

CARRIER FOR ROTARY KNIFE FOR WEB-SLITTING MACHINE

Original Filed June 28, 1955

Fig. 3.

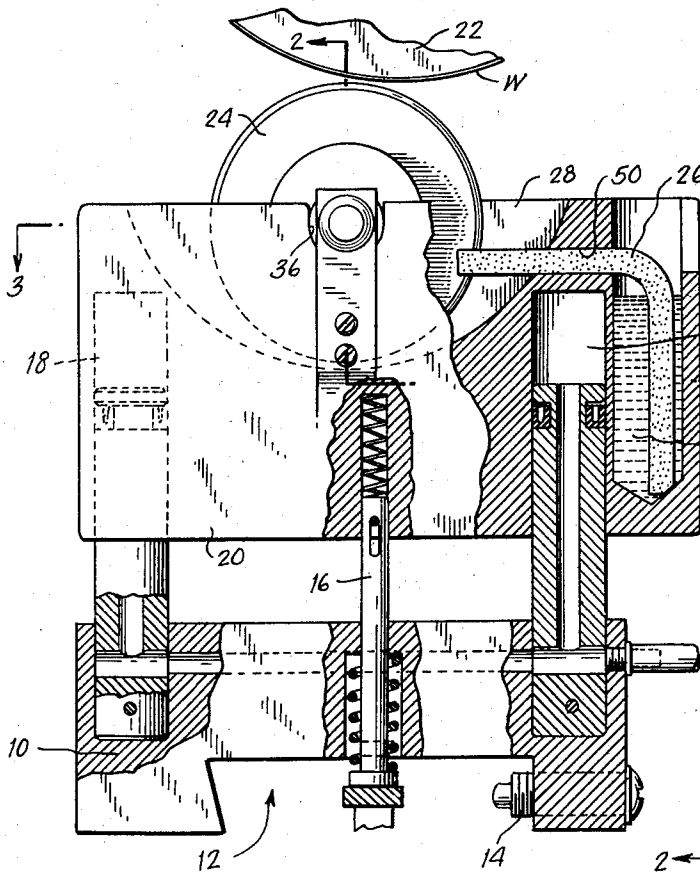
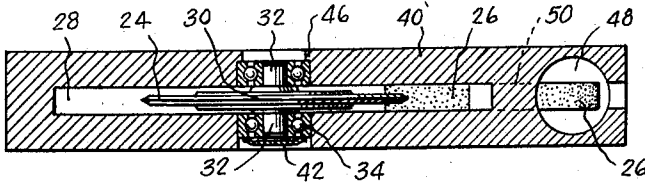


Fig. 1.

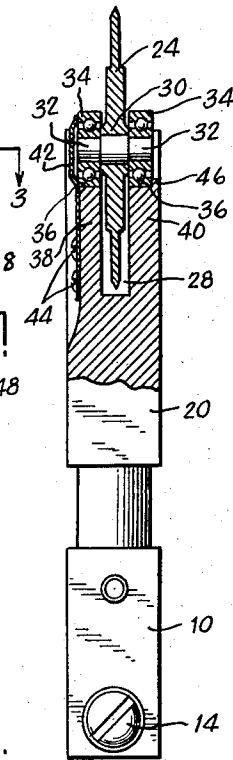


Fig. 2.

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CARRIER FOR ROTARY KNIFE FOR WEB-SLITTING MACHINE

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Original application June 28, 1955, Serial No. 518,630, now Patent No. 2,796,933, dated June 25, 1957. Divided and this application March 5, 1956, Serial No. 569,462

1 Claim. (Cl. 164—70)

This invention relates to improvements in means by which rotary cutting knives of web-slitting machines are supported in relationship to a cutting mandrel; the terms "web-slitting" or "slitting" being employed in this description and in the following claims to comprehend, also, the terms "web-scoring" and "scoring," as those conversant with the art have come to recognize a close similarity between slitting and scoring and that similar machines are used for the two purposes.

This application is a division of my copending application, Serial No. 518,630, which was filed on June 28, 1955 and patented June 25, 1957, No. 2,796,933.

An important object of this invention is the provision of a carrier for a rotary knife for a web-slitting machine wherein the knife may be very quickly installed in or removed from the carrier.

Another important object is the provision of such a knife carrier wherein bearing means for the knife are so arranged that the knife is positively supported during a slitting operation, yet is only held yieldably against removal from its carrier.

Another important object is the provision of spring means in such a knife carrier which hold the knife firmly in a precise position in its carrier and also hold the knife against accidental dislodgment from its carrier.

Another important object is the provision of such a knife carrier having a knife-lubricating wick so disposed therein that proper installation of the knife into the carrier automatically establishes a proper lubricating relationship between the knife and the wick.

The foregoing and other more or less obvious objects are accomplished through the present invention of which only a single embodiment is disclosed herein for illustrative purposes without, however, limiting the invention to that particular embodiment.

In the accompanying drawing:

Figure 1 is a side elevational view of a rotary knife and its carrier means according to a preferred embodiment of this invention; certain portions being broken away to afford sectional views of internal parts.

Fig. 2 is a partially elevational and partially sectional view of the knife and its carrier, substantially on the irregular line 2—2 of Fig. 1.

Fig. 3 is a horizontal, sectional view, substantially on the line 3—3 of Fig. 1.

My mentioned application Ser. No. 518,630 contains a complete disclosure of the manner in which a base block 10 of the device is rigidly fixed by means of a dovetail recess 12 and a lock-screw 14 upon a dovetail portion (not shown) of a cross-member of a complete slitting machine. In said application, also, means are disclosed for actuating a rod 16 and for supplying fluid under pressure to cylinders 18 to afford controlled vertical movement of cutter-carrier block 20 relatively to a rotary cutting roll or mandrel 22 to cause a rotary knife 24, mounted in or on said carrier block, to slit or score a web W passing about said mandrel in a manner

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well known in this art. The several just-mentioned parts relate to the present invention only indirectly and in the sense just explained; hence, no further description thereof appears necessary in the present specification.

The principal and general concern of the present invention is an arrangement by which the rotary knife 24 and (optionally) a lubricating wick 26 are mounted in the cutter-carrier block 20.

The block 20 is formed with an upwardly opening, arcuate recess 28 therein to accommodate the lower part of the circular knife 24. This knife has a hub 30 with journals 32 borne within the inner races of similar ball-bearing assemblies 34, and the outer races of the latter seat within similar, complementary, semicircular seat-recesses 36 formed at the top of block 20 in side walls 38 and 40 defining the knife recess 28.

The knife with said bearing assemblies may easily be moved vertically downwardly into the recesses 28 and 36 in operating position as shown in Fig. 2, and, by gravity alone, they probably would remain in said position. However, there is preferably provided a spring cap 42 held in place on the side wall 38 by screws 44 extending through the lower part of said spring cap. The upper end of the spring cap is dished so that it engages only the outer race of adjacent ball-bearing assembly 34.

The upper end of the spring cap 42 may be manually flexed outwardly to permit the knife and its bearings to be lowered into place with the bearings in recesses 36; then the upper end of the spring cap may be released to enable it to engage the adjacent bearing and urge the knife rightwardly to a central position in its recess 28, this rightward movement being limited by an integral abutment flange 46, formed on wall 40. The frictional engagement of cap 42 and abutment flange 46 with the bearings 34 gives adequate assurance against unintended displacement of the knife.

The block 20 is shown as formed with a lubricant well 48 from which the wick 26 extends through a bore 50 into recess 28 and into engagement with the sides of the cutting edge of knife 24. It will be readily understood that, with the wick thus disposed, the knife may be removed and replaced for sharpening or other purposes without disturbing the wick which remains in position to coact properly with a replaced knife.

It should be apparent that the present concepts may be employed in various structures or arrangements other than those disclosed herein without, however, departing from the present invention as set forth in the following claim.

I claim:

A cutter assembly for web-slitting machines comprising a continuously rotatable circular knife having bearing means at opposite sides thereof, a knife-holding block having two spaced walls defining therebetween a knife recess adapted to freely accommodate a portion of said knife therein, leaving a portion of the knife protruding from said block and resilient retention means for releasably holding said knife rotatably in said block; said spaced walls being formed with aligned, bearing-receiving recesses in which said bearing means are slidably disposed with an accurate fit, to position the knife in said knife recess, one of said spaced walls having an abutment flange at the other side of its said bearing-receiving recess, and said retention means comprising a cap resiliently fixed to the other of said spaced walls, said cap being adapted to yieldably engage the end of one of the bearing means at one side of the knife and urge the latter bearing means and the knife sidewise to centrally position the knife in said knife recess with the bearing means at the other side of the knife in abutment with said abutment flange; said bearing means each having an inner annulus constrained to rotate with the knife and an outer

annulus constrained against rotation within said bearing-receiving recesses, said abutment flange being in engagement with the outer annulus and clear of engagement with the inner annulus of the adjacent one of said bearing means, and said cap having a circularly dished portion approximately coaxial with and clear of the inner annulus of the one of said bearing means which is adjacent to said cap; and an annular portion of said cap which extends about said dished portion being in engagement with the outer annulus of the last-mentioned bearing means.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,895,553

July 21, 1959

Gerrit De Gelleke

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 63, for "other" read -- outer --.

Signed and sealed this 27th day of October 1959.

(SEAL)

Attest:

KARL H. AXLINE

Attesting Officer

ROBERT C. WATSON
Commissioner of Patents