March 7, 1933. R. McC. JOHNSTONE 1,900,183

SLITTING DEVICE

Filed April 14, 1932 3 Sheets-Sheet 1

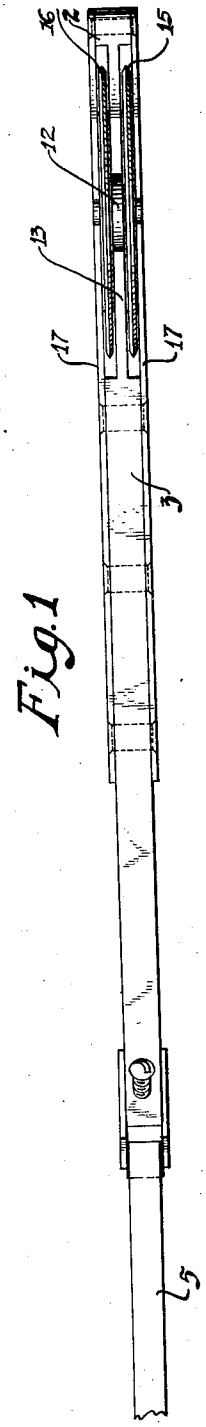

Fig. 1

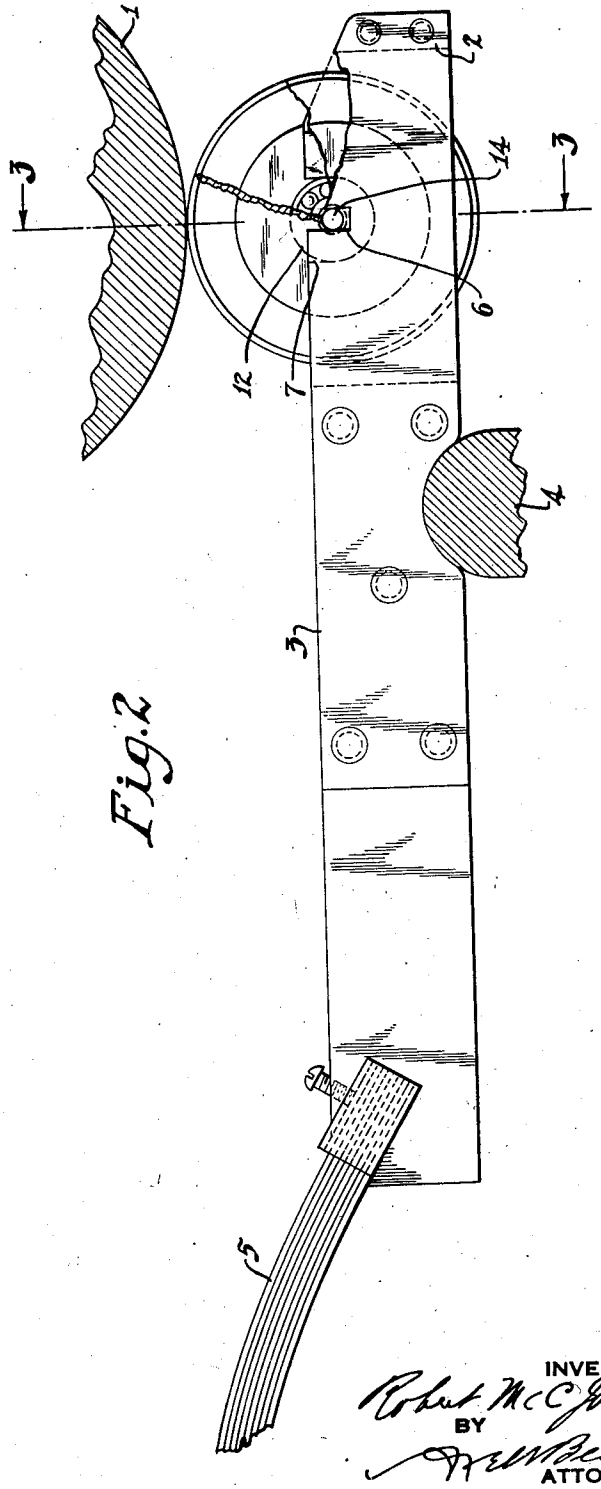

Fig. 2

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Filed April 14, 1932 3 Sheets-Sheet 2

Fig. 3

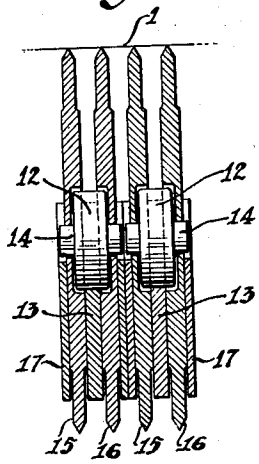


Fig. 4

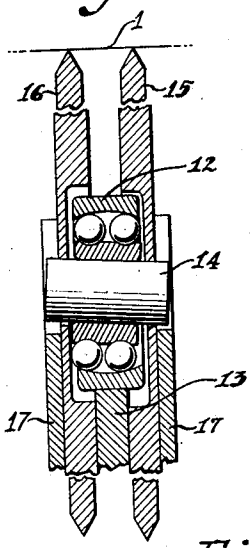


Fig. 5

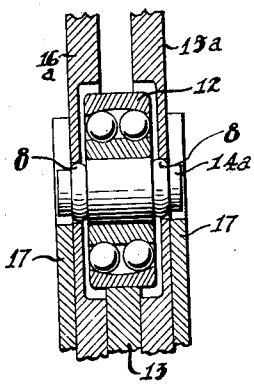


Fig. 6

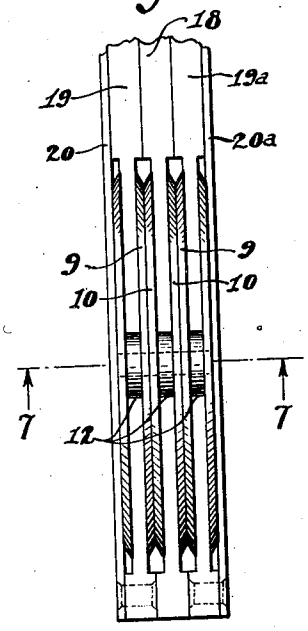
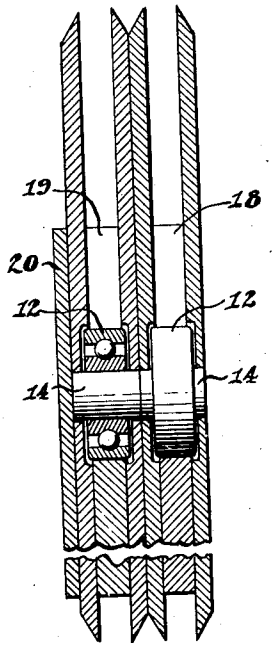


Fig. 7



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March 7, 1933. R. McC. JOHNSTONE 1,900,183

SLITTING DEVICE

Filed April 14, 1932 3 Sheets-Sheet 3

Fig. 8

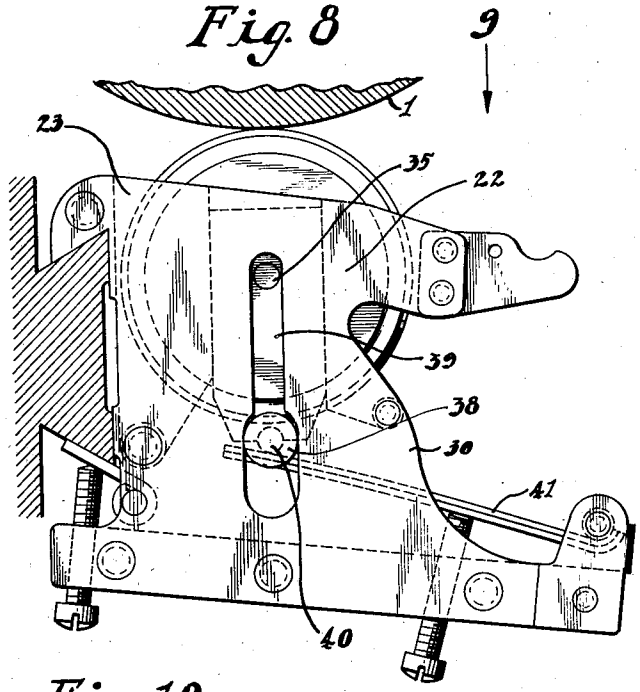


Fig. 10

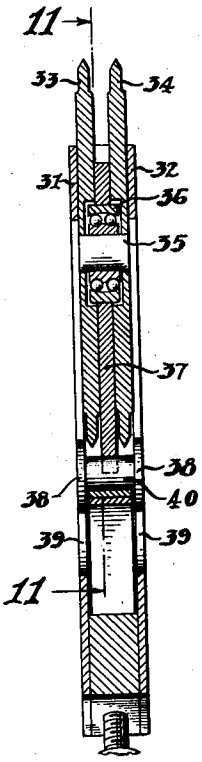


Fig. 9

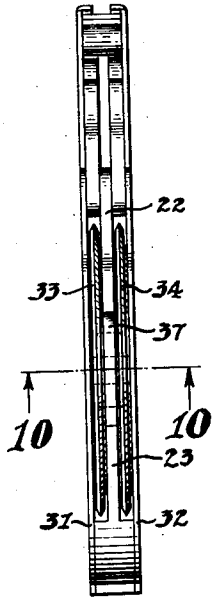
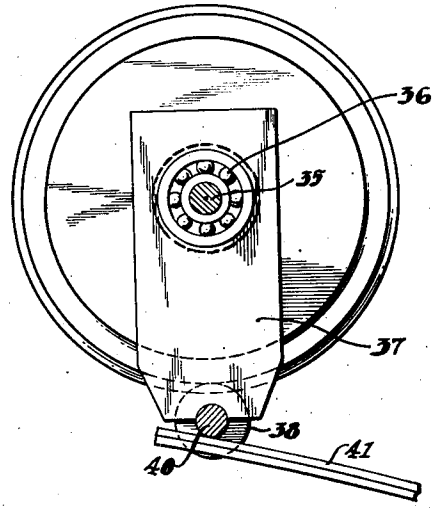


Fig. 11



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Patented Mar. 7, 1933

1,900,183

UNITED STATES PATENT OFFICE

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SLITTING DEVICE

Application filed April 14, 1932. Serial No. 605,144.

This invention relates to slitting means, and has for its main object and feature the production of a device capable of slitting flexible material into strips of very narrow widths.

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

Fig. 1 is a plan view of two slitters in their mounting, embodying one form of the invention;

Fig. 2 is a view in side elevation of the device shown in Fig. 1, with parts broken away and in section, elements associated with said parts also being shown;

Fig. 3 is a vertical sectional view substantially on the plane of line 3—3 of Fig. 2, showing two pairs of slitters;

Fig. 4 is a view similar to Fig. 3, but on an enlarged scale and showing only one pair of slitters;

Fig. 5 is a view similar to Fig. 4, but showing a slightly modified form of the invention;

Fig. 6 is a fragmentary plan view showing a modified form of the invention in which adjacent slitters of adjacent pairs of slitters act as side cheeks for each other;

Fig. 7 is an enlarged sectional view substantially on the plane of line 7—7 of Fig. 6;

Fig. 8 is a view partly in elevation and partly in section of another modified form of the invention;

Fig. 9 is a top plan view looking in the direction of arrow 9 of Fig. 8;

Fig. 10 is an enlarged sectional view substantially on the plane of line 10—10 of Fig. 9; and

Fig. 11 is a sectional view substantially on the plane of line 11—11 of Fig. 10.

In order to produce very narrow sections from a web of flexible material, by means of score-cut devices, it is necessary to have as few as possible supporting means, such as levers, for the slitters. Attempts have therefore been made, heretofore, to mount a plurality of slitters, such as two slitters, in a single lever. If the two slitters are of exactly the same diameter, such construction will produce good results; but if two score-cut slitters, carried by a single lever, are of unequal diameter, then only the larger one of said slitters will engage the backing means, and the smaller one will therefore not sever the flexible material properly, with the result that the coils of wound material cannot be separated.

To overcome this difficulty it is proposed here to retain the mounting of two slitters in a single element, and to introduce equalizing means, such as a tiltable member whereby both slitters will engage the backing means whether said slitters are of equal or unequal diameter.

In the drawings several forms of the invention are shown, but considering first the form of the invention shown in Figs. 1 to 4 inclusive, it will be seen that 1 indicates a backing means such as a roller having a glass-hard surface, which roller is usually driven and which, in turn, drives score-cut slitters 15, 16 by frictional contact. 3 indicates a slitter lever mounted to rock on bar 4, that end of the lever which is adjacent the backing roll being urged toward the latter by a yielding pressure exerted by spring 5 in a well-understood manner. The slitter lever is provided with side cheeks 17 that engage the outer sides of the slitters, and with an intermediate member 13 that extends between the slitters, a head 2 connecting the outer ends of the side cheeks and the intermediate member. The side cheeks are slotted as at 6, and the intermediate member has a cradle portion 7 that receives the outer race-member of a self-alining anti-friction bearing 12. 14 is a pintle secured, as by a driven fit, to the inner race-member of the bearing, and this pintle is of sufficient length to extend into slots 6 and to be capable both of being tilted and of rotating in said slots. It should be noted, however, that it does not engage the bottom of said slots. Slitters 15 and 16 are loosely mounted on pintle 14, and the latter therefore forms a common support for the two slitters, said slitters being recessed as shown to accommodate the bearing. If one of the slitters is somewhat larger than the other, then the action indicated in Fig. 4 will take place, where it will be seen that the

larger slitter (15) causes pintle 14 to tilt and that both slitters will therefore engage the backing means. It is to be observed that the pressure of spring 5 is exerted through intermediate member 13 and will therefore be transmitted substantially equally to both slitters, and further that, with the construction shown, adequate side support is given to the slitters both by side cheeks 17 and intermediate member 13 so that a very stable structure is produced. Of course, as many of these units as may be desired can be employed, and from Fig. 3 it will be seen that very narrow slitting can be effected, the distance between slitters being not substantially greater than the thickness of a slitter wheel.

In Fig. 5 is shown a slightly modified form, which consists in forming rounded bearing surfaces 8 on pintle 14^a so that the clearance between the central base of slitters 15^a and 16^a and said surfaces 8 can be lessened.

In Figs. 6 and 7 is shown a modification of the invention in which the slitter lever is provided with a plurality of intermediate members 18, 19 and 19^a so that the same lever can carry three pairs of slitters. In this instance it is only necessary to provide two side cheeks 20 and 20^a, because adjacent slitters 9 and 10 of adjacent pairs act as side guides for each other.

Figs. 8 to 11 show a still further modification. Here slitter holder 30 is provided with two stationary side cheeks 31 and 32 and with two stationary end guides 22 and 23. The slitters are indicated by 33 and 34, are mounted, as before, with a clearance on pintle 35. 36 indicates an antifriction bearing, the outer race-member of which is carried by an intermediate member 37, and the inner race-member of which is secured to pintle 35. Intermediate member 37 is slidable in a rectilinear direction between end guides 22 and 23, and is provided with rollers 38 that engage in slots 39 of the side cheeks. 40 indicates a bar that extends between rollers 38 and, against this bar, a spring 41 bears to thereby move the slitters against the backing means. The action in this form of the invention is the same as in the others, the pintle being tiltable to equalize variations in diameter of the two slitters.

I claim:

1. In a slitting device: backing means; two rotatable score-cut slitters arranged side by side; and an equalizing mounting for the slitters including: tiltable means to enable both slitters, whether they be of equal or unequal diameter, to engage the backing means; and means to exert, through the tiltable means, a yielding pressure on said slitters toward the backing means.

2. In a slitting device: backing means; two rotatable score-cut slitters arranged side by side; and an aqualizing mounting for the slitters including: tiltable bearing means common to the two slitters to enable both of the latter, whether they be of equal or unequal diameter, to engage the backing means; and means to exert, through the tiltable bearing means, a yielding pressure on said slitters toward the backing means.

3. In a slitting device: backing means; two rotatable score-cut slitters arranged side by side; and an equalizing mounting for the slitters including: a tiltable pintle to support both slitters to thereby enable both of them, whether they be of equal or unequal diameter, to engage the backing means; and means to exert a yielding pressure on said pintle toward the backing means.

4. In a slitting device: backing means, two rotatable score-cut slitters, to engage the backing means, arranged side by side in spaced relation; a spring-pressed member extending intermediate the slitters; and a bearing common to both slitters carried by the intermediate member.

5. In a slitting device: backing means, two rotatable score-cut slitters, to engage the backing means, arranged side by side in spaced relation; a spring-pressed member extending intermediate the slitters; a self-alining anti-friction bearing the outer race of which is carried by the intermediate member; and a pintle secured on the inner race of the bearing and loosely supporting both slitters.

6. In a slitting device: backing means, two rotatable score-cut slitters, to engage the backing means, arranged side by side in spaced relation; side cheeks confining the outer sides of the slitters; a member extending intermediate the slitters; and a pintle, common to both slitters, carried by the intermediate member and movable in the side cheeks.

7. In a slitting device: backing means, two rotatable score-cut slitters, to engage the backing means, arranged side by side in spaced relation; side cheeks confining the outer sides of the slitters; a member extending intermediate the slitters; a self-alining anti-friction bearing the outer race of which is carried by the intermediate member; and a pintle, loosely supporting both slitters, secured in the inner race of the bearing and tiltable and rotatable in the side cheeks.

Signed at the city of New York, in the borough of Brooklyn, county of Kings, and State of New York, this 7 day of April, 1932.

ROBERT McC. JOHNSTONE.