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SLITTING MACHINE

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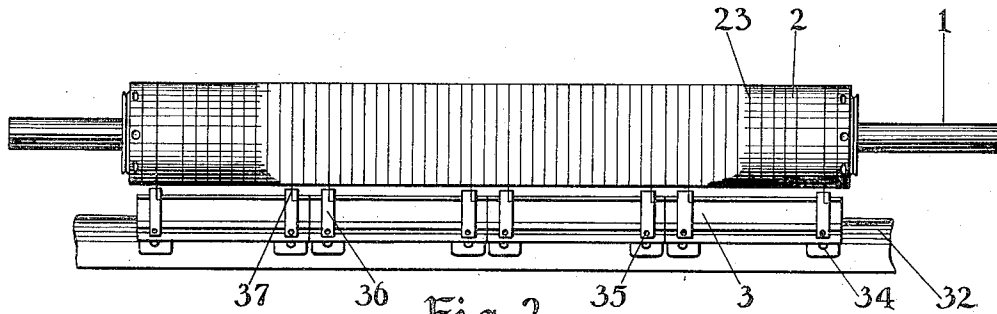


Fig. 2

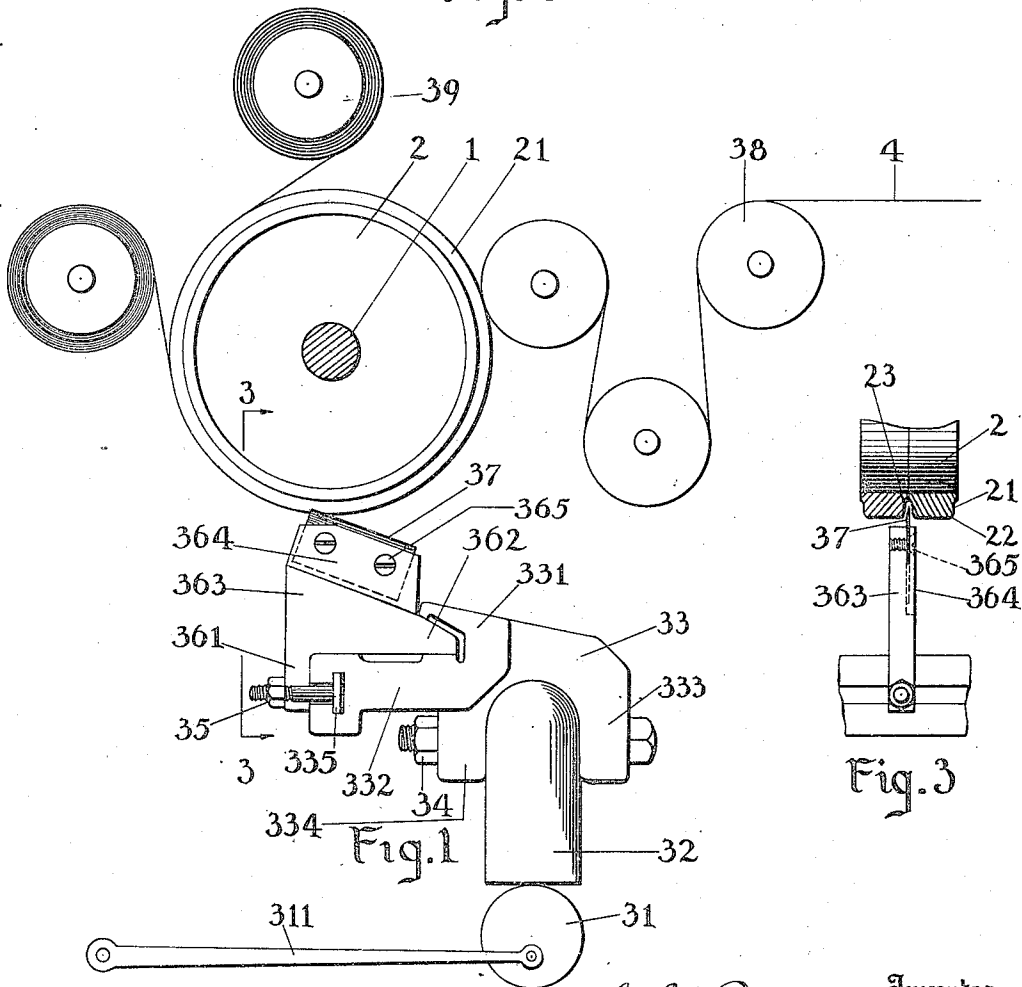


Fig. 1

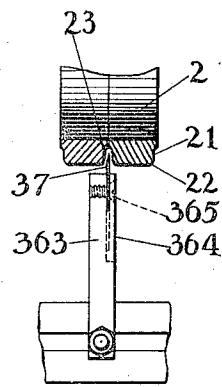


Fig. 3

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SLITTING MACHINE

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6 Claims. (Cl. 164—39)

This invention relates to slitting machines. More particularly the invention relates to the slitting of regenerated cellulose films.

In the slitting of wide sheets of paper into narrower sheets, little difficulty is experienced because the paper has sufficient "body" to resist tendencies to wrinkle. Consequently, machines of ordinary character will slit paper in an entirely satisfactory manner. Considerable difficulty is experienced, however, in accurately slitting films of regenerated cellulose. They are very thin, have little body, and consequently wrinkle seriously when not supported on a roller or similar surface. The inability of ordinary slitting machines to satisfactorily slit sheets of regenerated cellulose results in the production of slit films having varying widths, fuzzy torn edges which combine, when used in an automatic wrapping machine, to cause jamming of the machine and breaking of the film.

It is an object of this invention to provide a mechanism whereby knife-blade slitting of thin cellulosic sheeting may be carried out upon a surface. Another object of the invention is to provide a slitting machine for webs of material having little body. Other objects of the invention will be in part apparent, and in part set forth as the description proceeds. These objects are accomplished by the mechanism hereinafter described.

In the drawing, Fig. 1 is an end view, partly diagrammatic, showing one form of my invention; Fig. 2 is a front view of a machine according to the preferred form of my invention; Fig. 3 is a view partly in section taken on the line 3—3 of Fig. 1.

In the figures of the drawing, 1 is a core which serves as an axle; 2 are thin annular rings of equal size mounted in abutting relation upon the core; 21 are reduced portions of adjacent rings whose presence forms a circumferential slot 23 between abutting faces of adjacent rings. The outer edge or edges of said slots are bevelled as at 22 to facilitate the entry of the knife blade into the slot.

Numeral 3 indicates generally the support for the knife blades; 32 is an elongated bar reciprocable toward and away from the rings 2 in guides not shown; 31 is an eccentric by means of which supporting bar 32 is reciprocated; 311 is a lever by means of which eccentric 31 is turned to reciprocate support 32; 33 is an elongated casting, of less length than the length of bar 32, which is attached to bar 32 by means of nut and bolt 34; 333 and 334 are U shaped portions

of casting 33 designed for cooperation with support 32 and nut and bolt 34; 331 is an overhanging lip portion of casting 33; 332 is a plate-like portion of casting 33; 335 is a slot for bolt heads running the length of casting 33; 36 is a knife blade support; 363 is a portion of the knife blade support, 364 is a plate; 365 are screws by means of which a razor blade or other knife blade 37 is clamped between plate 364 and support portion 363; 361 is a depending portion of support 36 provided with a hole for cooperation with nut and bolt 35 in slot 335; 362 is an angular portion of support 36, designed for firm contact and cooperation with portion 331 of support 33.

In the operation of my machine a sheet of regenerated cellulose or other flexible material is passed over smoothing rollers 38 to the surface of supporting rings 2 with which it is maintained in firm contact, the knife blades are moved into cutting position above the grooves in the roll. To move the knife blade out of cutting position, the eccentric is rotated into the position shown in Figure 1, which moves the support toward rings 2 and carries the knife blade 37 into the groove 23. Should a knife blade be slightly off center the bevelled edge of the groove will direct the blade into its proper position. Should a blade be considerably out of alignment, quick adjustment thereof can be effected through nut and bolt 35. Should the adjustment of an entire bank of blades (Figure 2 shows four banks) be desired, this adjustment can be obtained by loosening bolt 34 and sliding the bank in slots provided in support 32 or arms 333—334 for that purpose. After the material has been slit it is wound on mandrels 39.

Rings 2 may be formed by cutting circumferential slots in the surface of a metal cylinder, but the resulting product is not as desirable as that made by the preferred method, because the destruction of a single ring of the preferred structure requires only the replacement of the ring, whereas the unit roll must be replaced entirely when a single ring is damaged. The slots in the roll should not be so close together that substantially no support is given to the film.

The rings of the supporting roll may all be of the same width or may be of different widths, depending upon the necessity of the moment.

The preferred position of the knife blade is at an angle of about $30^{\circ} \pm 10^{\circ}$ to the tangent of the sheet at the cutting point, but it is to be understood that other angles may be used.

If the supports 36 be accurately machined and

if the rings 2 be accurately machined, it is possible to set up the entire machine by the simple expedient of accurately alining the end knife with its slot and pushing the other knife supports into
5 contact with the alined support.

In machines operating on the score cutting principle the cutting is accomplished at an angle perpendicular to the travelling film. With my invention the angle of the blade is such, as will
10 be seen by reference to the drawing, that the cutting is done in a direction almost in the plane of the film. It follows that the knife blade of my machine has little or no tendency to distort the film out of its plane, and that my machine
15 produces flat films with uniform width and clean-cut edges.

An advantage of my invention lies in the ability to slit light and easily distorted films accurately. Another advantage of the invention lies in the
20 ability to remove or adjust individual blades or rings of the machine without disturbing the set up. Another advantage of the invention lies in the ability to aline the entire set up accurately by the alining of one support alone. Another advantage
25 lies in the ability to slit sheets of material without crushing, while that material is upon the surface of a support. Other advantages of the invention will be apparent.

As many apparently widely different embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that I do not limit myself to the
30 specific embodiments thereof except as defined in the appended claims.

35 I claim:

1. A slitting machine comprising a supporting roll having a thin circumferential slot with a bevelled edge, and a knife mechanism for cooperation with said roll and slot comprising a non-rotary
40 knife blade and an adjustable support therefor reciprocable toward and away from the roll.

2. A slitting machine comprising a supporting

roll having annular rings mounted in abutting relation, the abutting edges of the said rings being reduced to provide a thin slot having bevelled edges, and a knife mechanism for cooperation
5 with said roll and slot comprising a knife blade and an adjustable support therefor reciprocable toward and away from the roll.

3. A slitting machine comprising a core, a supporting roll comprising annular rings mounted in abutting relation on the core, the abutting edges
10 of the said rings being reduced to provide a thin slot having bevelled edges, and a knife mechanism for cooperation with said roll and slot comprising a laterally adjustable blade support reciprocable toward and away from the roll, and a
15 knife blade mounted on the blade support.

4. A slitting machine comprising a core, a supporting roll comprising annular rings of equal width mounted in abutting relation on the core, the abutting edges of the said rings being reduced
20 to provide a thin slot, bevelled portions on the edges of said slot, and a knife mechanism for cooperation with said roll and slot comprising a support reciprocable toward and away from the roll, a blade support mounted for lateral adjustment on the reciprocable support, and a knife
25 blade mounted on the blade support.

5. In a machine for slitting travelling films, a film-supporting roll having a thin circumferential slot with bevelled edges, a knife blade alined
30 in said slot at an angle such that slitting takes place in a direction substantially in the plane of the film.

6. In a slitting machine a supporting roll having thin circumferential slots, knife blades for
35 operation secant-wise of said slots, and means for mounting said knife blades comprising a support movable toward and away from said roll, a plurality of bars adjustably mounted on said support and a plurality of knife blades adjustably carried by each said bar.
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