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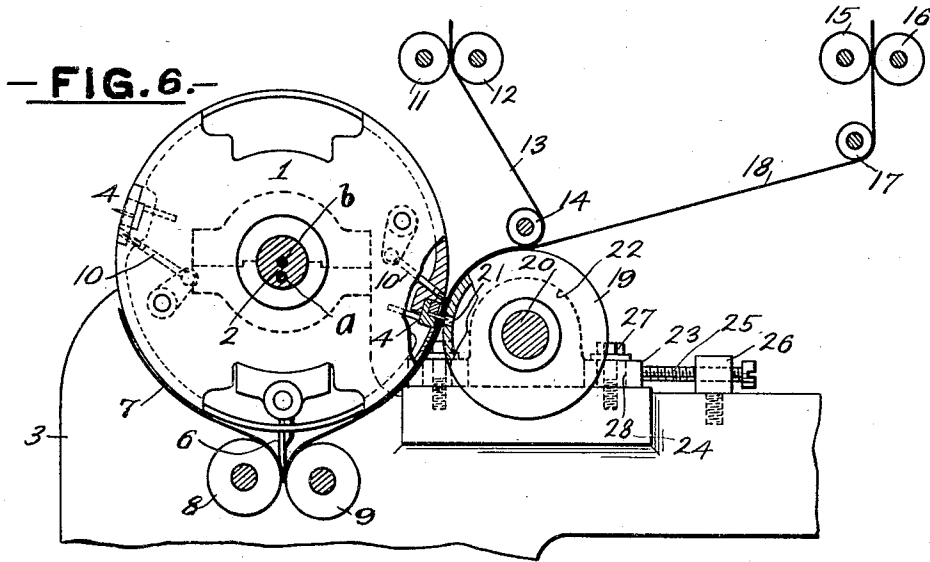
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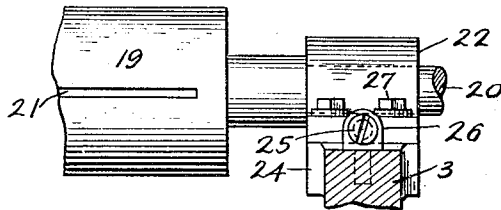
CUTTING MECHANISM

Filed Nov. 3, 1925

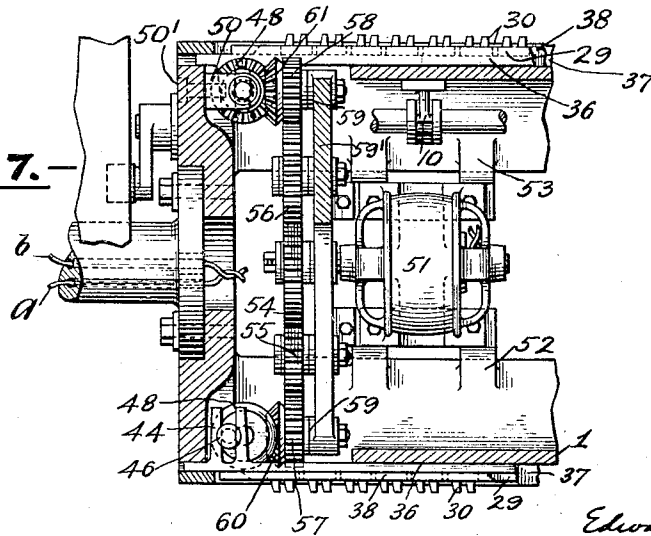
2 Sheets-Sheet 2



— FIG. 8. —



— FIG. 7. —



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CUTTING MECHANISM

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This invention relates to certain improvements in cutting mechanism and has been particularly designed for severing a large number of associated webs or sheets.

5 In cutting products from a large number of associated webs or sheets, particularly products of forty pages and above, difficulty has been experienced in cleanly severing such a large number of sheets, in that the cutting
10 mechanism is not capacitated to cut a product of this thickness. Furthermore, where the cutting mechanism, as is usually the case, comprises a rotary knife carrier and a cooperating rotary abutment the cutting mechanism
15 will not satisfactorily operate at the high speed required in fast running printing machines.

It is a particular object of the present invention to provide an improved cutting mechanism which will act to cleanly cut products
20 made up of a large number of pages, as say forty and over, the mechanism operating to produce a clean cut at the high speed required in a high speed rotary printing machine.
25

A further object of the invention is to provide such a cutting mechanism and an improved means for driving it which may be self contained within the knife carrier and
30 which may be operated at the required speed in a simple and efficient manner.

A further object of the present invention is to provide an improved cutting knife the parts of which in the case of a break in the
35 cutting teeth may be quickly dismantled and reassembled for repairing and replacement.

With these and other objects not specifically referred to in view, the invention consists in certain novel parts, arrangements
40 and combinations which will be described in connection with the accompanying drawings and the novel features pointed out in the claims hereunto annexed.

In these drawings,—

45 Figure 1 is a partially broken away and partly sectional view of a rotary knife carrier showing the position of the parts;

Figure 2 is a broken sectional view taken on the line A—A of Fig. 1 looking in the direction of the arrow of that figure, the right
50

hand portion of the view being a section taken on the line B—B of Fig. 3 and the left hand portion being taken on the line C—C of Fig. 3;

Figure 3 is a plan view of the construction
55 shown in Fig. 2;

Figure 4 is a detail view of one form of cutting knife which may be employed;

Figure 5 is a detail view of a modified form of cutting knife which may be employed;
60

Figure 6 is a side elevation, partly in section and partly broken away, of the knife carrier and its cooperating abutment;

Figure 7 is a partly broken away sectional
65 side view of the driving mechanism for operating the knife carrier, the section being taken on the irregular line D—D of Fig. 1, and

Figure 8 is a detail view of the adjusting
70 mechanism for adjusting the abutment for the cutting knife.

Referring now to these drawings, the machine selected to illustrate the invention is a folder end of a rotary printing machine,
75 but it will be understood that the invention is capable of and has been designed for use in other relations and is not to be restricted to such type of mechanism.

In the machine illustrated there is provided
80 a knife carrier which is in the form of a rotary cylinder 1 mounted on a shaft 2 which is suitably supported in framing 3 of any suitable or desired configuration. This knife carrier carries a pair of cutting knives, indicated generally by the numeral 4, these knives
85 being arranged diametrically opposite in the cylinder. In the particular construction illustrated the cylinder is a folding cylinder and is provided with a tucking blade 6 which
90 acts to tuck off a severed product 7 into the bite of a pair of folding-off rolls 8, 9. The cylinder is or may be provided with sheet taking devices in the form of pins 10, two sets of these pins being provided located just
95 behind the cutting knives. A product is forwarded to this cutting cylinder and this product is an associated one and may if desired come from several sources. As shown, there is provided a pair of forwarding rolls 11, 12
100

over which associated webs 13 are forwarded over a guide roll 14, and a second pair of forwarding rolls 15, 16 and a guide roll 17 over which associated webs 18 are forwarded, these webs being associated with the webs 13 to form the thick product 7.

Cooperating with the knife carrier is a co-operating abutment in the form of a cylinder 19. This cylinder is mounted on a shaft 20 suitably supported in the frame of the machine and is provided with a slot 21, hereinafter referred to. To accommodate thick products of a variable number of plies between the cylinder 19 and the knife carrier 1, means are provided for effecting an adjustment of one of these members, and in the particular construction shown, the cylinder 19 is laterally adjusted relatively to the knife carrier. While this may be effected in various ways, this cylinder is supported in frames 22, one of which is shown, which frames have lugs 23, these frames and lugs sliding on extensions 24 supported from the sides frames 3, before referred to. The outer one of these lugs has threaded thereto a screw rod 25 which has bearing through a block 26 supported on the side frames 3, before referred to, this construction being duplicated on each side of the cylinder. The frames 22 are secured to the extensions 24 in any suitable manner. In the particular construction shown they are secured by screw bolts 27 and the lugs are provided with slots 28 in which the screw bolts 27 work. With this construction the cylinder 19 may be given the required adjusting movement toward and away from the knife carrier 1 to take care of the required products which are to pass between them.

In accordance with the invention an improved cutting knife is provided and means for rapidly reciprocating this knife so that a thick product will be cleanly and effectively cut from the associated webs. The specific construction of the cutting knife and its operating means may be somewhat varied. The construction illustrated is an effective one for the purpose and such a construction will be described as illustrative of the invention. In the structure shown there is provided a knife carrier in the form of a bar 29. In the best constructions the cutting member will be made up of a plurality of cutting teeth so that if a tooth breaks it may be taken out and a new tooth inserted. In the particular construction shown, therefore, there are provided cutting teeth 30, these teeth being preferably arranged in pairs and secured to the bar 29 by means of dowels 31. These cutting teeth may be formed in various ways, but in the best constructions they will be formed so as to effect a preliminary punching of the paper and then a cutting action. As shown in Fig. 4, the teeth are formed with a punching point 32 and a cutting edge 33.

If desired, however, the teeth may be formed as shown in Fig. 5 in which each tooth has oppositely disposed cutting faces 34, 35.

Various means may be employed for operating this bar and for securing the bar in place in the cylinder. In the particular construction shown the bar is secured in a block 36 which has a reciprocating movement in a recess 37 cut in the cylinder wall. This block has a movable clamping member 38 secured to the block by screws 39, 40. This clamping bar 38 is arranged to have a sliding movement in the block 36. If it is desired to remove any of the teeth, it is only necessary to remove the screw 39, whereupon the bar can be slipped to the right in Fig. 3 so as to clear projection 41 under which the end of the bar is positioned, the bar being provided with an enlarged recess 42 to receive the screw 40, a handhold 43 being provided to facilitate the movement of the bar. With this construction the teeth may be readily gotten at for replacement or repair.

In the best constructions the reciprocating movement of the bar is effected by a mechanism carried by the cylinder. While this may be varied to some extent, in the particular construction illustrated the block 36 has a downwardly extending projection 44 which is formed with an open ended slot 45 in which works a pin 46 screw-threaded, as at 47, in an eccentric gear 48 supported on a stud 49 carried in a bracket 50 supported from the cylinder head 50'. This eccentric gear 48 is driven in any suitable manner. In the best constructions two sets of knives are used, as shown in Fig. 6, and these knives will be simultaneously operated. In the particular construction illustrated, referring to Fig. 7, there is provided a motor 51 in a circuit *a, b*, passing in to the cylinder, this motor being mounted in brackets 52, 53 supported from the cylinder walls. The armature shaft of this motor carries a driving gear 54 which, through intermediates 55, 56, drives gears 57, 58, these gears and intermediates being mounted on studs 59 supported from a web 59'. The hubs of the gears 57, 58 have miters 60, 61 which mesh with the eccentric gear 48, before referred to.

With this construction it will be observed that the knives project beyond the surface of the cylinder so that as they come around to the cutting point they are inserted into the product, and practically simultaneously are reciprocated so that a clean cut of a thick product is effected.

While the invention has been described in its preferred form, it will be understood that various changes and alterations may be made in the specific structure and arrangement of the parts without departing from the invention as defined in the appended claims.

What I claim is:

1. The combination of a cutting cylinder, 126

a cutter bar having a plurality of cutting teeth removably secured in position, a gear, eccentric connections between the bar and gear for reciprocating the bar, means carried by the cylinder for driving the gear, and a cooperating abutment for the cutter bar.

2. The combination of a cutting cylinder, a cutter bar having a plurality of cutting teeth projecting beyond the surface of the cylinder, a driving gear, an eccentric pin connecting the gear and bar for reciprocating the bar axially of the cylinder, a motor carried by the cylinder, driving connections between the motor and the gear, and a cooperating abutment for the cutter bar.

3. In a cutting mechanism the combination of a cutting cylinder having a recess, a block in the recess, means for reciprocating the block in directions parallel with the longitudinal axis of the cylinder, a cutting knife secured to the block, and a clamp removably secured to the block and holding the knife in position.

4. In a cutting mechanism, the combination of a cutting cylinder having a recess, a block in the recess, means for reciprocating the block in directions parallel with the longitudinal axis of the cylinder, a knife secured to the block, and a clamp secured to the block and having a sliding movement thereon for positioning and release.

5. In a cutting mechanism, the combination of a cutting cylinder having a recess, a block in the recess, a guide carried by the block, a pin working in the guide, a gear eccentrically mounted on the pin, means for driving the gear, and a cutting knife mounted on the gear.

6. In a cutting mechanism, the combination of a cutting cylinder having a recess, a block in the recess, a guide carried by the block, a pin working in the guide, a gear eccentrically mounted on the pin, means for driving the gear, a plurality of cutter knives mounted on the block, and a clamp removably mounted on the block.

7. The combination of a cutting cylinder, a cutter bar carried by the cylinder, a gear, eccentric connections between the bar and gear for positively reciprocating the bar in opposite directions, means for continuously operating the connections, and a cooperating abutment for the cutter bar.

8. The combination of a cutting cylinder, a cutter bar carried by the cylinder, means for effecting a positive and continuous reciprocating cutting movement of the bar in opposite directions parallel with the longitudinal axis of the cylinder, and a cooperating abutment for the cutter bar.

9. The combination of a cutting cylinder, a cutter bar carried by the cylinder, a motor carried by the cylinder, connections operated by the motor for continuously reciprocating the bar in opposite directions parallel with

the longitudinal axis of the cylinder, and a cooperating abutment for the cutter bar.

10. The combination of a cutting cylinder, a cutter bar carried by the cylinder, a motor carried by the cylinder, connections between the motor and bar including an eccentric for continuously reciprocating the bar in opposite directions, and a cooperating abutment for the cutter bar.

11. The combination of a rotary cutting cylinder, a reciprocating cutter bar carried by the cylinder and sharpened to cut in either directions of its reciprocating movement, means independent of the movement of the cylinder for effecting a continuous reciprocating cutting movement of the bar in opposite directions, and a cooperating abutment for the cutter bar.

12. The combination of a cutting cylinder, a reciprocating cutter bar mounted thereon and having a plurality of aligned cutting teeth removably secured in position and sharpened to cut in either direction of its reciprocating movement, means for positively and rapidly reciprocating the cutter bar continuously in opposite directions parallel with the longitudinal axis of the cylinder, and a cooperating abutment for the cutter bar.

13. The combination of a cutting cylinder, a reciprocating cutter bar mounted thereon and having a plurality of cutting teeth sharpened to cut in either direction of its reciprocating movement, means for continuously reciprocating the bar in opposite directions parallel with the longitudinal axis of the cylinder, a cooperating abutment for the cutter bar, and means for effecting a relative adjusting movement between the bar and the abutment.

In testimony whereof, I have hereunto set my hand.

EDWARD P. SHELDON.