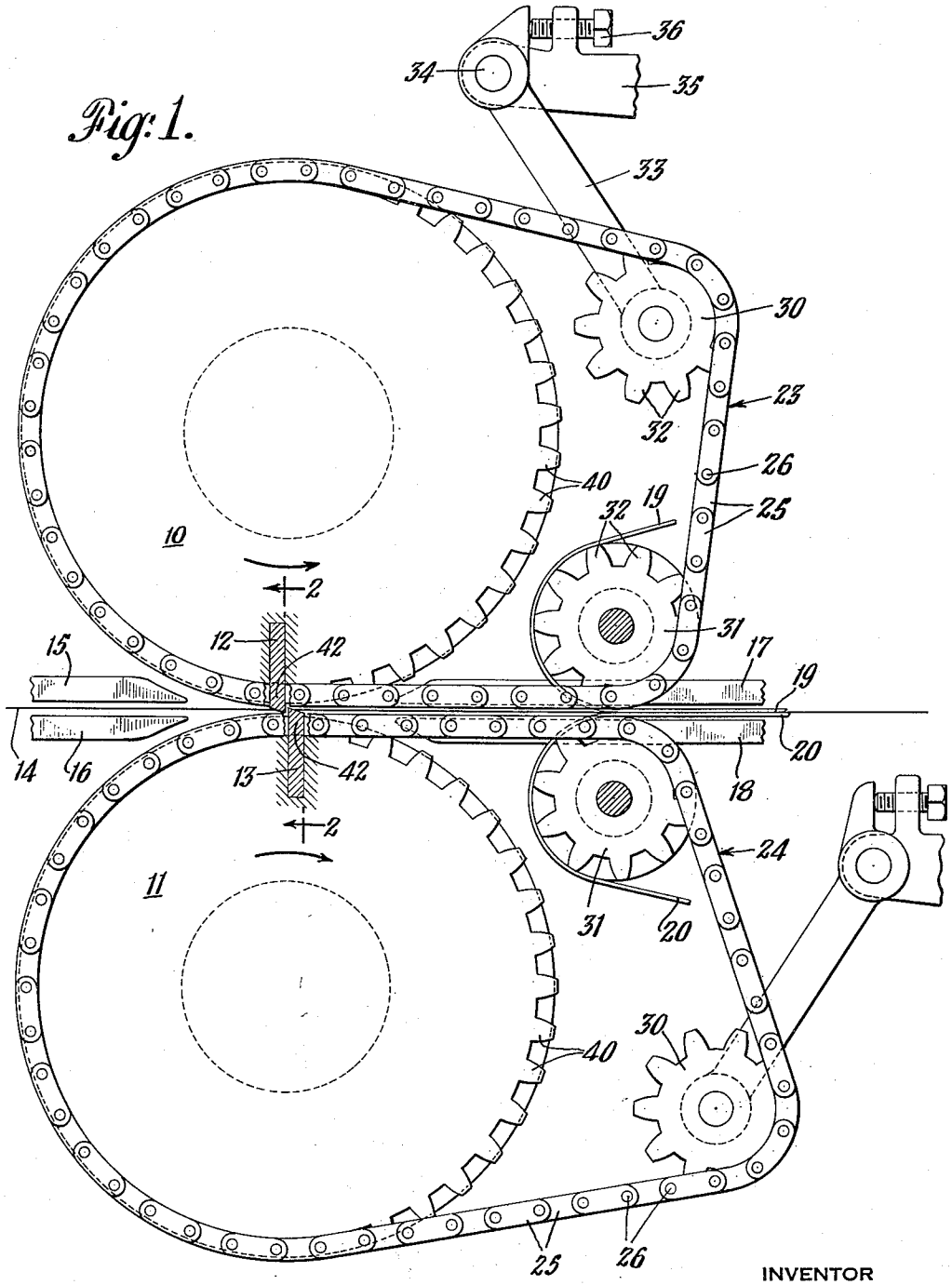
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CUTTING MECHANISM

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Fig. 1.



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Fig: 2.

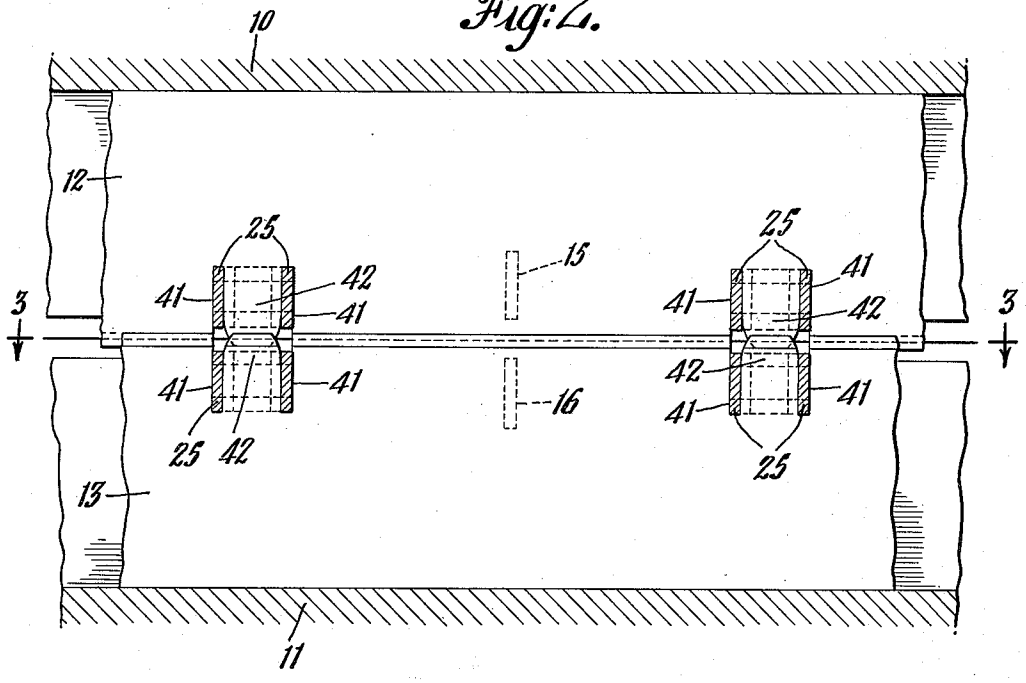


Fig: 3.

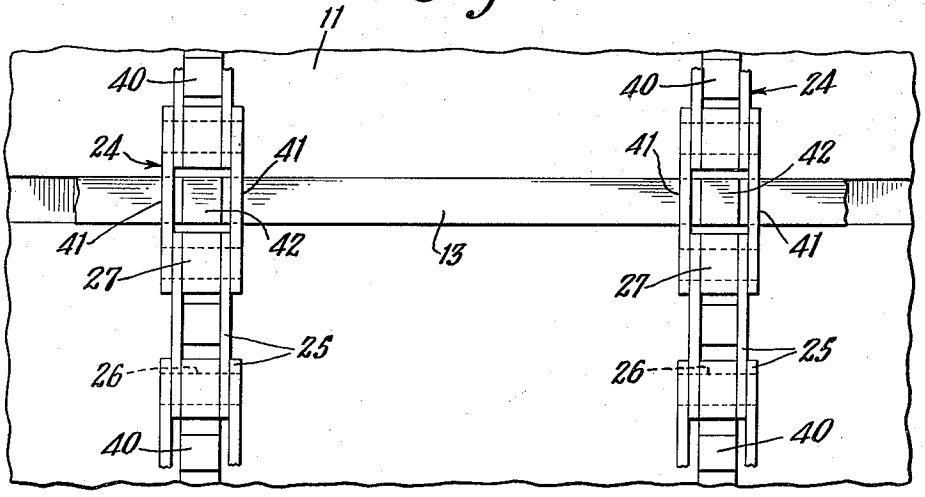
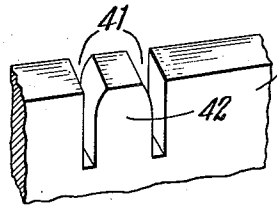


Fig: 4.



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CUTTING MECHANISM

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3 Claims. (Cl. 164—68)

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The present invention relates to cutting mechanism and more particularly to mechanism of the rotary type adapted to cut sheets from a travelling web.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:

Fig. 1 is a transverse cross-sectional view of a pair of rotary cutting cylinders and associated mechanism comprising a typical and illustrative embodiment of the present invention;

Fig. 2 is a longitudinal cross-sectional view taken along line 2—2 of Fig. 1;

Fig. 3 is a fragmentary plan view of the lower of the cutting cylinders said view being taken along line 3—3 of Fig. 2; and

Fig. 4 is a detail perspective view of a portion of the cutting blade for the lower of the cutting cylinders.

The present invention has for an object the provision of a novel and improved rotary cutting mechanism which may be used, for instance, in the cutting of sheets from a travelling web as in rotary printing presses although the mechanism is of general application and utility and by no means limited to the field mentioned. Another object of the invention is the provision of improved cutting mechanism in which the material to be severed is guided to and through the cutting means and beyond and the possibility of the material following the cutting cylinders or bunching and jamming in the mechanism is removed.

With the foregoing and other objects in view there is provided in an illustrative embodiment of the invention a pair of cutting cylinders provided with cooperating cutting blades to impart a shear cut to a web or sheet of material passing between them, and chain guiding means are provided to form a confined path for the cut sheets beyond the cylinders to suitable guiding means and forwarding means. The cutting blades are interrupted to accommodate links of the chain guiding means, and the cutting is thus substantially completed by the blades despite the association of guiding means around the cylinders. Such uncut portions of the web or sheet as remain as a result of the interruptions in the cutting blades are extremely small and are either torn during the cutting operation or during the later handling of the paper, contributing meanwhile to the guiding of the sheets.

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It will be understood that the foregoing general description and the following detailed description as well are exemplary and explanatory of the invention but are not restrictive thereof.

Referring now in detail to the embodiment of the invention shown in the drawings there are provided a pair of cutting cylinders 10 and 11 carrying, in the conventional manner, longitudinally extending cutting blades 12 and 13 respectively, seated in suitable grooves in the bodies of the cylinders. A plurality of cutting blades could be provided on each cylinder but the embodiment illustrated has but a single blade on each cylinder.

The cutting mechanism of the present invention may be provided upon a rotary printing press, as one example of use, wherein a travelling web 14 coming from the printing mechanism is directed through guides 15 and 16 between cylinders 10 and 11 to be cut into sheets by cooperating blades 12 and 13. The cylinders 10 and 11 are preferably driven rollers, as is the case in conventional mechanism of the type.

The sheets cut from web 14 are to be directed between guides 17 and 18 when they are caught between the adjacent cooperating reaches of tapes 19 and 20 for forwarding to such other operations as may be desired or delivered immediately. The means for guiding the web and cut sheets to and through and beyond the cutting cylinders comprise upper and lower endless chains 23 and 24 cooperating with the cylinders 10 and 11 respectively. As best shown in Fig. 3, each chain is of conventional construction having overlapping link members 25 connected by pins 26 and with spacing members 27 surrounding the pins to keep the link members at either side properly spaced apart.

A plurality of chains 23 and 24 are provided for cooperation with each of their respective cylinders, the chains being spaced apart along the lengths of the cylinders. For instance, the chains may be spaced at about five inch intervals along each cylinder. As shown in Fig. 1 of the drawings the chains 23 are directed around sprockets 30 and 31 each of which is provided with suitable teeth 32 to engage the chains between the links thereof. The sprocket 31 may be journalled in any stationary part of the mechanism as, for instance, a frame, but the sprocket 30 is preferably mounted for rotation at the end

of an arm 33 pivotally mounted at 34 on a stationary support 35. By means of set screws 36 the pressure of sprockets 30 on the chains 23 may be adjusted, so as to keep the chains tight in operation and to facilitate removal thereof. The lower chains 24 are provided with identical sprockets 30 and 31.

As shown the chains 23 and 24 are also positioned on their respective driven cutting cylinders 10 and 11, the cylinders being formed with suitable sprocket teeth 40 to cooperate with the chains. At places where the longitudinally extending cutting blades intersect with the sprocket teeth formations on the cylinders, a tooth 40 is omitted to accommodate the blades. The blades at these places are formed as shown in detail in Fig. 4 of the drawings, having a pair of spaced slots 41 to receive the links 25 of the chains, and an intervening blade portion 42 filling the space between the links of the chains. The sprocket portions of the cylinders 10 and 11 are formed with an even number of teeth 40 (including the portions 42 in the number) and the chains likewise are provided with an even number of links so that the blade portions 42 may always be positioned between the same chain links. The more widely spaced links are preferably arranged to fall in the slots 41 and enclosed portions 42, as best shown in Fig. 3 of the drawings, although the machine could be constructed in the opposite arrangement.

It will be apparent that the sprocket teeth 40 can be eliminated if desired, and the chains 23 and 24 merely guided in the grooves in cylinders 10 and 11 and sprockets 31 can be suitably driven to drive the chains.

The material 14, upon leaving cylinders 10 and 11, is directed between guides 17 and 18 and forwarded by tapes 19 and 20 which are directed around smooth or roller portions of the sprockets 31 for the chains 23 and 24.

With the cutting mechanism shown and described it will be apparent that sheets cut from the web of material 14 are positively guided by the chains 23 and 24 to the guides 17 and 18 where they are forwarded to such other operations as may be desired. The leading edge of the material 14 is thus prevented from following the rotation of either of the cylinders 10 and 11 as is its tendency, and bunching or jamming of the material at the entrance of guides 17 and 18 is prevented. It will be apparent that small tabs of material will be left uncut at positions corresponding with the slots 41 in the blades 12 and 13. These are either immediately torn in the cutting of the sheets, or are later easily torn apart as, for instance, by the pull of tapes 19 and 20 or in the folding machinery usually associated with such a cutting device.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:

1. In combination, a pair of cutting cylinders, cooperating cutting devices mounted on said cylinders, parallel elements adjacent said cylinders forming a guideway to receive material from between said cylinders, a pair of endless flexible members each passing around a respective one of said cylinders, first guide rollers one for each of said flexible members positioned adjacent said parallel elements said flexible members passing over respective ones of said guide rollers providing adjacent reaches for guiding material from between said cutting cylinders to said guideway, a pair of other endless flexible members each passing around a respective one of said guide rollers and providing adjacent reaches for engaging and carrying material along said guideway, and second guide rollers one for each of said first endless flexible members to be engaged thereby, said second guide rollers being adjustably mounted for varying the distance between the axes thereof and the axes of said cutting cylinders.

2. In combination, a pair of cutting cylinders, cooperating cutting devices mounted on said cylinders, parallel elements adjacent said cylinders forming a guideway to receive material from said cylinders, a pair of endless chains each passing around a respective one of said cylinders, said cylinders having toothed sprocket portions to receive said chains, guide rollers of smaller diameter than said cutting cylinders positioned in opposed relationship to each other adjacent said parallel elements having toothed sprocket portions to receive respective ones of said chains providing adjacent reaches for guiding material from between said cutting cylinders to said guideway, and a pair of tape members each passing around a respective one of said guide rollers and providing adjacent reaches moving at a higher rate of speed than said chains for engaging and carrying material along said guideway.

3. In combination, a pair of cutting cylinders, a longitudinally extending cutting blade on each cylinder said blades cooperating to cut sheets from a web of material passing between the cylinders, parallel elements adjacent said cylinder forming a guideway to receive the sheets from between the cylinders, a pair of endless chains each passing around a respective one of said cylinders, said cylinders having toothed sprocket portions to receive said chains and said blades having relieved places to receive links of said chains, guide rollers of smaller diameter than said cutting cylinders positioned in opposed relationship to each other adjacent said parallel elements having toothed sprocket portions to receive respective ones of said chains providing adjacent reaches for guiding sheets from between said cutting cylinders to said guideway, a pair of tape members each passing around a respective one of said guide rollers and providing adjacent reaches moving at a higher rate of speed than said chains for engaging and carrying sheets along said guideway, and other guide rollers one for each said chain adjustably mounted for varying the distance between the axes thereof and the axes of said cutting cylinders.

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