

June 17, 1930.

T. A. PALMER ET AL
STRIP PRINTING MACHINE

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Filed May 18, 1929

2 Sheets-Sheet 2

Fig. 2.

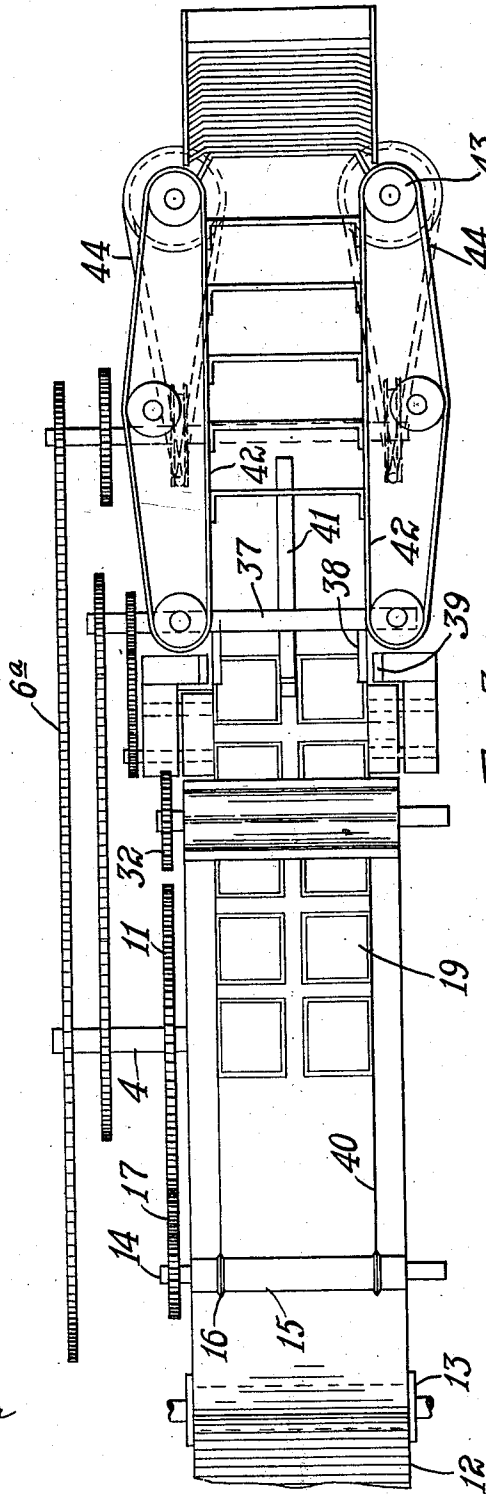
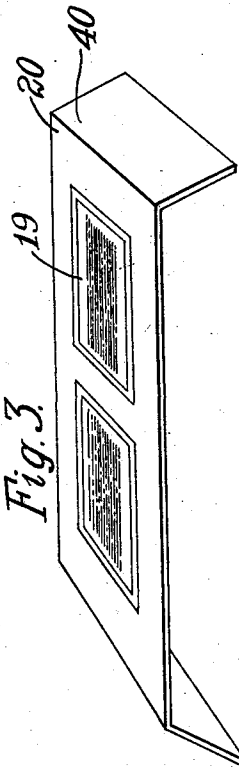


Fig. 3.



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UNITED STATES PATENT OFFICE

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STRIP-PRINTING MACHINE

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This invention relates to apparatus for printing, scoring, bending and slitting of paper strips, more particularly to the making of safety strips for matches.

5 Safety strips for matches are employed as a means for preventing the spilling of the matches from their container if the box is accidentally opened with the bottom side up and they consist of cardboard strips having their ends bent to fit against the end walls of the box against which they are held by the matches which they embrace, and the present invention is directed to apparatus for scoring and bending the ends of the strip 10 for printing the same and for cutting off the strips to proper size from a continuous roll, all by a single machine operation.

The apparatus is designed to pass a continuous paper cardboard strip of a width 20 corresponding to the length of the safety strip through the machine which successively acts to score the paper at the point of bending, then print the safety strip, cut it off in predetermined widths, bend the ends on 25 the line of scoring, and assemble the finished strips at the opposite end of the machine.

In the accompanying drawings constituting a part hereof and in which like reference characters designate like parts, Fig. 1 is a side elevational view of a machine embodying the principles of this invention; Fig. 2 is a top plan view thereof with the printing head removed, and Fig. 3 is a view in perspective of the finished strip as produced 35 by the apparatus.

In the drawings 1 designates the machine frame supported on suitable pedestals 2 having an extension 3 on which is mounted a conveying apparatus as will be hereinafter explained. A drive shaft 4 is journaled in the frame 1 and carries a large pulley 5 which is driven by motor 6 to which it is connected by a sprocket chain 6^a. Mounted on the 45 frame 1 is a head casting 7 which supports the printing apparatus and an ink pot 8. In the head 7 is journaled a main shaft 9 which is driven through gear wheels 10 and 11 by the drive shaft 4.

50 An endless roll of paper 12 is mounted

at the end of the machine and is passed over guide rollers 13 and die rollers 14 which are grooved for cooperation with a scoring roller 15 having sharp V-shaped shoulders 16 that score the sheet 12 as it passes therebetween. 55 The roller 14 is geared through wheels 17 to the gear 11 of the drive shaft 4 so that the paper is not under strain when passing through the scoring dies.

Journalled on the shaft 9 is a printing 60 roll 18 provided with type for printing suitable legends as generally designed at 19 in the strip 20 shown in Fig. 3. Cooperating with the printing roll are a series of composition rolls 21 and in engagement there- 65 with a pair of brass rolls 22, the latter being mounted on levers 23 which are operated by a cam 24 mounted on the shaft 9. A duck roll 25 is mounted on a lever 26 that is connected through a linkage to a cam follower 70 engaging a cam 27 carried by the shaft 9 to cause the duck roll to oscillate making contact with an inking roll 28 and the brass rolls 22 for the purpose of transferring the ink to the printing roll. 75

The legend to be printed on the safety strip is arranged in suitable spaced relation on the printing roll 18 at intervals corresponding to the length of the paper passing through the rolls and the rate of feeding 80 the strip through the machine and the rotation of the printing roll is properly timed to get a clear imprint of the legend in spaced relation as shown in Figure 2 of the drawing. Adjacent the printing head is a pair 85 of rolls 30 and 31 driven through suitable gear connections 32 with the drive shaft 4 and the roll 30 is provided with cutters 33 of which there are three uniformly spaced corresponding to the width of the safety 90 strips 20. The cutters 33 are adapted to cut off the strip after it is printed and the cut off pieces are subsequently drawn into a conveying element comprising a plurality of 95 rolls 34 and 35 joined by rubber belts 36 between which the cut off strips are engaged and passed to the bending mechanism which consists of a shaft 37 carrying a pair of fingers 38 that cooperate with shoes 39 to bend the cut off strips at their scored por- 100

tion along the line 40. A spring 41 having a fish hook at one end projects in the path of the strips and prevents the same from being thrown back when the bending fingers 38 bear down on it.

After the strip has been bent, on its scored portions, it engages a pair of feed belts 42 which are positively driven by pulley 43 through a belt connection 44 with a counter-shaft 45 operated by the motor 6. The strips are engaged on their bent ends in the manner shown in Fig. 2 and built up in a stack at the end of the conveyor in the manner shown. They are subsequently removed from the stack and packed.

The operation of the apparatus is briefly as follows: A roll of sheet material from which the safety strip is manufactured, is fed over the guide roll 13 between the scoring rollers 14 and 15 into the printing press which imprints the proper legends thereon in suitably spaced relation. The printed strip then passes between the cutting rolls 30 and 31 which are timed through their gear connection with the main gear to cut off the strips in proper widths, corresponding to the spacing of the printed matter. The cut strips then pass to the bending mechanism through the conveyor rolls 35 and 36 and are bent on their scored portion 40 and fed into the belt 42 which assembles the finished strips in a stack, at the opposite end of the machine.

It is evident from the foregoing description of this invention that a combined scoring, printing, cutting and bending machine for finishing safety strips for match boxes as therein described, produces such strips in uniform quantities and in an inexpensive manner.

Although one embodiment of the invention has been herein described and set forth, it will be obvious to those skilled in the art that various modifications may be made in the details of construction without departing from the principles herein set forth.

We claim herein as our invention:

1. Apparatus for making printed strips comprising the combination of a printing cylinder, a pair of scoring rolls in the path of the sheet material, a rotatable cutter acting upon the material transversely of its length and having edges in angularly spaced relation, a conveyor for engaging the cut-off portions, and means for bending the ends of the cut-off portions on the line of scoring, and conveying means for engaging the bent strips and for stacking them.

2. Apparatus as set forth in claim 1 in which the operations of the printing cylinder and cutter are coordinated to cut-off the strips with the printed matter suitably spaced from the edges thereof.

3. Apparatus for making printed strips comprising in combination a supporting

frame structure, a pair of scoring rolls, a printing cylinder, a rotatable cutter and bending mechanism arranged in longitudinally spaced relation and adapted to successively act upon an endless strip of sheet material in the order named to score it adjacent the edges thereof, to print it, cut it in predetermined lengths and bend the cut-off members on the line of scoring, means for feeding the sheet material from a supply roll at one end of the machine, and means for assembling the finished bent strips at the other end thereof.

4. Apparatus as set forth in claim 3 in which the elements acting upon the strip are positively driven to reduce the strain on the sheet material passing through the machine.

In testimony whereof we have hereunto set our hands this 24th day of April, 1929.

THOMAS A. PALMER.
JOHN W. DENMEAD.

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