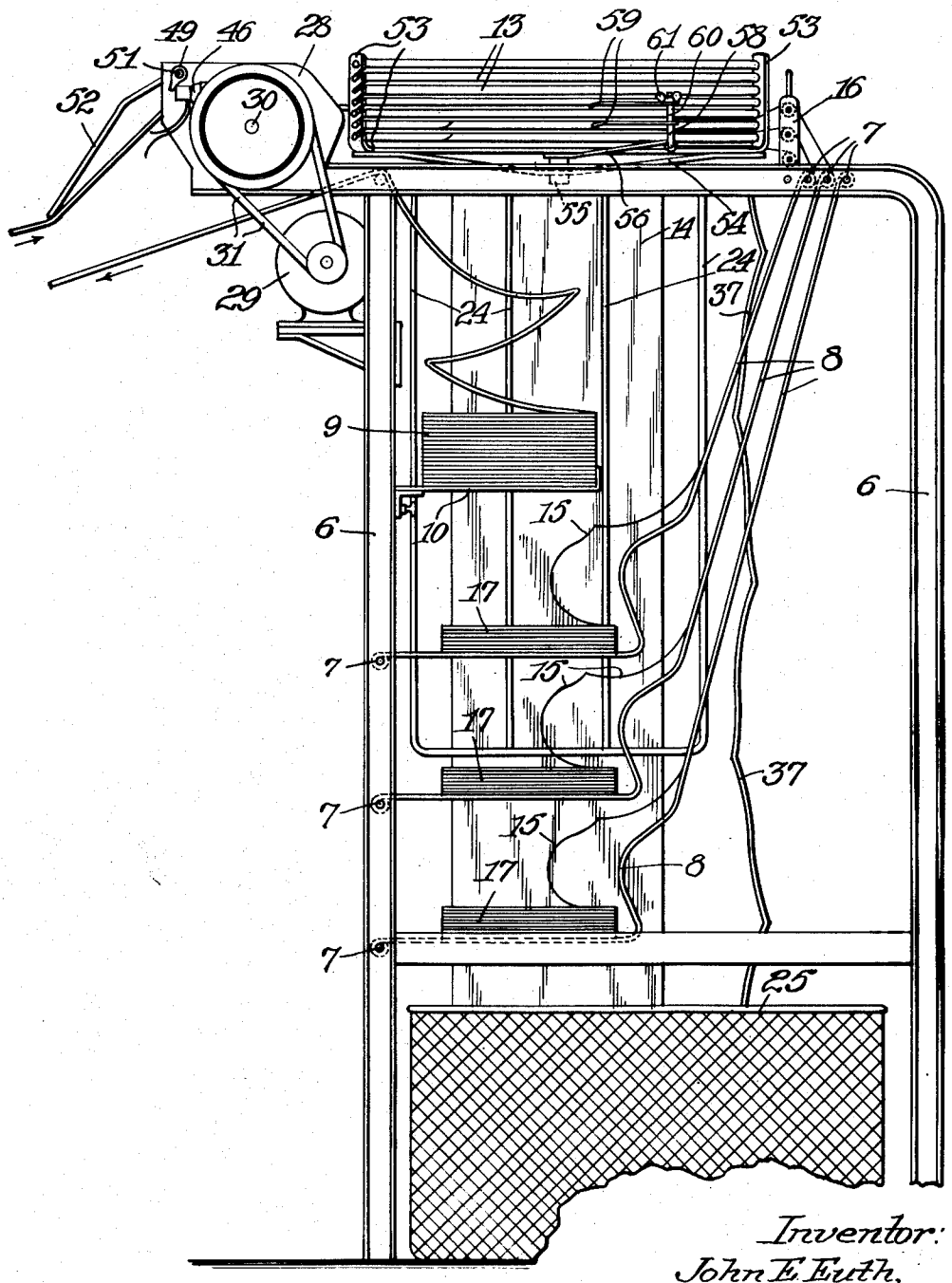
April 21, 1942. J. E. EUTH 2,280,224

CARBON DELEAVING MACHINE

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Fig. 1.



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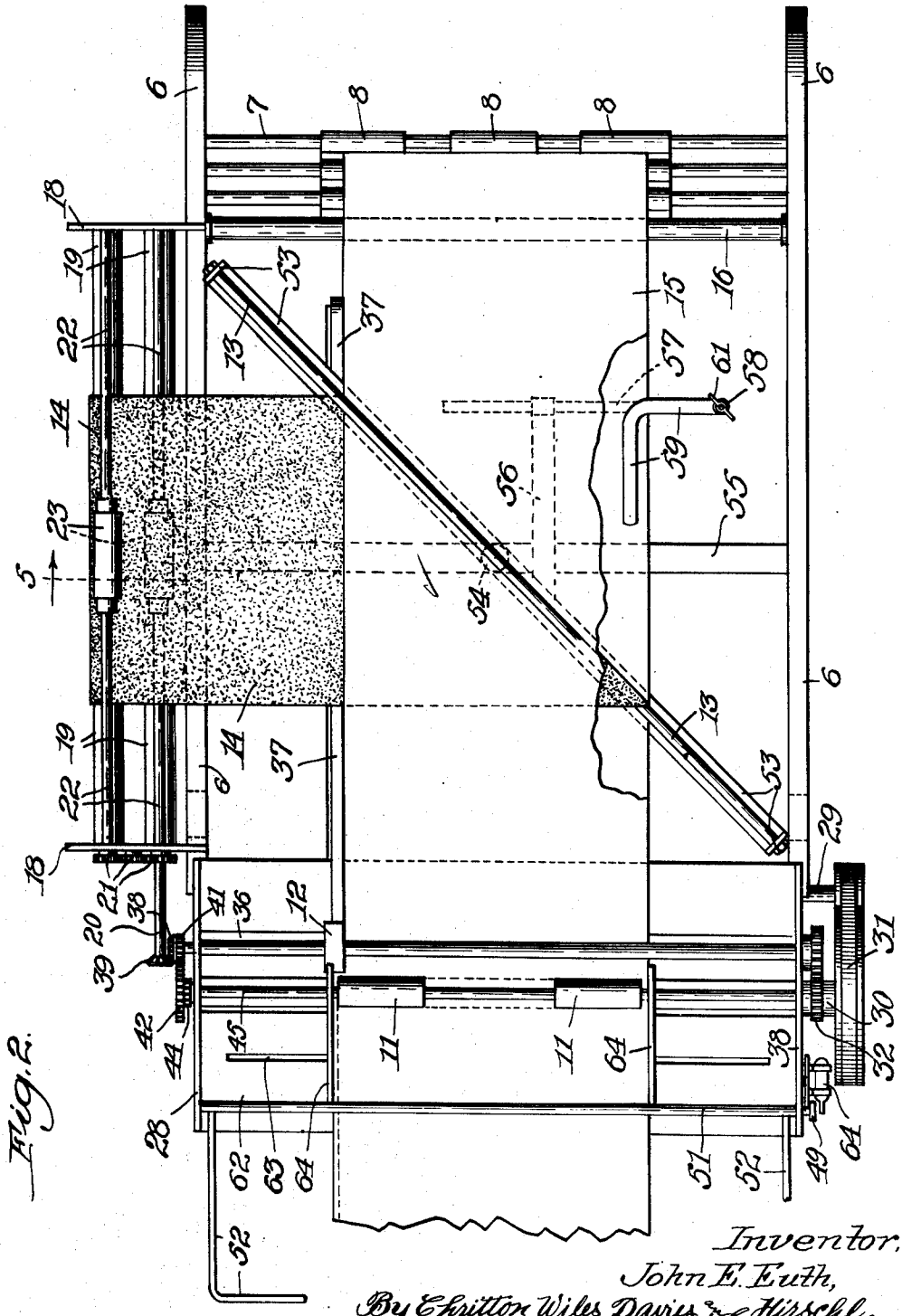


Fig. 2.

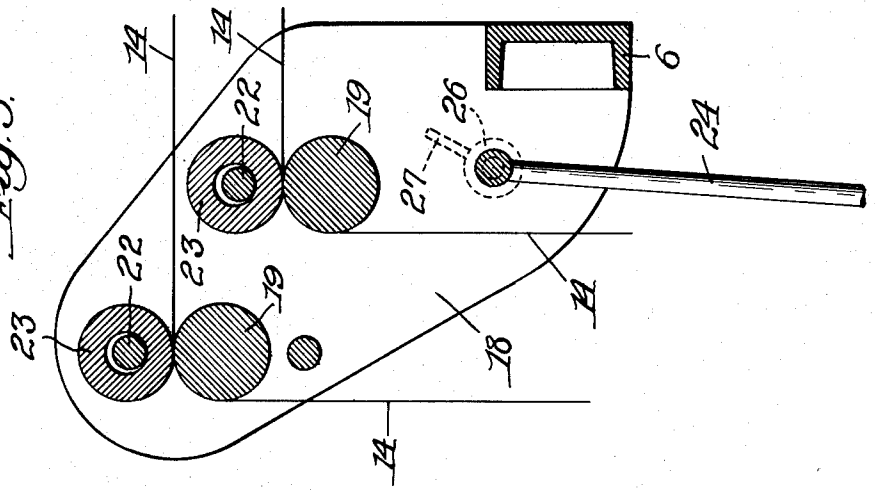
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Filed July 28, 1941 3 Sheets-Sheet 3

Fig. 5.



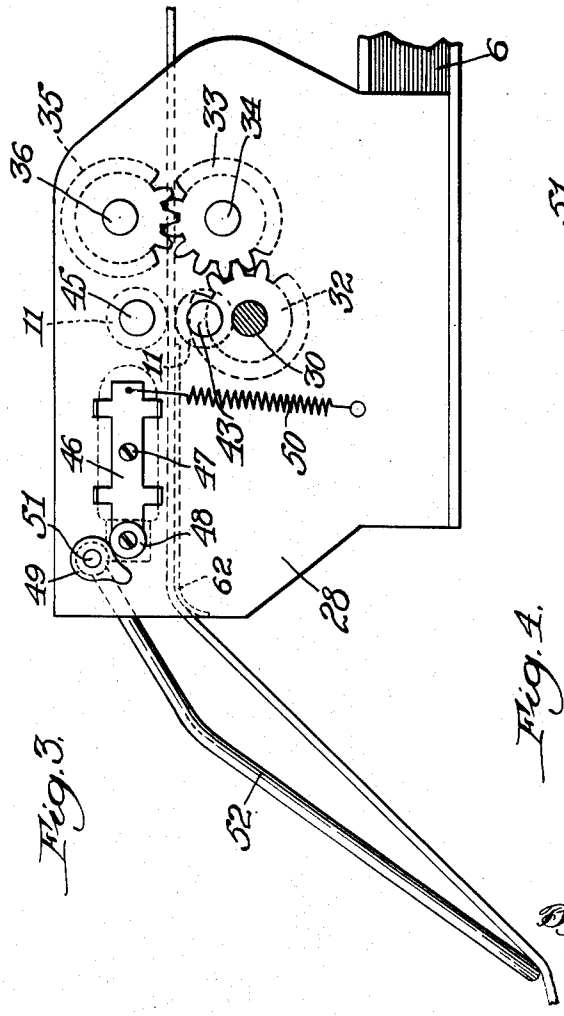


Fig. 3.

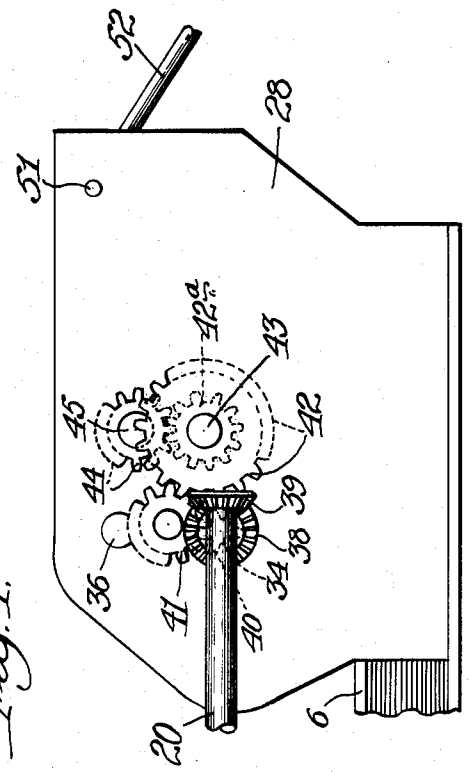


Fig. 4.

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UNITED STATES PATENT OFFICE

2,280,224

CARBON DELEAVING MACHINE

John E. Euth, Chicago, Ill., assignor to United Autographic Register Co., a corporation of Illinois

Application July 28, 1941, Serial No. 404,435

9 Claims. (Cl. 164—61)

This invention relates to machines for separating carbon strips from continuous-form stationery strips after a writing operation, and more particularly to a machine which is automatically controlled and will refold the stationery strips into separate zigzag folded packs.

The primary object of the invention is to provide an automatic deleaving machine which may be placed in rear of a tabulating machine or the like, and will automatically deleave and refold the stationery at whatever rate it is passed through the tabulating machine.

A further object of the invention is to provide improved guide-means for refolding the stationery under the influence of gravity and to provide improved guide-means for handling stationery of various widths.

Another object of the invention is to provide a machine in which the carbon strips may be drawn through the machine and the friction between the carbons and stationery strips will be sufficient to propel the stationery into the guide device.

Another object of the invention is to provide feed-rolls for advancing the stationery to a rotary cutter and another set of feed-rolls for pulling the carbon laterally over biased turn-bars, both sets of feed-rolls and cutter mechanism being driven by a single motor which is controlled automatically by the tension of the paper advancing to the machine.

The invention is illustrated in a preferred embodiment in the accompanying drawings, in which:

Figure 1 is a broken side elevational view of a machine embodying the invention; Figure 2 is a fragmentary top plan view of the same; Figure 3, a fragmentary side elevational view showing the automatic switch; Figure 4, a fragmentary view of the opposite side of the machine from that shown in Figure 3 and showing part of the gearing; and Figure 5, a fragmentary sectional view, taken as indicated at line 5 of Figure 2.

In the embodiment illustrated, a main frame is formed by channel members 6 connected by suitable cross-rods 7 on which sheet metal curved guide-members 8 are laterally adjustable to accommodate various widths of stationery. A pack 9 of continuous-form stationery interleaved with carbon strips may be supported on a suitable shelf 10 and the stationery drawn into the rear of a tabulating machine from whence it may be drawn under tension to the top of the deleaving machine.

The stationery is drawn into the deleaving machine by means of a pair of rear sets of feed-rolls 11 through a rotary cutter 12 and thence through a set of biased turn-bars 13 which deflect carbon strips 14 laterally, as shown in Figure 2, while the stationery strips 15 pass through the guide frame 16 and thence downwardly into refolded packs 17.

As shown in Figures 2 and 5, a pair of rearwardly extending brackets 18 support and form bearings for carbon feed-rolls 19 which are driven from a shaft 20 by means of spur gears 21. Above each driven roll 19 is a cross-bar 22, on which is loosely journalled a cylindrical presser roll 23. The weight of the rolls 23 provides sufficient pressure on the carbon strips 14 to produce a satisfactory feeding operation. As shown in Figures 1 and 5, a guide-member 24 is suspended from the brackets 18 and serves to guide the carbon strips 14 away from the frame of the machine and permits them to drop into a waste-basket 25. An adjusting lock nut 26 with an arm 27 permits the guide-member to be swung outwardly to a desired fixed position.

The stationery is drawn into the deleaving machine, directly from a tabulating or typewriting machine, as stated above, by a feeding and cutting mechanism carried by plates 28 at the top and front of the machine. An electric motor 29 is mounted on a front bracket and drives a shaft 30 by means of a belt 31. The shaft 30 is provided with a gear 32 which meshes with a gear 33 on the lower cutter roll shaft 34, as shown in Figure 3. The gear 33 also meshes with a spur gear 35 on the upper cutter roll shaft 36 so that the cutter shafts will rotate together at the same rate of speed. The cutter rolls 12 are laterally adjustable on the shafts 34 and 36, so that they trim off marginal binding strip 37 which may hold the carbon sheets 14 and stationery strips 15 together prior to the deleaving operation.

As shown in Figure 4, the opposite end of the shaft 34 is provided with a miter gear 38 which meshes with the miter gear 39 on the shaft 20 and drives the carbon feed-rolls 19. The shaft 34 is also provided with a spur gear 40 which meshes with a larger idler gear 41 which meshes with a spur gear 42 on the lower feed-roll shaft 43. Fixed to the gear 42 is a spur gear 42a which meshes with a spur gear 44 provided on the upper feed-roll shaft 45. Thus it will be understood that the feed-rolls 11 on the shafts 43 and 45 rotate at constant speed to draw the interleaved stationery into the machine and that the carbon feed-rolls will be driven in timed relation to

withdraw the carbon laterally from the advancing stationery.

In order that the deleaving machine may be operated automatically in timed relation to an associated tabulating machine or any other machine which may be operating intermittently, an automatic control is provided which is responsive to the tension on the stationery being drawn into the deleaving machine.

As best shown in Figures 1 and 3, a mercury switch 46 is pivotally mounted at 47 and has one end yieldingly urged into engagement with a cam 49 under the influence of a tension spring 50. The cam 49 is fixed to a shaft 51 which is journalled in plates 28 and has an operating arm 52 which bears downwardly against the tensioned interleaved strip under the influence of gravity. The mercury switch is connected in the circuit (not shown) of the motor 29 so that whenever the tension in the strip is not sufficient to hold arm 52 in the position shown in Figure 1, the arm will drop and cause the cam 49 to tip the mercury switch and thereby energize the motor and start the feed-rolls and cutter mechanism to operate. When sufficient tension develops in the advancing interleaved strip, it will raise the arm 52 and the motor will automatically be shut off by the mercury switch, as will be readily understood.

In the embodiment illustrated, the carbon is withdrawn laterally from the path of the stationery by means of turn-bars 13 which are removably mounted in a U-shaped rack 53 which has a supporting member 54 secured to a cross-bar 55 extending between the channel members 6 of the main frame. The turn-bars are shown disposed at an angle of 45°, so that the carbon may be withdrawn at right angles to the path of the stationery.

As shown in Figures 1 and 2, a special supporting guide is also provided for the stationery after it passes the turn-bars. A supporting bar 56 is fixed to the cross-bar 55 and frictionally grips a laterally adjustable rod 57, which has one end turned upwardly, as indicated at 58. A series of L-shaped guide-fingers 59, separated by a spacing washer 60, may be gripped in position by a winged nut 61. The fingers 59 serve to support one marginal edge portion of the stationery as it passes from the turn-bars to the guide-members 8. At the front of the machine, the first passes over a table 62 which is slotted at 63 and is provided with laterally adjustable guides 64.

In the embodiment illustrated, only three continuous-form strips with two interleaved carbon strips are shown, although more turn-bars 13 are provided than necessary for such stationery. It will be understood, however, that the machine may be enlarged by providing additional guides and the deleaving operation performed in exactly the same way.

The deleaving machine is loaded after sufficient stationery has travelled from the pack 9, and through the tabulating machine to permit a three or four foot length to extend beyond the feed rolls 11. The end of the strip is inserted under the feed rolls 11 and the paper may be fed through by power and all of the strips projected over the turn-bars 13. The power to the motor is then shut off by an ordinary line switch (not shown). The free end of the strips may then be turned back over the feed rolls 11 and the bottom stationery strip with its superposed carbon strip is threaded between the lower turn-bar 13 and the support 53. The stationery strip is threaded over the lower roll in the guide frame 16 and directed over the front guide-members 8 to refolding position. The adjacent superposed carbon strip is then turned over the lower bar 13 and directed between the nearest carbon feed roll shaft 19 and presser roll 23. In the same way, the next lowest stationery strip and its superposed carbon strip is threaded between the two lower turn-bars 13, and after the stationery strip is directed into the next chute, the carbon strip is turned up over the adjacent turn-bar and is threaded between the carbon feed rolls. The top stationery strip may be threaded straight through and directed into the third chute. After smoothing out the various strips, the line switch may be turned on again and the feeding controlled by the automatic switch.

In operation, the interleaved stationery is drawn by the rear feed-rolls 11, under tension, into the machine. If the tension increases sufficiently to raise the arm 52, the motor will be shut off by the mercury switch to avoid danger of tearing the paper. While the motor is operating the rear feed-rolls 11, the rotary cutters 12 and the carbon rolls 23 are driven in timed relation. The carbon passes over the turn-bars and is withdrawn laterally by the carbon rolls where they drop down over the guide 24 and into the wastebasket 25. The pulling of the carbon also helps to carry along the stationery so that it passes between the guides 8 where it is directed down into zigzag folded packs 17.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom for some modifications will be obvious to those skilled in the art.

I claim:

1. A machine for deleaving carbon strips from interconnected continuous-form stationery strips, comprising: a frame to which marginally connected stationery strips may be drawn under tension; a rotary cutting mechanism mounted on said frame to trim off a marginal binding edge of said stationery strips fed therethrough; feed-rolls for advancing the strips through the cutter mechanism; guide-means for directing the stationery strips into separate zigzag folded relation; power-means for driving said cutting mechanism and feed-rolls in timed relation; and control-means for energizing the power-means, said control-means having an arm resting on the strips advancing to said frame so as to make the control-means responsive to the tension on said strips.

2. A device as specified in claim 1, in which the feed-rolls, in rear of the cutter mechanism, engage only the carbon strips.

3. A device as specified in claim 1, in which angularly biased turn-bars are provided between the stationery strips so that the carbons may be drawn laterally from the path of the stationery strips, and the feed-rolls will engage the carbon strips after they have been deleaved from the said stationery strips.

4. A machine for deleaving carbon strips from interconnected continuous-form stationery strips, comprising: a frame over which continuous-form stationery strips interleaved with carbon strips may be drawn under tension; feed-rolls adapted to engage the carbon strips and separate them from said stationery strips; guide-means for directing the separated stationery strips into

zigzag folded relation as they advance downwardly under the influence of gravity; electric power-means for driving the feed-rolls; and a control-switch for said power-means having an operating arm resting on the interleaved strips advancing to the frame so that the starting and stopping of the machine is responsive to the tension on said strips.

5. A machine for deleaving carbon strips from interconnected continuous-form stationery strips, comprising: a frame over which continuous-form stationery strips interleaved with carbon strips may be drawn under tension; a pair of rear feed-rolls for advancing said interleaved strips; a pair of carbon feed-rolls adapted to engage the carbon strips and separate them from the stationery strips; unitary electric drive-mechanism for driving both sets of feed-rolls in timed relation; and an electric switch, responsive to the tension in the interleaved stationery, for controlling said drive-mechanism.

6. A device as specified in claim 5, in which angularly biased turn-bars are disposed in advance of the rear feed-rolls so that the carbon strips may be withdrawn laterally from the stationery strips, and the carbon feed-rolls are horizontally disposed at a right angle to the rear feed-rolls.

7. A machine for deleaving carbon strips from interconnected continuous-form stationery strips, comprising: a frame over which continuous-form stationery strips interleaved with carbon strips may be drawn under tension; a pair of rear feed-rolls for advancing said interleaved strips; a pair of carbon feed-rolls adapted to engage the carbon strips and separate them from the stationery strips; angularly biased turn-bars in advance of the rear feed-rolls for directing the carbon strips laterally out of interleaved relation; guide-means for directing the separated stationery strips into zigzag folded relation as they advance downwardly under the influence of gravity; electric power-means for driving the feed-rolls; and a control-switch for said power-means having an operating arm resting on the interleaved strips advancing to the frame so that the starting and stopping of the machine is responsive to the tension on said strips.

8. A device as specified in claim 7, in which the guide-means includes a plurality of curved sheet metal strips which are laterally adjustable on cross-bars provided on the frame of the machine.

9. A device as specified in claim 7, in which a U-shaped adjustable guide is provided, adjacent to the carbon feed-rolls, to direct the carbon strips laterally away from the machine.

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