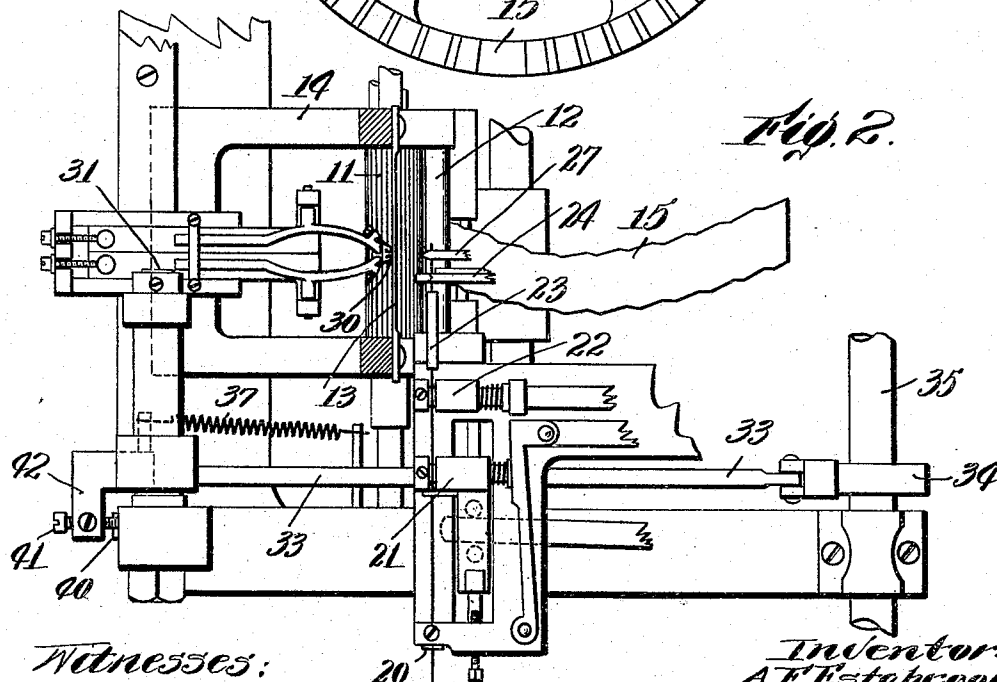
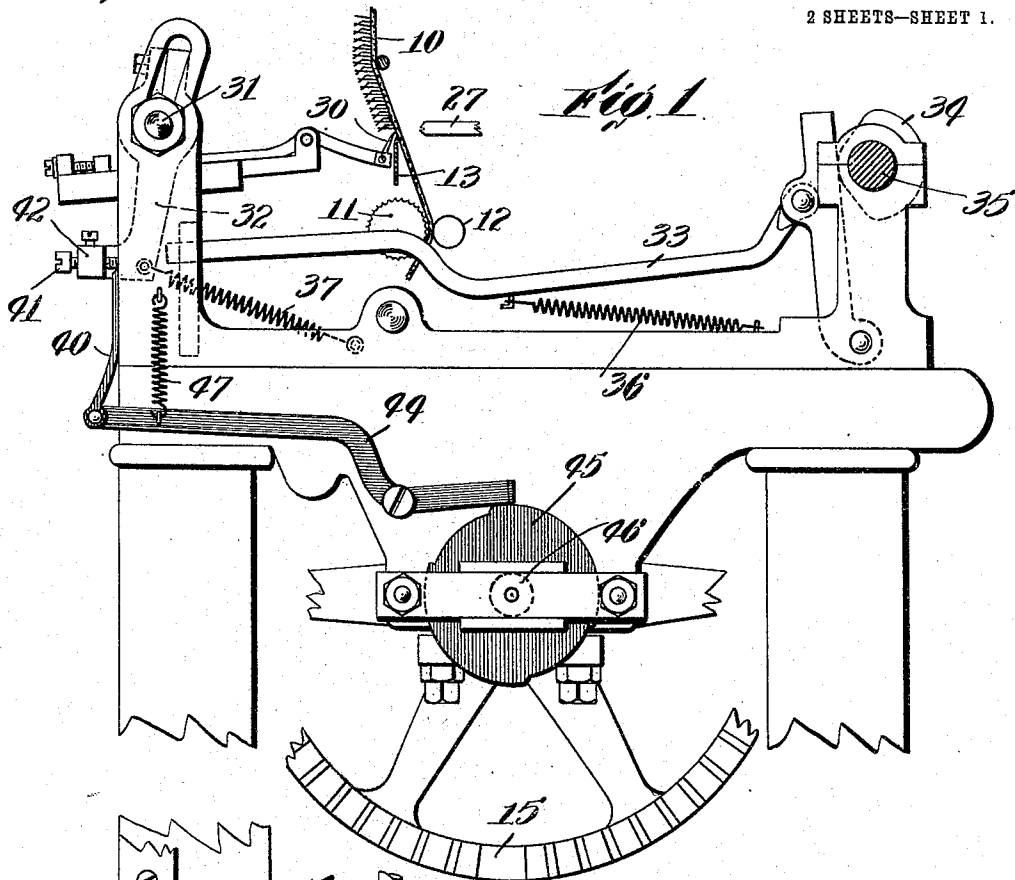


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 APPARATUS FOR MAKING CARD CLOTHING.
 APPLICATION FILED JAN. 10, 1908.

937,058.

Patented Oct. 19, 1909.

2 SHEETS—SHEET 1.



Witnesses:

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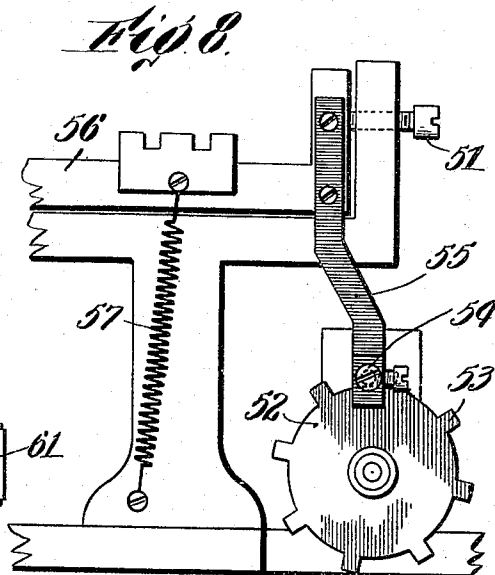
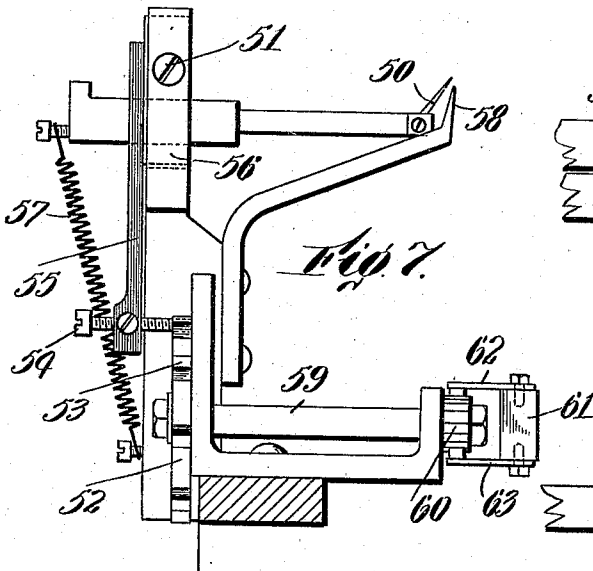
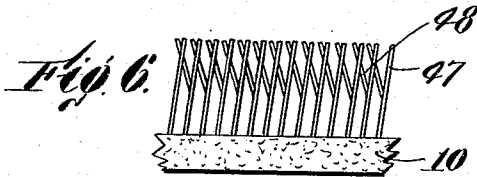
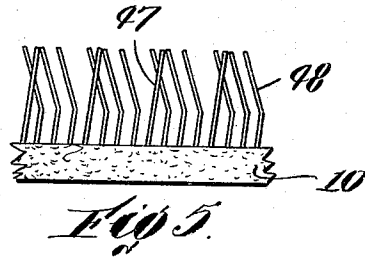
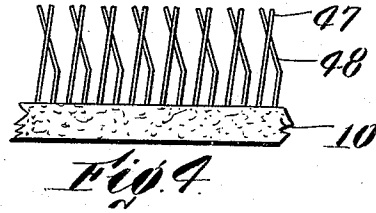
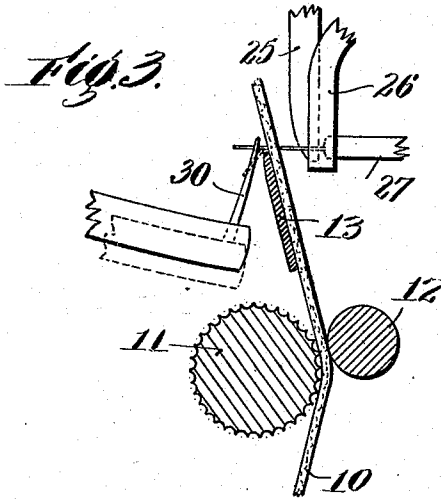
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ARTHUR F. ESTABROOK AND GEORGE O. CURRIER, OF LEICESTER, MASSACHUSETTS.

APPARATUS FOR MAKING CARD-CLOTHING.

937,058.

Specification of Letters Patent.

Patented Oct. 19, 1909.

Application filed January 10, 1908. Serial No. 410,134.

To all whom it may concern:

Be it known that we, ARTHUR F. ESTABROOK and GEORGE O. CURRIER, citizens of the United States, both residing at Leicester, in the county of Worcester and State of Massachusetts, have invented a new and useful Apparatus for Making Card-Clothing, of which the following is a specification.

This invention relates to an apparatus for making card clothing, the principal objects being to provide means applicable to all forms of card setting machines for producing a form of card clothing in which some of the wires are bent and some of them are straight. This is preferably carried out by providing for the periodical prevention of the operation of any of the ordinary means (ordinarily called the second bender die) for bending the wires or staples.

Reference is to be had to the accompanying drawings which show certain ways in which the invention may be applied to certain forms of card clothing machines and illustrate how the invention may be carried out, and in which,

Figure 1 is an elevation of a part of one form of a card setting machine showing the invention applied thereto. Fig. 2 is a fragmentary plan of the same. Fig. 3 is a diagrammatic view showing the operation. Figs. 4, 5 and 6 are side views of three forms of card clothing on an enlarged scale which may be made in accordance with this invention, and Figs. 7 and 8 are elevations of a portion of another machine showing how the invention may be applied thereto.

Referring first to Figs. 1, 2 and 3, it will be seen that the invention is herein shown as applied to a machine in which the foundation strip 10 is carried between a feed roller 11 and the friction roller 12 up over a rest 13, these parts being mounted on a reciprocating carriage 14 the operation of which is controlled by a cam wheel 15 as is well understood in this art. In this type of machine, the wire for forming the staples which are to be passed through the foundation is fed through an eye 20 into a draw 21 from which it is received in a holder 22 and passed through a guide 23 to shears 24 and is bent up and forced over a doubler 25 by means of wings 26 and forced through the foundation by means of a crowner 27. As the foundation moves upwardly in an inclined direction and the staples in this type of machine are forced in horizontally,

they will be left at a slight inclination to the surface of the foundation. They are then engaged by a second bender die 30 to form the ordinary bends. This die is movably mounted so as to swing, or reciprocate or both and moves upwardly to make the bend. It is shown as swinging on a shaft 31 and is connected with an arm 32 which swings with it. This arm is controlled by a rod 33 adapted to be operated by a cam 34 on a cam shaft 35. A spring 36 acts to keep the rod in a certain position except when operated by the cam and another spring 37 acts normally to cause the arm 32 to follow the rod 33 back.

The ordinary operation is as follows:—The bending die is moved down by the operation of the bar 33 to the left and is moved up by the spring 37. Ordinarily this total reciprocation of the bending die occurs as each row of pins comes into proper position so that each row is bent.

The parts of the machine so far described are well known and they have not been described herein in detail as they do not form a part of the present invention except as the invention may be combined with those parts to produce the desired results. In order to do this, the machine is provided with a stop 40 adapted to engage an adjustable screw 41 on a projection 42 extending from the arm to stop the arm and hold it, as well as the second bender die, in inoperative position. This stop comes against the frame when the bender die 30 operates and is connected in the present instance with a lever 44 mounted to swing on a pivot and controlled by a disk or cam 45 mounted on the shaft 46 which carries the cam wheel 15. This disk or cam is so constructed that while the high portions are in contact with the lever 44, the stop 40 is withdrawn, and the bending die operates in the normal manner. But when the low parts of the cam engage the lever 44 a spring 47 moves the stop 40 up, which holds the second bender die down in inoperative position during the desired number of operations of the machine in order to allow one or more rows of staples to pass by without being bent.

It will be readily understood that when it is desired to produce a different piece of card clothing, that is one in which the number of rows of bent or unbent wires or staples will be changed, the cam 45 can be removed and replaced by another one having the proper

shape for accomplishing the desired result. It will be obvious that the forms of card clothing which can be made in this way may be varied within wide limits because the shaft 46 rotates only once while the staple forming and setting mechanism goes through several operations. Consequently, by varying the form of the cam 45, the machine may be made to produce card clothing having alternate rows of bent and straight wires or one row of either and a larger number of rows of the other or in fact it can be varied to produce for instance, first one number of rows of straight wires, then a different number of rows of bent wires, then still a different number of rows of straight wires if desired and in fact any combination of this kind within the limits of the machine.

Three simple forms of card clothing which may be produced are shown in Figs. 4, 5 and 6. In Fig. 4 the foundation 10 is provided with alternate cross rows of straight and bent wires 47 and 48 respectively, while in Fig. 5 the foundation is provided with one transverse row of straight wires to every three rows of bent wires. The rows may extend across the foundation or in any other direction according to the design of the cam and other parts of the machine. In Fig. 6 they are longitudinal.

In Figs. 7 and 8 is shown a form in which the second bender die 50 is mounted on a bender frame 56 which is arranged to swing on an axis 51. This frame is operated in any desired way and provided with a spring 57 for turning it to normal position. The usual rest 58 is provided adjacent to the bender die. The parts so far described in this construction operate continuously to bend the wires. In order to interrupt the bending operation and prevent it from taking place periodically, the following mechanism is provided:— On the frame 56 is fixed an arm 55 which is provided with an adjustable screw 54. Mounted on a shaft 59 is a wheel 52 having teeth or projections 53 spaced apart in any desired way. In the form shown, each space between two of the projections is substantially equal in width to three of the projections. The shaft 59 is provided with a ratchet-wheel 60 operated in any desired way, as for example, by a reciprocating bar 61 having two pawls 62 and 63 thereon, one of which rotates the wheel in one direction on the forward motion, and the other rotates it in the same direction on the backward motion, so as to provide a rotation of the wheel 52. The end of the screw 54 is so arranged that as the wheel 52 rotates and the frame 56 oscillates, on certain motions of the screw 54 toward the wheel it will engage one of the teeth or projections 53, but at other times it will pass into the space between two of the teeth. When it is free to oscillate in the space between two teeth the bender die oper-

ates in the usual manner, but when it engages one of the teeth the bender die is held down and its operation prevented. Consequently if the space between two teeth is equal to the width of three of the teeth the device will produce card clothing having one straight tooth for every three bent teeth. It will be obvious that by changing the wheel, the character of the card clothing can be changed within any desired limits.

While we have illustrated and described certain preferred forms of the invention, we are aware that many modifications may be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims, we do not wish to be limited to the details of construction shown.

Having thus fully described our invention, what we claim is:—

1. In a card-setting machine, the combination with a bender die, of means for operating it, and means for periodically preventing the operation of the bender die.

2. In a card-setting machine, the combination with a bender die, of means for applying wires to a foundation, means for operating said bender die to bend certain of said wires after they are applied, and means for interrupting the operation of said operating means to permit some of the wires to remain straight.

3. In a card-setting machine, the combination of a rest, means for feeding a foundation over the rest, means for applying wires to the foundation, means for bending the wires over the rest, and means for throwing the bending means out of operation periodically.

4. In a card-setting machine, the combination of a rest over which a foundation is adapted to be fed, means for applying staples to said foundation; means for bending certain of said staples over the edge of the rest, and means for periodically interrupting the operations of the bending means.

5. In a card-setting machine, the combination of a rest, means for feeding a foundation over the rest, means for applying wires to the foundation, means for bending the wires over the rest, and means for throwing the bending means out of operation periodically, said means comprising a bender die, an arm connected therewith and adapted to turn with the bender die, and movable means for preventing the bender die from moving into operative position.

6. In a card-setting machine, the combination of a rest, means for feeding a foundation over the rest, means for applying wires to the foundation, a swinging bender die, an arm swinging with the die, a stop adapted to move into position to engage the arm and prevent the die from moving into operative position, a lever connected with

said stop, and means for operating the lever to control the operation of the stop.

7. In a card-setting machine, the combination with a carriage, a wheel for controlling the operation of the carriage, a bending device, and means connected with said wheel for causing the bending device to skip certain operations.

8. In a card-setting machine, the combination with a carriage, a wheel for controlling the operation of the carriage, a bending device, and means connected with said wheel

for controlling the bending device, said means comprising a movable stop, and a cam rotatable with said wheel for operating the stop.

In testimony whereof we have hereunto set our hands, in the presence of two subscribing witnesses.

ARTHUR F. ESTABROOK.

GEORGE O. CURRIER.

Witnesses:

A. E. FAY,

C. FORREST WESSON.