A. L. GRAMMER.

MACHINE FOR MAKING SIGNATURES.

APPLICATION FILED MAR. 28, 1919.

1,326,860.

Patented Dec. 30, 1919.

2 SHEETS—SHEET 1.

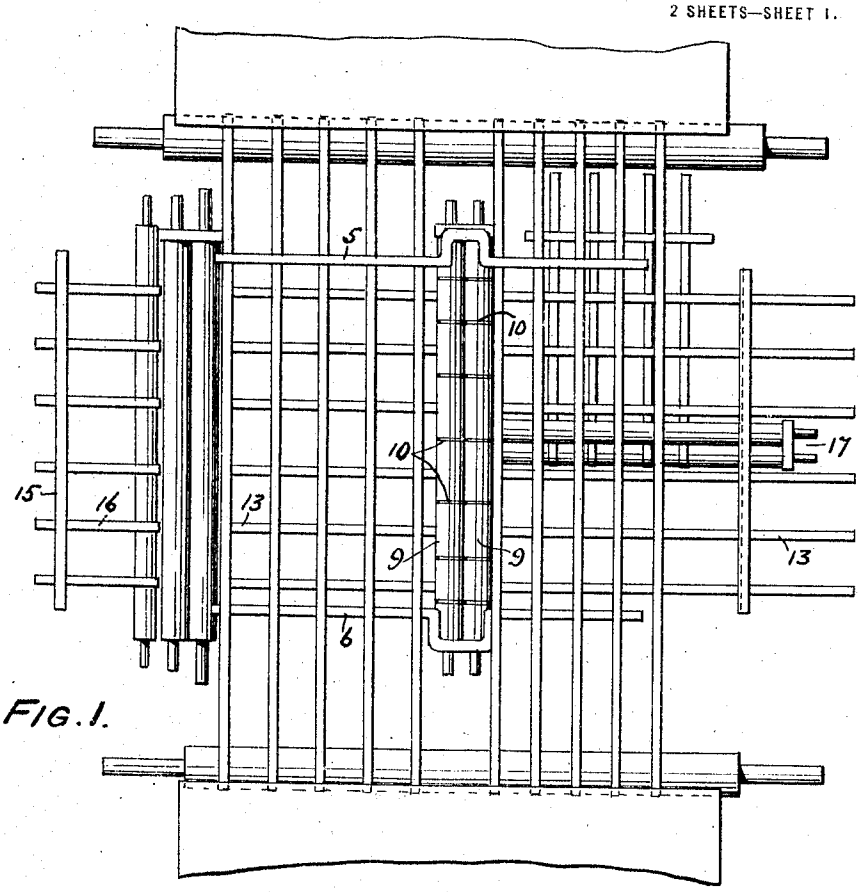


FIG. 1.

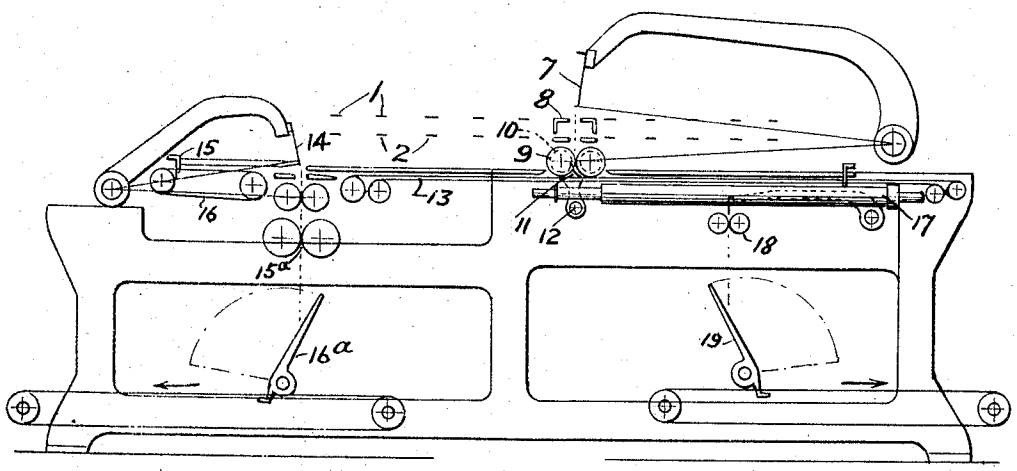


FIG. 2.

WITNESS:

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2 SHEETS—SHEET 2.

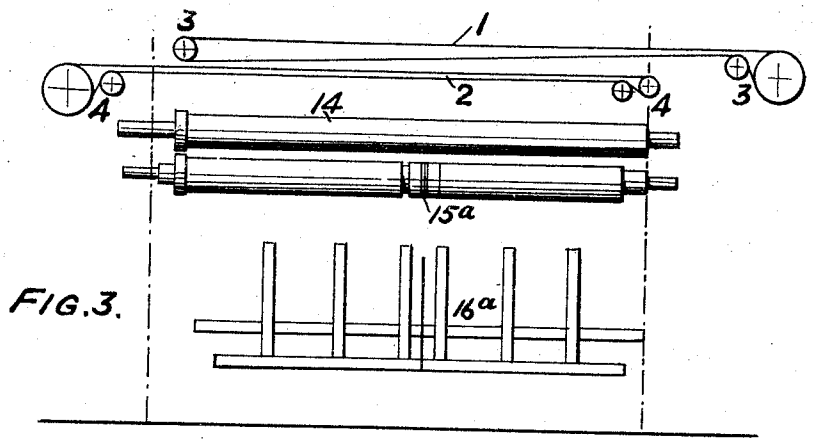


FIG. 3.

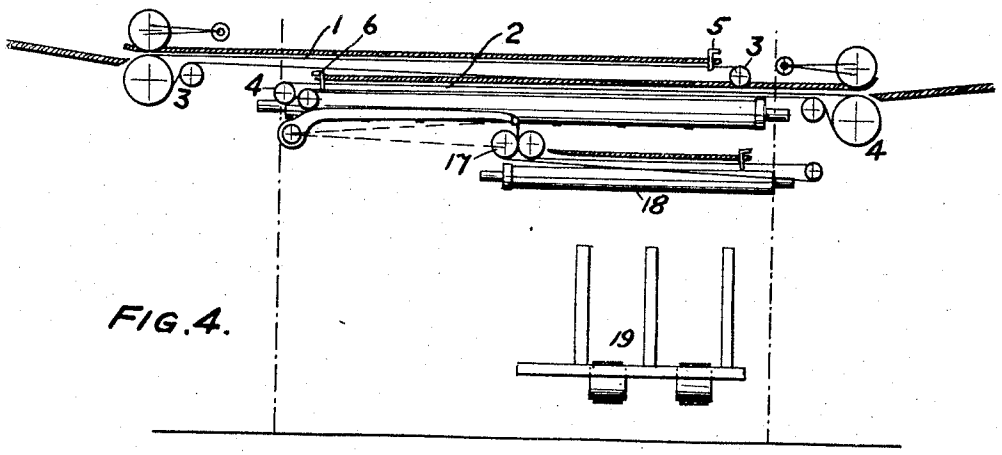


FIG. 4.

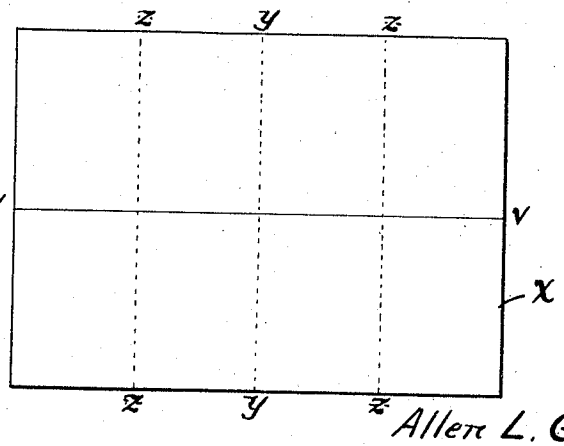


FIG. 5.

WITNESS:

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UNITED STATES PATENT OFFICE.

ALLEN L. GRAMMER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO CURTIS PUBLISHING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

MACHINE FOR MAKING SIGNATURES.

1,326,860. Specification of Letters Patent. Patented Dec. 30, 1919.

Application filed March 28, 1919. Serial No. 285,916.

To all whom it may concern:

Be it known that I, ALLEN L. GRAMMER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Making Signatures, of which the following is a specification.

In my application for a patent Serial No. 284,795, filed March 24th, 1919, I have described among other things the manufacture of signatures by superposing detached sheets of printed pages, either wholly black or partly color, prior to folding; and then folding the superposed sheets into page form and cutting them or not as desired.

The objects of the present invention are, first, to provide a machine for use in that method of manufacture, second to enable the machine either to fold and cut duplicate signatures at one operation or to fold single signatures of larger size at one operation, and third, to provide a machine for increasing the rate of production of signatures.

Other objects of the invention will appear from the following description which will be given in connection with the accompanying drawings diagrammatically illustrating a form of embodiment of the invention chosen for the sake of illustration, and in which—

Figure 1, is a top or plan view.

Fig. 2, is a side view.

Fig. 3, is an elevational view of the left-hand end of the machine in Fig. 1.

Fig. 4, is a similar view of the righthand end, and

Fig. 5, is a view illustrative of a detached sheet printed in pages of black or color.

In the drawings I have illustrated the machine diagrammatically and have indicated partly by showing a frame and partly by means of center lines the relative positions of the parts as they occur in one embodiment of the invention, but I have omitted illustration of the driving gear because such gear needs no illustration to those skilled in the art and can be supplied by them from the following description. Again the embodiment of the invention chosen for illustration is adapted to simultaneously operate upon two sheets printed in eight pages on each side, but the machine of the invention can be made to operate simultaneously upon more than two sheets and upon sheets printed in different numbers of pages by duplication or omission of parts as will be evident from the following description:

There are overlapping feeding mechanisms arranged for operation in different planes and adapted to feed detached sheets into superposed relation. As shown in the drawings the series of belts 1 and 2, their driving rollers 3 and 4, and stops 5 and 6, constitute the principal parts of the feeding mechanisms, and these feeding mechanisms are arranged at different levels and operate to simultaneously feed detached sheets into the machine from opposite directions and to superpose the sheets in a position determined by the setting of the stops 5 and 6. There is a folder mechanism common to the feeding mechanisms and adapted to simultaneously fold the sheets which have been superposed by the feeding mechanisms. The principal parts of the folding mechanism illustrated in the drawings are the folder blade 7, and its actuating arm, the guides 8, and the folding and delivery rolls 9. The folding and delivery rolls 9, coöperate with a switch mechanism, and in the embodiment of the latter chosen for illustration the rolls 9, are grooved as at 10, for the reception of a switch 11, pivoted at 12, and adapted to direct the feed of the superposed and folded sheets to one side or the other according as the switch lies in the groove of one roll 9, or in the groove of the other roll 9. While I have referred to one switch and its complemental grooves, the number may of course be increased. Delivery mechanism is shown at 13, as consisting of a series of belts which are driven in either direction according to the position in which the switch mechanism 11, has been set. At one end of the delivery mechanism 13, toward the left in Fig. 2, there is a second folder mechanism 14, arranged parallel with the first folder mechanism and adapted to operate upon superposed sheets after they have been folded once by the first folder mechanism 7, and in order to fold the sheets a second time in the same direction. This folder mechanism 14, is substantially like the folder mechanism 7, and therefore needs no further description, although it may be remarked that it is provided with a stop 15, and with an auxiliary series of belts 16. At the exit of the second folder mechanism 14, there is a cutting

mechanism 15ª, shown as of the rotary disk variety, arranged parallel with the folding mechanism 14, and adapted to divide the twice folded sheets crosswise of their folds. 16ª, is ejection mechanism for delivering the multifolded and cut superposed sheets, or in other words, for simultaneously delivering a plurality of signatures. At the other end of the delivery mechanism 13, toward the right in Fig. 2, there is a third folder mechanism 17, arranged crosswise of the first folder mechanism 7, and at the delivery end of the third folder mechanism 17, there is a fourth folder mechanism 18, parallel with the first folder mechanism 7. The folder mechanisms 7, 17 and 18, operate to fold the superposed sheets twice in the same direction and once transversely of that direction. 19, is an ejector mechanism for delivering the multifolded superposed sheets or in other words the signatures. The folding mechanisms 17 and 18, need not be further described because they will be understood by those skilled in the art, or from the foregoing description.

For the sake of further description of the invention its mode of operation, as embodied in the machine illustrated in the drawings, will now be briefly summarized.

The inset and outset feeding mechanisms 1, 5 and 2, 6 simultaneously superpose detached printed sheets x, and the folding mechanism 7, folds all these superposed sheets at one operation along the line y—y, at the side edges of the pages; then according to the setting of the switch mechanism 11, and direction of travel of the conveyer 13, the superposed once folded sheets are fed toward the right or toward the left. If the superposed detached and once folded sheets are fed toward the left in Fig. 2, the folder mechanism 14, folds them along the line z—z, and the cutting mechanism 15, cuts them along the line v—v, producing two signatures which may be duplicates. If the superposed detached once folded sheets are fed toward the right, they are folded along the lines v—v and z—z, producing a single relatively large signature.

By superposing or insetting and outsetting the detached printed sheets x, as they ordinarily leave the presses and operating upon them in superposed relation the output of the machine is made very great and rapid, and the signatures themselves are improved in such a way that color and black can be properly placed and the signatures conveniently gathered.

It will be obvious to those skilled in the art that the invention is capable of embodiment in forms differing from the form illustrated and described.

I claim:

1. A machine for making signatures comprising the combination of a plurality of overlapping detached sheet mechanical feed-mechanisms arranged for contemporaneous operation in different planes and adapted to simultaneously feed sheets into superposed relation, a folder mechanism common to all the feed-mechanisms and adapted to fold the superposed sheets, a second folder mechanism parallel with and spaced to one side of the first folder mechanism, a cutter at the exit of the second folder mechanism, coöperating third and fourth folder mechanisms arranged crosswise of, and parallel with, and spaced to the other side of the first folder mechanism, and a switch delivery mechanism for the first folder mechanism, substantially as described.

2. A machine for making signatures comprising the combination of a plurality of overlapping detached sheet mechanical feed-mechanisms arranged for contemporaneous operation in different planes and adapted to simultaneously feed sheets into superposed relation, a folder mechanism common to all the feed-mechanisms and adapted to fold the superposed sheets, a second folder mechanism parallel with and spaced to one side of the first folder mechanism, a cutter at the exit of the second folder mechanism, cooperating additional folder mechanisms arranged crosswise of and parallel with, and spaced to the other side of the first folder mechanism, and a switch delivery mechanism for the first folder mechanism, substantially as described.

ALLEN L. GRAMMER.