No. 739,090. PATENTED SEPT. 15, 1903.

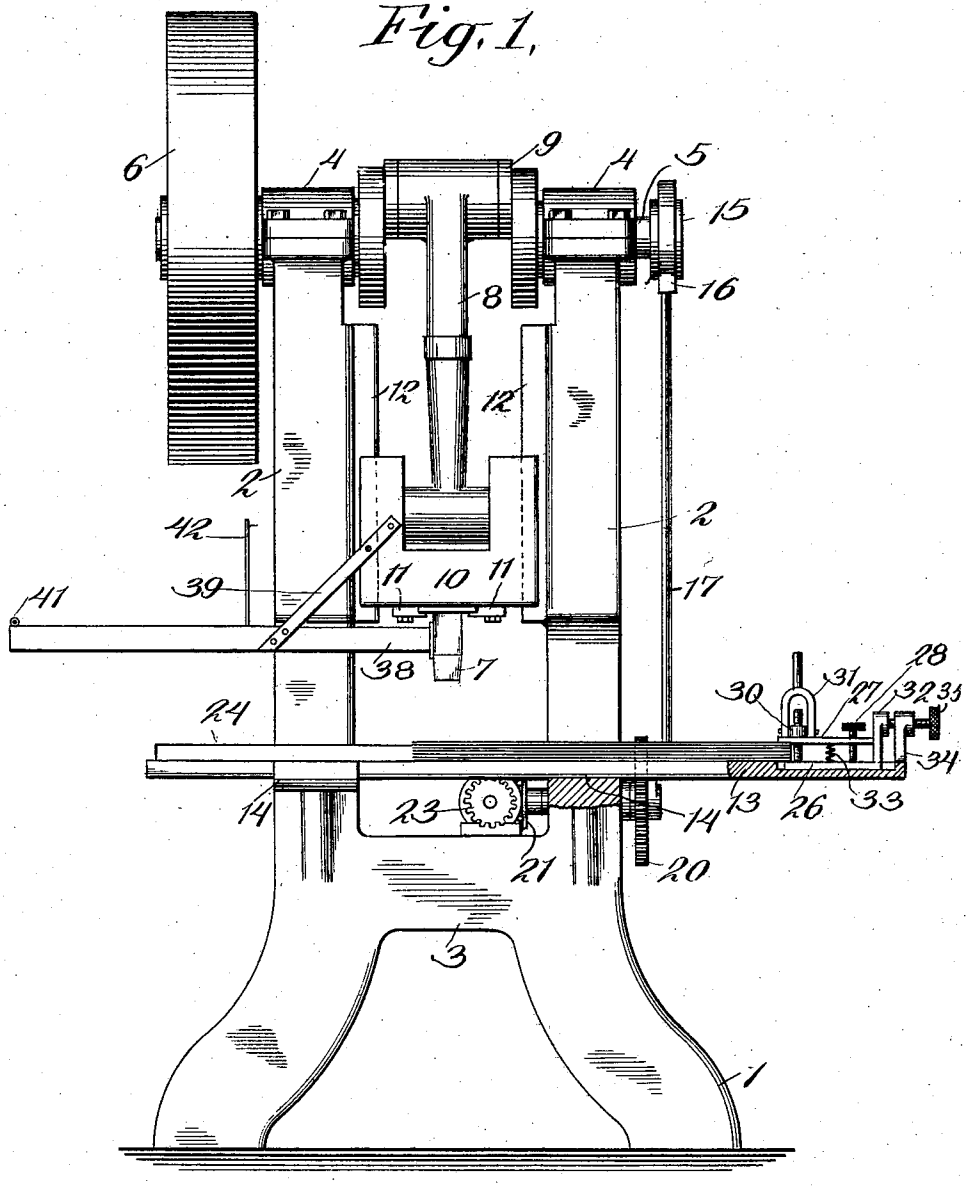
H. W. KUPFER & C. E. SCHODER.

DIE CUTTING MACHINE.

APPLICATION FILED JULY 9, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

John O. Kempler

Timothy E. Raftery

INVENTORS

Henry W. Kupfer

Charles E. Schoder

BY

Kenyon & Kenyon

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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DIE CUTTING MACHINE.

APPLICATION FILED JULY 9, 1902.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2

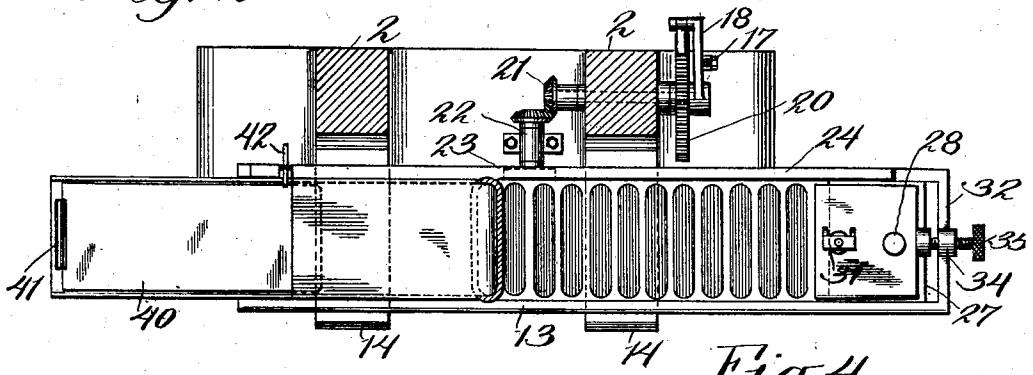


Fig. 4,

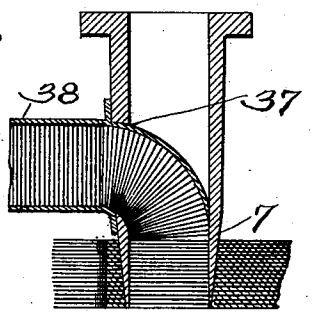


Fig. 3,

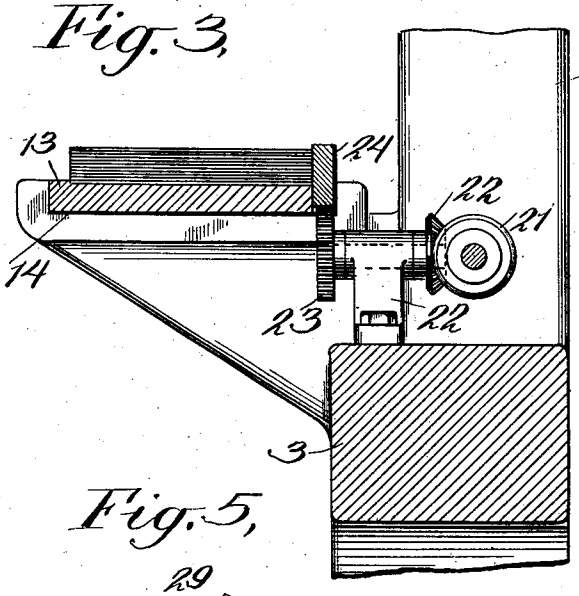


Fig. 6

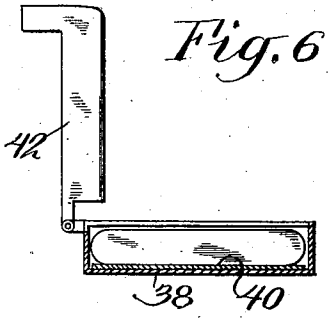


Fig. 5,

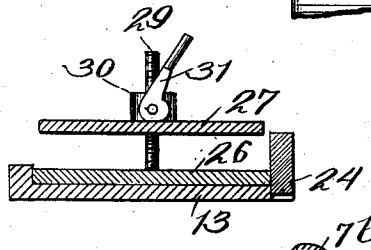


Fig. 7

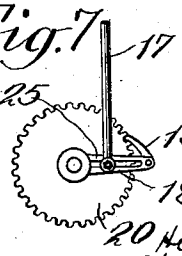
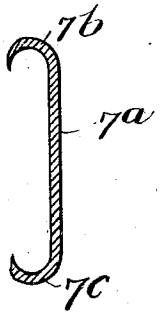


Fig. 8,



WITNESSES:

John O. Kempler

Timothy E. Raftery

INVENTORS

Henry W. Kupfer

Charles E. Schoder

BY

Kenyon & Kenyon

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 739,090. Patented September 15, 1903.

UNITED STATES PATENT OFFICE.

HENRY W. KUPFER AND CHARLES E. SCHODER, OF NEW YORK, N. Y.

DIE-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 739,090, dated September 15, 1903.

Application filed July 9, 1902. Serial No. 114,857. (No model.)

To all whom it may concern:

Be it known that we, HENRY W. KUPFER, a resident of the city and county of New York, and CHARLES E. SCHODER, a resident of the city of New York, borough of Bronx, State of New York, both citizens of the United States, have invented new and useful Improvements in Die-Cutting Machines, of which the following is a specification.

The invention relates to a die-cutting machine, and while the machine is particularly adapted for cutting out prints to be used as wrappers, labels, or the like it may also be used for cutting out patterns which have been marked or outlined in any way upon paper, cloth, or other similar materials.

In the manufacture of labels sheets of paper are first printed in suitable colors, so as to produce a group of label designs in rows and columns on each sheet. These sheets after being properly dried are assembled and are secured together to form registered packs or blocks, so that the prints on adjacent sheets will lie one on top of another. The blocks are then taken to a suitable cutting-machine and divided into sections, each section usually consisting of strips having single rows of prints, the prints of each strip lying on top of those of the strip beneath. Inasmuch as the sheets of each block have been dried the same length of time and under the same conditions the prints on each strip of the block will be substantially the same distance apart. The distance between the prints on the strips, however, will vary from day to day, owing to the differing conditions of the atmosphere. For this reason, among others, it has been the universal practice heretofore in cutting out the labels from these registered blocks to secure the proper cutting relation between the die and each set of prints on a block by separate hand adjustment. This, however, is a slow tedious process and adds materially to the cost of the production of the labels.

An object of the invention is to provide a die-cutting machine whereby the labels may be cut out of the registered blocks rapidly and with a minimum amount of hand adjustment or manipulation and one which will also cut out the prints with great accuracy and without wasting material or marring the prints.

These and other objects of the invention will more fully appear from the following description.

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

The accompanying drawings, which are referred to herein and form a part hereof, illustrate one embodiment of the invention and serve, in connection with the description herein, to explain the principles of the invention and the best mode contemplated of carrying these principles into effect.

Of the drawings, Figure 1 is a front elevation of a machine constructed in accordance with the invention. Fig. 2 is a horizontal section of the same, illustrating certain features of the mechanism in the plan. Fig. 3 is a vertical central section of a portion of the machine, illustrating certain details. Fig. 4 is a vertical sectional view illustrating a die-cutter adapted to be used in carrying out the invention. Fig. 5 and Fig. 6 are sectional views illustrating details. Fig. 7 is a side elevation illustrating a detail of the feeding mechanism, and Fig. 8 is a sectional view illustrating a modified form of die.

The invention generally considered would be embodied in a machine comprising a suitable die-cutting mechanism, means for supporting a registered bank of printed sheets in coöperative relation therewith, and means for securing a cutting relation between the die and the successive prints. The support for the bank of sheets preferably includes a cutting-bed for the die, and the means for securing a cutting relation between the die and the successive prints in the best embodiment of the invention comprises a feeding mechanism operated to intermittently advance the support for the sheets the distance between the successive prints during the intervals between the successive operations of the die. A registering mechanism is also preferably provided, whereby the operation of the feeding mechanism may be compensated for or corrected at intervals to secure accurate registry between the prints and the die, as hereinafter is more fully described.

Referring now to the drawings in detail, 1 indicates the base of the machine from which project two upright standards 2 2, suitably connected together by the integral cross-piece

or girder 3, and they carry at their upper ends bearings 4 4, in which the main shaft 5 is journaled.

7 is the cutting-die by which the prints or labels are cut out of the blocks of registered sheets. This die may be of any configuration such as is required to give the prints or labels the desired form. The die, as shown in Fig. 4, is made with the usual beveled outside cutting edges and straight inside walls, the latter serving to guide the labels to a suitable delivery or receiving device. In the preferred embodiment of the invention the die is moved to and from a relatively fixed cutting-bed upon which the labels are supported. The die may be actuated by any suitable mechanism. As shown, the shaft 5 is provided between the bearings 4 with a crank 9, which is connected by a pitman 8 with a cross-head 10, upon which the die 7 is removably secured in any suitable manner, as by the clamps 11. The cross-head is guided to move accurately in a vertical direction by the guide-flanges 12. The shaft 5 may be driven in any suitable manner to reciprocate the die, as by the pulley fly-wheel 6, which is secured to one end thereof.

The registered bank of printed sheets may be supported in coöperative relation with the die in any suitable manner. In the preferred embodiment of the invention the bank of sheets is supported upon a carriage 13, mounted to slide in suitable ways 14 on the frame of the machine. The carriage or support 13 preferably constitutes a cutting-bed which coöperates with the die 7 to effect the cutting operations. For the purpose of securing a registering relation between the successive prints on the registered bank of sheets and the die any suitable feeding mechanism by which the bank of prints may be advanced the distance between the successive prints step by step during the intervals between the successive operations of the cutting-die may be used. Preferably the feeding mechanism is arranged to move the carriage together with the sheets, and while a hand-operated feeding mechanism may be advantageously employed for this purpose a feeding mechanism which is automatically operated from the main shaft 5 is illustrated. As shown, this feeding mechanism consists of an eccentric 15, affixed to one end of the main shaft 5, a strap 16, mounted on the eccentric and connected by a rod 17 with an oscillating pawl-arm 18, carrying a pawl 19, adapted to engage the ratchet-wheel 20. The ratchet-wheel 20 is mounted upon a stub-shaft which passes through one of the upright standards 2 of the frame and is provided at its opposite end with a bevel-wheel 21, which meshes with a corresponding bevel-wheel 22, which is mounted on one end of a second stub-shaft journaled in a bracket 22', carried by the girder 3, and having at its opposite end a pinion 23, adapted to mesh with a rack 24 on the carriage 13. The arm 18 is preferably provided with a slot 25, in which the pivot of the rod 17 may be adjustably secured to vary the stroke of the pawl and the number of the teeth of the ratchet 20 which are engaged thereby at each revolution of the eccentric.

For the purpose of fixing the position of the registered bank of sheets upon the support 13 and coöperate with the support to hold the sheets in register the rack 24 is preferably extended somewhat above the supporting-surface 13 to form a longitudinal side guide or gage against which the side of the bank of sheets may be placed. To further insure that the sheets of the bank be reliably supported and maintained in accurate registering relation, means in place of or in addition to the said guide or carriage may be and preferably are used in the best embodiment of the invention. These holding means may be of any suitable character. In the embodiment of the invention illustrated means are provided for clamping the bank of sheets on the carriage. Any suitable clamp may be used. As shown, the clamp is arranged to engage one end only of the bank of sheets. This clamp consists of a pair of jaws 26 and 27, the former of which is mounted in a suitable recess in the support 13. The member 27 of the clamp is adjustably mounted with relation to the member 26 by means of a set-screw 28, threaded in an opening in the member 27, and a threaded stud 29, fixed in the member 26 and passing loosely through an opening in the member 27. A suitably tapped collar 30 is mounted at the upper end of the stud 29 in position, and on this collar is pivoted a two-armed cam-lever 31, by which the clamp member 27 may be quickly and powerfully operated to clamp the end of the bank of sheets. The member 27 is guided at its rear end in a standard 32, carried by the clamp member 26, and the member 27 is pressed upwardly to always keep it in engagement with the cam-lever 31 by means of a spring 33.

With a machine constructed as so far described it is difficult to so adapt and adjust the feeding mechanism that it will act during each operation to advance the bank of printed sheets the exact distance between the successive prints. This difficulty is aggravated by the fact that the distance between the successive prints of any one job are apt to vary from day to day, as above explained. With the object in view of practically overcoming this difficulty the machine is preferably provided with means whereby the operation of the feeding mechanism may be corrected from time to time during the operation of cutting out the successive prints from any one bank of sheets, so as to adjust the cutting relation between the die and the successive prints. While this may be done in various ways, as by so adjusting the feeding mechanism as to vary the position to which the carriage is moved thereby, it is preferably accomplished by providing a means whereby the position of the bank of sheets

upon the carriage may be easily and accurately adjusted. This is accomplished in the construction shown by so mounting the clamp for the bank of sheets that it may be moved with relation to the support 13 and in the direction of the feeding movement of the latter. As shown, the recess in which the member 26 is mounted, while formed to accurately guide the member 26 in a lateral direction, is made somewhat longer than the member, so as to permit of a limited movement of the latter. To enable the clamp to be moved slight distances with great accuracy, the support 13 is provided at the end with a standard 34, corresponding to the standard 32 of the clamp, and in the upper end of the standard 34 an adjusting-screw 35 is threaded, said screw being provided at one end with a thumb-wheel, as shown, and being swiveled at its opposite end in the standard 32 in such manner as to prevent longitudinal movement of the screw with relation to said standard.

The cut-out prints may be delivered from the die in any suitable manner. Preferably, however, the hollow die is provided with a suitable side delivery-passage 37, and a suitable delivery device is carried with the die and arranged to receive the cut-out prints as they are discharged from the die. As shown, the delivery device consists of a chute 38, which is formed at one end to enter the opening 37 in the die and guide the prints therethrough, said chute being firmly held in place by the members 39. At its opposite end the chute is provided with bottom and side walls only, and to facilitate the removal of the prints a tray 40, having an end wall 41, is arranged to slide in the bottom of the chute and to receive the prints as they are forced outwardly by the successive cutting operations. A pivoted back stop or guide 42 is provided at an intermediate point on the chute 38, as shown, to hold the prints in the forward part of the chute while one tray is being removed and replaced by another.

Where the adjacent sides of the successive prints are either straight, as in the example shown, (see Fig. 2,) or complementary in form, the rear side of the die, or that shown on the left in the figures of the drawings, may be omitted, the ends of the die being made to conform to the shape of the ends of the labels. Such a construction is illustrated in the sectional view in Fig. 8, in which 7^a is a side and 7^b and 7^c are the ends of a die constructed to cut out a print of the form shown in Fig. 2. By reason of this construction there will be no waste of material between the successive prints, the side 7^a of the die serving at successive operations to form the opposite sides of the prints.

The operation of the machine is as follows: A bank of printed sheets in which the prints are accurately registered one on top of another is placed upon the support 13 and secured in place against the side gage 24 by the clamp 26 27. The support is then moved so as to bring the first series of prints beneath the die and as near the proper cutting relation therewith as is possible by the adjustment of the feeding mechanism. If it is found that the prints do not register exactly with the cutter, an exact registry may be secured by manipulating the adjusting-screw 35. The machine is set in operation, and the die proceeds to cut out the successive prints. By reason of the fact, however, that any variation between the distance through which the prints are moved by the feeding mechanism and the distance between the successive prints is cumulative and is multiplied by the number of operations of the die it usually happens that before all of the successive prints in a registered bank have been cut out the cutting relation which was secured at the start between the die and the prints will be impaired. When this occurs, the bank of prints is moved in the proper direction to correct the error by hand manipulation of the adjusting-screw 35. These operations will be repeated for each bank of prints which is placed in the machine.

In its broader aspects the invention is not limited to the particular construction shown, nor to any particular construction by which it may be carried into effect, as many changes may be made in the construction without departing from the main principles of the invention and without sacrificing its chief advantages.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a machine for cutting out prints, the combination of a cutting-die, means for supporting a registered bank of printed sheets in coöperative relation with the die said means being constructed to hold the sheets in register and mechanism for securing a registering cutting relation between the die and the successive prints.

2. In a machine for cutting out prints, the combination of a reciprocating cutting-die, means for supporting a registered bank of printed sheets in coöperative relation with said reciprocating die, said means being constructed to hold the sheets in register and mechanism including intermittently-operative feeding mechanism for securing a registering cutting relation between the reciprocating die and the successive prints.

3. In a machine for cutting out prints, the combination of a reciprocating cutting-die, means including a cutting-bed for supporting and maintaining a registered bank of printed sheets in coöperative relation with said reciprocating die, and mechanism for securing a registering cutting relation between the reciprocating die and the successive prints.

4. In a machine for cutting out prints, the combination of a reciprocating cutting-die, means for supporting a registered bank of printed sheets in coöperative relation with

said reciprocating die, means carried by said support for clamping said bank of sheets, and mechanism for securing a registering cutting relation between the reciprocating die and the successive prints.

5. In a machine for cutting out prints, the combination of a reciprocating cutting-die, a cutting-bed for supporting a registered bank of printed sheets in a coöperative relation with said reciprocating die, a gage and clamp carried by said bed for positioning said bank of sheets thereon, and intermittently-operative feeding mechanism for securing a cutting relation between the reciprocating die and the successive prints.

6. In a machine for cutting out prints, the combination of a reciprocating cutting-die, means for supporting a registered bank of printed sheets in coöperative relation with said reciprocating die, said means being constructed to hold the sheets in register and mechanism including feeding mechanism for moving said bank of sheets with relation to the reciprocating die to secure a registering cutting relation between the die and the successive prints.

7. In a machine for cutting out prints, the combination of a reciprocating cutting-die, a support including a cutting-bed for supporting and maintaining a registered bank of printed sheets in coöperative relation with said reciprocating die, and mechanism including intermittent feeding mechanism for moving the support to secure a registering cutting relation between the reciprocating die and the successive prints.

8. In a machine for cutting out prints, the combination of a reciprocating cutting-die, a support comprising a cutting-bed for supporting and maintaining a registered bank of printed sheets in coöperative relation with said reciprocating die, and mechanism including automatic feeding mechanism for intermittently moving the support so as to secure a registering cutting relation between the reciprocating die and the successive prints.

9. In a machine for cutting out prints, the combination of a cutting-die, means for supporting a registered bank of printed sheets in coöperative relation with said die, said means being constructed to hold the sheets in register, feeding mechanism for securing a cutting relation between the die and the successive prints, and means for correcting the operation of the feeding mechanism whereby said cutting relation may be adjusted to secure accurate registry between the prints and the die.

10. In a machine for cutting out prints, the combination of a reciprocating cutting-die, means for supporting a registered bank of printed sheets in coöperative relation with said reciprocating die, said means being constructed to hold the sheets in register, feeding mechanism for moving the bank of sheets with relation to the reciprocating die to secure a cutting relation between the die and the successive prints, and means for correcting the operation of the feeding mechanism whereby said cutting relation may be adjusted to secure accurate registry between the prints and the die.

11. In a machine for cutting out prints, the combination of a reciprocating cutting-die, means for supporting and maintaining a registered bank of printed sheets in coöperative relation with said reciprocating die, feeding mechanism for moving the support so as to secure a cutting relation between the reciprocating die and the successive prints, and means for correcting the operation of the feeding mechanism whereby said cutting relation may be adjusted to secure accurate registry between the prints and the die.

12. In a machine for cutting out prints, the combination of a reciprocating cutting-die, means for supporting and maintaining a registered bank of printed sheets in coöperative relation with said reciprocating die, automatic feeding mechanism for intermittently moving the supporting means to secure a cutting relation between the die and the successive prints, and means for correcting the operation of the feeding mechanism whereby said cutting relation may be adjusted to secure accurate registry between the prints and the die.

13. In a machine for cutting out prints, the combination of a reciprocating cutting-die, means including a cutting-bed for supporting and maintaining a registered bank of printed sheets in coöperative relation with said reciprocating die, feeding mechanism for moving the supporting means so as to secure a cutting relation between the die and the successive prints, and means for correcting the operation of the feeding mechanism whereby said cutting relation may be adjusted to secure accurate registry between the prints and the die.

14. In a machine for cutting out prints, the combination of a reciprocating cutting-die, means including a cutting-bed for supporting and maintaining a registered bank of printed sheets in coöperative relation with said reciprocating die, automatic feeding mechanism for intermittently moving the supporting means so as to secure a cutting relation between the die and the successive prints, and means for correcting the operation of the feeding mechanism whereby said cutting relation may be adjusted to secure accurate registry between the prints and the die.

15. In a machine for cutting out prints, the combination of a reciprocating cutting-die, means for supporting a registered bank of printed sheets in coöperative relation with said reciprocating die, a clamp for the sheets carried by said supporting means, feeding mechanism for securing a cutting relation between the die and the successive prints, and means for adjusting the clamp so as to cor-

rect the operation of the feeding mechanism and thereby secure accurate registry between the prints and the die.

16. In a machine for cutting out prints, the combination of a reciprocating cutting-die, means for supporting a registered bank of printed sheets in coöperative relation with said reciprocating die, feeding mechanism for moving the support so as to secure a cutting relation between the die and the successive prints, a clamp carried by said supporting means to secure the bank of sheets thereon, and means for adjusting the clamp so as to correct the operation of the feeding mechanism and thereby secure accurate registry between the prints and the die.

17. In a machine for cutting out prints, the combination of a hollow reciprocating cutting-die having an opening in one side through which the cut-out prints are delivered, means for supporting a registered bank of printed sheets in coöperative relation with said reciprocating die, feeding mechanism for securing a cutting relation between the reciprocating die and the successive prints, and a delivery-chute carried with said die and having a portion projecting into the opening in said die to guide the cut-out prints through said opening into said chute.

18. In a machine for cutting out prints, the combination of a hollow reciprocating cutting-die having an opening in one side through which the cut-out prints are delivered, means for supporting a registered bank of printed sheets in coöperative relation with said reciprocating die, feeding mechanism for securing a cutting relation between the reciprocating die and the successive prints, and a delivery-chute carried with said die and located adjacent to the opening therein to receive the cut-out prints as they are delivered through said opening, said chute having a pivoted stop and a removable tray to facilitate the removal of the prints.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

HENRY W. KUPFER.
CHARLES E. SCHODER.

Witnesses:
B. R. HOAGLAND,
ARCHIBALD E. KNOWLES.