(No Model.) 2 Sheets—Sheet 1.

W. SCOTT.

MECHANISM FOR SUPERIMPOSING AND FOLDING SHEETS.

No. 331,091. Patented Nov. 24, 1885.

Fig. 4.

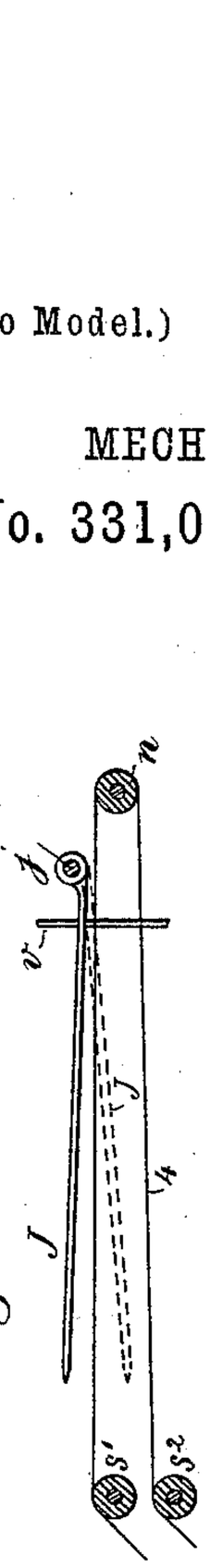
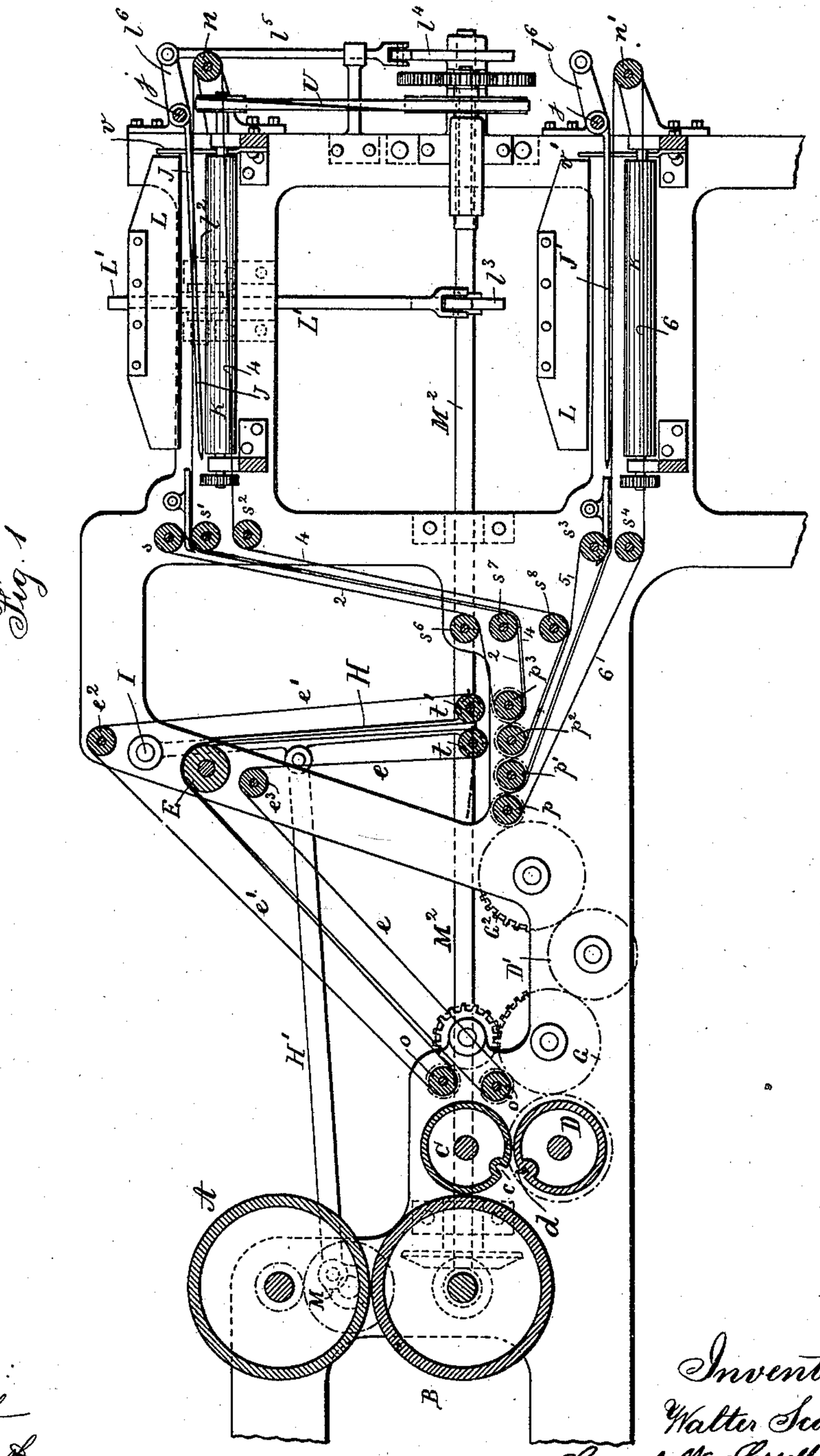


Fig. 1.



Witnesses:
I. Stair
Chas. H. Smith

Inventor:
Walter Scott
per Samuel W. Serrell atty

(No Model.) 2 Sheets—Sheet 2.

W. SCOTT.

MECHANISM FOR SUPERIMPOSING AND FOLDING SHEETS.

No. 331,091. Patented Nov. 24, 1885.

Fig. 2.

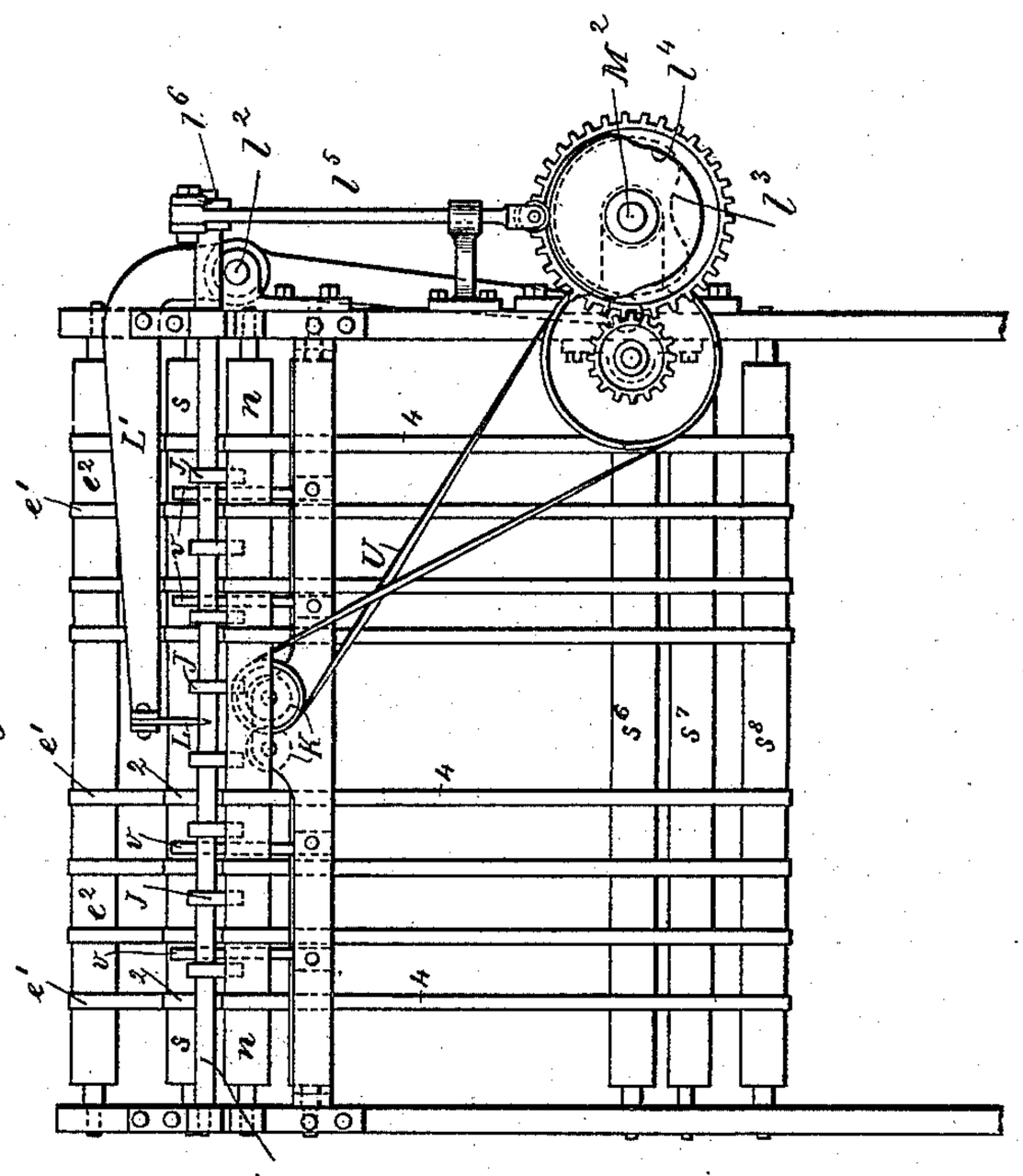
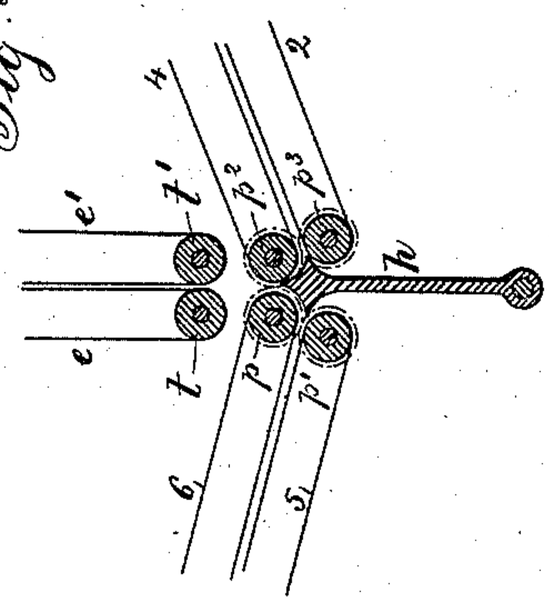


Fig. 3.



Witnesses:
I. Stair
Chas. H. Smith

Inventor
Walter Scott
per Lemuel W. Serrell
atty

UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

MECHANISM FOR SUPERIMPOSING AND FOLDING SHEETS.

SPECIFICATION forming part of Letters Patent No. 331,091, dated November 24, 1885.

Application filed March 3, 1885. Serial No. 157,996. (No model.)

To all whom it may concern:

Be it known that I, WALTER SCOTT, of Plainfield, in the county of Union and State of New Jersey, have invented an Improvement in Mechanism for Superimposing and Folding Sheets, of which the following is a specification.

The object of this invention is to deliver the printed and cut sheets at two or more places, and to hold up one sheet while the next sheet is passed in beneath it by the action of tapes, and then to fold each pair of sheets together and convey them away in the ordinary manner made use of in folding-machines.

By this improvement after two sheets have been conveyed away from the cutting apparatus and are being taken to one folding apparatus and laid one upon another beneath the creaser and folded the next two sheets are being conveyed away to another folding apparatus, where the same operations are performed. This gives the time that is necessary for the folding operation without lessening the speed of the printing and cutting apparatus.

In the drawings, Figure 1 is a longitudinal section representing the paper delivering and folding mechanism and its connection to the printing-press. Fig. 2 is an end view showing the manner in which the gearing and cams are operated for giving motion to the parts of the upper folding mechanism, and Fig. 3 is a detached view showing the rollers for the conveying-tapes and a switch. Fig. 4 is a detached view illustrating how two fingers may be used for placing three sheets one under another.

A represents a printing-cylinder, and B an impression-cylinder, of an ordinary web-printing press. C and D are the cutting-cylinders for puncturing the web of paper and partially separating the same into sheets, *d* being the serrated cutter, and *c* the groove in the cylinder C, into which the points of the cutter pass in puncturing the sheet. A swinging frame, H, with pivot I at its upper end, is caused to swing periodically by the action of a link, H′, and a crank, M, upon a gear-wheel driven by a gearing upon the shaft of the impression-cylinder A. At the lower end of the swinging frame H, and sustained by the same, is a pair of rollers, *t t′*, and there are tapes *e e′* passing around the rollers *o o′ t t′*, and over the rollers e^2 e^3 and at the impinging-roller E the belts or tapes *e e′* rest one upon another. The paper as it is cut by the cylinders C D passes up between the tapes or belts *e e′*, up over the impinging-roller E, and down between the rollers *t t′*. The speed of the belts *e e′* being greater than the speed at which the paper is delivered by the cylinders C D, the paper is pulled apart on the lines of perforation separating one sheet from another, causing an opening between one sheet and the next when the sheets reach the rollers *t t′* successively.

The parts thus far described are somewhat similar to those heretofore made use of by me and shown in my application No. 102,668, filed August 3, 1883.

There are two pairs of rollers, *p p′* and p^2 p^3. These receive their rotary motion from the cylinder D by suitable gearing. I have shown the gear-wheels G D′ G^2 as connecting with a gear-wheel on the cutting-cylinder D. The rollers *p p′* and p^2 p^3 are geared together and the end gear receives its motion from the gear-wheel G^2. There are belts or tapes 2 4 5 6 passing off from the rollers *p p′* and p^2 p^3 to the rollers *s s′* s^2 s^3 s^4, and the belts 2 4 5 are guided in their passage by the rollers s^6 s^7 s^8. Each folding mechanism is constructed the same or nearly so, and in it there are rollers K for conveying away the folded paper to a belt or conveyer or to another portion of the folding-machine in which the paper is folded transversely once or twice. These last-named features of my folding mechanism are well known, and may be of any desired character.

The creaser L is represented as being actuated by a lever, L′, pivoted at l^2, and acted upon by the cam l^3 upon the shaft M^2, and the rollers K are shown as geared together and as rotated by a belt-wheel and belt, U.

There are tapes extending from the rollers *s′* s^2 around the roller *n*. These tapes may be the tapes 4, before referred to, or they may be separate tapes passing around and extending from the roller *s′* to the roller *n*. In like manner the roller *n′* of the lower folding mechanism has around it tapes passing to the roller s^4. These tapes are preferably those marked

6, before referred to, but they might be separate ones passing around and extending from the roller s^4 to the roller n'.

In each folding apparatus I make use of fingers or flies. The fingers or flies J of the upper folder are pivoted at the shaft j, from which they extend out laterally. I have shown the cam l^4, roller-link l^5, and arm l^6 as the means for moving the rock-shaft j and the fingers J, extending out from it.

The fingers J′ of the lower folder and the shaft of the same are to be moved by similar appliances, (not shown in the drawings,) and the parts are to be timed in such a manner as to operate as follows: When the parts are in the position shown in Fig. 1, a sheet of paper passing down with the tapes e e' and between the rollers t t' is received between the pair of rollers p^2 p^3 and conveyed by the belts 2 4 beneath p^3 and s^7, up over the roller s', and along above the fingers J, and as the rear end of the sheet passes the outer end of the fingers J such fingers are instantly lifted by the action of the cam l^4, link l^5, and arm l^6 on the rock-shaft j, and the end of the next advancing sheet runs in beneath the fingers J and beneath the sheet that is being held up by them, and the stop v arrests the forward ends of the two sheets, so that they are properly in position the one beneath the other. At this moment the creaser L is brought down by the action of the cam l^3, and the two sheets are folded in the center and delivered by the revolving rollers K K, to be still further folded or otherwise disposed of, as in ordinary folding-machines. As soon as the second sheet has passed away from the belts e e' between the rollers p^2 p^3, or rather while the last portion of the said sheet is passing, the frame H is swung and the rollers t t' are carried directly over the pair of rollers p p', so that the next two sheets in succession are carried off by the tapes or belts 5 6 and pass beneath the roller s^3, and the first one of said sheets is carried along by the belts 6 above the fingers J′, and these fingers J′ are moved, as aforesaid, at the moment the last end of the sheet passes their ends, so that the next sheet is carried by the belts 6 in beneath the fingers J′, and the ends of the sheets stop against the stop l', and are carried down into the folding mechanism by the blade L. These operations are repeated in succession, so that one pair of sheets is being folded by the blade L′ and carried away by the rollers K while the next pair of sheets is being carried to the next folder and received above and below the fingers J′. This gives opportunity for the folded sheets to be carried away and the creaser to rise and the fingers to be dropped before fresh sheets are presented for the next lapping and folding operations.

Three folding-machines may be operated in the manner before described if three pairs of rollers are made use of in place of the two pairs p p' and p^2 p^3, the frame H receiving the proper swinging movement, so as to pause over each pair of rollers, or the crank may give a swinging movement across the standing rollers, so that the ends of the sheets will be properly passed into such rollers as they issue from between the rollers on the swinging frame.

I do not limit myself to the arrangement of the pairs of rollers p p' and p^2 p^3 shown in Fig. 1, because if these rollers are arranged in the manner shown in Fig. 3 a switch, h, may be placed between the pairs of rollers and moved every second sheet to direct the sheet as delivered from the belts e e' between the rollers p p', and then to deliver the next two sheets between the rollers p^2 p^3, the fingers J and J′ acting in connection with the tapes from the aforesaid rollers, and with the creasers and folding-rollers of the folding mechanism in the manner before described.

If the printing-cylinder is of a size to print three or more sheets each revolution, the said three sheets may be laid one under the other by using two layers of fingers, as indicated by dotted lines in Fig. 4, the fingers receiving a second motion after the second sheet has been run in by the belts below the second sheet.

I claim as my invention—

1. The combination, in a press for printing upon a web of paper, of the printing and impression cylinders, the cutting-cylinders for perforating the paper and partially separating one sheet from another, the belts e e', and the rollers having an accelerated movement for separating one sheet from the next, the rollers p^2 p^3, and the belts or tapes for conveying away the separated sheets, and means, substantially as specified, for directing the sheets to the conveying-belts, the fingers J, the creaser L, and folding-rollers K, substantially as set forth.

2. The combination, with the creaser L, the rollers K, and belts for conveying the sheets, of the fingers J, between and parallel to the belts and the rock-shaft, and mechanism, substantially as described, for moving said rock-shaft and fingers, whereby the first sheets are conveyed by the tapes along over the fingers and by said fingers are raised off the tapes, and the second sheet is carried along upon the tapes beneath the fingers and the first sheet, substantially as specified.

3. The combination, in a sheet delivery and folding mechanism, of two pairs of rollers, a creasing-blade for each pair of rollers, cutting-cylinders to act on the web of paper, accelerating and conveying belts to separate the sheets and deliver two sheets in succession beneath one creaser and the next two sheets in succession beneath the other creaser, and fingers to lift the respective sheets so that the second sheet may run in beneath the first, substantially as specified.

Signed by me this 20th day of February, A. D. 1885.

WALTER SCOTT.

Witnesses:
GEO. T. PINCKNEY,
WILLIAM G. MOTT.