

(No Model.)

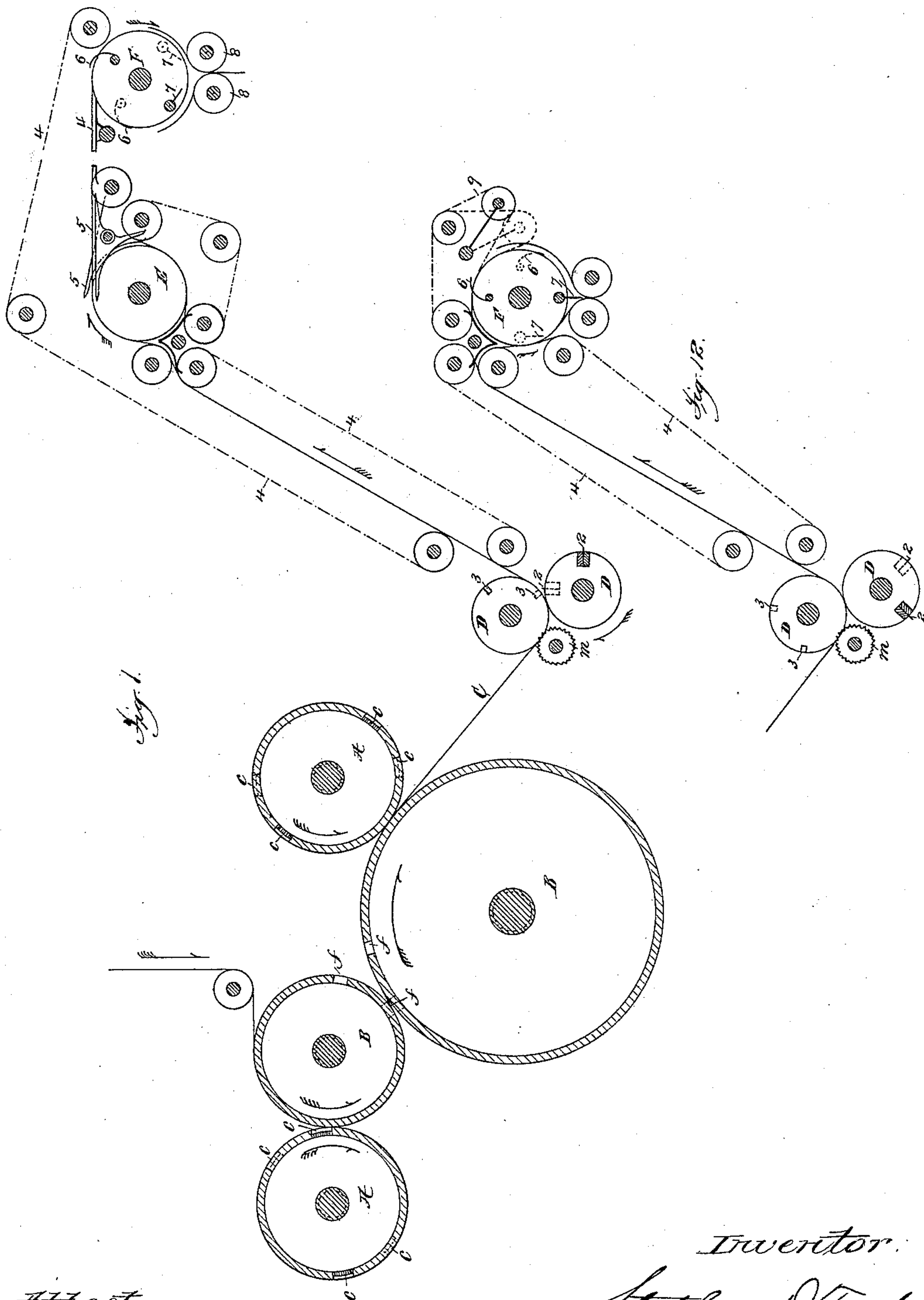
2 Sheets—Sheet 1.

S. D. TUCKER.

WEB PRINTING AND DELIVERY MECHANISM.

No. 408,394.

Patented Aug. 6, 1889.



Attest  
Chas. H. White  
J. M. Borst

Inventor:  
Stephen D. Tucker  
by Philip Phelps, Attorney

(No Model.)

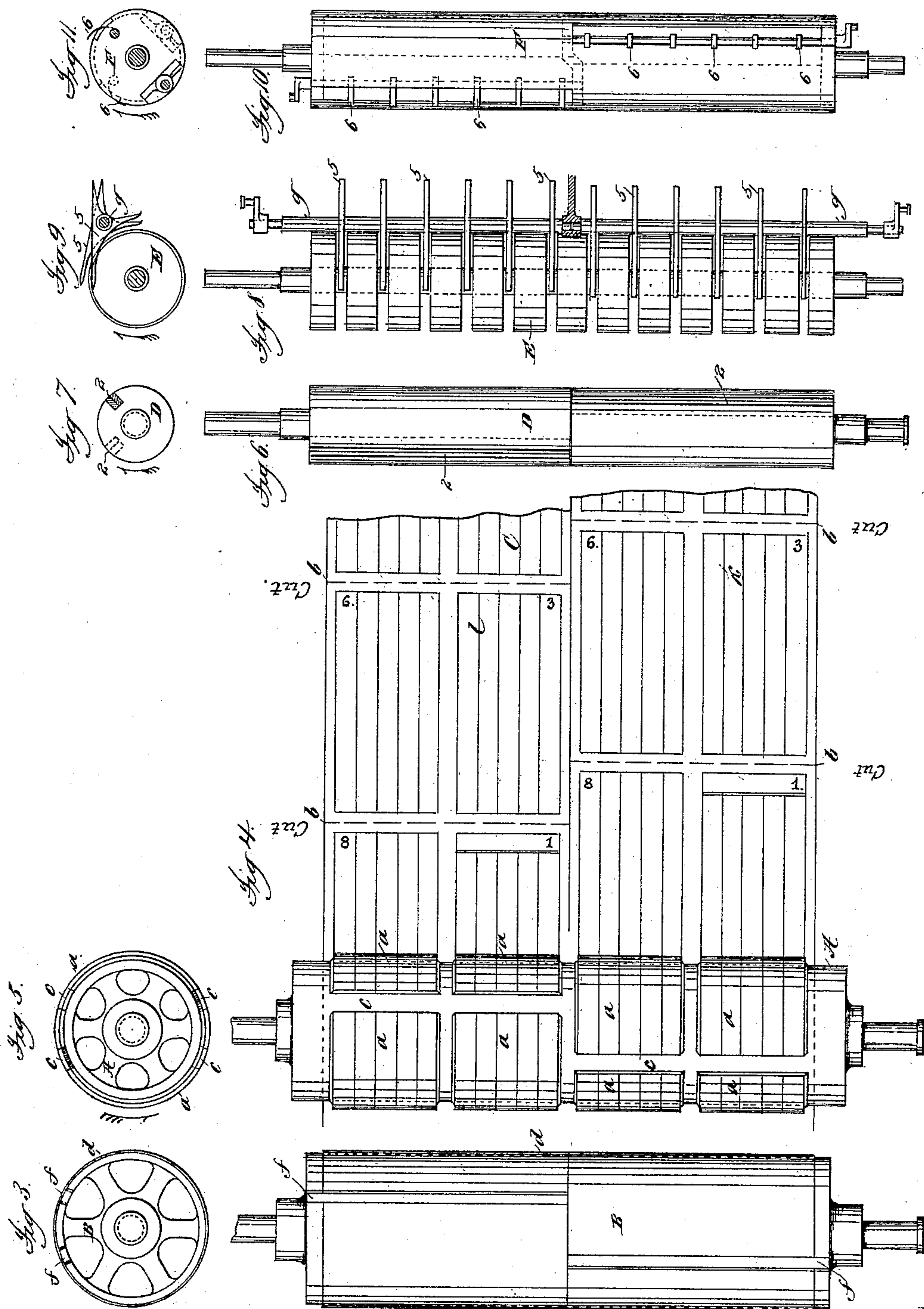
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Att'y



# UNITED STATES PATENT OFFICE.

STEPHEN D. TUCKER, OF NEW YORK, N. Y.

## WEB PRINTING AND DELIVERY MECHANISM.

SPECIFICATION forming part of Letters Patent No. 408,394, dated August 6, 1889.

Application filed June 28, 1888. Serial No. 278,446. (No model.)

*To all whom it may concern:*

Be it known that I, STEPHEN D. TUCKER, a citizen of the United States, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in Web Printing and Delivery Mechanism, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

It has heretofore been common in web-printing machines where two or more forms were carried abreast lengthwise of the form-cylinders to so place the forms upon the cylinders that the ends of the forms or sides, as the case might be, would be in line with each other lengthwise of the cylinder.

It has been found in practice that where the form-cylinders are of considerable length, say of sufficient length to carry three or four forms abreast and the forms are arranged in this manner, the quality of the printing produced by different parts of the forms is not quite uniform—that is to say, there will appear in the impression of each form, near the advance end of the impression, a portion which is lighter or of poorer quality than the remainder of the impression, and this is particularly noticeable in the impressions produced by those forms located at or near the middle of the length of the cylinders. This defect, while it is not sufficiently marked to present a very serious objection in ordinary newspaper work, is such as to be quite objectionable where a fine quality of printing is required. This defect I have found can be overcome by imposing the forms upon the cylinder so that they will break joints longitudinally of the cylinder. It is found in practice that by thus arranging the forms the lack of uniformity between the different parts of the impression made by each form is entirely overcome. This is probably due to the fact that in the old arrangement, where all of the forms were arranged in line lengthwise of the cylinder, the ends of all the forms in each row were caused to come into engagement with the impression-cylinder and the inking-rolls at the same time, and this probably caused a slight vibration in the form-cylinder and inking-rolls which resulted in the defective impression given by the advance portion of the forms, whereas by the present arrangement

some of the forms are always in contact with the impression-cylinder and inking-rolls, and thus this tendency to vibrate is destroyed. This method of imposing the forms is not herein claimed, as such method forms the subject-matter of a companion application, Serial No. 278,445, for Letters Patent.

The present invention relates to a delivery mechanism which is adapted to operate upon a web perfected by forms imposed according to the above-stated method.

A full understanding of the invention can best be given by an illustration and a somewhat detailed description of a web printing and delivery mechanism embodying the same. All further preliminary description of the invention will therefore be omitted and a detailed description given, reference being had to the accompanying drawings, in which—

Figure 1 is a diagrammatic sectional elevation of the principal parts of a web printing and delivery mechanism embodying the invention. Fig. 2 is a plan view, partly in section, of one of the impression-cylinders. Fig. 3 is an end view of the same. Fig. 4 is a plan view of one of the form-cylinders, showing the order in which the forms are arranged, and showing, also, a portion of the printed web, showing the order of the impressions. Fig. 5 is an end view of the form-cylinder. Fig. 6 is a plan view of one of the cutting-cylinders. Fig. 7 is an end view of the same. Fig. 8 is a plan view of the collecting-cylinder and its switches. Fig. 9 is an end view of the same. Fig. 10 is a plan view of the folding-cylinder. Fig. 11 is an end view of the same. Fig. 12 illustrates a modification in the collecting and folding mechanism, which will be hereinafter referred to.

Referring to said figures, it is to be understood that A represents the form-cylinders, and B the impression-cylinders, of an ordinary form of web-printing mechanism. These cylinders may be arranged in any suitable manner, and may be of any suitable size.

As illustrated in the drawings, the printing mechanism is what is termed a "double-width" mechanism, and the form-cylinders are capacitated to carry four forms *a* abreast or lengthwise of the cylinders and two forms circumferentially. As shown in the drawings, these forms are arranged with their col-



umns of matter extending circumferentially of the cylinders; but this is not material, as the forms may be arranged so that the columns extend longitudinally of the cylinders, if preferred.

The forms *a*, instead of being so arranged upon the cylinder that their adjacent ends are in line with each other lengthwise of the cylinder, as has heretofore been the common arrangement, are so arranged, as best shown in Fig. 4, that they break joints, thus causing the blank margins *b* between the printed pages, which correspond to the spaces *c* between the ends of the forms, to fall in different positions lengthwise of the web *C*, as also indicated in Fig. 4. The forms *a* are secured upon the form-cylinders by the usual locking devices, which are suitably positioned to correspond to the position of the forms.

The impression-cylinders *B* are provided with the usual blankets and tympan-sheets *d*, the ends of which are secured in the recesses *f*, formed in the cylinders in the usual manner, the only difference being that the recesses *f* are arranged to correspond with the arrangement of the forms *a*, so that the spaces *c* between the forms will fall opposite the recesses *f* as the cylinders revolve together. The web *C*, after being perfected, is acted upon by a slit *m*, by which it is split upon the central margin line between the printed pages and then passes between a pair of cutting-cylinders *D*, provided with blades 2 and cooperating-grooves 3, which act to positively sever the two narrow webs *l* *k* in the usual manner. By reason, however, of the arrangement of the forms *a* upon the form-cylinders, the blank margins *b* do not, as hereinbefore described, fall in line widthwise of the web, and the blades 2 and grooves 3 are therefore so arranged that each extends only one-half of the length of the cylinders *D* and in different positions circumferentially of the cylinders to correspond with the positions of the blank margins *b*. The webs *k* *l*, having been partially severed into sheets by the blades 2, pass into the control of the accelerated tapes 4, which are arranged in the usual manner and which operate to complete the severance of the sheets, and the sheets are then delivered by said tapes onto a collecting-cylinder *E*, which operates in the usual manner to collect the sheets into pairs or lots to form the complete product.

The collecting-cylinder *E* is provided with the usual switches 5, which operate to direct the pairs of sheets off the cylinder in the usual manner. By reason, however, of the arrangement of the forms the heads of the sheets of each collected lot will occupy different positions upon the cylinder. The switches 5 for each end of the cylinder are therefore mounted upon separate shafts *g*, which are operated by separate cams of the usual description located at the opposite sides of the machine, the cams being constructed to act at different times, so that the respective

switches will operate at the proper times to direct the sheets from the opposite ends of the cylinder. The sheets thus directed from the cylinder are then conducted in the usual manner to a folding-cylinder *F*, having sheet-grippers 6, which operate to take and release the sheets at the proper times, and folding-blades 7, which operate to fold the sheets between folding-rolls 8, from which they pass to any suitable form of final-delivery mechanism.

Each set of the grippers 6 extends only one-half the length of the cylinder *F*, and the two sets are located in different positions circumferentially of the cylinder to correspond to the difference in time at which the collected sheets will arrive at the opposite ends of the cylinder, and the folding-blades 7 are similarly arranged to correspond to the position of the grippers. Each set of the grippers 6 and each folding-blade 7 are operated by a cam in the usual manner, and the cams for the respective grippers and folding-blades are located upon the opposite sides of the machine.

In some cases it may be preferred to dispense with the gathering-cylinder *E* and its switches and to cause the sheets, when collecting is desired, to be collected upon the folding-cylinder *F*. This can readily be done, as illustrated in Fig. 12, in which case the folding-cylinder is provided with a set of vibrating tapes 9, which are operated in the manner described in my prior Letters Patent, No. 191,494, and which act to retain the first sheet or sheets of each lot upon the cylinder and cause it or them to be carried around and associated with the next succeeding sheet, and then operate to release the sheets and permit them to be folded off by the blades 7. The tapes 9 will of course be divided into two sets, each occupying one-half of the length of the cylinder *F*, and will be vibrated at different times to correspond to the positions of the grippers 6.

Instead of the grippers 6 and switches 5 any of the other well-known forms of sheet retaining and directing devices may be employed, and are to be regarded as the equivalent of the devices shown.

What I claim is—

1. The combination, with a form-cylinder carrying forms which break joints longitudinally of the cylinder, of a pair of cutting-cylinders having a plurality of blades and grooves, each extending a part of the length of the cylinders and located in different positions circumferentially of the cylinders, substantially as described.

2. The combination, with a form-cylinder carrying forms which break joints longitudinally of the cylinder, of a pair of cutting-cylinders having a plurality of blades and grooves, each extending a part of the length of the cylinders and located in different positions circumferentially of the cylinders, and a sheet-collecting mechanism having its sheet-directing devices timed to direct the sheets



from different portions at different times, substantially as described.

3. The combination, with a form-cylinder carrying forms which break joints longitudi-  
5 nally of the cylinder, of a pair of cutting-cylinders having a plurality of blades and grooves, each extending a part of the length of the cylinders and located in different positions circumferentially of the cylinders, and  
10 a sheet-folding mechanism having its blades

timed to conform to the cutting mechanism, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

STEPHEN D. TUCKER.

Witnesses:

J. A. HOVEY,  
FRED. W. H. CRANE.