

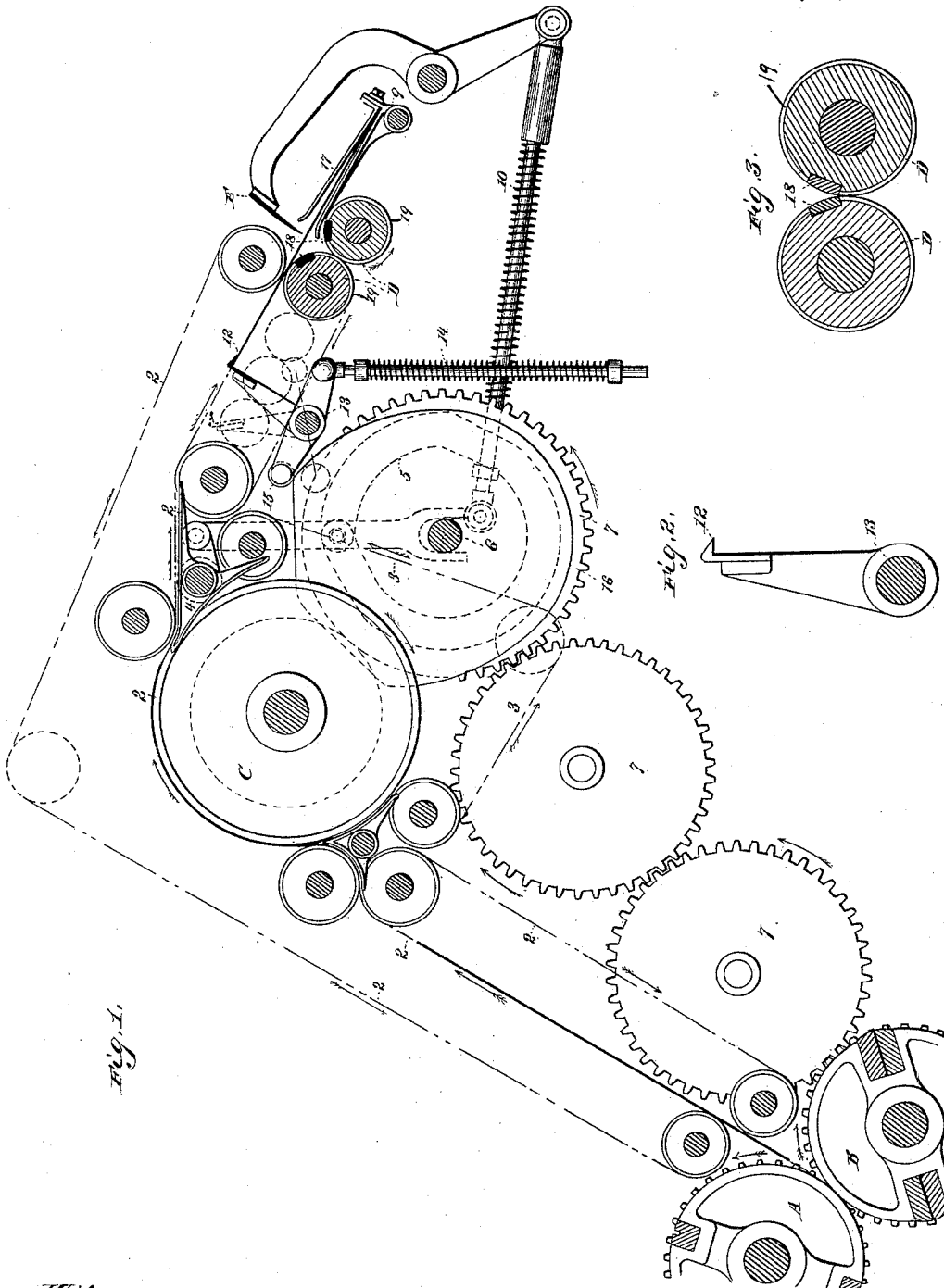
(No Model.)

S. D. TUCKER.

SHEET DELIVERY MECHANISM FOR PRINTING MACHINES.

No. 465,119.

Patented Dec. 15, 1891.



Witnesses:
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UNITED STATES PATENT OFFICE.

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

SHEET-DELIVERY MECHANISM FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 465,119, dated December 15, 1891.

Application filed June 18, 1888. Serial No. 277,438. (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 Sheet-Delivery Mechanism for Printing-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to a folding delivery mechanism of that class in which a number of sheets are collected before being folded. The invention relates, particularly, to a means for securing a perfect register of the several sheets of the collected lot prior to the folding of the lot.

The invention can be best understood by an illustration and a detailed description of the principal parts of a delivery mechanism embodying the same. All preliminary description will therefore be omitted and a full description given, reference being had to the accompanying drawings, in which—

Figure 1 is a diagrammatic sectional elevation of the principal parts of a folding delivery mechanism embodying the invention. Figs. 2 and 3 illustrate details which will be hereinafter referred to.

Referring to said drawings, it is to be understood that A B represent a pair of cutting-cylinders of the ordinary form and construction used for severing or partially severing the printed web into sheets as it passes from a web-perfecting printing mechanism. The sheets severed from the web or the web in a partially-severed condition passes into the control of the usual accelerated tapes 2, which lead to a collecting-cylinder C of any of the ordinary forms, and which is provided with any suitable means for retaining the sheets upon its surface. As herein shown, the sheets are retained upon the cylinder by one set of the tapes 2, which pass over the cylinder and partly around the same, and by a set of auxiliary tapes 3, arranged in the usual manner.

The collecting-cylinder C may be of any suitable size, so as to receive one or more sheets circumferentially. As herein shown, it is of a size sufficient to receive three sheets, one following the other around its circumference, with sufficient spaces between them to

permit the operation of the switches 4, by which the sheets are directed off the cylinder when the required number has been collected. The switches 4 are operated at the proper intervals by means of a cam 5, carried by a shaft 6, which is driven through a train of gears 7 from the cutting-cylinders. The gears 7 are so proportioned in the case shown that the switches 4 will be operated to direct the sheets off the cylinder C in lots of three sheets each.

The parts of the mechanism which have been thus far described are common and well known in the art and will therefore be readily understood without a more detailed description.

The collected lot of sheets as they are directed off the cylinder C pass into the control of the tapes 2 and the set of tapes 8, by which they are conveyed into proper position above a pair of folding-rolls D, where they are arrested by stops 9 in proper position to be folded. Co-operating with the rolls D is an ordinary vibrating folding-blade E, which is operated through a rod 10 from the shaft 6 in the usual manner. It has been found in practice that where a lot of sheets thus collected are directed off the collecting-cylinder into the control of tapes and conveyed thence to a folding mechanism there is more or less liability of the several sheets of the lot shifting their position one with relation to another, so as to destroy the perfect register between the sheets, and thus cause them to be folded out of register and to the injury of the folded product. To overcome this tendency I provide the mechanism with a vibrating striker 12, which is carried by arms extending from a rock-shaft 13, and is so positioned as to be just in the rear of the lot of sheets as they are brought to rest against the stops 9 and above the folding-rolls. The shaft 13 is provided with an arm which is connected to a rod 14, which is acted upon by a spring in such manner as to normally hold the striker 12 rocked to the rear sufficiently to be below the path of the sheets as they pass forward between the tapes 2 8, as indicated by dotted lines in Fig. 1. The shaft 13 is also provided with a second arm, having a bowl 15, which travels upon a cam 16, carried by the shaft 6, and so timed that immediately after each collected

lot of sheets is brought to rest against the stops 9 and before the folding-blade E descends to fold the sheets it will rock the striker 12 forward and cause it to strike several times in quick succession against the rear ends of the sheets of the lot, and thus even up the sheets and cause them all to be brought against the stops 9 and in proper register. The striker 12 is of course provided with suitable recesses in its upper edge to permit it to pass forward and not interfere with the tapes 2 8.

In order to prevent the sheets of the lot from rebounding from the stops 9 or from buckling upward when arrested by the stops, there are preferably provided a number of fingers 17, which extend from the stops above the sheets, as shown, and which are so arranged as to provide a gradually-contracting throat, into which the forward ends of the sheets pass.

Where a lot containing several sheets are folded between a pair of folding-rolls by a vibrating-blade in the manner shown in the present case, it is found in practice that it is desirable to cause the folding-rolls to bite with greater pressure upon the sheets just at the fold-line than at other points. Where a single sheet or a pair of sheets are folded, this is not usually necessary or desirable; but where several sheets are folded together this additional pressure or bite at the point of the fold insures a more thorough breaking or creasing of the paper, so that the fold will be more certainly retained. For this purpose the folding-rolls D, which are positively driven, as is usual, are so timed with relation to the folding-blade E and the other parts that the fold-line of the sheets will always be received at the same point of the rolls, and the rolls are provided at this point with raised portions 18, which come together at the time the fold is made and nip the paper very firmly at the fold-line, so as to insure its being broken and creased at that point so as to retain the fold. The portions 18 may be formed in any suitable manner, but will preferably be formed by pieces set into channels formed longitudinally of the rolls, as indicated.

The folding-rolls D, as indicated in the present case, are provided with circumferential ribs or raised portions 19, which are so located upon the rolls as to bear upon the blank margins of the paper at the sides of the printed pages.

What I claim is—

1. The combination, with a sheet-collecting mechanism and a sheet-folding mechanism, of stops for arresting the sheets in position to receive the fold, and the vibrating striker 12, acting against the sheets to move them up to the stops and thus secure accurate register between the several sheets, substantially as described.

2. The combination, with the cutting-cylinders, of the collecting-cylinder, the tapes for conveying the sheets from the cutting to the collecting cylinder, a switch for delivering the collected lots of sheets from the collecting-cylinder, conveying-tapes for receiving the sheets from the collecting-cylinder, stops 9, against which the front edges of the sheets are arrested, and a vibrating striker acting against the rear edges of the sheets to even up the same, substantially as described.

3. The combination, with the tapes 2 8, of the stop 9, the vibrating striker 12, the shaft 13, carrying the same, having an arm acted upon by a cam 16 to vibrate said striker, a folding-blade E, and rollers D for folding and delivering the sheets, substantially as described.

4. The combination, in a paper-folding machine, of the folding-rolls D, the folding-blade E, the vibrating striker 12, acting on one edge of the sheets, and mechanism, substantially as described, for giving motion to the parts, and a stop 9, whereby the sheets after being collected are evened up and folded, 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.