

March 5, 1935.

E. W. DEAN

1,993,652

PAPER FOLDING MACHINE

Filed Aug. 31, 1931

2 Sheets-Sheet 1

Fig. 1.

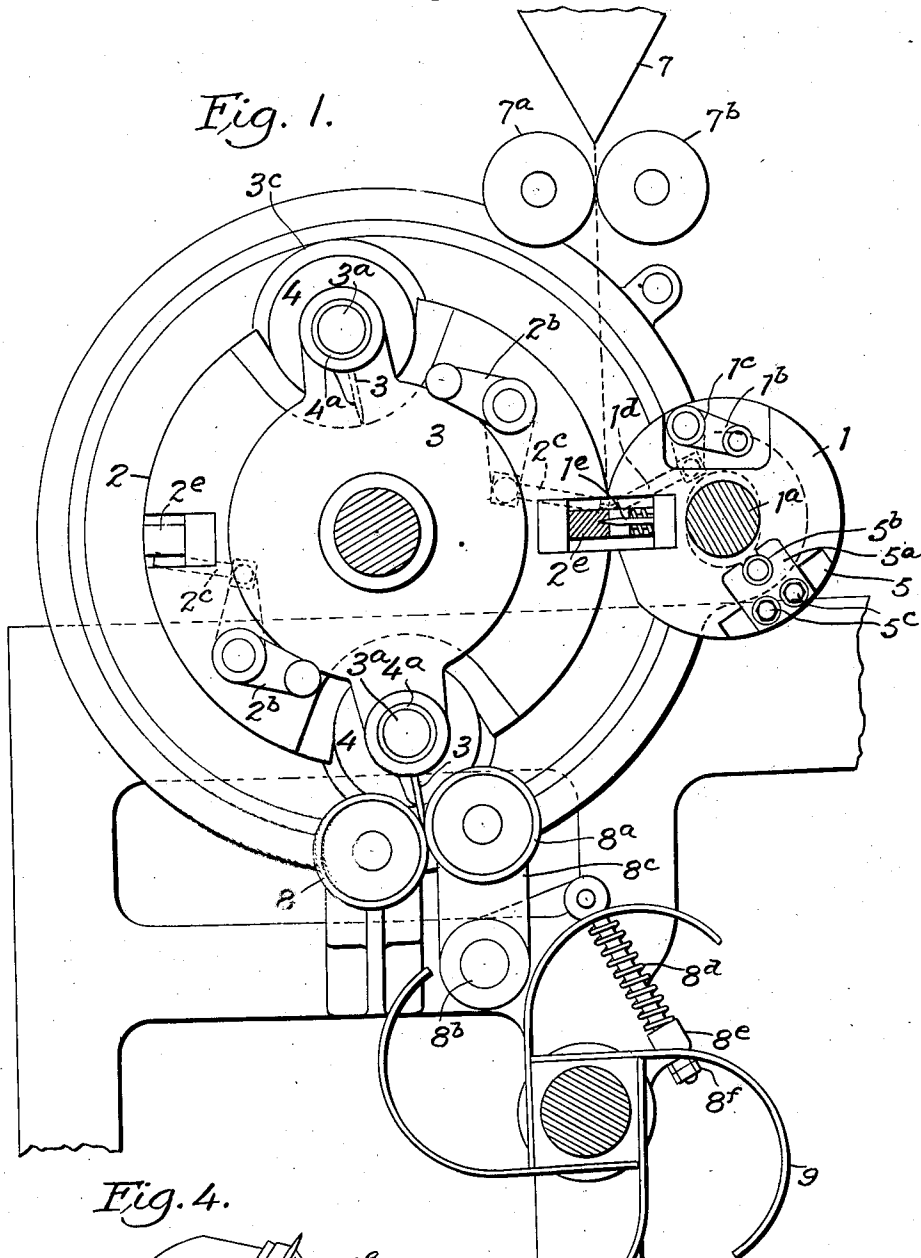
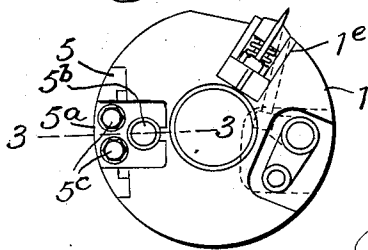


Fig. 4.



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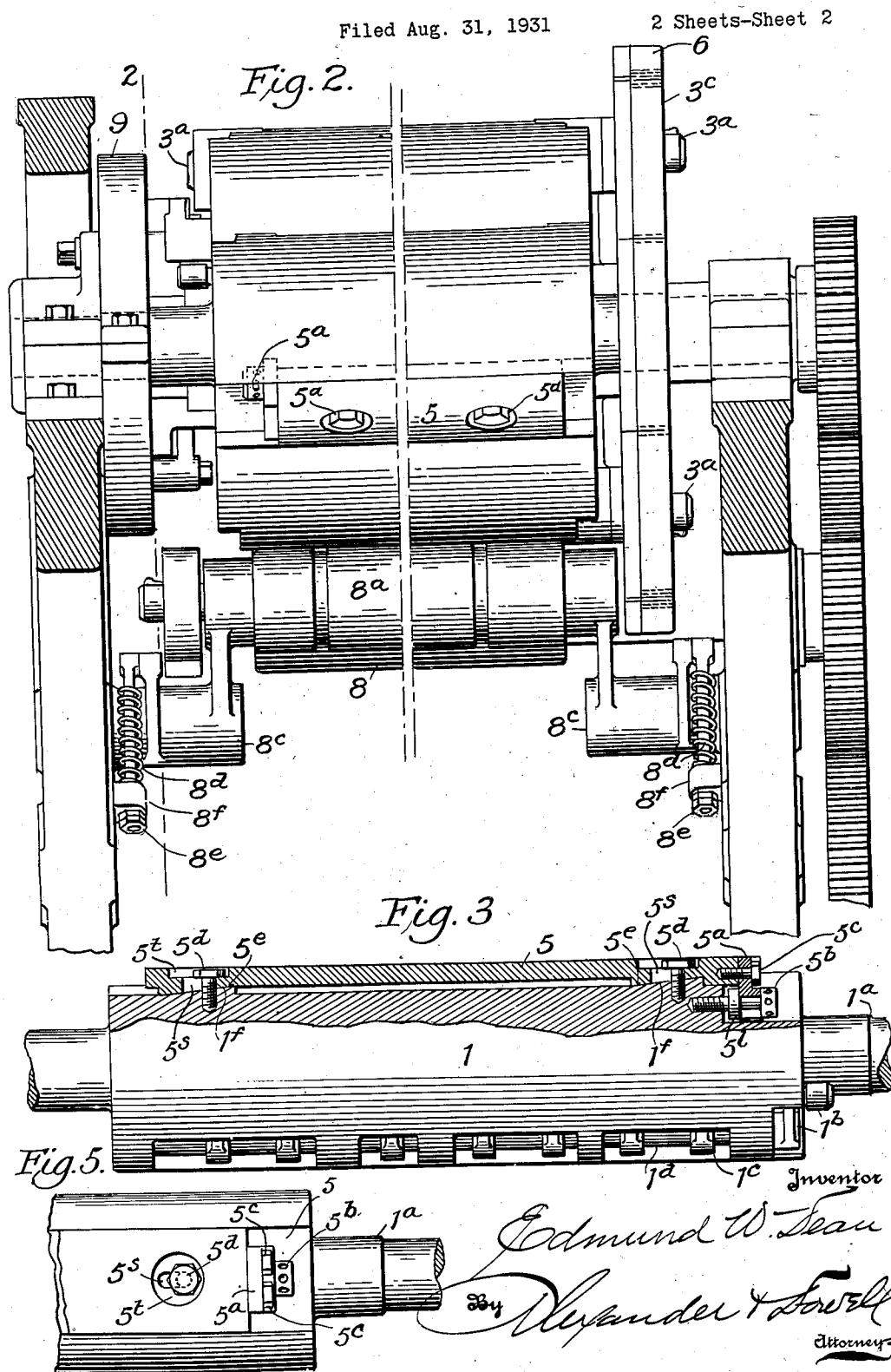
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UNITED STATES PATENT OFFICE

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PAPER FOLDING MACHINE

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10 Claims. (Cl. 270-77)

This invention is an improvement in rotary folding mechanisms for web printing presses and its object is to provide an improved cutting cylinder having an adjustable circumference so that the peripheral circumference of the collected sections of paper thereon may be kept practically uniform and cause the surface speed of the outermost sheet of paper collected on the cylinder to be the same as the speed of the paper webs passing from the former of the folder.

The cutting cylinder is provided with means whereby one or more successive sheets separate from the web can be collected thereon in accordance with the size of the edition of the paper, different editions of the paper varying in the number of pages employed. The cutting cylinder is usually of one fixed diameter or circumference and therefore the thickness of the paper sections collected thereon will vary its diameter according to the number of sections collected thereon. While the paper used is itself of no great thickness, the accumulated thickness of the number of collected sheets will vary appreciably in various editions, and it is important that the peripheral surface speed of the paper collected on the cutting cylinder should remain practically uniform with that of the web passing from the former regardless of the number of pages delivered to the folding cylinder.

The present invention provides a cutting cylinder having an adjustable peripheral section which can be adjusted in or out to increase or diminish the circumference of the cylinder, in accordance with the number of sections of paper to be collected thereon; so that whatever given number of sections are collected thereon the exterior periphery or circumference of the outermost sheet of paper thereon will be such as will cause the peripheral speed of the paper on the cutting cylinder to equal the speed of the paper delivered to the folder.

In the accompanying drawings I have illustrated the invention as applied to a well known type of rotary folder and will explain the same with reference thereto and then set forth in the claims the novel features and combinations of parts for which protection is desired.

In said drawings:

Fig. 1 is a diagrammatical part sectional elevation of a rotary folder having a cutting cylinder constructed in accordance with my invention;

Fig. 2 is a side view of such folder partly broken away, the paper delivery mechanism being omitted;

Fig. 3 is a side view of the cutting cylinder partly in section;

Fig. 4 is an end view of the cutting cylinder detached;

Fig. 5 is a detail plan view of the right hand end of the cutting cylinder.

The cutting cylinder 1 and folding cylinder 2, may be mounted as usual on shafts 1a, 2a, journaled in bearings in suitable framing and provided with the usual cutting devices 1e, 2e. The cylinder 2 is provided with the usual pin operating devices, indicated at 2b-2c in the drawings; while cylinder 1 is provided with the customary pin operating mechanism, indicated at 1b, for collecting sections of paper. Cylinder 2 is also provided as usual with two rotary tucking blades 3, which are diametrically opposite and mounted on shafts 3a journaled in bearings 4a attached to rocking plates 4 rotatably mounted upon the shaft 2a. All these parts are well known and need no specific explanation or illustration.

The web coming from the printing press is led over the usual former 7 by which it is given its first longitudinal fold, and is then passed between the first folding rolls 7a and 7b to and between the cylinders 1 and 2, being severed into sections of sheet length by the cutting blade 1e cooperating with the cushion 2e at the proper time. When the sections are to be collected, the leading edge of the severed section is engaged by the collecting pins 1d so that the section is wrapped around the cutting cylinder 1. One or more sections may be successively collected on the cylinder 1 as desired. At the proper time the collected sections are released by the pins 1d and engaged by collecting pins 2c on the folding cylinder 2 which also engages the following section; and the collected sections on cylinder 2 are then tucked by a tucker 3 between the second fold rolls 8 and 8a; the collected sheets being tucked between the second fold rolls in the usual manner, as will be readily understood by pressmen. Roll 8a is usually mounted in swingable arms 8c on a rock shaft 8b yieldingly pressed by springs 8d strung on a rod 8f passing through an eye bolt 8e. From the second fold rolls the papers are directed by the fly reel 9 onto a carrier belt (not shown) by which they are delivered from the press.

In the present invention the cutting cylinder 1 is provided with a peripheral longitudinal recess in which is fitted an adjustable segment 5, having its outer surface substantially conforming in cross section to the curvature of the

outer surface of cylinder 1. Within the slot adjacent the ends of the segment are projections 1f, the outer surfaces of which are inclined longitudinally of the axis of the cylinder, see Fig.

3. The segment 5 is provided on its undersurface with projections 5e, the inner surfaces of which are inclined similar to and engage with the inclined surfaces of the projections 1f.

If the segment 5 is moved longitudinally of the cylinder 1 it is caused to project or retract relatively to the surface of the cylinder 1 by the engagement of the inclined faces of the projections 1f and 5e.

The plate 5 may be longitudinally adjusted and secured in adjusted position by any suitable means. In the construction shown the segment is provided at one end with an inwardly extending projection, which is shown as a plate 5a secured to the end of the segment 5 by bolts 5c. This plate 5a has a slot in its inner end through which passes a bolt 5b which is provided with a collar 5l to engage the inner face of the plate (see Fig. 3) and when the bolt is turned the plate 5 will be moved longitudinally of the cylinder 1. To secure the segment in adjusted position bolts 5d are tapped into the projections 1f and pass through slots 5s in the projections 5e; the heads of such bolts being concealed in recesses 5t in the outer surface of the segment.

If it is desired to diminish the circumference of the cylinder 1, segment 5 should be adjusted to the left; to do this the bolts 5d are loosened and then the segment adjusted by turning screw 5d until it is in the desired position; then the segment is fastened by tightening the bolts 5d. If it is desired to increase the circumference of the cutting cylinder, segment 5 should be adjusted to the right, which would cause its periphery to project more or less beyond the periphery of the cylinder 1 and thus increase the circumference of the latter.

By means of this adjustable segment the circumference of the cutting cylinder 1 can be readily increased or diminished as desired, in accordance with the number of paper sections to be collected thereon, so that the exterior circumference of the sections collected on the cylinder shall be such that the peripheral surface speed of the paper sections on the cutting cylinder will exactly equal the speed of the paper web passing from the former thus insuring uniform and correct final folding of the collected papers when tucked between the final fold rolls 8 and 8a.

I do not limit my invention to the exact forms shown in the accompanying drawings for obvious changes may be made therein within the scope of the claims.

I claim:—

1. A cutting cylinder having a longitudinal peripheral recess, a rigid segment in said recess, and means for adjusting the segment to cause its bodily projection or retraction radially of the cylinder.

2. A cutting cylinder having a longitudinal recess and inclines in said recess; a rigid segment in said recess having inclines engaging the inclines in the recess; the inclines being adapted to cause the bodily projection or retraction of the segment, and means for securing the segment in adjusted position.

3. A cutting cylinder for a rotary folder having a longitudinal peripheral recess and longitudinally inclined projections in said recess, a segment fitted in said recess having longitudinal inclines opposite and engaging the inclines in the recess and adapted to cause the projection or retraction of the segment, and means for fastening the segment in adjusted position.

4. A cutting cylinder for a rotary folder, having a longitudinal recess, a segment in said recess, means for adjusting the segment longitudinally of the cylinder and means whereby longitudinal adjustment of the segment causes its projection or retraction according to the direction of the adjustment thereof.

5. A cutting cylinder having a longitudinal recess and inclines in said recess, the segment in said recess having inclines engaging the inclines in the recess, means for adjusting the segment longitudinally, the inclines causing the projection or retraction of the segment simultaneously with its longitudinal adjustment, and means for securing the segment in adjusted position.

6. A cutting cylinder having a longitudinal peripheral recess and longitudinally inclined projections in said recess, a segment fitted in said recess having longitudinal inclines opposite and engaging the inclines in the recess, means for adjusting the segment longitudinally in the slot, the inclines causing the projection or retraction of the segment according to the direction of adjustment, and means for fastening the segment in adjusted position.

7. For a paper folding machine a cutting cylinder having a longitudinal peripheral recess and longitudinally inclined projections in said recess, a segment fitted in said recess having longitudinal inclines opposite and engaging the inclines in the recess, a bolt engaging the segment to longitudinally adjust the same, the inclines causing the projection or retraction of the segment according to the direction of its adjustment, and means engaging the cylinder and extending through slots in the segment for fastening the segment in adjusted position.

8. For a paper folding machine, a cutting cylinder having a longitudinal peripheral recess and longitudinally inclined projections in said recess, a segment fitted in said recess having longitudinal inclines opposite and engaging the inclines in the recess, a bolt engaging the segment to longitudinally adjust the same in the recess, the inclines causing the projection or retraction of the segment according to the direction of the adjustment, and bolts engaging the cylinder and extending through slots in the segment for fastening the segment in adjusted position.

9. In a rotary folder a cutting cylinder having a peripheral recess, a rigid segment mounted in said recess, and means to bodily adjust said segment to cause its projection or retraction radially of the cylinder and vary the effective circumference of the cylinder.

10. In a rotary folder, a cutting cylinder having a longitudinal peripheral recess, a longitudinally adjustable segment in said recess, and means to adjust said segment to cause its projection or retraction radially of the cylinder and vary the effective circumference of the cylinder.

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