

No. 612,966.

Patented Oct. 25, 1898.

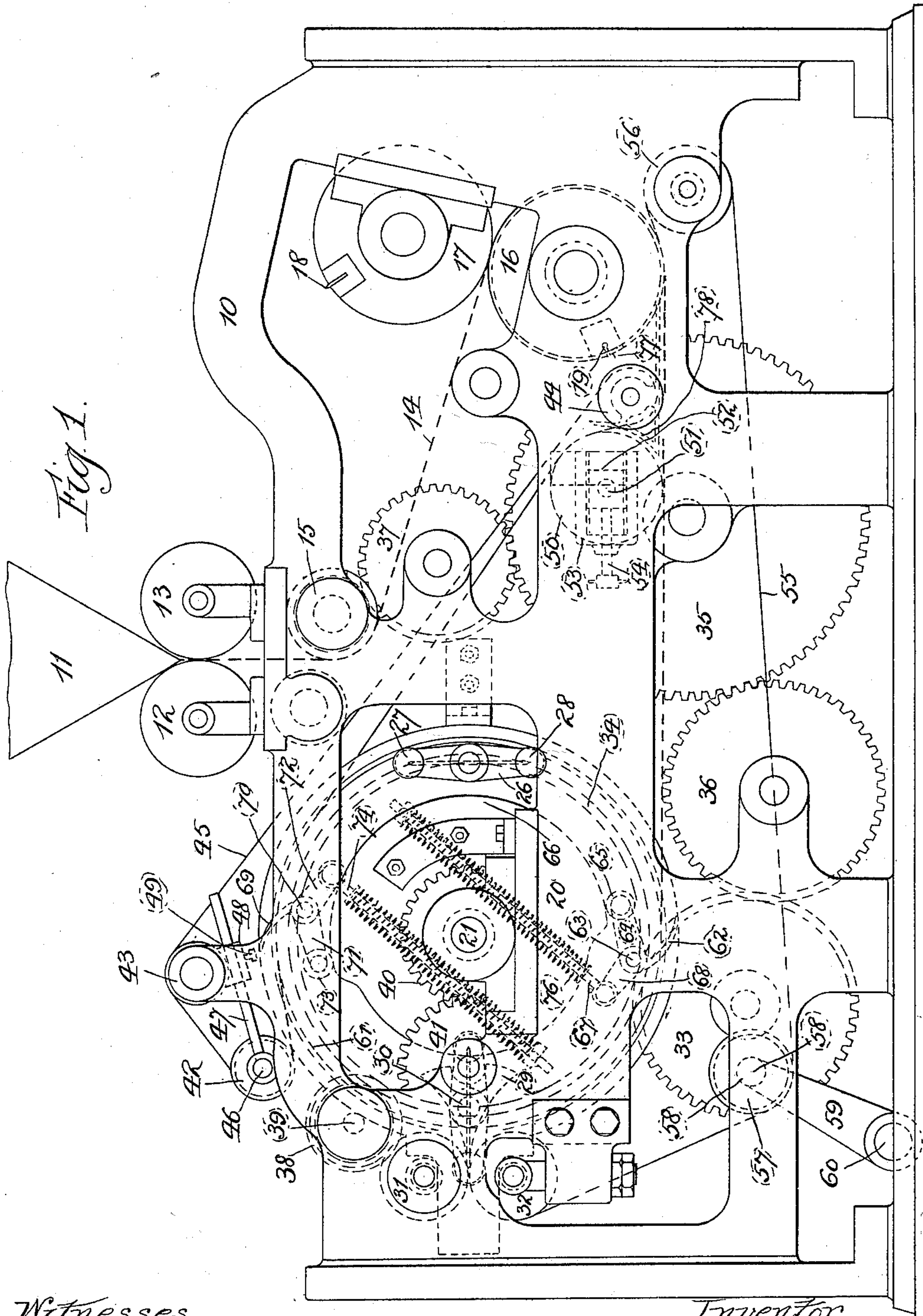
S. G. GOSS.

PRINTING MACHINE.

(Application filed Dec. 7, 1894.)

(No Model.)

4 Sheets—Sheet I.



Witnesses.  
Wm. N. Rhems  
Wm. J. Fleming

Inventor.  
Samuel G. Goss  
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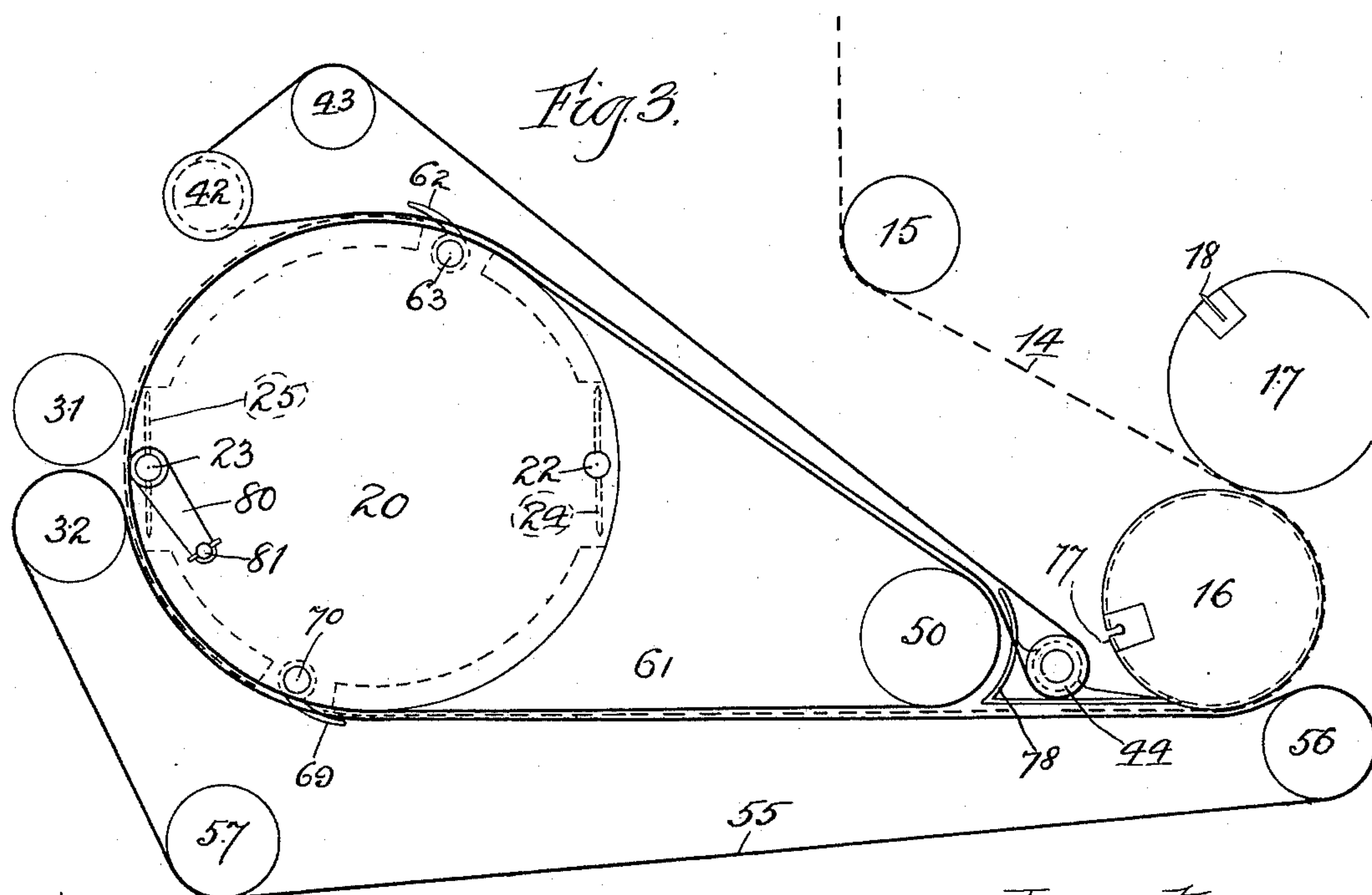
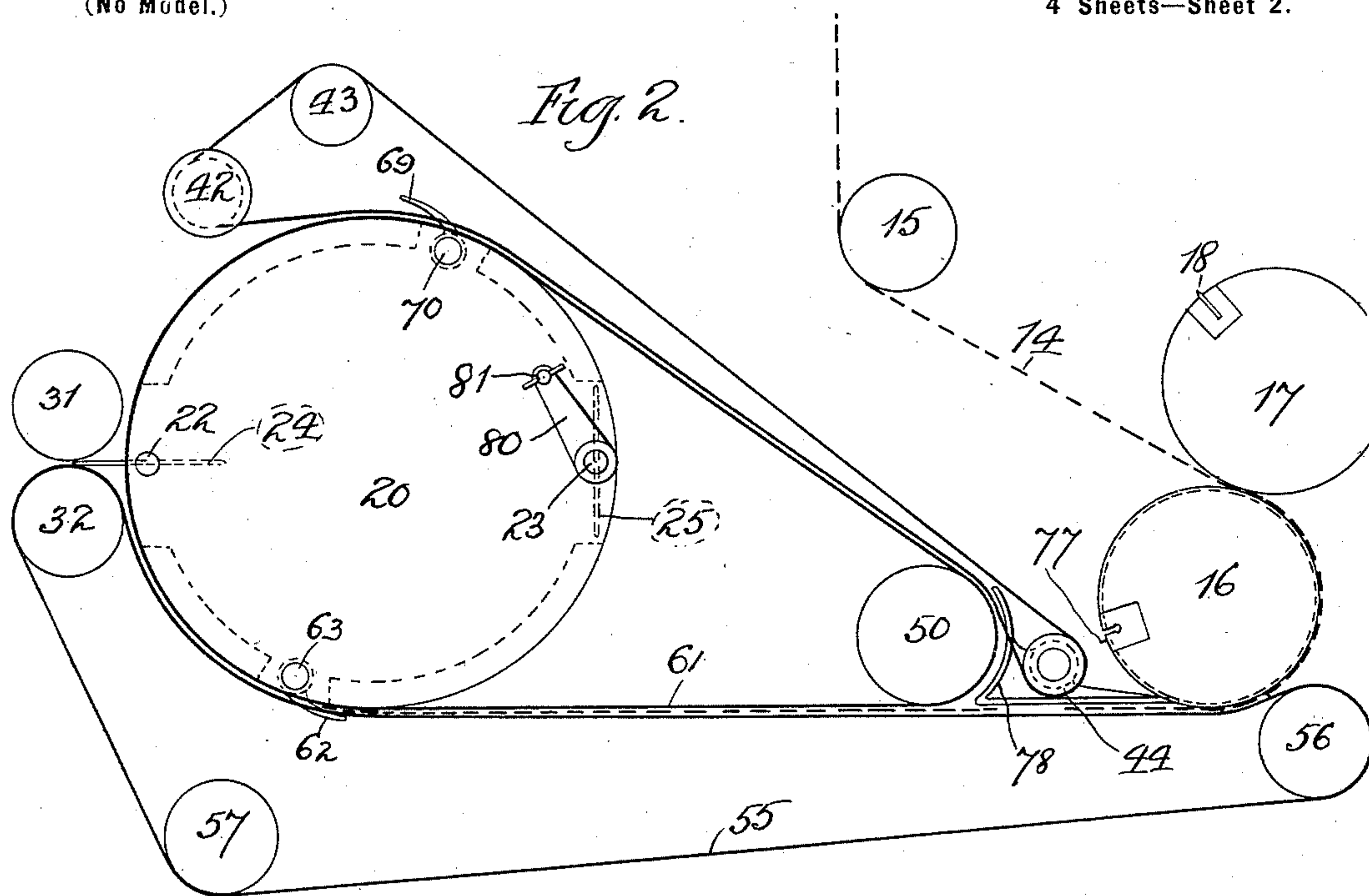
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(No Model.)

4 Sheets—Sheet 2.



Witnesses,

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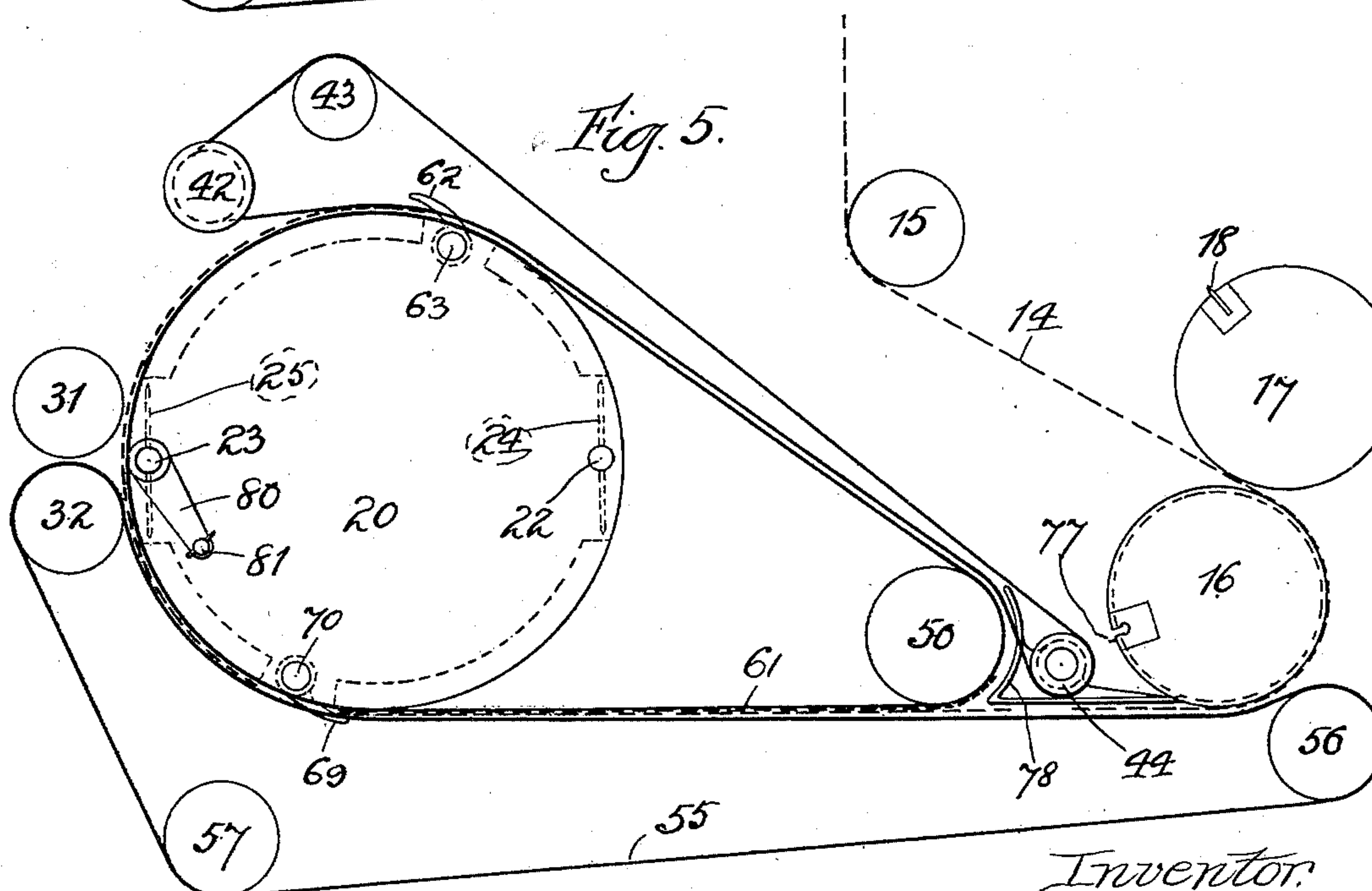
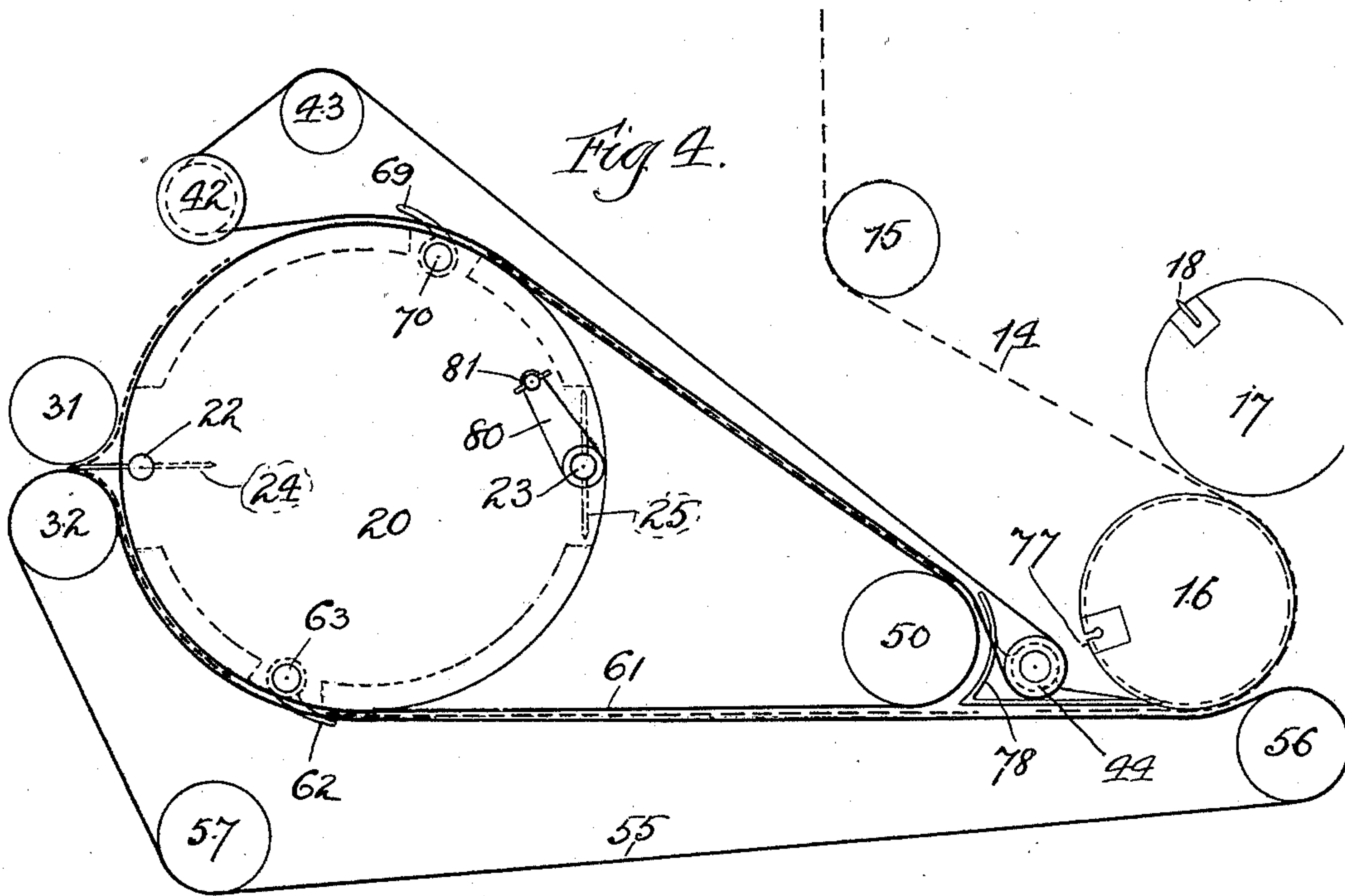
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PRINTING MACHINE.  
(Application filed Dec. 7, 1894.)

(No Model.)

4 Sheets—Sheet 3.



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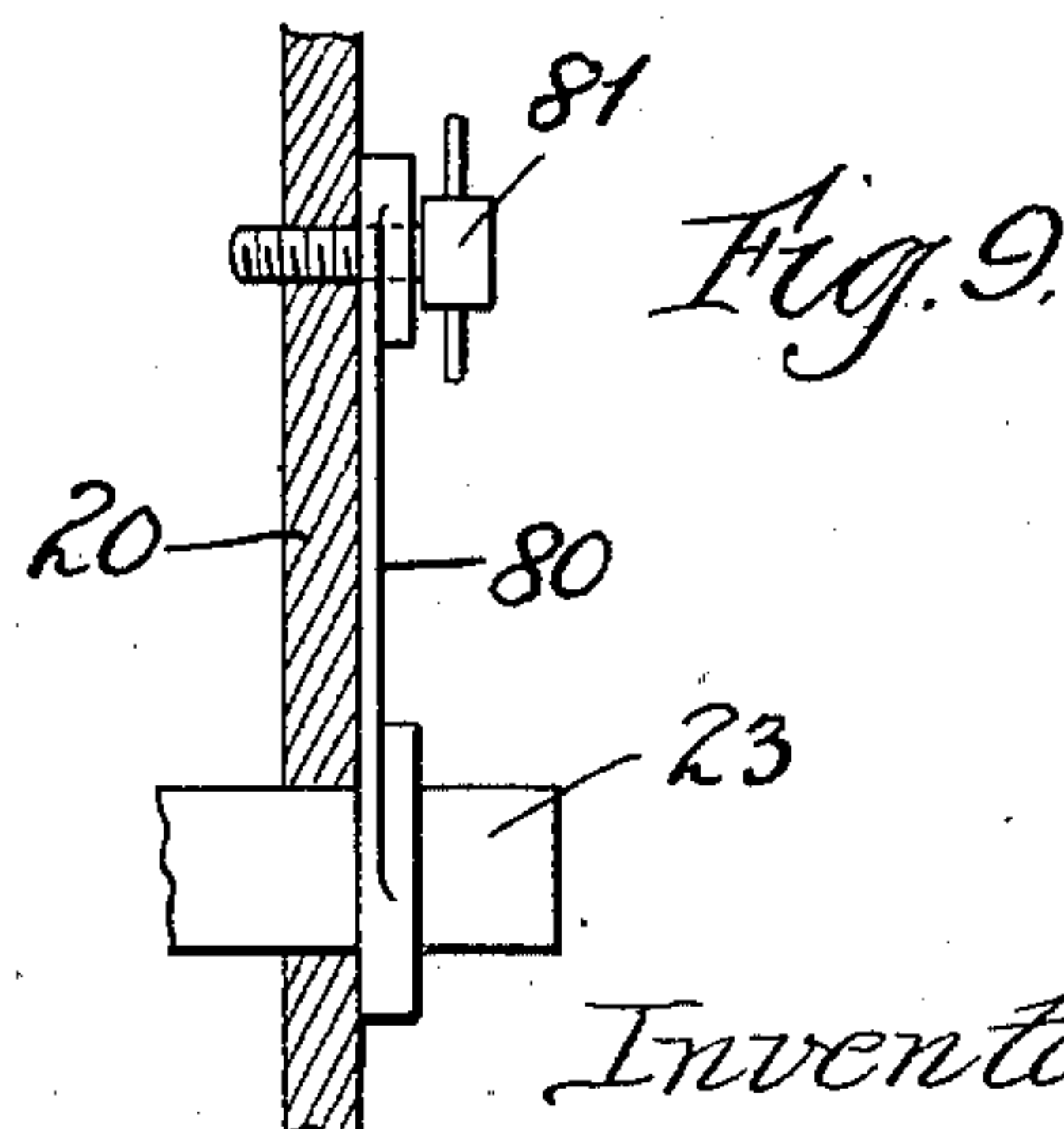
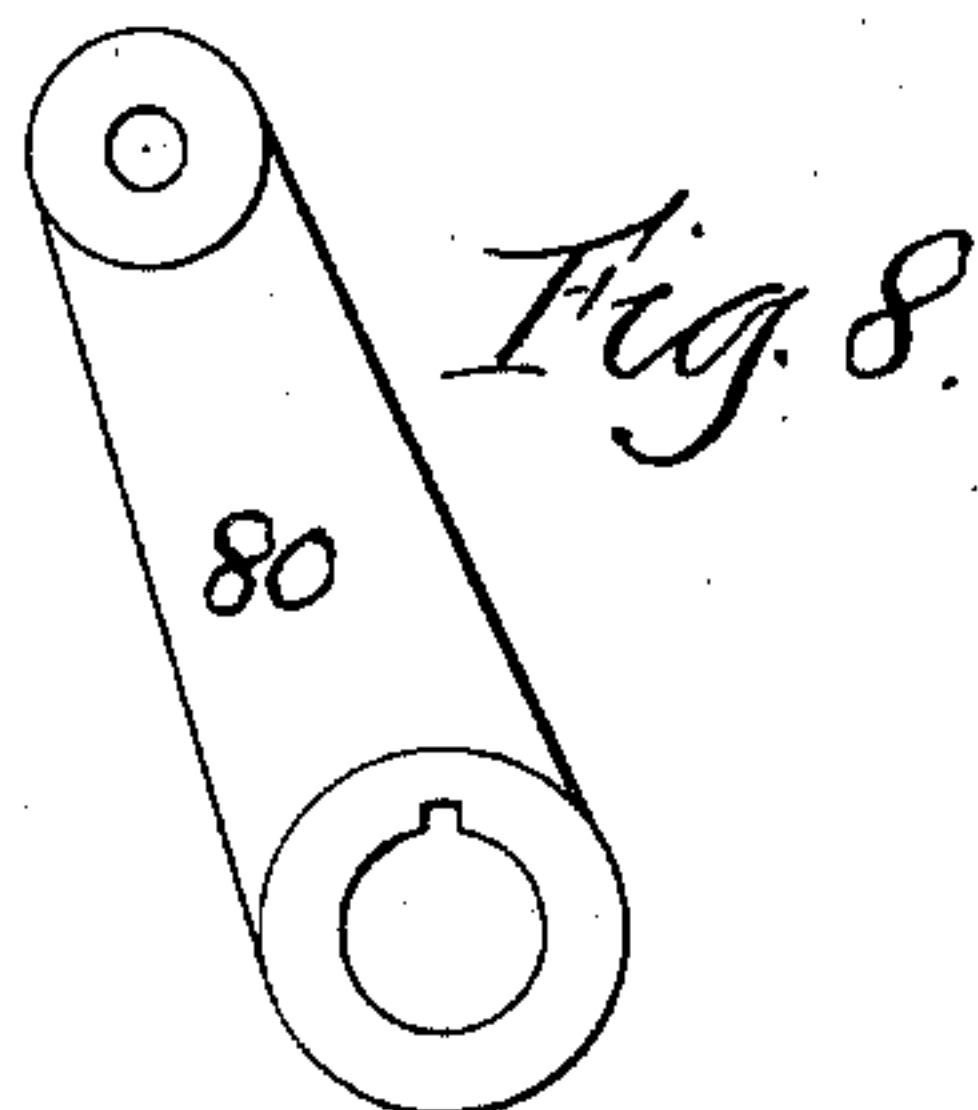
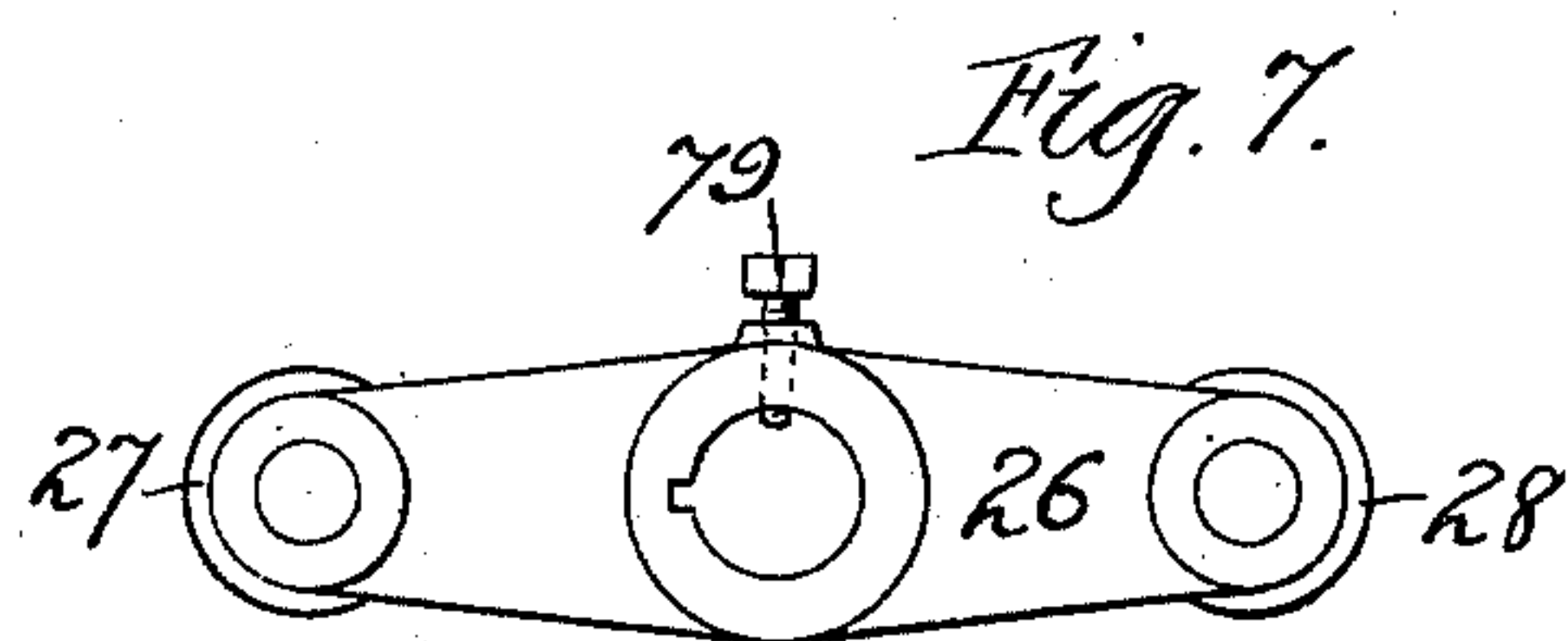
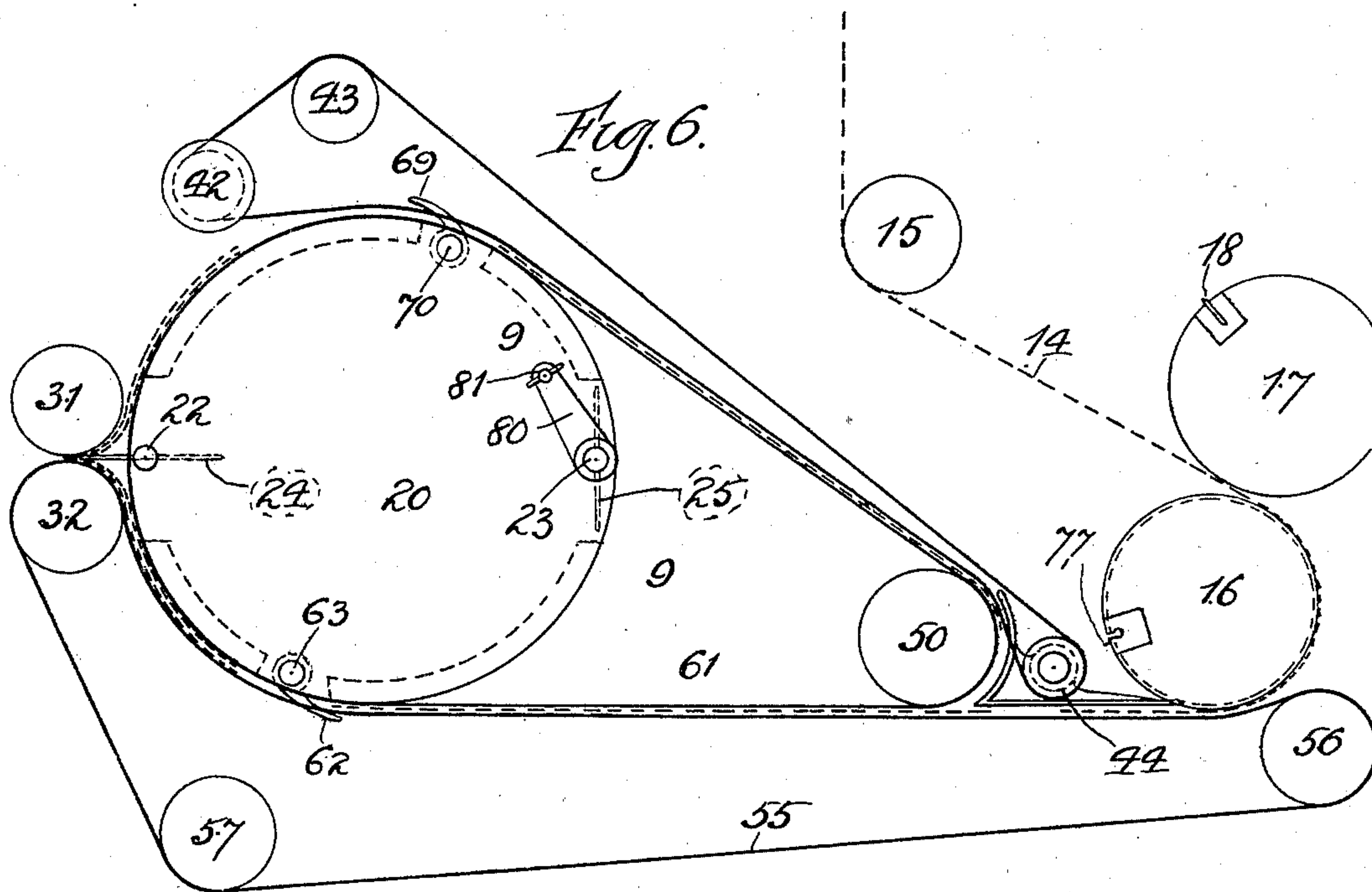
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PRINTING MACHINE.

(Application filed Dec. 7, 1894.)

(No Model.)

4 Sheets—Sheet 4.



Witnesses  
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# UNITED STATES PATENT OFFICE.

SAMUEL G. GOSS, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE GOSS PRINTING PRESS COMPANY, OF SAME PLACE.

## PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 612,966, dated October 25, 1898.

Application filed December 7, 1894. Serial No. 531,137. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL G. GOSS, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Delivery Apparatus for Printing-Presses, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation. Figs. 2 to 6, inclusive, are diagrammatic views showing the position of the sheets at different stages of the operation. Fig. 7 is a side elevation of one of the cross-heads. Fig. 8 is a side view of the arm by which the folding-blades are silenced; and Fig. 9 is a vertical section on line 9 9 of Fig. 6, showing the manner of locking said arm in position.

My invention relates to delivery apparatus for printing-presses, and has for its object to provide various improvements by which papers of various sizes may be delivered expeditiously.

To this end my invention consists in the various combinations and arrangements hereinafter described, and pointed out in the claims.

Referring to the drawings, 10 indicates the frame of the press.

11 indicates a former which is used to longitudinally fold the web before it is conducted to the delivery-press. Rollers 12 13 are preferably arranged at the apex of said former to draw the web over it and to lay the fold; but other well-known mechanism may be used, if desired. A slit is also provided for slitting the web longitudinally. I wish it to be understood, however, that my invention is not limited to the use of my improved cutting, associating, and folding mechanism for the treatment of a longitudinally-folded web, since, if desired, a web of single width may be used, in which case single sheets may be delivered from the press having a single transverse fold, or by arranging the delivery apparatus for associating two associated sheets may be delivered with a single fold. When the longitudinal folding mechanism is employed, the number of sheets delivered is doubled.

It will be understood that the word "sheet"

as hereinafter used is intended to include either a portion severed from a web of single thickness or from a web of double thickness—that is, a web folded longitudinally—the action of the associating mechanism being the same in either case.

14 indicates the web; 15, a roller around which the web is conducted; 16 17, cutting-cylinders, one of the cylinders, as 17, provided with a blade 18, adapted to enter a recess 19 in the cylinder 16, as shown in Fig. 1.

20 indicates a folding-cylinder mounted upon a shaft 21, in which cylinder are mounted shafts 22 23, which carry folding or tucking blades 24 25, respectively, as shown in Fig. 2.

Upon one end of each shaft 22 23 is mounted a cross-head 26, carrying rollers 27 28, as shown in Fig. 1. The rollers 27 28 are adapted to be engaged by a cam 29, mounted upon a shaft 30, arranged in the frame of the press opposite the meeting edges of folding-rollers 31 32. The arrangement of the cam 29 and cross-heads 26 is such that as the cross-heads are moved around by the rotation of the cylinder 20 the rollers 27 28 will come in contact with the cam 29, thereby causing the cross-heads to turn to a radial position with reference to the rolls, thereby causing the folding-blade carried by such shaft to assume a similar position and projecting the sheet upon the cylinder into the bite of the folding-rollers 31 32. Inasmuch as the operation of such cam and cross-heads is well understood it will be unnecessary for me to describe it more particularly herein.

The cylinder 20 is caused to rotate by means of a gear 33, which meshes with a gear 34, mounted upon the shaft 21, which gear is indicated by dotted lines in Fig. 1. The gear 33 is driven from a gear 35 by an intermediate gear 36 in any suitable manner. The gear 35 is itself driven by any suitable mechanism. Said gear 35 also drives the roller 15 through an intermediate gear 37. The folding-rollers 31 32 are driven by means of a gear 38, mounted upon a suitable shaft 39 and driven from the gear 34. The cam 29 is driven from the shaft 21 by a gear 40, which is mounted upon said shaft and meshes with an intermediate gear 41, as shown in Fig. 1.



42 43 44 indicate upper tape-rollers carrying tapes 45, as shown in Fig. 1. The rollers 43 44 are fixedly mounted in any suitable manner; but the rollers 42 are mounted upon a shaft 46, carried by rods 47, movable in bearings 48 in the upper portion of the press-frame, by which arrangement the tension of the tapes 45 may be adjusted as desired. A suitable set-screw 49 or other device is provided for locking the rods 47 in position. The rollers 42 43 are arranged over the cylinder 20 in such position that the tapes will extend over such cylinder for a short distance to adapt them to receive sheets from said cylinder.

50 indicates a series of tape-rollers mounted upon a shaft 51, which rollers are arranged opposite the rollers 44, the shaft 51 being fitted in blocks 52, movable in boxes 53 at opposite sides of the press-frame, so that the position of the rollers 50 may be adjusted, adjusting-screws 54 being provided, as shown in Fig. 1. Suitable tapes 61 pass around the rollers 50 and the cylinder 20, so that the upper portions of such tapes strip the sheets from the cylinder and coact with the tapes 45 to conduct the sheets away from said cylinder. The lower portions of the tapes 61, carried by the cylinder 20 and rollers 50, coact with a lower series of tapes 55, mounted upon rollers 56 57 and the folding-roller 32, as shown in Figs. 1 and 2, the tapes 55 being so arranged as to receive the sheets from the cutting-cylinders and conduct them around to the cylinder 20, as shown in the drawings. The rollers 57 are mounted upon a shaft 58, carried by arms 59, which project from a shaft 60. The arrangement is such that by rocking the shaft 60 the position of the rollers 57 may be adjusted as desired.

62 indicates a series of grippers which are mounted upon a shaft 63, which shaft is journaled in the cylinder 20 and carries at one end an arm 64, upon which is mounted a roller 65, as shown in Fig. 1. The roller 65 runs over the surface of a stationary cam 66, the shape of which is such as to cause the grippers 62 to be turned down toward the surface of the cylinder 20, and thereby grip the leading edge of the sheets upon said cylinder, thereby carrying said sheet or sheets around the upper side of said cylinder, where they are caused to be released by the action of the cam upon the roller 65, as shown in Fig. 1. To turn the grippers out from the cylinder 20, a spring 76 is provided, which is mounted upon a rod 67, one end of said rod being fixedly connected to the cylinder 20, the other end of said rod being connected to an arm 68, carried by the shaft 63, as shown in Fig. 1. Diametrically opposite the grippers 62 is another series of grippers 69, mounted upon a shaft 70, which shaft has arms 71 72, similar to the arms 64 68, respectively. The arm 71 carries a roll 73, and the arm 72 is connected to a rod 74, upon which is mounted a spring 75, similar in action to the spring 76.

The operation of the apparatus is as follows: When both the folding-blades are active, the web 14 passes between the cutting-cylinders 16 17 and is there severed into sheets. The leading end of each sheet is then impaled by pins 77, carried by the cylinder 16, and carried around to the tapes 55, when it is stripped off the pins 77 by a shoe 78. It is then carried forward between the tapes 55 and shoe 78 to the tapes 61. It is then carried between the tapes 55 and 61 to the under side of the cylinder 20, at which point it is seized by the grippers 62 and its leading end carried around to the upper side of said cylinder. When the middle portion of such sheet comes opposite the folding-rollers 31 32, it is acted upon by one of the folding-blades, which doubles the sheet at the middle line, advancing the doubled edge into the bite of the folding-rollers 31 32, by which the sheet is folded and conducted to other folding mechanism.

In case it is desired to associate two sheets before folding, one of the folding-blades is silenced. The result is that when one of the sheets arrives opposite the folding-rollers, since the folding-blade does not act upon it, it is carried around to the tapes 45, where it is received by the tapes 61, which strip it from the folding-cylinder and, together with the tapes 45, conduct it around the roller 50, where it meets the third succeeding sheet. The guide 78 serves to properly deflect the returning sheets, as shown in the drawings. The associated sheets are then carried along together between the tapes 55 61 back to the cylinder 20. At this time the two sheets will be acted upon by the active folding-blade and folded together transversely. In this way the operation is continued, every other sheet being carried back to meet a succeeding sheet.

When it is desired to adjust the length of the pathway formed by the tapes 61, this may be accomplished by turning the adjusting-screws 54, and thereby adjusting the position of the rollers 50. When slight adjustment is desired, the elasticity of the tapes will permit them to adjust themselves to the altered position of the rollers 50; but where the rollers 50 are moved a considerable distance new tapes are necessary.

The cross-heads 26 are made removable, being mounted upon feathers upon the shafts 22 23. They are secured in place by set-screws 79, as shown in Fig. 7. For the purpose of silencing one of the folding-blades the cross-head 26 of such blade is removed and an arm 80 is secured upon the shaft which carries the folding-blade in place of such cross-head, such arm being provided with a recess to receive the feather, as shown in Fig. 8. The arm 80 is fixedly secured to the cylinder 20 by means of a bolt 81, which passes through said arm and is screwed into or otherwise secured to said cylinder, as shown in Fig. 9. The position of the arm 80 is such as to hold the folding-blade in a position tan-



gential to the cylinder 20, as shown in Figs. 1 to 6. In this way one of the folding-blades may be so arranged that it will not be operated by the cam 29, and therefore every other sheet will pass around the cylinder 20 without being folded, as is necessary when the sheets are to be associated.

That which I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a folding-cylinder, tape-supporting mechanism, and tapes passing around said cylinder and tape-supporting mechanism for conducting, in connection with other suitable mechanism, as grippers, the sheet or sheets around, away from, and back to, said cylinder, of a folding device adjacent to said cylinder for folding the sheet or sheets transversely, a folding-blade carried by said cylinder, and mechanism for cutting a web transversely into sheets, said cutting mechanism being separate from said folding-cylinder, substantially as described.

2. The combination with a folding-cylinder, tape-supporting mechanism, and tapes passing around said cylinder and tape-supporting mechanism for conducting, in connection with other suitable mechanism, as grippers, the sheet or sheets around, away from, and back to, said cylinder, of folding-rollers mounted in substantially fixed bearings adjacent to said cylinder for folding the sheet or sheets transversely, a folding-blade carried by said cylinder, and mechanism for cutting a web transversely into sheets, said cutting mechanism being separate from said folding-cylinder, substantially as described.

3. The combination with mechanism for severing a web into sheets, of a folding-cylinder, sheet-carrying tapes passing around said cylinder for conducting, in connection with other suitable mechanism, as grippers, certain sheets around and away from said cylinder, back to and superposing them upon succeeding sheets, and a tucking device carried by said cylinder, substantially as described.

4. The combination with a folding-cylinder, tape-supporting mechanism, tapes passing around said cylinder and tape-supporting mechanism, and grippers carried by said cylinder for conducting the sheet or sheets around, away from, and back to, said cylinder, and means for operating said grippers, of a folding device adjacent to said cylinder for folding the sheet or sheets transversely, a folding-blade carried by said cylinder, and mechanism for cutting a web transversely into sheets, said cutting mechanism being separate from said folding-cylinder, substantially as described.

5. The combination with mechanism for severing a web into sheets, of a folding-cylinder, sheet-carrying tapes passing around said cylinder for conducting, in connection with other suitable mechanism, as grippers, certain sheets around and away from said cylinder, back to and superposing them upon succeeding sheets, a tucking device carried by said cyl-

inder, and means for adjusting the length of the pathway formed by said tapes, substantially as described.

6. The combination with a folding-cylinder, tape-supporting mechanism, tapes passing around said cylinder and tape-supporting mechanism for conducting, in connection with other suitable mechanism, as grippers, the sheet or sheets around said cylinder, away therefrom and back thereto, of a folding device adjacent to said cylinder for folding the sheet or sheets transversely, a pair of folding-blades carried by said cylinder, means for silencing one of said folding-blades, and mechanism for cutting a web transversely into sheets, substantially as described.

7. The combination with a folding-cylinder, shafts 22 23 carried thereby, and folding-blades carried by said shafts, of an arm adapted to be fitted upon one of said shafts, means for securing said arm in such position as to hold the folding-blade out of operative position, tape-rollers, tapes passing around said cylinder and tape-rollers for conducting, in connection with other suitable mechanism, as grippers, the sheet or sheets around said cylinder and tape-rollers, folding-rollers adjacent to said cylinder for folding the sheet or sheets transversely, and means for severing a web transversely into sheets, substantially as described.

8. The combination with a folding-cylinder, tape-rollers, and tapes passing around said cylinder and tape-rollers for conducting, in connection with other suitable mechanism, as grippers, the sheet or sheets around, away from, and back to, said cylinder, of a folding device adjacent to said cylinder for folding the sheet or sheets transversely, a folding-blade carried by said cylinder, mechanism for cutting a web transversely into sheets, and means for adjusting the distance between said cylinder and tape-rollers, substantially as described.

9. The combination with mechanism for folding a web longitudinally, and mechanism for severing the longitudinally-folded web into sheets, of a folding-cylinder, means for conducting the sheets from said longitudinal folder to said folding-cylinder, tape-and-roller mechanism for conducting, in connection with other suitable mechanism, as grippers, certain sets of severed sheets around and away from said folding-cylinder back to and superposing them upon succeeding sheets, said tapes acting also to strip the sheets from the folding-cylinder and means for transversely folding said associated sheets, substantially as described.

10. The combination with mechanism for folding a web longitudinally, of cutting-cylinders, a folding-cylinder independent of the cutting-cylinders, a roller and tapes passing around said roller and the folding-cylinder, folding-rollers arranged in juxtaposition to the folding-cylinder, rollers and 44 and tapes passing around said rollers,



rollers 56 and 57 and tapes passing around said rollers and the folding-roller 32, the roller 56 being so arranged with reference to the cutting-cylinders that the sheets are received  
5 from said cylinders by the tapes passing around said roller and conducted to the folding-cylinder, substantially as described.

11. The combination with mechanism for folding a web longitudinally, of cutting-cylinders, a folding-cylinder independent of the cutting-cylinders, a roller 50 and tapes passing around said roller and the folding-cylinder, folding-rollers 31, 32 arranged in juxtaposition to the folding-cylinder, rollers 42, 43  
15 and 44 and tapes passing around said rollers, rollers 56, 57, tapes passing around said rollers and the folding-roller 32, the roller 56 being so arranged with reference to the cutting-cylinders that the sheets are received from  
20 said cylinders by the tapes passing around said roller and conducted to the folding-cylinder, and a guide 78 arranged between the rollers 50 and 44, substantially as described.

12. The combination with cutting mechan-

ism for severing a web transversely into 25 sheets, and folding mechanism, of means for conducting the severed sheets from said cutting mechanism to said folding mechanism and for returning certain of such sheets back to and superposing them upon succeeding 30 sheets, and means for adjusting the length of the pathway traveled by such sheets, substantially as described.

13. In a sheet-collecting apparatus, the combination of a folding-cylinder, tape-supporting devices, tapes carried by said cylinder and tape-supporting devices, means for adjusting the tape-supporting devices to alter the length of the pathway formed by the tapes, means for delivering sheets to said collecting 40 apparatus, and means for conducting certain sheets around said cylinder back to and superposing them upon succeeding sheets, substantially as described.

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Witnesses:

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