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E. P. SHELDON.
PRINTING MACHINE.
APPLICATION FILED JUNE 16, 1908.

Patented Mar. 29, 1910.

6 SHEETS—SHEET 1.

Fig. 2.

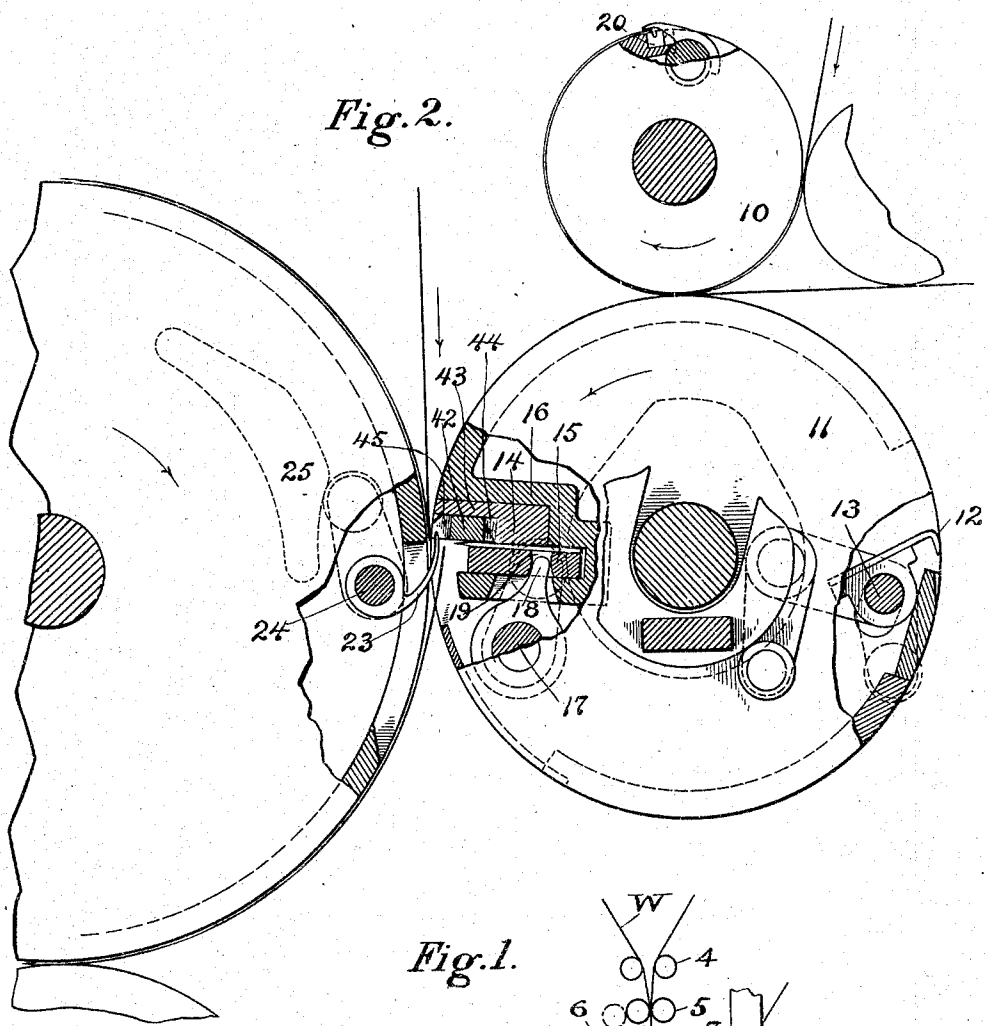
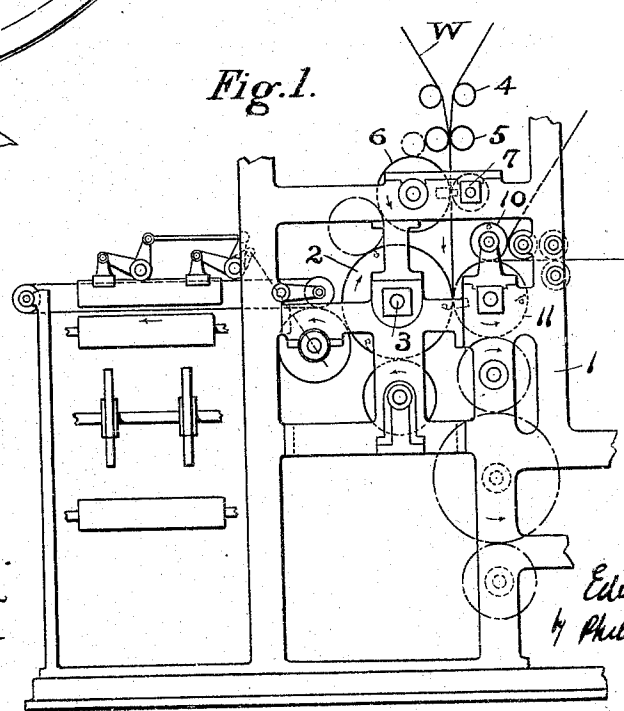


Fig. 1.



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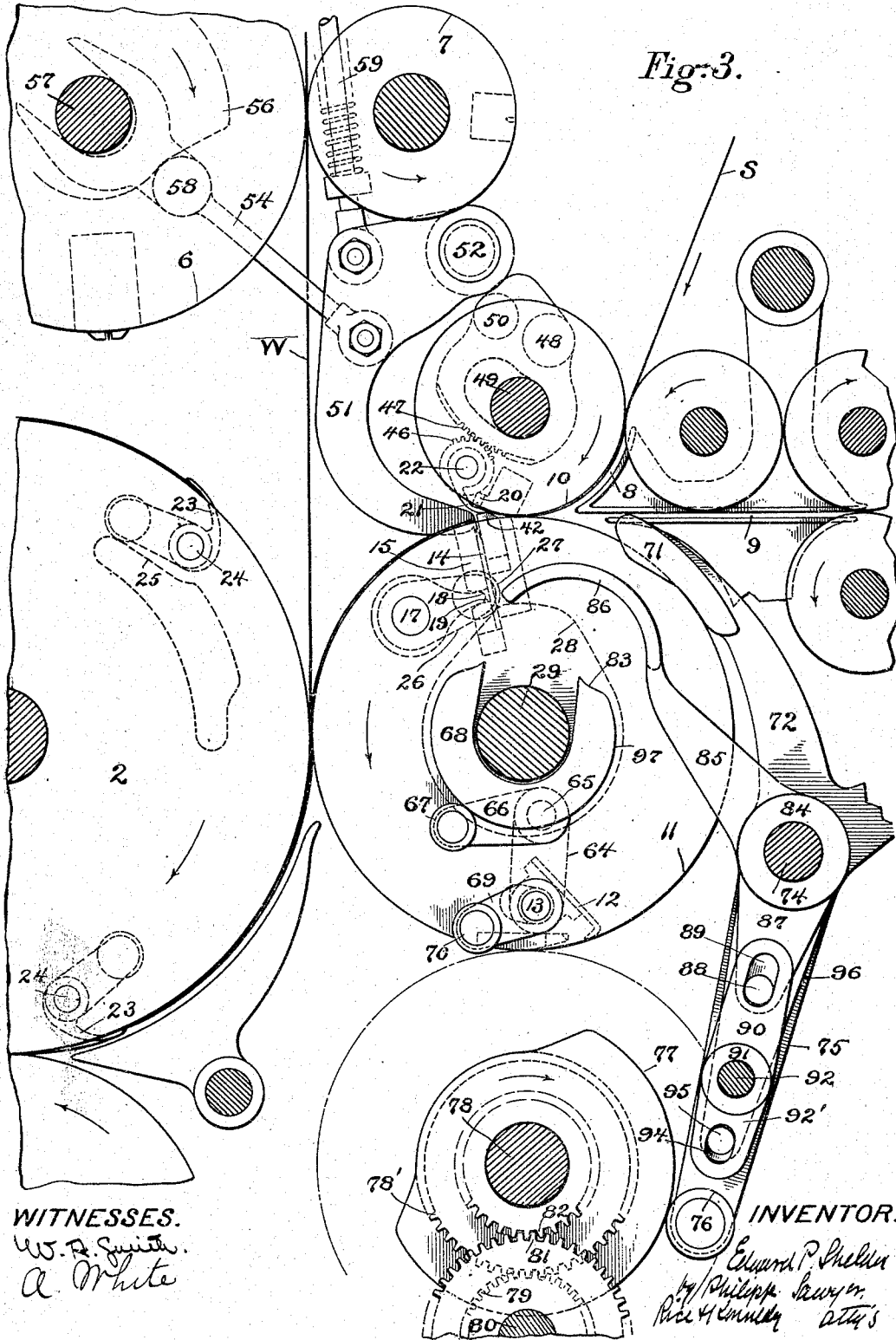
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6 SHEETS—SHEET 2.

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Fig. 3.



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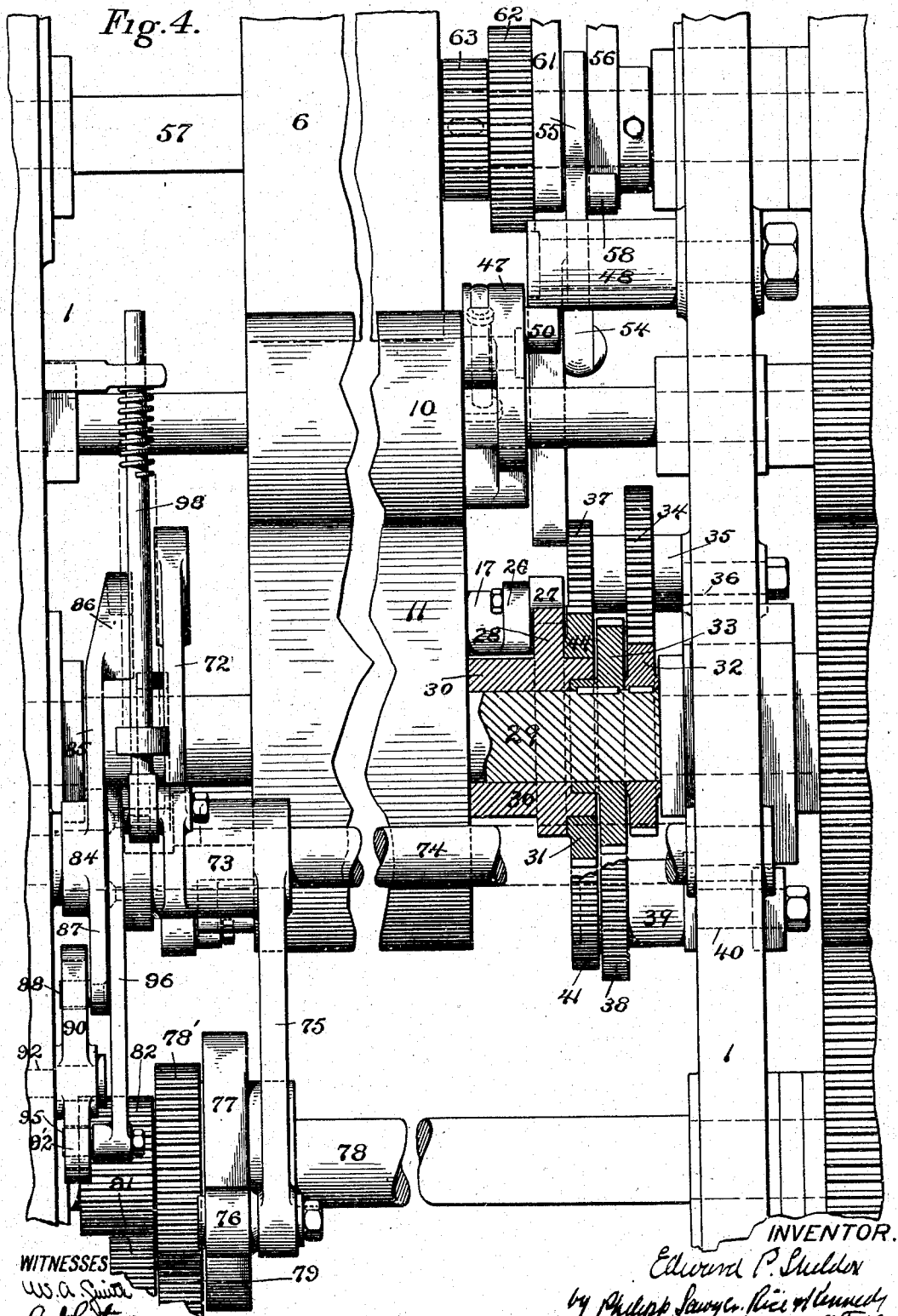
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6 SHEETS—SHEET 3.

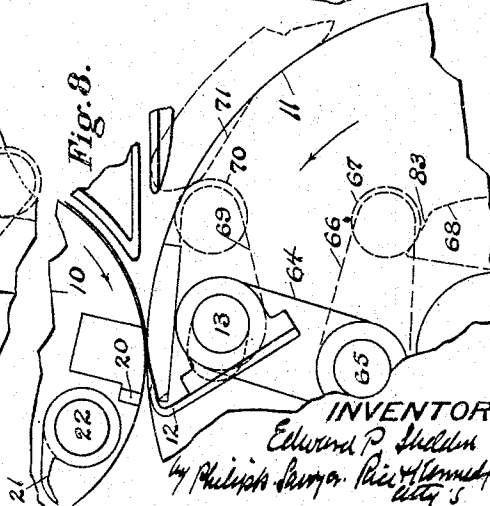
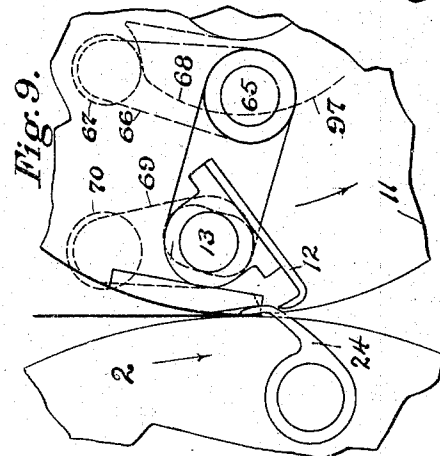
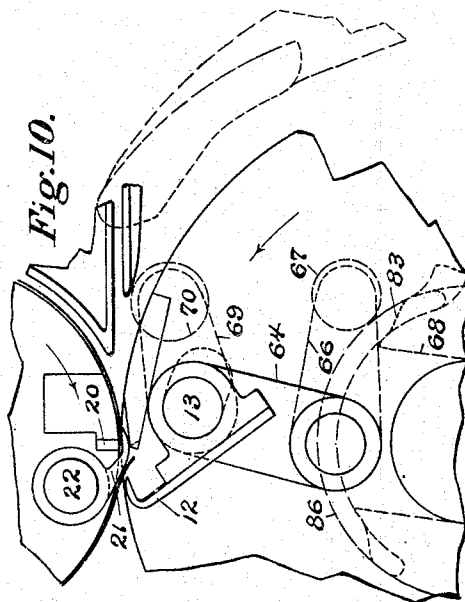
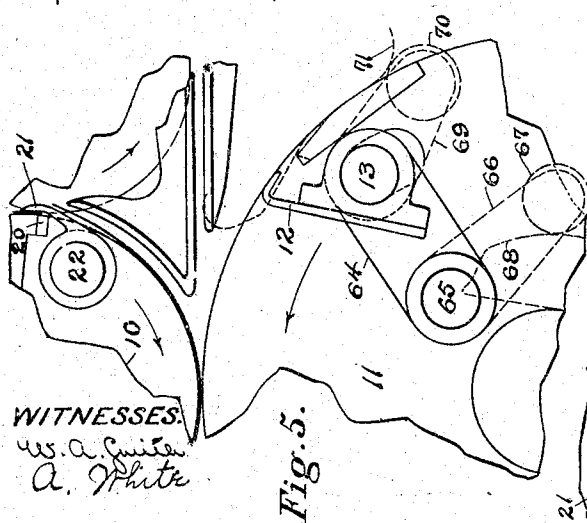
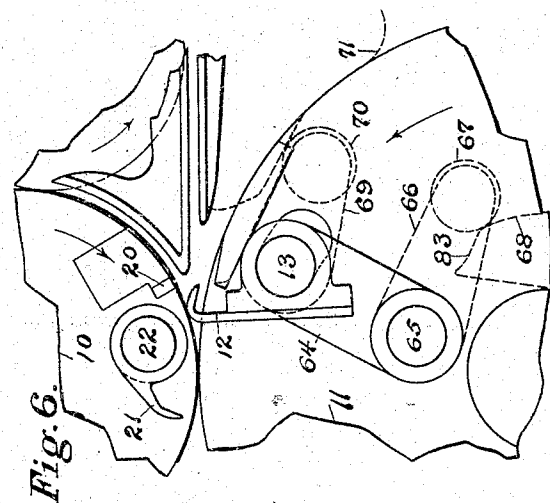
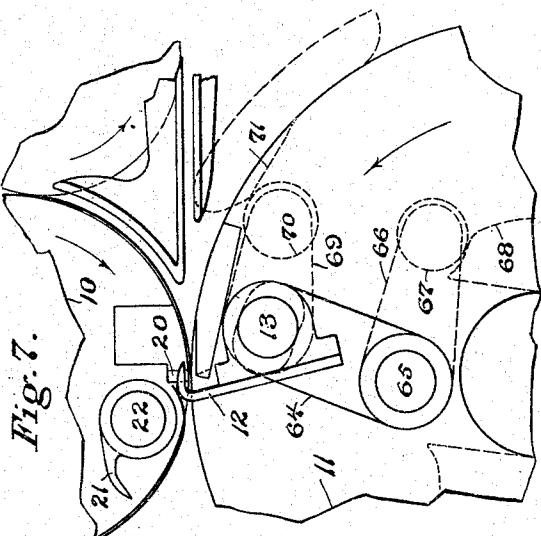
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Patented Mar. 29, 1910.

6 SHEETS—SHEET 4.



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Fig. 5.

Fig. 8.

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6 SHEETS—SHEET 5.

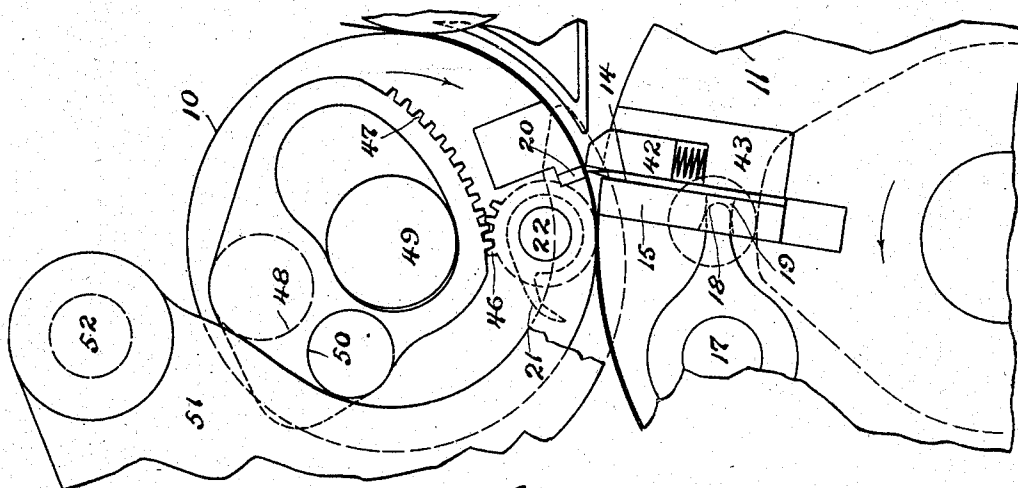


Fig. 11.

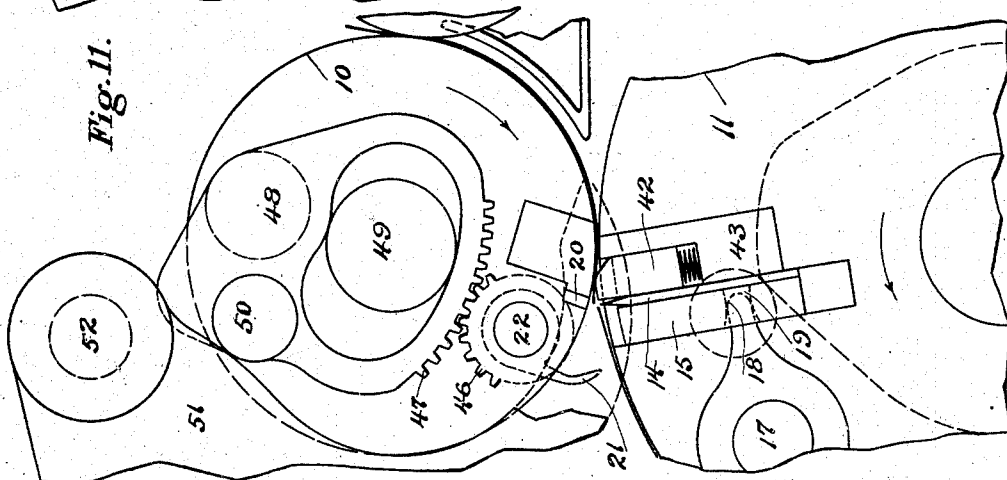


Fig. 12.

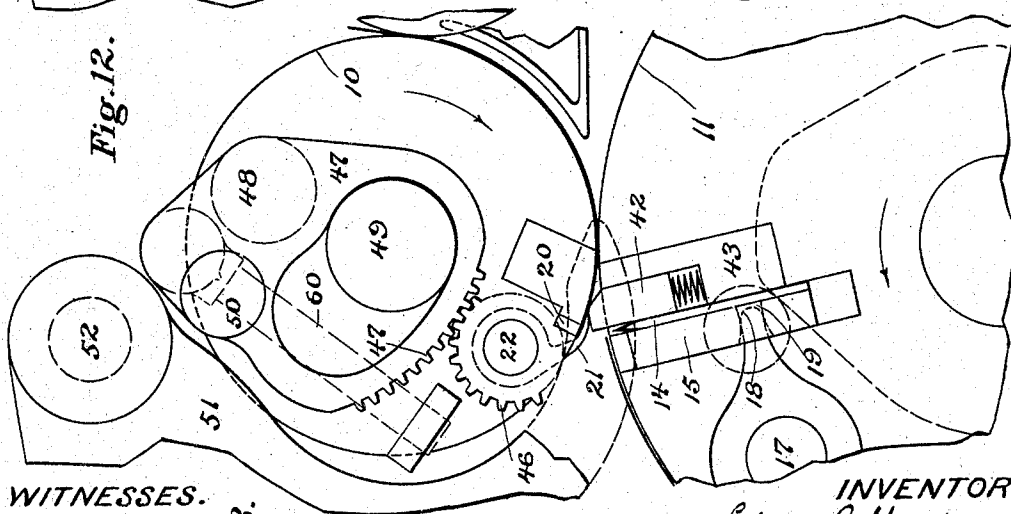


Fig. 13.

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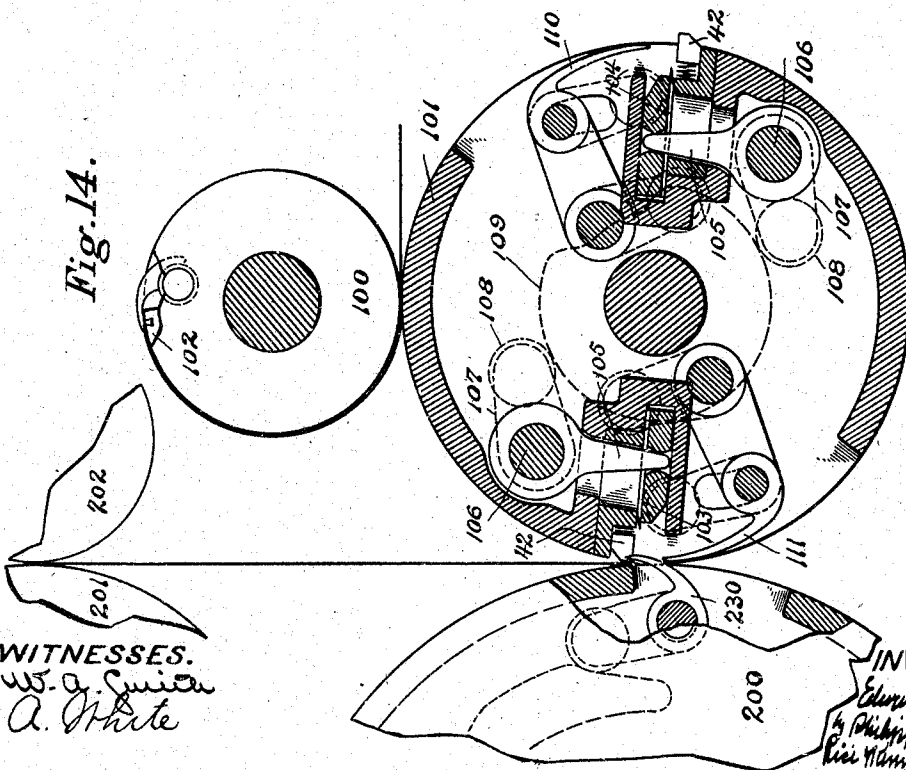
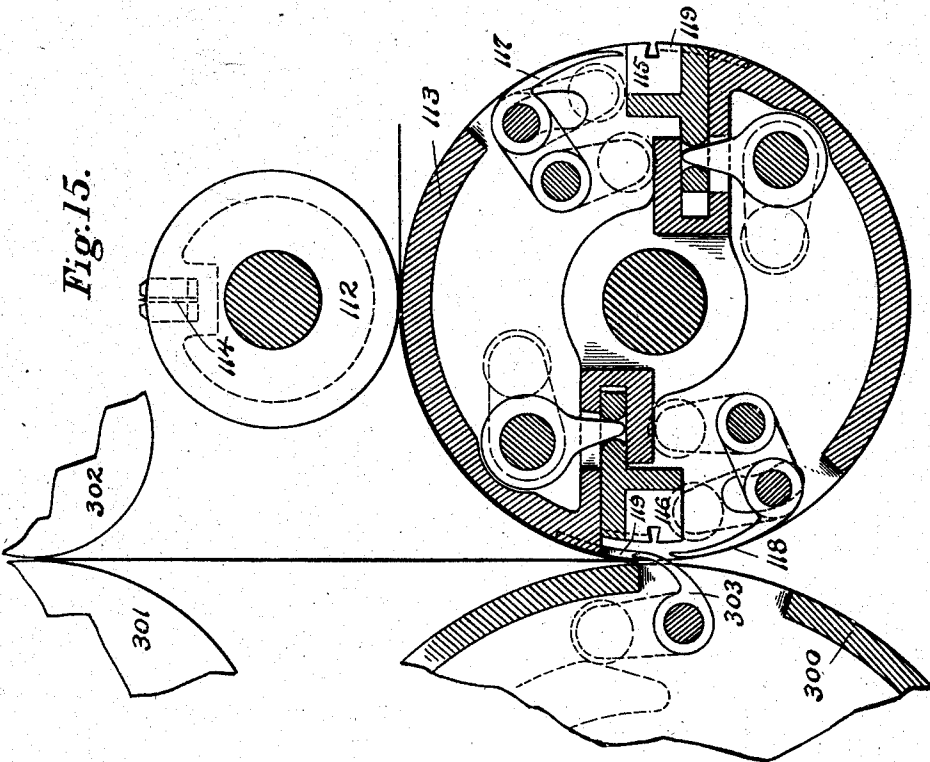
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6 SHEETS—SHEET 6.

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UNITED STATES PATENT OFFICE.

EDWARD P. SHELDON, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO
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PRINTING-MACHINE.

953,063.

Specification of Letters Patent.

Patented Mar. 29, 1910.

Application filed June 16, 1908. Serial No. 438,712.

To all whom it may concern:

Be it known that I, EDWARD P. SHELDON, a citizen of the United States, residing at New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Printing-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in printing machines.

In certain printing machines which employ a cylinder for the purpose of associating products, it is desirable to supply to the cylinder not only what may be described as ordinary sheets, such as sheets from a web, of which the product may be chiefly composed, but also to supply what may be described as specially printed sheets, such as sheets printed in special colors or carrying illustrations. In fast running printing machines where it is desirable to supply these specially printed sheets by cutting them from a web, or by cutting a multiple sheet into parts, the sheets being afterward forwarded by one of the cutting cylinders, it has been customary to use pins which impale the leading edge of the sheet immediately after cutting. The use of pins, however, is objectionable where specially printed sheets are to be handled, and especially so when, as is frequently the case, the leading edge of the sheet is to be taken in succession by a plurality of sets of pins, for the reason that the perforations made by the pins disfigure the sheet.

This invention has for one of its objects to produce an improved mechanism for cutting sheets which are afterward to be forwarded by one of the cutting members or cylinders, the forwarding mechanism including grippers instead of pins.

A further object of the invention is to produce a mechanism for cutting and forwarding sheets by means of cylinders provided with grippers, the cutting mechanism including a movable member or members by which the action of the grippers is facilitated.

A further object of the invention is to produce a mechanism for handling sheets from different sources, such as web sheets and specially printed sheets, said mechanism including a cylinder provided with grippers,

sheets being delivered to the cylinder from a cutting cylinder having grippers and also having a cutting member which is movable to facilitate the operation of the grippers.

The invention also includes certain details of construction by which the objects referred to are carried into effect.

With the objects specified and other objects in view, the invention consists in certain constructions and in certain parts, improvements and combinations as will be hereinafter fully described and then specifically pointed out.

Referring to the drawings—Figure 1 is a diagrammatic end view of the delivery end of a printing machine embodying the invention. Fig. 2 is an enlarged detail view of the cutting and collecting cylinders employed in the construction illustrated in Fig. 1. Fig. 3 is a detail view on an enlarged scale illustrating more particularly the operating mechanism for the construction shown in Fig. 2. Fig. 4 is an elevation, partly in section, illustrating more particularly the mechanism for operating the cutting mechanism and the various grippers. Figs. 5 to 10 inclusive are detail diagrammatic views illustrating more particularly the operation of the transferring cylinder grippers employed. Figs. 11, 12 and 13 are detail diagrammatic views illustrating more particularly the operation of the cutting mechanism in constructions in which a knife carrying cylinder provided with a movable knife operates in connection with a companion cylinder provided with grippers. Figs. 14 and 15 are detail diagrammatic views illustrating modified constructions embodying certain features of the invention.

Referring to the drawings, and more particularly to Figs. 1–13, 1 indicates the frame of the machine in which the various operating parts are mounted. In the particular construction selected to illustrate an embodiment of the invention, a collecting cylinder is employed, marked 2, which is supported on a shaft 3 carried in the usual boxes in the frame. The particular collecting cylinder employed in the mechanism illustrated in the figures referred to is of the well-known three-part type.

In the particular machine illustrated, the sheets which are to be assembled on the collecting cylinder are derived from different

sources. Part of the sheets which are to be assembled on the collecting cylinder may be derived from a web and are shown as being derived from a web W which is illustrated as passing between the usual bending rolls 4 and drawing-off rolls 5, then between the usual cutting cylinders 6, 7 from which cylinders they pass to the collecting cylinder. The other sheets which are to be supplied to the collecting cylinder may be brought into the machine in various ways, but in the construction shown in Figs. 1 to 13, they are supplied from either or both of two sheet pathways 8, 9 (see Fig. 3) these pathways including the usual guides and forwarding rolls to which the sheets may be delivered by tapes. A suitable arrangement of guides and forwarding rolls is illustrated in Fig. 3, and when tapes are employed in connection therewith, those skilled in the art will readily understand how they are to be arranged without specific description.

The particular machine illustrated in Figs. 1 to 13, is designed to supply to the collecting cylinder an additional sheet such as a cover sheet or an inset sheet or both, these sheets being obtained by cutting a multilength sheet into two parts. The first part of such sheet passes on directly to the collecting cylinder, and the second half of the sheet is detained for a sufficient length of time to permit the collecting cylinder to acquire its proper accumulation of sheets. In the particular construction shown, the collecting cylinder is a three part cylinder and the sheet would, therefore, be detained for one-third of a revolution of the three-part cylinder. The manner in which these multilength sheets are supplied has no particular relation to the present invention. They may, however, be supplied in any suitable manner, as, for instance, they may be fed from piles by hand or automatically, if desired.

In the particular construction illustrated in Figs. 1 to 13 inclusive, the multilength sheets are delivered to a pair of cylinders 10, 11 which are cutting cylinders and one of which also operates as a transferring cylinder by which the sheets are delivered to the collecting cylinder. In the construction illustrated in these figures, the cylinder 11 is the transferring cylinder and is provided with suitable grippers by which the leading end of the multilength sheet or sheets, according to whether one or both of the sheet pathways 8, 9, is employed, is seized and advanced to the collecting cylinder. The grippers employed may be of any suitable construction. As shown, these grippers comprise fingers 12 mounted on a rock-shaft 13 operated through suitable connections to be hereinafter referred to.

The cylinders 10, 11, will, as indicated,

be provided with suitable cutting members, 65 and one of said members will be movable. In the construction shown in Figs. 1 to 13 inclusive, the cylinder 11 is provided with a movable knife 14 fast on a knife carrying bar 15, this bar being arranged to slide in a socket 16 in the cylinder. The knife will be moved at the proper time by any suitable means. In the construction illustrated, there is provided for this purpose a rock-shaft 17 having a series of arms or toe-pieces 18, these toe-pieces engaging openings 19 in the bar 15. The shaft 17 is operated by a suitable mechanism which will be hereinafter referred to. The knife 14 coöperates with a suitable member, as a cutting wood 20, mounted in the cylinder 10.

When, as in the construction illustrated in Figs. 1 to 13, inclusive, a construction is employed for supplying parts of multilength sheets to be associated with other sheets on the collecting cylinder, the cylinder 10 will be provided with suitable sheet retaining devices to take the edge of the second-half of the multilength sheet after cutting and carry this sheet around so as to retain the sheet during the proper period of revolution of the collecting cylinder. While the construction of these sheet retaining devices may be varied, as illustrated they consist of grippers 21 of a usual type, these grippers being mounted on and operated by a rock-shaft 22.

The collecting cylinder will be provided with suitable grippers for taking the sheets from the various sources, that is, from the web when sheets are supplied from a web, and also from the transferring cylinder. In the particular construction illustrated, the collecting cylinder is provided with sets of sheet taking grippers, one set being illustrated in Fig. 2 and marked 23. These grippers may be operated in any suitable manner, and are shown as mounted on a rock-shaft 24 provided with an operating arm and roll arranged to be operated by a stationary cam indicated in dotted lines at 25 in Fig. 2, the construction referred to being one well-understood in the art.

In the particular construction illustrated in Figs. 1 to 13 inclusive, the cylinder 10 has its circumference substantially equal in length to the sheet to be taken upon it, and the cylinder 11 has its circumference twice the length of the cylinder 10.

With the construction so far described, and assuming that a multilength sheet S has been fed through one or both of the pathways 8, 9 and that its leading edge has been taken by the grippers 12 and been delivered to the grippers 23 on the cylinder 2, which grippers have also taken a web sheet, the next operation to be performed in the machine will be to effect the cutting of the multilength sheet. The position of the

parts just prior to the cutting of the multilength sheet is illustrated in Fig. 11, the knife 14 having been thrown up by its operating mechanism into cutting position so that as the rotation of the cylinder continues, the multilength sheet will be severed. As has been explained, after the multilength sheet is severed, the leading edge of the rear part of it is to be taken by the grippers 21, so that this part may be carried around the cylinder 10.

The position of the parts just after cutting is illustrated in Fig. 12, at which time the grippers 21 have begun to move forward in order to take the leading edge of the rear part of the sheet.

Fig. 13 illustrates the position of the parts after the cutting operation has been completed and the grippers 21 have closed down upon the sheet. It will be observed that during the movement of the cylinder 11 from the position shown in Fig. 11 to the position shown in Fig. 13, the knife has been retracted, so that it is out of the way of the grippers, thus permitting them to swing in over the leading edge of the sheet without interfering with the knife.

It has been heretofore stated that the movement of the knife is effected by means of arms or toe-pieces 18 carried on a rock shaft 17. This rock-shaft (see Fig. 4 and dotted lines in Fig. 3) is provided with an arm 26 having a roll 27 which runs on a cam 28 supported on a shaft 29 which is the shaft which carries the cylinder 11. The operating means for effecting the movement of the knife will, in the best constructions, be of such a character that the movement of the knife can be varied according to the products which are to be produced.

In the machine illustrated in Figs. 1 to 13 inclusive, the collecting cylinder is a three-part cylinder and is arranged to collect two successive layers on each of its parts, a specially printed sheet being then assembled on the collecting cylinder with these two layers, so that an operation of the knife is required on every second revolution of the cylinder 11. Should, however, it be desired to use the three part cylinder to collect four layers and assemble with the four layers a specially printed sheet, then the knife should operate to sever a specially printed sheet once in four revolutions of the cylinder 11. In the particular construction illustrated, the variation in the movement of the knife is effected by making the cam 28 a movable cam and driving it at varying speeds. As shown (see Figs. 3 and 4) this cam 28 is loosely mounted on the shaft 29 and there is fast to the hub 30 of the cam a gear 31. Beyond this gear 31 and fast on the shaft 29 are two gears 32, 33. Located above the gear 32 is a gear 34, this gear be-

ing mounted on a hub 35 supported on a pin 36, the opening in the hub being eccentric to the center of the stud 36. On the hub 35 is also mounted a gear 37 which can be arranged to mesh with the gear 31. Located below the gear 33 and arranged so as to mesh with it is a gear 38, this gear being supported on a hub 39 in turn carried by a pin 40, the opening of the hub being eccentric to the axis of the pin. Fast on this hub 39 is a second gear 41 which can also be arranged to mesh with the gear 31. In the particular construction illustrated, when the gears 32, 34, 37 and 31 are in mesh, the cam is driven at one-half the speed of the cylinder 11. When the other set of gears described is in mesh, the cam is driven at one quarter the speed of the cylinder 11. The knife is, therefore, by the construction shown operated and brought into cutting position once in every second or once in every fourth revolution of the cylinder 11.

There may be a tendency in cutting, and particularly in cutting with a movable knife, for the edge of the sheet which is behind the knife to spring slightly out of position, so as to be beyond the reach of the sheet retaining devices, particularly where grippers are employed, or become so shifted that the grippers will not take a firm hold of it. In the best constructions embodying the invention, therefore, a sheet edge holder will be employed in connection with the movable knife. While the sheet edge holder may be variously constructed, in the particular construction illustrated, it comprises a bar 42 (see Fig. 2) this bar being located in a box 43 which is supported in the socket 16 before referred to as in the cylinder 11. This bar 42, in the particular construction illustrated, is supported on springs 44 in its box, and, in the best constructions will be formed with recesses 45 along its length into which the grippers may pass as they nip the sheet. With this construction after cutting, as the knife retreats, the edge holding bar 42 nips the sheet against the companion cutting cylinder and holds it firmly in position until it is taken by the grippers.

It has been before stated that the sheet retaining devices on the cylinder 10 take the second half of the multilength sheet after cutting, these sheet retaining devices being, in the particular construction illustrated, shown as grippers. The particular mechanism for operating the grippers 21 on the cylinder 10, when these grippers are employed, may be varied, but in the best constructions, the mechanism will be such that these grippers may operate on differing revolutions of the cylinder 10, according to the number of layers of sheets which are being collected on the collecting cylinder. In the particular construction illustrated,

the shaft 22 is provided with a segment gear 46, this gear being in mesh with a toothed sector 47 pivoted at 48 to the end of the cylinder 10, this sector being cut away so as to surround the shaft 49 which is the shaft of the cylinder 10. This sector carries a roll 50 arranged to contact with a swinging cam 51 pivoted at 52 to the frame of the machine, this swinging cam (see Fig. 3) being operated through a rod and yoke 54, 55 from a cam 56 mounted on a shaft 57, this shaft being the shaft which supports the web cutting cylinder 6. The rod 54 is provided with a roll 58 on which the cam 56 operates. The swinging cam 51 is normally held out of operative position by a spring rod construction of the usual type indicated at 59. The sector 47 is held in such position that the grippers are normally closed by means of a spring rod construction of usual type indicated at 60.

The operation of the grippers, in connection with the movable cutting knife, is well shown in the diagrams Figs. 11, 12 and 13. As the construction is illustrated in Fig. 12, the cutting operation is completed, the knife is withdrawn, the spring edge holder is holding the edge of the sheet against the cylinder 10 and the grippers 21 have begun their movement to close on the sheet. As the construction is illustrated in Fig. 13, the grippers 21 are fully closed on the sheet.

The variation in the operation of the grippers which has been referred to may be effected in various ways. As shown (see Fig. 4) the cam 56 is fast on the shaft and effects the operation of the grippers when the collecting cylinder is making two revolutions to collect its product. When the collecting cylinder is making four revolutions, the operation of the swinging cam 51 is correspondingly changed by shifting the roll 58, so that it will bear on a cam 61 which is loose on the shaft 57 and which has connected to it a gear 62. The shaft 57 is provided with a gear 63 which is fast on it, and this gear drives back through gearing, which is omitted in the interest of clearness of illustration, but which will be well understood, to the gear 62.

It has been heretofore stated that the transferring cylinder is provided with grippers by which the sheets are taken and transferred to the collecting cylinder 2. The means for operating these grippers may be varied, but they will, in the best constructions, be of such a construction that the grippers may take on differing revolutions of the cylinder in accordance with the character of the product to be collected on the collecting cylinder. In the particular construction illustrated, the shaft 13 which carries the grippers 12 is mounted in a pair of arms 64 (see Fig. 3 and Figs. 5 to 8), these

arms 64 being fast on a rock shaft 65 mounted in the heads of the cylinder 11. This shaft has fast to it an arm 66 which carries a roll 67 running on the circumference of a cam 68 fast on the inside of the frame. The shaft 13 is also provided with an arm 69 carrying a cam roll 70. This cam roll 70 at proper times is operated upon by a cam 71 mounted on an arm 72, this arm being fast on a hub 73 which is loosely supported on a rod 74 extending across the frame. Extending from the hub 73 is an arm 75 having a cam roll 76 which runs on the surface of a cam 77, this cam being mounted on a shaft 78 and being so constructed that it may either run loose on the shaft or be fast thereto. In the particular construction illustrated, the cam is fast on the shaft when the collecting cylinder is collecting two layers of sheets and is loose on the shaft when it is collecting four layers of sheets. This cam 77 has fast to it a gear 78 which meshes with a gear 79 on an eccentric stud 80 suitably supported in the frame. This stud also carries a gear 81 which meshes with a gear 82 fast on the end of the shaft 78.

Assuming that the grippers 12 are to be operated to take the sheet from the cylinder 10, the arm 72 is rocked so as to place the cam 71 in the path of the cam roll 70, so that as the cylinder 11 revolves, the cam roll will strike this cam. The position of the parts just as the cam roll 70 comes into contact with the cam is indicated in the diagram Fig. 5 in which the outline of the cam is shown in dotted lines. As the cam roll travels along the cam the shaft 13 is rocked, throwing the grippers up and out of the cylinder, the position of the parts being indicated in the diagram, Fig. 6. During the movement of the grippers so far described, the cam roll 67 is traveling on the concentric surface of the cam 68. Just as the grippers reach the taking position, however, the cam roll 67 runs off the concentric portion of the cam 68 and into the position indicated in the diagram Fig. 7 which moves the grippers toward the abutment onto which they clamp. It will be observed that the upper end of the cam 68 across which the roll 67 is moving, at the time the gripping action takes place, is formed with a slight depression marked 83. As the cam roll settles into this depression, the grippers are drawn down onto their abutment, clamping the sheet. It will be understood, of course, that while these operations are taking place, the grippers 21 are operated by their operating mechanism to release the sheet.

It will be understood that the grippers must be kept out of operation and within the cylinder on every other revolution of the cylinder 11 when the collecting cylinder

is collecting two layers of sheets. While this may be accomplished in various ways, in the particular construction illustrated, there is loosely mounted on the shaft 74 a hub 84 from which projects an arm 85, this arm being provided with a cover section 86, this cover section being adapted to be swung down in line with the open portion of the cam 68, the curvature of the outer side of this cover section corresponding to the concentric portion of the cam. When this cover section is swung down, therefore, the cam roll 67 will be traveling on a surface which is concentric throughout, and there will be no operation of the parts moved by this cam roll. The hub 84 has projecting from it a short arm 87 which is provided with a pin 88. This pin is engaged by a slot 89 in an arm 90 which projects from a hub 91 pivoted on a stud 92 on the frame. From the other side of this hub projects an arm 92' provided with a slot 94 which slot is engaged by a pin 95 on an arm 96 extending from the hub 73 before referred to. When, therefore, the arm 72 is rocked so as to bring the cam 71 into the path of the roll 70, the cover section is rocked out of position, the position of the parts referred to being that indicated in Fig. 3. When, however, the arm 72 is rocked so as to bring the cam 71 out of the path of the cam roll 70, then the cover section is rocked into its operative position, this position being indicated in dotted lines in the diagram, Fig. 10.

It will be understood that by changing the speed of the cam 77, the grippers will be caused to operate either on the second or fourth revolution of the cylinder 11. After the grippers 12 have taken the leading edge of the sheet, they carry the sheet forward and deliver it to the grippers on the collecting cylinder where it is assembled with the sheets on that cylinder and with the sheet held or being taken by the grippers on that cylinder.

Various mechanisms may be provided for opening the grippers 12 in order to release the sheet. In the particular construction illustrated, the cam 68 is provided with an elevation 97 which elevation is met by the roll 70 just as the grippers are to be opened to deliver the sheet to the grippers 24 on the cylinder 2. As the cam strikes this elevation, the shaft 65 is rocked, swinging the grippers open, as indicated at Fig. 9, this occurring just after the grippers 24 have seized the leading edge of the sheet. It will, of course, be understood that the ordinary spring rod constructions are employed in connection with the shafts 13 and 65 to cause the rolls 67 and 70 to follow the configuration of the cams. This spring rod mechanism is a well-known feature of gripper construction and the illustration thereof is

omitted in the interest of clearness. A similar spring rod construction, indicated at 98, (see Fig. 4) is employed for causing the roll 76 to follow the configuration of the cam 77.

Any suitable mechanism, as, for instance, the ordinary pressure roll may be employed for retaining the collected sheets on the cylinder 2 at the time the grippers 23 open to receive the sheets from the transferring cylinder grippers 12.

In the particular construction so far described, intermittently fed multilength sheets are cut in parts, one part being delivered directly after cutting to and assembled with plies on the collecting cylinder, the other part being taken by grippers and carried around one of the cutting cylinders, after which it is transferred to the grippers on the transferring cylinder to be forwarded and delivered to the collecting cylinder where it is also associated with plies thereon. Constructions including a movable cutting member operating in connection with grippers may also be employed where the product handled is derived from a web. Two such constructions including the invention are illustrated.

Referring to Fig. 14, a cylinder 200 provided with grippers 230 is arranged as in the construction previously described, and operating in connection with this cylinder are two cutting cylinders, 100 and 101, between which the web is led. The cutting cylinder 100 is provided with a cutting wood 102 which coöperates with two movable knives 103, 104 mounted in the cylinder 101, these knives being operated from arms or toe pieces 105 mounted on shafts 106, these shafts deriving their movements from arms 107, and cam rolls 108 which run on a cam 109 suitably supported on the frame of the machine. The cylinder 101 is further provided with two sets of grippers 110, 111, these grippers being mounted and operated in a manner substantially similar to the grippers 12 previously described. The movable edge holder 42 may also be employed in connection with the knives 103, 104, if desired.

The form of construction illustrated in Fig. 14, when the cylinder 200 is a three-part cylinder, is particularly adapted for delivering to the three-part cylinder a specially printed web made up, for instance, of covers and specially printed advertising sheets, these covers and sheets being alternately arranged on the web. With such a web running between the cylinders 101, 102, properly timed, and with the web or webs being led to the cylinder 200 and cut by cutting cylinders 201, 202, a cover would be delivered in proper position on one part of the three-part cylinder, a specially printed sheet on the next part, a cover on the next

part, and so on. The cylinder 200 need not, however, be a three-part collecting cylinder. It may, on the contrary, be provided with grippers, and simply take the cut sheets
 5 formed from the webs running between the cylinders 200 and 201 and the sheets cut from the web running between the cylinders 100, 101. Such a construction would be of value, for instance, in applying covers to the
 10 product derived from the webs running between the cylinders 201, 202, where it is desired to apply the covers without having the edges marred by pin holes.

Another form of construction which may
 15 be employed involving the invention, where a specially printed web is to be utilized, is illustrated in Fig. 15. In this figure, a pair of cutting cylinders 112, 113 are employed in connection with a cylinder 300 receiving
 20 the webs from a pair of cutting cylinders 301, 302, the cylinder 112 carrying a knife 114. This knife coöperates with two movable cutting members, such, for instance, as woods 115, 116, these woods being operated
 25 in the same manner as the knives in the modification previously described. The cylinder 113 carries two sets of grippers 117, 118 which take the leading edge of the web after cutting, and deliver it to the collecting
 30 cylinder, these grippers being also mounted and operated in substantially the same manner as the grippers previously described. In this construction, after cutting, the woods 115, 116 will be moved out of the way in
 35 order to permit the grippers 117, 118 to take the edges of the web, and also to permit the action of the grippers 303 on the cylinder 300. When this form of construction is employed, suitable provision should be made
 40 for an abutment for the grippers to clamp against, which may be readily accomplished by providing abutment pieces 119 which are fast on the cylinder and overlie the tops of the movable cutting woods.

45 It will be noticed that in all the constructions which have been described the product is handled throughout by grippers. This is of great advantage where products which include specially printed sheets are desired.
 50 The paper employed for such specially printed sheets is usually of a high grade and the use of pins which have been heretofore employed is objectionable, because of the marring of the edges of the sheets by the
 55 holes produced by the pins.

It will be understood that after the sheets have been collected or associated on the cylinder 2, 200, or 300, as the case may be, they will be forwarded to any suitable delivery
 60 mechanism. An ordinary type of delivery mechanism is illustrated in Fig. 1, but as the construction is so well-known, a detailed description thereof is unnecessary.

Changes and variations may be made in

the construction by which the invention is
 65 carried into effect. The invention is not, therefore, to be limited to the specific constructions set forth and illustrated in the accompanying drawings.

What is claimed is:—

70 1. The combination with a collecting cylinder having grippers, of a pair of cylinders one of which is provided with grippers and operates to transfer sheets to the collecting cylinder, the other of said cylinders
 75 being provided with sheet retaining devices, coöperating cutting members on said pair of cylinders, and means for moving a cutting member into and out of operative position.

2. The combination with a collecting cylinder having grippers, of a pair of cylinders one of which is provided with grippers and operates as a transferring cylinder for the collecting cylinder, the other of said
 80 cylinders being provided with sheet retaining devices, coöperating cutting members on said cylinders, and means for moving the cutting member on the transferring cylinder into and out of operative position.

3. The combination with a collecting cylinder having grippers, of a pair of cylinders one of which is provided with grippers and operates as a transferring cylinder for the collecting cylinder the other of said cylinders
 90 being provided with grippers, coöperating cutting members on the cylinders of said pair, and means for moving the cutting member on the transferring cylinder into and out of operative position.

4. The combination with a collecting cylinder having grippers, of a cylinder provided with two pairs of grippers and a cutting member, said cylinder operating as a transferring cylinder for the collecting cylinder,
 100 a companion cylinder having grippers and a coöperating cutting member, and means for moving the cutting member on the transferring cylinder into and out of operative position.

5. The combination with a three-part collecting cylinder, of a second cylinder having sheet retaining devices, the circumference of said second cylinder being substantially equal in length to the sheet to be taken thereon,
 110 a cylinder having two sets of grippers intermediate said second cylinder and the collecting cylinder, the circumference of said intermediate cylinder being substantially twice the length of the sheet to be taken thereon, coöperating cutting members
 120 on said second cylinder and the intermediate cylinder, and means for moving a cutting member into and out of operative position.

6. The combination with a three-part collecting cylinder, of a second cylinder having
 125 grippers, the circumference of said second cylinder being substantially equal in length to the sheet to be taken thereon, a cylinder

having two sets of grippers operating to transfer sheets to the collecting cylinder, said transferring cylinder being intermediate said second cylinder and the collecting cylinder and its circumference being substantially twice the length of the sheet to be taken, cooperating cutting members on the second cylinder and the transferring cylinder, and means for moving the cutting member on the transferring cylinder into and out of operative position.

7. The combination with a cylinder provided with grippers, of means for supplying sheets thereto, a sheet transferring cylinder also operating to supply sheets thereto, a cutting member on the transferring cylinder, cooperating cutting means, and means for moving the cutting member out of operative position to permit the grippers to open and take the sheets other than those supplied by the transferring cylinder.

8. The combination with a collecting cylinder provided with grippers, of means for supplying sheets thereto, a sheet transferring cylinder also operating to supply sheets thereto, a cutting member on the transferring cylinder, cooperating cutting means, and means for moving the cutting member out of operative position to permit the grippers to open and take the sheets other than those supplied by the transferring cylinder.

9. The combination with a collecting cylinder provided with grippers, of means for supplying sheets thereto, a sheet transferring cylinder having grippers, said cylinder also supplying sheets to the collecting cylinder, a cutting member on the transferring cylinder, cooperating cutting means, means for moving the cutting member into and out of operative position, and means for operating the grippers, said means including mechanism by which the grippers on the transferring cylinder may be caused to operate at varying times according to the character of the products to be collected.

10. The combination with a collecting cylinder provided with grippers, of means for supplying sheets thereto, a pair of cylinders one of which operates as a transferring cylinder for the collecting cylinder and both of which are provided with grippers, cooperating cutting members on said pair of cylinders, gripper operating means, and cutter operating means, both of said means including mechanism by which the operation

of the cutting members and grippers may be caused to occur on different rotations of the cylinder, according to the product to be collected on the collecting cylinder.

11. The combination with a rotary knife carrying member, of a cooperating cutting member, grippers on one of said members, said grippers being independent of said cutting member, and means for moving a cutting member after cutting to permit the operation of the grippers.

12. The combination with a cylinder having a cutting member, of a companion cylinder having a cooperating cutting member and grippers, said grippers being independent of the cutting member, and means for withdrawing the cutting member on said companion cylinder to permit the sheet to be taken from the grippers.

13. The combination with a cylinder provided with a cutting member, of a companion cylinder having a cooperating cutting member and grippers by which the edge of the sheet is taken after cutting, said grippers being independent of the cooperating cutting member, means for withdrawing said cooperating cutting member after cutting, and means for holding the sheet until taken by the grippers.

14. The combination with a cylinder provided with a cutting member, of a companion cylinder having a cooperating cutting member and grippers, said grippers being independent of the cooperating cutting member, a sheet edge holder mounted in the rear of a cutting member, and means for moving said cutting member out of operative position after cutting.

15. The combination with a cylinder provided with a cutting member, of a companion cylinder having a cooperating cutting member and grippers, said grippers being independent of the cooperating cutting member, a spring pressed sheet edge holder mounted in the rear of a cutting member, and means for moving said cutting member out of operative position after cutting.

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

EDWARD P. SHELDON.

Witnesses:

F. W. H. CRANE,
LOUIS ROEHM.