

No. 804,293.

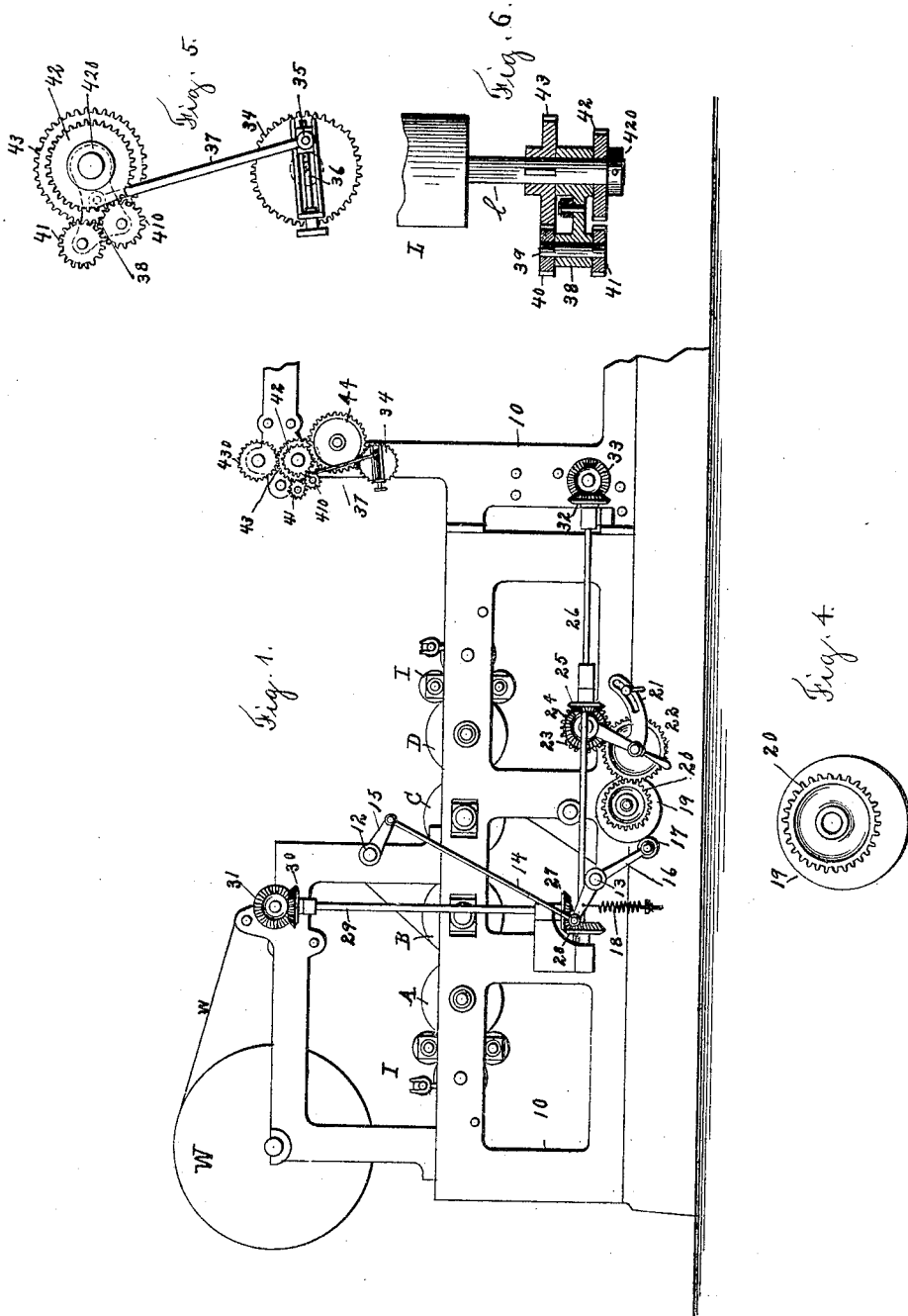
PATENTED NOV. 14, 1905.

H. A. W. WOOD.

COVERING MECHANISM FOR PRINTING PRESSES.

APPLICATION FILED MAY 18, 1896. RENEWED FEB. 13, 1905.

4 SHEETS—SHEET 1.



Witnesses.

Chas. F. Fennell
W. M. M. M. M.

Inventor.

H. A. W. Wood,

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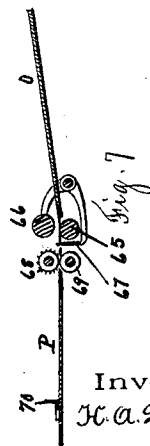
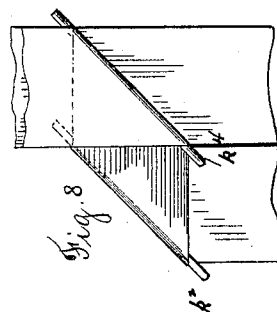
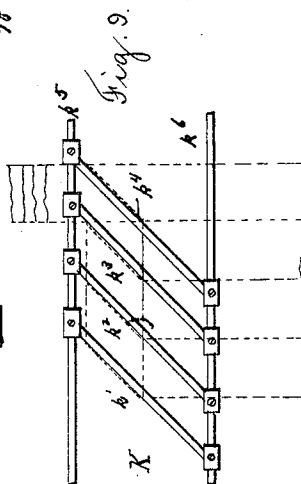
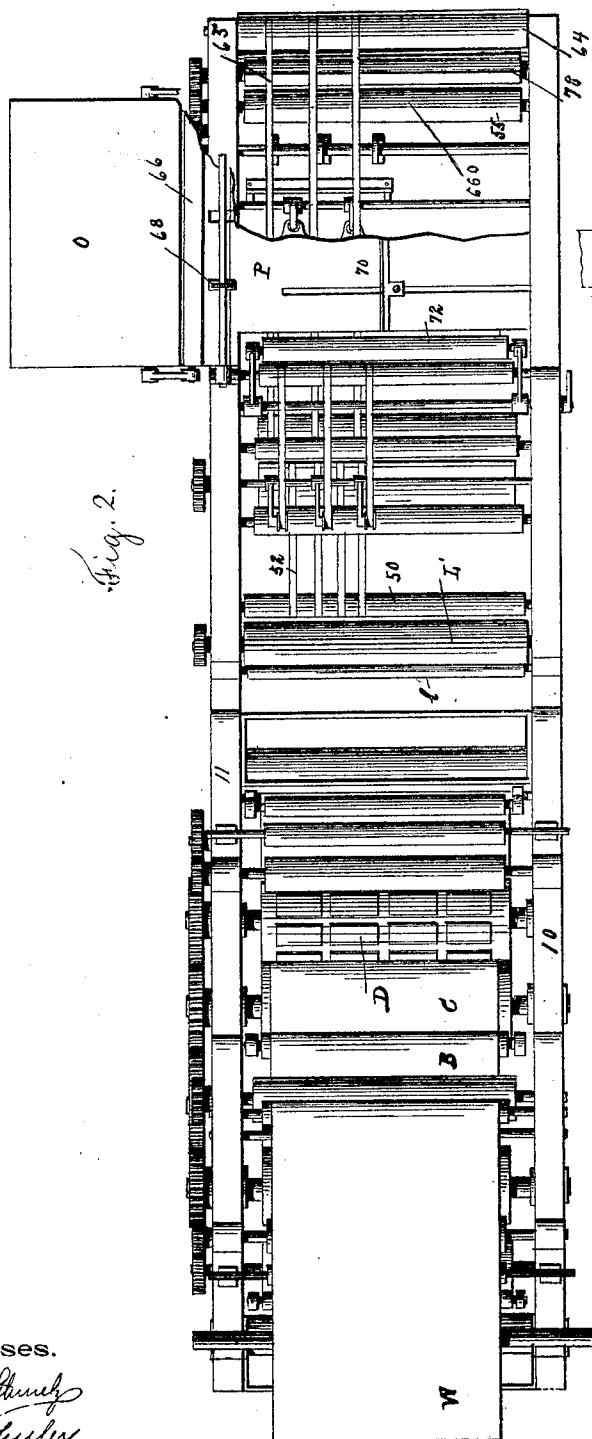
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4 SHEETS--SHEET 2.



Witnesses.

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4 SHEETS—SHEET 3.

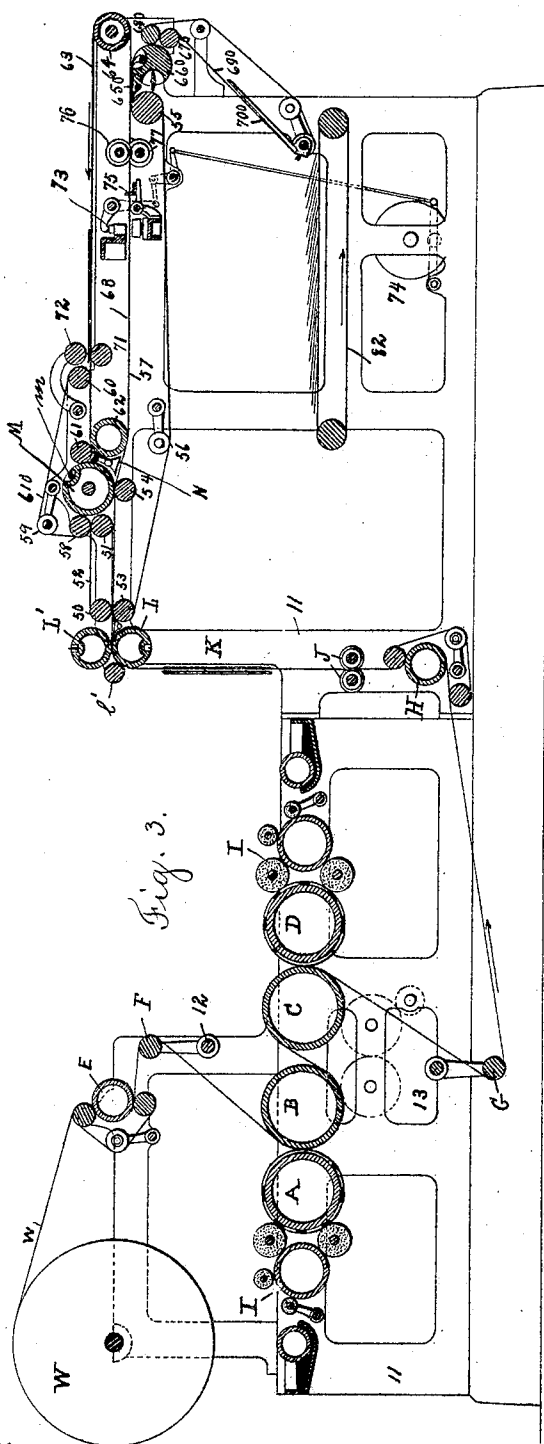


Fig. 3.

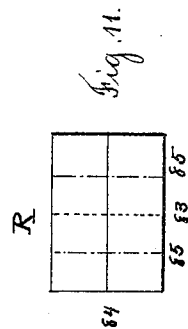


Fig. 11.

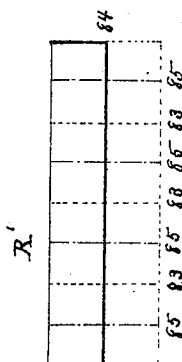


Fig. 10.

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4 SHEETS—SHEET 4.

Fig. 12.

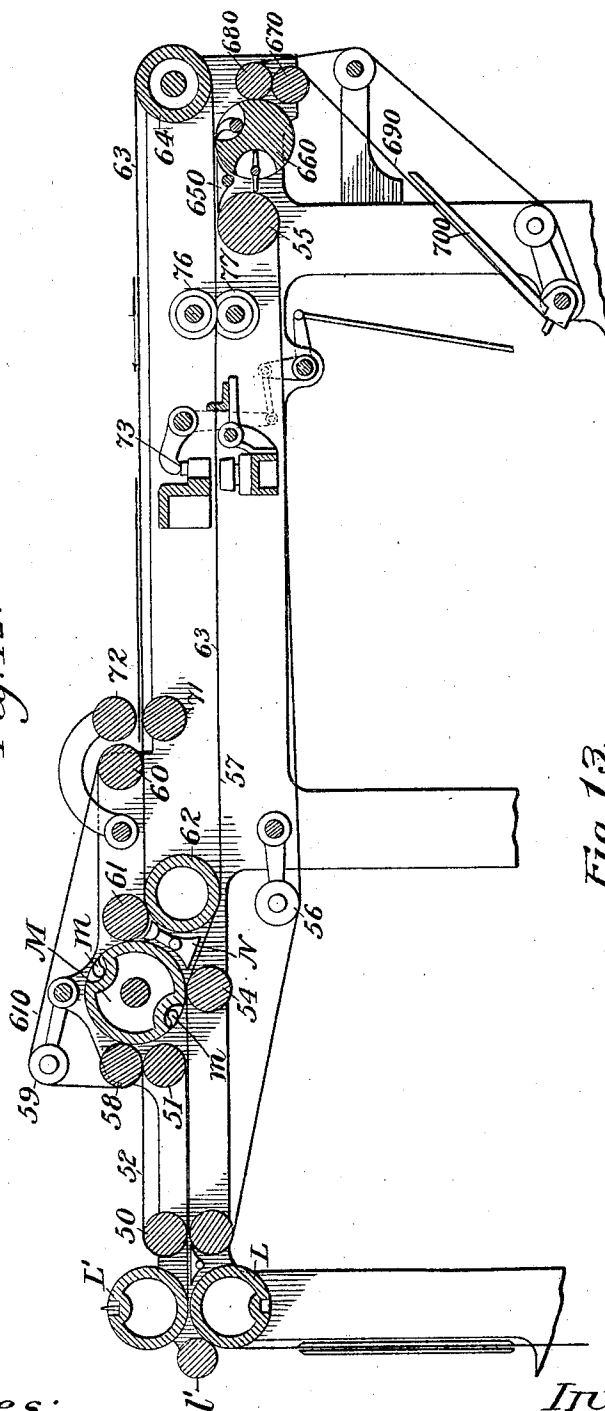
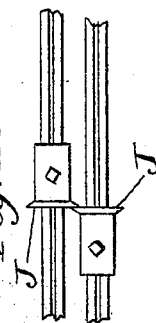


Fig. 13.



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UNITED STATES PATENT OFFICE.

HENRY A. WISE WOOD, OF NEW YORK, N. Y., ASSIGNOR TO CAMPBELL PRINTING PRESS AND MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

COVERING MECHANISM FOR PRINTING-PRESSES.

No. 804,293.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed May 18, 1896. Renewed February 13, 1905. Serial No. 245,397.

To all whom it may concern:

Be it known that I, HENRY A. WISE WOOD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Improvement in Covering Mechanism for Use in Connection with Printing-Presses, of which the following is a specification.

The aim of this invention is to provide a printing-machine and assembling mechanism especially arranged so that variously-sized and variously-paged covered pamphlets may be produced.

To this end the invention consists of the arrangements described in this specification and hereinafter particularly pointed out in the claims and illustrated in the accompanying three sheets of drawings, which show one way in which my invention may be carried out.

Referring to the drawings in detail, Figure 1 is a side elevation of the preferred form of printing mechanism. Fig. 2 is a plan of the entire device. Fig. 3 is a sectional elevation thereof. Fig. 4 is a detail view, on an enlarged scale, of the change cam and gear. Figs. 5 and 6 are detail views of the mechanism used to impart a varying motion to the cutting-cylinders. Fig. 7 is a sectional detail of the mechanism used to forward the covers from the feed-board. Fig. 8 is a detail view illustrating the way the web may be severed and associated. Fig. 9 is an end elevation of the preferred form of associating mechanism, and Figs. 10 and 11 are diagrammatic views illustrating the way the cover-sheets are manipulated. Fig. 12 is an enlarged view of the gripper-cylinder and its appurtenances, and Fig. 13 is a detail plan view of one of the adjustable slitters.

It is desired in many branches of printing to produce covered pamphlets, such as almanacs, advertising-circulars, &c. The covers for these pamphlets generally consist of paper of different or better material than the regular pages of the pamphlets and generally are printed in several colors. These conditions prevent, as a rule, the cover being printed with the pamphlet, as color-printing generally has to be done by running sheets a number of times through a flat-bed printing-machine, and the aim of my invention is to provide means whereby covers of this general character can be associated with the pamphlet

while the same is being produced in the printing and assembling mechanism.

My invention consists, in combination with a web-printing machine preferably adapted to print different lengths and widths of sheets, of mechanism for assembling the products thereof and means whereby cover-sheets printed as desired may be drawn or fed into the machine to cover the assembled products. By the term "assembling" I include any mechanism for bringing together the products of a printing-press, and in the special arrangement shown I use a mechanism for associating sections of web and a mechanism for collecting the sheets. The mechanism preferably used to collect the sheets consists of a collecting-cylinder and its usual cooperating devices. The way the mechanism for manipulating the covers is preferably arranged is as follows: A cover-sheet-feeding mechanism is mounted preferably parallel to the axis of the collecting-cylinder. This mechanism consists in the specific illustration shown of a feed-board upon which a cover-sheet, consisting of a number of covers, may be placed, and of the devices hereinafter described. This feed-board is provided with means whereby sheets placed in position by hand on said feed-board will be drawn forward and at the same time perforated. After this movement takes place the sheets will then be moved at right angles to their first movement and the perforated sections broken off and associated with the products passing around the collecting-cylinder. The cover-sheet thus fed may be made single or multi width and may be associated with a single or multi width product, which if of multiwidth will be thereafter slit with the cover-sheet to form a plurality of pamphlets. A binding and folding mechanism may be also used to bind the product together with its cover and to fold the same.

The details hereinafter described sufficiently illustrate the mechanisms employed in printing machinery to enable a printing-press mechanic to construct a printing-press to accomplish the functions of my invention and illustrate the best mode now known to me for applying the principle of my invention.

Referring to the drawings and in detail, A represents the first printing-cylinder, B the first-impression cylinder, C the second-impression cylinder, and D the second printing-cyl-

inder, of a web-printing machine arranged in the usual manner. The printing-cylinders are arranged so that plates may be arranged to cover any portion or the whole of the surface thereof circumferentially or axially.

Coöperating with the printing-cylinders A and B are any of the usual or approved inking mechanisms I I.

W represents a web-roll which may be mounted in the frames of the machine in any of the usual ways and from which the web *w* is drawn into the machine. The web *w* is first led around a drawing-in drum E, coacting with which is a set of drawing-tapes. The web then passes around a feeding-in looper F, then around the two impression-cylinders B and C, then around a feeding-out looper G, and then around a feeding-out drum H, coacting with which is a set of the usual drawing-tapes. The web from this point may be slit into any desired number of sections by a set or plurality of adjustable slitters J of the usual pattern, and these sections of the web may be associated by suitable angle-bars K, so that an associated product consisting of any desired number of webs may pass to the cutting-cylinders L L', the associated webs being drawn thereto by a drawing-roller Z'. This mechanism is mounted in any of the usual side frames 10 and 11.

The feeding-in looper F is arranged in arms secured upon a shaft 12, and the feeding-out looper G is arranged in arms secured to a shaft 13. The shaft 12 carries an arm 15, which connects by link 14 to an arm 16, secured upon shaft 13. A spring 18 is connected to the arm 16 and to a stationary part of the machine, so as to keep a roll 17, carried by the end of the arm 16, in constant engagement with a cam 19, which carries a gear 20. The cam 19 and the gear 20 are made one piece and are secured on the end of a power-driven shaft, and various sizes of cams and gears may be secured on the end of this shaft.

21 designates a suitable sweep, which carries an intermediate 22, which may be set to engage whatever sized gear 20 is used. This gear 22 meshes with a gear 23, which carries a bevel-gear 24, which meshes with a bevel-gear 25, secured upon a shaft 26. This shaft 26 by means of bevel-gears 28 27, shaft 29, and bevel-gears 30 31 drives the feeding-in drum E and by means of bevel-gears 32 and 33 drives the feeding-out drum H. By this arrangement any desired length of sheet within the limit of the circumference of the type-cylinders can be printed by placing the proper number of forms or plates on the type-cylinders and by using the proper cam and gear 19 and 20, so that the web around the impression-cylinders B and C will be withheld during the interval of non-impression or during the time that the parts of the plate-cylinders A and B which have no plates thereon pass

by the engaging line of the impression-cylinders, the feeding-in and feeding-out drums and the loopers being so actuated that the proper length of web will be fed into and out of the machine to accomplish this result. By this means the cylinders and the various other parts of the machine can be run at a constant speed, the devices that are adjusted being simply the web-manipulating devices. Of course the width of the sheet can be varied in the ordinary manner by varying the width of the plates used and the width of the web.

The web issuing from the feeding-out device is slit by the adjustable slitters J, as before stated, into any number of sections, and the sections are then assembled by the assembling device K, which consists, preferably, of four forty-five-degree turner-bars $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, and $\frac{1}{5}$, adjustably secured upon shafts $\frac{1}{2}$ and $\frac{1}{5}$, so that the same may be adjusted to properly associate whatever width or sections of web are produced. Any number of these turner-bars may be used—for example, two used, as shown in Fig. 8—to make a two-ply associated web.

Varying the length of the sheet produced necessitates varying the speed of the cutting-cylinders, and one mechanism for accomplishing this function that can be well used is the following: 34 designates a disk or gear, which is driven from any suitable part of the machine. Mounted on the surface of the same is a crank-block, which may be adjusted by screw 36, which crank-block carries a crank-pin 35, which connects by link 37 to bracket 38, hung on the shaft Z of the cutting-cylinder L. A shaft 39 is journaled in this bracket and has secured on the ends thereof pinions 40 and 41, the pinion 40 meshing with a gear 43, rigidly secured to the shaft Z. The bracket 38 also carries a suitable stud, on which is mounted an intermediate pinion 410, which meshes with said pinion 41 and with gear 42, said gear 42 being held in place on said shaft Z by a collar 420 and being driven from the gear 34 by a suitable intermediate 44. By this arrangement if the crank-pin 35 is set at exact center of the disk 34 the bracket 38 will be held stationary and the cutting-cylinders will be driven at a constant speed, power being transmitted to the same from gear 34 by means of intermediate 44, loose gear 42, intermediate pinion 410, pinion 41, pinion 40, and driving-gear 43. However, in most instances it is desired to impart a varying peripheral speed to the cutting-cylinders, so that the cutting-cylinders will move at the same speed as the web moves at the instant the knives act to sever the web. This can be easily done by adjusting the crank-pin 35. Then the bracket 38 will be oscillated up and down and a varying movement will be imparted to the cutting-cylinders, the time of which and the speed of which can be adjusted as desired, so that the

peripheral speed of the cutting-cylinders at the instant of cutting will equal the speed of the web.

The upper cutting-cylinder *L'* is driven from the gear 43 by means of gear 430.

From the cutting-cylinders *L* and *L'* the severed products pass out over suitable guide-fingers between tapes 52, which are carried by pulleys 50 and 51, and tapes 57, which are carried by pulleys 53, 54, 55, and 56, to a collecting-cylinder *M*, which preferably has two sets of grippers *m m*, as shown in Fig. 12, although the collecting-cylinder may have only one set of grippers, as shown in Fig. 3, the cutting-cylinders *L L'* being arranged, preferably, to make two revolutions to every one revolution of the cylinder *M* and to cut two sheets from the web or webs for each rotation of the cylinder *M*.

The number of grippers in the collecting-cylinder *M* and the relative speed and arrangement between the collecting-cylinder *M* and the cutting-cylinders *L L'* can be varied and arranged as desired to suit the particular use to which the machine is to be put.

The gripping mechanism of the collecting-cylinder is operated by any of the usual mechanisms not necessary here to describe, so that any desired number of sheets or associated products will be collected thereon.

Running around pulleys 58, 59, 60, and 61 is a set of tapes 610, which operates to keep the sheets on the surface of the collecting-cylinder and for a purpose hereinafter described.

Arranged adjacent to the collecting-cylinder is a cylinder 62, around which and a cylinder 64 a set of tapes 63 is led.

A suitable switch *N* is arranged between the collecting-cylinder *M* and the cylinder 62 in any of the ordinary ways, so that after the desired number of sheets has been collected on the collecting-cylinder the same will be guided down onto the tapes 57 and under the cylinder 62 into the bite of the tapes 57 and the tapes 63. The tapes 63 in passing back from cylinder 64 to cylinder 62 run under the tape-pulleys 60 and 61, and in conjunction with the tapes 610 form a taped pathway extending to the collecting-cylinder *M*.

A feed-board *O* is arranged to be supported by the framework of the machine and preferably parallel to the axis of the collecting-cylinder *M*. Arranged to project through the lower end of this feed-board is a feeding-roller 65, (see Fig. 7,) coacting with which is a drop-roller 66 and a stop 67 of the usual construction, these parts being so arranged that when a sheet is placed in proper position against the stop 67 the roller 66 and the stop 67 will drop and the rollers 65 and 66 will feed or draw the sheet forward from the feed-board *O* and pass the same onto a receiving table or board *P* and push the same against a suitable adjustable stop 70. As the sheets

pass from the feed-board *O* onto the receiving-board *P* the same pass through suitable perforators 68 and 69, which perforate the sheet into as many sections as desired. This mechanism is used to introduce the cover-sheets into the assembling mechanism or, specifically, into the collecting mechanism of the machine. It will be noticed that as the cover-sheet is passed from the feed-board *O* to the receiving-board *P* the edge of the same passes over a feeding-roller 71, arranged just under the tapes 63, and arranged in conjunction with which is a drop-roller 72. This drop-roller 72 and feeding-roller 71 are timed to act to move the sheet at right angles to its former movement, and the roll 71 is driven at a slightly less peripheral speed than the tapes 63 and 610 in the ordinary manner, so that as the sheet is fed forward by the same and passes into the bite of the tapes 63 and 610 the perforated sections thereof will be broken off and passed to the collecting-cylinder, and the products of the printing-press will be collected by the collecting-cylinder on top of the covers for the pamphlets. The cover-sheets are first taken by the grippers on the collecting-cylinder at the same point at which the collected sheets are thereafter seized, so that the cover-sheets lie next to the surface of the collecting-cylinder, and when the covered and assembled product passes therefrom the cover-sheet will be on top. The tops of the switch-fingers *N* are arranged to form suitable guides to direct the cover-sheets up onto the collecting-cylinder from the roll 62. The cover-sheets are seized by the grippers on the collecting-cylinder *M* as the same pass the upper ends of the switch-fingers *N* and the cylinder 61, and the products are thereafter seized by the grippers as the same pass the cylinders 54, so that the covered product or products when passed into the bite of tapes 57 and 63 will have the covers on top thereof. After the covered products have been switched from the collecting-cylinder the same will pass forward in the bite of the tapes 63 and 57 to a stop 75, which is arranged in the path of the products to momentarily stop the same, so that a suitable binding device, as a stapling mechanism 73, which is driven from cam 74, can be used to permanently bind the product together and the cover to the product. As soon as this operation takes place the stop 75 is dropped, and the product then passes through slitters 76 and 77, which if the product collected and covered consists of a number of pamphlets slits the same to form separate covered pamphlets. From these slitters the pamphlets pass forward over a suitable guide 650 and are seized by the grippers of a rotary folder 660, which tucks or folds the pamphlets on their central lines between the folding-rollers 670 and 680 in the usual manner. The gripping-line on cylinder 660 is preferably made adjustable circumferentially to adapt

the same for the various-sized products of the cutting-cylinders. The folded pamphlets then run down the tapes 690 onto a fly 700, which delivers them onto a suitable delivery device, as any of the usual jogged tapes 82.

In Fig. 11, R represents a cover for a double-width pamphlet. The same is perforated along the line 83 as the same is fed from the feed-board O to the receiving-table P and is broken along this line 83 as the same is drawn to the collecting-cylinder M. The covers are slit along the line 84 as the same pass through the slitters 76 and 77 and are folded along the lines 85 by the folding mechanism.

In some cases it may be desirable to use the slitters 76 and 77 to trim off the top and the bottom of the pamphlets.

In Fig. 10 the cover R' is shown of single width in full lines and double width in dotted lines and of a length sufficient to cover products associated by the angle-bars and not collected by the collecting-cylinder, the cover R' in this figure being perforated along the lines 83 and folded along the lines 85, and in this particular arrangement the associated products simply pass from the cutting-cylinders L and L' directly into the bite of the tapes 57 and 63, and as they pass by the collecting-cylinder M they will be associated with the covers fed in by hand, coming in around the surface of the collecting-cylinder exactly as if sheets were led around the collecting-cylinder.

Of course a small section of web could be printed and sheets cut therefrom led directly to the collecting-cylinder M without using the angle-bars K, and sheets cut from this section of web could be collected on the collecting-cylinder and covered, as before described, or this section could be cut into sheets and each sheet covered. Therefore by my mechanism I can add covers to single products, associated products, to collected products, or to products which are both associated and collected, and each of these operations is within the scope of my claims. Thus by the mechanisms described I can produce a pamphlet of almost any desired size and almost any desired number of pages and properly cover the same.

I have shown in the drawings simply the operative parts of the machine and have omitted much of the gearing, &c., as the same is so well understood by a skilled printing-press mechanic that a description thereof would add nothing to the clearness of this specification and would unnecessarily complicate the same. The essence of the invention will be seen to reside in feeding to the machine at one time a sheet made up of many covers, mechanism for separating the cover-sheet into its various covers, and mechanism for applying these covers to any of the above-described products.

There are a number of automatic devices known for automatically feeding sheets into

a printing-machine, and I may use any of these automatic devices, if so desired, to introduce the large cover-sheets into position, or, again, I may introduce the same by cutting sheets off from a web and feeding the same in automatically in the manner well known and understood in this art.

The feed-board that I have shown in the drawings simply is intended to designate one well-known way by which the cover-sheets may be introduced into the machine.

The details and arrangements herein described may be greatly varied by a skilled mechanic without departing from the scope of my invention as expressed in the claims.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with mechanism for assembling printed products, means for moving forward separate cover-sheets, each consisting of a number of separate covers, means for separating the cover-sheets into the respective covers, and means for associating said covers with the products assembled by the assembling mechanism.

2. The combination of a printing mechanism, a mechanism for assembling the product thereof into a plurality of assembled products, and means whereby separate cover-sheets, each consisting of a number of covers, may be introduced into the machine, divided into separate covers, and brought to cover the plurality of assembled products.

3. The combination of a printing mechanism, an associating and collecting mechanism, arranged to bring the product of the printing-press into a plurality of products, and means whereby separate cover-sheets, each consisting of a number of covers, may be fed in one by one, divided into separate covers, and brought to cover the plurality of products.

4. The combination of a printing-machine adapted to print different lengths of sheets, an assembling mechanism for assembling the product of the printing-machine into a plurality of assembled products, and means whereby separate cover-sheets, each consisting of a number of covers, may be fed in one after the other, divided into separate covers, and brought to cover the assembled products.

5. The combination with an assembling mechanism, means for moving cover-sheets forward, perforators for perforating the cover-sheets on this movement, and means for then moving the sheets at right angles to their first movement so that the same will be associated with the products assembled in the assembling mechanism to form covers therefor.

6. The combination with a collecting-cylinder, of a cover-sheet-feeding mechanism, arranged parallel to the axis of the collecting-cylinder, means whereby sheets will be moved forward and perforated, and means whereby said sheets will then be broken on the line of

perforations and fed to the products collected by the collecting-cylinder to form covers therefor.

7. The combination of a collecting-cylinder, a cover-sheet-feeding mechanism, arranged parallel to the axis thereof, a drop-roller arranged to draw sheets forward, perforators arranged to perforate the sheets moved in this manner, and a drop-roller and feeding mechanism adapted to then feed the sheet forward to the collecting-cylinder and break the same so that the sheets thus formed will form covers for the products collected by the collecting-cylinder.

8. The combination with a web-printing machine adapted to print various lengths of sheets, an adjustable slitting mechanism, a series of adjustable turner-bars, an adjustable cutting mechanism for severing the associated webs, a collecting-cylinder, and means for feeding sheets to the products handled by the collecting-cylinder to form covers therefor.

9. The combination with a collecting-cylinder, of a cover-sheet-feeding mechanism, arranged parallel to the axis thereof, means for drawing sheets forward and slitting the same, means for then breaking the sheets and feeding the same to form covers for the products on the collecting-cylinder, means for then forwarding the covered products from the collecting-cylinder, and slitters arranged to slit the products thus formed, to form a plurality of pamphlets.

10. The combination of a printing-machine, a collecting-cylinder arranged to collect the product thereof, means for feeding forward separate large cover-sheets, one after the other, each cover-sheet consisting of a number of separate covers, means for separating each of the large cover-sheets into its separate covers, and for forwarding the same to the collecting-cylinder, so that the product of the printing-press will be collected thereon, and means for forwarding the covered products from the collecting-cylinder.

11. The combination with a printing-machine, a collecting-cylinder for collecting the product thereof, means for feeding large cover-

sheets into the device, one after the other, each cover-sheet consisting of a number of separate covers, means for separating each large cover-sheet into its various covers, and passing the same to the collecting-cylinder, so that the product of the press will be collected therewith, means for forwarding the covered products from the collecting-cylinder, and folding mechanism arranged to fold the covered products.

12. The combination with a printing-press, a collecting-cylinder arranged to collect the product thereof, means for feeding large cover-sheets, one after the other, into the device, each cover-sheet consisting of a number of covers, and means for separating each large cover-sheet into its respective covers, and for passing the separated covers to the collecting-cylinder, the whole being so arranged that the product coming from the printing-press will be collected with one or more covers.

13. The combination with mechanism for assembling printed products, means for moving forward separate cover-sheets, each consisting of a number of separate covers, means for separating the cover-sheets into the respective covers, means for associating said covers with the products assembled by the assembling mechanism, and mechanism for binding the covers onto the assembled products.

14. The combination with mechanism for assembling printed products, means for moving forward separate large cover-sheets, each consisting of a number of separate covers, means for separating the cover-sheets into the respective covers, means for associating said covers with the products assembled by the assembling mechanism, means for binding the covers onto the assembled products, and folding mechanism for folding the covered products.

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

H. A. WISE WOOD.

Witnesses:

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R. E. EMBLETON, Jr.