

O. ROESEN.
PRINTING MACHINE.

APPLICATION FILED MAR. 21, 1906. RENEWED JULY 7, 1910.

1,132,215.

Patented Mar. 16, 1915.

2 SHEETS—SHEET 1.

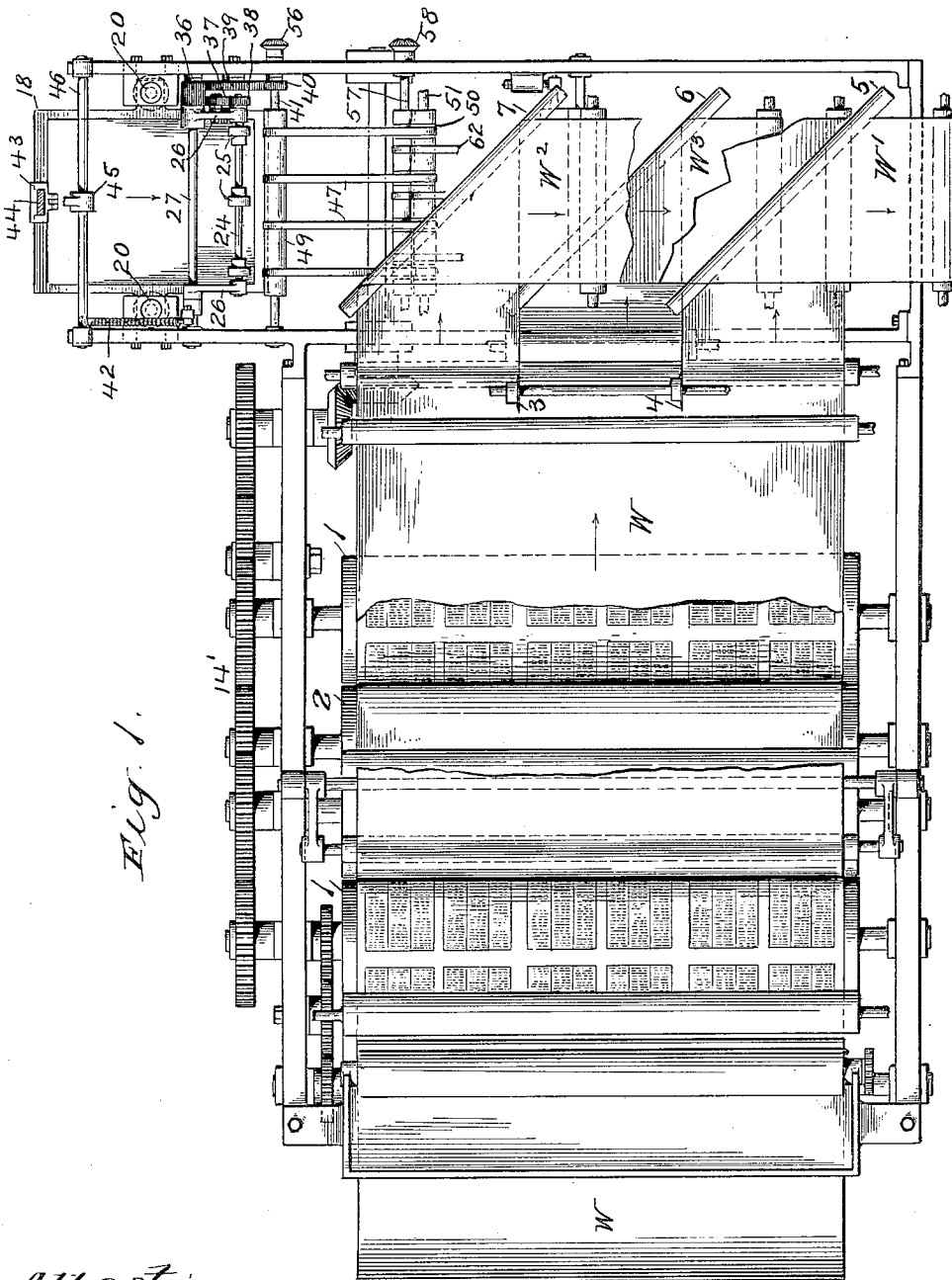


Fig. 1.

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Inventor:
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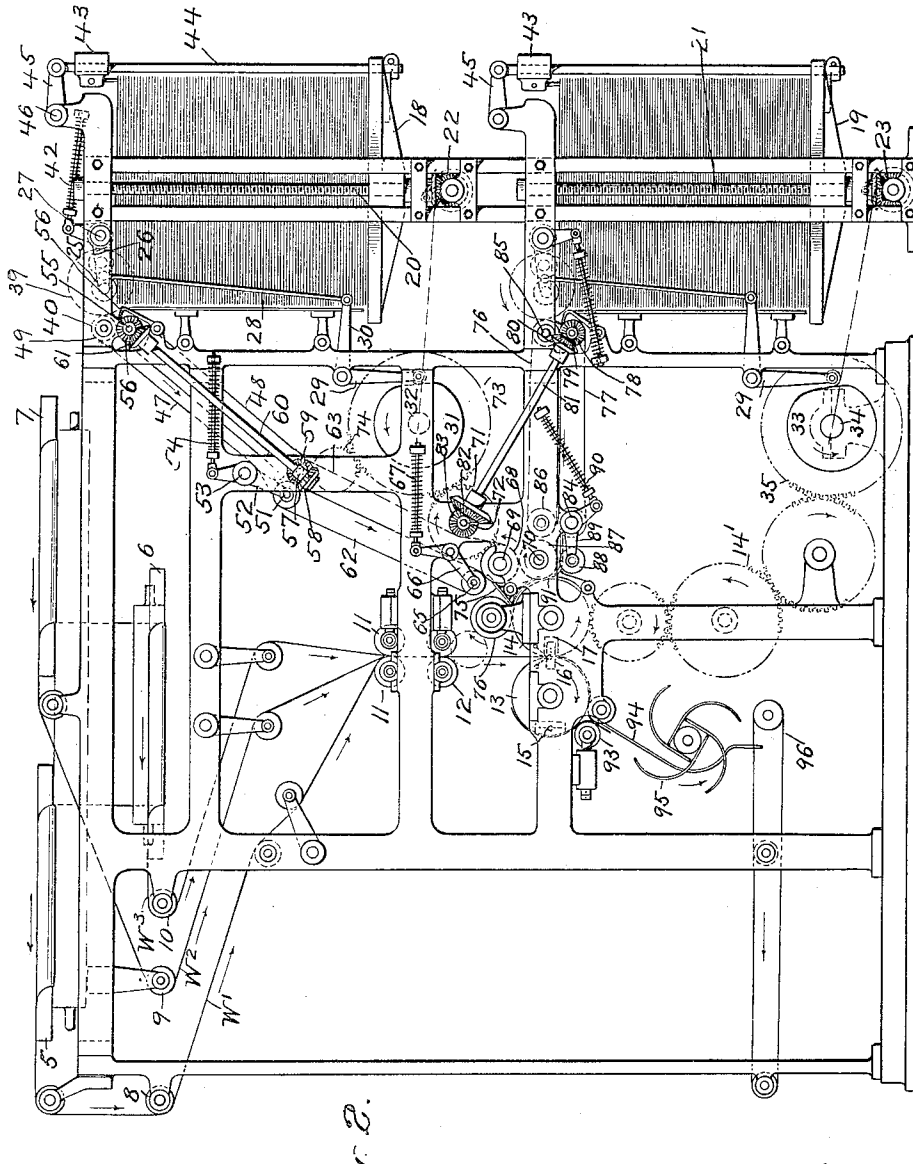


Fig. 2.

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UNITED STATES PATENT OFFICE.

OSCAR ROESEN, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO R. HOE AND CO., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

PRINTING-MACHINE.

1,132,215.

Specification of Letters Patent.

Patented Mar. 16, 1915.

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To all whom it may concern:

Be it known that I, OSCAR ROESEN, a citizen of the United States, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in 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.

It is frequently necessary to associate with the product of a printing machine pages bearing subject-matter which cannot be placed or which it is not desirable to place thereon by the cylinders which produce the printed pages. Thus, for instance, it is desirable frequently to introduce into a magazine advertising pages printed in color which cannot well be printed, if at all, on the cylinders of the machine which produce the remainder of the advertising pages, or it may be desired to associate with the said printed pages a cover executed in such a manner that it cannot be printed on the machine in which the magazine is printed.

It is the object of this invention to produce an improved printing machine in which a web or webs may be printed, forwarded and manipulated in such a way as to produce a product consisting of a plurality of plies or pages, and in which there may be united or associated with this product sheets which are fed from a pile, or, if desired, from a plurality of piles.

With this 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 plan view of so much of a printing machine as is necessary for an understanding of the invention; Fig. 2 is an end elevation of part of the printing machine illustrating the invention in detail.

Referring to the drawings, it may be remarked that the particular type of printing mechanism with which the invention is employed may be varied. As shown, the printing mechanism embodies two couples comprising printing cylinders 1 and impression cylinders 2, the cylinders carrying the necessary plates to produce twelve pages printed and perfected. A three wide web, marked

W, is led to these cylinders from the other roll, and is slit into three parts by slitters marked 3, 4. The usual gearing for driving the cylinders and the slitter is illustrated, but as this gearing is well-known to those skilled in the art, a description of it is unnecessary. The slitters, in the particular machine shown, converts the web into three parts marked W', W², W³. These parts are led over turner bars 5, 6 and 7, in the usual and well-understood way and then over guides 8, 9 and 10, these webs being, by the action of these bars and guides, superposed. The webs are then directed by means of suitable guides to a pair of rolls 11, and from these they pass between a pair of drawing rolls 12.

The web manipulating and forwarding mechanism so far described is well-known in the art and any other mechanism by which a web or webs may be forwarded and manipulated to produce a product comprising a plurality of plies may be substituted therefor.

In the particular construction shown, the web manipulating and forward mechanism further includes a pair of cutting and collecting cylinders 13, 14, the collecting cylinder being marked 13 and the cutting cylinder 14. The train of gearing indicated at 14' is so proportioned that the cutting and collecting cylinders make two revolutions between each folding operation so that a product of twenty-four pages, so far as the web product is concerned, is produced. The collecting cylinder is provided with the usual folding off blade, indicated in dotted lines at 15, in Fig. 2, and also provided with the usual cutting woods indicated at 16 in the same figure, the knife on the cutting cylinder being indicated in dotted lines at 17.

Machines embodying the invention will include means for supporting one or more piles of sheets. In the particular construction illustrated, the machine is designed to support two piles of sheets, the supporting platforms being marked 18 and 19 respectively. The means by which the sheets are supported may be brought within range of the automatic feeding means, when such means are employed, in any suitable manner. In the construction shown, two screws 20 and 21 are provided for this purpose, these screws being driven by gearing indicated at 22 and 23. This gearing is driven

in any suitable intermittent manner from any convenient moving part of the machine.

In the best constructions, and as shown, the sheets will be automatically fed from the pile or piles, the automatic feeding means being of any desired description. In the particular construction illustrated, the means for feeding the sheets from each pile is identical, and therefore a description of one will do for both. Referring to these feeding means, a shaft 24 is provided on which is mounted sheet feeding rolls 25. This shaft 24 is mounted in arms 26 which project from a shaft 27 mounted in extensions of the side frames. One of the arms 26 has connected thereto a rod 28 which is connected to the arm 30 of a bell-crank lever 29, 30 suitably mounted in the frame. The upper bell-crank lever is operated at suitable times by a cam 31 mounted on a shaft 32 which will be hereinafter referred to. The lower bell-crank lever 29, 30 is operated at suitable times by a cam 33, this cam being mounted on a shaft 34 and being driven by a suitable gear 35 which is in mesh with one of the gears of the train 14' before referred to. The shaft 27 is provided with a broad faced gear 36 which, through an intermediate 37, drives a gear 38 on the shaft 24, so that this shaft is constantly revolving. This broad faced gear 26 is driven through an intermediate 39 from a gear 40 on a shaft 41 which will be hereinafter referred to. The shaft 24 is moved in a direction opposite to the movement produced by the connections from the cam 31, by a spring rod construction 42 of the ordinary type.

In order to prevent more than one sheet being removed from the pile at a time, a detent, indicated at 43, may be provided, this detent being carried on a rod 44 which is pivoted to an arm 45 journaled on a shaft 46 which is suitably supported in extensions from the side frames, the construction being a well-known one.

In the construction so far described, it will be seen that at suitable times, controlled by the speed of rotation of the cams 31 and 33, the rolls 25 will be brought into contact with the upper sheets of the piles and the sheets automatically fed therefrom.

While the relation between the feeding rolls and the cylinders of the printing machine may be varied as desired, in the particular construction illustrated, the sheets are simultaneously fed from the piles and fed at a less speed than the speed of the cylinders, and are then speeded up so that the sheets, before association in the manner to be hereinafter described, are running at the speed of the web. When it is desired to feed the sheets from the piles at less than the speed of the cylinders and then speed the sheets up, the mechanism employed may be varied within wide limits. In the par-

ticular construction illustrated, the sheets from the upper pile are delivered to a taped pathway consisting of upper tapes 47 and lower tapes 48. The upper tapes pass around a roll 49 on the shaft 41 before referred to and around collars 50 which are loose on a shaft 51. This shaft 51 is an idle shaft and is mounted in arms 52 suitably supported on a shaft 53, the position of this shaft being determined by a spring rod construction 54 of well-known type. The lower tapes 48 pass around a roll mounted on a shaft 55, this roll and shaft being directly under the roll 49 and shaft 41 before referred to. The shaft 55 is provided with a bevel gear 56 and with a spur gear, (not shown) which meshes with the gear 40 before described as on the shaft 41, this gear being the gear which drives the intermediate 38. The tapes 48 also pass around collars on a shaft 57 which is in operative relation with the shaft 51 before referred to. This shaft 57 carries a bevel gear 58 which meshes with a bevel gear 59 mounted on an inclined way-shaft 60. This inclined way-shaft 60 carries at its upper end a bevel gear 61 meshing with the gear 56 on the shaft 55. It will be observed that the bevel gear 59 is larger than the bevel gear 58, so that the way-shaft 60 runs at a less speed than the shaft 57. The gears 61 and 56 are, however, the same size, so that the shaft 41 runs at the same speed as the shaft 60. The tapes 47, 48 deliver the sheets to a tapered pathway composed of upper tapes 62 and lower tapes 63. The tapes 62 run around collars fast on the shaft 51 before referred to, and also around a roll 65 carried on arms 66, these arms being mounted on a shaft and maintained in position by a spring rod construction 67 of the usual type. The lower tapes 63 run around collars which are fast on the shaft 57 before referred to, and then around a roll 68 on a driven shaft 69, the roll 65 being in co-operative relation with this roll 68. The cutting cylinder 14 drives a shaft 70 to be hereinafter referred to, and this shaft 70 is intergeared with shaft 69. The shaft 69 is provided with a gear which is in mesh with a gear 71 on a shaft 72, this gear 71 being in mesh with a gear 73 on the shaft 32 before referred to as carrying the cam 31. This gear 73 is also in mesh with an intermediate 74 which meshes with a gear on and drives the shaft 57 before referred to. The gearing on the shafts 69, 70 the gear 71 and the gears 73 and 74 are so related to each other that the tapes 62, 63 run at the speed of the cutting cylinder and consequently at the speed of the web. The sheets from the tapes 62, 63 run over a guide 75 and are then delivered between cutting cylinder 14 and a roll 76 which coöperates therewith. The sheets from the lower pile are, in the

particular machine illustrated, delivered by the feeding rolls between upper and lower tapes 76, 77, the lower tapes running around rolls on a shaft 78, this shaft carrying a bevel gear 79 which is in mesh with a bevel gear 80 on an inclined way-shaft 81. This shaft carries a bevel gear 82 in mesh with a bevel gear 83 on the shaft 72 before referred to, the gears 79, 80, 82, 83 being so proportioned that these tapes run at half the speed of the web. The tapes 77 pass around collars on a shaft 84 suitably supported in the frame of the machine. The upper tapes 76 run around a roll 85 which is mounted on a shaft intergeared with the shaft 78, and also around a roll 86 which is suitably supported in the frame above the collars on the shaft 84. The sheets, therefore, are delivered from the lower pile which it may be remarked is intended, in the machine shown, to represent a pile of covers. The shaft 70 which has been referred to as driven by the cutting cylinder 14 has a roll 87 thereon, this roll coöperating with a roll 88 mounted in arms 89 supported on the shaft 84 before referred to, this roll being held in position by a spring rod construction 90 of the ordinary type. A guide 91 is employed to direct the sheets from the rolls 87, 88 around the cutting cylinder 14.

With the mechanism so far described, it will be understood that the sheets from the piles are automatically fed therefrom at half the speed in which the web runs through the machine and that they are brought up to the speed of the web as they reach the cutting cylinder 14. The guides 75 and 91 terminate at the bite of the roll 76 and the cutting cylinder. The pile sheets therefore are delivered between the cutting cylinder and this roll 92 and are carried around by the cutting cylinder, this cylinder being provided with the usual pin construction.

In the particular machine shown, the upper pile is intended to represent inner sheets which may be printed in any desired manner, and the lower pile is intended to represent cover sheets. In the operation of the machine, therefore, it will be understood that as the webs W^1 , W^2 , W^3 pass between the cutting and collecting cylinders, the cylinders operate to first cut into sheet lengths the webs which are carried around the collecting cylinder on its first revolution. On the next revolution of the cylinder, the head of the sheet lengths thus cut meet the heads of the webs and at this time the sheets from the piles have been forwarded, so that their heads meet the heads of the webs. The sheet lengths on the collecting cylinder, the webs and the sheets from the piles thereafter pass between the cutting and collecting cylinders, after which the web is again severed. There is at this time on the collecting cyl-

inder 13 therefore a product consisting of six web lengths, a sheet from the inner pile of sheets, and a cover sheet from the cover pile. At the proper time, the folding blade 15 is operated to tuck this product between the folding rolls 93 which are of the usual type, and the sheets pass down along the guide 94 to a rotating fly 95. By this fly they are run off on carrier tapes 96, all these parts being of the usual construction. It will be understood, therefore, that the particular machine shown produces a product comprising twenty-four pages printed on and cut from the webs, four pages supplied by the sheets from the inner pile, and a cover, or, in all, a twenty-eight page product having a four page cover. It will be readily understood that by causing the cylinder 13 to fold off on every revolution instead of collecting, and by changing the time of the sheet feeding devices for the piles, so that the sheets will be removed from the piles successively instead of simultaneously, a product can be produced consisting of twelve printed pages and a cover, each pile in that case containing cover sheets. The changes referred to are so simple and so obvious that they are not illustrated.

The mechanism by which the invention is carried into effect may be varied within wide limits. The invention is not, therefore, to be confined to the specific machine illustrated. It is to be regarded simply as a preferred mechanism for carrying the invention into effect.

What is claimed is:—

1. In a printing machine, the combination with web forwarding and severing devices, of a collecting cylinder having sheet taking devices to which the sheets cut from the web are delivered; means for supporting a pile of sheets, sheet feeding and forwarding means for the pile sheets, said means operating to deliver the pile sheets to the taking devices of the collecting cylinder simultaneously with its last collection of the web sheets and outside the same, and means for folding the web sheets and pile sheets together after collection.

2. In a printing machine, the combination with web forwarding and severing devices, of a collecting cylinder having sheet taking devices and to which the sheets cut from the web are delivered, means for supporting a pile of sheets of the size of the web sheets, sheet feeding and forwarding means for said pile sheets, said means operating to deliver the pile sheets to the taking devices of the collecting cylinder simultaneously with its last collection of the web sheets and outside the same, and means for folding the web sheets and pile sheets together after collection.

3. In a printing machine, the combination

with web forwarding and severing devices, of a collecting cylinder having sheet taking devices and to which the sheets cut from the web are delivered, means for supporting a pile of sheets, sheet feeding and forwarding means for said pile sheets operating to feed the sheets from the pile at a less speed than the speed of the web, means for speeding up the sheets and delivering them to the collecting cylinder simultaneously with its last collection of the web sheets and outside the same, and means for folding the web sheets and pile sheets together after collection.

4. In a printing machine, the combination with web forwarding and severing devices, of a collecting cylinder having sheet taking devices and to which the sheets cut from the web are delivered, means for supporting a pile of sheets of the size of the web sheets, sheet feeding and forwarding means for said pile sheets operating to feed the sheets from the pile at a less speed than the speed of the web, means for speeding up the sheets and delivering them to the collecting cylinder simultaneously with its last collection of web sheets and outside the same, and means for folding the web sheets and pile sheets together after collection.

5. In a printing machine, the combination with web forwarding and manipulating means including a collecting cylinder, of means for supporting a pile of inner sheets, means for supporting a pile of cover sheets, means for feeding sheets from each of said

piles at a less speed than the speed of the web, means for speeding up the sheets from the piles and delivering them to the collecting cylinder, web severing means, and means for folding together the sheets cut from the web, the inner pile sheets and the cover sheets.

6. The combination with means for forwarding a web, of web-severing means, means for receiving the web product, means for supporting a plurality of piles of sheets, means for forwarding sheets from the piles and causing them to be superposed, and means for associating the superposed pile sheets with the web product outside of the same when the web product is first delivered to the web-receiving means so that the outer pile sheet may form a cover for the product.

7. The combination with means for forwarding a web, of means for supporting a plurality of piles of sheets, means for feeding sheets from the piles and for causing them to be superposed, means for associating the superposed sheets with the running web, web severing means, and means for folding together sheets cut from the severed web and said superposed sheets.

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

OSCAR ROESEN.

Witnesses:

OTTO L. RAABE,
FRED G. LOUGEE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."