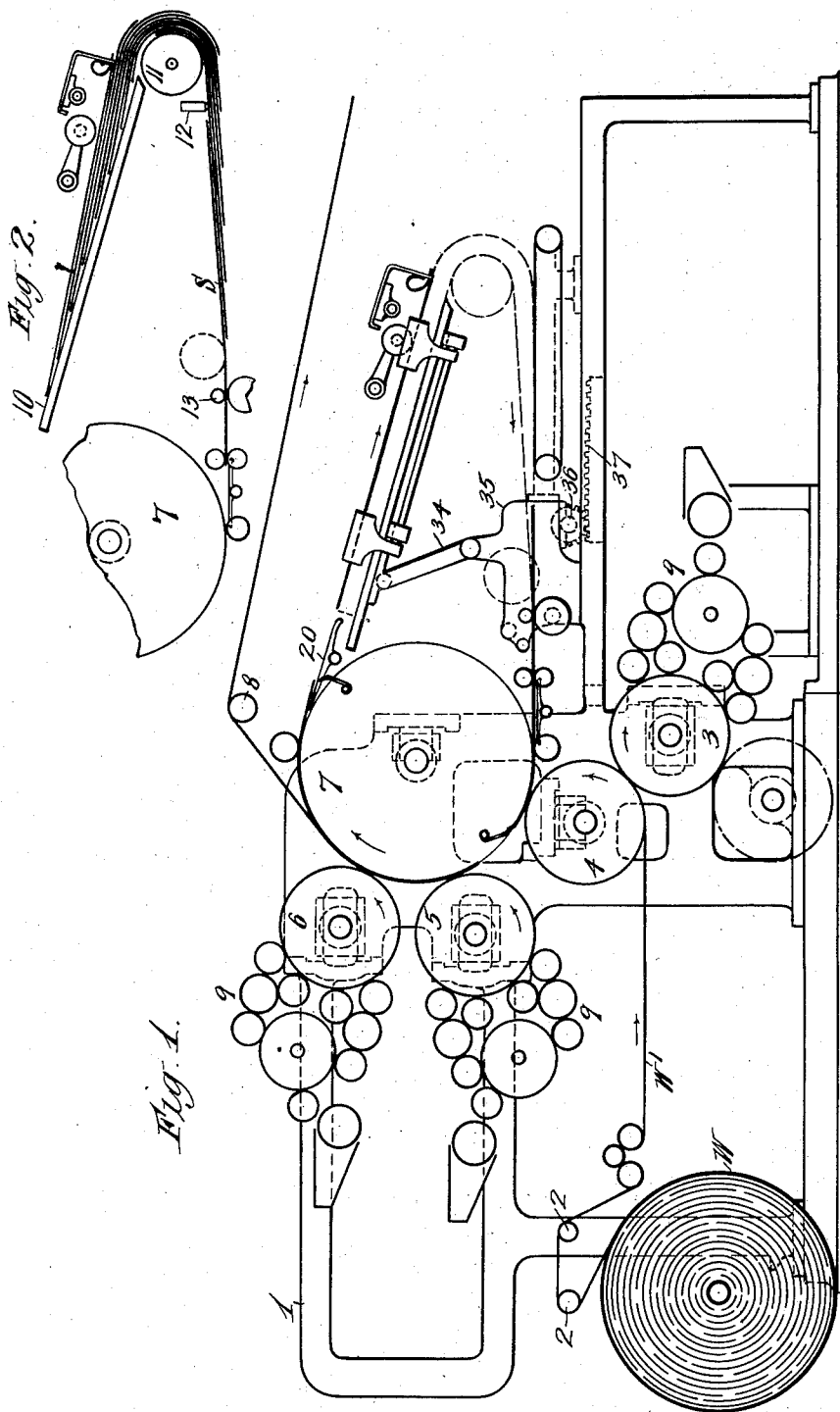


I. TORNBORG
 OFFSET PREVENTING MECHANISM FOR PRINTING MACHINES.
 APPLICATION FILED SEPT. 6, 1917.

1,374,253.

Patented Apr. 12, 1921.

4 SHEETS—SHEET 1.



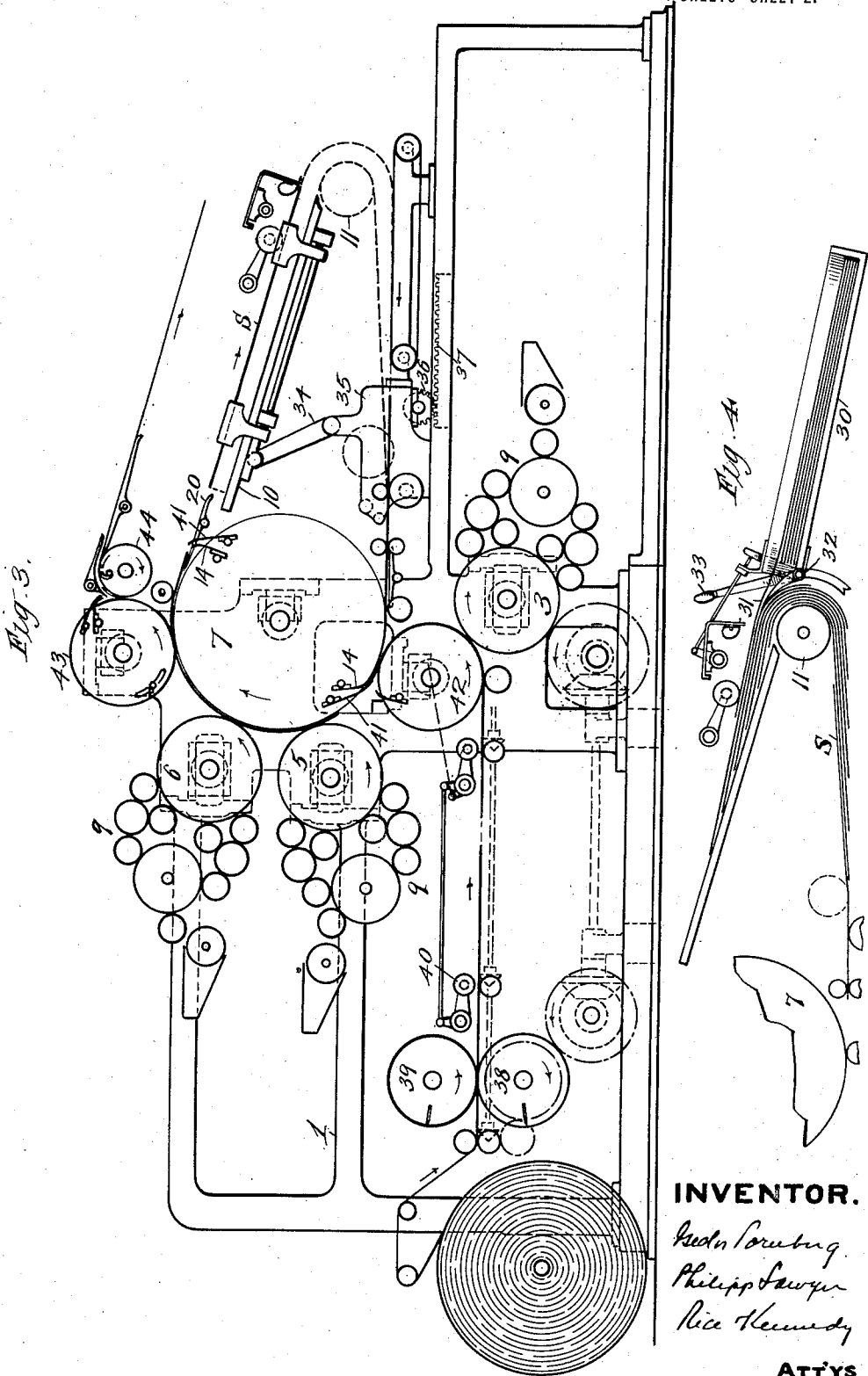
INVENTOR
 Victor G. Goring
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4 SHEETS—SHEET 2.



INVENTOR.

Ivan Tornborg
Philip Sawyer
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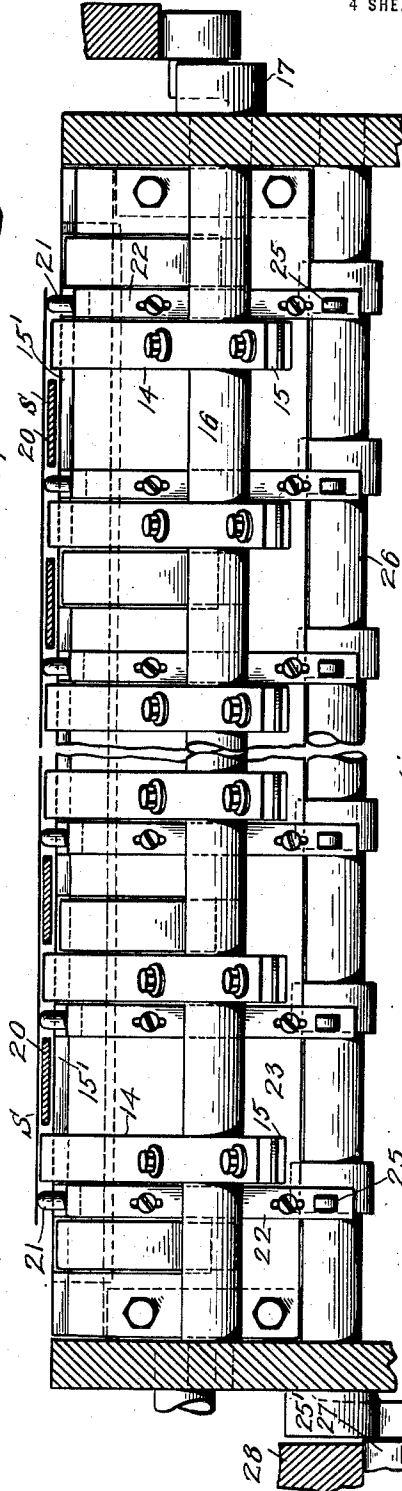
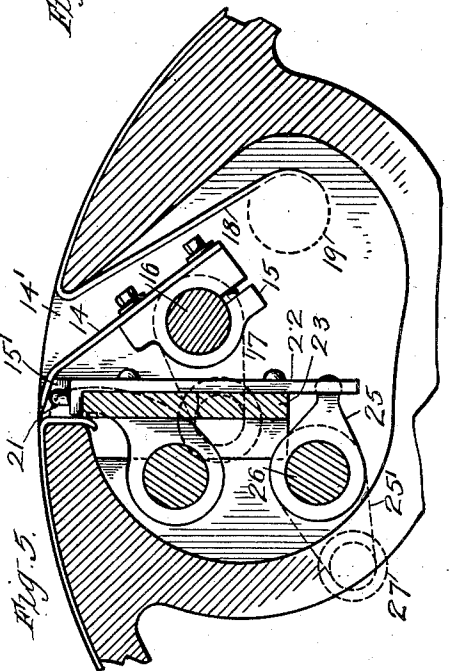
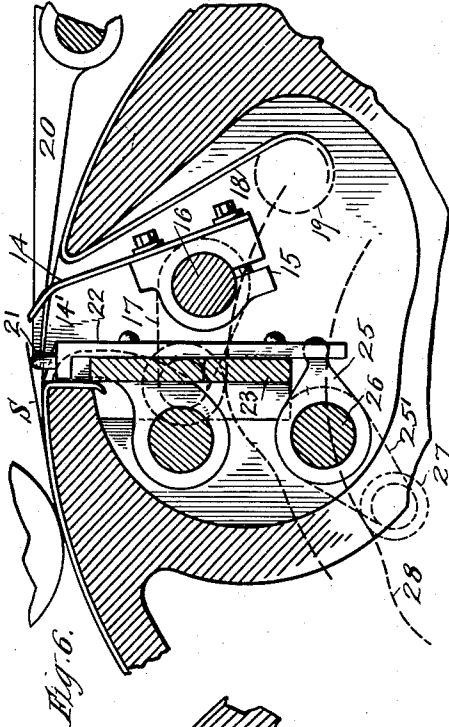
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4 SHEETS—SHEET 3.



INVENTOR

I. Tornborg
Philip L. Lipp
Rich. Kennedy

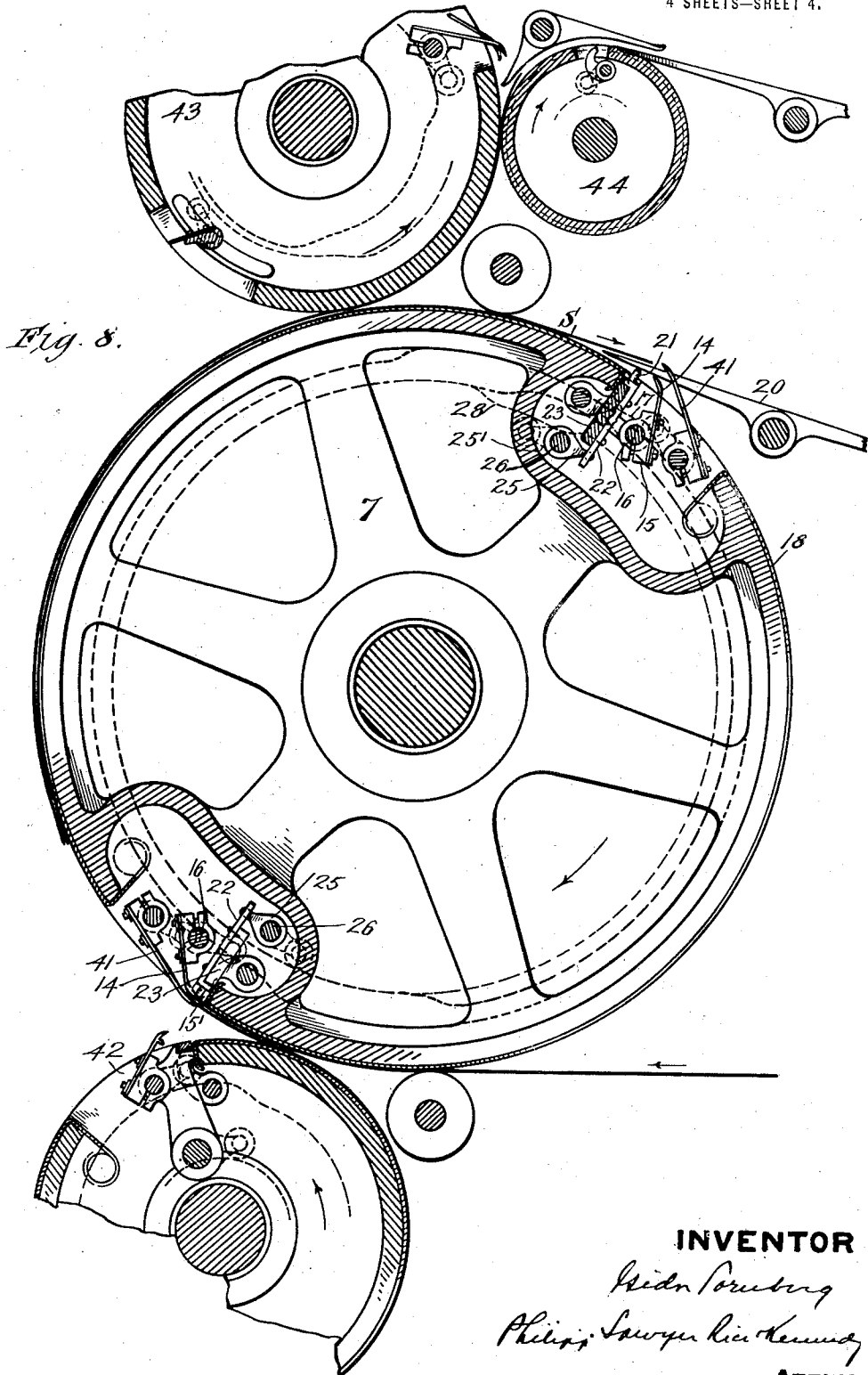
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4 SHEETS—SHEET 4.



INVENTOR

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Philip Sawyer Rice Kennedy

ATT'YS

UNITED STATES PATENT OFFICE.

ISIDOR TORNBERG, OF NEW YORK, N. Y., ASSIGNOR TO R. HOE AND CO., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

OFFSET-PREVENTING MECHANISM FOR PRINTING-MACHINES.

1,374,253.

Specification of Letters Patent.

Patented Apr. 12, 1921.

Application filed September 6, 1917. Serial No. 189,935.

To all whom it may concern:

Be it known that I, ISIDOR TORNBERG, a citizen of the United States, residing at New York city, county of Queens, and State of New York, have invented certain new and useful Improvements in Offset-Preventing Mechanism for 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 offset preventing mechanism for printing machines.

To prevent offset, that is, an impression from the freshly printed side of the web or sheet and the second impression member, in perfecting a web or sheet, there have been commonly used a traveling offset web which, after being used, is rewound to be used over again, or a shifting offset web or tympan which is automatically periodically shifted so as to present a fresh surface against the freshly printed side of the web every so many revolutions of the impression cylinder, this shifting tympan being wound up as it shifts in a suitable recess provided within the cylinder walls. Both of these offset preventing means are open to objection, in that much time is lost in changing the position of the offset rolls, resulting in frequent stoppage of the machine, and, if any damage should be done to the central portion of the roll, such as a wrinkle or tear, the entire roll is ruined and has to be thrown away, thus causing a considerable cost. It has been proposed, to overcome these disadvantages, to employ offset sheets which shall be presented to the freshly printed side of the web between it and the second impression member. In the prior constructions, however, for effecting this, the offset sheet was presented to the freshly printed side of the web only after a number of revolutions of the impression cylinder, and, consequently, after a number of impressions. While this construction obviated some of the difficulties referred to, there still was apt to be a smut caused by the freshly printed side of the web leaving offset on the offset sheet, which is offset or smutted onto the succeeding portions of the web, owing to the fact that the sheet made a number of contact impressions with the printed side of the web before it was changed. This resulted in bad print-

ing and is objectionable for this reason, particularly where fine printing is desired.

It is one object of the present invention to produce a construction whereby offset sheets may be fed from a pile or other suitable source of supply, so that a fresh sheet shall be presented between the printed web or sheet and the impression cylinder at each impression, the offset sheet, after it has been printed against, being returned to the pile and a fresh sheet substituted, a sufficient number of sheets being used in rotation and a sufficient number of sheets being provided, so that they will have time to sufficiently dry before they are again presented to the printed web or sheet.

It is a further object of the invention to provide a feeding mechanism for feeding offset sheets, which may be loaded while the work is going on, so that the feeding can be continuous and no time lost and no stoppage of the machine for changing the feeding devices is required.

It is a further object of the invention to produce an improved mechanism for feeding offset sheets which may be so mounted in relation to the impression cylinder or other impression member of the machine that the feeding mechanism as a whole may be moved away from the impression cylinder so as to allow ready access thereto.

It is a further object of the invention to provide such an offset preventing mechanism which may be employed with any type of perfecting printing machine, whether the machine prints from a web, or from sheets supplied thereto in any suitable manner, or from a web cut into sheets prior to printing.

With these and other objects not specifically referred to in view, the invention consists in certain parts and combinations which will be specifically described in connection with the accompanying drawings, in which—

Figure 1 is a diagrammatic side elevation of a rotary web perfecting press embodying the invention;

Fig. 2 is a detail side view showing the run of the offset sheets through the feeding mechanism, the feeding mechanism being that shown in Fig. 1;

Fig. 3 is a side elevation diagrammatically showing a rotary printing machine in which the sheets are cut from the web

before being printed and perfected, and embodying the invention;

Fig. 4 is a detail side elevation showing one form of switch mechanism which may be employed to prevent a worn or dirty sheet from being returned to the impression cylinder;

Fig. 5 is a sectional view, partly broken away, showing an impression cylinder and the arrangement for holding the blanket, and the grippers for holding the offset sheet in position, where the machine is used for printing on a continuous web, the grippers being shown in closed position;

Fig. 6 is a view similar to Fig. 5, the grippers being shown in open position;

Fig. 7 is a side view, partly in section, of the construction shown in Figs. 5 and 6, and

Fig. 8 is a view showing the impression cylinder and arrangement where the machine shown in Fig. 3 is employed for printing and perfecting sheets cut from a web.

Referring now to the drawings and first to Figs. 1, 2 and 4 to 7, inclusive, the invention is shown as embodied in a rotary machine in which a continuous web is printed and perfected and then led to other mechanisms in which it is cut or folded. The various parts of the mechanism are mounted in side frames 1 which may be of any usual or suitable construction. Suitably supported in the frames is a web roll W from which the web W' is led over the usual guide rolls 2 through the first printing couple which includes a form cylinder 3 and an impression cylinder 4. The particular machine illustrated in Fig. 1 is arranged to print in one color on one side of the web and to perfect a web in two colors. After the web is printed in the printing couple 3, 4, it is perfected by form cylinders 5, 6 which cooperate with a large impression cylinder 7, the web, after it has been perfected, being led from the machine over the usual guide roll 8. Inking mechanisms 9 of any usual type are provided for inking the form cylinders, 3, 5 and 6.

In machines embodying the invention, there will be provided a mechanism for feeding offset sheets between the freshly printed side of the web and the impression cylinder of the second all perfecting printing couple, and in machines embodying the invention in its best form these offset sheets will be fed continuously and by mechanism which can be loaded while the machine is working, so that the operation of feeding the sheets will be continuous, thus obviating any necessity for stopping the machine to effect the change of the sheets. Furthermore, these offset sheets will be of dimensions corresponding with the length of the impression made by the form cylinder and one of these offset sheets will be fed between the freshly printed web and the impression cylinder of the perfecting couple at each operation of the

impression cylinder, a sufficient number of offset sheets being provided so that each sheet will have time to dry before it is again used for its offset work. Various feeding mechanisms may be employed for effecting this feeding of the offset sheets and such mechanism may vary widely in its specific construction. In the particular machine illustrated, however, there is provided a feeding mechanism in which the sheets marked S (see Fig. 2) are fed into the machine from a pile which may be placed on a feed table 10 which is suitably located closely adjacent the second impression cylinder 7. The sheets are fed from this table so that the under sheet of the pile is first delivered or fed to the impression cylinder, this feeding being effected by means of the usual combing roll 11 which acts to comb or fan out the sheets as is usual in sheet feeders, a presser foot 12 being provided as usual to prevent the feed of more than one sheet at a time. This type of feeder illustrated is a common one and of itself forms no part of the invention.

The offset sheets are fed from the feeder over suitable feeding-in rolls 13 and are taken by suitable sheet taking devices carried by the second impression cylinder. The sheet taking devices may be of any suitable character. In the particular construction illustrated, these sheet taking devices are grippers 14 which are carried in blocks 15 mounted on a shaft 16 suitably positioned within the cylinder, this shaft being carried on rock arms 17 which are operated in any usual or desired manner for effecting the opening and closing movement of the grippers. The grippers 14 operate through a slot 14' formed in the cylinder wall and in the best constructions these grippers will be formed and will be operated so that when in their closed position they will be entirely below the surface of the cylinder as shown in Fig. 5, so as not to interfere with the web passing around the cylinder. These grippers cooperate with suitable abutments 15' to hold the sheet firmly in position on the cylinder blanket. Where, as in the machine illustrated, the second impression cylinder is twice the diameter of the two form cylinders with which it cooperates, this cylinder will, as shown in Fig. 1, be provided with two sets of offset sheet taking grippers which are identical in construction and operation, the two sets of grippers being provided so that the fresh sheet may be fed for each impression. It may be stated that the impression cylinder is as usual provided with an impression blanket indicated at 18 (Figs. 5 and 6), the ends of which extend into the cylinder and which may be adjusted by the usual blanket rolls 19 located within the cylinder walls.

After the offset sheet has been passed

with the web through the machine, it is delivered from the cylinder back onto the top of the pile on the feed table 10 over suitable guide 20 so that it is given an opportunity to dry before being again sent through the machine. In machines embodying the invention in its best form means will be provided for pushing or lifting the end of the offset sheet from the cylinder to insure the sheet passing to the guide 20 before referred to, over which the sheet is delivered to the table. While these means may vary, in the particular construction illustrated there are provided a series of pushing pins 21 carried on slides 22 mounted on blocks 23 suitably secured within the cylinder, the slides 22 being operated by rock arms 25, 25' on a shaft 26, one of the arms, as 25, taking into a slot in the lower end of the slides, and the other arm 25' being operated from a cam roll 27 secured thereto and operated from a cam 28 suitably secured to the frame of the machine, this cam being indicated in dotted lines in Fig. 6. These pushers, as shown in Fig. 6, when elevated, act to lift up or strip the end of the sheet S from the cylinder and assure the sheet passing onto the guide 20.

In machines embodying the invention in its best form, devices will be provided whereby a worn or too badly soiled sheet may be prevented from again passing through the machine from the feeder, such worn or soiled sheet being removed as it is delivered to the top of the pile by the guide. Various devices may be employed for such purpose, but a convenient one is that illustrated in Fig. 4 in which there is shown a receptacle 30 mounted in any suitable manner adjacent the feeding mechanism. This receptacle has an open end and at the open end is provided a switch 31 pivotally mounted on a stud 32, the switch being operated by hand lever 33. When a worn or badly soiled sheet comes through, the operator simply throws this switch into the position shown in Fig. 4, which causes such sheet to be delivered to the receptacle 30, instead of again passing around the combining roll 11 and into the machine.

For convenience in access to the second impression cylinder, in the best construction the feeding mechanism is so mounted that it can be moved bodily away from the cylinder so that the latter may be readily reached for the purpose of adjusting the blanket or for any other reason. Various constructions for effecting this may be employed. As illustrated, the feeding table is carried on arms 34 secured to a traveling block 35, this block being movable on guides (not illustrated) on the frame of the machine. The block 35 is moved to and from the second impression cylinder by means of a pinion 36 coöperating with

racks 37, this pinion being operated by any suitable tool.

The construction so far described provides for the feeding of the offset sheets at each impression to printing machines in which a continuous web is printed. In Figs. 3 and 8 is shown a construction in which the web is cut into sheets after being printed upon. Such construction, in addition to the mechanisms hereinbefore described, includes a pair of cutting cylinders 38, 39, sheet feeding mechanism 40, and additional sheet taking devices which are shown as grippers 41, are provided, on the second impression cylinder for holding the cut sheets thereon. When the machine is, as shown in Figs. 3 and 8, arranged to print and perfect sheets cut prior to the printing, the usual taking cylinder 42 and delivery cylinders 43, 44 may be provided. The mechanism for feeding the offset sheet to the second impression cylinder in this type of machine will, however, be similar to that heretofore described and consequently need not be described again.

While a simple and efficient construction has been illustrated and described for effecting the objects of the invention and such construction has been shown as embodied in two types of perfecting printing machines, it will be understood that various feeding mechanisms may be employed for continuously feeding offset sheets in rotation through the machine and that such feeding mechanism may be employed with other types of perfecting machines than those shown and described and that the invention is not to be limited to the precise type of perfecting machine or feeding mechanism shown.

What is claimed is:—

1. In a printing machine, the combination with a printing couple, of a pile of offset sheets, and means for feeding offset sheets continuously thereto from the bottom of the pile, one such sheet being fed for each impression operation of the impression member of the couple.

2. In a printing machine, the combination with an impression cylinder, of means for feeding one of a plurality of superposed offset sheets thereto in rotation, one such sheet being fed for each impression operation of the cylinder.

3. In a printing machine, the combination with an impression cylinder, of means for continuously feeding one of a plurality of superposed offset sheets thereto in rotation, one such sheet being fed for each impression operation of the cylinder.

4. In a printing machine, the combination with an impression cylinder, of means for supporting a pile of offset sheets, means for feeding the sheets successively to the impression cylinder, one sheet being fed for each

impression operation thereof, and means for returning the sheets to the pile.

5. In a printing machine, the combination with an impression cylinder, of means for supporting a pile of offset sheets, means for feeding the sheets successively from the bottom of the pile to the cylinder, and devices for returning the sheet to the top of the pile.

6. In a printing machine, the combination with an impression cylinder, of means for supporting a pile of offset sheets, means for successively feeding the sheets to the cylinder, means for delivering the sheets to the pile and devices for preventing the return of a sheet to the pile.

7. In a printing machine, the combination with an impression cylinder, of means for supporting a pile of offset sheets, means for feeding the sheets successively to the cylinder, and devices whereby the supporting and feeding means may have a bodily movement to and from the cylinder, a clear space being left after such movement so that free access may be had to the cylinder.

8. In a printing machine, the combination with an impression cylinder, of a support for a pile of offset sheets, a feeding mechanism for feeding the sheets successively to the cylinder, a frame in which the pile support and the feeding mechanism is mounted, and means for sliding the frame to and from the impression cylinder, a clear space being left after such movement so that free access may be had to the cylinder.

9. In a printing machine, the combination with an impression cylinder, of means for supporting a pile of sheets, of means for successively feeding the sheets to the cylinder, means for delivering the sheets from the cylinder to the top of the pile, and a switch for switching a sheet away from the pile.

10. In a printing machine, the combination with a printing couple and means for

supporting a pile of offset sheets, of means for feeding the sheets successively to the impression member of the couple, one sheet being fed for each impression operation thereof, and means for returning the sheets to the pile.

11. In a printing machine, the combination with an impression cylinder, of means for supporting a pile of offset sheets, means for feeding the sheets successively from the bottom of the pile to the impression cylinder, one sheet being fed for each impression operation thereof, and means for returning the sheets to the pile.

12. In a printing machine, the combination with a printing couple, of means for supporting a pile of offset sheets, means for successively feeding the sheets to the impression member of the couple, means for delivering the sheets to the pile, and devices for preventing the return of a sheet to the pile.

13. In a printing machine, the combination with a printing couple, of means for supporting a pile of offset sheets, means for successively feeding the sheets to the impression member of the couple from the bottom of the pile, means for returning the sheets to the top of the pile, and devices for preventing the return of a sheet to the pile.

14. In a printing machine, the combination of an impression member, means for feeding offset sheets thereto from a pile and means for returning the sheets to the same pile from which they were fed.

15. In a printing machine, the combination of an impression member, means for feeding a fresh offset sheet thereto from a pile at each operation of the member, and means for returning the sheets to the same pile from which they were fed.

In testimony whereof, I have hereunto set my hand.

ISIDOR TORNBERG.