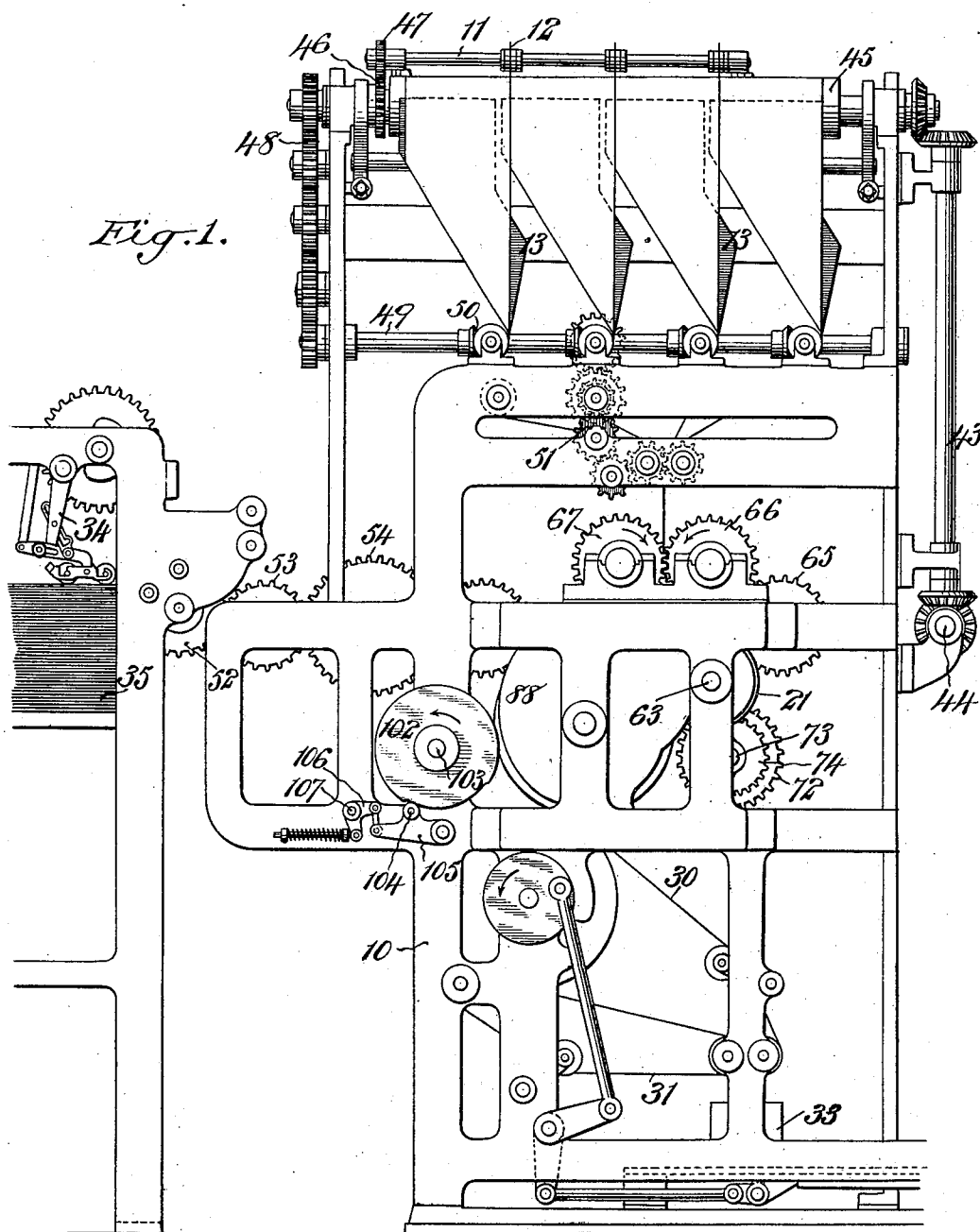


H. M. BARBER.
 COMBINED COVER AND CENTER PAGE INSERT SHEET FEEDING AND FOLDING MECHANISM.
 APPLICATION FILED OCT. 2, 1906.

992,474.

Patented May 16, 1911.

6 SHEETS—SHEET 1.



Witnesses:
 F. George Barry
 Henry Thorne

Inventor:
 Howard M. Barber
 By attorneys
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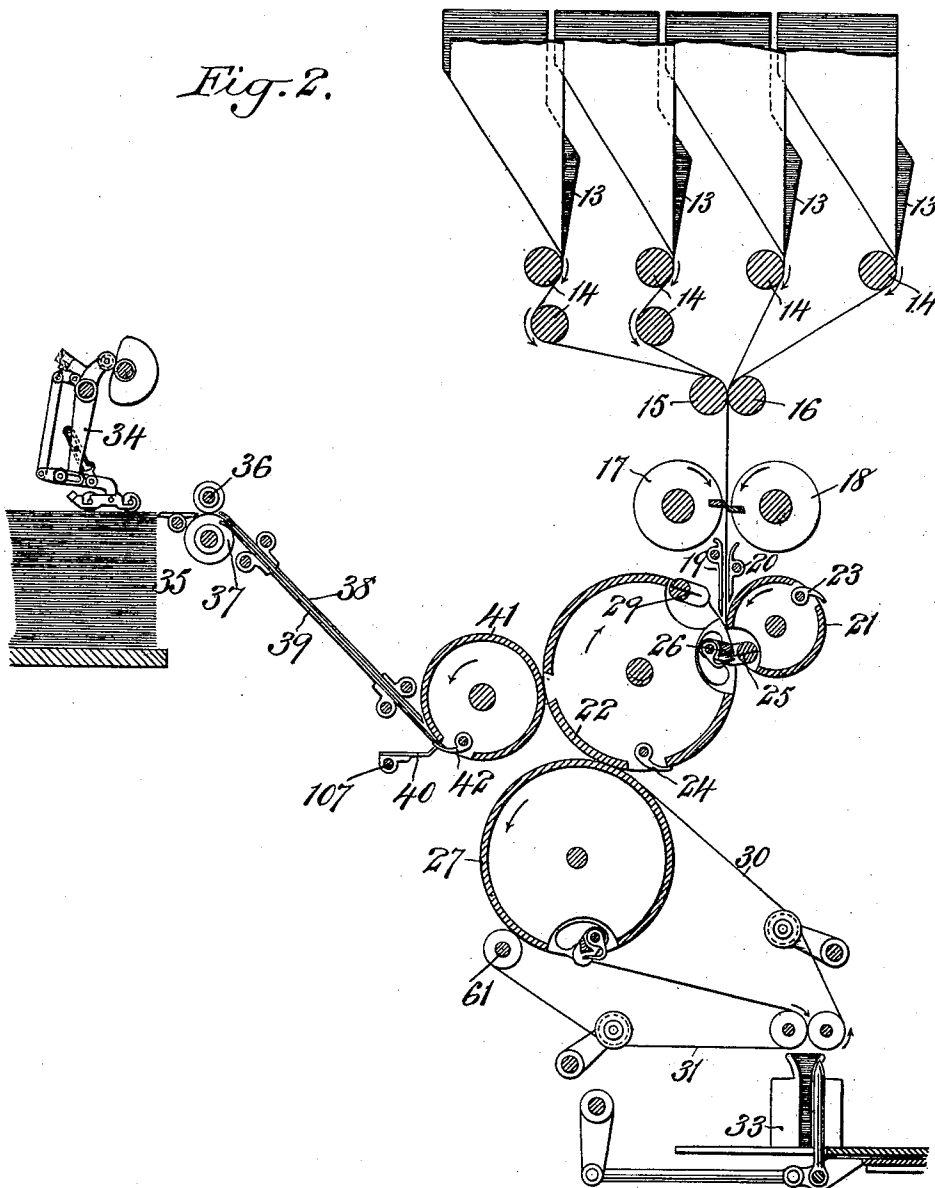
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5 SHEETS—SHEET 2.

Fig. 2.



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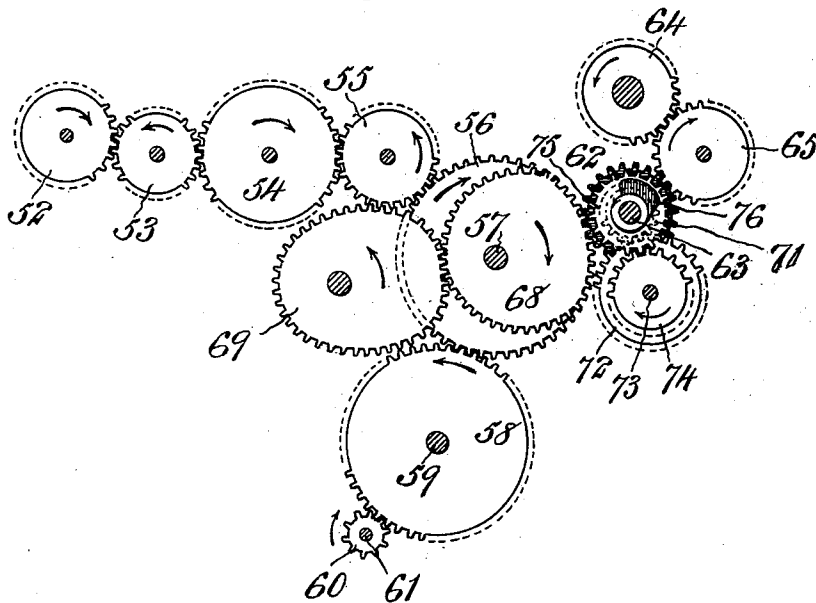
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5 SHEETS—SHEET 3.

Fig. 3.



Witnesses:
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Henry Thime.

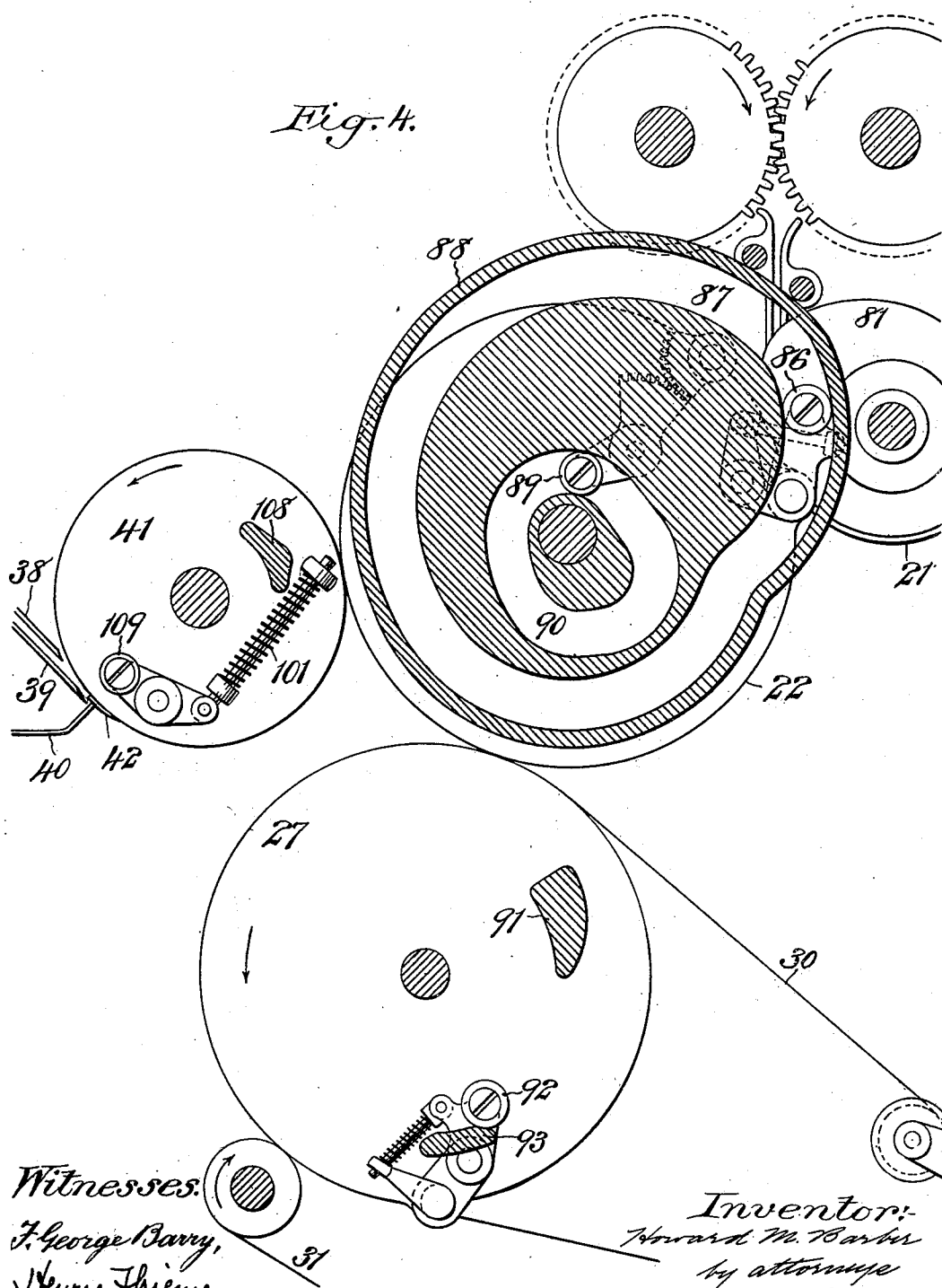
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5 SHEETS—SHEET 4.



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5 SHEETS—SHEET 5.

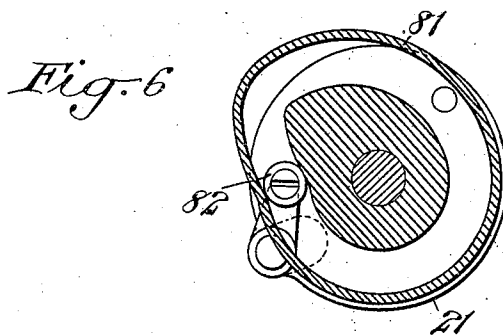
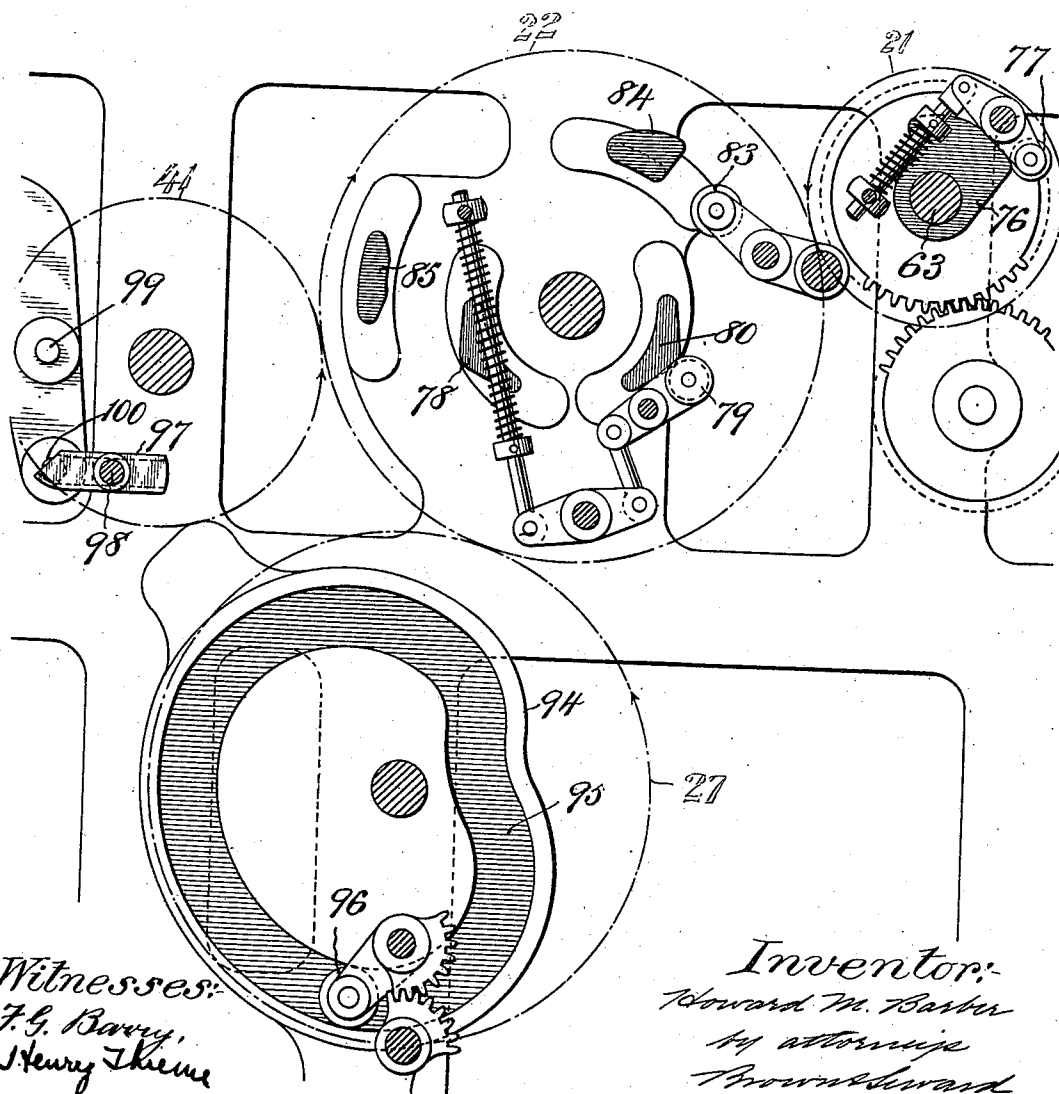


Fig. 5.



Witnesses:
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 Henry Thome

Inventor:
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UNITED STATES PATENT OFFICE.

HOWARD M. BARBER, OF STONINGTON, CONNECTICUT, ASSIGNOR TO C. B. COTTRELL & SONS COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

COMBINED COVER AND CENTER-PAGE INSERT SHEET FEEDING AND FOLDING MECHANISM.

992,474.

Specification of Letters Patent.

Patented May 16, 1911.

Application filed October 2, 1906. Serial No. 337,102.

To all whom it may concern:

Be it known that I, HOWARD M. BARBER, a citizen of the United States, and resident of Stonington, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Combined Cover and Center-Page Insert Sheet Feeding and Folding Mechanisms, of which the following is a specification.

10 This invention contemplates novel mechanism arranged to feed combined previously printed cover and center page insert sheets one by one from a pile into position to be assembled with the printed product as it comes from the press and subsequently folded together with said printed product and finally delivered to a predetermined point.

15 In the accompanying drawings, Figure 1 is a view of the machine in front elevation, Fig. 2 is a vertical transverse section indicating diagrammatically the several parts which coöperate to produce the assembling and the folding together of the printed product and combined cover and center page insert sheets, Fig. 3 is a diagrammatic view showing the driving connections between the several parts, Fig. 4 is an enlarged detail view taken immediately inside the framing and illustrating the parts of the mechanism at the front side of the machine for controlling the movements of the grippers and folding devices on the several cylinders, Fig. 5 is a detail section on the same scale as Fig. 4, taken adjacent to the back frame of the machine and showing the remaining parts of the mechanisms for controlling the movements of the grippers and folding devices on the several cylinders, and Fig. 6 is a detail section showing the box cam and truck roller arranged to control the movement of the folding blade on one of the folding cylinders.

20 The framing of the machine is denoted by 10. This machine is shown as provided with slitting mechanism mounted in position to divide the printed web as it comes from the press into a plurality of webs. These webs are led around half-turners and rollers and are assembled into a group before reaching the cutting mechanism. In the present instance I have shown the slitting mechanism as comprising three slitters 12 arranged to slit the printed web as it comes

from the press, into four webs which four webs pass around four half-turners 13 and from thence around rolls 14 and finally between rolls 15, 16. A pair of rotary smooth-edged cutters 17, 18 are mounted in the machine framing 10 in position to receive the assembled group of previously printed webs and cut sheets therefrom of the desired lengths.

Stationary sheet guides 19, 20, are arranged in position to receive the assembled group of previously printed webs from the cutting mechanism and direct the same between the folding cylinders 21, 22. The folding cylinder 21 is provided with a set of grippers 23 and the folding cylinder 22 with a set of grippers 24. The folding cylinder 21 is also provided with a folding blade 25 which is arranged to coact with the floating folding jaw 26 carried by the folding cylinder 22. The delivery cylinder is denoted by 27 and it is provided with a floating folding jaw 28 arranged to coöperate with a folding blade 29 mounted on the folding cylinder 22. Carrying tapes 30, 31 are arranged in position to receive the signature from the delivery cylinder 27 and convey it to any suitable point, as, for instance, a suitable delivery mechanism 23 of the well known packer type.

The mechanism for feeding the previously printed multicolor cover and center page insert sheets one at a time from the pile to the folding cylinder 22 to be assembled together with the groups of the previously printed sheets from the press is as follows. A sheet feeding device 34 of any desired construction is arranged in position to feed the combined cover and center page insert sheets one at a time from the pile between rollers 36, 37; from thence the sheets are passed down between guides 38, 39, into engagement with a movable stop 40 located adjacent to the sheet feeding cylinder 41. This cylinder 41 is provided with a set of grippers 42 arranged to engage the advance edges of the sheets as they come from between the guides 38, 39, and deliver the same one by one to the set of grippers 24 on the folding cylinder 22 at the required times.

Proceeding to describe the driving and operating mechanism for the several parts; the slitting mechanism and the rolls for

feeding the plurality of previously printed webs to the cutters are driven from the press as follows: A vertical shaft 43 is driven from a horizontal shaft 44 and it in turn drives the slitting roll 45. This slitting roll has a geared connection 46, 47 with the shaft 11 of the slitters 12. The slitting roll shaft drives the plurality of web feeding rolls 14 through a train of gears 48 which drives a cross shaft 49 having bevel gear connections 50 with the shafts of the rolls 14. The web assembling rolls 15, 16, are driven from one of the rolls 14 through a train of gears 51. The gear 52 on the roll 37 is driven through gears 53, 54, 55 from a gear 56 fast on the shaft 57 of the folding cylinder 22. The gear 55 also meshes with a gear 58 on the shaft 59 of the delivery cylinder 27. This gear 58 in turn meshes with a pinion 60 on a driving roll shaft 61 of the carrying tapes 31. The gear 56 also meshes with a gear 62 on the shaft 63 and is fixed to the shaft 57 of the folding cylinder 22. The gear 56 drives the gear 62 on the shaft 63 of the folding cylinder 21. This gear 62 drives a gear 64 on the cutter 18 through an idler gear 65. This cutter 18 is also provided with a gear 66 which meshes with a gear 67 on the cutter 17.

The cover and center page insert sheet feeding cylinder 41 is driven at varying speeds through irregular gears 68, 69, fixed to the shafts of the cylinders 22 and 41 respectively, the shape of the said irregular gears being such that the cylinder 41 will be driven very slowly at the time that its set of grippers 42 engage the advance edge of the combined cover and center page insert sheet and at the surface speed of the cylinder 22 at the time that the said combined cover and center page insert sheet is transferred from the grippers 42 on the cylinder 41 to the grippers 24 on the cylinder 22. The mechanism arranged to open the said set of grippers 23 on the folding cylinder 21 every other revolution of the cylinder so that every other group of assembled sheets from the press may be engaged by the said grippers, is as follows. A gear 71 is fixed to the shaft 63, which gear drives a gear 72 twice the size of the gear 71. This gear 72 is loosely mounted on a stud 73. A gear 74 is fixed to the gear 72 and is loosely mounted on the stud 73, which gear 74 drives a gear 75 of the same size as the gear 74, the gear 75 being loosely mounted on the shaft 63 of the folding cylinder 21. This gear 75 has fixed thereto a cam 76 loosely mounted on the shaft 63 of the cylinder 21, which cam is arranged to travel at one-half the speed of the cylinder 21 so that it will engage the gripper operating stud roller 77 every other revolution of the said cylinder.

The folding cylinder 22 is twice the size

of the folding cylinder 21 and its set of grippers 24 are opened to receive the advance edge of the combined cover and center page insert sheet as it is delivered from the grippers 42 on the cylinder 41, by providing a stationary cam 78 arranged to engage the gripper operating stud roller 79. This set of grippers 24 is also opened at the proper time to release the combined cover and center page insert sheet by means of a stationary cam 80 arranged in position to engage the gripper operating stud roller 79.

A stationary box cam 81 is arranged in position to engage the stud roller 82 which controls the movement of the folding blade 25 carried by the folding cylinder 21. The floating folding jaw 26 on the folding cylinder 22 is opened to receive the folding blade 25 on the folding cylinder 21 by the engagement of its operating stud roller 83 with a stationary cam 84. This floating folding jaw 26 is also opened at the proper time to release the assembled group of sheets after their first fold, by the engagement of the stud roller 83 with a stationary cam 85. The floating of the folding jaw 26 is accomplished through the engagement of its stud roller 86 with the outer cam groove 87 in the stationary box cam 88.

The floating of the blade 29 on the cylinder 22 is accomplished by the engagement of its stud roller 89 with the inner cam groove 90 of the box cam 88. The opening of the floating folding jaw 28 on the delivery cylinder 27 is accomplished at the time of co-action with the folding blade 29 on the cylinder 22 by means of a stationary cam 91 which engages its operating stud roller 92. The opening of the floating folding jaw 28 at the proper time to release the assembled group of sheets after their second fold for delivering the sheets between the carrier tapes 30, 31 is accomplished through a stationary cam 93 which engages the said operating stud roller 92. The floating of the folding jaw 28 is accomplished by means of a stationary cam 94 the groove of which engages an operating stud roller 96 of the said floating folding jaw.

The mechanism for controlling the movement of the set of grippers 42 on the cylinder 41 so that they will be thrown back out of the way while passing the stop 40 and then closed on to the advance edge of the sheet, is as follows. A tumbler cam 97 is fixed to the shaft 98 of the grippers 42, which tumbler cam is arranged to first engage a stationary stud 99 for swinging the grippers back into the cylinder when passing the stop 40 and subsequently engage a stationary stud 100 for swinging the grippers into position to be closed by their spring 101.

A cam 102 is fixed to the shaft 103 of the cylinder 41, which cam is arranged to en-

gage a stud roller 104 on a rocking arm 105 connected to a spring-actuated rock lever 106 fast on the shaft 107 of the movable stop 40, for withdrawing the stop 40 from in front of the advance edge of the sheet after the grippers 42 have grasped the same.

The opening of the set of grippers 42 at the proper time for delivering the advance edge of the combined cover and center page insert sheet to the grippers 24 on the cylinder 22 is accomplished by the engagement of a stationary cam 108 with the operating stud roller 109 of the said grippers.

The operation of the machine as herein described is as follows. The multicolor cover and center page insert sheets are fed one by one between the rollers 36, 37, and from thence between the guides 38, 39, to the stop 40. The grippers 42 are operated as hereinbefore described for causing them to grip the advance edge of the sheet while the cylinder 41 is rotated at a very slow speed owing to the irregular geared connection 68, 69 with the shaft of the folding cylinder 22. The stop 40 is then swung down out of the way and the surface speed of the cylinder 41 is accelerated until its speed is the same as the surface speed of the cylinder 22 at the time the sheet is transferred thereto. The cylinder 41 makes one revolution for each sheet fed and because of the retarding and acceleration of the cylinder an absolute sheet register of the cover and center page insert sheet with the assembled groups of sheets cut and fed from the press is insured.

The grippers 24 on the cylinder 22 bring the combined cover and center page insert sheet into position to be folded with two groups of previously printed sheets from the press as follows. As the printed web comes from the press it is slit into a plurality of webs and then assembled and fed down between the cutters 17 and 18. The movements of these cutters are so arranged that only one combined cover and center page insert sheet is supplied for each two groups of assembled sheets that are cut from the main webs. The folding cylinder 21 and its set of grippers 23 are so timed that the grippers 23 will engage the advance edges of each alternate group of assembled sheets from the press so that one group of assembled sheets will be carried around the cylinder 21 at the proper time to meet the next succeeding group of sheets, each succeeding group will be fed with its advance edges free, down between the cylinders 21 and 22 outside of the combined cover and center page insert on the cylinder 22. The two groups of sheets and the combined cover and center page insert sheet are folded together by the operation of the folding mechanism 25, 26, the grippers 23 and 24 having been opened. After the assembled groups of sheets from the press and the combined

cover and center page insert sheet have been folded once, a second fold is imparted thereto and the same transferred to the delivery cylinder 27 by the coöperation of the folding blade 29 and floating folding jaw 28. It is to be understood that the floating folding jaw 26 is opened at the proper time to release the sheets from the cylinder 22. After the sheets have received their second fold, they are delivered between the carrying tapes 30, 31 and from thence carried to any suitable delivery device 33.

What I claim is:

1. Means for cutting and feeding a plurality of groups of sheets from a web fed from a press, to a predetermined point, means for feeding sheets one at a time from a pile of previously cut combined cover and center page insert sheets, into position to be associated with the said plurality of groups and means for submitting the associated sheets to a plurality of folding operations.

2. Folding cylinders, means for feeding a group of sheets thereto, a feeding cylinder arranged to feed combined cover and center page insert sheets one at a time to one of the folding cylinders to be associated with the said group of sheets and means for folding the associated sheets.

3. Folding cylinders, means for feeding a plurality of groups of sheets thereto, a feeding cylinder arranged to feed combined cover and center page insert sheets one at a time to one of the folding cylinders to be associated with the plurality of groups of sheets and means for folding the associated sheets.

4. Folding cylinders, means for feeding a group of sheets thereto, a feeding cylinder arranged to receive sheets one at a time from a pile of previously cut combined cover and center page insert sheets, and transfer them to one of the folding cylinders to be associated with the group of sheets and folded together therewith and means for imparting an irregular movement to the feeding cylinder whereby it will move very slowly at the time of engaging the sheet and at the surface speed of the folding cylinder at the time of transferring it thereto.

5. Folding cylinders, means for feeding a plurality of groups of sheets thereto, a feeding cylinder arranged to receive sheets one at a time from a pile of previously cut combined cover and center page insert sheets, and transfer them to one of the folding cylinders to be associated with the said plurality of groups of sheets and folded together and means for imparting an irregular movement to the feeding cylinder whereby it is moved very slowly at the time of engaging the sheets and at the surface speed of the folding cylinder at the time of transferring the sheet thereto.

6. Three folding cylinders, means for

feeding a group of sheets into engagement
with the first two folding cylinders, means
for feeding a combined cover and center
page insert sheet to one of the first two
5 folding cylinders to be associated thereon
with the said group of sheets, the first two
cylinders being arranged to impart the first
fold to the associated sheets and the second
and third cylinders being arranged to im-
10 part the second fold to the said sheets.
7. Three folding cylinders, means for
feeding a plurality of groups of sheets to
the first two cylinders, means for feeding a
previously cut combined cover and center
15 page insert sheets to one of the said folding

cylinders to be associated thereon with the
plurality of groups of sheets, the first two
folding cylinders being arranged to impart
the first fold to the associated sheets and
the second and third cylinders being ar- 20
ranged to impart the second fold to the
said sheets.

In testimony, that I claim the foregoing
as my invention, I have signed my name in
presence of two witnesses, this first day of 25
October A. D. 1906.

HOWARD M. BARBER.

Witnesses:

A. R. STILLMAN,
G. BURDICK.

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