

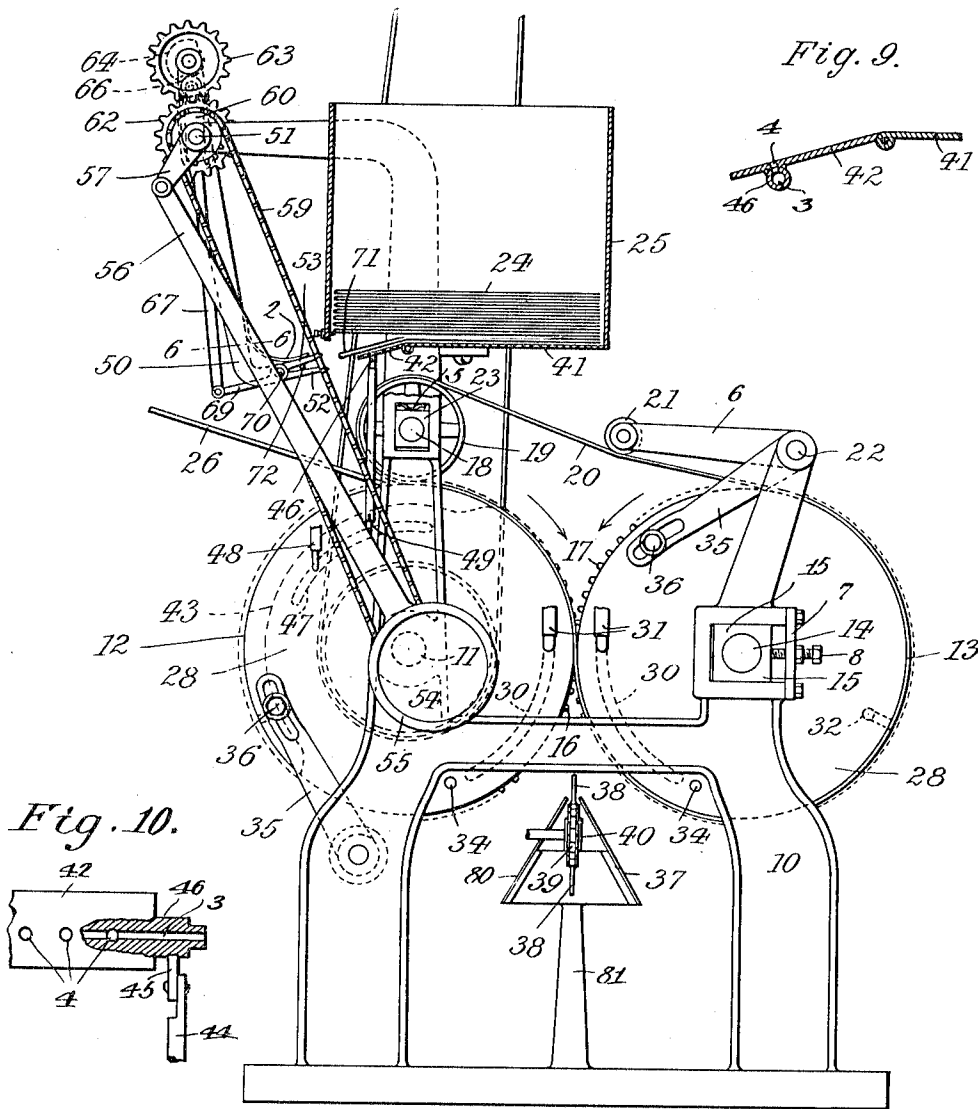
C. GITZENDANNER.
BOOK OR PAMPHLET MAKING MACHINE.
APPLICATION FILED APR. 25, 1910.

1,118,409.

Patented Nov. 24, 1914.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

Katherine Koch.
Stephen Pichler

INVENTOR

Charles Gitzendanner

BY

Briesen & Zump.
ATTORNEYS

C. GITZENDANNER.
BOOK OR PAMPHLET MAKING MACHINE.
APPLICATION FILED APR. 25, 1910.

1,118,409.

Patented Nov. 24, 1914.

3 SHEETS-SHEET 2.

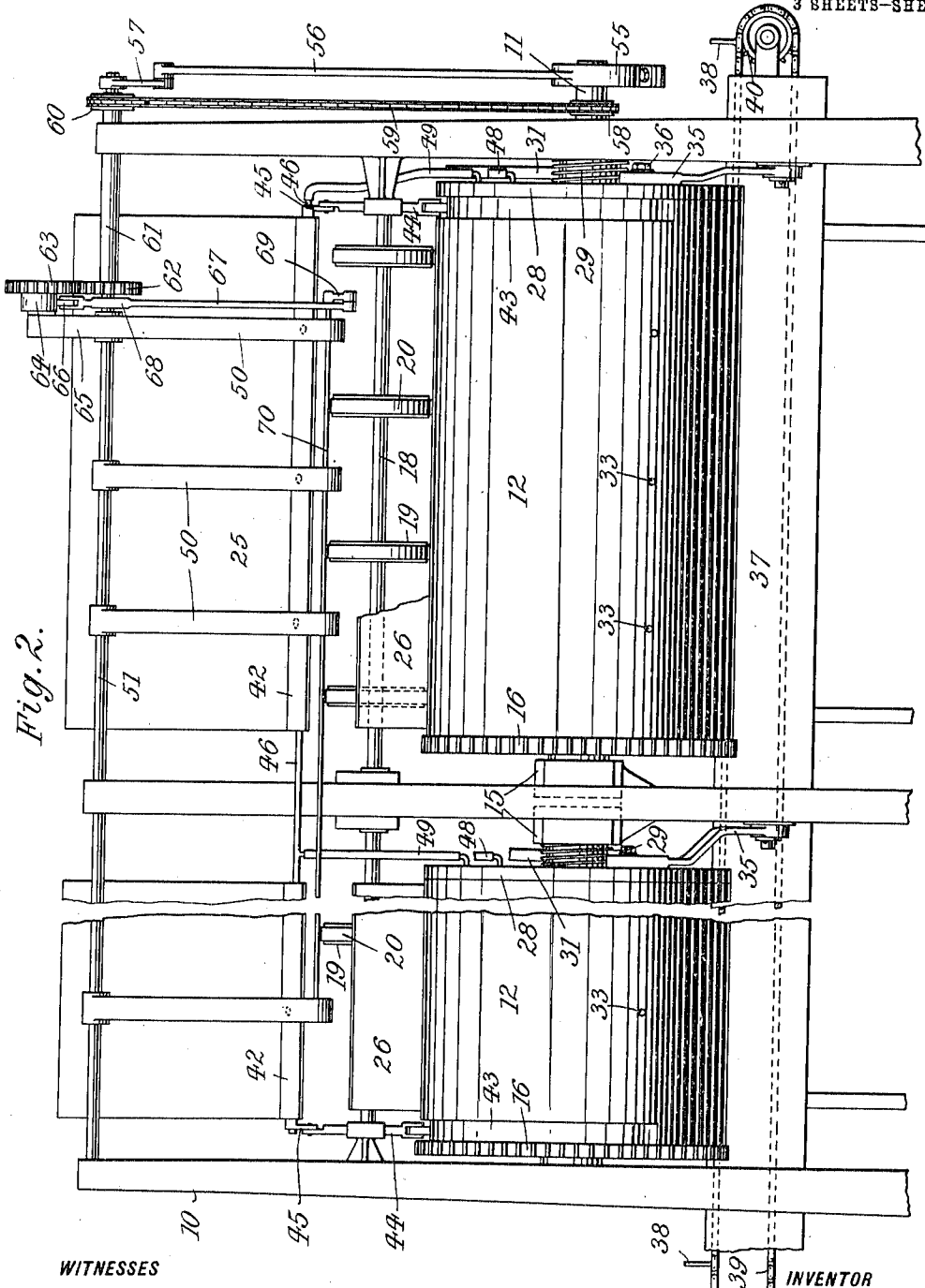


Fig. 2.

WITNESSES

Katherine Koch
Stephen Fischer

BY

Charles Gitzendanner,

Briesen & Zump
ATTORNEYS

C. GITZENDANNER.
BOOK OR PAMPHLET MAKING MACHINE.
APPLICATION FILED APR. 25, 1910.

1,118,409.

Patented Nov. 24, 1914.
3 SHEETS—SHEET 3.

Fig. 3.

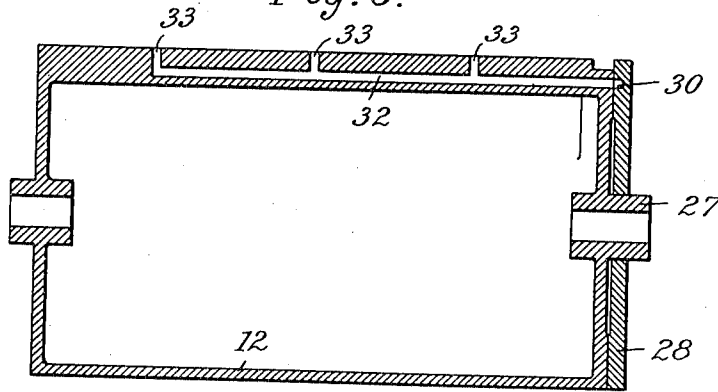


Fig. 4.

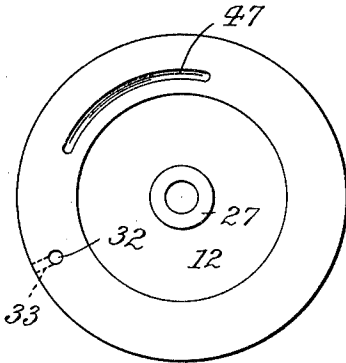


Fig. 5.

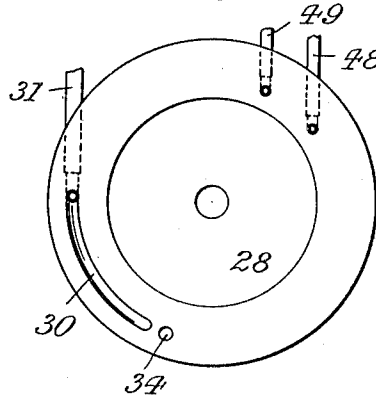


Fig. 6.

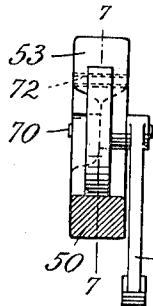


Fig. 7.

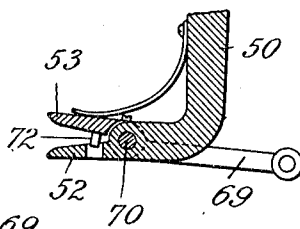
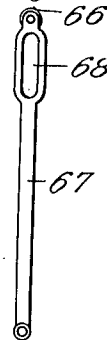


Fig. 8.



WITNESSES

Katherine Koch.
Stephen Pichler

INVENTOR

Charles Gitzendanner,

BY

Priesen & Grunp
ATTORNEYS

UNITED STATES PATENT OFFICE.

CHARLES GITZENDANNER, OF NEW YORK, N. Y., ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO EAST INSETTING AND GATHERING MACHINE COMPANY, A CORPORATION OF DELAWARE.

BOOK OR PAMPHLET MAKING MACHINE.

1,118,409.

Specification of Letters Patent.

Patented Nov. 24, 1914.

Application filed April 25, 1910. Serial No. 557,430.

To all whom it may concern:

Be it known that I, CHARLES GITZENDANNER, a citizen of the United States, residing at New York city, Brooklyn, county of Kings, and State of New York, have invented new and useful Improvements in Book or Pamphlet Making Machines, of which the following is a specification.

The invention relates to machines for making books or pamphlets, and more especially to machines for building up a book or pamphlet by assembling a plurality of folded sheets or signatures by inseting one within the other.

Objects of the invention are to provide a novel mechanism for opening a plurality of folded signatures and inseting one within another to constitute a book or pamphlet; to provide a mechanism for so inseting the signatures while keeping all the signatures open; to provide for forwarding the associated inset and open signatures along a path to be operated upon by a subsequent mechanism while in such open position; to provide signature-opening means wherein the opening action is obtained by the relative movement of rotary members; to provide a mechanism for opening the signatures and forwarding them with the open edge foremost to the next mechanism whereby said mechanism may engage the signature within; to provide for opening signatures and delivering them open downwardly, and for placing or dropping subsequent open signatures thereon; to provide for progressing the signatures between said successive droppings or placings of additional signatures. These and other objects of invention will in part be obvious and will in part more fully appear herein.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and forming a part hereof, illustrate one embodiment of the invention, the same serving in connection with the description herein to explain the principles of the invention.

Of the drawings: Figure 1 is an end elevation of a machine embodying the principles of the invention (the signature holder being shown in section); Fig. 2 is a side

elevation looking at Fig. 1 from the left; Fig. 3 is a longitudinal section through one of the opening cylinders; Fig. 4 is an end elevation of one of said cylinders; Fig. 5 is an elevation of the suction controlling head shown in section at the right hand end of Fig. 3; Fig. 6 is a section, on an enlarged scale, on the line 6—6 of Fig. 1, looking downwardly; Fig. 7 is a central section on the line 7—7 of Fig. 6; Fig. 8 is a detail of the gripper actuating rod; Fig. 9 is a central section on an enlarged scale, through the suction gate at the bottom of the magazine holder; and Fig. 10 is a fragmentary detail of the connections between the gate 42 and its actuating rod 44.

Referring to the accompanying drawings, illustrating by way of example one embodiment of the invention, the form of signature-opening means comprises opposed rotary members between which the signature passes, said members taking hold of the sides of the signature, their subsequent movement relatively to each other serving to open the signature and, upon their releasing the signature, to deliver it in the open position. The embodied form of such means comprises a cylinder 12, shown horizontally arranged and carried by a shaft 11 journaled in the frame 10 of the machine. Opposed to the cylinder 12 is a cylinder 13, likewise horizontally arranged and carried on a shaft 14 journaled in boxes 15 slidably mounted in the frame 10. Suitable means are provided for adjusting the box 15 to govern the position of the cylinders 12 and 13 relatively to each other, in order to work to the best advantage with signatures of different pagings and thicknesses. For this purpose adjusting screws 8 are threaded into the web 7 on the frame and connect with the box 15. The cylinders 12 and 13 rotate together and for this purpose a gear 16 on the cylinder 12 intermeshes with the gear 17 on the cylinder 13, the drums traveling in the direction of the arrows in Fig. 1.

The embodied form of means for holding one side of a signature to one of the cylinders 12 and 13 and the other side thereof to the other cylinder as the signature is fed thereto operates pneumatically, although this is immaterial so far as concerns certain features of the invention. The form of such means herein shown comprises a series of

suction-orifices 33 arranged in a longitudinal series in the surface of each of the cylinders 12 and 13. Said orifices connect with a duct 32 leading to one of the heads of the cylinder (see Figs. 3 and 4). Against this head of the cylinder rests the disk 28, said disk resting on the cylinder hub 27. The cylinder head and disk are shaped to provide a space therebetween as will be understood from Figs. 3, 4 and 5. The surfaces of the cylinder head and disk are machined to fit closely and air tight together; a spring 29 coiled about the cylinder shaft serves to press the head 28 and the cylinder head closely together. In said annular surface of the disk or head 28 is formed a groove 30 concentric with the cylinder and disk. Said groove 30 has at one end an orifice extending through the head 28 and connecting on the outside with a tube 31 leading to a suitable source of suction. Adjacent to the other end of the groove 30 is an orifice 34 passing through the head 28 and communicating with the external atmosphere.

The heads 28 are sleeved upon the hubs 27 of their respective cylinders, but are held against rotation in a suitable manner. In the present instance arms 35 are pivotally mounted upon the machine frame, said arms being provided at their other end with slots. A clamping bolt 36 passes through each of said slots and is threaded into the respective head 28. This serves to hold the head 28 from rotation while permitting adjustment of the groove 30 and orifice 34 with respect to the duct 32 to control the timing and duration of the suction and the timing of the release of the signature. The operation of the said suction devices is substantially as follows: During the rotation of the cylinder the duct 32 comes into register with one end of the groove 30, the suction through the tube 31 then creating a suction through the orifices 33 to draw the signature against the surface of the cylinder. As long as the duct 32 travels along the groove 30 said suction continues. But when the duct 32 registers with the orifice 34, the suction ceases and the signature is released from the surface of the cylinder.

Means for supplying the signatures to the opening devices are provided, and in accordance with certain features of the invention the signatures are supplied with the front edge or the edge opposite the fold foremost. As is well known, a folded and uncut signature, by reason of the folding over of the top or bottom ends opens only at the middle. In other words, at the back it is folded into one, and at the top or bottom edge it is folded into two parts. By the term open edge as used herein, is meant the front edge, that is, the edge opposite the folded back, and at which edge the signature opens into two halves. In the embodied

form of such signature supplying means an inclined table 26 is arranged above the cylinder 12, having its lower edge closely contiguous to said cylinder. Adjacent to said lower edge of said table 26 are a series of rolls 19 fixed to a shaft 18, said shaft 18 being journaled in boxes 23 slidably mounted in the machine frame. Running over the rolls 19 are belts or tapes 20 which run between the rollers 19 and the cylinder 12, pass along the surface of said cylinder and between it and the cylinder 13, then about the cylinder 13 and back to the rollers 19. A series of rollers 21 are carried on arms 6 fixed to the shaft 22, said shaft being acted on by suitable springs (not shown) to press on the tapes or belts 20 to keep them in tension. Springs 5 are arranged to act between the machine frame and the sliding boxes 23 to press the rollers 19 and the tapes 20 against the surface of the cylinder 12. It will thus be seen that the belts 20 travel at the same speed as the surface speed of the cylinders 12 and 13, and that the signatures will be received and carried between the belts and the cylinder 12, but that at the point where the belts pass to the cylinder 13, the signatures will be released therefrom, each half of the signature moving with the cylinder to which it is attached to open the signature.

In the operation of the mechanism described it will be understood that if the signatures be placed upon the table 26 with their front or open edge forward, they will be carried between the cylinder 12 and the tapes 20. As it approaches the contact point of the two cylinders, the suction devices operate to engage or hold the opposite sides of the signature to each of said cylinders, respectively. The parts are so timed that the suction orifices will engage the signature preferably close to said open edge. As the two cylinders continue to rotate, the points where the opposite sides of the signature are engaged will separate from each other, thus opening out the signature. When the suction ceases the signature will be released, and will be delivered open to the next succeeding mechanism. In this embodiment it will be further delivered with the opened edge of the signature foremost. With the horizontally arranged cylinders, the signature will also be delivered downwardly and in position to be dropped open upon a suitable support. Means are provided in accordance with one feature of the invention for receiving and keeping such opened signature open, said means in the present embodiment being located just below and centrally of the two drums to receive the signatures as they are dropped. In the embodied form said means comprise a saddle having two supporting members 37 and 80 extending horizontally and having their upper edges

closely adjacent to each other and their lower edges more widely separated, so as to support a signature or signatures in a partly open position. Said members are mounted upon supports 81 fixed to the machine frame.

The invention in one of its features provides for a plurality of the signature opening devices arranged in a series for inseting the signature opened by each of said devices with the signatures opened by the other devices. The invention, in one aspect thereof, provides further for progressing the open signatures past successive opening devices in order that the signatures opened by each of said devices may be associated and inset with the others. The form of such progressing means shown herein comprises pins or fingers 38 traveling in the slot between the upper edges of the members 37 and 80. Said fingers are carried upon a sprocket chain 39 traveling over a sprocket wheel 40 at one end and over a similar sprocket wheel (not shown) at the other end. Suitable driving means for said chain will also be provided. It will thus be understood that the open signatures are kept open and are progressed along the members 37 and 80. As they pass each of the signature-opening devices, another signature opened by such other opening device is dropped thereon, the signatures then being conveyed away so associated, inset and open, to be operated upon by the next succeeding mechanism.

Suitable means for supplying the signatures automatically to each of the signature opening devices may be provided. The embodied form of such means comprises a signature holder 25 for each of the signature opening devices arranged above and adapted to deposit the signatures upon the corresponding feed board 26 and in operative relation with the tapes 20, and with their front edge forward signature forward. The bottom 41 of said holder 25 has pivoted thereto a gate 42 provided with a series of suction orifices 4 communicating with a duct 3 in suction pipe 46. The gate 42 is actuated by suitable means to rock it against the bottom signature and then draw the signature away with the gate. The embodied form of such actuating means comprises a cam groove 43 in the cylinder 12, in which groove runs a cam roll on the reciprocable rod 44 (see Fig. 2). Said rod 44 is pivoted to a lug 45 on the suction pipe 46. Said duct 3 connects by a tube 49 with an orifice passing through the head 28, which is mounted in cooperation with the head of cylinder 12 as shown in Fig. 3. Adjacent to said orifice is a second orifice connecting with a tube 48, said tube connecting in turn to a suitable source of suction (see Figs. 4 and 5.) In the corresponding annular surface of the cylinder head is a groove 47 which registers in passing with said orifices in the head 28.

It will be understood that when the groove 47 passes the orifices, as the cylinder 12 rotates (the head 28 being stationary) it will establish communication for a brief time between said orifices and produce suction at the orifices 4 of the gate 42. This action will occur on each revolution of the cylinder. The gate 42 is thus swung against the bottom signature of the stack 24, and is then swung away with the signature adherent thereto by reason of the suction of the orifices 4. Said gate is proportioned so that the edge of the signature projects beyond it in position to be gripped by a suitable sheet taking mechanism.

The form of signature taking mechanism herein shown comprises a fixed jaw 52 carried upon an arm 50 fixed to a shaft 51 journaled in the machine frame. Fixed to the end of the shaft 51 is a crank arm 57 to which is pivoted a link 56. The other end of the link 56 terminates in a strap 55 of an eccentric 54 on the shaft 11. Pivoted to the fixed jaw 52 at 70 is shown a movable jaw 53, to which is fixed a backwardly extending arm 69. Pivoted to the end of the arm 69 is a link 67 having a slot 68 which embraces the shaft 51. A cam roller 66 is carried in the other end of the rod 67. The arm 50 extends upwardly past the shaft 51 and carries in its end a stub shaft, upon which shaft is fixed a cam 64 and a gear 63. A gear 62 meshes with said gear 63. Said gear 62 is fixed to a sleeve 61 loosely mounted on the shaft 51. Fixed to the sleeve 61 is a sprocket wheel 60 over which runs a sprocket chain 59, which also runs over a sprocket wheel 58, said sprocket wheel 58 being fixed on the shaft 11. A suitable spring 2 serves to press the jaws together and also to keep the roller 66 to its cam 64. For the purpose of registering the signatures exactly, a stop 72 is shown mounted in the movable jaw 53 and working in an aperture in the jaw 52. The manner of operation of these signature-taking devices is substantially as follows: The eccentric 54, through the link 56 and arm 57, rocks the arms 50 to and fro. At the same time the sprocket train 58, 59 and 60, through the gears 62 and 63 rotates the cam 64 to open and close the gripper jaws 52 and 53 at the proper time. As the jaws swing up to the downwardly bent signature as shown in Fig. 1, the jaws close upon the signature 71, the stops 72 registering same. They then swing backwardly withdrawing the signature from the holder 25, dropping it upon the table 26 and at the same time releasing it. The signature is then fed forward as already described.

The invention, in its broader aspects, is not limited to the particular constructions shown, nor to any particular constructions by which it has been or may be carried into effect, as many changes may be made in the

construction without departing from the main principles of the invention and without sacrificing its chief advantages.

I claim:

5 1. A signature gatherer or inseting machine for assembling folded signatures, including in combination signature-holding means, a pair of opposed signature-opening devices, and a swinging gripper adapted to
10 grip a signature in said signature-holding means and to withdraw it as the gripper travels in one direction and to push said withdrawn and gripped signature to the signature-opening devices while said gripper is
15 traveling in a direction opposite to that in which it was withdrawn from the signature-holding means.

2. A signature gatherer or inseting machine for assembling folded signatures, including in combination a signature-holding device, opposed rotary cylinders between which a signature passes to be opened, means upon said cylinders for holding the sides of the signatures thereto and releasing
25 them therefrom, and a swinging gripper adapted to grip a signature in said signature-holder and withdraw it therefrom while swinging in one direction and to push the withdrawn and gripped signature into operative relation with one of said cylinders
30 while swinging in a direction opposite that in which the signature was withdrawn from the signature-holding device.

3. A signature gatherer or inseting machine for assembling folded signatures, including in combination a signature-holding device, two opposed rotating cylinders between which a signature passes to be opened, means upon said cylinders for holding the sides of the signature thereto and releasing
40 them therefrom, means for pressing the signature against one of said cylinders, and a swinging gripper adapted to grip the signature in said signature holder and withdraw
45 it therefrom while swinging in one direction and for pushing the withdrawn and gripped signature between said cylinder and said pressing means while swinging in a direction opposite to that in which the signature
50 was withdrawn from the signature-holding device.

4. A signature gatherer or inseting machine for assembling folded signatures, including in combination two traveling signature-opening members between which a folded signature is presented to be opened, means for holding the sides of the signature against said members as they travel and for releasing the opened signature from said surfaces,
60 said holding and releasing means upon said respective traveling members moving apart from each other during the travel of the members, a signature holder, a swinging gripper adapted to grip a signature in said
65 holder and withdraw it therefrom while

traveling in one direction and for then advancing it while so gripped to said traveling members with the ungripped edge foremost while traveling in a direction opposite to that in which the signature was withdrawn 70 from the signature holder.

5. In an inseting machine for assembling folded signatures, the combination of means for opening the signatures comprising a pair of oppositely disposed oppositely rotating 75 cylinders each provided on its periphery with a plurality of longitudinally arranged suction orifices and also provided with a duct communicating with said orifices, a stationary head bearing against one end of 80 each cylinder and provided with a groove communicating with a source of suction, which groove periodically registers with said duct, means feeding signatures to said cylinders open edge foremost, and a support 85 on which the opened signatures are deposited and held open.

6. In an inseting machine for assembling folded signatures, the combination of means for opening the signatures comprising a pair of oppositely disposed oppositely rotating cylinders each provided on its periphery with a plurality of longitudinally arranged suction orifices and also provided with a duct communicating with said orifices, a stationary head bearing against one end of each cylinder and provided with a groove communicating with a source of suction which groove periodically registers with said duct, said head being also provided adjacent said groove with an orifice that vents to the atmosphere and that is also adapted to register with said duct, means feeding signatures to said cylinders open edge foremost, and a support on which the opened 105 signatures are deposited and held open.

7. A signature gatherer or inseting machine for assembling folded signatures, including in combination signature-holding means, a signature-opening device, a gripper adapted to swing in one direction to grip a signature in said signature-holding means and to withdraw it as the gripper travels in a direction opposite to that in which said gripper moved to grip the signature, and an inclined support leading to the signature-opening device on which rest the signatures withdrawn from the signature-holding means by the swinging gripper as said signatures move to said device. 120

8. A signature gatherer or inseting machine for assembling folded signatures, including in combination a signature-holding device, opposed rotary cylinders between which a signature passes to be opened, means upon said cylinders for holding the sides of the signature thereto and releasing it therefrom, a gripper adapted to swing in one direction to grip a signature in said signature-holder and withdraw it therefrom while 130

swinging in a direction opposite to that in which said gripper swung to grip the signature, and an inclined support leading to the signature-opening device on which rest the signatures withdrawn from the signature-holding means by the swinging gripper as said signatures move to said cylinders.

9. A signature gatherer or inseting machine for assembling folded signatures, including in combination a signature-holding device, two opposed rotating cylinders between which a signature passes to be opened, means upon said cylinders for holding the sides of the signature thereto and releasing it therefrom, means for pressing the signature against one of said cylinders, a gripper adapted to swing in one direction to grip the signature in said signature-holder and withdraw it therefrom while swinging in a direction opposite to that in which said gripper moved to grip the signature, and an inclined support on which the signature is deposited by said swinging gripper, said support being in coöperative relation with said pressing means and one of said rotating cylinders.

10. A signature gatherer or insetting machine for assembling folded signatures, including in combination two traveling signature-opening members between which a folded signature is presented to be opened, means for holding the sides of the signature against said members as they travel and for releasing the open signature from said surfaces, said holding and releasing means upon said respective traveling members moving apart from each other during the travel of the members, a signature-holder, a gripper adapted to swing in one direction to grip a signature in said holder and withdraw it therefrom while said gripper travels in a direction opposite to that in which it moved to grip the signature, and an inclined support leading to said signature-opening members on which the signature is deposited by said swinging gripper.

Signed by me at New York city, N. Y.,
this 23rd day of April, 1910.

CHARLES GITZENDANNER.

Witnesses:

FRANK V. BRIESEN,
ARTHUR E. ZUMPE.