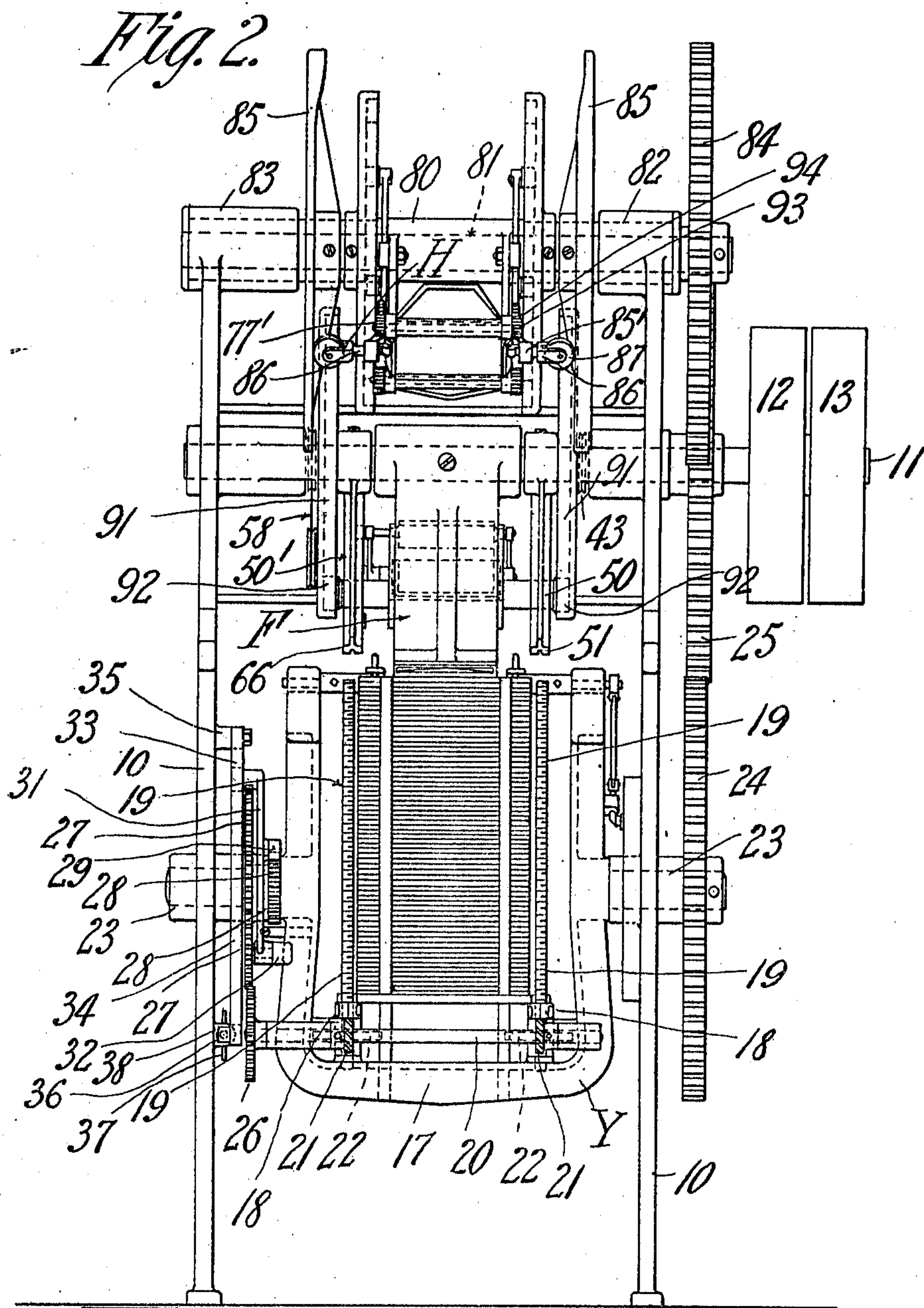


S. A. GRANT.
ENVELOP MACHINE.
APPLICATION FILED JULY 7, 1908.

945,386.

Patented Jan. 4, 1910.

6 SHEETS—SHEET 2.



WITNESSES:

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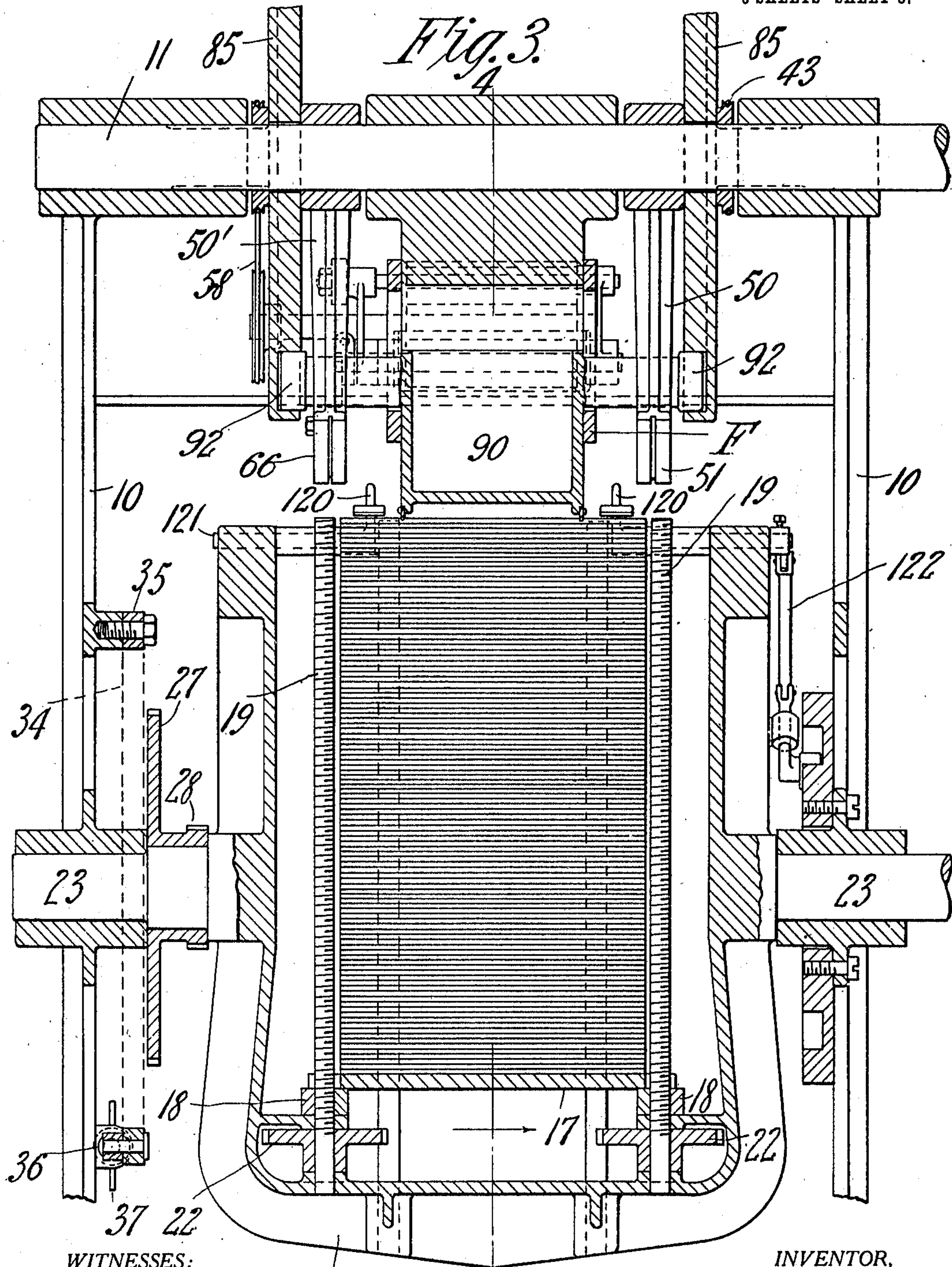
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6 SHEETS—SHEET 3.



WITNESSES:

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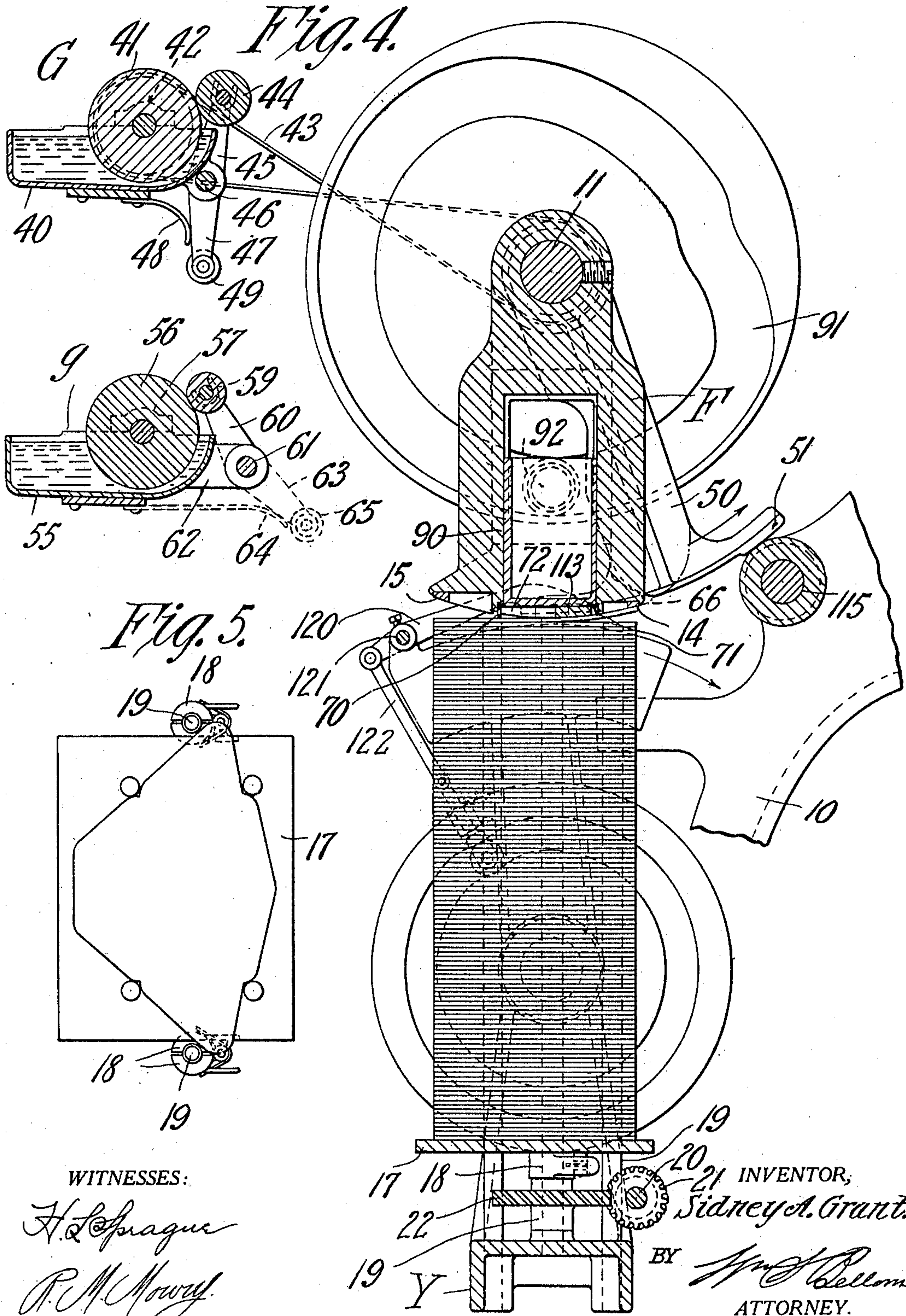
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6 SHEETS—SHEET 4.



WITNESSES:

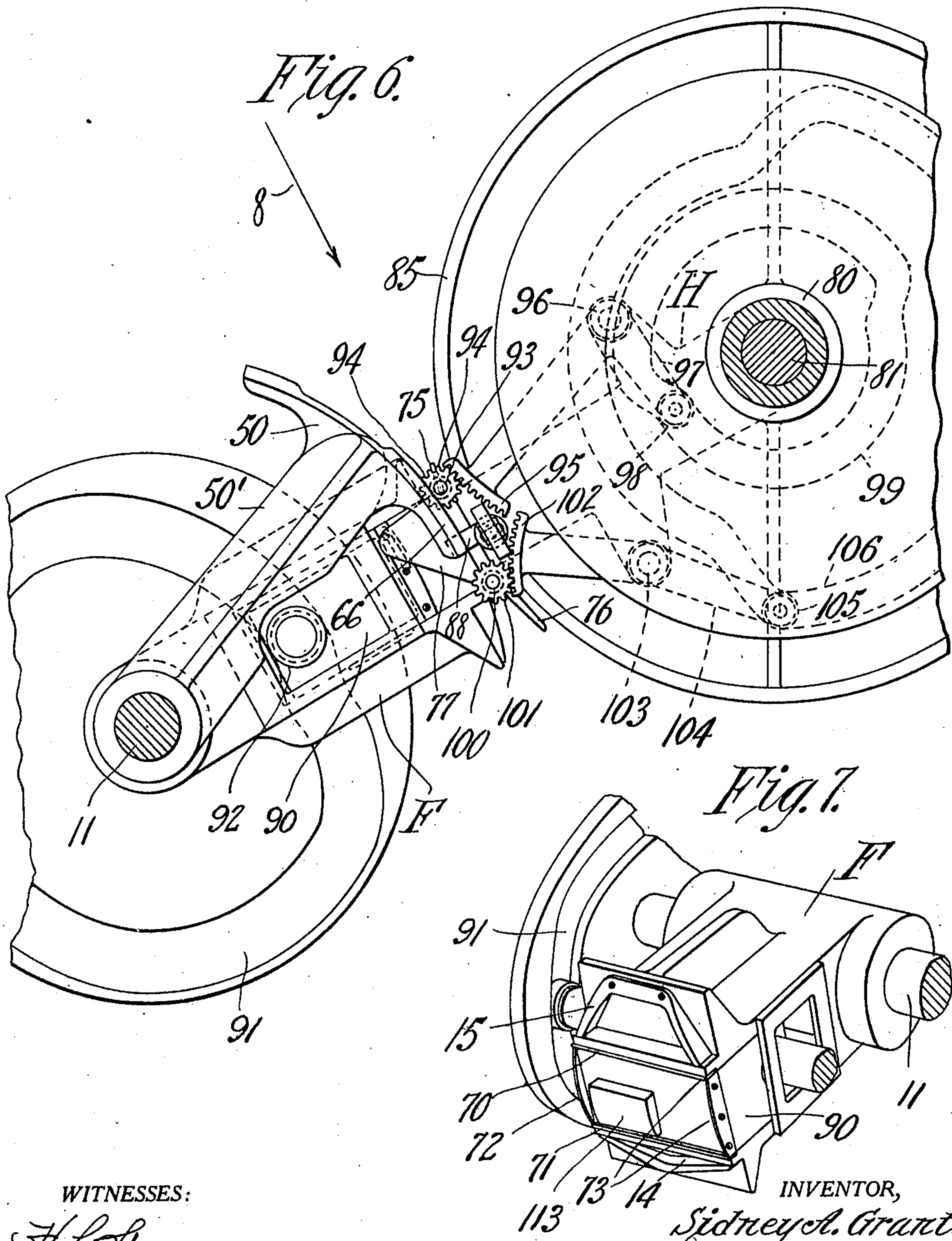
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ENVELOP MACHINE.
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945,386.

Patented Jan. 4, 1910.
6 SHEETS—SHEET 5.



WITNESSES:

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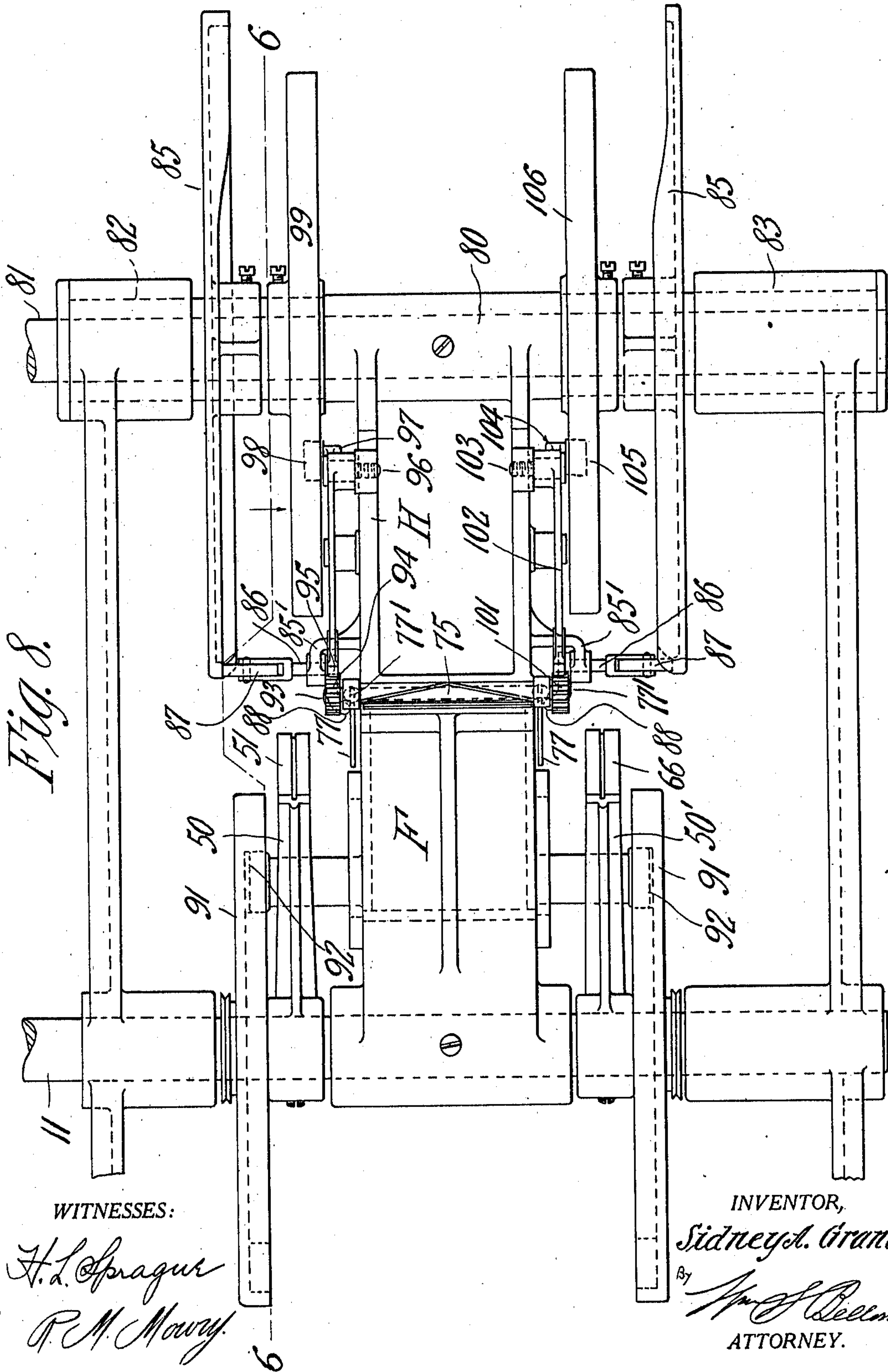
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S. A. GRANT.
 ENVELOP MACHINE.
 APPLICATION FILED JULY 7, 1908.

945,386.

Patented Jan. 4, 1910.

6 SHEETS—SHEET 6.



UNITED STATES PATENT OFFICE.

SIDNEY A. GRANT, OF THOMPSONVILLE, CONNECTICUT.

ENVELOP-MACHINE.

945,386.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed July 7, 1908. Serial No. 442,383.

To all whom it may concern:

Be it known that I, SIDNEY A. GRANT, a citizen of the United States of America, and resident of Thompsonville, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Envelop-Machines, of which the following is a full, clear, and exact description.

This invention relates to envelop-machines, and more especially to that class thereof in which the pile of cut blanks is held on a rotary table coöperative with the gumming and printing devices, so as to bring those elements into rolling contact with the blanks.

My invention has for one of its objects the provision of improved gumming means, which comprise two different adhesive-supplying devices, one adhesive being of a lower grade than the other and employed for gumming all portions of the envelop excepting the seal-flap, which latter obtains a film of higher grade adhesive.

My invention has, furthermore, for its object the provision of automatic means for bringing these adhesive-supplying devices successively into coaction with the gum-depositing devices, preparatory to their engagement with the successive blanks on the table.

Further objects of my invention will be found in the improved means for printing or embossing the several successive blanks before they leave the picker or transfer mechanism, whereby the finished envelops are placed into the drying apparatus.

Further objects of the invention reside in the improved organization and construction of some of the elements of the machine as will be hereinafter described.

In the drawings, in which similar characters denote similar parts:—Figure 1 is a side view of an envelop machine embodying my invention; Fig. 2 is a front view thereof; Fig. 3 is a section on line 3—3, Fig. 1, on an enlarged scale; Fig. 4 is a section on line 4—4, Fig. 3; Fig. 5 is a top view of the blank table and a pile of blanks thereon; Fig. 6 is a detail view of the stripper mechanism; Fig. 7 is a perspective view of the die for gumming, creasing and printing successive blanks; Fig. 8 is a top view of the stripper mechanism shown in Fig. 6 and looking in the direction of arrow 8 in said figure.

Referring to the drawings, 10 denotes the frame supporting in suitable bearings the

main shaft 11 which is provided with tight and loose pulleys 12 and 13 respectively and have secured thereto the device whereby the envelop blanks are gummed, this mechanism consisting substantially of a hollow frame indicated in a general way by F. The free or outer end of this frame is provided with suitable gum or adhesive depositing devices (see Fig. 7) one of which, 14, serves to supply gum to the seal flap of the envelop while the other die or form 15 places a film of glue on the back flap thereof, it being understood that both of these devices may be removed from the frame F and others substituted therefor according to the size of the flaps to be gummed.

The frame F constitutes a member which revolves with and around the axis of the shaft 11 and rolls the adhesive onto the successive blanks in a manner shown in Fig. 4 in which the blanks are illustrated as being held on a table 17 provided at its under side with clips 18 which are screw threaded to correspond with a pair of feed screws 19, the rotation of which gradually moves the table 17 upward and in a manner as controlled by a special feed mechanism provided therefor. This feed mechanism is clearly shown in Figs. 1 and 2 and comprises a shaft 20 provided with a pair of spiral pinions 21 in engagement with similar gears 22 secured to the feed screws 19 above mentioned and which are journaled with their lower ends in a yoke Y having trunnions 23 which are journaled in suitable bearings in the side frames 10.

The yoke Y is revolved around the axes of the trunnions 23 by virtue of a gear 24 mounted upon one of said trunnions and in engagement is a similar gear 25 secured upon the main shaft 11.

The particular manner in which the table 17 is raised by the screws 19 on account of their rotation as caused by the shaft 20 results from a gear 26 mounted on one end of the shaft 20 which is in engagement with a gear 27 loosely mounted upon one of the trunnions of the yoke 23 but which carries a ratchet 28 adapted to be rotated intermittently by a pawl 29 (see Fig. 1), this pawl being pivoted at 30 to a lever 31 having its fulcrum at 32 on the yoke Y above mentioned, so that in this manner the lever 31 in its entirety is revolved around with the yoke Y around the trunnions 23. The other end of the lever 31 carries a roller 33 adapt-

ed to engage an adjustable cam 34 shaped in arcuate form and pivoted at 35 to the frame 10, and it may be held in its adjusted position by a rod 36 having a thumb nut 37 in engagement with the lug 38 on the frame while the other end of said rod is connected with the cam 34 so as to bring the inner working face thereof into position nearer to or farther away from the center of the trunnion.

From the foregoing it will be readily understood that the nearer the working face of the cam 34 will be to the center of the trunnion, the more will be the movement imparted to the lever 31 and vice versa.

As above stated my present invention comprises a pair of mechanisms for supplying adhesives of different kinds to the envelop blanks, and in order to distinguish between them reference will hereinafter be made to a gluing device and a gumming device, the former of which serves to deposit glue on such portions of the envelop blank as are permanently united, while the latter is applied only to the seal flap, and, therefore, consists of a gum of a higher and more expensive grade than the other. In Fig. 4 both of these adhesive supplying mechanisms have been clearly shown. Of these the gumming device is indicated by G and comprises a gum fountain 40 containing a roller 41 mounted in bearings 42 of the fountain and adapted to be positively driven from the shaft 11 as, for instance, by a belt 43. Normally in running contact with the roller 41 is a gum transfer roll 44 journaled in arms 45 which are secured to a shaft 46 mounted for rocking movements in suitable bearings provided therefor on the fountain 40. The shaft 46 carries an arm 47 which is normally thrust outward by a spring 48 so as to bring the roller 44 into contact with the roll 41 and which carries a roll 49 adapted to be operated by an actuator so as to bring the gum roll 44 into contact with the gum die 14 above referred to during a certain period of the latter's revolution around the main shaft 11. The actuator for performing this function consists substantially of an arm 50 having a laterally projecting lip 51 adapted to engage the actuator 49 so as to bring the gum roller 44 into rolling contact with the gum die 14, it being understood that the projection 41 is sufficiently far in advance of said gum die as to properly perform this function.

Similar to the gum supplying device G is the glue supplying mechanism indicated herein by g and comprising a fountain 55 having a glue roller 56 which is journaled in bearings 57 on said fountain, and which may also be driven in a positive manner, as for instance by a belt 58 (see Fig. 2) from the main shaft 11. Normally resting against the glue roller 56 is a distributing roller 59 jour-

naled in arms 60 which are secured to a shaft 61 mounted for rocking movement on ears 62 of the glue fountain 55, the said shaft also carrying an arm 63 which is acted upon by a spring 64 to throw the roller 59 into contact with the glue roller 56. This arm 63 also has a cam roller 65 adapted to be engaged by a laterally projecting lip 66 carried on an actuator 50 for actuating the glue roller 59 at the proper time and into contact with the glue die 15 above referred to.

From the organization of the different elements shown in Fig. 4, it will be understood that the frame F coming into a rolling contact with a pile of blanks on the table 17 will result in bringing the gum die 14 into contact with the top blank, which latter will thus adhere to said die during the continuation of the revolving movement of the frame F and subsequently will bring the film of glue on the die 15 into contact with the back flap of the envelop blank. The top blank is now ready to be folded, which is attained by creasing blades clearly shown in Fig. 7, and comprising side creasers 70, 71, and end creasers 72, 73, respectively, which form indentations into the blank preparatory to the blanks being acted upon by the flap folding devices.

The flap folding devices comprise a folding blade 75 for the seal flap (see Fig. 6) a back flap folder 76 and a pair of side folders 77.

By referring to Figs. 6 and 8, it will be seen that the flap folding devices are carried on a frame indicated in a general way by H, the hub 80 of which is secured to a shaft 81, which is journaled in bearing sleeves 82, 83, of the frame 10, and which shaft is rotated by a gear 84 (see Fig. 2) in engagement with the gear 25 above mentioned.

Secured to the bearing sleeves 82 and 83 are a pair of stationary cams 85, the inward edges of which are adapted to actuate the end folders 77 above referred to and which are pivoted at 77' on the frame H. The latter has brackets 85' provided with preferably squared apertures to receive in sliding contact therewith studs 86, the outer ends of which carry rollers 87 for engagement with the cams 85 above referred to, while their inner ends carry bunters 88 adapted to engage the blades 77 respectively so that as the frame H is revolved around with the shaft 81 the bunters 88 will be caused to move toward the center of the blank and thus actuate the side folders 77; and in order to permit this movement the creaser blades 72 and 73 are mounted for movement inwardly and are therefore secured upon the plunger 90 which may be automatically retracted and again projected by a stationary cam 91 engaging a roller 92 on the plunger 90.

The folders for manipulating the back flap and also the seal flap of the several envelop

blanks consist, as above described, of blades 75 and 76 respectively. Of these the seal flap folder 75 is mounted upon a spindle 93 journaled in the frame H and having a pinion 94 in engagement with a sector 95 which is fulcrumed at 96 on the frame H and has an arm 97 provided with a roller 98 which is timely actuated by a stationary cam 99 to impart an oscillatory movement to the seal flap folder 75. In a similar manner the back flap folder 76 is mounted upon a spindle 100 journaled in the frame H and having a pinion 101 in engagement with a sector 102 which is fulcrumed at 103 on the frame H, and the other arm 104 of which carries a roller 105 operated upon by a cam 106 which is also stationary and serves to oscillate the spindle 101 with the back flap folder 76 in proper time, the oscillatory movement of the spindles 94 and 100 being, however, different in the amount of throw inasmuch as the back flap folder blade 76 has an angular movement of nearly 180 degrees in order to press the back flap firmly against the side flaps to form the envelop body, while the seal flap folder only bends the seal flap without causing the gummed face thereof to touch the body of the envelop.

Each blank after it has received its adhesive will be carried around by the frame F until it arrives at a position substantially as shown in Fig. 6, at which point the folders become operative and therefore release the blank, now folded, from said frame F and now carry it over to the drying mechanism which may be of any suitable construction, and is herein shown as a general drier indicated in a general way by B.

In order to save an extra manipulation of the envelops when it is desired to print a business card or other character thereon, the present machine comprises as one of its features a printing or embossing mechanism which consists in its preferred form of a printing die 110 secured to a shaft 111, which is journaled in the frames 10 of the machine and the circumferential speed of which is equal to that of the carrier frame F, this result being accomplished by a suitable pinion 112 in engagement with the gear 25 on the main shaft 11 above referred to.

The printing or embossing die 110 may receive a coating of ink from a fountain I and a series of ink distributing rollers which may be of any desired number and construction. And in order to support each blank so as to receive its impression from the printing die 110, I prefer to provide an impression plate 113 (see Fig. 4) secured to the plunger 90 and movable therewith to permit the operation of the folding devices as previously mentioned.

Interposed between the point where the gumming frame F engages the pile of blanks on the table and the printing mechanism

just described, is a roller 115 whereby each blank as it is carried around by the frame F will be pressed against the same so as to insure a full surfacing contact of the blank with the gum dies carried by the frame F, it being furthermore understood that the pile of blanks on the table 17 may be held thereon in any suitable manner consistent with the construction of the machine in general, and as is, for instance, shown in Fig. 4, in which fingers 120 are mounted upon a shaft 121 carried by the yoke Y and forced against the pile of blanks by a cam actuated rod 122 in a manner similar to that shown in a patent issued to me on July 31, 1888, No. 387,065, and to which reference may be had.

The operation of my improved machine is as follows: A pile of blanks being placed on the table 17 and power applied to the motion shaft 11, the frame F will be carried around so as to bring the cam die 14 to a point opposite the mechanism G or more particularly speaking opposite the gum roller 44 thereof at which time the lip 51 will have engaged a roller 49 to bring the gum roller 44 into contact with the die 14 for a length of time sufficient to deposit a film of gum on the entire surface thereof. The frame F during its continued revolution with the shaft 11 will bring the glue die 15 opposite the glue roller 59 at which time the extension 66 of the arm 51 will have engaged the roller 65 and thus bring the glue roller 59 into contact with the glue die 15. Both dies are now coated with an adhesive which is then deposited on the uppermost blank on the table 17 by virtue of a rolling contact established between the frame F and the revolution of the yoke Y. It will now be understood that the uppermost blank will adhere to the dies carried by the frame F past the pressing roller 115 and into engagement with the printing die 110 whereby an impression is made upon the outside face of the envelop blank which is then carried over by the frame F into contact with the folding devices carried by the frame H whereby it is stripped from the carrier frame F. Each folded envelop is then advanced by the frame H to a point near the drier where the folding devices will automatically release each envelop and the latter will gravitate into a pocket of the drying mechanism.

It should be noted that many changes in the particular organization and construction of the elements may be made without departing from the gist of the present invention or sacrificing any of the advantages thereof.

I claim:—

1. The combination with a revoluble gumming mechanism and a yoke mounted for rotation relatively to said gumming mechanism, of a blank supporting table, a pair of screws carried by said yoke and engaging

said table, a means for rotating said screws during each revolution of the yoke, and means for varying the amount of such rotation.

5 2. The combination with a revoluble gumming mechanism and a yoke mounted for rotation relatively to and with said gumming mechanism, of a blank supporting table, a pair of screws carried by said yoke
10 and engaging said table, and a cam for controlling the amount of rotation of said screws.

3. The combination with a gumming mechanism and a yoke mounted for rotation
15 therewith, of a blank supporting table, a pair of screws carried by said yoke and engaging said table, a cam for controlling the rotation of said screws during each revolution of the yoke, and means for shifting said
20 cam and for varying the rotative movement of said screws.

4. The combination with a revoluble gumming mechanism and a yoke mounted for rotation therewith, of a blank supporting
25 table, a pair of screws carried by said yoke and engaging said table, a stationary cam for controlling the rotation of the screws, and means for variably positioning said cam to vary the rotative movement of the
30 screws.

5. The combination with a revoluble gumming mechanism and a yoke mounted for rotation therewith, of a blank supporting
35 table, a pair of screws carried by said yoke and engaging said table, gearing for operating the screws, a lever for actuating the gearing, and a cam for operating said gearing.

6. The combination with a revoluble gumming mechanism and a yoke mounted for rotation therewith, of a blank supporting
40 table, a pair of screws carried by said yoke and engaging said table, a lever pivoted on the yoke and for controlling the movement of said screws, and a cam for actuating said
45 lever.

7. The combination with a revoluble gumming mechanism and a yoke mounted for rotation therewith, of a blank supporting
50 table, a pair of screws carried by said yoke and engaging said table, a lever pivoted on the yoke and for controlling the movement of said screws, a cam for actuating said lever, and means for variably positioning
55 said cam to vary the amount of movement of the lever.

8. The combination with a revoluble gumming mechanism and a yoke mounted for

rotation therewith, of a blank supporting table, a pair of screws carried by said yoke
60 and engaging said table, a lever pivoted on the yoke and for controlling the movement of said screws, a cam for actuating said lever, and a rod connected with said cam for adjusting the same for different throws
65 of the lever.

9. The combination with a revoluble gumming mechanism and a yoke mounted for rotation therewith, of a blank supporting
70 table, a pair of screws carried by said yoke and engaging said table, gearing for operating both of said screws simultaneously and comprising a shaft mounted in said yoke, a ratchet controlling said shaft, a lever mounted on said yoke and having a pawl in en-
75 gagement with said ratchet and a stationary cam for actuating said lever.

10. The combination with a revoluble gumming mechanism and a yoke mounted for rotation therewith, of a blank support-
80 ing table, a pair of screws carried by said yoke and engaging said table, gearing for operating both of said screws simultaneously and comprising a shaft mounted in said yoke, a ratchet controlling said shaft, a lever
85 mounted on said yoke and having a pawl in engagement with said ratchet and a stationary cam for actuating said lever, and means for varying the throw of the cam.

11. The combination with a carrier, a pair
90 of adhesive supplying dies carried thereby, a blank supporting table and means for simultaneously rotating both said carrier and table, a glue supply and a gum supply, a pair of arms movable with the carrier and
95 for actuating said adhesive supplying mechanisms and for operating said supply mechanism respectively to deposit films of adhesive on said dies.

12. The combination with a revoluble car-
100 rier and means for gumming a blank thereon, of a revoluble folding mechanism co-operative with the carrier and comprising a revoluble frame, folding blades mounted on said frame, a pair of sectors pivoted on said
105 frame and for actuating the seal and back flap folders of the blank, independent cams for actuating said sectors, and means for actuating the side flap folders for the blank.

Signed by me at Springfield, Mass., in
110 presence of two subscribing witnesses.

SIDNEY A. GRANT.

Witnesses:

WM. S. BELLOWES,
G. R. DRISCOLL.