

T. B. KENDALL.

MACHINE FOR GUMMING AND FOLDING ENVELOPS.

(Application filed Sept. 16, 1901.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.

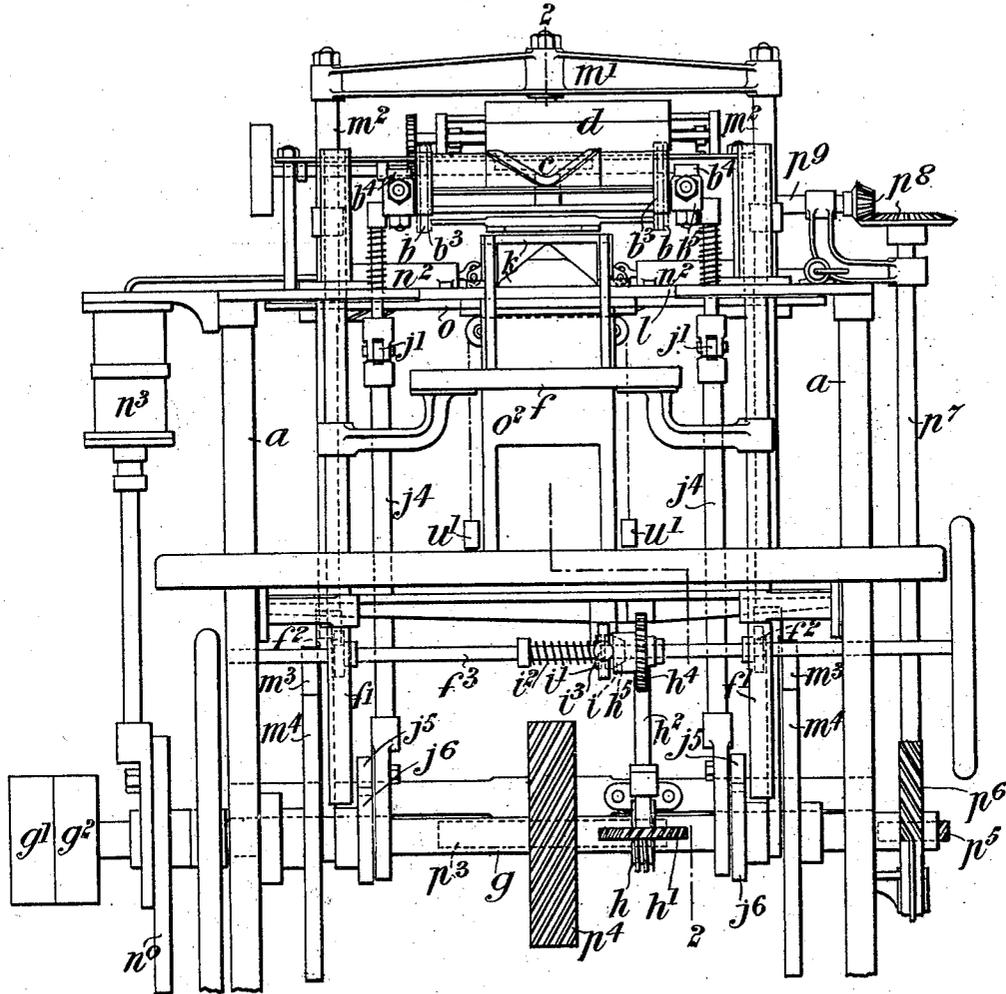
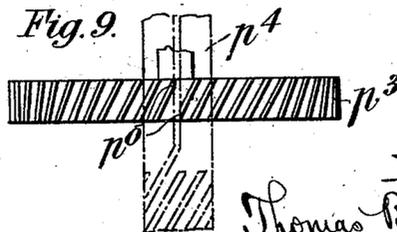


Fig. 9.



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 J. K. Moore
 F. H. Hubbard

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 Thomas B. Kendall
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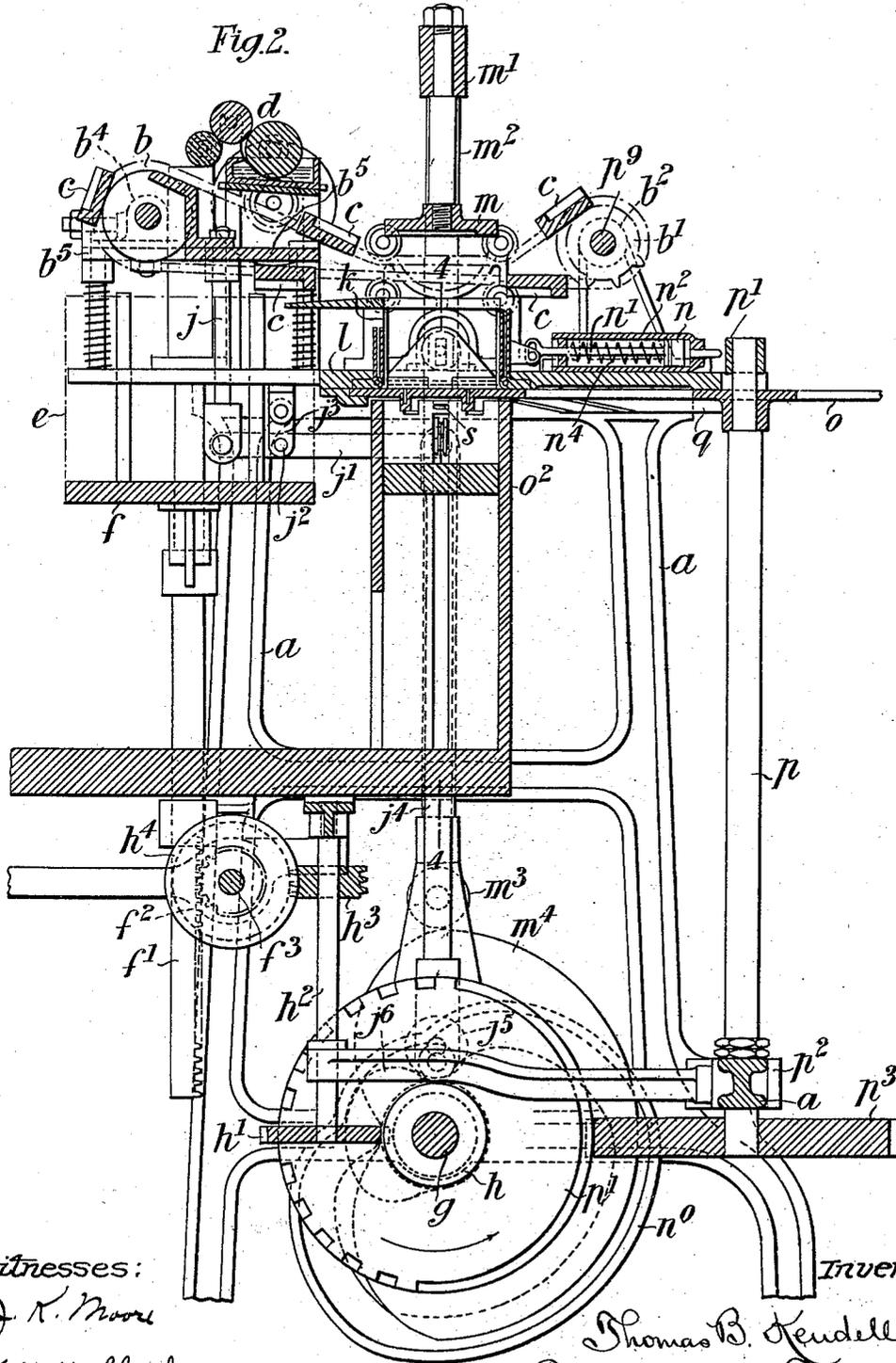
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4 Sheets—Sheet 2.

Fig. 2.



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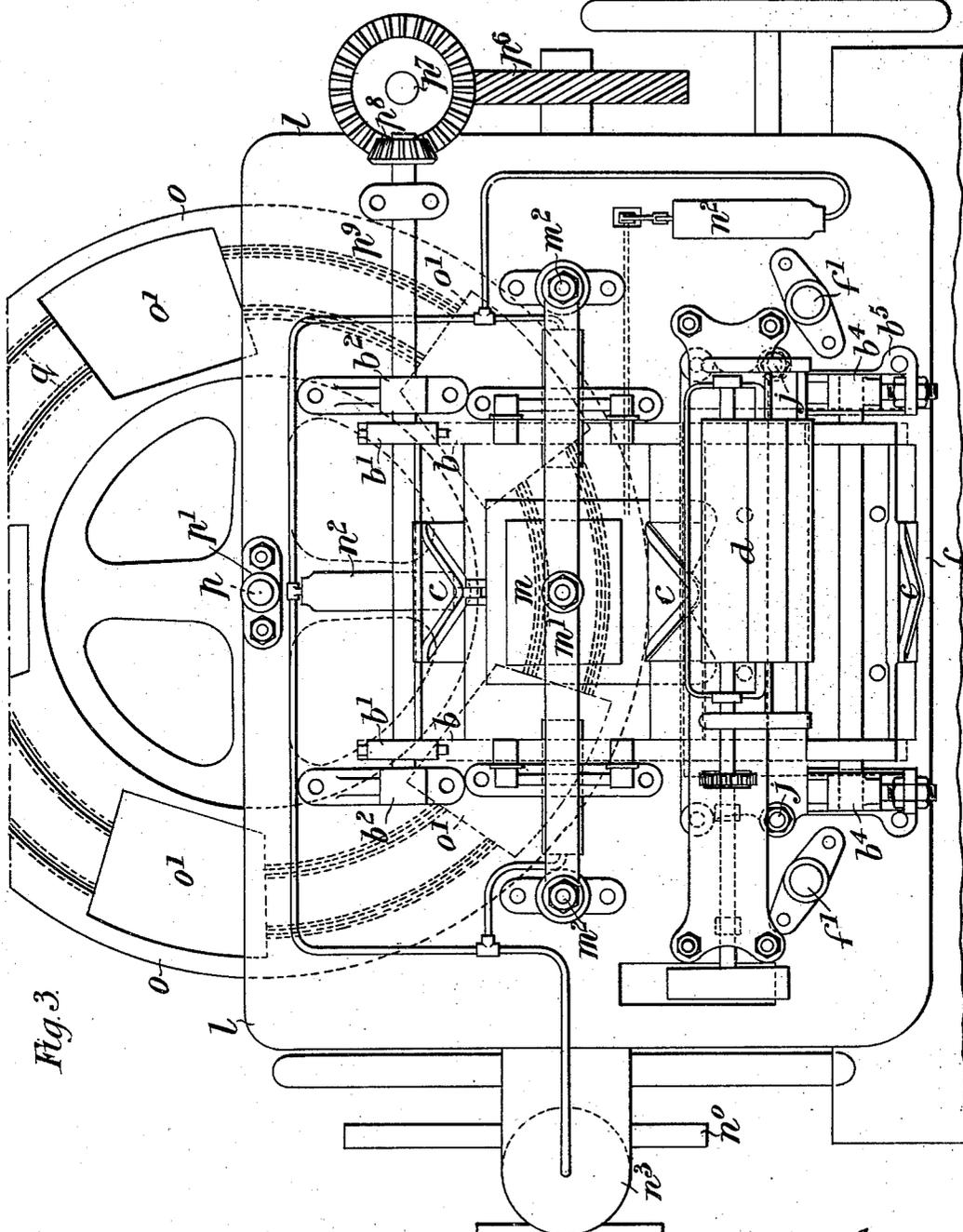


Fig. 3.

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g^1 g^2

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4 Sheets—Sheet 4.

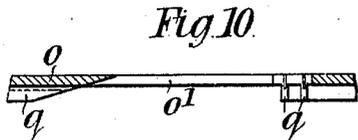


Fig. 10.

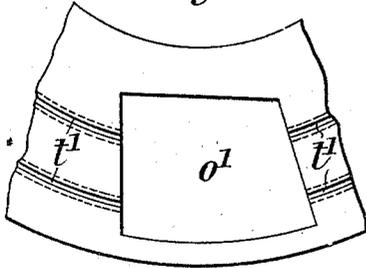


Fig. 11.

Fig. 7.



Fig. 8.

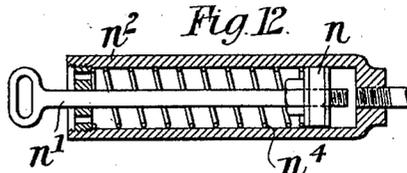
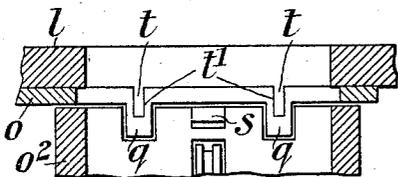


Fig. 12.

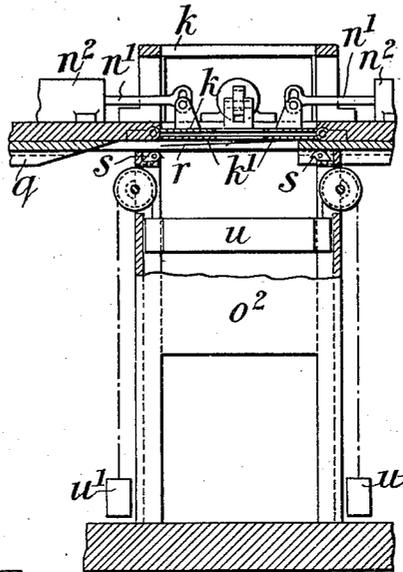


Fig. 5.

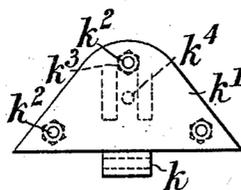


Fig. 6.

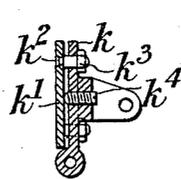


Fig. 13.



Fig. 14.

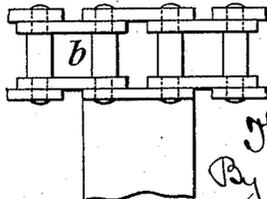
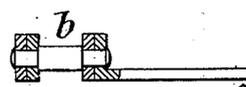


Fig. 15.



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UNITED STATES PATENT OFFICE.

THOMAS BOULTON KENDELL, OF LONDON, ENGLAND.

MACHINE FOR GUMMING AND FOLDING ENVELOPS.

SPECIFICATION forming part of Letters Patent No. 692,016, dated January 28, 1902.

Application filed September 16, 1901. Serial No. 75,586. (No model.)

To all whom it may concern:

Be it known that I, THOMAS BOULTON KENDELL, a subject of the King of Great Britain, residing at Norfolk Iron Works, Norfolk Place, Shoreditch, London, England, have invented new and useful Improvements in Machines for Gumming and Folding Envelops, of which the following is a specification.

This invention relates to improvements in machines for gumming and folding envelopes.

In the accompanying drawings, Figure 1 is a front elevation of a machine having the improvements applied thereto. Fig. 2 is a vertical section on the line 2 2, Fig. 1. Fig. 3 is a plan of the machine. Fig. 4 is a section on the line 4 4, Fig. 2. Figs. 5, 6, 7, and 8 are views of details hereinafter described. Fig. 9 is a view illustrating the construction of the wheels $p^3 p^4$. Fig. 10 is a sectional elevation of a part of the table o , and Fig. 11 is a plan of the same. Fig. 12 is a longitudinal section of one of the cylinders n^2 , showing its contained piston and spring. Fig. 13 is a side elevation of a part of one of the sprocket-chains b , showing the mode of attaching the bar carrying a gummer. Fig. 14 is a plan, and Fig. 15 a sectional end view, of the same.

The machine comprises a framework a , upon which are mounted two endless chains or the like $b b$ in parallel planes and running over chain-wheels $b^1 b^1$ in bearings $b^2 b^2$, secured to the frame a , and over wheels $b^3 b^3$, mounted in bearings $b^4 b^4$, secured upon a support b^5 . These chains or the like are arranged to be moved intermittently, as hereinafter described, and are provided with a number—say 5—of gummers $c c$, which are adapted to apply the gum to the envelop-blanks and which receive the gum from the device d , of any suitable known construction, as the chains rotate.

The envelop-blanks to be gummed and folded are placed in a pile e of suitable height upon a table f , arranged in front of the machine, and this table f is then raised until the topmost blank is within, say, about a quarter of an inch of one of the gummers upon the under side of the endless chains. To enable the table f to be raised initially and also automatically and intermittently fed upward, so as to always bring the topmost blank in

the same position with respect to the gummer, it has depending from its under side a pair of racks $f^1 f^1$, which gear with pinions $f^2 f^2$, keyed upon a shaft f^3 , rotatably mounted in the frame a and adapted to be operated from the main shaft g , arranged at the lower part of the machine and provided with fast and loose pulleys $g^1 g^2$, whereby it can be driven from any suitable source of power. The shaft f^3 is actuated from the shaft g by means of the worm h , which gears with the worm-wheel h^1 , keyed upon the lower end of the upright shaft h^2 , mounted in bearings in the framework a and carrying upon its upper end a worm h^3 , which gears with a worm-wheel h^4 upon the shaft f^3 . This wheel h^4 is loosely mounted upon the shaft f^3 and has its boss made in the form of a hollow clutch-cone h^5 , with which the cone i upon the clutch i^1 , keyed upon the shaft f^3 , is normally held in engagement by the spiral spring i^2 , coiled upon the said shaft. When the blanks have all been removed from the table f by the gummer, as hereinafter described, the operator can disengage the clutch i^1 by means of the handle i^3 , so that the table drops and can be refilled and again raised by hand, after which the clutch can be again put into operation, so that the table is again automatically fed upward as the blanks are removed from the top of the pile.

When a gummer c has moved into the position shown in Fig. 2 of the drawings—that is to say, immediately over the bottom flap of the topmost envelop-blank—it is pressed downward upon the blank, so as to apply the gum to the bottom two edges of the said bottom flap, (and, if required, also upon the portion of the edge of the central flap in the ordinary manner.) To press the gummer upon the blank, the support or plate b^5 , upon which the bearings $b^4 b^4$ are mounted, is pressed down in such a manner that it pulls down the chains at this end and also comes to bear upon the upper face of the gummer and directly presses it against the envelop-blank. The plate b^5 is depressed by means of the two rods $j j$, which are secured to the said support and extend downward, each being pivoted at its lower end to one end of a lever j^1 , fulcrumed at j^2 to a link j^3 , pivoted to the

frame *a*, the other ends of each of the said levers being pivoted to the upper end of a rod j^4 , the lower end of which is furnished with a cam-roll j^5 , which bears upon the periphery of cam j^6 , keyed upon the main shaft *g* of the machine. This cam is of such a profile and is keyed upon the shaft in such a position that the cam is depressed at the precise moment required. When the blank is gummed, the pressure upon the chains is released by the further rotation of the actuating-cam j^6 , so that the gummer *c* rises and carries with it the topmost blank, which adheres to it, whereby the chains, and consequently the gummer *c* and the envelop-blank adhering to it, are carried forward until the blank comes to lie over the folding-box *k*, which is secured to the table *l* of the machine. When in this position, the plunger *m* descends and forces the blank into the folding-box *k*, so as to turn up the four flaps of the blank. The plunger *m* is mounted upon a cross-piece m' , which is held upon rods $m^2 m^2$, supported in guides in the machine-frame and having at their lower ends cam-rolls m^3 , which bear upon the peripheries of cams m^4 , keyed upon the main shaft *g*. The four flaps of the envelop being then turned up, the sides of the box *k* are forced inward in the proper sequence to fold down the flaps and gum the bottom flap to the side flaps in the usual way.

To operate the hinged sides of the box, I provide improved means comprising a number of pistons *n n*, the rods n' of which are connected to the hinged flaps and which are moved in cylinders n^2 through the medium of compressed air supplied by a suitable compressor n^3 , operated from the main shaft *g* of the machine through the medium of the cam n^6 . As the hinged sides of the folding-box must not operate simultaneously, I provide three out of the four pneumatic pistons with springs, one being shown at n^4 , Fig. 2, the strength of the three springs being different, so that by this means the piston which is not fitted with a spring is first operated by the air-pressure, the other three being operated in rotation according to the strength of the springs against which they have to work. In some cases it is not required to turn down the flap flat against the body of the envelop-blank, and to enable the extent of the pressure upon the turned-down flaps to be varied I provide the hinged sides of the box with liners $k' k'$, (Figs. 5 and 6, which represent an elevation and a section of one of the sides,) the said liners being secured to the box sides *k* by means of pins k^2 and nuts k^3 , a central screw k^4 being provided in the sides *k k* to adjust the distance between the liners and the sides, which distance determines the pressure upon the flaps when turned down. The envelops being thus folded and gummed, it is necessary to discharge them from the box, and to this end I proceed as follows—that is to say, I provide underneath the box a disk

or table *o*, adapted to be intermittently rotated and containing a number—say five—of orifices or holes $o' o'$ of about the size of the box *k*, the rest of the disk being plain. With this arrangement the disk is operated so that the plain portion of its surface is brought under the box to form the bottom thereof when the envelop-blank is being folded, as shown in Fig. 2. When the folding operation is completed, the disk partially rotates, thus bringing an orifice o' under the box and allowing the folded envelop to drop through into a receptacle o^2 , provided underneath to receive it.

The disk or table *o* is mounted upon the upper end of a spindle *p*, held at its upper part in a bearing p' on the table *l* and at its lower part in a bearing p^2 in the frame *a*, the lower end of the spindle projecting through the bearing p^2 and carrying a spiral wheel p^3 , which gears with a spiral wheel p^4 , keyed upon the main shaft *g* of the machine. The teeth of this spiral wheel p^4 only extend around a portion of its periphery, so that it only actuates the spiral wheel p^3 with which it gears for about half a revolution, so as to only intermittently give motion to the disk or table *o*. To hold the table *o* rigidly in position for the other half-revolution of the wheel p^4 , one of the teeth of the latter is carried completely around the periphery of the wheel, but parallel to the lateral faces thereof, so that it engages the space between two of the teeth of the wheel p^3 , but does not rotate the latter wheel, the said teeth being cut away, as at $p^0 p^0$, Fig. 9, to allow of this.

Spiral wheels p^5 and p^6 similar to the wheels p^3 and p^4 , respectively, are employed for intermittently rotating the chain-wheel $b' b'$ through the medium of a shaft p^7 , bevel-wheels p^8 , and shaft p^9 .

The under side of the disk *o* is preferably provided with concentric ribs *q q* between the orifices $o' o'$, the front ends of the said ribs being beveled, as clearly shown at $q' q'$. These ribs have for their object to force the folded envelop *r* into the receptacle o^2 , as will be seen by reference to Fig. 4, where they are retained by the weight-clips *s s*, under which they are forced. One of the clips *s* is shown drawn to a larger scale in Fig. 7.

$t t$, Fig. 8, are projections on the table *l*, which extend downward into grooves $t' t'$ in the disk *o* below the level of the top of the receptacle o^2 and serve as stops to prevent the envelops when being discharged from the box *k'* from accidentally getting between the top of the receptacle o^2 and the disk *o*.

u is a plate in the receptacle o^2 , which is caused to press upward through the medium of weights *u'*, so as to keep the envelops pressed together, and thus prevent the ungummed flaps from opening.

It will be clear that the various operating-cams are arranged upon the shaft *g* in such a manner that they cause the various opera-

tions of the machine to be carried out in their proper sequence.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a machine for gumming and folding envelops, the combination with an endless band, supporting-rollers therefor, a series of gummings secured to said band, a blank-supporting table, located below said band, and devices for raising and lowering one of said supporting-rollers to press the gummings upon the blanks and driving mechanism for said band, substantially as described.

2. In a machine for gumming and folding envelops, the combination with an endless band, supporting-rollers therefor, a vertically-movable plate carrying the bearings for one of said rollers, a blank-supporting table below said plate, a series of gummings secured to said band and adapted to travel between said plate and the topmost blank, mechanism for applying adhesive material to said gummings, mechanism for depressing said plate into contact with the gummer beneath the same to force it down upon the topmost blank and mechanism for driving said band, substantially as described.

3. In a machine for gumming and folding envelops, the combination with the folding-box having hinged sides, of a series of fluid-pressure cylinders provided with pistons connected to said hinged sides, certain of said pistons being provided with retracting-springs of different strengths and means for supplying fluid under pressure to said pistons to fold said hinged sides in sequence, substantially as described.

4. In a machine for gumming and folding envelops, the combination with the folding-box provided with hinged sides, of fluid-pressure cylinders provided with pistons connected to said hinged sides and means for supplying fluid under pressure to said cylinders, substantially as described.

5. In a machine for gumming and folding envelops, the combination with the folding-box provided with hinged sides, of fluid-pressure cylinders provided with pistons connected to said hinged sides, retracting-springs for said pistons and means for supplying fluid under pressure to said cylinders, substantially as described.

6. In a machine for gumming and folding envelops, the combination with the folding-box provided with hinged sides, of fluid-pressure cylinders provided with pistons connected to said hinged sides, liners adjustably secured to the inner faces of said sides, and means for supplying fluid under pressure to said cylinders, substantially as described.

7. In a machine for gumming and folding envelops, the combination with the folding-box having an open bottom and hinged folding sides, of a horizontal plate arranged be-

low said box and provided with a solid portion adapted to form the bottom of said folding-box and an aperture adapted to register with said folding-box to permit the folded envelop to pass through said plate and means for moving said plate, substantially as described.

8. In a machine for folding envelops, the combination with the folding-box having an open bottom and hinged folding sides, of a rotary horizontal disk arranged below said folding-box, provided with solid portions at intervals adapted to form the bottom of the folding-box, and with apertures between said solid portions to allow the folded envelops to pass through said disk, and means for intermittently rotating said disk, substantially as described.

9. In a machine for folding envelops, the combination with the folding-box having an open bottom and hinged folding sides, of a rotary horizontal disk arranged below said folding-box provided with solid portions at intervals adapted to form the bottom of the folding-box, and with apertures between said solid portions to allow the folded envelops to pass through said disk, projections on the lower side of said disk beneath the solid portions thereof having inclined portions to engage and depress the folded envelop, substantially as described.

10. In a machine for folding envelops, the combination with the folding-box having an open bottom and hinged folding sides, of a rotary horizontal disk arranged below said folding-box provided with solid portions at intervals adapted to form the bottom of the folding-box, and with apertures between said solid portions to allow the folded envelops to pass through said disk, said folding-box being provided with downwardly-extending projections engaging grooves in solid portions of said disk to prevent the folded envelop from passing between the disk and the folding-box, substantially as described.

11. In a machine for folding envelops, the combination with the folding-box having an open bottom and hinged folding sides, of a rotary horizontal disk arranged below said folding-box provided with solid portions at intervals adapted to form the bottom of the folding-box, and with apertures between said solid portions to allow the folded envelops to pass through said disk, a receptacle for the folded envelops below said disk and in line with the folding-box, said receptacle having a vertically-movable bottom and movable retaining-clip for holding folded envelops in said receptacle, substantially as described.

12. In a machine for folding envelops, the combination with the folding-box having an open bottom and hinged folding sides, of a rotary horizontal disk arranged below said folding-box provided with solid portions at intervals adapted to form the bottom of the folding-box, and with apertures between said

solid portions to allow the folded envelopes to pass through said disk, a receptacle for the folded envelopes below said disk and in line with said folding-box, said receptacle being provided with a downwardly-yielding bottom, downwardly-extending projections below the solid portions of said disk having inclined portions for forcing the folded envelopes into said receptacle and movable retaining-clips for preventing the folded envelopes from moving upward in said receptacle, substantially as described.

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