No. 800,999. PATENTED OCT. 3, 1905.

G. N. FRENCH.

ENVELOP SEALING MACHINE.

APPLICATION FILED FEB. 16, 1903.

4 SHEETS—SHEET 1.

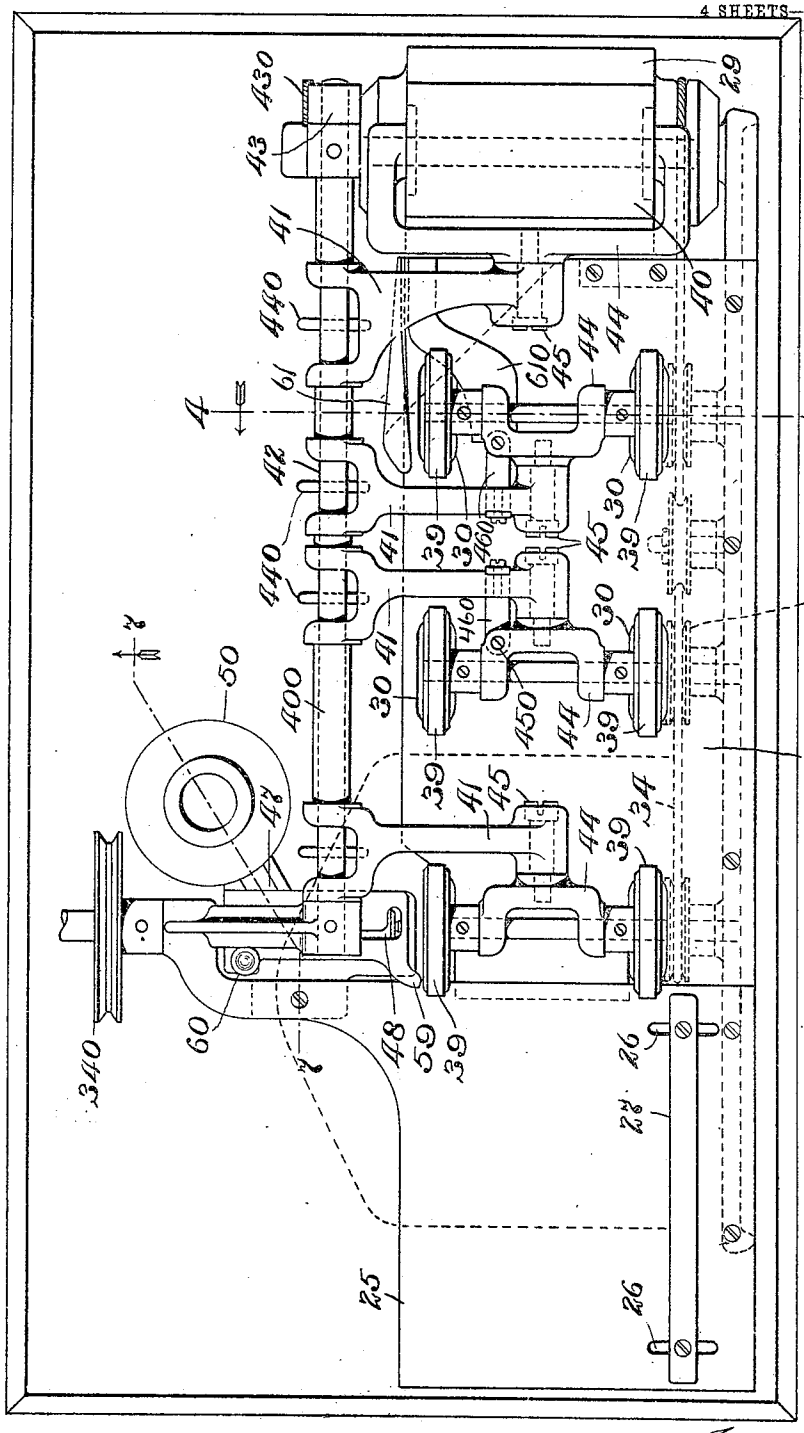


Fig. 1.

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4 SHEETS—SHEET 2.

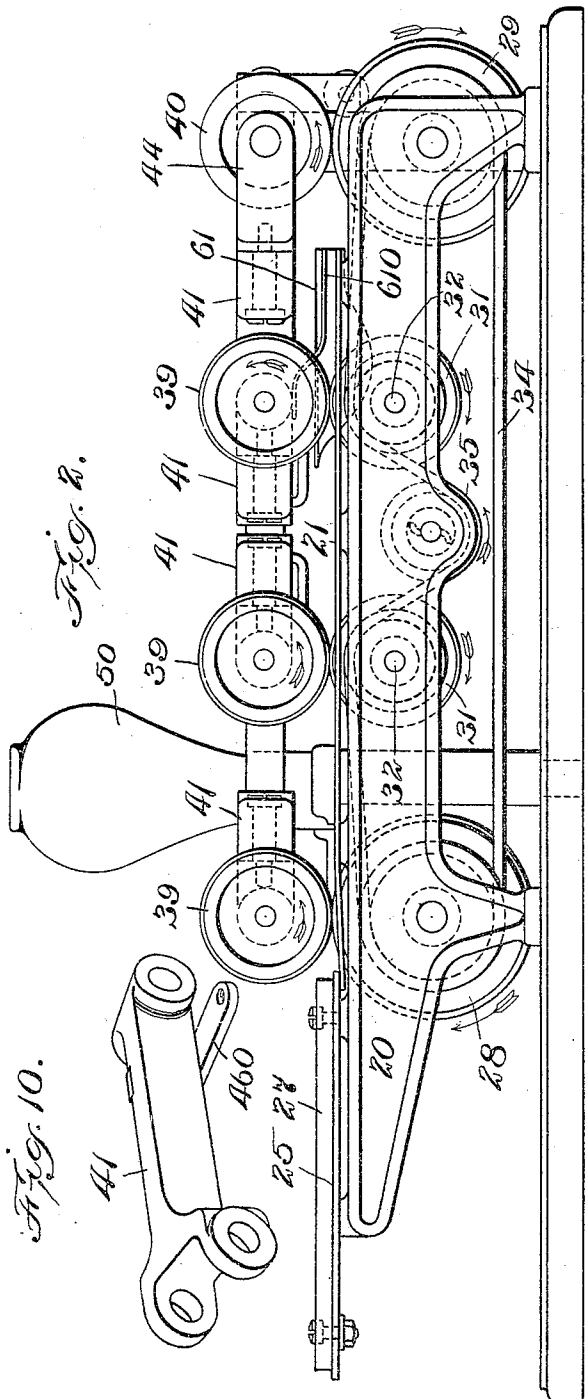


Fig. 2.

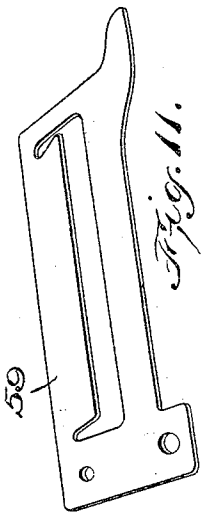


Fig. 11.

Fig. 10.

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4 SHEETS—SHEET 3.

Fig. 3.

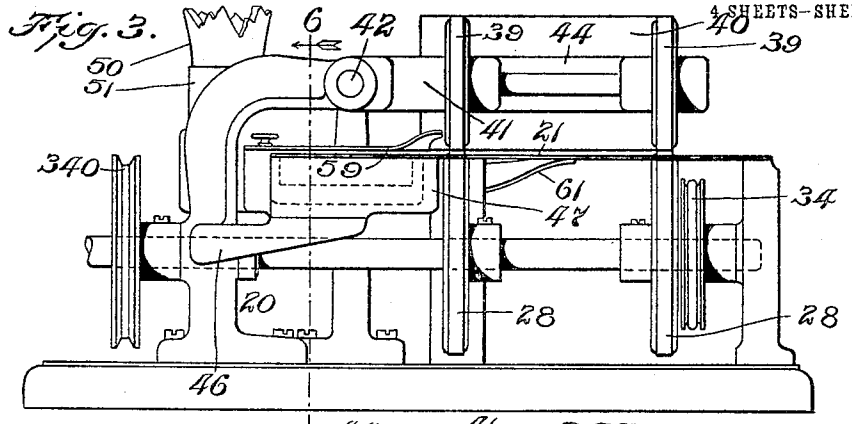


Fig. 4.

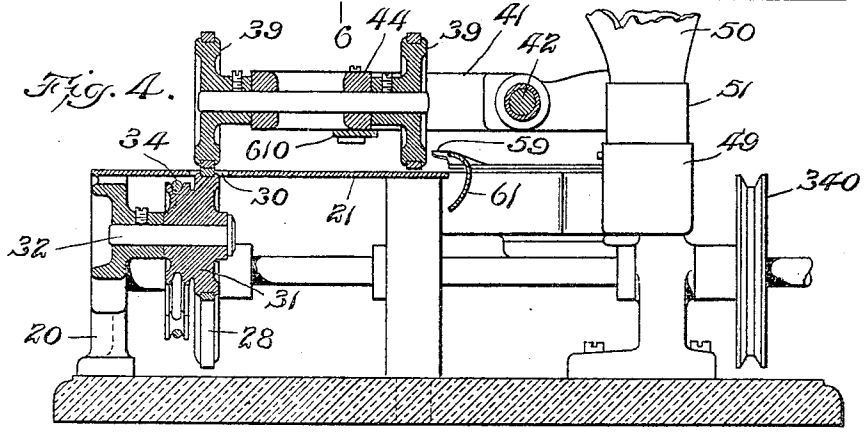


Fig. 5.

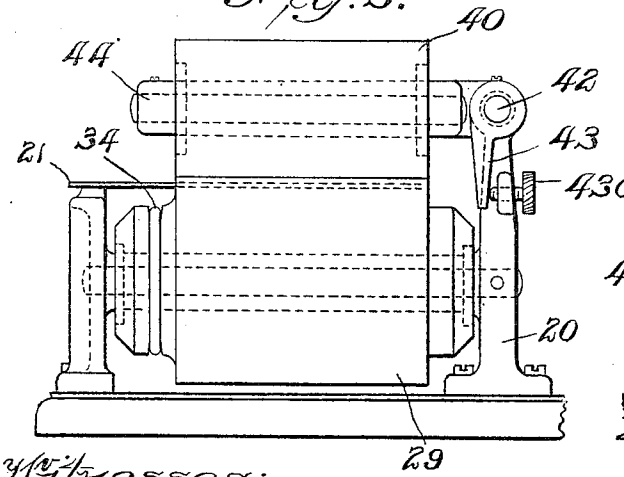
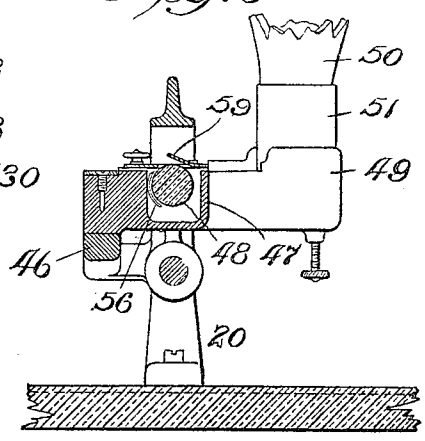


Fig. 6



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4 SHEETS—SHEET 4.

Fig. 7.

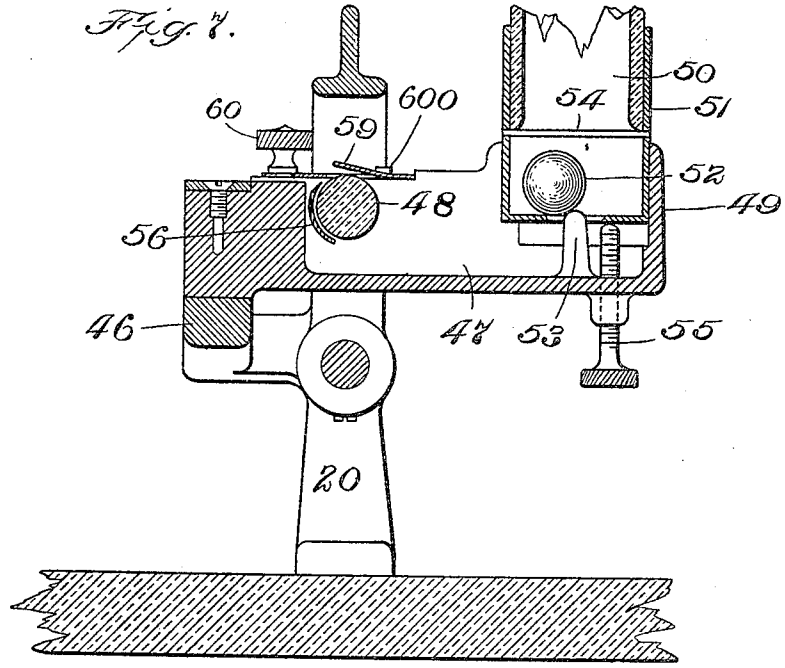


Fig. 9.

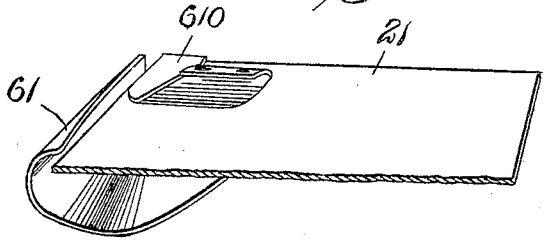


Fig. 8.

Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE N. FRENCH, OF WASHINGTON, DISTRICT OF COLUMBIA.

ENVELOP-SEALING MACHINE.

No. 800,999. Specification of Letters Patent. Patented Oct. 3, 1905.

Application filed February 16, 1903. Serial No. 143,582.

To all whom it may concern.

Be it known that I, GEORGE N. FRENCH, of Washington, in the District of Columbia, have invented certain new and useful Improvements in Envelop-Sealing Machines, of which the following is a specification.

This invention relates to machines for automatically sealing envelops.

Of the accompanying drawings, Figure 1 represents a plan view of an envelop-sealing machine embodying my invention. Fig. 2 represents a side elevation thereof. Fig. 3 represents a front end elevation. Fig. 4 represents a section on line 4 4 of Fig. 1. Fig. 5 represents a rear end elevation. Fig. 6 represents a sectional view of the moistener and related parts. Fig. 7 represents a sectional view of the same enlarged and taken on the plane of line 7 7 of Fig. 1. Fig. 8 represents a perspective view of said moistener and parts. Fig. 9 represents a perspective view showing the rear end of the table and folder and the guard. Fig. 10 is a detail perspective view of one of the pivotal arms supporting the swivels which journal the pressure-rolls. Fig. 11 represents a detail perspective view of the envelop-guard over the moistener.

The same reference characters indicate the same parts in all the figures.

The frame 20 of the machine supports a platform or table 21 for the envelops to be sealed. The front end of the table is provided with a lateral extension 25, in which are formed slots 26, in which is adjustably secured an edge-guide 27 for the envelops. The guide 27 forms the only projection from the table above its upper surface, and therefore envelops of any size within the limit prescribed by the length of the slots 26 may be passed through the machine and sealed.

The frame is formed with bearings in which are mounted the shafts of the front and rear rollers 28 and 29, respectively. At the front there are two rollers 28, (see Fig. 3,) one at each edge of the table, while at the rear the roller 29 is shown as a drum extending across the rear end of the table. (See Figs. 1 and 5.) Projecting slightly upward through slots 30 in the table are intermediate disk-shaped rollers 31, (see Fig. 4,) carried by spindles 32, supported in the sides of the frame 20.

On the shafts or spindles of the rollers 28, 29, and 31 are grooved pulleys engaged by an endless belt 34 in such manner that all the rollers will be revolved in the same direction, as indicated in Fig. 2. The system of rollers is driven by a belt-pulley 340 on the shaft of roller 28. 35 is a tension-pulley engaging the belt.

The envelops are placed on the table with their flaps open and bearing downward and with their closed edges against the guide 27 and moved over the rollers 28 and by them and the rollers 31 and 29 carried through the machine and deposited in a suitable receptacle. During their passage the flaps are moistened, folded, and sealed, as will presently be described, and to cause their engagement with the rollers 28 and 31, so as to be fed thereby, a series of upper rollers 39 are employed. In Fig. 1 some of the rollers 39 conceal the feed-rollers, which are directly below them and of the same size. Coöperating with the rear roller or drum 29 is a pressure roller or drum 40. The upper feed-rollers 39 and the pressure-drum 40 are freely rotatable and carried by arms 41, the outer ends or hubs of which are connected by sleeves or tubes 400 and loosely surround a longitudinal shaft 42, fixed in suitable supports on the frame. This shaft has secured to it at one end an arm 43, engaged by an adjustable stop-screw 430, whereby the shaft may be rotated and the limit of its turning movement in one direction determined. The shaft carries pins 440, whose inner ends reside under the arms 41, so that when the shaft is properly rotated these pins will rotate the arms 41, and thus elevate all the upper rollers and hold them out of contact with the lower rollers whenever it is desirable to do so, as to clean the table or remove an envelop. The rollers 39 and drum 40 are immediately supported or journaled in swivels or equalizing-yokes 44, pivoted at 45 on axes parallel to the shaft 42, whereby the rollers and drum are enabled to bear evenly on thick or thin envelops throughout the full width thereof. The swinging movements of the yokes of the pressure-rollers 39, which cooperate with the rollers 31, are limited by adjustable stop-screws 450 passing through the yokes and screwing in brackets 460 on the arms 41.

It is generally considered that in machines of this character it is best to employ rotary devices for applying moisture to the envelop-flaps, not only because of the greater speed that can be imparted to the machine, but also because such devices supply the moisture more nearly in accord with the demands for it when running fast. Stationary capillary feeding devices are liable to supply too much moisture

when the machine is running slowly and an insufficient quantity for high speed. There are two objections to rotary moisteners, however, one being that the roller frequently throws off water when the machine is run at fast speed. The other objection is that when the machine has been idle for a time the first envelop to be passed through will not be properly moistened, for the reason that the top of the roller will be dry, or substantially so. By the improvements which will be presently described both of these objections are overcome.

A bracket 46 on the frame supports a box or trough 47, in which is mounted a freely-rotatable roll 48, over and in contact with which the gummed flaps of the envelops pass in the usual manner. At one end of the trough 47 and communicating with it is a socket 49 for the reception of the water-reservoir. The reservoir comprises a globular flask 50, which may be of glass, having a nipple to which is secured a neck 51, which may be of metal. The outer end of the neck is turned inward to form practically a cup, which, however, has a central aperture that is closed by a spherical valve 52, such as a marble, when said valve is not in contact with the tip of a lug 53, projecting upwardly from the bottom of the trough. A bar or pin 54 across the neck or cup adjacent to the valve prevents the valve from dropping into the flask 50 when the reservoir is turned for filling and retains said valve sufficiently near its seat so that when the reservoir is inverted after filling so as to place the neck or cup 51 in the socket the valve will close and prevent the escape of water. A stop-screw 55, tapped through the bottom of the trough at one side of the lug 53, limits the point to which the reservoir can be inserted in the socket of the trough, and since the only inlet for air to the reservoir to take the place of escaping water is through the aperture in the bottom of the cup 51 the rise of the level of water in the trough to a height sufficient to prevent passage of air through said aperture will stop the feed of water to the trough from the reservoir. The screw 55 therefore determines the level of water in the trough. Located within the trough or box and extending parallel with and substantially the entire length of the roll 48 is a concave convex plate 56, having its inner face accurately coinciding or concentric with the periphery of the roll. In practice the plate 56 is set so close to the side of the roll 48 as to prevent the accumulation of more than a very thin film of liquid upon the surface of the latter even at a high speed of rotation. Although no contact is established between the plate and roll, the former acts as a brush or wiper for the latter to the extent of reducing the thickness of the film elevated by the roll very much below that naturally assumed by water upon a freshly-dipped surface. Therefore the roll when whirled rapidly by the contact with its upper surface of a passing envelop-flap cannot throw any water centrifugally, because there is no excess of water to be so projected. This closeness of relationship between the curved plate and roll also produces a capillarity between them, which when the roll is stationary preserves a film of water reaching to the upper edge of the plate, which, as shown, extends nearly to the top of the roll. Therefore the first envelop to be introduced to the machine after a long period of rest will have its gummed flap properly moistened.

To insure the necessary and continuous contact of the entire length of the gummed flap with the roll 48, a spring-guide or presser-plate 59 is secured over the trough and roll, as by a screw 60 and dowel 600, at one end of the guide. If desired, the guide after disengagement from the dowel may be swung around on the screw as a pivot to entirely uncover the trough to facilitate access to the latter and its roll. Preferably the guide or presser is slotted, as shown, to reduce friction against the upper surface of a passing envelop-flap. The edge of the guide at the entrance side is turned up to prevent the edge of a flap from catching against the guide, and the edge at the rear of the slot is similarly turned up. The spring or presser-plate will cause the flap to arch over the roll and set the latter in motion as it passes, the momentum imparted to the roll causing it to continue to revolve as the next envelop approaches it.

The envelops are to be fed to the machine so that the line of fold of the open flaps will register with the edge of the table, and after they pass the moistener the natural tendency of the flaps to close or turn down will cause the resulting angle of the paper to slide along the edge of the table and coöperate with the several intermediate lower and upper feed rolls or disks in guiding the envelops accurately through the machine.

Before the envelops reach the pressing and ejecting drums 29 40 the flaps engage the folder 61, consisting of a single piece of sheet metal bent to a substantial semicone shape open at one side and secured to an arm of the frame with the greater portion of its folding-surface below the plane of the table, so that the flaps will be fully engaged below and brought up to or nearly to the plane of the table and carried evenly between the "bite" of the pressing drums which act to seal them to the bodies of the envelops. To prevent the body of the envelop from rising unduly when the flap thereof is engaged by the folder 61, I provide an auxiliary guard 610, one end of which is secured to one of the swivels 44, while its free end extends close to the table, as indicated in Figs. 2, 4, and 9.

It will be noted that by the described arrangement of the guard 610 the latter, as well

as the rolls, can automatically adapt itself to the work, and its motion up and down will not affect at all the folder. Further, since the auxiliary guard 610 is mounted independently of the folder there is no opportunity for jamming or crowding of the work in the folder, as might be the case but for the independent mounting of the auxiliary guard. The described arrangement leaves a space between the folder and the table clear for the passage of the flap, while at the same time allowing the rolls and the auxiliary guard to automatically adjust themselves to the work irrespective of the thickness of the latter.

By the term "envelop" I desire to include any wrapper provided with a flap to be attached to the body of said wrapper.

Having thus explained the nature of my invention and described a way of making and using the same, although without attempting to set forth all of the forms in which it may be made or all of the modes of its use, what I claim, and desire to secure by Letters Patent, is—

1. An envelop-sealing machine comprising a table, a flap-moistener, a flap-turner and means for feeding envelops through the machine and sealing them, the parts of said means that are above the table having their axes supported solely along the same edge of the table as that carrying the moistener, whereby envelops of any size may be operated upon.

2. An envelop-sealing machine comprising a table, a flap-moistener, upper and lower feed-rolls, a flap-turner, sealing-rolls and an adjustable edge-guide, the upper sealing-roll and feed-rolls having their axes supported solely along the same edge of the table as that carrying the moistener.

3. An envelop-sealing machine comprising a table, a flap-moistener, upper and lower feed-rolls, a flap-turner, sealing-rolls, an edge-guide, the upper sealing-roll and the feed-rolls being pivotally supported adjacent to and above the flap-turner, and means for holding said upper rolls elevated.

4. An envelop-sealing machine comprising a table, a flap-moistener, feed-rolls below the table and projecting slightly above the plane of the upper surface thereof, a plurality of pivoted arms carrying upper feed-rolls adapted to rest on the lower feed-rolls, a shaft having means engaging said arms and adapted to be turned to tilt the arms and their rolls upward, and a flap-turner and sealing-rolls.

5. An envelop-sealing machine comprising a table, a flap-moistener, lower feed-rolls, upper pressure-rolls, pivotal arms supporting said pressure-rolls, and swivels or equalizing-yokes journaled on said arms and carrying said pressure-rolls.

6. In an envelop-sealing machine, a moistening device comprising a rotary member, means for supplying liquid to the lower portion thereof, and means for forming a film on said rotary member by capillary attraction.

7. In an envelop-sealing machine, a moistening device comprising a trough, means for supplying liquid thereto, a rotary member mounted above the liquid in the trough and adapted to dip therein, and means for forming a film on said rotary member by capillary attraction.

8. In an envelop-sealing machine, a moistening device comprising a trough, a roll mounted therein, means for supplying the liquid to the trough, a curved plate closely conforming to the side of the roll, means for supporting said plate at a slight distance from said roll whereby a film is maintained in said space by capillary action, said roll being arranged and adapted to have its surface when in operation turn toward the lower edge up by said plate and away from the top edge of said plate.

9. In combination with the coöperative elements of an envelop-sealing machine a capillary moistening device comprising two members arranged close to each other to form a capillary space, one of said members being rotary.

10. In an envelop-sealing machine, means for feeding the envelops and for moistening the flaps thereof, and a folder for turning in the flaps after the moistening operation, said folder consisting of a single piece of sheet metal bent to a substantial semicone shape open at one side and having a greater portion of its folding-surface below the path of travel of the envelop, the free edge of said folder forming a spiral incline to engage and fold the flap of the envelop.

11. An envelop-sealing machine comprising a table, means for feeding envelops over said table, means for moistening the flaps of the envelops, pressing-rolls beyond the end of the table, and a flap-turner located at the end of the table, said turner consisting of a single piece of sheet metal bent to a substantial semicone shape open at one side and having a greater portion of its folding-surface below the plane of the table.

12. An envelop-sealing machine comprising a table, means for feeding the envelops and moistening the flaps thereof, a folder for turning in the flaps after the moistening operation, and an independently-mounted auxiliary guard arranged adjacent said folder to yieldingly resist the lifting of the envelop due to the action of the folder.

13. In a machine of the class specified, a shaft carrying a pair of rolls, an arm to which said shaft is pivotally connected, and means for pivotally supporting said arm, a table arranged below the rolls, whereby the rolls automatically adjust themselves upon the work and can move to and from the table in vertical lines.

14. In a machine of the class specified, a

table, an adjustable arm pivoted at one side of said table, a roll pivotally connected at the end of said arm, whereby said roll can be positioned at a predetermined point, and by means of its pivotal adjustment can automatically adjust itself to the work engaged thereby.

15. In a machine of the class specified, a table, a feed-roll, a folder arranged below the table and formed with a spiral incline adapted to engage a flap of the work and fold the latter toward the under side of the table.

16. In a machine of the class specified, a folder extending from underneath the table and about one edge of the latter, but supported therefrom, an incline formed on said folder arranged to engage the flap of the work and fold the latter toward the under side of the table.

17. In a machine of the class specified, a table, a folder arranged about one edge of the table, an adjustably-pivoted arm, a shaft pivotally secured to said arm, rolls carried by said shaft adapted to engage the work, a yielding guard secured to said arm arranged in proximity to said folder, whereby the guard can move toward and from the table by the work, without affecting the folder.

18. In combination with the coöperative elements of an envelop-sealing machine, a flap-turner, and an independently-mounted guard arranged to resist the motion imparted to the envelop by the action of the flap-turner.

19. In combination with the coöperative elements of an envelop-sealing machine, a moistening-roll, a plate or finger on each side of said roll below the top of the latter, and arranged to permit the passage of the flap between the roll and fingers, whereby the flap is bent about and held against the roll in its passage over the latter.

20. In combination with the coöperative elements of an envelop-sealing machine, a pivotally-mounted feed-roll.

21. In combination with the coöperative elements of an envelop-sealing machine, a sealing-roll, and means for pivotally supporting said roll at one end only.

22. In an envelop-sealing machine in combination with a revoluble roller, and means for supplying liquid thereto, a pressure-plate for holding the flap of the envelop in contact with such roller, and an opening in such pressure-plate opposite such roller.

23. In an envelop-sealing machine in combination with a revoluble roller, and means for supplying liquid thereto, a pressure-plate for bending the flap of the envelop partially around such roller, and an opening in such pressure-plate opposite such roller.

24. In an envelop-sealing machine in combination with a revoluble roller, and means for supplying liquid thereto, a pressure-arm each side of such roller and arranged to hold the flap of the envelop in contact therewith.

25. In an envelop-sealing machine in combination with a revoluble roller, and means for supplying liquid thereto, a pressure-arm each side of such roller and arranged to bend the flap of the envelop partially around such roller.

In testimony whereof I have affixed my signature in presence of two witnesses.

GEORGE N. FRENCH.

Witnesses:
ANNA R. MOHUN,
J. H. LAMAR OGDEN.