Nov. 30, 1926. 1,609,218

F. W. STORCK

MOISTENING DEVICE

Filed Feb. 1, 1922 2 Sheets-Sheet 1

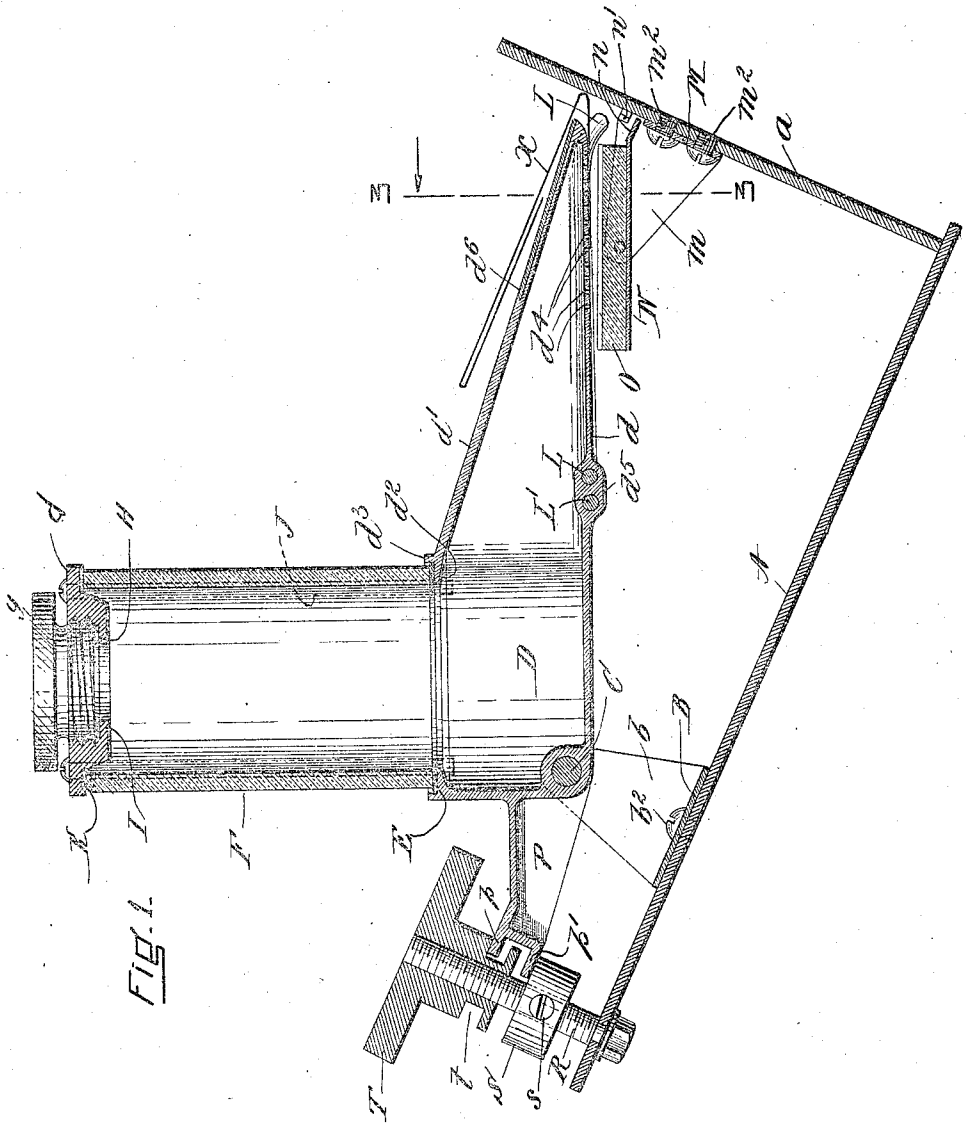


Fig. 1.

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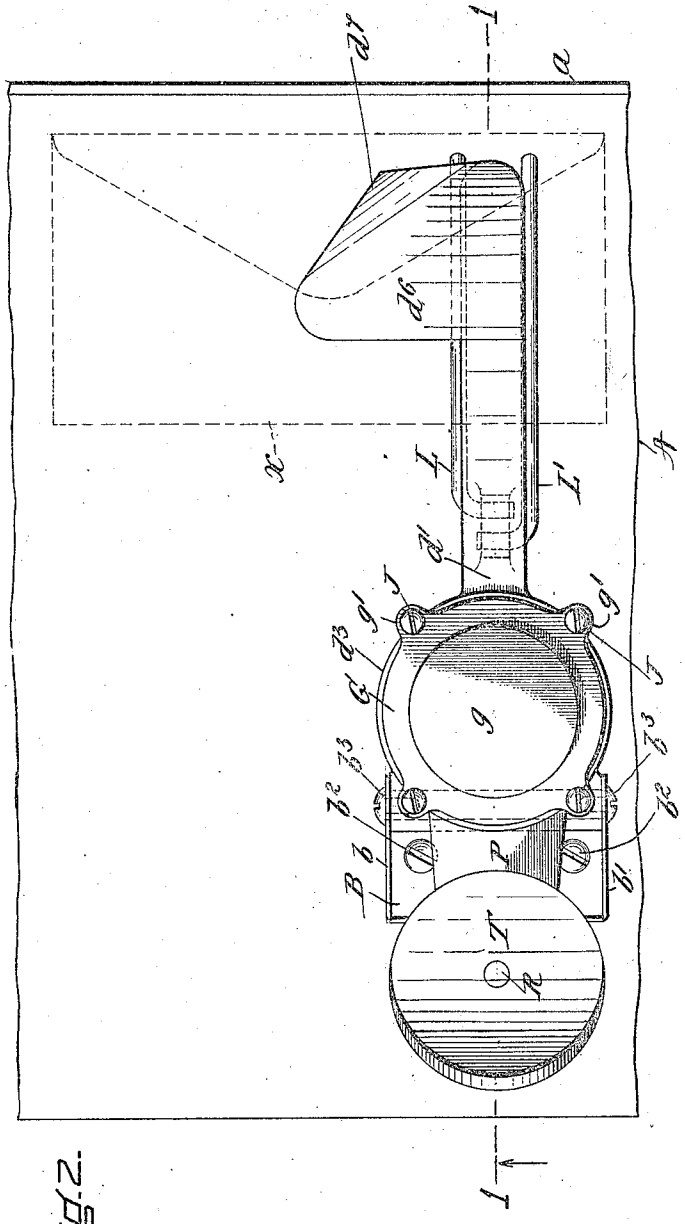


Fig. 2.

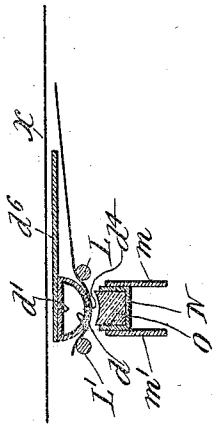


Fig. 3.

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UNITED STATES PATENT OFFICE.

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MOISTENING DEVICE.

Application filed February 1, 1922. Serial No. 533,462.

My invention relates to a type of moistener especially designed and intended for use in connection with envelope sealing machines and gummed tape dispensers although it may be used for moistening other articles or material other than paper.

It has heretofore been the practice in connection with envelope sealing and gummed tape dispensing devices to provide a moistener for the gummed flap or tape comprising a wick or a roller mounted in a water tank in which the water must be maintained at a fairly uniform level. Such devices are objectionable for the reasons that the wick accumulates gum from the envelope flaps or paper strips passing over the wick which thus becomes fouled so that it no longer feeds water fast enough, whereas the roller rotating in the water is likely to throw an excess of water when the envelope or gummed paper strip is passed rapidly over the moistening roller so as to revolve it with considerable speed. The deficiency or excess of moisture often resulting from the use of such moistening devices is very detrimental to proper sealing with the moistened gum. The maintenance of a proper water level in such devices is always a matter of difficulty.

It has been the special object of my invention to provide a moistening device which shall not become gummed and fouled in the course of operation and which shall distribute moisture over the gummed surface of the envelope flap or tape in a uniform manner regardless of the speed at which the envelope or tape is passed over the point of moistening contact. It has been the further object of my invention to provide a device wherein the water level need not be kept constant and which may be easily and conveniently replenished with a fresh supply of water.

My device may be best understood by reference to the accompanying drawings in which:

Fig. 1 is a vertical cross-section of my device on line 1—1 of Fig. 2 mounted in the frame of an envelope sealing machine, an envelope being shown in operative relation therewith.

Fig. 2 is a top view of the device shown in operative relation with an envelope shown in dotted outline.

Fig. 3 is a cross-section on line 3—3 of Fig. 1.

Referring now more specifically to the drawings, in which like reference characters indicate like parts, A is the base of the frame of an envelope sealing machine having a side-wall a. It will be observed that this frame is tilted at an angle of approximately 30° being supported in this position by legs or other suitable supports (not shown). The reasons for this angular position of the frame will be later stated. A bracket B having upwardly extending arms b and b^1 is secured by screws b^2 to the base A. Pivotally mounted on a shaft C is the metallic moistener tank D which has a solid portion provided with a hole through which passes loosely the shaft C, the extremities of which are supported in holes in the upper ends of arms b and b^1 of the bracket B, being secured therein by screws b^3 which enter threaded holes in the ends of shaft C.

The tank D has a substantially horizontal base portion d and an upwardly inclined top wall d^1. The main portion of the tank D is enlarged and rounded and provided at its top with an annular flange d^2 and an annular lip d^3. The annular flange d^2 carries a rubber gasket E upon which rests a cylindrical glass tube F on the top of which is mounted metallic plate G which has a threaded hole therein, which hole may be tightly closed by the screw cap g which seats upon a rubber basket H which rests upon an annular flange I. Passing through off-set portions g^1 of plate G are four posts J having slotted heads and threaded lower extremities which enter threaded holes in corresponding offset portions of the top of metallic tank D. By screwing up these posts J the glass tube F is seated firmly against the gasket E making an air tight joint and the top plate G is seated firmly against a rubber gasket K mounted on the top of glass tube F, thereby making an air tight joint between the top of the glass tube F and the top plate G.

The base d of the tank D is preferably made $\frac{1}{32}$ of an inch in thickness and is provided with a group of small holes d^4 arranged in alignment. These holes d^4 are

preferably made each .038 of an inch in diameter. The base d is rounded in proximity to the line of holes d^4, as shown in Fig. 3. The base d of the tank is also provided with an enlarged portion d^5 in which are holes wherein enter the bent fingers of arms L and L^1 which extend along the sides of tank D and at a slight distance therefrom in proximity to the line of holes d^4. These arms L and L^1 have a firm frictional engagement within their respective holes but are movable into any desired position of adjustment as to elevation or distance from the sides of the tank D.

A fin d^6 is mounted on the top d^1 of the tank D at its outer extremity. This fin d^6 extends outwardly and laterally in the direction from which the envelopes to be moistened are successively advanced and is shaped as shown in Fig. 2 and provided with a slightly upturned portion d^7.

Mounted on the side a of the frame directly beneath the outer end of tank D is a bracket M having arms m and m^1. This bracket M is fastened to the side a of the frame by screws m^2.

Pivotally mounted on the extremities of arms m and m^1 of the bracket M is a metallic channel member N which is pivoted near its central portion and which is provided with a lug n arranged to contact with a stop n^1 on the arm m and with the top of the base of bracket M. The lug n is given a slight freedom of motion between stop n^1 and its opposite point of contact with the bracket M, thus permitting a slight pivotal motion of the channel member N which bears a rubber insert O which extends slightly above the top of the channel member N. The top of the rubber insert O is slightly hollowed to conform to the shape of the adjacent portion of the base d of the tank D. (See Fig. 3.)

Extending rearwardly from the back of tank D is an integral arm P, the outer extremity of which is divided forming projections p and p^1. Extending upwardly from the base A is a threaded post R upon which is screwed a threaded collar S which is normally held in a fixed position by means of set-screw s. A large thumb-nut T is screwed down upon the upper end of the threaded post R. This thumb nut T is provided in its lower portion with an annular groove t into which the extremity p of the arm P loosely enters so that by turning down the thumb-nut T the arm P is depressed until its extremity p^1 bears upon the top of the collar S which is so adjusted upon post R that when these parts are in this position the tank D will have swung upwardly about pivot C so that its base d is substantially level and its elongated extremity bearing the holes d^4 is slightly elevated above the rubber insert O, so as to permit the free passage of an envelope flap between the base d and the rubber insert O.

I have described my device as mounted in an envelope sealing machine of which only the adjacent frame has been shown, but it will be readily understood by those familiar with the art that the machine is equipped with suitable feed-rollers the tops of which are approximately on the plane of the top d^1 of the tank D, the rollers being mounted at right angles to the side wall a. Hence the need of tilting the whole device at an angle, as before stated, so that the envelopes while being actuated by the feed-rollers pass over the inclined top d^1 of the tank D while the base d of the tank is kept substantially level thereby insuring an even pressure of water at the several holes d^4.

The operation of my device is as follows:—First the tank must be filled with water and before this is done the thumb nut T is turned so as to elevate it, thus permitting the tank D to tilt downward so that the outer part of its base d wherein are located the holes d^4 rests upon the rubber member O which tilts upon its swivel support so that it bears uniformly against the base d covering all of the holes d^4. The continued turning of the thumb nut T will force the elevation of the arm P and cause the base d to bear very firmly against the rubber member O, thus tightly sealing the holes d^4. The cap g is then removed and water is poured into the opening until the tank D has been filled and the water level shows near the top of the glass tube F. The cap g is then screwed tightly into place and the thumb nut T is turned down on post R until the parts assume the position shown in Fig. 1, the base d of tank D being slightly elevated above the rubber member O. The desired extent of such elevation may be determined by adjustment of the position of the collar S. Now, with the cap g securely in place, no water will flow through the holes d^4 due to the tendency of such a flow to create disparity of pressures above and below the column of water and due further to capillary attraction of the holes d^4 and surface tension of the water therein. There is not even a slight initial flow that might be expected before a marked disparity of pressures might be established by the creation of a considerable vacuum on top of the column of water.

The moistener is now ready to perform its function and we will assume that envelopes are delivered to it, an envelope X upon approaching the moistener, the flap side of the envelope being underneath the body of the envelope, encounters the fin d^6, the upturned edge d^7 of the fin inserting itself between the flap and the back of the envelope so that the flap is somewhat opened and directed downward, while the body of the envelope

is passing over the top d^1 of the tank D, and passed over the arms L and L^1 and against the base d of the tank, there passing over the line of holes d^4. It will be observed that the gummed portion of the flap of the envelope passes in contact with the holes d^4. The effect of the frictional engagement of the gummed flap with the base d bearing the holes d^4 is to draw water from the holes due probably partly to suction breaking the surface tension of the water and partly to the affinity of the gum for water. I find that the ungummed portion of the flap gets little or no water which is, of course, highly desirable. The water is withdrawn evenly and at a rate corresponding to the rapidity of the passage of the envelopes. As water is withdrawn air bubbles upward through holes d^4 and the bubbles contacting with the inclined top d^1 of the tank tend readily to travel toward the glass tube F and thence to the top of the column of water. I find it very important that the air bubbles should be afforded this unrestricted passage to the top of the column of water as any formation of the device which would permit them to become "pocketed" before reaching the top of the column of water will result in the formatiom of such a vacuum above the column of water that none will flow from holes d^4 after a brief interval of operation of the device.

Although I have hereinabove set forth certain preferred dimensions of thickness of base, and consequent depth of holes, and diameter of the round holes constituting the water outlet, it is nevertheless obvious that within the scope of my invention, as described and claimed, the size and shape of the water outlet passage may be considerably varied. A very narrow elongated slot will, for instance, serve the purpose of a row of holes; but it is to be noted that if the depth of the holes or slot is increased by adding to the thickness of the base of the tank then a wider opening should be employed in order that there may be a greater weight of water in the passage to offset the increased capillary attraction present in the deeper passage. To obtain the proper balance between the forces of gravity, capillary attraction and "skin" tension of the exposed surface of the water is, indeed, largely a matter of experiment when it is desired to depart from those dimensions given, as may often be the case when a slower or more rapid flow of water is sought because of the requirements of the particular article upon which the device is intended to operate.

It will be readily apparent from the foregoing that my device affords ease and convenience of filling and the machine embodying the device may be readily moved about without fear of spilling water as is the case where a device is employed having a wick or roller inserted in a tank wherein there is a body of water which may spill out of the tank opening adjacent to the roller or wick. Moreover the maintenance of a certain water level is not a necessity in my device. As water flows downward through the holes d^4 it is impossible for them to become clogged with gum as is the case with a wick, and moreover the wearing out of the wick because of frictional contact with the envelope flaps is not a trouble to be met with in my device wherein the envelope flaps contact with a smooth metallic surface.

Should it be desired to use such a moistener as I have above described in connection with a machine wherein the envelopes are fed with the flap sides uppermost, such machines for instance as those shown in my patents for envelope sealing machines No. 1,194,568 of August 15, 1916, and No. 1,365,803 of January 18, 1921, my moistener may be readily adapted for use in connection with such machines by locating the small holes d^4 on the plate d^1 and giving the plate d^1 the desirable rounded contour in proximity to the water outlet.

Having thus fully described my invention, what I claim is:

1. A moistening attachment for envelope sealing machines, gummed tape dispensers and the like, in which the article to be moistened is passed across the moistener, comprising a tank, means whereby said tank may be airlocked above the level of water contained therein, said tank being provided with a water-outlet passage located below the level of the water as it is maintained in said tank in the normal operation of said device, said water outlet passage communicating directly with the body of water in said tank and being of restricted size such that water will not flow normally therefrom when the top of said tank is airlocked, the outer surface of said tank in proximity to said outlet passage being so arranged that a strip of material to be moistened, when passed across the mouth of said passage, may be pressed close thereto and operate to draw water therefrom against the influence of the air lock.

2. A moistening attachment for envelope sealing machines, gummed tape dispensers and the like, in which the article to be moistened is passed across the moistener, comprising a tank, means whereby said tank may be airlocked above the level of water contained therein, said tank being provided with a water-outlet passage located in the base of said tank, said water outlet passage communicating directly with the body of water in said tank and being of restricted size such that water will not flow normally therefrom when the top of said tank is airlocked, the outer surface of said tank in proximity to said outlet passage being so ar-

ranged that a strip of material to be moistened, when passed across the mouth of said passage, may be pressed close thereto and operate to draw water therefrom against the influence of the air lock.

3. A moistening attachment for envelope sealing machines, gummed tape dispensers and the like, in which the article to be moistened is passed across the moistener, comprising a tank provided with an offset portion, means whereby said tank may be airlocked above the level of water contained therein, said tank being provided with a water outlet passage in said offset portion and located below the level of the water as it is maintained in said tank in the normal operation of said device, said water outlet passage communicating directly with the body of water in said tank and being of restricted size such that water will not flow normally therefrom when the top of said tank is airlocked, the outer surface of said offset portion of said tank in proximity to said outlet passage being so arranged that a strip of material to be moistened, when passed across the mouth of said passage, may be pressed close thereto and operate to draw water therefrom against the influence of the air lock.

4. A moistening attachment for envelope sealing machines, gummed tape dispensers and the like, in which the article to be moistened is passed across the moistener, comprising a tank, which is provided with an offset portion, means whereby said tank may be airlocked above the level of the water contained therein, said offset portion of said tank being provided with a water outlet located in the base thereof, said water outlet passage communicating directly with the body of water in said tank and being of restricted size such that water will not flow normally therefrom when the top of said tank is airlocked, the outer surface of said offset portion of said tank in proximity to said outlet passage being so arranged that a strip of material to be moistened, when passed across the mouth of said passage, may be pressed close thereto and operate to draw water therefrom against the influence of the air lock.

5. In a device of the character specified the combination of a tank, means whereby the top of said tank may be air locked, means whereby said tank is hingedly mounted at one end thereof, a water outlet in the bottom of said tank adjacent the other end thereof, a rubber closure means mounted beneath said outlet and means whereby said tank may be tilted and caused to bear forcibly against said rubber closure means thereby closing said outlet.

6. In a device of the character specified the combination of a tank, means whereby said tank is hingedly mounted at one end thereof, an arm extending outwardly from said end of said tank, said arm having a divided extremity, a threaded post, a collar adjustably mounted on said post, and a thumb-nut on said post, said thumb-nut being provided with an annular groove into which one part of the divided extremity of said arm loosely enters substantially as and for the purposes specified.

In testimony whereof I have hereunto affixed my signature.

FREDERICK W. STORCK.