

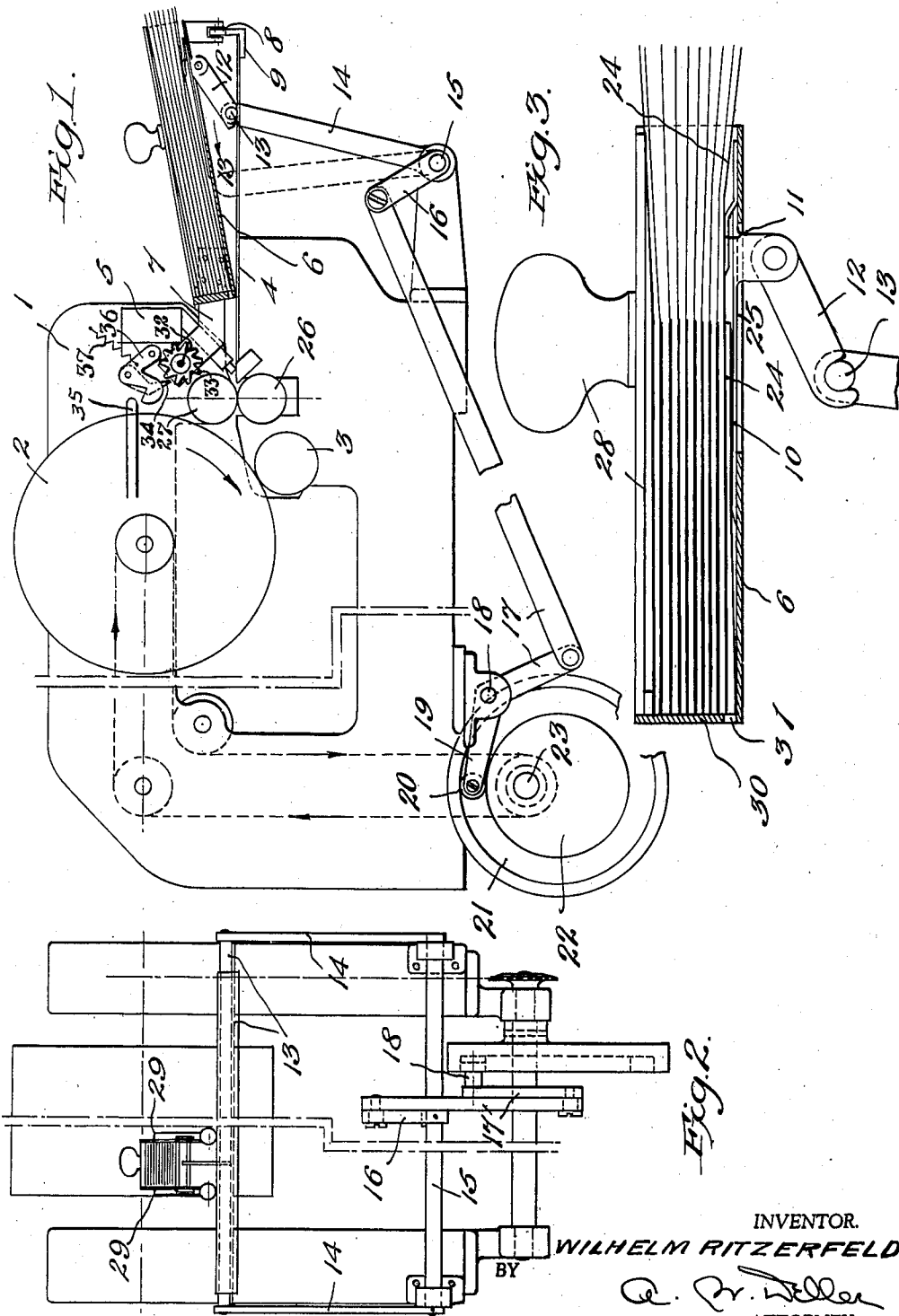
Sept. 13, 1938.

W. RITZERFELD

2,130,101

APPARATUS FOR FEEDING ENVELOPES AND METHOD RELATING THERETO

Filed Sept. 6, 1935



UNITED STATES PATENT OFFICE

2,130,101

APPARATUS FOR FEEDING ENVELOPES AND
METHOD RELATING THERETO

Wilhelm Ritzerfeld, Berlin, Germany

Application September 6, 1935, Serial No. 39,376
In Germany September 7, 1934

9 Claims. (Cl. 101—132)

The present invention relates to an automatic feeding device for paper bags, and more particularly, to a device for automatically feeding paper bags, salary envelopes and the like into a duplicating apparatus adapted to moisten them with a rapidly volatilizing solvent and to print onto them from a copyable mirror-script original.

Heretofore, prior devices of the described character, generally employed a feeding member working on a friction or suction principle. It was usually very difficult to adjust the operation of this member to the degree of friction or suction necessary for assuring correct operation of the device and for preventing simultaneous feeding of bags, envelopes and the like which adhered to each other. Numerous proposals have been made to eliminate these disadvantages of prior feeding devices and to provide a reliable feeding device, but, as far as I am aware, none of these proposals was wholly successful or entirely satisfactory.

I have discovered that it is possible to eliminate all of the aforesaid inconveniences and shortcomings of prior feeding devices and to provide an improved feeding device which is completely reliable and satisfactory in its operation.

It is an object of the present invention to provide an improved feeding device for paper bags and the like which is simple in construction, and reliable in its operation and which avoids the danger of occasionally simultaneously feeding several paper bags which adhere to each other.

It is another object of the present invention to provide a feeding attachment especially adapted to be used on duplicating apparatus working on the copyable mirror-script original principle, which can be easily attached to conventional duplicating apparatus without necessitating any changes therein.

The invention also contemplates the provision of an automatic feeding device adapted to moisten paper bags, envelopes and the like with a rapidly volatilizing solvent, to feed them into a duplicating apparatus and to print onto them from different parts of a copyable mirror-script original so that different envelopes will be printed upon with different texts.

Other objects and advantages of the invention will become apparent from the following description taken in conjunction with the accompanying drawing, in which:

Fig. 1 is a side elevational view, somewhat fragmentary, of an automatic feeding device embodying the invention;

Fig. 2 shows an elevational view of the feeding device shown in Fig. 1 as viewed from the right hand side thereof; and

Fig. 3 illustrates an enlarged and fragmentary side elevational view of the gripper member employed in the automatic feeding device.

According to the principles of my invention, I provide a pile of paper bags, envelopes and the like and a gripper member adapted to slide into the opening of the bags and to conduct them into a feeding position. In most cases and especially for feeding salary envelopes, I prefer to use a gripper member having the form of a flat slide which is provided with one or with a plurality of tongue-like plates extending in the direction of the forward movement of the slide. I also provide means for moving the said slide back and forth in the plane of the bags whereby the slide will slide into the opening of the bag and in co-operation with the tongue-like member will grip the bag and will positively move the same forward. I have found it to be preferable to move the slide or gripper member in the plane of the feed table on which the bags or envelopes have been piled up, so that during the back and forth displacement of the slide always the lowest bag will be engaged and will be moved forward towards the printing drum of the duplicating apparatus. This positive method of feeding permits a tight or close adjustment of the pile by means of friction lining and the like which is placed, for example, on the sides of the feed table whereby the danger of dragging along a plurality of bags or envelopes which have adhered to each other is definitely avoided. I have also found that moving the gripper member in the plane of the feed table assures the further advantage of having a common working and feeding plane. With the present device, it is not necessary to readjust the feeding table at any time or to give to it a curve-like construction or shape because the bags or envelopes will automatically fall into the working plane of the feeding device or gripper member in consequence of their own weight or of an additional weight placed, if necessary, on top of the pile of bags.

In order to make my automatic feeding device more adaptable to conventional duplicating apparatus, I usually prefer to provide the device in the form of a removable auxiliary attachment on top of the feeding table proper which is used when sheets or forms of papers are fed into the apparatus by hand. According to further principles of my invention, I arrange the automatic feeding device slidably and parallel to the

axis of the printing drum so that it can be easily displaced in this direction and can be printed onto by different parts or sections of the copyable mirror-script original. This sliding displacement of the feeding device can be obtained by different conventional means, such as, for example, by means of a worm or threaded shaft intermittently driven from the printing drum by means of a ratchet wheel and pawl.

Referring now more particularly to the drawing, a machine frame (1) has a printing drum (2) rotatably arranged therein and adapted to co-operate with a counter pressure roller (3). In the front of the printing drum, a stationary feeding table (4) is arranged for feeding letters, forms and the like by hand. A moistening device (5) is positioned in the proximity of the printing drum to moisten the letters, forms and the like with a rapidly volatilizing solvent. On the top of a feed table proper (4), a smaller auxiliary feeding table (6) is mounted and is fastened to one end of a moistening device (5) by a connecting piece (7). The other end of the auxiliary feeding table rests on a roller (8) which travels on a rail (9) which is mounted at the rear of the feed table (4) and parallel to the axis of the printing drum. Within feeding table (6), a gripper member having the form of a flat slide (10) is slidably arranged. The gripper member carries on its upper side a tongue-like plate (11) extending in the direction of the forward movement of the slide.

A connecting lever (12) is jointly connected at one end to the lower face of slide (10) and is provided at the other end with a semicircular cut-out portion by means of which the lever grips a transverse rod (13) which is arranged parallel to the axis of the printing drum. The transverse rod rests in arms (14) rigidly connected to shaft (15) which is rotatably arranged in the machine frame (1). Shaft (15) also carries a rigidly connected lever (16) which co-operates with lever rods (17). These lever rods in turn are connected to one end of a bell lever (19) which is pivoted in a pivot (18) and which is provided with a roller (20) at its other end. This roller runs in an endless cam groove (21) of an eccentric disc (22) rigidly connected to a drive shaft (23) which rests in the machine frame. The cam groove of the eccentric disc (22) will produce a swinging movement of roller (20) which will be transmitted to shaft (15) by means of levers (16), (17) and (19). The transverse rod (13) resting in arms (14) will perform an oscillating movement parallel to its own axis. This oscillating movement is transferred to slide (10) by means of lever (12) resting on transverse bar (13). The salary envelopes, bags or the like (24) are piled up on top of slide (10) with their opening (25) facing downwards.

The closing flaps of the envelopes extend over the slide and the tongue-like plate (11) which are located underneath the closing flap of the envelope (24) on the bottom of the pile in the initial position of the slide (10). During the forward movement of the slide, the tongue-like plate will move underneath the flap towards and into opening (25) until the open edge of the envelope strikes against the connection between the slide and the tongue. At this moment, the bag will be engaged and moved off the feed table (6) in between the conveying rollers (26) and (27) which further convey the envelope between the printing drum and the counter pressure roller. On its way to the printing drum, the en-

velope is moistened with a rapidly volatilizing solvent by means of a moistening device (5). In some cases, the conveying rollers (26) and (27) may be omitted without any difference in the operation of the feeding device.

The bags or envelopes are preferably weighted down by a weight (28) placed on top of the pile of the envelopes in order to insure uniform pressure on the lowest envelope and thereby reliability of the feeding operation. In order to eliminate the danger of dragging along envelopes which adhere to each other, adjustable friction lining (29) is provided on both sides of the pile. In addition, it is advisable to provide a plate or wall (30) at the front edge of the feeding table (6) in contact with the front edges of the envelopes. A narrow slot (31) is provided between this wall and the front edge of the feeding table sufficient to permit the passage of the lowest envelope.

Usually each bag or envelope is to be printed onto with a different line of the copyable mirror-script original. This arrangement is especially useful in connection with the printing of salary envelopes. For this reason, the feeding device or the feeding table (6) is intermittently and automatically displaced by the width of a line dependent on the rotation of the printing drum whereby each salary envelope will be printed with a different line of the mirror-script original. This lateral displacement will not interfere with the oscillating movement of the gripper member or slide (10) which is transmitted by means of the transverse rod (13) on which the connecting lever (12) slidably rests and engages the slide (10). The intermittent and lateral displacement of the feeding device has to be accompanied by a similar displacement of the moistening device in order to be able to copy single lines of the original. This is accomplished by the provision of a rigid connecting piece (7) between the feeding table and the housing of the moistening device. The lateral displacement of the moistening device and of the feeding device is accomplished by means of the threaded or worm shaft (32) which is intermittently rotated, for example, by means of a ratchet wheel (33) and pawl (34). Pawl (34) is pivotally mounted on a lever (36) held by a spring (37) and is intermittently actuated by means of catch (35) attached to the drum.

From the foregoing description the operation of my automatic feeding device will be readily understood by those skilled in the art.

During the operation of the duplicating apparatus, the printing drum (2) will drive shaft (23) and the eccentric disc (22) connected thereto by means of a chain drive indicated by the broken line in the drawing. Roller (20) and bell lever (19) will perform a swinging movement which by means of lever rods (17) will be communicated to shaft (15). A transverse rod (13) which is rigidly connected to shaft (15) by means of arms (14) will alternately swing back and forth in the direction of the arrow and will by means of lever (12) communicate this movement to slide (10). At each forward movement of the slide, tongue (11) will enter the opening of the envelope on the bottom of the pile and will transfer the same to the conveying rollers (26) or directly to the printing drum. The envelope will be simultaneously moistened in the width of one line by moistening device (5) and passing through printing drum (2) and counter pressure roller (3) will be printed with the corresponding line of the copyable mirror-script original. After this

part of the printing procedure has been finished, catch (35) arranged on one side of the printing drum will displace pawl (34) by means of lever (36). The ratchet pawl (34) will displace the ratchet wheel (33) by one tooth thereby turning shaft (32) with a corresponding part of one revolution and by means of the thread on the surface of the shaft will displace both the moistening device as the feeding device rigidly connected to the former by the width of one line. During this time slide (10) has been already moved back into its initial position by means of the disc (22) and the members co-operating therewith, so that a new feeding and printing operation may be started in the described manner.

Although I have described my invention in connection with one embodiment thereof, it is to be understood that variations and modifications are possible and will readily suggest themselves to those skilled in the art. These modifications and variations are to be considered as within the true scope and spirit of my invention as disclosed in the present specification and as defined by the appended claims.

I claim:

1. In a duplicating apparatus having a printing drum bearing copyable mirror-script original and a counter pressure roller co-operating with said drum, the combination which comprises a feeding table in proximity of said printing drum adapted to receive and to hold a plurality of envelopes piled on top of each other with their flaps out and their opening down and capable of being displaced parallel to the axis of said printing drum, moistening means rigidly connected to said displaceable table to moisten a strip of said envelopes with a rapidly volatilizing solvent, a gripper member adapted to slidably move back and forth normally to the axis of said printing drum, and to engage the lowest of said envelopes by entering the opening thereof whereby said lowest envelope will be engaged by said gripper member and will be moved forward in between the said printing drum and said counter pressure roller during the forward movement of said gripper member, and will be printed onto by a part of the copyable mirror-script original corresponding to the position of said slidable feeding table in relation to the printing drum.

2. In a duplicating apparatus having a printing drum bearing copyable mirror-script original and a counter pressure roller co-operating with said drum, the combination which comprises a feeding table holding a plurality of envelopes with their flaps out and their opening down and adapted to be displaced parallel to the axis of said printing drum and vertically to the direction of feeding, means displacing said table by steps in relation to the printing drum, moistening means rigidly connected to said displaceable table to moisten a strip of said envelopes with a rapidly volatilizing solvent, a slide member having a tongue-like plate extending towards the opening of said envelopes slidably arranged in the plane of said feeding table and underneath the flap of the lowest envelope, means for moving said slide member back and forth normally to the axis of said printing drum and in relation to said drum whereby said tongue-like plate will enter the opening of said lowest envelope, will engage and move same in between said printing drum and said counter pressure roller during the forward movement of said slide member, and said envelope will be printed onto by a part of the mirror-script original corresponding to the po-

sition of said displaceable feeding table in relation to the printing drum.

3. In a duplicating apparatus having a printing drum bearing copyable mirror-script original and a counter pressure roller co-operating with said drum, the combination which comprises a displaceable feeding table holding a plurality of envelopes with their flaps out and opening down, means including a ratchet and a threaded shaft operated by said printing drum for displacing said table by steps parallel to the axis of the printing drum, moistening means rigidly connected to said displaceable table to moisten a strip of said envelopes with a rapidly volatilizing solvent, a slide member having a tongue-like plate slidably arranged in the plane of said feeding table and underneath the lowest envelope, a transverse bar resting in arms and driven by the printing drum to swing normally to the axis of said drum, a jointed lever slidably connecting said bar and said slide member to maintain same in back and forth movement irrespective to transverse displacements of the feeding table whereby said tongue-like plate will enter the opening of said lowest envelope and will move same in between said printing drum and said counter pressure roller, and said envelope will be printed onto by a part of the mirror-script original corresponding to the transverse position of said displaceable feeding table in relation to the printing drum.

4. In a duplicating apparatus having a printing drum bearing copyable mirror-script original, a counter pressure roller co-operating with said drum and a main feeding table for feeding paper sheets into the apparatus by hand, the combination which comprises an auxiliary, and easily removable feeding table for holding a plurality of envelopes with their flaps out and opening down, displaceably mounted on top of said main feeding table, means for transversely displacing said auxiliary table by steps parallel to the axis of the printing drum, moistening means rigidly connected to said auxiliary feeding table to moisten said envelopes with a rapidly volatilizing solvent, a slide-like gripper member adapted to slidably move back and forth in the plane of said auxiliary feeding table underneath the lowest of said envelopes, and having a tongue-like plate extending in the direction of the forward movement thereof whereby said tongue-like plate will enter the opening of said lowest envelope and will engage and move same in between said printing drum and said counter pressure roller and said envelope will be printed onto by a part of the mirror-script original corresponding to the transverse position of said displaceable auxiliary feeding table in relation to the printing drum.

5. The method of feeding envelopes into duplicating apparatus having printing drum bearing copyable mirror-script original and counter pressure roller co-operating with said drum comprising piling up envelopes on top of each other with their flaps out and openings down, engaging the lowest of said envelopes underneath the flap and within the opening, moistening a portion of said envelope with a rapidly volatilizing solvent, pushing the moistened envelope in between said printing drum and said roller to print onto the same transversely, displacing said pile of envelopes parallel to the axis of said printing drum, and repeating said feeding and moistening operation with the next envelope whereby said envelope is fed into said duplicating apparatus and is printed onto by a part of the mirror-script

original corresponding to the transverse position of said pile of envelopes in relation to said printing drum.

6. In a device of the character described, the combination which comprises a feeding table adapted to receive and to hold a plurality of envelopes piled on top of each other with their flaps out and openings down, a slide-like reciprocating member adapted to be slidably moved back and forth substantially in the plane of said feeding table parallel to and in direct contact with the bottom surface thereof, and a tongue-like plate mounted on said reciprocating member and extending in the direction of the opening of said envelopes, said tongue-like plate being constructed and arranged to slide during its rearward movement on the bottom surface of said lowest envelope and its flap without engaging the same and being adapted to engage during its forward movement the interior of said lowest envelope through the opening thereof and to move said engaged envelope forward and off the feeding table in the direction of the closed end of said envelope.

7. In a device of the character described, the combination which comprises a feeding table adapted to receive and to hold a plurality of envelopes piled on top of each other with their flaps out and opening down, a slide-like reciprocating member adapted to be slidably moved back and forth substantially in the plane of said feeding table and underneath the lowest of said envelopes parallel to and in direct contact with the bottom surface thereof, a tongue-like plate mounted on said reciprocating member and extending in the direction of the opening of said envelopes, said tongue-like plate being constructed and arranged to slide during its rearward movement on the bottom surface of said lowest envelope and its flap without engaging the same and being adapted to engage during its forward movement the interior of said lowest envelope through the opening thereof, and means for moving said slide-like reciprocating member back and forth to cause engaging and feeding of an envelope in the direction of the closed end thereof for each reciprocation of said slide-like member.

8. In a device of the character described, the combination which comprises a feeding table adapted to receive and to hold a plurality of envelopes piled on top of each other with their

flaps out and their opening down, friction-lined side walls at both sides of said envelopes, a plate located in front of said envelopes and having a narrow slot for the lowest of the same, a slide-like reciprocating member adapted to be slidably moved back and forth substantially in the plane of said feeding table and underneath the lowest of said envelopes parallel to and in direct contact with the bottom surface thereof, a tongue-like plate mounted on said reciprocating member and extending in the direction of the opening of said envelopes, said tongue-like plate being constructed and arranged to slide during its rearward movement on the bottom surface of said lowest envelope and its flap without engaging the same and being adapted to engage during its forward movement the interior of said lowest envelope through the opening thereof, and means for moving said slide-like reciprocating member back and forth to cause engaging and feeding of an envelope in the direction of the closed end thereof for each reciprocation of said slide-like member.

9. In a device of the character described, the combination which comprises a feeding table adapted to receive and to hold a plurality of envelopes piled on top of each other with their flaps out and their openings down, friction-lined side walls at both sides of said envelopes, a plate bearing against the closed edges of said envelopes, a narrow slot in said plate substantially in the plane of the lowest of said envelopes, a slide-like reciprocating member adapted to be slidably moved back and forth underneath the lowest of said envelopes parallel to and in direct contact with the bottom surface thereof, a tongue-like plate mounted on said reciprocating member and extending in the direction of the opening of said envelopes, said tongue-like plate being constructed and arranged to slide during its rearward movement on the bottom surface of said lowest envelope and its flap without engaging the same and being adapted to engage during its forward movement the interior of said lowest envelope through the opening thereof, and means including a cam and a lever mechanism to move said reciprocating member back and forth to cause engaging and feeding of an envelope in the direction of the closed end thereof for each reciprocation of said slide-like member.

WILHELM RITZERFELD.