Inventor

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By: Assistant
APPARATUS FOR FEEDING ENVELOPES OR THE LIKE FROM A STACKED PILE


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1 Claim. (Cl. 271 — 20)

This invention relates to apparatus for feeding envelopes, documents and the like from a stacked pile.

Apparatus of this kind are known in which the envelopes and the like are fed up in a bottomless holder wherein they are supported on two fixed ledges or the like provided along the lower edges of two opposite sides of the holder, the envelopes or the like being removed therefrom by a suction mechanism and delivered to means for carrying them away. It has also been proposed to support the pile of envelopes or the like against removable supporting fingers and successively remove the envelopes or the like by suction nozzles pivotally mounted on a displaceable shaft. The object of the present invention is to provide an apparatus of the kind referred to provided with suction nozzles and the construction of which is substantially simplified as compared with the apparatus hitherto proposed.

The invention consists in an apparatus for feeding envelopes, documents and the like from a pile comprising a bottomless holder for the said pile having two fixed ledges or the like provided along the lower edges of two opposite sides of the holder to support the pile, at least one suction nozzle located underneath the pile, means for mechanically actuating the said nozzle in such a manner that it is first brought into contact with the lowermost envelope and caused to grip the same by suction, then moved rearwardly with respect to the direction in which the envelope is to be fed so as to disengage the forward edge of the envelope from the ledge or like support of the pile and then lowered away from the bottom of the pile and moved forwardly so as to detach the lowermost envelope from the pile and deliver it and means for carrying away the envelope that has been delivered, the said nozzle actuating means including a transverse shaft to which the nozzle is secured and which runs parallel to the said ledges, two pivoted arms arranged at right angles to and on either side of the said transverse shaft and having longitudinal slots into which engage the ends of the transverse shaft, a cross bar connecting together the free ends of the said pivoted arms, a rocking shaft arranged below the slotted arms and two rocking levers secured at one end to the said rocking shaft and having forks at their free end engaging with the transverse shaft to which the nozzle is secured.

Referring to the accompanying drawing showing the apparatus in part sectional elevation, a pile of envelopes or the like b are stacked in the holder 8, being supported therein on two ledges 49, 50 which project under the opposite edges of the lowermost envelope in the pile, thereby supporting the stack whilst allowing free access to the underside of the lowermost envelope. The ledges 49 and 50 extend transversely to the direction in which the envelopes are to be fed from the bottom of the pile. The holder 8 may conveniently be open at its upper end so that fresh envelopes can be added to the pile for the purpose of replenishing the same when necessary by simply dropping the envelopes on to the top of the pile. Mounted below the holder 8 is a pneumatic suction nozzle 51, attached to a shaft 52 which extends horizontally beneath the pile of envelopes b in a direction parallel to the ledges 49 and 50. If desired two or more such nozzles 51 may be mounted on the shaft 52. The latter shaft is fixed at its ends to two slides which are mounted to move in slots or slide ways formed in two arms extending approximately horizontally below the pile of envelopes and on either side at right angles to the shaft 52. One of these arms is shown at 53. The two arms are attached together at their rear ends by means of a cross bar 54 and are supported on pivots at their forward ends, the pivots being attached to fixed supports 55. The arms 53 are rocked by means of a cam or like mechanism (not shown) so as to raise the nozzle or nozzles 51 sufficiently to bring them into engagement with the lowermost envelope in the stack of envelopes, to dwell in this position for a short time and then to lower the nozzle or nozzles and to dwell in the lower position, this cycle of movement of the arms being regularly repeated.

The movement of the slides in the slots or slide ways in the arms 53 is controlled by a pair of levers 56 each of which is fixed at one end to a rock shaft 57 mounted below the arms 53. The levers 56 are in alignment with one another so that only one of them is seen in the drawing. The free end of each lever 56 is provided with a fork 55 which embraces the shaft 52, the fork being so designed as to accommodate the raising and lowering movement controlled by the arms 53, whilst allowing the lever 56 to control the movement of the shaft in the direction of the slots in the arms 53. The rock shaft 57 is mechanically actuated by a cam or the like (not shown) so that during the dwell at the lower end of the rocking movement of the arms 53 the shaft 52 is moved forwardly and then partially retracted to a position intermediate its extreme forward and rear positions, where it pauses whilst
the arms 53 receive their upward movement. During the dwell at the upper end of the movement of the arms 53, the rock shaft completes its rearward movement along the slots or slideways in the arms 53 and then after the arms have again moved downwards, recommences its forward movement at the start of the next cycle of operations.

Suitable means is provided for establishing suction at the nozzle or nozzles 51 at or just before the end of each upward movement of the arms 53 and for releasing the suction at the end of each forward movement of the shaft 52 along the slots or slideways in the arms 53. A pair of feed rollers 59, 60 or other gripping means are provided to receive the envelopes from the nozzle or nozzles and to carry them away.

In the operation of the mechanism the holder 5 is kept supplied with envelopes by depositing additional ones on the top of the pile as and when required. During each cycle of operation of the mechanism the suction nozzle or nozzles 51 move rearwardly beneath the pile until they reach the position shown in full lines in the drawing, being then lifted by the upward movement of the arms 53 to the position shown in dotted lines. The nozzles are thus brought into engagement with the lower surface of the lowest envelope, whereupon they grip the same by suction.

The continued rearward movement of the suction nozzle or nozzles then moves the lowermost envelope rearwardly so as to disengage its forward edge from the supporting ledge 56. During this action the nozzles move to the position marked y and the portion of the lowermost envelope which lies between the nozzle or nozzles and the ledge 49 is buckled as indicated by the broken line z. The envelope is thus partly separated from the pile. The nozzle or nozzles now move downwards so as to detach the envelope from the pile and then move forwards so that the rear edge of the envelope is withdrawn from the ledge 43 and the envelope is fed forward and delivered to the gripping rollers 59, 60 for carrying it away, and delivering it on to the table 7. The gripping rollers are arranged to receive the envelope from the suction nozzle or nozzles when the latter reach the position marked q and the mechanism controlling the supply of suction to the nozzles is arranged to release the suction when the nozzles reach this position so that the envelope is freed therefrom.

I claim:

Apparatus for feeding envelopes, documents and the like from a pile comprising a bottomless holder for the said pile having two fixed ledges or the like provided along the lower edges of two opposite sides of the holder to support the pile, at least one suction nozzle located underneath the pile, means for mechanically actuating the said nozzle in such a manner that it is first brought into contact with the lowermost envelope and caused to grip the same by suction, then moved rearwardly with respect to the direction in which the envelope is to be fed so as to disengage the forward edge of the envelope from the ledge or like support of the pile and then lowered away from the bottom of the pile and moved forwardly so as to detach the lowermost envelope from the pile and deliver it and means for carrying away the envelope that has been delivered, the said nozzle actuating means including a transverse shaft to which the nozzle is secured and which runs parallel to the said ledges, two pivoted arms arranged at right angles to and on either side of the said transverse shaft and having longitudinal slots into which engage the ends of the transverse shaft, a cross bar connecting together the free ends of the said pivoted arms, a rocking shaft arranged below the slotted arms and two rocking levers secured at one end to the said rocking shaft and having forks at their free end engaging with the transverse shaft to which the nozzle is secured.

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