

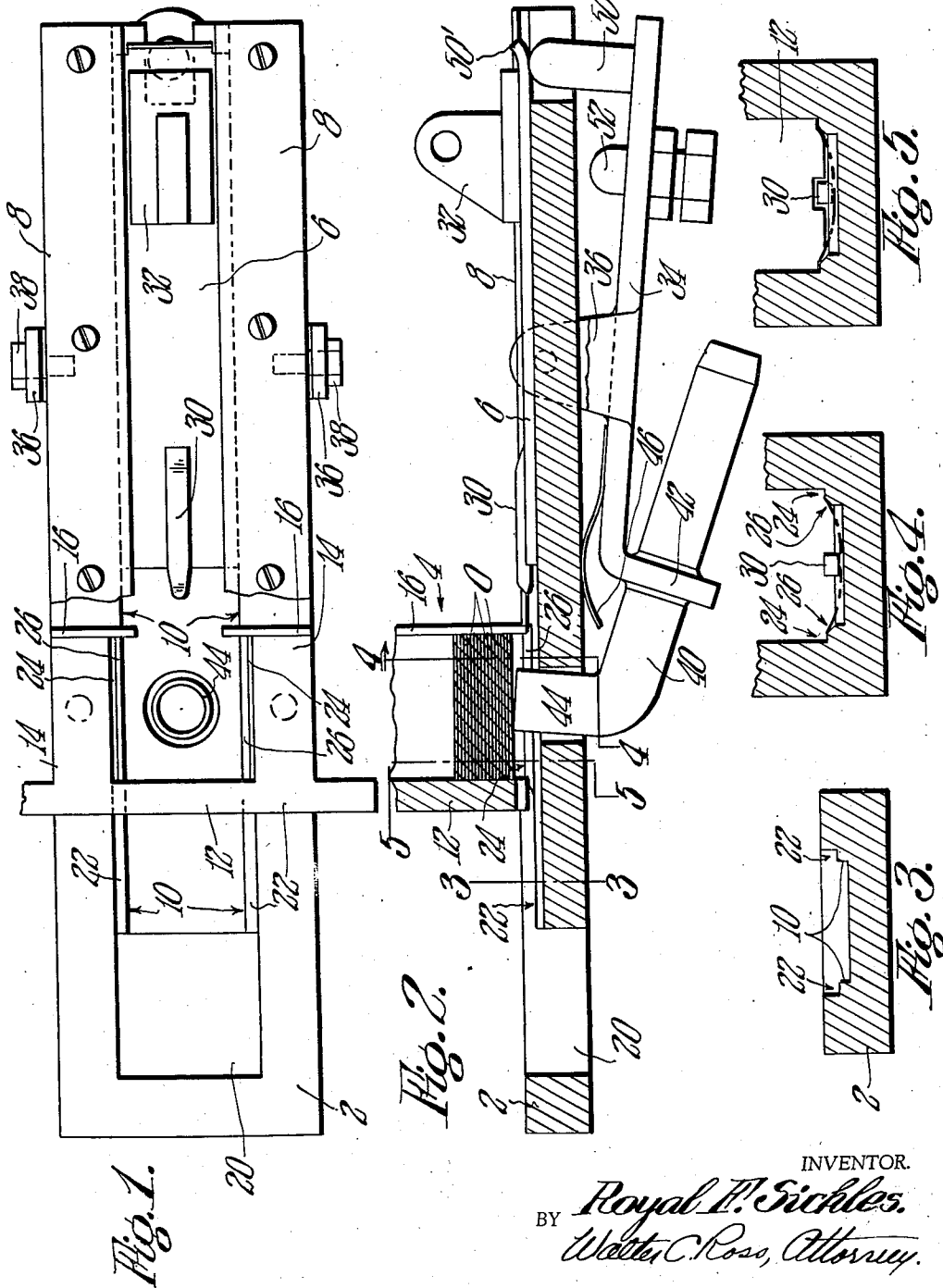
Sept. 19, 1944.

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2,358,742

DISPENSING APPARATUS

Filed April 3, 1943



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UNITED STATES PATENT OFFICE

2,358,742

DISPENSING APPARATUS

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Application April 3, 1943, Serial No. 481,763

4 Claims. (Cl. 271—32)

This invention relates to apparatus for dispensing or delivering successive objects from a supply thereof.

The principal objects of the invention are directed to a novel apparatus for dispensing or delivering successive relatively flat and thin objects from a supply thereof.

The novel features of the invention are adapted for broad application but is particularly adapted for use in connection with such small flat and thin objects as the mica plates which are laminated with metal foil in the manufacture of condensers.

Such condensers are relatively small and include small plates of thin mica, from one to a few thousandths of an inch in thickness. These plates are difficult to handle and assemble with the metallic foil of the condenser.

The mechanism of this invention is characterized by means for separating successive mica blanks from a supply thereof, such as a stack, and delivering them singly whereby the same may be readily handled thereby to overcome the difficulties experienced in picking up the blanks and handling them as is necessary in condenser manufacture.

While reference is made to mica blanks it will be understood that the invention is adapted for the dispensing of other similar flat and thin objects of various dimensions and shapes.

The invention in the form at present preferred will be described in connection with the accompanying drawing, wherein:

Fig. 1 is a plan view of an apparatus embodying the novel features of the invention;

Fig. 2 is a longitudinal sectional elevational view through the apparatus shown in Fig. 1;

Fig. 3 is a sectional elevational view on the line 3—3 of Fig. 2; and

Figs. 4 and 5 are similar views respectively on the lines 4—4 and 5—5 of Fig. 2.

Referring now to the drawing more in detail, the invention will be fully described.

A support is shown at 2 on which is a vertically disposed magazine 4 for a supply of objects to be dispensed.

An ejector 6 which is relatively thin and flat is slidable in the support, guides 8 being provided for maintaining the ejector in its guideway 10. The ejector is movable back and forth so that its forward end passes beneath the magazine to transfer an object therefrom to an opening 20 in the support.

The magazine 4 has vertical forward, side and rear walls 12, 14 and 16 adapted to hold a stack of flat, thin objects such as mica plates.

In the form of the invention shown the magazine is adapted for objects 0 that are substantially square but it may be adapted for objects of various other sizes and shapes.

There are ledges 22 forwardly of the magazine at opposite sides of the guideway 10. There are disposed in planes above that of the bottom side or floor of the guideway 10 ledges 22 on which side edges of an object slide when being transferred by the ejector 6 from the magazine.

Ledges 24 at opposite sides of the magazine and above the plane of ledges 22 are provided to support opposite side edges of the lowermost object of the stack and thereby support said stack. Adjacent inner sides 26 of the ledges 24 are inclined inwardly and downwardly as shown in Figs. 4 and 5.

A prong 30 is carried by the forward end of the ejector and projects therebeyond. It preferably has an upper side in a plane above the plane of the ejector. The ejector 6 may be operated in any convenient manner as by an operating member connected to a bracket 32 carried thereby.

A separator 34 has ears 36 on opposite sides that are swingable on pivot members 38 in engagement with the support. A tube 40 secured to a portion 42 of the separator has an object engaging forward end 44. The tube 40 is adapted for connecting to a suitable source of suction so that its end 44 may suctionally engage the lowermost object of the stack.

Spring means which may consist of a flat leaf spring 46 has one end secured to member 34 while its other end bears on the underside of the support. The spring urges the separator counterclockwise from the position shown.

A projection 50 carried by the separator is adapted to be engaged by the rear curving end 50' of the ejector when approaching its rear non-ejection position shown so as to swing the separator clockwise. A stop 52 is carried by the ejector 34 which abuts the support when the ejector moves forwardly towards the magazine and limits its counterclockwise movement of the separator when acted upon by spring 46.

With tube 40 connected to a source of suction and the ejector moved back and forth the operation is substantially as follows:

In the position shown the tube end 44 acting on the lowermost object 0 elevates the stack to some extent from off the ledges 24 and said tube suctionally engages said lowermost object.

As the ejector 6 moves towards the magazine its end 50' passes off the projection 50 so that spring 46 moves the separator counterclockwise to the limit of its movement. The stack of objects descends so that the lowermost object rests on ledges 24 and said lowermost object being engaged by tube end 44 it is bowed downwardly thereby to the positions shown in dot-dash lines in Figs. 4 and 5.

The ejector in moving forwardly into the magazine has its prong 30 so constructed that it may overlies the object bowed downwardly by

the tube. The inclined surfaces 26 permit the bowing of the lowermost object which separates it from the object next above and the prong 30 enters between these two objects.

As the ejector 6 moves forwardly with its prong over the object and its forward end engaging the rear edge of the object the lateral edges of said object pass onto and slide along the ledges 22 until it arrives at the opening 20.

Thus as the ejector 6 advances so that its forward end engages the rear edge of the lowermost object, which is bowed downwardly by tube 44 with its side edges on ledges 24, the prong 30 engages the upper sides of the object. As the ejector moves the object from beneath the stack the side edges of the object slide down onto ledges 22 on which they slide to opening 20. The prong 30 is preferably so arranged relative to the ledges 22 that the prong presses slightly downwardly on the object as it slides along on ledges 22 thereby to maintain the bowed condition of the object whereby it moves forwardly without shifting relative to the ejector.

The tube 44 as it moves upwardly for engaging the lowermost object may as stated elevate the stack to some extent so as to jog the objects and overcome sticking together thereof. The prong 30 may also in its reciprocating movements elevate the stack for the same purpose.

Various changes and modifications may be made in the form of the apparatus to adapt it for operation with various objects without departing from the spirit and scope thereof.

What it is desired to claim and secure by Letters Patent of the United States is:

1. Apparatus for separating and delivering the lowermost relatively thin object from a stack thereof comprising, a support having a guide way for an ejector, a magazine extending upwardly from said guide way for positioning the lowermost object of a stack of objects therein over said guide way, an ejector slidable back and forth in said guide way having a forward end edge for engaging said lowermost object as the said ejector slides forwardly in said guide way, ledges below said magazine at opposite sides of the guide way for supporting opposite sides of said lowermost object, a prong at the forward portion of the ejector projecting forwardly thereof for overlying said lowermost object as the ejector slides forwardly, a separator for suctionally engaging said lowermost object to bow it downwardly into said guide way whereby said prong may overlie the said object as the forward end edge of the ejector engages the object when said ejector slides forwardly, said separator being movable between an object engaging position and a position away therefrom, and means on said separator engageable by said ejector whereby the former is actuated by the latter.

2. Apparatus for separating and delivering the lowermost relatively thin object from a stack thereof comprising, a support having a guide way for an ejector, a magazine extending upwardly from said guide way for positioning the lowermost object of a stack of objects therein over said guide way, an ejector slidable back and forth in said guide way having a forward end edge for engaging said lowermost object as the said ejector slides forwardly in said guideway, ledges below

said magazine at opposite sides of the guide way for supporting opposite sides of said lowermost object, a prong at the forward portion of the ejector projecting forwardly thereof for overlying said lowermost object as the ejector slides forwardly, a separator for suctionally engaging said lowermost object to bow it downwardly into said guide way whereby said prong may overlie the said object as the forward end edge of the ejector engages the object when ejector slides forwardly, said separator being movable on said support between an object engaging position and a position away therefrom, and means on said separator engageable by said ejector when in its rear position whereby the former is actuated by the latter.

3. Apparatus for separating and delivering the lowermost relatively thin object from a stack thereof comprising, a support having a guide way for an ejector, a magazine extending upwardly from said guide way for positioning the lowermost object of a stack of objects therein over said guide way, an ejector slidable back and forth in said guide way having a forward end edge for engaging said lowermost object as the said ejector slides forwardly in said guide way, ledges below said magazine at opposite sides of the guide way for supporting opposite sides of said lowermost object, a prong at the forward portion of the ejector projecting forwardly thereof for overlying said lowermost object as the ejector slides forwardly, a separator for suctionally engaging said lowermost object to bow it downwardly into said guide way whereby said prong may overlie the said object as the forward end of the ejector engages the object when the ejector slides forwardly, said separator being swingable on said support between an object engaging position and a position away therefrom, and means on said separator engageable by said ejector as it slides rearwardly whereby the former is actuated by the latter.

4. Apparatus for separating and delivering the lowermost relatively thin object from a stack thereof comprising, a support having a guide way for an ejector, a magazine extending upwardly from said guide way for positioning the lowermost object of a stack of objects therein over said guide way, an ejector slidable back and forth in said guide way having a forward end edge for engaging said lowermost object as the said ejector slides forwardly in said guide way, ledges below said magazine at opposite sides of the guideway for supporting opposite sides of said lowermost object, a prong at the forward portion of the ejector projecting forwardly thereof for overlying said lowermost object as the ejector slides forwardly, a separator for suctionally engaging said lowermost object to bow it downwardly into said guide way whereby said prong may overlie the said object as the forward end of the ejector engages the object when the ejector slides forwardly, said separator being swingable between an object engaging position and a position away therefrom, means on said separator engageable by the rear end of said ejector as it moves rearwardly whereby the former is actuated by the latter to object engaging position, and means for moving said separator away from object engaging position.

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