Feb. 16, 1937. A. E. ALMGREN 2,070,568

STACKING DEVICE

Filed Aug. 15, 1933

Fig. 1

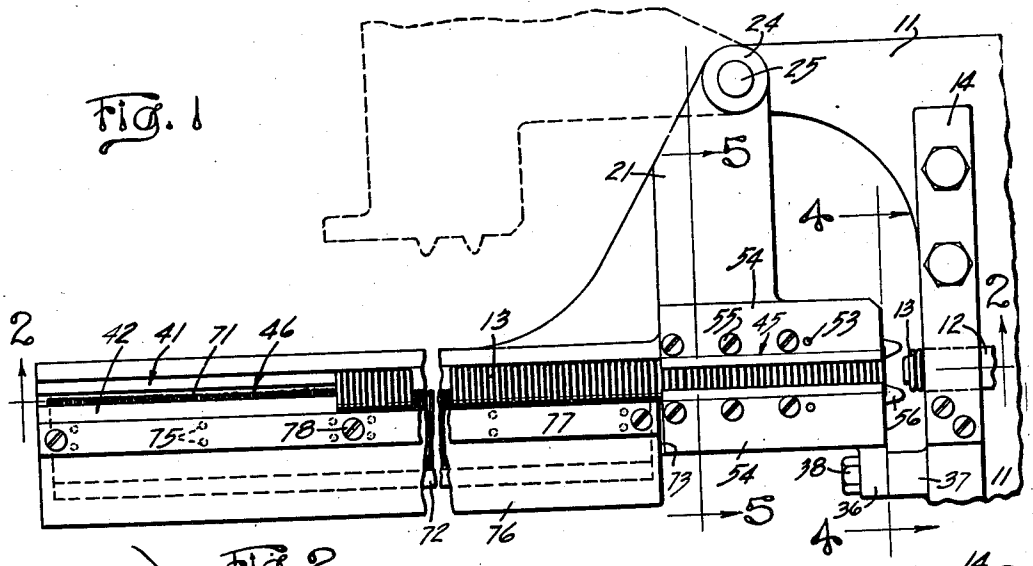


Fig. 2

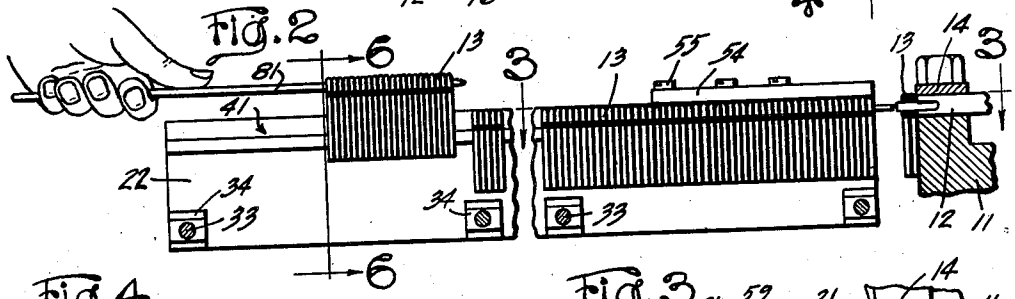


Fig. 4

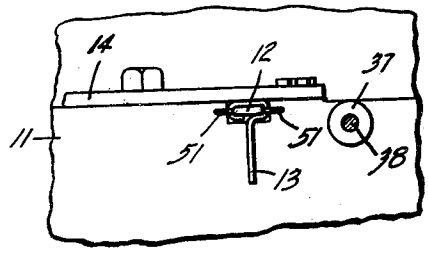


Fig. 3

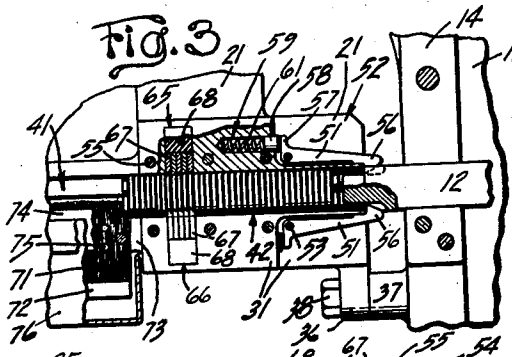


Fig. 5

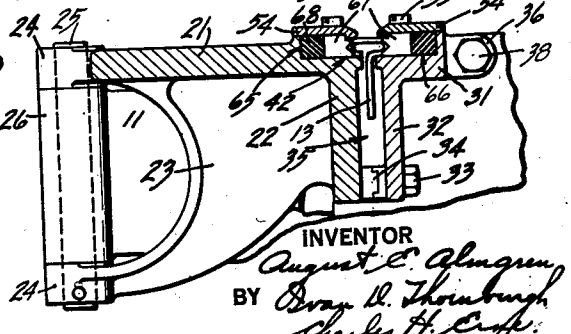
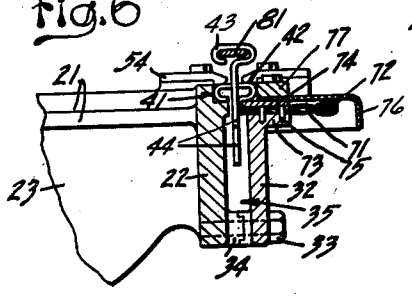


Fig. 6



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STACKING DEVICE

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Application August 15, 1933, Serial No. 685,293

6 Claims. (Cl. 214—7)

The present invention relates to stacking devices and has particular reference to devices which receive stacked and formed articles, such as can opening keys, as they come from key forming machines or from machines adapted to eject the articles in successive order. One embodiment of the invention is herein shown as associated and used with a key forming machine disclosed in my pending application for Letters Patent Serial No. 626,529, filed July 30, 1932, in the United States Patent Office now Patent No. 1,954,791 for "Machine for making can opening keys."

An important object of the present invention is the provision of stacking devices embodying key magazines in which keys are received in successive order, are stacked and the stacked condition maintained while the keys advance through the magazine to the end that quantities of keys may be removed from time to time without disturbing the stacked relation either of the keys removed or those remaining in the magazine.

A further important object of the invention is the provision of stacking devices which may be secured to the discharge end of key forming or other machines and which operate to strip off or hold the keys from feeding parts of such machines, which correctly locate the keys in stacked form as received and which thereafter maintain such stacked relation until, during and following the removal of keys.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawing, discloses a preferred embodiment thereof.

Referring to the drawing:

Figure 1 is a plan view of an apparatus embodying the present invention disclosing its attachment to a key forming machine;

Fig. 2 is a longitudinal section, partly in elevation, as viewed substantially along the line 2—2 in Fig. 1;

Fig. 3 is a fragmentary plan view of the receiving end of the device, with parts broken back and parts removed, the point of view being suggested by the line 3—3 in Fig. 2;

Figs. 4 and 5 are part sectional and part elevational views taken substantially along the lines 4—4 and 5—5 in Fig. 1; and

Fig. 6 is a sectional detail taken substantially along the line 6—6 in Fig. 2 and showing the removal of keys from the magazine.

There is illustrated in the drawing only sufficient of the parts of the key forming machine of my pending application referred to above to provide an attachment for the stacking device and to indicate the key ejecting or discharge elements by means of which the keys are introduced into the stacking device. Such machine parts include a frame 11 (Figs. 1 and 2) and a reciprocating mandrel 12 on which keys 13 may be partially or fully formed, the mandrel having movement in a block 14 bolted to the frame.

While the machine of my pending application ejects a key blank or a partially formed key and while such a key blank is herein shown, in the operation of stacking the shape of the key or key blank is immaterial and accordingly the instant specification and claims will refer to such a key part in its broad sense as a key.

The stacking device or stacker preferably embodies a frame or housing formed with a horizontal section 21 (Fig. 5) and vertical wall 22 joined at one end by a web 23, the parts 21 and 23 being extended into spaced lugs 24 which carry a vertical hingepin 25. This construction provides a pivotal connection for the stacker, the hinge pin being pivotally carried in a lug 26 formed in the machine frame 11.

The stacker also embodies a supplemental frame or housing which is formed with a horizontal section 31 and a vertical wall 32. This supplemental frame is bolted to and carried by the stacker main frame. Bolts 33 (Figs. 2, 5 and 6) secure together portions of the lower edges of the walls 22, 32, spacer lugs 34 being interposed therebetween to keep the frame walls separated.

This relation of parts provides a magazine for receiving the keys the space between the walls constituting a magazine pocket or channel 35 into which the shanks of the keys 13 enter and along which they advance during the stacking operation. The keys are preferably held in a horizontal path while passing through the stacker, this feature having certain advantages, particularly when the keys are to be taken out of the magazine. This will be more apparent as the description proceeds.

The stacker frames with all parts carried thereby may be swung on the pivotal connection 25, 26 relative to the supporting machine frame 11 into working or non-working positions. When the device is in working position it is securely bolted in place as indicated in Figs. 1, 3 and 5. For this purpose the frame part 31 is provided with a lug 36 which is moved into engagement with a projection 37 formed in the frame 11. A

bolt 38 carried in the lug 36 is threadedly secured in the frame projection 37 and clamps the parts against any hinging movement for the stacking operation. The stacking device, however, may be swung back out of key receiving position into the non-working position indicated by the dotted lines in Fig. 1 upon removal of the bolt 38.

The upper corner of the frame section 21 (Figs. 1, 3 and 5) is notched out to form an elongated slot 41 (Figs. 1, 2 and 6) which extends throughout the length of the wall 22 and along its upper edge. In a similar manner a slot 42 is correspondingly formed in the frame part 31 at the top edge of its wall 32 and the keys 13 move along these slots. The key head, designated by the numeral 43, is directly supported upon the horizontal shelf bottoms or shoulders of the slots. The shank of the key, designated by the numeral 44, extends down in the pocket or channel between the walls 22, 32.

To simplify the description of operation of stacking, the magazine may be thought of as comprising two sections, a key receiving section 45 and a stack holding section 46. The former is adjacent the mandrel 12 of the key forming machine and the keys 13 are introduced into the receiving end of this section upon each forward movement of the mandrel 12, this being the ejecting stroke of the key forming machine.

Fingers 51 (Figs. 3 and 4) are located in the end of the magazine section 45 and have slight movement in clearance slots 52 cut in the frame parts 21, 31, there being a finger on each side of the magazine pocket 35. Each finger is pivotally mounted on a pin 53 carried in its associated frame part 21 or 31. These fingers are enclosed and held in working position by plates 54 (Figs. 1 and 5) which are secured by screws 55 to the frame parts.

Such fingers may strip off the key from the mandrel as herein shown or other stripping or ejecting devices associated with the key machine proper may be used to actually deposit the keys in the fingers. In such an alternate construction the fingers 51 will function as holding fingers. In either event the fingers provide holding elements for one side of the key stack in the magazine.

Forward rounded, projecting and hooked ends 56 of the fingers 51 extend beyond the stacker frames on opposite sides of the mandrel 12 and when the mandrel moves into the receiving end of the magazine (Fig. 3) the keys 13 carried thereby move past these hooked ends forcing the fingers outward on their pivotal connections 53. As the mandrel 12 moves back on its return stroke (Fig. 1) the hooked ends 56 of the fingers catch and hold the keys in the magazine.

Each finger 51 is provided with a tail 57 (Fig. 3) which is engaged at all times by a button 58 sliding in a bore 59 cut in the frame 21 or 31, each button being backed up by a spring 61 confined within the bore. This provides the necessary yielding element for the fingers. Each time the mandrel 12 introduces new keys into the magazine all of the keys therein are advanced along the magazine pocket 35.

A pocket 65 (Figs. 3 and 5) is cut in the frame part 21 adjacent one side of the line of travel of the keys and a corresponding pocket 66 is similarly formed in the frame part 31. It may be considered that these pockets are located at or closely adjacent the junction of the key receiving section 45 and the stack holding section 46, although it will be understood that this division of the magazine into sections is only a fanciful one and that no actual physical division exists as to the path of the keys.

A plurality of slide blocks 67 are confined within each of the pockets 65, 66, these blocks being disposed alongside of each other. Each set of blocks is backed up at their rear edges by a rubber cushion 68. The forward edges of the blocks are V-shape and these edges are also beveled. These forward edges normally project within the path of travel of the keys and are engaged by the moving keys during which time the blocks are forced back against their yielding rubber cushions. While permitting passage of the keys a solid stack relationship is maintained insuring correct stacking along the magazine section 45.

After passing the blocks 67 the keys continue to advance as a solid mass throughout the stack holding section 46. The feeding control for the keys in this second or holding section is effected by means of a brush device comprising bristles 71 (Figs. 1, 3 and 6) and a clamping head 72. The former project into the pocket 35 and in the path of the shanks 44 of the advancing keys 13, and the clamping head holds the bristles together.

The brush is rigidly held with its bristles resting upon a shelf 73 formed in the upper part of the wall 32 of the auxiliary stacker frame. The brush bristles are held down on this wall part by a clamping strip 74. Anchor pins 75 extend up from the shelf 73 and project between certain of the bristles of the brush. A protecting cover plate 76 is clamped on the top of the strip 74 by a holding bar 77 and screws 78 passing through the parts 77, 76 and 74 and also extending between the bristles of the brush, are threadedly secured in the shelf portion 73 of the wall locking these parts together as a unit.

In this manner the brush is securely held in its position and accurately controls the passage of the keys preventing misalignment or irregular movement. As the ends of the brush fibres 71 wear out new surfaces are provided by a loosening of the screws 78 to unclamp the brush which is then moved forward to present a new front edge of bristles and to again bring them into the path of travel of the key shanks.

The keys in passing along the edge of the brush remain vertically in their stacked positions and it will be observed that the magazine is entirely open above the key heads. The keys adjacent the outer end of the stack holding section 46 may therefore be easily lifted up or pulled endwise out of the magazine. It is often found desirable to further subject the keys, or key blanks as the case may be, to other operations such as subsequent slotting, flattening or welding to container parts and in any of these or other analogous events the stacked relationship of the keys should be maintained in order to simplify the proper feeding in such subsequent operation machines.

Fig. 2 illustrates a desirable manner of removal of keys vertically from the magazine while maintaining their stacked form. A feed bar 81 (Figs. 2 and 6) or other suitable device may be employed for insertion into the heads of the keys from the end of the stack and this is used to lift a given desired quantity of keys vertically from magazine position.

The stacked relationship of the keys is maintained on the bar and at the same time the re-

maining keys in the magazine are undisturbed. Such a bar 81 may have a cross section shaped to loosely fit within the heads of the keys and to prevent rocking on the bar to the end that the full stacked relationship is maintained during any transfer into other machines.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a stacking device for use with machines adapted to eject formed can opening keys or the like, the combination of a magazine for receiving said ejected keys, a finger located in said magazine for yieldably engaging the said key as it is ejected and for holding it in said magazine and preventing reverse movement thereof, and yielding means arranged on opposite sides of said magazine and engaging between successive keys for holding the same in engagement with one another in stacked relation while in said magazine.

2. In a stacking device for use with machines adapted to eject formed can opening keys or the like, the combination of a magazine having a horizontally disposed pocket for receiving the ejected keys and for guiding them in a horizontal line of travel, a finger cooperating with said magazine for yieldably engaging and holding against reverse movement a said ejected key, and slide blocks arranged on opposite sides of said magazine and yieldably engaging between successive keys for holding the same in stacked relation while in said magazine.

3. In a stacking device for use with machines adapted to eject formed can opening keys or the like, the combination of a magazine having a pocket for receiving the ejected keys and for guiding them in said pocket, a finger cooperating with said magazine for yieldably engaging and holding against reverse movement a said ejected key, slide blocks arranged on opposite sides of said magazine and yieldably engaging between successive keys for holding the same in stacked relation while in said magazine, and means frictionally and yieldably engaging said keys while in said magazine pocket for retarding their movement while permitting their vertical removal from said stack.

4. In a stacking device for use with machines adapted to eject formed can opening keys or the like, the combination of a magazine having a pocket for receiving the ejected keys, fingers located in said magazine for yieldably engaging said keys as they enter said pocket to prevent reverse movement thereof, and slide blocks mounted in said magazine in the path of said keys and adapted to yieldably engage between successive keys to compress the same between said slide blocks and said fingers, whereby said keys are maintained in stacked relation in said magazine.

5. In a stacking device for use with machines adapted to eject formed can opening keys or the like, the combination of a magazine having a key receiving section and a stack holding section, fingers pivotally mounted in said key receiving section for yieldably engaging said keys as received therein and preventing reverse movement thereof, slide blocks located in said magazine receiving section and projecting into the path of travel of said keys to yieldably engage the same and maintain the keys in abutting relation between said blocks and said fingers, and yieldable means located in said key holding section and adapted to engage said keys therein for retarding their movement therethrough, said key holding section permitting unrestricted removal of a plurality of keys therefrom.

6. In a stacking device for use with machines adapted to eject formed can opening keys or the like, the combination of a magazine having a key receiving section and a stack holding section, a pair of fingers pivotally mounted in one end of the said key receiving section for effecting the proper passage of said keys into said magazine, slide blocks arranged in the opposite end of said key receiving section for cooperating with said fingers to maintain the keys in stacked relation within said section, and a holding brush located in said stack holding section and cooperating with said slide blocks to maintain the keys in stacked relation within said holding section the while permitting removal of keys therefrom in stacked form.

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