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FORM SEPARATOR MECHANISM

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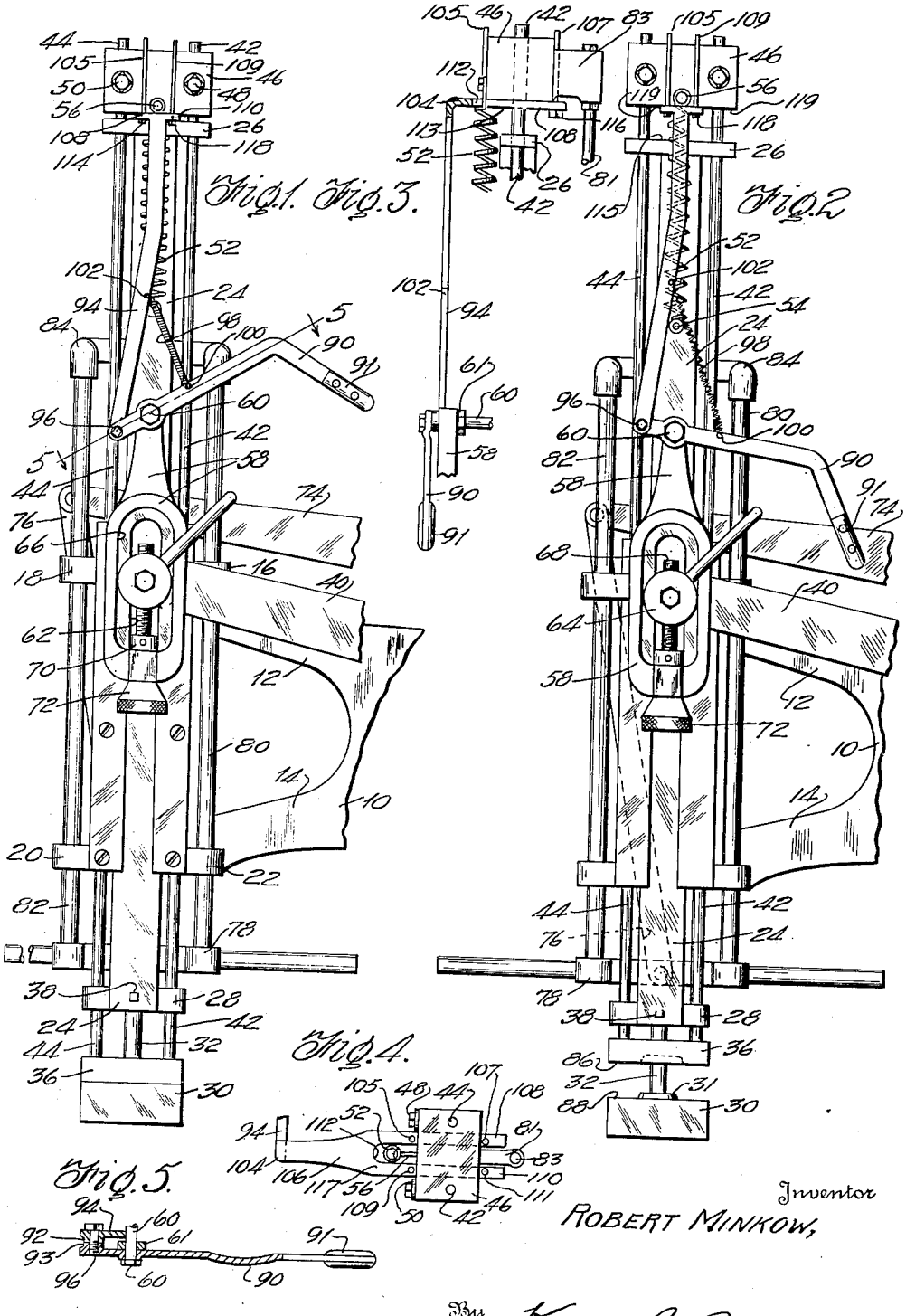


Fig. 1. Fig. 3. Fig. 2. Fig. 4. Fig. 5.

Inventor
ROBERT MINKOW,

By Kimmel & Crowell,
Attorneys

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FORM SEPARATOR MECHANISM

Robert Minkow, New York, N. Y., assignor to Hobbs Sales & Service Station, Inc., New York, N. Y., a corporation of New York

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2 Claims. (Cl. 93—54.2)

This invention relates to box machinery and more particularly to an arrangement for separating the component parts of a form-block.

In the operation of box forming machines glue, adhesive, paper, card-board and other materials may get between the faces of the form-block and either stick the parts together or otherwise interfere with the operation.

One object of this invention is to provide a new and improved construction of the class described. Another object is to provide means for facilitating the removal of the foreign matter heretofore described from between the faces of a form-block. Another object is to provide means for this purpose which does not require holes to be drilled in the existing machinery. Another object is to provide means which is simple and easy to apply. A further object is to provide an arrangement of the type contemplated with fewer parts. Another object it to provide a means which can serve to separate the component parts of the form-block. Other objects are: to provide such means which is suitable for use in connection with different types of boxes; to provide a device which may be applied to an adjustable machine but which device will continue to operate independently of the adjustments which are made in the machine. Other objects of this invention will appear in the following description when taken in connection with the accompanying drawing.

In the drawing, wherein corresponding parts in the various figures are indicated by the same numerals, Fig. 1 is a front elevation of the form-block part of the machine incorporating features of this invention. Fig. 2 is a similar view with the device operated to separate the elements of the form-block. Fig. 3 is a partial side elevation of the device as viewed from the right hand side of Fig. 2. Fig. 4 is a partial top plan view of Fig. 3. Fig. 5 is a partial section on line 5—5 of Fig. 1.

Considering the drawing in greater detail, the invention contemplates means to be applied to machines of a type well known in the art and described in the Patent 1,131,792 to Reifsnyder et al. of 1915. The entire structure of the machine has not been shown because persons skilled in the art are thoroughly acquainted with such machinery.

The frame of a machine of the type illustrated in the Reifsnyder patent supra, is indicated at 10 and includes a bracket portion which is bifurcated having the arms 12 and 14 supporting at their outer ends a bearing structure having upper bearing blocks 16 and 18 and lower bearing blocks 20 and 22 and an interconnecting housing for a slide 24. All of the relatively movable parts of the apparatus are supported from this frame structure.

Arranged to move up and down and housed in said bearing structure is the slide 24 which carries guide blocks 26 and 28 at its upper and lower ends respectively. The lower member 30 of the form-block is secured upon the lower guide block 28 by means of the shaft 32, which is fastened at 31 to the form-block, and which extends through the upper form-block 36, being finally secured by appropriate fastening means at the point 38. The slide 24 and the lower form-block 30 together reciprocate vertically.

To accomplish this vertical reciprocating motion the lever arm 40 is pivoted to the right in Fig. 1 upon the frame at a point not shown and is arranged to be operated by a cam, the cam follower being fastened on the arm 40 at a point somewhere between the pivot, which is not shown, and that portion of the lever arm which is shown. The cam causes the arm 40 to move about the pivot point and to impart vertical reciprocating motion to the slide 24.

The upper form-block 36 is carried at the lower end of the slide rods 42 and 44, the opposite ends of the rods being interconnected by means of the cross head 46 to which the rods are fastened by the fastening means 48 and 50. These rods are supported in the frame structure in appropriate slide bearings and are also arranged to pass through oppositely disposed bearings in the guide blocks 26 and 28.

The upper and lower form-blocks as heretofore described are arranged to have a limited relative movement with respect to each other and are also arranged to have controlled relative movement with respect to the supporting structure of the frame. To further control the movement of the form-blocks a light spring 52 is provided connected at the lower end 54 to the slide 24 and at the opposite end 56 to the crosshead 46. Whenever the blocks are moved apart relatively with respect to each other this spring is extended and maintains a yieldable force tending to pull the blocks together.

The slide 24 and the lever arm 40 are interconnected by means of a link 58 which latter is pivotally connected to the slide 24 by the bolt 60. A washer 61 rides between the slide and the link. The lower end of the link has an elongated slot 62 which is secured to the arm 40 by a pivotal connection. A circular bearing member 64 is ar-

ranged to ride within the slot 66 and is secured to the arm 40 by a downwardly extending threaded portion as is well known in the art. To provide for adjustment of the machine for different sizes of boxes, the bearing member 64 is threadedly secured to the link as at 68. The threaded member is secured in the link by collars 70 and is arranged for easy adjustment by means of the knurled head end 72. The pivot point 64 is, in this manner, adjustable relative to the opposite ends of the slot.

Another lever 74 is mounted on the framework of the machine and is operated by a cam to provide a vertical motion. This latter member is fastened by the link 76 to a yoke 78 carried at the lower end of the rods 80 and 82. These latter rods are arranged to slide in the bearing portions 16, 20 and 22 and are interconnected by a yoke 84 at their upper ends.

A limit stop pin 81 carried on the back extension 83 of the cross-head 46 is arranged to engage an abutment carried on the lever arm 74 so that in the downward stroke of the form-block a point is reached at which the upper form-block 36 stops its downward movement as a result of the coaction between the arm and the lever. After certain coordinated operations have taken place to glue the parts of a box together, the lever 74 continues its downward movement so that the upper plunger or pusher block 36 may approach the block 30 performing the final gluing operation which is taking place. At the completion of this operation the upper and lower form-blocks are moved away from the box.

It will be appreciated that glue may get on the adjacent faces 86 and 88 of the elements of the form-block and stick the two parts of the block together. This prevents the parts of the block from properly separating thereby causing improper action of the machinery and damage to the boxes being formed.

In order to separate these relatively movable elements of the block means is provided for manual operation. A lever 90 is pivotally mounted, eccentrically thereof on the bolt 60 to provide it with a short and a long arm. The latter at its outer end is connected to an angularly disposed handle portion 91. The pivot serves as the relatively fixed point in the system. An upstanding link 94 is correlated with the lever 90. The lower end of the outer side of link 94 is formed with a lateral annular boss 92. The outer end of the inner side of the short arm of lever 90 is formed with a lateral annular boss 93. The bosses 92, 93 abut. A pivot 96 extends through the outer end of the short arm of lever 90, the lower end of the link 94 and the abutting bosses 92, 93 for pivotally connecting lever 90 and link 94 together. A spring 98 is fastened at 100 to the lever 90, and at the point 102 to the link 94. The connection between the lever and link and the spring is so arranged that the parts normally move as a unit up and down with the link 58.

Disposed at right angles to and extending inwardly from the upper end of link 94 is a lifting fork 106 formed of a head and a pair of tines or prongs 108, 110. The head of fork 106 is integral with the upper end of the inner face of link 94. The fork 106 is arranged centrally of and disposed in transverse relation with respect to the lower face of the cross head and the upper face of guide block 26. The space 112 between the tines or prongs 108, 110 provides for the passage of the spring 52 to the cross head, this avoids any interference between the parts. The tines or prongs 108 and 110 carry confining rods 105, 107, and 109, 111 respectively. These rods are threadedly secured to the tines or prongs and locked by nuts 114, 116, 118 and 120. The two rods 105 and 109 extend in front of the crosshead while the two rods 107 and 111 extend in rear of the crosshead and at either side of the extension 83. The lower face 113 of the fork is arranged to rest upon the upper face 115 of the guide 26. The upper face 117 of the fork rests under the lower face 119 of the crosshead 46.

When the two blocks are stuck together the machine is stopped. The operator grasps the handle 91 and pulls the lever 90 in a clockwise direction about the pivot 60. This forces the upper face of the fork against the lower face of the crosshead. The lower block 30 is fixed with respect to the pivot 60 and the upper block 36 is fixed with respect to the crosshead 46. The leverage between these two members effects a braking of the glue connection between the blocks and separates them as in Fig. 2. There is not any positive connection to the crosshead and consequently no boring of holes is necessary. If desirable a slot can be cut in either the crosshead or the guide but this is not necessary.

This movement breaks the seal between the surfaces 86 and 88 and allows the two parts to be separated so that the glue or other material can be cleaned away from the abutting surfaces. After the cleaning operation has been completed the lever and link will be moved from their actuated positions seen in Fig. 2, to the normal inactive position shown in Fig. 1 by merely releasing the lever from the grip of the hand.

This device can be installed in a very few minutes without necessitating any drilling of holes, whereas the devices of the prior art require many new holes and at least a half a day to install.

Further detail operation of the other parts of the machine will be found in the previously mentioned patent and is not repeated herein.

Although a preferred embodiment of this invention has been shown and described, variations within the true spirit and scope of the same are to be determined by the appended claims.

What I claim is:

1. A form separator for a pair of relatively movable upper and lower form blocks of a box machine of that type including a vertically shiftable supporting structure for the lower block having a cross head and a slide structure carrying the upper block in suspended relation with respect to the lower block, said form separator comprising an elevating fork arranged centrally of and disposed in transverse relation with respect to the lower face of the cross head and the upper end of the slide structure, said fork consisting of a head and a pair of tines, a pair of spaced upstanding parallel confining rods carried by each tine and arranged at opposite sides of the cross head, an upstanding link merging at its upper end into the head of the fork, the latter being disposed at right angles to said head, and an operating lever pivotally connected eccentrically thereof with said slide structure to form a short and a long arm, the outer end of said short arm being pivotally connected to the lower end of the link.

2. A form separator for a pair of relatively movable upper and lower form blocks of a box machine of that type including a vertically shiftable supporting structure for the lower block having a cross head and a slide structure carrying

the upper block in suspended relation with respect to the lower block, said form separator comprising an elevating fork arranged centrally of and disposed in transverse relation with respect to the lower face of the cross head and the upper end of the slide structure, said fork consisting of a head and a pair of tines, a pair of spaced upstanding parallel confining rods carried by each tine and arranged at opposite sides of the cross head, an upstanding link merging at its upper end into the head of the fork, the latter being disposed at right angles to said head, an operating lever pivotally connected eccentrically thereof with said slide structure to form a short and a long arm, said link being formed on its outer face at its lower end with an annular boss, said short arm being formed on its inner face at its outer end with an annular boss, said bosses abutting each other, and means extending through the outer end of said short arm, the lower end of said link and said bosses for pivotally connecting said link and lever together.

ROBERT MINKOW.