

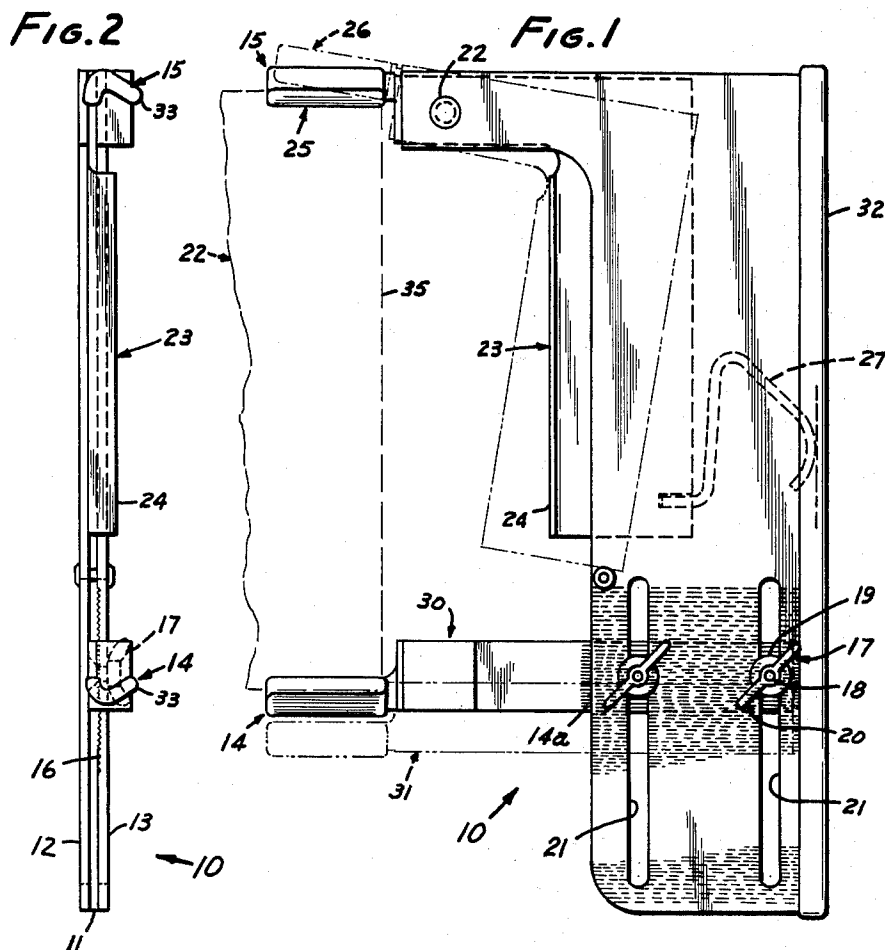
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CARD HANDLING DEVICE

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CARD HANDLING DEVICE

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This invention relates to a card holder which finds its principal utility in the insertion and extraction of circuit cards into and from computers.

Printed circuit cards utilized in modern computers are well known. They conventionally include a stiff card generally of Micarta or some other insulating material, to which there is attached a plurality of circuit elements and printed circuit lines. The assembly is adapted to be slid into a cabinet or rack where it engages clips which connect the circuits on the card into the computer circuitry. Because computers are set up to handle this card in racks of rows and columns, it is very difficult to get ahold of the edges of them and to handle them without potential damage, particularly when they are already in the rack. A number of devices have been produced with attempt to handle these cards, but invariably it has been found that they either require matching holes in the cards themselves or require a specific card-handling device for each width of card.

It is an object of this invention to provide a card-handling device which is useful for over a wide range of card widths, which can handle the cards without requiring the cards to be punched or otherwise treated for being grasped by the card-handling device, and which handles them without risk of damage to the components which they carry.

A card-handling device according to this invention includes a rigid frame, and a first finger which is non-rotatably attached to the frame along with the second finger which is pivotally attached to the frame. The second finger is so disposed and arranged in alignment with the first finger as to be pivotable between first and second positions which are respectively closer to and farther away from the first finger. A trigger is pivotally attached to the frame and engaged to the second finger so as to move the same between its two positions, the trigger being aligned with the frame so that it can be squeezed in opposition to the frame, thereby to move the second finger toward one of its positions. Releasing the trigger enables the second finger to move toward the other of its positions. The fingers engage the card in one position, and release it in the other.

According to a preferred but optional feature of this invention, the first finger is adjustably mounted to the frame so that it can be moved toward and away from the second finger, thereby adjustably to vary the nominal spacing between the two fingers. This adapts the device to handle a wide range of circuit card widths.

The above and other features of this invention will be fully understood from the following detailed descriptions and the accompanying drawings in which:

FIG. 1 is a plan view of the presently preferred embodiment of the invention; and

FIG. 2 is a left-hand end view of FIG. 1.

A card-handling device 10 according to the invention is preferably U-shaped, and as can best be seen in FIG. 2, includes a bight 11 and a pair of arms 12, 13, which are spaced apart from each other. The arms are spaced apart by about the thickness of a first and second finger 14, 15, which fit between the arms.

A first finger 14 is non-rotatably and adjustably attached to the frame by means of serrations 14a, which may be common knife-edge serrations. These serrations are matched with similar serrations 16 on the inside

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of arm 13. A releaseable fastener 17, preferably comprising a bolt 18, a washer 19 and a wing nut 20, joins the frame and the first finger at a slot 21. As can be seen, the slotted construction enables the first finger to be moved up and down the slot.

Second finger 15 is pivotally mounted by means of a pin 22 acting as a hinge. Pin 22 is engaged to both arms and passes through the first finger so as pivotally to mount it.

A trigger 23 is preferably integral with the first finger and projects inside the frame where it may conveniently be provided with a flange 24 which renders the device more conveniently grasped by a user. The second finger has a first position 25 shown in solid line, and a second position 26 shown in dashed line in FIG. 1, which are respectively closer to and farther away from the first finger.

A leaf spring 27 is placed in opposition between the trigger and the frame so as to bias the second finger toward its second position. Then, squeezing the trigger and the frame toward each other will tend to move the first finger toward its first position in which it will tend to grasp the edges of a stiff circuit card 22.

To vary the nominal spacing between the first finger and second finger (which nominal spacing may be considered that between the first finger in its first position and the second finger in its adjusted position), the first finger is merely slid up or down the slot, and the fastener tightened in the selected location. In FIG. 1, one position of the first finger is shown by solid lines 30, and another position of the first finger is shown by dashed lines 31, illustrating the adjustability of the nominal spacing between the two fingers.

A fairing strip 32, preferably of a smooth, soft material, is fitted over the bight of the frame so as to render the frame more conveniently handled.

Both of the fingers are conveniently coated with epoxy or other relatively pliable layers 33, which exert a stronger frictional grip upon the edges of the card than would a metal surface, and render the handling of the card more positive. The pliable layers conform to the contour of the grooves in the fingers, which grooves face each other.

The use of this card-handling device should be evident from the foregoing. First, the nominal spacing of the first finger relative to the second finger is set by releasing fastener 17, and moving the first finger along slot 21, and the tightening the fastener. Then, with the trigger released, the device is set over edge of card 35 and then the trigger is pressed. Because the fingers are arranged in alignment with each other, this motion moves the second finger toward the first, and exerts a compressive force on the card which enables the card to be grasped and either extracted from a rack or inserted therein as desired.

This device thereby provides a means for handling circuit cards having a wide range of dimensions of width, which is easily constructed, and requires no maintenance.

This invention is not to be limited by the embodiment shown in the drawings and described in the description which is given by way of example and not of limitation, but only in accordance with the scope of the appended claims.

What is claimed is:

1. A card handling device adapted to grasp opposite edges of a stiff card, comprising: a rigid frame; a plurality of serrations on said frame; a first finger; a plurality of serrations on said first finger; releasable fastener means joining the first finger to the frame so that the serrations on the frame and on the first finger engage each other and hold the first finger aligned at a selected location; a second finger pivotally attached to the frame and so disposed and arranged in alignment with said

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first finger as to be pivotable between first and second positions which are respectively closer to and farther away from the first finger; a trigger pivotally attached to said frame and engaged to said second finger so as to move the second finger from one of said positions to the other, the trigger being aligned with the frame, whereby squeezing the trigger and frame together moves the second finger toward one of said positions, and releasing the trigger enables the second finger to move toward the other one of said positions; and each of the fingers being in the form of a groove with the recesses of the grooves facing each other, whereby to grasp the card at its two faces when the device is applied to the card.

2. A card handling device according to claim 1 in

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which the trigger and second finger are integral and hinged to the frame.

3. A card handling device according to claim 1 in which a pliable layer covers the surface of the groove.

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