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CARD SEPARATING DEVICE

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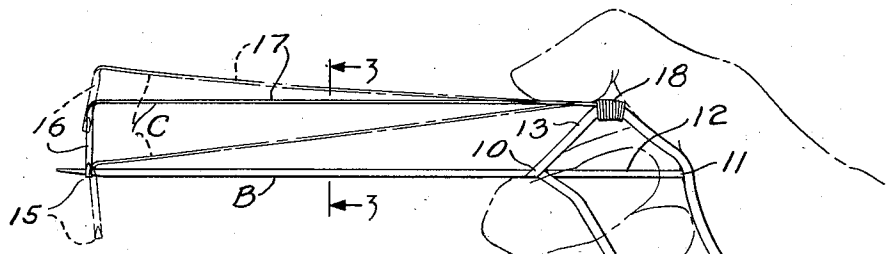


FIG. 1

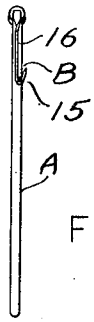


FIG. 2

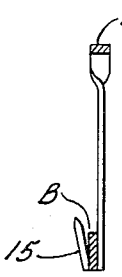


FIG. 3

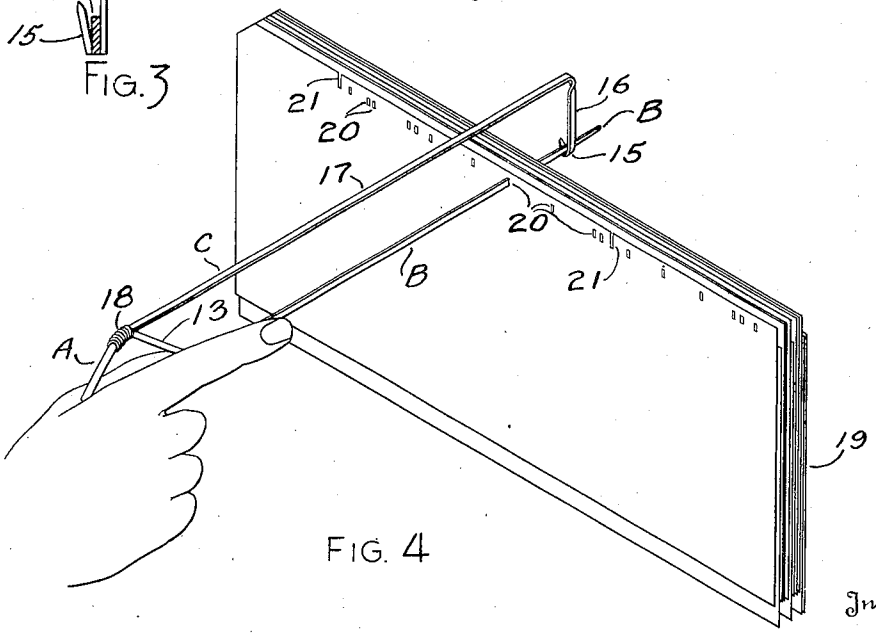


FIG. 4

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CARD SEPARATING DEVICE

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4 Claims. (Cl. 129—16.1)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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The invention described herein may be manufactured and used by or for the Government of the United States for governmental purposes without the payment to me of any royalty thereon in accordance with the provisions of the act of April 30, 1928 (Ch. 460, 45 Stat. L. 467).

This invention relates to a device for separating cards, sheets and the like, and more particularly to a device having a needle-like element which may be passed through aligned perforations or openings in a stack of cards, sheets or the like, and which may then be vibrated to secure card separation according to the openings in the cards.

The device of the present invention has demonstrated its advantages when used with perforated or slotted record cards to facilitate a direct sorting and classifying of the cards. Record cards, such as those in census taking, have printed indicia and a pattern of uniform perforations. Each perforation of a card corresponds to a particular fact concerning the subject, such as a farm, of which that card is to be a record. When a stack of perforated cards has been processed by enlarging selected perforations in each card, the stack may be classified or sorted by means of the device of this invention. The needle of the device is passed through a perforation or enlarged opening in each card of the stack and is then vibrated to secure card classification into two groups. One group of cards will consist of those cards having unmodified perforations which extends the separating needle. The other group will separate out since they have enlarged perforations through which the separating needle extends.

It is therefore an object of this invention to provide an improved device for separating cards, sheets and the like.

Another object is to provide a card or sheet separating device which will preclude accidental removal of the cards or sheets from its needle during the separating operation.

A further object is to provide a record card separating device which is of relatively simple, inexpensive, efficient, light weight, and durable construction.

In the accompanying drawing, Fig. 1 is an elevational side view of a device embodying the present invention;

Fig. 2 is an end view of the device of Fig. 1;

Fig. 3 is a cross sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is a perspective view of the device of

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Figs. 1 through 3 assembled with a stack of cards to demonstrate a separating operation.

Referring now to the accompanying drawing in describing a preferred embodiment of the present invention, the illustrated device is formed of three metallic parts A, B and C. The part A is shown in the form of heavy wire or a rod which is shaped or bent to provide a handle similar to a pistol-grip in side view.

The part B is the separating needle and is secured in suitable manner at 10 and 11 to the handle A. Thus the inner end 12 of the needle B extends across and acts as a brace for the handle A and contributes to its rigidity and resistance to pressure if squeezed by the hand of an operator.

The downwardly extending end 13 of the rod or wire forming the handle A serves both as a brace for the handle A and as a spacer for the parts B and C.

The needle part B preferably is rectangular in cross section (see Fig. 3) with a depth about twice its width and is formed of resilient material to permit lateral deflection (looking at Figs. 2 and 3) while being resistant to deflection in the plane normal to the plane of said lateral deflection and the plane of the accompanying drawing. The indicated cross sectional shape and measurements for the needle part B have been determined to be well suited to the requirements of conventional, rectangularly-perforated record cards generally used in census analysis procedures.

The part C is resilient and may be formed of the same stock as the part B. One end of the part C has the shape of a hook 15 for engagement with the needle B, as illustrated in full lines in Fig. 1. The intermediate section 16 of the part C serves as a card retainer or barrier when the separating device has the setting of Figs. 2, 3 and 4 (also shown in full lines in Fig. 1). Section 17 of the part C is rigidly and suitably connected at 18 to the top of the handle A and serves both as a spring and as a support for the card retainer or barrier 16 and for the hook 15. Section 17 in its full line position of Fig. 1 is slightly bowed by reason of its resiliency, but in general is substantially parallel to the needle B. Section 17 and the needle B are so relatively disposed that the edges of one lie in a plane normal to the plane defined by the edges of the other, as shown by Fig. 3. Thus looking at Fig. 3, the needle B is flexible laterally while the section 17 is flexible in a plane passing through the normal position of the needle B.

Sections 16 and 17 are relatively bent at an an-

gle of about 90 degrees and are also relatively twisted at an angle of about 90 degrees so that section 16 is relatively rigid in the direction for withstanding a thrust endwise of the needle B and by a stack of cards supported by the needle B.

The use of the present device in separating a stack of cards 19 is illustrated in Fig. 4. For convenience, only a few cards 19 are shown in Fig. 4. But it is obvious that the device may be used for separating a stack of cards corresponding substantially in total thickness to the length of the needle B between its point of support 10 and the hook 15. Fig. 4 shows the cards 19 after separation into two groups, one group being retained by the needle B.

In preparing the separating device for use in sorting material such as record cards, the part C is set in the upper dotted line position of Fig. 1. The outer end of the needle B, which is preferably pointed, is now clear for insertion in a stack of cards 19 having aligned openings, some of which are regular perforations 20, the remainder being enlarged perforations or slots 21. The needle is passed completely through the group of cards 19 to be separated. The operator now presses the thumb of his hand, in which the device is supported, against the section or spring 17 to position (see the lower dotted line position of Fig. 1) the hook 15 below the outer end portion of the needle B. During this downward movement, the hook 15 engages the needle B and laterally displaces the latter to permit the hook to pass. This displacement is facilitated by the rounded shape of the leading end of the hook 15. When the hook 15 has passed beyond the needle B, the operator releases the thumb pressure on the spring 17 thereby permitting it to return until the hook 15 engages the needle B as shown in full lines in Figs. 1 through 4. The pierced cards are now prevented from sliding off the inner end of the needle B by the handle portion 13 and the outer end of the needle B by the retainer 16. At this time, it will be noted that the spring 17 and the needle B in the full line position of Figs. 1 and 4 have such spacing as to provide the necessary clearance between the impaled cards 19 and the spring 17. This clearance is obtained by spacing the spring 17 and the needle B a distance greater than the spacing of a card perforation 20 and the adjacent card edge (see Fig. 4).

The operator moves his hand to vibrate the supported separating device. The cards having engaged unmodified perforations 20 retain their position on the needle B, and the cards having engaged enlarged perforations 21 fall under the action of gravity. In the event the needle engaged, enlarged perforations 21 extend through the edges of the cards 19, the latter fall completely off the separating needle B.

The cards 19 retained on the needle B may be removed therefrom by shifting the spring 17 to the upper dotted line position of Fig. 1.

The spring 17 and the hook 15 are reset from the full line position of Figs. 1 and 4 to the upper dotted line position of Fig. 1 by thumb control. By pressing downwardly on the spring 17 with the thumb, and then pressing the spring 17 slightly sidewise while relieving it of the downward pressure, the hook 15 is permitted to pass the needle B, and the spring 17 returns to its upper dotted line position of Fig. 1 under its inherent resilient action.

Obvious modifications falling within the scope of this invention include the formation of the parts B and C of relatively inflexible rod-like material with a resilient connection for supporting the part C so that it may be thumb operated in the above described manner.

The foregoing is merely illustrative of the present invention which is to be understood as including all modifications falling within the scope of the appended claims.

I claim:

1. A separating device for sorting or classifying perforated record cards and the like, said device comprising: a substantially straight needle adapted to have one end thereof passed through aligned perforations in a stack of record cards or the like; a card retainer movable into one position for precluding said cards from slipping off said needle end and into a second position to free said needle for removal of cards from said needle end; a handle supporting said needle; a finger operated, elongated member spaced from said needle and connecting said card retainer to said handle; and means for securing said member and said retainer relative to said needle with said retainer in said one position, said member being adapted for finger operation to control said securing means.

2. A separating device for sorting or classifying perforated record cards and the like, said device comprising: a handle supporting two spaced elongated members, one of said members being in the form of a substantially straight needle adapted to be passed through aligned perforations in a stack of record cards or the like; the second member being resilient at least in part, and being adapted for finger operation toward said needle; and means for securing said second member in predetermined depressed position relative to said needle, said second member in said predetermined secured position having a section thereof arranged to preclude record cards from slipping off one end of said needle.

3. A separating device for sorting or classifying perforated record cards and the like, said device comprising: a substantially straight and elongated needle adapted to be passed through aligned perforations in a stack of record cards or the like; a handle for supporting one end of said needle; and a resilient elongated member supported by said handle, said member having a hook-shaped outer end for engaging the outer end of said needle to preclude record cards from slipping off said needle end; said member being resilient to retain said hook and said needle in engagement, to permit finger operation for disengaging and engaging said hook and said needle, and to maintain said hook spaced from said needle when freed therefrom to permit record cards to be placed on and removed from said needle.

4. A device for sorting or classifying perforated record cards and the like, according to the size of the engaged perforations in the cards, said device comprising: a first elongated member shaped into the form of a pistol-grip; a second elongated member extending across and secured at spaced points to said pistol-grip to brace the same and also extending from said pistol-grip at a point intermediate the ends thereof to form a substantially straight needle adapted to have the outer end thereof passed through aligned perforations or openings in a stack of cards or the like, said needle being of oblong cross-section and being laterally flexible; and a third elongated member secured adjacent one end thereof to the

upper portion of said pistol-grip, having a first longitudinal section extending outwardly from said pistol-grip for a distance corresponding substantially to the length of said needle, and having a second longitudinal section extending at an angle from said first section and toward said needle, said second section terminating in a hook-shaped part for engaging said needle adjacent the outer end thereof, said third member being oblong in cross-section and having a 90 degree twist therein between said first and second sections thereof, said first section being resilient in a plane passing through said needle.

CARL R. NYMAN.

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