Aug. 10, 1965 R. E. CONE 3,199,389

CARD NOTCHER

Filed Nov. 20, 1963 2 Sheets-Sheet 1

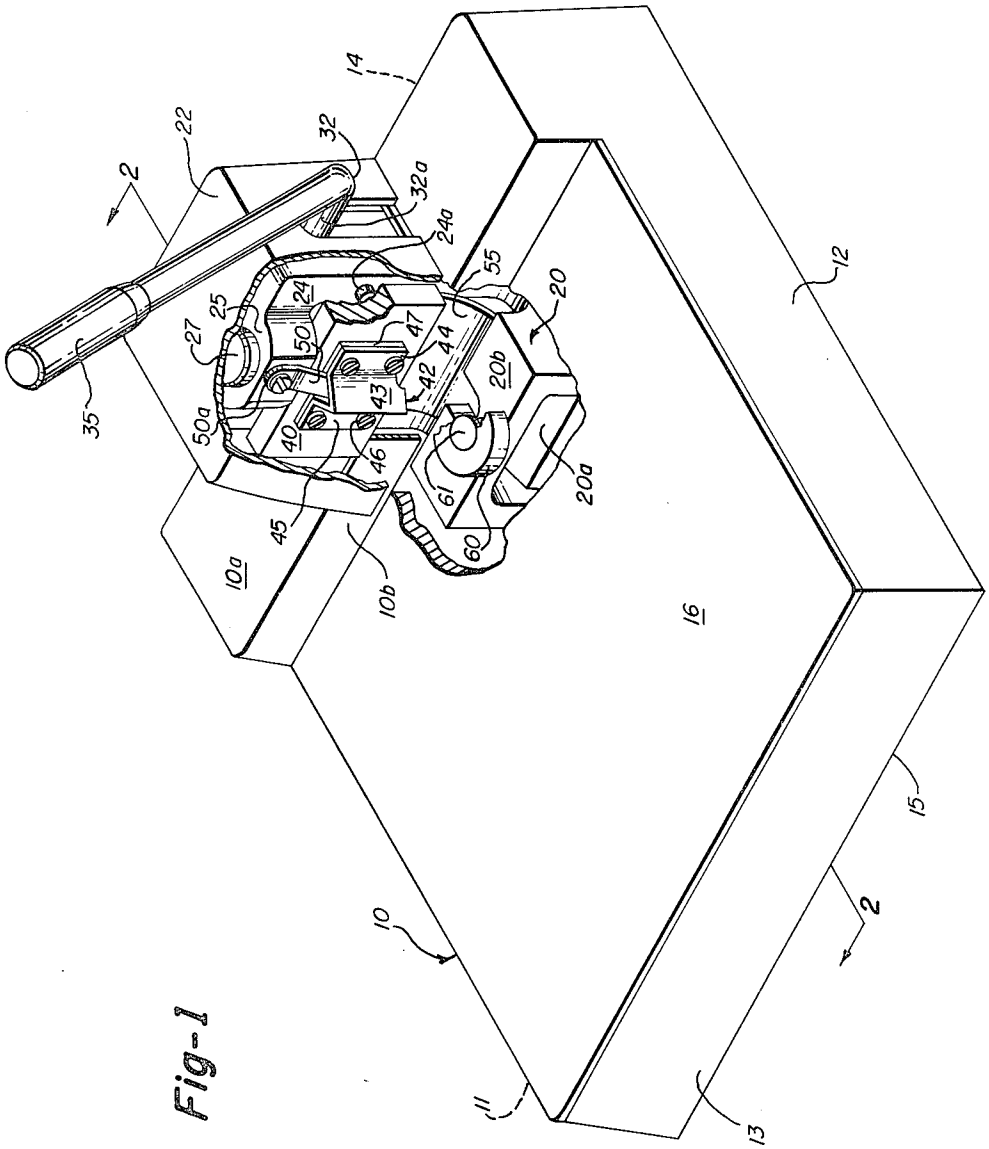


Fig-1

INVENTOR
RICHARD E. CONE
Thomas S. Ross
BY James R. Black Jr.,

ATTORNEYS

Aug. 10, 1965 R. E. CONE 3,199,389

CARD NOTCHER

Filed Nov. 20, 1963 2 Sheets-Sheet 2

Fig-2

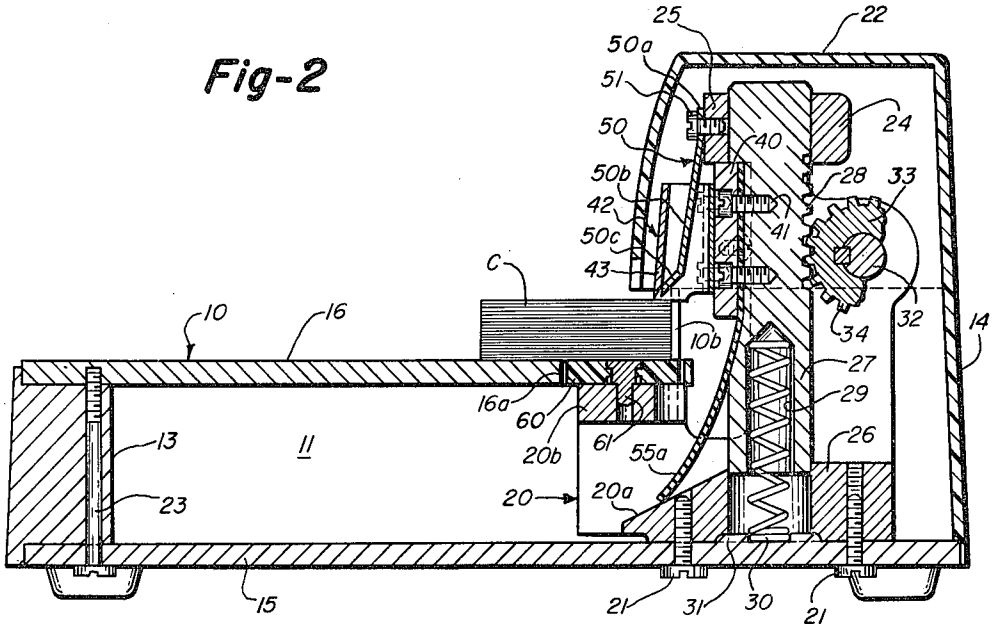
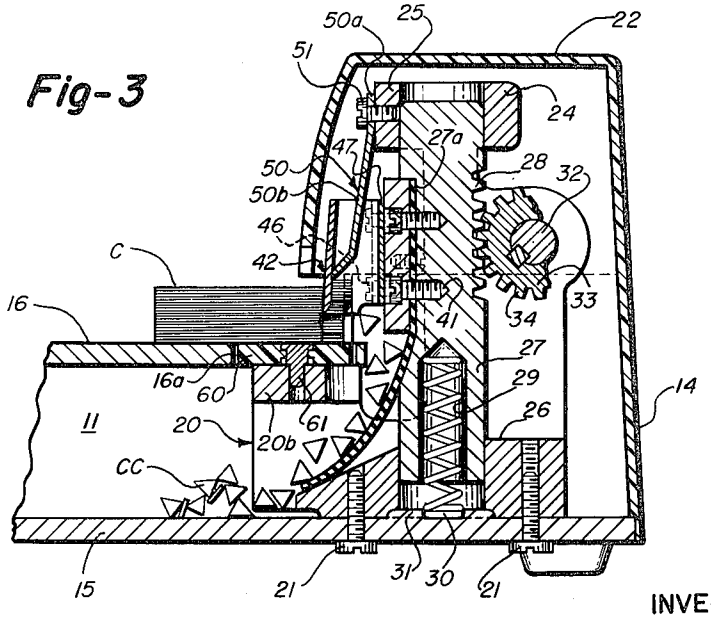


Fig-3



INVENTOR
RICHARD E. CONE
Thomas S. Ross
BY James L. Black Jr.
ATTORNEYS

United States Patent Office

3,199,389
Patented Aug. 10, 1965

1

3,199,389

CARD NOTCHER

Richard E. Cone, Athens, Ohio, assignor to Royal McBee Corporation, New York, N.Y., a corporation of New York

Filed Nov. 20, 1963, Ser. No. 325,068
2 Claims. (Cl. 83—145)

This invention relates to a portable, manually operable machine for cutting notches in small batches of stacked record cards and is generally of the type disclosed in Feiertag 2,690,219.

The Feiertag machine which is manufactured by the assignee hereof has enjoyed wide commercial acceptance for processing the well know "Keysort" record cards. It is, however, relatively expensive equipment and lacks versatility in that it cannot be adapted to cut notches of different depth. For example, if the Feiertag notcher is initially designed to cut a .200" deep notch it cannot be converted if a .150" notch is desired.

Prior equipment of this nature is characterized by knife breakage resulting from accumulation of chips in the V-shaped knife which exert sufficient pressure at times against the sides of the knife as to occasionally result in fracturing the knife along or near its apex. This is particularly prevalent where the chips become so tightly packed in the knife that a subsequent notching stroke thereof results in knife fracture. Still further, such a packed accumulation of chips in the knife can, and, indeed occasionally does preclude a full notching stroke of the knife with the result that a number of cards at the botton of the stack are not notched. Then too, the inside of the knife is usually inaccessible, making it necessary to partially disassemble the machine in order to gain access to the inside of the knife.

Another characteristic of many prior machines of this nature lies in the geometric pattern of knife travel during the notching operation. In such machines the knife describes an arcuate path during the notching of the cards, the result of which is that the topmost and sometimes the bottom-most cards are notched less deeply than those intervening the several top and bottom cards. The result is inaccurate, or rather inconsistent notching that could well adversely affect subsequent information retrieval, this condition being particularly characteristic of manually operated card notches. While this condition does not usually obtain in powered notches, such machines are so structurally complicated and accordingly costly as to be economically out of reach of many users.

It is accordingly one of the objects of this invention to provide a portable manually operable record card notching machine that obviates the several foregoing disadvantages.

Another object of the invention is to provide such a machine that is light in weight, that is structurally simple and rugged, that is inexpensive in cost of manufacture and use, that needs little or no field servicing, that can readily be operated by unskilled personnel, and that rapidly and efficiently may be employed to process, i.e. notch small batches of record cards. Other objects will be in part apparent and in part pointed out hereinafter.

In the drawing wherein I have shown a preferred embodiment of my invention and wherein similar reference characters refer to similar parts throughout the several views:

FIGURE 1 is an isometric view of my card notcher;

2

FIGURE 2 is a vertical section taken along the line 2—2 of FIGURE 1 showing the machine in rest position; and

FIGURE 3 is a section similar to FIGURE 2 but showing the machine in active position.

In general the machine comprises a housing, preferably fabricated from a suitable plastic material and having a base and a table. Disposed in the rear portion of the housing and secured centrally thereto is a cast iron frame in which a rack is mounted for vertical reciprocal movement. A pinion is mounted on a transverse shaft journalled in the frame and meshes with the rack, a spring being disposed in a well formed in the lower end of the rack and bearing against the housing base to bias the rack upwardly, a stop being provided to limit such upward movement. One end of the transverse shaft projects through an opening in a plastic cover which is removably mounted on the housing over the frame. A knife mounting block is adjustably secured to the top of the rack by aligning screws to detachably receive a V-shaped (in cross section) knife. By virtue of the detachability of the knife, shims of any desired thickness may be interposed between the knife and its mounting block whereby notch depths of various amounts may readily be obtained. A chip stripper is secured to the frame adjacent the top of the rack and comprises a downwardly extending flexible member, preferably of sheet metal, whose lower end is formed to ride along the inside of the knife's apex as it travels up and down. Thus on the upstroke of the knife the stripper end strips the accumulation of chips from within the knife and accordingly precludes packing or jamming of such strips as might damage the knife or preclude a full downward stroke thereof. A flexible chip rake or apron, preferably fabricated from rubber or similar material, is secured to the rack and its lower end rides over a forwardly and downwardly inclined ramp portion of the frame underlying the knife. When the knife is lowered the chips resulting from the previous cut are swept away and accordingly a build-up of chips in this area of the housing is precluded. The housing may be periodically emptied of chips by removing the detachable frame cover and then shaking the chips out of the housing.

The housing table which supports the cards to be notched is provided with a cut-out underlying the knife adapted to receive a small reversible cutting block formed from nylon or the like. This block is detachably secured to the frame so that when one side of the block is too worn for further efficient use it may be turned over and the other side used to uselessness after which the block may be discarded and replaced.

More particularly, and with reference to FIGURE 1, the machine includes a housing, generally indicated at 10, comprising side walls 11 and 12, front and rear walls 13 and 14, a base or floor 15 and a table 16. The front, rear and side walls of housing 10 are preferably molded integrally from a suitable plastic material, the base 15 is preferably made from hardwood and secured in any suitable manner to the housing walls and the table 16 may be of composition board or other material adapted to the support of a stack of cards C to be notched. The housing also includes a top portion 10*a* lying in a plane preferably parallel to but elevated from the plane of table 16, a vertical transverse fence 10*b* extending downwardly from top portion 10*a* to provide a stop against which the cards to be notched may be positioned (see FIGURE 2).

A cast frame generally indicated at 20 is secured as by screws 21 (FIGURE 2) to housing floor 15 and is enclosed by a plastic cover 22 which is detachably secured to the housing in any suitable manner as to be readily removable to permit access to frame 20 and the operating components carried thereby. It might be noted that the several components of the housing are held together by upwardly extending screws 23.

Frame 20 includes a column 24 having an upper boss 25 and a base 26 which reciprocably receive a rack 27 the teeth 28 of which face to the rear of the machine. The lower end of rack 27 is provided with a well 29 which receives a spring 30, the lower end of this spring being received in a collar 31 fastened to housing base 15 thus to center and secure the lower end of the spring against transverse movement relative to the rack. Spring 30 constitutes a return spring that biases rack 27 upwardly. A transverse shaft 32 is rotatably mounted in frame 20 and has keyed thereto a pinion 33 whose teeth 34 mesh with rack teeth 28. One end 32*a* of shaft 32 extends outwardly from frame 20 (FIGURE 1) through an opening in cover 22 and has connected thereto an operating handle 35 whereby shaft 32 may be rotated thus to reciprocate rack 27.

Rack 27 (FIGURE 2) is recessed as at 27*a* to receive a knife mounting block 40 which is adjustably fastened to the rack by aligning screws 41 whereby the block may be accurately adjusted and set in adjusted position. The rear face of block 40 rides adjacent the front surface which may be provided with guide pins 24*a* against which block 40 rides and which accordingly preclude any rotation of rack 27 relative to the frame, table 16 and fence 10*b*. The top of block 40 abuts the bottom of frame boss 25 to limit return movement of rack 27. A knife generally indicated at 42 (FIGURE 1) includes a V-shaped (in cross section) blade 43 and integral attaching flanges 44 and 45 through which extend screws 46 which fasten the knife to mounting block 40. A shim 47 of predetermined thickness may be interposed between the knife flanges 44 and 45 and mounting block 40 whereby the depth of knife 43 may be controlled in turn to provide notches CN in cards C of the desired depth. For example, if the knife is designed to normally provide a .150" notch and a .200" notch is desired, a .050 shim 47 may be interposed to effect the desired notch depth. Thus the versatility of the machine is considerably enhanced.

As pointed out above a jammed accumulation of chips inside of knife blade 43 can result in damage to the blade and can impede if not preclude a full downward notching stroke of the knife. To the obviation of such a condition, I provide a chip stripping finger generally indicated at 50 fabricated from a flexible material, such as sheet metal, and comprising a securing flange 50*a* and a stripper blade 50*b*. The stripper is secured to frame boss 25 by a screw 51 extending through the stripper flange 50*a* and threaded into the frame boss. Stripper blade 50*b* is preferably contoured at its lower end 50*c* to conform to the configuration of the inside of knife blade 43 so that upon upward or return movement of the knife (see FIGURE 3) the lower end 50*c* of the stripper blade rides against the inner surface of the knife blade and strips away the chips CC lodged therein.

As an accumulation of chips in housing 10 in the area underlying knife 42 is undesirable, I provide a rake or apron 55 (FIGURE 2) the upper end of which is attached to mounting block 40 in any suitable manner and the lower end 55*a* of which is adapted to ride over a forwardly and downwardly inclined ramp portion 20*a* of frame 20 during the downward or notching stroke of rack 27 and knife 42. Rake 55 is preferably made of rubber or similar material. Thus, as shown in FIGURE 3, during the up or return stroke of knife 42, stripper 50 strips the chips CC from inside the knife and the chips fall downwardly toward frame ramp 20*a*. Upon the next down or cutting stroke of the knife, rake 55 sweeps the chips forwardly of the frame and prevents them from accumulating beneath the knife or under the lower end of rack 27 as might impede a full downward stroke of the rack.

Table 16 is provided with a cut-out 16*a*, underlying knife 42, which receives a cutting block 60 that is reversibly secured as by a screw 61 to a bench 20*b* comprising an integral portion of frame 20. Cutting block 60 is made of nylon or other similar material and is preferably circular in shape. Thus as one portion of block 60 becomes unusable because of successive impacts of knife blade 43, the block may be rotated to present a fresh surface. When one face of the block has become too used for further efficient notching, screw 61 may be removed and the block reversed and resecured to present a clean surface. When the reverse surface is completely used the block may be inexpensively discarded and replaced.

It will now appear that a stack of cards C may be loaded on table 16 with the card edges to be notched lodged against fence 10*b* and in appropriate registry with respect to and beneath knife 42. With the stack of cards so located handle 35 may be manipulated to drive the knife downwardly against the stack of cards to cut the desired notches therein. Upon the upward return stroke of the knife under the bias of spring 30 stripper 50 cleans the chips from within the knife. Upon the next downward notching stroke of the knife, rake end 55*a* sweeps any accumulation of chips off frame ramp 20*a* into the housing. At the appropriate time, cover 22 may be removed from the housing and the chips removed therefrom.

It will now be seen that I have provided a record card notching machine that attains the several objects set forth above in a thoroughly practical and efficient manner.

As other embodiments of the invention are possible and as modifications of the one disclosed may be made, all without departing from the scope of the invention, it is to be understood that the foregoing should be interpreted as illustrative and not in a limiting sense.

I claim:

1. In a machine for cutting notches in a stack of record cards, the combination of

a housing including a card supporting table,

a frame mounted on the base of said housing,

a rack mounted in said frame for vertical reciprocatory movement,

spring means for biasing said rack upwardly,

a pinion rotatably mounted in said frame and meshing with said rack,

a V-shaped knife secured to said rack adapted to cut notches in a stack of cards supported on said table when said rack is driven downwardly,

a flexible chip stripper mounted on said frame above said knife and having its lower end disposed within said knife so that its end bears against the inner side of the apex of said knife whereby when the knife is raised said stripper end strips the accumulation of chips deposited within said knife as a result of the notching operation,

a cutting block mounted on said frame beneath said knife,

said frame having a portion underlying said cutting block and sloping downwardly and forwardly of the the housing to a point adjacent the bottom thereof,

and a flexible apron secured to the lower end of said rack with its lower end overlying the upper portion of said sloping frame portion and riding over said sloping frame portion during a notching operation thereby to divert chips stripped from said knife to the bottom of said housing away from said rack.

2. A machine according to claim 1 including a cover for said frame removably attached to said housing where-

by it may be disassembled from said housing to permit removal of an accumulation of chips therefrom.

References Cited by the Examiner

UNITED STATES PATENTS

412,802	10/89	Simoulin	83—658
524,622	8/94	Walker	83—629 X
1,049,676	1/13	Cousins et al.	83—145
2,267,517	12/41	Barney	83—111 X
2,289,076	7/42	Ryan	83—145
2,576,211	11/51	Bone	83—917 X
2,614,631	10/52	Bone	83—917 X

WILLIAM W. DYER, JR., *Primary Examiner.*

WILLIAM S. LAWSON, *Examiner.*