April 30, 1968 W. E. HEDDERICH 3,380,652

ENCODING MACHINE FOR DATA CARDS

Filed June 30, 1965 2 Sheets-Sheet 1

Fig. 1

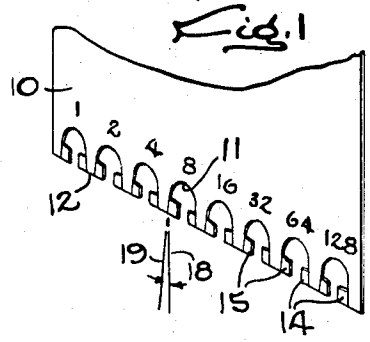

Fig. 2

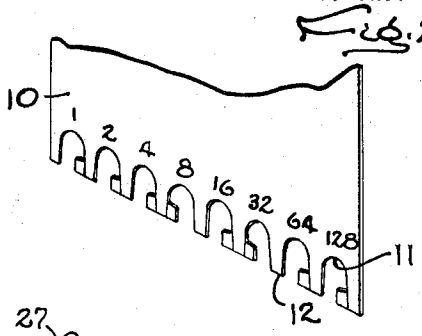

Fig. 3

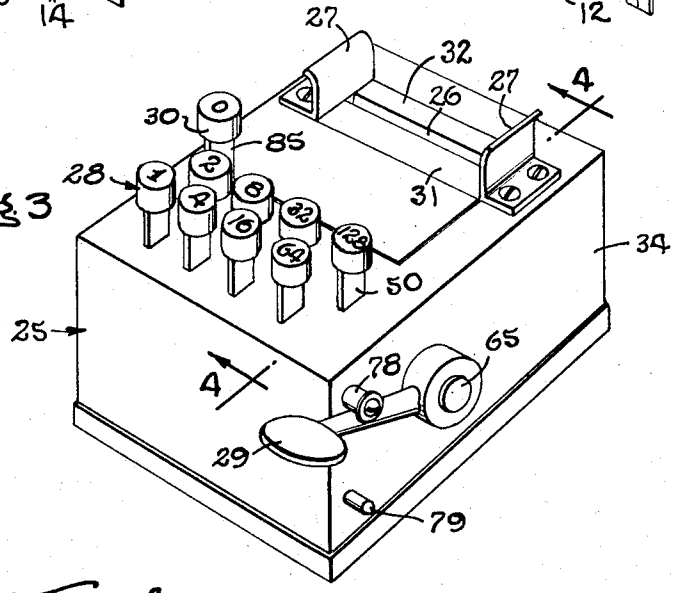

Fig. 4

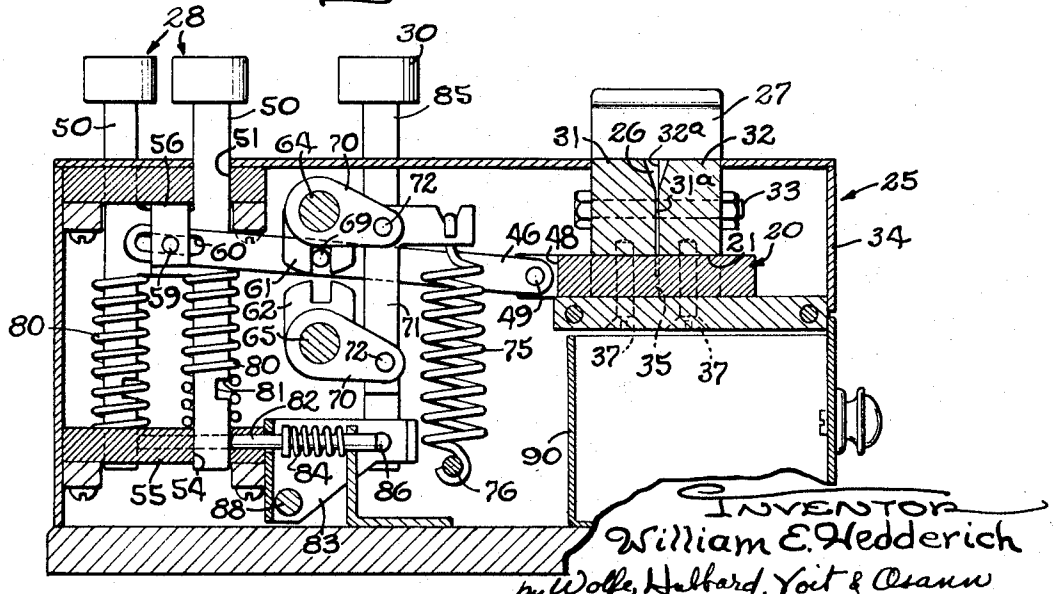

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Fig. 5

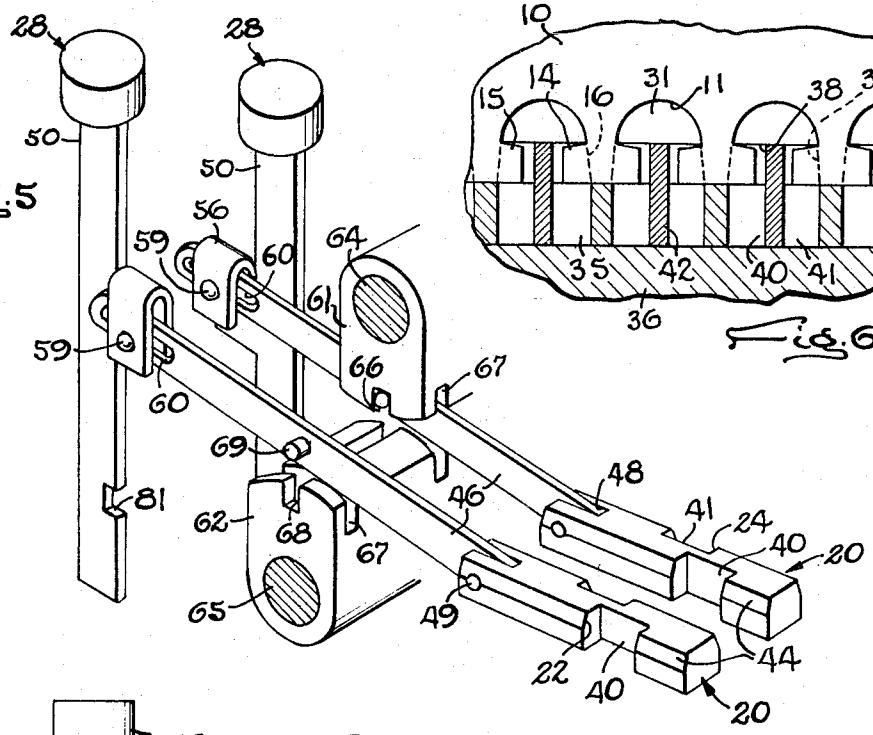


Fig. 6

Fig. 7

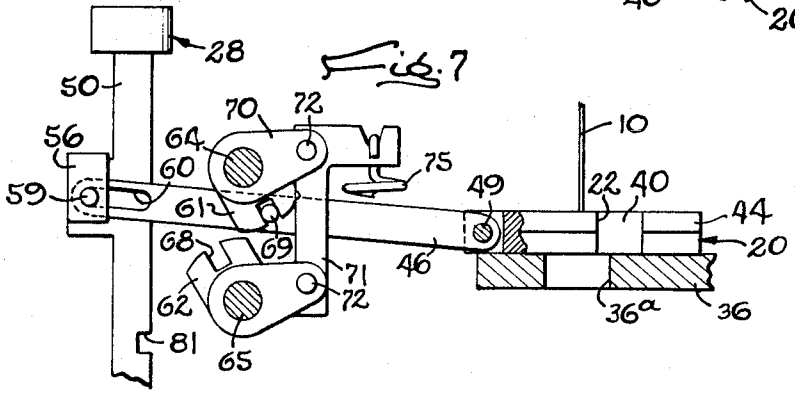
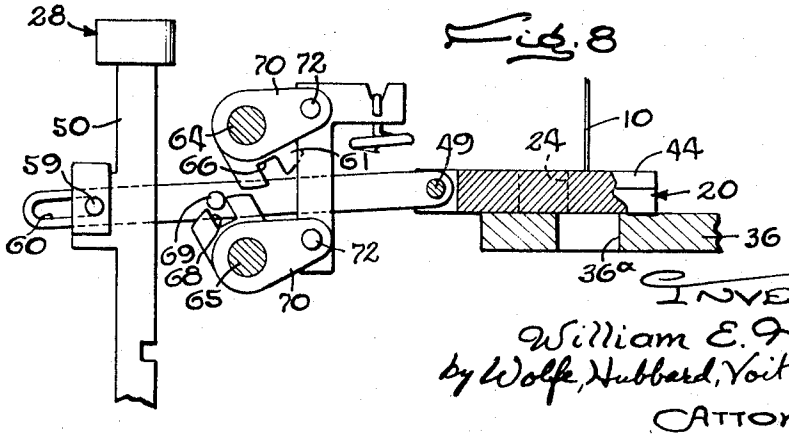


Fig. 8



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3,380,652

ENCODING MACHINE FOR DATA CARDS

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11 Claims. (Cl. 234—117)

This invention relates to a card encoding machine of the type for punching or otherwise marking file cards containing data for storage.

Data storage cards, and especially those types used for storing information for use in computers, are in widespread use in industry today because of their value in storing information in a small amount of space. However, as with any storage system, a method as simple and foolproof as possible for marking and cataloging such cards must be used to make the information thereon readily obtainable when needed.

The general object of this invention is to provide a simple and compact machine for selectively encoding such data storage cards so that they can be instantly retrieved from storage.

A more specific object of this invention is to provide a simple machine for encoding data storage cards which provides the versatility of enabling the user to easily select the encoding indicia to be used from a plurality of indicia available on the machine, and when the user thereafter activates the machine, positively and simply encodes the card in accordance with the indicia selected.

An even more specific object of this invention is to provide a simple and compact machine for encoding data storage cards, by selectively removing ears from notches in the edges thereof, in which the program for removing the ears from the cards may be quickly and easily selected from a plurality of programs available on the machine, and the machine is thereafter activated to sever the ears from the card in accordance with the program selected in a positive and precise manner.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which

FIGURE 1 is a fragmentary perspective view of the type of data card which the present invention may be used to encode,

FIG. 2 is a fragmentary perspective view of a data card which has been encoded,

FIG. 3 is a perspective view of the encoding machine,

FIG. 4 is an enlarged cross-sectional view along the line 4—4 of FIG. 3,

FIG. 5 is a perspective view of the main parts of the mechanism of the encoding machine,

FIG. 6 is an enlarged fragmentary view of a card positioned in the machine with the cutters which encode the card shown in cross section,

FIG. 7 is a side plan view showing the position of the mechanism and cutters as they are actuated when the encoding key has not been depressed,

FIG. 8 is a side plan view showing the position of the mechanism and cutters as they are actuated after the encoding key has been depressed.

For purposes of illustration, in FIGS. 1, 2 and 6 is shown a portion of the type of card **10** with which the present invention may be used. Such cards are well known and are used for storing data or other information. For instance, holes may be punched in the card in predetermined locations such that by feeding the card through a decoding machine, the information may be fed back into a computer. Such cards also may be made of a magnetic sensitive material and be fed into a readout device capable of detecting the information stored. In either example, one way of encoding such cards so they can be individually selected from a storage file is by notching one edge according to a program so a mechanical arm can be inserted through the notches to pull out those encoded in a predetermined manner.

In the present instance, a series of round bottomed notches **11** are present in the edge **12** of the card to be encoded, with each having an ear **14** and **15** projecting from each side respectively of the notch adjacent the edge **12**, as shown in FIG. 1. In this particular instance there are eight notches on each card with each notch representing the number marked adjacent thereto in FIG. 1 (usually the notches are not marked as shown here). These numbers represent a geometric progression from which numbers may be selected to add up to any number less than 256. Thus by selectively encoding a series of such cards, the cards can be selectively numbered from 1 to 256 if desired.

To encode a card, that is, to mark the notches to indicate whether a particular notch is to be counted or disregarded in the encoding, the ears **14** and **15** are selectively cut off in a particular manner, since one type of decoding machine used with such cards detects the encoding thereof by inserting an arm into each slot. Because of this method of selection utilized by the decoding machine, the ear to be cut off must be cut along the dotted line **16** which must closely approximate 7 degrees from an imaginary line **18** perpendicular to the edge **12** of the card. If the angle is much greater, the decoding machine will not decode the card correctly, and if the angle is much less than 7 degrees, the card will become frayed from contact with the arm. Previously, such cards usually have been encoded by manually cutting off the ears with scissors.

In accordance with the present invention, an encoding machine is provided into which a data card may be inserted and which includes a plurality of marking members movable in two directions to mark the card in a different manner with movement in the respective directions. An actuator is provided to move the marking members, with the direction of movement, and therefore the encoding of the card, being preselectable by actuation of a plurality of keys, one for each member.

In the illustrated encoding machine, the marking members are a plurality of cutter bars **20** (FIGS. 5, 7 and 8) which are positioned in spaced alined channels **21** with actuating means provided to move them in either direction transversely of the data card **10**, and each including cutting edges **22** and **24** on opposite sides thereof to thus sever the ears **14** and **15** in a manner corresponding to the direction of movement of each bar, for encoding the card. As shown in FIG. 3, the cutter bars are supported in a housing **25** having in the top thereof a slot **26**, with a guide **27** at each end, into which the notched edge of a data card may be inserted. By selectively depressing the numbered encoding keys **28** and thereafter pushing a lever **29** downward, either the right or left ear of each notch is severed precisely at a 7 degree angle to thereby encode the card. A release key **30** may then be depressed to reset the machine to zero for repeating this encoding operation with another card.

To achieve the foregoing, the slot **26** in which the card is inserted is formed by two spaced cutter blocks **31** and **32**, which are each beveled at the upper edge adjacent the top of the slot to make it easier to insert the card. These blocks are held in juxtaposed position by bolts **33** passing therethrough with block **31** including an offset **35** at the bottom of the slot **26** and shims (not shown) positioned between the ends thereof and out of the path of the slot for holding the data card spacing them apart sufficiently for insertion therebetween of the data card to be encoded. The joined cutter blocks are fastened at the bottom to a support block **36** by screws **37** attached to a housing **34** and including

a large opening 36*a* cut directly below the slot 26 formed by the blocks.

In the bottom edges of the cutter blocks 31 and 32 are a series of spaced alined channels 38 (FIG. 6) running transverse of the slot 26 and each positioned to aline with a notch 11 of the card when it is inserted in the slot to rest on the offset 35. The top of the vertical sides of each channel 38 are angled inward at 38*a* at an angle of 7 degrees to aline with the position at which it is desired to sever the ears 14 and 15. In each channel is held a cutter bar 20 (FIGS. 4, 5 and 6) resting on the support block 36, with the sides and top closely approximating the shape of the channel such that each cutter bar may be slid lengthwise in either direction therethrough.

The opposite sides of the cutter bar are notched to form slots 40 and 41 which are slightly offset from each other laterally along the bar, but overlap for approximately one-half their total length to thus form the cutting edges 22 and 24. The overlapping slots form a neck 42 therebetween joining the ends of each bar which is sufficiently thin to fit between the ears 14 and 15 (FIG. 6) of the card. Thus, each cutter bar is positioned initially with this neck 42 alined with and extending laterally across the slot 26 such that when the card is inserted to rest on the offset 35, notch 11 of the card fits over the cutter bar with this neck exending between the ears as shown in FIG. 6. The top portion of each side wall of the bars are beveled inward at 44 with the cutting edges 22 and 24 cooperating with the corresponding edges 31*a* and 32*a* of the cutter blocks to form cutting members which, when the bar is moved laterally through the channel, sever the ears 14 and 15 at the required angle of 7 degrees to a line perpendicular to the edge of the card. Thus, if the bar 20 is moved a short distance from left to right in the drawings, the cutting edge 22 of slot 40 will cooperate with edge 32*a* of cutter block 32 to cut off the ear 14 on that side of the notch, and the ear 15, positioned in the slot 41 will not be severed. Similarly, movement of the cutter bar a short distance from right to left will sever the ear 15 by the cutting action of cutting edge 24 of slot 41 cooperating with edge 31*a* of cutter bar 31, while ear 14 remains intact so long as the bar is not moved sufficiently for the trailing edge of slot 40 to move past the slot 26.

To actuate the cutter bars lengthwise through the channels, a link 46 projecting into a slot 48 in the end of each cutter bar is pivotally connected to the bar by a pin 49. Each link extends to one of a plurality of key stems 50 which are supported for up and down movement in slots 51 in a support block 52 fixed adjacent the top of the housing and in slots 54 in a support block 55 fixed adjacent the bottom of the housing. Each link 46 is attached to a stem by being pivotally attached to a U-shaped yoke 56 fixed on an extension 58 of the stem by a pin 59 passing through both legs of the yoke and an elongated slot 60 extending lengthwise in the link. Thus each link may move a short distance laterally with respect to the associated stem 50, but the vertical positioning of the link is controlled by vertical movement of that stem.

To actuate the link longitudinally in either direction, and thereby move the cutter bars 20 in the channels 21, a pair of rockers 61 and 62 (FIGS. 4 and 5), are positioned above and below the parallel extending links 46. These rockers are fixed to turn with shafts 64 and 65, respectively, which are journaled in the housing 34. Slots 66 and 68 are cut longitudinally in the rockers 61 and 62 respectively, to receive a pin 69 fixed to the link when the link is moved vertically up or down into a laterally extending slot 67 in each rocker.

Cranks 70 fixed to each shaft 64 and 65 are pivotally connected to an arm 71 by pins 72 so the shafts must turn together. A lateral extension 74 on the arm 71 is attached to a contractile spring 75 extending downward to a pin 76 on the housing 34 to bias the shafts in the clockwise direction. For turning or actuating the shafts, the end of shafts 65 is extended through the side of the housing 34 to which the lever 29 is attached. This lever may be rotated between stops 78 and 79 fixed in the housing, with the spring 75 acting through the crank 70 to normally hold the lever in the upward position against the stop 78.

Thus, by depressing the lever 29 to move it from stop 78 to stop 79, shafts 65 and 64 may be rotated counterclockwise for a like rotation of the rockers 61 and 62. Since the slot 66 extends radially downward from shaft 64 while slot 68 extends radially upward from shaft 65, vertical movement of a link 46 upward to engage the attached pin 69 in slot 66 will effect movement of the link from left to right when the lever 26 is moved downward as shown in FIG. 7, while movement of a link 46 downward to engage pin 69 in slot 68 will cause movement of that link from right to left as shown in FIG. 8. By this arrangement, depending upon whether the pin is engaged in slot 66 or 68, the pin and link 46 may be moved laterally in either direction to move the attached cutter bar 20 within the associated channel 38 when the lever 29 is pressed.

The vertical position of the attached stem 50 thus determines which of the slots, 66 or 68, the pin 69 of each link is engaged in. Each stem 50 is biased upward by a compression spring 80 thereby normally pivoting the attached link 46 upwardly about pin 49 at the cutter bar to engage pin 69 in a slot 66 of the rocker 61 for movement of the link and cutter bar 20 from left to right. For movement of the cutter bar from right to left, the corresponding key 28 is depressed to carry pivot link 46 downward about pin 49 and thereby engage pin 69 in slot 68 of rocker 62. When a key 28 is depressed, the stem 50 moves downward until a pin 82 seats in a detent 81 (FIG. 8). This pin 82 is held by a bracket 83 and urged against the stem by a compression spring 84 and when the detent alines with the pin, the spring 84 moves the pin into the detent to hold the stem 50 from moving upward under force of spring 80, even though the original force on the key 25 is removed. By this arrangement, depressing a key 28 determines that the cutter bar 20 will be moved to the left when lever 29 is depressed, while not depressing the associated key determines the cutter bar will be moved to the right when lever 29 is depressed.

To reset the device, that is, release all the keys so they return upward to the position shown in FIGS. 4 and 7, the reset key 30 is pressed to move arm 85 downward. Arm 85 is pinned at 86 to bracket 83, with this bracket pivotally supported in the housing 34 on a shaft 88. Movement of arm 85 downward pivots the bracket 83 clockwise along an arcuate path about shaft 88 to move pin 82 horizontally and thus disengage it from the detent 81, thereby permitting any of the stems 50 being held downward to move upward under the force of spring 80.

In operation, after a determination of the encoding to be used on a particular card has been made, the card is inserted into slot 26 and the encoding keys 28 corresponding to the encoding program selected are depressed. Thereafter the lever 29 is pushed downward to move the links 46 corresponding to the keys 28 that have been depressed to the left carrying with them the cutter bars 20 to thereby cut the ears 15 from the slot edges. At the same time, the links 46 attached to the keys 28 not depressed, are moved to the right to move the associated cutter bars in the corresponding direction and thus sever the ears 14 corresponding to the unpressed keys. The severed ears fall through the opening 36*a* in support block 36 into a drawer container 90, which can be removed for emptying when needed. While in the example cooperating cutter bars and blocks are described, other means of encoding the card can be used with this machine. For example, a printing or hole punching apparatus could be attached to each link 46 in place of a cutter bar, which when moved, would encode the card at that position in the corresponding manner.

I claim as my invention:

1. A machine for encoding cards of the type having

a plurality of notches in one edge with ears projecting thereacross from each side of the notch to be selectively removed, said machine comprising, in combination, a housing, said housing having a receptacle for receiving the notched edge of said card, a pair of cutter blocks one positioned on each side of and forming the walls of said receptacle, a plurality of alined channels in said blocks extending transverse to said receptacle and each alined with a notch in said card, a cutter bar positioned in each channel having notches in two sides thereof overlapping at said receptacle but offset longitudinally along the bar relative to each other whereby movement of said bar in one direction severs only the ear on one side of the card notch by the cutting action of the notch edge and the cutter block and movement of said bar in the other direction severs only the ear on the other side of said card notch in the same manner, a link pivotally attached at one end to said each bar, a stem pivotally attached to the other end of said link, means supporting said stem for movement transverse to said link between two positions, an encoding key attached to said stem and extending outside said housing, a pair of parallel positioned rockers journaled for rotation transverse to and positioned one on each side of said link, means connecting said rockers for simultaneous rotation thereof, a lever for rotating said rockers, said rocker including a slot in the side thereof alined with each link for receiving said link, a second slot in each rocker extending transverse of and intercepting the first slot, a pin in said link positioned to engage said second slot in each rocker when the link is moved into said first slot thereof to couple said link to said rocker and move it longitudinally with rotation of said rocker whereby said encoding keys can be moved to position said stem and link for engagement with either of said rockers and said lever actuated for rotating said rockers to thereby selectively sever the card ears for encoding the card.

2. A machine for encoding cards of the type having a plurality of notches in one edge with ears projecting thereacross from each side of the notch to be selectively removed, said machine comprising, in combination, a housing, said housing having a receptacle for receiving the notched edge of said card, a pair of cutter blocks one positioned on each side of and forming the walls of said receptacle, a plurality of alined channels in said blocks extending transverse to said receptacle and each alined with one notch in said card, a cutter bar positioned in each channel having offset notches in two sides thereof overlapping at the receptacle but offset longitudinally along the bar relative to each other whereby movement of said bar a short distance in one direction severs only the ear on one side of the card notch by the cutting action of the notch edge passing the cutter block and movement of said bar in the other direction severs only the ear on the other side of said card notch in the same manner, a link pivotally attached to each bar, a stem pivotally attached to each said link at a point remote from said cutter bar, means supporting said stem for movement transverse to said link between two positions, an encoding key attached to said stem and extending outside said housing, a pair of parallel positioned rockers journaled for rotation transverse to and positioned one on each side of said link, means connecting said rockers for simultaneous rotation thereof, a manual lever for rotating said rockers, and cooperating means for coupling said rockers and links together in response to said link being moved laterally toward said rocker for movement of the link in the same direction as the juxtaposed side of said rocker whereby by laterally moving said link by moving said encoding key fixed thereto each said link can be connected to either of said rockers and said lever depressed to thereby move each cutting bar in either direction for selectively severing the ears to encode said card.

3. A machine for encoding cards of the type having ears thereon adjacent one edge to be selectively severed, said machine comprising, in combination, a housing, said housing including a receptacle for receiving said card to be encoded, encoding means supported in said housing for movement transverse to said card in either direction including cutting edges for cutting said card ears in the card edge in a manner corresponding to the encoding means being moved in one direction and second cutting edges for severing the ears in a second manner when said encoding means is moved in the other direction, a link attached to said encoding means and extending along the path of movement thereof, a rocker journaled for rotation on each side of said link about axes transverse of said link, a slot in each rocker in the side adjacent said link for receiving said link, a second slot in each rocker extending transverse of and intercepting said first slot, a pin in said link positioned to engage said second slot in each rocker when the link is moved into the first slot thereof to connect the link and rocker and move said link longitudinally with rotation of said rocker, means to selectively move said link into the first slot of either roller, and means to rotate said rollers to thereby move said encoding means and encode said card by selectively severing the ear therefrom.

4. A machine for encoding cards, comprising, in combination, a housing, said housing including a receptacle for receiving said card to be encoded, encoding means supported in said housing for movement transverse to said card in either direction for encoding said card in one manner if moved in one direction and a second manner if moved in the opposite direction, a link attached to said encoding means and extending along the path of movement thereof, a rocker journaled for rotation on each side of said link about axes transverse of said link, a slot in each rocker in the side adjacent said link for receiving said link, a second slot in each rocker extending transverse of and intercepting said first slot, a pin in said link positioned to engage said second slot in each rocker when the link is moved into the first slot thereof to connect the link and rocker and move said link longitudinally with rotation of said rocker, means to selectively connect said link with either roller, and means to rotate said rollers to thereby move said encoding means and encode said card in a manner responsive to the direction the encoding means is moved.

5. A machine for encoding cards of the type having a plurality of notches in one edge with ears projecting thereacross from each side of the notch to be selectively removed, said machine comprising, in combination, a housing, said housing including a receptacle for receiving the notched edge of said card, a cutter block positioned in the housing on each side of said receptacle, a plurality of channels in each cutter block each alining with one of the notches in said card edge, a cutter bar in each said channel and sized to fit closely therewith, a notch in two sides of said bar overlapping but offset slightly along the longitudinal axis of said bar from each other whereby longitudinal movement of the bar in one direction for a short distance will sever the card ear on one side by cutting it between the end of the bar notch and the cutter block and longitudinal movement of the bar a short distance in the other direction will sever the other card ear by cutting it between the notch on the other side of the bar and the cutter block, and means to selectively move each individual cutter bar in either longitudinal direction for selectively severing said ears and thereby encoding said card.

6. A machine for encoding cards of the type having a plurality of notches in one edge with ears projecting thereacross from each side of the notch to be selectively removed, said machine comprising, in combination, a housing, said housing including a receptacle for receiving the edge of said card, a cutter block positioned in said housing on each side of said receptacle, a plurality of channels in each said cutter block each alining with one of said notches in said card edge, a cutter bar in each said chan-

nel sized for longitudinal movement therein transverse to the receptacle, a cutting edge on each side of said bar offset longitudinally along said bar relative to each other whereby longitudinal movement of the bar in one direction for a short distance will sever the card ear on one side by cutting it between the cutting edge of the bar and the cutter block and longitudinal movement of the bar a short distance in the other direction will sever the other card ear by cutting it between the cutting edge on the other side of the bar and the cutter block, and means to selectively move each individual cutter bar in either longitudinal direction for selectively severing said ears and encoding said card.

7. A machine for encoding cards of the type having ears at one edge thereof to be severed from the card, said machine having, in combination, a housing, said housing including a receptacle for receiving said card, encoding means supported in said housing adjacent said receptacle for back and forth movement transverse to said card and having cutting edges thereon for severing said card ears in a first manner when moved in one direction and in a second manner when moved in the second direction, a link attached to said encoding means, a pair of rockers journaled for rotation about axes transverse to and on each side of said link, means to selectively couple said link to the adjacent side of either of said rockers whereby said link will be moved longitudinally with rotation of the rockers, and means to simultaneously rotate said rockers to thereby encode said card by movement of said encoding means for severing said card ears in a preselected manner.

8. A machine for encoding cards, having, in combination, a housing, said housing including a receptacle for receiving said card, encoding means supported in said housing adjacent said receptacle for back and forth movement transverse to said card for marking said card in a first manner when moved in one direction and in a second manner when moved in the second direction, a link attached to said encoding means, a pair of rockers journaled for rotation about axes transverse to and on each side of said link, means to selectively couple said link to the adjacent side of each said rocker, and means to rotate said rockers to thereby encode said cards by movement of the encoding means for marking said card.

9. A machine for encoding cards, comprising, in combination, a means for receiving a card to be encoded, a member for movement in two directions relative to a card positioned in the receiving means and including cutting edges for cutting the card in two different manners responsive to movement of the member in the two different directions respectively, a mechanism for preselecting the direction of movement of said member, and an actuator for moving said member.

10. A machine for encoding cards, comprising, in combination, a means for receiving a card to be encoded, a member supported for movement in two directions relative to a card positioned in the receiving means and including means for marking the card in two different manners responsive to movement of the member in the two directions respectively, a mechanism for preselecting the direction of movement of said member, and an actuator for moving said member.

11. A machine for encoding cards, comprising, in combination, a support, said support including means for receiving a card to be encoded, encoding means on said support adjacent said receiving means supported for movement in either direction transverse to said card for marking said card in a first manner when said encoding means is moved in one direction and in a second manner when moved in the other direction, a link attached to said encoding means, and means to actuate said link for selective movement of said encoding means in either direction to thereby encode said card.

References Cited

UNITED STATES PATENTS

2,062,153	11/1936	Welk et al.	234—109 X
2,419,781	4/1947	Keefe	234—46 X
2,448,961	9/1948	Curtis	234—47
2,569,208	9/1951	Welk	234—46 X
2,735,490	2/1956	Hooe	234—47

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