

Feb. 1, 1949.

R. CONNOR

2,460,378

RECORD CARD

Filed April 24, 1944

2 Sheets-Sheet 1

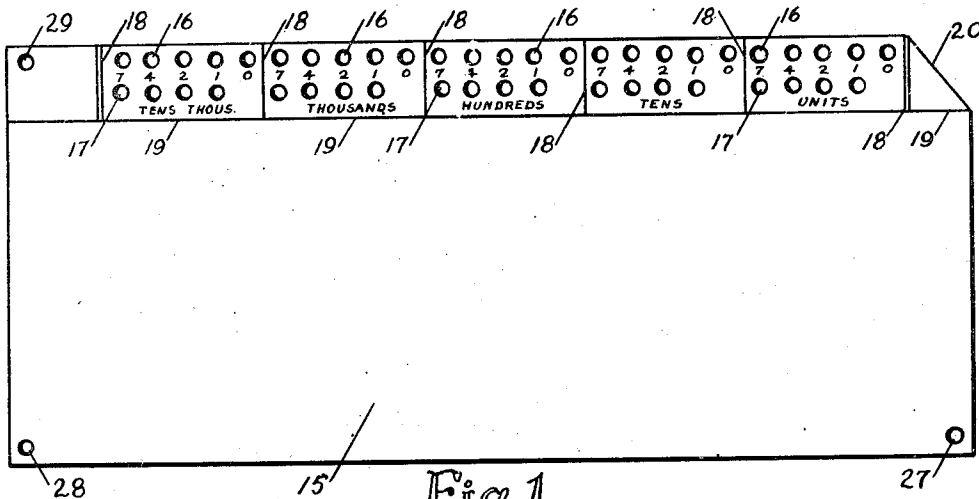


Fig. 1

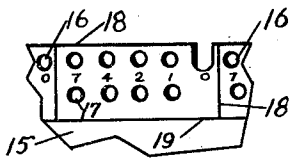


Fig. 2

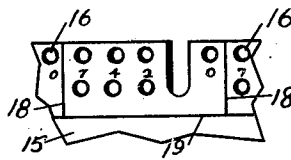


Fig. 3

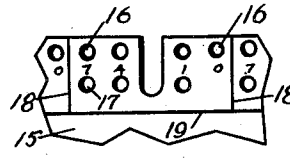


Fig. 4

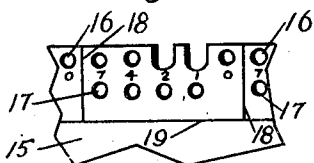


Fig. 5

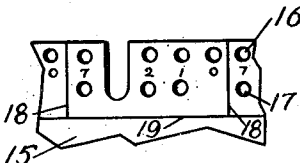


Fig. 6

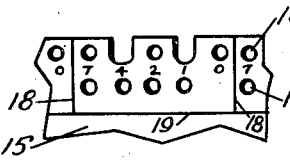


Fig. 7

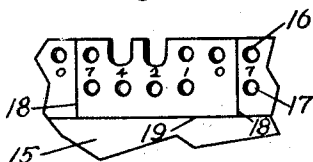


Fig. 8

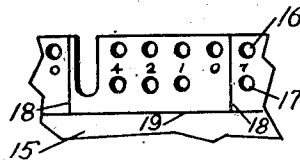


Fig. 9

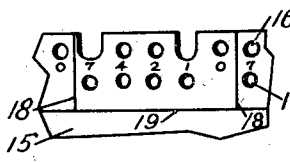


Fig. 10

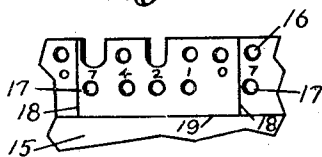


Fig. 11

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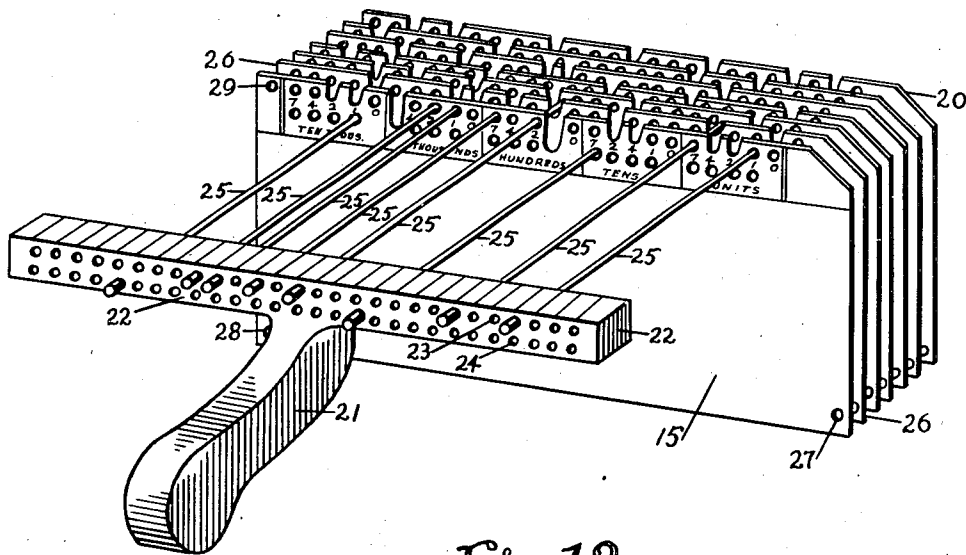


Fig. 12

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UNITED STATES PATENT OFFICE

2,460,378

RECORD CARD

Roger Connor, Athens, Ohio, assignor to The
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Application April 24, 1944, Serial No. 532,525

2 Claims. (Cl. 129—16.1)

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This application is a substitute for my prior application entitled "Record card," Serial No. 446,588, filed June 11, 1942.

This invention relates to cards or other flat bodies of sheet materials adapted to be sorted or classified. More particularly the invention relates to perforated record cards, sheets or checks and the like which may be sorted, separated or classified for accounting and statistical purposes.

As is well known in the art of sorting record cards, one type of marginally perforated card incorporates groups of perforations which can be notched out to an edge, individually or in combination, to identify certain numerical or alphabetical indicia. Each of such groups of perforations may, for example, represent a numerical digit or field of a complete number. As taught in Perkins United States Patents Nos. 1,544,172 and 1,739,087 such cards when properly notched may be sorted into a desired sequence by inserting a rod or needle through the perforations and lifting the stack of cards impaled thereon. Cards that are notched out to the edge from the perforations threaded on the rod will fall clear and the others will remain in place on the rod. Examples of cards of this general type are illustrated and described in the above patents and in United States Patent No. 2,213,607 issued to Donald A. Nevin, September 3, 1940.

It is also well known in the art that there are two different ways of sorting record cards. In one of these the cards are sorted into sequence whereby all of them are rearranged from their original order into the desired order or sequence. Under the second method the cards are sorted selectively, that is only those cards of a particular or desired classification are wholly or partially removed from a stack of similar cards. A selective sort may be further described as one through which the cards of a particular classification may be sorted from a file of prearranged cards in one sorting operation and without disturbing the filed arrangement of the undesired cards.

By referring to the above patents it will be readily apparent how in a field of ten classifications certain ones can be identified through the notching of only four perforations in certain combinations. For example, while only one perforation need be notched to identify the numeral 1 and one other to identify the numeral 2, both of these perforations are notched to identify numeral 3. Similar combinations of notches are used in identifying numerals 5, 6, 8, and 9. Thus it can be seen that it is impossible under an arrangement wherein only four perforations are

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notched in combinations, to identify a field of ten classifications, to select or sort from a stack of cards in one sorting those for a particular classification since more than one classification falls with a single sort.

The general practice followed in producing a card for selective sorting purposes is to provide six perforations to identify each field or digit. In addition to the —1—2—4—7— coded perforations, for example, a—0— perforations and one identified by a symbol as "V" or "SF" may be used. Thus two different notches are provided to identify each classification within a field, the "V" or "SF" perforation being notched only in combination where a classification or digit is identified by a single perforation. An example of a card of this general type is illustrated and described in United States Patent No. 2,198,127 issued to Albert A. Rembold, April 23, 1940. A card such as shown in the patent just referred to has in common with other prior cards the disadvantage that it cannot be selectively sorted for any of the numerals zero to 9, inclusive, with a single sort, since more than one classification falls with a single sort.

One of the disadvantages resulting from increasing the number of perforations from four to six per group for each field or digit is that the overall size of the card must be increased. Where the card size cannot be enlarged because of the limitations of filing or other reasons it is necessary to decrease the number of fields or digits per card and use a greater number of cards. Either of these changes results in increased card or filing costs. And since the cost of cards and filing space for the keeping of these records is a large item in modern business, it is desirable that the cards be designed so as to secure a maximum of information on the smallest standard size card thus insuring the use of a minimum quantity of cards and filing space.

It is the principal object of the present invention to provide a card which is so formed that but a minimum of card edge space is required to identify a complete numerical field for either sequence or selective sorting purposes, the perforations of the numerical field being so arranged and identified that when notched out the card may be sorted for numerals from zero to 9, inclusive, with a single sort.

Another object of this invention is to provide a card having perforations so arranged as to facilitate the punching or notching by the operator. This is accomplished by providing a punching sequence in which, for example, the —1—2—4—7— classifications are always punched in the

lower row of perforations while all figures requiring a combination of two notches are always punched in the upper row.

Other objects and advantages of this invention will be apparent to those skilled in the art from the following description, the appended claim, and the accompanying drawings.

In the drawings, in which a preferred embodiment only of this invention has been chosen as the one to be illustrated,

Fig. 1 is a plan view of a card illustrating the perforations arranged according to this invention and as applied to one edge only of a card;

Figs. 2 to 11, inclusive, are fragmentary views of a card as illustrated in Fig. 1 showing successive representation of such a card after it has been notched to indicate classifications from "0" to "9," only one group of perforations in each view being so shown; and

Fig. 12 is a perspective view of a series of cards embodying the present invention and having a card-sorting device in position for releasing or removing the second card in the series, as seen from the front, and which is identified by the number 13,978 as shown by the notches cut in the upper edge thereof.

It should be noted and understood at this point that although the various fields along the card edge as illustrated have been identified throughout any numerical codes, they may be identified alphabetically, geographically or otherwise and not depart from the present invention.

Similar reference numerals refer to similar parts throughout the specification and drawings. Referring now more particularly to the drawings by reference numerals: a card 15, or other body of sheet material intended for sorting purposes, and hereafter in the specification and claim for the sake of brevity referred to as a card, is provided with an upper or outer row of perforations generally indicated by numeral 16 and an inner or lower row of perforations generally indicated by the numeral 17. These inner and outer rows of perforations are parallel to each other and to the edge of card 15. Although the perforations as shown throughout the drawings are of similar size and shape it is to be understood that some variation in this respect may be allowed without departing from this invention. However it is important and required by the present invention that the perforations 17 of the inner row be placed directly in vertical alignment, that is, in a direction perpendicular to the edge of the card with the perforations in the upper row.

Fig. 1 illustrates the perforations 16 and 17 as being separated into certain groups or fields, which may be identified with the printed indicia units — tens — hundreds — thousands — ten thousands, etc., as shown, or by alphabetical or geographical symbols if desired. By means of the printed lines 18 extending from the top or outer edge of the card to a line 19 running parallel thereto, further segregation of the fields for the operator's convenience may be obtained. Other groups or arrangements of these perforations may be obtained by placing these printed lines at other positions on the card, it being understood that the positions of lines 18 are a matter of preference only. They may be placed as desired or entirely omitted without affecting the invention since they are inserted merely as a matter of convenience and to facilitate the operator's location of a desired field.

In the embodiment shown in Fig. 1, groups or combinations of perforations have been selected

from rows 16 and 17, which essentially comprise five perforations from the upper or outer row and four from the lower or inner row, and which may be identified, for example, with the indicia — 0—1—2—4—7—, for each numerical digit or field. This arrangement of perforations when notched, as hereafter described, adapts card 15 for either sequence or selective sorting, classifying or separating in accordance with certain values associated with each field. The card illustrated in Fig. 1 carries printed indicia associated with each field showing values ranging from 1 to 99,999. It should be noted in this connection that these assigned values are arbitrary and may be increased or decreased as desired.

A cut or beveled corner 20 is provided on the card to facilitate sorting the cards and arranging them with their corresponding faces and edges in the same direction. Corner sorting perforations 27, 28 and 29 are also provided for the same purpose. These features are well known in the art and for this reason will not be further described at this time.

It will also be obvious to those skilled in this art that the rows of perforations 16 and 17 do not have to be confined to a single edge of the card, as here illustrated, but may be extended around the card along each edge if so desired thereby increasing the range of the various classifications, or permitting additions of other classifications or codes.

Figs. 2 to 11, inclusive, wherein the notchings as applied to one group of perforations are illustrated, indicate the manner in which the card is punched or notched to represent numerical indicia from "0" to "9." Throughout these figures, the group of perforations for the digit or field represented is identified with the indicia — 0—1—2—4—7—. Thus in notching this card for a numerical classification the figures — 1—2—4—7— are each identified with a single notch which always extends from the edge of the card into the lower row of perforations 17 while the figures — 3—5—6—8—9— are each uniformly identified with two notches which only extend from the edge of the card into the upper row of perforations 16.

The single notching required for the zero is obtained by punching or grooving the perforation indicated by the "0." See Fig. 2. To obtain the numeral 1 the perforation marked "1" in the lower row 17 is notched out to the edge of the card. See Fig. 3. If the numeral 2 is required the perforation marked "2" in the lower row is notched as in Fig. 4. In Fig. 5 the perforations in the upper row 16 marked "2" and "1" have been notched and thereby combine to obtain the numeral 3. Numeral 4 is obtained by notching perforation "4" in the lower row as in Fig. 6. Similarly the numeral 5 is obtained by notching perforations "4" and "1" while 6 is obtained by notching perforations "4" and "2" as shown in Figs. 7 and 8 respectively. The numeral 7 requires the perforation "7" to be notched in the lower row as shown in Fig. 9. To obtain the numeral 8 the "7" and "1" perforations in the upper row are notched while the numeral 9 requires the "7" and "2" perforations in the upper row to be notched as shown in Figs. 10 and 11.

A card sorting device similar to that shown in United States Patent No. 2,261,719 issued to Roger Connor and D. A. Nevin, November 14, 1941, is illustrated in Fig. 12. Construction and operation of this needle holder 21 is so similar to that illustrated and described in the above patent that

it will not be necessary to generally describe it here. With the exception of needle support 22 having a double row of holes 23 and 24 bored therein to support needles 25, to correspond in number and register to perforations 16 and 17 in the cards, they are identical.

Fig. 12 illustrates how a selective sort is made to remove a card from a stack of cards all numerically identified. The card to be removed in the illustration is the second card in the stack shown in Fig. 12 and generally identified in the drawing by the numeral 26. By referring to card 26 it can be seen along the upper edge thereof that the "7" and "1" perforations in the units field have been notched out. Similarly the "7" perforation in the tens field and the "7" and "2" perforations in the hundreds field have been notched while the "2" and "1" perforations have been notched in the thousands field and the "1" perforation only in the ten thousand field. Card 26 has thus been notched for the numerical identification 13,978. After inserting needles 25 in support 22 so that they will register with the perforations in the cards representing the number 13,978, as illustrated in Fig. 12, to select this card the holder 21 is then inserted into the stack in the usual manner. Card 26 (No. 13,978) being the only card having its perforations notched out to correspond to this number will fall clear when the stack impaled on the needles is lifted.

It will be readily apparent to those familiar with this art that where a card is to be selected which is identified with a number complete in the units or tens fields; for example, 78 that it would be necessary to insert the needles as above described for the units and tens fields but in the hundreds, thousands and ten thousand fields a single needle only will be inserted through the "0" perforations. In this way all the other cards having a number which ends in 78 are prevented from falling.

It is also desired to point out that in sequentially sorting the cards, it is only necessary to sort through the perforations of the upper or outer row, disregarding the perforations in the inner row. By this means a sequence sort may be made and performed in accordance with the teachings of the Perkins patent hereinbefore referred to.

Modifications of the arrangement of printed indicia on the card may be made or various other symbols may be used as desired, such as letters, etc., to identify certain fields or groups of perforations along a card edge, the numerical system as shown and described herein being used only because it affords a quick and easy method of segregating. While a card construction has been described throughout, this invention is equally applicable to any bodies of sheet material having various shapes, provided they are capable of being stacked to bring similarly positioned rows of perforations in each in a position with the perforations of such rows in registration with each other.

Although the cards herein described and shown for carrying out the invention constitute a preferred embodiment, it is to be understood that the invention is not limited to these precise forms or identifying indicia, and that changes may be made therein without departing from the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. As an article of manufacture a card of the character described having formed therein similar fields of perforations relative to one edge of the card, each field of perforations comprising an outer row of five perforations arranged adjacent and parallel to the edge of the card and an inner row of four perforations arranged in parallelism to the outer row at a spaced distance inwardly thereof, the perforations of the inner row being aligned with the four perforations at the left hand end of the outer row in a direction perpendicular to the adjacent card edge, the perforations of the rows being identified on the card by the numerals —0—1—2—4— and —7— commencing with the perforation at the right hand end of the outer row whereby the digits —0—1—2—4— and —7— will each identify a single classification by notching the perforation "0" to the card edge and by notching the perforations of both rows identified with each numeral —1—2—4— and —7— to the card edge, and the digits —3—5—6—8— and —9— will each identify a single classification by notching two perforations of the outer row only whose combined numerical value equals that of the selected digit classification to the card edge whereby the cards when so notched may be selectively sorted for digits "0" to "9" inclusive with a single sort.

2. A stack of cards for classification purposes, each having a first row of coded perforations closely adjacent one edge thereof and a second row of similar perforations adjacent to and parallel with said first row, said perforations in each card being disposed in groups of eight with four perforations from each row in four pairs respectively in alignment in direction at right angles to said edge, card identifying means for sequence sorting comprising a pair of notches in said edge of certain of said cards terminating in a pair of openings in said first row only and in certain of said groups, identifying means for direct selection of cards from said stack comprising the aforesaid pairs of notches and a single notch in said edge to a single perforation in the second row of one only of certain others of said groups, any group of said perforations in any one card having one of said pairs of perforations notched out being different from any other group of said perforations in the same card having such single perforation slotted out, similar means identifying each of said four pairs of perforations but distinguishing each of said four pairs from each other, the said four pairs in each group being respectively identified by the printed numerals 7, 4, 2, 1.

ROGER CONNOR.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,198,127	Rembold	Apr. 23, 1940
2,213,607	Nevin	Sept. 3, 1940
2,261,719	Connor	Nov. 4, 1941
2,289,380	Nevin	July 14, 1942

FOREIGN PATENTS

Number	Country	Date
294,724	Great Britain	1928
522,386	Great Britain	1940