

June 22, 1937.

W. W. LASKER, JR

2,084,848

STATISTICAL CARD

Filed Nov. 17, 1933

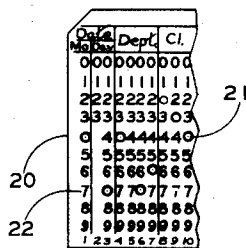


Fig. 1.

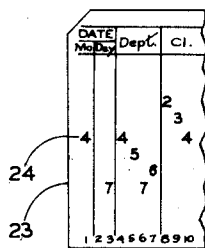


Fig. 2.

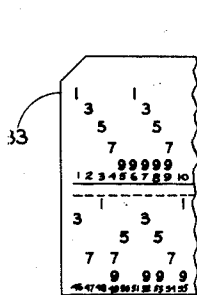


Fig. 4.

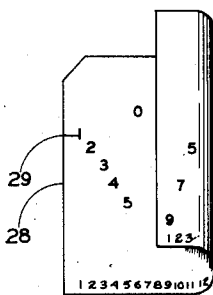


Fig. 3.

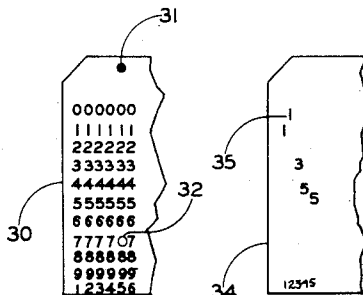


Fig. 7.

Fig. 5.

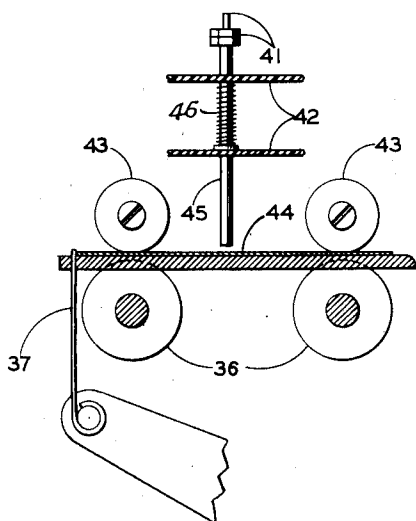


Fig. 6.

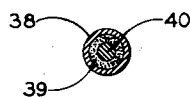


Fig. 8.

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UNITED STATES PATENT OFFICE

2,084,848

STATISTICAL CARD

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Application November 17, 1933, Serial No. 698,387

2 Claims. (Cl. 235—61.12)

This invention relates to record cards, sheets or the like which are used for statistical purposes and adapted to be analyzed by accounting, tabulating and sorting machines. Statistics are usually represented on the card by means of perforations located in certain predetermined positions known as index points. The value or representations of the index points vary according to their relative positions on the card which it has been the practice to arrange in columnar form.

It has been observed that difficulty is experienced in reading the information represented by perforations when the cards or sheets are arranged in a pile, it being necessary to hold each card so that more light is emitted through the perforations so as to permit ease of reading.

The record cards intended for perforation have usually printed thereon the positions of the index points, so that when a certain perforation is made, the index point at that particular position is readable only by comparing its relative position with an adjacent index point which has not been perforated.

It is evident that the perforations structurally weaken the cards, which sometimes result in improper machine operation and various methods which are well-known have been devised to overcome this defect.

To increase the statistical capacity of a card, it has been the practice to perforate combinational holes in a column according to a code. This system practically renders it impossible to quickly read the data, and machines have been devised at a great cost whereby the different codes may be interpreted and the interpretation printed on the card at the proper place.

This application is an improvement over my Patent No. 1,567,325, granted to me December 29, 1925, and also an improvement over the perforated system of representing data.

The main object of the present invention is to provide an improved means for facilitating the reading of the data indicated on the cards as well as to produce a card for providing a greater amount of data for a given size.

A further object of this invention is to provide means of representing data on the card so that the card itself is not materially or physically weakened.

A still further object of this invention is to provide means whereby a new method is provided to interpret combinational index points.

A still further object of this invention is to provide data graphically on the surface of a card in such a way that the data itself will adapt the card to be analyzed by accounting and tabulating machines.

To accomplish the present invention, the data is represented graphically by electrically conductive indications on the surface of the card or

sheet at predetermined positions, such indications being capable of effecting machine operation.

Other objects and advantages of the present invention will hereafter appear in the accompanying specifications and drawing, which show by way of illustration what I consider to be a preferred embodiment of my invention.

In the drawing:

Fig. 1 is a fragmentary portion of a perforated record card of the type generally used with tabulating and sorting machines.

Fig. 2 is a fragmentary portion of a record card with graphic numbers indicated at the index points according to the present invention.

Fig. 3 is a fragmentary portion of a record card having data indicated on both sides thereof.

Fig. 4 is a fragmentary portion of a record card with a plurality of graphic numbers indicated in a column to represent a code.

Fig. 5 is a fragmentary portion of a record card having a modification of the present invention by interstaggering adjacent columnar index points.

Fig. 6 is a sectional view of one form for means of sensing the records.

Fig. 7 shows a card with a senseable medium and a perforation in the same column.

Fig. 8 is a sectional view of one form of sensing pin.

The record card 20, Fig. 1, is of the type commonly used, having data represented by the perforations 21. The index point designations 22 are printed thereon. It will be apparent that the perforations not only structurally weaken the card but also present some difficulty in reading the data especially if the examined card be superimposed on top of others of the same color. Furthermore, it will be observed that the perforations 21 remove the printed index point and reference must be made to an unperforated adjacent index point to determine the reading.

One modification of the improved record card 23, Fig. 2, illustrates the graphical representation of data by the characters 24 which are disposed on the record card by an electrical conductive medium. The positions of the characters 24 are predetermined according to their value or meaning just as are the perforations 21 of the card 20. This condition, however, may sometimes vary as is well-known in the art, according to the arrangement of the fields of the record card. It is to be noted that all the index point positions are not printed on card 23.

By comparing the perforated record card 20 with the improved record card 23 it will be apparent that a card of the improved type effects decided advantages as regards ease of reading, physical structure of the card, and elimination of printed index points.

Furthermore, it will be apparent that since the

improved record card of the present invention is imperforate, it is possible to produce a card of double the capacity of the perforated type regardless as to the dimensional arrangement of the index points, size or shape of the perforation, or whether or not combinational holes are used. Record card 28, Fig. 3 has data on both sides and the data indicated as 29 may be as heretofore described as graphically designated and the marking medium being electrically conductive.

It may sometimes be desirable to automatically obtain certain particular results during the analysis of the record cards such as non-add, subtraction, non-feed, clearing the machine and other operations well-known in the art. In the present invention these results may be obtained from the card itself by depositing within a certain field on the card apart from the index points a material or medium capable of being sensed and thereby effect control of the proper circuit.

Another advantage of the present invention is that the data wrongly indicated may be erased. In the case of a perforation it has been the practice in some instances to correct a wrongly positioned perforation by means of another perforation located in the same column on the card. It would therefore be possible to correct a wrongly positioned perforation by marking at the proper place in the column a sensible substance capable of being detected and thereby prevent the sensing or recording of the perforation. This can be accomplished merely by making the indication with a lead pencil or an ink. In this instance the combination of a perforation and a material disposed on the card in the same column prevents the reading of the perforation.

Record card 30, Fig. 7, has a sensible medium 31 arranged in the same column with a perforation 37 to prevent the recording of the hole.

It is also possible in the present invention to use a code by indicating data on the card by an arrangement of a plurality of graphic numbers in a column. In Fig. 4 a 5 point combinational code is shown on card 33 as one modification of coding. Single designations in a column represent the numbers 1, 3, 5, 7 and 9 and two designations in a column represent 2, 4, 6, 8. It will be evident that the combination of 1, 3, 5 and 7 with the number 9 is used to represent the numbers 2, 4, 6 and 8. Where it has been the practice to use combinational holes, great difficulty is experienced in reading the code and machines have been built at great cost to interpret and print on the card the code interpretation. With the present invention this is not necessary, for in this instance only the digit indications are indicated on the card. Thus, the odd digits, being indicated without another digit-indication in the same row, may be read as indicating their true value, and in the case of the even digits which have combination designations, by merely adding the digit one to the uppermost number of the combination the interpretation is arrived at, thus eliminating an interpreting or decoding machine. It will be apparent that this is merely one method of interpretation and that other modifications may readily be devised according to the same principle. In some instances a constant number added or subtracted to the sum or difference of the combinational numbers may be used in interpretation.

It is of course to be understood that card 33 as one modification may have the index points printed and the data indicated by a conducting substance.

Record card 34, Fig. 5, has increased capacity due to the interstaggering of adjacent columns. This follows to some extent the teaching of Goerlitz, 2,054,811, except in this case the card is not perforated and does not have all of the index positions printed on the card but only those of the digits to be sensed from the cards. This permits the columns to be closer together although the designations 35 are not as easy to read but is merely illustrated as one form of modification.

The conductive markings may be sensed by means of a double pole contact to thereby control circuits and mechanism. In Fig. 6 is shown a card 44 in analyzing position. Rollers 36 are constantly rotating but the stop 37 prevents the card from moving until the proper part of the machine cycle. Rollers 43 are merely pressure rollers to prevent the card from buckling. The card 44 is similar to card 23, Fig. 2 with the numbers graphically indicated. The double pole contact 45 is held between two plates 42 which are reciprocated by means not shown so that when in their lowest position the contact 45 senses or contacts the card surface due to the action of springs 46. Leads 41 are connected to the detecting circuit which in turn controls various operating devices. A cross section of the double pole contact is shown in Fig. 8 in which 38 is one terminal, 39 insulating material and 40 the other terminal. When data is sensed a circuit is completed by means of the conductive medium through the terminals 38 and 40.

By comparison of the improved record card with the perforated type of Fig. 1 many advantages will be evident. Although several modifications of the novel features of the invention have been described and illustrated, it will be understood that various changes in its form and arrangement may be made by those skilled in the art without departing from the spirit of the invention.

It will of course be obvious the records may also be in the form of a tape, strip or other form capable of having data carried thereby.

It is my intention therefore to be limited only by the scope of the following claims.

What I claim as new and desire to secure by Letters Patent, is:

1. A card for controlling statistical machines having a plurality of index point positions and index points of a visible conductive substance at some of said positions, each of said index points being in the form of a legible character representing the signification of the position at which it is located.

2. A card for controlling statistical machines having a plurality of index point positions and index points of a visible conductive substance at some of said positions, each of said index points being in the form of a legible character representing when used singly the signification of the position at which it is located and representing when used in combination a signification according to a predetermined code.

WILLIAM W. LASKER, JR.