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Clair D. Lake, of Endicott, New York, assignor to the Tabulating Machine Company, of Endicott, New York, a Corporation of New Jersey

Record Sheet for Tabulating Machines

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This invention is directed to the general end of providing an improved means of placing a greater amount of statistical, or like data, upon a given record card than has been heretofore possible, resulting in increased efficiency and benefits accruing from tabulating, or like machines preferably employed in connection with such record cards. Where card cost and filing space are important considerations, it is possible, by means of the present improvements to place on a record card of appreciably smaller dimensions the same statistical or tabular data placed on record cards of a size heretofore employed.

In machines of the Hollerith type, for example, it has been the practice to provide record cards with index points thereon arranged in columns and with the index points all laterally spaced from each other and arranged in transverse rows. It has also been the practice to space the perforations, which are usually circular, an appreciable and suitable distance apart laterally in order to prevent the brush cooperating with one column of holes from accidentally contacting through the holes of an adjacent column.

While the natural solution of placing more data on a given card is to make the circular perforations smaller in diameter it has been observed that cards having relatively small circular perforations were not satisfactory with respect to machine operation and strength or durability.

In tabulating and sorting machines of the electrical type a certain length of time is required for establishing the circuit through the holes in the card. This length of time and other requirements of the machine have, without resorting to other mechanical expediences, governed the diametrical dimensions of circular card perforations and when the smallest size that could be used was determined it was found that the additional data that could be placed on the new record was, to all extents, not appreciable.

It has also been discovered in practice that as the circular perforations were reduced in diameter and placed closer together a straight line of such perforations would act in the manner of a line-perforated stub card and record cards weakened in this manner did not possess the necessary characteristics of strength and durability.

It is then a main object of the present invention to provide an improved means of providing a greater quantity of perforated data upon a record card of a given size without sacrificing card strength or durability as well as to produce a record card that is satisfactory with respect to machine operation and one that may be employed in connection with machines now in commercial use without material changes in the mechanisms therein.

It is a still further object of the present invention to provide an index point having the necessary characteristics and requirements for proper analyzing operations for deriving tabular data from a record card.

In carrying out the present invention the spacing of adjacent card columns is reduced in order to provide more data on a given card and to provide for the necessary time element for electrical contact the holes are elongated in the direction of card feed. The form and spacings of the perforations are such that considerable resistance to tearing by a series of such perforations is effected.

In the drawings:

Fig. 1 represents a card having the usual form and spacings employed in connection with Hollerith tabulating and sorting machines;

Fig. 2 is a plan view of a perforated record card having index points constructed according to the present invention;

Fig. 3 is a cross sectional view of the brush section of a tabulator, sorting machine or the like, showing the cooperation of an analyzing brush with the preferred form of perforation of an improved record card as the card is fed thereto;

Fig. 4 is a fragmentary portion of a record card employing small circular perforations;

Figs. 5 and 6 are fragmentary portions of record cards illustrating modifications of the present invention.

The improved record card 10 (Fig. 2) is of the usual construction except that the index point designations 11 are spaced closer to.
gether than the index point designations 12 (Fig. 1) of the usual form of Hollerith record
on any card. Since the improved form of perforations are of a reduced width than
herefore it enables a closer lateral spacing of the index point columns and with the at
tendant possibility of placing more columns of data upon a record card of a given size.
The number of columns that may be placed
upon a card is determined not only by the
strength of the perforated card but by the
closeness to which adjacent brushes
may be brought together without the resul
tant danger of a brush associated with one
column engaging an adjacent brush or col
umn perforation resulting in irregular ac
counting machine operations. The present
column width has been adopted with the
above in mind and with slight modifica
tions the brushes and holders now employed may be
satisfactorily used in connection with the
new form of record cards.

Where a series of perforations 11 are re
quired, it will be apparent that the card will
be weakened along the line of perforations
and this is particularly true if the perfora
tions are circular, as indicated by numeral 14
in Fig. 4 which are shown as small as may
be practical to use. Such groups of perfora
tions materially weaken the card since the
circular perforations converge naturally to
a tearing line as is readily evidenced by the
preferred employment of such perforations
for stub cards.

It has been observed that if the perfora
tions are elongated as those indicated by nu
meral 11 in Fig. 2 and have adjacent substan
tially straight edges that the resistance to
tearing a record card along a horizontal line
of perforations is substantially increased.
The preferred form of index point perfora
tions 11 are substantially rectangular in
which the length is considerably greater than
the width. Other forms may be used with
similar marked advantages and may be substan
tially oval-shaped holes as shown in
Fig. 5 or have adjacent straight edges along
the longer side and be substantially circular
or elliptical on the other edges such as shown
by numeral 17 in Fig. 6.

Considering Fig. 2 it will be apparent that
the separation as indicated by A, is consider
dably less than the separation B, the latter
being substantially equivalent to a cor
sponding spacing of the index points of Fig.
1. This requires no change in the timing of
the mechanical or electrical parts of the ap
paratus and the new type of cards may be
readily substituted with a similar degree of
efficiency in operation. It will be obvious
that since a vertical line of elongated per
forations never occurs due to the fact that but
one perforation in a vertical card column is
used the separation at B may also be reduced
without materially weakening the card.

Thus the same amount of data may be placed
on a card of still smaller dimensions.

Observing Fig. 4 it will be apparent that if
a card having small circular holes 14 should
be fed downwardly by feeding rollers 15 to
a brush 19 that the duration of electrical con
tact is directly proportional to the diameter
of the perforation and where holes of small
diameters have been employed not sufficient
time was given for electrical contact without
employing special brush construction and
mechanical expediences. With the employ
ment of the elongated form of perforations it
will be apparent that a construction is pro
vided which permits a circuit of longer dura
tion even though the perforation is smaller
in width than a circular perforation, by rea
son of the fact that the wires of brush 19 are
in contact with the contact member 20 for a
greater number of time than the perforation
is passing between the brush and the contact
member.

In other words, between the time the brush
falls into the leading edge of the hole and the
time the brush is lifted by the rear edge of
the hole a greater length of time will have
transpired than when circular holes having a
diameter equivalent to the width of the
elongated holes are used. At the same time
since the card columns may be closer a greater
amount of data may be placed on a given card
and the card will still be satisfactory with re
spect to machine operation and structural
strength.

By a comparison of Figs. 1 and 2, it will be
apparent that a card formed according to the
present invention may represent considerable
more tabular data than heretofore.

In the present instance 30 columns of data
may be placed on a card as compared to a 45
column card used heretofore. It will be ap
parent that when a card having 40 columns is
suitable for all purposes record cards con
structed according to the present embodi
ment will be about half the size of regular
Hollerith cards giving marked advantages
with respect to card cost, ease in handling,
reduction in filing space, etc.

While there has been shown and described
and pointed out the fundamental novel fea
tures of the invention as applied to a single
modification it will be understood that variou
changes in the form and details of the
device illustrated and in its operation may be
made by those skilled in the art with
out departing from the spirit of the inven
tion. It is the intention, therefore, to be lim
ited only as indicated by the scope of the
following claims.

I claim—

1. A tabulating card having oblong con
rol apertures arranged in vertical columns
and horizontal lines with the greater dimen
sion in the vertical direction whereby the
card is stronger and contains more perfora.

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tions than a similar card having similarly arranged and spaced circular perforations of a diameter equal to said vertical dimension.

2. A card as in claim 1 in which the apertures are rectangular.

In testimony whereof I hereto affix my signature.

CLAIR D. LAKE.