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RECORD CONTROLLED DATA STORING DEVICE

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2 Sheets-Sheet 2

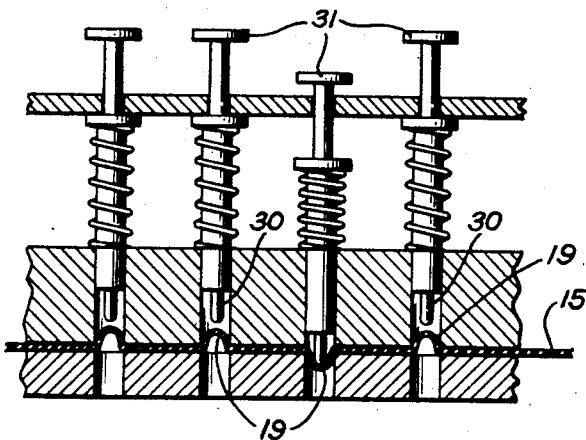


Fig. 4

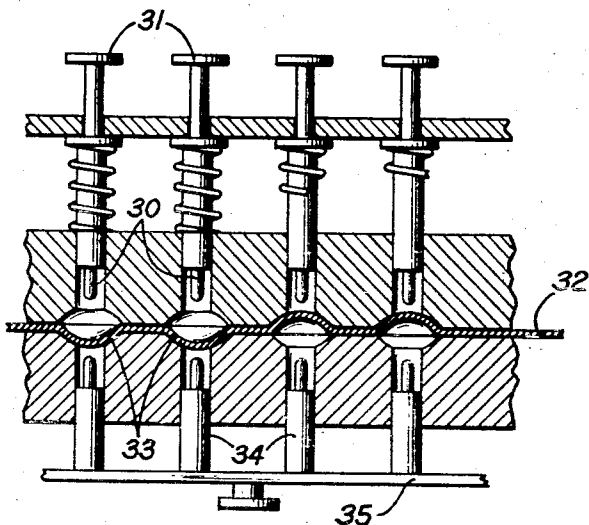


Fig. 5

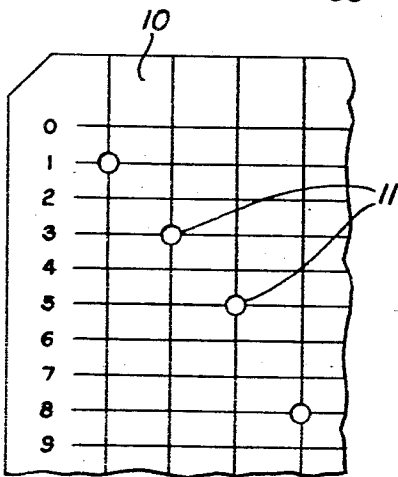


Fig. 6

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RECORD CONTROLLED DATA STORING
DEVICE

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7 Claims. (Cl. 200—46)

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This invention relates to statistical machines and more particularly to devices for sensing data designations contained in record cards for controlling machine operations.

The principal object of the invention resides in the provision of a novel storage device for receiving data from a record card and retaining said data for subsequent controlling operations.

A specific object is to provide a data receiving record medium comprising a sheet of resilient material in which there are provided columns and rows of designating positions. In each position the material is configured to form a cup or dish extending to one side of the material. Pressure exerted against the cup will cause it to reverse its position and extend from the opposite side of the material. By selectively reversing the cups, a pattern of projections will be formed on one side of the material representing by the location of the cups desired data. Subsequent movement of the material in the plane of its surface will cause the projecting cups to engage and operate circuit closing devices to complete electric circuits in accordance with the data pattern set up.

A more specific object of the invention is to provide perforated record controlled mechanisms for setting up a pattern of inverted cups on the record material.

A still further object is to provide resetting mechanism for returning any inverted cup to its initial condition.

Another object is to provide an arrangement whereby inverted cups will serve as a printing medium to record on a tape a printed pattern corresponding to the pattern of the inverted cups.

Other objects of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawings, which disclose, by way of example, the principle of the invention and the best mode, which has been contemplated, of applying that principle.

In the drawings:

Fig. 1 is a sectional elevation of the record feeding and storage mechanism.

Fig. 2 is a view looking from the left of Fig. 1 along lines 2—2, with portions broken away to show the interior construction.

Fig. 3 is a view of a modified arrangement to show the manner in which the storage medium may effect printing.

Fig. 4 is a detail showing the manner in which the setting of the storage medium may be key-controlled.

Fig. 5 is a further detail of another form of storage medium with differently configured cups.

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Fig. 6 is a fragment of a perforated record card.

In Fig. 6 is shown a portion of a well known record card 10 which is provided with the usual vertical columns and horizontal rows of designating positions whose intersections constitute the individual designation receiving points in which perforations 11 may be made to signify data. Thus, in Fig. 6 the four perforations shown represent the value 1358.

This card is fed between rollers 13 and 14 (Fig. 1) between which there is also an endless web or belt 15, of resilient material. Roller 14 is rotatable on a fixed post 16 and is driven in unison with roller 13 through gears 17 (Fig. 2) from a suitable source of power.

Roller 14 is provided with circles of holes 18, axially spaced to correspond to the vertical spacing of the rows of designating positions of Fig. 6 and circumferentially spaced to correspond to the columnar spacing of the hole positions. Thus, as the rollers turn, the card and web are advanced to bring the columns successively into line with the common axis of the rollers and, as each card column is in such position, there will be a line of holes 18 adjacent thereto.

The web 15 is provided with a plurality of cups or dished areas 19 spaced so that they normally face the interior of the web and extend into the openings 18 as roller 16 rotates. The web 15 and cups 19 are preferably made of rubber with the cups so proportioned that pressure exerted against the head of the cup will force it to reverse its position, that is, it will snap through the web and emerge on the opposite side, the resiliency of the material enabling such action.

Extending through the fixed post 16 is a bore 20 with ducts 21 extending therefrom to the rows of holes 18 as they arrive at the common axis. From a suitable source (not shown) compressed air is directed into bore 20 and ducts 21 to exert pressure against the cups 19 that lie on the common axis. If there is a hole 11 in the card 10 adjacent to any such cup, the air pressure will cause the cup to snap to its outer position, through hole 11 as shown in Fig. 1, while in positions where there is no hole 11 the card material will prevent such change in position of the cup. The roller 13 is suitably grooved as shown in Fig. 2 to straddle the hole positions and not interfere with the snapping action.

The effect of this action is to transfer to the web a cup setting corresponding to the arrangement of hole positions in the card columns by a simple shift of corresponding cups 19 from what may be termed a non-set or in position to a set

or out position. As the web 15 continues its travel, its outer surface (Figs. 1 and 2) will contain a data setting evidenced by the number and arrangement of cups 19 protruding therefrom.

Located in the path of each vertical line of cups is a pair of contacts 22 which will be engaged and closed by the protruded cup 19, as the latter passes by. The angle of engagement is such that the cup remains protruded as it passes the contact. Contact 22 may close a circuit to control mechanism it is desired to operate in response to the data setting on the cups.

From the foregoing, therefore, it is readily seen that web 15 constitutes a storage device upon which data is set, and subsequent to such setting the data is read out by the actuation of contacts 22 by the protruded cups. The web 15 passes around a roller 23 provided with openings 24, which pass stationary ports 25 connected to a bore 26. This bore 26 is connected to a suitable source of reduced air pressure, so that as the cups pass the ports 25 any protruded or set cup will be drawn or sucked back to its initial non-set position in readiness to receive a new setting when it arrives in the setting position opposite ports 21.

In Fig. 3, an inking roller 27 is located in the path of set cups 19, so that as the cups pass by they will take up a quantity of ink which later, as these cups pass opposite a platen 28 geared to roller 24, will imprint a mark on a record sheet 29 to record thereon a pattern of marks corresponding in arrangement to the hole arrangement on the record card 10.

In Fig. 4 is shown the manner in which the web may be utilized as a sheet of record material in which data entries may be made directly. In each of a row of cupped positions there is located a spring-pressed plunger 30 with a button 31 which upon depression will force the plunger to engage the related cup and snap it from its non-set to its set position. Thus, a sheet of material of the kind mentioned may have located thereon columns and rows of cups 19 and by selectively setting the cups various data may be recorded therein. When such data is to be changed, it is simply necessary to snap the set cups back to their initial positions, whereupon a new setting may be made on the same record material.

The foregoing contemplates the web 15 to be of a rubber-like material, but this is not a limitation as it may also be of thin metallic construction as shown in Fig. 5, where 32 represents a thin sheet with cups 33 formed therein. The action in effecting a setting is the same as for web 15, namely, the operation of a plunger 30 will snap a cup 33 to a set position as shown. In Fig. 5 there is shown a set of plungers 34 on a common bar 35 by means of which the cups may be concurrently reset as is apparent.

While there have been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention therefore to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. A data receiving and retaining device comprising a sheet provided with transverse columns

and rows of receiving positions, the sheet being configured to provide a flexible protruding cup at each position, all the cups normally protruding from one side of the sheet and the flexibility of the material being such that the cup may be flexed at will to selectively protrude from either side of the sheet, whereby a data representing pattern may be formed in the columns and rows of positions by flexing selected cups from said one side of the sheet and through the plane of the sheet to the opposite side to cause their protrusion from the said opposite side of the sheet and the remainder from the said one side.

2. A record sheet for controlling the operation of a statistical machine which comprises columns of index point positions, there being in each column one position for each of the digits, the sheet being configured at each position to form a spherical protrusion and being flexible at such point to enable the protrusion to be shifted transversely to the plane of the sheet so as to extend at will from either side thereof whereby a digit may be represented in a column by causing the protrusion corresponding to the digit to extend from one side of the sheet and the remainder from the opposite side.

3. A record sheet for controlling the operation of a statistical machine which comprises columns of index point positions, there being in each column one position for each of the digits, the sheet being configured to have a portion thereof raised at each position above the plane of the sheet to form a cup and resilient at such position whereby the cup may be sprung to the opposite side of the sheet to form an inverted cup thereat, whereby a digit may be represented in a column by having its related position sprung to one side of the sheet while the remaining positions in the column are sprung to the opposite side, the resiliency of the sheet being such that a snap action effects the springing of the cups from one side to the other and holds the cups on one side or the other in all positions.

4. In a device of the class described, a sheet having a portion thereof flexible to spring to either side of the plane of the sheet to form a protrusion thereat, means for applying air under pressure against the protruded portion to spring it to the opposite side of the sheet and a record card engaging the said opposite side to control the action by preventing the springing if the card is imperforate at the said portion or enabling the springing if the card is perforated at the said portion.

5. In a machine of the class described, a record card having a column of perforating positions in any of which a perforation may be present, a storage sheet having a column of index positions spaced correspondingly to the perforating position in the card, each index position of the sheet being configured to extend to one side of the plane of the sheet and flexible to spring to the opposite side, means for superimposing the card and sheet with the columns of both coinciding and with the raised portions in the sheet facing away from the card, and means for applying pressure to all the raised portions, said card resisting said pressure at the imperforate portions thereof, said pressure causing the portions of the sheet coinciding with perforations in the card to spring to the opposite side of the sheet and extend into said perforations.

6. The invention set forth in claim 5 in which both the card and sheet have a plurality of columns of perforating and index positions re-

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spectively and in which the superimposing means causes related pairs of columns to be successively superimposed to thereby set up on the sheet a representation of the perforation arrangement in the card columns.

7. In a device of the class described, a sheet having a column of digit representing positions, the sheet being configured to have portions thereof raised at each position above the plane of the sheet and resilient to be sprung to the opposite side of the sheet, means for moving the sheet to present the column to a setting device, means controlled by the device to spring a selected portion to its alternate position, a circuit closing member and means engaged by the spring por-

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tion upon subsequent movement of the sheet for operating said circuit closing member.

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