

June 14, 1938.

G. TAUSCHEK

2,120,378

LUMINOUS SIGN

Filed April 11, 1934

3 Sheets-Sheet 1

FIG. 1.

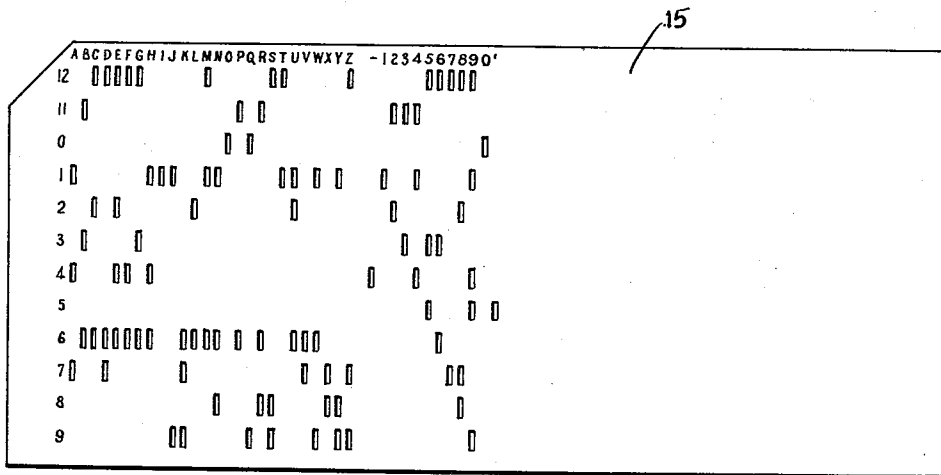
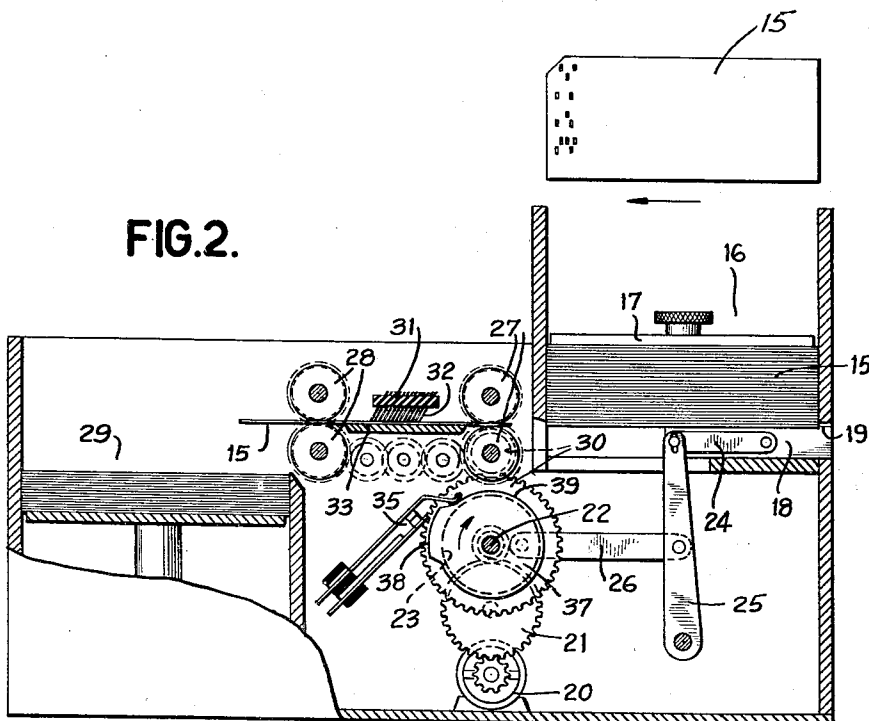


FIG. 2.



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3 Sheets-Sheet 2

FIG.3.

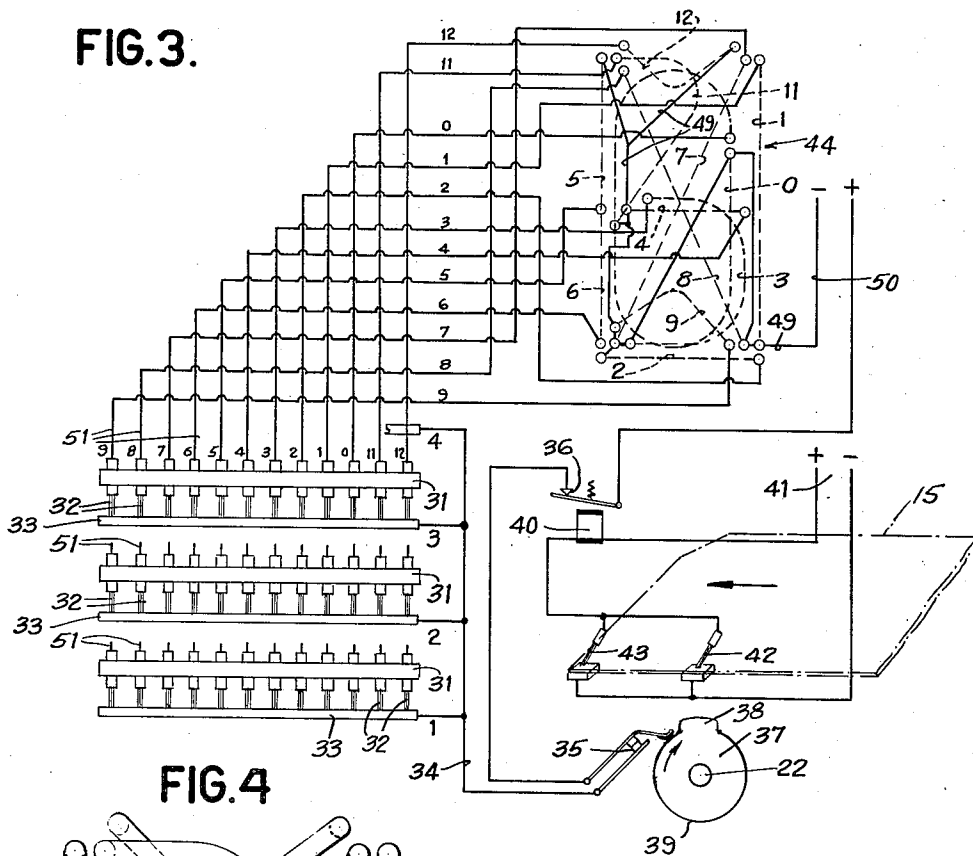


FIG.4

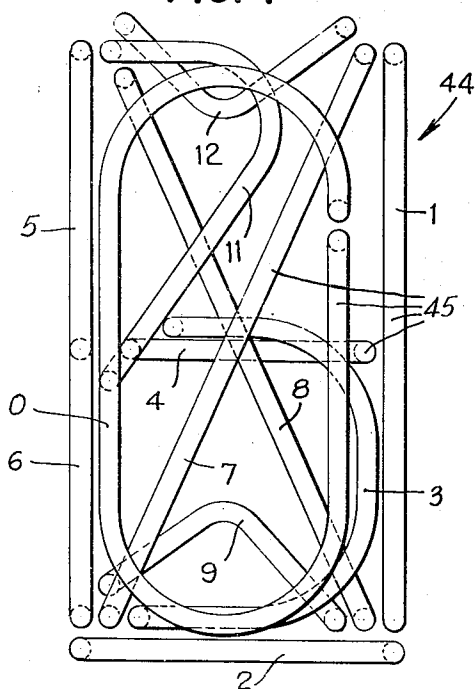
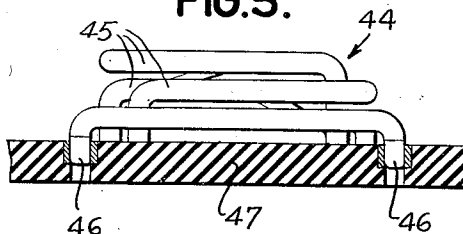


FIG.5.



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3 Sheets-Sheet 3

FIG. 6.

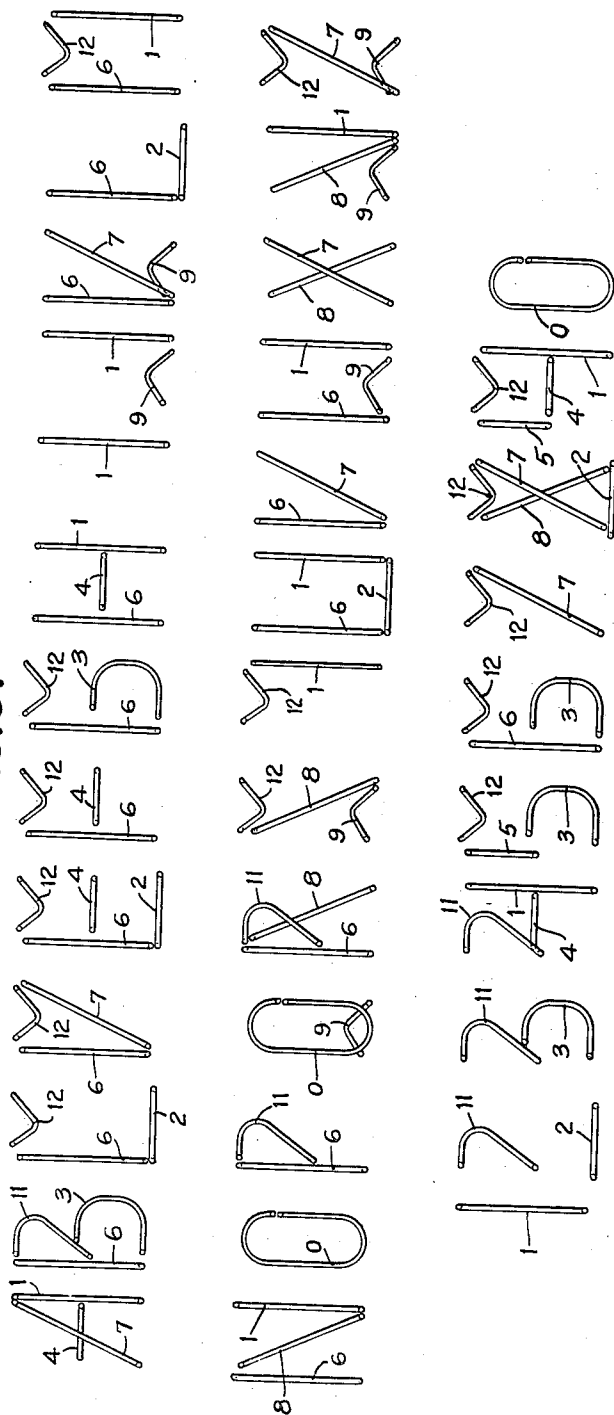
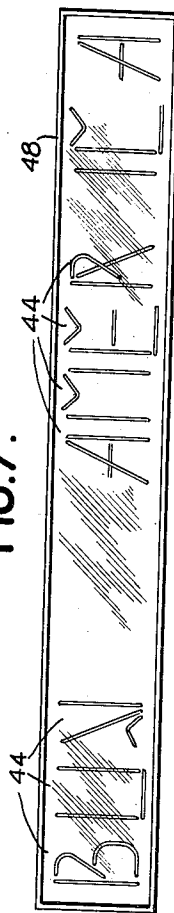


FIG. 7.



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LUMINOUS SIGN

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Application April 11, 1934, Serial No. 720,078

3 Claims. (Cl. 177—350)

This invention relates to electrically controlled luminous signs usually employed for advertising or signaling purposes.

The main object of the present invention is to improve the construction of the signaling or character representing devices of such signs, which ordinarily are in the form of individual incandescent lamps each of the same form and type, so that the sign can be used either day or night.

Contrasting to prior practice each character representing device, ordinarily known as a monogram, comprises in accordance with this invention a series of neon tubes which are either distinct in configuration or else of the same form but located at different positions. The form and location of such tubes are so devised that when the tubes are lighted singly or in predetermined combinations various characters, such as letters and numerals, may be visibly presented.

Another object of the invention is to cause the representation of all the English characters ordinarily used by as few of such neon tubes as is possible and still adhere to the conventional representation of such characters.

A further object is to arrange the neon tubes of a signaling or character representing device so that for compactness they may overlie each other without any detriment to the efficiency of the character representing device since a lighted neon tube may be clearly visible through an overlying unlighted tube.

A still further object of the invention is to devise for operative control of said character representing device a suitable mechanism such as a pattern sheet analyzing mechanism. In connection with the analyzing mechanism suitable electrical control connections extend to the tubes whereby the latter are individually selected for illumination in accordance with character representations on the pattern sheet.

A still further object is to provide a series of such character representing units to cause a reproduction of words, etc. represented on the pattern sheet.

A still further object is to cause the character representing units to represent the advertisement, etc., in the form of a "traveling" sign, the characters traveling to the left step by step.

A more specific object is to prevent improper illumination of the neon tubes of the character representing units when there is no pattern sheet in the machine in position for control purposes.

Other and relatively important objects will be apparent as the invention is understood by ref-

erence to the following description and accompanying drawings, in which:—

Fig. 1 is a plan view of a conventional tabulating card herein employed as the pattern sheet.

Fig. 2 is a longitudinal sectional view of the machine.

Fig. 3 is an electrical circuit diagram showing only three of the thirteen sets of analyzing brushes and the circuit connections for a single character representing unit.

Fig. 4 is a plan view of the preferred arrangement of neon tubes of one of the indicating or character representing units and Fig. 5 is an end view of the same.

Fig. 6 is a diagrammatic illustration of the manner in which each of the characters is represented when an indicating unit is constructed as shown in Fig. 4.

Fig. 7 illustrates the manner in which characters appear at the initial character representing operation, certain words being selected by way of example.

In Fig. 1 there is represented a tabulating card 15 which, in the present instance, is the pattern sheet and of the type shown and described in the patent to C. D. Lake No. 1,772,492 dated August 12, 1930. The card is shown perforated by rectangular holes arranged singly at predetermined index point positions in a card column or in predetermined combinations in any of the twelve index point positions. The arrangement of the holes or perforations to represent all the letters of the alphabet and all the digits is shown in vertical columns of the card shown in Fig. 1. The letter "A", for example, is represented by perforations at the index point positions 1, 4 and 7 in the first card column. "I" is represented by a single perforation at position "1". If characters are represented by single holes they are located at distinctive positions, as in the case of letters "I" and "O". Obviously combinations of holes to represent different characters are distinctive as in the case, for example, with letters A, B, C, etc.

To cause the indication of some particular word or sentence the card is perforated by a punching machine in the different vertical columns. The limit of characters that can be expressed in the type of card shown in the Lake patent identified is eighty but obviously with a different form of pattern sheet, such as a continuous sheet, more or less characters can be represented.

As shown in Fig. 2 the tabulating cards 15 are stacked in a supply hopper 16 and the cards are pressed downwardly by a weighted plate 17 lo-

cated on the top of the stack. Below the bottom card and arranged to slide longitudinally in the machine framework is a picker 18 which has a shoulder 19 of sufficient height to receive one edge of the bottom card 15 so that each movement of the picker to the left after its return to the right will feed a single card. The reciprocation of the picker 18 is effected by the following described operating mechanism. A motor 20 is adapted to drive a gear 21 and by suitable gearing a shaft 22, to which there is secured a disk 23. The picker 18 has a link connection 24 to an arm 25 and at the mid-point of the latter there is connected a link 26, the latter also being connected to disk 23 in such a manner that the latter acts as a crank for arm 25, whereby the latter for each complete rotation of disk 23 reciprocates the picker 18. When the motor is set in operation the cards 15 are fed one after the other automatically and without the attention of the operator and as long as the supply of cards lasts. It should be pointed out that the cards are fed in the direction of the longer dimension of the card, that is, at right angles to the vertical columns of the card and in the arrow direction in Fig. 2. The reason for this directional feed is to permit the sensing of the perforations in each vertical card column.

When the cards are fed and issue from the supply stack 16 they reach and pass between a pair of feeding rollers 27 and are then fed to another pair of feeding rollers 28 to finally land in a storage hopper 29. The feeding rollers 27 and 28 are intergeared and have a high ratio gear connection 30 to the shaft 22 so as to be driven thereby at a higher speed than the shaft 22.

Between the pairs of feeding rollers 27 and 28 there is located a block of insulating material 31 carrying preferably thirteen sets of columns of brushes 32. In Fig. 3 only three of such sets of brushes are shown and each set consists of twelve individual flexible wire brushes pressing upon the card to pass through perforations if located at corresponding positions of a correlated vertical card column and thus contact with a common electrical conducting plate 33.

Referring to Fig. 3 it will be observed that current to the common conducting plate 33 is furnished by a wire 34 having a connection to one line side through cam controlled contacts 35 and relay contacts 36.

For reasons that will be later apparent it is necessary that current to plate 33 from the line side by wire 34 be cut off; when no card is beneath the sets of brushes 32; during the passage of a card beneath the brushes 32 and until the thirteen sets of brushes 32 are correlated with the thirteen leading card columns of perforations.

Fastened to the shaft 22 is a disk 37 having a high portion 38 and a low concentric portion 39. When a card is being fed from the stack and until the first card column is operatively associated with the first set of brushes 32 encountered the high portion 38 will retain contacts 35 open cutting off current to the plate 33. As the card is fed further the low portion 39 will permit contacts 35 to close the circuit at this point and until the last card column has been analyzed.

Contacts 36 are controlled by a relay magnet 40 energized by a source of current 41 and current to the magnet is controlled by two special card operated brushes 42 and 43 normally, that is, in the absence of a card beneath both brushes, closing the circuit to magnet 40 and thereby keeping the contacts 36 open. The card brush 42 is so disposed as to contact with one marginal hori-

zontal edge of a card and is so located that substantially when the first card column is correlated with the first set of brushes 32 encountered the brush 42 will be raised by the leading edge of the card but magnet 40 will still be energized to keep contacts 36 open since brush 43 has not been raised and even though at this time the low portion 39 of disk 37 could or will permit contacts 35 to close. When the first thirteen card columns are in position for the analyzing operation brush 43 is raised by the card and it will permit contacts 36 to close. Contacts 35 are adapted to be closed at this time so that current is now supplied to contact plate 33. The cam disk 37 is arranged to cause the closure of the contacts 35 at or slightly after the relay contacts 36 close to prevent arcing and burning of the relay contacts 36. The arc caused by the making of the circuit is thus transferred to contacts 35 which are heavier, more positively operated, and are better able to resist destruction usually caused by arcing. Further the cam 37 can be closely timed to cause the circuit closing at the precise times. After the last column of perforations leaves the left hand (Fig. 2) set of brushes 32 the trailing vertical edge of the card leaves brush 42 so that the circuit to the relay magnet 40 will be closed opening contacts 36 and ultimately the trailing edge of the card leaves brush 43. The contacts 35 are timed to open before the relay contacts 36 open to thus transfer the arc caused by the opening of the circuit to the contacts 35. Obviously brushes 42 and 43 prevent current from being supplied to contact plate 33 when no cards are being fed at which time the motor 20 might be running and contacts 35 are being opened and closed.

The means whereby a visible illumination of characters represented on the card may be effected will now be described.

Referring to Figs. 4 and 5 it will be observed that each indicating unit 44 consists of a series of twelve neon tubes 45, one for each index point position. Such types of tubes are well known and have long been used for advertising signs. Their particular advantages are well known and the possibility of being bent into different shapes lend themselves particularly qualified for the present invention. The tubes marked by all the numbers, except 5 and 6 are individual, while tubes 5 and 6 are divisions of a single vertical tube capable of being used separately or together. Each tube is either straight or curved and their forms are so selected that when lighted singly or in combinations they will represent as shown in Fig. 6 letters of the alphabet or the digits.

The letter "A", which it will be recalled is represented by holes at positions 1, 4 and 7, will be visibly represented as shown in Fig. 6 when tubes 45 having corresponding numbers are selected for illumination. In Fig. 6 there is outlined each character representation when tubes identified by the numerals shown are lighted. Most characters are close to the conventional form and others sufficiently close for easy recognition of the character intended to be represented.

As is best shown in Fig. 5 the tubes are arranged in three layers and the ends of the tubes and the middle of tubes 5-6 have contact terminals 46 fitting in a supporting board 47 of insulating material, in a manner well known in the art.

It is pointed out that when a lighted tube underlies unlighted tubes the illumination will be visible through the clear unlighted tubes so that a full illumination will be effected.

A series of thirteen such indicating units 44 are

provided and arranged in a suitable glass covered casing 48 (Fig. 7).

In Fig. 3 by means of a common return lead 49 one end of each of the twelve tubes is connected to the line side 50 which leads to a suitable voltage transformer for applying the necessary voltage to the neon tubes selected for illumination. If desired the ends of the tubes may be connected to individual transformers if said tubes require different voltages. The twelve wire connections leading from the ends of the twelve neon tubes 45 of one unit 44 are connected by wires 51 to the corresponding twelve brushes 32 of the related set of brushes 32. Thus, in the same manner each indicating unit 44 is electrically connected to the related set of brushes 32 for control purposes.

If a card 15 is perforated to represent in the first thirteen columns "Buy America" the thirteen sets of brushes 32 will be positioned over the first thirteen card columns and each brush of a set will select for illumination particular tubes 45 of a related indicating unit 44 and the characters of the two words will be simultaneously flashed and made visible to an observer. Thereafter the card progresses past the brushes 32 the lighted tubes will be darkened and when the card is fed a distance corresponding to a column the tubes will, if the fourteenth column is unperforated, again light and indicate "Uy America". If the 15th, 16th and 17th are perforated to represent "And" the two remaining letters U and Y of the word "Buy" will successively fade out and the word "America" shifted to the left step by step as the letters A, N and D successively come into view at the right. This illusion gives the effect, as is well known, of a traveling sign after the simultaneous appearance of characters represented by the first thirteen columns.

Of course, if the first thirteen columns are blank the letters will appear at the right in succession and traveling to the left step by step. After all the card columns have been analyzed and all the represented characters made visible the card is fed to the storage hopper 29. The sign, of course, will be unlighted during the feeding of the next card and when the first thirteen columns of the next card are analyzed and the characters simultaneously flashed the "traveling" of the characters represented by the succeeding card will ensue. Obviously, the pattern sheet may be a long strip preventing discontinuity between the words to be flashed and their initial simultaneous flashing as the use of the form of tubes is not limited to control by individual elements such as the separate cards shown.

What is claimed is as follows:—

1. In an electrical sign, in combination, a plurality of lamp circuits, a perforated pattern sheet having perforations for selecting circuits of the lamps to be illuminated, a source of electrical power for said circuits, relay contacts, a cam, said cam controlling contacts in series with said relay contacts, means for testing the presence of a sheet and operative upon the absence of said pattern sheet for disconnecting the source of power from said circuits irrespective of the closure of the cam controlled contacts by causing the opening of the relay contacts, means for feeding the sheet to and past said testing means, and means for rotating said cam in synchronous relationship with the feeding of the sheet past said testing means to cause said cam to close its

contacts at the time said testing means has caused the closure of the relay contacts when the testing means has determined that the sheet has been fed a predetermined extent.

2. In an electrical sign, a plurality of character representing units each unit comprising a set of lamps, a pattern sheet perforated in columns for the representation of characters by said lamps by predetermined perforations, a plurality of sets of analyzing means, a plurality of sets of lamp circuits, one set for each unit and closed by the related set of analyzing means through the perforations in a column, an electrical motor, a source of electrical power supply for said motor for uninterrupted operation thereof and for said lamps, electrical switching means for connecting said source of power to said circuits, sensing means cooperating with said sheet and shifted by said sheet from an inactive position to an active position when a plurality of columns of the sheet are correlated with the analyzing means, means operated by said electrical motor for uninterruptedly feeding the sheet to said analyzing means and said sensing means, and means controlled by said sensing means for rendering said electrical switching means ineffective during the uninterrupted operation of the feeding means to connect the power supply to said circuits by the inactive position of the sensing means due to the absence of the sheet in cooperation with said sensing means, and for causing by the active position of said sensing means said switching means to connect said electrical power supply to said circuits when said sheet has been uninterruptedly fed by said feeding means to correlate a predetermined number of columns of said sheet with said analyzing means to thereby cause said sets of circuits to be closed through the perforations of the predetermined number of columns to effect the simultaneous illumination of the sets of lamps of a plurality of units, and thereafter through the perforations of successive columns of perforations as said sheet is thereafter fed by the uninterrupted operation of said feeding means.

3. In an electrical sign, a plurality of character representing units each unit comprising a set of lamps, a pattern sheet perforated in columns, sets of perforation analyzing devices, sets of electrical lamp circuits closed through the perforations by said analyzing devices for causing the illumination of said lamps, a continually driven electrical motor, means operated by said motor for uninterruptedly feeding the pattern sheet to the past said analyzing devices, a pair of spaced elements adapted to cooperate with said sheet at a pair of spaced columns thereof by uninterruptedly feeding said sheet to correlate a plurality of columns of the sheet with said analyzing devices, and means controlled by said elements and rendered operable by both of said elements for causing the analyzing devices to simultaneously close said sets of lamp circuits through the perforations of a plurality of columns when both of said elements cooperate with the sheet at said pair of spaced columns thereof, the last named means being rendered inoperable by one of said elements to prevent the analyzing devices from closing the lamp circuits until the uninterrupted feeding of said sheet correlates said sheet with both of said elements at said pair of spaced columns.

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