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SIGNALING SYSTEM

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This invention relates to signaling systems, and more specifically to means capable of initiating groups of control impulses upon the sensing of perforations in a control sheet or tape.

The present invention is particularly applicable to printing telegraph systems or similar systems wherein perforated tapes or sheets are utilized for controlling impulse initiating circuits.

Several common methods of sensing perforated sheets are employed in commercial practice at present, namely, sensing by means of exploring pins, and sensing by means of electrical brushes. The pin sensing method requires apparatus for inserting and withdrawing the pins in and out of the perforations which usually renders this type of sensing relatively more costly. It has also been recognized that limitations are encountered as to the size of perforations which can be accurately sensed by groups of exploring pins. Similarly, with the brush sensing method, certain limitations are recognized as to the size of perforations which can be accurately sensed, and in addition thereto, due to the constant pressure exerted on the paper sheets, it is imperative that the thickness of the perforated sheets must be maintained to exceed a predetermined minimum thickness.

An object of the present invention resides in the provision of an improved means for sensing perforated sheets in order to initiate control impulses whenever the perforations are encountered, and which are capable of overcoming the above mentioned disadvantages.

Another object of the present invention resides in the provision of sensing means consisting of conductive rubber. It has been determined by experimentation that by means of the suggested improved sensing means smaller perforations in sheets can be analyzed, and in addition thereto, thinner sheets than heretofore deemed practical can be employed which contain extremely minute perforations for exercising the desired control functions.

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

In the drawing:

Fig. 1 is a diagrammatic showing of the tape advancing and sensing means.

Fig. 2 is a detail view showing a suitable mounting for a sensing element.

Fig. 3 is a circuit diagram showing the electrical connections of the control elements.

Referring now to Fig. 1, the perforated sheet 10 to be analyzed is shown, for illustrative purposes, to be the well known type of perforated tape employed in printing telegraph systems. The perforations are usually formed in various combinations, in transverse rows, in accordance with a combinational code, such as the Baudot code. Suitable tape advancing means are diagrammatically shown in the form of a motor with the associated feed rollers, which are indicated generally by the reference character 11.

Disposed beneath the perforated tape and in physical engagement therewith is a common contact roller 12 consisting of conductive rubber, or if desired the roller may comprise one formed of metal, or the like, and covered with a suitable thickness of conductive rubber. A plurality of individual rollers or disks 13 of conductive rubber are disposed above the tape and in physical engagement with the latter. An individual roller or disk is provided for each column of perforations formed in the tape, which for telegraph purposes is usually five or six.

With reference now to Fig. 2, a suitable mounting for the conductive rollers or disks is shown. Each rubber roller is secured between thin metallic supporting washers, one of which is shown and indicated 14. This assembly of roller and washers is carried by a pin shaft 15 which in turn is supported by a suitable extension arm 16 of the pivoted lever 17. Said lever 17 is pivoted on and supported by a suitable metallic plate 18 to which a suitable contact terminal 19 is connected. Individual plates 18 are provided for supporting each pivoted lever 16, which plates are supported by a suitable insulating member 20. Individual pressure springs 21 are provided to urge the related rollers 13 into engagement with the common roller 12.

Now, upon advancement of the tape 10 to present each row of perforations to the sensing position, the individual, conductive rubber rollers, which are formed with a suitable degree of elasticity, are effective to protrude through the perforations as they are encountered to engage the common conductive roller 12. By this method, it has been found that smaller perforations and thinner perforated sheets can be employed than found practical heretofore.

With reference now to Fig. 3, a well known type of impulse initiating system is shown. The individual rollers or disks 13 used for sensing the data perforations are connected to individual

pick-up coils of the relays R1 to R5, which coils are also connected to a common ground 25. A suitable grounded source of power supply 26 is connected to the common contact roller 12. Now, upon the sensing of any perforation or groups of perforations, circuits are completed from the said power supply 26 to common roller 12, individual roller or rollers 13, related pick-up coils of relays R1 to R5 to ground 25, energizing those relays connected to the sensing rollers which encounter the perforations. Holding circuits are established immediately through the R1a to R5a contacts, and a typical circuit can be traced from grounded battery 27 to the normally closed contacts 28, contacts R1a, holding coil of relay R1 to the common ground 25. This holding circuit is maintained until the common contacts 28 are opened.

A second group of contacts R1b to R5b are provided, each contact being connected to an individual conducting segment 29 of a well known type start-stop distributor. The distributor briefly comprises the said conducting segments 29, brushes 30 which when released engage successively the said segments and connect them to the common conducting strip 31, which in turn can be connected to any suitable transmission terminal or medium.

As is well known, normally the brushes are held from rotating, under control of the latching magnet 32, which is shown connected to one of the conductive rubber rollers designated 13a. Each time a row of perforations is presented to the sensing rollers, the said roller 13a senses a perforation which is provided on the tape for each row of perforations presented thereto. In this manner, it is seen that the magnet 32 is energized, momentarily, each time a row of perforations is presented to the sensing position, to release the brushes 30. As mentioned, brushes 30 traverse the conducting segments 29 progressively to initiate signals at differential times, depending upon which contacts of the group R1b to R5b are closed during the signaling cycle.

Cam 33 is suitable secured to the start-stop shaft carrying the rotatable brushes 30, and is arranged to open the contacts 28 momentarily, near the end of each signaling cycle to break the established holding circuit, and thus reset the system to the normal condition shown. The rate of advancing the tape is adjusted so that the brushes can complete one revolution, or stated in other words, so that a signaling cycle can be completed before another row of perforations is presented to the sensing position.

While there has 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. Apparatus for sensing perforated sheets and initiating control impulses comprising means for feeding a perforated sheet, and individual elements for sensing the perforations for controlling the initiation of control impulses, each of said elements consisting of conductive rubber.

2. Apparatus for sensing perforated sheets and initiating control impulses comprising means for feeding a perforated sheet, and individual elements for sensing the perforations for controlling the initiation of control impulses, each of said elements comprising a conductive rubber roller.

3. Apparatus for sensing perforated sheets and initiating control impulses comprising means for feeding a perforated sheet, and sensing means for sensing the perforations for controlling the initiation of control impulses, said sensing means consisting of a common conductive rubber element and individual conductive rubber elements.

4. Apparatus for sensing perforated sheets and initiating control impulses comprising means for feeding a perforated sheet, and individual elements for sensing the perforations for controlling the initiation of control impulses, each of said elements comprising a circular element of conductive rubber disposed between a pair of electrically conductive discs, the diameter of each of the latter being less than the diameter of the said conductive rubber elements.

5. The invention set forth in claim 4 wherein resiliently urged means are provided for supporting the said conductive rubber elements, whereby the latter are urged into the path of the said perforated sheets.

6. The invention set forth in claim 4 wherein individual resiliently urged means are provided for supporting each of the said conductive rubber elements, whereby the latter are urged into the path of the said perforated sheets, the said resiliently urged means consisting of electrically conductive material.

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