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CARD SENSING MECHANISM

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Fig. 1

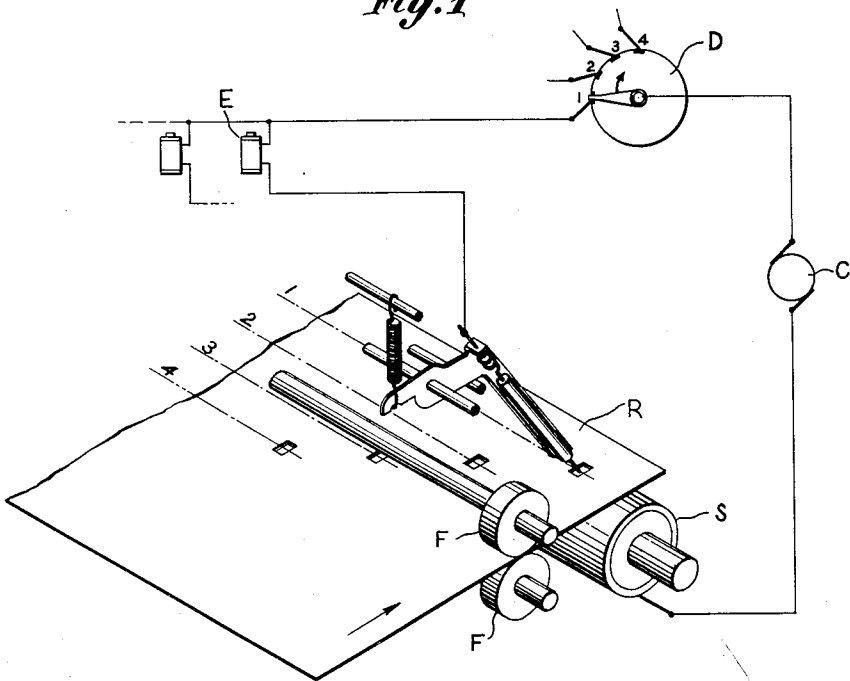


Fig. 2

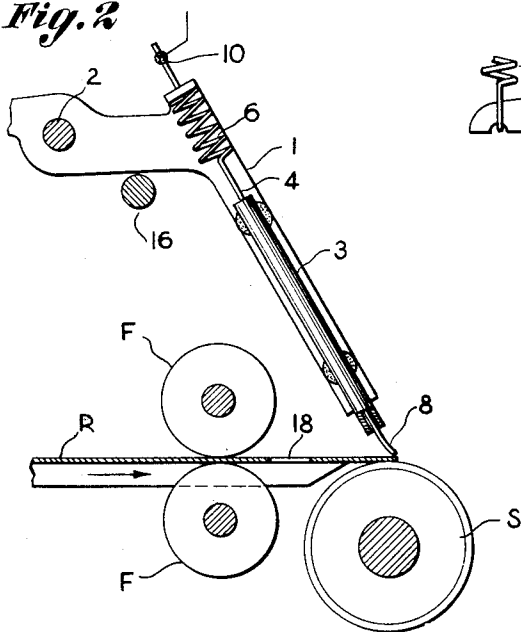
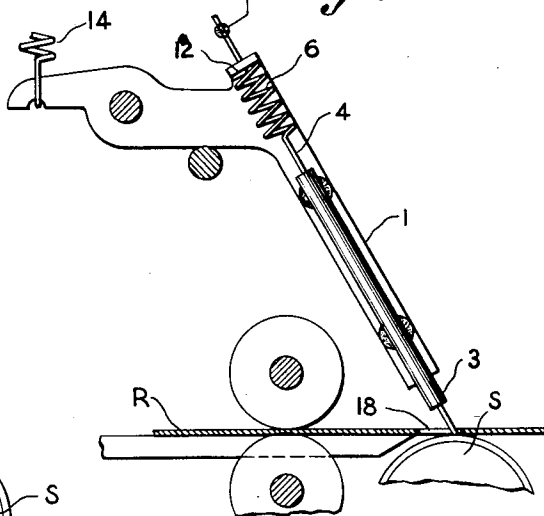


Fig. 3



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This invention relates to sensing devices in machines which analyze punched record cards and the like.

Heretofore, in inventions along this line, wherein brushes were utilized as part of the sensing device to sense perforated records, the brushes would be subjected to wear. This wear on the brushes would, in time, change their position with respect to the perforations on the records being sensed. In turn, the change in position of the brushes led to a gradual but detrimental change in the timing of the machine. However, the present novel sensing device with its associated brush is so constructed and arranged that no matter how much wear the brush is subjected to, it will always keep the machine timed exactly the same throughout the particular set-up of the machine and the life of the brush.

It is therefore one of the main objects of the present invention to maintain machine timing accurate regardless of wear in the sensing brushes used in the machine.

Another object of the invention is to provide novel means which will compensate for wear in the brushes by automatically moving the brushes into the proper timing position.

Still another object of the invention is to provide a brush which is simple and cheap to manufacture and which is fool-proof in operation.

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 drawing:

Figure 1 is a diagrammatic showing of the novel sensing device as a punched record card is being passed through the feed rollers and between the sensing brush and roll.

Figure 2 is a side elevation of Figure 1 with the card deflecting the end of the brush as it passes between the brush and sensing roll.

Figure 3 is a side elevation as in Figure 2, but now the card is in position to allow the sensing brush to project through a perforation in the card and make contact with the sensing roll.

The sensing device as seen in Figures 2 and 3 consists of a brush holder or frame 1 pivoted about a pivot 2. On one side of the pivot and fastened to the holder, as by soldering or by other suitable means, is a non-conductive or insulated guide tube 3. Mounted on the holder and to be resiliently urged toward the rotating metallic roll S is the brush 4.

Brush 4 is composed of a wire-like conductive material and consists of an automatic or resilient urging means formed by a bent or coiled portion 6, intermediate a sensing end portion 8 and a contact or circuit connection end portion 10. The lower or body portion of the brush is slidably mounted in the guide tube 3 and is guided loosely therein. The lower or sensing end portion 8 of the brush extends beyond the lower end of the

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tube while the bent or coiled portion 6 rests against an abutment 12 on the holder. By this arrangement, when the bent or coiled portion is stressed it acts as a spring to yieldingly urge the sensing end portion of the brush against the roll S.

At the other end of the brush holder there is provided a spring 14 which constantly applies a turning force on the entire assembly about the pivot 2 to urge the brush into engagement with the roll S. The brush assembly is predeterminedly limited in its rotation about the pivot by the setting of the stop 16.

In the operation of the device the card R is fed through the machine by feed rolls F in the direction of the arrow. As the card attempts to pass through the sensing brush 4 and roll S it crimps or deflects the sensing end portion of the brush 4 as shown in Figure 2. This locks the brush to the tube 3 and the holder 1 and subsequent movement of the card R causes the entire assembly to rock or turn about the pivot 2 and away from stop pin 16. After this has occurred, the brush automatically straightens and permits heavy spring 14 to rotate the brush holder and the tube about the pivot until they are again arrested by stop 16.

Continued movement of the card R then brings a perforation 18 under the brush. At this time the light spring 6 forces the brush through the tube and the perforation 18 to touch or engage with the contact roll S to complete a circuit.

For illustrative purposes the brush is shown connected in series with an electro-magnet E, a distributor D and a source of current C. In this particular hook-up, when the brush senses a perforated portion on the record card R (by completing a circuit with roll S), corresponding to the associated distributor position, the electro-magnet E will be actuated. This is illustrated diagrammatically in Fig. 1. The closing of the circuit to the magnet E may be used to control some useful machine function or to accomplish any other reasonable purpose.

From the foregoing it is obvious that as the point of the needle or brush 4 wears from contact with the record cards and the rotating sensing roll S, the spring 6 or its equivalent will continuously feed the brush further and further down into the tube 3 until it is completely worn out. This is in contradistinction to previous brushes which have been fixed with respect to their holders. With the fixed brushes, the only way of adjusting them was to rotate them in their holders about their pivot points (equivalent to the present pivot point). This of course, resulted in the brushes contacting the rotating sensing rolls at positions varying from the original positions due to the arcuate motions of the brushes about the pivot points of the holders. Hence, the timing of the machine was changed slightly each time a brush was readjusted for wear. With the present invention, the sensing end of the brush has no pivotal motion for adjustment and the brush always contacts the sensing roll S at the same spot for the entire life of the brush, maintaining the exact machine timing for which the brush is set originally.

In actual practice the brush 4 is properly insulated from the holder as by the tube 3 and the provision of insulating material at the abutment 12. However, it is also within the contemplation of the instant invention to construct the holder 1 and tube 3 of nonconductive material.

While I have described my invention in a certain preferred form, I desire it to be understood that modifications may be made therein, and that no limitations upon my invention are intended except as may be imposed within the scope of the appended claims.

What I claim is:

1. A sensing device for punched records comprising

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a contact means, a holder pivoted about a point, a guide on said holder, a sensing brush movable in said guide, and means carried by said holder resiliently urging said brush in said guide in a direction to contact said contact means.

2. A sensing device for punched records comprising a contact, a holder pivoted about a point, a brush supported by and slidable relative to said holder, and resilient means individual to said brush for automatically urging said brush toward said contact and relative to said holder whereupon touching of said brush with the contact completes a circuit.

3. A sensing device in a punched record analyzing mechanism comprising a holder, a pivot about which the holder is pivotally mounted, a sensing brush non-pivotally supported by the holder and slidable relative thereto, and resilient means attached to the holder, said resilient means applying a turning force to said holder causing the same to turn about said pivot to move the brush into sensing position.

4. In a punched record analyzing mechanism a sensing device comprising a contact, a holder pivoted intermediate its ends, a guide mounted on the holder at one of its ends, a brush slidable in and guided by said guide, first resilient means urging said brush into said guide toward said contact to complete a circuit, and second resilient means connected to the holder at its other end to supplement the action of said first resilient means and to create a turning of said holder about said pivot mounting to move the brush toward said contact.

5. In a punched record analyzing mechanism a sensing device comprising a contact, a holder pivoted intermediate its ends, a guide mounted on the holder at one of its ends, a brush slidable in and guided by said guide, first resilient means urging said brush into said guide toward said contact to complete a circuit, and second resilient means connected to the holder at its other end to supplement the action of said first resilient means and to create a turning of said holder about said pivot mounting to move the brush toward said contact, and stop means arresting said turning of said holder at a predetermined time.

6. In a sensing device as in claim 5 in which said guide is of tubular form and of nonconductive material.

7. A sensing device for punched records comprising a contact means, a holder pivoted about a point, a guide on said holder, a sensing brush in said guide, and automatic means resiliently urging said brush in said guide in a direction to contact said contact means, said brush being of unitary, wire-like construction, having a sensing end portion, a circuit connection end portion, and plurality of coils formed intermediate the end portions, said coils being the automatic means.

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8. The invention as set forth in claim 2 in which the brush is of unitary, wire-like construction, having a sensing end portion, a circuit connection end portion, and a plurality of coils formed intermediate the end portions, said coils being said resilient means.

9. A sensing device in a punched record analyzing mechanism comprising a holder, a pivot about which the holder is pivotally mounted, a sensing brush nonpivotally supported by the holder and slidable relative thereto, and resilient means attached to the holder, said resilient means applying a turning force to said holder causing the same to turn about said pivot to move the brush into sensing position, said brush being of unitary, wire-like construction, having a sensing end portion, a circuit connection end portion, and a plurality of coils formed intermediate the end portions, the coils, when stressed, resiliently urging only the brush into said sensing position.

10. In a punched record card analyzing mechanism a plurality of feed rolls, a sensing roll, a sensing brush cooperating with the sensing roll to complete a circuit, a tubular, insulated guide, said brush being guidingly and slidably mounted in said guide, a pivot, a holder pivotally mounted intermediate its ends on the pivot, the guide attached to the holder on one side of the pivot, a resilient means attached to the holder at the other side of the pivot, a resilient means individual to said brush and between the brush and holder urging only the brush toward contact with the sensing roll, the resilient urging action of the first mentioned resilient means supplementing that of the second mentioned resilient means by urging the holder to rotate about the pivot in a direction moving the brush toward the sensing roll, said second mentioned resilient means being an integral part of the brush, and stop means predeterminedly limiting the rotation of the holder about the pivot so that the holder will always be returned to the same predetermined brush sensing position by said first mentioned resilient means and the sensing brush will be urged constantly into exactly the same contacting position with the sensing roll by said second mentioned resilient means.

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