

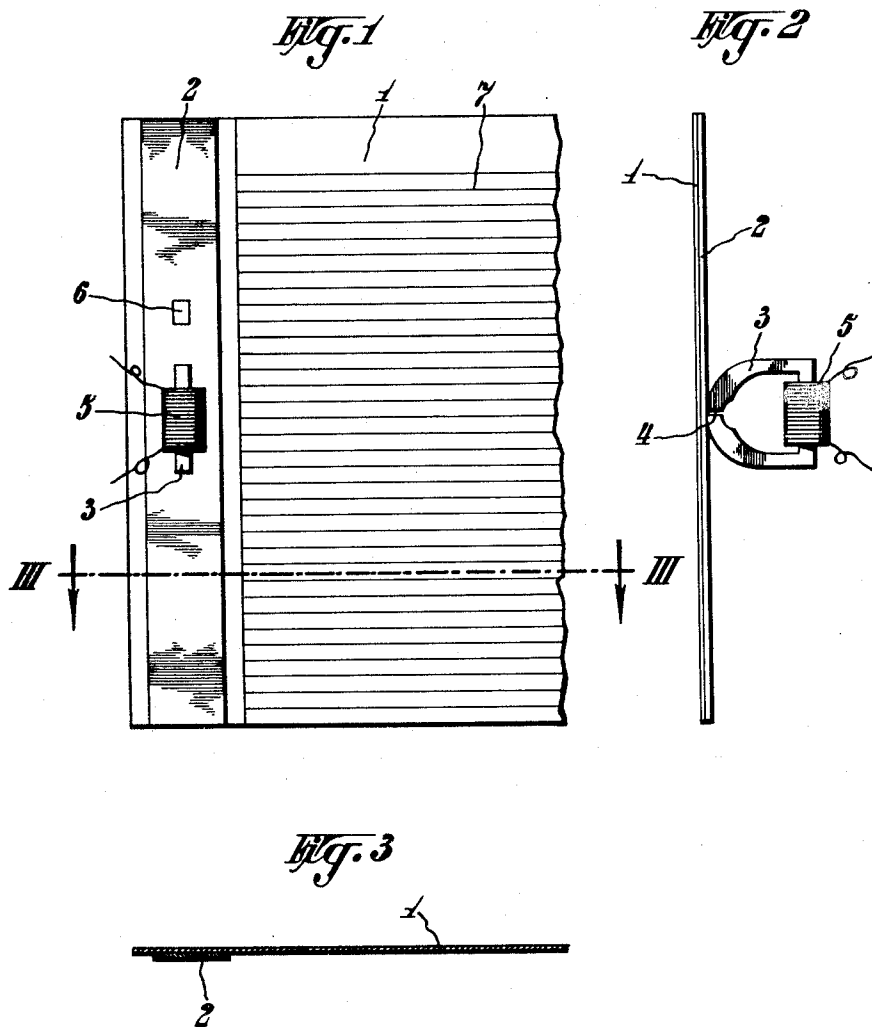
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ACCOUNT SHEET AND OFFICE MACHINE TO BE USED THEREWITH

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ACCOUNT SHEET AND OFFICE MACHINE TO BE USED THEREWITH

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The present invention relates to account sheets and office machines for posting information on account sheets.

In particular, the present invention relates to the automatic transporting of an account sheet to a desired position in an office machine.

At the present time such automatic transporting of account sheets in office machines is carried out in a purely mechanical manner by mechanical feelers which feel cut-outs, gaps, slits or the like which are punched in the sheets. Such structure does not give satisfactory results in all respects. Thus, the provision of suitable cutouts, slits or the like in the account sheet weakens the latter, deprives the latter of area capable of holding information, and renders the reading of information on the sheet more difficult. Also, because of the relative weakness of such sheets they are easily torn by the feeling apparatus which usually is made of mechanical pins, or the like, which are capable of exerting on the sheet forces which will tear the latter if, for example, the sheet is not accurately placed in the machine.

Furthermore, mechanical feeler structure of the above type becomes worn after a certain period of time and fails to provide accurate automatic location of punched or otherwise mechanically marked sheets in an office machine.

One of the primary objects of the present invention is to overcome above drawbacks by providing means enabling a relatively thin, weak account sheet made of paper or the like to be accurately and automatically positioned in an office machine without the use of mechanical feeling structure and without any perforations, slits, or cutouts of any type in the account sheet itself.

Another object of the present invention is to provide means capable of placing desired markings on an account sheet as well as capable of sensing markings previously located thereon.

The above and other objects of the invention will become further apparent from the following detailed description, reference being made to the accompanying drawing, showing a preferred embodiment of the invention.

In the drawing:

Fig. 1 is a fragmentary plan view of an account sheet according to the invention, together with a ring gap magnet, the left marginal portion of the sheet of Fig. 1 being illustrated at an enlarged scale relative to the remainder of the sheet for the purpose of clearly illustrating the invention;

Fig. 2 is a side view of the structure of Fig. 1 as seen from the left side of Fig. 1; and

Fig. 3 is a sectional view taken along line III—III of Fig. 1.

As may be seen in the drawing, the account sheet 1, 2 includes a sheet 1 of paper or the like provided along its left edge, as viewed in Fig. 1, with a magnetizable strip 2 which forms a magnetizable portion of the account sheet and which extends in a direction perpendicular to the writing lines 7. The approximate thickness of the strip

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or tape 2 with respect to the remainder of the account sheet is apparent from Figs. 2 and 3. This magnetizable account sheet portion 2, in the illustrated example, is in the form of a conventional magnetic tape adapted to be used with conventional tape recorders. This tape 2 is glued onto the sheet 1 in the position indicated in Fig. 1.

A means for producing magnetic markings on portion 2 and for receiving electrical impulses from such markings is shown in the form of a ring gap magnet 3, whose supporting structure is not shown. Magnet 3 is so arranged that the magnetizable tape always moves past an end of the gap 4 of the magnet and is located very close to this gap during movement of the account sheet 1, 2 in the office machine in the direction in which the tape 2 extends. The ring gap magnet 3 includes a coil 5. When required, this coil 5 is supplied with current in order to make a magnetic mark on the tape 2, or, as the tape 2 moves past the ring gap magnet magnetic markings already on the tape 2 are sensed by the ring gap magnet which receives an induction impulse for example, from a marking 6, diagrammatically indicated in Fig. 1, as the marking moves past the air gap 4.

Such an impulse is transmitted through an amplifier or other intermediate devices to an unillustrated means which transport the sheet so as to stop the operation of the transporting means and thus stop the movement of the sheet in a position which is predetermined automatically by the position of the marking 6. In this way the transporting means is automatically controlled to determine the position of the account sheet. During return movement or removal of the sheet from the office machine, the magnetic portion of the sheet is provided with a marking which will determine automatically the position of the sheet when it is again placed in the machine.

Thus, it will be apparent from the above description that there is provided, for use with an office machine having a transporting means for transporting an account sheet, an account sheet having a magnetizable portion, and means for producing magnetic markings on the sheet portion and for receiving electrical impulses from magnetic markings thereon, so that an electric impulse derived from such a magnetic marking may be transmitted through an amplifier and/or other intermediate device to a transporting means which transports the account sheet, so as to control the transporting means to determine automatically the position of the account sheet.

With the above-described structure the disadvantage of the mechanical devices referred to above are avoided, and, moreover, the feeling and marking arrangement of the invention is relatively simple and may be compactly arranged so as to occupy a small amount of space, whereby the frequency of repairs is reduced and the cost of the device is also reduced.

The entire account sheet may be made of a magnetic material, so that it may be used with all types of systems. However, with conventional devices for inserting an account sheet into a machine it is desirable to have the magnetic portion of the account sheet extend in a predetermined direction which is preferably perpendicular to the direction of the lines written on the account sheet.

The transporting structure of an office machine for an account sheet as described above can be made exactly like a conventional transporting structure used with a conventional mechanical feeling arrangement, the only difference being that the operation of the transporting structure is stopped by an electrical impulse which operates an electromagnet or the like for terminating the operation of the transporting structure.

Instead of providing magnetic markings, it is also possible to provide a fully magnetized portion of the account sheet which is then demagnetized at predetermined loca-

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tions in order to provide the necessary markings. This is done where the entire account sheet is of a magnetic material.

Placing a magnetizable material on an account sheet is relatively inconvenient and expensive. The material which is to be applied to the sheet must be in a finely particulated form and must be presintered. Furthermore, it is necessary to polish or grind the layer of magnetic material after it is placed on the sheet. These same manufacturing steps are, in general, used for making conventional magnetic tapes for tape recorders and the like, but the quantity of magnetic tapes which are manufactured is so great that the relatively complex, expensive manufacturing process is economically feasible. However, the same process would not be economically feasible for the relatively small number of account sheets which would have to be provided with magnetizable portions.

Thus, in order to overcome this disadvantage of the great expense which would be required in depositing a magnetic layer on an account sheet, in accordance with the present invention, substantially the same results are obtained simply by taking a portion of a conventional magnetic tape, wire or the like and joining it to a sheet. Preferably such a tape, wire or the like is simply glued onto the sheet. However, it is also possible, of course, to provide sheets other than account sheets, such as paper webs, plastic foil and the like with magnetizable bands or the like.

The magnetizing of certain parts of the magnetic edge portion of the account sheet may be produced by a permanent magnet instead of a ring gap magnet, as described above. Such a permanent magnet may have a relatively large air gap which can be regulated as to size by adjusting means until, for example, blade-like, substantially pointed pole-shoe ends of the magnet come to lie either against or almost against the magnetic portion of the sheet.

With such a magnet there is produced between the pole shoe ends a densifying action of the lines of magnetic flux, these lines of flux passing through the magnetic edge portion of the sheet in order to produce magnetic markings thereon.

Magnet 3 and coil 5 may form parts of a machine similar to that disclosed in copending application Serial No. 641,306 filed on even date in the name of Hermann Fleck entitled "Account Sheets and Office Machine Structure for Cooperation Therewith," now abandoned, whereby contacts 3 and 4 are replaced by hereinabove described sensing means (magnet 3 and coil 5).

Various changes and modifications may be made without departing from the spirit and scope of the present invention and it is intended that such obvious changes and modifications be embraced by the annexed claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

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1. An office machine having means for controlling the transport of an account sheet, said account sheet comprising an elongated strip of magnetizable material bonded to said sheet, first means for producing magnetic markings on said strip and for receiving electric impulses from magnetic markings produced on said strip, and second means connected to said first means for transmitting an electric impulse obtained from a magnetic marking on said strip for actuating said control means of said office machine to determine the position to which the account sheet is transported in said machine, said first means for producing magnetic markings and receiving electric impulses therefrom being in the form of a ring magnet provided with an air gap.

2. The combination of an office machine having transporting means for moving an account sheet to a predetermined position with said account sheet provided with strip means of magnetizable material, with means for producing magnetic markings on said strip means and for receiving electric impulses from magnetic markings on said strip means, whereby an electric impulse may be obtained from a magnetic marking on said strip means for controlling said transporting means of the office machine to determine the position to which the account sheet is moved by said transporting means, said means for producing magnetic markings and receiving electric impulses therefrom being in the form of a ring gap magnet having an adjustable air gap, said strip means being in the form of a magnetic tape, said sheet having a plurality of spaced parallel writing lines thereon, said magnetic tape being bonded to said sheet normal to said writing lines.

3. In an office machine for feeding an element along a path and which element is provided with magnetizable strip means; first means for producing magnetic markings on said strip means and supported by said machine and for receiving impulses from said markings thus produced and arranged in the path of said magnetizable strip means, said element with said magnetizable strip means being movable past said first means, said first means including a ring magnet provided with an air gap, and means operatively connected with said ring magnet controlling the movement of said element dependent upon the magnetic marking produced thereon by said first means.

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