

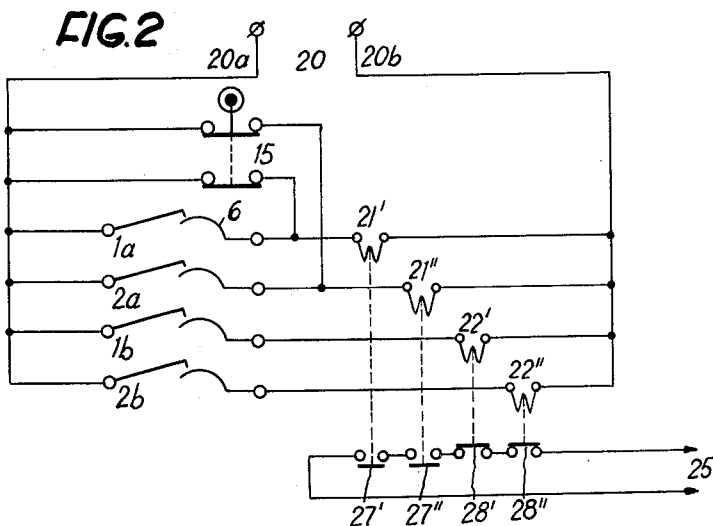
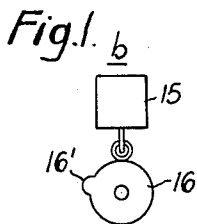
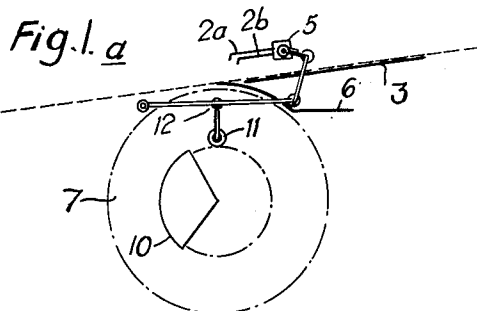
Dec. 31, 1957

H. B. NILSSON
DEVICES FOR CONTROLLING THE POSITION OF A SHEET
MATERIAL ON A SUPPORT

2,818,252

Filed March 11, 1955

2 Sheets-Sheet 1



INVENTOR.

HERMAN BERTIL NILSSON

BY

Young, Enright & Thompson

ATTYS.

Dec. 31, 1957

H. B. NILSSON

2,818,252

DEVICES FOR CONTROLLING THE POSITION OF A SHEET
MATERIAL ON A SUPPORT

Filed March 11, 1955

2 Sheets-Sheet 2

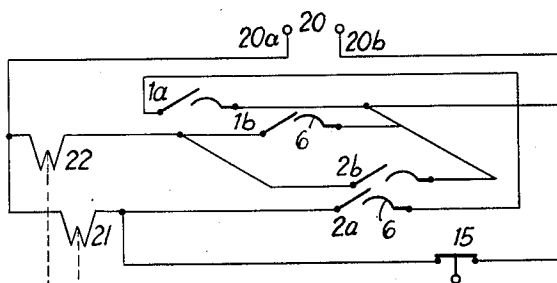


FIG. 3

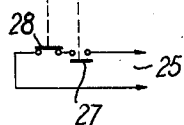


Fig. 4. a

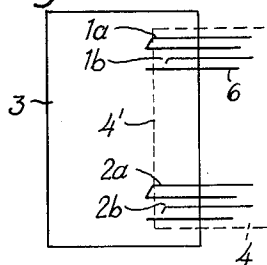


Fig. 4. b

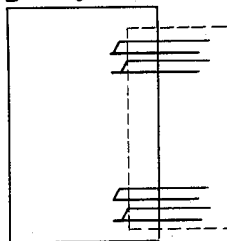


Fig. 4. c

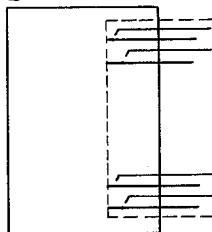
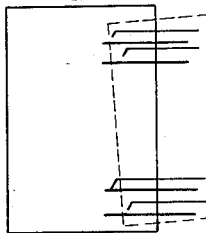


Fig. 4. d



INVENTOR.

HERMAN BERTIL NILSSON
BY

Young, Emery & Thompson
ATTYS

1

2,818,252

DEVICES FOR CONTROLLING THE POSITION OF
A SHEET MATERIAL ON A SUPPORT

Herman Bertil Nilsson, Solna, Sweden, assignor, by mesne assignments, to Etablissement Mecatron, Vaduz, Liechtenstein

Application March 11, 1955, Serial No. 493,768

1 Claim. (Cl. 271—57)

The present invention relates to a device for controlling the position of a sheet material on a support, for instance for controlling the position of a sheet of paper in a printing machine, such as a book printing machine or an offset machine, before said sheet is carried to the printing cylinder of the machine.

In a printing machine where the sheet is fed to a cylinder for carrying out a printing operation on same it is very important that the sheet occupies a correct position around the cylinder, i. e. the one edge of the sheet must be accurately parallel to the axis of the cylinder since the print will else occupy a wrong position on the sheet which in the case of multicoloured printing will result in a misalignment of the component colours.

One object of the present invention is to provide a device which either generates a warning signal of the light or directly stops the feeding means for the paper sheet or alternately stops the rotating movement of the cylinder, if the sheet occupies a wrong position for some reason, especially if the front edge of the paper as seen in the feeding direction should not be parallel to the cylinder axis.

A device according to the invention is characterized by at least two contact means provided in the vicinity of the support on which the sheet is fed and is arranged to cooperate with an edge of the sheet in such manner that an electric circuit comprising one or more contact elements of said contact means is closed or broken when the position of the sheet on said support deviates from a predetermined position defined by the position of said contact means, said edge of the sheet in said predetermined position preventing one or more contact elements from being closed while admitting one or more other compact elements of the contact means to be closed.

The contact means may be arranged to sense the position of the sheet material during a short period in that they are movable and controlled in dependence of a movable part of the printing machine or by a special driving means.

The contact elements may cooperate with the support for the sheet or with special counter contacts provided in such manner that the sheet material may pass between the contact elements and the counter contacts.

The invention will hereinafter be more fully described with reference to the accompanying drawings showing an embodiment thereof. On the drawing Fig. 1 shows an embodiment of the invention in a schematically side view, Fig. 1a showing the contact means and their position as well as the means for controlling same, whereas Fig. 1b shows the principle for a switch for effecting contact closing and opening in the device according to the invention. Fig. 2 shows a preferred circuit arrangement for the electric system in a device according to the invention. Fig. 3 shows a possible simplification of the circuit diagram shown in Fig. 2. Figs. 4a, b, c and d show the contact means and the support in different positions of the sheet material on said support.

2

The device according to the embodiment shown comprises at least two contact means 1a, 1b and 2a, 2b mounted in front of a printing cylinder 7 around which a paper sheet 4, marked by broken lines in Fig. 4, shall be passed to a predetermined position corresponding to the position of the sheet shown in Fig. 4a. The contact elements 1a, 1b and 2a, 2b are mounted on a pivotable carrier 5 in such a manner, that the contact means are pivotable in a plane perpendicular to the cylinder axis. The mounting may alternatively be such that the contact means are displaceable in and/or perpendicular to the direction of the cylinder axis.

Each of the contact devices comprises two contact means 1a, 1b and 2a, 2b respectively each of which being arranged to cooperate with a counter contact 6, the paper sheet being passed between said counter contacts and the corresponding contact elements.

At least some of said counter contacts may, if desired, be constituted by the support 3 on which the paper 4 is advanced before reaching the cylinder 7. The contact elements in each contact means are mounted at a very small distance from each other in the direction of movement of the paper, for instance at the most one or a few mm. according to the desired degree of accurateness and in such manner that a sheet fed to the correct position on the support will have its front edge 4 between the two contact elements in each contact means. On the axis of the cylinder 7 is provided a cam 10 cooperating with a cam follower 11 which via a link system 12 is coupled to the pivotable carrier 5 for the contact means. The cam 10 and the rest of the device is arranged in such manner that the contact elements are swung down against the counter contacts 6 during a time period which may be relatively short whereafter they return to an upper resting position. For this purpose cam 10 may be formed with a raised portion over which the cam follower 11 passes during this time period.

In the same interval also the switch 15 shown in Fig. 1b comes into function by the action of cam 16 or the like carried by another movable part of the printing machine and showing a raised portion 16'. Said portion effects a desired breaking of the switch 15 during a short time interval after which the switch is closed again automatically.

As appears from the preferred circuit diagram of the device according to the invention shown in Fig. 2 all contact elements 1a, 2a, 1b and 2b as well as their corresponding counter electrodes 8 are connected in series with a relay 21', 21'', 22' and 22'' respectively, each series connection of such a contact element and corresponding relay being connected between the poles 20a and 20b of a current source 20 or for instance 24 volts. The switch 15 in this embodiment is a two-way-switch connected across the contact means 1a and 2a.

Each of the relays 21' and 21'' has a contact 27' and 27'' respectively inserted in a circuit 25 for the main driving motor of the machine, said contact being closed when the corresponding relay is passed by current. Each of the relays 22' and 22'' respectively has a contact 28' and 28'' respectively which is also inserted in said circuit and is closed when the corresponding relay is not passed by current.

Fig. 3 shows a simplification of the electric circuit arrangement shown in Fig. 2. According to Fig. 3 the two contact elements 1a and 2a mounted in advance of the corresponding other contacts 1b and 2b respectively, as seen in the feeding direction of the paper sheet 4, and their counter electrodes 6 are connected in series and the series connection is connected between one pole 20b of the source 20 and the one terminal of a relay 21, the other terminal of which being connected to the other

3.

pole 20a of the source. The two other or rear contact elements 1b and 2b and their counter contacts 6 are connected in parallel and the parallel connection is connected between the pole 20b of source 20 and the one terminal of a relay 22, the other terminal of which being connected to the other pole 20a of the current source. Relay 21 has a work contact 27 inserted in the circuit 25 of the main driving motor of the machine. Relay 22 has a resting contact 28 which is also inserted in said electric surface. Finally, the switch 15 mentioned above is inserted between relay 21 and the pole 20b of the source 20 and is a single-way switch.

The function of the device shown and described will hereinafter be described with reference to Fig. 4.

When a sheet 4 has been passed to its sensing position on the support 3 the contact elements 1a, 1b, 2a and 2b are lowered by the action of cam 10, the contact elements 1a and 2a making contact with the corresponding counter contacts 6 while contact elements 1b and 2b engaging the sheet 4 which normally isolates the contact elements from their corresponding counter contacts 6, provided that the sheet has been passed to its correct position, i. e. the position shown by broken lines 4' in Fig. 4a. If the sheet does not occupy the correct position the relay 21 is energized so that contact 24 is closed, whereas relay 22 is not energized, so that even the contact 28 of this relay is closed. During said lowering of the contact elements for sensing the position of the sheet the switch 15 is opened for a short moment but circuit 25 will not be broken if the sheet occupies its correct position on the support. When the contact elements are returned to their upper resting position the switch 15 is closed and assures that the relay 21 is still energized so that contact 27 is always closed. Thus, the switch 15 is opened only during said sensing intervals.

Should the sheet 4 after the termination of the feeding movement not have reached the position shown in Fig. 4a the rear contact elements 1b and 2b will make contact with the corresponding counter electrodes 6 as shown in Fig. 4b, whereby the relay 22 is energized and breaks the main circuit for the driving motor. If on the other hand the sheet is advanced too much the front contact elements will be insulated from the corresponding counter contacts by the paper sheet so that the corresponding relay 21 will not be energized during the sensing period, and the switch 15 which is shunted over these contact elements breaks the circuit, so that the main circuit for the driving motor is broken. Finally, it may occur that the sheet is advanced to a position in which it is somewhat turned in its own plane as shown in Fig. 4b. In this case either at least one of the front contact elements 1a and 2a will be insulated from their counter electrodes or at least one of

4.

the rear contact elements 1b and 2b will make contact with their counter electrodes, so that in either case the main circuit of the driving motor is broken as desired. Thus the shown and described device will assure an effective watch of the position of the sheet 4 on the support 3.

When the said device senses an incorrect position of the sheet so that the main motor circuit is broken it is possible either to take out the sheet in question manually or by means of an automatically operating device, so that the printing process may be continued after another sheet has been advanced.

It is not necessary that all contact means for sensing the position of the sheet on the support are provided for sensing the front edge of the sheet as seen in the feeding direction, for it is possible to provide the contact means at other places than those shown in the drawings, in that for instance only one of the two contact means 1a, 1b and 2a, 2b may be mounted in the manner described in connection with the shown embodiment, while the other contact means may be mounted for instance in such manner that it cooperates with one of the side edges of the paper. Thus the mounting of the contact means may be chosen in different manners with respect to the machine used and to the kind of sheet material the position of which shall be watched by a device according to the invention.

What I claim is:

In a printing machine a device for controlling the position of a sheet on a support, comprising: at least two contact means which are spaced apart and mounted in the vicinity of the support over which the sheet material shall be advanced and are arranged to cooperate with an edge of the sheet material in such manner that an electric circuit containing one or more of said contact means is closed or broken when the position of the sheet material on said support deviates from a predetermined position defined by the position of the contact means; a switch operated by a driven shaft of the printing machine being included in a current path of said electric circuit and being arranged to be closed or opened during a short-time interval when the contact means are in the sheet sensing position.

References Cited in the file of this patent

UNITED STATES PATENTS

1,174,989	Jones	Mar. 14, 1916
1,468,754	Smith	Sept. 25, 1923
2,709,960	Alix	June 7, 1955

FOREIGN PATENTS

835,749	Germany	Apr. 3, 1952
---------	---------	--------------