No. 886,936. PATENTED MAY 5, 1908.

T. BROCK.

TWO COLOR PRINTING MACHINE.

APPLICATION FILED APR. 19, 1907.

6 SHEETS—SHEET 1.

Fig. 1

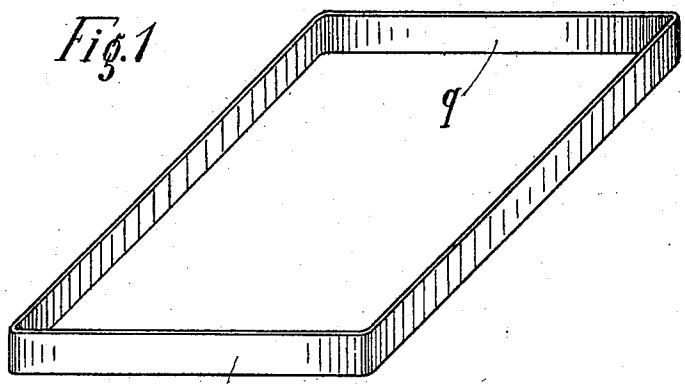


Fig. 2

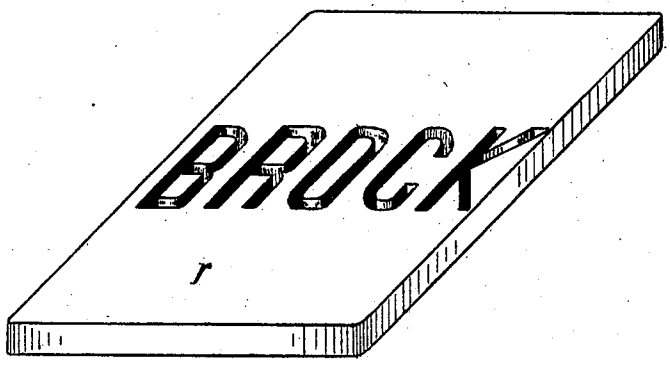
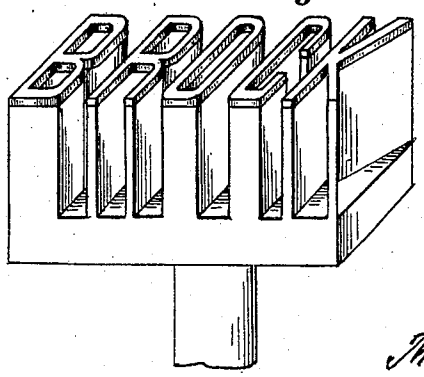


Fig. 3



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Inventor
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Attorney

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6 SHEETS—SHEET 2.

Fig. 4

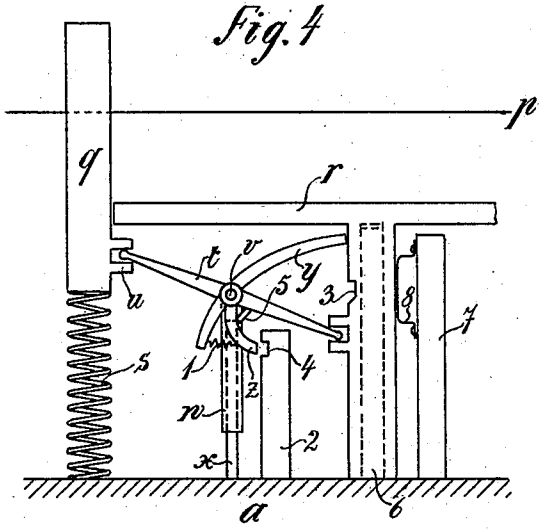
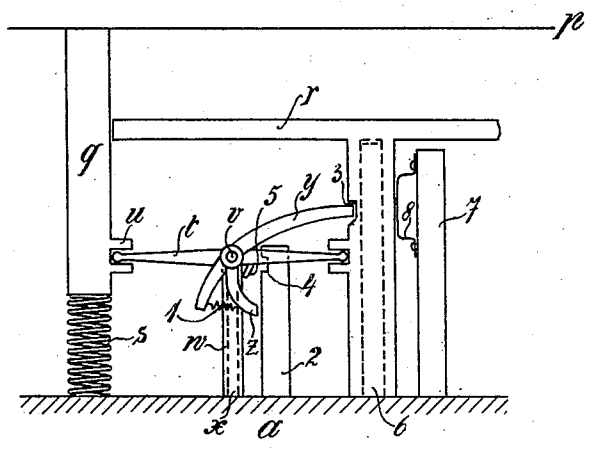


Fig. 5



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6 SHEETS—SHEET 3.

Fig. 6

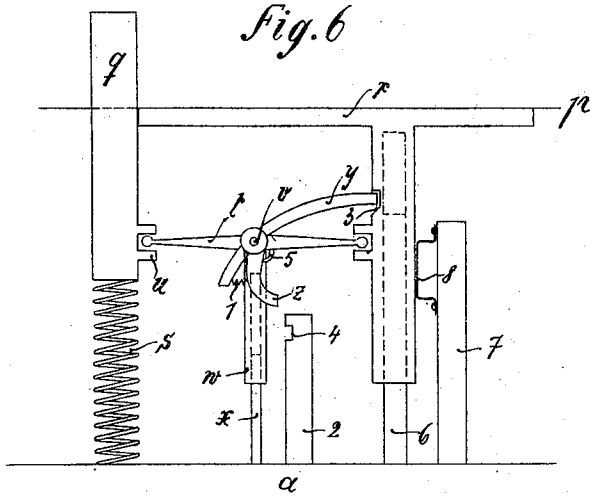
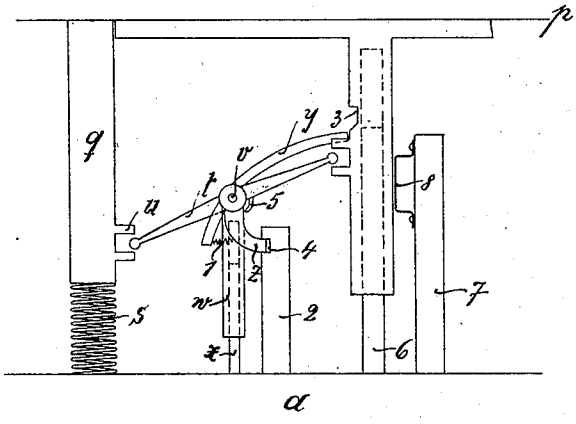


Fig. 7



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No. 886,936. PATENTED MAY 5, 1908.

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6 SHEETS—SHEET 4.

Fig. 8

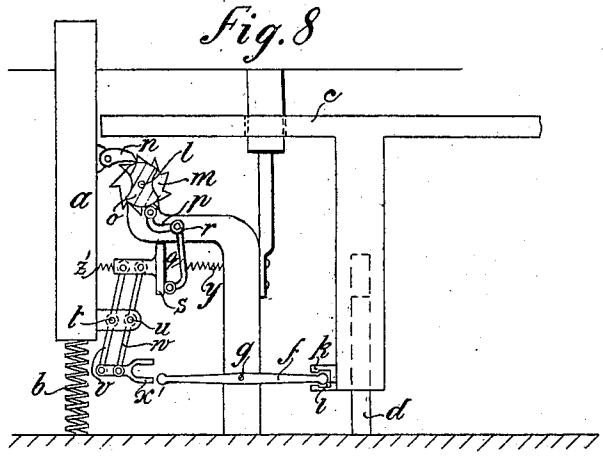
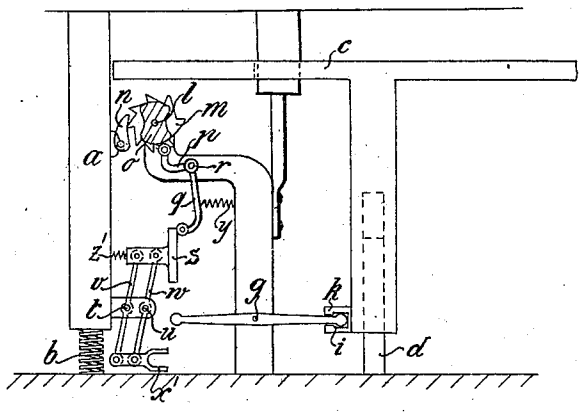


Fig. 9.



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No. 886,936. PATENTED MAY 5, 1908.

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TWO COLOR PRINTING MACHINE.

APPLICATION FILED APR. 19, 1907.

6 SHEETS—SHEET 5.

Fig. 10

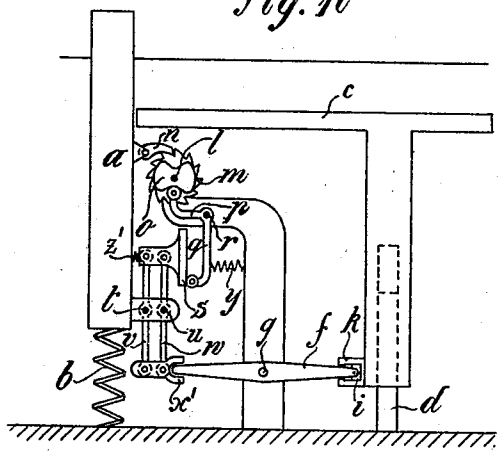
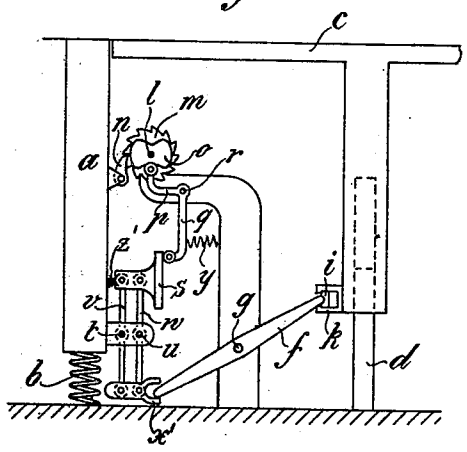


Fig. 11



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No. 886,936. PATENTED MAY 5, 1908.

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TWO COLOR PRINTING MACHINE.

APPLICATION FILED APR. 19, 1907.

6 SHEETS—SHEET 6.

Fig. 12.

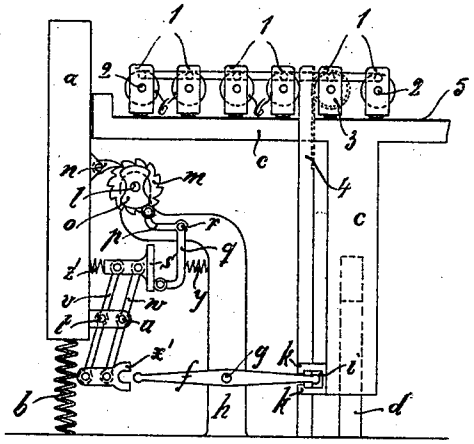
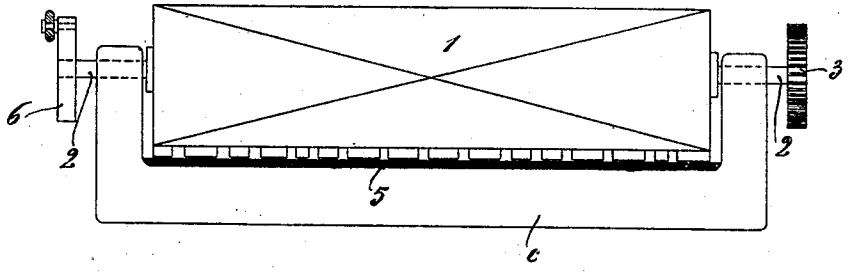


Fig. 13.



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UNITED STATES PATENT OFFICE.

THOMAS BROCK, OF JÜCHEN, GERMANY.

TWO-COLOR-PRINTING MACHINE.

No. 886,936. Specification of Letters Patent. Patented May 5, 1908.

Application filed April 19, 1907. Serial No. 369,148.

To all whom it may concern:

Be it known that I, THOMAS BROCK, a subject of the King of Prussia, German Emperor, residing at Jüchen, in the Province of the Rhine, Kingdom of Prussia, German Empire, have invented a certain new and useful Two-Color-Printing Machine, of which the following is a specification.

Attempts have often been made in the past to arrange a printing machine so that without using any particular multiple impression apparatus a certain part of the printing matter can be made to give in the one impression a different colored printing from the rest of the matter. The need is especially felt in the case of advertisements where it is desirable to bring out or emphasize the advertisement by using a different color. For this object it is already known to employ for the differently colored advertisements a case with movable types in it inserted in the rest of the form, which types at a given moment may move backward away from the black inking roller, become differently colored, and return with the remaining portion of the form into the printing position. In several constructions the movement of the printing types was produced by the pressure of the inking roller or of the impression cylinder by the help of intermediate members. All such devices have, however, lacked success in practice. The reason for this consists in the difficulty of inking the movable colored types and the faulty impression resulting from the defective inking. The present invention differs from the above in that it is not the actual type surface of the advertisement to be emphasized which is colored but the ground surface of the types; for this purpose a special movable background is provided surrounding the fixed types. The movement of the background or plate which is necessary for drawing it away from the black inking roller and for giving it a different colored inking is effected by a movable matrix which gives a black impression.

The types of the advertisement to be emphasized are, therefore, inked in the usual way and give a clean and sharp impression just like the remaining part of the printed matter, because said advertisement types do not move. The background, however, which only serves to give a colored surface is always sufficiently definitely printed in order to give the desired emphasis to the advertisement owing to the contrast between the colors.

According to this invention, therefore, the matrices for printing a red background for example and for printing a black border to the advertisement are movably mounted in the before mentioned known type cases. The form for printing the border projects a little above the remaining stationary letters of the advertisement and is consequently pressed down both by the black inking roller and by the paper impression cylinder during the passage of these latter. The border printing form by its movement and through the action of intermediate members, operates the impression face which serves for printing the background and which contains the coloring matter after the manner of a stamp pad or in the form of oil crayons, in such a way that the latter is raised up to the circumference of the impression cylinder during the passage thereof but is lowered during the passage of the black inking cylinder in order to avoid touching this latter.

The invention is illustrated in the accompanying drawings in which

Figures 1 to 3 are figures illustrating the types for advertising in perspective, while Figs. 4 to 13 illustrate diagrammatically two separate forms of construction of devices working according to this invention.

The border printing matrix is illustrated in Fig. 1 while the background matrix for printing red for example, is shown in Fig. 2 and the types for the black letters of the advertisement are shown separately in Fig. 3. In Figs. 4 to 7 the same parts are shown with the same letters of the alphabet as in Figs. 1 to 3 and the height of the surface of the rest of the types of the printing plate or roller is indicated by the line *p*. The printing form however is different in Figs. 4 to 12 from that shown in Fig. 1.

Referring to Figs. 4 to 7, Fig. 4 shows the position taken up by the parts automatically after the passage of the black inking roller, when the border printing form *q* projects above the line *p*, that is to say, beyond the rest of the printing face; the background form *r* which prints the red color for instance then lies below the line *p*. If now in the course of revolution of the impression cylinder the black inking cylinder passes the case it depresses the border printing form *q* which is only projecting a little so that it now comes into the position shown in Fig. 5 against the resistance of the compression spring *s;* at the same time the lever *t* is

pressed downward by the projection u on the border printing form q. The other end of the lever meets a resistance in the background printing form r because this latter is pressed against its guide rods 6 by a spring 8 attached to the post 7, or is provided with some other means for introducing a suitable amount of resistance to motion. In consequence of this resistance the turning point v of the lever t is forced downward in the direction of motion of the sleeve w which slides on the rod x fixed in the case a. Two further levers y and z are arranged to turn on the pin v, these levers being pressed apart by the action of a spring 1 in such a way that under ordinary circumstances the lever y is pressed against the background printing form, while lever z is pressed against the rod 2 fixed in the case a. If now during the lowering of the pin v the lever y comes to the slot 3 it snaps into this latter in consequence of the pressure of the spring 1; at the same time the lever z moves a little under the action of its weight away from the rod 2. As soon as the black inking cylinder has passed the border printing form q rises again under the action of the spring s. During this motion the rigid connection between the border-and-background-printing forms, resulting from the positions of the levers t and y as is seen in Figs. 5 and 6 causes the latter form to rise with the former to the position of Fig. 6. The background printing form r now lies at the height of the remaining stationary types and as soon as the paper drum passes this form it imparts its impression to the paper in the same way as the letters and the border printing matrix which is pressed down as indicated in Fig. 7 under the action of the drum.

During the lowering of the border printing form the catch lever y is moved out of the notch 3 sliding over the inclined lower edge of this latter, by which means the pressure of the spring 1 on the lever z is increased so that as soon as said lever reaches the notch 4 it snaps into it as is illustrated in Fig. 7. As soon as the border printing form has given its impression to the paper drum and this latter has passed, the form immediately rises. This time, however, the point of rotation of the lever t is fixed by its connection to the guide rod x through the catch lever z, so that the raising of the one end of the lever causes the lowering of the other which consequently lowers the background printing form. By this means the latter form is again withdrawn so that it is protected from contact with the black inking roller which is then just passing. In the final position shown in Fig. 4 the lever z is again freed and drawn out from the notch 4 owing to the action of a projection 5 on the lever t which presses the lever z backward. Another form of construction of a device serving the same purpose is illustrated in Figs. 8 to 11. In these figures new letters of reference are used beginning from a. In this case a indicates the border printing form which is raised above the level of the remaining types by the spring b. c is the background printing form which slides on the guide rod d. The relative motion of the two matrices is caused by the double armed lever f pivoted at g. The lever f is coupled when required with the border printing form while it is permanently connected with the movable slide i which works in the guides k of the background printing form. This coupling device consists of a ratchet wheel m mounted on a stationary axle l which wheel is engaged by the pawl n mounted on the border printing form, and it further consists of the cam disk o mounted on the same axle and of an elbow lever pivoted at r which works on said disk by its arm p while its other arm g slides on the disk s. The vertically arranged disk s is supported on a pair of parallel levers v, w which swing about the pins t and u attached to projections of the border printing form a. At the lower end of these levers is arranged a forked piece x which engages when required with the one end of the lever f. The disk s is always kept vertical owing to the arrangement of a pair of levers v, w.

The following is the sequence of operations during the printing. When the black inking roller presses back the border printing form from the position of Fig. 8 into that of Fig. 9, the pawl n slips over the ratchet wheel n while the pair of levers v, w together with all the remaining parts of the device retain their position and become displaced only relatively to the lever arm q. After the passage of the black inking roller the border printing form a again rises, pawl n engages in the ratchet wheel m and turns it through a certain angle until the cam disk o comes into the position shown in Fig. 10. The arm p of the elbow lever which is pressed by the spring y against the disk o enters a notch in the latter by which means the arm q is allowed to be moved by its spring so as to press back the disk s with the pair of levers v, w against the resistance of the weaker spring z' so that the fork x' engages the double armed lever f. If now the paper drum presses down the border printing form a the pawl n again slips backward while, however, the fork x brings the lever f into the position of Fig. 11 whereby the background printing form a is raised to the level of the rest of the types. In this position the border and background printing matrices impart their colors to the paper. When in the passage of the paper drum the border printing form again rises the background printing form is again lowered whereupon the device returns to the position shown in Fig. 8.

If the background printing form does not contain the coloring matter in itself, or if the types with the exception of the border printing form are to have a suitable color imparted to them during the printing, the device shown in Figs. 12 and 13 is added to that above described. In Fig. 12 the separate rows of types of an advertisement are indicated by 1; these rows are each pivotally or rotatably supported at their two ends on pins 2 which turn in the device *c* before described as the background printing form. On one or more of these pins are arranged toothed wheels 3 engaged by a rack bar 4. If now the device *c* is raised or lowered the toothed wheel 3 turns in one or other direction while rolling on the rack bar 4 by which means the upper surface of the rows of types connected to it is either turned downward for taking up ink from the surface 5, or is turned back again into the position of Fig. 12. The disks 6 mounted on the pins of the other rows of types are coupled with the toothed wheel 3 so that all the rows of types are moved or turned simultaneously.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. In a device of the character described, fixed type, a movable back ground surrounding the type, means for moving said back ground away from the inking roller, and a form for printing the border portion projecting above said stationary type.

2. In a device of the character described, fixed type, a movable back ground surrounding the type, means for moving said back ground away from the inking roller, a form for printing the border portion projecting above said stationary type, and means for rigidly connecting the border and background printing forms.

3. In a device of the character described, fixed type, a movable back ground surrounding the type, means for moving said back ground away from the inking roller, a form for printing the border portion projecting above said stationary type, and means for rigidly connecting the border and back ground printing forms, and a catch lever arranged in the path of means on the border printing form.

4. In a device of the character described, fixed type, a movable back ground surrounding the type, means for moving said back ground away from the inking roller, a form for printing the border portion projecting above said stationary type, and means for rigidly connecting the border and back ground printing forms, a catch lever arranged in the path of means on the border printing form, and means for resisting the motion of the back ground printing form.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS BROCK.

Witnesses:
R. MATTHIAS,
W. FERGG.