

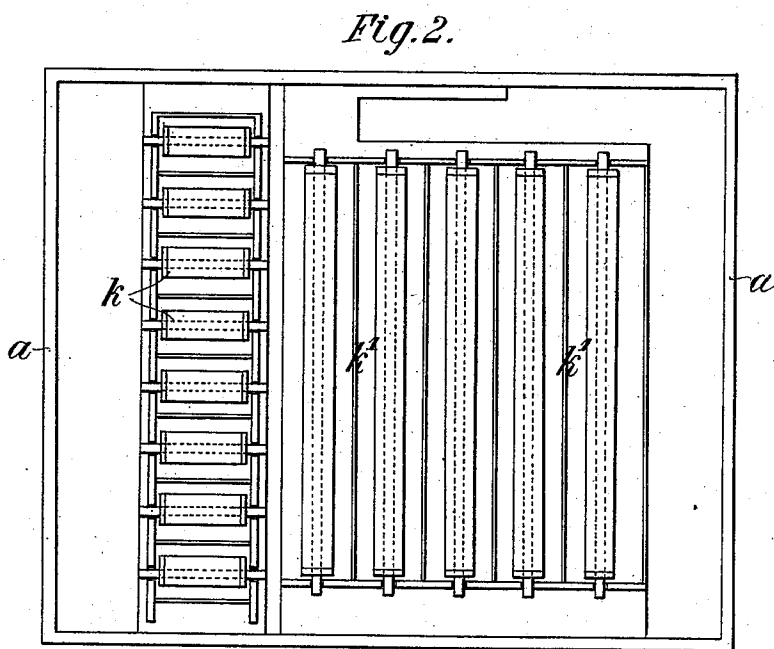
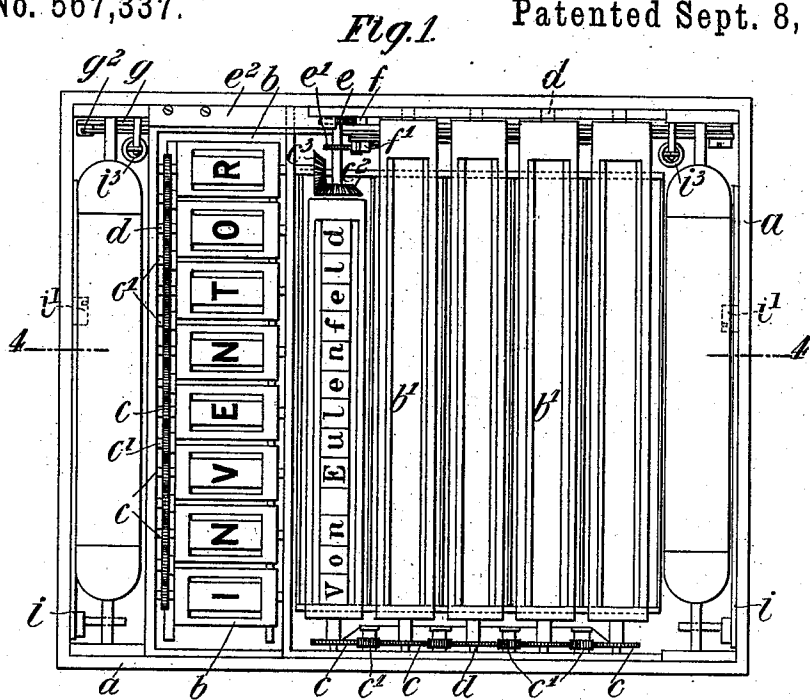
(No Model.)

4 Sheets—Sheet 1.

F. VON EULENFELD.
MULTICOLOR PRINTING APPARATUS.

No. 567,337.

Patented Sept. 8, 1896.



Witnesses.
J. D. Kingsbury
& A. Kauberschnitt.

Inventor.
Ferdinand von Eulenfeld
By Whitaker & Treadwell
attys.

F. VON EULENFELD.
MULTICOLOR PRINTING APPARATUS.

No. 567,337.

Patented Sept. 8, 1896.

Fig. 3.

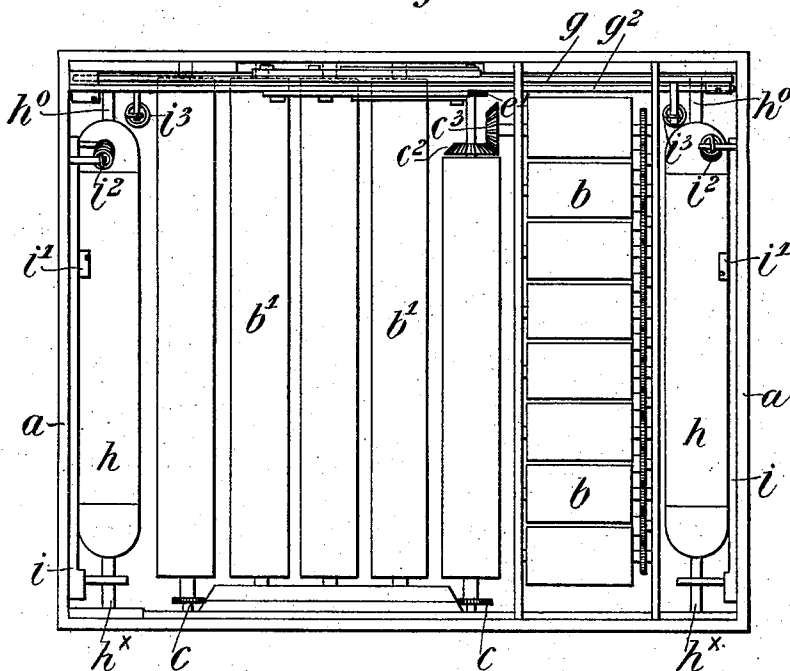


Fig. 4.

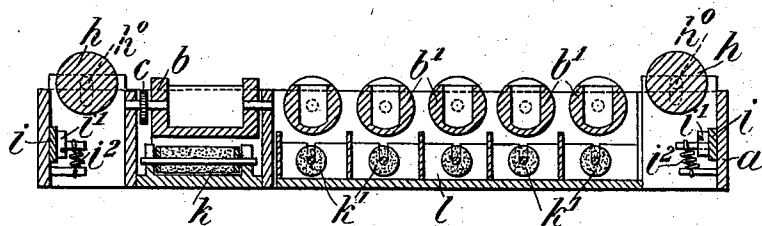
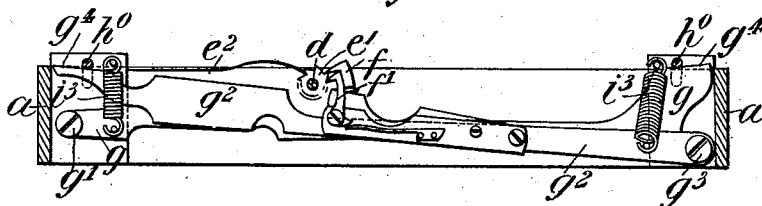


Fig. 5.



Witnesses.

J. D. Kingsbury
G. A. Fauschmidt.

Inventor.

Ferdinand von Eulenfeld
By Whitaker & Reed atty.

(No Model.)

4 Sheets—Sheet 3.

F. VON EULENFELD.
MULTICOLOR PRINTING APPARATUS.

No. 567,337.

Patented Sept. 8, 1896.

Fig. 4^a

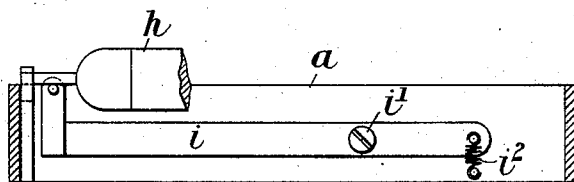
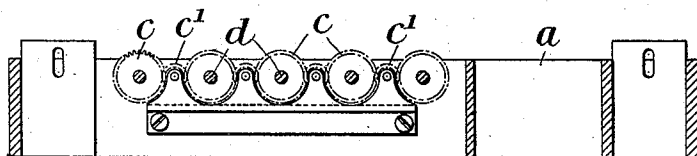


Fig. 5^a



Witnesses.

E. P. Hubbard,
G. A. Pauerschmidt.

Inventor.

Ferdinand von Eulenfeld
By Whitaker & Brewster, atty.

(No Model.)

4 Sheets—Sheet 4.

F. VON EULENFELD.
MULTICOLOR PRINTING APPARATUS.

No. 567,337.

Patented Sept. 8, 1896.

Fig. 6.

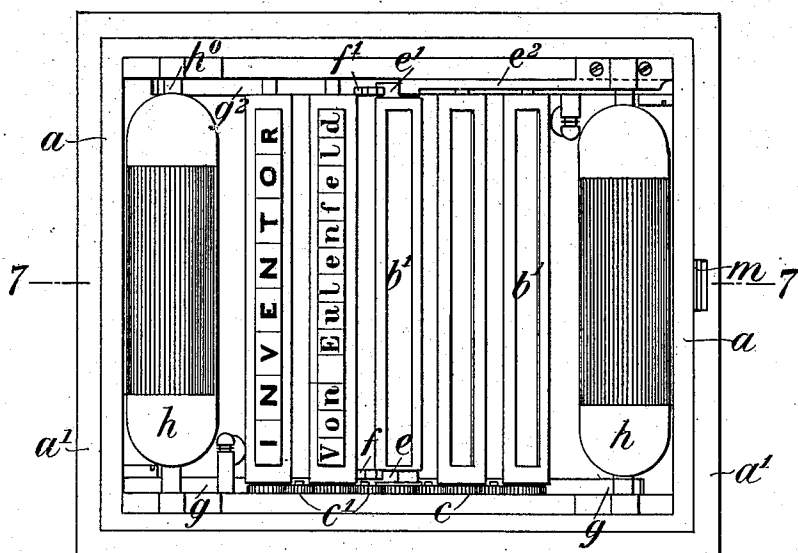
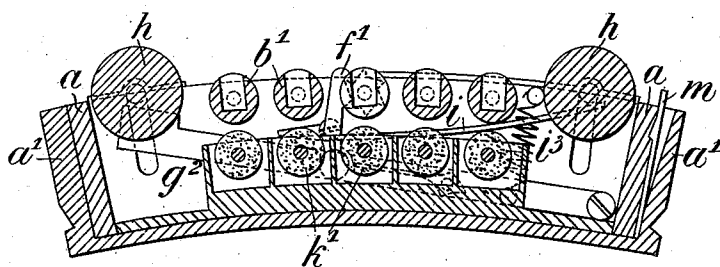


Fig. 7.



Witnesses.

J. D. Kuigsberg.

G. A. Fauberschmitt.

Inventor:
Ferdinand Von Eulenfeld
By W. A. R. Revost Atty.

UNITED STATES PATENT OFFICE.

FERDINAND VON EULENFELD, OF Breslau, GERMANY.

MULTICOLOR-PRINTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 567,337, dated September 8, 1896.

Application filed October 11, 1895. Serial No. 565,359. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND VON EULENFELD, a subject of the Emperor of Germany, residing at Breslau, Germany, have invented a new and useful Apparatus for Printing Simultaneously in Various Colors, of which the following is a specification.

This invention relates to apparatus for printing simultaneously in various colors.

According to my invention I employ separate cylindrical movable type-carriers for those parts of the matter or composition which are to be differently colored, the said carriers being operated by any suitable means, such as, for instance, by the inking-rollers designed to ink the type for printing the remaining portions of the matter or composition, and being each provided with a special inking arrangement for supplying the type with the desired color. My movable type-carriers are not operated directly by the inking-rollers, as the type-carriers must remain free from the color on the inking-rollers, but for this purpose intermediate devices are employed. The said devices, which are contained in the frame holding the type-carriers and the inking arrangements for the type, consist of rollers or the like adapted to be pressed downward and actuated by the inking-rollers of the press or printing-machine, the said rollers themselves operating other devices which actuate the type-carriers. The whole arrangement is held in a frame which is arranged in the form between the ordinary type in such a manner that the faces of the movable type are in the same plane as those of the ordinary type. The number of type-carriers depends entirely on the number of letters or words which it is desired to print in different colors. If desired, each word can be printed in a different color, or even each letter, or a combination of these two methods can be employed. The type-carriers are preferably arranged on horizontal axes and are connected together by toothed wheels, for instance, so that when motion is imparted to one of the said carriers it will be transmitted to the others, that is to say, motion will be transmitted from the above-mentioned rollers or the like, which are adapted to be pressed downward, to those type-carriers which are arranged to move all

the others by means of one or more ratchet-wheels and pawls, whereby an intermittent movement is imparted to the type-carriers. As each of the inking-rollers imparts an intermittent motion to each (if there are more than one) of the rollers adapted to be pressed downward, the number of ratchet-teeth in each ratchet-wheel must have a certain relation to the number of rollers to be pressed down and to the number of inking-rollers in the machine in order to insure that the type carried in the movable carriers is inked with the proper color simultaneously with the inking of the ordinary type by the inking-rollers of the machine, that is to say, to insure that the type-carriers make one complete revolution during the time employed in inking the ordinary type.

From the foregoing it is evident that the chief characteristic of my invention is the employment of a frame which is inserted in the form of a printing-machine, the said frame having one or more movable type-carriers, each being provided with a separate inking device, suitable means being employed for actuating these parts.

To enable my invention to be fully understood, I will describe the same by reference to the accompanying drawings, in which—

Figure 1 is a plan of my color-printing apparatus. Fig. 2 is a plan of the inking arrangement. Fig. 3 is an under side view of the apparatus with the inking arrangement removed. Fig. 4 is a section on the line 4 4 of Fig. 1. Fig. 4^a is a sectional view of one end of the apparatus. Fig. 5 is an elevation of a suitable arrangement of mechanism for actuating the type-carriers. Fig. 5^a is a view similar to Fig. 5, showing the opposite side of the apparatus. Fig. 6 is a plan of my apparatus adapted for use with rotary printing-machines. Fig. 7 is a section on the line 7 7 of Fig. 6.

a represents the frame to be inserted in the form of the printing-machine, the said frame being shown in Figs. 1 to 5 provided with eight type-carriers *b* for letters and five type-carriers *b'* for words. These type-carriers *b b* and *b' b'* are connected together by toothed wheels *c* and *c'*, and the two sets *b* and *b'* are connected by the bevel-wheels *c*²

c^3 , so that the type-carriers are caused to rotate on their axes $d\ d$ simultaneously. The axis of the type-carrier b' , lying next to the type-carriers b , is provided with two ratchet-wheels $e\ e'$, actuated by the pawls $f\ f'$ and held in position by the spring-detent e^2 . The pawl f is fixed to a lever g , pivoted at g' to the frame a , and the pawl f' to a lever g^2 , pivoted to the frame a at g^3 . Both of these levers are provided with or form at their free ends a bearing g^4 for one of the pivots h^0 of the rollers h , which are adapted to be pressed downward. In the drawings two such rollers are shown, arranged at the smaller sides of the frame a , and projecting sufficiently far above the same to enable the inking-rollers of the machine to actuate them, that is to say, to press them downward. The other pivot h^x of each of these two rollers $h\ h$ is held by a lever i , pivoted at i' to the frame a , and provided with a spring i^2 , which tends to keep the said pivot in its highest position. Similar springs i^3 act in a similar manner on the levers g and g^2 , carrying the pawls. If, now, it be supposed that the printing-machine is provided with six inking and impression rollers, the latter will, in passing once backward and forward, press on the two rollers $h\ h$, so that each of the pawls $f\ f'$ will be actuated twelve times and each of the type-carriers twenty-four times and all the type-carriers b and b' will make one complete revolution, the ratchet-wheels e and e' being provided with the required number of teeth for that purpose. In this rotation the type in the type-carriers come in contact with inking-rollers k and k' , the number of which is equal to that of the type-carriers b and b' . The inking-rollers k and k' are arranged so as to give under pressure either by means of spiral springs, which are arranged within the ink-reservoirs $l\ l$, or by means of flat springs, which act on the pivots of the inking-rollers which project through the side walls of the said reservoirs l , or by any other suitable means. Each type-carrier can be provided, if desired, with two inking-rollers arranged in the usual manner. In practice the inking-rollers do not rotate the type-carriers through a whole revolution, the type being brought into the proper position by means of the impression member, which presses on the roller h in the same manner as the inking-rollers. For instance, supposing there are five inking-rollers and one impression-roller, the five inking-rollers cause the type-carriers to rotate into such a position that the action of the impression-roller on the first contact-roller h will further rotate the carriers into the proper position for printing. The contact of the said impression-roller with the second contact-lever h will cause the type-carriers to commence another revolution, so that the type are removed out of the way of the inking-rollers which follow the impression member.

The above-described arrangement is adapted for ordinary platen or other printing-presses, while Figs. 6 and 7 represent an arrangement adapted for use with rotary machines. In this arrangement the frame a is made to fit the curve of the periphery of the cylinder. As the cylinder in such machines is encircled with stereotype-casts from the type, it is therefore necessary when employing my invention with such machines to provide the stereotype-plate with a recess in which the frame a can be received. For this purpose I provide a small receptacle a' in the said plate, the interior of which forms the recess in which the frame a is received, and held by a suitable spring-catch m .

With regard to the simultaneous action of the pawls $f\ f'$ and the ratchet-wheels $e\ e'$, I may remark that the mechanism can be so arranged that the movement of the pawls can be altered for the purpose of enabling the arrangement to be used with presses having a different number of inking-rollers (or of parts) which actuate the apparatus.

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 multicolor-printing apparatus the combination with a frame, of a plurality of revoluble type-carriers mounted therein, separate inking-rollers for each type-carrier actuating means directly connected with one of said type-carriers and operative connections independent of said actuating means between said carrier and all the other type-carriers, substantially as described.

2. In a multicolor-printing apparatus, the combination with a series of revoluble type-carriers, an independent inking device for each type-carrier, means for simultaneously moving said carriers to bring the type into and out of engagement with said inking devices including a plurality of independent depressible actuating devices operatively connected with said type-carriers and located in different transverse planes longitudinally of said printing apparatus, of a device adapted to engage said depressible actuating devices, substantially as described.

3. In a multicolor-printing apparatus the combination with a series of revoluble type-carriers, an independent inking device for each type-carrier, means for simultaneously moving said carriers to bring the type into and out of engagement with said inking devices, including a plurality of independent depressible actuating-levers, and a plurality of independent engaging devices, operatively connected with said type-carriers and located in different transverse planes longitudinally of the frame, of a printing-press and a part connected with each of said actuating-levers, disposed in the path of a movable part of said press, substantially as described.

4. In a multicolor-printing apparatus, the

combination with a frame, of parallel revolvable type-carriers arranged in said frame, of a series of type-carriers arranged perpendicularly to the first-mentioned carriers independent inking devices for each type-carrier, and means for simultaneously moving all of said carriers to bring the type into and out

of engagement with said inking devices, substantially as described.

FERDINAND VON EULENFELD.

Witnesses:

JOHN E. BOUSFIELD,
C. G. REDFERN.