

No. 607,648.

Patented July 19, 1898.

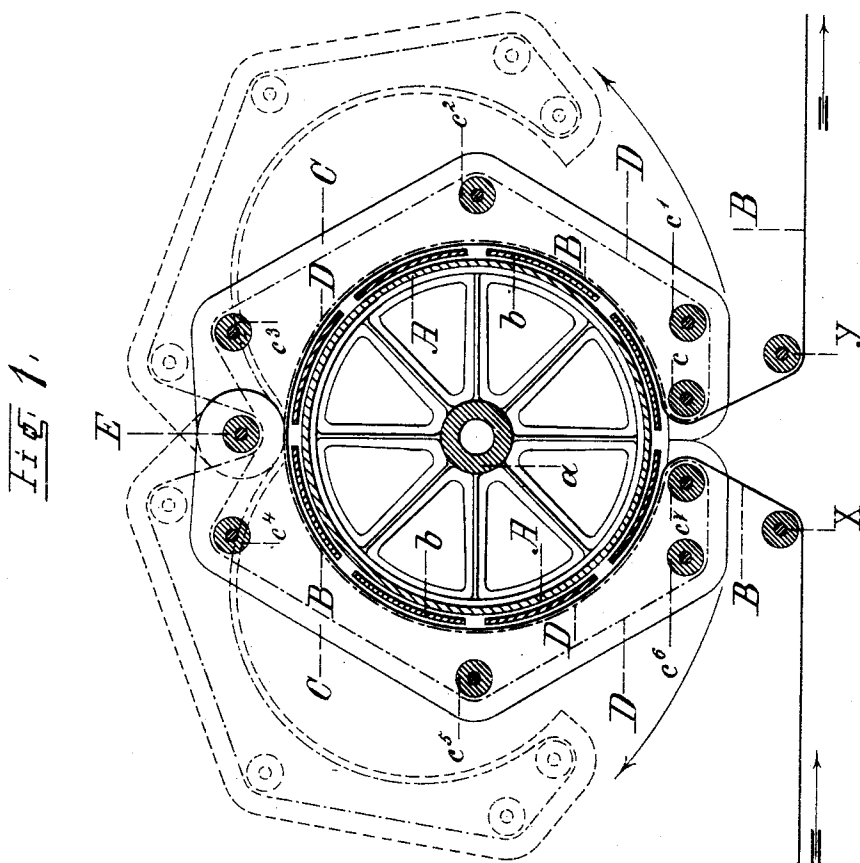
A. SCHWARZ.

CONTINUOUS PHOTOGRAPHIC PRINTING APPARATUS.

(Application filed Mar. 29, 1897.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses.
J. C. Hebert
C. Black.

Inventor.
Arthur Schwarz,
By *J. H. de Vos.*
Attorney. —

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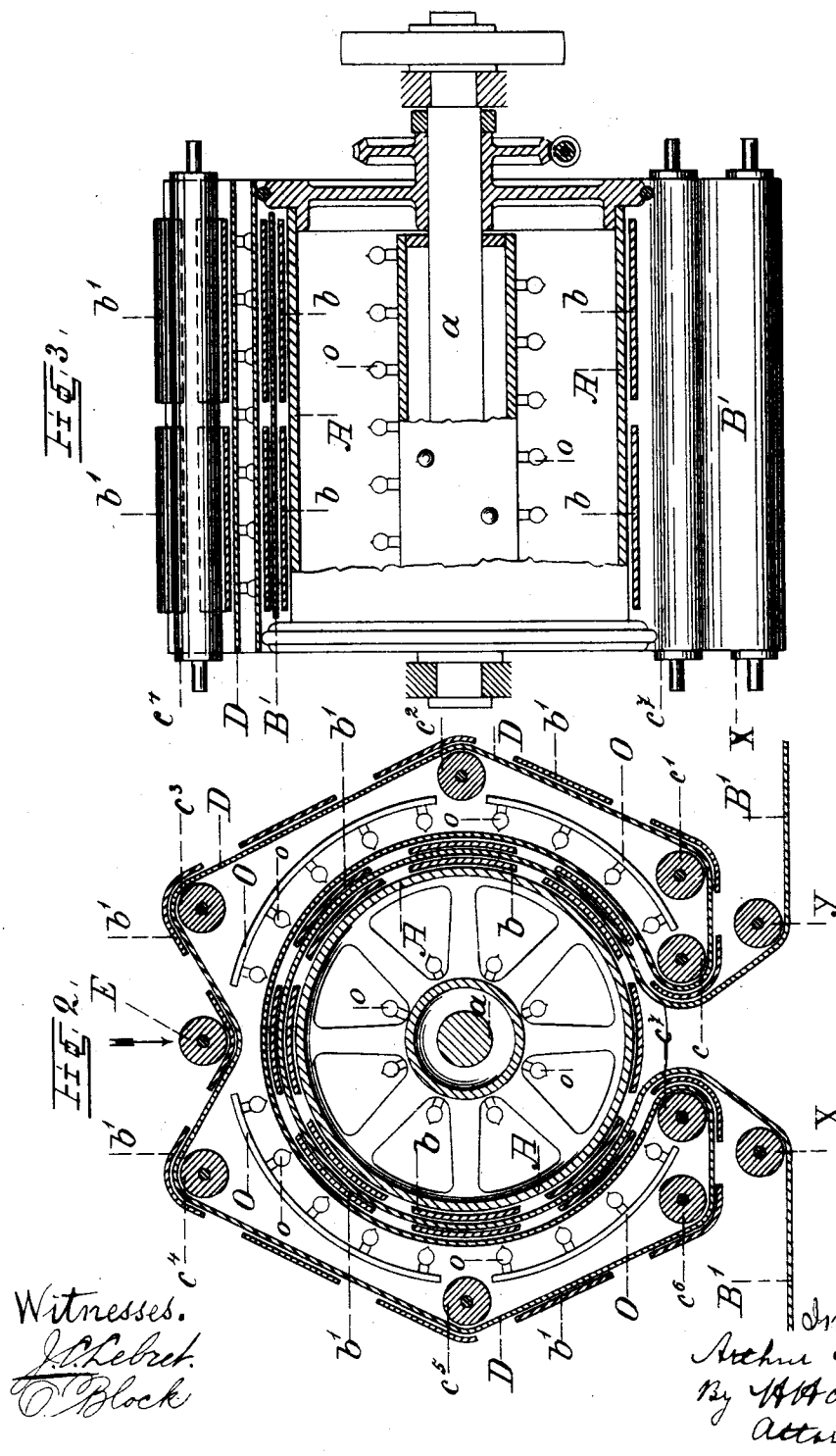
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UNITED STATES PATENT OFFICE.

ARTHUR SCHWARZ, OF BERLIN-SCHÖNEBERG, GERMANY.

CONTINUOUS PHOTOGRAPHIC-PRINTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 607,648, dated July 19, 1898.

Application filed March 29, 1897. Serial No. 629,796. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR SCHWARZ, a subject of the German Emperor, residing at Berlin-Schöneberg, Germany, have invented certain new and useful Improvements in Continuous Photographic-Printing Apparatus, of which the following is a specification.

In the well-known devices for exposing sensitized paper for making copies the negative is pressed firmly against the sensitized paper by means of a blanket. When the paper has been sufficiently exposed, fresh paper must be placed under the negative, and for this purpose the blanket must be removed. While this method will answer the purpose if only a small number of copies are to be made, it is obvious that when very large numbers of copies are desired the continual removal and readjustment of the blanket will cause a considerable loss of time.

My invention has for its purpose to remove this disadvantage; and to this end I have devised a circulating or endless blanket moving around a cylinder, the negatives being placed upon the cylinder, the blanket, or upon both.

A method of carrying my invention into practice is diagrammatically shown in the annexed drawings, making a part of this specification, and wherein—

Figure 1 shows a side view in section of a copying apparatus with endless blanket, the negatives being arranged upon the cylinder. Fig. 2 shows a similar view of a copying apparatus adapted for exposing paper sensitized on both sides, and Fig. 3 shows a cross-section of Fig. 2.

Referring to Fig. 1, the transparent negatives *b* of the pictures are suitably fixed upon a transparent or translucent cylinder *A*, rotating with or upon its axle *a*. Around this cylinder is suitably guided the strip of sensitized paper *B*, which is fed at *X* and carried off at *Y*. Around the cylinder *A*, which is preferably mounted in a hinged frame *C*, are provided at suitable places rolls *c c' c'' c'''*, &c., around which an endless blanket *D* is moved, so that it also surrounds the cylinder. This blanket is adapted firmly to press the sensitized paper against the negatives *b*, arranged upon the cylinder *A*, and the necessary pres-

sure is obtained by means of the pressure-roll *E*, located between the guiding-rolls *c''* and *c'''*, as shown. It is obvious, of course, that the pressure-roll *E* must be adjustable in its position in relation to the cylinder *A*, so that by moving this roll nearer to the cylinder the pressure of the blanket upon the sensitized paper can be regulated at will.

It is clear that when the cylinder *A* is rotated it will carry along both the sensitized paper *B* and the blanket *D*, both being firmly adjusted against its circumference, and that while fresh sensitized paper is being continually fed the blanket will continually move around the rolls *c* to *c'''* and the cylinder *A*.

The speed of the cylinder *A* is so regulated that the picture is fully developed during the time the sensitized paper performs its motion around the cylinder. If new negatives are to be placed upon the cylinder, the frame is opened, so that it will assume the position shown in dotted lines in the drawings, and the new negatives can now be placed on the cylinder whereby the same is rotated.

In the construction above described the cylinder *A* is transparent and the source of light—for instance, in the shape of one or more electric lamps—is arranged within the cylinder. The arrangement of such electric lamps *o* in the cylinder is shown in Figs. 2 and 3; but this arrangement may be varied, as it is also possible to use an opaque cylinder, provided the blanket be made of a transparent or translucent fabric. In this case the negatives are arranged upon the blanket and move with the same around the cylinder *A* and the guiding-rolls *c* to *c'''* and will adjust themselves when reaching the cylinder upon the sensitized paper. They will remain in this position until the blanket leaves the cylinder and move then around the guiding-rolls until they reach the place where the sensitized paper is released. In this construction the source of light is provided at the outside, and the light is thrown through the blanket *D* and the negatives *b* upon the sensitized paper, while in the construction first described it goes from the interior of the cylinder through the negatives to the paper.

In Figs. 2 and 3 I have illustrated a circular copying apparatus adapted for exposing

paper sensitized on both sides. The construction is substantially the same as for the single copying apparatus; but both the cylinder and the blanket must be transparent or translucent. The endless transparent blanket C is moved about the transparent cylinder A in the manner heretofore described by means of the rolls c c' c^2 c^3 , &c., and the tension of the blanket is also regulated in the same manner by means of the adjustable pressure-roll E. The negatives b are arranged upon the cylinder A and the negatives b' on the blanket D, so that when the cylinder is rotated, thereby imparting motion to the blanket, the negatives b and b' will exactly cover each other. The paper B', sensitized on both sides, passes between the negatives of the cylinder and those attached to the blanket, the feed and release places being entirely as shown in Fig. 1 and as near together as practicable in order to use as much as possible the entire circumference of the cylinder. Between the part of the blanket surrounding the cylinder and the part passing over the rolls c to c' is an open space, wherein the electric lamps o can be conveniently placed. These lamps are attached to suitable supports O, that must of course be held to a suitable frame. (Not shown in the drawings.) For the exposure of the inner side of the sensitized paper B' similar electric lamps o are located within the cylinder A.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An exposing device for making copies

on sensitized paper, provided with an endless blanket, and means for exerting pressure upon the blanket and upon the negatives from which the copies are to be made, substantially as and for the purposes described. 40

2. An exposing device for making copies on sensitized paper, provided with a transparent or translucent endless blanket, substantially as and for the purpose described and set forth. 45

3. An exposing device for making copies on paper sensitized on both sides, provided with a transparent or translucent blanket, circulating about a transparent or translucent cylinder, substantially as and for the purpose described and set forth. 50

4. In an exposing device, the combination of a rotary cylinder, an endless blanket circulating around this cylinder, and adapted to press the negatives upon the sensitized paper, substantially as described. 55

5. In an apparatus for exposing paper sensitized on both sides, a cylinder around which the blanket is passed, means for sustaining a portion of the blanket at a distance from the cylinder so as to leave a space between the cylinder and said portion of the blanket, and electric lamps located in said space, substantially as and for the purposes described. 65

In witness whereof I have hereunto set my hand in presence of two witnesses.

ARTHUR SCHWARZ.

Witnesses:

HENRY HASPER,
W. HAUPT.