

March 6, 1951

K. J. J. VAN DER GRINTEN

2,544,287

EXPOSURE APPARATUS FOR MAKING PHOTOPRINTS

Filed July 19, 1948

Fig. 1

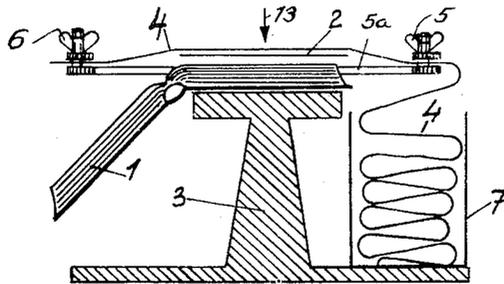


Fig. 2

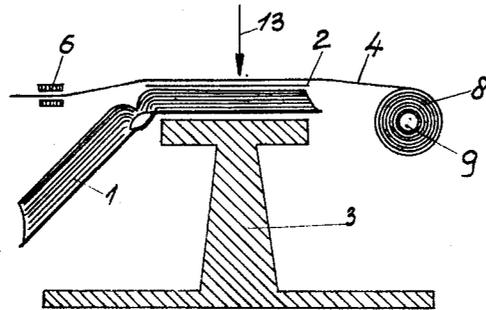


Fig. 3

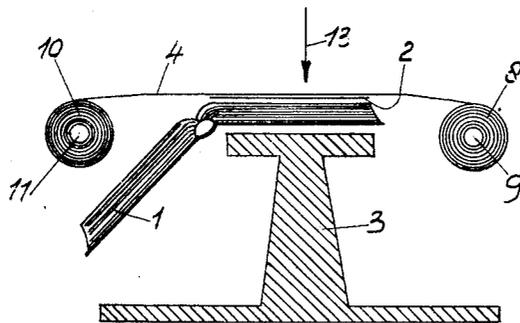
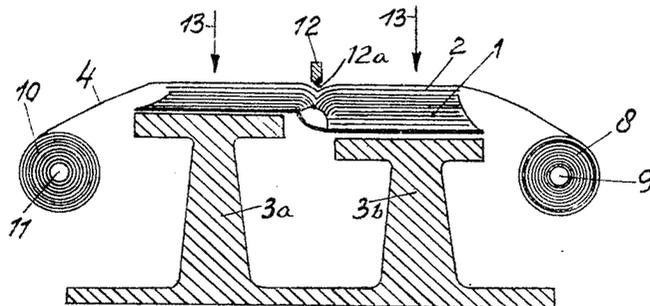


Fig. 4



INVENTOR KAREL JAN JOZEF VANDER GRINTEN
BY Hammond & Little
ATTORNEYS

UNITED STATES PATENT OFFICE

2,544,287

EXPOSURE APPARATUS FOR MAKING PHOTOPRINTS

Karel Jan Jozef van der Grinten, Venlo, Netherlands, assignor to Chemische Fabriek L. Van Der Grinten, a company of the Netherlands

Application July 19, 1948, Serial No. 39,430
In the Netherlands July 19, 1947

3 Claims. (Cl. 95—73)

1

This invention relates to an exposure apparatus for making photoprints (photocopies) by contact-reflex copying, of the type provided with a flexible transparent pressure- or contacting-sheet which keeps the light-sensitive sheet during exposure in close contact with the original to be copied. It is an object of the invention to make the apparatus particularly suited for copying from books without deterioration.

Contact printing from books heretofore has almost exclusively been done by means of a flat glass plate keeping the light-sensitive material in contact with the original (book) to be copied. This glass plate method, however, has serious disadvantages. It obviously is difficult, considering the nature of an opened book, to bring the page to be copied into a perfectly flat state which is necessary to have it contacted all over its surface by the glass plate, and certainly it is difficult to obtain all over the surface approximately a constant contact pressure.

The flexible sheet method has appeared to be better in this respect. Difficulties are likely to be encountered only because the flexible sheet soon will show dents, folds or other damages and deformations as a consequence of it being pressed alternatively over books of different sizes. Flexible sheets might be used, however, for the purpose indicated—of sufficiently cheap material that they may be replaced at low costs as often as necessary.

The apparatus provided according to this invention shows further development in the art. An exposure device according to the invention comprises a supporting device for originals to be copied, a flexible transparent pressure sheet passing over same, tensioning means engaging said pressure sheet and acting on same to hold it tight, means for enabling the supporting device and the pressure sheet to approach one another until they are firmly pressed together, and a press-ruler mounted for movement towards the pressure sheet so that a rectilinear edge of the ruler will be pressed onto the pressure sheet and the supporting device. The flexible transparent pressure sheet may form part of a belt or a band or strip of transparent material, successive parts of which can be brought into the position (operative position) in which they are active as a pressure- or contacting sheet. Replacement of worn parts of the sheet is simple and can be effected in a short time as soon as it appears to be necessary. Copying need not be retarded by it to any appreciable extent.

The transparent material may consist of cellu-

2

lose or a cellulose derivative, resinous material, rubber or the like.

Preferably the transparent material is rolled up at both ends. When replacement of the active part is necessary it may be rolled off at one end and rolled up at the opposite end at the same time.

For making copies from two adjacent pages of a book simultaneously a ruler is provided, approximately in the middle of the operative area of the contacting-sheet, e. g. transversely to the longitudinal direction of the band of transparent material, for pressing the transparent contacting-sheet into the fold of the opened book.

In the drawings:

The Figures 1-4 illustrate diagrammatically cross-sectional elevations of various embodiments of the apparatus according to the invention, arranged for exposure from a light source above it.

In Figures 1-4, 1 is the book, two adjacent pages of which are to be copied. 2 is the sheet of light-sensitive material e. g. silver bromide paper or a screened diazotype film, on which a reflex copy of the pages is to be made. The book is supported by the supporting table 3, and sheet 2 is brought into close contact with book 1 by means of the transparent film 4 constituting the pressure or contacting sheet. For this purpose the table 3 and the film 4 are made to approach one another and the film 4 is stretched tightly over the table 3. Film 4 e. g. consists of cellulose acetate.

In Fig. 1, 5 and 6 are clamping means holding tight the film 4. These clamping means are fastened to a frame 5a, which can be lowered onto the book, viz. approach the table 3 in order to press the film 4 tightly upon the pages to be copied. The frame 5a carrying the clamping means 5 and 6 also could be stationary itself. In that case the support 3 must be capable of being raised in order to lift the book and press it against the film 4. The support 3 might be capable of being lifted i. e. of being moved upward by means of lifting-screws or the like. The part of the film 4, which has not yet been used, is stored in box 7. If the active part of film 4 between 5 and 6 has been deteriorated, crumpled e. g. by use, the clamping means 5 and 6 are loosened, and film 4 is moved to the left until a fresh piece of it is located between 5 and 6. The deteriorated piece may be cut off. The fresh piece is taken from the reserve stock in box 7. The clamping means 5 and 6 are then tightened again and the apparatus is ready for use again.

In Figure 2 a roll 8 on shaft 9 has been used

3

instead of the clamping means 5 and the box 7 in Fig. 1. The shaft 9 is provided with an arresting device (not shown) adapted to fix the shaft 9 during operation of the apparatus and to be loosened when the film 4 has to be shifted (to the left).

In the embodiment according to Figure 3 the clamping means 6 also has been replaced by a rolling-up device, consisting of a roll 10 on a shaft 11. This, like shaft 9, is provided with an arresting device.

Apparatus according to Figure 3 is operated as follows:

As soon as film 4 has deteriorated in the operative area between rolling-off device 8—9 and rolling-up device 10—11, and thus cannot be used further, the arresting devices on the rolls 9 and 11 are loosened, which, if both are connected to one handle, can be done by one manipulation. The part of the film which has become useless is rolled up on 10, whilst a new piece rolls off from 8.

The shaft of rolls 9 and 11 are now again arrested and exposure and copying can be proceeded with.

The apparatus according to Figure 4 is particularly suitable for simultaneously printing two adjacent pages of a book; it contains a ruler 12, mounted for up and down movement above the gap left between the two tables 3a and 3b constituting together the support for the book 1. It therefore can be pressed down with its rectilinear lower edge 12a pressing into the fold of the book 1. The press-ruler 12 is connected to the shafts 9 and 11 of the rolls 8 and 10 to move up and down with the latter as a unit. In this case the film 4 is automatically stretched and tightened over the book 1 when the ruler 12 is pressed down.

The film 4 is then held tightly convex or bulging over the two pages of the opened book.

In all the figures the arrows 13 schematically indicate the direction of the light falling down from a light source above the apparatus.

What I claim is:

1. Exposure apparatus for making photoprints from books by contact reflex copying, comprising a device for supporting an open book with at least one page exposed and covered by light-sensitive sheet material, a flexible transparent pressure sheet extending over said device, tensioning means including elements at opposite sides of said device for holding portions of said pressure sheet tightly with the sheet spanning such page, the supporting device and the tensioning means being relatively movable in a direction transverse to such page so as to press the latter and the spanning pressure sheet firmly together, and a press-ruler mounted over the pressure sheet for movement in the said direction and having a rectilinear edge acting upon movement toward

4

the book to press part of the spanning pressure sheet into the fold of the open book.

2. Exposure apparatus for making photoprints from books by contact reflex copying, comprising a supporting device presenting two table surfaces separated by a gap for supporting an open book with its fold over and along the gap and with two opposite pages facing upward and covered by light-sensitive sheet material, a flexible transparent pressure sheet extending over said device, tensioning means including elements at opposite sides of said device for holding portions of said pressure sheet tightly with the sheet spanning said pages and adapted to sustain tension in a direction transverse to said gap, the supporting device and the tensioning means being relatively movable in a direction transverse to said surfaces so as to press the spanning pressure sheet and said pages firmly together, and a press-ruler positioned over the pressure sheet above and along said gap and movable toward the gap, said ruler having a rectilinear edge acting upon such movement to press part of the pressure sheet into the fold of the open book.

3. Apparatus for making photoprints from books by contact reflex copying, comprising a device for supporting an open book with at least one page exposed and covered by light-sensitive sheet material, a flexible transparent pressure sheet extending over said device so as to span such page and having rolled up ends at opposite sides of said device, tensioning means including elements engaging said rolled ends to hold them tight, said elements being rotatable to replace a pressure sheet portion between the rolled ends by another pressure sheet portion, the supporting device and the tensioning means being relatively movable in a direction transverse to such page so as to press the latter and the spanning pressure sheet firmly together, and a press-ruler mounted over the pressure sheet for movement in the said direction and having a rectilinear edge acting upon movement toward the book to press part of the pressure sheet into the fold of the open book.

KAREL JAN JOZEF VAN DER GRINTEN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,408,310	Hassler	Sept. 24, 1946
2,436,085	Amering	Feb. 17, 1948
2,445,566	De Lano	July 20, 1948

FOREIGN PATENTS

Number	Country	Date
93,396	Germany	Aug. 13, 1897
693,002	Germany	June 29, 1940