March 24, 1959 H. T. HODGES 2,878,740

PHOTOGRAPHIC COPIER

Filed Jan. 31, 1958

2 Sheets-Sheet 1

Fig. 1

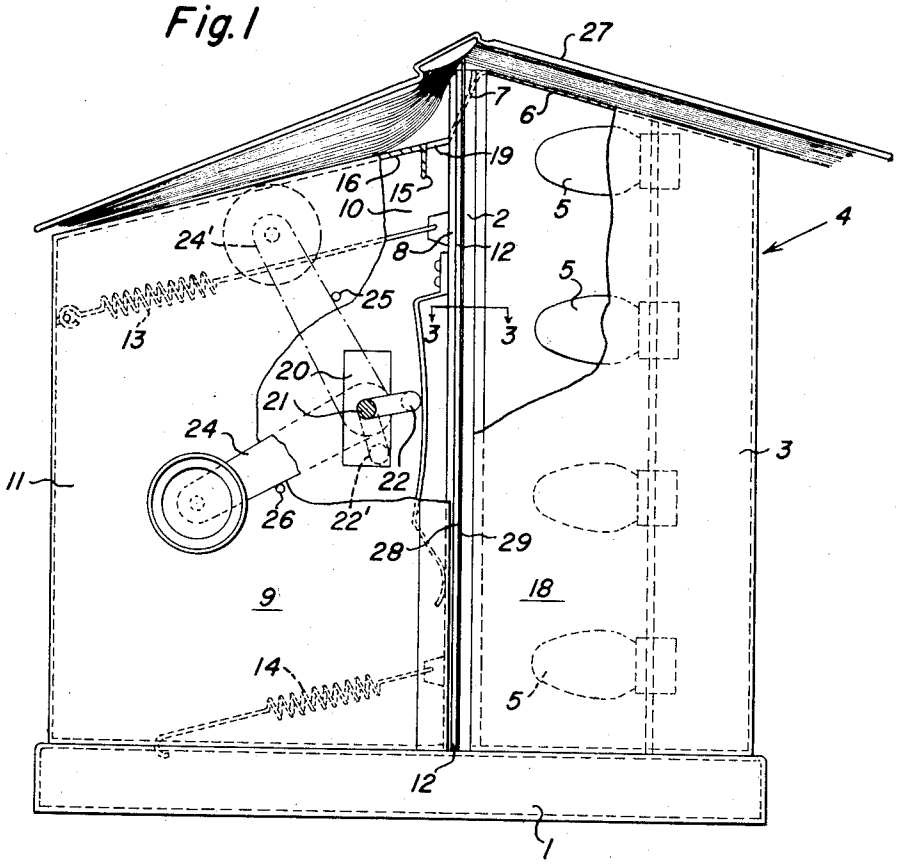
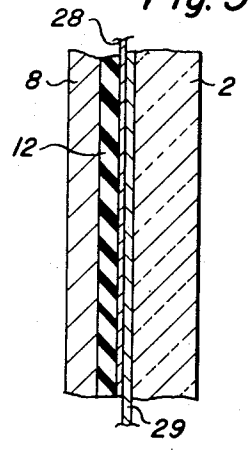


Fig. 3



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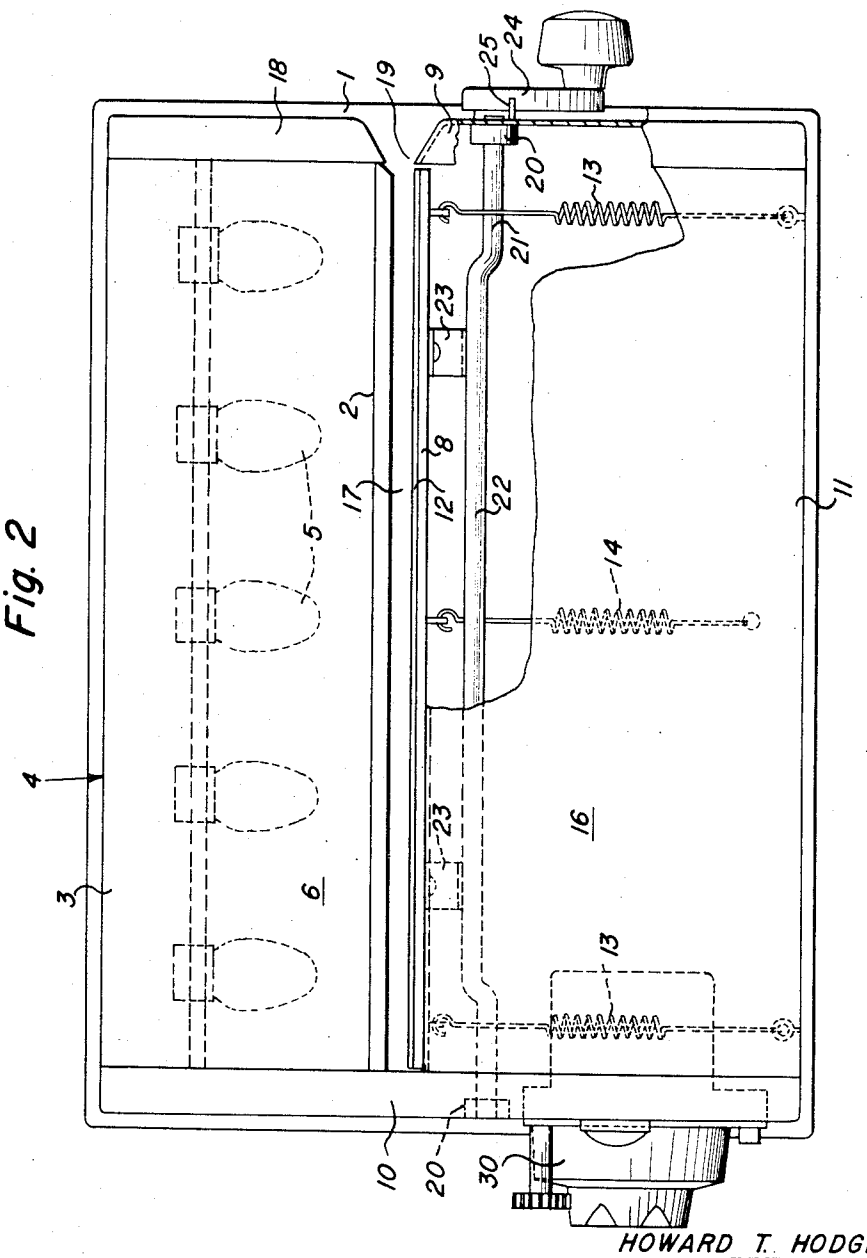
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Fig. 2



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PHOTOGRAPHIC COPIER

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Application January 31, 1958, Serial No. 712,408

7 Claims. (Cl. 95—73)

This invention relates to a photographic copier especially designed to facilitate the photographic copying of the individual pages of bound books.

Copiers for reproducing one or more copies of individual documents and/or pages of books, by utilizing the reflex printing technique, are well known in the art. However, such devices as have been heretofore available, while they performed very satisfactorily insofar as the reproduction of individual sheets or documents was concerned, were quite unsatisfactory when used to reproduce single pages from bound volumes. The problem of holding the page to be reproduced firmly against the illuminated panel of the copier without damaging the binding of the book or volume was not readily overcome in these prior devices and required either a very awkward manipulation of the volume being reproduced or, in some cases, a partial dismantling of the apparatus in order to obtain successful copies.

It is therefore an object of this invention to produce such a copying device which is equally readily useable either for the copying of individual documents or single pages from bound volumes.

A further object is to provide such a copying device wherein there is provided a generally roof-shaped supporting surface upon which a bound volume may be rested, face down, with the page to be reproduced extending substantially vertically downward between an illuminated panel and pressure platen.

A still further object is to provide such a device wherein the panel and pressure platen are so related to the above mentioned book-supporting surface that the page to be copied may be readily reproduced substantially to the binding margin of the page without causing any undue stress on the book binding itself.

A still further object is to provide such a copying device of relatively simple construction and with sufficiently small dimensions and weight that it may be readily carried from place to place.

Broadly, these results are attained by providing a housing containing a vertically arranged illuminating panel and coacting pressure platen, arranged so that when the platen is retracted, a relatively narrow vertical work-receiving space or gap is provided between the platen and panel. The top wall of the housing is provided with a slot in vertical alignment with the space and preferably extending across the entire width of the top and down one side of the housing to permit ready access to the work-receiving space. Moreover, the top of the housing is preferably generally roof-shaped so that a book, a page of which is to be copied, may be rested on the top wall of the housing with the page to be copied, together with a suitable sensitized sheet, extending downwardly between the platen and the illuminating panel.

Further objects will become apparent from the following description and claims particularly when considered in the light of the accompanying drawing wherein:

Fig. 1 is an end view of my improved copier with certain parts broken away to better show the internal construction.

Fig. 2 is a top plan view of the copier, again with portions broken away to show the interior construction; and

Fig. 3 is a fragmentary transverse section taken in the plane indicated by the line 3—3 of Fig. 1.

As best shown in Fig. 1, my improved copier comprises a base across the midportion of which extends a panel 2 of transparent material extending upwardly therefrom. This panel forms the forward wall of the rear section 3 of a housing 4 carried by the base 2. Suitably mounted within the housing section 3 are a plurality of lamps 5 so arranged as to illuminate the panel 2 substantially uniformly over its entire surface. The top wall 6 of the housing section 3 is inclined upwardly toward the panel 2, the forward end of this wall and the upper edge 7 of the panel being substantially coplanar. A pressure platen 8, coextensive in size with panel 2, is carried by the base forwardly of panel 2 for limited movement toward and away from the panel. As is best shown in Fig. 2, this platen is loosely confined between the side members 9 and 10 of the front section 11 of the housing 4 and is likewise positioned substantially vertically. The face of the platen toward the panel 2 is preferably covered with or formed of a resilient pad of rubber or rubber-like material 12. Platen 8 is normally urged to a retracted position by means of tension springs 13 and 14, the upper portion of the platen, when in such retracted position, resting against a suitable flange 15 formed on the rear edge of the top wall 16 of the front housing section 11. Under these conditions there will be a relatively narrow vertical work-receiving space 17 between the panel 2 and platen 8. As is shown in Figs. 1 and 2 the top walls 6 and 16 and the end walls 9 and 18 of the front and rear housing sections have their adjacent edges spaced apart so as to conjointly form a continuous slot 19 extending across the top and down the right hand side of the housing in alignment with the space 17 so as to provide ready access to said space from the exterior of the housing.

Carried by suitable bearings 20 in the front housing section 11 is a cranked shaft 21, the cranked portion 22 of which is arranged to engage or cam against a pair of resilient straps 23 mounted on the forward face of the platen 8. Shaft 21 is provided on its right end with an operating handle 24, exterior of the housing. When this handle 24 is swung to the phantom line position shown at 24' in Fig. 1 the cranked or camming portion 22 of shaft 21 will swing downwardly to the phantom line position indicated at 22' permitting the springs 13 and 14 to move the platen to its normal or retracted position. Movement of the handle counterclockwise from its phantom line position to the full line position shown in Fig. 1 will cause portion 22 of shaft 21 to exert a force against the straps 23 sufficient to overcome the bias of springs 13 and 14 and to move the platen 8 into clamping relationship with the panel 2. The movement of handle 24 may be limited by suitable stops such as indicated at 25 and 26. The latter is preferably so located that portion 22 of shaft 21 will be swung to a position slightly above the axis of shaft 21 so as to effectively constitute a past-center lock which will maintain the platen in its clamping position even though the handle 24 be released.

As is best shown in Fig. 1 both the forward section 16 and the rear section 6 of the top wall of the housing 4 are inclined upwardly toward the work-receiving slot. Moreover, the wall 16 of the front section is preferably depressed slightly below the level of the upper edge of the platen 8 and channel 2. These surfaces conjointly form a work-supporting surface which is particularly effective in supporting a book such as book 27, in face-down position, with the page 28 to be copied ex-

tending downwardly through the slot 19 and into the space between the platen and the transparent panel 2. By having the panel 2 and platen 8 extend clear to the upper edge of the top wall 6 it is possible to copy any page of a bound book substantially to the bound edge of the page. At the same time, due to the fact that the front portion 16 of the top wall is at a somewhat lower level than the top edges of the platen and panel, the remaining pages and cover of the book are supported in a position which removes undue strain from the binding.

It is believed that the operation of this device will be apparent from the preceding description. Ordinary single page documents, together with a sheet 29 of sensitized material, may be readily inserted between the platen 8 and the printing panel 2 when the platen is in its normal, retracted position. Such insertion may be made either through the top or from the side depending upon the individual preference of the operator. Movement of the handle 24 to the full line position as shown in Fig. 1 will thereupon move platen 8 into clamping position wherein it will clamp the document and the sensitized sheet firmly against the panel 2. Lamps 5 will then be illuminated by conventional means, which may include a suitable automatic timer such as is indicated at 30 and which per se forms no part of this invention.

On the other hand, when it is desired to reproduce a particular page, such as the page 28 of book 27, the latter may be opened to the desired page and laid as shown in Fig. 1 across the top of the housing with the page to be reproduced extending downwardly between the platen and panel. A suitable sheet of sensitized paper 29 will of course, be interposed, in accordance with the usual practice for reflex printing, between the page 28 and the panel 2. Operation of the handle 24 to effect the clamping action will then firmly press the desired page and sensitized sheet against the panel 2. Due to the fact that the upper end of the platen 8 is relatively thin and due to the relationship of the top wall 16 of the front portion of the housing to the rest of the apparatus, the book will be supported in a stable fashion, without any undue strain on the binding and yet with the page 28 effectively held in position to be reproduced substantially to its bound margin.

Thus, it can be seen that my improved copying device fully meets the objects of the invention and provides a relatively simple, light unit which may be readily transported. Both pages of bound volumes and individual sheets, so long as they fall within the dimensional limits of the exposure panel 2, may be readily reproduced. While but one specific embodiment has been shown, it will be obvious to those skilled in the art that many variations may be made without departing from the spirit and scope of the invention as defined by the appended claims.

I claim:

1. A photographic copier comprising a base, a substantially vertical panel of transparent material extending upwardly from and transversely across said base, a pressure platen generally parallel to and coextensive with said panel and mounted on said base for movement toward and away from said panel, means normally urging said platen to a retracted position spaced slightly away from said panel to form a relatively narrow vertical work receiving space therebetween, a housing carried by said base having top and side walls, said top and at least one side wall of said housing being provided with a continuous slot extending thereacross in substantial alignment with said work receiving space to permit

access to said work receiving space from the exterior of said housing, means for urging said platen into work-clamping relationship with said panel, and means in said housing on the opposite side of said panel from said platen for substantially uniformly illuminating said panel.

2. A photographic copier as in claim 1 wherein said means for urging said platen to a retracted position comprise tension springs acting on said platen at vertically spaced locations thereon and said means for urging said platen into work-clamping relationship with said panel comprises camming means acting against said platen at a point intermediate said spaced locations, the relative strength of said springs and the point of application of said camming action relative to said spaced locations being so proportioned that, upon actuation of said camming means, the lower portion of said platen will move into work clamping position prior to such movement of the upper portion of said platen.

3. A photographic copier as set forth in claim 1 wherein the portions of the top wall of said housing on opposite sides of the slot therein are inclined upwardly toward said slot to conjointly form a generally inverted V-shaped work supporting surface with said slot extending along its apex.

4. A photographic copier as set forth in claim 1 wherein that portion of the top wall of said housing on the panel side of said slot is inclined upwardly toward said slot, the upper edge of said panel being substantially coplanar with said top wall portion.

5. A photographic copier as set forth in claim 4 wherein that portion of the top wall of said housing on the platen side of said slot is at a lower level than the upper edge of said panel.

6. A photographic copier comprising a base, a box-like housing carried by said base having a continuous slot formed therein extending transversely across the top wall of said housing and thence substantially vertically downwardly across one side wall to said base, a substantially vertical panel of transparent material extending from said top wall to said base and positioned along the rear edge of said slot, means mounted within said housing rearwardly of said panel for substantially uniformly illuminating said panel, a pressure platen generally parallel to and coextensive with said panel movably supported by said base forwardly of said panel, spring means normally urging said platen to a retracted position along the front edge of said slot whereby to provide a relatively narrow, generally vertical work-receiving space between said platen and said panel, said slot providing access to said space through the top and said one side wall of said housing, the top wall of said housing, both forwardly and rearwardly of said slot, being inclined upwardly toward said slot to form a generally inverted V-shaped surface adapted to support a book lying thereon, face downward, with a page to be copied extending downwardly into said space between said panel and said platen, and means for urging said platen toward said panel to clamp said page therebetween.

7. A photographic copier as in claim 6 wherein that portion of said top wall forwardly of said slot is at a lower level than the upper edges of said panel and said platen.

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