May 1, 1934. L. S. WATRES 1,956,887

PHOTOGRAPHIC REPRODUCTION APPARATUS

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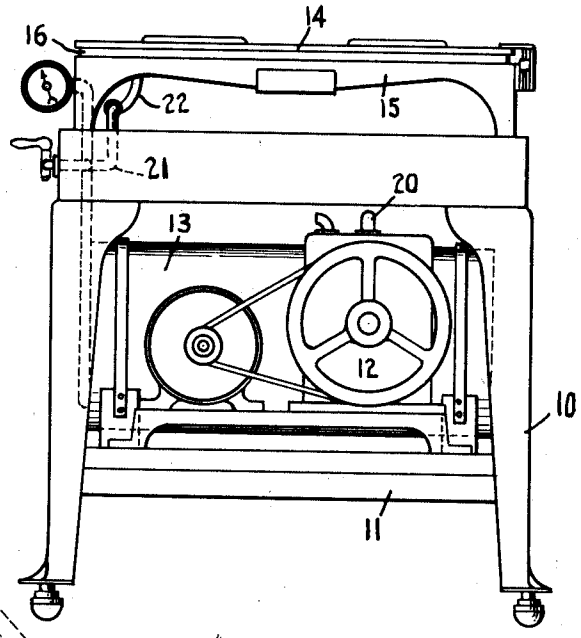



FIG. 1

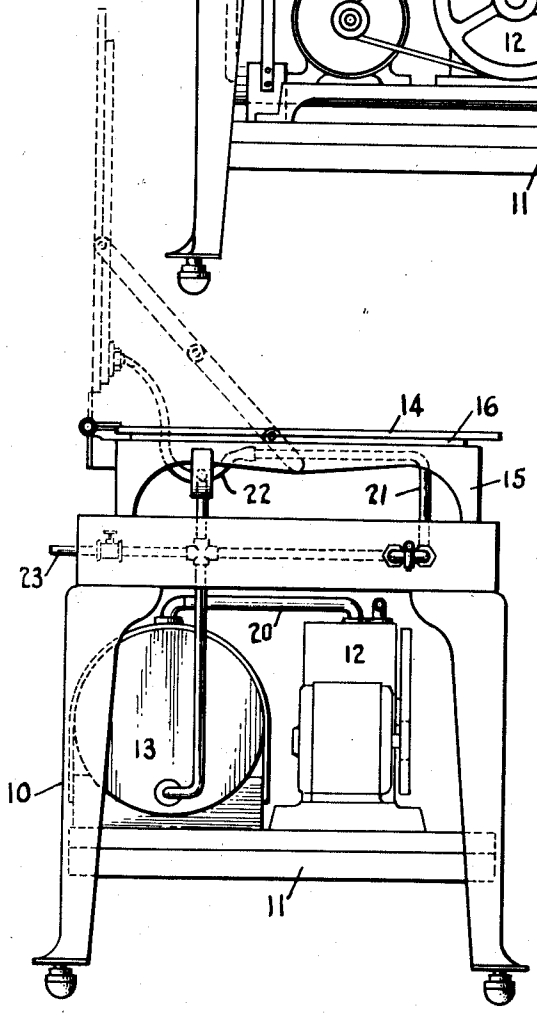



FIG. 2

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## PHOTOGRAPHIC REPRODUCTION APPARATUS

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5 Claims. (Cl. 95—76)

The invention relates to photographic reproduction apparatus and more particularly to printing frames, copyboards and plate or film holders of the vacuum type as employed by photo-engravers, lithographers and rotary gravure printers.

In the operation of such photographic reproduction apparatus it is the practice to mount the negative and a sensitized plate, copy or film in a suitable glass-carrying frame, the said negative and sensitized plate being held therein by means of a flexible cushioning and sealing blanket under the action of a vacuum introduced by means of a connection through the said blanket. It has been proposed, also, to mount the photographic reproduction apparatus for vertical or horizontal position for exposure purposes, the suction connection being constituted by a flexible member such as a rubber hose or the like, and being in direct connection with a vacuum pump.

The present invention has for an object the provision of means in connection with a photographic reproduction apparatus of the nature aforesaid whereby the capacity or output of the frame may be greatly increased through the material reduction in the time required for effecting proper contact between the blanket and the plates, copies or films held thereby within the frame; also, to insure against damage to the work being reproduced in the event of failure of the vacuum pump, as, for example, through the blowing of a fuse in the circuit of the motor driving the same, or from other causes. It will be appreciated that the photographer invariably is busy preparing for the next operation after having set one frame in operation and would not be in a position to prevent the work being reproduced from relaxing from the frame in case of release thereof by the blanket upon failure of the vacuum—it being the practice in most cases to operate the exposure by automatic timing mechanism.

A further object of the invention is to secure the aforesaid advantages without increasing the size of the vacuum pump heretofore utilized.

In carrying out the invention, the glass-carrying frame, which is adapted to receive the negative and a sensitized plate, copy or film for exposure in a vertical or horizontal position, carries also a flexible cushioning and sealing blanket which serves to retain the plate and negative, copy or film temporarily to the frame upon application of suction to the space behind the blanket. In accordance with the invention, this suction is not obtained by connecting the vacuum space behind the blanket directly to a vacuum pump but to a storage tank or reservoir disposed between the pump and vacuum connection, the said tank being of a capacity sufficient to maintain the holding engagement of the blanket to the glass frame element for substantially the full printing period so that, should failure of the said pump occur, no damage will result to the work being reproduced.

Furthermore, in having this initial relatively large supply of vacuum available in preparing the frame, seepage at the contact between the usual marginal bead of the blanket and the glass plate upon which it presses is rapidly overcome, and a positive and perfect contact is attained without the usual delay occasioned in first exhausting the connections. Increase of pump capacity would not materially assist in overcoming this delay, and would also involve increased expense of operation. The time of the set-up of the frame has been reduced in the novel apparatus from some 14 seconds to 3 seconds, thus greatly increasing the capacity of said apparatus. Moreover, in the provision of this storage reservoir, it is possible to operate a plurality of reproduction frames from a single pump by making the proper connection to said reservoir.

The nature of the invention, however, will best be understood when described in connection with the accompanying drawing, in which:

Fig. 1 is a front elevation of the novel photographic reproduction unit.

Fig. 2 is a side elevation thereof, and illustrates also the printing frame in one of the many operative positions.

Referring to the drawing, 10 designates a suitable support or frame having the platform 11 for supporting a motor-driven vacuum pump 12 and a storage tank or reservoir 13. To the top of this supporting frame is attached the glass frame element 14 which is designed normally to rest upon a base member 15. The glass printing frame and base member may be of substantially the nature set forth in U. S. Letters Patent #1,750,253. This printing frame, furthermore, is designed to receive the usual negative and a sensitized plate, copy or film, (not shown) which are to be held to the frame, during the reproducing operation, by means of a flexible cushioning and sealing blanket or the like 16 under the action of a vacuum, all of which is well understood and forms no particular part of the present invention.

Heretofore, it has been the practice to connect the vacuum pump 12 directly to the frame through the blanket 16 for providing sufficient suction behind said blanket to cause the latter to retain the negative, and sensitized plate, copy or film, to the glass frame element. A flexible con-

nection, as of rubber hose, was provided to this end and to admit of tilting the frame into a position suitable for reproduction, as indicated in Fig. 2 of the drawing.

In accordance with the present invention, however, connection is made from the vacuum pump 12 through the pipe 20 to the storage tank or reservoir 13, which is of a capacity of several times that of the pump 12. A connection, as by means of the pipe 21, is then made from this tank to a flexible connection or hose 22 which passes through the blanket as aforesaid.

By this expedient, it is not necessary to increase the capacity of the pump in the endeavor to attain the objects hereinbefore noted, but, as stated, rapid contact is obtained without the usual manipulation between the blanket and the frame; and when the latter is elevated to the upright position indicated in Fig. 2, this contact is assured under all contingencies. There is no danger, therefore, of the blanket separating from the glass frame and releasing the work which would probably be ruined as a result.

Furthermore, additional photographic reproduction apparatus may be operated from the one storage reservoir as by taking one or more connections 23 from the said reservoir.

I claim:

1. A photographic reproduction apparatus, comprising a glass-carrying frame, a sealing blanket adapted to hold the work to the glass, said blanket having a vacuum connection whereby it is attached to and supported by the glass, a vacuum pump, and a reservoir, intermediate the pump and the vacuum connection to the blanket, of a capacity sufficient to maintain holding engagement of the blanket with the glass for the full reproduction period should failure of the said pump occur.

2. A photographic reproduction apparatus, comprising a base, a glass-carrying frame attached thereto, a sealing blanket adapted to hold the work to the glass, a vacuum pump and a vacuum tank mounted upon said base, a suction connection between the pump and tank, and a connection between the tank and the reproduction apparatus through said blanket whereby the blanket is attached to and supported by the glass, said vacuum tank being of a capacity sufficient to maintain holding engagement of the blanket with the glass for the full reproduction period should failure of the said pump occur.

3. A photographic reproduction apparatus, comprising a base, a glass-carrying frame pivotally mounted upon the base, a flexible sealing blanket adapted to hold the work temporarily to the glass, a vacuum connection through said sealing blanket whereby the blanket is temporarily attached to and supported by the glass, a vacuum pump, and a vacuum tank, connected in series with the pump and the connection to the blanket, said tank being of sufficient capacity to maintain the sealing member in holding engagement with the glass for the full reproduction period, should failure of the pump occur.

4. In a photographic reproduction apparatus, the combination of a base, a printing frame mounted upon the base, said frame comprising a support member having a glass-carrying frame pivotally attached thereto, a flexible cushioning and sealing member adapted to temporarily hold the work to the glass, a vacuum connection through the sealing member, a vacuum pump, and a vacuum tank between the pump and the connection to the sealing member, said tank being of sufficient capacity to maintain the sealing member in holding engagement with the glass of the printing frame for the full reproduction period, should failure of the pump occur.

5. In a photographic reproduction apparatus, the combination of a base having a platform formed therewith, a printing frame mounted upon the base, said frame comprising a support member having a glass-carrying frame pivotally attached thereto, a flexible cushioning and sealing member adapted to receive a sensitized plate and a negative from which a print is to be made, a vacuum connection through the sealing member, a vacuum pump mounted upon the platform formed with the base and a vacuum tank mounted upon said platform between the pump and the vacuum connection to the sealing member, said tank being of sufficient capacity to maintain the sealing member in holding engagement with the glass of the printing frame for the full reproduction period, should failure of the pump occur.

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