G. NOETZEL.

VACUUM PRINTING FRAME.

APPLICATION FILED SEPT. 10, 1912.

1,096,640. Patented May 12, 1914.

Fig. 1

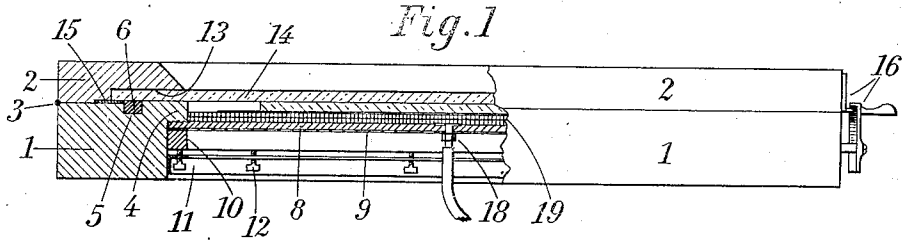


Fig. 2

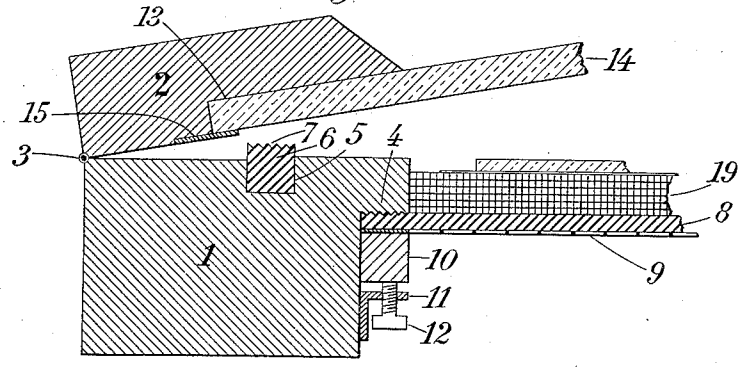
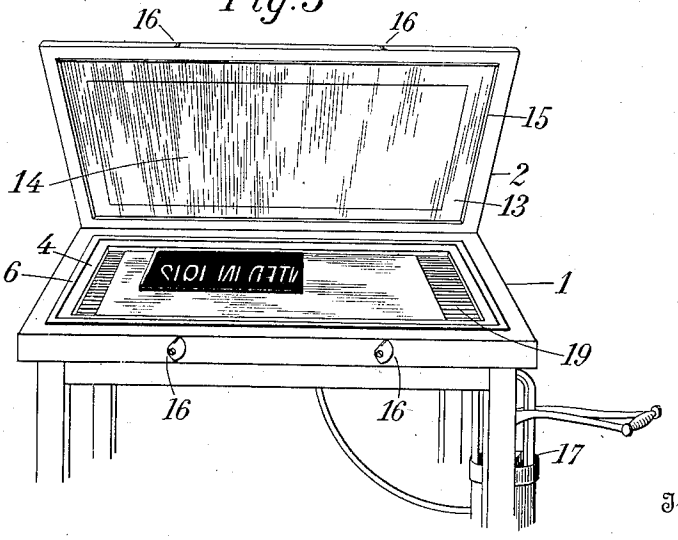


Fig. 3



Witnesses

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UNITED STATES PATENT OFFICE.

GREGOR NOETZEL, OF WASHINGTON, DISTRICT OF COLUMBIA.

VACUUM PRINTING-FRAME.

1,096,640. Specification of Letters Patent. Patented May 12, 1914.

Application filed September 10, 1912. Serial No. 719,677.

To all whom it may concern:

Be it known that I, GREGOR NOETZEL, a citizen of the United States, residing at Washington, in the District of Columbia, and whose post-office address is 812 Taylor street northwest, Washington, District of Columbia, have invented a certain new and useful Improvement in Vacuum Printing-Frames, of which the following is a full, clear, and exact description.

This invention relates to photographic printing apparatus, and the objects of the invention are to provide a simple but efficient apparatus by which a close contact between a tracing or a photographic negative and a sensitized paper or other sensitized material, such as a zinc or an aluminum plate, may be effected more expeditiously than has been possible with printing apparatus heretofore provided for this purpose; to provide a printing frame by which the number of operations necessary in the "loading" of the frame is decreased, and which will enable the operator to maintain the frame in a serviceable condition with least expenditure of time and cost; and further and more particularly to provide a printing frame or apparatus for carrying out the method of printing a design requiring more than one negative by successively printing sections of the design upon a sensitized medium through one negative at a time, as described and claimed in my application for patent filed August 8, 1912, Serial No. 714,051.

It is recognized in the art of photographic printing that the closest contact between the medium carrying the design and the sensitized sheet, whether it be paper or other material, can be obtained, with the least danger of breakage of parts of the printing frame, by that type of apparatus known as "vacuum printing frames," none of which, however, has been so constructed as to be suitable for carrying out the method of photographic reproduction of designs set forth in my application hereinbefore referred to, which method requires that the bottom or pad holding portion of the frame be stationary in order that the sensitized sheet may be deposited in the frame face up, and that the negative or other design-bearing medium may be deposited in the frame upon the sensitized sheet last, and the top of the frame containing the light-admitting glass be fastened down upon the loaded bottom portion of the frame. Furthermore, it is well known that in operating a printing frame which opens from the back, it is necessary to remove and to replace certain parts of the frame itself and all of the inner equipments, such as are used as "backing". Then, also, the various devices for obtaining an air-tight compartment within the frame from which the air may be exhausted, are at present very expensive, and comprise certain mechanical parts of such construction that they cannot be readily repaired or replaced whenever they become worn or damaged.

Therefore, it is the object of my invention to provide a vacuum printing frame which opens and may be loaded from the top and thus diminish the number of operations necessary in the loading of such frames as heretofore constructed, and also enable the operator to maintain the frame in a serviceable condition with least delay and least expense.

The invention consists in a vacuum printing frame opening and adapted to be loaded from the top; and also in the details of construction of such a frame, all substantially as I will proceed now more particularly to set forth and finally claim.

In the accompanying drawings, illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1 is a side view, partly in section and partly in elevation. Fig. 2 is a cross-section, on a larger scale, of the hinged side of the frame, and Fig. 3 is a perspective view of the frame mounted upon a table and in open position, with the sensitized medium and negative arranged therein, and showing the air pump for exhausting the air from the frame.

1 is the main or bottom frame, and 2 is the top frame hinged to the main or bottom frame 1, as at 3.

The main or bottom frame 1 is preferably of rectangular shape, and provided at its upper inner edge with an overhanging flange or ledge 4. A groove or recess 5 extends around the entire upper surface of the frame, and is adapted to receive a suitable elastic packing, preferably a solid strip of rubber 6, loosely fitted in said groove 5 and having its upper surface grooved as at 7, to better effect an air-tight contact with the glass of the top frame 2 to be referred to.

Fitted within the frame 1 and underlying

the over-hanging flange 4 is a rubber or other air-tight blanket or sheet 8, and placed upon the underside of the rubber blanket 8 is a piece of wire netting or other suitable stiff, foraminous material 9, which serves as a diaphragm or support for the rubber blanket or sheet. Also closely fitted within the underside of the frame 1, and capable of a sliding movement therein, is a follower frame 10, adapted to be forced into engagement with the rubber blanket and its supporting wire netting to press the edges of said rubber blanket into firm contact with the overhanging flange 4 to effect an air-tight contact between said parts.

Rigidly secured to the inner side of the frame 1 and below the follower frame 10 is preferably a right angle frame or bracket 11, of metal or other suitable rigid material, and fitted in said frame or bracket 11 at suitable distances apart are a series of set screws 12 adapted to engage the follower frame 10 and serve to force said follower frame into engagement with the rubber blanket or sheet to maintain said blanket or sheet in firm or air-tight contact with the overhanging flange 4, as above stated.

The top frame 2 is suitably rabbeted as at 13, to receive the glass 14, which may be secured in the frame in any suitable manner, but as shown is secured in the frame by a metallic binding strip 15 fastened to the frame in any suitable manner and overhanging the glass, whereby the glass may readily be removed or replaced by a new one in case of breakage. The glass 14 rests upon the packing 6 and in order to effect an air-tight contact between the glass and the packing 6 the frame is provided at any number of places with a tightening and locking device 16.

Any suitable connection with the interior of the frame with an exhaust pump may be provided, but as herein shown, such a pump as at 17, Fig. 3, may be connected with the interior of the frame by means of a hose and nipple connection through the rubber blanket, as shown at 18, Fig. 1.

19 is a pad or backing of felt or any other suitable material as is usually employed in printing frames, upon which the sensitized printing medium is placed. By this construction it will be observed that an air-tight frame is provided from which the air can be exhausted by any well-known apparatus for producing a vacuum, and the operation of which does not require the repeated removal and replacing of the parts of the frame for each loading or successive printing operation of the frame. And, furthermore, the frame is so constructed that its various parts can readily be adjusted, renewed, or replaced, in case of emergency, by any material suitable for the purpose, irrespective of any specific or special construction of such parts to adapt them to perform their functions or purposes. This is particularly true of the air-tight blanket or bottom of the frame, thereby enabling the operator to maintain the frame in serviceable condition with least expense and least time and labor.

The frame as thus constructed is adapted to be supported upon a table or other support, either fixed or movable, as shown in Fig. 3, with its hinged top or exposure side up, and when it is desired to use the frame it is only necessary to raise its hinged top and then lay the sensitized printing medium in the lower part of the frame upon the pad or backing, face up, and upon this sensitized printing medium the negative is then properly positioned, and the top closed down upon the thus loaded frame, and clamped tightly by its locking devices, the glass 14 making a firm and air-tight contact with the elastic packing 6. The air pump is then put into operation and the air exhausted from the interior of the frame, the vacuum thus produced in the frame causes the external atmospheric pressure to act upon the rubber blanket or sheet 8 through the foraminous diaphragm 9 and to effect the desired pressure between the sensitized printing medium and the negative, forcing said parts against the glass 14 and producing an efficient contact throughout between the entire surfaces of the negative and printing medium. The frame is then subjected to the light to effect the printing, and then it is simply necessary to unlock the frame and lift the hinged top to remove the negative and the print made therefrom, and the operation of printing as thus carried on may be repeated as many times as is necessary without the necessity of removing any parts of the frame or its equipment or of turning the frame upside down for the purpose of loading, printing and unloading, as has heretofore been necessary with the vacuum printing frames now in use.

As hereinbefore stated, this invention is designed more particularly to carry out the method of reproducing designs requiring more than one negative, as set forth in my application referred to, and it will be observed that with this invention, it is only necessary to place within the frame the sensitized printing medium of the required size to take the complete design to be reproduced, and to successively print the several sections of the design by properly placing and registering the several negatives in the frame upon the sensitized printing medium, it being essential, in carrying out this method, that the negative, the placing of which concludes the loading of the frame, must be deposited upon the face of the sensitized medium.

I have shown in Fig. 3 a frame loaded

with a sensitized printing medium to receive a design requiring more than one negative, with a negative containing a section of the design to be printed, positioned thereon.

What I claim is:—

1. A vacuum printing frame, comprising a lower frame having a flexible air-tight bottom adapted to support the sensitized medium and negative placed in said frame from the top, a frame and a glass fitted therein adapted to close said lower frame after it has been loaded, whereby the loaded frame may be exposed to the light without reversing, and an elastic packing interposed between said frames to effect an air-tight closure of the same.

2. A vacuum printing frame, comprising a lower frame, a rubber blanket fitted air-tight in and constituting the bottom of said lower frame and adapted to support the sensitized medium and negative loaded in said frame from the top or exposure side, an elastic packing in the upper surface of said lower frame and surrounding the opening therein, and a hinged top or upper frame having a glass therein adapted to engage said elastic packing, and means for clamping said top or upper frame in closed position to effect an air-tight closure of such printing frame, said frame as thus loaded from the top being adapted to be exposed to the light without reversing the frame.

3. A vacuum printing frame, comprising a lower frame, a rubber blanket fitted air-tight in and constituting the bottom of said lower frame, a foraminous diaphragm arranged next to said blanket and serving as a support therefor, an elastic packing in the top of said lower frame and surrounding the opening therein, and a top or upper frame having a glass therein adapted to engage said elastic packing, and means for clamping said top or upper frame in closed position to effect an air-tight closure of such printing frame.

4. A vacuum printing frame, comprising a lower frame, a rubber blanket fitted in and constituting the bottom of said lower frame, a foraminous diaphragm arranged next to said blanket and serving as a support therefor, a follower frame fitted in said lower frame and engaging said blanket and diaphragm, adjusting means engaging said follower frame for forcing said blanket into air-tight contact with the lower frame, an elastic packing in the top of said lower frame and surrounding the opening therein, a hinged top for said lower frame having a glass therein adapted to engage said elastic packing, and means for clamping said top in closed position to effect an air-tight closure of such printing frame.

In testimony whereof, I have hereunto set my hand this 9th day of September 1912.

GREGOR NOETZEL.

Witnesses:
ALBERT B. BLACKWOOD,
W. O. BLACKWOOD.